Schema documentation for Project.xsd

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Resource hierarchy:

Legend: *Import,* *Include,* *Redefine,* *Cycle detected*

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    - CommonSystemProperties.xsd
      - Common.xsd
      - EnergyConsumption.xsd
        - Common.xsd
      - Schedule.xsd
  - Building.xsd
    - Common.xsd
    - RoofPlane.xsd
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        - Common.xsd
    - EnergyConsumption.xsd
      - Common.xsd
    - Zone.xsd
      - Common.xsd
      - Schedule.xsd
  - Common.xsd
  - DistributionSystem.xsd
    - Common.xsd
    - CommonSystemProperties.xsd
      - Common.xsd
      - EnergyConsumption.xsd
        - Common.xsd
      - Schedule.xsd
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    - Common.xsd
  - HVACSystem.xsd
    - Common.xsd

- CommonSystemProperties.xsd
  - Common.xsd
  - EnergyConsumption.xsd
    - Common.xsd
  - Schedule.xsd
- Schedule.xsd

- LightingSystem.xsd
  - Common.xsd
  - CommonSystemProperties.xsd
    - Common.xsd
    - EnergyConsumption.xsd
      - Common.xsd
    - Schedule.xsd
  - Schedule.xsd

- Participant.xsd
  - Common.xsd

- PvSystem.xsd
  - Common.xsd
  - CommonElectrical.xsd
    - Common.xsd
  - CommonSolar.xsd
    - Common.xsd
  - RoofPlane.xsd
    - CommonSolar.xsd
      - Common.xsd

- UtilityService.xsd
  - Common.xsd
  - EnergyConsumption.xsd
    - Common.xsd

- WaterHeatingSystem.xsd

- Common.xsd
- CommonSystemProperties.xsd
  - Common.xsd
  - EnergyConsumption.xsd
    - Common.xsd
  - Schedule.xsd
- Schedule.xsd
- DistributionSystem.xsd
  - Common.xsd
  - CommonSystemProperties.xsd
    - Common.xsd
    - EnergyConsumption.xsd
      - Common.xsd
    - Schedule.xsd

Namespace: "http://www.iepmodel.net"

Schema(s)

Main schema `Project.xsd`

Namespace	http://www.iepmodel.net
Properties	attribute form default: `unqualified` element form default: `unqualified`

Included schema `Appliance.xsd`

Namespace	http://www.iepmodel.net
Properties	attribute form default: `unqualified` element form default: `unqualified`

Included schema `CommonSystemProperties.xsd`

Namespace	http://www.iepmodel.net

Annotations	`This schema defines the common attributes used by all systems.`
	
	`System contains "Design_____" quantities to refer to the level of performance that the "system" was design to operate at. Generally when doing an analysis, the design range of performance is considered. However, a particular equipment may have a different constraint on its capacity or output.`

Properties	attribute form default: `unqualified` element form default: `unqualified`

Included schema `Common.xsd`

Namespace	http://www.iepmodel.net

Annotations	The purpose of this schema is to define a set of types and quantities that are frequently used by other schema and can be referenced in a consistent manner. Each object is a ComplexType that includes a Value attribute and a Units attribute, which refers to an associated enumeration of units of measurement. Some objects have additional attributes that are useful for specifying additional information relevant to the value of the quantity (such as test conditions). The purpose of these classes/objects is not to indicate the way a quantity is used, but rather the value and unit of measurement of that quantity. The naming of the element or attribute, which is of a "CommonQuantities" type is the way in which we should indicate the manner in which the quantity is use
Properties	attribute form default: unqualified element form default: unqualified version: 1.0

Included schema EnergyConsumption.xsd

Namespace	http://www.iepmodel.net
Annotations	<xs:include schemaLocation="\CommonQuantities.xsd"/> The IEPModel team looked at using the gbXML model for energy consumption, which uses a time period ENUM of named calendar months, or "annual." A critical IEP use of energy consumption data is to pass historical billing data. Billing data starts on any given date, and has a number of billing days, along with qty. We should not assume that such raw billing data will be transformed into monthly/annual periods prior to being transferred via IEP between applications. Consider that a PV marketer could actually collect billing data as part of their service. They would transfer the data as part of a lead that they sell to a contractor. The IEP team agreed that it is NOT sufficient to simplify energy consumption periods into calendar months or annual periods. We agreed that it makes sense to provide for abilty to send raw billing data or monthly/annual data. Therefore our IEP model defines an EnergyConsumption type that can contain multiple EnergyConsumptionRecords that each correspond to a defined time period. Note that we currently use UtilityService XSD for capturing simple rough consumption estimates (e.g. I use 1000kWhrs/month, or my bill averages $X/month).
Properties	attribute form default: unqualified element form default: unqualified

Included schema Schedule.xsd

Namespace	http://www.iepmodel.net
Annotations	This is based on the gbxml Schedule classes
Properties	attribute form default: unqualified element form default: unqualified

Included schema Building.xsd

Namespace	http://www.iepmodel.net
Annotations	Need to add other types of spaces within a building to cover buildings other than homes Consider extending BuildingType and SpaceType in the Space xml class to cover more than one program type
Properties	attribute form default: unqualified element form default: unqualified

Included schema RoofPlane.xsd

Namespace	http://www.iepmodel.net
Properties	attribute form default: unqualified

	element form default: `unqualified`
	version: `1.0`

Included schema `CommonSolar.xsd`

Namespace	http://www.iepmodel.net
Properties	attribute form default: `unqualified`
	element form default: `qualified`
	version: `1.0`

Included schema `Zone.xsd`

Namespace	http://www.iepmodel.net
Annotations	`A Zone should point to systems that condition it. (Systems point to a zone to indicate location - where the equipment resides).`
Properties	attribute form default: `unqualified`
	element form default: `unqualified`

Included schema `DistributionSystem.xsd`

Namespace	http://www.iepmodel.net
Properties	attribute form default: `unqualified`
	element form default: `unqualified`

Included schema `CommonElectrical.xsd`

Namespace	http://www.iepmodel.net
Properties	attribute form default: `unqualified`
	element form default: `unqualified`
	version: `1.0`

Included schema `HVACSystem.xsd`

Namespace	http://www.iepmodel.net
Annotations	`This schema defines the parameters associated with an HVAC system.` `An HVAC system may contain any combination of the following: a heating system, a cooling system and ventilation system. Ventilation is defined here as a system that exchanges air in a conditioned zone with air outside the building.` `An HVAC system may also contain an instance of a distribution system, which is used to condition (transfer heat to or from) a space. The distribution system consists (optionally) of prime movers (pumps or fans) and segments (segments of duct or pipe, etc.). Note that there can be only one space-serving distribution system per instance of an HVAC system. Therefore, if multiple distribution systems serve a space, multiple HVAC systems must be defined.`  `An HVAC system serves a zone, however, zones reference the HVAC systems that serve them.`  `Note that parameters associated with the transport and movement of air and water are captured in a Distribution System.`
Properties	attribute form default: `unqualified`
	element form default: `unqualified`

Included schema `LightingSystem.xsd`

Namespace	http://www.iepmodel.net

Annotations	<xs:include schemaLocation="\CommonQuantities.xsd"/> <xs:include schemaLocation="\Equipment.xsd"/> The lighting system is a collection of lighting as defined by the user that illuminates one area. Note that the area may encompass many rooms or a single physical space as the user desires. However, if the user wishes to distinguish between different areas, multiple Lighting Systems should be defined. This object may represent a collection of different types of lighting or it may be convenient (and simpler) to only define one type of lighting in the system and use multiple Lighting Systems varying lighting types.
Properties	attribute form default: unqualified element form default: unqualified

Included schema `Participant.xsd`

Namespace	http://www.iepmodel.net
Annotations	This is intended to cover all participants including Consumers, Service Providers, etc.
Properties	attribute form default: unqualified element form default: unqualified

Included schema `PvSystem.xsd`

Namespace	http://www.iepmodel.net
Properties	attribute form default: unqualified element form default: unqualified

Included schema `UtilityService.xsd`

Namespace	http://www.iepmodel.net
Annotations	Defines a utility service for a site.
Properties	attribute form default: unqualified element form default: unqualified

Included schema `WaterHeatingSystem.xsd`

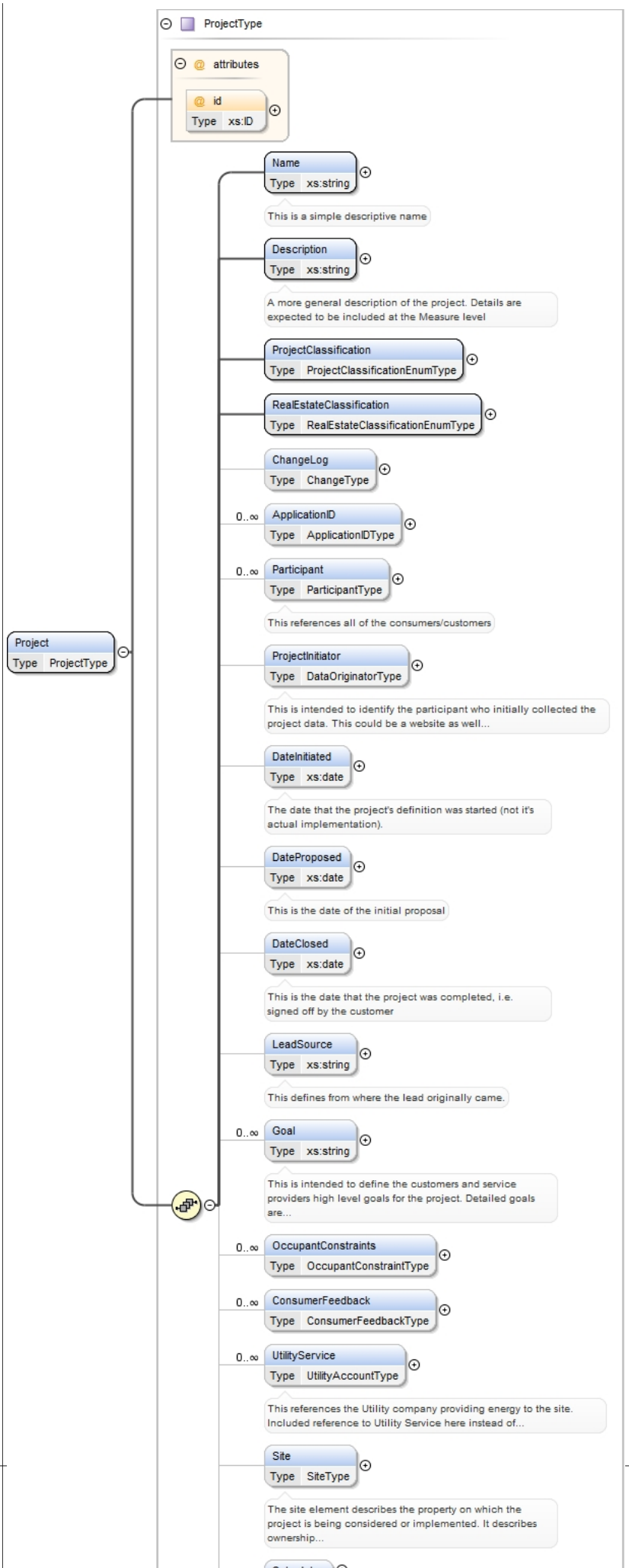
Namespace	http://www.iepmodel.net
Properties	attribute form default: unqualified element form default: unqualified

Element(s)

Element `Project`

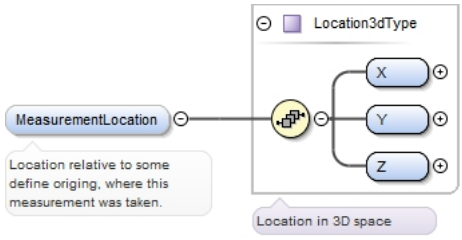
Namespace	http://www.iepmodel.net

Diagram


ProjectType
attributes
id
Type xs:ID
Name
Type xs:string
This is a simple descriptive name
Description
Type xs:string
A more general description of the project. Details are expected to be included at the Measure level
ProjectClassification
Type ProjectClassificationEnumType
RealEstateClassification
Type RealEstateClassificationEnumType
ChangeLog
Type ChangeType
0..∞
ApplicationID
Type ApplicationIDType
0..∞
Participant
Type ParticipantType
This references all of the consumers/customers
Project
Type ProjectType
ProjectInitiator
Type DataOriginatorType
This is intended to identify the participant who initially collected the project data. This could be a website as well...
DateInitiated
Type xs:date
The date that the project's definition was started (not it's actual implementation).
DateProposed
Type xs:date
This is the date of the initial proposal
DateClosed
Type xs:date
This is the date that the project was completed, i.e. signed off by the customer
LeadSource
Type xs:string
This defines from where the lead originally came.
0..∞
Goal
Type xs:string
This is intended to define the customers and service providers high level goals for the project. Detailed goals are...
0..∞
OccupantConstraints
Type OccupantConstraintType
0..∞
ConsumerFeedback
Type ConsumerFeedbackType
0..∞
UtilityService
Type UtilityAccountType
This references the Utility company providing energy to the site. Included reference to Utility Service here instead of...
Site
Type SiteType
The site element describes the property on which the project is being considered or implemented. It describes ownership...

Type	ProjectType
Properties	content: complex
Model	Name , Description , ProjectClassification , RealEstateClassification , ChangeLog{0,1} , ApplicationID* , Participant* , ProjectInitiator{0,1} , DateInitiated{0,1} , DateProposed{0,1} , DateClosed{0,1} , LeadSource{0,1} , Goal* , OccupantConstraints* , ConsumerFeedback* , UtilityService* , Site{0,1} , Schedules{0,1} , ExistingAppliance* , ExistingDistributionSystem* , ExistingElectricalDistributionSystem{0,1} , ExistingHVAC* , ExistingLighting* , ExistingPvSystem* , ExistingWaterHeatingSystem* , Measure* , ScopeOfWork*
Children	ApplicationID, ChangeLog, ConsumerFeedback, DateClosed, DateInitiated, DateProposed, Description, ExistingAppliance, ExistingDistributionSystem, ExistingElectricalDistributionSystem, ExistingHVAC, ExistingLighting, ExistingPvSystem, ExistingWaterHeatingSystem, Goal, LeadSource, Measure, Name, OccupantConstraints, Participant, ProjectClassification, ProjectInitiator, RealEstateClassification, Schedules, ScopeOfWork, Site, UtilityService
Instance	<Project id="" xmlns="http://www.iepmodel.net"> <Name>{1,1}</Name> <Description>{1,1}</Description> <ProjectClassification>{1,1}</ProjectClassification> <RealEstateClassification>{1,1}</RealEstateClassification> <ChangeLog>{0,1}</ChangeLog> <ApplicationID>{0,unbounded}</ApplicationID> <Participant id="">{0,unbounded}</Participant> <ProjectInitiator ParticipantID="">{0,1}</ProjectInitiator> <DateInitiated>{0,1}</DateInitiated> <DateProposed>{0,1}</DateProposed> <DateClosed>{0,1}</DateClosed> <LeadSource>{0,1}</LeadSource> <Goal>{0,unbounded}</Goal> <OccupantConstraints>{0,unbounded}</OccupantConstraints> <ConsumerFeedback>{0,unbounded}</ConsumerFeedback> <UtilityService>{0,unbounded}</UtilityService> <Site id="">{0,1}</Site> <Schedules>{0,1}</Schedules> <ExistingAppliance>{0,unbounded}</ExistingAppliance> <ExistingDistributionSystem id="">{0,unbounded}</ExistingDistributionSystem> <ExistingElectricalDistributionSystem>{0,1}</ExistingElectricalDistributionSystem> <ExistingHVAC id="">{0,unbounded}</ExistingHVAC> <ExistingLighting>{0,unbounded}</ExistingLighting> <ExistingPvSystem>{0,unbounded}</ExistingPvSystem> <ExistingWaterHeatingSystem id="">{0,unbounded}</ExistingWaterHeatingSystem> <Measure id="">{0,unbounded}</Measure> <ScopeOfWork id="">{0,unbounded}</ScopeOfWork> </Project>
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **id** / xs:ID / / / optional
Source	<xs:element name="Project" type="ProjectType"/>

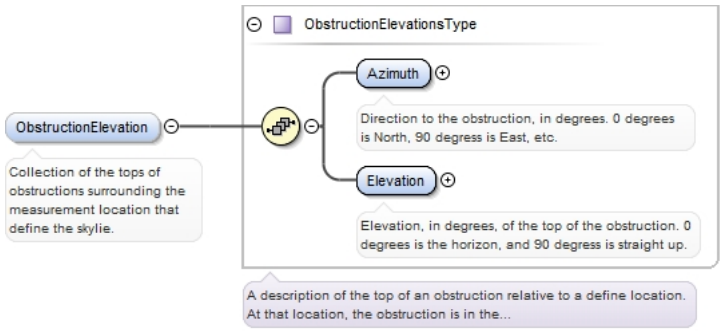
Element BasicSolarAccessMeasurementType / MeasurementLocation

Namespace	http://www.iepmodel.net
Annotations	Location relative to some define origing, where this measurement was taken.
Diagram	
Type	Location3dType
Properties	content: complex minOccurs: 0
Model	X , Y , Z
Children	X, Y, Z
Instance	<MeasurementLocation xmlns="http://www.iepmodel.net"> <X>{1,1}</X> <Y>{1,1}</Y> <Z>{1,1}</Z>

	`</MeasurementLocation>`

Source	`<xs:element name="MeasurementLocation" type="Location3dType" minOccurs="0">`
	`  <xs:annotation>`
	`  <xs:documentation>Location relative to some define origing, where this measurement was taken.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element ObstructionElevationsMeasurementType / ObstructionElevation

Namespace	http://www.iepmodel.net
Annotations	Collection of the tops of obstructions surrounding the measurement location that define the skylie.
Diagram	
Type	ObstructionElevationsType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Azimuth , Elevation
Children	Azimuth, Elevation

Instance	`<ObstructionElevation xmlns="http://www.iepmodel.net">`
	`  <Azimuth>{1,1}</Azimuth>`
	`  <Elevation>{1,1}</Elevation>`
	`</ObstructionElevation>`

Source	`<xs:element name="ObstructionElevation" type="ObstructionElevationsType" minOccurs="0" maxOccurs="unbounded">`
	`  <xs:annotation>`
	`  <xs:documentation>Collection of the tops of obstructions surrounding the measurement location that define the skylie.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

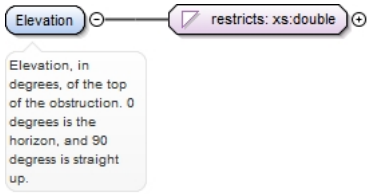
Element ObstructionElevationsType / Azimuth

Namespace	http://www.iepmodel.net
Annotations	Direction to the obstruction, in degrees. 0 degrees is North, 90 degress is East, etc.
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 1 maxOccurs: 1
Facets	maxInclusive 359 minInclusive 0

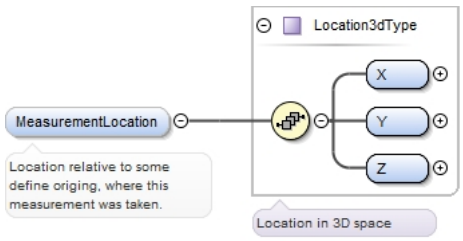
Source	`<xs:element name="Azimuth" maxOccurs="1" minOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>Direction to the obstruction, in degrees. 0 degrees is North, 90 degress is East, etc.</xs:documentation>`

```
  </xs:annotation>
  <xs:simpleType>
    <xs:restriction base="xs:double">
      <xs:minInclusive value="0"/>
      <xs:maxInclusive value="359"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

Element ObstructionElevationsType / Elevation

Namespace	http://www.iepmodel.net
Annotations	Elevation, in degrees, of the top of the obstruction. 0 degrees is the horizon, and 90 degress is straight up.
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 1 maxOccurs: 1
Facets	maxInclusive 90 minInclusive 0
Source	<xs:element name="Elevation" maxOccurs="1" minOccurs="1"> <xs:annotation> <xs:documentation>Elevation, in degrees, of the top of the obstruction. 0 degrees is the horizon, and 90 degress is straight up.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="0"/> <xs:maxInclusive value="90"/> </xs:restriction> </xs:simpleType> </xs:element>

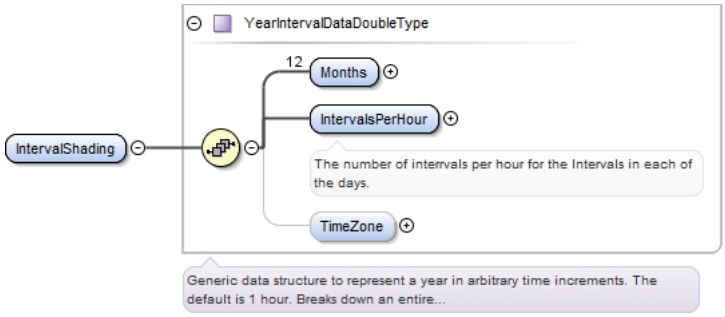
Element ObstructionElevationsMeasurementType / MeasurementLocation

Namespace	http://www.iepmodel.net
Annotations	Location relative to some define origing, where this measurement was taken.
Diagram	
Type	Location3dType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	X , Y , Z
Children	X, Y, Z
Instance	<MeasurementLocation xmlns="http://www.iepmodel.net"> <X>{1,1}</X> <Y>{1,1}</Y> <Z>{1,1}</Z>

	`</MeasurementLocation>`

Source	`<xs:element name="MeasurementLocation" type="Location3dType" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>Location relative to some define origing, where this measurement was taken.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

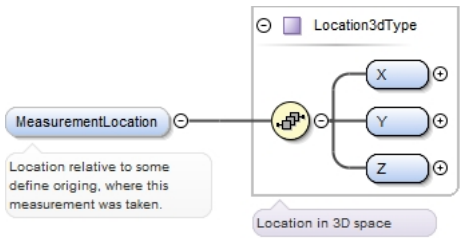
Element `TimeIntervalShadingMeasurmentType / IntervalShading`

Namespace	http://www.iepmodel.net
Diagram	
Type	YearIntervalDataDoubleType
Properties	content: `complex` minOccurs: `1` maxOccurs: `1`
Model	Months{12,12} , IntervalsPerHour , TimeZone{0,1}
Children	IntervalsPerHour, Months, TimeZone

Instance	`<IntervalShading xmlns="http://www.iepmodel.net">`
	`  <Months>{12,12}</Months>`
	`  <IntervalsPerHour>{1,1}</IntervalsPerHour>`
	`  <TimeZone>{0,1}</TimeZone>`
	`</IntervalShading>`

Source	`<xs:element name="IntervalShading" type="YearIntervalDataDoubleType" maxOccurs="1" minOccurs="1"/>`

Element `TimeIntervalShadingMeasurmentType / MeasurementLocation`

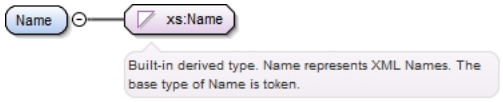
Namespace	http://www.iepmodel.net
Annotations	`Location relative to some define origing, where this measurement was taken.`
Diagram	
Type	Location3dType
Properties	content: `complex` minOccurs: `0` maxOccurs: `1`
Model	X , Y , Z
Children	X, Y, Z

Instance	`<MeasurementLocation xmlns="http://www.iepmodel.net">`
	`  <X>{1,1}</X>`
	`  <Y>{1,1}</Y>`
	`  <Z>{1,1}</Z>`
	`</MeasurementLocation>`

Source	`<xs:element name="MeasurementLocation" type="Location3dType" minOccurs="0" maxOccurs="1">`

```
  <xs:annotation>
    <xs:documentation>Location relative to some define origing, where this measurement was
 taken.</xs:documentation>
  </xs:annotation>
</xs:element>
```

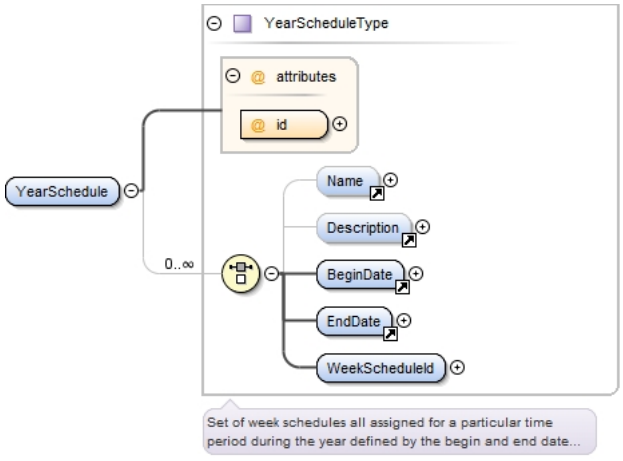
Element Name

Namespace	http://www.iepmodel.net
Diagram	
Type	xs:Name
Properties	content: simple
Used by	Complex Types DayScheduleType, ScheduleType, WeekScheduleType, YearScheduleType
Source	`<xs:element name="Name" type="xs:Name"/>`

Element Description

Namespace	http://www.iepmodel.net
Diagram	
Type	DescriptionType
Properties	content: simple
Used by	Complex Types DayScheduleType, ScheduleType, WeekScheduleType, YearScheduleType
Source	`<xs:element name="Description" type="DescriptionType"/>`

Element YearSchedule

Namespace	http://www.iepmodel.net
Diagram	
Type	YearScheduleType
Properties	content: complex
Used by	Complex Type ScheduleType
Model	Name{0,1} | Description{0,1} | BeginDate | EndDate | WeekScheduleId
Children	BeginDate, Description, EndDate, Name, WeekScheduleId

Instance	`<YearSchedule id="" xmlns="http://www.iepmodel.net">`
	`  <Name>{0,1}</Name>`
	`  <Description>{0,1}</Description>`
	`  <BeginDate>{1,1}</BeginDate>`
	`  <EndDate>{1,1}</EndDate>`
	`  <WeekScheduleId weekScheduleIdRef="">{1,1}</WeekScheduleId>`

	`</YearSchedule>`

Attributes	QName	Type	Fixed	Default	Use
	id	xs:ID			required

Source	`<xs:element name="YearSchedule" type="YearScheduleType"/>`

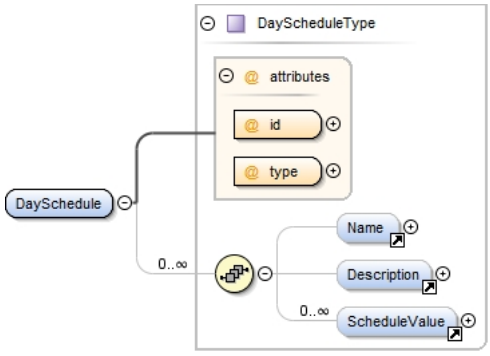
Element BeginDate

Namespace	http://www.iepmodel.net
Diagram	
Type	BeginDateType
Properties	content: simple
Used by	Complex Type YearScheduleType
Source	`<xs:element name="BeginDate" type="BeginDateType"/>`

Element EndDate

Namespace	http://www.iepmodel.net
Diagram	
Type	EndDateType
Properties	content: simple
Used by	Complex Type YearScheduleType
Source	`<xs:element name="EndDate" type="EndDateType"/>`

Element DaySchedule

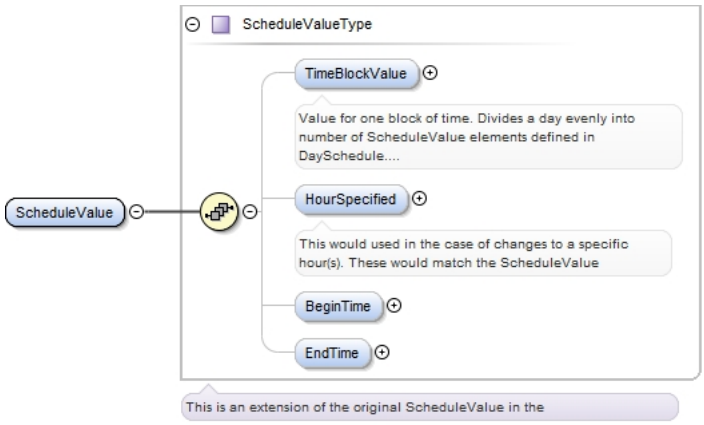
Namespace	http://www.iepmodel.net
Diagram	
Type	DayScheduleType
Properties	content: complex
Used by	Element ProjectType/Schedules
Model	Name{0,1} , Description{0,1} , ScheduleValue*
Children	Description, Name, ScheduleValue

Instance	`<DaySchedule id="" type="" xmlns="http://www.iepmodel.net">`
	`  <Name>{0,1}</Name>`
	`  <Description>{0,1}</Description>`
	`  <ScheduleValue>{0,unbounded}</ScheduleValue>`
	`</DaySchedule>`

Attributes	QName	Type	Fixed	Default	Use
	id	xs:ID			required
	type	scheduleEnumType			required

Source	`<xs:element name="DaySchedule" type="DayScheduleType"/>`

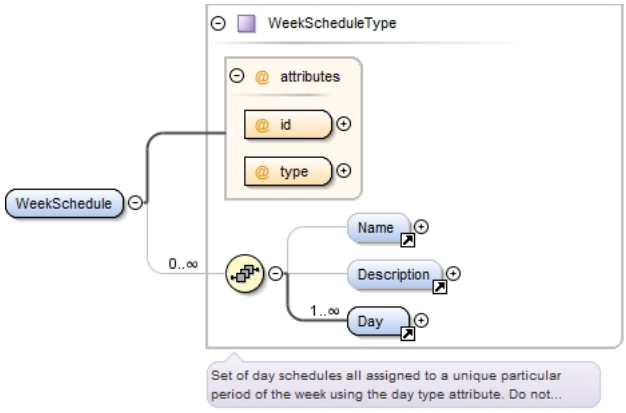
Element ScheduleValue

Namespace	http://www.iepmodel.net
Diagram	
Type	ScheduleValueType
Properties	content: complex
Used by	Complex Type DayScheduleType
Model	TimeBlockValue{0,1} , HourSpecified{0,1} , BeginTime{0,1} , EndTime{0,1}
Children	BeginTime, EndTime, HourSpecified, TimeBlockValue

Instance	<pre><ScheduleValue xmlns="http://www.iepmodel.net">
	  <TimeBlockValue>{0,1}</TimeBlockValue>
	  <HourSpecified>{0,1}</HourSpecified>
	  <BeginTime>{0,1}</BeginTime>
	  <EndTime>{0,1}</EndTime>
	</ScheduleValue></pre>

Source	<pre><xs:element name="ScheduleValue" type="ScheduleValueType"/></pre>

Element WeekSchedule

Namespace	http://www.iepmodel.net
Diagram	
Type	WeekScheduleType
Properties	content: complex
Used by	Element ProjectType/Schedules
Model	Name{0,1} , Description{0,1} , Day+
Children	Day, Description, Name

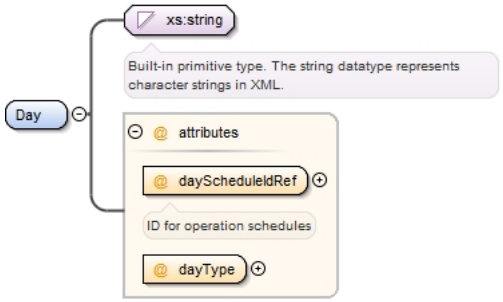
Instance	<pre><WeekSchedule id="" type="" xmlns="http://www.iepmodel.net">
	  <Name>{0,1}</Name>
	  <Description>{0,1}</Description>
	  <Day dayScheduleIdRef="" dayType="">{1,unbounded}</Day>
	</WeekSchedule></pre>

Attributes	

QName	Type	Fixed	Default	Use
id	xs:ID			required

	QName	Type	Fixed	Default	Use
	type	scheduleEnumType			required
Source	<xs:element name="WeekSchedule" type="WeekScheduleType"/>				

Element Day

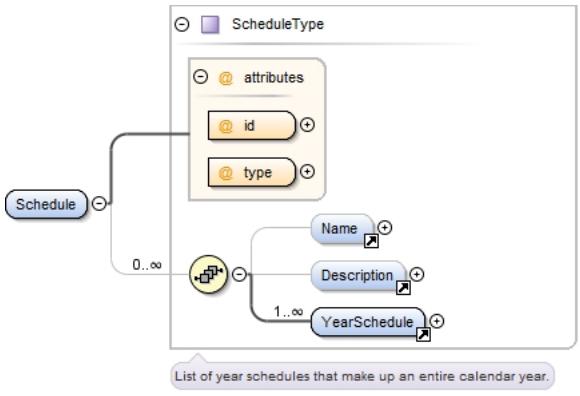
Namespace	http://www.iepmodel.net
Diagram	
Type	extension of xs:string
Properties	content: complex
Used by	Complex Type WeekScheduleType

Attributes	QName	Type	Fixed	Default	Use
	dayScheduleIdRef	xs:IDREF			required
		ID for operation schedules			
	dayType	dayTypeEnum			required

Source

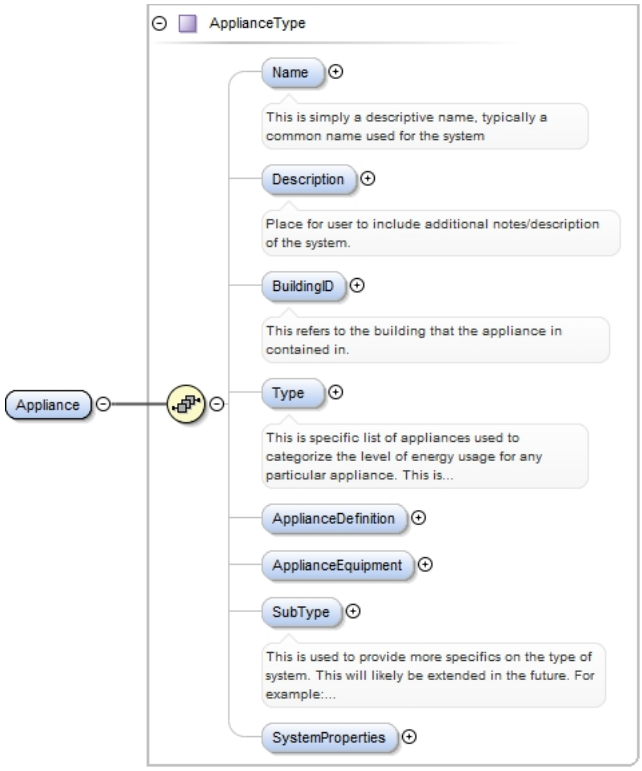
```
<xs:element name="Day">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="xs:string">
        <xs:attribute name="dayScheduleIdRef" type="xs:IDREF" use="required">
          <xs:annotation>
            <xs:documentation>ID for operation schedules</xs:documentation>
          </xs:annotation>
        </xs:attribute>
        <xs:attribute name="dayType" type="dayTypeEnum" use="required"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
```

Element Schedule

Namespace	http://www.iepmodel.net
Diagram	
Type	ScheduleType
Properties	content: complex
Used by	Element ProjectType/Schedules
Model	Name{0,1} , Description{0,1} , YearSchedule+

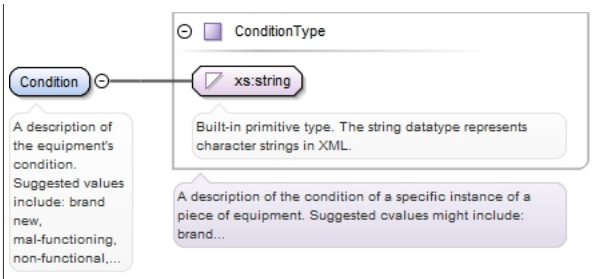
Children	Description, Name, YearSchedule
Instance	<Schedule id="" type="" xmlns="http://www.iepmodel.net"> <Name>{0,1}</Name> <Description>{0,1}</Description> <YearSchedule id="">{1,unbounded}</YearSchedule> </Schedule>
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **id** / xs:ID / / / required **type** / scheduleEnumType / / / required
Source	<xs:element name="Schedule" type="ScheduleType"/>

Element Appliance

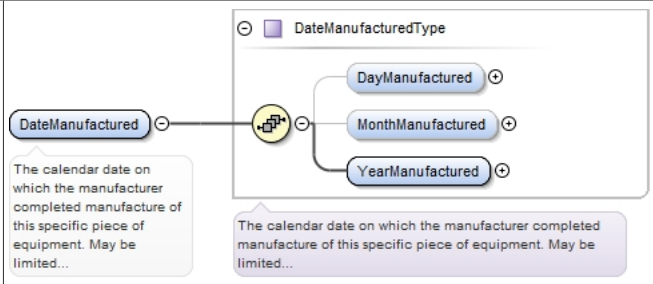
Namespace	http://www.iepmodel.net
Diagram	
Type	ApplianceType
Properties	content: complex
Model	Name{0,1} , Description{0,1} , BuildingID{0,1} , Type{0,1} , ApplianceDefinition{0,1} , ApplianceEquipment{0,1} , SubType{0,1} , SystemProperties{0,1}
Children	ApplianceDefinition, ApplianceEquipment, BuildingID, Description, Name, SubType, SystemProperties, Type
Instance	<Appliance xmlns="http://www.iepmodel.net"> <Name>{0,1}</Name> <Description>{0,1}</Description> <BuildingID>{0,1}</BuildingID> <Type>{0,1}</Type> <ApplianceDefinition id="">{0,1}</ApplianceDefinition> <ApplianceEquipment EquipmentDefinitionIdRef="" id="">{0,1}</ApplianceEquipment> <SubType>{0,1}</SubType> <SystemProperties>{0,1}</SystemProperties> </Appliance>
Source	<xs:element name="Appliance" type="ApplianceType"/>

Element Condition

Namespace	http://www.iepmodel.net
Annotations	A description of the equipment's condition. Suggested values include: brand new, mal-functioning, non-functional, normal wear, other.

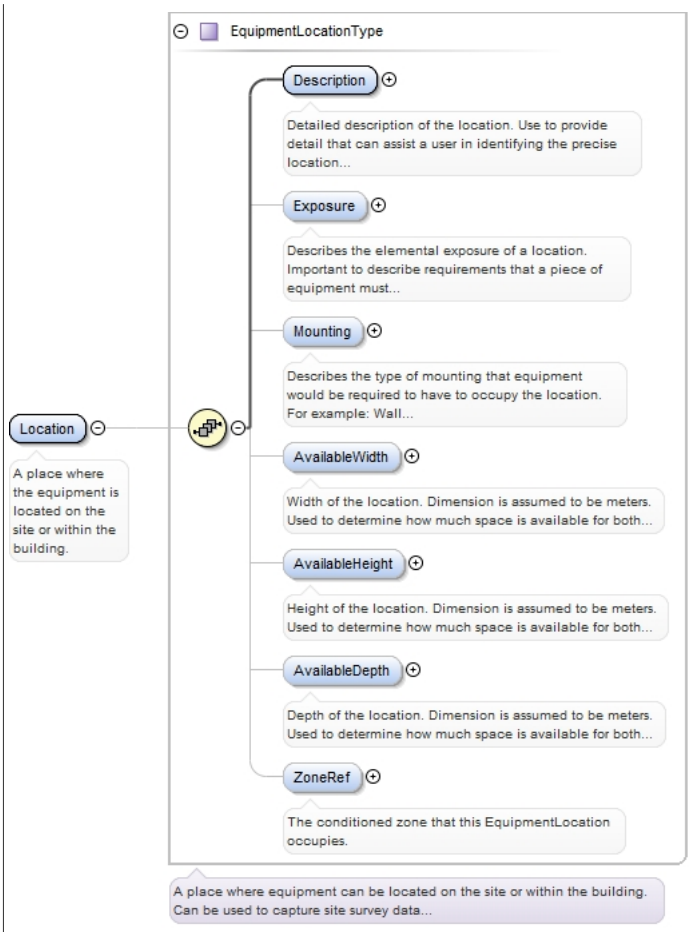
Diagram	
Type	ConditionType
Properties	content: complex
Source	<xs:element name="Condition" type="ConditionType"> <xs:annotation> <xs:documentation>A description of the equipment's condition. Suggested values include: brand new, mal-functioning, non-functional, normal wear, other.</xs:documentation> </xs:annotation> </xs:element>

Element DateManufactured

Namespace	http://www.iepmodel.net
Annotations	The calendar date on which the manufacturer completed manufacture of this specific piece of equipment. May be limited to the year.
Diagram	
Type	DateManufacturedType
Properties	content: complex
Model	DayManufactured{0,1} , MonthManufactured{0,1} , YearManufactured
Children	DayManufactured, MonthManufactured, YearManufactured
Instance	<DateManufactured xmlns="http://www.iepmodel.net"> <DayManufactured>{0,1}</DayManufactured> <MonthManufactured>{0,1}</MonthManufactured> <YearManufactured>{1,1}</YearManufactured> </DateManufactured>
Source	<xs:element name="DateManufactured" type="DateManufacturedType"> <xs:annotation> <xs:documentation>The calendar date on which the manufacturer completed manufacture of this specific piece of equipment. May be limited to the year.</xs:documentation> </xs:annotation> </xs:element>

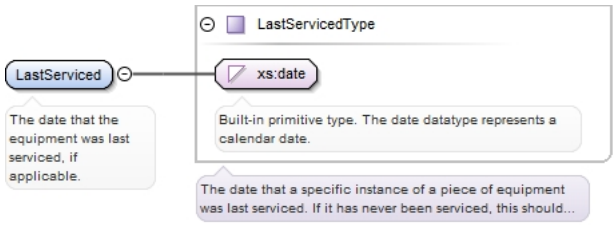
Element Location

Namespace	http://www.iepmodel.net
Annotations	A place where the equipment is located on the site or within the building.

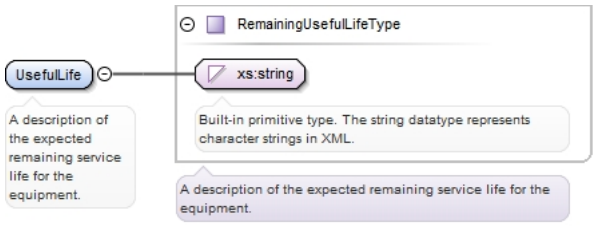
Diagram	
Type	EquipmentLocationType
Properties	content: complex
Model	Description , Exposure{0,1} , Mounting{0,1} , AvailableWidth{0,1} , AvailableHeight{0,1} , AvailableDepth{0,1} , ZoneRef{0,1}
Children	AvailableDepth, AvailableHeight, AvailableWidth, Description, Exposure, Mounting, ZoneRef
Instance	<Location xmlns="http://www.iepmodel.net"> <Description>{1,1}</Description> <Exposure>{0,1}</Exposure> <Mounting>{0,1}</Mounting> <AvailableWidth>{0,1}</AvailableWidth> <AvailableHeight>{0,1}</AvailableHeight> <AvailableDepth>{0,1}</AvailableDepth> <ZoneRef>{0,1}</ZoneRef> </Location>
Source	<xs:element name="Location" type="EquipmentLocationType"> <xs:annotation> <xs:documentation>A place where the equipment is located on the site or within the building.</xs:documentation> </xs:annotation> </xs:element>

Element LastServiced

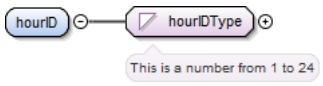
Namespace	http://www.iepmodel.net
Annotations	The date that the equipment was last serviced, if applicable.

Diagram	
Type	LastServicedType
Properties	content: complex
Source	<xs:element name="LastServiced" type="LastServicedType"> <xs:annotation> <xs:documentation>The date that the equipment was last serviced, if applicable.</xs:documentation> </xs:annotation> </xs:element>

Element UsefulLife

Namespace	http://www.iepmodel.net
Annotations	A description of the expected remaining service life for the equipment.
Diagram	
Type	RemainingUsefulLifeType
Properties	content: complex
Source	<xs:element name="UsefulLife" type="RemainingUsefulLifeType"> <xs:annotation> <xs:documentation>A description of the expected remaining service life for the equipment.</xs:documentation> </xs:annotation> </xs:element>

Element hourID

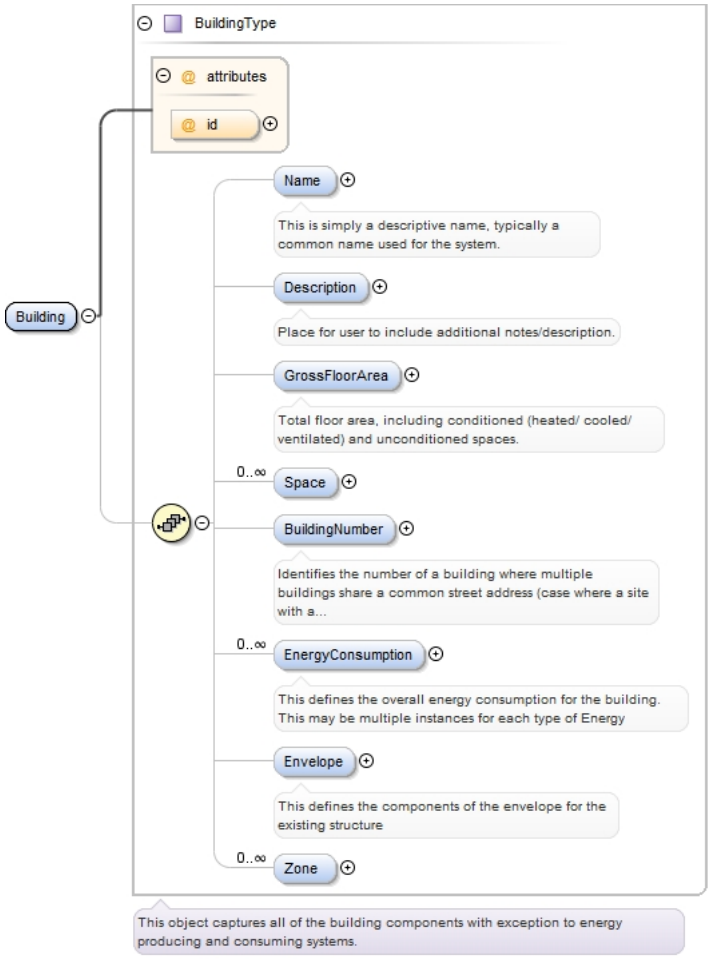
Namespace	http://www.iepmodel.net
Diagram	
Type	hourIDType
Properties	content: simple
Facets	maxInclusive 24 minInclusive 1
Source	<xs:element name="hourID" type="hourIDType"/>

Element DaylightSavings

Namespace	http://www.iepmodel.net
Diagram	
Type	DaylightSavingsType
Properties	content: simple

Source	<xs:element name="DaylightSavings" type="DaylightSavingsType"/>

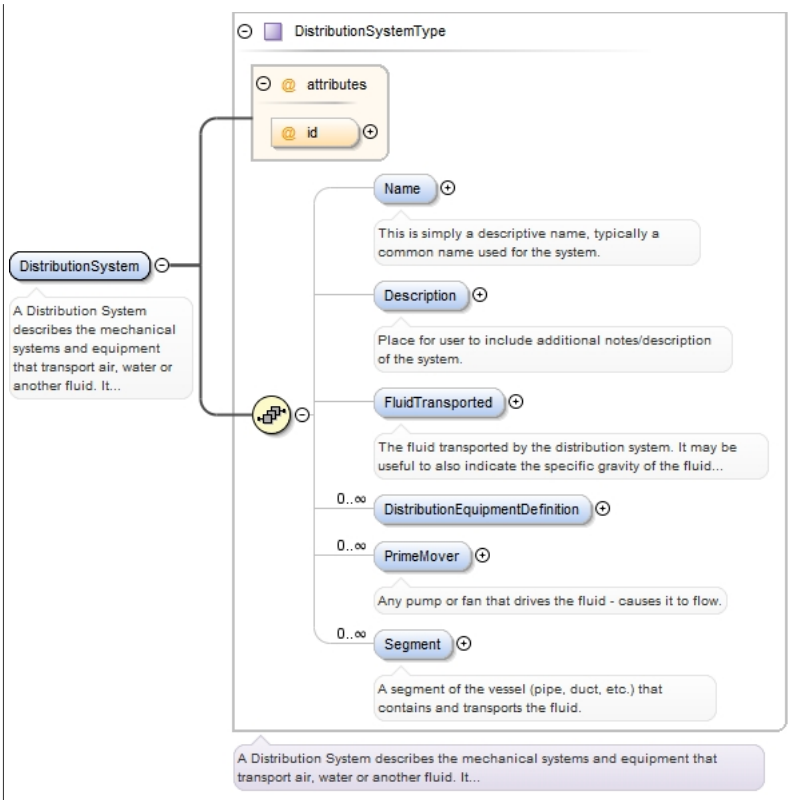
Element Building

Namespace	http://www.iepmodel.net
Diagram	
Type	BuildingType
Properties	content: complex
Model	Name{0,1} , Description{0,1} , GrossFloorArea{0,1} , Space* , BuildingNumber{0,1} , EnergyConsumption* , Envelope{0,1} , Zone*
Children	BuildingNumber, Description, EnergyConsumption, Envelope, GrossFloorArea, Name, Space, Zone
Instance	<Building id="" xmlns="http://www.iepmodel.net"> <Name>{0,1}</Name> <Description>{0,1}</Description> <GrossFloorArea Unit="SquareMeters">{0,1}</GrossFloorArea> <Space id="">{0,unbounded}</Space> <BuildingNumber>{0,1}</BuildingNumber> <EnergyConsumption RevenueMeterIdRef="">{0,unbounded}</EnergyConsumption> <Envelope id="">{0,1}</Envelope> <Zone id="">{0,unbounded}</Zone> </Building>
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **id** / xs:ID / / / optional
Source	<xs:element name="Building" type="BuildingType"/>

Element DistributionSystem

Namespace	http://www.iepmodel.net
Annotations	A Distribution System describes the mechanical systems and equipment that transport air, water or another fluid. It consists of two components: Prime Mover (pump or fan) and Segment.

	A Distribution System (optionally) consists of one or many Prime Movers, which is a pump or fan that causes the fluid to flow. The Prime Mover has System and Equipment properties. A Distribution System (optionally) consists of one or many Segments, which is a duct or pipe that transports the fluid. The Segment has Equipment properties in addition to leakage and insulation properties (referenced from the Building schema). The Distribution Systems was chosen to stand alone because of how the other systems interact with it and because on distribution system may serve multiple purposes. It is be referenced by other systems such as an HVAC or WaterHeating system that interact with it. A Distribution System (particularly air or water) may be referenced by an HVAC system in one of three ways. A Distribution System may be referenced as the method of delivery of conditioning from the HVAC system (i.e. the ducting or piping that delivers conditioning). Alternatively, a Distribution System may be referenced as the source of heat or cold (fluid to reject heat to) for a Heating or Cooling system, respectively. Note that the Distribution System itself does not instance System Properties. A distribution system can only consume energy through its prime mover and thermal transfer. The Prime Mover object instances System Properties. Thermal transfer to or from the fluid through its segments will affect the system(s) that are connected to (reference) it (such as a Hot Water Heating or HVAC system). Thus, the thermal energy transferred through the segment surface should be captured by the zone in which the segment is located and the systems that reference it. Example 1. A water DistributionSystem may serve both space heating as well as domestic hot water for kitchen and bathroom fixtures (i.e. dishwasher, shower). Systems that may reference this DistributionSystem include: a WaterHeating system, a grey-water HeatRecovery system and an HVACSystem. Example 2 An air DistributionSystem may consist of supply and return ducting and a supply fan. An HVACSystem such as a furnace or air-source heat-pump would reference the DistributionSystem (through its DeliveryMethod element). Example 3 A Whole house fan would be modeled as an HVAC system with a DeliveryMethod that references a Distribution System. The Distribution System may include segments (inlet and exhaust ducting) and a fan (Prime Mover). The Ventilation properties in HVAC would further describe the rate of air exchange with outside. The zone(s) referencing the HVAC system would specify the temperature setpoint schedule and any additional thermal loads. Alternatively, if the fan is controlled by a time schedule, rather than temperature schedule, the schedule may defined in the Prime Mover system properties. Then, no HVAC system needs to be defined. Example 4 A bathroom or kitchen exhaust fan may be modeled as a Distribution System with just a Prime Mover (segments optional). The schedule in the System Properties of the Primer Mover may define the operating schedule of the fan.

Diagram	
Type	DistributionSystemType
Properties	content: complex
Model	Name{0,1} , Description{0,1} , FluidTransported{0,1} , DistributionEquipmentDefinition* , PrimeMover* , Segment*
Children	Description, DistributionEquipmentDefinition, FluidTransported, Name, PrimeMover, Segment

Instance	`<DistributionSystem id="" xmlns="http://www.iepmodel.net">`
	`<Name>{0,1}</Name>`
	`<Description>{0,1}</Description>`
	`<FluidTransported>{0,1}</FluidTransported>`
	`<DistributionEquipmentDefinition id="">{0,unbounded}</DistributionEquipmentDefinition>`
	`<PrimeMover id="">{0,unbounded}</PrimeMover>`
	`<Segment id="">{0,unbounded}</Segment>`
	`</DistributionSystem>`

Attributes

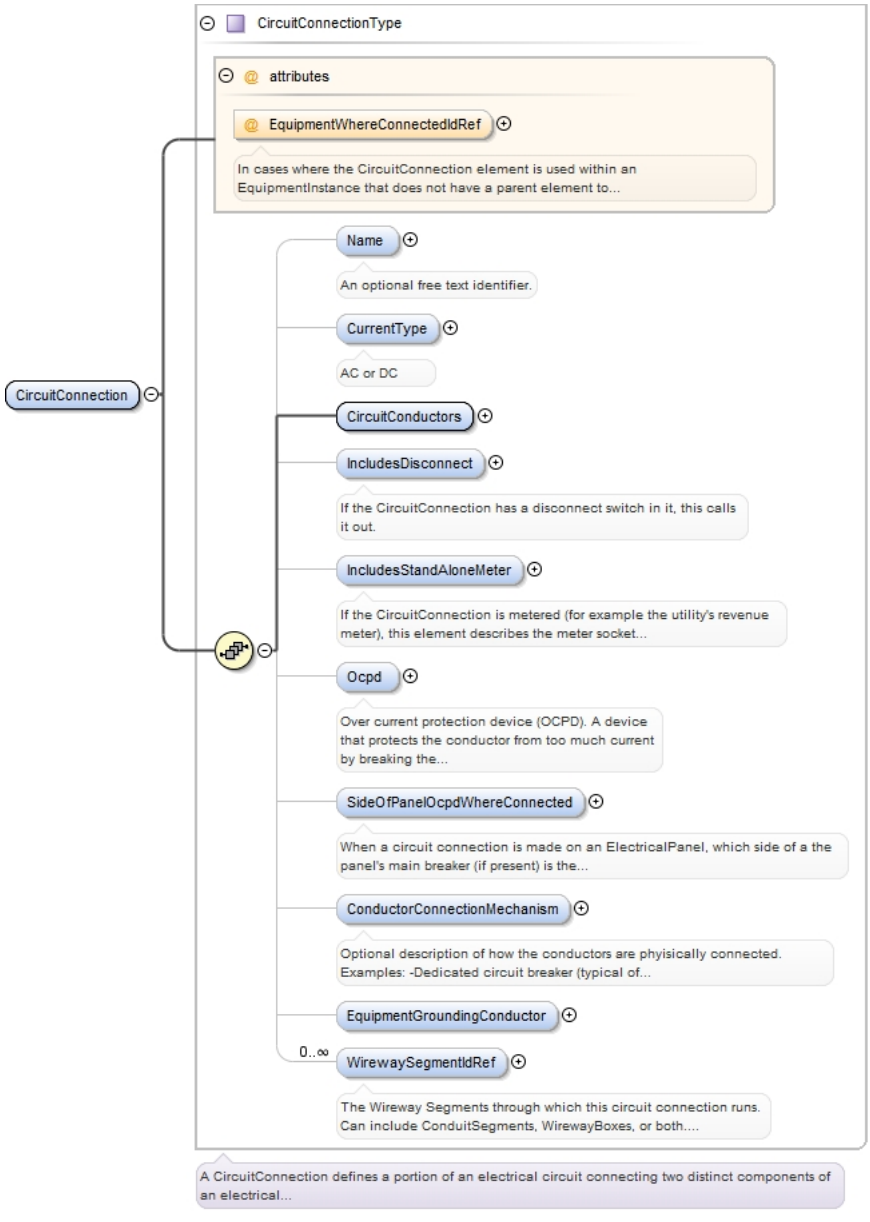
QName	Type	Fixed	Default	Use
id	xs:ID			optional

Source


```
<xs:element name="DistributionSystem" type="DistributionSystemType">
  <xs:annotation>
    <xs:documentation>A Distribution System describes the mechanical systems and equipment
 that transport air, water or another fluid. It consists of two components: Prime Mover
 (pump or fan) and Segment. A Distribution System (optionally) consists of one or many
 Prime Movers, which is a pump or fan that causes the fluid to flow. The Prime Mover
 has System and Equipment properties. A Distribution System (optionally) consists of
 one or many Segments, which is a duct or pipe that transports the fluid. The Segment
 has Equipment properties in addition to leakage and insulation properties (referenced
 from the Building schema). The Distribution Systems was chosen to stand alone because
 of how the other systems interact with it and because on distribution system may serve
 multiple purposes. It is be referenced by other systems such as an HVAC or WaterHeating
 system that interact with it. A Distribution System (particularly air or water) may
 be referenced by an HVAC system in one of three ways. A Distribution System may be
 referenced as the method of delivery of conditioning from the HVAC system (i.e. the
 ducting or piping that delivers conditioning). Alternatively, a Distribution System
 may be referenced as the source of heat or cold (fluid to reject heat to) for a Heating
 or Cooling system, respectively. Note that the Distribution System itself does not
 instance System Properties. A distribution system can only consume energy through its
 prime mover and thermal transfer. The Prime Mover object instances System Properties.
 Thermal transfer to or from the fluid through its segments will affect the system(s)
 that are connected to (reference) it (such as a Hot Water Heating or HVAC system). Thus,
 the thermal energy transferred through the segment surface should be captured by the
 zone in which the segment is located and the systems that reference it. Example 1. A
 water DistributionSystem may serve both space heating as well as domestic hot water
 for kitchen and bathroom fixtures (i.e. dishwasher, shower). Systems that may reference
```

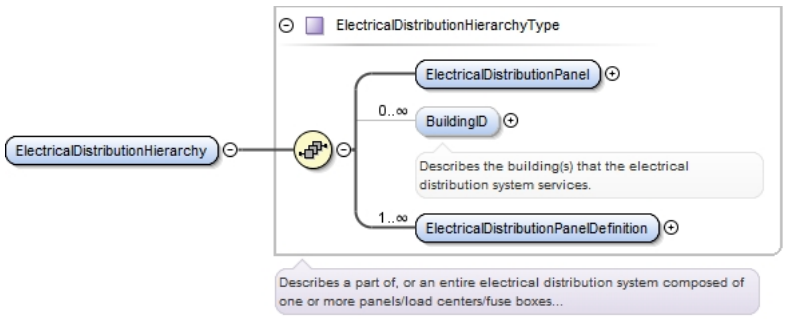
```
 this DistributionSystem include: a WaterHeating system, a grey-water HeatRecovery system
 and an HVACSystem. Example 2 An air DistributionSystem may consist of supply and return
 ducting and a supply fan. An HVACSystem such as a furnace or air-source heat-pump would
 reference the DistributionSystem (through its DeliveryMethod element). Example 3 A Whole
 house fan would be modeled as an HVAC system with a DeliveryMethod that references a
 Distribution System. The Distribution System may include segments (inlet and exhaust
 ducting) and a fan (Prime Mover). The Ventilation properties in HVAC would further
 describe the rate of air exchange with outside. The zone(s) referencing the HVAC system
 would specify the temperature setpoint schedule and any additional thermal loads.
 Alternatively, if the fan is controlled by a time schedule, rather than temperature
 schedule, the schedule may defined in the Prime Mover system properties. Then, no HVAC
 system needs to be defined. Example 4 A bathroom or kitchen exhaust fan may be modeled
 as a Distribution System with just a Prime Mover (segments optional). The schedule in
 the System Properties of the Primer Mover may define the operating schedule of the fan.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

Element `CircuitConnection`

Namespace	http://www.iepmodel.net
Diagram	
Type	CircuitConnectionType
Properties	content: `complex`

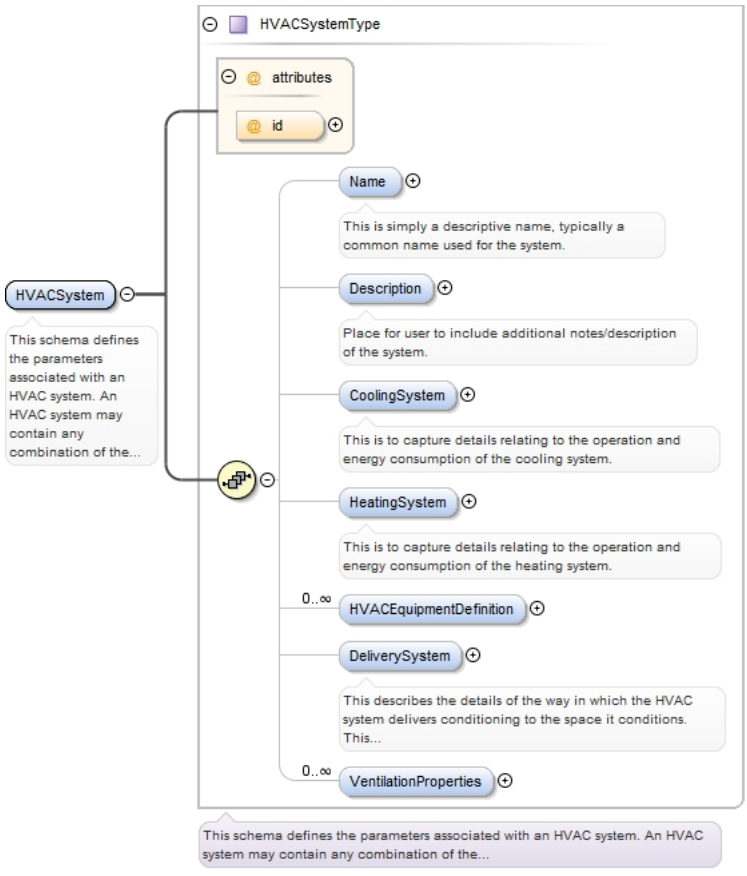
Model	Name{0,1} , CurrentType{0,1} , CircuitConductors , IncludesDisconnect{0,1} , IncludesStandAloneMeter{0,1} , Ocpd{0,1} , SideOfPanelOcpdWhereConnected{0,1} , ConductorConnectionMechanism{0,1} , EquipmentGroundingConductor{0,1} , WirewaySegmentIdRef*
Children	CircuitConductors, ConductorConnectionMechanism, CurrentType, EquipmentGroundingConductor, IncludesDisconnect, IncludesStandAloneMeter, Name, Ocpd, SideOfPanelOcpdWhereConnected, WirewaySegmentIdRef
Instance	<CircuitConnection EquipmentWhereConnectedIdRef="" xmlns="http://www.iepmodel.net"> <Name>{0,1}</Name> <CurrentType>{0,1}</CurrentType> <CircuitConductors>{1,1}</CircuitConductors> <IncludesDisconnect ConductorSegmentIdRef="" WirewayBoxIdRef="">{0,1}</IncludesDisconnect> <IncludesStandAloneMeter ConductorSegmentIdRef="">{0,1}</IncludesStandAloneMeter> <Ocpd EquipmentWhereLocatedIdRef="">{0,1}</Ocpd> <SideOfPanelOcpdWhereConnected>{0,1}</SideOfPanelOcpdWhereConnected> <ConductorConnectionMechanism>{0,1}</ConductorConnectionMechanism> <EquipmentGroundingConductor>{0,1}</EquipmentGroundingConductor> <WirewaySegmentIdRef>{0,unbounded}</WirewaySegmentIdRef> </CircuitConnection>
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **EquipmentWhereConnectedIdRef** / IDREF / / / optional In cases where the CircuitConnection element is used within an EquipmentInstance that does not have a parent element to which the CircuitConnection is assumed to connect, a reference ID can be used to associate this CircuitConnection to another EquipmentInstance elsewhere in a document instance. For example, a PvSystem may have an AcPointOfConnection that uses a new ElectricalPanel as an AC combiner for more than one Inverter. The new electrical panel can be described by an ElectricalPanel element in the PvDesign (which in turn refers to an ElectricalPanelDefinition element). in the AcPointOfConnection's EquipmentWhereConnected element. That ElectricPanel's EnergizingCircuitConnection element may reference another ElectricPanel in an instance of the Project's ExistingElectricalHierarchy element.
Source	<xs:element name="CircuitConnection" type="CircuitConnectionType"/>

Element ElectricalDistributionHierarchy

Namespace	http://www.iepmodel.net
Annotations	
Diagram	
Type	ElectricalDistributionHierarchyType
Properties	content: complex
Model	ElectricalDistributionPanel , BuildingID* , ElectricalDistributionPanelDefinition+
Children	BuildingID, ElectricalDistributionPanel, ElectricalDistributionPanelDefinition
Instance	<ElectricalDistributionHierarchy xmlns="http://www.iepmodel.net"> <ElectricalDistributionPanel EquipmentDefinitionIdRef="" id="">{1,1}</ElectricalDistributionPanel> <BuildingID>{0,unbounded}</BuildingID> <ElectricalDistributionPanelDefinition id="">{1,unbounded}</ElectricalDistributionPanelDefinition> </ElectricalDistributionHierarchy>
Source	<xs:element name="ElectricalDistributionHierarchy"> type="ElectricalDistributionHierarchyType"> <xs:annotation> <xs:documentation/>

```
  </xs:annotation>
</xs:element>
```

Element HVACSystem

Namespace	http://www.iepmodel.net
Annotations	This schema defines the parameters associated with an HVAC system. An HVAC system may contain any combination of the following: a heating system, a cooling system and ventilation properties. Ventilation is defined here as the exchange of air in the space/zone with air outside. An HVAC system references Distribution systems that serve one of three purposes: - deliver conditioning to a space/zone. - provide heat. - provide cold (a fluid to reject heat to). An HVAC system serves a zone, however, zones reference the HVAC systems that serve them. Note that parameters associated with the transport and movement of air and water are captured in a Distribution System.
Diagram	
Type	HVACSystemType
Properties	content: complex
Model	Name{0,1} , Description{0,1} , CoolingSystem{0,1} , HeatingSystem{0,1} , HVACEquipmentDefinition* , DeliverySystem{0,1} , VentilationProperties*
Children	CoolingSystem, DeliverySystem, Description, HVACEquipmentDefinition, HeatingSystem, Name, VentilationProperties

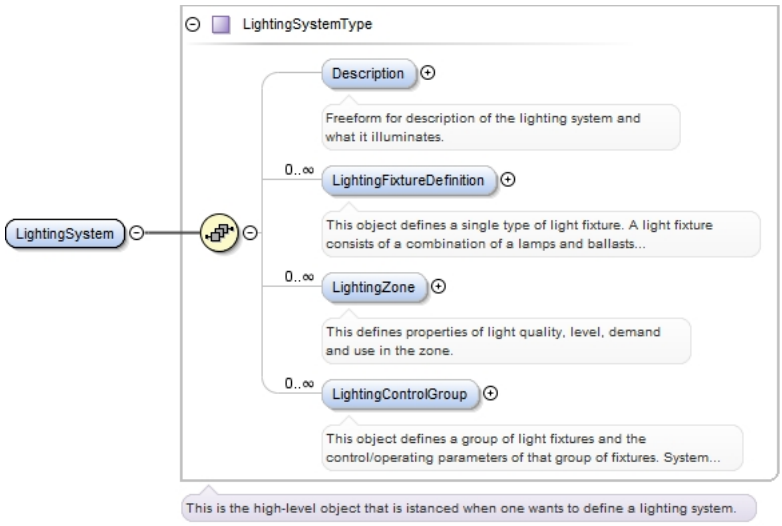
Instance	`<HVACSystem id="" xmlns="http://www.iepmodel.net">`
	`  <Name>{0,1}</Name>`
	`  <Description>{0,1}</Description>`
	`  <CoolingSystem>{0,1}</CoolingSystem>`
	`  <HeatingSystem>{0,1}</HeatingSystem>`
	`  <HVACEquipmentDefinition id="">{0,unbounded}</HVACEquipmentDefinition>`
	`  <DeliverySystem>{0,1}</DeliverySystem>`
	`  <VentilationProperties>{0,unbounded}</VentilationProperties>`
	`</HVACSystem>`

Attributes	QName	Type	Fixed	Default	Use
	id	xs:ID			optional

Source

```
<xs:element name="HVACSystem" type="HVACSystemType">
  <xs:annotation>
    <xs:documentation>This schema defines the parameters associated with an HVAC system.
 An HVAC system may contain any combination of the following: a heating system, a cooling
 system and ventilation properties. Ventilation is defined here as the exchange of air
 in the space/zone with air outside. An HVAC system references Distribution systems that
 serve one of three purposes: - deliver conditioning to a space/zone. - provide heat.
 - provide cold (a fluid to reject heat to). An HVAC system serves a zone, however,
 zones reference the HVAC systems that serve them. Note that parameters associated with
 the transport and movement of air and water are captured in a Distribution System.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

Element LightingSystem

Namespace	http://www.iepmodel.net
Annotations	
Diagram	
Type	LightingSystemType
Properties	content: complex
Model	Description{0,1} , LightingFixtureDefinition* , LightingZone* , LightingControlGroup*
Children	Description, LightingControlGroup, LightingFixtureDefinition, LightingZone
Instance	

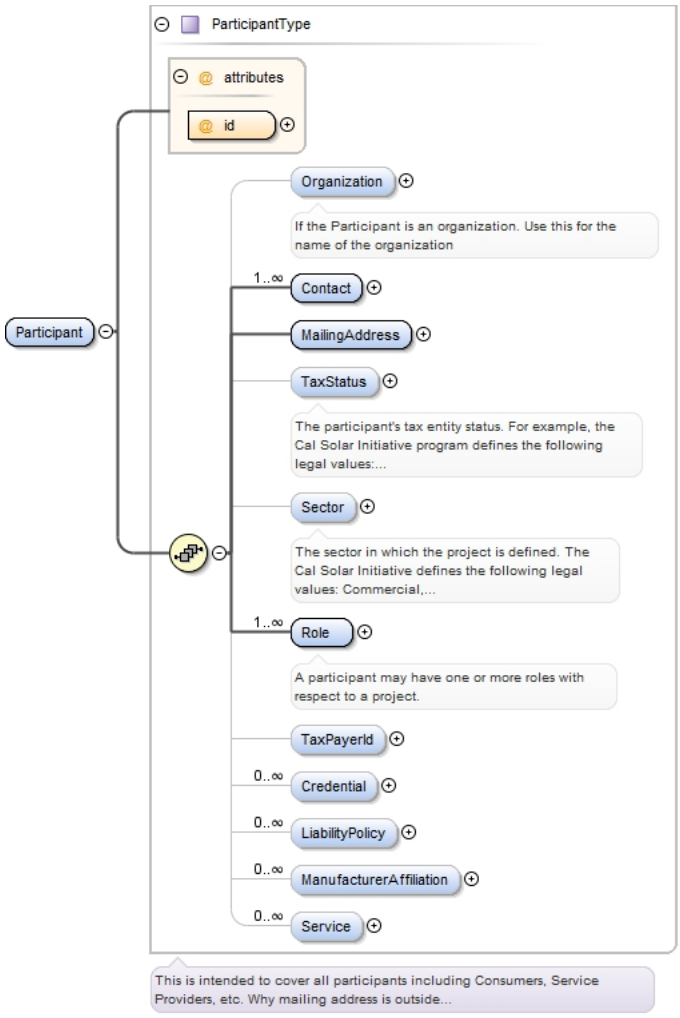
```
<LightingSystem xmlns="http://www.iepmodel.net">
  <Description>{0,1}</Description>
  <LightingFixtureDefinition id="">{0,unbounded}</LightingFixtureDefinition>
  <LightingZone id="">{0,unbounded}</LightingZone>
  <LightingControlGroup id="">{0,unbounded}</LightingControlGroup>
</LightingSystem>
```

Source

```
<xs:element name="LightingSystem" type="LightingSystemType">
  <xs:annotation>
    <xs:documentation>
    </xs:documentation>
  </xs:annotation>
</xs:element>
```

Element Participant

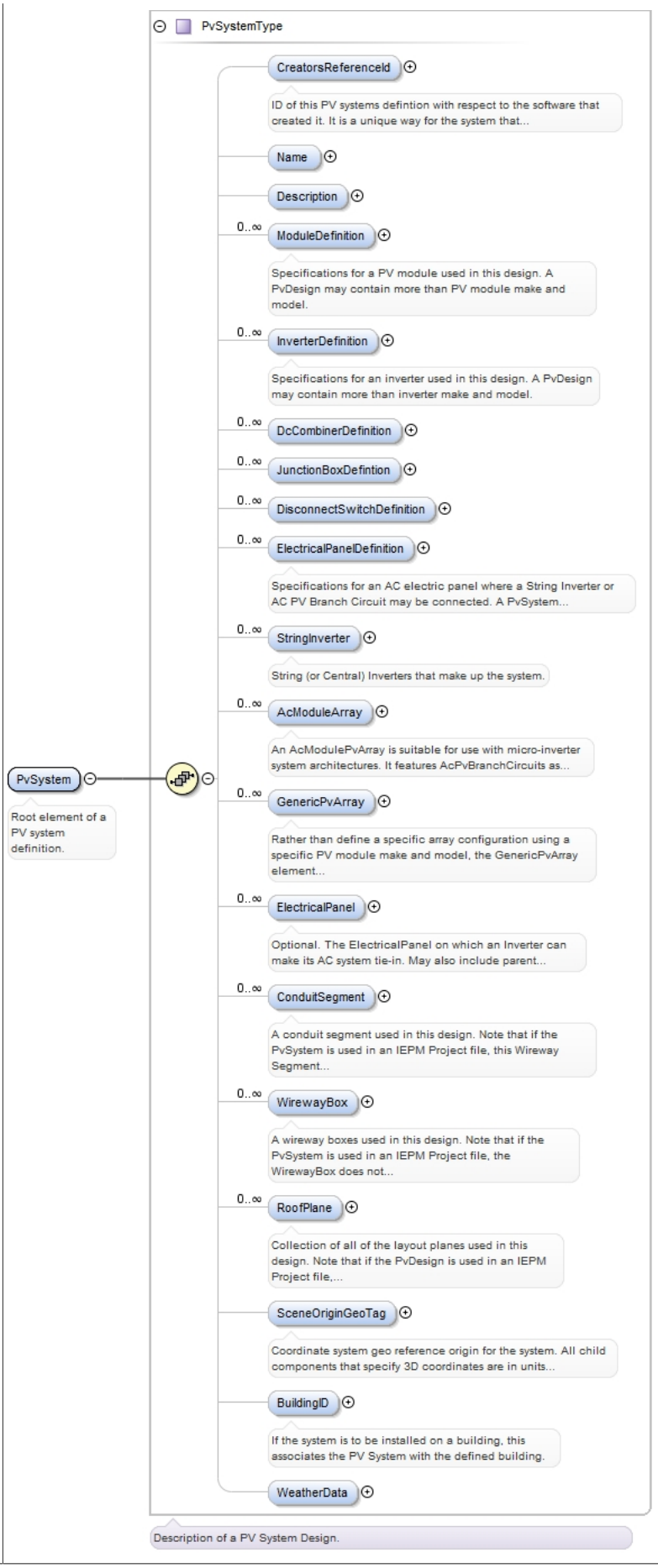
Namespace	http://www.iepmodel.net

Diagram	
Type	ParticipantType
Properties	content: complex
Model	Organization{0,1} , Contact+ , MailingAddress , TaxStatus{0,1} , Sector{0,1} , Role+ , TaxPayerId{0,1} , Credential* , LiabilityPolicy* , ManufacturerAffiliation* , Service*
Children	Contact, Credential, LiabilityPolicy, MailingAddress, ManufacturerAffiliation, Organization, Role, Sector, Service, TaxPayerId, TaxStatus
Instance	<Participant id="" xmlns="http://www.iepmodel.net"> <Organization>{0,1}</Organization> <Contact>{1,unbounded}</Contact> <MailingAddress>{1,1}</MailingAddress> <TaxStatus>{0,1}</TaxStatus> <Sector>{0,1}</Sector> <Role>{1,unbounded}</Role> <TaxPayerId>{0,1}</TaxPayerId> <Credential>{0,unbounded}</Credential> <LiabilityPolicy>{0,unbounded}</LiabilityPolicy> <ManufacturerAffiliation>{0,unbounded}</ManufacturerAffiliation> <Service>{0,unbounded}</Service> </Participant>
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **id** / xs:ID / / / required
Source	<xs:element name="Participant" type="ParticipantType"/>

Element PvSystem

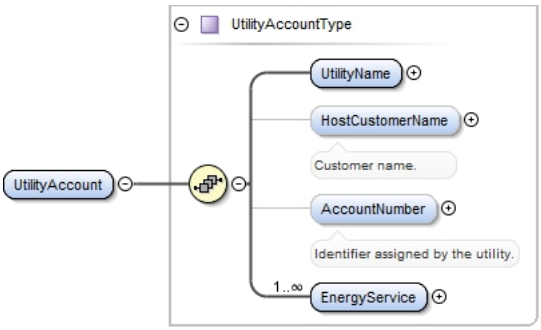
Namespace	http://www.iepmodel.net
Annotations	Root element of a PV system definition.

Diagram


PvSystemType
CreatorsReferenceId
ID of this PV systems defintion with respect to the software that created it. It is a unique way for the system that...
Name
Description
0..∞
ModuleDefinition
Specifications for a PV module used in this design. A PvDesign may contain more than PV module make and model.
0..∞
InverterDefinition
Specifications for an inverter used in this design. A PvDesign may contain more than inverter make and model.
0..∞
DcCombinerDefinition
0..∞
JunctionBoxDefintion
0..∞
DisconnectSwitchDefinition
0..∞
ElectricalPanelDefinition
Specifications for an AC electric panel where a String Inverter or AC PV Branch Circuit may be connected. A PvSystem...
0..∞
StringInverter
String (or Central) Inverters that make up the system.
0..∞
AcModuleArray
An AcModulePvArray is suitable for use with micro-inverter system architectures. It features AcPvBranchCircuits as...
PvSystem
Root element of a PV system definition.
0..∞
GenericPvArray
Rather than define a specific array configuration using a specific PV module make and model, the GenericPvArray element...
0..∞
ElectricalPanel
Optional. The ElectricalPanel on which an Inverter can make its AC system tie-in. May also include parent...
0..∞
ConduitSegment
A conduit segment used in this design. Note that if the PvSystem is used in an IEPM Project file, this Wireway Segment...
0..∞
WirewayBox
A wireway boxes used in this design. Note that if the PvSystem is used in an IEPM Project file, the WirewayBox does not...
0..∞
RoofPlane
Collection of all of the layout planes used in this design. Note that if the PvDesign is used in an IEPM Project file,...
SceneOriginGeoTag
Coordinate system geo reference origin for the system. All child components that specify 3D coordinates are in units...
BuildingID
If the system is to be installed on a building, this associates the PV System with the defined building.
WeatherData
Description of a PV System Design.

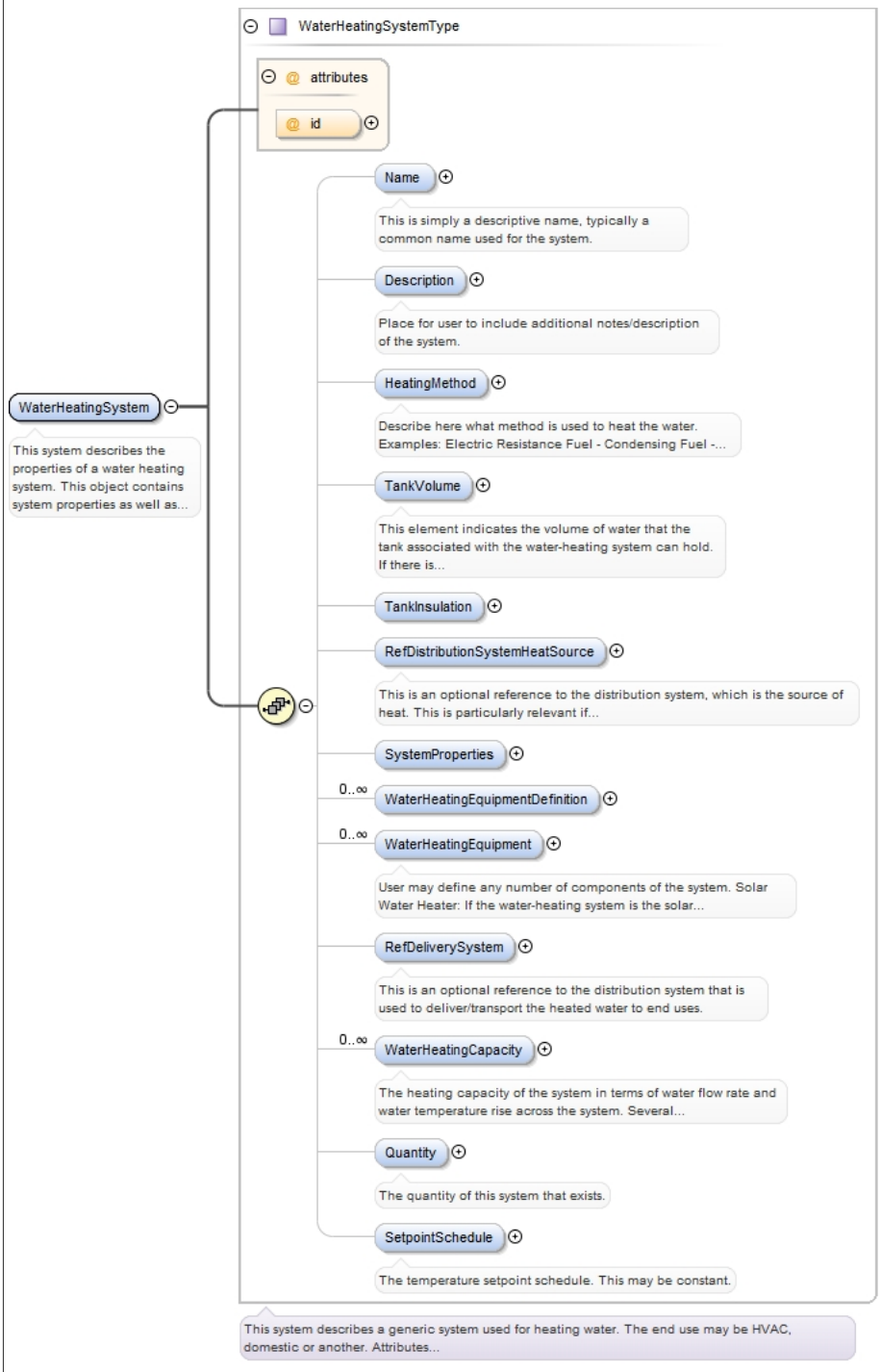
Type	PvSystemType
Properties	content: complex
Model	CreatorsReferenceId{0,1} , Name{0,1} , Description{0,1} , ModuleDefinition* , InverterDefinition* , DcCombinerDefinition* , JunctionBoxDefintion* , DisconnectSwitchDefinition* , ElectricalPanelDefinition* , StringInverter* , AcModuleArray* , GenericPvArray* , ElectricalPanel* , ConduitSegment* , WirewayBox* , RoofPlane* , SceneOriginGeoTag{0,1} , BuildingID{0,1} , WeatherData{0,1}
Children	AcModuleArray, BuildingID, ConduitSegment, CreatorsReferenceId, DcCombinerDefinition, Description, DisconnectSwitchDefinition, ElectricalPanel, ElectricalPanelDefinition, GenericPvArray, InverterDefinition, JunctionBoxDefintion, ModuleDefinition, Name, RoofPlane, SceneOriginGeoTag, StringInverter, WeatherData, WirewayBox
Instance	<PvSystem xmlns="http://www.iepmodel.net"> <CreatorsReferenceId>{0,1}</CreatorsReferenceId> <Name>{0,1}</Name> <Description>{0,1}</Description> <ModuleDefinition id="">{0,unbounded}</ModuleDefinition> <InverterDefinition id="">{0,unbounded}</InverterDefinition> <DcCombinerDefinition id="">{0,unbounded}</DcCombinerDefinition> <JunctionBoxDefintion id="">{0,unbounded}</JunctionBoxDefintion> <DisconnectSwitchDefinition id="">{0,unbounded}</DisconnectSwitchDefinition> <ElectricalPanelDefinition id="">{0,unbounded}</ElectricalPanelDefinition> <StringInverter EquipmentDefinitionIdRef="" id="">{0,unbounded}</StringInverter> <AcModuleArray Id="" MicroInverterDefinitionIdRef="" PvModuleDefinitionIdRef="">{0,unbounded}</AcModuleArray> <GenericPvArray Id="">{0,unbounded}</GenericPvArray> <ElectricalPanel EquipmentDefinitionIdRef="" id="">{0,unbounded}</ElectricalPanel> <ConduitSegment EquipmentDefinitionIdRef="" id="">{0,unbounded}</ConduitSegment> <WirewayBox EquipmentDefinitionIdRef="" id="">{0,unbounded}</WirewayBox> <RoofPlane id="">{0,unbounded}</RoofPlane> <SceneOriginGeoTag>{0,1}</SceneOriginGeoTag> <BuildingID>{0,1}</BuildingID> <WeatherData>{0,1}</WeatherData> </PvSystem>
Source	<xs:element name="PvSystem" type="PvSystemType"> <xs:annotation> <xs:documentation>Root element of a PV system definition.</xs:documentation> </xs:annotation> </xs:element>

Element UtilityAccount

Namespace	http://www.iepmodel.net
Diagram	
Type	UtilityAccountType
Properties	content: complex
Model	UtilityName , HostCustomerName{0,1} , AccountNumber{0,1} , EnergyService+
Children	AccountNumber, EnergyService, HostCustomerName, UtilityName
Instance	<UtilityAccount xmlns="http://www.iepmodel.net"> <UtilityName>{1,1}</UtilityName> <HostCustomerName>{0,1}</HostCustomerName> <AccountNumber>{0,1}</AccountNumber> <EnergyService RevenueMeterIdRef="">{1,unbounded}</EnergyService> </UtilityAccount>
Source	<xs:element name="UtilityAccount" type="UtilityAccountType"/>

Element WaterHeatingSystem

Namespace	http://www.iepmodel.net

Annotations	`This system describes the properties of a water heating system. This object contains system properties as well as equipment properties.`
Diagram	
Type	WaterHeatingSystemType
Properties	content: `complex`
Model	Name{0,1} , Description{0,1} , HeatingMethod{0,1} , TankVolume{0,1} , TankInsulation{0,1} , RefDistributionSystemHeatSource{0,1} , SystemProperties{0,1} , WaterHeatingEquipmentDefinition* , WaterHeatingEquipment* , RefDeliverySystem{0,1} , WaterHeatingCapacity* , Quantity{0,1} , SetpointSchedule{0,1}
Children	Description, HeatingMethod, Name, Quantity, RefDeliverySystem, RefDistributionSystemHeatSource, SetpointSchedule, SystemProperties, TankInsulation, TankVolume, WaterHeatingCapacity, WaterHeatingEquipment, WaterHeatingEquipmentDefinition

`Instance`	`<WaterHeatingSystem id="" xmlns="http://www.iepmodel.net">`
	`  <Name>{0,1}</Name>`
	`  <Description>{0,1}</Description>`

```
  <HeatingMethod>{0,1}</HeatingMethod>
  <TankVolume Unit="" UnitDesc="">{0,1}</TankVolume>
  <TankInsulation>{0,1}</TankInsulation>
  <RefDistributionSystemHeatSource>{0,1}</RefDistributionSystemHeatSource>
  <SystemProperties>{0,1}</SystemProperties>
  <WaterHeatingEquipmentDefinition id="">{0,unbounded}</WaterHeatingEquipmentDefinition>
  <WaterHeatingEquipment EquipmentDefinitionIdRef="" id="">{0,unbounded}</
WaterHeatingEquipment>
  <RefDeliverySystem>{0,1}</RefDeliverySystem>
  <WaterHeatingCapacity>{0,unbounded}</WaterHeatingCapacity>
  <Quantity>{0,1}</Quantity>
  <SetpointSchedule>{0,1}</SetpointSchedule>
</WaterHeatingSystem>
```

Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			optional

Source

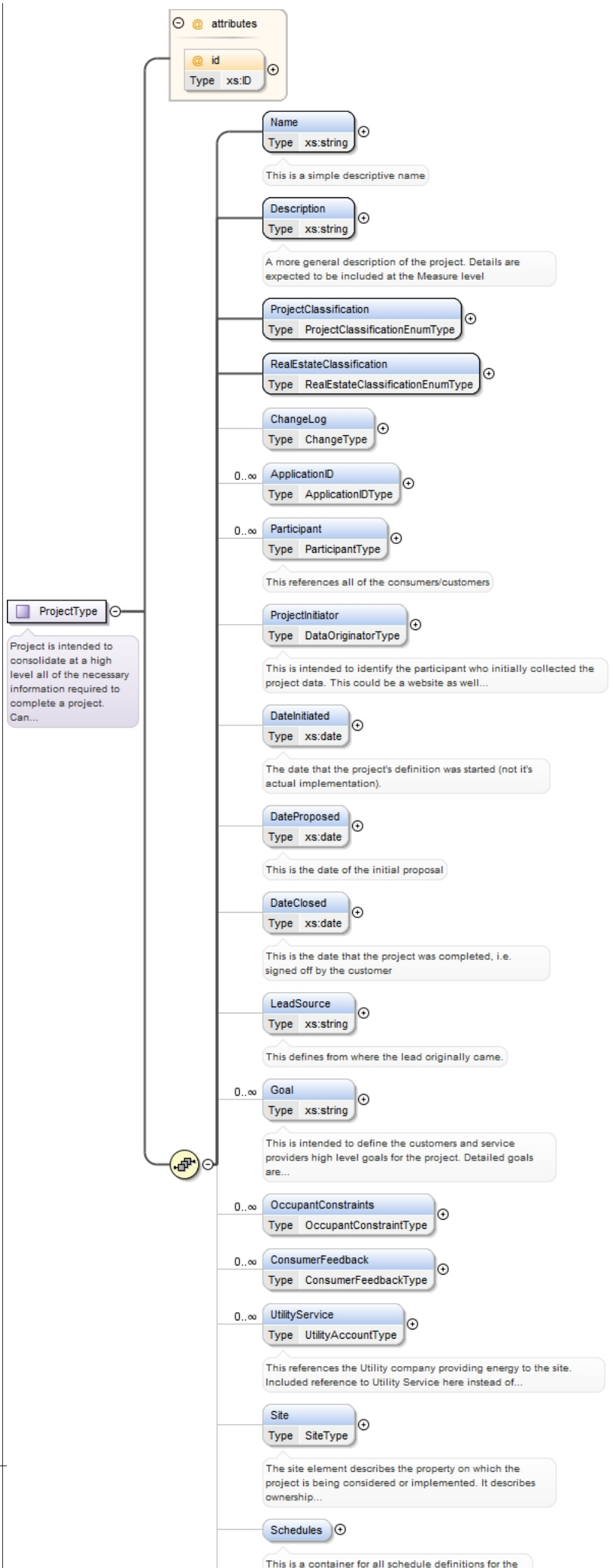
```
<xs:element name="WaterHeatingSystem" type="WaterHeatingSystemType">
  <xs:annotation>
    <xs:documentation>This system describes the properties of a water heating system. This
 object contains system properties as well as equipment properties.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Complex Type(s)

Complex Type `ProjectType`

Namespace	http://www.iepmodel.net
Annotations	Project is intended to consolidate at a high level all of the necessary information required to complete a project. Can be used for multiple use cases where data is passed between parties/tools, including: project leads, collection of site audit data, proposing a set of measures, proposing a scope of work based on defined measures, etc. Included reference to Utility Service here instead of in Building since Project encapsulates building

Diagram


attributes
id
Type xs:ID
ProjectType
Project is intended to consolidate at a high level all of the necessary information required to complete a project. Can...
Name
Type xs:string
This is a simple descriptive name
Description
Type xs:string
A more general description of the project. Details are expected to be included at the Measure level
ProjectClassification
Type ProjectClassificationEnumType
RealEstateClassification
Type RealEstateClassificationEnumType
ChangeLog
Type ChangeType
0..∞
ApplicationID
Type ApplicationIDType
0..∞
Participant
Type ParticipantType
This references all of the consumers/customers
ProjectInitiator
Type DataOriginatorType
This is intended to identify the participant who initially collected the project data. This could be a website as well...
DateInitiated
Type xs:date
The date that the project's definition was started (not it's actual implementation).
DateProposed
Type xs:date
This is the date of the initial proposal
DateClosed
Type xs:date
This is the date that the project was completed, i.e. signed off by the customer
LeadSource
Type xs:string
This defines from where the lead originally came.
0..∞
Goal
Type xs:string
This is intended to define the customers and service providers high level goals for the project. Detailed goals are...
0..∞
OccupantConstraints
Type OccupantConstraintType
0..∞
ConsumerFeedback
Type ConsumerFeedbackType
0..∞
UtilityService
Type UtilityAccountType
This references the Utility company providing energy to the site. Included reference to Utility Service here instead of...
Site
Type SiteType
The site element describes the property on which the project is being considered or implemented. It describes ownership...
Schedules
This is a container for all schedule definitions for the

Used by	Element Project
Model	Name , Description , ProjectClassification , RealEstateClassification , ChangeLog{0,1} , ApplicationID* , Participant* , ProjectInitiator{0,1} , DateInitiated{0,1} , DateProposed{0,1} , DateClosed{0,1} , LeadSource{0,1} , Goal* , OccupantConstraints* , ConsumerFeedback* , UtilityService* , Site{0,1} , Schedules{0,1} , ExistingAppliance* , ExistingDistributionSystem* , ExistingElectricalDistributionSystem{0,1} , ExistingHVAC* , ExistingLighting* , ExistingPvSystem* , ExistingWaterHeatingSystem* , Measure* , ScopeOfWork*
Children	ApplicationID, ChangeLog, ConsumerFeedback, DateClosed, DateInitiated, DateProposed, Description, ExistingAppliance, ExistingDistributionSystem, ExistingElectricalDistributionSystem, ExistingHVAC, ExistingLighting, ExistingPvSystem, ExistingWaterHeatingSystem, Goal, LeadSource, Measure, Name, OccupantConstraints, Participant, ProjectClassification, ProjectInitiator, RealEstateClassification, Schedules, ScopeOfWork, Site, UtilityService

Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			optional

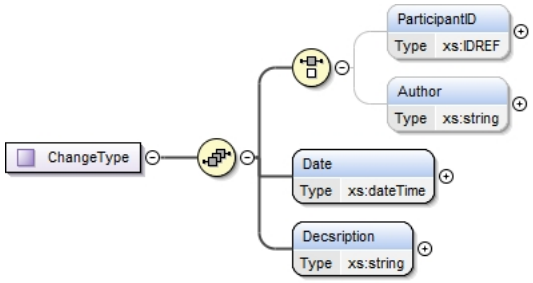
Source

```
<xs:complexType name="ProjectType">
  <xs:annotation>
    <xs:documentation>Project is intended to consolidate at a high level all of the
 necessary information required to complete a project. Can be used for multiple use cases
 where data is passed between parties/tools, including: project leads, collection of
 site audit data, proposing a set of measures, proposing a scope of work based on defined
 measures, etc. Included reference to Utility Service here instead of in Building since
 Project encapsulates building</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="1" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is a simple descriptive name</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Description" type="xs:string" minOccurs="1" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>A more general description of the project. Details are expected
 to be included at the Measure level</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ProjectClassification" type="ProjectClassificationEnumType"
 minOccurs="1" maxOccurs="1"/>
    <xs:element name="RealEstateClassification" type="RealEstateClassificationEnumType"
 maxOccurs="1" minOccurs="1"/>
    <xs:element minOccurs="0" name="ChangeLog" type="ChangeType"/>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="ApplicationID"
 type="ApplicationIDType"/>
    <xs:element name="Participant" type="ParticipantType" minOccurs="0"
 maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>This references all of the consumers/customers</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ProjectInitiator" type="DataOriginatorType" maxOccurs="1"
 minOccurs="0">
      <xs:annotation>
        <xs:documentation>This is intended to identify the participant who
 initially collected the project data. This could be a website as well as a person</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="DateInitiated" type="xs:date" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The date that the project's definition was started (not it's
 actual implementation).</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="DateProposed" type="xs:date" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is the date of the initial proposal</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="DateClosed" type="xs:date" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is the date that the project was completed, i.e. signed off
 by the customer</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="LeadSource" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This defines from where the lead originally came.</
xs:documentation>
```

```
      </xs:annotation>
    </xs:element>
    <xs:element name="Goal" type="xs:string" minOccurs="0" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>This is intended to define the customers and service providers
 high level goals for the project. Detailed goals are expected to be recorded at the
 Measure level</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="OccupantConstraints" type="OccupantConstraintType" minOccurs="0"
 maxOccurs="unbounded"/>
    <xs:element name="ConsumerFeedback" type="ConsumerFeedbackType" minOccurs="0"
 maxOccurs="unbounded"/>
    <xs:element name="UtilityService" type="UtilityAccountType" minOccurs="0"
 maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>This references the Utility company providing energy to the
 site. Included reference to Utility Service here instead of in Building since Project
 encapsulates building</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Site" type="SiteType" minOccurs="0">
      <xs:annotation>
        <xs:documentation>The site element describes the property on which the project is
 being considered or implemented. It describes ownership and jurisdictional information,
 as well as physical attributes. It inlcudes elements describing both buildings and
 grounds. The Site element is particularly useful for capturing site audit data prior to
 defining specific measures, including relevant data about locations for where proposed
 energy system equipment can be placed.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="Schedules">
      <xs:annotation>
        <xs:documentation>This is a container for all schedule definitions for the systems
 within the project. This design is modeled on the gbxml Schedule. The organization is
 consistent in many energy management systems and programable controllers. Typically
 schedules for these are created first by creating the Day schedule and then build
 Week schedules upon Day schedules and Year schedules built off of Week schedules.</
xs:documentation>
      </xs:annotation>
      <xs:complexType>
        <xs:sequence>
          <xs:element maxOccurs="unbounded" minOccurs="1" ref="DaySchedule"/>
          <xs:element maxOccurs="unbounded" minOccurs="1" ref="WeekSchedule"/>
          <xs:element maxOccurs="unbounded" minOccurs="1" ref="Schedule"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="ExistingAppliance"
 type="ApplianceType"/>
    <xs:element name="ExistingDistributionSystem" type="DistributionSystemType"
 minOccurs="0" maxOccurs="unbounded"/>
    <xs:element minOccurs="0" name="ExistingElectricalDistributionSystem"
 type="ElectricalDistributionHierarchyType" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This defines the hierarchy of existing panels and their
 subpanels</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ExistingHVAC" type="HVACSystemType" minOccurs="0"
 maxOccurs="unbounded"/>
    <xs:element name="ExistingLighting" type="LightingSystemType" minOccurs="0"
 maxOccurs="unbounded"/>
    <xs:element name="ExistingPvSystem" nillable="false" minOccurs="0"
 maxOccurs="unbounded" type="PvSystemType">
      <xs:annotation>
        <xs:documentation>An existing photovoltaic (PV) system on the site. Generates
 electrical energy from sunlight.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ExistingWaterHeatingSystem" type="WaterHeatingSystemType"
 minOccurs="0" maxOccurs="unbounded"/>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="Measure" type="MeasureType">
      <xs:annotation>
        <xs:documentation>This is a list of requested and/or proposed and/or additional
 optional measures</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ScopeOfWork" type="ScopeOfWorkType" minOccurs="0"
 maxOccurs="unbounded">
      <xs:annotation>
```

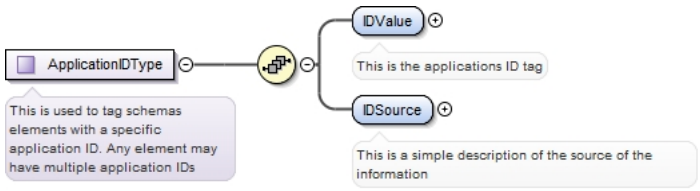
```
        <xs:documentation>This may be used to capture multiple scopes of work as a General
 Contractor may be obtaining independent Scopes of Work from multiple contractors. Each of
 those scopes of work would be captured in an independent Project.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="id" type="xs:ID"/>
</xs:complexType>
```

Complex Type ChangeType

Namespace	http://www.iepmodel.net
Diagram	
Used by	Elements ChangeLogType/Change, ProjectType/ChangeLog
Model	(ParticipantID{0,1} | Author{0,1}) , Date , Decsription
Children	Author, Date, Decsription, ParticipantID
Source	

```
<xs:complexType name="ChangeType">
  <xs:sequence>
    <xs:choice>
      <xs:element minOccurs="0" name="ParticipantID" type="xs:IDREF"/>
      <xs:element minOccurs="0" name="Author" type="xs:string"/>
    </xs:choice>
    <xs:element name="Date" type="xs:dateTime"/>
    <xs:element name="Decsription" type="xs:string"/>
  </xs:sequence>
</xs:complexType>
```

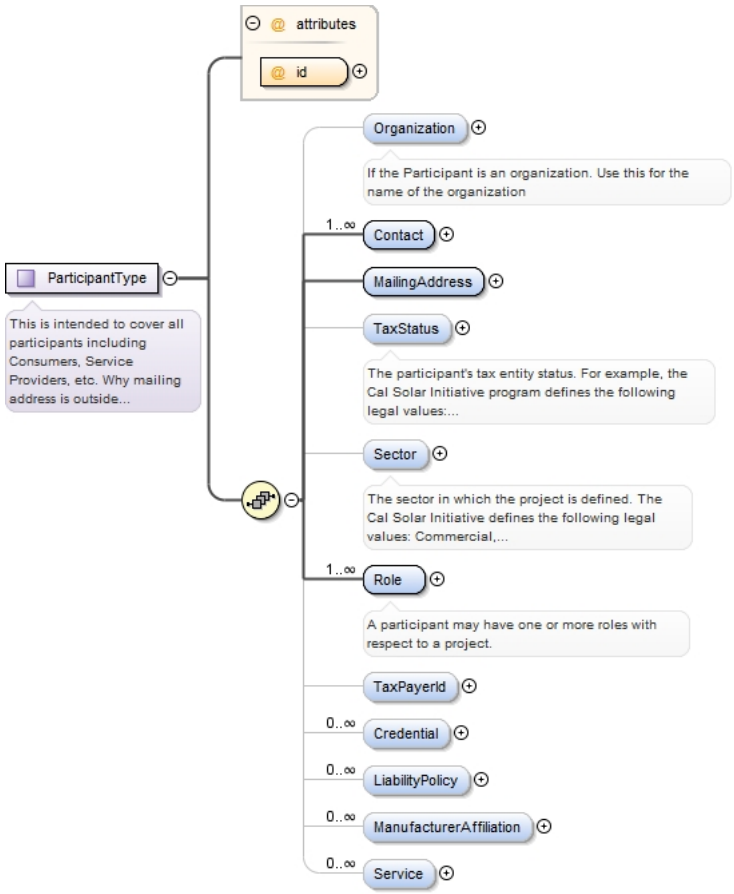
Complex Type ApplicationIDType

Namespace	http://www.iepmodel.net
Annotations	This is used to tag schemas elements with a specific application ID. Any element may have multiple application IDs
Diagram	
Used by	Elements ProjectType/ApplicationID, PvSystemType/CreatorsReferenceId
Model	IDValue , IDSource
Children	IDSource, IDValue
Source	

```
<xs:complexType name="ApplicationIDType">
  <xs:annotation>
    <xs:documentation>This is used to tag schemas elements with a specific application ID.
 Any element may have multiple application IDs</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="IDValue" type="xs:string" minOccurs="1" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is the applications ID tag</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="IDSource" type="xs:string" minOccurs="1" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is a simple description of the source of the information</
xs:documentation>
      </xs:annotation>
```

```
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

Complex Type `ParticipantType`

Namespace	http://www.iepmodel.net
Annotations	This is intended to cover all participants including Consumers, Service Providers, etc. Why mailing address is outside the Contact? mailing addresses are closely associated with the role of the participant, not the individual contacts within a participant.
Diagram	
Used by	Elements Participant, ProjectType/Participant
Model	Organization{0,1} , Contact+ , MailingAddress , TaxStatus{0,1} , Sector{0,1} , Role+ , TaxPayerId{0,1} , Credential* , LiabilityPolicy* , ManufacturerAffiliation* , Service*
Children	Contact, Credential, LiabilityPolicy, MailingAddress, ManufacturerAffiliation, Organization, Role, Sector, Service, TaxPayerId, TaxStatus

Attributes

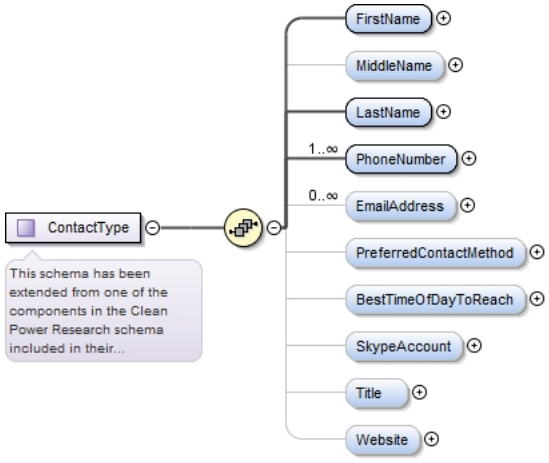
QName	Type	Fixed	Default	Use
id	xs:ID			required

Source

```
<xs:complexType name="ParticipantType">
  <xs:annotation>
    <xs:documentation>This is intended to cover all participants including Consumers,
 Service Providers, etc. Why mailing address is outside the Contact? mailing addresses are
 closely associated with the role of the participant, not the individual contacts within a
 participant.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Organization" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>If the Participant is an organization. Use this for the name of
 the organization</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Contact" type="ContactType" minOccurs="1" maxOccurs="unbounded"/>
```

```
    <xs:element name="MailingAddress" type="AddressType" minOccurs="1" maxOccurs="1"/>
    <xs:element name="TaxStatus" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The participant's tax entity status. For example, the Cal Solar
 Initiative program defines the following legal values: Corporation, Individual, LLC
 (Corporation), LLC (Non-Corporation), Partnership, Sole Proprietor, Tax Exempt. This may
 hold other values depending on the needs of the user.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Sector" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The sector in which the project is defined. The Cal Solar
 Initiative defines the following legal values: Commercial, Government, Non-Profit,
 Residential. Other values can be used to support defined sectors used by other
 programs.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Role" type="ParticipantRoleEnumType" minOccurs="1"
 maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>A participant may have one or more roles with respect to a
 project.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="TaxPayerId" type="xs:string" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Credential" type="CredentialType" minOccurs="0"
 maxOccurs="unbounded"/>
    <xs:element name="LiabilityPolicy" type="LiabilityPolicyType" minOccurs="0"
 maxOccurs="unbounded"/>
    <xs:element name="ManufacturerAffiliation" type="ManufacturerAffiliationType"
 minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="Service" type="ServiceType" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="id" use="required" type="xs:ID"/>
</xs:complexType>
```

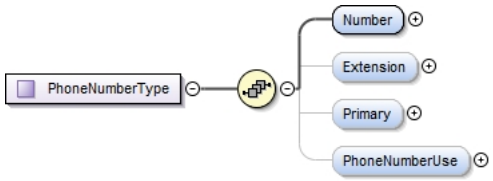
Complex Type `ContactType`

Namespace	http://www.iepmodel.net
Annotations	This schema has been extended from one of the components in the Clean Power Research schema included in their PowerClerk schema. It's intended use is to define the contacts in a particular project for customers, contractors, service providers, etc.
Diagram	
Used by	Elements CertifyingAuthority/Contact, ParticipantType/Contact
Model	FirstName , MiddleName{0,1} , LastName , PhoneNumber+ , EmailAddress* , PreferredContactMethod{0,1} , BestTimeOfDayToReach{0,1} , SkypeAccount{0,1} , Title{0,1} , Website{0,1}
Children	BestTimeOfDayToReach, EmailAddress, FirstName, LastName, MiddleName, PhoneNumber, PreferredContactMethod, SkypeAccount, Title, Website
Source	

```
<xs:complexType name="ContactType">
  <xs:annotation>
    <xs:documentation>This schema has been extended from one of the components in the
 Clean Power Research schema included in their PowerClerk schema. It's intended use
 is to define the contacts in a particular project for customers, contractors, service
 providers, etc.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="FirstName" type="xs:string" minOccurs="1" maxOccurs="1"/>
```

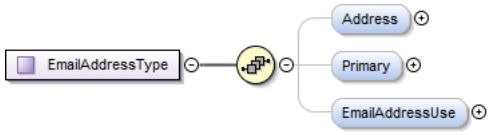
```
    <xs:element name="MiddleName" type="xs:string" minOccurs="0" maxOccurs="1"/>
    <xs:element name="LastName" type="xs:string" minOccurs="1" maxOccurs="1"/>
    <xs:element name="PhoneNumber" type="PhoneNumberType" minOccurs="1"
 maxOccurs="unbounded"/>
    <xs:element name="EmailAddress" type="EmailAddressType" minOccurs="0"
 maxOccurs="unbounded"/>
    <xs:element name="PreferredContactMethod" type="PreferredContactMethodEnumType"
 minOccurs="0" maxOccurs="1"/>
    <xs:element name="BestTimeOfDayToReach" type="xs:string" minOccurs="0" maxOccurs="1"/>
    <xs:element name="SkypeAccount" type="xs:string" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Title" type="xs:string" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Website" type="xs:string" minOccurs="0" maxOccurs="1"/>
  </xs:sequence>
</xs:complexType>
```

Complex Type PhoneNumberType

Namespace	http://www.iepmodel.net
Diagram	
Used by	Element ContactType/PhoneNumber
Model	Number , Extension{0,1} , Primary{0,1} , PhoneNumberUse{0,1}
Children	Extension, Number, PhoneNumberUse, Primary

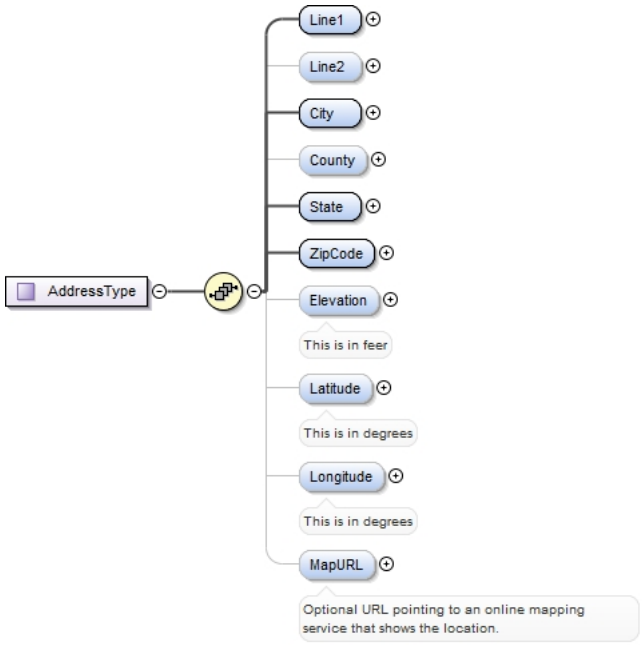
Source	<xs:complexType name="PhoneNumberType">
	  <xs:sequence>
	  <xs:element name="Number" type="xs:string" minOccurs="1" maxOccurs="1"/>
	  <xs:element name="Extension" type="xs:int" minOccurs="0" maxOccurs="1"
	  nillable="true"/>
	  <xs:element name="Primary" type="xs:boolean" minOccurs="0" maxOccurs="1"/>
	  <xs:element name="PhoneNumberUse" type="PhoneNumberEnumType" minOccurs="0"
	  maxOccurs="1"/>
	  </xs:sequence>
	</xs:complexType>

Complex Type EmailAddressType

Namespace	http://www.iepmodel.net
Diagram	
Used by	Element ContactType/EmailAddress
Model	Address{0,1} , Primary{0,1} , EmailAddressUse{0,1}
Children	Address, EmailAddressUse, Primary
Source	<xs:complexType name="EmailAddressType"> <xs:sequence> <xs:element name="Address" type="xs:string" minOccurs="0" maxOccurs="1"/> <xs:element name="Primary" type="xs:boolean" minOccurs="0" maxOccurs="1"/> <xs:element name="EmailAddressUse" type="EmailAddressEnumType" minOccurs="0" maxOccurs="1"/> </xs:sequence> </xs:complexType>

Complex Type AddressType

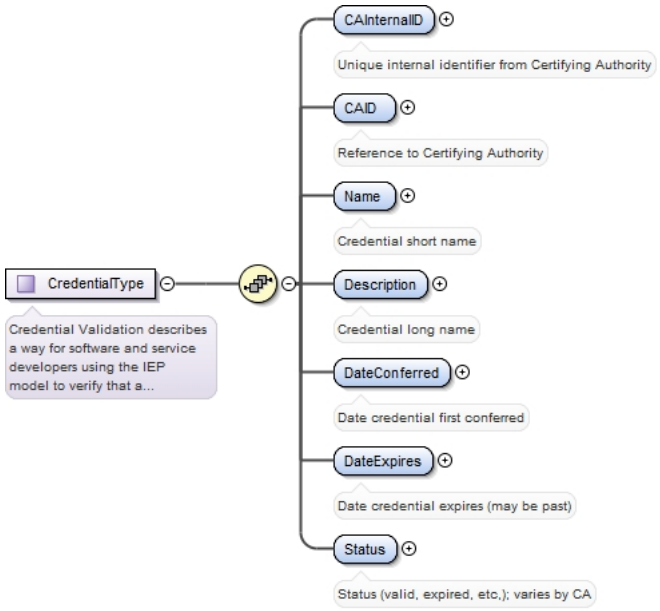
Namespace	http://www.iepmodel.net

Diagram	
Used by	Elements CertifyingAuthority/MailingAddress, ParticipantType/MailingAddress, SiteType/Location
Model	Line1 , Line2{0,1} , City , County{0,1} , State , ZipCode , Elevation{0,1} , Latitude{0,1} , Longitude{0,1} , MapURL{0,1}
Children	City, County, Elevation, Latitude, Line1, Line2, Longitude, MapURL, State, ZipCode
Source	

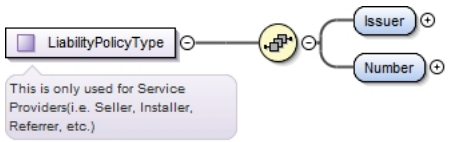
```
<xs:complexType name="AddressType">
  <xs:sequence>
    <xs:element name="Line1" type="xs:string"/>
    <xs:element name="Line2" type="xs:string" minOccurs="0" maxOccurs="1"/>
    <xs:element name="City" type="xs:string"/>
    <xs:element name="County" type="xs:string" minOccurs="0" maxOccurs="1"/>
    <xs:element name="State" type="xs:string" minOccurs="1"/>
    <xs:element name="ZipCode" type="ZipCodeType"/>
    <xs:element name="Elevation" type="xs:float" minOccurs="0" nillable="true">
      <xs:annotation>
        <xs:documentation>This is in feer</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Latitude" type="xs:float" minOccurs="0" nillable="true">
      <xs:annotation>
        <xs:documentation>This is in degrees</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Longitude" type="xs:float" minOccurs="0" nillable="true">
      <xs:annotation>
        <xs:documentation>This is in degrees</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="MapURL" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Optional URL pointing to an online mapping service that shows
 the location.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

Complex Type `CredentialType`

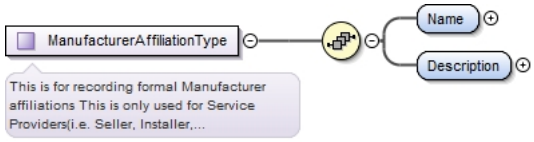
Namespace	http://www.iepmodel.net
Annotations	Credential Validation describes a way for software and service developers using the IEP model to verify that a particular individual (typically a contractor, home energy rater, or similar professional) has a credential issued by a certifying authority (“CA”, such as a contractor licensing board, HERS provider, or similar authority). It also specifies a way to describe credential metadata, such as status and dates.

Diagram	
Used by	Element ParticipantType/Credential
Model	CAInternalID , CAID , Name , Description , DateConferred , DateExpires , Status
Children	CAID, CAInternalID, DateConferred, DateExpires, Description, Name, Status
Source	`<xs:complexType name="CredentialType">` `  <xs:annotation>` ` <xs:documentation>Credential Validation describes a way for software and service developers using the IEP model to verify that a particular individual (typically a contractor, home energy rater, or similar professional) has a credential issued by a certifying authority (“CA”, such as a contractor licensing board, HERS provider, or similar authority). It also specifies a way to describe credential metadata, such as status and dates.</xs:documentation>` ` </xs:annotation>` ` <xs:sequence>` ` <xs:element name="CAInternalID" type="xs:string" minOccurs="1" maxOccurs="1">` ` <xs:annotation>` ` <xs:documentation>Unique internal identifier from Certifying Authority</xs:documentation>` ` </xs:annotation>` ` </xs:element>` ` <xs:element name="CAID" type="xs:int" minOccurs="1" maxOccurs="1">` ` <xs:annotation>` ` <xs:documentation>Reference to Certifying Authority</xs:documentation>` ` </xs:annotation>` ` </xs:element>` ` <xs:element name="Name" type="xs:string" minOccurs="1" maxOccurs="1">` ` <xs:annotation>` ` <xs:documentation>Credential short name</xs:documentation>` ` </xs:annotation>` ` </xs:element>` ` <xs:element name="Description" type="xs:string" minOccurs="1" maxOccurs="1">` ` <xs:annotation>` ` <xs:documentation>Credential long name</xs:documentation>` ` </xs:annotation>` ` </xs:element>` ` <xs:element name="DateConferred" type="xs:date" minOccurs="1" maxOccurs="1">` ` <xs:annotation>` ` <xs:documentation>Date credential first conferred</xs:documentation>` ` </xs:annotation>` ` </xs:element>` ` <xs:element name="DateExpires" type="xs:date" minOccurs="1" maxOccurs="1">` ` <xs:annotation>` ` <xs:documentation>Date credential expires (may be past)</xs:documentation>` ` </xs:annotation>` ` </xs:element>` ` <xs:element name="Status" type="xs:string" minOccurs="1" maxOccurs="1">` ` <xs:annotation>` ` <xs:documentation>Status (valid, expired, etc,); varies by CA</xs:documentation>` ` </xs:annotation>` ` </xs:element>` ` </xs:sequence>` `</xs:complexType>`

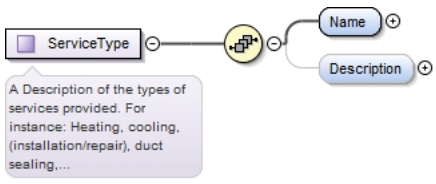
Complex Type `LiabilityPolicyType`

Namespace	http://www.iepmodel.net
Annotations	This is only used for Service Providers(i.e. Seller, Installer, Referrer, etc.)
Diagram	
Used by	Element ParticipantType/LiabilityPolicy
Model	Issuer , Number
Children	Issuer, Number
Source	<xs:complexType name="LiabilityPolicyType"> <xs:annotation> <xs:documentation>This is only used for Service Providers(i.e. Seller, Installer, Referrer, etc.)</xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="Issuer" type="xs:string" minOccurs="1" maxOccurs="1"/> <xs:element name="Number" type="xs:int" minOccurs="1" maxOccurs="1"/> </xs:sequence> </xs:complexType>

Complex Type `ManufacturerAffiliationType`

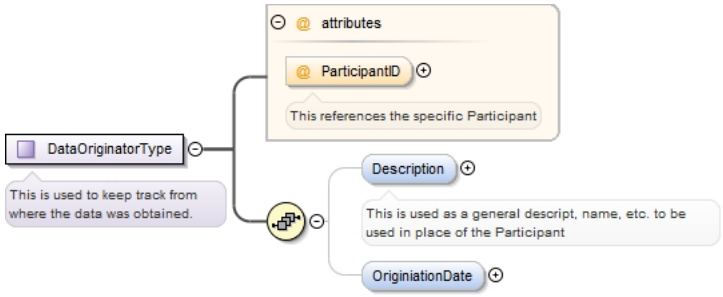
Namespace	http://www.iepmodel.net
Annotations	This is for recording formal Manufacturer affiliations This is only used for Service Providers(i.e. Seller, Installer, Referrer, etc.)
Diagram	
Used by	Element ParticipantType/ManufacturerAffiliation
Model	Name , Description
Children	Description, Name
Source	<xs:complexType name="ManufacturerAffiliationType"> <xs:annotation> <xs:documentation>This is for recording formal Manufacturer affiliations This is only used for Service Providers(i.e. Seller, Installer, Referrer, etc.)</xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="Name" type="xs:string" minOccurs="1" maxOccurs="1"/> <xs:element name="Description" type="xs:string" minOccurs="1" maxOccurs="1"/> </xs:sequence> </xs:complexType>

Complex Type `ServiceType`

Namespace	http://www.iepmodel.net
Annotations	A Description of the types of services provided. For instance: Heating, cooling, (installation/repair), duct sealing, asbestos removal, etc. This is only used for Service Providers(i.e. Seller, Installer, Referrer, etc.)
Diagram	
Used by	Element ParticipantType/Service

Model	Name , Description{0,1}
Children	Description, Name
Source	<xs:complexType name="ServiceType"> <xs:annotation> <xs:documentation>A Description of the types of services provided. For instance: Heating, cooling, (installation/repair), duct sealing, asbestos removal, etc. This is only used for Service Providers(i.e. Seller, Installer, Referrer, etc.)</xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="Name" type="xs:string" minOccurs="1" maxOccurs="1"/> <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"/> </xs:sequence> </xs:complexType>

Complex Type DataOriginatorType

Namespace	http://www.iepmodel.net
Annotations	This is used to keep track from where the data was obtained.
Diagram	
Used by	Elements BenefitType/DeterminationAuthor, MeasureType/Author, ProjectType/ProjectInitiator
Model	Description{0,1} , OriginiationDate{0,1}
Children	Description, OriginiationDate

Attributes

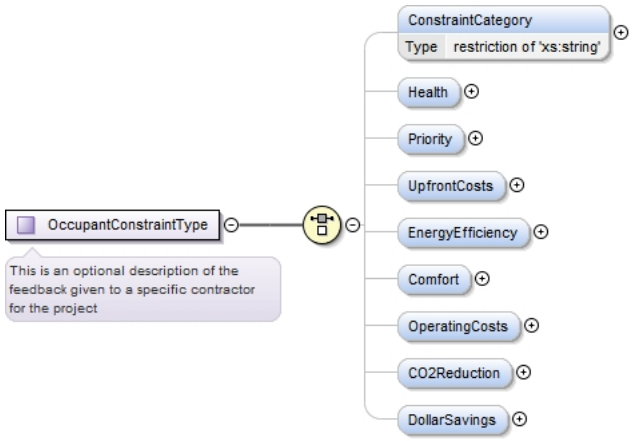
QName	Type	Fixed	Default	Use
ParticipantID	xs:IDREF			optional
	This references the specific Participant			

Source

```
<xs:complexType name="DataOriginatorType">
  <xs:annotation>
    <xs:documentation>This is used to keep track from where the data was obtained.</
xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is used as a general descript, name, etc. to be used in
 place of the Participant</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="OriginiationDate" type="xs:date"/>
  </xs:sequence>
  <xs:attribute name="ParticipantID" type="xs:IDREF">
    <xs:annotation>
      <xs:documentation>This references the specific Participant</xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:complexType>
```

Complex Type OccupantConstraintType

Namespace	http://www.iepmodel.net
Annotations	This is an optional description of the feedback given to a specific contractor for the project

Diagram	
Used by	Element ProjectType/OccupantConstraints
Model	ConstraintCategory{0,1} | Health{0,1} | Priority{0,1} | UpfrontCosts{0,1} | EnergyEfficiency{0,1} | Comfort{0,1} | OperatingCosts{0,1} | CO2Reduction{0,1} | DollarSavings{0,1}
Children	CO2Reduction, Comfort, ConstraintCategory, DollarSavings, EnergyEfficiency, Health, OperatingCosts, Priority, UpfrontCosts
Source	

```
<xs:complexType name="OccupantConstraintType">
  <xs:annotation>
    <xs:documentation>This is an optional description of the feedback given to a specific
 contractor for the project</xs:documentation>
  </xs:annotation>
  <xs:choice>
    <xs:element name="ConstraintCategory" minOccurs="0">
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="Health"/>
          <xs:enumeration value="Comfort"/>
          <xs:enumeration value="EnergyEfficiency"/>
          <xs:enumeration value="UpfrontCosts"/>
          <xs:enumeration value="OperatingCosts"/>
          <xs:enumeration value="CO2Reduction"/>
          <xs:enumeration value="DollarSavings"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="Health" minOccurs="0">
      <xs:complexType>
        <xs:annotation>
          <xs:documentation>This is used to describe health constraints such as specific
 allergies</xs:documentation>
        </xs:annotation>
        <xs:sequence>
          <xs:element name="Name" type="xs:string" minOccurs="1" maxOccurs="1"/>
          <xs:element name="Description" type="xs:string" minOccurs="1" maxOccurs="1"/>
          <xs:element name="Severity" type="xs:string" minOccurs="1" maxOccurs="1"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
    <xs:element name="Priority" minOccurs="0">
      <xs:complexType>
        <xs:annotation>
          <xs:documentation>Scale of 1 to 10.</xs:documentation>
        </xs:annotation>
        <xs:sequence minOccurs="0" maxOccurs="unbounded">
          <xs:element name="PriorityLevel" type="xs:int" minOccurs="1" maxOccurs="1"/>
          <xs:element name="PriorityType" type="xs:string" minOccurs="1" maxOccurs="1"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
    <xs:element name="UpfrontCosts" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="MaximumUpfrontCosts" type="xs:float" minOccurs="1"
 maxOccurs="1"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
    <xs:element name="EnergyEfficiency" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
```

```
          <xs:element name="RequestedLevelOfEfficiency" type="xs:string" minOccurs="1"
maxOccurs="1"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
    <xs:element name="Comfort" minOccurs="0">
      <xs:complexType>
        <xs:annotation>
          <xs:documentation>This is used to describe specific comfort constraints in the
building such as drafts, ventilation, hot and cold spots, etc.</xs:documentation>
        </xs:annotation>
        <xs:sequence>
          <xs:element name="Name" type="xs:string" minOccurs="1" maxOccurs="1"/>
          <xs:element name="Description" type="xs:string" minOccurs="1" maxOccurs="1"/>
          <xs:element name="Severity" type="xs:string" minOccurs="1" maxOccurs="1"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
    <xs:element name="OperatingCosts" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="MaximumOperatingCosts" type="xs:float" minOccurs="1"
maxOccurs="1"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
    <xs:element name="CO2Reduction" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="RequestedCO2ReductionDesc" type="xs:string" minOccurs="1"
maxOccurs="1">
            <xs:annotation>
              <xs:documentation>This is a descriptive element and may be represented in
several ways</xs:documentation>
            </xs:annotation>
          </xs:element>
          <xs:element name="RequestedCO2ReductionInTonsPerYear" type="xs:float"
minOccurs="1" maxOccurs="1"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
    <xs:element name="DollarSavings" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="ExpectedTotalDollarSavingsInOperatingCosts" type="xs:float"
minOccurs="1" maxOccurs="1"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:choice>
</xs:complexType>
```

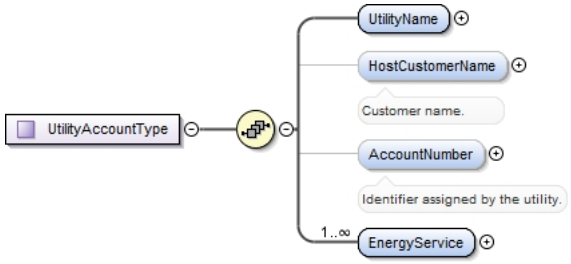
Complex Type `ConsumerFeedbackType`

Namespace	http://www.iepmodel.net
Diagram	
Used by	Element ProjectType/ConsumerFeedback
Model	ProductRating{0,1} , ServiceProviderRating{0,1}
Children	ProductRating, ServiceProviderRating
`Source`	

```
<xs:complexType name="ConsumerFeedbackType">
  <xs:sequence>
    <xs:element name="ProductRating" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="Comments" type="xs:string" minOccurs="0" maxOccurs="1">
            <xs:annotation>
              <xs:documentation>Fair Good Great</xs:documentation>
            </xs:annotation>
          </xs:element>
          <xs:element name="EaseOfUse" type="xs:string" minOccurs="0" maxOccurs="1"/>
          <xs:element name="QualityOfProduct" type="xs:string" minOccurs="0"
maxOccurs="1"/>
          <xs:element name="SatisfactionLevel" type="xs:string" minOccurs="0"
maxOccurs="1">
            <xs:annotation>
```

```
            <xs:documentation>Fair Good Excellent or 5 star rating?</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="ServiceProviderRating" minOccurs="0">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="BudgetSatisfaction" type="xs:string" minOccurs="0"
 maxOccurs="1"/>
        <xs:element name="Compliments" type="xs:string" minOccurs="0" maxOccurs="1"/>
        <xs:element name="OverallSatisfaction" type="xs:string" minOccurs="0"
 maxOccurs="1"/>
        <xs:element name="QualityOfWork" type="xs:int" minOccurs="0" maxOccurs="1"/>
        <xs:element name="TimelinessSatisfaction" type="xs:string" minOccurs="0"
 maxOccurs="1"/>
        <xs:element name="Suggestions" type="xs:string" minOccurs="0" maxOccurs="1"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
 </xs:sequence>
</xs:complexType>
```

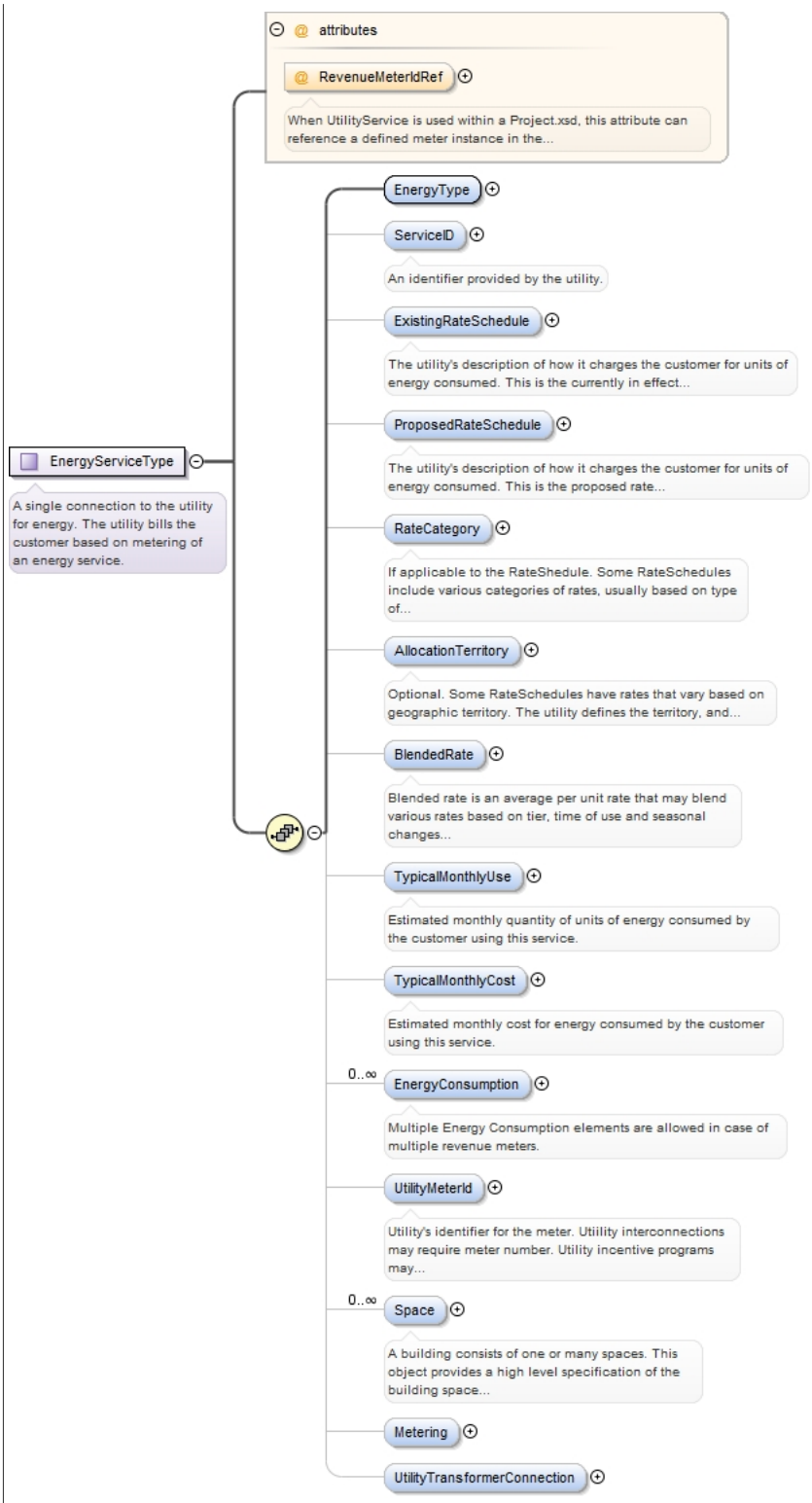
Complex Type `UtilityAccountType`

Namespace	http://www.iepmodel.net
Diagram	
Used by	Elements ProjectType/UtilityService, UtilityAccount
Model	UtilityName , HostCustomerName{0,1} , AccountNumber{0,1} , EnergyService+
Children	AccountNumber, EnergyService, HostCustomerName, UtilityName
Source	

```
<xs:complexType name="UtilityAccountType">
  <xs:sequence minOccurs="1" maxOccurs="1">
    <xs:element name="UtilityName" type="xs:string"/>
    <xs:element name="HostCustomerName" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Customer name.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="AccountNumber" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Identifier assigned by the utility.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="EnergyService" type="EnergyServiceType" minOccurs="1"
 maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
```

Complex Type `EnergyServiceType`

Namespace	http://www.iepmodel.net
Annotations	A single connection to the utility for energy. The utility bills the customer based on metering of an energy service.

Diagram	
Used by	Element UtilityAccountType/EnergyService
Model	EnergyType , ServiceID{0,1} , ExistingRateSchedule{0,1} , ProposedRateSchedule{0,1} , RateCategory{0,1} , AllocationTerritory{0,1} , BlendedRate{0,1} , TypicalMonthlyUse{0,1} , TypicalMonthlyCost{0,1} , EnergyConsumption* , UtilityMeterId{0,1} , Space* , Metering{0,1} , UtilityTransformerConnection{0,1}
Children	AllocationTerritory, BlendedRate, EnergyConsumption, EnergyType, ExistingRateSchedule, Metering, ProposedRateSchedule, RateCategory, ServiceID, Space, TypicalMonthlyCost, TypicalMonthlyUse, UtilityMeterId, UtilityTransformerConnection

Attributes

QName	Type	Fixed	Default	Use
RevenueMeterIdRef	xs:IDREF			optional

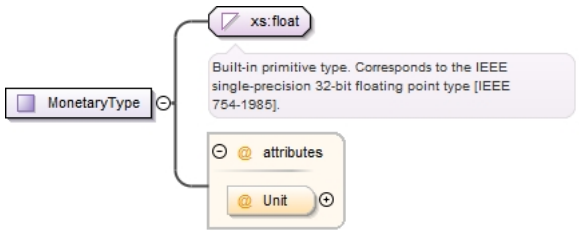
	QName	Type	Fixed	Default	Use
		When UtilityService is used within a Project.xsd, this attribute can reference a defined meter instance in the ElectricalDistributionHierarchy, or within a PvSystem.			

Source

```
<xs:complexType name="EnergyServiceType">
  <xs:annotation>
    <xs:documentation>A single connection to the utility for energy. The utility bills the
 customer based on metering of an energy service.</xs:documentation>
  </xs:annotation>
  <xs:sequence minOccurs="1" maxOccurs="1">
    <xs:element name="EnergyType" type="EnergyUnitEnumType"/>
    <xs:element name="ServiceID" type="xs:string" minOccurs="0">
      <xs:annotation>
        <xs:documentation>An identifier provided by the utility.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ExistingRateSchedule" type="xs:string" maxOccurs="1" minOccurs="0">
      <xs:annotation>
        <xs:documentation>The utility's description of how it charges the customer
 for units of energy consumed. This is the currently in effect rate schedule.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ProposedRateSchedule" maxOccurs="1" minOccurs="0" type="xs:string">
      <xs:annotation>
        <xs:documentation>The utility's description of how it charges the customer for
 units of energy consumed. This is the proposed rate schedule in cases where the project
 includes a change of rate schedule.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="RateCategory" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>If applicable to the RateShedule. Some RateSchedules include
 various categories of rates, usually based on type of customer (for example, "All
 Electric," "Low Income," etc).</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="AllocationTerritory" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Optional. Some RateSchedules have rates that vary based on
 geographic territory. The utility defines the territory, and this is their identifier.
 May be a name or a code.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="BlendedRate" type="MonetaryType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Blended rate is an average per unit rate that may blend various
 rates based on tier, time of use and seasonal changes into a single rate. This will be in
 cents/kwh or dollars/therm</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="TypicalMonthlyUse" type="EnergyConsumptionType" minOccurs="0"
 maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Estimated monthly quantity of units of energy consumed by the
 customer using this service.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="TypicalMonthlyCost" type="MonetaryType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Estimated monthly cost for energy consumed by the customer using
 this service.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="EnergyConsumption" type="EnergyConsumptionType" minOccurs="0"
 maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>Multiple Energy Consumption elements are allowed in case of
 multiple revenue meters.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="UtilityMeterId" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Utility's identifier for the meter. Utiility interconnections
 may require meter number. Utility incentive programs may require meter id as well.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Space" type="xs:IDREF" minOccurs="0" maxOccurs="unbounded">
      <xs:annotation>
```

```
        <xs:documentation>A building consists of one or many spaces. This object provides
 a high level specification of the building space profile intended for use with Projects
 and simulations such as SaveEnergy123 and Portfolio Manager. https://saveenergy123.com/
 http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Metering" type="MeteringTypesEnumType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="UtilityTransformerConnection"
 type="UtilityTransformerConnectionTypesEnumType" minOccurs="0" maxOccurs="1"/>
  </xs:sequence>
  <xs:attribute name="RevenueMeterIdRef" type="xs:IDREF">
    <xs:annotation>
      <xs:documentation>When UtilityService is used within a Project.xsd, this attribute
 can reference a defined meter instance in the ElectricalDistributionHierarchy, or within
 a PvSystem.</xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:complexType>
```

Complex Type `MonetaryType`

Namespace	http://www.iepmodel.net
Diagram	
Type	extension of xs:float
Used by	Elements: EnergyServiceType/BlendedRate, EnergyServiceType/TypicalMonthlyCost, ValueType/Money

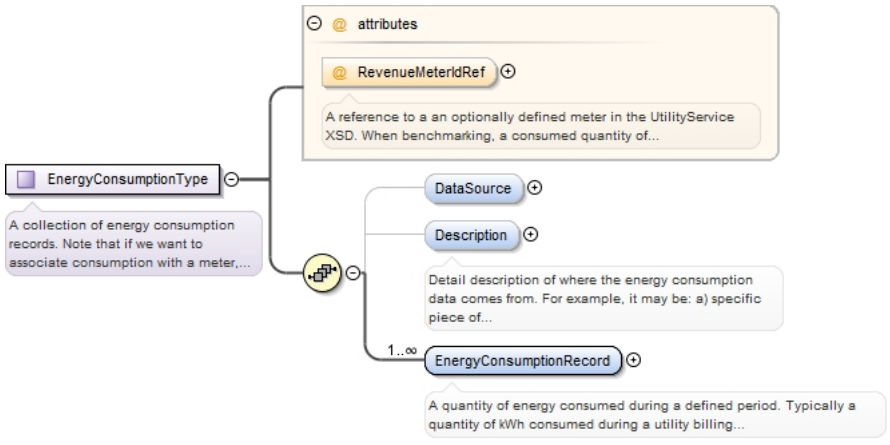
Attributes

QName	Type	Fixed	Default	Use
Unit	MonetaryUnitEnumType			optional

`Source`

```
<xs:complexType name="MonetaryType">
  <xs:simpleContent>
    <xs:extension base="xs:float">
      <xs:attribute name="Unit" type="MonetaryUnitEnumType"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

Complex Type `EnergyConsumptionType`

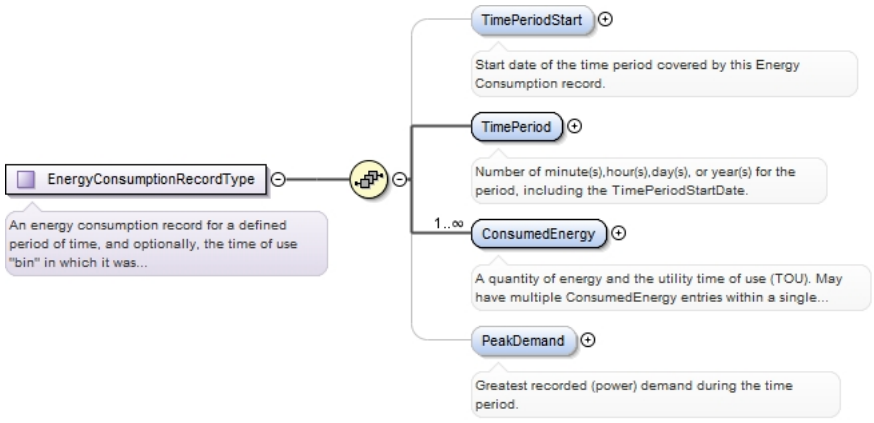
Namespace	http://www.iepmodel.net
Annotations	A collection of energy consumption records. Note that if we want to associate consumption with a meter, EnergyConsumption is included as an optional element of a meter within the UtilityService schema.
Diagram	
Used by	Elements: BuildingType/EnergyConsumption, CommonSystemPropertiesType/EnergyConsumption, EnergyServiceType/EnergyConsumption, EnergyServiceType/TypicalMonthlyUse

Model	DataSource{0,1} , Description{0,1} , EnergyConsumptionRecord+
Children	DataSource, Description, EnergyConsumptionRecord
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **RevenueMeterIdRef** / xs:IDREF / / / optional A reference to a an optionally defined meter in the UtilityService XSD. When benchmarking, a consumed quantity of energy must be associated to a defined revenue meter.

Source

```
<xs:complexType name="EnergyConsumptionType">
  <xs:annotation>
    <xs:documentation>A collection of energy consumption records. Note that if we want to
 associate consumption with a meter, EnergyConsumption is included as an optional element
 of a meter within the UtilityService schema.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="DataSource" type="ConsumptionDataSourceEnumType" minOccurs="0"
 maxOccurs="1"/>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Detail description of where the energy consumption data comes
 from. For example, it may be: a) specific piece of software, b) customer's bill, c)
 measurements, d) etc. This field may contain information about who captured the data.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="EnergyConsumptionRecord" type="EnergyConsumptionRecordType"
 minOccurs="1" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>A quantity of energy consumed during a defined period. Typically
 a quantity of kWh consumed during a utility billing period.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="RevenueMeterIdRef" type="xs:IDREF">
    <xs:annotation>
      <xs:documentation>A reference to a an optionally defined meter in the UtilityService
 XSD. When benchmarking, a consumed quantity of energy must be associated to a defined
 revenue meter.</xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:complexType>
```

Complex Type `EnergyConsumptionRecordType`

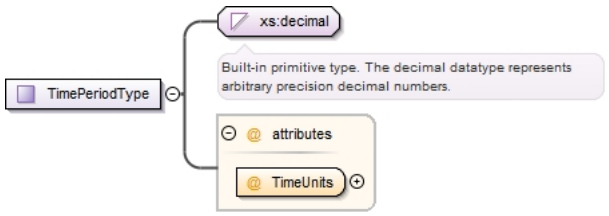
Namespace	http://www.iepmodel.net
Annotations	An energy consumption record for a defined period of time, and optionally, the time of use "bin" in which it was consumed.
Diagram	
Used by	Element EnergyConsumptionType/EnergyConsumptionRecord
Model	TimePeriodStart{0,1} , TimePeriod , ConsumedEnergy+ , PeakDemand{0,1}
Children	ConsumedEnergy, PeakDemand, TimePeriod, TimePeriodStart

Source

```
<xs:complexType name="EnergyConsumptionRecordType">
  <xs:annotation>
    <xs:documentation>An energy consumption record for a defined period of time, and
 optionally, the time of use "bin" in which it was consumed.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
```

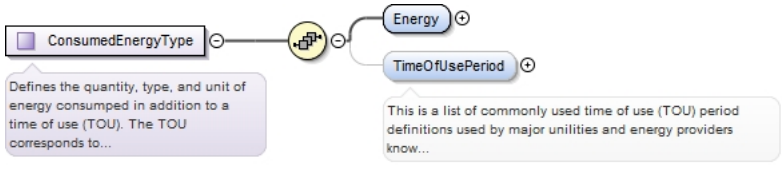
```
    <xs:element name="TimePeriodStart" type="xs:dateTime" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Start date of the time period covered by this Energy Consumption
 record.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="TimePeriod" minOccurs="1" maxOccurs="1" type="TimePeriodType">
      <xs:annotation>
        <xs:documentation>Number of minute(s),hour(s),day(s), or year(s) for the period,
 including the TimePeriodStartDate.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ConsumedEnergy" type="ConsumedEnergyType" minOccurs="1"
 maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>A quantity of energy and the utility time of use (TOU).
 May have multiple ConsumedEnergy entries within a single EnergyConsumptionRecord to
 account for different types of energy (for example, electrcity and natural gas), as
 well as to account for multiple time of use periods during the metered TimePeriod.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="PeakDemand" type="PeakPowerType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Greatest recorded (power) demand during the time period.</
xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

Complex Type `TimePeriodType`

Namespace	http://www.iepmodel.net
Diagram	
Type	extension of xs:decimal
Used by	Element EnergyConsumptionRecordType/TimePeriod
Attributes	**QName** | **Type** | **Fixed** | **Default** | **Use** **TimeUnits** | TimeUnitEnumType | | | required

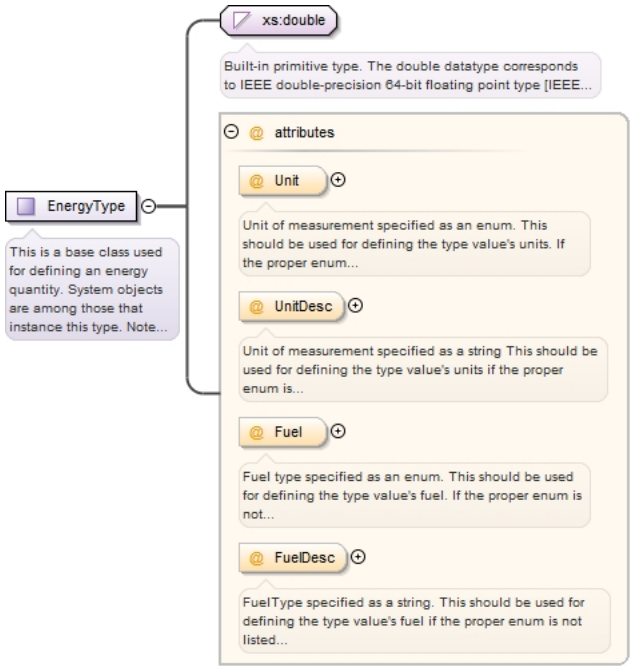
Source	`<xs:complexType name="TimePeriodType">`
	`  <xs:simpleContent>`
	`  <xs:extension base="xs:decimal">`
	`  <xs:attribute name="TimeUnits" type="TimeUnitEnumType" use="required"/>`
	`  </xs:extension>`
	`  </xs:simpleContent>`
	`</xs:complexType>`

Complex Type `ConsumedEnergyType`

Namespace	http://www.iepmodel.net
Annotations	Defines the quantity, type, and unit of energy consumped in addition to a time of use (TOU). The TOU corresponds to commonly used time-periods defined by several major utilities and energy providers know by the authors. Typically, the rate structure (cost per unit of energy) varies with TOU. Note that if no energy type or units are included, the amount is considered to be kilowatt-hours of Electricity.
Diagram	
Used by	Element EnergyConsumptionRecordType/ConsumedEnergy

Model	Energy , TimeOfUsePeriod{0,1}
Children	Energy, TimeOfUsePeriod
Source	<xs:complexType name="ConsumedEnergyType"> <xs:annotation> <xs:documentation>Defines the quantity, type, and unit of energy consumped in addition to a time of use (TOU). The TOU corresponds to commonly used time-periods defined by several major utilities and energy providers know by the authors. Typically, the rate structure (cost per unit of energy) varies with TOU. Note that if no energy type or units are included, the amount is considered to be kilowatt-hours of Electricity.</xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="Energy" type="EnergyType" minOccurs="1" maxOccurs="1"/> <xs:element name="TimeOfUsePeriod" type="TOUPeriodsEnumType" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is a list of commonly used time of use (TOU) period definitions used by major unilities and energy providers know by the authors. Typically, the rate structure (cost per unit of energy) varies with TOU.</xs:documentation> </xs:annotation> </xs:element> </xs:sequence> </xs:complexType>

Complex Type EnergyType

Namespace	http://www.iepmodel.net
Annotations	This is a base class used for defining an energy quantity. System objects are among those that instance this type. Note that Title24 & HPXML uses "EnergyType" as their Enums name so we followed suit.
Diagram	
Type	extension of xs:double
Used by	Elements ConsumedEnergyType/Energy, ValueType/Energy

Attributes

QName	Type	Fixed	Default	Use
Fuel	EnergyClassEnumType			optional
	Fuel type specified as an enum. This should be used for defining the type value's fuel. If the proper enum is not listed, please use the FuelDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.			
FuelDesc	xs:string			optional
	FuelType specified as a string. This should be used for defining the type value's fuel if the proper enum is not listed in Fuel.			

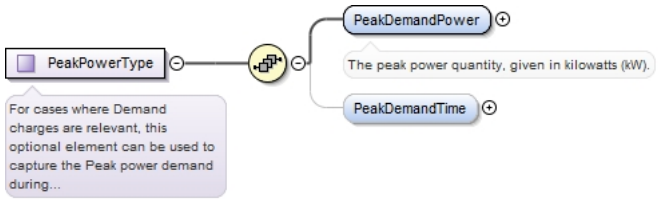
QName	Type	Fixed	Default	Use
	These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.			
Unit	EnergyUnitEnumType			optional
	Unit of measurement specified as an enum. This should be used for defining the type value's units. If the proper enum is not listed, please use the UnitDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			
UnitDesc	xs:string			optional
	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			

Source

```
<xs:complexType name="EnergyType">
  <xs:annotation>
    <xs:documentation>This is a base class used for defining an energy quantity.
 System objects are among those that instance this type. Note that Title24 & HPXML uses
 "EnergyType" as their Enums name so we followed suit.</xs:documentation>
  </xs:annotation>
  <xs:simpleContent>
    <xs:extension base="xs:double">
      <xs:attribute name="Unit" type="EnergyUnitEnumType" use="optional">
        <xs:annotation>
          <xs:documentation>Unit of measurement specified as an enum. This should be used
 for defining the type value's units. If the proper enum is not listed, please use the
 UnitDesc field to specify the units. These are all optional attributes in order to allow
 for a simplified value descriptions since these are used throughout the IEP schemas.
 Additionally the UnitDesc may contain a default type.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
      <xs:attribute name="UnitDesc" type="xs:string">
        <xs:annotation>
          <xs:documentation>Unit of measurement specified as a string This should be used
 for defining the type value's units if the proper enum is not listed in Unit. These are
 all optional attributes in order to allow for a simplified value descriptions since these
 are used throughout the IEP schemas. Additionally the UnitDesc may contain a default
 type.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
      <xs:attribute name="Fuel" type="EnergyClassEnumType" use="optional">
        <xs:annotation>
          <xs:documentation>Fuel type specified as an enum. This should be used for
 defining the type value's fuel. If the proper enum is not listed, please use the
 FuelDesc field to specify the units. These are all optional attributes in order to allow
 for a simplified value descriptions since these are used throughout the IEP schemas.
 Additionally the FuelDesc may contain a default type.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
      <xs:attribute name="FuelDesc" type="xs:string">
        <xs:annotation>
          <xs:documentation>FuelType specified as a string. This should be used for
 defining the type value's fuel if the proper enum is not listed in Fuel. These are all
 optional attributes in order to allow for a simplified value descriptions since these are
 used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.</
xs:documentation>
        </xs:annotation>
      </xs:attribute>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

Complex Type PeakPowerType

Namespace	http://www.iepmodel.net
Annotations	For cases where Demand charges are relevant, this optional element can be used to capture the Peak power demand during the period defined.

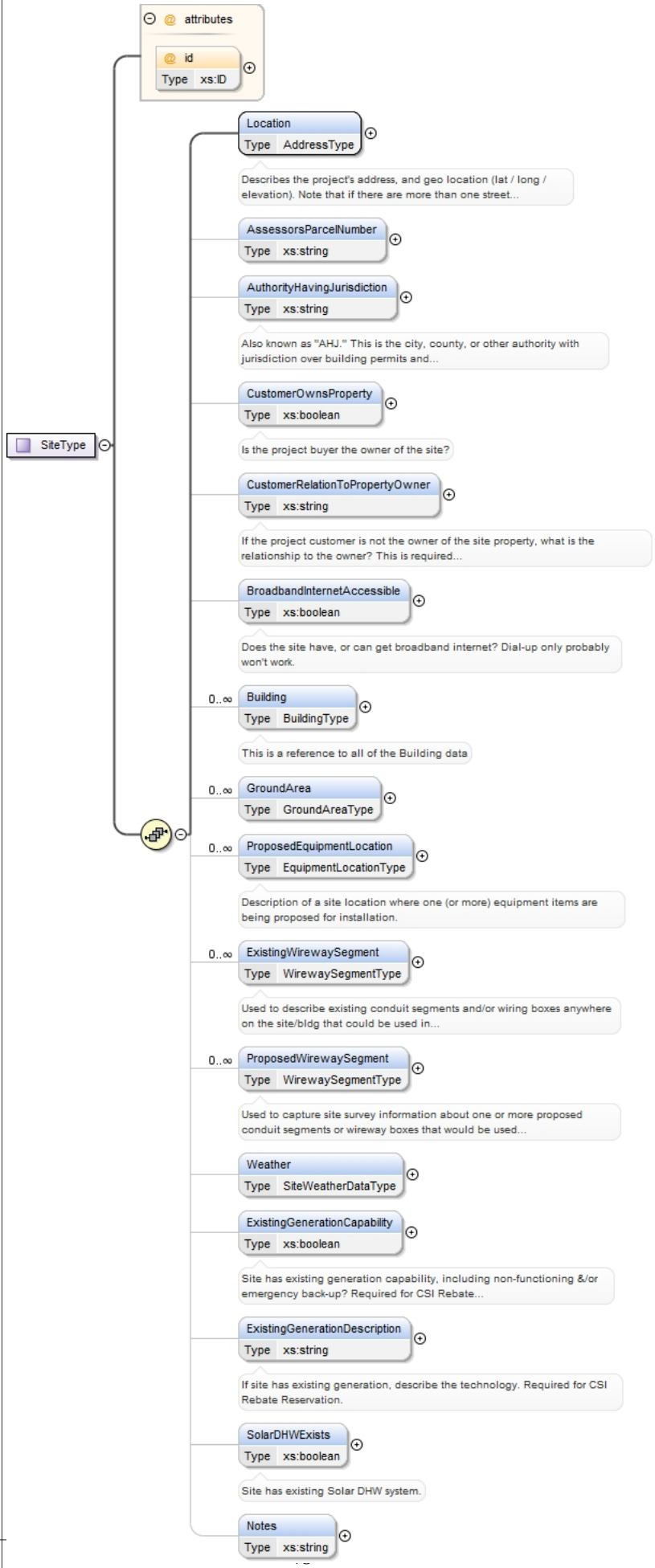
Diagram	
Used by	Element EnergyConsumptionRecordType/PeakDemand
Model	PeakDemandPower , PeakDemandTime{0,1}
Children	PeakDemandPower, PeakDemandTime

Source	`<xs:complexType name="PeakPowerType">`
	`  <xs:annotation>`
	`  <xs:documentation>For cases where Demand charges are relevant, this optional element can be used to capture the Peak power demand during the period defined.</xs:documentation>`
	`  </xs:annotation>`
	`  <xs:sequence>`
	`  <xs:element name="PeakDemandPower" minOccurs="1" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>The peak power quantity, given in kilowatts (kW).</xs:documentation>`
	`  </xs:annotation>`
	`  <xs:simpleType>`
	`  <xs:restriction base="xs:float">`
	`  <xs:minInclusive value="0"/>`
	`  </xs:restriction>`
	`  </xs:simpleType>`
	`  </xs:element>`
	`  <xs:element name="PeakDemandTime" type="xs:dateTime" minOccurs="0" maxOccurs="1"/>`
	`  </xs:sequence>`
	`</xs:complexType>`

Complex Type `SiteType`

Namespace	http://www.iepmodel.net

Diagram


attributes
id
Type xs:ID
SiteType
Location
Type AddressType
Describes the project's address, and geo location (lat / long / elevation). Note that if there are more than one street...
AssessorsParcelNumber
Type xs:string
AuthorityHavingJurisdiction
Type xs:string
Also known as "AHJ." This is the city, county, or other authority with jurisdiction over building permits and...
CustomerOwnsProperty
Type xs:boolean
Is the project buyer the owner of the site?
CustomerRelationToPropertyOwner
Type xs:string
If the project customer is not the owner of the site property, what is the relationship to the owner? This is required...
BroadbandInternetAccessible
Type xs:boolean
Does the site have, or can get broadband internet? Dial-up only probably won't work.
0..∞
Building
Type BuildingType
This is a reference to all of the Building data
0..∞
GroundArea
Type GroundAreaType
0..∞
ProposedEquipmentLocation
Type EquipmentLocationType
Description of a site location where one (or more) equipment items are being proposed for installation.
0..∞
ExistingWirewaySegment
Type WirewaySegmentType
Used to describe existing conduit segments and/or wiring boxes anywhere on the site/bldg that could be used in...
0..∞
ProposedWirewaySegment
Type WirewaySegmentType
Used to capture site survey information about one or more proposed conduit segments or wireway boxes that would be used...
Weather
Type SiteWeatherDataType
ExistingGenerationCapability
Type xs:boolean
Site has existing generation capability, including non-functioning &/or emergency back-up? Required for CSI Rebate...
ExistingGenerationDescription
Type xs:string
If site has existing generation, describe the technology. Required for CSI Rebate Reservation.
SolarDHWExists
Type xs:boolean
Site has existing Solar DHW system.
Notes
Type xs:string

Used by	Element ProjectType/Site
Model	Location , AssessorsParcelNumber{0,1} , AuthorityHavingJurisdiction{0,1} , CustomerOwnsProperty{0,1} , CustomerRelationToPropertyOwner{0,1} , BroadbandInternetAccessible{0,1} , Building* , GroundArea* , ProposedEquipmentLocation* , ExistingWirewaySegment* , ProposedWirewaySegment* , Weather{0,1} , ExistingGenerationCapability{0,1} , ExistingGenerationDescription{0,1} , SolarDHWExists{0,1} , Notes{0,1}
Children	AssessorsParcelNumber, AuthorityHavingJurisdiction, BroadbandInternetAccessible, Building, CustomerOwnsProperty, CustomerRelationToPropertyOwner, ExistingGenerationCapability, ExistingGenerationDescription, ExistingWirewaySegment, GroundArea, Location, Notes, ProposedEquipmentLocation, ProposedWirewaySegment, SolarDHWExists, Weather

Attributes

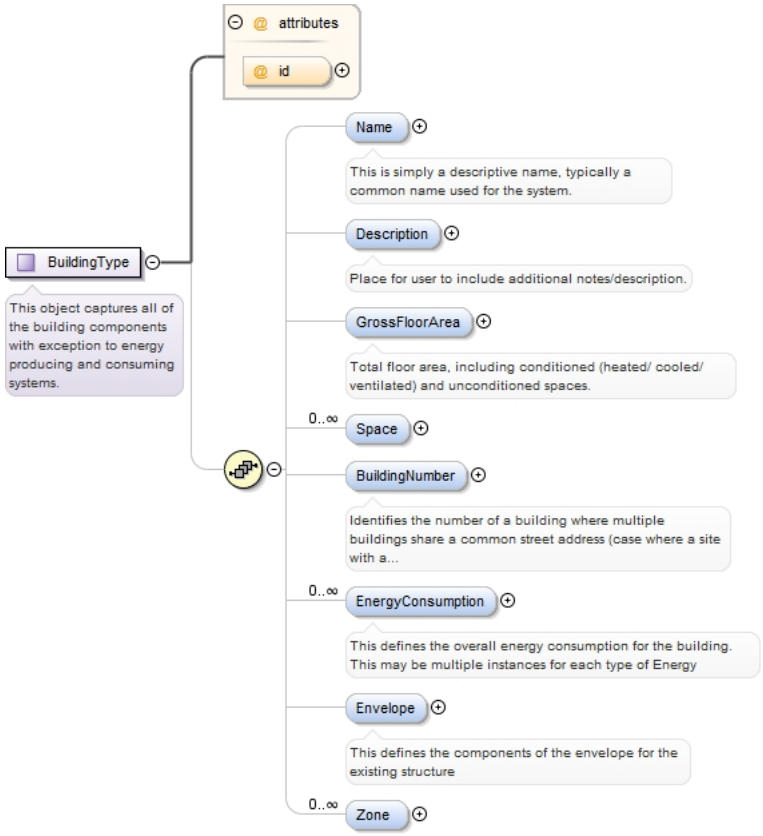
QName	Type	Fixed	Default	Use
id	xs:ID			optional

Source

```
<xs:complexType name="SiteType">
  <xs:sequence>
    <xs:element maxOccurs="1" minOccurs="1" name="Location" type="AddressType">
      <xs:annotation>
        <xs:documentation>Describes the project's address, and geo location (lat / long /
 elevation). Note that if there are more than one street address, the model forces these
 to be separate Sites/Projects. If a Building on the project site has more than one street
 address, only one is required to identify the location.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="AssessorsParcelNumber" type="xs:string"/
>
    <xs:element maxOccurs="1" minOccurs="0" name="AuthorityHavingJurisdiction"
 type="xs:string">
      <xs:annotation>
        <xs:documentation>Also known as "AHJ." This is the city, county, or other
 authority with jurisdiction over building permits and inspections.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="CustomerOwnsProperty" type="xs:boolean">
      <xs:annotation>
        <xs:documentation>Is the project buyer the owner of the site?</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="CustomerRelationToPropertyOwner"
 type="xs:string">
      <xs:annotation>
        <xs:documentation>If the project customer is not the owner of the site property,
 what is the relationship to the owner? This is required for CSI incentive application.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="BroadbandInternetAccessible"
 type="xs:boolean">
      <xs:annotation>
        <xs:documentation>Does the site have, or can get broadband internet? Dial-up only
 probably won't work.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Building" type="BuildingType" minOccurs="0" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>This is a reference to all of the Building data</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="GroundArea"
 type="GroundAreaType"/>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="ProposedEquipmentLocation"
 type="EquipmentLocationType">
      <xs:annotation>
        <xs:documentation>Description of a site location where one (or more) equipment
 items are being proposed for installation.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="ExistingWirewaySegment"
 type="WirewaySegmentType">
      <xs:annotation>
        <xs:documentation>Used to describe existing conduit segments and/or wiring boxes
 anywhere on the site/bldg that could be used in implementation of one or more measures.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="ProposedWirewaySegment"
 type="WirewaySegmentType">
      <xs:annotation>
```

```
        <xs:documentation>Used to capture site survey information about one or more
 proposed conduit segments or wireway boxes that would be used to support a new system.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="Weather" type="SiteWeatherDataType"/>
    <xs:element maxOccurs="1" minOccurs="0" name="ExistingGenerationCapability"
 type="xs:boolean">
      <xs:annotation>
        <xs:documentation>Site has existing generation capability, including
 non-functioning &/or emergency back-up? Required for CSI Rebate Reservation.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="ExistingGenerationDescription"
 type="xs:string">
      <xs:annotation>
        <xs:documentation>If site has existing generation, describe the technology.
 Required for CSI Rebate Reservation.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="SolarDHWExists" type="xs:boolean">
      <xs:annotation>
        <xs:documentation>Site has existing Solar DHW system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="Notes" type="xs:string"/>
  </xs:sequence>
  <xs:attribute name="id" type="xs:ID"/>
</xs:complexType>
```

Complex Type `BuildingType`

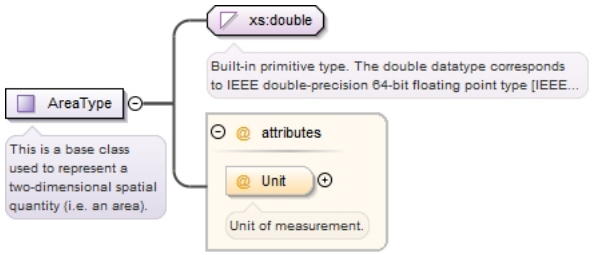
Namespace	http://www.iepmodel.net
Annotations	`This object captures all of the building components with exception to energy producing and consuming systems.`
Diagram	
Used by	Elements Building, SiteType/Building
Model	Name{0,1} , Description{0,1} , GrossFloorArea{0,1} , Space* , BuildingNumber{0,1} , EnergyConsumption* , Envelope{0,1} , Zone*
Children	BuildingNumber, Description, EnergyConsumption, Envelope, GrossFloorArea, Name, Space, Zone

Attributes	QName	Type	Fixed	Default	Use
	id	xs:ID			optional

Source

```
<xs:complexType name="BuildingType">
  <xs:annotation>
    <xs:documentation>This object captures all of the building components with exception
 to energy producing and consuming systems.</xs:documentation>
  </xs:annotation>
  <xs:sequence minOccurs="0" maxOccurs="1">
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="GrossFloorArea" type="AreaType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Total floor area, including conditioned (heated/ cooled/
 ventilated) and unconditioned spaces.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Space" type="SpaceType" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element minOccurs="0" name="BuildingNumber" type="xs:string">
      <xs:annotation>
        <xs:documentation>Identifies the number of a building where multiple buildings
 share a common street address (case where a site with a single address contains multiple
 buildings). Note that if a single Building has more than one street address, only one is
 required to identify the location.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="EnergyConsumption" type="EnergyConsumptionType" minOccurs="0"
 maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>This defines the overall energy consumption for the building.
 This may be multiple instances for each type of Energy</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Envelope" type="EnvelopeType" maxOccurs="1" minOccurs="0">
      <xs:annotation>
        <xs:documentation>This defines the components of the envelope for the existing
 structure</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Zone" type="ZoneType" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="id" type="xs:ID"/>
</xs:complexType>
```

Complex Type AreaType

Namespace	http://www.iepmodel.net
Annotations	This is a base class used to represent a two-dimensional spatial quantity (i.e. an area).
Diagram	
Type	extension of xs:double
Used by	Elements: AtticType/Area, BuildingType/GrossFloorArea, CeilingType/Area, DoorType/Area, FenestrationType/Area, FoundationType/Area, GroundAreaType/ApproxArea, LeakageType/LeakageArea, RoofType/Area, WallType/Area, WindowType/Area

Attributes	QName	Type	Fixed	Default	Use
	Unit	AreaUnitEnumType		SquareMeters	optional

	QName	Type	Fixed	Default	Use
		Unit of measurement.			

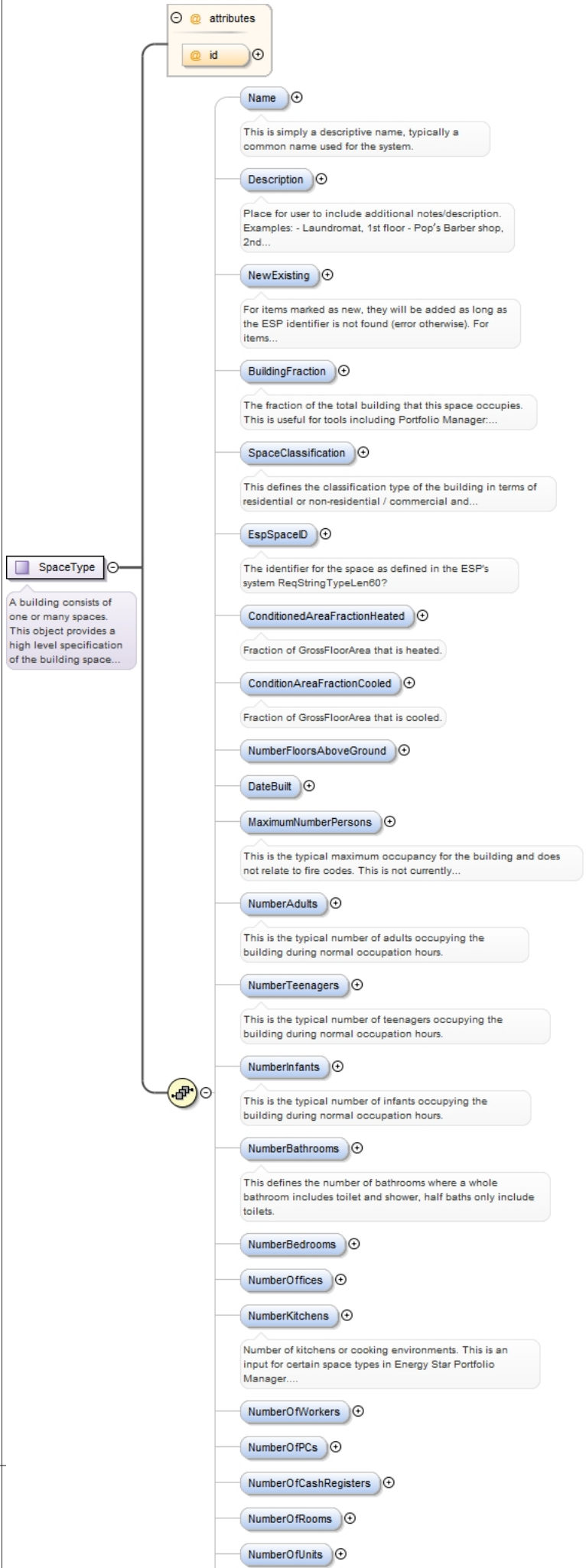
Source

```
<xs:complexType name="AreaType">
  <xs:annotation>
    <xs:documentation>This is a base class used to represent a two-dimensional spatial
 quantity (i.e. an area).</xs:documentation>
  </xs:annotation>
  <xs:simpleContent>
    <xs:extension base="xs:double">
      <xs:attribute name="Unit" type="AreaUnitEnumType" use="optional"
 default="SquareMeters">
        <xs:annotation>
          <xs:documentation>Unit of measurement.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

Complex Type SpaceType

Namespace	http://www.iepmodel.net
Annotations	A building consists of one or many spaces. This object provides a high level specification of the building space profile intended for use with Projects and simulations such as SaveEnergy123 and Portfolio Manager. https://saveenergy123.com/ http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager ISSUES / TO DO: 2) get Space documentation from Portfolio Manager 3) To use for benchmarking, need to add in additional operational attributes per space. The set of attributes differs based on PortfolioMgrSpaceType.

Diagram


attributes
id
SpaceType
A building consists of one or many spaces. This object provides a high level specification of the building space...
Name
This is simply a descriptive name, typically a common name used for the system.
Description
Place for user to include additional notes/description. Examples: - Laundromat, 1st floor - Pop's Barber shop, 2nd...
NewExisting
For items marked as new, they will be added as long as the ESP identifier is not found (error otherwise). For items...
BuildingFraction
The fraction of the total building that this space occupies. This is useful for tools including Portfolio Manager:...
SpaceClassification
This defines the classification type of the building in terms of residential or non-residential / commercial and...
EspSpaceID
The identifier for the space as defined in the ESP's system ReqStringTypeLen60?
ConditionedAreaFractionHeated
Fraction of GrossFloorArea that is heated.
ConditionAreaFractionCooled
Fraction of GrossFloorArea that is cooled.
NumberFloorsAboveGround
DateBuilt
MaximumNumberPersons
This is the typical maximum occupancy for the building and does not relate to fire codes. This is not currently...
NumberAdults
This is the typical number of adults occupying the building during normal occupation hours.
NumberTeenagers
This is the typical number of teenagers occupying the building during normal occupation hours.
NumberInfants
This is the typical number of infants occupying the building during normal occupation hours.
NumberBathrooms
This defines the number of bathrooms where a whole bathroom includes toilet and shower, half baths only include toilets.
NumberBedrooms
NumberOffices
NumberKitchens
Number of kitchens or cooking environments. This is an input for certain space types in Energy Star Portfolio Manager....
NumberOfWorkers
NumberOfPCs
NumberOfCashRegisters
NumberOfRooms
NumberOfUnits

Used by	Element BuildingType/Space
Model	Name{0,1} , Description{0,1} , NewExisting{0,1} , BuildingFraction{0,1} , SpaceClassification{0,1} , EspSpaceID{0,1} , ConditionedAreaFractionHeated{0,1} , ConditionAreaFractionCooled{0,1} , NumberFloorsAboveGround{0,1} , DateBuilt{0,1} , MaximumNumberPersons{0,1} , NumberAdults{0,1} , NumberTeenagers{0,1} , NumberInfants{0,1} , NumberBathrooms{0,1} , NumberBedrooms{0,1} , NumberOffices{0,1} , NumberKitchens{0,1} , NumberOfWorkers{0,1} , NumberOfPCs{0,1} , NumberOfCashRegisters{0,1} , NumberOfRooms{0,1} , NumberOfUnits{0,1} , newElement{0,1} , AverageNumberOfResidents{0,1} , ResidentCapacity{0,1} , SeatingCapacity{0,1} , PresenceOfCookingFacilities{0,1} , NumberOfReachInRefrigerators{0,1} , NumberOfWalkInRefrigerators{0,1} , NumberOfCommericalWashingMachines{0,1} , NumberOfResidentialWashingMachines{0,1} , NumberOfResidentialElectronicLifts{0,1} , AnnualITEnergy{0,1} , WeekdayOperation{0,1} , OpenWeekends{0,1} , ExteriorEntrance{0,1} , WeeklyOperatingHours{0,1}
Children	AnnualITEnergy, AverageNumberOfResidents, BuildingFraction, ConditionAreaFractionCooled, ConditionedAreaFractionHeated, DateBuilt, Description, EspSpaceID, ExteriorEntrance, MaximumNumberPersons, Name, NewExisting, NumberAdults, NumberBathrooms, NumberBedrooms, NumberFloorsAboveGround, NumberInfants, NumberKitchens, NumberOfCashRegisters, NumberOfCommericalWashingMachines, NumberOfPCs, NumberOfReachInRefrigerators, NumberOfResidentialElectronicLifts, NumberOfResidentialWashingMachines, NumberOfRooms, NumberOfUnits, NumberOfWalkInRefrigerators, NumberOfWorkers, NumberOffices, NumberTeenagers, OpenWeekends, PresenceOfCookingFacilities, ResidentCapacity, SeatingCapacity, SpaceClassification, WeekdayOperation, WeeklyOperatingHours, newElement

Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			optional

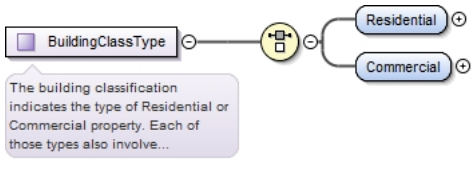
Source

```
<xs:complexType name="SpaceType">
  <xs:annotation>
    <xs:documentation>A building consists of one or many spaces. This object provides a
 high level specification of the building space profile intended for use with Projects
 and simulations such as SaveEnergy123 and Portfolio Manager. https://saveenergy123.com/
 http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager ISSUES /
 TO DO: 2) get Space documentation from Portfolio Manager 3) To use for benchmarking,
 need to add in additional operational attributes per space. The set of attributes differs
 based on PortfolioMgrSpaceType.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description.
 Examples: - Laundromat, 1st floor - Pop's Barber shop, 2nd floor - Apartments, floors
 3-6</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="NewExisting" type="ExistenceEnumType">
      <xs:annotation>
        <xs:documentation>For items marked as new, they will be added as long as the ESP
 identifier is not found (error otherwise). For items marked as existing, only updates
 will be performed if the ESP identifier is found (error otherwise). For items marked
 unknown, they will be created if the ESP identifier is not found and updated if the ESP
 identifier is found (similar to ABS 1.0)</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="BuildingFraction">
      <xs:annotation>
        <xs:documentation>The fraction of the total building that this space occupies.
 This is useful for tools including Portfolio Manager: http://www.energystar.gov/
index.cfm?c=evaluate_performance.bus_portfoliomanager</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:float">
          <xs:minInclusive value="0"/>
          <xs:maxInclusive value="1"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="SpaceClassification" type="BuildingClassType" minOccurs="0"
 maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This defines the classification type of the building in terms
 of residential or non-residential / commercial and further details where relevant.</
xs:documentation>
      </xs:annotation>
    </xs:element>
```

```
    <xs:element name="EspSpaceID" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The identifier for the space as defined in the ESP's system
ReqStringTypeLen60?</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ConditionedAreaFractionHeated" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Fraction of GrossFloorArea that is heated.</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:float">
          <xs:minInclusive value="0"/>
          <xs:maxInclusive value="1"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="ConditionAreaFractionCooled" minOccurs="0">
      <xs:annotation>
        <xs:documentation>Fraction of GrossFloorArea that is cooled.</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:float">
          <xs:minInclusive value="0"/>
          <xs:maxInclusive value="1"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="NumberFloorsAboveGround" minOccurs="0" maxOccurs="1">
      <xs:simpleType>
        <xs:restriction base="xs:int">
          <xs:minInclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="DateBuilt" type="xs:date" minOccurs="0" maxOccurs="1"/>
    <xs:element name="MaximumNumberPersons" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is the typical maximum occupancy for the building and
does not relate to fire codes. This is not currently validated against the NumberAdults,
NumberInfants and NumberTeenagers.</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:int">
          <xs:minInclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="NumberAdults" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is the typical number of adults occupying the building
during normal occupation hours.</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:int">
          <xs:minInclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="NumberTeenagers" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is the typical number of teenagers occupying the building
during normal occupation hours.</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:int">
          <xs:minInclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="NumberInfants" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is the typical number of infants occupying the building
during normal occupation hours.</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:int">
          <xs:minInclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="NumberBathrooms" minOccurs="0" maxOccurs="1">
      <xs:annotation>
```

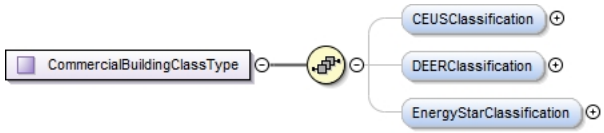
```
        <xs:documentation>This defines the number of bathrooms where a whole bathroom
 includes toilet and shower, half baths only include toilets.</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:float">
          <xs:minInclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="NumberBedrooms" minOccurs="0" maxOccurs="1">
      <xs:simpleType>
        <xs:restriction base="xs:int">
          <xs:minInclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="NumberOffices" minOccurs="0" maxOccurs="1">
      <xs:simpleType>
        <xs:restriction base="xs:int">
          <xs:minInclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element minOccurs="0" name="NumberKitchens">
      <xs:annotation>
        <xs:documentation>Number of kitchens or cooking environments. This is an input
 for certain space types in Energy Star Portfolio Manager. http://www.energystar.gov/
index.cfm?c=eligibility.bus_portfoliomanager_space_types#hotel</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:int">
          <xs:minInclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element minOccurs="0" name="NumberOfWorkers" type="xs:int"/>
    <xs:element minOccurs="0" name="NumberOfPCs" type="xs:int"/>
    <xs:element minOccurs="0" name="NumberOfCashRegisters" type="xs:int"/>
    <xs:element minOccurs="0" name="NumberOfRooms" type="xs:int"/>
    <xs:element minOccurs="0" name="NumberOfUnits" type="xs:int"/>
    <xs:element minOccurs="0" name="newElement" type="xs:int"/>
    <xs:element minOccurs="0" name="AverageNumberOfResidents" type="xs:int"/>
    <xs:element minOccurs="0" name="ResidentCapacity" type="xs:int"/>
    <xs:element minOccurs="0" name="SeatingCapacity" type="xs:int"/>
    <xs:element minOccurs="0" name="PresenceOfCookingFacilities" type="xs:int"/>
    <xs:element minOccurs="0" name="NumberOfReachInRefrigerators" type="xs:int"/>
    <xs:element minOccurs="0" name="NumberOfWalkInRefrigerators" type="xs:int"/>
    <xs:element minOccurs="0" name="NumberOfCommericalWashingMachines" type="xs:int"/>
    <xs:element minOccurs="0" name="NumberOfResidentialWashingMachines" type="xs:int"/>
    <xs:element minOccurs="0" name="NumberOfResidentialElectronicLifts" type="xs:int"/>
    <xs:element minOccurs="0" name="AnnualITEnergy" type="xs:int"/>
    <xs:element minOccurs="0" name="WeekdayOperation " type="xs:boolean"/>
    <xs:element minOccurs="0" name="OpenWeekends " type="xs:boolean"/>
    <xs:element minOccurs="0" name="ExteriorEntrance " type="xs:boolean"/>
    <xs:element minOccurs="0" name="WeeklyOperatingHours" type="xs:int"/>
  </xs:sequence>
  <xs:attribute name="id" type="xs:ID"/>
</xs:complexType>
```

Complex Type `BuildingClassType`

Namespace	http://www.iepmodel.net
Annotations	The building classification indicates the type of Residential or Commercial property. Each of those types also involve multiple classifications. Residential consists of Single-Family and Multi-Family. Commercial consists of enumerations of common commercial property classifications from three organizations: CEUS, DEER and EnergyStar (US DOE). This is contained in Common to allow for use in both Building.xsd and UtilityService.xsd
Diagram	
Used by	Element SpaceType/SpaceClassification

Model	Residential | Commercial
Children	Commercial, Residential
Source	<xs:complexType name="BuildingClassType"> <xs:annotation> <xs:documentation>The building classification indicates the type of Residential or Commercial property. Each of those types also involve multiple classifications. Residential consists of Single-Family and Multi-Family. Commercial consists of enumerations of common commercial property classifications from three organizations: CEUS, DEER and EnergyStar (US DOE). This is contained in Common to allow for use in both Building.xsd and UtilityService.xsd</xs:documentation> </xs:annotation> <xs:choice> <xs:element name="Residential" type="ResidentialEnumType"> </xs:element> <xs:element name="Commercial" type="CommercialBuildingClassType"/> </xs:choice> </xs:complexType>

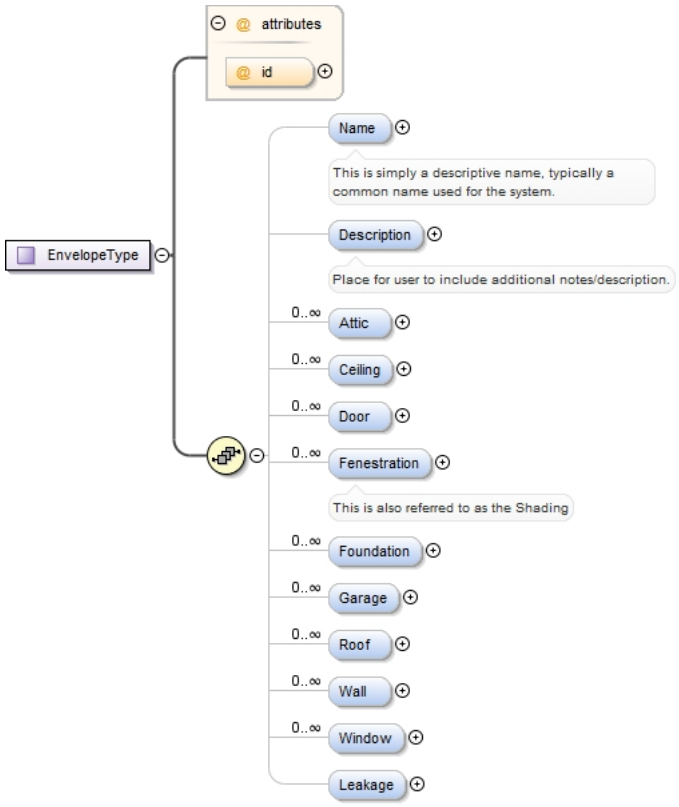
Complex Type CommercialBuildingClassType

Namespace	http://www.iepmodel.net
Diagram	
Used by	Element BuildingClassType/Commercial
Model	CEUSClassification{0,1} , DEERClassification{0,1} , EnergyStarClassification{0,1}
Children	CEUSClassification, DEERClassification, EnergyStarClassification
Source	<xs:complexType name="CommercialBuildingClassType"> <xs:sequence> <xs:element name="CEUSClassification" minOccurs="0" type="CEUSBuildingEnumType"> </xs:element> <xs:element name="DEERClassification" minOccurs="0" type="DEERBuildingEnumType"> </xs:element> <xs:element minOccurs="0" name="EnergyStarClassification" type="EnergyStarBuildingEnumType"> <xs:annotation> <xs:documentation/> </xs:annotation> </xs:element> </xs:sequence> </xs:complexType>

Complex Type EnvelopeType

Namespace	http://www.iepmodel.net

Diagram



Used by

Elements BuildingType/Envelope, SystemChoiceType/Envelope

Model

Name{0,1} , Description{0,1} , Attic* , Ceiling* , Door* , Fenestration* , Foundation* , Garage* , Roof* , Wall* , Window* , Leakage{0,1}

Children

Attic, Ceiling, Description, Door, Fenestration, Foundation, Garage, Leakage, Name, Roof, Wall, Window

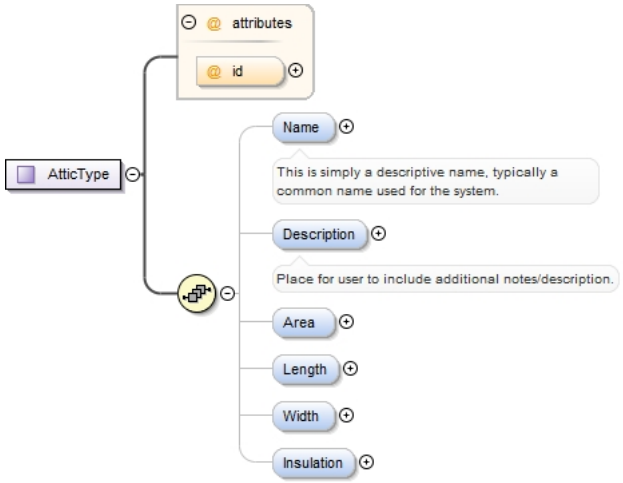
Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			optional

Source

```
<xs:complexType name="EnvelopeType">
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Attic" type="AtticType" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="Ceiling" type="CeilingType" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="Door" type="DoorType" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="Fenestration" type="FenestrationType" minOccurs="0"
 maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>This is also referred to as the Shading</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Foundation" type="FoundationType" minOccurs="0"
 maxOccurs="unbounded"/>
    <xs:element name="Garage" type="GarageType" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="Roof" type="RoofType" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="Wall" type="WallType" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="Window" type="WindowType" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element minOccurs="0" name="Leakage" type="LeakageType"/>
  </xs:sequence>
  <xs:attribute name="id" type="xs:ID"/>
</xs:complexType>
```

Complex Type `AtticType`

Namespace	http://www.iepmodel.net
Diagram	
Used by	Element EnvelopeType/Attic
Model	Name{0,1} , Description{0,1} , Area{0,1} , Length{0,1} , Width{0,1} , Insulation{0,1}
Children	Area, Description, Insulation, Length, Name, Width

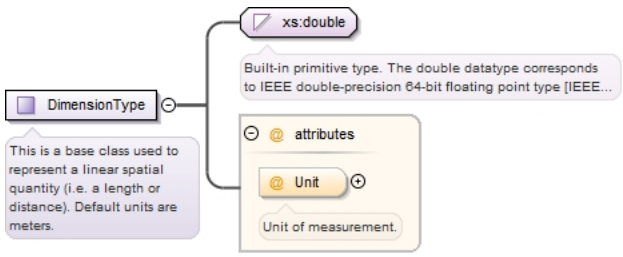
Attributes

QName	Type	Fixed	Default	Use
id	xs:IDREF			optional

Source

```
<xs:complexType name="AtticType">
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Area" type="AreaType" minOccurs="0"/>
    <xs:element name="Length" type="DimensionType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Width" type="DimensionType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Insulation" type="InsulationType" minOccurs="0" maxOccurs="1"/>
  </xs:sequence>
  <xs:attribute name="id" type="xs:IDREF"/>
</xs:complexType>
```

Complex Type `DimensionType`

Namespace	http://www.iepmodel.net
Annotations	This is a base class used to represent a linear spatial quantity (i.e. a length or distance). Default units are meters.
Diagram	
Type	extension of xs:double
Used by	Elements AtticType/Length, AtticType/Width, CeilingType/Length, CeilingType/Width, DoorType/Height, DoorType/Width, FenestrationType/Height, FenestrationType/Overhang/Depth,

	FenestrationType/Overhang/Distance, FenestrationType/Overhang/LeftExtension, FenestrationType/Overhang/RightExtension, FenestrationType/SideFin/LeftDepth, FenestrationType/SideFin/LeftDistance, FenestrationType/SideFin/RightDepth, FenestrationType/SideFin/RightDistance, FenestrationType/Width, FoundationType/Length, FoundationType/Width, GarageType/Height, GarageType/Length, GarageType/Width, RoofType/ParapetWallHeight, WallType/Height, WallType/Width, WindowType/Height, WindowType/Width

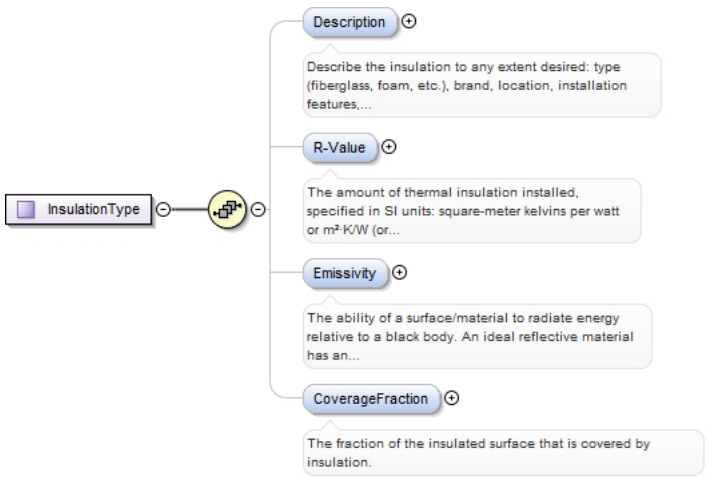
Attributes

QName	Type	Fixed	Default	Use
Unit	DimensionUnitEnumType		Meters	optional
	Unit of measurement.			

Source

```
<xs:complexType name="DimensionType">
  <xs:annotation>
    <xs:documentation>This is a base class used to represent a linear spatial quantity
 (i.e. a length or distance). Default units are meters.</xs:documentation>
  </xs:annotation>
  <xs:simpleContent>
    <xs:extension base="xs:double">
      <xs:attribute name="Unit" type="DimensionUnitEnumType" use="optional"
 default="Meters">
        <xs:annotation>
          <xs:documentation>Unit of measurement.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

Complex Type `InsulationType`

Namespace	http://www.iepmodel.net
Diagram	

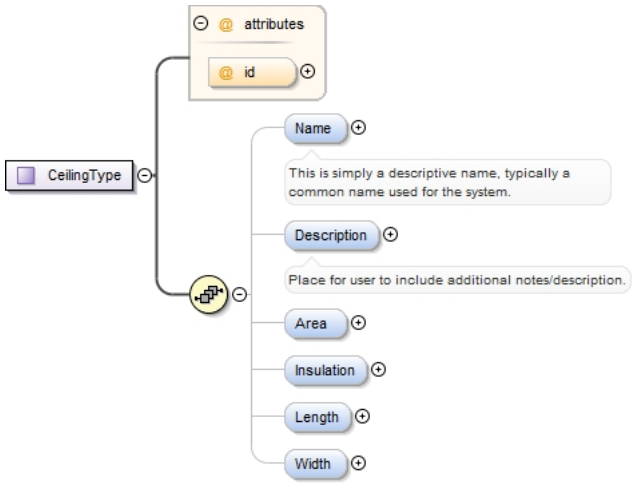
Used by	Elements	AtticType/Insulation, CeilingType/Insulation, DistributionSegmentType/Insulation, FoundationType/Insulation, GarageType/Insulation, RoofType/DeckInsulationLevel, WallType/Insulation, WaterHeatingSystemType/TankInsulation
Model	Description{0,1} , R-Value{0,1} , Emissivity{0,1} , CoverageFraction{0,1}	
Children	CoverageFraction, Description, Emissivity, R-Value	

Source

```
<xs:complexType name="InsulationType">
  <xs:sequence>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Describe the insulation to any extent desired: type (fiberglass,
 foam, etc.), brand, location, installation features, etc. It is important to specify the
 units of measurement for R-value if one intends to use non-SI units. This is discouraged,
 as SI units are expected and indicated in the annotation of R-Value.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="R-Value" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The amount of thermal insulation installed, specified in SI
 units: square-meter kelvins per watt or m²·K/W (or equivalently to m²·°C/W). Note that
 if you intend to use different units then this should be noted in the Description.</
xs:documentation>
      </xs:annotation>
```

```
      <xs:simpleType>
        <xs:restriction base="xs:float">
          <xs:minInclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="Emissivity" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The ability of a surface/material to radiate energy relative
 to a black body. An ideal reflective material has an emissivity close to zero. An ideal
 black body has an emissivity of one.</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:float">
          <xs:minInclusive value="0"/>
          <xs:maxInclusive value="1"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="CoverageFraction" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The fraction of the insulated surface that is covered by
 insulation.</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:float">
          <xs:minInclusive value="0"/>
          <xs:maxInclusive value="1"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

Complex Type `CeilingType`

Namespace	http://www.iepmodel.net
Diagram	
Used by	Element EnvelopeType/Ceiling
Model	Name{0,1} , Description{0,1} , Area{0,1} , Insulation{0,1} , Length{0,1} , Width{0,1}
Children	Area, Description, Insulation, Length, Name, Width

Attributes

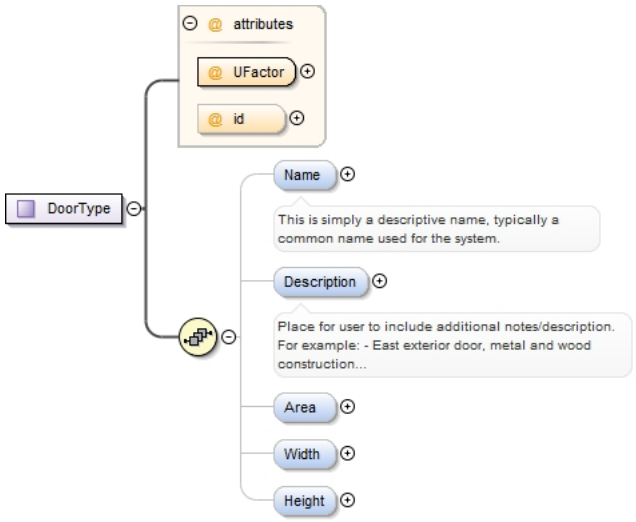
QName	Type	Fixed	Default	Use
id	xs:IDREF			optional

Source

```
<xs:complexType name="CeilingType">
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description.</
xs:documentation>
```

```
      </xs:annotation>
    </xs:element>
    <xs:element name="Area" type="AreaType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Insulation" type="InsulationType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Length" type="DimensionType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Width" type="DimensionType" minOccurs="0" maxOccurs="1"/>
  </xs:sequence>
  <xs:attribute name="id" type="xs:IDREF"/>
</xs:complexType>
```

Complex Type `DoorType`

Namespace	http://www.iepmodel.net
Diagram	
Used by	Element EnvelopeType/Door
Model	Name{0,1} , Description{0,1} , Area{0,1} , Width{0,1} , Height{0,1}
Children	Area, Description, Height, Name, Width

Attributes

QName	Type	Fixed	Default	Use
UFactor	xs:double			required
id	xs:IDREF			optional

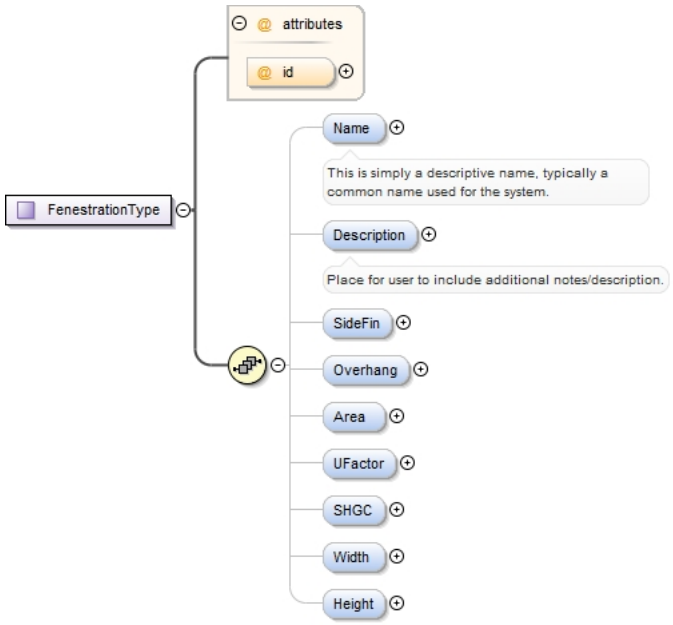
Source

```
<xs:complexType name="DoorType">
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description. For
 example: - East exterior door, metal and wood construction - Interior, upstairs bathroom
 door, wood construction</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Area" type="AreaType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Width" type="DimensionType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Height" type="DimensionType" minOccurs="0" maxOccurs="1"/>
  </xs:sequence>
  <xs:attribute name="UFactor" use="required" type="xs:double"/>
  <xs:attribute name="id" type="xs:IDREF"/>
</xs:complexType>
```

Complex Type `FenestrationType`

Namespace	http://www.iepmodel.net

Diagram



Used by

Element EnvelopeType/Fenestration

Model

Name{0,1} , Description{0,1} , SideFin{0,1} , Overhang{0,1} , Area{0,1} , UFactor{0,1} , SHGC{0,1} , Width{0,1} , Height{0,1}

Children

Area, Description, Height, Name, Overhang, SHGC, SideFin, UFactor, Width

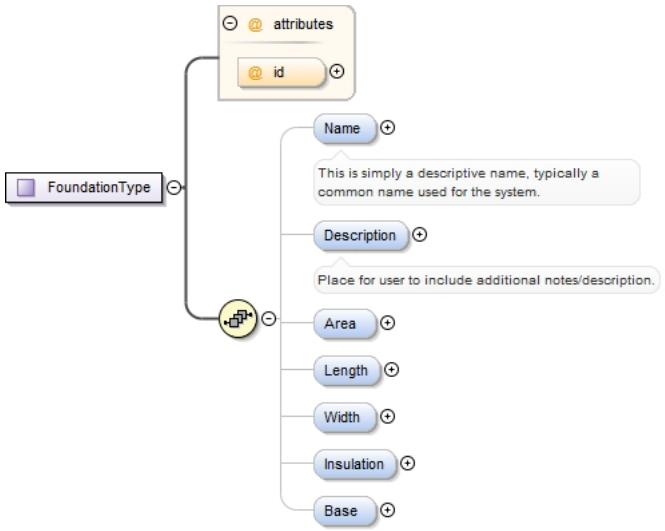
Attributes

QName	Type	Fixed	Default	Use
id	xs:IDREF			optional

Source

```
<xs:complexType name="FenestrationType">
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="SideFin" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="LeftDistance" type="DimensionType"/>
          <xs:element name="LeftDepth" type="DimensionType"/>
          <xs:element name="RightDistance" type="DimensionType"/>
          <xs:element name="RightDepth" type="DimensionType"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
    <xs:element name="Overhang" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="Depth" type="DimensionType"/>
          <xs:element name="Distance" type="DimensionType"/>
          <xs:element name="LeftExtension" type="DimensionType"/>
          <xs:element name="RightExtension" type="DimensionType"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
    <xs:element name="Area" type="AreaType" minOccurs="0"/>
    <xs:element name="UFactor" type="xs:double" minOccurs="0"/>
    <xs:element name="SHGC" type="xs:double" minOccurs="0"/>
    <xs:element name="Width" type="DimensionType" minOccurs="0"/>
    <xs:element name="Height" type="DimensionType" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="id" type="xs:IDREF"/>
</xs:complexType>
```

Complex Type `FoundationType`

Namespace	http://www.iepmodel.net
Diagram	
Used by	Element EnvelopeType/Foundation
Model	Name{0,1} , Description{0,1} , Area{0,1} , Length{0,1} , Width{0,1} , Insulation{0,1} , Base{0,1}
Children	Area, Base, Description, Insulation, Length, Name, Width

Attributes

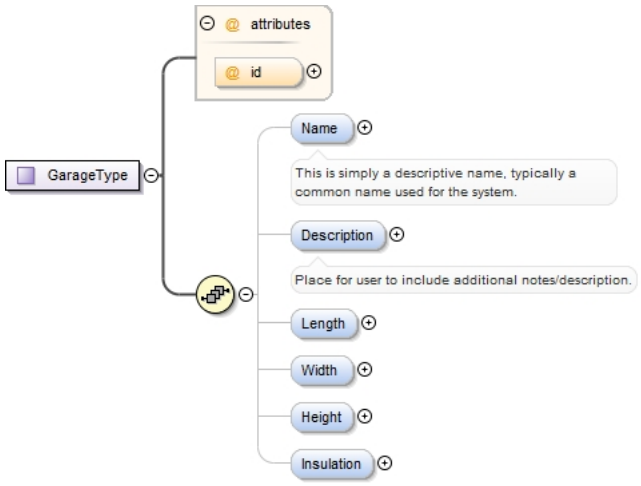
QName	Type	Fixed	Default	Use
id	xs:IDREF			optional

Source

```
<xs:complexType name="FoundationType">
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Area" type="AreaType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Length" type="DimensionType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Width" type="DimensionType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Insulation" type="InsulationType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Base" type="FoundationBaseEnumType" minOccurs="0" maxOccurs="1"/>
  </xs:sequence>
  <xs:attribute name="id" type="xs:IDREF"/>
</xs:complexType>
```

Complex Type `GarageType`

Namespace	http://www.iepmodel.net

Diagram	
Used by	Element EnvelopeType/Garage
Model	Name{0,1} , Description{0,1} , Length{0,1} , Width{0,1} , Height{0,1} , Insulation{0,1}
Children	Description, Height, Insulation, Length, Name, Width

Attributes

QName	Type	Fixed	Default	Use
id	xs:IDREF			optional

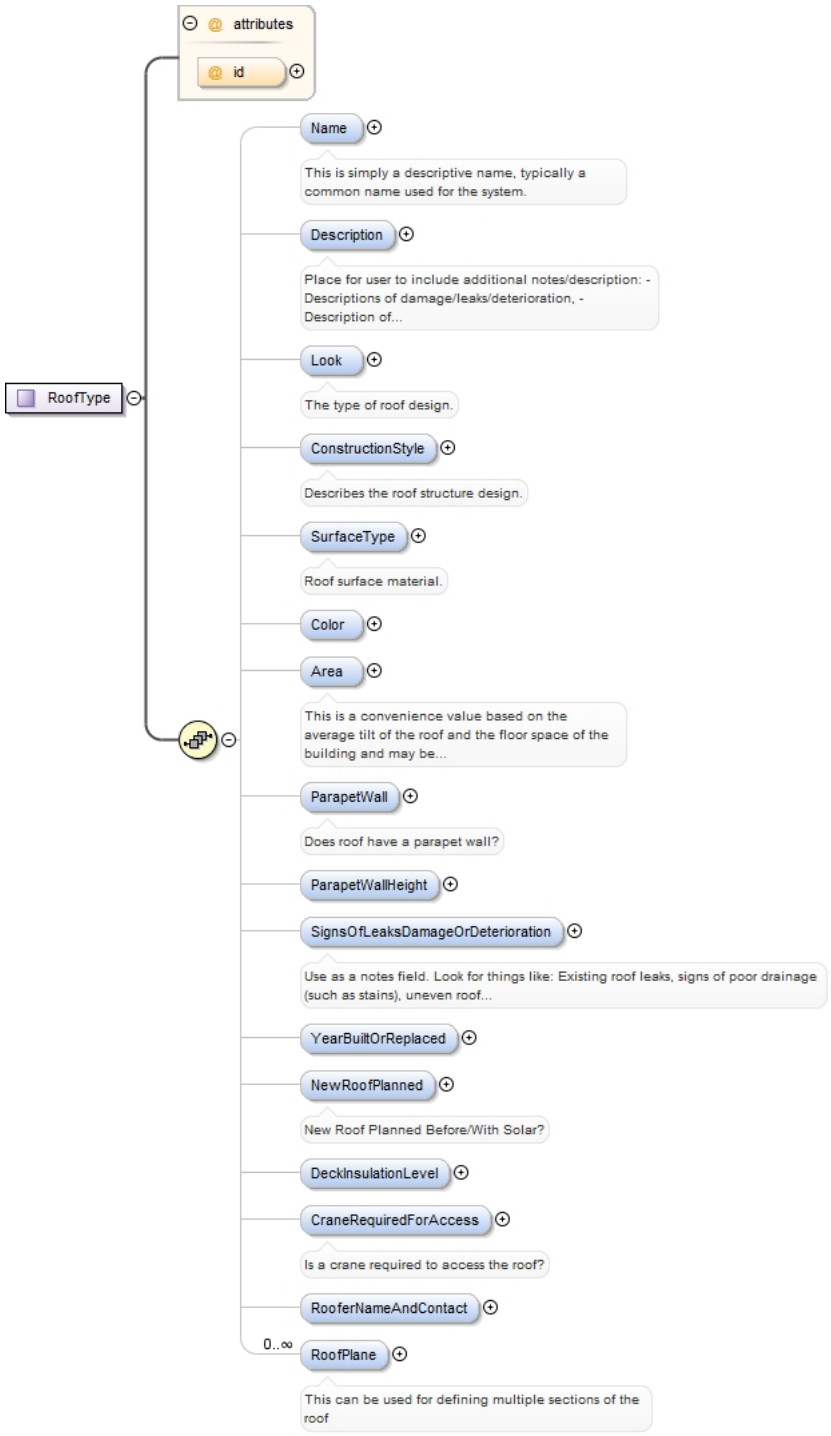
Source

```
<xs:complexType name="GarageType">
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Length" type="DimensionType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Width" type="DimensionType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Height" type="DimensionType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Insulation" type="InsulationType" minOccurs="0" maxOccurs="1"/>
  </xs:sequence>
  <xs:attribute name="id" type="xs:IDREF"/>
</xs:complexType>
```

Complex Type RoofType

Namespace	http://www.iepmodel.net

Diagram



Used by	Element EnvelopeType/Roof
Model	Name{0,1} , Description{0,1} , Look{0,1} , ConstructionStyle{0,1} , SurfaceType{0,1} , Color{0,1} , Area{0,1} , ParapetWall{0,1} , ParapetWallHeight{0,1} , SignsOfLeaksDamageOrDeterioration{0,1} , YearBuiltOrReplaced{0,1} , NewRoofPlanned{0,1} , DeckInsulationLevel{0,1} , CraneRequiredForAccess{0,1} , RooferNameAndContact{0,1} , RoofPlane*
Children	Area, Color, ConstructionStyle, CraneRequiredForAccess, DeckInsulationLevel, Description, Look, Name, NewRoofPlanned, ParapetWall, ParapetWallHeight, RoofPlane, RooferNameAndContact, SignsOfLeaksDamageOrDeterioration, SurfaceType, YearBuiltOrReplaced

Attributes

QName	Type	Fixed	Default	Use
id	xs:IDREF			optional

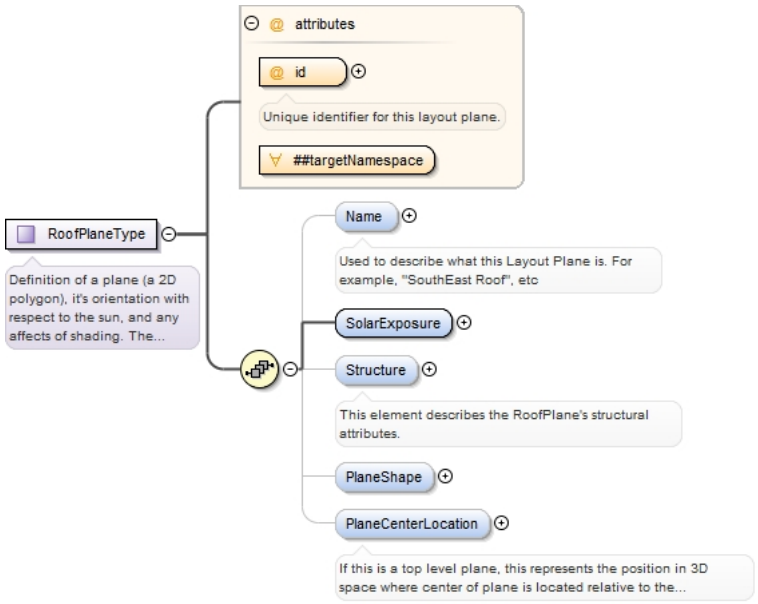
Source

```
<xs:complexType name="RoofType">
  <xs:sequence>
```

```
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description:
 - Descriptions of damage/leaks/deterioration, - Description of access requirements
 to chillers / air handlers / etc. - Was the customer told of their options if solar
 will outlive roof? - Attic accessibility - special requirements? Crane? Key?</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Look" type="RoofLookEnumType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The type of roof design.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ConstructionStyle" type="RoofConstructionEnumType" minOccurs="0"
 maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Describes the roof structure design.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="SurfaceType" type="RoofSurfaceEnumType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Roof surface material.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Color" type="xs:string" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Area" type="AreaType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is a convenience value based on the average tilt of
 the roof and the floor space of the building and may be overridden by the LayoutPlane
 dimensions</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ParapetWall" type="xs:boolean" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Does roof have a parapet wall?</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ParapetWallHeight" type="DimensionType" minOccurs="0" maxOccurs="1"/
>
    <xs:element name="SignsOfLeaksDamageOrDeterioration" type="xs:string" minOccurs="0"
 maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Use as a notes field. Look for things like: Existing roof leaks,
 signs of poor drainage (such as stains), uneven roof decks, etc</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="YearBuiltOrReplaced" minOccurs="0" maxOccurs="1">
      <xs:simpleType>
        <xs:restriction base="xs:int">
          <xs:minInclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="NewRoofPlanned" type="xs:boolean" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>New Roof Planned Before/With Solar?</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="DeckInsulationLevel" type="InsulationType" minOccurs="0"
 maxOccurs="1"/>
    <xs:element name="CraneRequiredForAccess" type="xs:boolean" minOccurs="0"
 maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Is a crane required to access the roof?</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="RooferNameAndContact" type="xs:string" minOccurs="0" maxOccurs="1"/>
    <xs:element name="RoofPlane" type="RoofPlaneType" minOccurs="0" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>This can be used for defining multiple sections of the roof</
xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="id" type="xs:IDREF"/>
```

```
</xs:complexType>
```

Complex Type RoofPlaneType

Namespace	http://www.iepmodel.net
Annotations	Definition of a plane (a 2D polygon), it's orientation with respect to the sun, and any affects of shading. The LayoutPlane is primarily used to define roof planes on which solar panels can be attached. For that reason it also includes structural attributes for such a roof plane. A roof plane can have panels directly laid out on it. RoofPlane is in the Common XSD so that it can be used in Project XSD for site surveys, as well as within PvSystem XSD for system definitions.
Diagram	
Properties	abstract: false
Used by	Elements PvSystemType/RoofPlane, RoofType/RoofPlane
Model	Name{0,1} , SolarExposure , Structure{0,1} , PlaneShape{0,1} , PlaneCenterLocation{0,1}
Children	Name, PlaneCenterLocation, PlaneShape, SolarExposure, Structure

Attributes

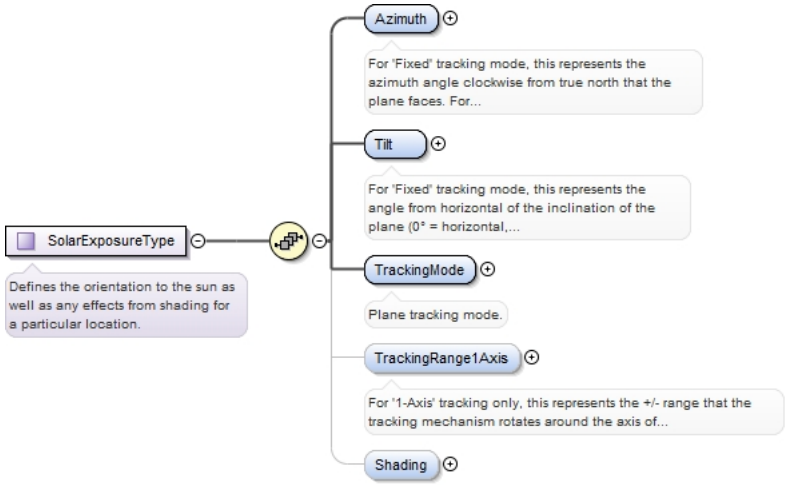
QName	Type	Fixed	Default	Use
ANY attribute from TARGET namespace 'http://www.iepmodel.net'				
id	xs:ID			required
	Unique identifier for this layout plane.			

Source

```
<xs:complexType name="RoofPlaneType" abstract="false">
  <xs:annotation>
    <xs:documentation>Definition of a plane (a 2D polygon), it's orientation with respect
 to the sun, and any affects of shading. The LayoutPlane is primarily used to define roof
 planes on which solar panels can be attached. For that reason it also includes structural
 attributes for such a roof plane. A roof plane can have panels directly laid out on it.
 RoofPlane is in the Common XSD so that it can be used in Project XSD for site surveys, as
 well as within PvSystem XSD for system definitions.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <!--
                TODO: this causes ambiguity with derived class polygonLayoutPlane
                <xs:any namespace="##targetNamespace" processContents="lax" minOccurs="0"
 maxOccurs="unbounded"/>
            -->
    <xs:element name="Name" type="xs:string" minOccurs="0" form="unqualified">
      <xs:annotation>
        <xs:documentation>Used to describe what this Layout Plane is. For example,
 "SouthEast Roof", etc</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="SolarExposure" type="SolarExposureType"/>
    <xs:element minOccurs="0" name="Structure" type="RoofPlaneStructureType"
 form="unqualified">
```

```
      <xs:annotation>
        <xs:documentation>This element describes the RoofPlane's structural attributes.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="PlaneShape" type="PlaneShapeType" form="unqualified">
    </xs:element>
    <xs:element name="PlaneCenterLocation" type="Location3dType" maxOccurs="1"
 minOccurs="0">
      <xs:annotation>
        <xs:documentation>If this is a top level plane, this represents the position in 3D
 space where center of plane is located relative to the scene origin. If this a child of
 another plane, this represents the center of this plane relative to its parent plane.</
xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="id" type="xs:ID" use="required">
    <xs:annotation>
      <xs:documentation>Unique identifier for this layout plane.</xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:anyAttribute namespace="##targetNamespace" processContents="lax"/>
</xs:complexType>
```

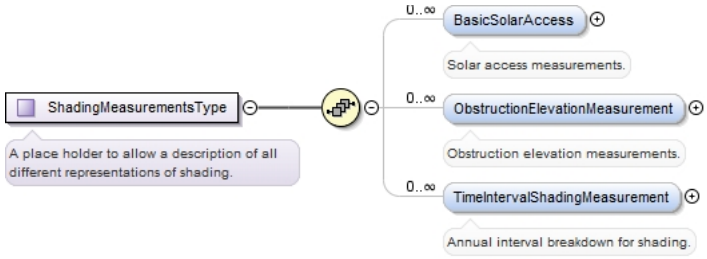
Complex Type `SolarExposureType`

Namespace	http://www.iepmodel.net
Annotations	Defines the orientation to the sun as well as any effects from shading for a particular location.
Diagram	
Used by	Elements PvArrayType/SolarExposure/ArraySpecificSolarExposure, RoofPlaneType/SolarExposure
Model	Azimuth , Tilt , TrackingMode , TrackingRange1Axis{0,1} , Shading{0,1}
Children	Azimuth, Shading, Tilt, TrackingMode, TrackingRange1Axis
Source	

```
<xs:complexType name="SolarExposureType">
  <xs:annotation>
    <xs:documentation>Defines the orientation to the sun as well as any effects from
 shading for a particular location.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element maxOccurs="1" minOccurs="1" name="Azimuth" nillable="true"
 form="unqualified">
      <xs:annotation>
        <xs:documentation>For 'Fixed' tracking mode, this represents the azimuth angle
 clockwise from true north that the plane faces. For '1-Axis' tracking, this represents
 the azimuth angle clockwise from true north of the axis of rotation. If this is a child
 plane, instead of the angle representing azimuth relative to world space north, this
 represent the angle rotation about the z-axis relative to the parent plane of this child
 plane.</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:double">
          <xs:minInclusive value="0"/>
          <xs:maxInclusive value="360"/>
        </xs:restriction>
      </xs:simpleType>
```

```
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="1" name="Tilt" nillable="true"
 form="unqualified">
      <xs:annotation>
        <xs:documentation>For 'Fixed' tracking mode, this represents the angle from
 horizontal of the inclination of the plane (0° = horizontal, 90° = vertical). For '1-
Axis' tracking, this represents the angle from horizontal of the inclination of the
 tracker axis. Units are degrees. If this is a child plane, instead of this angle being
 relative to the horizontal, it is relative to its parent plane.</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:double">
          <xs:minInclusive value="0"/>
          <xs:maxInclusive value="90"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element default="fixed" maxOccurs="1" minOccurs="1" name="TrackingMode"
 type="TrackingModeEnumType" form="unqualified">
      <xs:annotation>
        <xs:documentation>Plane tracking mode.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element default="45" maxOccurs="1" minOccurs="0" name="TrackingRange1Axis"
 nillable="true" type="xs:double" form="unqualified">
      <xs:annotation>
        <xs:documentation>For '1-Axis' tracking only, this represents the +/- range that
 the tracking mechanism rotates around the axis of rotation.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="Shading" type="ShadingMeasurementsType"
 form="unqualified"/>
  </xs:sequence>
</xs:complexType>
```

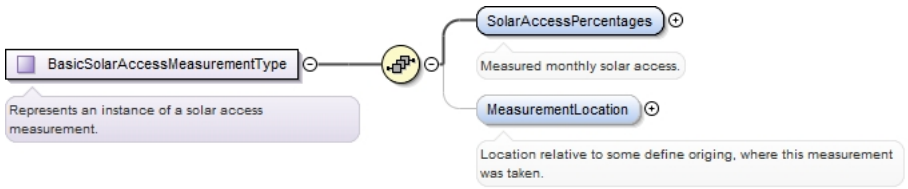
Complex Type ShadingMeasurementsType

Namespace	http://www.iepmodel.net
Annotations	A place holder to allow a description of all different representations of shading.
Diagram	
Used by	Element SolarExposureType/Shading
Model	BasicSolarAccess* , ObstructionElevationMeasurement* , TimeIntervalShadingMeasurement*
Children	BasicSolarAccess, ObstructionElevationMeasurement, TimeIntervalShadingMeasurement
Source	

```
<xs:complexType name="ShadingMeasurementsType">
  <xs:annotation>
    <xs:documentation>A place holder to allow a description of all different
 representations of shading.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="BasicSolarAccess" type="BasicSolarAccessMeasurementType"
 minOccurs="0" maxOccurs="unbounded" form="unqualified">
      <xs:annotation>
        <xs:documentation>Solar access measurements.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ObstructionElevationMeasurement"
 type="ObstructionElevationsMeasurementType" minOccurs="0" maxOccurs="unbounded"
 form="unqualified">
      <xs:annotation>
        <xs:documentation>Obstruction elevation measurements.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="TimeIntervalShadingMeasurement"
 type="TimeIntervalShadingMeasurmentType" minOccurs="0" maxOccurs="unbounded"
 form="unqualified">
      <xs:annotation>
```

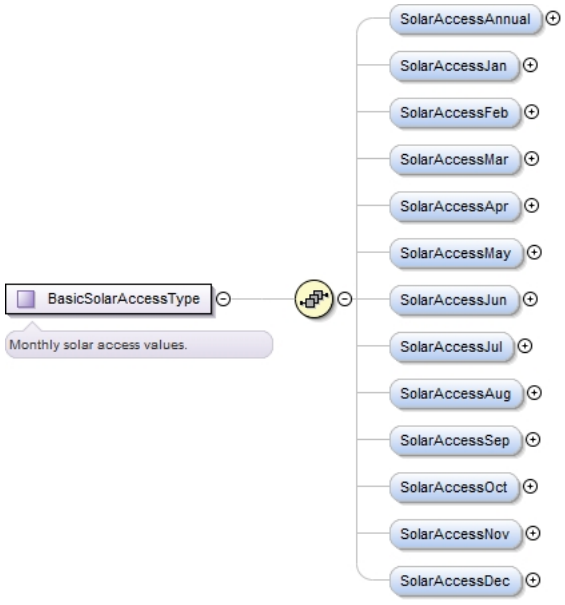
```
        <xs:documentation>Annual interval breakdown for shading.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

Complex Type `BasicSolarAccessMeasurementType`

Namespace	http://www.iepmodel.net
Annotations	`Represents an instance of a solar access measurement.`
Diagram	
Used by	Element ShadingMeasurementsType/BasicSolarAccess
Model	SolarAccessPercentages , MeasurementLocation{0,1}
Children	MeasurementLocation, SolarAccessPercentages
`Source`	

```
<xs:complexType name="BasicSolarAccessMeasurementType">
  <xs:annotation>
    <xs:documentation>Represents an instance of a solar access measurement.</
xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="SolarAccessPercentages" type="BasicSolarAccessType" maxOccurs="1"
 minOccurs="1" form="unqualified">
      <xs:annotation>
        <xs:documentation>Measured monthly solar access.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="MeasurementLocation" type="Location3dType" minOccurs="0">
      <xs:annotation>
        <xs:documentation>Location relative to some define origing, where this measurement
 was taken.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

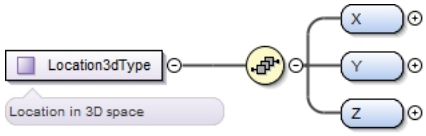
Complex Type `BasicSolarAccessType`

Namespace	http://www.iepmodel.net
Annotations	`Monthly solar access values.`
Diagram	

Used by	Element BasicSolarAccessMeasurementType/SolarAccessPercentages
Model	SolarAccessAnnual{0,1} , SolarAccessJan{0,1} , SolarAccessFeb{0,1} , SolarAccessMar{0,1} , SolarAccessApr{0,1} , SolarAccessMay{0,1} , SolarAccessJun{0,1} , SolarAccessJul{0,1} , SolarAccessAug{0,1} , SolarAccessSep{0,1} , SolarAccessOct{0,1} , SolarAccessNov{0,1} , SolarAccessDec{0,1}
Children	SolarAccessAnnual, SolarAccessApr, SolarAccessAug, SolarAccessDec, SolarAccessFeb, SolarAccessJan, SolarAccessJul, SolarAccessJun, SolarAccessMar, SolarAccessMay, SolarAccessNov, SolarAccessOct, SolarAccessSep
Source	

```
<xs:complexType name="BasicSolarAccessType">
  <xs:annotation>
    <xs:documentation>Monthly solar access values.</xs:documentation>
  </xs:annotation>
  <xs:sequence minOccurs="0" maxOccurs="1">
    <xs:element name="SolarAccessAnnual" type="xs:int" minOccurs="0" maxOccurs="1"
 form="unqualified"/>
    <xs:element name="SolarAccessJan" type="xs:int" minOccurs="0" maxOccurs="1"
 form="unqualified"/>
    <xs:element name="SolarAccessFeb" type="xs:int" minOccurs="0" maxOccurs="1"
 form="unqualified"/>
    <xs:element name="SolarAccessMar" type="xs:int" minOccurs="0" maxOccurs="1"
 form="unqualified"/>
    <xs:element name="SolarAccessApr" type="xs:int" minOccurs="0" maxOccurs="1"
 form="unqualified"/>
    <xs:element name="SolarAccessMay" type="xs:int" minOccurs="0" maxOccurs="1"
 form="unqualified"/>
    <xs:element name="SolarAccessJun" type="xs:int" minOccurs="0" maxOccurs="1"
 form="unqualified"/>
    <xs:element name="SolarAccessJul" type="xs:int" minOccurs="0" maxOccurs="1"
 form="unqualified"/>
    <xs:element name="SolarAccessAug" type="xs:int" minOccurs="0" maxOccurs="1"
 form="unqualified"/>
    <xs:element name="SolarAccessSep" type="xs:int" minOccurs="0" maxOccurs="1"
 form="unqualified"/>
    <xs:element name="SolarAccessOct" type="xs:int" minOccurs="0" maxOccurs="1"
 form="unqualified"/>
    <xs:element name="SolarAccessNov" type="xs:int" minOccurs="0" maxOccurs="1"
 form="unqualified"/>
    <xs:element name="SolarAccessDec" type="xs:int" minOccurs="0" maxOccurs="1"
 form="unqualified"/>
  </xs:sequence>
</xs:complexType>
```

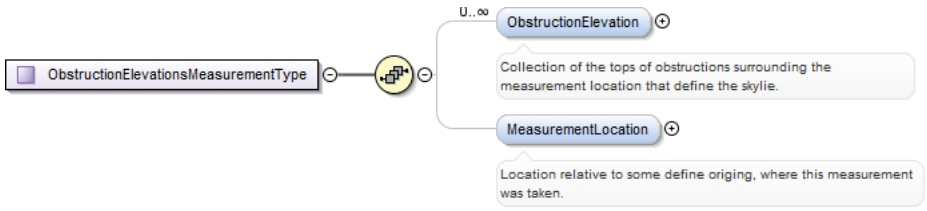
Complex Type `Location3dType`

Namespace	http://www.iepmodel.net
Annotations	Location in 3D space
Diagram	
Used by	Elements BasicSolarAccessMeasurementType/MeasurementLocation, ObstructionElevationsMeasurementType/MeasurementLocation, PvModuleType/LocationOnPlane, RoofPlaneType/PlaneCenterLocation, TimeIntervalShadingMeasurmentType/MeasurementLocation
Model	X , Y , Z
Children	X, Y, Z
Source	


```
<xs:complexType name="Location3dType">
  <xs:annotation>
    <xs:documentation>Location in 3D space</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="X" type="xs:double"/>
    <xs:element name="Y" type="xs:double"/>
    <xs:element name="Z" type="xs:double"/>
  </xs:sequence>
</xs:complexType>
```

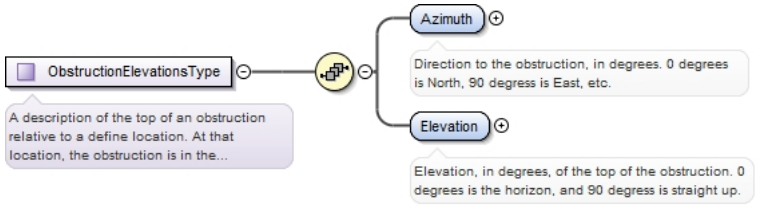
Complex Type `ObstructionElevationsMeasurementType`

Namespace	http://www.iepmodel.net

Diagram	
Used by	Element ShadingMeasurementsType/ObstructionElevationMeasurement
Model	ObstructionElevation* , MeasurementLocation{0,1}
Children	MeasurementLocation, ObstructionElevation

Source	`<xs:complexType name="ObstructionElevationsMeasurementType">`
	`  <xs:sequence>`
	`  <xs:element name="ObstructionElevation" type="ObstructionElevationsType" minOccurs="0" maxOccurs="unbounded">`
	`  <xs:annotation>`
	`  <xs:documentation>Collection of the tops of obstructions surrounding the measurement location that define the skylie.</xs:documentation>`
	`  </xs:annotation>`
	`  </xs:element>`
	`  <xs:element name="MeasurementLocation" type="Location3dType" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>Location relative to some define origing, where this measurement was taken.</xs:documentation>`
	`  </xs:annotation>`
	`  </xs:element>`
	`  </xs:sequence>`
	`</xs:complexType>`

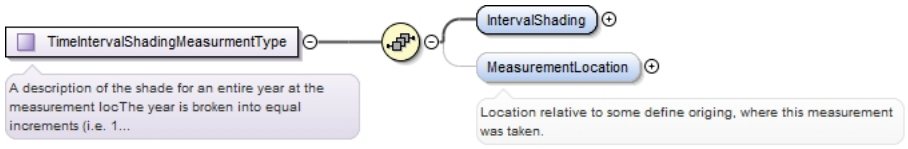
Complex Type `ObstructionElevationsType`

Namespace	http://www.iepmodel.net
Annotations	A description of the top of an obstruction relative to a define location. At that location, the obstruction is in the direction define by Azimuth, and the top of that obstruction is at the elevation angle define by Elevation.
Diagram	
Used by	Element ObstructionElevationsMeasurementType/ObstructionElevation
Model	Azimuth , Elevation
Children	Azimuth, Elevation

Source	`<xs:complexType name="ObstructionElevationsType">`
	`  <xs:annotation>`
	`  <xs:documentation>A description of the top of an obstruction relative to a define location. At that location, the obstruction is in the direction define by Azimuth, and the top of that obstruction is at the elevation angle define by Elevation.</xs:documentation>`
	`  </xs:annotation>`
	`  <xs:sequence>`
	`  <xs:element name="Azimuth" maxOccurs="1" minOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>Direction to the obstruction, in degrees. 0 degrees is North, 90 degress is East, etc.</xs:documentation>`
	`  </xs:annotation>`
	`  <xs:simpleType>`
	`  <xs:restriction base="xs:double">`
	`  <xs:minInclusive value="0"/>`
	`  <xs:maxInclusive value="359"/>`
	`  </xs:restriction>`
	`  </xs:simpleType>`
	`  </xs:element>`
	`  <xs:element name="Elevation" maxOccurs="1" minOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>Elevation, in degrees, of the top of the obstruction. 0 degrees is the horizon, and 90 degress is straight up.</xs:documentation>`

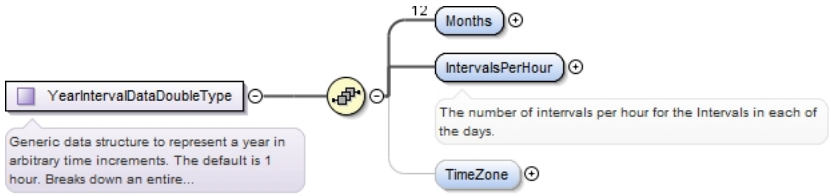
```
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:double">
          <xs:minInclusive value="0"/>
          <xs:maxInclusive value="90"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

Complex Type `TimeIntervalShadingMeasurmentType`

Namespace	http://www.iepmodel.net
Annotations	A description of the shade for an entire year at the measurement locThe year is broken into equal increments (i.e. 1 hour increments) and for each increment the data value is 1 if at that location it is not shaded for that hour, and 0 if at that location it is shaded for that hour.
Diagram	
Used by	Element ShadingMeasurementsType/TimeIntervalShadingMeasurement
Model	IntervalShading , MeasurementLocation{0,1}
Children	IntervalShading, MeasurementLocation
Source	

```
<xs:complexType name="TimeIntervalShadingMeasurmentType">
  <xs:annotation>
    <xs:documentation>A description of the shade for an entire year at the measurement
 locThe year is broken into equal increments (i.e. 1 hour increments) and for each
 increment the data value is 1 if at that location it is not shaded for that hour, and 0
 if at that location it is shaded for that hour.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="IntervalShading" type="YearIntervalDataDoubleType" maxOccurs="1"
 minOccurs="1"/>
    <xs:element name="MeasurementLocation" type="Location3dType" minOccurs="0"
 maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Location relative to some define origing, where this measurement
 was taken.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

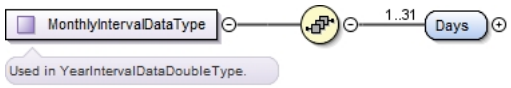
Complex Type `YearIntervalDataDoubleType`

Namespace	http://www.iepmodel.net
Annotations	Generic data structure to represent a year in arbitrary time increments. The default is 1 hour. Breaks down an entire year into equal intervals of time, with the ability to associate a value of type double for each time interval. TODO: Look at consiolidating with the Schedule schema, also look at newly discovered interval data structures such as http://naesb.org/, and http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/GreenButtonInitiative
Diagram	
Used by	Element TimeIntervalShadingMeasurmentType/IntervalShading
Model	Months{12,12} , IntervalsPerHour , TimeZone{0,1}
Children	IntervalsPerHour, Months, TimeZone
Source	

```
<xs:complexType name="YearIntervalDataDoubleType">
```

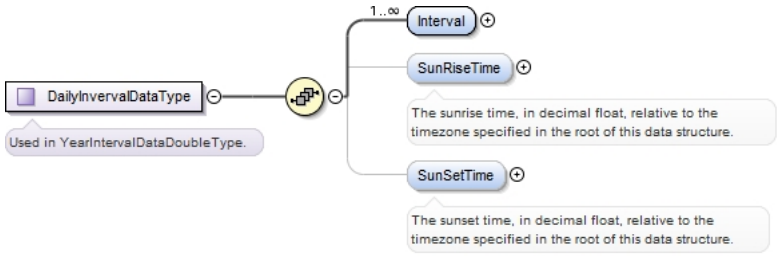
```
  <xs:annotation>
    <xs:documentation>Generic data structure to represent a year in arbitrary time
 increments. The default is 1 hour. Breaks down an entire year into equal intervals of
 time, with the ability to associate a value of type double for each time interval. TODO:
 Look at consiolidating with the Schedule schema, also look at newly discovered interval
 data structures such as http://naesb.org/, and http://collaborate.nist.gov/twiki-sggrid/
bin/view/SmartGrid/GreenButtonInitiative</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element maxOccurs="12" minOccurs="12" name="Months"
 type="MonthlyIntervalDataType"/>
    <xs:element maxOccurs="1" minOccurs="1" name="IntervalsPerHour" type="xs:int">
      <xs:annotation>
        <xs:documentation>The number of interrvals per hour for the Intervals in each of
 the days.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="TimeZone" type="xs:double"/>
  </xs:sequence>
</xs:complexType>
```

Complex Type `MonthlyIntervalDataType`

Namespace	http://www.iepmodel.net
Annotations	`Used in YearIntervalDataDoubleType.`
Diagram	
Used by	Element YearIntervalDataDoubleType/Months
Model	Days{1,31}
Children	Days
`Source`	

```
<xs:complexType name="MonthlyIntervalDataType">
  <xs:annotation>
    <xs:documentation>Used in YearIntervalDataDoubleType.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element maxOccurs="31" minOccurs="1" name="Days" type="DailyInvervalDataType"/>
  </xs:sequence>
</xs:complexType>
```

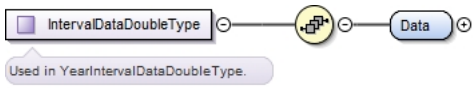
Complex Type `DailyInvervalDataType`

Namespace	http://www.iepmodel.net
Annotations	`Used in YearIntervalDataDoubleType.`
Diagram	
Used by	Element MonthlyIntervalDataType/Days
Model	Interval+ , SunRiseTime{0,1} , SunSetTime{0,1}
Children	Interval, SunRiseTime, SunSetTime
`Source`	

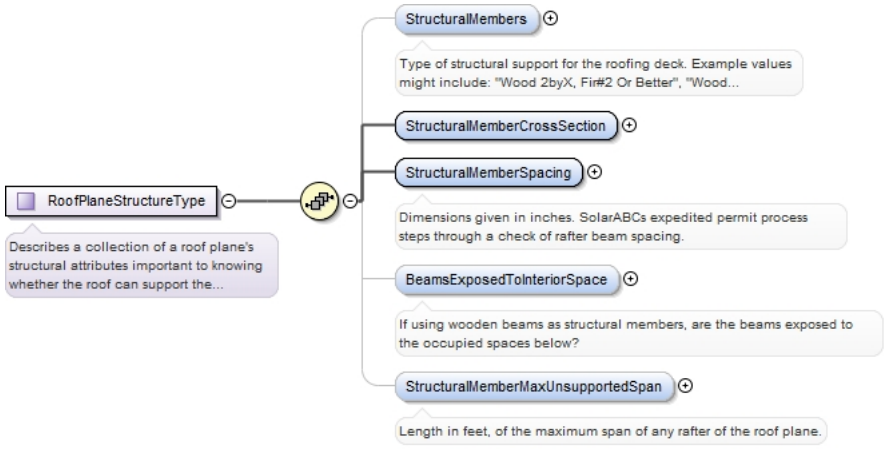
```
<xs:complexType name="DailyInvervalDataType">
  <xs:annotation>
    <xs:documentation>Used in YearIntervalDataDoubleType.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element maxOccurs="unbounded" minOccurs="1" name="Interval"
 type="IntervalDataDoubleType"/>
    <xs:element maxOccurs="1" minOccurs="0" name="SunRiseTime" type="xs:double">
      <xs:annotation>
        <xs:documentation>The sunrise time, in decimal float, relative to the timezone
 specified in the root of this data structure.</xs:documentation>
```

```
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="SunSetTime" type="xs:double">
      <xs:annotation>
        <xs:documentation>The sunset time, in decimal float, relative to the timezone
 specified in the root of this data structure.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

Complex Type `IntervalDataDoubleType`

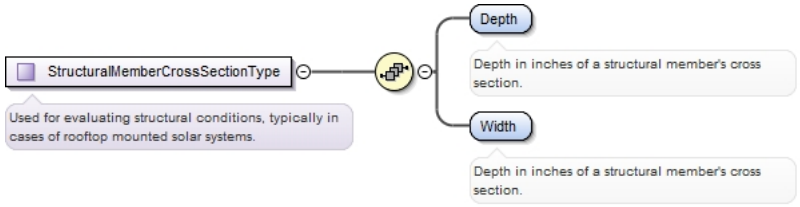
Namespace	http://www.iepmodel.net
Annotations	`Used in YearIntervalDataDoubleType.`
Diagram	
Used by	Element DailyInvervalDataType/Interval
Model	Data
Children	Data
Source	<xs:complexType name="IntervalDataDoubleType"> <xs:annotation> <xs:documentation>Used in YearIntervalDataDoubleType.</xs:documentation> </xs:annotation> <xs:sequence> <xs:element maxOccurs="1" minOccurs="1" name="Data" type="xs:double"/> </xs:sequence> </xs:complexType>

Complex Type `RoofPlaneStructureType`

Namespace	http://www.iepmodel.net
Annotations	`Describes a collection of a roof plane's structural attributes important to knowing whether the roof can support the additional weight of added equipment, such as solar panels.`
Diagram	
Used by	Element RoofPlaneType/Structure
Model	StructuralMembers{0,1} , StructuralMemberCrossSection , StructuralMemberSpacing , BeamsExposedToInteriorSpace{0,1} , StructuralMemberMaxUnsupportedSpan{0,1}
Children	BeamsExposedToInteriorSpace, StructuralMemberCrossSection, StructuralMemberMaxUnsupportedSpan, StructuralMemberSpacing, StructuralMembers
Source	<xs:complexType name="RoofPlaneStructureType"> <xs:annotation> <xs:documentation>Describes a collection of a roof plane's structural attributes important to knowing whether the roof can support the additional weight of added equipment, such as solar panels.</xs:documentation> </xs:annotation> <xs:sequence> <xs:element maxOccurs="1" minOccurs="0" name="StructuralMembers" type="xs:string"> <xs:annotation>

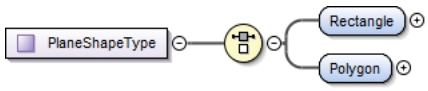
```
        <xs:documentation>Type of structural support for the roofing deck. Example values
 might include: "Wood 2byX, Fir#2 Or Better", "Wood 2byX", "Wood I-beam", "Steel I-beam",
 "Steel C-channel", etc</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="1" name="StructuralMemberCrossSection"
 type="StructuralMemberCrossSectionType"/>
    <xs:element maxOccurs="1" minOccurs="1" name="StructuralMemberSpacing"
 type="xs:decimal">
      <xs:annotation>
        <xs:documentation>Dimensions given in inches. SolarABCs expedited permit process
 steps through a check of rafter beam spacing.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="BeamsExposedToInteriorSpace"
 type="xs:boolean">
      <xs:annotation>
        <xs:documentation>If using wooden beams as structural members, are the beams
 exposed to the occupied spaces below?</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="StructuralMemberMaxUnsupportedSpan" type="xs:decimal">
      <xs:annotation>
        <xs:documentation>Length in feet, of the maximum span of any rafter of the roof
 plane.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

Complex Type `StructuralMemberCrossSectionType`

Namespace	http://www.iepmodel.net
Annotations	Used for evaluating structural conditions, typically in cases of rooftop mounted solar systems.
Diagram	
Used by	Element RoofPlaneStructureType/StructuralMemberCrossSection
Model	Depth , Width
Children	Depth, Width
Source	

```
<xs:complexType name="StructuralMemberCrossSectionType">
  <xs:annotation>
    <xs:documentation>Used for evaluating structural conditions, typically in cases of
 rooftop mounted solar systems.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Depth">
      <xs:annotation>
        <xs:documentation>Depth in inches of a structural member's cross section.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Width">
      <xs:annotation>
        <xs:documentation>Depth in inches of a structural member's cross section.</
xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

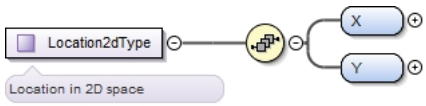
Complex Type `PlaneShapeType`

Namespace	http://www.iepmodel.net
Diagram	

Used by	Element RoofPlaneType/PlaneShape
Model	Rectangle | Polygon
Children	Polygon, Rectangle
Source	

```
<xs:complexType name="PlaneShapeType">
  <xs:choice>
    <xs:element name="Rectangle">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="Width" type="xs:double">
            <xs:annotation>
              <xs:documentation>Width of rectangluar plane, in meters.</xs:documentation>
            </xs:annotation>
          </xs:element>
          <xs:element name="Height" type="xs:double">
            <xs:annotation>
              <xs:documentation>Height of rectangular plane, in meters.</xs:documentation>
            </xs:annotation>
          </xs:element>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
    <xs:element name="Polygon">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="PlaneShape2d" type="Location2dType" nillable="true"
 minOccurs="3" maxOccurs="unbounded">
            <xs:annotation>
              <xs:documentation>2D polygon points to define an arbitrary plane shape.</
xs:documentation>
            </xs:annotation>
          </xs:element>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:choice>
</xs:complexType>
```

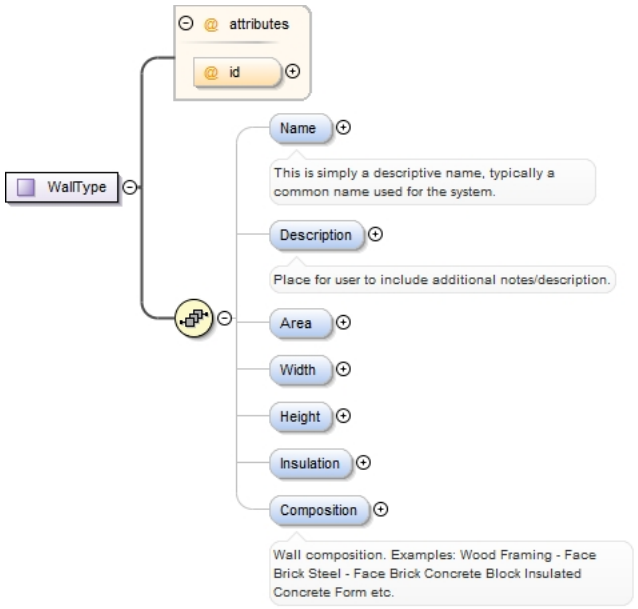
Complex Type `Location2dType`

Namespace	http://www.iepmodel.net
Annotations	Location in 2D space
Diagram	
Used by	Element PlaneShapeType/Polygon/PlaneShape2d
Model	X , Y
Children	X, Y
Source	


```
<xs:complexType name="Location2dType">
  <xs:annotation>
    <xs:documentation>Location in 2D space</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="X" type="xs:double"/>
    <xs:element name="Y" type="xs:double"/>
  </xs:sequence>
</xs:complexType>
```

Complex Type `WallType`

Namespace	http://www.iepmodel.net

Diagram	
Used by	Element EnvelopeType/Wall
Model	Name{0,1} , Description{0,1} , Area{0,1} , Width{0,1} , Height{0,1} , Insulation{0,1} , Composition{0,1}
Children	Area, Composition, Description, Height, Insulation, Name, Width

Attributes

QName	Type	Fixed	Default	Use
id	xs:IDREF			optional

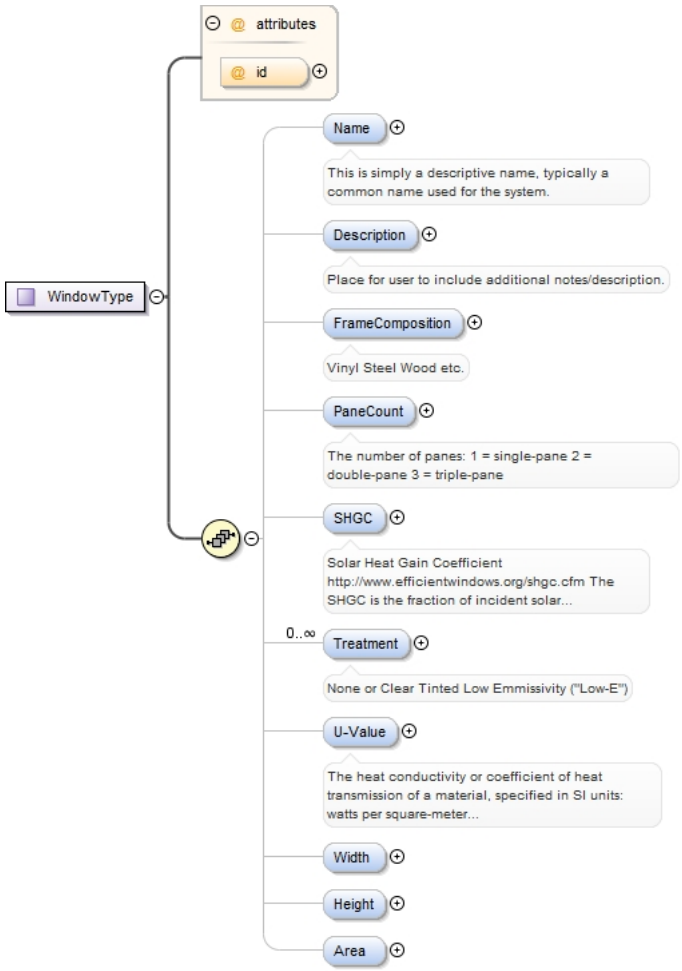
Source

```
<xs:complexType name="WallType">
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Area" type="AreaType" minOccurs="0"/>
    <xs:element name="Width" type="DimensionType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Height" type="DimensionType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Insulation" type="InsulationType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Composition" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Wall composition. Examples: Wood Framing - Face Brick Steel -
 Face Brick Concrete Block Insulated Concrete Form etc.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="id" type="xs:IDREF"/>
</xs:complexType>
```

Complex Type `WindowType`

Namespace	http://www.iepmodel.net

Diagram



Used by

Element EnvelopeType/Window

Model

Name{0,1} , Description{0,1} , FrameComposition{0,1} , PaneCount{0,1} , SHGC{0,1} , Treatment* , U-Value{0,1} , Width{0,1} , Height{0,1} , Area{0,1}

Children

Area, Description, FrameComposition, Height, Name, PaneCount, SHGC, Treatment, U-Value, Width

Attributes

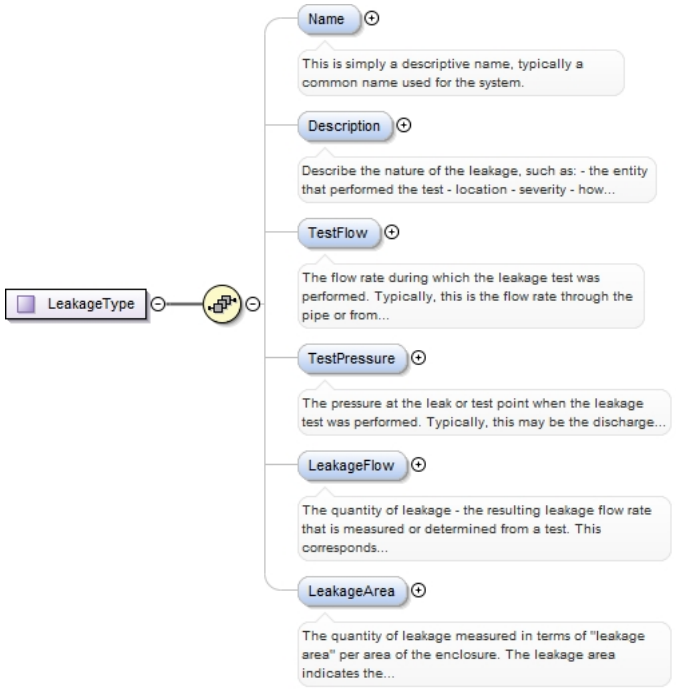
QName	Type	Fixed	Default	Use
id	xs:IDREF			optional

Source

```
<xs:complexType name="WindowType">
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="FrameComposition" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Vinyl Steel Wood etc.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="PaneCount" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The number of panes: 1 = single-pane 2 = double-pane 3 = triple-
pane</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:int">
          <xs:minInclusive value="1"/>
        </xs:restriction>
```

```
      </xs:simpleType>
    </xs:element>
    <xs:element name="SHGC" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Solar Heat Gain Coefficient http://www.efficientwindows.org/
shgc.cfm The SHGC is the fraction of incident solar radiation admitted through a window,
 both directly transmitted and absorbed and subsequently released inward. SHGC is
 expressed as a number between 0 and 1. The lower a window's solar heat gain coefficient,
 the less solar heat it transmits.</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:float">
          <xs:minInclusive value="0"/>
          <xs:maxInclusive value="1"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="Treatment" type="xs:string" minOccurs="0" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>None or Clear Tinted Low Emmissivity ("Low-E")</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="U-Value" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The heat conductivity or coefficient of heat transmission of a
 material, specified in SI units: watts per square-meter kelvins W/(m²·K) or equivalently
 W/(m²·°C). Note that if you intend to use different units then this should be noted in
 the Description.</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:float">
          <xs:minInclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="Width" type="DimensionType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Height" type="DimensionType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Area" type="AreaType" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="id" type="xs:IDREF"/>
</xs:complexType>
```

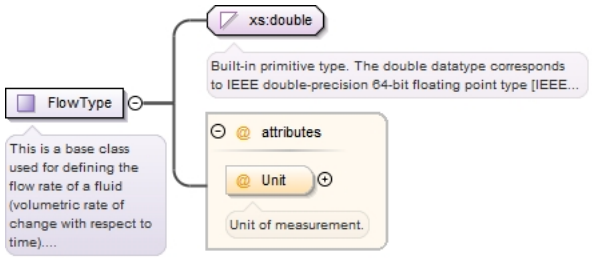
Complex Type LeakageType

Namespace	http://www.iepmodel.net
Diagram	
Used by	Elements DistributionSegmentType/Leakage, EnvelopeType/Leakage
Model	Name{0,1} , Description{0,1} , TestFlow{0,1} , TestPressure{0,1} , LeakageFlow{0,1} , LeakageArea{0,1}

Children	Description, LeakageArea, LeakageFlow, Name, TestFlow, TestPressure
Source	

```
<xs:complexType name="LeakageType">
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Describe the nature of the leakage, such as: - the entity that
 performed the test - location - severity - how discovered - systems, equipment affected -
 etc.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="TestFlow" type="FlowType">
      <xs:annotation>
        <xs:documentation>The flow rate during which the leakage test was performed.
 Typically, this is the flow rate through the pipe or from the fan if a blower door or
 duct leakage test is performed. This flow rate correspondes to the Leakage Value.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="TestPressure" type="PressureType">
      <xs:annotation>
        <xs:documentation>The pressure at the leak or test point when the leakage test
 was performed. Typically, this may be the discharge pressure of the fan if a blower door
 or duct leakage test is performed. This pressure corresponds to the Leakage Value.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="LeakageFlow" type="FlowType">
      <xs:annotation>
        <xs:documentation>The quantity of leakage - the resulting leakage flow rate that
 is measured or determined from a test. This corresponds to the Test Flow and Pressure.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="LeakageArea" type="AreaType">
      <xs:annotation>
        <xs:documentation>The quantity of leakage measured in terms of "leakage area" per
 area of the enclosure. The leakage area indicates the effective net size (area) of the
 leak. The area of the enclosure typically refers to the floor-area of the enclosure being
 tested. This corresponds to the Test Flow and Pressure.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

Complex Type `FlowType`

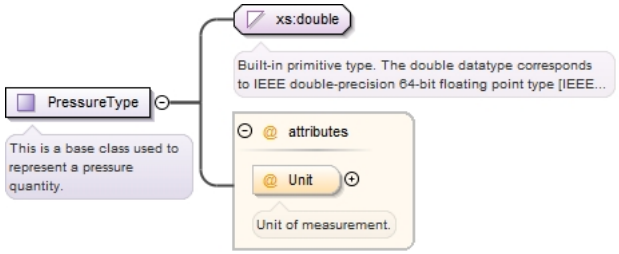
Namespace	http://www.iepmodel.net
Annotations	This is a base class used for defining the flow rate of a fluid (volumetric rate of change with respect to time). Distribution system is a example of an object that instances this type.
Diagram	
Type	extension of xs:double
Used by	Elements: DistributionSegmentType/FlowRated, LeakageType/LeakageFlow, LeakageType/TestFlow, PrimeMoverSystemType/DesignFlow, WaterHeatingCapacityType/RatedFlowRate
Attributes	
Source	

QName	Type	Fixed	Default	Use
Unit	FlowUnitEnumType			optional
	Unit of measurement.			

```
<xs:complexType name="FlowType">
```

```
  <xs:annotation>
    <xs:documentation>This is a base class used for defining the flow rate of a fluid
 (volumetric rate of change with respect to time). Distribution system is a example of an
 object that instances this type.</xs:documentation>
  </xs:annotation>
  <xs:simpleContent>
    <xs:extension base="xs:double">
      <xs:attribute name="Unit" type="FlowUnitEnumType" use="optional">
        <xs:annotation>
          <xs:documentation>Unit of measurement.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

Complex Type PressureType

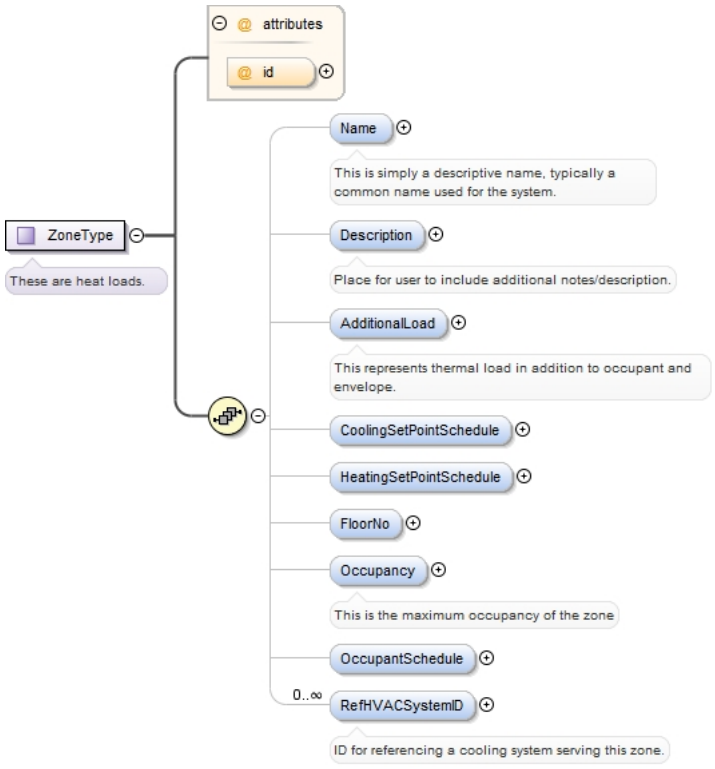
Namespace	http://www.iepmodel.net
Annotations	This is a base class used to represent a pressure quantity.
Diagram	
Type	extension of xs:double
Used by	Elements: DistributionSegmentType/PressureRated, LeakageType/TestPressure, PrimeMoverSystemType/DesignPressure
Attributes	**QName**: **Unit** — **Type**: PressureUnitEnumType — **Fixed**: — **Default**: — **Use**: optional Unit of measurement.

Source	`<xs:complexType name="PressureType">`
	`  <xs:annotation>`
	`    <xs:documentation>This is a base class used to represent a pressure quantity.</xs:documentation>`
	`  </xs:annotation>`
	`  <xs:simpleContent>`
	`    <xs:extension base="xs:double">`
	`      <xs:attribute name="Unit" type="PressureUnitEnumType" use="optional">`
	`        <xs:annotation>`
	`          <xs:documentation>Unit of measurement.</xs:documentation>`
	`        </xs:annotation>`
	`      </xs:attribute>`
	`    </xs:extension>`
	`  </xs:simpleContent>`
	`</xs:complexType>`

Complex Type ZoneType

Namespace	http://www.iepmodel.net
Annotations	These are heat loads.

Diagram



Used by

Element BuildingType/Zone

Model

Name{0,1} , Description{0,1} , AdditionalLoad{0,1} , CoolingSetPointSchedule{0,1} , HeatingSetPointSchedule{0,1} , FloorNo{0,1} , Occupancy{0,1} , OccupantSchedule{0,1} , RefHVACSystemID*

Children

AdditionalLoad, CoolingSetPointSchedule, Description, FloorNo, HeatingSetPointSchedule, Name, Occupancy, OccupantSchedule, RefHVACSystemID

Attributes

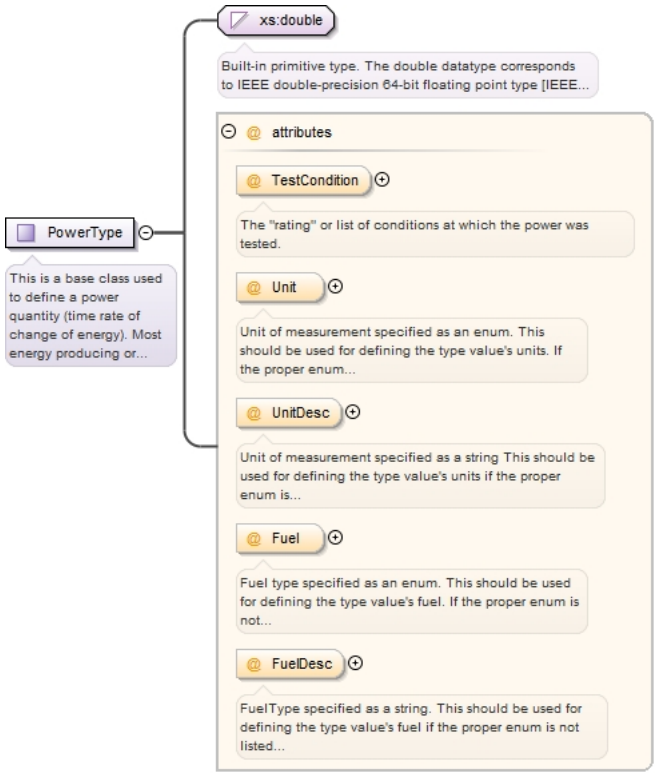
QName	Type	Fixed	Default	Use
id	xs:ID			optional

Source

```
<xs:complexType name="ZoneType">
  <xs:annotation>
    <xs:documentation>These are heat loads.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="AdditionalLoad" type="PowerType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This represents thermal load in addition to occupant and
 envelope.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="CoolingSetPointSchedule" type="ScheduleType" minOccurs="0"
 maxOccurs="1"/>
    <xs:element name="HeatingSetPointSchedule" type="ScheduleType" minOccurs="0"
 maxOccurs="1"/>
    <xs:element name="FloorNo" type="xs:int" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Occupancy" type="xs:int" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is the maximum occupancy of the zone</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="OccupantSchedule" type="ScheduleType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="RefHVACSystemID" type="xs:IDREF" minOccurs="0"
 maxOccurs="unbounded">
```

```
      <xs:annotation>
        <xs:documentation>ID for referencing a cooling system serving this zone.</
xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="id" type="xs:ID" use="optional"/>
</xs:complexType>
```

Complex Type PowerType

Namespace	http://www.iepmodel.net
Annotations	This is a base class used to define a power quantity (time rate of change of energy). Most energy producing or consuming systems and equipment instance this type.
Diagram	
Type	extension of xs:double
Used by	Elements: CommonSystemPropertiesType/DesignInput, CommonSystemPropertiesType/DesignOutput, CommonSystemPropertiesType/MaxInput, InputPowerType/Power, ValueType/Power, ZoneType/AdditionalLoad

Attributes

QName	Type	Fixed	Default	Use
Fuel	EnergyClassEnumType		Electricity	optional
	Fuel type specified as an enum. This should be used for defining the type value's fuel. If the proper enum is not listed, please use the FuelDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.			
FuelDesc	xs:string		Electricity	optional
	FuelType specified as a string. This should be used for defining the type value's fuel if the proper enum is not listed in Fuel. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.			
TestCondition	xs:string			optional
	The "rating" or list of conditions at which the power was tested.			
Unit	PowerUnitEnumType			optional
	Unit of measurement specified as an enum. This should be used for defining the type value's units. If the proper enum is not listed, please use the UnitDesc field to specify the units. These are			

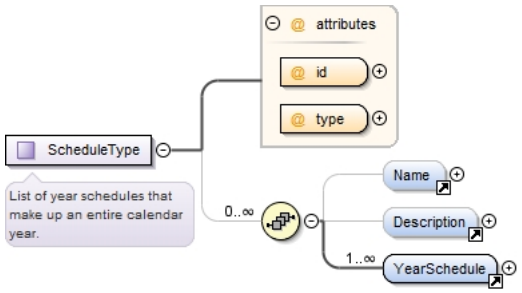
QName	Type	Fixed	Default	Use
	all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			
UnitDesc	xs:string		kwh	optional
	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			

Source

```
<xs:complexType name="PowerType">
  <xs:annotation>
    <xs:documentation>This is a base class used to define a power quantity (time rate of
 change of energy). Most energy producing or consuming systems and equipment instance this
 type.</xs:documentation>
  </xs:annotation>
  <xs:simpleContent>
    <xs:extension base="xs:double">
      <xs:attribute name="TestCondition" type="xs:string" use="optional">
        <xs:annotation>
          <xs:documentation>The "rating" or list of conditions at which the power was
 tested.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
      <xs:attribute name="Unit" type="PowerUnitEnumType" use="optional">
        <xs:annotation>
          <xs:documentation>Unit of measurement specified as an enum. This should be used
 for defining the type value's units. If the proper enum is not listed, please use the
 UnitDesc field to specify the units. These are all optional attributes in order to allow
 for a simplified value descriptions since these are used throughout the IEP schemas.
 Additionally the UnitDesc may contain a default type.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
      <xs:attribute default="kwh" name="UnitDesc" type="xs:string">
        <xs:annotation>
          <xs:documentation>Unit of measurement specified as a string This should be used
 for defining the type value's units if the proper enum is not listed in Unit. These are
 all optional attributes in order to allow for a simplified value descriptions since these
 are used throughout the IEP schemas. Additionally the UnitDesc may contain a default
 type.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
      <xs:attribute name="Fuel" type="EnergyClassEnumType" use="optional"
 default="Electricity">
        <xs:annotation>
          <xs:documentation>Fuel type specified as an enum. This should be used for
 defining the type value's fuel. If the proper enum is not listed, please use the
 FuelDesc field to specify the units. These are all optional attributes in order to allow
 for a simplified value descriptions since these are used throughout the IEP schemas.
 Additionally the FuelDesc may contain a default type.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
      <xs:attribute default="Electricity" name="FuelDesc" type="xs:string">
        <xs:annotation>
          <xs:documentation>FuelType specified as a string. This should be used for
 defining the type value's fuel if the proper enum is not listed in Fuel. These are all
 optional attributes in order to allow for a simplified value descriptions since these are
 used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.</
xs:documentation>
        </xs:annotation>
      </xs:attribute>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

Complex Type ScheduleType

Namespace	http://www.iepmodel.net
Annotations	List of year schedules that make up an entire calendar year.

Diagram	
Used by	Elements Schedule, ZoneType/CoolingSetPointSchedule, ZoneType/HeatingSetPointSchedule, ZoneType/OccupantSchedule
Model	Name{0,1} , Description{0,1} , YearSchedule+
Children	Description, Name, YearSchedule

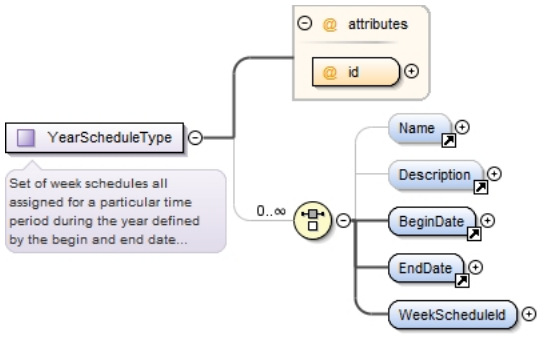
Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			required
type	scheduleEnumType			required

Source

```
<xs:complexType name="ScheduleType">
  <xs:annotation>
    <xs:documentation>List of year schedules that make up an entire calendar year.</
xs:documentation>
  </xs:annotation>
  <xs:sequence minOccurs="0" maxOccurs="unbounded">
    <xs:element ref="Name" minOccurs="0" maxOccurs="1"/>
    <xs:element ref="Description" minOccurs="0" maxOccurs="1"/>
    <xs:element ref="YearSchedule" minOccurs="1" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="id" use="required" type="xs:ID"/>
  <xs:attribute name="type" use="required" type="scheduleEnumType"/>
</xs:complexType>
```

Complex Type `YearScheduleType`

Namespace	http://www.iepmodel.net
Annotations	Set of week schedules all assigned for a particular time period during the year defined by the begin and end date elements. These must not span more than one calendar year.
Diagram	
Used by	Element YearSchedule
Model	Name{0,1} | Description{0,1} | BeginDate | EndDate | WeekScheduleId
Children	BeginDate, Description, EndDate, Name, WeekScheduleId

Attributes

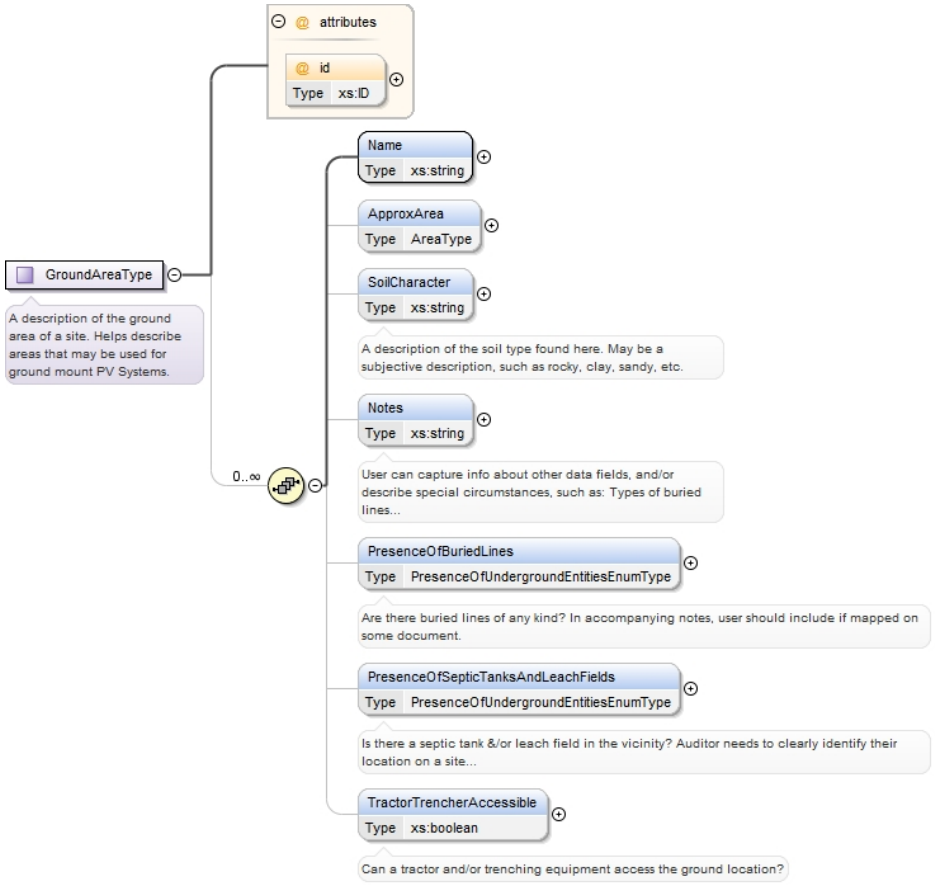
QName	Type	Fixed	Default	Use
id	xs:ID			required

Source

```
<xs:complexType name="YearScheduleType">
  <xs:annotation>
    <xs:documentation>Set of week schedules all assigned for a particular time period
 during the year defined by the begin and end date elements. These must not span more than
 one calendar year.</xs:documentation>
  </xs:annotation>
  <xs:choice minOccurs="0" maxOccurs="unbounded">
    <xs:element ref="Name" minOccurs="0" maxOccurs="1"/>
    <xs:element ref="Description" minOccurs="0" maxOccurs="1"/>
    <xs:element ref="BeginDate" minOccurs="1" maxOccurs="1"/>
```

```
    <xs:element ref="EndDate" minOccurs="1" maxOccurs="1"/>
    <xs:element minOccurs="1" maxOccurs="1" name="WeekScheduleId">
      <xs:complexType>
        <xs:attribute name="weekScheduleIdRef" type="xs:IDREF" use="required"/>
      </xs:complexType>
    </xs:element>
  </xs:choice>
  <xs:attribute name="id" use="required" type="xs:ID"/>
</xs:complexType>
```

Complex Type `GroundAreaType`

Namespace	http://www.iepmodel.net
Annotations	A description of the ground area of a site. Helps describe areas that may be used for ground mount PV Systems.
Diagram	
Used by	Element SiteType/GroundArea
Model	Name , ApproxArea{0,1} , SoilCharacter{0,1} , Notes{0,1} , PresenceOfBuriedLines{0,1} , PresenceOfSepticTanksAndLeachFields{0,1} , TractorTrencherAccessible{0,1}
Children	ApproxArea, Name, Notes, PresenceOfBuriedLines, PresenceOfSepticTanksAndLeachFields, SoilCharacter, TractorTrencherAccessible

Attributes

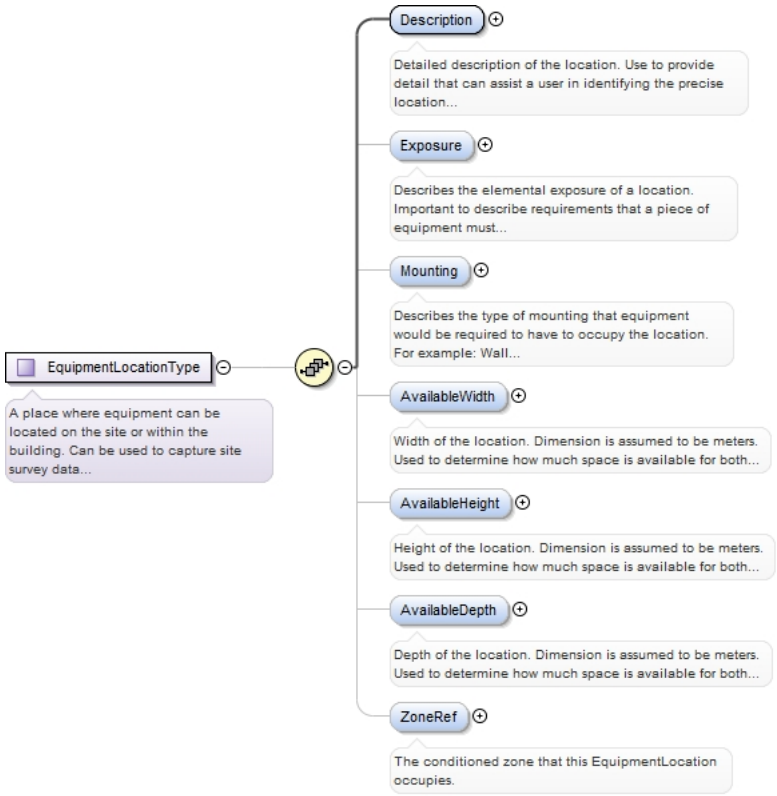
QName	Type	Fixed	Default	Use
id	xs:ID			optional

Source

```
<xs:complexType name="GroundAreaType">
  <xs:annotation>
    <xs:documentation>A description of the ground area of a site. Helps describe areas
 that may be used for ground mount PV Systems.</xs:documentation>
  </xs:annotation>
  <xs:sequence maxOccurs="unbounded" minOccurs="0">
    <xs:element name="Name" type="xs:string"/>
    <xs:element minOccurs="0" name="ApproxArea" type="AreaType"/>
    <xs:element maxOccurs="1" minOccurs="0" name="SoilCharacter" type="xs:string">
      <xs:annotation>
        <xs:documentation>A description of the soil type found here. May be a subjective
 description, such as rocky, clay, sandy, etc.</xs:documentation>
      </xs:annotation>
```

```
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="Notes" type="xs:string">
      <xs:annotation>
        <xs:documentation>User can capture info about other data fields, and/or describe
 special circumstances, such as: Types of buried lines and how marked, Equipment &/or
 materials access issues, whether there is an existing professional soils report, if
 the site is in a biotic reserve (when applicable), &/or whether an environmental impact
 report has been done</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="PresenceOfBuriedLines"
 type="PresenceOfUndergroundEntitiesEnumType">
      <xs:annotation>
        <xs:documentation>Are there buried lines of any kind? In accompanying notes, user
 should include if mapped on some document.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="PresenceOfSepticTanksAndLeachFields"
 type="PresenceOfUndergroundEntitiesEnumType">
      <xs:annotation>
        <xs:documentation>Is there a septic tank &/or leach field in the vicinity? Auditor
 needs to clearly identify their location on a site schematic.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="TractorTrencherAccessible"
 type="xs:boolean">
      <xs:annotation>
        <xs:documentation>Can a tractor and/or trenching equipment access the ground
 location?</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="id" type="xs:ID"/>
</xs:complexType>
```

Complex Type `EquipmentLocationType`

Namespace	http://www.iepmodel.net
Annotations	A place where equipment can be located on the site or within the building. Can be used to capture site survey data before any systems are designed, and can be used to specify where specific proposed equipment will be placed during implementation. Note, it can be used to describe an existing equipment location in cases of remove and replace scenarios.
Diagram	
Used by	Elements EquipmentInstanceType/Location, Location, SiteType/ProposedEquipmentLocation

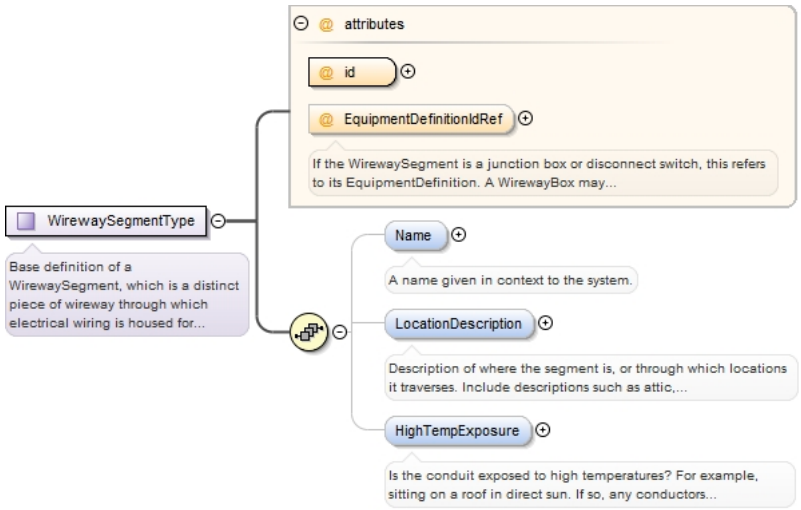
Model	Description , Exposure{0,1} , Mounting{0,1} , AvailableWidth{0,1} , AvailableHeight{0,1} , AvailableDepth{0,1} , ZoneRef{0,1}
Children	AvailableDepth, AvailableHeight, AvailableWidth, Description, Exposure, Mounting, ZoneRef
Source	

```
<xs:complexType name="EquipmentLocationType">
  <xs:annotation>
    <xs:documentation>A place where equipment can be located on the site or within the
 building. Can be used to capture site survey data before any systems are designed,
 and can be used to specify where specific proposed equipment will be placed during
 implementation. Note, it can be used to describe an existing equipment location in cases
 of remove and replace scenarios.</xs:documentation>
  </xs:annotation>
  <xs:sequence minOccurs="0" maxOccurs="1">
    <xs:element name="Description" type="xs:string" minOccurs="1" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Detailed description of the location. Use to provide detail that
 can assist a user in identifying the precise location on a site, access information, etc.
 Typically use room names, compass directions, etc to identify the location to users.
 When used for site surveys, should include what types of equipment are envisioned to be
 placed here. For eaxample, in PV Systems, equipment might include: DC transition box, DC
 Combiner, DC Disconnect, Inverter.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Exposure" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Describes the elemental exposure of a location. Important to
 describe requirements that a piece of equipment must fulfill. Suggested values include:
 Indoor-Conditioned, Indoor-Unconditioned, Outdoor-Covered, Outdoor-Uncovered, Rooftop.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Mounting" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Describes the type of mounting that equipment would be required
 to have to occupy the location. For example: Wall Mount, Wall Mount-Surface, Wall Mount-
Flush, Pad Mount.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="AvailableWidth" type="xs:float" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Width of the location. Dimension is assumed to be meters.
 Used to determine how much space is available for both equipment and code mandated
 clearances.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="AvailableHeight" type="xs:float" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Height of the location. Dimension is assumed to be meters.
 Used to determine how much space is available for both equipment and code mandated
 clearances.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="AvailableDepth" type="xs:float" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Depth of the location. Dimension is assumed to be meters.
 Used to determine how much space is available for both equipment and code mandated
 clearances.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="ZoneRef" type="xs:IDREF">
      <xs:annotation>
        <xs:documentation>The conditioned zone that this EquipmentLocation occupies.</
xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

Complex Type `WirewaySegmentType`

Namespace	http://www.iepmodel.net
Annotations	Base definition of a WirewaySegment, which is a distinct piece of wireway through which electrical wiring is housed for its prtotection and the protection of people and property. Wireway segments can be either electrical conduit or boxes. Multiple segments are connected to form a single continuous path for one or more CircuitConnections. Each segment is distinct by its characteristics.

Diagram



Properties

abstract:	`true`

Used by

Elements	SiteType/ExistingWirewaySegment, SiteType/ProposedWirewaySegment
Complex Types	ConduitSegmentType, WirewayBoxType

Model

Name{0,1} , LocationDescription{0,1} , HighTempExposure{0,1}

Children

HighTempExposure, LocationDescription, Name

Attributes

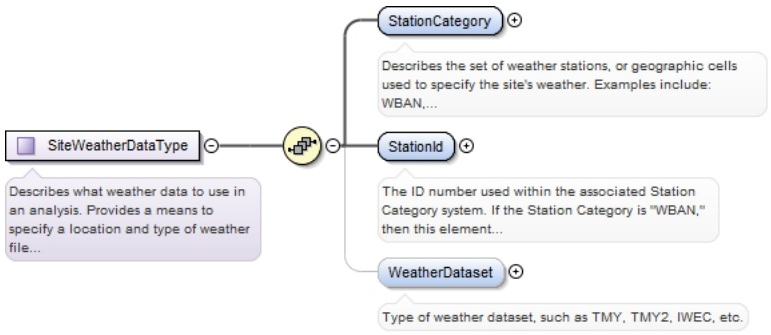
QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			optional
	If the WirewaySegment is a junction box or disconnect switch, this refers to its EquipmentDefinition. A WirewayBox may be a pass through where multiple ConduitSegments are combined into a single ConduitSegment for example. A disconnect switch box may also be modeled as a WirewayBox, provided that the circuit(s) involved are simply disoconnected and not combined in any way. DO NOT use WirewayBox to represent a combiner, or distribution panel.			
id	xs:ID			required

Source

```
<xs:complexType name="WirewaySegmentType" abstract="true">
  <xs:annotation>
    <xs:documentation>Base definition of a WirewaySegment, which is a distinct piece
 of wireway through which electrical wiring is housed for its prtotection and the
 protection of people and property. Wireway segments can be either electrical conduit or
 boxes. Multiple segments are connected to form a single continuous path for one or more
 CircuitConnections. Each segment is distinct by its characteristics.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0">
      <xs:annotation>
        <xs:documentation>A name given in context to the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="LocationDescription" type="xs:string">
      <xs:annotation>
        <xs:documentation>Description of where the segment is, or through which locations
 it traverses. Include descriptions such as attic, interior, exterior, roof, or trench.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="HighTempExposure" type="xs:boolean" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Is the conduit exposed to high temperatures? For example,
 sitting on a roof in direct sun. If so, any conductors contained within the segment may
 have to have their rated current carrying capacity derated.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="id" type="xs:ID" use="required"/>
  <xs:attribute name="EquipmentDefinitionIdRef" type="xs:IDREF">
    <xs:annotation>
      <xs:documentation>If the WirewaySegment is a junction box or disconnect switch, this
 refers to its EquipmentDefinition. A WirewayBox may be a pass through where multiple
 ConduitSegments are combined into a single ConduitSegment for example. A disconnect
 switch box may also be modeled as a WirewayBox, provided that the circuit(s) involved are
```

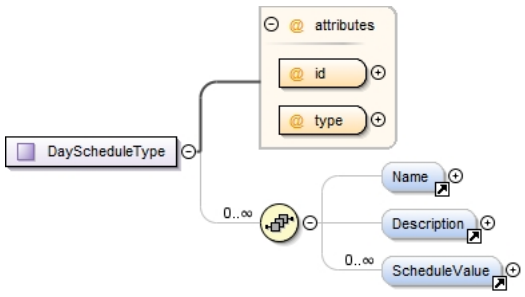
```
 simply disoconnected and not combined in any way. DO NOT use WirewayBox to represent a
 combiner, or distribution panel.</xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:complexType>
```

Complex Type `SiteWeatherDataType`

Namespace	http://www.iepmodel.net
Annotations	Describes what weather data to use in an analysis. Provides a means to specify a location and type of weather file dataset to use in an analysis.
Diagram	
Used by	Elements PvSystemType/WeatherData/SiteWeatherData, SiteType/Weather
Model	StationCategory , StationId , WeatherDataset{0,1}
Children	StationCategory, StationId, WeatherDataset
Source	

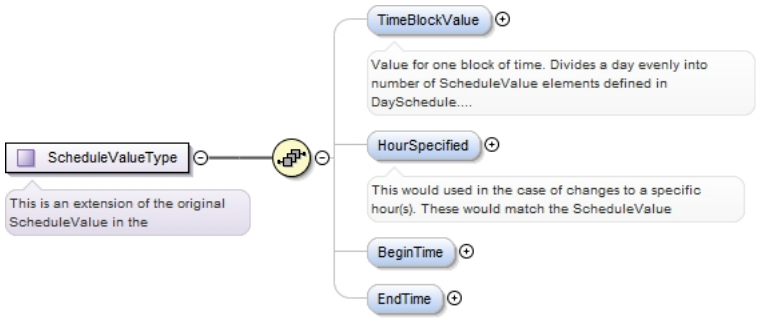

```
<xs:complexType name="SiteWeatherDataType">
  <xs:annotation>
    <xs:documentation>Describes what weather data to use in an analysis. Provides a
 means to specify a location and type of weather file dataset to use in an analysis.</
xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element form="unqualified" name="StationCategory" type="xs:string">
      <xs:annotation>
        <xs:documentation>Describes the set of weather stations, or geographic cells used
 to specify the site's weather. Examples include: WBAN, WMO, NREL 40km Monthly Grid Cell,
 etc.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element form="unqualified" minOccurs="1" name="StationId" type="xs:string">
      <xs:annotation>
        <xs:documentation>The ID number used within the associated Station Category
 system. If the Station Category is "WBAN," then this element would contain the WBAN
 number for the desired station. For example, San Francisco, CA is WBAN "23234." And
 Cairo, Egypt is WMO "623660."</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element form="unqualified" minOccurs="0" name="WeatherDataset" type="xs:string">
      <xs:annotation>
        <xs:documentation>Type of weather dataset, such as TMY, TMY2, IWEC, etc.</
xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

Complex Type `DayScheduleType`

Namespace	http://www.iepmodel.net
Diagram	

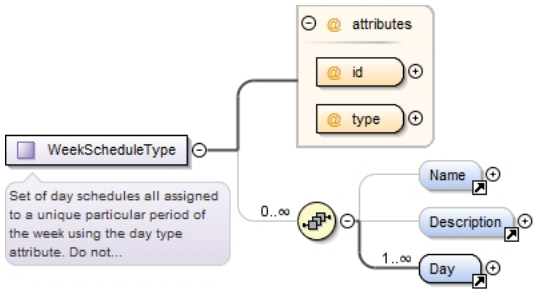
Used by	Element DaySchedule
Model	Name{0,1} , Description{0,1} , ScheduleValue*
Children	Description, Name, ScheduleValue
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **id** / xs:ID / / / required **type** / scheduleEnumType / / / required
Source	<xs:complexType name="DayScheduleType"> <xs:sequence minOccurs="0" maxOccurs="unbounded"> <xs:element ref="Name" minOccurs="0" maxOccurs="1"/> <xs:element ref="Description" minOccurs="0" maxOccurs="1"/> <xs:element ref="ScheduleValue" minOccurs="0" maxOccurs="unbounded"/> </xs:sequence> <xs:attribute name="id" use="required" type="xs:ID"/> <xs:attribute name="type" use="required" type="scheduleEnumType"/> </xs:complexType>

Complex Type ScheduleValueType

Namespace	http://www.iepmodel.net
Annotations	This is an extension of the original ScheduleValue in the
Diagram	
Used by	Element ScheduleValue
Model	TimeBlockValue{0,1} , HourSpecified{0,1} , BeginTime{0,1} , EndTime{0,1}
Children	BeginTime, EndTime, HourSpecified, TimeBlockValue
Source	<xs:complexType name="ScheduleValueType"> <xs:annotation> <xs:documentation>This is an extension of the original ScheduleValue in the</xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="TimeBlockValue" type="xs:decimal" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Value for one block of time. Divides a day evenly into number of ScheduleValue elements defined in DaySchedule. Example: If 12 ScheduleValue elements are defined, each will represent two hours</xs:documentation> </xs:annotation> </xs:element> <xs:element name="HourSpecified" type="hourIDType" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This would used in the case of changes to a specific hour(s). These would match the ScheduleValue</xs:documentation> </xs:annotation> </xs:element> <xs:element name="BeginTime" type="xs:time" minOccurs="0" maxOccurs="1"/> <xs:element name="EndTime" type="xs:time" minOccurs="0" maxOccurs="1"/> </xs:sequence> </xs:complexType>

Complex Type WeekScheduleType

Namespace	http://www.iepmodel.net
Annotations	Set of day schedules all assigned to a unique particular period of the week using the day type attribute. Do not schedule conflicting day types to the same week schedule.

Diagram	
Used by	Element WeekSchedule
Model	Name{0,1} , Description{0,1} , Day+
Children	Day, Description, Name

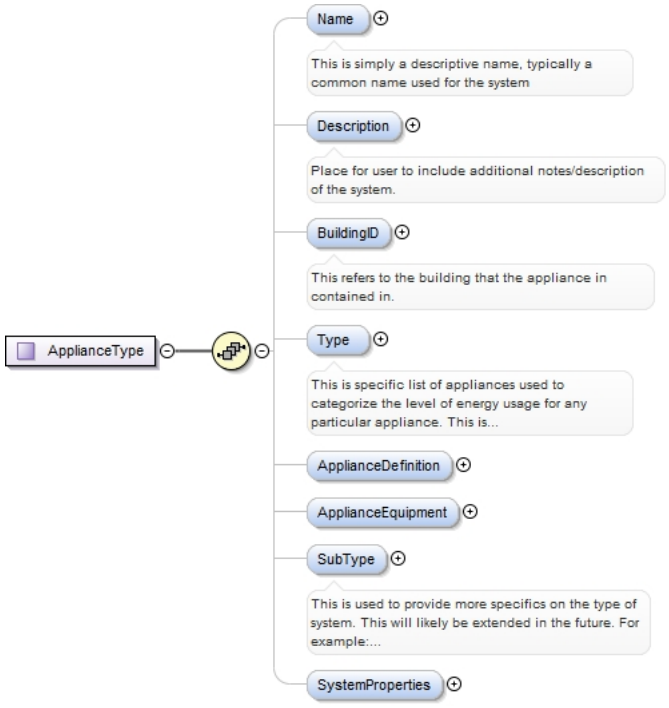
Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			required
type	scheduleEnumType			required

Source

```
<xs:complexType name="WeekScheduleType">
  <xs:annotation>
    <xs:documentation>Set of day schedules all assigned to a unique particular period of
 the week using the day type attribute. Do not schedule conflicting day types to the same
 week schedule.</xs:documentation>
  </xs:annotation>
  <xs:sequence minOccurs="0" maxOccurs="unbounded">
    <xs:element ref="Name" minOccurs="0" maxOccurs="1"/>
    <xs:element ref="Description" minOccurs="0" maxOccurs="1"/>
    <xs:element ref="Day" minOccurs="1" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="id" use="required" type="xs:ID"/>
  <xs:attribute name="type" use="required" type="scheduleEnumType"/>
</xs:complexType>
```

Complex Type `ApplianceType`

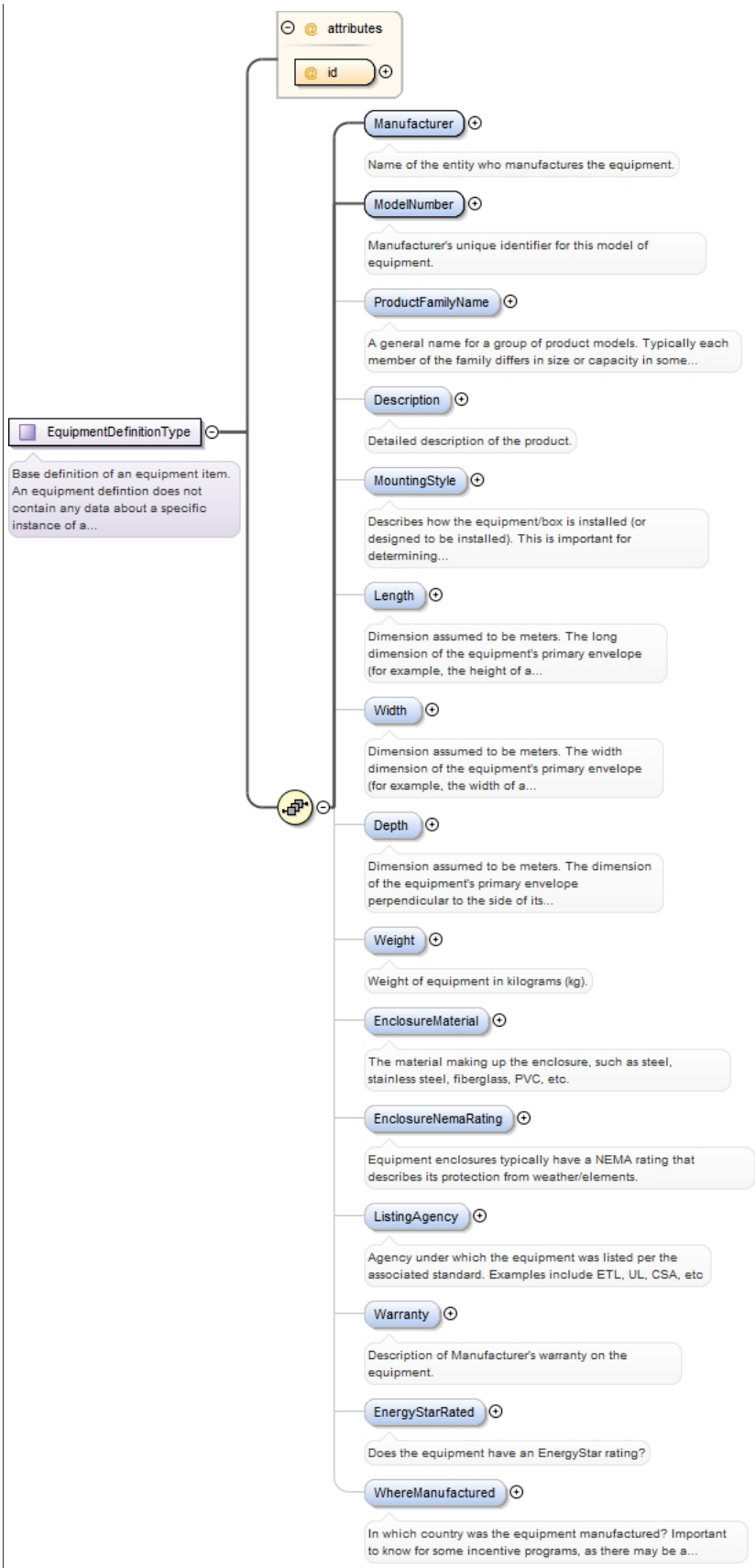
Namespace	http://www.iepmodel.net
Diagram	
Used by	Elements Appliance, ProjectType/ExistingAppliance, SystemChoiceType/Appliance
Model	Name{0,1} , Description{0,1} , BuildingID{0,1} , Type{0,1} , ApplianceDefinition{0,1} , ApplianceEquipment{0,1} , SubType{0,1} , SystemProperties{0,1}
Children	ApplianceDefinition, ApplianceEquipment, BuildingID, Description, Name, SubType, SystemProperties, Type

Source

```
<xs:complexType name="ApplianceType">
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description of the
 system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="BuildingID" nillable="false" type="xs:IDREF">
      <xs:annotation>
        <xs:documentation>This refers to the building that the appliance in contained
 in.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Type" type="ApplianceEnumType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is specific list of appliances used to categorize the level
 of energy usage for any particular appliance. This is intended to be used as a simple
 description of the system and is suited for use with the SaveEnergy123 tool: https://
saveenergy123.com/</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ApplianceDefinition" type="EquipmentDefinitionType" minOccurs="0"/>
    <xs:element minOccurs="0" name="ApplianceEquipment" type="EquipmentInstanceType"/>
    <xs:element name="SubType" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is used to provide more specifics on the type of system.
 This will likely be extended in the future. For example: type of computer, type of TV,
 etc.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="SystemProperties" type="CommonSystemPropertiesType" minOccurs="0"
 maxOccurs="1"/>
  </xs:sequence>
</xs:complexType>
```

Complex Type `EquipmentDefinitionType`

Namespace	http://www.iepmodel.net
Annotations	Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a piece of equipment (for example, SerialNumber, DataManufactured, Location, or Condition). Equipment definitions are extended from this base type (for example "PvModuleDefinition").

Diagram	
Properties	abstract: `true`

<table>
<tr><td>Used by</td><td>
<table>
<tr><td>Elements</td><td>ApplianceType/ApplianceDefinition, DistributionSystemType/DistributionEquipmentDefinition, HVACSystemType/HVACEquipmentDefinition, WaterHeatingSystemType/WaterHeatingEquipmentDefinition</td></tr>
<tr><td>Complex Types</td><td>BallastPropertiesType, DcCombinerDefinitionType, DisconnectSwitchDefinitionType, ElectricalPanelDefinitionType, InverterDefinitionType, JunctionBoxDefinitionType, LampPropertiesType, LightingFixtureDefintionType, MeterDefinitionType, PvModuleDefinitionType, StandAloneMeterSocketDefintionType</td></tr>
</table>
</td></tr>
<tr><td>Model</td><td>Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1}</td></tr>
<tr><td>Children</td><td>Depth, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, Length, ListingAgency, Manufacturer, ModelNumber, MountingStyle, ProductFamilyName, Warranty, Weight, WhereManufactured, Width</td></tr>
<tr><td>Attributes</td><td>
<table>
<tr><th>QName</th><th>Type</th><th>Fixed</th><th>Default</th><th>Use</th></tr>
<tr><td>id</td><td>xs:ID</td><td></td><td></td><td>required</td></tr>
</table>
</td></tr>
<tr><td>Source</td><td>

```
<xs:complexType abstract="true" name="EquipmentDefinitionType">
  <xs:annotation>
    <xs:documentation>Base definition of an equipment item. An equipment defintion does
 not contain any data about a specific instance of a piece of equipment (for example,
 SerialNumber, DataManufactured, Location, or Condition). Equipment definitions are
 extended from this base type (for example "PvModuleDefinition").</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Manufacturer" type="xs:string">
      <xs:annotation>
        <xs:documentation>Name of the entity who manufactures the equipment.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ModelNumber" type="xs:string">
      <xs:annotation>
        <xs:documentation>Manufacturer's unique identifier for this model of equipment.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="ProductFamilyName" type="xs:string">
      <xs:annotation>
        <xs:documentation>A general name for a group of product models. Typically each
 member of the family differs in size or capacity in some way.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="Description" type="xs:string">
      <xs:annotation>
        <xs:documentation>Detailed description of the product.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="MountingStyle" type="xs:string">
      <xs:annotation>
        <xs:documentation>Describes how the equipment/box is installed (or designed to
 be installed). This is important for determining components required for interfacing
 with it. Suggested values include: Wall Mount, Wall Mount-Surface, Wall Mount-Flush, Pad
 Mount.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="Length" type="xs:double">
      <xs:annotation>
        <xs:documentation>Dimension assumed to be meters. The long dimension of the
 equipment's primary envelope (for example, the height of a wall mounted inverter, or the
 long edge of a PV Module frame).</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="Width" type="xs:double">
      <xs:annotation>
        <xs:documentation>Dimension assumed to be meters. The width dimension of the
 equipment's primary envelope (for example, the width of a wall mounted inverter, or the
 short edge of a PV Module frame).</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="Depth" type="xs:double">
      <xs:annotation>
        <xs:documentation>Dimension assumed to be meters. The dimension of the equipment's
 primary envelope perpendicular to the side of its primary interface (for example the
 thickness of a PV module's frame, or the thickness of a wall mounted inverter from the
 wall to the front of the inverter.) Note: PV Module thickness with J-box would be given
 as part of PvModuleDefintion.</xs:documentation>
      </xs:annotation>
    </xs:element>
```

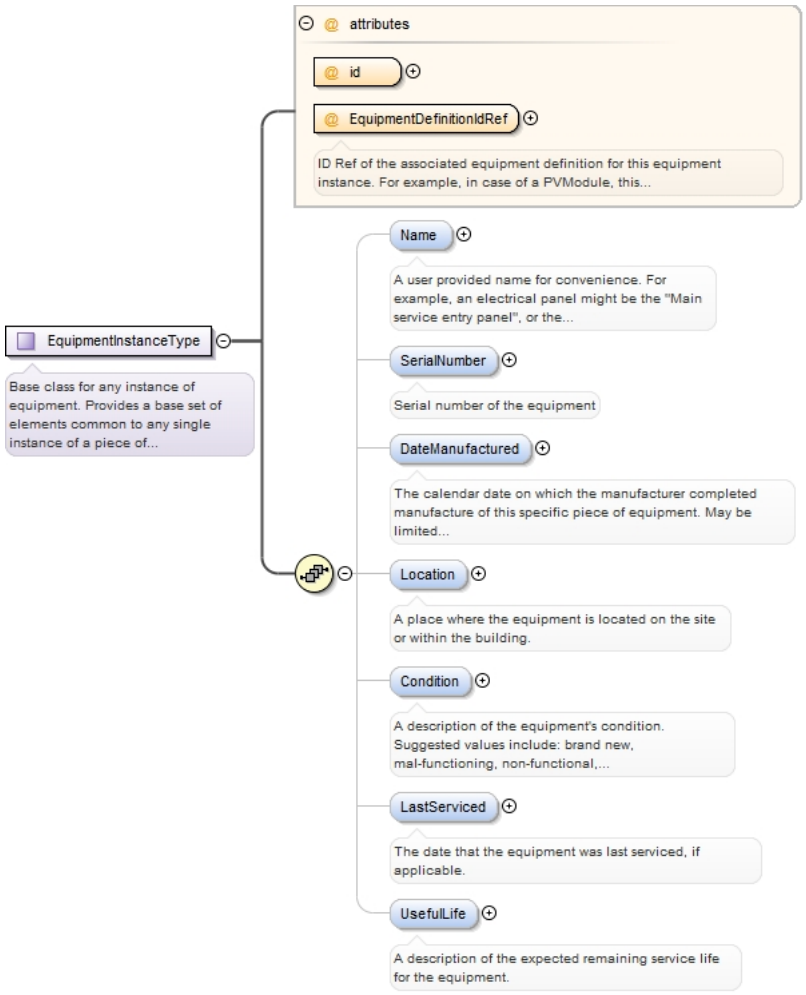
</td></tr>
</table>

```
    <xs:element minOccurs="0" name="Weight" type="xs:double">
      <xs:annotation>
        <xs:documentation>Weight of equipment in kilograms (kg).</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="EnclosureMaterial" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The material making up the enclosure, such as steel, stainless
 steel, fiberglass, PVC, etc.</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:maxLength value="255"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element minOccurs="0" name="EnclosureNemaRating" type="NemaRatingEnumType">
      <xs:annotation>
        <xs:documentation>Equipment enclosures typically have a NEMA rating that describes
 its protection from weather/elements.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="ListingAgency" type="xs:string">
      <xs:annotation>
        <xs:documentation>Agency under which the equipment was listed per the associated
 standard. Examples include ETL, UL, CSA, etc</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Warranty" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Description of Manufacturer's warranty on the equipment.</
xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:maxLength value="255"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element minOccurs="0" name="EnergyStarRated" type="xs:boolean">
      <xs:annotation>
        <xs:documentation>Does the equipment have an EnergyStar rating?</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="WhereManufactured" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>In which country was the equipment manufactured? Important to
 know for some incentive programs, as there may be a requirement for rebates to only be
 paid on domestically manufactured equipment.</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:maxLength value="255"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="id" type="xs:ID" use="required"/>
</xs:complexType>
```

Complex Type `EquipmentInstanceType`

Namespace	http://www.iepmodel.net
Annotations	Base class for any instance of equipment. Provides a base set of elements common to any single instance of a piece of equipment. Extend with other elements that are specific to the type of equipment instance being defined.

Diagram



Properties

abstract:	`true`

Used by

Elements	ApplianceType/ApplianceEquipment, CircuitConnectionType/IncludesStandAloneMeter/Meter, CoolingSystemType/CoolingInstance, DistributionSegmentType/SegmentEquipment, ElectricalPanelType/IncludedMeter, HeatingSystemType/HeatingEquipment, PrimeMoverSystemType/PrimeMoverEquipment, WaterHeatingSystemType/WaterHeatingEquipment
Complex Types	DcCombinerType, ElectricalPanelType, LightingFixtureGroupType, MicroInverterType, PvModuleType, StringInverterType

Model

Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1}

Children

Condition, DateManufactured, LastServiced, Location, Name, SerialNumber, UsefulLife

Attributes

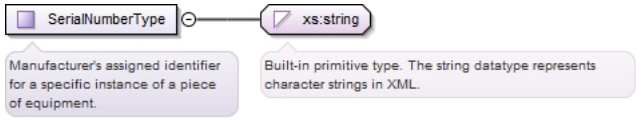
QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			required
	`ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.`			
id	xs:ID			required

Source

```
<xs:complexType abstract="true" name="EquipmentInstanceType">
  <xs:annotation>
    <xs:documentation>Base class for any instance of equipment. Provides a base
 set of elements common to any single instance of a piece of equipment. Extend with
 other elements that are specific to the type of equipment instance being defined.</
xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element minOccurs="0" name="Name" type="xs:string">
      <xs:annotation>
```

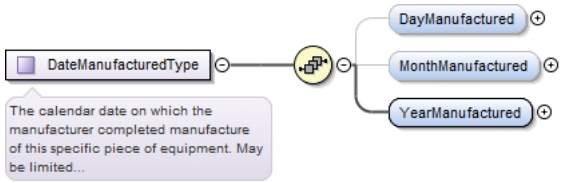
```
        <xs:documentation>A user provided name for convenience. For example, an
 electrical panel might be the "Main service entry panel", or the "AC combiner panel."</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="SerialNumber" type="SerialNumberType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Serial number of the equipment</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="DateManufactured" type="DateManufacturedType">
      <xs:annotation>
        <xs:documentation>The calendar date on which the manufacturer completed
 manufacture of this specific piece of equipment. May be limited to the year.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="Location" type="EquipmentLocationType">
      <xs:annotation>
        <xs:documentation>A place where the equipment is located on the site or within the
 building.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="Condition" type="ConditionType">
      <xs:annotation>
        <xs:documentation>A description of the equipment's condition. Suggested
 values include: brand new, mal-functioning, non-functional, normal wear, other.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="LastServiced" type="LastServicedType">
      <xs:annotation>
        <xs:documentation>The date that the equipment was last serviced, if applicable.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="UsefulLife" type="RemainingUsefulLifeType">
      <xs:annotation>
        <xs:documentation>A description of the expected remaining service life for the
 equipment.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="id" type="xs:ID" use="required"/>
  <xs:attribute name="EquipmentDefinitionIdRef" type="xs:IDREF" use="required">
    <xs:annotation>
      <xs:documentation>ID Ref of the associated equipment definition for this
 equipment instance. For example, in case of a PVModule, this would be the ID of
 the PvModuleDefinition element that describes this particular PV module instance.</
xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:complexType>
```

Complex Type `SerialNumberType`

Namespace	http://www.iepmodel.net
Annotations	`Manufacturer's assigned identifier for a specific instance of a piece of equipment.`
Diagram	
Type	extension of xs:string
Used by	Element EquipmentInstanceType/SerialNumber
`Source`	

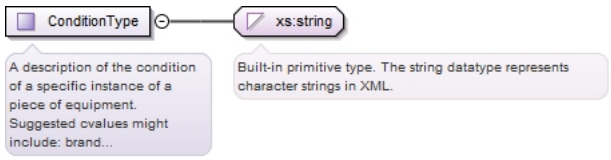
```
<xs:complexType name="SerialNumberType">
  <xs:annotation>
    <xs:documentation>Manufacturer's assigned identifier for a specific instance of a
 piece of equipment.</xs:documentation>
  </xs:annotation>
  <xs:simpleContent>
    <xs:extension base="xs:string">
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

Complex Type `DateManufacturedType`

Namespace	http://www.iepmodel.net
Annotations	The calendar date on which the manufacturer completed manufacture of this specific piece of equipment. May be limited to the year.
Diagram	
Used by	Elements DateManufactured, EquipmentInstanceType/DateManufactured
Model	DayManufactured{0,1} , MonthManufactured{0,1} , YearManufactured
Children	DayManufactured, MonthManufactured, YearManufactured

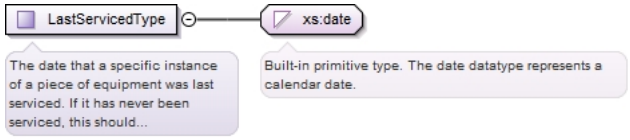
Source	`<xs:complexType name="DateManufacturedType">`
	`  <xs:annotation>`
	`  <xs:documentation>The calendar date on which the manufacturer completed manufacture of this specific piece of equipment. May be limited to the year.</xs:documentation>`
	`  </xs:annotation>`
	`  <xs:sequence>`
	`  <xs:element minOccurs="0" name="DayManufactured" type="xs:gDay"/>`
	`  <xs:element minOccurs="0" name="MonthManufactured" type="xs:gMonth"/>`
	`  <xs:element name="YearManufactured" type="xs:gYear"/>`
	`  </xs:sequence>`
	`</xs:complexType>`

Complex Type `ConditionType`

Namespace	http://www.iepmodel.net
Annotations	A description of the condition of a specific instance of a piece of equipment. Suggested cvalues might include: brand new, mal-functioning, non-functional, normal wear, other.
Diagram	
Type	extension of xs:string
Used by	Elements Condition, EquipmentInstanceType/Condition

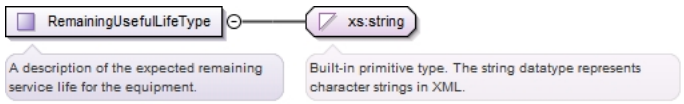
Source	`<xs:complexType name="ConditionType">`
	`  <xs:annotation>`
	`  <xs:documentation>A description of the condition of a specific instance of a piece of equipment. Suggested cvalues might include: brand new, mal-functioning, non-functional, normal wear, other.</xs:documentation>`
	`  </xs:annotation>`
	`  <xs:simpleContent>`
	`  <xs:extension base="xs:string">`
	`  </xs:extension>`
	`  </xs:simpleContent>`
	`</xs:complexType>`

Complex Type `LastServicedType`

Namespace	http://www.iepmodel.net
Annotations	The date that a specific instance of a piece of equipment was last serviced. If it has never been serviced, this should be "N/A".
Diagram	
Type	extension of xs:date

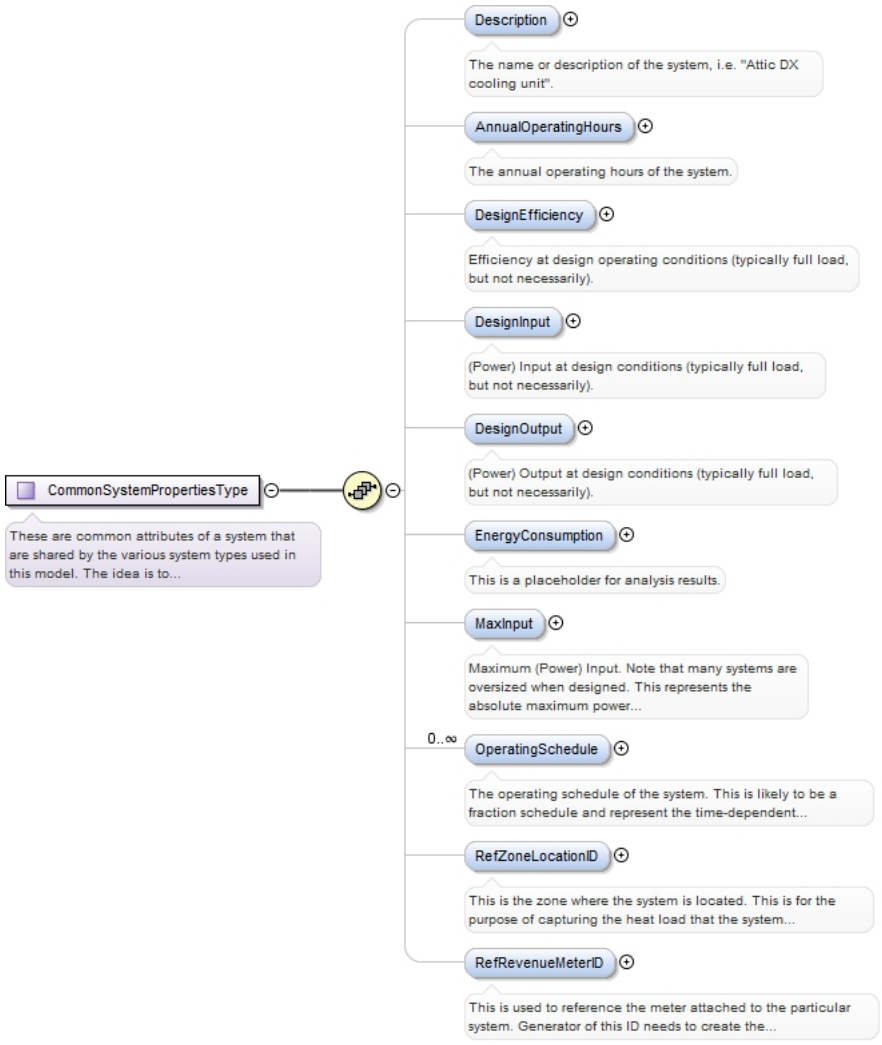
Used by	Elements EquipmentInstanceType/LastServiced, LastServiced
Source	<xs:complexType name="LastServicedType"> <xs:annotation> <xs:documentation>The date that a specific instance of a piece of equipment was last serviced. If it has never been serviced, this should be "N/A".</xs:documentation> </xs:annotation> <xs:simpleContent> <xs:extension base="xs:date"> </xs:extension> </xs:simpleContent> </xs:complexType>

Complex Type RemainingUsefulLifeType

Namespace	http://www.iepmodel.net
Annotations	A description of the expected remaining service life for the equipment.
Diagram	
Type	extension of xs:string
Used by	Elements EquipmentInstanceType/UsefulLife, UsefulLife
Source	<xs:complexType name="RemainingUsefulLifeType"> <xs:annotation> <xs:documentation>A description of the expected remaining service life for the equipment.</xs:documentation> </xs:annotation> <xs:simpleContent> <xs:extension base="xs:string"/> </xs:simpleContent> </xs:complexType>

Complex Type CommonSystemPropertiesType

Namespace	http://www.iepmodel.net
Annotations	These are common attributes of a system that are shared by the various system types used in this model. The idea is to capture here, high-level properties related to the operation and energy consumption of various systems. Details of actual hardware not required for a 1st level analysis are not included here (these are located in CommonEquipmentAttributes).

Diagram	
Used by	Elements ApplianceType/SystemProperties, CoolingSystemType/SystemProperties, HeatingSystemType/SystemProperties, LightingControlGroupType/SystemProperties, PrimeMoverSystemType/SystemProperties, WaterHeatingSystemType/SystemProperties
Model	Description{0,1} , AnnualOperatingHours{0,1} , DesignEfficiency{0,1} , DesignInput{0,1} , DesignOutput{0,1} , EnergyConsumption{0,1} , MaxInput{0,1} , OperatingSchedule* , RefZoneLocationID{0,1} , RefRevenueMeterID{0,1}
Children	AnnualOperatingHours, Description, DesignEfficiency, DesignInput, DesignOutput, EnergyConsumption, MaxInput, OperatingSchedule, RefRevenueMeterID, RefZoneLocationID
Source	

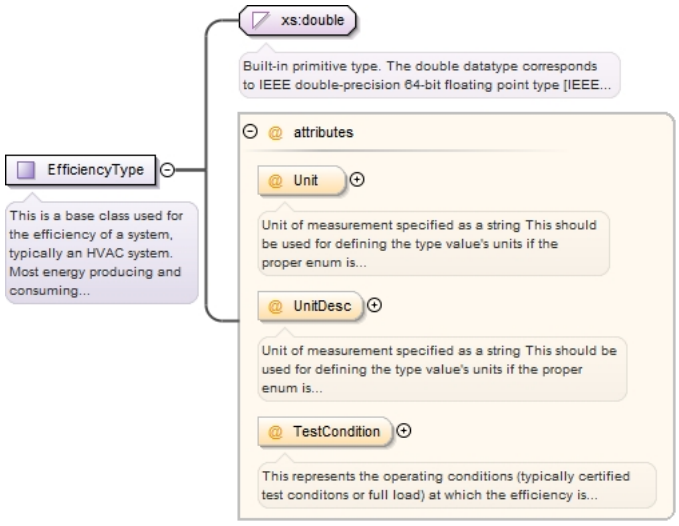
```
<xs:complexType name="CommonSystemPropertiesType">
  <xs:annotation>
    <xs:documentation>These are common attributes of a system that are shared by the
 various system types used in this model. The idea is to capture here, high-level
 properties related to the operation and energy consumption of various systems. Details
 of actual hardware not required for a 1st level analysis are not included here (these are
 located in CommonEquipmentAttributes).</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The name or description of the system, i.e. "Attic DX cooling
 unit".</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="AnnualOperatingHours" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The annual operating hours of the system.</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:int">
          <xs:minInclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
```

```
    </xs:element>
    <xs:element name="DesignEfficiency" type="EfficiencyType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Efficiency at design operating conditions (typically full load,
 but not necessarily).</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="DesignInput" type="PowerType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>(Power) Input at design conditions (typically full load, but not
 necessarily).</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="DesignOutput" type="PowerType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>(Power) Output at design conditions (typically full load, but
 not necessarily).</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="EnergyConsumption" type="EnergyConsumptionType" minOccurs="0"
 maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is a placeholder for analysis results.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="MaxInput" type="PowerType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Maximum (Power) Input. Note that many systems are oversized
 when designed. This represents the absolute maximum power consumption of the equipment.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="OperatingSchedule" type="xs:IDREF" minOccurs="0"
 maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>The operating schedule of the system. This is likely to be a
 fraction schedule and represent the time-dependent capacity of the system. Note that
 particular systems, such as HVAC system, have additional schedules such as temperature
 schedules. This references the IDREF of a complete Schedules element at the Project
 level</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="RefZoneLocationID" type="xs:IDREF" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is the zone where the system is located. This is for the
 purpose of capturing the heat load that the system introduces to its environment.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="RefRevenueMeterID" type="xs:IDREF">
      <xs:annotation>
        <xs:documentation>This is used to reference the meter attached to the particular
 system. Generator of this ID needs to create the RevenueMeter first in the UtilityService
 schema in order to link back here.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

Complex Type `EfficiencyType`

Namespace	http://www.iepmodel.net
Annotations	This is a base class used for the efficiency of a system, typically an HVAC system. Most energy producing and consuming systems and equipment instance this type.

Diagram



Type: extension of xs:double

Used by: Element CommonSystemPropertiesType/DesignEfficiency

Attributes

QName	Type	Fixed	Default	Use
TestCondition	TestConditionEnumType			optional
	This represents the operating conditions (typically certified test conditons or full load) at which the efficiency is realized. Note that at other conditions, the efficiency may be a different value.			
Unit	EfficiencyUnitEnumType			optional
	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			
UnitDesc	xs:string			optional
	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			

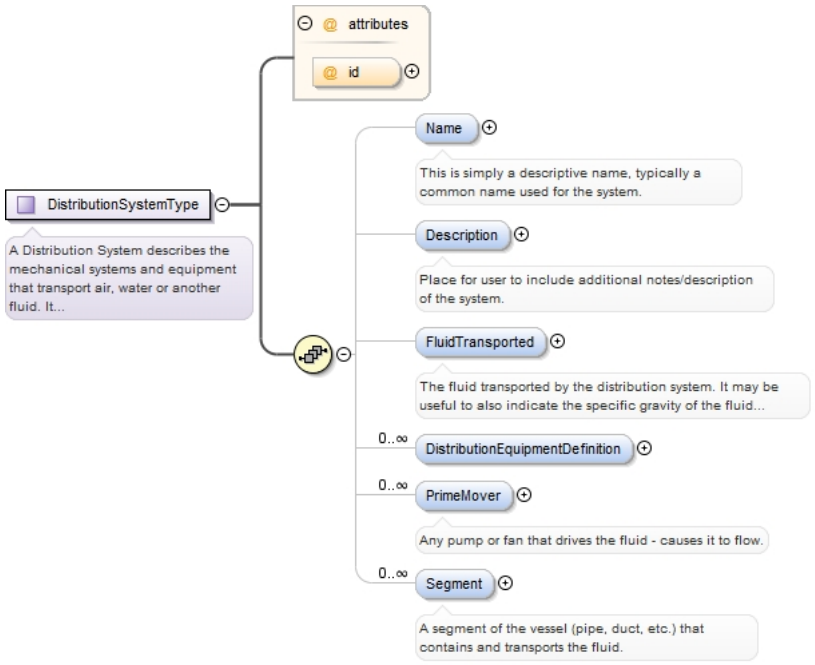
Source

```
<xs:complexType name="EfficiencyType">
  <xs:annotation>
    <xs:documentation>This is a base class used for the efficiency of a system, typically
an HVAC system. Most energy producing and consuming systems and equipment instance this
type.</xs:documentation>
  </xs:annotation>
  <xs:simpleContent>
    <xs:extension base="xs:double">
      <xs:attribute name="Unit" type="EfficiencyUnitEnumType" use="optional">
        <xs:annotation>
          <xs:documentation>Unit of measurement specified as a string This should be used
for defining the type value's units if the proper enum is not listed in Unit. These are
all optional attributes in order to allow for a simplified value descriptions since these
are used throughout the IEP schemas. Additionally the UnitDesc may contain a default
type.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
      <xs:attribute name="UnitDesc" type="xs:string">
        <xs:annotation>
          <xs:documentation>Unit of measurement specified as a string This should be used
for defining the type value's units if the proper enum is not listed in Unit. These are
all optional attributes in order to allow for a simplified value descriptions since these
are used throughout the IEP schemas. Additionally the UnitDesc may contain a default
type.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
      <xs:attribute name="TestCondition" type="TestConditionEnumType" use="optional">
        <xs:annotation>
          <xs:documentation>This represents the operating conditions (typically certified
test conditons or full load) at which the efficiency is realized. Note that at other
conditions, the efficiency may be a different value.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
```

```
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

Complex Type `DistributionSystemType`

Namespace	http://www.iepmodel.net
Annotations	A Distribution System describes the mechanical systems and equipment that transport air, water or another fluid. It consists of two components: Prime Mover (pump or fan) and Segment. A Distribution System (optionally) consists of one or many Prime Movers, which are pumps or fans that causes the fluid to flow. The Prime Mover has System and Equipment properties. A Distribution System (optionally) consists of one or many Segments, which is a duct or pipe that transports the fluid. The Segment has Equipment properties in addition to leakage and insulation properties (referenced from the Building schema). The Distribution Systems was chosen to stand alone because of how the other systems interact with it and because one distribution system may serve multiple purposes. It is be referenced by other systems such as an HVAC or WaterHeating system that interact with it. A Distribution System (particularly air or water) may be referenced by an HVAC system in one of three ways. A Distribution System may be referenced as the method of delivery of conditioning from the HVAC system (i.e. the ducting or piping that delivers conditioning). Alternatively, a Distribution System may be referenced as the source of heat or cold (fluid to reject heat to) for a Heating or Cooling system, respectively. Note that the Distribution System itself does not instance System Properties. A distribution system can only consume energy through its prime mover and thermal transfer with the environment. The Prime Mover object instances System Properties. Thermal transfer to or from the fluid through its segments will affect the system(s) that are connected to (reference) it (such as a Hot Water Heating or HVAC system). Thus, the thermal energy transferred through the segment surface should be captured by the zone in which the segment is located and the systems that reference it. Example 1. A water DistributionSystem may serve both space heating as well as domestic hot water for kitchen and bathroom fixtures (i.e. dishwasher, shower). Systems that may reference this DistributionSystem include: a WaterHeating system, a grey-water HeatRecovery system and an HVACSystem. Example 2. An air DistributionSystem may consist of supply and return ducting and a supply fan. An HVACSystem such as a furnace or air-source heat-pump would reference the DistributionSystem (through its DeliveryMethod element). Example 3. A whole-house fan would be modeled as an HVAC system with a DeliveryMethod that references a Distribution System. The Distribution System may include segments (inlet and exhaust ducting) and a fan (Prime Mover). The Ventilation properties in HVAC would further describe the rate of air exchange with outside. The zone(s) referencing the HVAC system would specify the temperature setpoint schedule and any additional thermal loads. Alternatively, if the fan is controlled by a time schedule, rather than temperature schedule, the schedule may defined in the Prime Mover system properties. Then, no HVAC system needs to be defined. Example 4. A bathroom or kitchen exhaust fan may be modeled as a Distribution System with just a Prime Mover (segments optional). The schedule in the System Properties of the Primer Mover may define the operating schedule of the fan.

Diagram	
Used by	Elements: DistributionSystem, ProjectType/ExistingDistributionSystem, SystemChoiceType/Distribution
Model	Name{0,1} , Description{0,1} , FluidTransported{0,1} , DistributionEquipmentDefinition* , PrimeMover* , Segment*
Children	Description, DistributionEquipmentDefinition, FluidTransported, Name, PrimeMover, Segment

Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			optional

Source

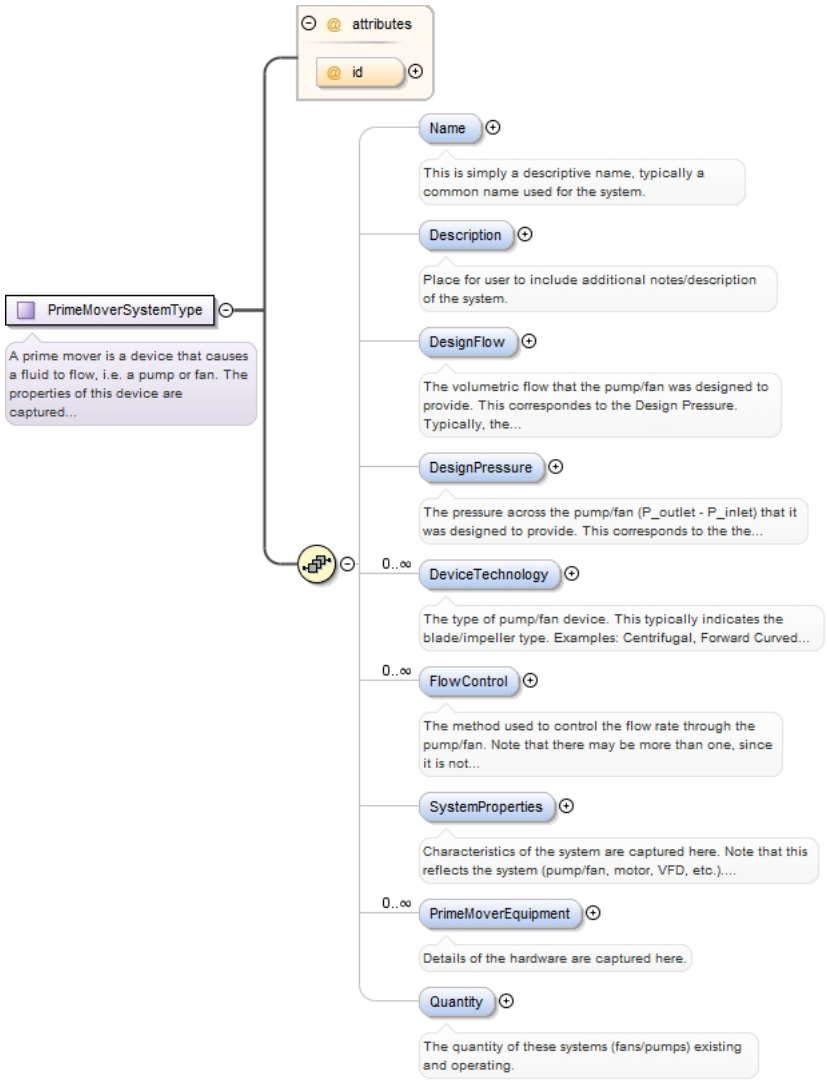
```
<xs:complexType name="DistributionSystemType">
  <xs:annotation>
    <xs:documentation>A Distribution System describes the mechanical systems and equipment
 that transport air, water or another fluid. It consists of two components: Prime Mover
 (pump or fan) and Segment. A Distribution System (optionally) consists of one or many
 Prime Movers, which are pumps or fans that causes the fluid to flow. The Prime Mover
 has System and Equipment properties. A Distribution System (optionally) consists of
 one or many Segments, which is a duct or pipe that transports the fluid. The Segment
 has Equipment properties in addition to leakage and insulation properties (referenced
 from the Building schema). The Distribution Systems was chosen to stand alone because
 of how the other systems interact with it and because one distribution system may serve
 multiple purposes. It is be referenced by other systems such as an HVAC or WaterHeating
 system that interact with it. A Distribution System (particularly air or water) may
 be referenced by an HVAC system in one of three ways. A Distribution System may be
 referenced as the method of delivery of conditioning from the HVAC system (i.e. the
 ducting or piping that delivers conditioning). Alternatively, a Distribution System
 may be referenced as the source of heat or cold (fluid to reject heat to) for a Heating
 or Cooling system, respectively. Note that the Distribution System itself does not
 instance System Properties. A distribution system can only consume energy through its
 prime mover and thermal transfer with the environment. The Prime Mover object instances
 System Properties. Thermal transfer to or from the fluid through its segments will
 affect the system(s) that are connected to (reference) it (such as a Hot Water Heating
 or HVAC system). Thus, the thermal energy transferred through the segment surface
 should be captured by the zone in which the segment is located and the systems that
 reference it. Example 1. A water DistributionSystem may serve both space heating as
 well as domestic hot water for kitchen and bathroom fixtures (i.e. dishwasher, shower).
 Systems that may reference this DistributionSystem include: a WaterHeating system, a
 grey-water HeatRecovery system and an HVACSystem. Example 2. An air DistributionSystem
 may consist of supply and return ducting and a supply fan. An HVACSystem such as a
 furnace or air-source heat-pump would reference the DistributionSystem (through its
 DeliveryMethod element). Example 3. A whole-house fan would be modeled as an HVAC system
 with a DeliveryMethod that references a Distribution System. The Distribution System may
 include segments (inlet and exhaust ducting) and a fan (Prime Mover). The Ventilation
 properties in HVAC would further describe the rate of air exchange with outside. The
 zone(s) referencing the HVAC system would specify the temperature setpoint schedule and
 any additional thermal loads. Alternatively, if the fan is controlled by a time schedule,
 rather than temperature schedule, the schedule may defined in the Prime Mover system
 properties. Then, no HVAC system needs to be defined. Example 4. A bathroom or kitchen
 exhaust fan may be modeled as a Distribution System with just a Prime Mover (segments
```

```
 optional). The schedule in the System Properties of the Primer Mover may define the
 operating schedule of the fan.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description of the
 system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="FluidTransported" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The fluid transported by the distribution system. It may
 be useful to also indicate the specific gravity of the fluid if it is not a common
 one. Examples: Air Water Glycol Oil, specific gravity = 0.8 Heat Transfer Fluid</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="DistributionEquipmentDefinition"
 type="EquipmentDefinitionType"/>
    <xs:element name="PrimeMover" type="PrimeMoverSystemType" minOccurs="0"
 maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>Any pump or fan that drives the fluid - causes it to flow.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="Segment"
 type="DistributionSegmentType">
      <xs:annotation>
        <xs:documentation>A segment of the vessel (pipe, duct, etc.) that contains and
 transports the fluid.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="id" type="xs:ID"/>
</xs:complexType>
```

Complex Type `PrimeMoverSystemType`

Namespace	http://www.iepmodel.net
Annotations	A prime mover is a device that causes a fluid to flow, i.e. a pump or fan. The properties of this device are captured here. This object includes System and Equipment properties.

Diagram



Used by

Element DistributionSystemType/PrimeMover

Model

Name{0,1} , Description{0,1} , DesignFlow{0,1} , DesignPressure{0,1} , DeviceTechnology* , FlowControl* , SystemProperties{0,1} , PrimeMoverEquipment* , Quantity{0,1}

Children

Description, DesignFlow, DesignPressure, DeviceTechnology, FlowControl, Name, PrimeMoverEquipment, Quantity, SystemProperties

Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			optional

Source

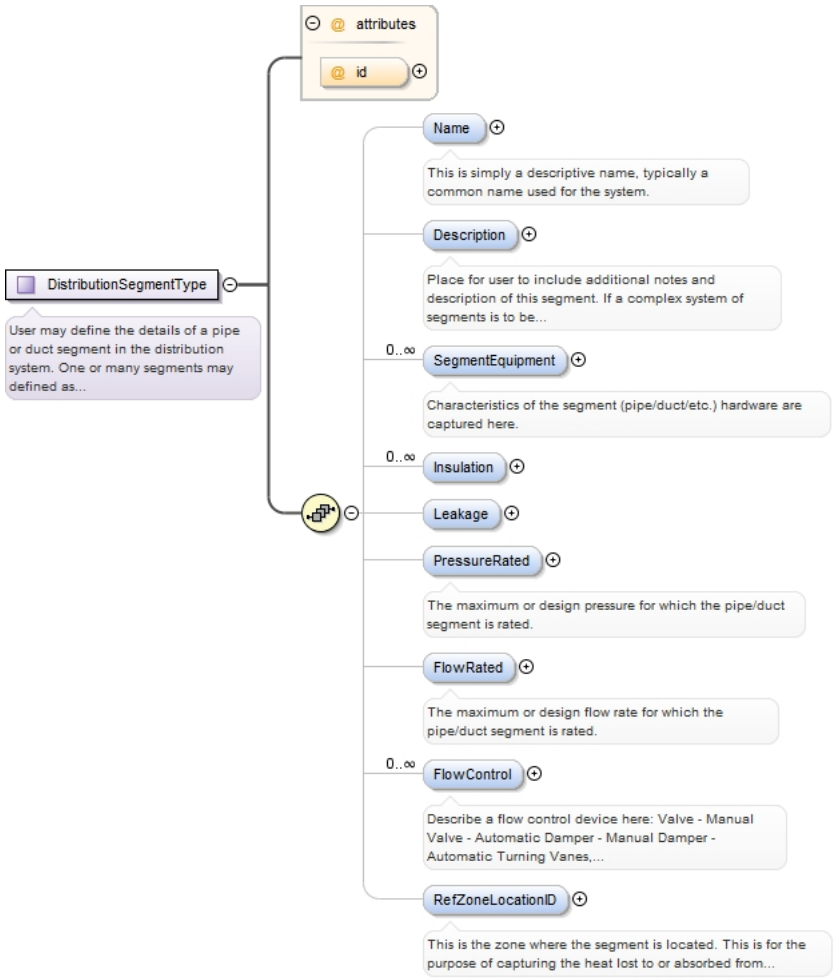
```
<xs:complexType name="PrimeMoverSystemType">
  <xs:annotation>
    <xs:documentation>A prime mover is a device that causes a fluid to flow, i.e. a pump
 or fan. The properties of this device are captured here. This object includes System and
 Equipment properties.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description of the
 system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="DesignFlow" type="FlowType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
```

```
        <xs:documentation>The volumetric flow that the pump/fan was designed to provide.
 This correspondes to the Design Pressure. Typically, the design pressure and design flow
 represent the maximum efficiency point on the manufacturer fan/pump curve. Typically,
 this is not the maximum flow that the device can provide.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="DesignPressure" type="PressureType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The pressure across the pump/fan (P_outlet - P_inlet) that it
 was designed to provide. This corresponds to the the Design Flow. Typically, the design
 pressure and design flow represent the maximum efficiency point on the manufacturer
 fan/pump curve. Typically, this is not the maximum pressure across the device.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="DeviceTechnology" type="xs:string" minOccurs="0"
 maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>The type of pump/fan device. This typically indicates the
 blade/impeller type. Examples: Centrifugal, Forward Curved Centrifugal, Backward Curved
 Centrifugal, Radial Blade Centrifugal, Airfoil Centrifugal, Plenum Axial, Propeller
 Axial, Turbine</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="FlowControl" type="xs:string" minOccurs="0" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>The method used to control the flow rate through the pump/
fan. Note that there may be more than one, since it is not uncommon (though somewhat
 inefficient) to find a VFD and throttle used. Examples: Valve-Manual/Automatic Damper-
Manual/Automatic Variable Speed Variable Pitch Blade Inlet Guide Vane Outlet Damper</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="SystemProperties" type="CommonSystemPropertiesType" minOccurs="0"
 maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Characteristics of the system are captured here. Note that this
 reflects the system (pump/fan, motor, VFD, etc.). Properties of the individual components
 may be captured in equipment attributes.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="PrimeMoverEquipment" type="EquipmentInstanceType" minOccurs="0"
 maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>Details of the hardware are captured here.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Quantity" type="xs:int" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The quantity of these systems (fans/pumps) existing and
 operating.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="id" type="xs:ID"/>
</xs:complexType>
```

Complex Type `DistributionSegmentType`

Namespace	http://www.iepmodel.net
Annotations	User may define the details of a pipe or duct segment in the distribution system. One or many segments may defined as necessary to describe the system in detail.

Diagram



Used by

Element DistributionSystemType/Segment

Model

Name{0,1} , Description{0,1} , SegmentEquipment* , Insulation* , Leakage{0,1} , PressureRated{0,1} , FlowRated{0,1} , FlowControl* , RefZoneLocationID{0,1}

Children

Description, FlowControl, FlowRated, Insulation, Leakage, Name, PressureRated, RefZoneLocationID, SegmentEquipment

Attributes

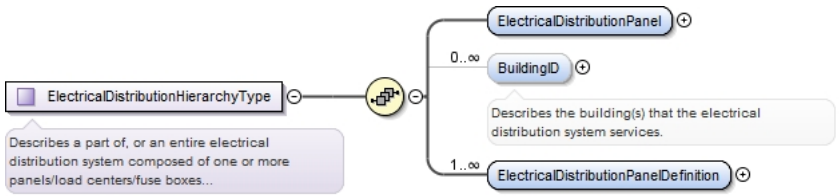
QName	Type	Fixed	Default	Use
id	xs:ID			optional

Source

```
<xs:complexType name="DistributionSegmentType">
  <xs:annotation>
    <xs:documentation>User may define the details of a pipe or duct segment in the
 distribution system. One or many segments may defined as necessary to describe the system
 in detail.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes and description of
 this segment. If a complex system of segments is to be defined, it would be useful to
 describe the system here. Other quantities or features may also be described here, such
 as the loss coefficient (i.e. pressure drop due to fluid friction).</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="SegmentEquipment" type="EquipmentInstanceType" minOccurs="0"
 maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>Characteristics of the segment (pipe/duct/etc.) hardware are
 captured here.</xs:documentation>
```

```
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="Insulation"
 type="InsulationType"/>
    <xs:element minOccurs="0" name="Leakage" type="LeakageType"/>
    <xs:element name="PressureRated" type="PressureType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The maximum or design pressure for which the pipe/duct segment
 is rated.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="FlowRated" type="FlowType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The maximum or design flow rate for which the pipe/duct segment
 is rated.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="FlowControl" type="xs:string">
      <xs:annotation>
        <xs:documentation>Describe a flow control device here: Valve - Manual Valve -
 Automatic Damper - Manual Damper - Automatic Turning Vanes, loss coefficient 0.24</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="RefZoneLocationID" type="xs:IDREF">
      <xs:annotation>
        <xs:documentation>This is the zone where the segment is located. This is for the
 purpose of capturing the heat lost to or absorbed from the environment by the fluid in
 the segment.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="id" type="xs:ID"/>
</xs:complexType>
```

Complex Type `ElectricalDistributionHierarchyType`

Namespace	http://www.iepmodel.net
Annotations	Describes a part of, or an entire electrical distribution system composed of one or more panels/load centers/fuse boxes in a hierarchical tree arrangement.
Diagram	
Used by	Elements: ElectricalDistributionHierarchy, ProjectType/ExistingElectricalDistributionSystem, SystemChoiceType/ElectricalDistributionPanel
Model	ElectricalDistributionPanel , BuildingID* , ElectricalDistributionPanelDefinition+
Children	BuildingID, ElectricalDistributionPanel, ElectricalDistributionPanelDefinition
Source	

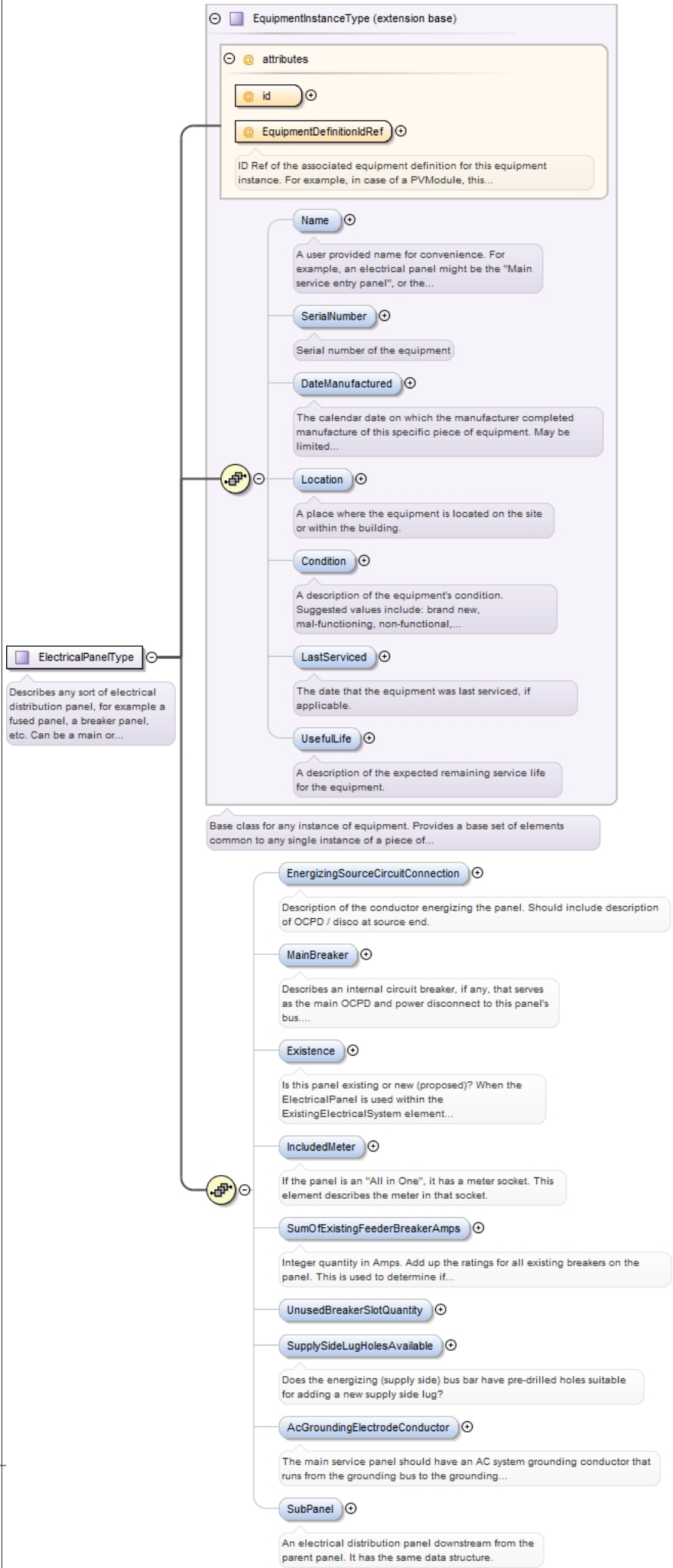
```
<xs:complexType name="ElectricalDistributionHierarchyType">
  <xs:annotation>
    <xs:documentation>Describes a part of, or an entire electrical distribution
 system composed of one or more panels/load centers/fuse boxes in a hierarchical tree
 arrangement.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="ElectricalDistributionPanel" type="ElectricalPanelType"/>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="BuildingID" type="xs:IDREF">
      <xs:annotation>
        <xs:documentation>Describes the building(s) that the electrical distribution
 system services.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="unbounded" name="ElectricalDistributionPanelDefinition"
 type="ElectricalPanelDefinitionType"/>
  </xs:sequence>
</xs:complexType>
```

Complex Type `ElectricalPanelType`

Namespace	http://www.iepmodel.net

Annotations	Describes any sort of electrical distribution panel, for example a fused panel, a breaker panel, etc. Can be a main or sub-panel.

Diagram


EquipmentInstanceType (extension base)
attributes
id
EquipmentDefinitionIdRef
ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this...
Name
A user provided name for convenience. For example, an electrical panel might be the "Main service entry panel", or the...
SerialNumber
Serial number of the equipment
DateManufactured
The calendar date on which the manufacturer completed manufacture of this specific piece of equipment. May be limited...
Location
A place where the equipment is located on the site or within the building.
Condition
A description of the equipment's condition. Suggested values include: brand new, mal-functioning, non-functional,...
LastServiced
The date that the equipment was last serviced, if applicable.
UsefulLife
A description of the expected remaining service life for the equipment.
Base class for any instance of equipment. Provides a base set of elements common to any single instance of a piece of...
ElectricalPanelType
Describes any sort of electrical distribution panel, for example a fused panel, a breaker panel, etc. Can be a main or...
EnergizingSourceCircuitConnection
Description of the conductor energizing the panel. Should include description of OCPD / disco at source end.
MainBreaker
Describes an internal circuit breaker, if any, that serves as the main OCPD and power disconnect to this panel's bus....
Existence
Is this panel existing or new (proposed)? When the ElectricalPanel is used within the ExistingElectricalSystem element...
IncludedMeter
If the panel is an "All in One", it has a meter socket. This element describes the meter in that socket.
SumOfExistingFeederBreakerAmps
Integer quantity in Amps. Add up the ratings for all existing breakers on the panel. This is used to determine if...
UnusedBreakerSlotQuantity
SupplySideLugHolesAvailable
Does the energizing (supply side) bus bar have pre-drilled holes suitable for adding a new supply side lug?
AcGroundingElectrodeConductor
The main service panel should have an AC system grounding conductor that runs from the grounding bus to the grounding...
SubPanel
An electrical distribution panel downstream from the parent panel. It has the same data structure.

Type	extension of EquipmentInstanceType
Type hierarchy	• EquipmentInstanceType • ElectricalPanelType
Used by	Elements: ElectricalDistributionHierarchyType/ElectricalDistributionPanel, ElectricalPanelType/SubPanel, PvSystemType/ElectricalPanel
Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1} , EnergizingSourceCircuitConnection{0,1} , MainBreaker{0,1} , Existence{0,1} , IncludedMeter{0,1} , SumOfExistingFeederBreakerAmps{0,1} , UnusedBreakerSlotQuantity{0,1} , SupplySideLugHolesAvailable{0,1} , AcGroundingElectrodeConductor{0,1} , SubPanel{0,1}
Children	AcGroundingElectrodeConductor, Condition, DateManufactured, EnergizingSourceCircuitConnection, Existence, IncludedMeter, LastServiced, Location, MainBreaker, Name, SerialNumber, SubPanel, SumOfExistingFeederBreakerAmps, SupplySideLugHolesAvailable, UnusedBreakerSlotQuantity, UsefulLife

Attributes

QName	Type	Fixed	Default	Use
EquipmentDefinitionIdREF	IDREF			required
	ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.			
id	xs:ID			required

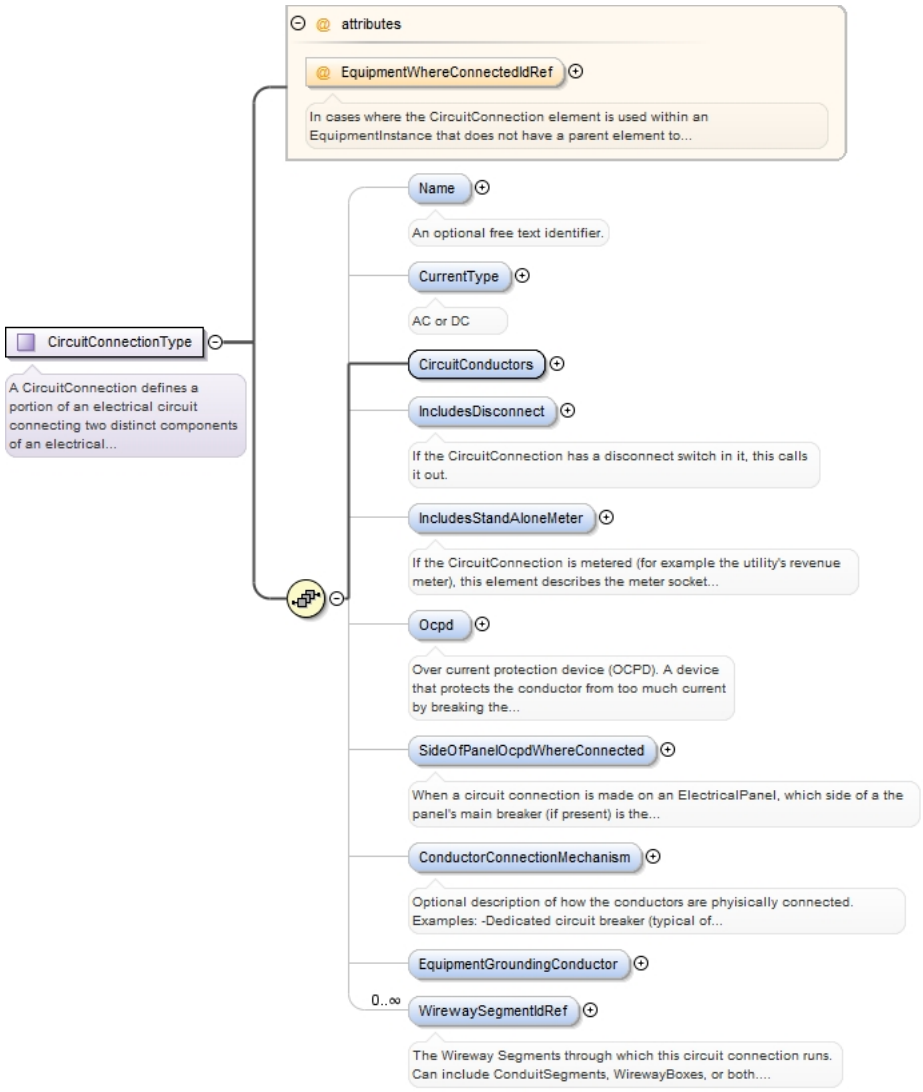
Source

```
<xs:complexType name="ElectricalPanelType">
  <xs:annotation>
    <xs:documentation>Describes any sort of electrical distribution panel, for example a fused panel, a breaker panel, etc. Can be a main or sub-panel.</xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="EquipmentInstanceType">
      <xs:sequence>
        <xs:element minOccurs="0" name="EnergizingSourceCircuitConnection" type="CircuitConnectionType" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Description of the conductor energizing the panel. Should include description of OCPD / disco at source end.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="MainBreaker" type="CircuitBreakerType" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Describes an internal circuit breaker, if any, that serves as the main OCPD and power disconnect to this panel's bus. Note that the ElectricPanel may or may not have an internal main breaker. Panels with or without a main internal breaker may also have an OCPD on the ElectricPanel's CircuitConnection element which serves as the energizing source for this panel.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="Existence" type="xs:string">
          <xs:annotation>
            <xs:documentation>Is this panel existing or new (proposed)? When the ElectricalPanel is used within the ExistingElectricalSystem element inside of a Project's Site element, this is assumed to be an existing panel. However, if the panel is just being defined within a PvDesign's AcTie-InPanel element, then its important to know if the panel being described already exists or is new (and therefore part of the scope of work).</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="IncludedMeter" type="EquipmentInstanceType">
          <xs:annotation>
            <xs:documentation>If the panel is an "All in One", it has a meter socket. This element describes the meter in that socket.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element maxOccurs="1" minOccurs="0" name="SumOfExistingFeederBreakerAmps" type="xs:integer">
          <xs:annotation>
            <xs:documentation>Integer quantity in Amps. Add up the ratings for all existing breakers on the panel. This is used to determine if existing panel configuration meets code, and if additional breakers can be added.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="UnusedBreakerSlotQuantity" type="xs:integer" maxOccurs="1"/>
        <xs:element minOccurs="0" name="SupplySideLugHolesAvailable" type="xs:boolean">
          <xs:annotation>
```

```
            <xs:documentation>Does the energizing (supply side) bus bar have pre-drilled
 holes suitable for adding a new supply side lug?</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="AcGroundingElectrodeConductor"
 type="GroundingElectrodeConductorType">
          <xs:annotation>
            <xs:documentation>The main service panel should have an AC system grounding
 conductor that runs from the grounding bus to the grounding electrode. The grounding
 electrode is a ground rod, or U-fer, for example.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="SubPanel" type="ElectricalPanelType">
          <xs:annotation>
            <xs:documentation>An electrical distribution panel downstream from the parent
 panel. It has the same data structure.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Complex Type `CircuitConnectionType`

Namespace	http://www.iepmodel.net
Annotations	A CircuitConnection defines a portion of an electrical circuit connecting two distinct components of an electrical system (for example, the connection of a PV String to a CombinerBox). A CircuitConnection is made by conductors. One end of the CircuitConnection is the element in which the CircuitConnection exists, and the other end is typically the parent element of the element in which the CircuitConnection element resides. For example, a CombinerBox element can have multiple PvString elements within it. Each PvString element contains a CircuitConnection element which defines its connection to the CombinerBox. A CombinerBox has a CircuitConnection element which defines its connection to an InverterDcInput, for example. Optionally, the CircuitConnectionType contains an optional EquipmentWhereConnectedIdRef attribute which can be used to reference another electrical equipment element in another part of a document. For example, a PvDesign's Inverter has no parent element. Instead, it's AcTie-InCircuitConnection uses the EquipmentWhereConnectedIdRef attribute to reference either an ElectricalPanel within the PvDesign, or an ElectricalPanel within a Project's ExistingElectricalDistributionHierarchy element may exist.

Diagram	
Used by	Elements AcPvBranchCircuitType/AcTieInCircuitConnection, CircuitConnection, DcCombinerType/OutputCircuit, ElectricalPanelType/EnergizingSourceCircuitConnection, PvStringType/CircuitConnection, StringInverterType/AcTieInCircuitConnection, StringPvArrayType/TypicalStringConnection
Model	Name{0,1} , CurrentType{0,1} , CircuitConductors , IncludesDisconnect{0,1} , IncludesStandAloneMeter{0,1} , Ocpd{0,1} , SideOfPanelOcpdWhereConnected{0,1} , ConductorConnectionMechanism{0,1} , EquipmentGroundingConductor{0,1} , WirewaySegmentIdRef*
Children	CircuitConductors, ConductorConnectionMechanism, CurrentType, EquipmentGroundingConductor, IncludesDisconnect, IncludesStandAloneMeter, Name, Ocpd, SideOfPanelOcpdWhereConnected, WirewaySegmentIdRef

Attributes

QName	Type	Fixed	Default	Use
EquipmentWhereConnectedIdRef				optional

In cases where the CircuitConnection element is used within an EquipmentInstance that does not have a parent element to which the CircuitConnection is assumed to connect, a reference ID can be used to associate this CircuitConnection to another EquipmentInstance elsewhere in a document instance. For example, a PvSystem may have an AcPointOfConnection that uses a new ElectricalPanel as an AC combiner for more than one Inverter. The new electrical panel can be described by an ElectricalPanel element in the PvDesign (which in turn refers to an ElectricalPanelDefinition element).

in the AcPointOfConnection's EquipmentWhereConnected element. That ElectricPanel's EnergizingCircuitConnection element may reference another ElectricPanel in an instance of the Project's ExistingElectricalHierarchy element.

Source

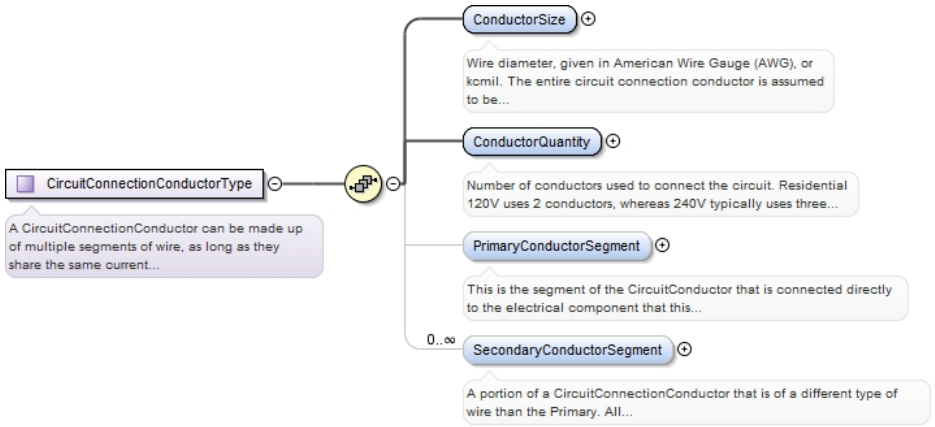
```
<xs:complexType name="CircuitConnectionType">
```

```
 <xs:annotation>
   <xs:documentation>A CircuitConnection defines a portion of an electrical circuit
 connecting two distinct components of an electrical system (for example, the connection
 of a PV String to a CombinerBox). A CircuitConnection is made by conductors. One end
 of the CircuitConnection is the element in which the CircuitConnection exists, and the
 other end is typically the parent element of the element in which the CircuitConnection
 element resides. For example, a CombinerBox element can have multiple PvString elements
 within it. Each PvString element contains a CircuitConnection element which defines
 its connection to the CombinerBox. A CombinerBox has a CircuitConnection element
 which defines its connection to an InverterDcInput, for example. Optionally, the
 CircuitConnectionType contains an optional EquipmentWhereConnectedIdRef attribute
 which can be used to reference another electrical equipment element in another part
 of a document. For example, a PvDesign's Inverter has no parent element. Instead, it's
 AcTie-InCircuitConnection uses the EquipmentWhereConnectedIdRef attribute to reference
 either an ElectricalPanel within the PvDesign, or an ElectricalPanel within a Project's
 ExistingElectricalDistributionHierarchy element may exist.</xs:documentation>
 </xs:annotation>
 <xs:sequence>
   <xs:element minOccurs="0" name="Name" type="xs:string">
     <xs:annotation>
       <xs:documentation>An optional free text identifier.</xs:documentation>
     </xs:annotation>
   </xs:element>
   <xs:element name="CurrentType" minOccurs="0" type="CurrentEnumType">
     <xs:annotation>
       <xs:documentation>AC or DC</xs:documentation>
     </xs:annotation>
   </xs:element>
   <xs:element name="CircuitConductors" type="CircuitConnectionConductorType"/>
   <xs:element minOccurs="0" name="IncludesDisconnect">
     <xs:annotation>
       <xs:documentation>If the CircuitConnection has a disconnect switch in it, this
 calls it out.</xs:documentation>
     </xs:annotation>
     <xs:complexType>
       <xs:attribute name="WirewayBoxIdRef" type="xs:IDREF" use="required">
         <xs:annotation>
           <xs:documentation>Reference to an instance of the DisconnectSwitch
 modeled generally as a WirewayBox. A disconnect switch can switch more than one
 CircuitConnection, so it is defined external to the CircuitConnection.</xs:documentation>
         </xs:annotation>
       </xs:attribute>
       <xs:attribute name="ConductorSegmentIdRef" type="xs:IDREF" use="required">
         <xs:annotation>
           <xs:documentation>ConductorSegment that contains the disconnect switch.</
xs:documentation>
         </xs:annotation>
       </xs:attribute>
     </xs:complexType>
   </xs:element>
   <xs:element minOccurs="0" name="IncludesStandAloneMeter">
     <xs:annotation>
       <xs:documentation>If the CircuitConnection is metered (for example the utility's
 revenue meter), this element describes the meter socket and meter. The meter and
 socket are individual entities. The MeterSocket is modeled as a simple WirewayBox.</
xs:documentation>
     </xs:annotation>
     <xs:complexType>
       <xs:sequence>
         <xs:element name="MeterSocket" type="WirewayBoxType"/>
         <xs:element name="Meter" type="EquipmentInstanceType"/>
       </xs:sequence>
       <xs:attribute name="ConductorSegmentIdRef" type="xs:IDREF"/>
     </xs:complexType>
   </xs:element>
   <xs:element name="Ocpd" minOccurs="0" form="unqualified">
     <xs:annotation>
       <xs:documentation>Over current protection device (OCPD). A device that protects
 the conductor from too much current by breaking the circuit. Fuses and circuit breakers
 are OCPDs. In this schema, an OCPD is not a piece of equipment, but rather a component
 within a piece of equipment. It is not necessary to include a mfr and model in most
 cases, but knowing the type and rating is required.</xs:documentation>
     </xs:annotation>
     <xs:complexType>
       <xs:choice>
         <xs:element name="Fuse" type="FuseType"/>
         <xs:element name="CircuitBreaker" type="CircuitBreakerType"/>
       </xs:choice>
       <xs:attribute name="EquipmentWhereLocatedIdRef">
         <xs:annotation>
           <xs:documentation>The ID referring to the equipment in which the OCPD is
 installed. In most cases, it is the parent Equipment of the CircuitConnection's immediate
 parent element. For example, if the CircuitConnection is within a StringInverter element,
```

```
then the circuit breaker within the ElectricalPanel to which the Inverter connects will
most like be the referenced OCPD.</xs:documentation>
         </xs:annotation>
       </xs:attribute>
     </xs:complexType>
   </xs:element>
   <xs:element default="load-side" minOccurs="0" name="SideOfPanelOcpdWhereConnected"
type="SideOfPanelOcpdWhereConnectedEnumType">
     <xs:annotation>
       <xs:documentation>When a circuit connection is made on an ElectricalPanel, which
side of a the panel's main breaker (if present) is the interconnection made (supply
or load side)? This is a very important consideration, as the NEC dictates the maximum
allowable interconnected current, and it is very different for each side of the OCPD. For
example, when tied to the load side of a panel's bus, the total of all circuits amperage
can sum to 120% of the bus's current rating when using a backfed breaker. If tied to the
supply side, the allowable PV circuit amperage can go up to the maximum rated amperage of
the bus (as the main breaker protects the load side). Note that this also differs between
residential and commercial systems. Most residential systems are interconnected on the
load side. Conversely, most commercial systems are interconnected on the supply side
because NEC 690 currently has no 120% rule on commercial load side tie-in (significantly
limiting possible size), and also commercial system equipment is more likely to have
connections available on the supply side (e.g. lugs).</xs:documentation>
     </xs:annotation>
   </xs:element>
   <xs:element minOccurs="0" name="ConductorConnectionMechanism" type="xs:string">
     <xs:annotation>
       <xs:documentation>Optional description of how the conductors are phyisically
connected. Examples: -Dedicated circuit breaker (typical of load side, but breaker-can
also be on service side if hot-bussed panel has breaker slot on the service side) -lugs
(supply side typical) -wire taps (supply side typical)</xs:documentation>
     </xs:annotation>
   </xs:element>
   <xs:element minOccurs="0" name="EquipmentGroundingConductor"
type="EquipmentGroundingConductorType"/>
   <xs:element name="WirewaySegmentIdRef" type="xs:IDREF" minOccurs="0"
maxOccurs="unbounded">
     <xs:annotation>
       <xs:documentation>The Wireway Segments through which this circuit connection runs.
Can include ConduitSegments, WirewayBoxes, or both. Note that the CircuitConnection
can be routed through a DisconnectSwitch or StandAloneMeterSocket without actually
being switched or metered. If the CircuitConnection is disconnected or metered, it
should be called out in a separate Disconnect or StandAloneMeter element within the
CircuitConnection.</xs:documentation>
     </xs:annotation>
   </xs:element>
 </xs:sequence>
 <xs:attribute name="EquipmentWhereConnectedIdRef" type="xs:IDREF">
   <xs:annotation>
     <xs:documentation>In cases where the CircuitConnection element is used within an
EquipmentInstance that does not have a parent element to which the CircuitConnection
is assumed to connect, a reference ID can be used to associate this CircuitConnection
to another EquipmentInstance elsewhere in a document instance. For example, a PvSystem
may have an AcPointOfConnection that uses a new ElectricalPanel as an AC combiner for
more than one Inverter. The new electrical panel can be described by an ElectricalPanel
element in the PvDesign (which in turn refers to an ElectricalPanelDefinition element).
in the AcPointOfConnection's EquipmentWhereConnected element. That ElectricPanel's
EnergizingCircuitConnection element may reference another ElectricPanel in an instance of
the Project's ExistingElectricalHierarchy element.</xs:documentation>
   </xs:annotation>
 </xs:attribute>
</xs:complexType>
```

Complex Type `CircuitConnectionConductorType`

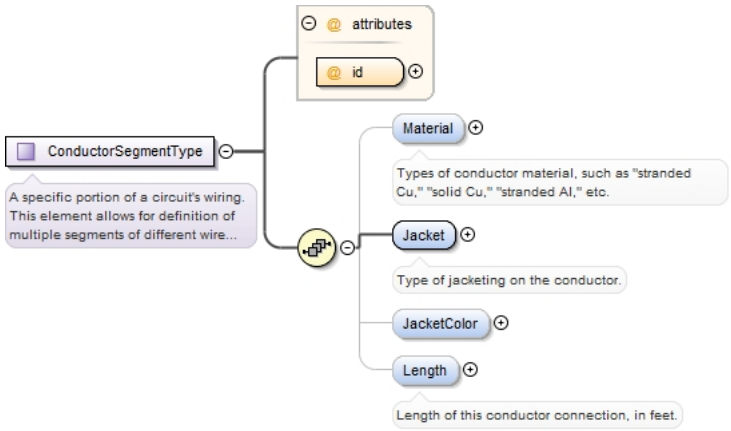
Namespace	http://www.iepmodel.net
Annotations	A CircuitConnectionConductor can be made up of multiple segments of wire, as long as they share the same current carrying capacity, defined by its ConductorSize. In PV Systems, for example, its common for an array's wiring to transition from wire outside of conduit into wire inside conduit. The wire is spliced together within a box (e.g. WirewayBox).

Diagram	
Used by	Element CircuitConnectionType/CircuitConductors
Model	ConductorSize , ConductorQuantity , PrimaryConductorSegment{0,1} , SecondaryConductorSegment*
Children	ConductorQuantity, ConductorSize, PrimaryConductorSegment, SecondaryConductorSegment
Source	

```
<xs:complexType name="CircuitConnectionConductorType">
  <xs:annotation>
    <xs:documentation>A CircuitConnectionConductor can be made up of multiple segments
 of wire, as long as they share the same current carrying capacity, defined by its
 ConductorSize. In PV Systems, for example, its common for an array's wiring to transition
 from wire outside of conduit into wire inside conduit. The wire is spliced together
 within a box (e.g. WirewayBox).</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="ConductorSize" type="ConductorSizeEnumType">
      <xs:annotation>
        <xs:documentation>Wire diameter, given in American Wire Gauge (AWG), or kcmil. The
 entire circuit connection conductor is assumed to be the same size conductor, even if it
 is physically made up of multiple conductor segments that are different kinds of wire.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="1" name="ConductorQuantity" type="xs:integer">
      <xs:annotation>
        <xs:documentation>Number of conductors used to connect the circuit. Residential
 120V uses 2 conductors, whereas 240V typically uses three conductors, and commercial
 three phase typically is 4 conductors.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="PrimaryConductorSegment" type="ConductorSegmentType">
      <xs:annotation>
        <xs:documentation>This is the segment of the CircuitConductor that is connected
 directly to the electrical component that this CircuitConnection belongs to. For example,
 let's assume that this ConductorSegment is part of a CircuitConnection for a PvString.
 The PvString typically starts out as USE-2 wire from the PV Modules and may transition
 to THWN-2 wire once inside a J-box (modeled as a Wireway box in this schema). The USE-2
 segment of the conductor is the Primary segment, while the THWN-2 wire is a secondary
 segment. All CircuitConnectionConductors have a primary segment, only some have any
 secondary instances. If there are more than one, then the splices made beween them are
 described by the ConnectsToConductorSegmentId and the WirewaySegmentWhereConnectedId
 attributes.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="SecondaryConductorSegment">
      <xs:annotation>
        <xs:documentation>A portion of a CircuitConnectionConductor that is of a
 different type of wire than the Primary. All CircuitConnectionConductors have a primary
 segment, only some have any secondary instances. If there are more than one, then the
 splices made beween them are described by the ConnectsToConductorSegmentId and the
 WirewaySegmentWhereConnectedId attributes.</xs:documentation>
      </xs:annotation>
      <xs:complexType>
        <xs:complexContent>
          <xs:extension base="ConductorSegmentType">
            <xs:attribute name="ConnectsToConductorSegmentId" type="xs:IDREF"
 use="required"/>
            <xs:attribute name="WirewaySegmentWhereConnectedId" type="xs:IDREF"
 use="required"/>
          </xs:extension>
        </xs:complexContent>
      </xs:complexType>
    </xs:element>
```

```
  </xs:sequence>
</xs:complexType>
```

Complex Type `ConductorSegmentType`

Namespace	http://www.iepmodel.net
Annotations	A specific portion of a circuit's wiring. This element allows for definition of multiple segments of different wire types within a single CircuitConnectionConductor.
Diagram	
Used by	Elements: CircuitConnectionConductorType/PrimaryConductorSegment, CircuitConnectionConductorType/SecondaryConductorSegment
Model	Material{0,1} , Jacket , JacketColor{0,1} , Length{0,1}
Children	Jacket, JacketColor, Length, Material

Attributes

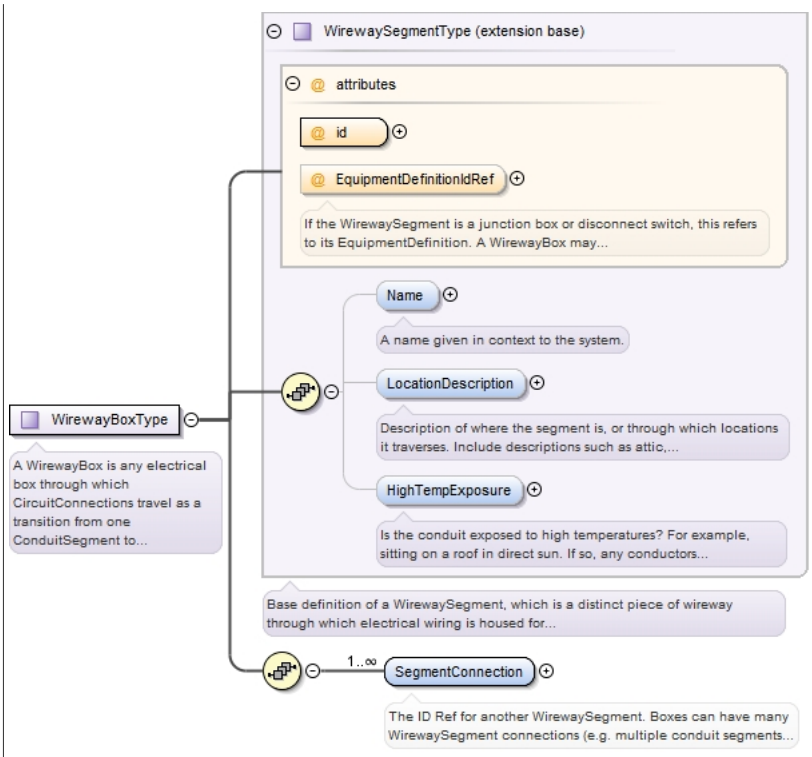
QName	Type	Fixed	Default	Use
id	xs:ID			required

Source

```
<xs:complexType name="ConductorSegmentType">
  <xs:annotation>
    <xs:documentation>A specific portion of a circuit's wiring. This element
 allows for definition of multiple segments of different wire types within a single
 CircuitConnectionConductor.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element minOccurs="0" name="Material" type="ConductorMaterialEnumType">
      <xs:annotation>
        <xs:documentation>Types of conductor material, such as "stranded Cu," "solid Cu,"
 "stranded Al," etc.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="1" name="Jacket" type="ConductorJacketEnumType">
      <xs:annotation>
        <xs:documentation>Type of jacketing on the conductor.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="JacketColor" type="xs:string"/>
    <xs:element name="Length" type="xs:double" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Length of this conductor connection, in feet.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="id" use="required" type="xs:ID"/>
</xs:complexType>
```

Complex Type `WirewayBoxType`

Namespace	http://www.iepmodel.net
Annotations	A WirewayBox is any electrical box through which CircuitConnections travel as a transition from one ConduitSegment to another. A WirewayBox is modeled like a piece of conduit in that they do not have their own CircuitConnections. Wireway boxes cannot change the current or voltage characteristics of any CircuitConnections passing through it. They may not combine or distribute current like a DcCombiner or ElectricalPanel. They may not change voltage characteristics such as a StringInverter. A WirewayBox may contain 1:1 wire splices or a disconnect switch (a switch does not change the current or voltage). Note that a WirewayBox may or may not refer to a defined piece of Equipment (e.g. a JunctionBoxDefintion, DisconnectSwitchDefinition, StandAloneMeterSocketDefintion). It may instead contain a free text name.

Diagram	
Type	extension of WirewaySegmentType
Type hierarchy	• WirewaySegmentType • WirewayBoxType
Used by	Elements CircuitConnectionType/IncludesStandAloneMeter/MeterSocket, PvSystemType/WirewayBox
Model	Name{0,1} , LocationDescription{0,1} , HighTempExposure{0,1} , SegmentConnection+
Children	HighTempExposure, LocationDescription, Name, SegmentConnection

Attributes

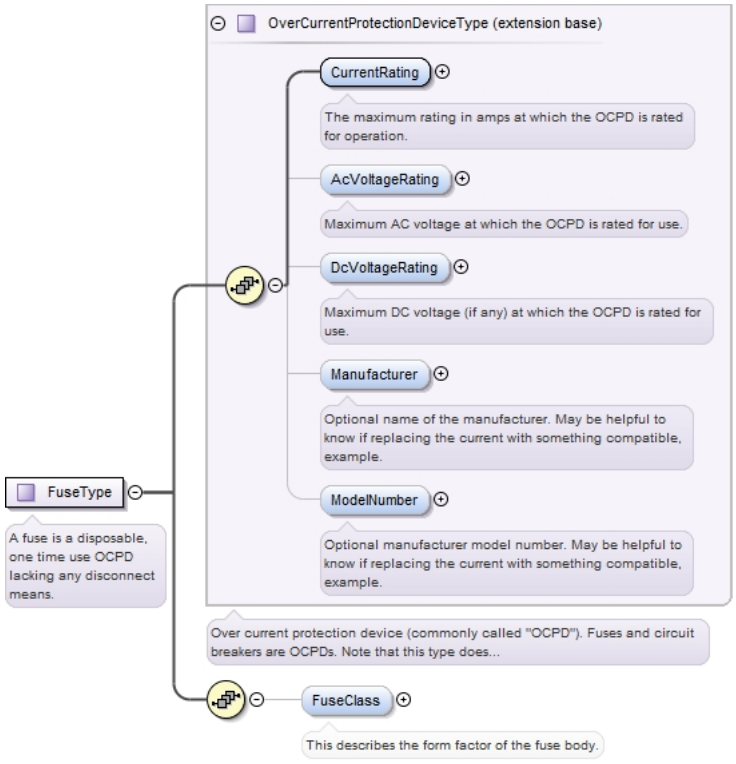
QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	xs:IDREF			optional
	If the WirewaySegment is a junction box or disconnect switch, this refers to its EquipmentDefinition. A WirewayBox may be a pass through where multiple ConduitSegments are combined into a single ConduitSegment for example. A disconnect switch box may also be modeled as a WirewayBox, provided that the circuit(s) involved are simply disoconnected and not combined in any way. DO NOT use WirewayBox to represent a combiner, or distribution panel.			
id	xs:ID			required

Source

```
<xs:complexType name="WirewayBoxType">
  <xs:annotation>
    <xs:documentation>A WirewayBox is any electrical box through which CircuitConnections
 travel as a transition from one ConduitSegment to another. A WirewayBox is modeled
 like a piece of conduit in that they do not have their own CircuitConnections. Wireway
 boxes cannot change the current or voltage characteristics of any CircuitConnections
 passing through it. They may not combine or distribute current like a DcCombiner or
 ElectricalPanel. They may not change voltage characteristics such as a StringInverter.
 A WirewayBox may contain 1:1 wire splices or a disconnect switch (a switch does not
 change the current or voltage). Note that a WirewayBox may or may not refer to a
 defined piece of Equipment (e.g. a JunctionBoxDefintion, DisconnectSwitchDefinition,
 StandAloneMeterSocketDefintion). It may instead contain a free text name.</
xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="WirewaySegmentType">
      <xs:sequence>
        <xs:element maxOccurs="unbounded" name="SegmentConnection" type="xs:IDREF"
 minOccurs="1">
          <xs:annotation>
            <xs:documentation>The ID Ref for another WirewaySegment. Boxes can have many
 WirewaySegment connections (e.g. multiple conduit segments can terminate at a box).
```

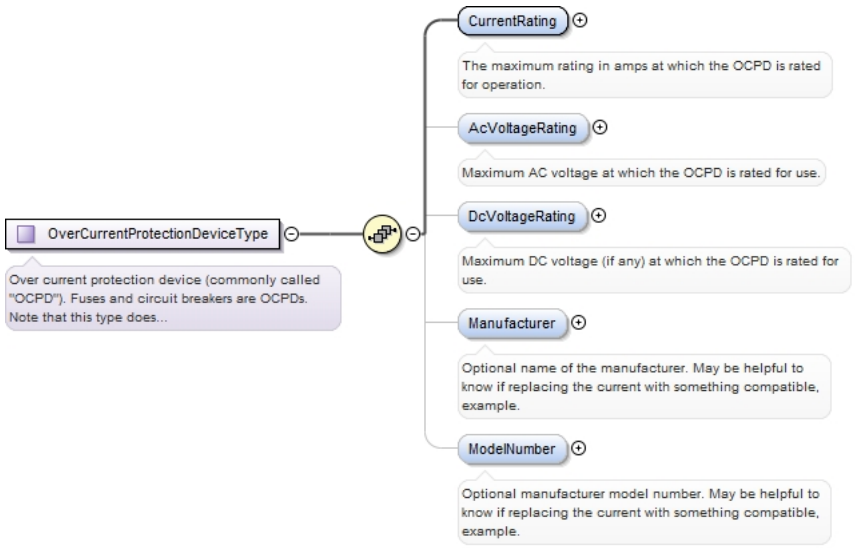
```
 Conduit is a pipe with 2 ends, so it has a maximum of two WirewaySegments to which it
 connects.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Complex Type FuseType

Namespace	http://www.iepmodel.net
Annotations	A fuse is a disposable, one time use OCPD lacking any disconnect means.
Diagram	
Type	extension of OverCurrentProtectionDeviceType
Type hierarchy	• OverCurrentProtectionDeviceType • FuseType
Used by	Elements CircuitConnectionType/Ocpd/Fuse, DisconnectSwitchDefinitionType/Fuse
Model	CurrentRating , AcVoltageRating{0,1} , DcVoltageRating{0,1} , Manufacturer{0,1} , ModelNumber{0,1} , FuseClass{0,1}
Children	AcVoltageRating, CurrentRating, DcVoltageRating, FuseClass, Manufacturer, ModelNumber
Source	

```
<xs:complexType name="FuseType">
  <xs:annotation>
    <xs:documentation>A fuse is a disposable, one time use OCPD lacking any disconnect
 means.</xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="OverCurrentProtectionDeviceType">
      <xs:sequence>
        <xs:element minOccurs="0" name="FuseClass" type="xs:string">
          <xs:annotation>
            <xs:documentation>This describes the form factor of the fuse body.</
xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

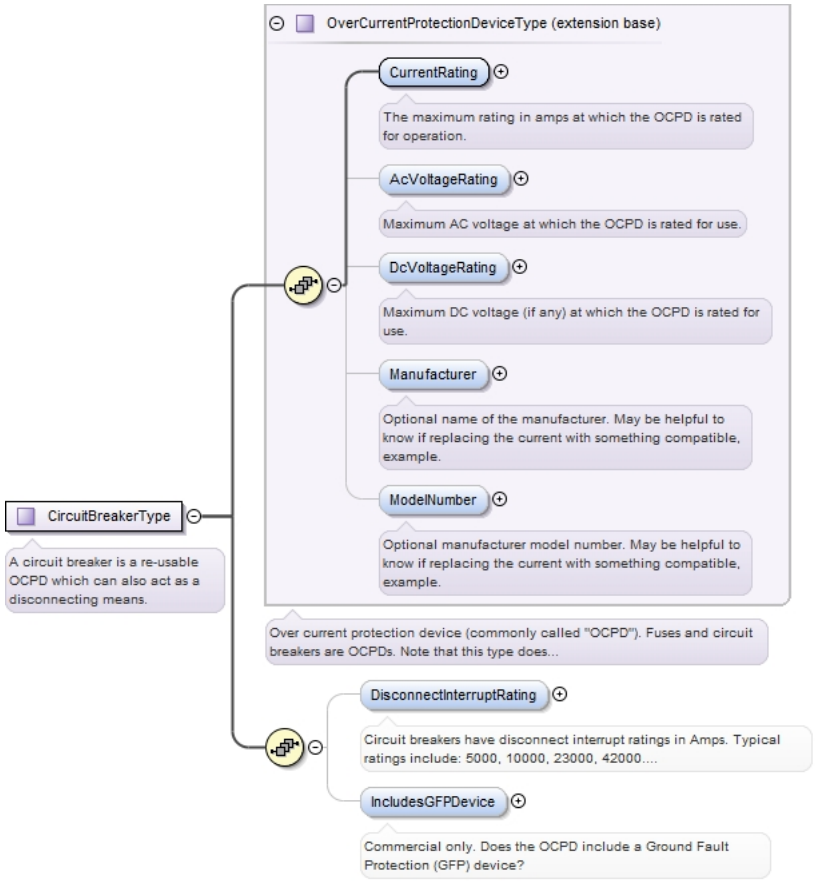
Complex Type `OverCurrentProtectionDeviceType`

Namespace	http://www.iepmodel.net
Annotations	Over current protection device (commonly called "OCPD"). Fuses and circuit breakers are OCPDs. Note that this type does not extend EquipmentDefinition nor EquipmentInstance. It is not a piece of equipment, but rather a component within a piece of equipment. It is not necessary to include a mfr and model in most cases; knowing the type and rating is required.
Diagram	
Properties	abstract: `true`
Used by	Complex Types CircuitBreakerType, FuseType
Model	CurrentRating , AcVoltageRating{0,1} , DcVoltageRating{0,1} , Manufacturer{0,1} , ModelNumber{0,1}
Children	AcVoltageRating, CurrentRating, DcVoltageRating, Manufacturer, ModelNumber
Source	

```
<xs:complexType name="OverCurrentProtectionDeviceType" abstract="true">
  <xs:annotation>
    <xs:documentation>Over current protection device (commonly called "OCPD"). Fuses and
 circuit breakers are OCPDs. Note that this type does not extend EquipmentDefinition nor
 EquipmentInstance. It is not a piece of equipment, but rather a component within a piece
 of equipment. It is not necessary to include a mfr and model in most cases; knowing the
 type and rating is required.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="CurrentRating" type="xs:integer" minOccurs="1" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The maximum rating in amps at which the OCPD is rated for
 operation.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="AcVoltageRating" type="xs:integer" minOccurs="0">
      <xs:annotation>
        <xs:documentation>Maximum AC voltage at which the OCPD is rated for use.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="DcVoltageRating" type="xs:integer">
      <xs:annotation>
        <xs:documentation>Maximum DC voltage (if any) at which the OCPD is rated for
 use.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="Manufacturer" type="xs:string">
      <xs:annotation>
        <xs:documentation>Optional name of the manufacturer. May be helpful to know if
 replacing the current with something compatible, example.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="ModelNumber" type="xs:string">
      <xs:annotation>
        <xs:documentation>Optional manufacturer model number. May be helpful to know if
 replacing the current with something compatible, example.</xs:documentation>
      </xs:annotation>
    </xs:element>
```

```
  </xs:sequence>
</xs:complexType>
```

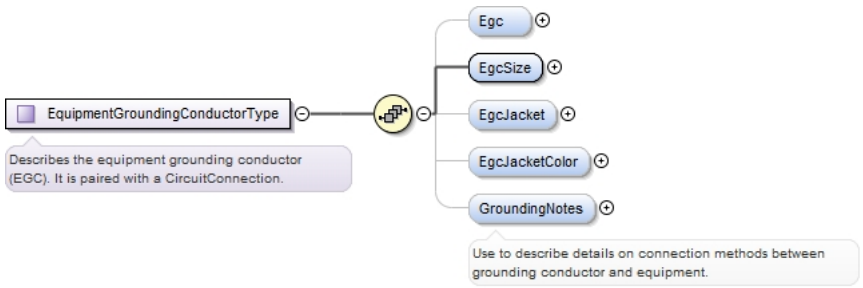
Complex Type `CircuitBreakerType`

Namespace	http://www.iepmodel.net
Annotations	`A circuit breaker is a re-usable OCPD which can also act as a disconnecting means.`
Diagram	
Type	extension of OverCurrentProtectionDeviceType
Type hierarchy	• OverCurrentProtectionDeviceType • CircuitBreakerType
Used by	Elements CircuitConnectionType/Ocpd/CircuitBreaker, ElectricalPanelType/MainBreaker
Model	CurrentRating , AcVoltageRating{0,1} , DcVoltageRating{0,1} , Manufacturer{0,1} , ModelNumber{0,1} , DisconnectInterruptRating{0,1} , IncludesGFPDevice{0,1}
Children	AcVoltageRating, CurrentRating, DcVoltageRating, DisconnectInterruptRating, IncludesGFPDevice, Manufacturer, ModelNumber

Source	`<xs:complexType name="CircuitBreakerType">`
	`  <xs:annotation>`
	`  <xs:documentation>A circuit breaker is a re-usable OCPD which can also act as a disconnecting means.</xs:documentation>`
	`  </xs:annotation>`
	`  <xs:complexContent>`
	`  <xs:extension base="OverCurrentProtectionDeviceType">`
	`  <xs:sequence>`
	`  <xs:element minOccurs="0" name="DisconnectInterruptRating" type="xs:integer" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>Circuit breakers have disconnect interrupt ratings in Amps. Typical ratings include: 5000, 10000, 23000, 42000. Typically if rating is not listed on a breaker, it is 5000.</xs:documentation>`
	`  </xs:annotation>`
	`  </xs:element>`
	`  <xs:element minOccurs="0" name="IncludesGFPDevice" type="xs:boolean" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>Commercial only. Does the OCPD include a Ground Fault Protection (GFP) device?</xs:documentation>`

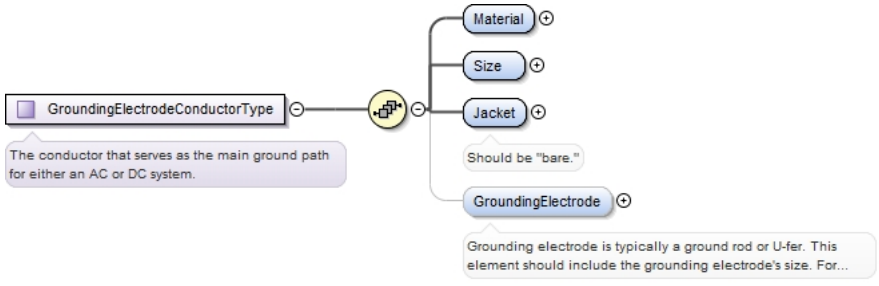
```
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Complex Type `EquipmentGroundingConductorType`

Namespace	http://www.iepmodel.net
Annotations	`Describes the equipment grounding conductor (EGC). It is paired with a CircuitConnection.`
Diagram	
Used by	Element CircuitConnectionType/EquipmentGroundingConductor
Model	Egc{0,1} , EgcSize , EgcJacket{0,1} , EgcJacketColor{0,1} , GroundingNotes{0,1}
Children	Egc, EgcJacket, EgcJacketColor, EgcSize, GroundingNotes
`Source`	

```
<xs:complexType name="EquipmentGroundingConductorType">
  <xs:annotation>
    <xs:documentation>Describes the equipment grounding conductor (EGC). It is paired with
 a CircuitConnection.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element minOccurs="0" name="Egc" type="ConductorMaterialEnumType"/>
    <xs:element name="EgcSize" type="ConductorSizeEnumType"/>
    <xs:element minOccurs="0" name="EgcJacket" type="ConductorJacketEnumType"/>
    <xs:element default="green" minOccurs="0" name="EgcJacketColor" type="xs:string"/>
    <xs:element minOccurs="0" name="GroundingNotes" type="xs:string">
      <xs:annotation>
        <xs:documentation>Use to describe details on connection methods between grounding
 conductor and equipment.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

Complex Type `GroundingElectrodeConductorType`

Namespace	http://www.iepmodel.net
Annotations	`The conductor that serves as the main ground path for either an AC or DC system.`
Diagram	
Properties	abstract: `false`
Used by	Elements ElectricalPanelType/AcGroundingElectrodeConductor, StringInverterType/ DcGroundingElectrodeConductor
Model	Material , Size , Jacket , GroundingElectrode{0,1}
Children	GroundingElectrode, Jacket, Material, Size
`Source`	

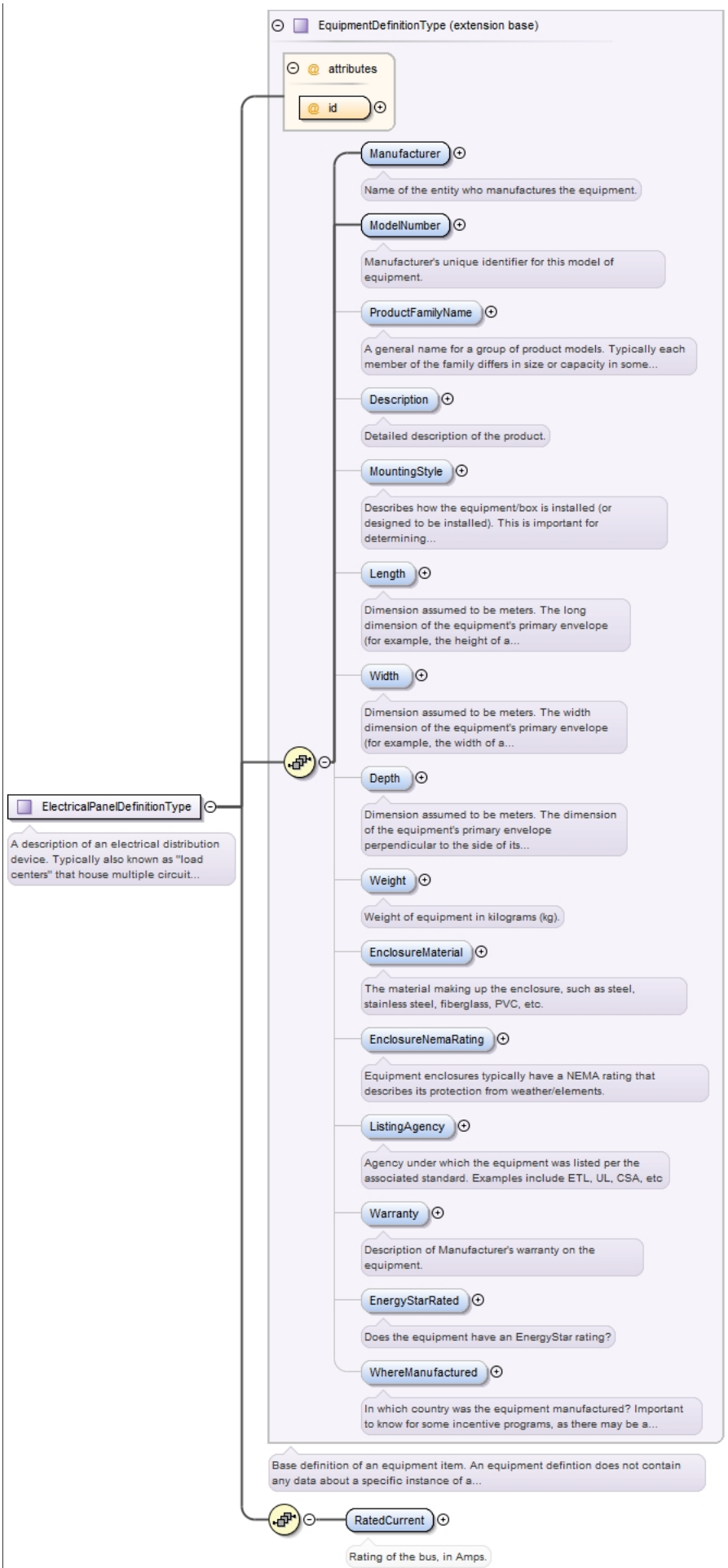
```
<xs:complexType abstract="false" name="GroundingElectrodeConductorType">
```

```
  <xs:annotation>
    <xs:documentation>The conductor that serves as the main ground path for either an AC
 or DC system.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element default="Solid Cu" name="Material" type="ConductorMaterialEnumType"/>
    <xs:element name="Size" type="ConductorSizeEnumType"/>
    <xs:element default="bare" name="Jacket" type="ConductorJacketEnumType">
      <xs:annotation>
        <xs:documentation>Should be "bare."</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="GroundingElectrode" type="xs:string">
      <xs:annotation>
        <xs:documentation>Grounding electrode is typically a ground rod or U-fer. This
 element should include the grounding electrode's size. For example "3/4 in ground rod."</
xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

Complex Type `ElectricalPanelDefinitionType`

Namespace	http://www.iepmodel.net
Annotations	`A description of an electrical distribution device. Typically also known as "load centers" that house multiple circuit breakers. A switch can also be modeled.`

Diagram


EquipmentDefinitionType (extension base)
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...
ElectricalPanelDefinitionType
A description of an electrical distribution device. Typically also known as "load centers" that house multiple circuit...
RatedCurrent
Rating of the bus, in Amps.

Type	extension of EquipmentDefinitionType
Type hierarchy	• EquipmentDefinitionType • ElectricalPanelDefinitionType
Used by	Elements: ElectricalDistributionHierarchyType/ElectricalDistributionPanelDefinition, PvSystemType/ElectricalPanelDefinition
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1} , RatedCurrent
Children	Depth, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, Length, ListingAgency, Manufacturer, ModelNumber, MountingStyle, ProductFamilyName, RatedCurrent, Warranty, Weight, WhereManufactured, Width

Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			required

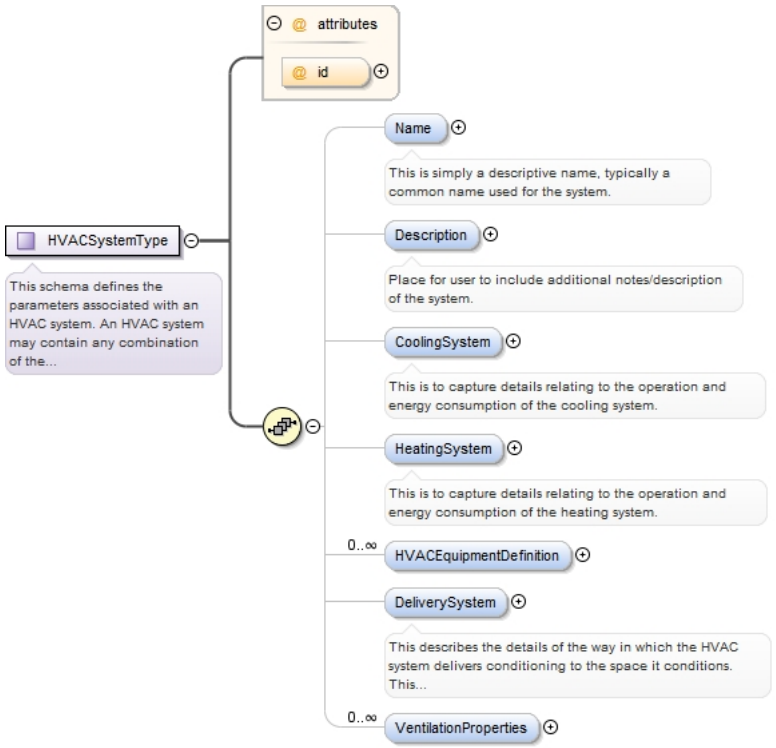
Source

```
<xs:complexType name="ElectricalPanelDefinitionType">
  <xs:annotation>
    <xs:documentation>A description of an electrical distribution device. Typically also
 known as "load centers" that house multiple circuit breakers. A switch can also be
 modeled.</xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="EquipmentDefinitionType">
      <xs:sequence>
        <xs:element name="RatedCurrent" type="xs:integer" minOccurs="1" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Rating of the bus, in Amps.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Complex Type `HVACSystemType`

Namespace	http://www.iepmodel.net
Annotations	This schema defines the parameters associated with an HVAC system. An HVAC system may contain any combination of the following: a heating system, a cooling system and ventilation properties. Ventilation is defined here as the exchange of air in the space/zone with air outside. An HVAC system references Distribution systems that serve one of three purposes: - deliver conditioning to a space/zone. - provide heat. - provide cold (a fluid to reject heat to). An HVAC system serves a zone, however, zones reference the HVAC systems that serve them. Note that parameters associated with the transport and movement of air and water are captured in a Distribution System.

Diagram



Used by

Elements HVACSystem, ProjectType/ExistingHVAC, SystemChoiceType/HVAC

Model

Name{0,1} , Description{0,1} , CoolingSystem{0,1} , HeatingSystem{0,1} , HVACEquipmentDefinition* , DeliverySystem{0,1} , VentilationProperties*

Children

CoolingSystem, DeliverySystem, Description, HVACEquipmentDefinition, HeatingSystem, Name, VentilationProperties

Attributes

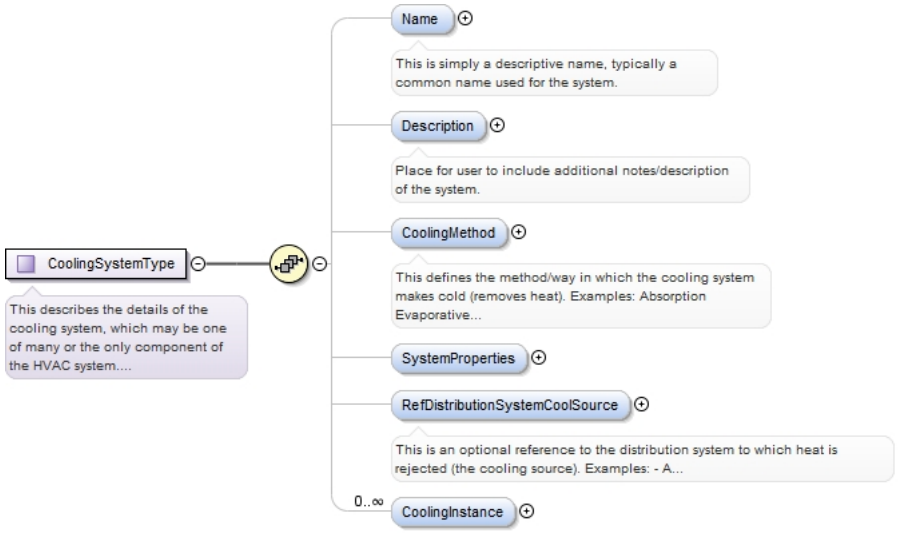
QName	Type	Fixed	Default	Use
id	xs:ID			optional

Source

```
<xs:complexType name="HVACSystemType">
  <xs:annotation>
    <xs:documentation>This schema defines the parameters associated with an HVAC system.
 An HVAC system may contain any combination of the following: a heating system, a cooling
 system and ventilation properties. Ventilation is defined here as the exchange of air
 in the space/zone with air outside. An HVAC system references Distribution systems that
 serve one of three purposes: - deliver conditioning to a space/zone. - provide heat.
 - provide cold (a fluid to reject heat to). An HVAC system serves a zone, however,
 zones reference the HVAC systems that serve them. Note that parameters associated with
 the transport and movement of air and water are captured in a Distribution System.</
xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description of the
 system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="CoolingSystem" type="CoolingSystemType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is to capture details relating to the operation and energy
 consumption of the cooling system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="HeatingSystem" type="HeatingSystemType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is to capture details relating to the operation and energy
 consumption of the heating system.</xs:documentation>
      </xs:annotation>
    </xs:element>
```

```
    <xs:element maxOccurs="unbounded" minOccurs="0" name="HVACEquipmentDefinition"
 type="EquipmentDefinitionType"/>
    <xs:element minOccurs="0" name="DeliverySystem" type="DeliverySystemType">
      <xs:annotation>
        <xs:documentation>This describes the details of the way in which the HVAC system
 delivers conditioning to the space it conditions. This allows the user to define
 ducting or piping etc. This includes an optional reference to a distribution system.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="VentilationProperties"
 type="VentilationPropertiesType"/>
  </xs:sequence>
  <xs:attribute form="unqualified" name="id" type="xs:ID"/>
</xs:complexType>
```

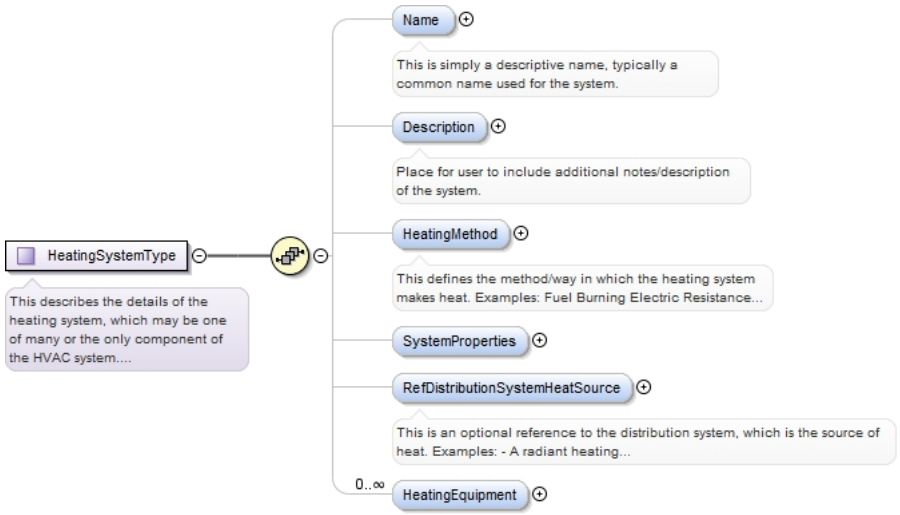
Complex Type `CoolingSystemType`

Namespace	http://www.iepmodel.net
Annotations	This describes the details of the cooling system, which may be one of many or the only component of the HVAC system. System properties are contained here.
Diagram	
Used by	Element HVACSystemType/CoolingSystem
Model	Name{0,1} , Description{0,1} , CoolingMethod{0,1} , SystemProperties{0,1} , RefDistributionSystemCoolSource{0,1} , CoolingInstance*
Children	CoolingInstance, CoolingMethod, Description, Name, RefDistributionSystemCoolSource, SystemProperties
Source	

```
<xs:complexType name="CoolingSystemType">
  <xs:annotation>
    <xs:documentation>This describes the details of the cooling system, which may be one
 of many or the only component of the HVAC system. System properties are contained here.</
xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description of the
 system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="CoolingMethod" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This defines the method/way in which the cooling system makes
 cold (removes heat). Examples: Absorption Evaporative Refrigeration – Air Rejection
 Refrigeration – Water Rejection Hydronic Coils Refrigerant (Direct Expansion, DX) Coils</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="SystemProperties" type="CommonSystemPropertiesType" minOccurs="0"/>
```

```
    <xs:element maxOccurs="1" minOccurs="0" name="RefDistributionSystemCoolSource"
 type="xs:IDREF">
      <xs:annotation>
        <xs:documentation>This is an optional reference to the distribution system to
 which heat is rejected (the cooling source). Examples: - A geothermal heat pump may
 reference a water loop that cycles to a pond or to piping in the ground. - An air
 handler with chilled water coils would reference the chilled water loop that serves the
 coils. - A water-cooled chiller or condenser would reference a condenser water loop.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="CoolingInstance"
 nillable="false" type="EquipmentInstanceType"/>
  </xs:sequence>
</xs:complexType>
```

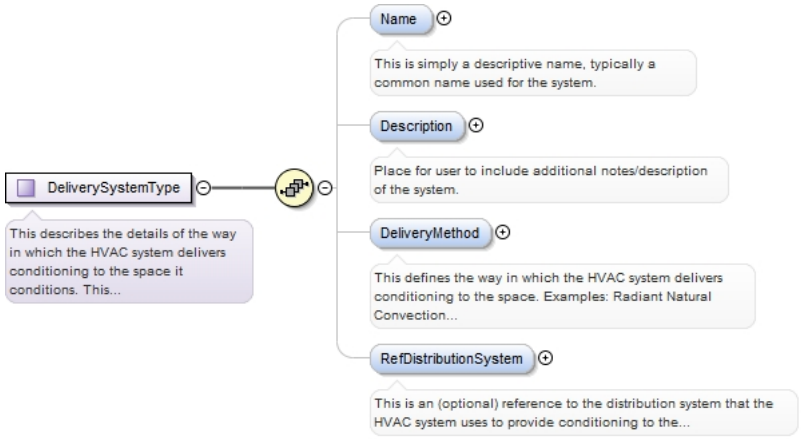
Complex Type `HeatingSystemType`

Namespace	http://www.iepmodel.net
Annotations	This describes the details of the heating system, which may be one of many or the only component of the HVAC system. System properties are contained here.
Diagram	
Used by	Element HVACSystemType/HeatingSystem
Model	Name{0,1} , Description{0,1} , HeatingMethod{0,1} , SystemProperties{0,1} , RefDistributionSystemHeatSource{0,1} , HeatingEquipment*
Children	Description, HeatingEquipment, HeatingMethod, Name, RefDistributionSystemHeatSource, SystemProperties
Source	

```
<xs:complexType name="HeatingSystemType">
  <xs:annotation>
    <xs:documentation>This describes the details of the heating system, which may be one
 of many or the only component of the HVAC system. System properties are contained here.</
xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description of the
 system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="HeatingMethod" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This defines the method/way in which the heating system makes
 heat. Examples: Fuel Burning Electric Resistance Refrigeration – Air-Source Refrigeration
 – Water-Source Hydronic Coils</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="SystemProperties" type="CommonSystemPropertiesType" minOccurs="0"/>
    <xs:element maxOccurs="1" minOccurs="0" name="RefDistributionSystemHeatSource"
 type="xs:IDREF">
```

```
      <xs:annotation>
        <xs:documentation>This is an optional reference to the distribution system, which
 is the source of heat. Examples: - A radiant heating system may consist of "radiators"
 and this references the hot water loop that serves it. - An air handler with hot water
 coils may reference the hot water loop that serves the coils. - A heat pump would
 reference the water loop from which it absorbs heat when it is in heating mode.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="HeatingEquipment" maxOccurs="unbounded" minOccurs="0"
 nillable="false" type="EquipmentInstanceType"/>
  </xs:sequence>
</xs:complexType>
```

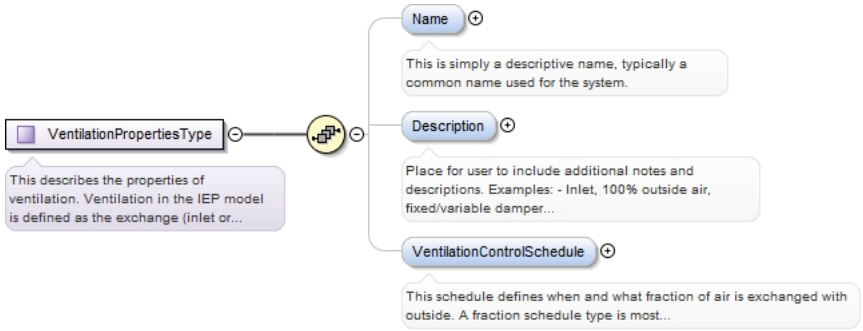
Complex Type `DeliverySystemType`

Namespace	http://www.iepmodel.net
Annotations	This describes the details of the way in which the HVAC system delivers conditioning to the space it conditions. This allows the user to define ducting or piping etc. This includes an optional reference to a distribution system.
Diagram	
Used by	Element HVACSystemType/DeliverySystem
Model	Name{0,1} , Description{0,1} , DeliveryMethod{0,1} , RefDistributionSystem{0,1}
Children	DeliveryMethod, Description, Name, RefDistributionSystem
Source	

```
<xs:complexType name="DeliverySystemType">
  <xs:annotation>
    <xs:documentation>This describes the details of the way in which the HVAC system
 delivers conditioning to the space it conditions. This allows the user to define
 ducting or piping etc. This includes an optional reference to a distribution system.</
xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description of the
 system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="DeliveryMethod" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This defines the way in which the HVAC system delivers
 conditioning to the space. Examples: Radiant Natural Convection Forced Convection</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="RefDistributionSystem" type="xs:IDREF">
      <xs:annotation>
        <xs:documentation>This is an (optional) reference to the distribution system that
 the HVAC system uses to provide conditioning to the space.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
```

```
</xs:complexType>
```

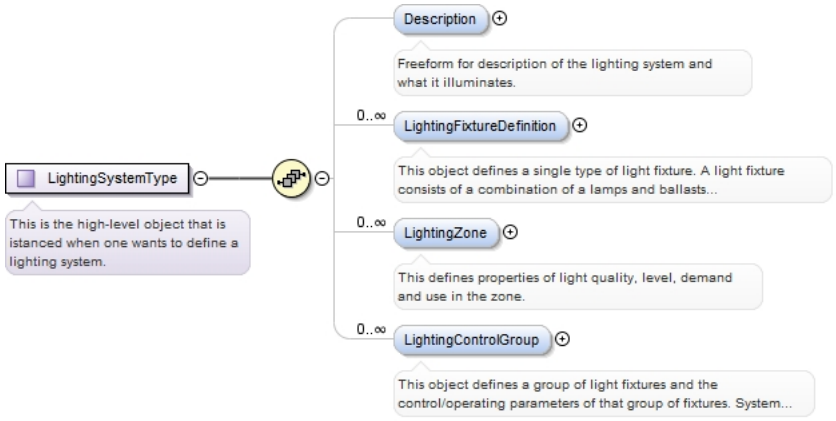
Complex Type `VentilationPropertiesType`

Namespace	http://www.iepmodel.net
Annotations	This describes the properties of ventilation. Ventilation in the IEP model is defined as the exchange (inlet or exhaust) of air with the environment outside of the building. Since Delivery System defines the way in which air is transported, this object simply defines how, when and what portion of that air is inlet from or exhausted to outside. It is not necessary to define a Delivery System in order to define ventilation. This is particularly true when the ventilation type is natural. Ventilation should not be confused with "venting". This is not where one describes the ducting that provides conditioned air to the space/zone. This is done in the DeliverySystem.
Diagram	
Used by	Element HVACSystemType/VentilationProperties
Model	Name{0,1} , Description{0,1} , VentilationControlSchedule{0,1}
Children	Description, Name, VentilationControlSchedule
Source	

```
<xs:complexType name="VentilationPropertiesType">
  <xs:annotation>
    <xs:documentation>This describes the properties of ventilation. Ventilation in the IEP
 model is defined as the exchange (inlet or exhaust) of air with the environment outside
 of the building. Since Delivery System defines the way in which air is transported,
 this object simply defines how, when and what portion of that air is inlet from or
 exhausted to outside. It is not necessary to define a Delivery System in order to define
 ventilation. This is particularly true when the ventilation type is natural. Ventilation
 should not be confused with "venting". This is not where one describes the ducting
 that provides conditioned air to the space/zone. This is done in the DeliverySystem.</
xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes and descriptions.
 Examples: - Inlet, 100% outside air, fixed/variable damper - Exhaust, fixed/variable
 damper - Outside air economizer system - Natural: Windows, manual/auto control - Exhaust,
 relief vent - Whole house fan It may be appropriate to define the nominal (maximum,
 100%) outside air flow rate, particularly when the Ventilation Control Schedule is a
 fraction schedule type. This would be useful when the ventilation type is natural or
 if no Delivery System is defined. It may be appropriate to define the flow rate units
 (cubic-feet per minute) if the Ventilation Control Schedule type is a value schedule.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="VentilationControlSchedule" type="xs:IDREF">
      <xs:annotation>
        <xs:documentation>This schedule defines when and what fraction of air is exchanged
 with outside. A fraction schedule type is most appropriate. The nominal (100%) flow rate
 would reflect the Delivery System flow rate at the given conditions. Alternatively,
 if the ventilation type is natural, the user may define the maximum flow rate in the
 Description. Another option would be to define a value schedule and indicate in the
 description what the units of the schedule values represent (i.e. cubic-feet per
 minute).</xs:documentation>
```

```
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

Complex Type `LightingSystemType`

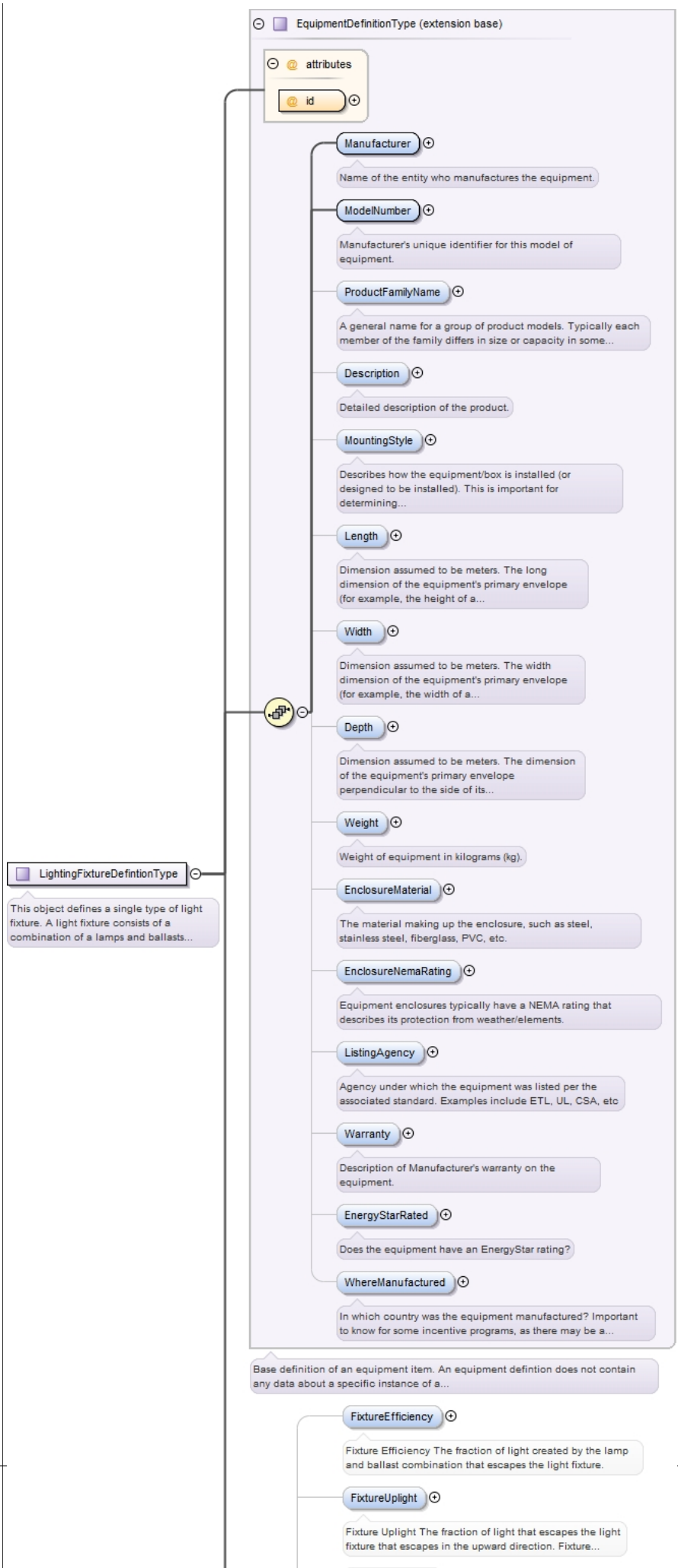
Namespace	http://www.iepmodel.net
Annotations	`This is the high-level object that is istanced when one wants to define a lighting system.`
Diagram	
Used by	Elements LightingSystem, ProjectType/ExistingLighting, SystemChoiceType/Lighting
Model	Description{0,1} , LightingFixtureDefinition* , LightingZone* , LightingControlGroup*
Children	Description, LightingControlGroup, LightingFixtureDefinition, LightingZone
Source	

```
<xs:complexType name="LightingSystemType">
  <xs:annotation>
    <xs:documentation>This is the high-level object that is istanced when one wants to
 define a lighting system.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Freeform for description of the lighting system and what it
 illuminates.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="LightingFixtureDefinition"
 type="LightingFixtureDefintionType">
      <xs:annotation>
        <xs:documentation>This object defines a single type of light fixture. A light
 fixture consists of a combination of a lamps and ballasts (optional) as well as the
 container and mounting accessories.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="LightingZone"
 type="LightingZoneType">
      <xs:annotation>
        <xs:documentation>This defines properties of light quality, level, demand and use
 in the zone.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="LightingControlGroup"
 type="LightingControlGroupType">
      <xs:annotation>
        <xs:documentation>This object defines a group of light fixtures and the control/
operating parameters of that group of fixtures. System properties are contained here.</
xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

Complex Type `LightingFixtureDefintionType`

Namespace	http://www.iepmodel.net
Annotations	`This object defines a single type of light fixture. A light fixture consists of a combination of a lamps and ballasts (optional) as well as the container and mounting accessories.`

Diagram


EquipmentDefinitionType (extension base)
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...
LightingFixtureDefintionType
This object defines a single type of light fixture. A light fixture consists of a combination of a lamps and ballasts...
FixtureEfficiency
Fixture Efficiency The fraction of light created by the lamp and ballast combination that escapes the light fixture.
FixtureUplight
Fixture Uplight The fraction of light that escapes the light fixture that escapes in the upward direction. Fixture...

Type	extension of EquipmentDefinitionType
Type hierarchy	• EquipmentDefinitionType • LightingFixtureDefintionType
Used by	Element LightingSystemType/LightingFixtureDefinition
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1} , FixtureEfficiency{0,1} , FixtureUplight{0,1} , FixtureDownlight{0,1} , FixtureIESFile* , LightingTechnology{0,1} , LampProperties{0,1} , BallastProperties{0,1}
Children	BallastProperties, Depth, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, FixtureDownlight, FixtureEfficiency, FixtureIESFile, FixtureUplight, LampProperties, Length, LightingTechnology, ListingAgency, Manufacturer, ModelNumber, MountingStyle, ProductFamilyName, Warranty, Weight, WhereManufactured, Width

Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			required

Source

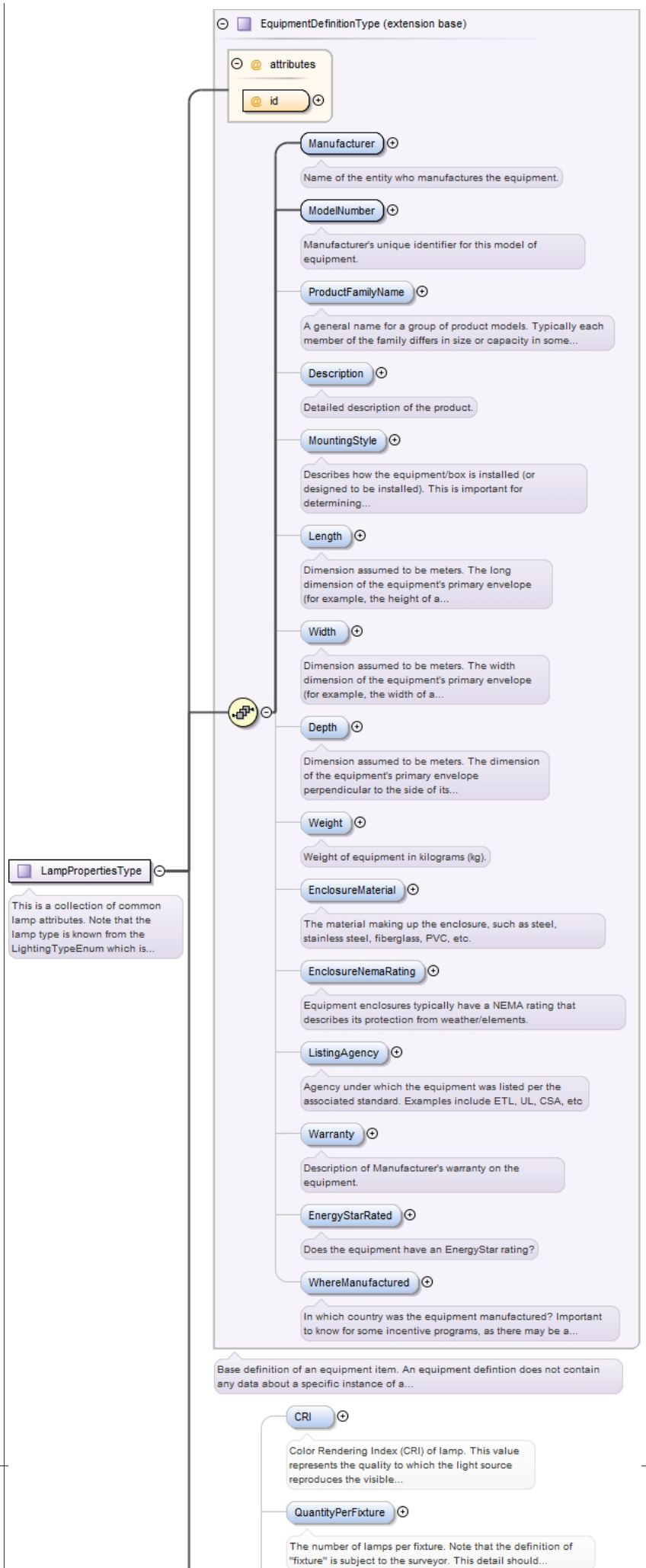
```
<xs:complexType name="LightingFixtureDefintionType">
  <xs:annotation>
    <xs:documentation>This object defines a single type of light fixture. A light fixture
 consists of a combination of a lamps and ballasts (optional) as well as the container and
 mounting accessories.</xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="EquipmentDefinitionType">
      <xs:sequence minOccurs="1" maxOccurs="1">
        <xs:element minOccurs="0" name="FixtureEfficiency">
          <xs:annotation>
            <xs:documentation>Fixture Efficiency The fraction of light created by the lamp
 and ballast combination that escapes the light fixture.</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:float">
              <xs:minInclusive value="0"/>
              <xs:maxInclusive value="1"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element minOccurs="0" name="FixtureUplight">
          <xs:annotation>
            <xs:documentation>Fixture Uplight The fraction of light that escapes the light
 fixture that escapes in the upward direction. Fixture uplight and fixture downlight
 should sum to 1.</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:float">
              <xs:minInclusive value="0"/>
              <xs:maxInclusive value="1"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element minOccurs="0" name="FixtureDownlight">
          <xs:annotation>
            <xs:documentation>Fixture Uplight The fraction of light that escapes the light
 fixture that escapes in the downward direction. Fixture uplight and fixture downlight
 should sum to 1.</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:float">
              <xs:minInclusive value="0"/>
              <xs:maxInclusive value="1"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element maxOccurs="unbounded" minOccurs="0" name="FixtureIESFile"
 type="xs:string">
          <xs:annotation>
            <xs:documentation>This element has not been fully implemented at this
 time. The IES file is created by ____ and contains... In the future, this element may
 contain the actual IES file converted to a suitable format such as text or binary.</
xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="LightingTechnology" type="LightingTechnologyEnumType"
 minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>The type of technology that is used to create light. This is
 also a general indication of the lamp type.</xs:documentation>
```

```
          </xs:annotation>
        </xs:element>
        <xs:element name="LampProperties" type="LampPropertiesType" minOccurs="0"
 maxOccurs="1">
          <xs:annotation>
            <xs:documentation>These are common attributes of a lamp.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="BallastProperties" type="BallastPropertiesType" minOccurs="0"
 maxOccurs="1">
          <xs:annotation>
            <xs:documentation>These are attributes of the ballast. There doesn't need to
 be a ballast.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Complex Type `LampPropertiesType`

Namespace	http://www.iepmodel.net
Annotations	This is a collection of common lamp attributes. Note that the lamp type is known from the LightingTypeEnum which is used in the LightingSystem element Type.

Diagram


EquipmentDefinitionType (extension base)
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...
LampPropertiesType
This is a collection of common lamp attributes. Note that the lamp type is known from the LightingTypeEnum which is...
CRI
Color Rendering Index (CRI) of lamp. This value represents the quality to which the light source reproduces the visible...
QuantityPerFixture
The number of lamps per fixture. Note that the definition of "fixture" is subject to the surveyor. This detail should...

Type	extension of EquipmentDefinitionType
Type hierarchy	• EquipmentDefinitionType • LampPropertiesType
Used by	Element LightingFixtureDefintionType/LampProperties
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1} , CRI{0,1} , QuantityPerFixture{0,1} , WattsNominal{0,1} , ColorTemperature{0,1} , InitialLumens{0,1} , MeanLumens{0,1} , SPRatio{0,1}
Children	CRI, ColorTemperature, Depth, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, InitialLumens, Length, ListingAgency, Manufacturer, MeanLumens, ModelNumber, MountingStyle, ProductFamilyName, QuantityPerFixture, SPRatio, Warranty, WattsNominal, Weight, WhereManufactured, Width

Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			required

Source

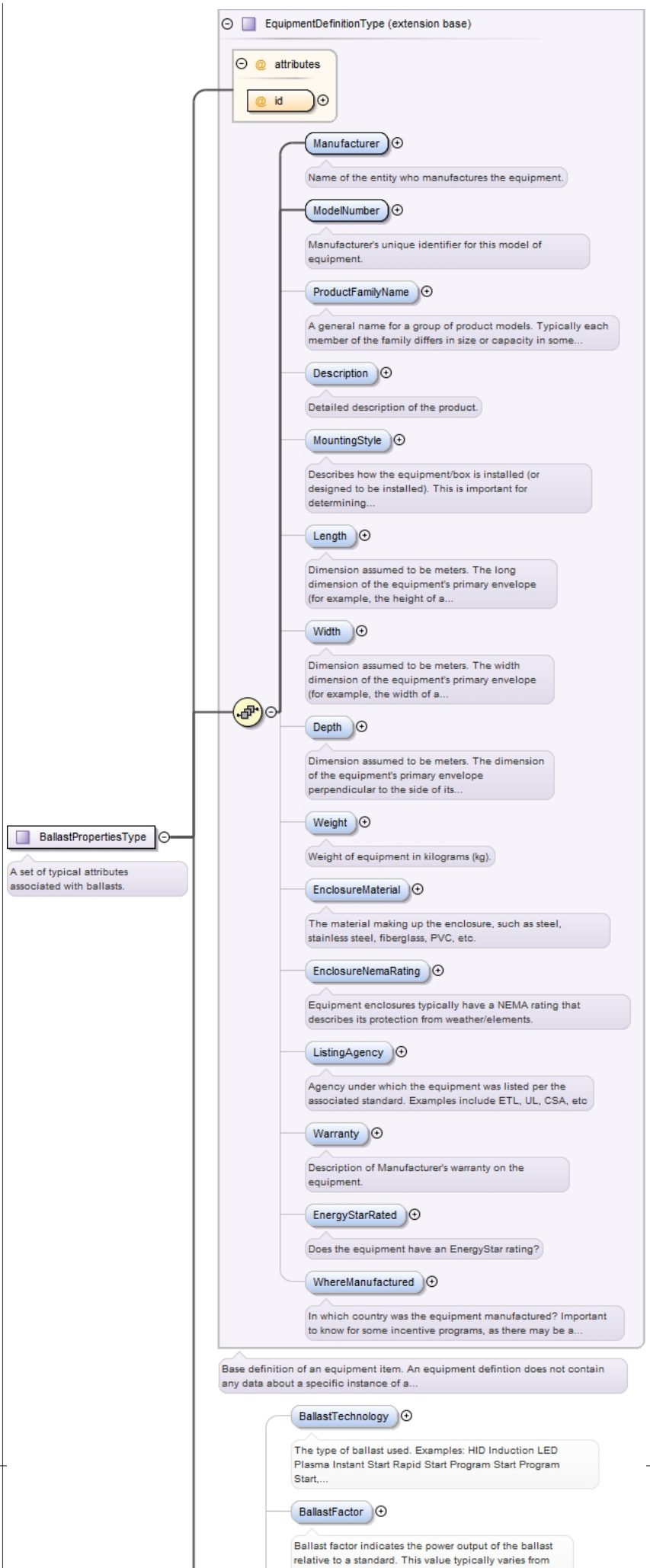
```
<xs:complexType name="LampPropertiesType">
  <xs:annotation>
    <xs:documentation>This is a collection of common lamp attributes. Note that the lamp
 type is known from the LightingTypeEnum which is used in the LightingSystem element
 Type.</xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="EquipmentDefinitionType">
      <xs:sequence minOccurs="1" maxOccurs="1">
        <xs:element name="CRI" type="xs:float" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Color Rendering Index (CRI) of lamp. This value represents
 the quality to which the light source reproduces the visible light spectrum.</
xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="QuantityPerFixture" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>The number of lamps per fixture. Note that the definition
 of "fixture" is subject to the surveyor. This detail should be described included in the
 Description element of Lighting Fixture Type.</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:int">
              <xs:minInclusive value="0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element name="WattsNominal" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Nominal wattage of the lamp (value listed on lamp label
 or nameplate). Note that this doesn't represent the actual input power of a ballasted
 fixture.</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:float">
              <xs:minExclusive value="0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element name="ColorTemperature" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>The lamp color temperature as measured in Kelvin.</
xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:float">
              <xs:minInclusive value="0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element name="InitialLumens" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Light output (in Lumens) when lamp is first powered.</
xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:int">
              <xs:minInclusive value="0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
```

```
        <xs:element name="MeanLumens" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Average light output over the lifetime of the lamp.</
xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:int">
              <xs:minInclusive value="0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element name="SPRatio" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>SP Ratio.</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:float">
              <xs:minInclusive value="0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Complex Type `BallastPropertiesType`

Namespace	http://www.iepmodel.net
Annotations	A set of typical attributes associated with ballasts.

Diagram


EquipmentDefinitionType (extension base)
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...
BallastPropertiesType
A set of typical attributes associated with ballasts.
BallastTechnology
The type of ballast used. Examples: HID Induction LED Plasma Instant Start Rapid Start Program Start Program Start,...
BallastFactor
Ballast factor indicates the power output of the ballast relative to a standard. This value typically varies from

Type	extension of EquipmentDefinitionType
Type hierarchy	• EquipmentDefinitionType • BallastPropertiesType
Used by	Element LightingFixtureDefintionType/BallastProperties
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1} , BallastTechnology{0,1} , BallastFactor{0,1} , QuantityPerFixture{0,1} , PowerFactor{0,1} , THD{0,1}
Children	BallastFactor, BallastTechnology, Depth, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, Length, ListingAgency, Manufacturer, ModelNumber, MountingStyle, PowerFactor, ProductFamilyName, QuantityPerFixture, THD, Warranty, Weight, WhereManufactured, Width

Attributes

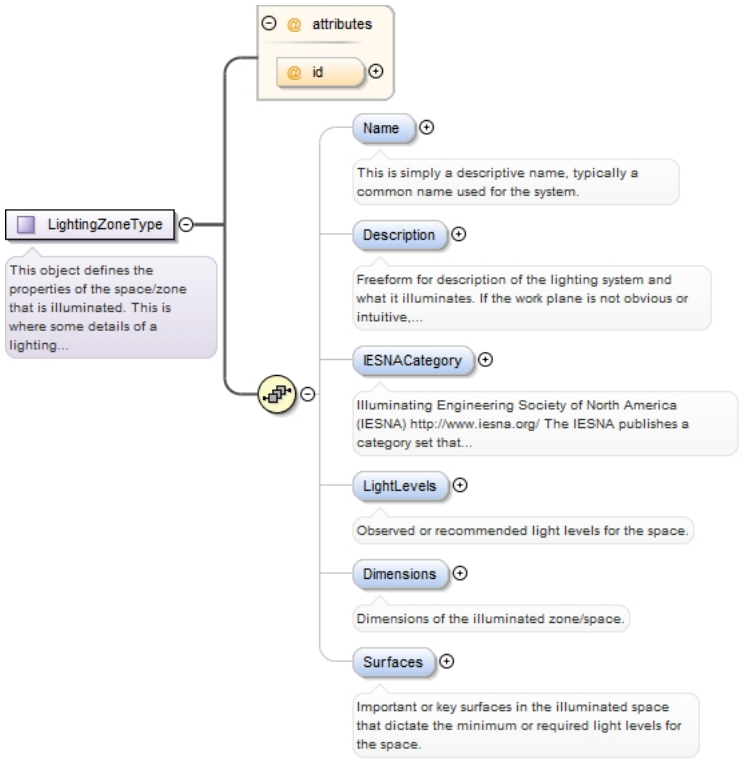
QName	Type	Fixed	Default	Use
id	xs:ID			required

Source

```
<xs:complexType name="BallastPropertiesType">
  <xs:annotation>
    <xs:documentation>A set of typical attributes associated with ballasts.</
xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="EquipmentDefinitionType">
      <xs:sequence minOccurs="1">
        <xs:element name="BallastTechnology" type="xs:string" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>The type of ballast used. Examples: HID Induction LED Plasma
 Instant Start Rapid Start Program Start Program Start, Dimming Program Start, Bi-Level
 Program Start, Multi-Level</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="BallastFactor" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Ballast factor indicates the power output of the
 ballast relative to a standard. This value typically varies from 0.5 to 1.5 and is
 typically falls 0.75 to 1.2. A value of zero may indicate that no ballast is used.</
xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:float">
              <xs:minInclusive value="0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element name="QuantityPerFixture" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>The number of ballasts per fixture. Note that the definition
 of "fixture" is subject to the surveyor. This detail should be described included in the
 Description element of Lighting System.</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:int">
              <xs:minInclusive value="0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element name="PowerFactor" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>This is the power factor of the ballast.</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:float">
              <xs:minInclusive value="0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element minOccurs="0" name="THD">
          <xs:annotation>
            <xs:documentation>Total Harmonic Distortion</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:float">
              <xs:minInclusive value="0"/>
              <xs:maxInclusive value="1"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
      </xs:sequence>
```

```
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Complex Type `LightingZoneType`

Namespace	http://www.iepmodel.net
Annotations	This object defines the properties of the space/zone that is illuminated. This is where some details of a lighting survey are contained, such as light leve, lighting planes and space use type.
Diagram	
Used by	Element LightingSystemType/LightingZone
Model	Name{0,1} , Description{0,1} , IESNACategory{0,1} , LightLevels{0,1} , Dimensions{0,1} , Surfaces{0,1}
Children	Description, Dimensions, IESNACategory, LightLevels, Name, Surfaces

Attributes

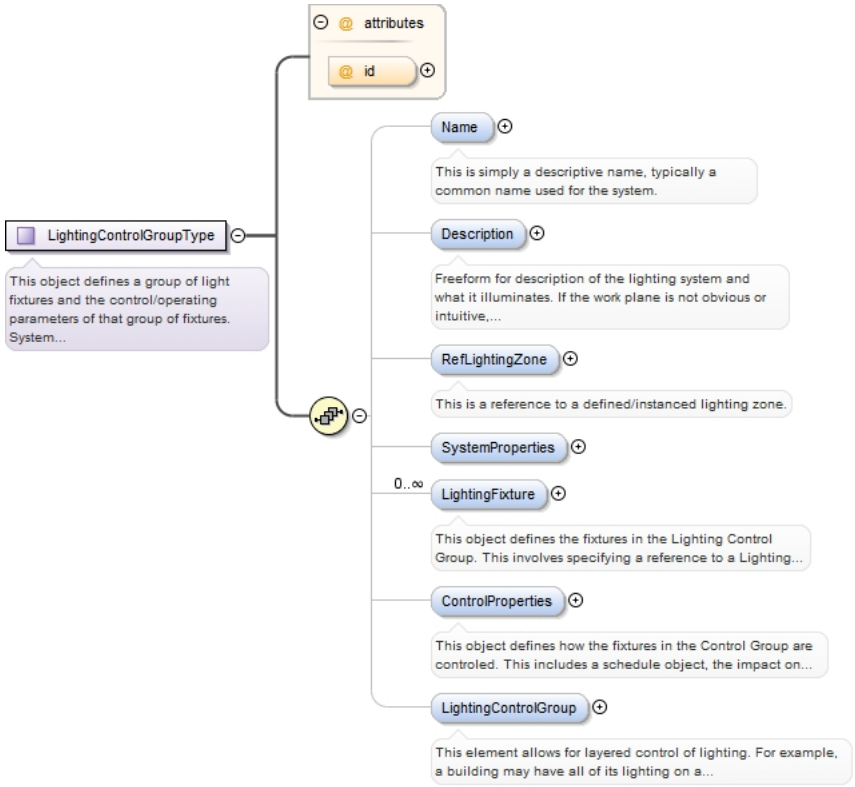
QName	Type	Fixed	Default	Use
id	xs:ID			optional

Source

```
<xs:complexType name="LightingZoneType">
  <xs:annotation>
    <xs:documentation>This object defines the properties of the space/zone that is
 illuminated. This is where some details of a lighting survey are contained, such as light
 leve, lighting planes and space use type.</xs:documentation>
  </xs:annotation>
  <xs:sequence minOccurs="1">
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Freeform for description of the lighting system and what it
 illuminates. If the work plane is not obvious or intuitive, it should be defined here.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="IESNACategory" type="xs:string">
      <xs:annotation>
        <xs:documentation>Illuminating Engineering Society of North America (IESNA)
 http://www.iesna.org/ The IESNA publishes a category set that describes the use case for
 lighting in a space. This listing can be found here:</xs:documentation>
      </xs:annotation>
    </xs:element>
```

```
    <xs:element minOccurs="0" name="LightLevels" type="xs:string">
      <xs:annotation>
        <xs:documentation>Observed or recommended light levels for the space.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="Dimensions" type="xs:string">
      <xs:annotation>
        <xs:documentation>Dimensions of the illuminated zone/space.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="Surfaces" type="xs:string">
      <xs:annotation>
        <xs:documentation>Important or key surfaces in the illuminated space that dictate
 the minimum or required light levels for the space.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="id" type="xs:ID"/>
</xs:complexType>
```

Complex Type `LightingControlGroupType`

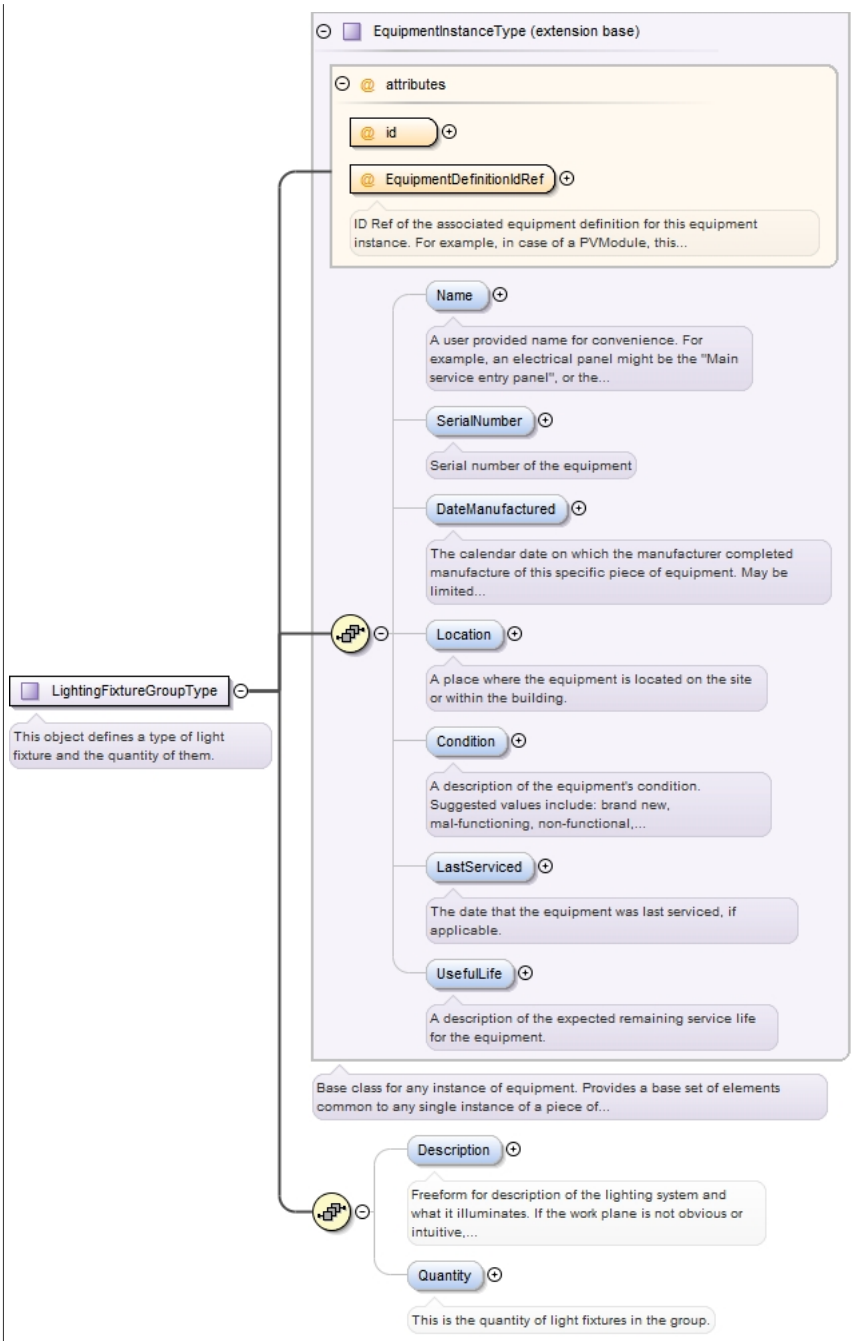
Namespace	http://www.iepmodel.net
Annotations	`This object defines a group of light fixtures and the control/operating parameters of that group of fixtures. System properties are contained here.`
Diagram	
Used by	Elements: LightingControlGroupType/LightingControlGroup, LightingSystemType/LightingControlGroup
Model	Name{0,1} , Description{0,1} , RefLightingZone{0,1} , SystemProperties{0,1} , LightingFixture* , ControlProperties{0,1} , LightingControlGroup{0,1}
Children	ControlProperties, Description, LightingControlGroup, LightingFixture, Name, RefLightingZone, SystemProperties
Attributes	**QName** | **Type** | **Fixed** | **Default** | **Use** **id** | xs:ID | | | optional
Source	

```
<xs:complexType name="LightingControlGroupType">
  <xs:annotation>
    <xs:documentation>This object defines a group of light fixtures and the control/
operating parameters of that group of fixtures. System properties are contained here.</
xs:documentation>
  </xs:annotation>
  <xs:sequence>
```

```
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Freeform for description of the lighting system and what it
 illuminates. If the work plane is not obvious or intuitive, it should be defined here.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="RefLightingZone" type="xs:IDREF">
      <xs:annotation>
        <xs:documentation>This is a reference to a defined/instanced lighting zone.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="SystemProperties" type="CommonSystemPropertiesType"/>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="LightingFixture"
 type="LightingFixtureGroupType">
      <xs:annotation>
        <xs:documentation>This object defines the fixtures in the Lighting Control Group.
 This involves specifying a reference to a Lighting Fixture Type defined in the Lighting
 System and a quantity of the Fixture Type.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ControlProperties" type="LightingControlMethodType" minOccurs="0">
      <xs:annotation>
        <xs:documentation>This object defines how the fixtures in the Control Group are
 controled. This includes a schedule object, the impact on the operating hours if an
 automatic control type is defined, the way in which the fixtures are controled (auto,
 manual, etc.), and the switching method (the way that the light output is modulated -
 dimming, on/off, bi-level...).</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="LightingControlGroup" type="LightingControlGroupType">
      <xs:annotation>
        <xs:documentation>This element allows for layered control of lighting. For
 example, a building may have all of its lighting on a timeclock that turns off power to
 all of the lighting system at night. In addition, the light fixtures in an open office
 area may be manually switched. The light fixtures in another exterior office are may
 be on an occupancy and/or daylight sensor. In this example, some light fixtures have
 multiple layers of control.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="id" type="xs:ID"/>
</xs:complexType>
```

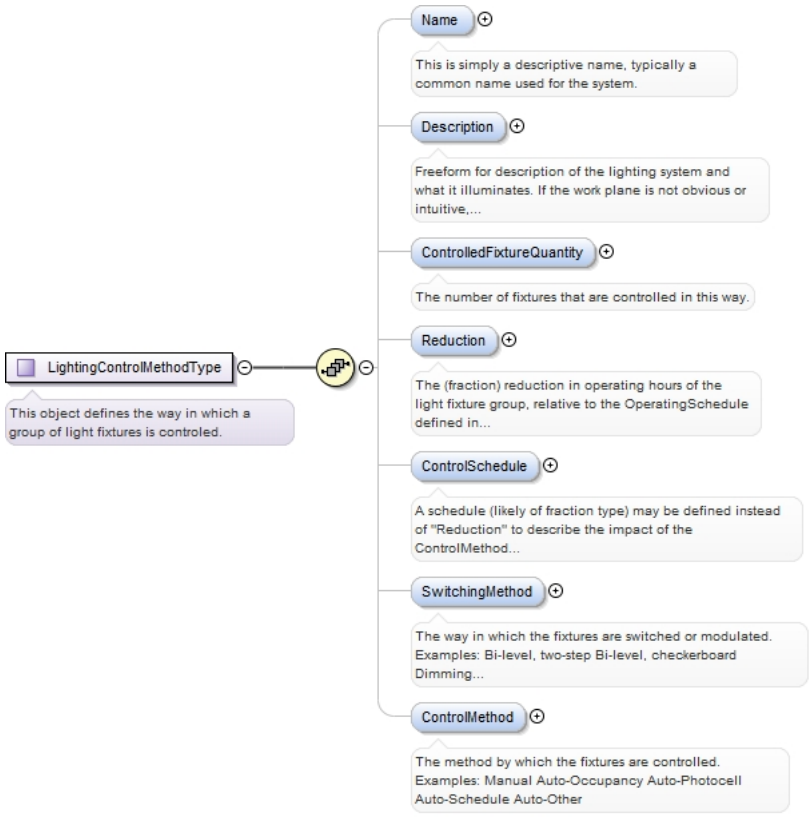
Complex Type `LightingFixtureGroupType`

Namespace	http://www.iepmodel.net
Annotations	This object defines a type of light fixture and the quantity of them.

Diagram	
Type	extension of EquipmentInstanceType
Type hierarchy	• EquipmentInstanceType • LightingFixtureGroupType
Used by	Element LightingControlGroupType/LightingFixture
Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1} , Description{0,1} , Quantity{0,1}
Children	Condition, DateManufactured, Description, LastServiced, Location, Name, Quantity, SerialNumber, UsefulLife
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **EquipmentDefinitionIdRef** IDREF — required `ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.` **id** xs:ID — required

Source	<xs:complexType name="LightingFixtureGroupType"> <xs:annotation> <xs:documentation>This object defines a type of light fixture and the quantity of them.</xs:documentation> </xs:annotation> <xs:complexContent> <xs:extension base="EquipmentInstanceType"> <xs:sequence> <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Freeform for description of the lighting system and what it illuminates. If the work plane is not obvious or intuitive, it should be defined here.</xs:documentation> </xs:annotation> </xs:element> <xs:element minOccurs="0" name="Quantity"> <xs:annotation> <xs:documentation>This is the quantity of light fixtures in the group.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:int"> <xs:minInclusive value="0"/> </xs:restriction> </xs:simpleType> </xs:element> </xs:sequence> </xs:extension> </xs:complexContent> </xs:complexType>

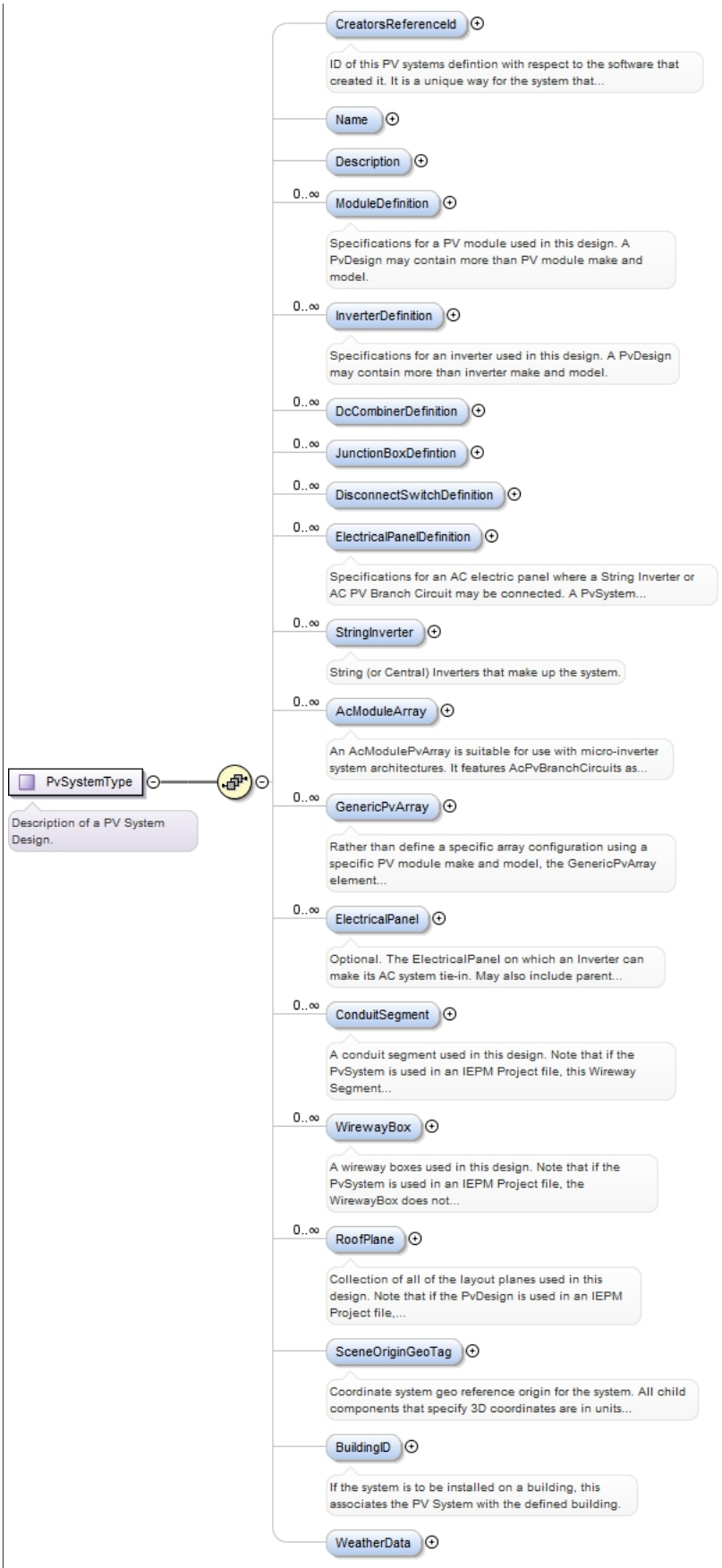
Complex Type `LightingControlMethodType`

Namespace	http://www.iepmodel.net
Annotations	This object defines the way in which a group of light fixtures is controled.
Diagram	
Used by	Element LightingControlGroupType/ControlProperties
Model	Name{0,1} , Description{0,1} , ControlledFixtureQuantity{0,1} , Reduction{0,1} , ControlSchedule{0,1} , SwitchingMethod{0,1} , ControlMethod{0,1}
Children	ControlMethod, ControlSchedule, ControlledFixtureQuantity, Description, Name, Reduction, SwitchingMethod
Source	<xs:complexType name="LightingControlMethodType">

```
  <xs:annotation>
    <xs:documentation>This object defines the way in which a group of light fixtures is
 controled.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Freeform for description of the lighting system and what it
 illuminates. If the work plane is not obvious or intuitive, it should be defined here.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="ControlledFixtureQuantity">
      <xs:annotation>
        <xs:documentation>The number of fixtures that are controlled in this way.</
xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:int">
          <xs:minInclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element minOccurs="0" name="Reduction">
      <xs:annotation>
        <xs:documentation>The (fraction) reduction in operating hours of the light fixture
 group, relative to the OperatingSchedule defined in SystemProperties, that results from
 the ControlMethod and SwitchingMethod.</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:float">
          <xs:minInclusive value="0"/>
          <xs:maxInclusive value="1"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element minOccurs="0" name="ControlSchedule" type="xs:IDREF">
      <xs:annotation>
        <xs:documentation>A schedule (likely of fraction type) may be defined instead
 of "Reduction" to describe the impact of the ControlMethod and SwitchingMethod on the
 operation/operating-hours of the Fixtures.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="SwitchingMethod" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The way in which the fixtures are switched or modulated.
 Examples: Bi-level, two-step Bi-level, checkerboard Dimming Three Position Switch On/Off
 Other</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ControlMethod" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The method by which the fixtures are controlled. Examples:
 Manual Auto-Occupancy Auto-Photocell Auto-Schedule Auto-Other</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

Complex Type PvSystemType

Namespace	http://www.iepmodel.net
Annotations	Description of a PV System Design.

Diagram	
Used by	Elements ProjectType/ExistingPvSystem, PvSystem, SystemChoiceType/PhotovoltaicSystem
Model	CreatorsReferenceId{0,1} , Name{0,1} , Description{0,1} , ModuleDefinition* , InverterDefinition* , DcCombinerDefinition* , JunctionBoxDefintion* , DisconnectSwitchDefinition* , ElectricalPanelDefinition* ,

	StringInverter* , AcModuleArray* , GenericPvArray* , ElectricalPanel* , ConduitSegment* , WirewayBox* , RoofPlane* , SceneOriginGeoTag{0,1} , BuildingID{0,1} , WeatherData{0,1}
Children	AcModuleArray, BuildingID, ConduitSegment, CreatorsReferenceId, DcCombinerDefinition, Description, DisconnectSwitchDefinition, ElectricalPanel, ElectricalPanelDefinition, GenericPvArray, InverterDefinition, JunctionBoxDefintion, ModuleDefinition, Name, RoofPlane, SceneOriginGeoTag, StringInverter, WeatherData, WirewayBox
Source	<xs:complexType name="PvSystemType"> <xs:annotation> <xs:documentation>Description of a PV System Design.</xs:documentation> </xs:annotation> <xs:sequence> <xs:element minOccurs="0" name="CreatorsReferenceId" type="ApplicationIDType"> <xs:annotation> <xs:documentation>ID of this PV systems defintion with respect to the software that created it. It is a unique way for the system that created it to know what data in its database that this PV System XML instance refers to.</xs:documentation> </xs:annotation> </xs:element> <xs:element minOccurs="0" name="Name" type="xs:string" maxOccurs="1"/> <xs:element minOccurs="0" name="Description" type="xs:string" maxOccurs="1"/> <xs:element name="ModuleDefinition" type="PvModuleDefinitionType" minOccurs="0" maxOccurs="unbounded"> <xs:annotation> <xs:documentation>Specifications for a PV module used in this design. A PvDesign may contain more than PV module make and model.</xs:documentation> </xs:annotation> </xs:element> <xs:element name="InverterDefinition" type="InverterDefinitionType" minOccurs="0" maxOccurs="unbounded"> <xs:annotation> <xs:documentation>Specifications for an inverter used in this design. A PvDesign may contain more than inverter make and model.</xs:documentation> </xs:annotation> </xs:element> <xs:element maxOccurs="unbounded" minOccurs="0" name="DcCombinerDefinition" type="DcCombinerDefinitionType"/> <xs:element maxOccurs="unbounded" minOccurs="0" name="JunctionBoxDefintion" type="JunctionBoxDefinitionType"/> <xs:element maxOccurs="unbounded" minOccurs="0" name="DisconnectSwitchDefinition" type="DisconnectSwitchDefinitionType"/> <xs:element maxOccurs="unbounded" minOccurs="0" name="ElectricalPanelDefinition" type="ElectricalPanelDefinitionType"> <xs:annotation> <xs:documentation>Specifications for an AC electric panel where a String Inverter or AC PV Branch Circuit may be connected. A PvSystem may contain more than one AC electric panel make and model (each Inverter or AC PV Branch Circuit can connect to different equipment).</xs:documentation> </xs:annotation> </xs:element> <xs:element name="StringInverter" type="StringInverterType" minOccurs="0" maxOccurs="unbounded"> <xs:annotation> <xs:documentation>String (or Central) Inverters that make up the system.</xs:documentation> </xs:annotation> </xs:element> <xs:element maxOccurs="unbounded" minOccurs="0" name="AcModuleArray" type="AcModulePvArrayType"> <xs:annotation> <xs:documentation>An AcModulePvArray is suitable for use with micro-inverter system architectures. It features AcPvBranchCircuits as building blocks. NOTE: An AC Module is assumed to be either: 1) an integrated micro-inverter and PV module, OR 2) an independent PV module and micro-inverter pair.</xs:documentation> </xs:annotation> </xs:element> <xs:element maxOccurs="unbounded" minOccurs="0" name="GenericPvArray" type="GenericPvArrayType"> <xs:annotation> <xs:documentation>Rather than define a specific array configuration using a specific PV module make and model, the GenericPvArray element allows an array to be defined simply as a total DC power output. The PvArray Base Type provides all the orientation, derate, and solar access parameters necessary to evaluate this "generic" array using a tool like NREL's PVWatts. The GenericPvArray element is useful for feasibility studies where specific designs are not required.</xs:documentation> </xs:annotation> </xs:element> <xs:element maxOccurs="unbounded" minOccurs="0" name="ElectricalPanel" type="ElectricalPanelType"> <xs:annotation> <xs:documentation>Optional. The ElectricalPanel on which an Inverter can make its AC system tie-in. May also include parent ElectricalPanels. Use of this element is

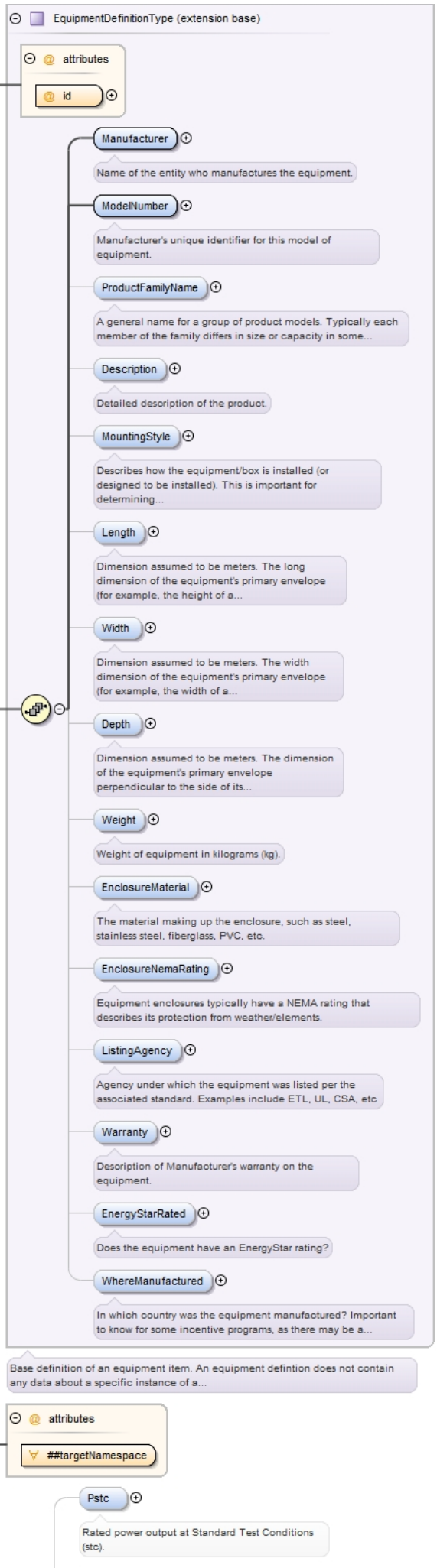
```
somewhat dependent on what XSDs are used. This element is always used to describe a new
electrical panel which will be added to a site to accommodate the addition of a PV system
(perhaps serving as an AC Combiner). If PvDesign xml document is used independently from
a broader Project XML document, then this element can also be used to define existing
ElectricalPanel(s) where the PV system may be interconnected. This element is not
required when the PvDesign is used within a broader Project XML instance that contains an
ExistingElectricalDitributionHierarchy and the PvDesign's Inverter(s) are to be connected
to the ElectricalPanel(s) defined there. NOTE: The EquipmentWhereConnectedIdRef within
the Inverter's AcCircuitConnection should reference either this element, or a similar
ElectricalPanel instance within an ExistingElectricalDistributionHierarchy element of a
Project.xml. NOTE: A PvDesign cannot be used within an ElectricalDistributionHierarchy
element. It can only be associated with an ElectricalDistributionHierarchy via
EquipmentWhereConnectedIdRef attribute of the Inverter's AcTie-InCircuitConnection
element.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ConduitSegment" type="ConduitSegmentType" minOccurs="0"
 maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>A conduit segment used in this design. Note that if the
PvSystem is used in an IEPM Project file, this Wireway Segment does not reference
any ExistingWirewaySegments or ProposedWirewaySegments defined in the Site element.
Those elements are used for site survey data collection, not system definition.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="WirewayBox"
 type="WirewayBoxType">
      <xs:annotation>
        <xs:documentation>A wireway boxes used in this design. Note that if the
PvSystem is used in an IEPM Project file, the WirewayBox does not reference any
ExistingWirewaySegments or ProposedWirewaySegments defined in the Site element.
Those elements are used for site survey data collection, not system definition.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="RoofPlane" type="RoofPlaneType" minOccurs="0" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>Collection of all of the layout planes used in this design. Note
that if the PvDesign is used in an IEPM Project file, this collection of LayoutPlanes
does not reference any LayoutPlane defined in the Site-Building-Envelope-Roof element.
LayoutPlane element(s) defined for a Roof element can be used in a PvDesign as the plane
on which modules are installed. The PvDesign would include those LayoutPlane elements
here, rather than referencing them as a part of the Building's Roof inside the Project's
Site element. The LayoutPlane elements in the Roof are primarily used for site survey
data collection, not system definition.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="SceneOriginGeoTag" type="GeoLocationType" minOccurs="0"
 maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Coordinate system geo reference origin for the system. All child
components that specify 3D coordinates are in units meters relative to this location. The
3D coordinate of this origin is (0,0,0).</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="BuildingID" type="xs:IDREF" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>If the system is to be installed on a building, this associates
the PV System with the defined building.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="WeatherData">
      <xs:complexType>
        <xs:sequence>
          <xs:element minOccurs="0" name="ExpectedHighTemperature" type="xs:decimal">
            <xs:annotation>
              <xs:documentation>Expected highest temperature in degrees Celcius at the
system's location. Used to evaluate equipment derating.</xs:documentation>
            </xs:annotation>
          </xs:element>
          <xs:element minOccurs="0" name="ExpectedLowTemperature" type="xs:decimal">
            <xs:annotation>
              <xs:documentation>Expected lowest temperature in degrees Celcius at the
system's location. Used to evaluate maximum system output.</xs:documentation>
            </xs:annotation>
          </xs:element>
          <xs:element minOccurs="0" name="SiteWeatherData" type="SiteWeatherDataType"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
```

	`</xs:complexType>`

Complex Type `PvModuleDefinitionType`

Namespace	http://www.iepmodel.net
Annotations	`Definition of a PV module.`

Diagram


EquipmentDefinitionType (extension base)
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...
attributes
##targetNamespace
Pstc
Rated power output at Standard Test Conditions (stc).

Type	extension of EquipmentDefinitionType
Type hierarchy	• EquipmentDefinitionType • PvModuleDefinitionType
Used by	Element PvSystemType/ModuleDefinition
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1} , Pstc{0,1} , PstcToleranceHighPercent{0,1} , PstcToleranceLowPercent{0,1} , Pptc{0,1} , Vmpp{0,1} , Impp{0,1} , Voc{0,1} , Isc{0,1} , MaxSystemVoltage{0,1} , MaxSystemCurrent{0,1} , FuseRating{0,1} , Noct{0,1} , VocTempCoefficient{0,1} , IscTempCoefficient{0,1} , MaxPowerTempCoefficient{0,1} , ModuleEfficiency{0,1} , CellEfficiency{0,1} , CellTechnology{0,1} , ModuleConstruction{0,1} , BIPV{0,1} , CableConnector{0,1} , CableDiameter{0,1} , ConnectorCableLength{0,1} , CellDimensions{0,1} , CellCount{0,1} , BypassDiodeCount{0,1} , ParallelSubstrings{0,1} , DepthWithJunctionBox{0,1} , FrameMaterial{0,1} , FrameColor{0,1} , BacksheetColor{0,1} , PowerWarranty* , Compliances{0,1} , UL1703Compliant{0,1} , NrtlCertifyingUl1703Compliance{0,1} , CsiApproved{0,1} , CecVmppLowLight{0,1} , CecImppLowLight{0,1} , CecVmppNoct{0,1} , CecImppNoct{0,1} , CecGeometricMultipl{0,1} , MeasurementDate{0,1} , FiveParamAref{0,1} , FiveParamILref{0,1} , FiveParamIoref{0,1} , FiveParamRs{0,1} , FiveParamRshref{0,1} , FiveParamAdjust{0,1} , SandiaIxo{0,1} , SandiaIxxo{0,1} , SandiaDiodeFactor{0,1} , SandiaThermalVoltage{0,1} , SandiaMbVoc{0,1} , SandiaMbVmpp{0,1} , GammaPmppPercent{0,1} , BetaVocPercent{0,1} , BetaMppPercent{0,1} , AlphaIscPercent{0,1} , AlphaImppPercent{0,1} , SandiaTempFactorA{0,1} , SandiaTempFactorB{0,1} , SandiaCoefA0{0,1} , SandiaCoefA1{0,1} , SandiaCoefA2{0,1} , SandiaCoefA3{0,1} , SandiaCoefA4{0,1} , SandiaCoefB0{0,1} , SandiaCoefB1{0,1} , SandiaCoefB2{0,1} , SandiaCoefB3{0,1} , SandiaCoefB4{0,1} , SandiaCoefB5{0,1} , SandiaCoefC0{0,1} , SandiaCoefC1{0,1} , SandiaCoefC2{0,1} , SandiaCoefC3{0,1} , SandiaCoefC4{0,1} , SandiaCoefC5{0,1} , SandiaCoefC6{0,1} , SandiaCoefC7{0,1} , SandiaDiffuseAcceptanceFactor{0,1} , Notes{0,1}
Children	AlphaImppPercent, AlphaIscPercent, BIPV, BacksheetColor, BetaMppPercent, BetaVocPercent, BypassDiodeCount, CableConnector, CableDiameter, CecGeometricMultipl, CecImppLowLight, CecImppNoct, CecVmppLowLight, CecVmppNoct, CellCount, CellDimensions, CellEfficiency, CellTechnology, Compliances, ConnectorCableLength, CsiApproved, Depth, DepthWithJunctionBox, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, FiveParamAdjust, FiveParamAref, FiveParamILref, FiveParamIoref, FiveParamRs, FiveParamRshref, FrameColor, FrameMaterial, FuseRating, GammaPmppPercent, Impp, Isc, IscTempCoefficient, Length, ListingAgency, Manufacturer, MaxPowerTempCoefficient, MaxSystemCurrent, MaxSystemVoltage, MeasurementDate, ModelNumber, ModuleConstruction, ModuleEfficiency, MountingStyle, Noct, Notes, NrtlCertifyingUl1703Compliance, ParallelSubstrings, PowerWarranty, Pptc, ProductFamilyName, Pstc, PstcToleranceHighPercent, PstcToleranceLowPercent, SandiaCoefA0, SandiaCoefA1, SandiaCoefA2, SandiaCoefA3, SandiaCoefA4, SandiaCoefB0, SandiaCoefB1, SandiaCoefB2, SandiaCoefB3, SandiaCoefB4, SandiaCoefB5, SandiaCoefC0, SandiaCoefC1, SandiaCoefC2, SandiaCoefC3, SandiaCoefC4, SandiaCoefC5, SandiaCoefC6, SandiaCoefC7, SandiaDiffuseAcceptanceFactor, SandiaDiodeFactor, SandiaIxo, SandiaIxxo, SandiaMbVmpp, SandiaMbVoc, SandiaTempFactorA, SandiaTempFactorB, SandiaThermalVoltage, UL1703Compliant, Vmpp, Voc, VocTempCoefficient, Warranty, Weight, WhereManufactured, Width

Attributes

QName	Type	Fixed	Default	Use
ANY attribute from TARGET namespace 'http://www.iepmodel.net'				
id	xs:ID			required

Source

```
<xs:complexType name="PvModuleDefinitionType">
  <xs:annotation>
    <xs:documentation>Definition of a PV module.</xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="EquipmentDefinitionType">
      <xs:sequence>
        <xs:element name="Pstc" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Rated power output at Standard Test Conditions (stc).</
xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:double">
              <xs:minInclusive value="1.0"/>
              <xs:maxInclusive value="800.0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element name="PstcToleranceHighPercent" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Upper range of variation from rated power at STC. A module
 with this specification may output up to x % more than rated Pstc.</xs:documentation>
          </xs:annotation>
```

```
          <xs:simpleType>
            <xs:restriction base="xs:double">
              <xs:minInclusive value="0.0"/>
              <xs:maxInclusive value="20.0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element name="PstcToleranceLowPercent" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Lower range of variation from rated power at STC. A module
 with this specification may output up to x % less than rated Pstc.</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:double">
              <xs:minInclusive value="-20.0"/>
              <xs:maxInclusive value="0.0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element name="Pptc" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Rated power at PVUSA test conditions (PTC).</
xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:double">
              <xs:minInclusive value="1.0"/>
              <xs:maxInclusive value="800.0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element name="Vmpp" minOccurs="0" maxOccurs="1" type="xs:double">
          <xs:annotation>
            <xs:documentation>Voltage at max power (V)</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="Impp" minOccurs="0" maxOccurs="1" type="xs:double">
          <xs:annotation>
            <xs:documentation>Current in amps at max power.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="Voc" minOccurs="0" maxOccurs="1" type="xs:double">
          <xs:annotation>
            <xs:documentation>Open Circuit Voltage (V)</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="Isc" minOccurs="0" maxOccurs="1" type="xs:double">
          <xs:annotation>
            <xs:documentation>Short circuit current in amps.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="MaxSystemVoltage" minOccurs="0" maxOccurs="1" type="xs:double">
        </xs:element>
        <xs:element name="MaxSystemCurrent" minOccurs="0" maxOccurs="1" type="xs:double">
        </xs:element>
        <xs:element name="FuseRating" minOccurs="0" maxOccurs="1" type="xs:integer">
        </xs:element>
        <xs:element name="Noct" minOccurs="0" maxOccurs="1" type="xs:double">
          <xs:annotation>
            <xs:documentation>Nominal operating cell temperature (NOCT), expressed in deg
 C.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="VocTempCoefficient" type="xs:double">
          <xs:annotation>
            <xs:documentation>Open circuit voltage temperature coefficient, expressed in
 % / deg C.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="IscTempCoefficient" type="xs:double">
          <xs:annotation>
            <xs:documentation>Short circuit current temperature coefficient, expressed in
 % / deg C.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="MaxPowerTempCoefficient" type="xs:double">
          <xs:annotation>
            <xs:documentation>Maximum power temperature coefficient, expressed in % / deg
 C.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="ModuleEfficiency" type="xs:double">
          <xs:annotation>
```

```
            <xs:documentation>Average efficiency of the entire module assembly, in
 percent.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="CellEfficiency" minOccurs="0" maxOccurs="1" type="xs:double">
          <xs:annotation>
            <xs:documentation>Average efficiency of a single cell within the module
 assembly, in percent.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="CellTechnology" minOccurs="0" maxOccurs="1" type="xs:string">
          <xs:annotation>
            <xs:documentation>Describes the type of photovoltaic cell material. Values
 include "Mono," "Poly," "a-Si," "Ribbon," "Mono + a-Si," "CdTe," "CIGS," "a-Si + micro-
c," and "CIS"</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="ModuleConstruction" minOccurs="0" maxOccurs="1"
 type="xs:string">
          <xs:annotation>
            <xs:documentation>Describes the type of construction used for the module.
 For example, "Glass on Glass - frameless," "Framed glass with backsheet," etc.</
xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="BIPV" minOccurs="0" maxOccurs="1" type="xs:boolean">
          <xs:annotation>
            <xs:documentation>Is the module classified as Building Integrated PV?
 The California Solar Initiative's (CSI) list of approved modules maintains such a
 classification. TRUE means that it is.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="CableConnector" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Types of cable connections. Values may include "J-
Box," "MC-3 (Solarline1)," "MC-4 (Solarline2)," "Tyco SolarLok," "Terminals," "MC
 (unspecified)"</xs:documentation>
          </xs:annotation>
          <xs:simpleType>
            <xs:restriction base="xs:string">
              <xs:maxLength value="255"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element name="CableDiameter" minOccurs="0" maxOccurs="1" type="xs:string">
          <xs:annotation>
            <xs:documentation>Wire gauge in AWG or kcmil.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="ConnectorCableLength" type="xs:double">
          <xs:annotation>
            <xs:documentation>Length of pre-installed cables.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="CellDimensions" minOccurs="0" maxOccurs="1" type="xs:string">
        </xs:element>
        <xs:element name="CellCount" minOccurs="0" maxOccurs="1" type="xs:integer">
        </xs:element>
        <xs:element name="BypassDiodeCount" minOccurs="0" maxOccurs="1" type="xs:integer">
        </xs:element>
        <xs:element name="ParallelSubstrings" minOccurs="0" maxOccurs="1"
 type="xs:integer">
        </xs:element>
        <xs:element name="DepthWithJunctionBox" minOccurs="0" maxOccurs="1"
 type="xs:double">
        </xs:element>
        <xs:element name="FrameMaterial" minOccurs="0" maxOccurs="1" type="xs:string">
        </xs:element>
        <xs:element minOccurs="0" name="FrameColor" type="xs:string"/>
        <xs:element minOccurs="0" name="BacksheetColor" type="xs:string"/>
        <xs:element name="PowerWarranty" minOccurs="0" maxOccurs="unbounded">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="WarrantyPeriod" type="xs:integer">
                <xs:annotation>
                  <xs:documentation>This defines the number of years of the warranty from
 the point at which the system was installed.</xs:documentation>
                </xs:annotation>
              </xs:element>
              <xs:element name="WarrantedPower" type="xs:string">
                <xs:annotation>
                  <xs:documentation>This describes the percentage of original rated output
 that can be expected at the end of the WarrantyPeriod</xs:documentation>
```

```
              </xs:annotation>
            </xs:element>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
      <xs:element minOccurs="0" name="Compliances" type="xs:string">
        <xs:annotation>
          <xs:documentation>Describes testing standards with which the PV module
complies.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element minOccurs="0" name="UL1703Compliant" type="xs:boolean">
        <xs:annotation>
          <xs:documentation>Is the PV module UL 1703 compliant?</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element minOccurs="0" name="NrtlCertifyingUl1703Compliance" type="xs:string">
        <xs:annotation>
          <xs:documentation>Name of the testing lab (NRTL) that certifies compliance
with UL 1703.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element minOccurs="0" name="CsiApproved" type="xs:boolean">
        <xs:annotation>
          <xs:documentation>Is the PV module listed as approved by the California Solar
Initiative (CSI)? True means that it is approved.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="CecVmppLowLight" minOccurs="0" maxOccurs="1">
        <xs:simpleType>
          <xs:restriction base="xs:double">
            <xs:minInclusive value=".1"/>
            <xs:maxInclusive value="500.0"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:element>
      <xs:element name="CecImppLowLight" minOccurs="0" maxOccurs="1">
        <xs:simpleType>
          <xs:restriction base="xs:double">
            <xs:minInclusive value=".1"/>
            <xs:maxInclusive value="50.0"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:element>
      <xs:element name="CecVmppNoct" minOccurs="0" maxOccurs="1">
        <xs:simpleType>
          <xs:restriction base="xs:double">
            <xs:minInclusive value="1.0"/>
            <xs:maxInclusive value="500.0"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:element>
      <xs:element name="CecImppNoct" minOccurs="0" maxOccurs="1">
        <xs:simpleType>
          <xs:restriction base="xs:double">
            <xs:minInclusive value=".1"/>
            <xs:maxInclusive value="50.0"/>
          </xs:restriction>
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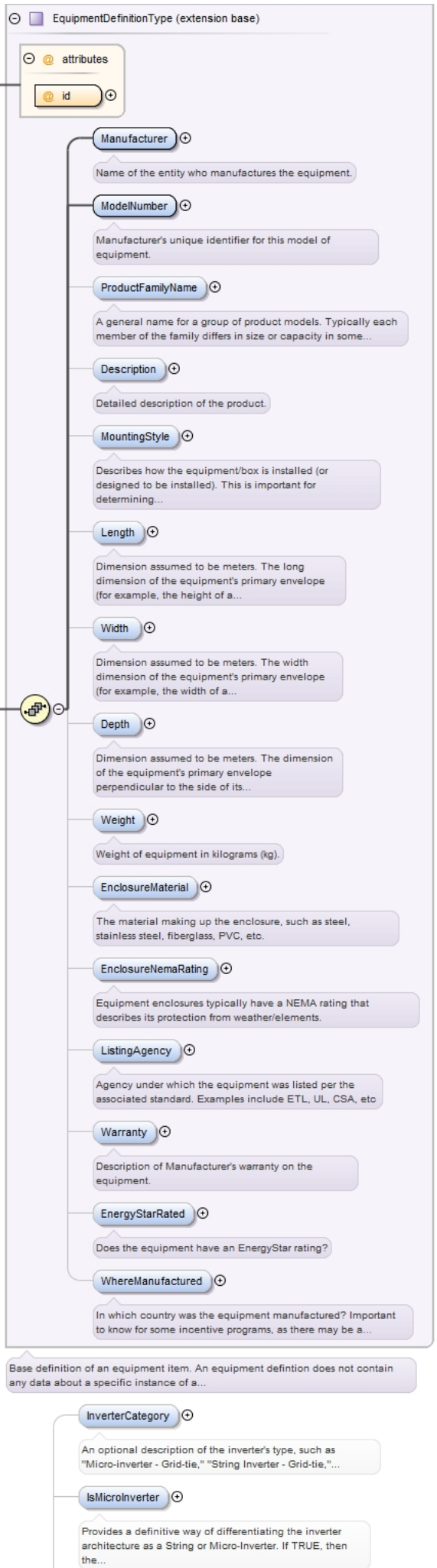
```

Complex Type `InverterDefinitionType`

Namespace	http://www.iepmodel.net
Annotations	`Definition of a DC to AC inverter.`

Diagram


EquipmentDefinitionType (extension base)
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...
InverterCategory
An optional description of the inverter's type, such as "Micro-inverter - Grid-tie," "String Inverter - Grid-tie,"...
IsMicroInverter
Provides a definitive way of differentiating the inverter architecture as a String or Micro-Inverter. If TRUE, then the...

Type	extension of EquipmentDefinitionType
Type hierarchy	• EquipmentDefinitionType • InverterDefinitionType
Used by	Element PvSystemType/InverterDefinition
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1} , InverterCategory{0,1} , IsMicroInverter{0,1} , MppTrackerQuantity{0,1} , MinMpptVoltage{0,1} , MaxMpptVoltage{0,1} , MaxDcInputPower{0,1} , NominalDcVoltage{0,1} , MaxDcVoltage{0,1} , PvDcStartVoltage{0,1} , NominalDcCurrent{0,1} , MaxDcCurrent{0,1} , DcTerminalQuantity{0,1} , DcTerminalMechanism{0,1} , DcTerminalWireRange{0,1} , IntegratedDcDisconnect{0,1} , IntegratedDcDisconnectRating{0,1} , IntegratedCombiner{0,1} , IntegratedCombinerFuses{0,1} , IntegratedCombinerMaxFuse{0,1} , NominalAcPower{0,1} , NominalAcVoltage{0,1} , GridVoltageRange{0,1} , GridFrequency{0,1} , MaxAcCurrent{0,1} , AcOcpdRating{0,1} , AcOcpdInterruptCapacity{0,1} , IntegratedAcDisconnect{0,1} , IntegratedAcDisconnectRating{0,1} , NeutralSizingRequirement{0,1} , AcTerminalQuantity{0,1} , AcTerminalWireRange{0,1} , GecTerminalQuantity{0,1} , GecTerminalWireRange{0,1} , MaxEfficiency{0,1} , CecWeightedEfficiency{0,1} , EuroEtaEffeciency{0,1} , Transformer{0,1} , PositiveGroundOption{0,1} , Cooling{0,1} , CSIApprovedBuiltInMeter{0,1} , CSINightTareLoss{0,1} , AmbientTempRange{0,1} , DataInterfaceOptions{0,1} , ConduitEntryZones{0,1} , Compliances{0,1} , UL1741Compliant{0,1} , NrtlCertifyingUL1741{0,1} , CsiApproved{0,1} , Notes{0,1}
Children	AcOcpdInterruptCapacity, AcOcpdRating, AcTerminalQuantity, AcTerminalWireRange, AmbientTempRange, CSIApprovedBuiltInMeter, CSINightTareLoss, CecWeightedEfficiency, Compliances, ConduitEntryZones, Cooling, CsiApproved, DataInterfaceOptions, DcTerminalMechanism, DcTerminalQuantity, DcTerminalWireRange, Depth, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, EuroEtaEffeciency, GecTerminalQuantity, GecTerminalWireRange, GridFrequency, GridVoltageRange, IntegratedAcDisconnect, IntegratedAcDisconnectRating, IntegratedCombiner, IntegratedCombinerFuses, IntegratedCombinerMaxFuse, IntegratedDcDisconnect, IntegratedDcDisconnectRating, InverterCategory, IsMicroInverter, Length, ListingAgency, Manufacturer, MaxAcCurrent, MaxDcCurrent, MaxDcInputPower, MaxDcVoltage, MaxEfficiency, MaxMpptVoltage, MinMpptVoltage, ModelNumber, MountingStyle, MppTrackerQuantity, NeutralSizingRequirement, NominalAcPower, NominalAcVoltage, NominalDcCurrent, NominalDcVoltage, Notes, NrtlCertifyingUL1741, PositiveGroundOption, ProductFamilyName, PvDcStartVoltage, Transformer, UL1741Compliant, Warranty, Weight, WhereManufactured, Width

Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			required

Source

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            <xs:documentation>An optional description of the inverter's type, such as
 "Micro-inverter - Grid-tie," "String Inverter - Grid-tie," "Battery-based Inverter
 - Grid-tie/Off-grid," "Battery-based Inverter - Off-grid," "Centraal Inverter"</
xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="IsMicroInverter" type="xs:boolean">
          <xs:annotation>
            <xs:documentation>Provides a definitive way of differentiating the inverter
 architecture as a String or Micro-Inverter. If TRUE, then the inverter is intended to be
 placed in series into an AC PV branch circuit. All other inverters essentially conform to
 a string architecture.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="MppTrackerQuantity" type="xs:integer" minOccurs="0"
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          <xs:annotation>
            <xs:documentation>The number of MPP Trackers within the inverter.</
xs:documentation>
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        <xs:element name="MinMpptVoltage" type="xs:double" minOccurs="0" maxOccurs="1">
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            <xs:documentation>Lower end of the inverter's Maximum Power Point Tracker DC
 voltage window.</xs:documentation>
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```

```
            <xs:documentation>Higher end of the inverter's Maximum Power Point Tracker DC
 voltage window.</xs:documentation>
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        </xs:element>
        <xs:element name="MaxDcInputPower" type="xs:double" minOccurs="0" maxOccurs="1">
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            <xs:documentation>Maximum PV module input power in DC watts at STC.</
xs:documentation>
          </xs:annotation>
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          <xs:annotation>
            <xs:documentation>DC voltage at normal operating conditions.</
xs:documentation>
          </xs:annotation>
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        <xs:element name="MaxDcVoltage" type="xs:double" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Maximum DC system voltage.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="PvDcStartVoltage" type="xs:double">
          <xs:annotation>
            <xs:documentation>Given in volts DC. Some inverters have a voltage point
 that differs from the minimum MPPT DC voltage at which it will start operation. This is
 typically higher than the minimum MPPT voltage.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="NominalDcCurrent" type="xs:double" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Nominal DC input current in amps.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="MaxDcCurrent" type="xs:double">
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            <xs:documentation>Maximum usable current (Isc) in amps.</xs:documentation>
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            <xs:documentation>Number of DC terminals.</xs:documentation>
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        <xs:element minOccurs="0" name="DcTerminalMechanism" type="xs:string">
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            <xs:documentation>Mechanism used for the terminal, for example "Screw
 Compression".</xs:documentation>
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            <xs:documentation>Describes the range of wire sizes that the DC
 terminals accept (for example "10-6" would be 10AWG on the small end up to 6AWG).</
xs:documentation>
          </xs:annotation>
        </xs:element>
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            <xs:documentation>Describes whether any DC disconnect is integrated into
 the inverter (for example as "Standard," "Standard (Load break rated)," "Optional," or
 "None").</xs:documentation>
          </xs:annotation>
        </xs:element>
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            <xs:documentation>Rating in amps of any pre-integrated DC disconnect.</
xs:documentation>
          </xs:annotation>
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            <xs:documentation>Describes whether a fused combiner is integrated into the
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          </xs:annotation>
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            <xs:documentation>The rating, in amps, of any fuses that ship pre-installed in
 the inverter's integrated fused combiner.</xs:documentation>
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```

```
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combiner can accomodate.</xs:documentation>
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            <xs:documentation>Maximum continuous power in watts AC.</xs:documentation>
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            <xs:documentation>The nominal grid voltage to which the inverter connects, for
example 240, 208, etc.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="GridVoltageRange" minOccurs="0" maxOccurs="1" type="xs:string">
          <xs:annotation>
            <xs:documentation>Range of AC voltages within which the inverter can
operate.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="GridFrequency" type="xs:double" minOccurs="0" maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Nominal grid frequency, in Hz, that the inverter is
specified to operate, for example "60".</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="MaxAcCurrent" type="xs:double">
          <xs:annotation>
            <xs:documentation>AC current in amps.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="AcOcpdRating" minOccurs="0" maxOccurs="1" type="xs:integer">
          <xs:annotation>
            <xs:documentation>Rating in amps for any integrated AC over current protection
device (OCPD).</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="AcOcpdInterruptCapacity" type="xs:integer">
          <xs:annotation>
            <xs:documentation>Interrupt rating in kAic for the AC OCPD.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="IntegratedAcDisconnect" type="xs:string">
          <xs:annotation>
            <xs:documentation>Describes whether any AC disconnect is integrated into the
inverter (for example as "Standard," "Optional," or "None").</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="IntegratedAcDisconnectRating" type="xs:integer">
          <xs:annotation>
            <xs:documentation>The rating, in amps, of the integrated AC disconnect, if
included.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="NeutralSizingRequirement" type="xs:string"/>
        <xs:element minOccurs="0" name="AcTerminalQuantity" type="xs:integer">
          <xs:annotation>
            <xs:documentation>Number of AC terminals per phase.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="AcTerminalWireRange" type="xs:string" minOccurs="0"
maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Describes the range of wire sizes that the AC
terminals accept (for example "10-6" would be 10AWG on the small end up to 6AWG).</
xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="GecTerminalQuantity" minOccurs="0" maxOccurs="1"
type="xs:integer">
          <xs:annotation>
            <xs:documentation>Number of GEC (grounding electrode conductor) terminals in
the inverter.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="GecTerminalWireRange" minOccurs="0" maxOccurs="1"
type="xs:string">
          <xs:annotation>
            <xs:documentation>Describes the range of wire sizes that the GEC (grounding
electrode conductor) terminals accept (for example "10-6" would be 10AWG on the small end
up to 6AWG).</xs:documentation>
```

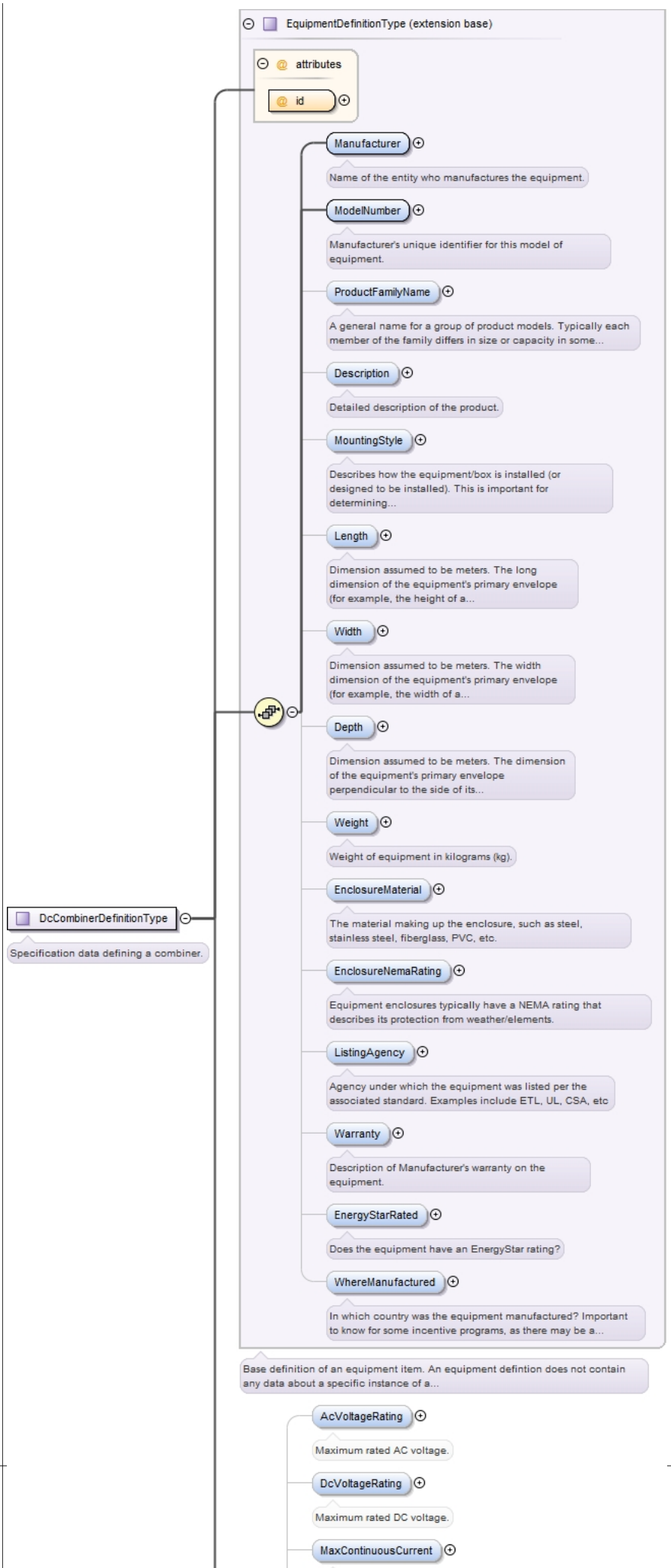
```
          </xs:annotation>
        </xs:element>
        <xs:element name="MaxEfficiency" type="xs:double" minOccurs="0" maxOccurs="1"/>
        <xs:element name="CecWeightedEfficiency" type="xs:double" minOccurs="0"
 maxOccurs="1">
          <xs:annotation>
            <xs:documentation>Efficiency published by the California Energy Commission
 (CEC).</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="EuroEtaEffeciency" type="xs:double" minOccurs="0" maxOccurs="1"/
>
        <xs:element name="Transformer" minOccurs="0" maxOccurs="1" type="xs:boolean">
          <xs:annotation>
            <xs:documentation>Is the inverter based on a transformer architecture? TRUE
 indicates there is a transformer.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="PositiveGroundOption" type="xs:boolean">
          <xs:annotation>
            <xs:documentation>Does the inverter have an option to make the positive end
 grounded?</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="Cooling" minOccurs="0" maxOccurs="1" type="xs:string">
          <xs:annotation>
            <xs:documentation>Describes the mechanism used for cooling the inverter.
 Values expected to inlcude: "Forced Air," "Passive," etc.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="CSIApprovedBuiltInMeter" type="xs:boolean">
          <xs:annotation>
            <xs:documentation>Is there a built in meter approved by the California Solar
 Initiative?</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="CSINightTareLoss" type="xs:double">
          <xs:annotation>
            <xs:documentation>Given in watts.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="AmbientTempRange" type="xs:string">
          <xs:annotation>
            <xs:documentation>Describes the allowable ambient temperature range for normal
 operation.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="DataInterfaceOptions" minOccurs="0" maxOccurs="1"
 type="xs:string">
          <xs:annotation>
            <xs:documentation>Describes any and all types of interfaces that can be used
 for communications with the inverter.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="ConduitEntryZones" type="xs:string">
          <xs:annotation>
            <xs:documentation>Describes the physical sides of the inverter enclosure where
 conduit may be connected. Assumes user is facing the front of the inverter. For example,
 "bottom, back, both sides."</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="Compliances" minOccurs="0" maxOccurs="1" type="xs:string">
          <xs:annotation>
            <xs:documentation>Lists any testing standards with which the inverter
 complies. For example, "UL 1741; IEEE 529; IEEE 1547; UL 1998."</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="UL1741Compliant" type="xs:boolean">
          <xs:annotation>
            <xs:documentation>Is the inverter UL 1741 compliant?</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="NrtlCertifyingUL1741" minOccurs="0" maxOccurs="1"
 type="xs:string">
          <xs:annotation>
            <xs:documentation>Names the NRTL (testing lab) that has certified UL 1741
 compliance.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="CsiApproved" type="xs:boolean">
          <xs:annotation>
            <xs:documentation>Is the Inverter listed as approved by the California Solar
 Initiative (CSI)? True means that it is approved.</xs:documentation>
```

```
          </xs:annotation>
        </xs:element>
        <xs:element name="Notes" minOccurs="0" maxOccurs="1" type="xs:string">
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Complex Type `DcCombinerDefinitionType`

Namespace	http://www.iepmodel.net
Annotations	`Specification data defining a combiner.`

Diagram


EquipmentDefinitionType (extension base)
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...
AcVoltageRating
Maximum rated AC voltage.
DcVoltageRating
Maximum rated DC voltage.
MaxContinuousCurrent
DcCombinerDefinitionType
Specification data defining a combiner.

Type	extension of EquipmentDefinitionType
Type hierarchy	• EquipmentDefinitionType • DcCombinerDefinitionType
Used by	Element PvSystemType/DcCombinerDefinition
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1} , AcVoltageRating{0,1} , DcVoltageRating{0,1} , MaxContinuousCurrent{0,1} , QtyInputCircuits{0,1} , MaxOcpdRating{0,1} , MinInputConductorSize{0,1} , MaxInputConductorSize{0,1} , QtyOutputConductors{0,1} , MinOutputConductorSize{0,1} , MaxOutputConductorSize{0,1} , IntegratedDisconnectIncluded{0,1} , IntegratedDisconnectRating{0,1} , MonitoringAvailable{0,1} , RevenueGradeMonitoring{0,1}
Children	AcVoltageRating, DcVoltageRating, Depth, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, IntegratedDisconnectIncluded, IntegratedDisconnectRating, Length, ListingAgency, Manufacturer, MaxContinuousCurrent, MaxInputConductorSize, MaxOcpdRating, MaxOutputConductorSize, MinInputConductorSize, MinOutputConductorSize, ModelNumber, MonitoringAvailable, MountingStyle, ProductFamilyName, QtyInputCircuits, QtyOutputConductors, RevenueGradeMonitoring, Warranty, Weight, WhereManufactured, Width

Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			required

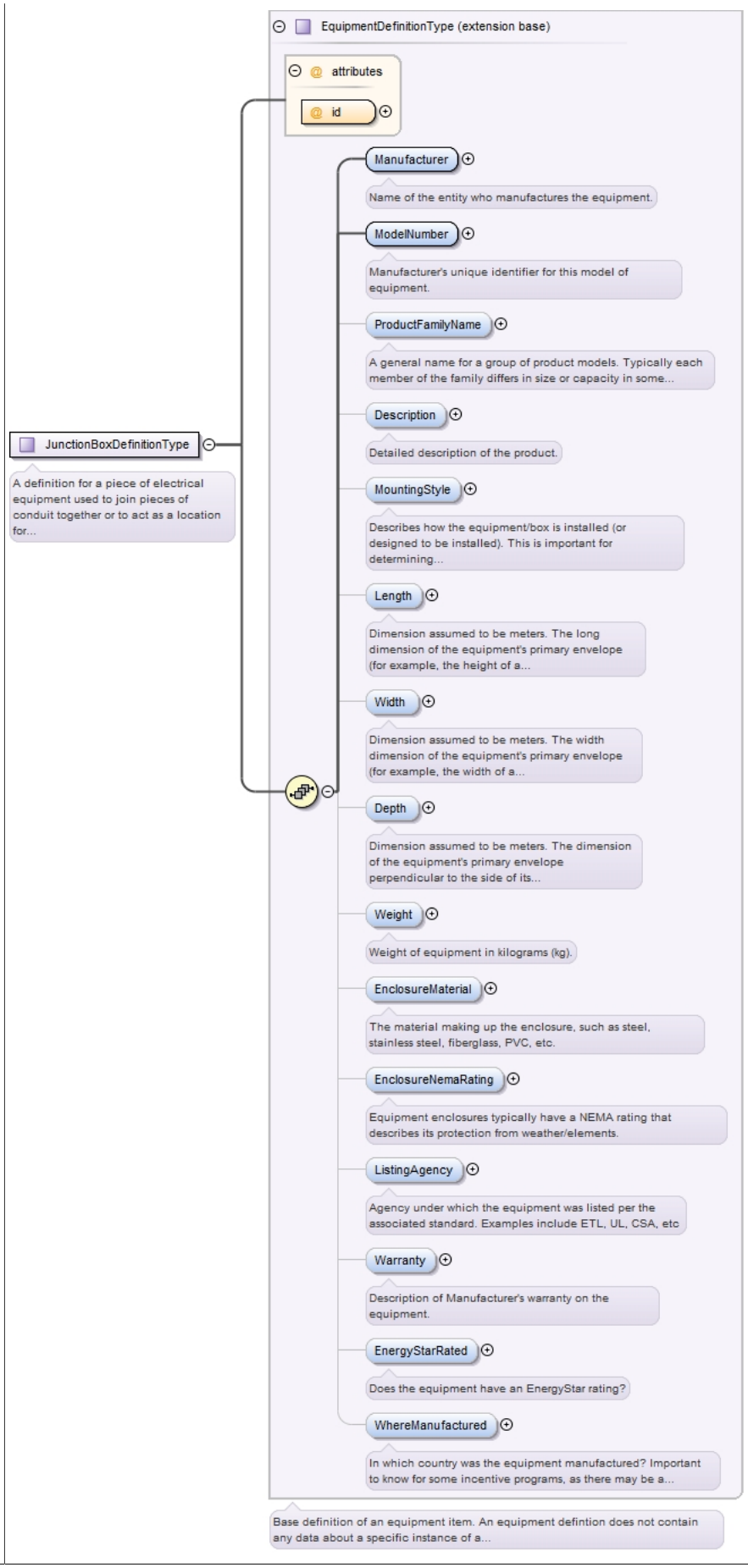
Source

```
<xs:complexType name="DcCombinerDefinitionType">
  <xs:annotation>
    <xs:documentation>Specification data defining a combiner.</xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="EquipmentDefinitionType">
      <xs:sequence>
        <xs:element minOccurs="0" name="AcVoltageRating" type="xs:integer">
          <xs:annotation>
            <xs:documentation>Maximum rated AC voltage.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="DcVoltageRating" type="xs:integer">
          <xs:annotation>
            <xs:documentation>Maximum rated DC voltage.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="MaxContinuousCurrent" type="xs:integer">
          <xs:annotation>
            <xs:documentation>Rating in amps.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="QtyInputCircuits" minOccurs="0" type="xs:integer">
          <xs:annotation>
            <xs:documentation>Max number of circuits on the input side.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="MaxOcpdRating" type="xs:integer">
          <xs:annotation>
            <xs:documentation>Maximum rated current (in Amps) of the over-current
 protection device (OCPD) per input circuit.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="MinInputConductorSize"
 type="ConductorSizeEnumType"/>
        <xs:element minOccurs="0" name="MaxInputConductorSize"
 type="ConductorSizeEnumType"/>
        <xs:element name="QtyOutputConductors" minOccurs="0" type="xs:integer">
          <xs:annotation>
            <xs:documentation>Max number of output conductors.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="MinOutputConductorSize"
 type="ConductorSizeEnumType"/>
        <xs:element minOccurs="0" name="MaxOutputConductorSize"
 type="ConductorSizeEnumType"/>
        <xs:element minOccurs="0" name="IntegratedDisconnectIncluded" type="xs:boolean"/>
        <xs:element minOccurs="0" name="IntegratedDisconnectRating" type="xs:integer"/>
        <xs:element minOccurs="0" name="MonitoringAvailable" type="xs:boolean"/>
        <xs:element minOccurs="0" name="RevenueGradeMonitoring" type="xs:boolean"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Complex Type `JunctionBoxDefinitionType`

Namespace	http://www.iepmodel.net
Annotations	A definition for a piece of electrical equipment used to join pieces of conduit together or to act as a location for making splices. In the model, specific instances of junction boxes are modeled as WirewayBoxes. Note that a JunctionBox may not combine any circuits, a separate DcCombiner element is defined for that purpose in PvSystems.

Diagram


EquipmentDefinitionType (extension base)
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...
JunctionBoxDefinitionType
A definition for a piece of electrical equipment used to join pieces of conduit together or to act as a location for...

Type	extension of EquipmentDefinitionType
Type hierarchy	• EquipmentDefinitionType • JunctionBoxDefinitionType
Used by	Element PvSystemType/JunctionBoxDefintion
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1}
Children	Depth, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, Length, ListingAgency, Manufacturer, ModelNumber, MountingStyle, ProductFamilyName, Warranty, Weight, WhereManufactured, Width

Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			required

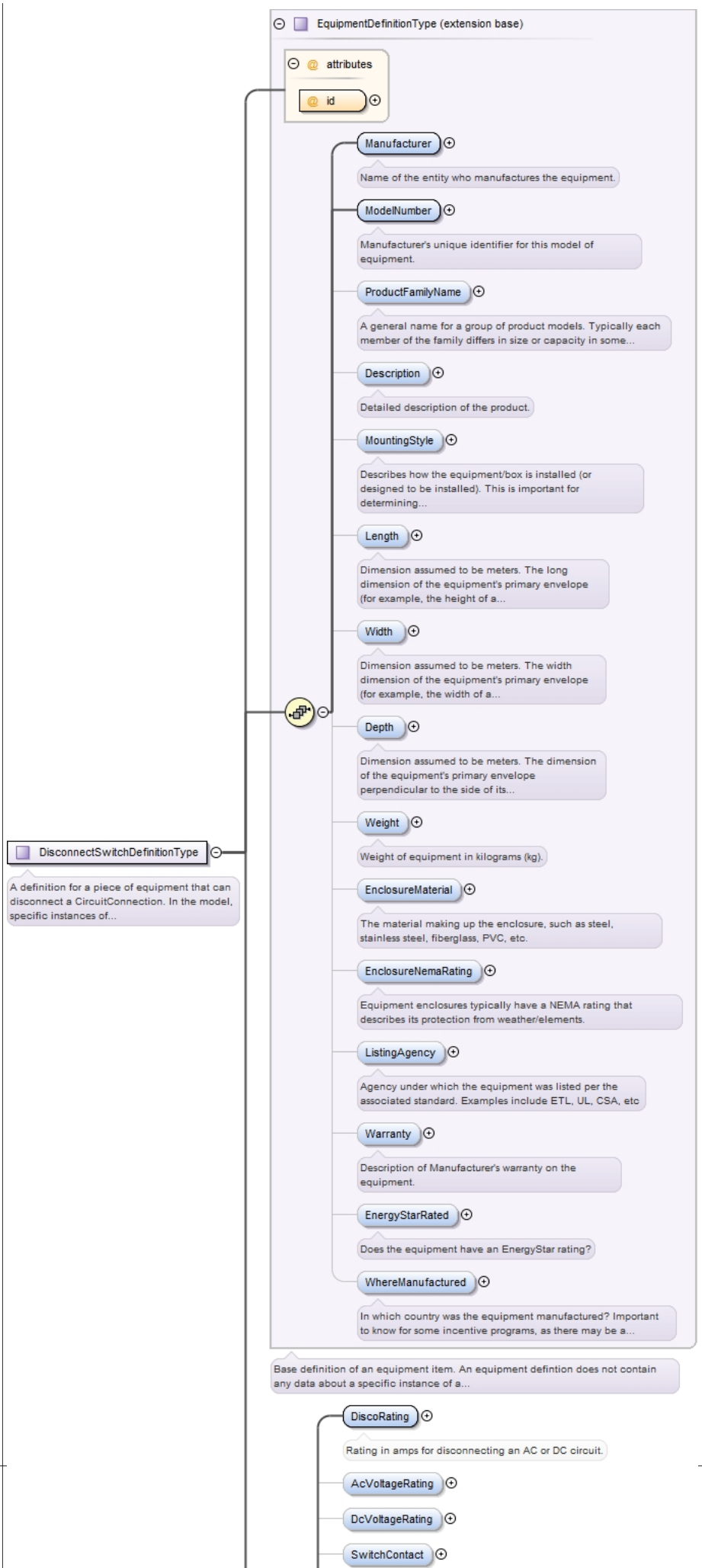
Source

```
<xs:complexType name="JunctionBoxDefinitionType">
  <xs:annotation>
    <xs:documentation>A definition for a piece of electrical equipment used to join pieces
 of conduit together or to act as a location for making splices. In the model, specific
 instances of junction boxes are modeled as WirewayBoxes. Note that a JunctionBox may
 not combine any circuits, a separate DcCombiner element is defined for that purpose in
 PvSystems.</xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="EquipmentDefinitionType"/>
  </xs:complexContent>
</xs:complexType>
```

Complex Type `DisconnectSwitchDefinitionType`

Namespace	http://www.iepmodel.net
Annotations	A definition for a piece of equipment that can disconnect a CircuitConnection. In the model, specific instances of Disconnect switches are modeled as WirewayBoxes.

Diagram


DisconnectSwitchDefinitionType
A definition for a piece of equipment that can disconnect a CircuitConnection. In the model, specific instances of...
EquipmentDefinitionType (extension base)
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...
DiscoRating
Rating in amps for disconnecting an AC or DC circuit.
AcVoltageRating
DcVoltageRating
SwitchContact

Type	extension of EquipmentDefinitionType
Type hierarchy	• EquipmentDefinitionType • DisconnectSwitchDefinitionType
Used by	Element PvSystemType/DisconnectSwitchDefinition
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1} , DiscoRating , AcVoltageRating{0,1} , DcVoltageRating{0,1} , SwitchContact{0,1} , Duty{0,1} , VisibleLock{0,1} , Fusible{0,1} , Fuse{0,1}
Children	AcVoltageRating, DcVoltageRating, Depth, Description, DiscoRating, Duty, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, Fuse, Fusible, Length, ListingAgency, Manufacturer, ModelNumber, MountingStyle, ProductFamilyName, SwitchContact, VisibleLock, Warranty, Weight, WhereManufactured, Width

Attributes

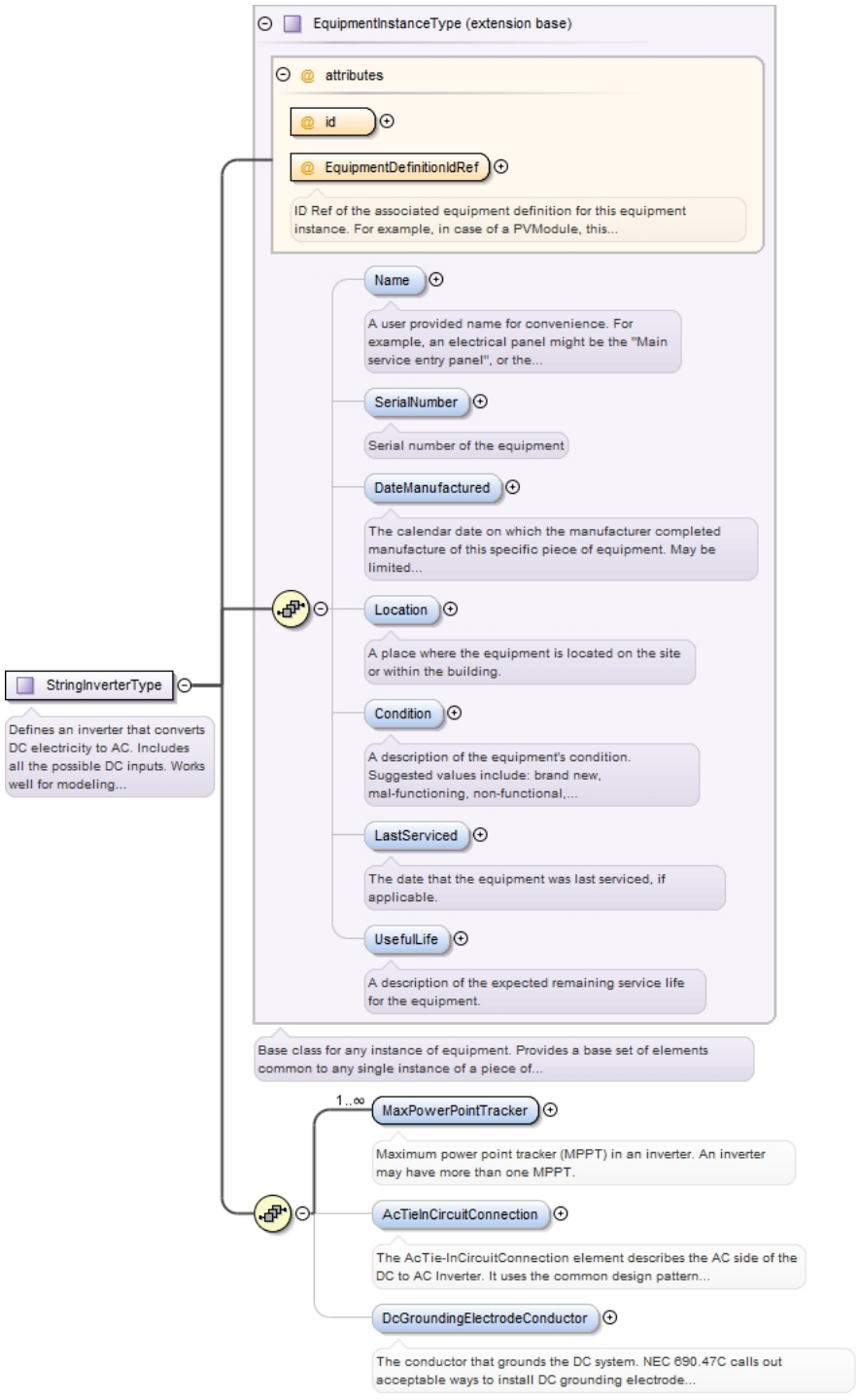
QName	Type	Fixed	Default	Use
id	xs:ID			required

Source

```
<xs:complexType name="DisconnectSwitchDefinitionType">
  <xs:annotation>
    <xs:documentation>A definition for a piece of equipment that can disconnect a
 CircuitConnection. In the model, specific instances of Disconnect switches are modeled as
 WirewayBoxes.</xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="EquipmentDefinitionType">
      <xs:sequence>
        <xs:element minOccurs="1" name="DiscoRating" type="xs:integer">
          <xs:annotation>
            <xs:documentation>Rating in amps for disconnecting an AC or DC circuit.</
xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="AcVoltageRating" type="xs:integer"/>
        <xs:element minOccurs="0" name="DcVoltageRating" type="xs:integer"/>
        <xs:element name="SwitchContact" minOccurs="0" type="SwitchContactActionEnumType">
          <xs:annotation>
            <xs:documentation>The terms pole and throw are also used to describe switch
 contact variations. The number of "poles" is the number of separate circuits which are
 controlled by a switch. For example, a "2-pole" switch has two separate identical sets
 of contacts controlled by the same knob. The number of "throws" is the number of separate
 positions that the switch can adopt. A single-throw switch has one pair of contacts that
 can either be closed or open. A double-throw switch has a contact that can be connected
 to either of two other contacts, a triple-throw has a contact which can be connected to
 one of three other contacts, etc</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="Duty" type="SwitchDutyEnumType"/>
        <xs:element minOccurs="0" name="VisibleLock" type="xs:boolean">
          <xs:annotation>
            <xs:documentation>Does the switch have a visible locking mechnism?</
xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="Fusible" type="xs:boolean">
          <xs:annotation>
            <xs:documentation>Do the switch circuits include fuses?</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="Fuse" type="FuseType">
          <xs:annotation>
            <xs:documentation>If the switch includes fuses, this describes the fuses.</
xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Complex Type `StringInverterType`

Namespace	http://www.iepmodel.net
Annotations	Defines an inverter that converts DC electricity to AC. Includes all the possible DC inputs. Works well for modeling string based inverters. Micro-inverters are modeled by defining a single PPT with a single IndividualCircuitInput for the module feeding it. To define an AC Branch Circuit, use the AcTie-InCircuitConnection element to refer to the next inverter in the series circuit.

Diagram	
Type	extension of EquipmentInstanceType
Type hierarchy	• EquipmentInstanceType • StringInverterType
Used by	Element PvSystemType/StringInverter
Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1} , MaxPowerPointTracker+ , AcTieInCircuitConnection{0,1} , DcGroundingElectrodeConductor{0,1}
Children	AcTieInCircuitConnection, Condition, DateManufactured, DcGroundingElectrodeConductor, LastServiced, Location, MaxPowerPointTracker, Name, SerialNumber, UsefulLife

Attributes

QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			required

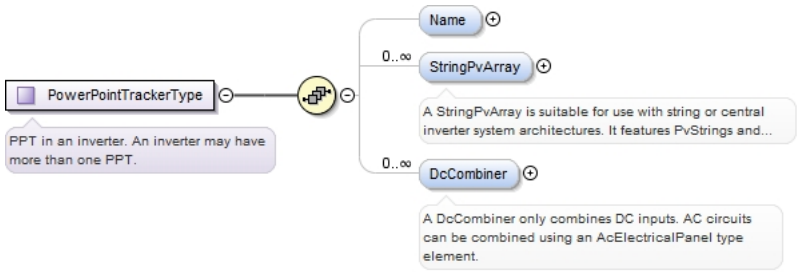
QName	Type	Fixed	Default	Use
	ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.			
id	xs:ID			required

Source

```
<xs:complexType name="StringInverterType">
  <xs:annotation>
    <xs:documentation>Defines an inverter that converts DC electricity to AC. Includes all
 the possible DC inputs. Works well for modeling string based inverters. Micro-inverters
 are modeled by defining a single PPT with a single IndividualCircuitInput for the module
 feeding it. To define an AC Branch Circuit, use the AcTie-InCircuitConnection element to
 refer to the next inverter in the series circuit.</xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="EquipmentInstanceType">
      <xs:sequence>
        <xs:element maxOccurs="unbounded" name="MaxPowerPointTracker"
 type="PowerPointTrackerType">
          <xs:annotation>
            <xs:documentation>Maximum power point tracker (MPPT) in an inverter. An
 inverter may have more than one MPPT.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="AcTieInCircuitConnection" type="CircuitConnectionType"
 minOccurs="0">
          <xs:annotation>
            <xs:documentation>The AcTie-InCircuitConnection element describes the AC side
 of the DC to AC Inverter. It uses the common design pattern of each electrical equipment
 instance having a single CircuitConnection element that describes its electrical
 connection to upstream electrical equipment (for example, Combiners, ElectricalPanels,
 etc). However, Inverters do not have a parent element to which the CircuitConnection
 refers. Instead, it relies on its optional EquipmentWhereConnectedIdRef attribute to
 describe the EquipmentInstance to which it is connected. For string inverters, the
 EquipmentWhereConnectedIdRef attribute should reference the ElectricalPanel element
 that represents the electrical panel where the Inverter will be (or already is)
 connected. In micro-inverter case, the EquipmentWhereConnectedIdRef attribute should
 reference the ID of the next micro-inverter in the circuit. The last inverter in the
 circuit will reference the electrical panel where interconnected. If the PvDesign
 is used independently (a PvDesign document) then the EquipmentWhereConnectedIdRef
 attribute should reference an ElectricalPanel element within the PvDesign element.
 The referenced ElectricalPanel can represent an existing electrical panel on the site,
 or a new panel (perhaps serving as an AC Combiner). If the PvDesign is used within a
 Project.xml document, and the PvDesign calls for the connection of the Inverter to an
 existing ElectricalPanel, the EquipmentWhereConnectedIdRef attribute should reference
 an ElectricalPanel element within the ExistingElectricalDistributionHierarchy element of
 the Site. If the PvDesign calls for the inverter to connect to a new ElectricPanel, then
 the EquipmentWhereConnectedIdRef attribute should reference an ElectricalPanel instance
 within the PvDesign itself. NOTE: If an external AC Disconnect Switch is required, it
 is a part of this CircuitConnection's WirewaySegments. One segment can be a disconnect
 type.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="DcGroundingElectrodeConductor"
 type="GroundingElectrodeConductorType">
          <xs:annotation>
            <xs:documentation>The conductor that grounds the DC system. NEC 690.47C calls
 out acceptable ways to install DC grounding electrode conductors.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Complex Type `PowerPointTrackerType`

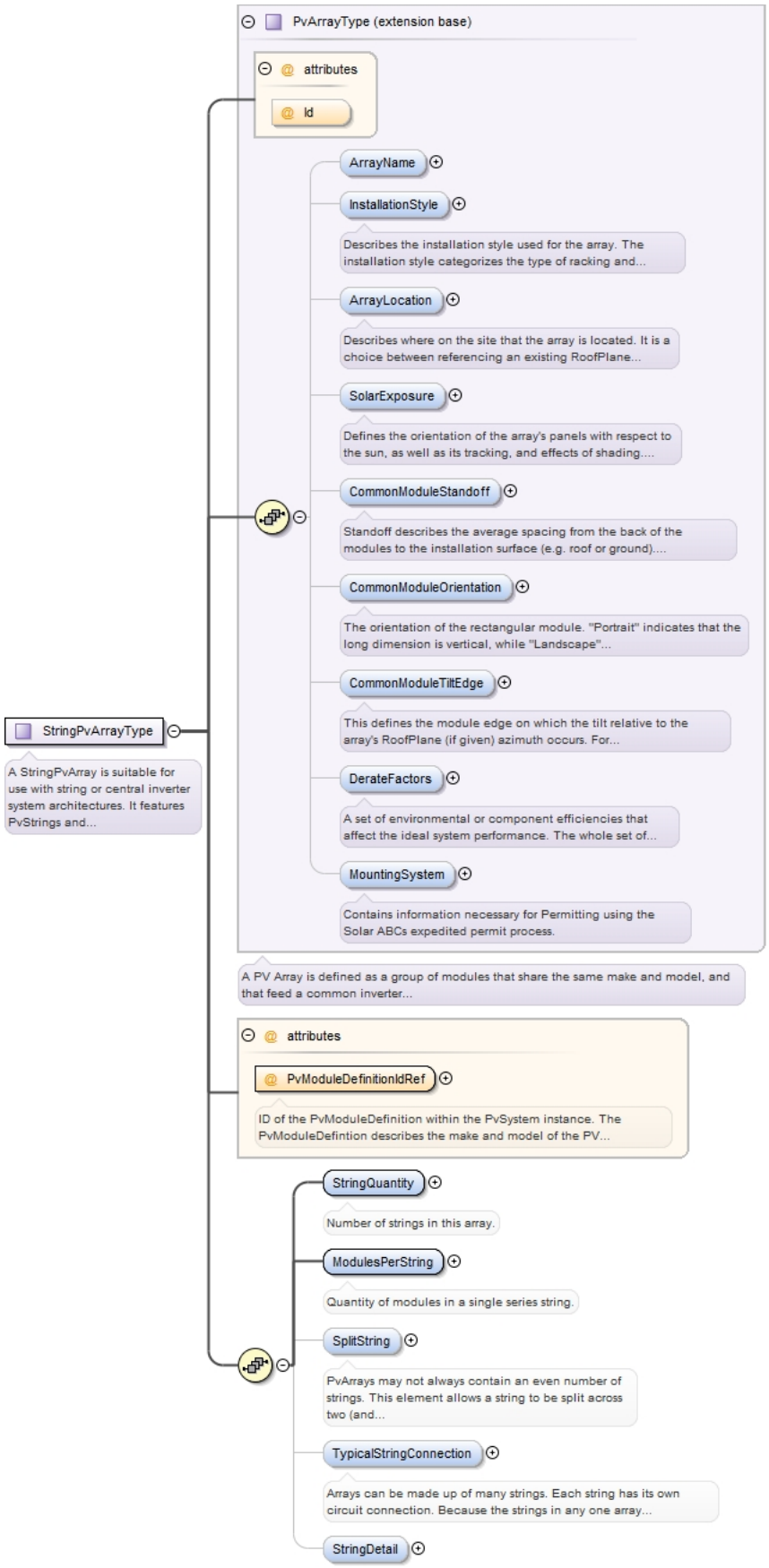
Namespace	http://www.iepmodel.net
Annotations	PPT in an inverter. An inverter may have more than one PPT.

Diagram	
Used by	Element StringInverterType/MaxPowerPointTracker
Model	Name{0,1} , StringPvArray* , DcCombiner*
Children	DcCombiner, Name, StringPvArray

Source	`<xs:complexType name="PowerPointTrackerType">`
	`  <xs:annotation>`
	`  <xs:documentation>PPT in an inverter. An inverter may have more than one PPT.</xs:documentation>`
	`  </xs:annotation>`
	`  <xs:sequence>`
	`  <xs:element name="Name" minOccurs="0" type="xs:string"/>`
	`  <xs:element maxOccurs="unbounded" minOccurs="0" name="StringPvArray" type="StringPvArrayType">`
	`  <xs:annotation>`
	`  <xs:documentation>A StringPvArray is suitable for use with string or central inverter system architectures. It features PvStrings and DcCombiners as building blocks.</xs:documentation>`
	`  </xs:annotation>`
	`  </xs:element>`
	`  <xs:element maxOccurs="unbounded" minOccurs="0" name="DcCombiner" type="DcCombinerType">`
	`  <xs:annotation>`
	`  <xs:documentation>A DcCombiner only combines DC inputs. AC circuits can be combined using an AcElectricalPanel type element.</xs:documentation>`
	`  </xs:annotation>`
	`  </xs:element>`
	`  </xs:sequence>`
	`</xs:complexType>`

Complex Type `StringPvArrayType`

Namespace	http://www.iepmodel.net
Annotations	`A StringPvArray is suitable for use with string or central inverter system architectures. It features PvStrings and DcCombiners as building blocks.`

Diagram	
Type	extension of PvArrayType
Type hierarchy	• PvArrayType

	• StringPvArrayType
Used by	Elements DcCombinerType/StringPvArray, PowerPointTrackerType/StringPvArray
Model	ArrayName{0,1} , InstallationStyle{0,1} , ArrayLocation{0,1} , SolarExposure{0,1} , CommonModuleStandoff{0,1} , CommonModuleOrientation{0,1} , CommonModuleTiltEdge{0,1} , DerateFactors{0,1} , MountingSystem{0,1} , StringQuantity , ModulesPerString , SplitString{0,1} , TypicalStringConnection{0,1} , StringDetail{0,1}
Children	ArrayLocation, ArrayName, CommonModuleOrientation, CommonModuleStandoff, CommonModuleTiltEdge, DerateFactors, InstallationStyle, ModulesPerString, MountingSystem, SolarExposure, SplitString, StringDetail, StringQuantity, TypicalStringConnection

Attributes

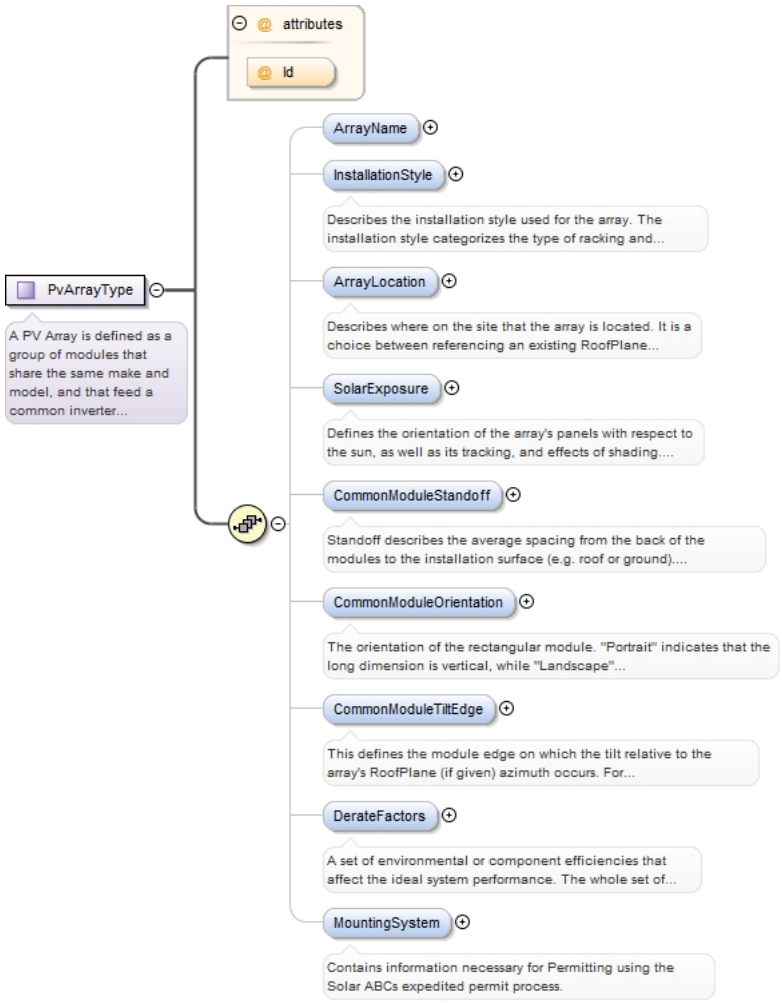
QName	Type	Fixed	Default	Use
Id				optional
PvModuleDefinitionIdRef	xs:IDREF			required
	ID of the PvModuleDefinition within the PvSystem instance. The PvModuleDefintion describes the make and model of the PV module. The PvArray is assumed to use the same module for the entire array.			

Source

```
<xs:complexType name="StringPvArrayType">
  <xs:annotation>
    <xs:documentation>A StringPvArray is suitable for use with string or central inverter
 system architectures. It features PvStrings and DcCombiners as building blocks.</
xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="PvArrayType">
      <xs:sequence>
        <xs:element name="StringQuantity" type="xs:integer">
          <xs:annotation>
            <xs:documentation>Number of strings in this array.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="ModulesPerString" type="xs:integer">
          <xs:annotation>
            <xs:documentation>Quantity of modules in a single series string.</
xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="SplitString" type="PartialSourceCircuitType">
          <xs:annotation>
            <xs:documentation>PvArrays may not always contain an even number of strings.
 This element allows a string to be split across two (and only two) arrays. It includes
 how many modules of the total string length are in this array, and refers to another
 array where the remainder of the string is included.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="TypicalStringConnection" minOccurs="0"
 type="CircuitConnectionType">
          <xs:annotation>
            <xs:documentation>Arrays can be made up of many strings. Each string has its
 own circuit connection. Because the strings in any one array are almost always connected
 to their parent element in a common way, this TypicalCircuitConnection element defines
 the commonly used connection approach from any one of the strings to the parent element
 (a combiner, or inverter). If circuit connections vary between strings, this element
 should not be used. Instead, use the IndividualString element which contains its own
 CircuitConnection element.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="StringDetail">
          <xs:complexType>
            <xs:sequence>
              <xs:element maxOccurs="unbounded" name="IndividualString"
 type="PvStringType" minOccurs="0">
                <xs:annotation>
                  <xs:documentation>Can optionally include detailed information on each
 individual string. Allows ability to define individual module properties within each
 string, including x/y locations on layout planes, serial numbers, shading affects, etc.
 This element is typically used by design software for detailed calculation of system
 output.</xs:documentation>
                </xs:annotation>
              </xs:element>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
      <xs:attribute name="PvModuleDefinitionIdRef" type="xs:IDREF" use="required">
        <xs:annotation>
```

```
          <xs:documentation>ID of the PvModuleDefinition within the PvSystem instance. The
 PvModuleDefintion describes the make and model of the PV module. The PvArray is assumed
 to use the same module for the entire array.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Complex Type `PvArrayType`

Namespace	http://www.iepmodel.net
Annotations	A PV Array is defined as a group of modules that share the same make and model, and that feed a common inverter instance (may be single string/central inverter or multiple micro-inverters, one per module). The PvArrayType serves as a base type for either StringPvArray or AcModulePvArrays based on their respective inverter architectures.
Diagram	
Properties	abstract: `true`
Used by	Complex Types AcModulePvArrayType, GenericPvArrayType, StringPvArrayType
Model	ArrayName{0,1} , InstallationStyle{0,1} , ArrayLocation{0,1} , SolarExposure{0,1} , CommonModuleStandoff{0,1} , CommonModuleOrientation{0,1} , CommonModuleTiltEdge{0,1} , DerateFactors{0,1} , MountingSystem{0,1}
Children	ArrayLocation, ArrayName, CommonModuleOrientation, CommonModuleStandoff, CommonModuleTiltEdge, DerateFactors, InstallationStyle, MountingSystem, SolarExposure

Attributes

QName	Type	Fixed	Default	Use
Id				optional

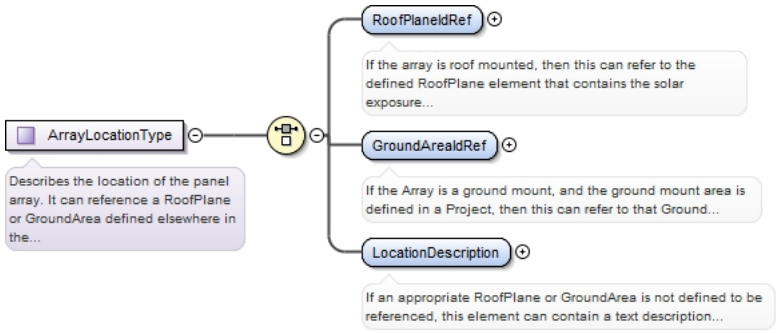
Source

```
<xs:complexType name="PvArrayType" abstract="true">
  <xs:annotation>
    <xs:documentation>A PV Array is defined as a group of modules that share the same
 make and model, and that feed a common inverter instance (may be single string/central
 inverter or multiple micro-inverters, one per module). The PvArrayType serves as a base
```

```
type for either StringPvArray or AcModulePvArrays based on their respective inverter
architectures.</xs:documentation>
 </xs:annotation>
 <xs:sequence>
   <xs:element minOccurs="0" name="ArrayName" type="xs:string"/>
   <xs:element minOccurs="0" name="InstallationStyle" type="ArrayInstallStyleEnumType">
     <xs:annotation>
       <xs:documentation>Describes the installation style used for the array. The
installation style categorizes the type of racking and mounting equipment used.</
xs:documentation>
     </xs:annotation>
   </xs:element>
   <xs:element minOccurs="0" name="ArrayLocation" type="ArrayLocationType">
     <xs:annotation>
       <xs:documentation>Describes where on the site that the array is located. It is a
choice between referencing an existing RoofPlane element, an existing GroundArea element,
or a text description.</xs:documentation>
     </xs:annotation>
   </xs:element>
   <xs:element name="SolarExposure" minOccurs="0">
     <xs:annotation>
       <xs:documentation>Defines the orientation of the array's panels with respect to
the sun, as well as its tracking, and effects of shading. This is a choice. If a roof
RoofPlane is defined, and the array will be mounted parallel to that RoofPlane, then
the array can simply inherit the roof's solar exposure via referring to its ID. Even
if the array is mounted on a RoofPlane, it is not required to use that RoofPlane's ID.
If the orientation is different from the RoofPlane (a tilt-up rack for example), or
if no RoofPlane is used, use the effective exposure to include all the solar exposure
attributes.</xs:documentation>
     </xs:annotation>
     <xs:complexType>
       <xs:choice>
         <xs:element name="ArraySpecificSolarExposure" type="SolarExposureType">
           <xs:annotation>
             <xs:documentation>This element provides the solar orientation, tracking, and
shade effects applicable to the array (its Az, tilt, and tracking). This reflects the
racking orientation, which could be the roof's orientation if a RoofPlane element is not
defined.</xs:documentation>
           </xs:annotation>
         </xs:element>
         <xs:element minOccurs="1" name="InheritRoofPlaneSolarExposure" type="xs:IDREF">
           <xs:annotation>
             <xs:documentation>The array can inherit the same orientation of a given
RoofPlane if defined. This is the case in "parallel roof" type installations.</
xs:documentation>
           </xs:annotation>
         </xs:element>
       </xs:choice>
     </xs:complexType>
   </xs:element>
   <xs:element minOccurs="0" name="CommonModuleStandoff" type="xs:string">
     <xs:annotation>
       <xs:documentation>Standoff describes the average spacing from the back of
the modules to the installation surface (e.g. roof or ground). Standoff is used in
calculating system output when the calculator considers heat effects of reduced air
circulation to the back of the modules. Many incentive programs reduce incentive payments
when air circulation is minimal.</xs:documentation>
     </xs:annotation>
   </xs:element>
   <xs:element minOccurs="0" name="CommonModuleOrientation"
type="PanelOrientationEnumType">
     <xs:annotation>
       <xs:documentation>The orientation of the rectangular module. "Portrait" indicates
that the long dimension is vertical, while "Landscape" indicates that the long dimension
is horizontal. If an individual module has an orientation different from the common
value, that orientation can be called out in that particular module's detail element.
That value can override the common value provided here.</xs:documentation>
     </xs:annotation>
   </xs:element>
   <xs:element name="CommonModuleTiltEdge" maxOccurs="1" minOccurs="0"
type="PanelTiltEdgeEnumType">
     <xs:annotation>
       <xs:documentation>This defines the module edge on which the tilt relative to the
array's RoofPlane (if given) azimuth occurs. For example, a "top" edge tilt is routinely
used on a north roof to tilt the module to face south (aka "reverse tilt"). "Bottom edge"
is the edge toward the azimuth direction of the LayoutPlane. If an individual module has
a tilt edge different from the common value, that tilt edge can be called out in that
particular module's detail element. That value can override the common value provided
here.</xs:documentation>
     </xs:annotation>
   </xs:element>
   <xs:element minOccurs="0" name="DerateFactors" type="DerateFactorsType">
     <xs:annotation>
```

```
        <xs:documentation>A set of environmental or component efficiencies that affect
 the ideal system performance. The whole set of DerateFactors is assumed to apply to the
 entire PvArray. Used as inputs to NREL's PVWatts and potentially other software that
 runs output estimations. Default values correspond to NREL's PVWatts default values.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="MountingSystem" type="MountingSystemType">
      <xs:annotation>
        <xs:documentation>Contains information necessary for Permitting using the Solar
 ABCs expedited permit process.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="Id" use="optional"/>
</xs:complexType>
```

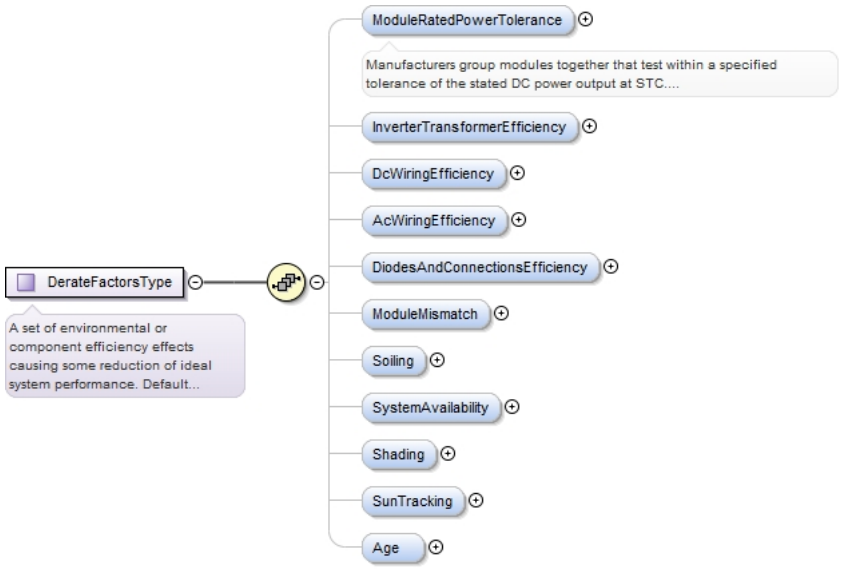
Complex Type `ArrayLocationType`

Namespace	http://www.iepmodel.net
Annotations	Describes the location of the panel array. It can reference a RoofPlane or GroundArea defined elsewhere in the document, or it can simply include a text description if such a roof or ground area element is not defined.
Diagram	
Used by	Element PvArrayType/ArrayLocation
Model	RoofPlaneIdRef | GroundAreaIdRef | LocationDescription
Children	GroundAreaIdRef, LocationDescription, RoofPlaneIdRef
Source	

```
<xs:complexType name="ArrayLocationType">
  <xs:annotation>
    <xs:documentation>Describes the location of the panel array. It can reference a
 RoofPlane or GroundArea defined elsewhere in the document, or it can simply include a
 text description if such a roof or ground area element is not defined.</xs:documentation>
  </xs:annotation>
  <xs:choice>
    <xs:element form="unqualified" name="RoofPlaneIdRef" type="xs:IDREF">
      <xs:annotation>
        <xs:documentation>If the array is roof mounted, then this can refer to the defined
 RoofPlane element that contains the solar exposure attributes (note, this is because a
 single RoofPlane can have multiple arrays).</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element form="unqualified" name="GroundAreaIdRef" type="xs:IDREF">
      <xs:annotation>
        <xs:documentation>If the Array is a ground mount, and the ground mount area is
 defined in a Project, then this can refer to that Ground Area element.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element form="unqualified" name="LocationDescription" type="xs:string">
      <xs:annotation>
        <xs:documentation>If an appropriate RoofPlane or GroundArea is not defined
 to be referenced, this element can contain a text description of the location.</
xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:choice>
</xs:complexType>
```

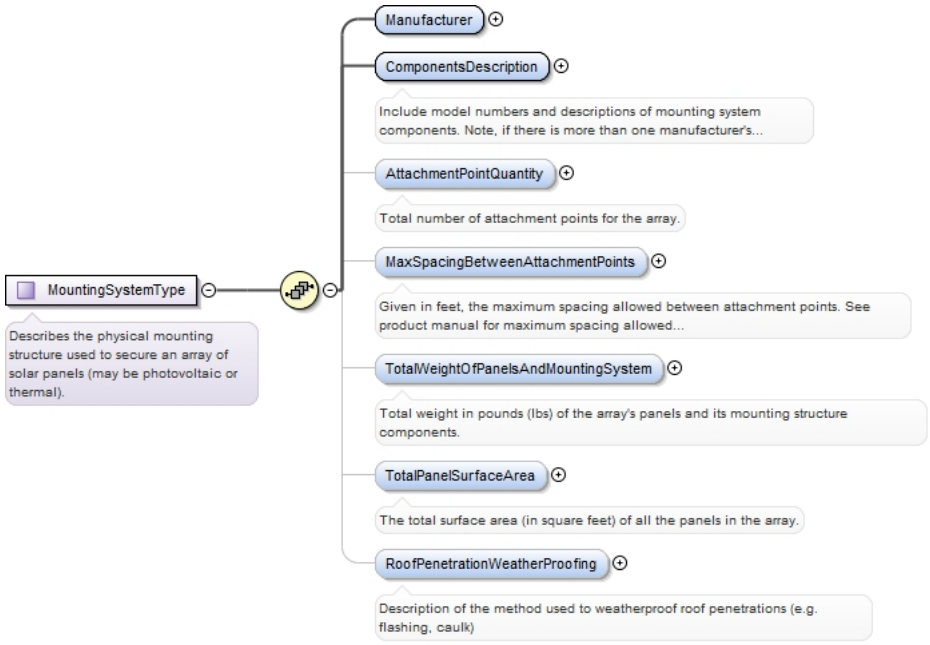
Complex Type `DerateFactorsType`

Namespace	http://www.iepmodel.net
Annotations	A set of environmental or component efficiency effects causing some reduction of ideal system performance. Default values correspond to NREL's PVWatts default values.

Diagram	
Used by	Element PvArrayType/DerateFactors
Model	ModuleRatedPowerTolerance{0,1} , InverterTransformerEfficiency{0,1} , DcWiringEfficiency{0,1} , AcWiringEfficiency{0,1} , DiodesAndConnectionsEfficiency{0,1} , ModuleMismatch{0,1} , Soiling{0,1} , SystemAvailability{0,1} , Shading{0,1} , SunTracking{0,1} , Age{0,1}
Children	AcWiringEfficiency, Age, DcWiringEfficiency, DiodesAndConnectionsEfficiency, InverterTransformerEfficiency, ModuleMismatch, ModuleRatedPowerTolerance, Shading, Soiling, SunTracking, SystemAvailability
Source	`<xs:complexType name="DerateFactorsType">` `<xs:annotation>` `<xs:documentation>A set of environmental or component efficiency effects causing some reduction of ideal system performance. Default values correspond to NREL's PVWatts default values.</xs:documentation>` `</xs:annotation>` `<xs:sequence>` `<xs:element default="0.95" minOccurs="0" name="ModuleRatedPowerTolerance" type="xs:double">` `<xs:annotation>` `<xs:documentation>Manufacturers group modules together that test within a specified tolerance of the stated DC power output at STC. Depending on how they define the group, the actual expected power of the modules may be lower than the STC ratings. For example, if the module is rated at 200Wstc, but it has a lower power tolerance of -5%, then the assumption should be made that the modules will only output 190Wstc, and have a derate of 0.95. If the module's lower tolerance is 0%, then the derate would be 1.0.</xs:documentation>` `</xs:annotation>` `</xs:element>` `<xs:element default="0.92" name="InverterTransformerEfficiency" type="xs:double" maxOccurs="1" minOccurs="0"/>` `<xs:element default="0.98" name="DcWiringEfficiency" type="xs:double" maxOccurs="1" minOccurs="0"/>` `<xs:element default="0.99" name="AcWiringEfficiency" type="xs:double" maxOccurs="1" minOccurs="0"/>` `<xs:element default="0.995" name="DiodesAndConnectionsEfficiency" type="xs:double" maxOccurs="1" minOccurs="0"/>` `<xs:element name="ModuleMismatch" default="0.98" type="xs:double" maxOccurs="1" minOccurs="0"/>` `<xs:element default="0.95" name="Soiling" type="xs:double" maxOccurs="1" minOccurs="0"/>` `<xs:element default="0.98" name="SystemAvailability" type="xs:double" maxOccurs="1" minOccurs="0"/>` `<xs:element name="Shading" default="1.0" type="xs:double" maxOccurs="1" minOccurs="0"/>` `<xs:element default="1.0" name="SunTracking" type="xs:double" form="unqualified" maxOccurs="1" minOccurs="0"/>` `<xs:element default="1.0" name="Age" type="xs:double" maxOccurs="1" minOccurs="0"/>` `</xs:sequence>` `</xs:complexType>`

Complex Type `MountingSystemType`

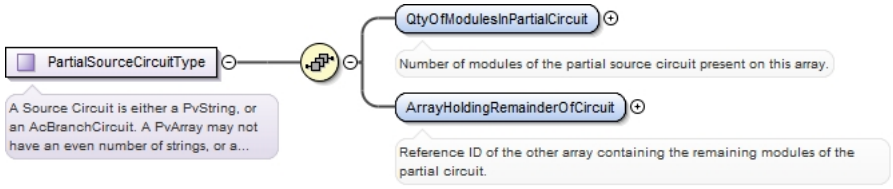
Namespace	http://www.iepmodel.net
Annotations	Describes the physical mounting structure used to secure an array of solar panels (may be photovoltaic or thermal).

Diagram	
Used by	Element PvArrayType/MountingSystem
Model	Manufacturer , ComponentsDescription , AttachmentPointQuantity{0,1} , MaxSpacingBetweenAttachmentPoints{0,1} , TotalWeightOfPanelsAndMountingSystem{0,1} , TotalPanelSurfaceArea{0,1} , RoofPenetrationWeatherProofing{0,1}
Children	AttachmentPointQuantity, ComponentsDescription, Manufacturer, MaxSpacingBetweenAttachmentPoints, RoofPenetrationWeatherProofing, TotalPanelSurfaceArea, TotalWeightOfPanelsAndMountingSystem

Source	`<xs:complexType name="MountingSystemType">`
	`<xs:annotation>`
	`<xs:documentation>Describes the physical mounting structure used to secure an array of solar panels (may be photovoltaic or thermal).</xs:documentation>`
	`</xs:annotation>`
	`<xs:sequence>`
	`<xs:element name="Manufacturer" type="xs:string" form="unqualified"/>`
	`<xs:element name="ComponentsDescription" type="xs:string" form="unqualified">`
	`<xs:annotation>`
	`<xs:documentation>Include model numbers and descriptions of mounting system components. Note, if there is more than one manufacturer's parts used, list the secondary mfr's name here with its component.</xs:documentation>`
	`</xs:annotation>`
	`</xs:element>`
	`<xs:element minOccurs="0" name="AttachmentPointQuantity" type="xs:integer" form="unqualified">`
	`<xs:annotation>`
	`<xs:documentation>Total number of attachment points for the array.</xs:documentation>`
	`</xs:annotation>`
	`</xs:element>`
	`<xs:element minOccurs="0" name="MaxSpacingBetweenAttachmentPoints" type="xs:double" form="unqualified">`
	`<xs:annotation>`
	`<xs:documentation>Given in feet, the maximum spacing allowed between attachment points. See product manual for maximum spacing allowed based on maximum design wind speed.</xs:documentation>`
	`</xs:annotation>`
	`</xs:element>`
	`<xs:element minOccurs="0" name="TotalWeightOfPanelsAndMountingSystem" type="xs:double" form="unqualified">`
	`<xs:annotation>`
	`<xs:documentation>Total weight in pounds (lbs) of the array's panels and its mounting structure components.</xs:documentation>`
	`</xs:annotation>`
	`</xs:element>`
	`<xs:element minOccurs="0" name="TotalPanelSurfaceArea" type="xs:double" form="unqualified">`
	`<xs:annotation>`
	`<xs:documentation>The total surface area (in square feet) of all the panels in the array.</xs:documentation>`
	`</xs:annotation>`
	`</xs:element>`

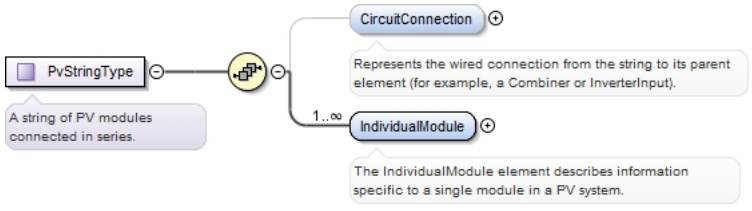
```
    <xs:element minOccurs="0" name="RoofPenetrationWeatherProofing" type="xs:string"
 form="unqualified">
      <xs:annotation>
        <xs:documentation>Description of the method used to weatherproof roof penetrations
 (e.g. flashing, caulk)</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

Complex Type `PartialSourceCircuitType`

Namespace	http://www.iepmodel.net
Annotations	A Source Circuit is either a PvString, or an AcBranchCircuit. A PvArray may not have an even number of strings, or a branch circuit may be split across two physical arrays. This type allows a partial source circuit (string or AC branch circuit) to be included within one array, noting how many modules of the total circuit length are in this array, and setting a reference to another array where the remainder of the circuit is included.
Diagram	
Used by	Elements AcPvBranchCircuitType/PartialAcPvBranchCircuit, StringPvArrayType/SplitString
Model	QtyOfModulesInPartialCircuit , ArrayHoldingRemainderOfCircuit
Children	ArrayHoldingRemainderOfCircuit, QtyOfModulesInPartialCircuit
Source	

```
<xs:complexType name="PartialSourceCircuitType">
  <xs:annotation>
    <xs:documentation>A Source Circuit is either a PvString, or an AcBranchCircuit. A
 PvArray may not have an even number of strings, or a branch circuit may be split across
 two physical arrays. This type allows a partial source circuit (string or AC branch
 circuit) to be included within one array, noting how many modules of the total circuit
 length are in this array, and setting a reference to another array where the remainder of
 the circuit is included.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="QtyOfModulesInPartialCircuit" type="xs:integer">
      <xs:annotation>
        <xs:documentation>Number of modules of the partial source circuit present on this
 array.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ArrayHoldingRemainderOfCircuit" type="xs:IDREF">
      <xs:annotation>
        <xs:documentation>Reference ID of the other array containing the remaining modules
 of the partial circuit.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

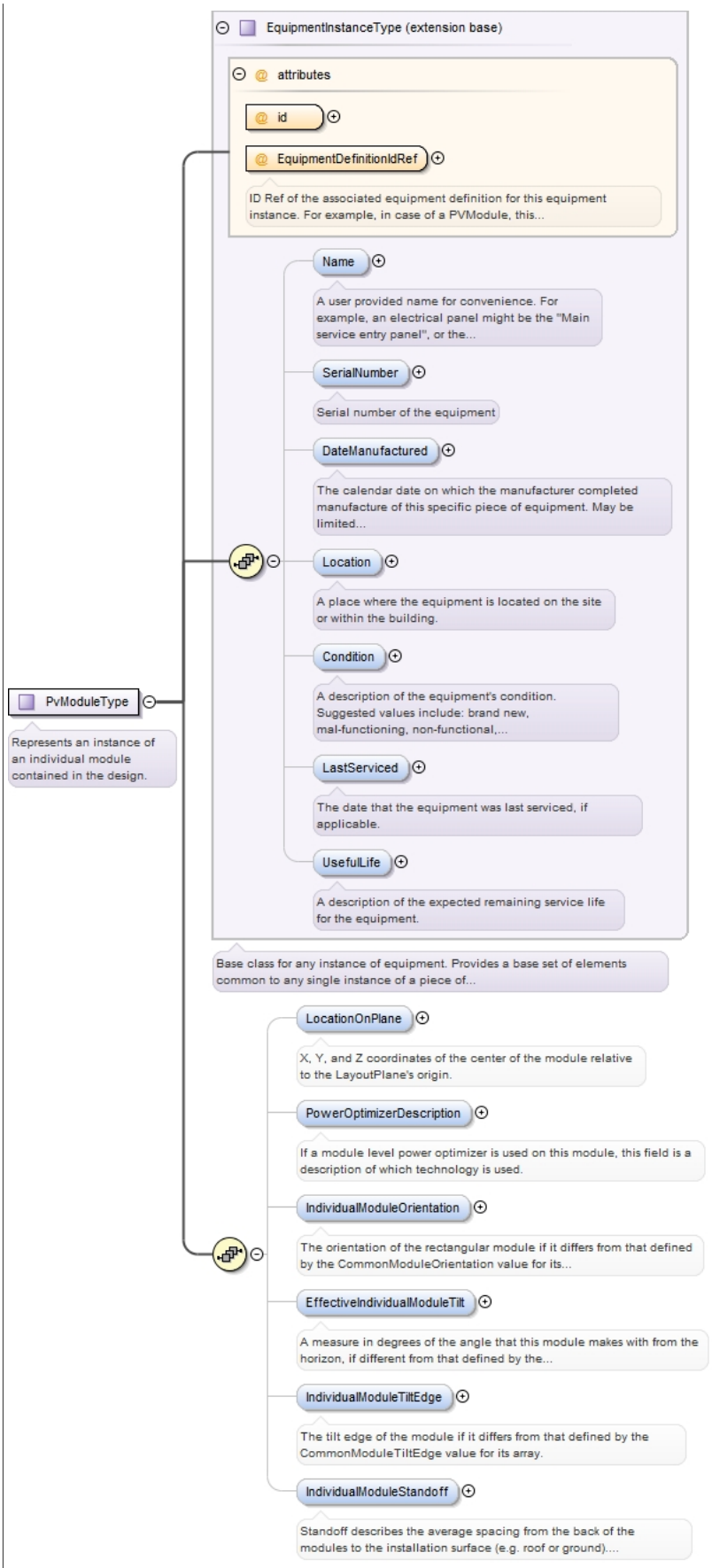
Complex Type `PvStringType`

Namespace	http://www.iepmodel.net
Annotations	A string of PV modules connected in series.
Diagram	
Used by	Element StringPvArrayType/StringDetail/IndividualString
Model	CircuitConnection{0,1} , IndividualModule+
Children	CircuitConnection, IndividualModule

Source	<xs:complexType name="PvStringType"> <xs:annotation> <xs:documentation>A string of PV modules connected in series.</xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="CircuitConnection" type="CircuitConnectionType" minOccurs="0"> <xs:annotation> <xs:documentation>Represents the wired connection from the string to its parent element (for example, a Combiner or InverterInput).</xs:documentation> </xs:annotation> </xs:element> <xs:element maxOccurs="unbounded" minOccurs="1" name="IndividualModule" type="PvModuleType"> <xs:annotation> <xs:documentation>The IndividualModule element describes information specific to a single module in a PV system.</xs:documentation> </xs:annotation> </xs:element> </xs:sequence> </xs:complexType>

Complex Type PvModuleType

Namespace	http://www.iepmodel.net
Annotations	Represents an instance of an individual module contained in the design.

Diagram	
Type	extension of EquipmentInstanceType
Type hierarchy	• EquipmentInstanceType

	• PvModuleType
Used by	Elements AcModuleInstanceType/IndividualModule, PvStringType/IndividualModule
Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1} , LocationOnPlane{0,1} , PowerOptimizerDescription{0,1} , IndividualModuleOrientation{0,1} , EffectiveIndividualModuleTilt{0,1} , IndividualModuleTiltEdge{0,1} , IndividualModuleStandoff{0,1}
Children	Condition, DateManufactured, EffectiveIndividualModuleTilt, IndividualModuleOrientation, IndividualModuleStandoff, IndividualModuleTiltEdge, LastServiced, Location, LocationOnPlane, Name, PowerOptimizerDescription, SerialNumber, UsefulLife

Attributes

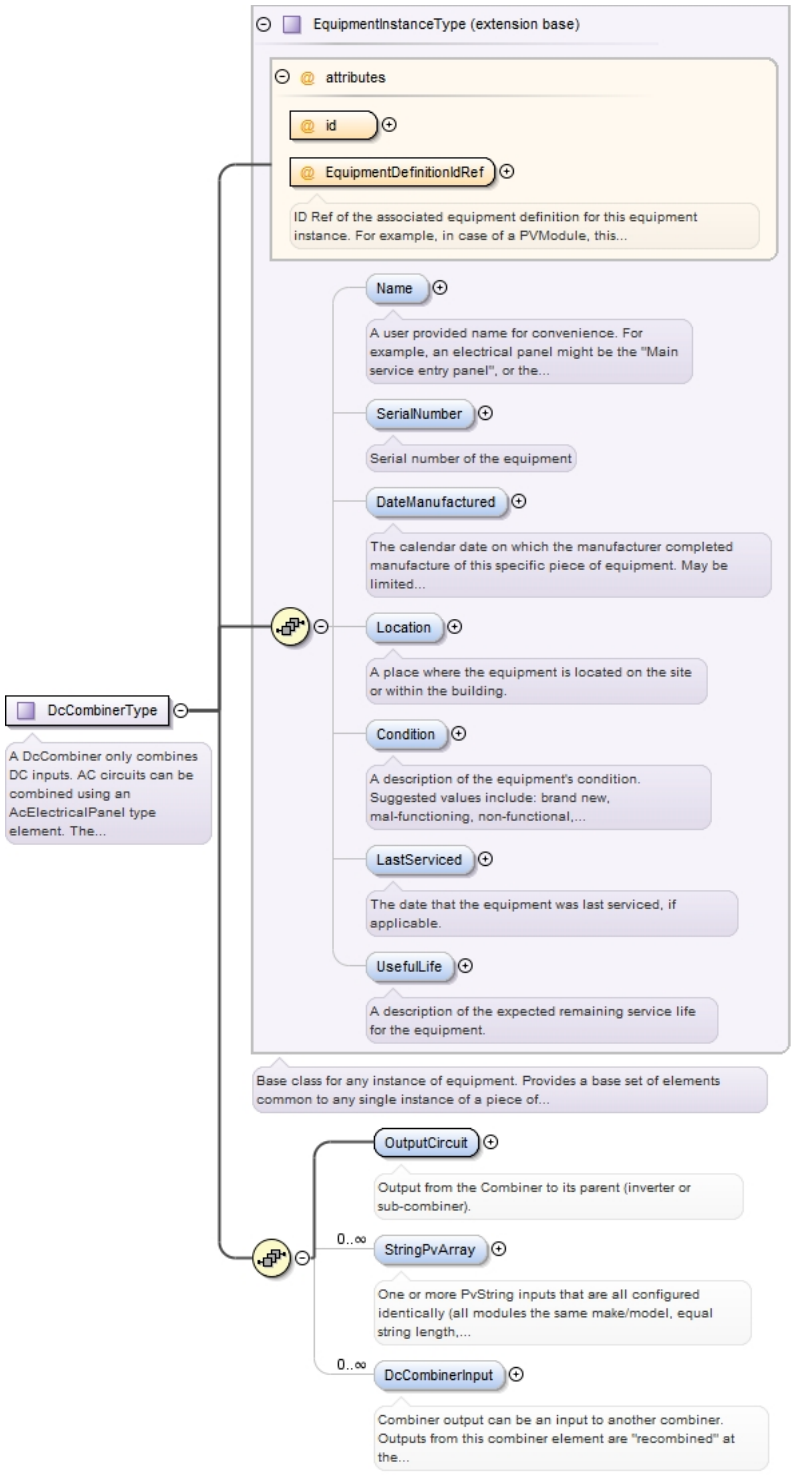
QName	Type	Fixed	Default	Use
EquipmentDefinitionIdREF	IDREF			required
	ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.			
id	xs:ID			required

Source

```
<xs:complexType name="PvModuleType">
  <xs:annotation>
    <xs:documentation>Represents an instance of an individual module contained in the
 design.</xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="EquipmentInstanceType">
      <xs:sequence>
        <xs:element minOccurs="0" name="LocationOnPlane" type="Location3dType">
          <xs:annotation>
            <xs:documentation>X, Y, and Z coordinates of the center of the module relative
 to the LayoutPlane's origin.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="PowerOptimizerDescription" type="xs:string">
          <xs:annotation>
            <xs:documentation>If a module level power optimizer is used on this module,
 this field is a description of which technology is used.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="IndividualModuleOrientation"
 type="PanelOrientationEnumType">
          <xs:annotation>
            <xs:documentation>The orientation of the rectangular module if it differs from
 that defined by the CommonModuleOrientation value for its array.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="EffectiveIndividualModuleTilt" type="xs:integer">
          <xs:annotation>
            <xs:documentation>A measure in degrees of the angle that this module makes
 with from the horizon, if different from that defined by the SolarResource element for
 the array.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="IndividualModuleTiltEdge"
 type="PanelTiltEdgeEnumType">
          <xs:annotation>
            <xs:documentation>The tilt edge of the module if it differs from that defined
 by the CommonModuleTiltEdge value for its array.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="IndividualModuleStandoff" type="xs:string">
          <xs:annotation>
            <xs:documentation>Standoff describes the average spacing from the
 back of the modules to the installation surface (e.g. roof or ground). Use
 IndividualModuleStandoff only if it differs from the CommonModuleStandoff defined for the
 array.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Complex Type DcCombinerType

Namespace	http://www.iepmodel.net
Annotations	A DcCombiner only combines DC inputs. AC circuits can be combined using an AcElectricalPanel type element.

	The EquipmentDefinitionRefID for the DcCombiner references the ID of the associated CombinerDefinition.
Diagram	
Type	extension of EquipmentInstanceType
Type hierarchy	• EquipmentInstanceType • DcCombinerType
Used by	Elements DcCombinerType/DcCombinerInput, PowerPointTrackerType/DcCombiner
Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1} , OutputCircuit , StringPvArray* , DcCombinerInput*
Children	Condition, DateManufactured, DcCombinerInput, LastServiced, Location, Name, OutputCircuit, SerialNumber, StringPvArray, UsefulLife

Attributes

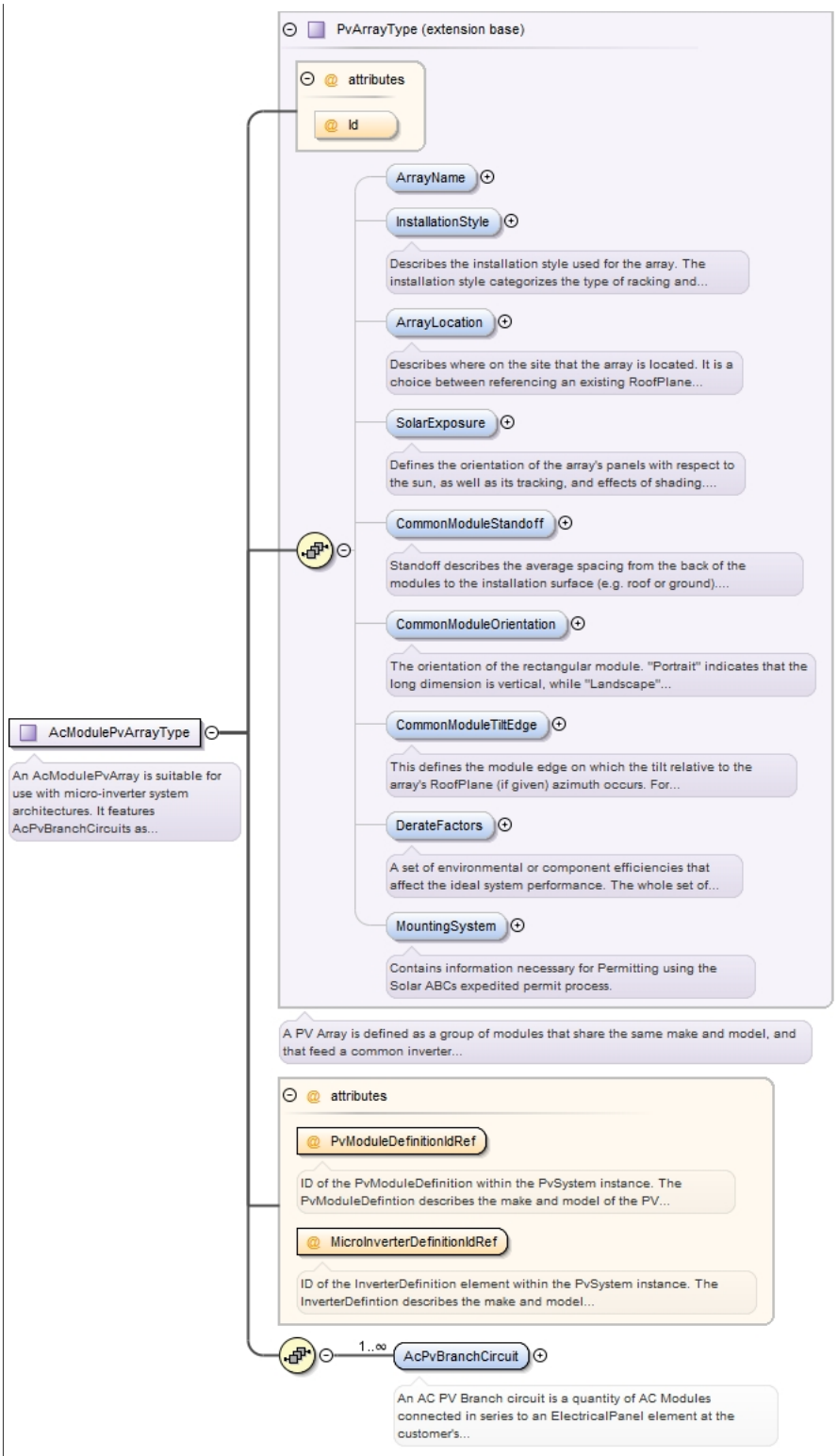
QName	Type	Fixed	Default	Use
EquipmentDefinitionIdREF	IDREF			required
	ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.			
id	xs:ID			required

Source

```
<xs:complexType name="DcCombinerType">
  <xs:annotation>
    <xs:documentation>A DcCombiner only combines DC inputs. AC circuits can be combined
 using an AcElectricalPanel type element. The EquipmentDefinitionRefID for the DcCombiner
 references the ID of the associated CombinerDefinition.</xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="EquipmentInstanceType">
      <xs:sequence>
        <xs:element name="OutputCircuit" type="CircuitConnectionType">
          <xs:annotation>
            <xs:documentation>Output from the Combiner to its parent (inverter or sub-
combiner).</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="StringPvArray" type="StringPvArrayType" maxOccurs="unbounded"
 minOccurs="0">
          <xs:annotation>
            <xs:documentation>One or more PvString inputs that are all configured
 identically (all modules the same make/model, equal string length, and share the same
 LayoutPlane). The PvArray element provides an alternate, and simpler means of defining
 a set of identical strings than using the PvString element which lists every module
 individually, making it quite verbose. The PvArray defines a single string and how many
 of them there are. NOTE: Must consider total number of strings to be separate inputs into
 the combiner.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element maxOccurs="unbounded" minOccurs="0" name="DcCombinerInput"
 type="DcCombinerType">
          <xs:annotation>
            <xs:documentation>Combiner output can be an input to another combiner. Outputs
 from this combiner element are "recombined" at the combiner in which this element is
 found.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Complex Type `AcModulePvArrayType`

Namespace	http://www.iepmodel.net
Annotations	An AcModulePvArray is suitable for use with micro-inverter system architectures. It features AcPvBranchCircuits as building blocks. NOTE: An AC Module is assumed to be either: 1) an integrated micro-inverter and PV module, OR 2) an independent PV module and micro-inverter pair.

Diagram	
Type	extension of PvArrayType
Type hierarchy	• PvArrayType • AcModulePvArrayType
Used by	Element PvSystemType/AcModuleArray
Model	ArrayName{0,1} , InstallationStyle{0,1} , ArrayLocation{0,1} , SolarExposure{0,1} , CommonModuleStandoff{0,1} , CommonModuleOrientation{0,1} , CommonModuleTiltEdge{0,1} , DerateFactors{0,1} , MountingSystem{0,1} , AcPvBranchCircuit+

Children	AcPvBranchCircuit, ArrayLocation, ArrayName, CommonModuleOrientation, CommonModuleStandoff, CommonModuleTiltEdge, DerateFactors, InstallationStyle, MountingSystem, SolarExposure

Attributes

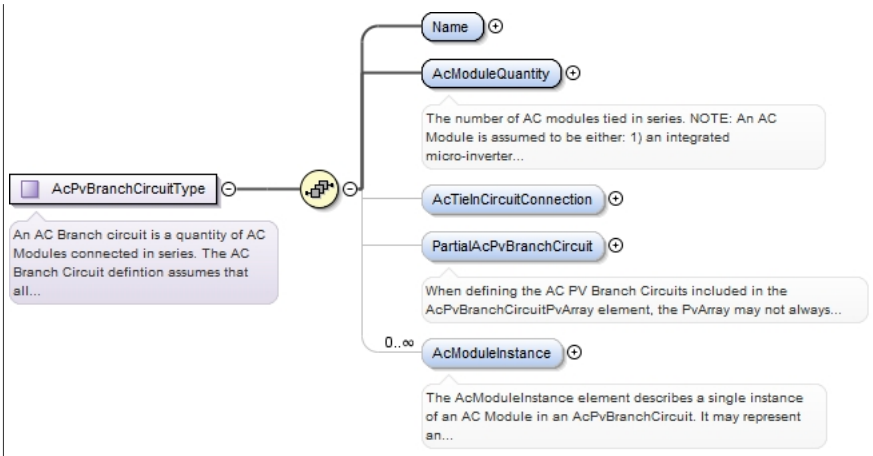
QName	Type	Fixed	Default	Use
Id				optional
MicroInverterDefinitionIdRef				required
	ID of the InverterDefinition element within the PvSystem instance. The InverterDefintion describes the make and model of the micro-inverter used in all the AC Modules within this array. Note that in case of an AC Module, the PvModuleDefinition and the MicroInverterDefinition may share the same make and model number.			
PvModuleDefinitionIdRef				required
	ID of the PvModuleDefinition within the PvSystem instance. The PvModuleDefintion describes the make and model of the PV module. The PvArray is assumed to use the same module for the entire array. Note that in case of an AC Module, the PvModuleDefinition and the MicroInverterDefinition may share the same make and model number.			

Source

```
<xs:complexType name="AcModulePvArrayType">
  <xs:annotation>
    <xs:documentation>An AcModulePvArray is suitable for use with micro-inverter system
 architectures. It features AcPvBranchCircuits as building blocks. NOTE: An AC Module is
 assumed to be either: 1) an integrated micro-inverter and PV module, OR 2) an independent
 PV module and micro-inverter pair.</xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="PvArrayType">
      <xs:sequence>
        <xs:element maxOccurs="unbounded" name="AcPvBranchCircuit"
 type="AcPvBranchCircuitType">
          <xs:annotation>
            <xs:documentation>An AC PV Branch circuit is a quantity of AC Modules
 connected in series to an ElectricalPanel element at the customer's site. The AC PV
 Branch Circuit defintion assumes that all AC modules in the circuit share the same
 PvModule and Inverter Definitions. Although micro-inverter technology allows an AC Branch
 to contain different makes and models in series, this is a highly unusual use case not
 supported by this schema. Such a case would typically come about in a remove and replace
 scenario well after the project was implemented.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
      <xs:attribute name="PvModuleDefinitionIdRef" use="required">
        <xs:annotation>
          <xs:documentation>ID of the PvModuleDefinition within the PvSystem instance.
 The PvModuleDefintion describes the make and model of the PV module. The PvArray is
 assumed to use the same module for the entire array. Note that in case of an AC Module,
 the PvModuleDefinition and the MicroInverterDefinition may share the same make and model
 number.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
      <xs:attribute name="MicroInverterDefinitionIdRef" use="required">
        <xs:annotation>
          <xs:documentation>ID of the InverterDefinition element within the PvSystem
 instance. The InverterDefintion describes the make and model of the micro-inverter
 used in all the AC Modules within this array. Note that in case of an AC Module, the
 PvModuleDefinition and the MicroInverterDefinition may share the same make and model
 number.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Complex Type `AcPvBranchCircuitType`

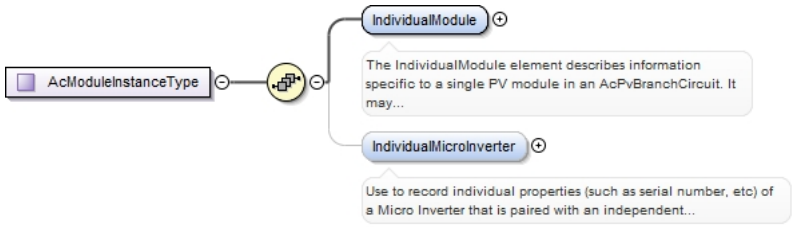
Namespace	http://www.iepmodel.net
Annotations	An AC Branch circuit is a quantity of AC Modules connected in series. The AC Branch Circuit defintion assumes that all AC modules in the circuit share the same PvModule and Inverter Definitions. Although micro-inverter technology allows an AC Branch to contain different makes and models in series, this is a highly unusual use case not supported by this schema. Such a case would typically come about in a remove and replace scenario well after the project was implemented.

Diagram	
Used by	Element AcModulePvArrayType/AcPvBranchCircuit
Model	Name , AcModuleQuantity , AcTieInCircuitConnection{0,1} , PartialAcPvBranchCircuit{0,1} , AcModuleInstance*
Children	AcModuleInstance, AcModuleQuantity, AcTieInCircuitConnection, Name, PartialAcPvBranchCircuit
Source	

```
<xs:complexType name="AcPvBranchCircuitType">
  <xs:annotation>
    <xs:documentation>An AC Branch circuit is a quantity of AC Modules connected in
 series. The AC Branch Circuit defintion assumes that all AC modules in the circuit share
 the same PvModule and Inverter Definitions. Although micro-inverter technology allows an
 AC Branch to contain different makes and models in series, this is a highly unusual use
 case not supported by this schema. Such a case would typically come about in a remove and
 replace scenario well after the project was implemented.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Name" type="xs:string"/>
    <xs:element name="AcModuleQuantity" type="xs:int">
      <xs:annotation>
        <xs:documentation>The number of AC modules tied in series. NOTE: An AC Module is
 assumed to be either: 1) an integrated micro-inverter and PV module, OR 2) an independent
 PV module and micro-inverter pair.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="AcTieInCircuitConnection" type="CircuitConnectionType"
 minOccurs="0"/>
    <xs:element minOccurs="0" name="PartialAcPvBranchCircuit"
 type="PartialSourceCircuitType">
      <xs:annotation>
        <xs:documentation>When defining the AC PV Branch Circuits included in the
 AcPvBranchCircuitPvArray element, the PvArray may not always have an even number
 of circuits. This type allows a partial branch circuit to be included in an array,
 noting how many modules of the total circuit length are in this array, and setting a
 reference to another array where the remainder of the branch circuit is included.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="AcModuleInstance"
 type="AcModuleInstanceType">
      <xs:annotation>
        <xs:documentation>The AcModuleInstance element describes a single instance of an
 AC Module in an AcPvBranchCircuit. It may represent an integrated module / micro-inverter
 assembly (common make/model) or a an independent PV module paired with an independent
 micro-inverter.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

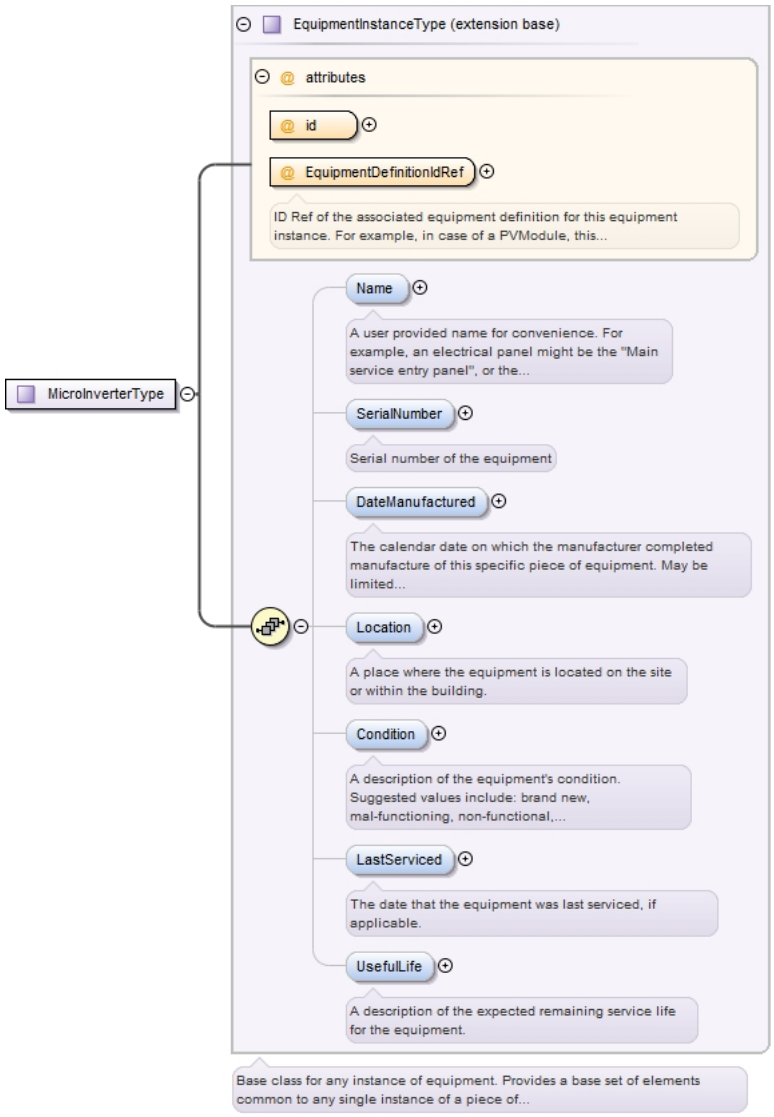
Complex Type `AcModuleInstanceType`

Namespace	http://www.iepmodel.net

Diagram	
Used by	Element AcPvBranchCircuitType/AcModuleInstance
Model	IndividualModule , IndividualMicroInverter{0,1}
Children	IndividualMicroInverter, IndividualModule
Source	`<xs:complexType name="AcModuleInstanceType">` `  <xs:sequence>` `  <xs:element maxOccurs="1" minOccurs="1" name="IndividualModule" type="PvModuleType">` `  <xs:annotation>` ` <xs:documentation>The IndividualModule element describes information specific to a single PV module in an AcPvBranchCircuit. It may represent an integrated module / micro-inverter assembly (common make/model) or an individual module that can be paired with an independent micro-inverter (described by the IndividualMicroInverter element).</xs:documentation>` ` </xs:annotation>` ` </xs:element>` ` <xs:element minOccurs="0" name="IndividualMicroInverter" type="MicroInverterType">` ` <xs:annotation>` ` <xs:documentation>Use to record individual properties (such as serial number, etc) of a Micro Inverter that is paired with an independent PV module. Together they form the AC Module.</xs:documentation>` ` </xs:annotation>` ` </xs:element>` ` </xs:sequence>` `</xs:complexType>`

Complex Type `MicroInverterType`

Namespace	http://www.iepmodel.net

Diagram	
Type	extension of EquipmentInstanceType
Type hierarchy	• EquipmentInstanceType • MicroInverterType
Used by	Element AcModuleInstanceType/IndividualMicroInverter
Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1}
Children	Condition, DateManufactured, LastServiced, Location, Name, SerialNumber, UsefulLife

Attributes

QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			required
	ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.			
id	xs:ID			required

Source

```
<xs:complexType name="MicroInverterType">
  <xs:complexContent>
    <xs:extension base="EquipmentInstanceType"/>
  </xs:complexContent>
</xs:complexType>
```

Complex Type `GenericPvArrayType`

Namespace	http://www.iepmodel.net

Annotations	Rather than define a specific array configuration using a specific PV module make and model, the GenericPvArray element allows an array to be defined simply as a total DC power output. The PvArray Base Type provides all the orientation, derate, and solar access parameters necessary to evaluate this "generic" array using a tool like NREL's PVWatts. The GenericPvArray element is useful for feasibility studies where specific designs are not required.
Diagram	
Type	extension of PvArrayType
Type hierarchy	• PvArrayType • GenericPvArrayType
Used by	Element PvSystemType/GenericPvArray
Model	ArrayName{0,1} , InstallationStyle{0,1} , ArrayLocation{0,1} , SolarExposure{0,1} , CommonModuleStandoff{0,1} , CommonModuleOrientation{0,1} , CommonModuleTiltEdge{0,1} , DerateFactors{0,1} , MountingSystem{0,1} , DcRating
Children	ArrayLocation, ArrayName, CommonModuleOrientation, CommonModuleStandoff, CommonModuleTiltEdge, DcRating, DerateFactors, InstallationStyle, MountingSystem, SolarExposure

Attributes

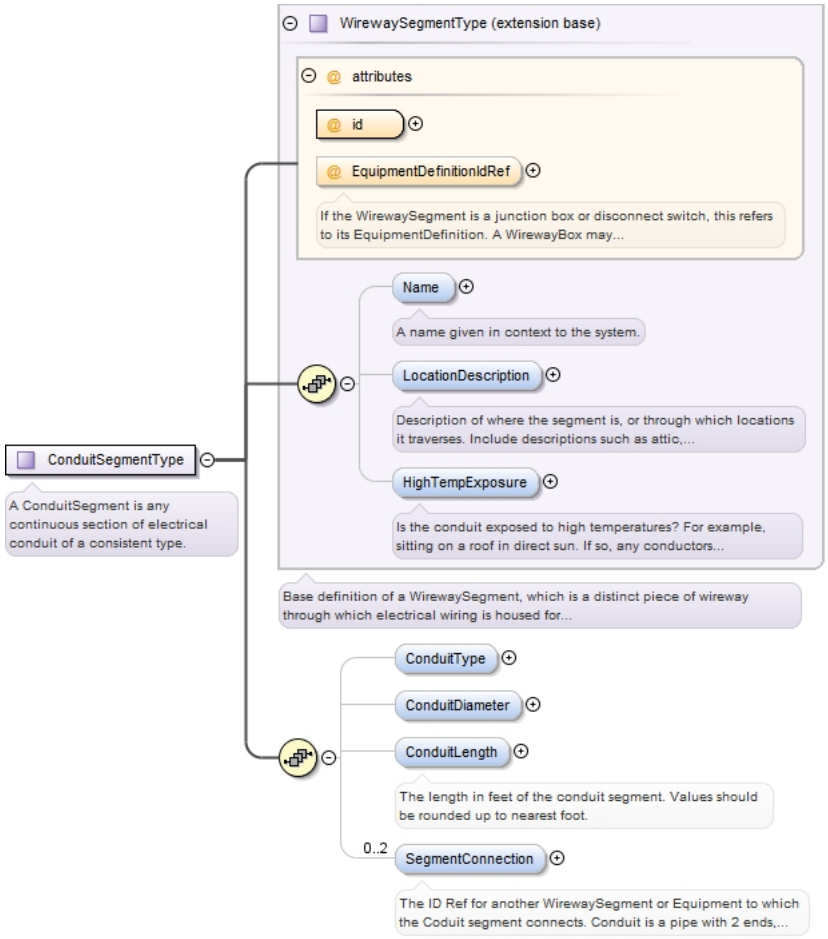
QName	Type	Fixed	Default	Use
Id				optional

Source

```
<xs:complexType name="GenericPvArrayType">
  <xs:annotation>
```

```
    <xs:documentation>Rather than define a specific array configuration using a specific
 PV module make and model, the GenericPvArray element allows an array to be defined simply
 as a total DC power output. The PvArray Base Type provides all the orientation, derate,
 and solar access parameters necessary to evaluate this "generic" array using a tool
 like NREL's PVWatts. The GenericPvArray element is useful for feasibility studies where
 specific designs are not required.</xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="PvArrayType">
      <xs:sequence>
        <xs:element name="DcRating" type="xs:integer">
          <xs:annotation>
            <xs:documentation>Sum total STC power rating for an entire generic array.</
xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Complex Type `ConduitSegmentType`

Namespace	http://www.iepmodel.net
Annotations	`A ConduitSegment is any continuous section of electrical conduit of a consistent type.`
Diagram	
Type	extension of WirewaySegmentType
Type hierarchy	• WirewaySegmentType • ConduitSegmentType
Used by	Element PvSystemType/ConduitSegment
Model	Name{0,1} , LocationDescription{0,1} , HighTempExposure{0,1} , ConduitType{0,1} , ConduitDiameter{0,1} , ConduitLength{0,1} , SegmentConnection{0,2}
Children	ConduitDiameter, ConduitLength, ConduitType, HighTempExposure, LocationDescription, Name, SegmentConnection

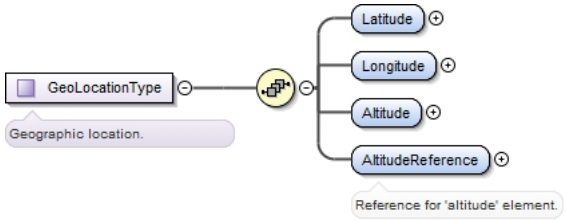
Attributes

QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			optional
	If the WirewaySegment is a junction box or disconnect switch, this refers to its EquipmentDefinition. A WirewayBox may be a pass through where multiple ConduitSegments are combined into a single ConduitSegment for example. A disconnect switch box may also be modeled as a WirewayBox, provided that the circuit(s) involved are simply disoconnected and not combined in any way. DO NOT use WirewayBox to represent a combiner, or distribution panel.			
id	xs:ID			required

Source

```
<xs:complexType name="ConduitSegmentType">
  <xs:annotation>
    <xs:documentation>A ConduitSegment is any continuous section of electrical conduit of
 a consistent type.</xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="WirewaySegmentType">
      <xs:sequence>
        <xs:element name="ConduitType" type="TypeOfConduitEnumType" minOccurs="0"
 maxOccurs="1"/>
        <xs:element name="ConduitDiameter" type="ConduitDiameterEnumType" minOccurs="0"
 maxOccurs="1"/>
        <xs:element name="ConduitLength" type="xs:double" minOccurs="0">
          <xs:annotation>
            <xs:documentation>The length in feet of the conduit segment. Values should be
 rounded up to nearest foot.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element maxOccurs="2" name="SegmentConnection" type="xs:IDREF" minOccurs="0">
          <xs:annotation>
            <xs:documentation>The ID Ref for another WirewaySegment or Equipment to which
 the Coduit segment connects. Conduit is a pipe with 2 ends, so it has a maximum of two
 WirewaySegments or Equipment to which it connects. Boxes can have many WirewaySegment
 connections.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Complex Type GeoLocationType

Namespace	http://www.iepmodel.net
Annotations	Geographic location.
Diagram	
Used by	Element PvSystemType/SceneOriginGeoTag
Model	Latitude , Longitude , Altitude , AltitudeReference
Children	Altitude, AltitudeReference, Latitude, Longitude

Source

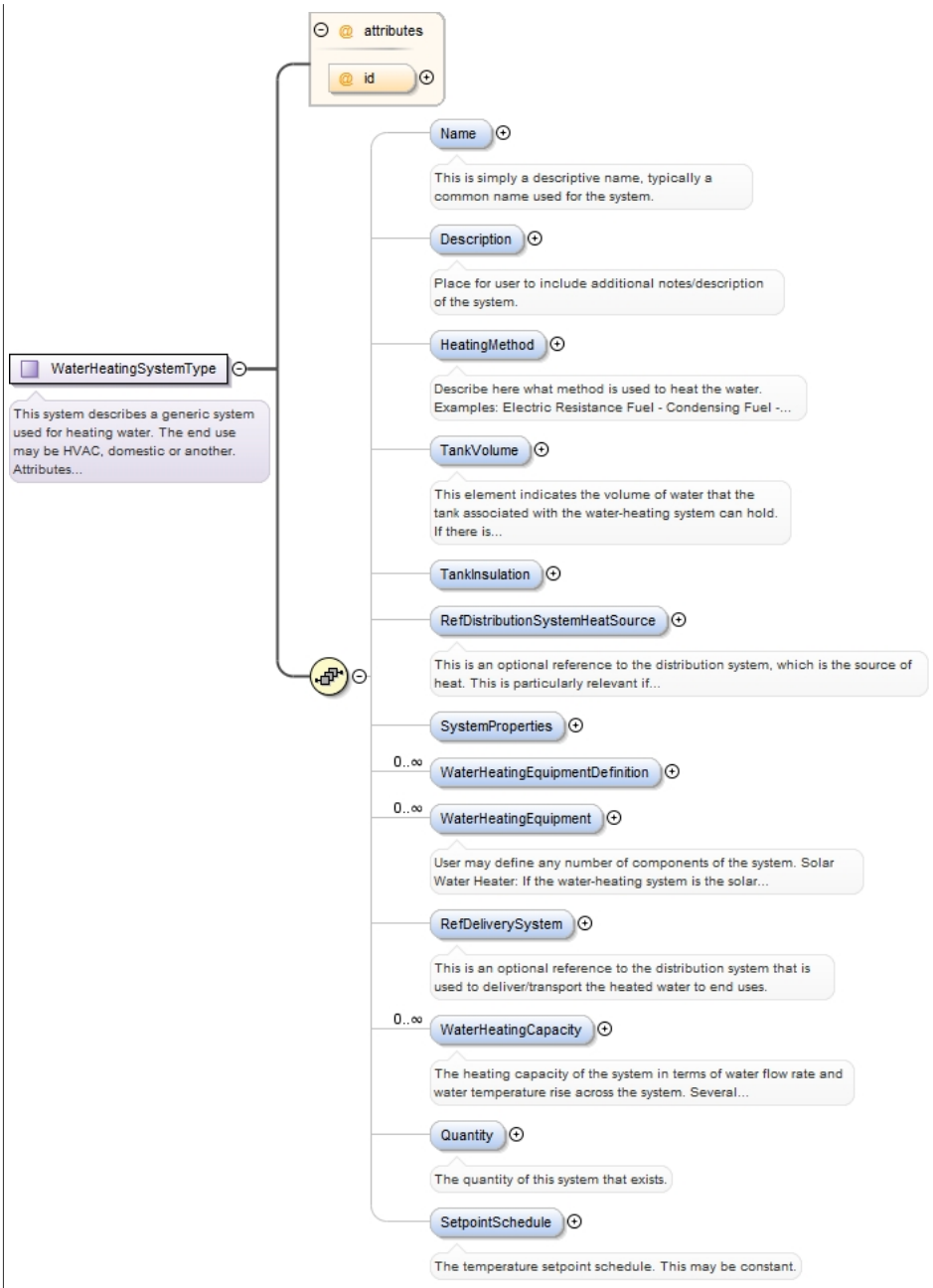
```
<xs:complexType name="GeoLocationType">
  <xs:annotation>
    <xs:documentation>Geographic location.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Latitude" type="xs:double"/>
    <xs:element name="Longitude" type="xs:double"/>
    <xs:element name="Altitude" type="xs:double"/>
    <xs:element name="AltitudeReference" default="Ground">
      <xs:annotation>
        <xs:documentation>Reference for 'altitude' element.</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="Ground">
            <xs:annotation>
```

```
              <xs:documentation>The altitude is measured from the ground.</
xs:documentation>
            </xs:annotation>
          </xs:enumeration>
          <xs:enumeration value="Ellipsoid">
            <xs:annotation>
              <xs:documentation>The altitude is measured from the ellipsoid.</
xs:documentation>
            </xs:annotation>
          </xs:enumeration>
          <xs:enumeration value="SeaLevel">
            <xs:annotation>
              <xs:documentation>The altitude is measured from sea level.</
xs:documentation>
            </xs:annotation>
          </xs:enumeration>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

Complex Type `WaterHeatingSystemType`

Namespace	http://www.iepmodel.net
Annotations	This system describes a generic system used for heating water. The end use may be HVAC, domestic or another. Attributes from Title24 WaterHeating

Diagram



Used by

Elements: ProjectType/ExistingWaterHeatingSystem, SystemChoiceType/WaterHeating, WaterHeatingSystem

Model

Name{0,1} , Description{0,1} , HeatingMethod{0,1} , TankVolume{0,1} , TankInsulation{0,1} , RefDistributionSystemHeatSource{0,1} , SystemProperties{0,1} , WaterHeatingEquipmentDefinition* , WaterHeatingEquipment* , RefDeliverySystem{0,1} , WaterHeatingCapacity* , Quantity{0,1} , SetpointSchedule{0,1}

Children

Description, HeatingMethod, Name, Quantity, RefDeliverySystem, RefDistributionSystemHeatSource, SetpointSchedule, SystemProperties, TankInsulation, TankVolume, WaterHeatingCapacity, WaterHeatingEquipment, WaterHeatingEquipmentDefinition

Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			optional

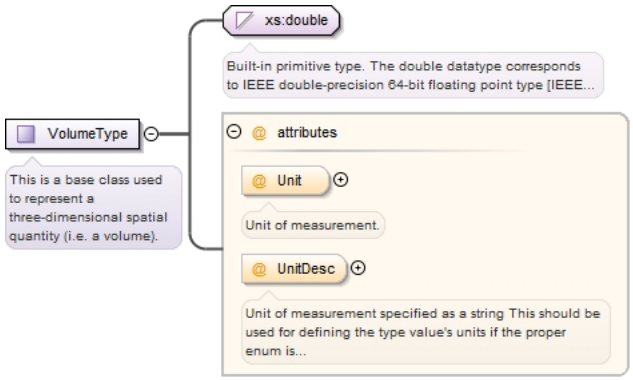
Source

```
<xs:complexType name="WaterHeatingSystemType">
  <xs:annotation>
    <xs:documentation>This system describes a generic system used for heating water.
 The end use may be HVAC, domestic or another. Attributes from Title24 WaterHeating</
xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
```

```
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name, typically a common name used
 for the system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description of the
 system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="HeatingMethod" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Describe here what method is used to heat the water. Examples:
 Electric Resistance Fuel - Condensing Fuel - Non-Condensing Heat Pump – Air Source Heat
 Pump – Water Source Hybrid Heat Exchanger Solar Note, that some of the examples above
 require additional objects to be defined. For example: - If the heating type is Heat
 Exchanger, a reference to a distribution system that is the heat source is needed. -
 If solar, then additional details regarding the solar heating system are needed. This
 may simply be a reference to the distribution system that transfers heat from the solar
 panels to the water heating system. It may be an instance of Equipment Properties.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="TankVolume" type="VolumeType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This element indicates the volume of water that the tank
 associated with the water-heating system can hold. If there is no tank, then this
 should have the value zero. Water heating systems wtih zero volume (no) tanks are
 commonly referred to as: - tankless - direct - instantaneous - boiler (typical in a large
 facility; used for space heating) Note that a hot water tank is not necessarily and does
 not have to be integrated with the water heating equipment. The water heater and the
 storage tank may be separate entities.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element minOccurs="0" name="TankInsulation" type="InsulationType"/>
    <xs:element maxOccurs="1" minOccurs="0" name="RefDistributionSystemHeatSource"
 type="xs:IDREF">
      <xs:annotation>
        <xs:documentation>This is an optional reference to the distribution system, which
 is the source of heat. This is particularly relevant if the heating method is a heat
 exchanger. For example, a facility may use hot water at multiple temperatures. One boiler
 may heat water to 180 degF to use for space heating. A heat exchanger may be used to
 extract heat from the 180degF water loop and heat another water loop to only 120 degF to
 be used as domestic hot water. Another use case is when multiple water heaters are used
 in series. The first heaters may heat water to 130 degF for one purpose, such as domestic
 hot water. Another heater may boost the water to a higher temperature for another use
 such as laundry or dish washing. Multiple hot water loops are often advantageous when the
 end uses are very far apart. The less distance that the hotter water has to travel, the
 less heat that will lost through the piping into the environment. It is then advantageous
 to boost the water temperature nearby the end use.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="SystemProperties" type="CommonSystemPropertiesType" minOccurs="0"
 maxOccurs="1"/>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="WaterHeatingEquipmentDefinition"
 type="EquipmentDefinitionType"/>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="WaterHeatingEquipment"
 nillable="false" type="EquipmentInstanceType">
      <xs:annotation>
        <xs:documentation>User may define any number of components of the system. Solar
 Water Heater: If the water-heating system is the solar type, it may be useful to describe
 the properties of the solar system with an instance of this object.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="RefDeliverySystem" type="xs:IDREF">
      <xs:annotation>
        <xs:documentation>This is an optional reference to the distribution system that is
 used to deliver/transport the heated water to end uses.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="WaterHeatingCapacity" type="WaterHeatingCapacityType" minOccurs="0"
 maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>The heating capacity of the system in terms of water flow rate
 and water temperature rise across the system. Several are allowed because it is not
 uncommon for manufacturers to specify the temperature rise at various flow rates.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Quantity" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The quantity of this system that exists.</xs:documentation>
```

```
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:int">
          <xs:minInclusive value="0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="SetpointSchedule" type="xs:IDREF" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The temperature setpoint schedule. This may be constant.</
xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="id" type="xs:ID" use="optional"/>
</xs:complexType>
```

Complex Type `VolumeType`

Namespace	http://www.iepmodel.net
Annotations	`This is a base class used to represent a three-dimensional spatial quantity (i.e. a volume).`
Diagram	
Type	extension of xs:double
Used by	Elements: ValueType/Water, WaterHeatingSystemType/TankVolume

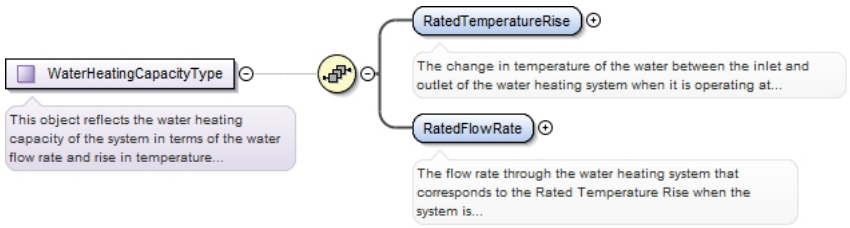
Attributes

QName	Type	Fixed	Default	Use
Unit	VolumeUnitEnumType			optional
	`Unit of measurement.`			
UnitDesc	xs:string			optional
	`Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.`			

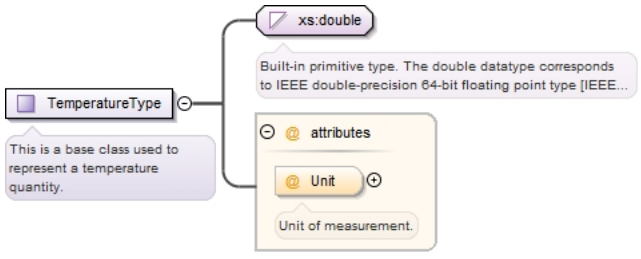
Source

```
<xs:complexType name="VolumeType">
  <xs:annotation>
    <xs:documentation>This is a base class used to represent a three-dimensional spatial
 quantity (i.e. a volume).</xs:documentation>
  </xs:annotation>
  <xs:simpleContent>
    <xs:extension base="xs:double">
      <xs:attribute name="Unit" type="VolumeUnitEnumType" use="optional">
        <xs:annotation>
          <xs:documentation>Unit of measurement.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
      <xs:attribute name="UnitDesc" type="xs:string">
        <xs:annotation>
          <xs:documentation>Unit of measurement specified as a string This should be used
 for defining the type value's units if the proper enum is not listed in Unit. These are
 all optional attributes in order to allow for a simplified value descriptions since these
 are used throughout the IEP schemas. Additionally the UnitDesc may contain a default
 type.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

Complex Type `WaterHeatingCapacityType`

Namespace	http://www.iepmodel.net
Annotations	This object reflects the water heating capacity of the system in terms of the water flow rate and rise in temperature of water across the system. This "capacity" is commonly used with domestic tankless (instantaneous) water heaters. Systems in the U.S. are often rated in a maximum gpm (flow rate) with a 35 degree Fahrenheit temperature rise. Detailed manufacturer specifications often also list the temperature rise at various flow rates.
Diagram	
Used by	Element WaterHeatingSystemType/WaterHeatingCapacity
Model	RatedTemperatureRise , RatedFlowRate
Children	RatedFlowRate, RatedTemperatureRise
Source	`<xs:complexType name="WaterHeatingCapacityType">` `  <xs:annotation>` ` <xs:documentation>This object reflects the water heating capacity of the system in terms of the water flow rate and rise in temperature of water across the system. This "capacity" is commonly used with domestic tankless (instantaneous) water heaters. Systems in the U.S. are often rated in a maximum gpm (flow rate) with a 35 degree Fahrenheit temperature rise. Detailed manufacturer specifications often also list the temperature rise at various flow rates.</xs:documentation>` ` </xs:annotation>` ` <xs:sequence minOccurs="0" maxOccurs="1">` ` <xs:element name="RatedTemperatureRise" type="TemperatureType" minOccurs="1" maxOccurs="1">` ` <xs:annotation>` ` <xs:documentation>The change in temperature of the water between the inlet and outlet of the water heating system when it is operating at full load (maximum heat output or firing rate). This Rated Temperature Rise corresponds to the Rated Flow Rate.</xs:documentation>` ` </xs:annotation>` ` </xs:element>` ` <xs:element name="RatedFlowRate" type="FlowType" minOccurs="1" maxOccurs="1">` ` <xs:annotation>` ` <xs:documentation>The flow rate through the water heating system that corresponds to the Rated Temperature Rise when the system is operating at full load (maximum heat output or firing rate).</xs:documentation>` ` </xs:annotation>` ` </xs:element>` ` </xs:sequence>` `</xs:complexType>`

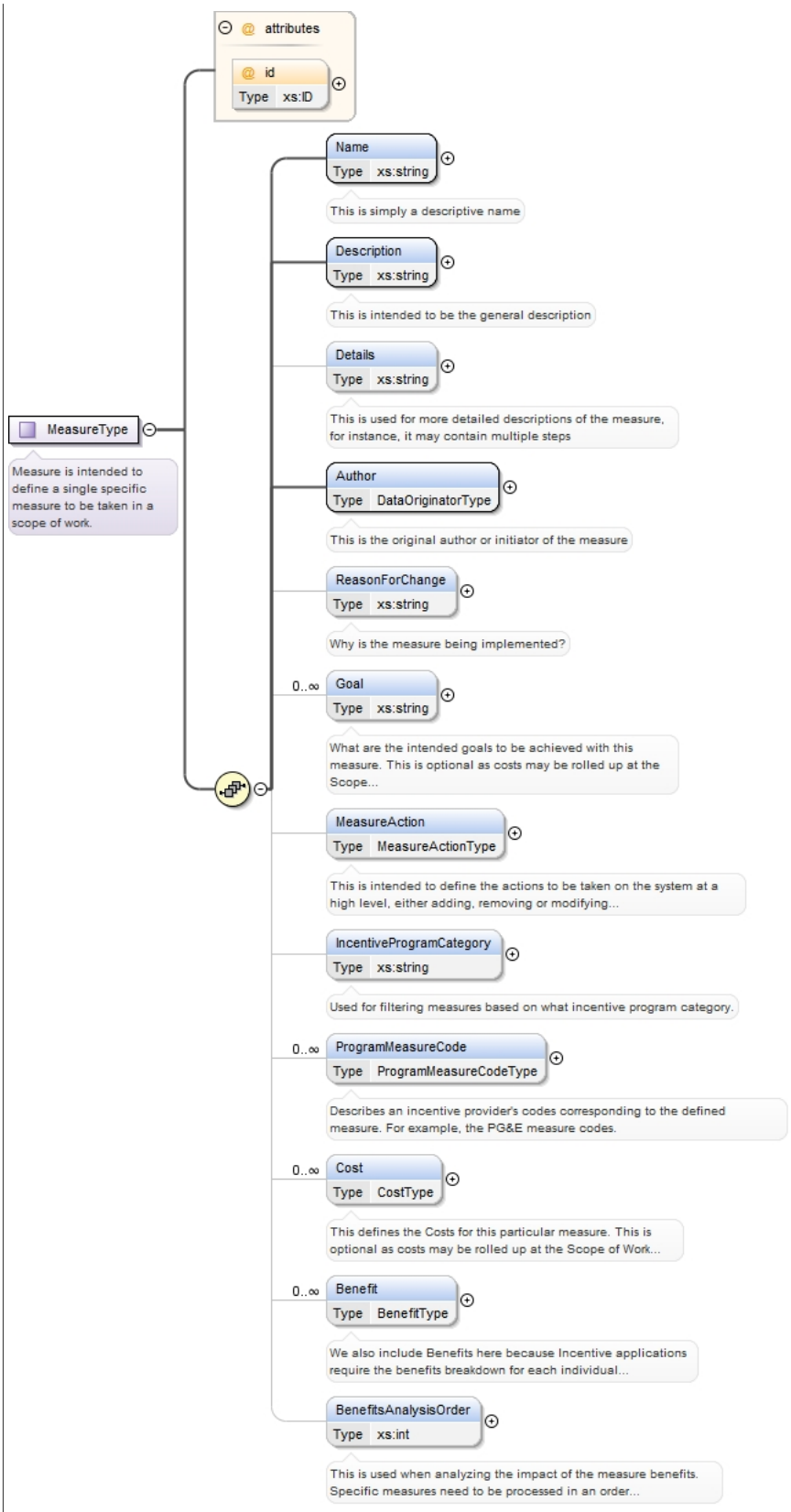
Complex Type `TemperatureType`

Namespace	http://www.iepmodel.net
Annotations	This is a base class used to represent a temperature quantity.
Diagram	
Type	extension of xs:double
Used by	Element WaterHeatingCapacityType/RatedTemperatureRise
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / TemperatureUnitEnumType / / / optional

	QName	Type	Fixed	Default	Use
		Unit of measurement.			
Source	<xs:complexType name="TemperatureType"> <xs:annotation> <xs:documentation>This is a base class used to represent a temperature quantity.</xs:documentation> </xs:annotation> <xs:simpleContent> <xs:extension base="xs:double"> <xs:attribute name="Unit" type="TemperatureUnitEnumType" use="optional"> <xs:annotation> <xs:documentation>Unit of measurement.</xs:documentation> </xs:annotation> </xs:attribute> </xs:extension> </xs:simpleContent> </xs:complexType>				

Complex Type MeasureType

Namespace	http://www.iepmodel.net
Annotations	Measure is intended to define a single specific measure to be taken in a scope of work.

Diagram	
Used by	Element ProjectType/Measure
Model	Name , Description , Details{0,1} , Author , ReasonForChange{0,1} , Goal* , MeasureAction{0,1} , IncentiveProgramCategory{0,1} , ProgramMeasureCode* , Cost* , Benefit* , BenefitsAnalysisOrder{0,1}
Children	Author, Benefit, BenefitsAnalysisOrder, Cost, Description, Details, Goal, IncentiveProgramCategory, MeasureAction, Name, ProgramMeasureCode, ReasonForChange

Attributes

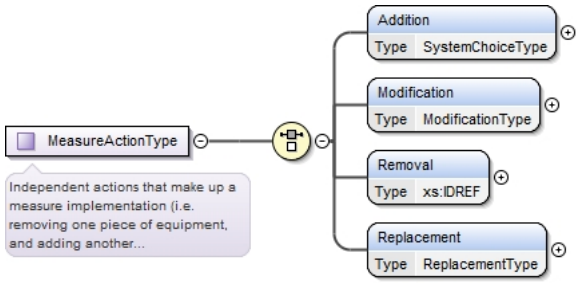
QName	Type	Fixed	Default	Use
id	xs:ID			optional

Source

```
<xs:complexType name="MeasureType">
  <xs:annotation>
    <xs:documentation>Measure is intended to define a single specific measure to be taken
 in a scope of work.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Name" type="xs:string" minOccurs="1" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is simply a descriptive name</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Description" type="xs:string" minOccurs="1" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is intended to be the general description</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Details" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is used for more detailed descriptions of the measure, for
 instance, it may contain multiple steps</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Author" type="DataOriginatorType">
      <xs:annotation>
        <xs:documentation>This is the original author or initiator of the measure</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ReasonForChange" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Why is the measure being implemented?</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Goal" type="xs:string" minOccurs="0" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>What are the intended goals to be achieved with this measure.
 This is optional as costs may be rolled up at the Scope of Work level</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="MeasureAction" type="MeasureActionType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is intended to define the actions to be taken on the system
 at a high level, either adding, removing or modifying the system</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="IncentiveProgramCategory" type="xs:string" minOccurs="0"
 maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Used for filtering measures based on what incentive program
 category.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ProgramMeasureCode" type="ProgramMeasureCodeType" minOccurs="0"
 maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>Describes an incentive provider's codes corresponding to the
 defined measure. For example, the PG&E measure codes.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Cost" type="CostType" minOccurs="0" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>This defines the Costs for this particular measure. This is
 optional as costs may be rolled up at the Scope of Work level</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Benefit" type="BenefitType" minOccurs="0" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>We also include Benefits here because Incentive applications
 require the benefits breakdown for each individual measure. This is optional as costs
 may be rolled up at the Scope of Work level. If BenefitsAnalysisOrder is defined then
 benefits are incremental relative to that order.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="BenefitsAnalysisOrder" type="xs:int" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is used when analyzing the impact of the measure benefits.
 Specific measures need to be processed in an order based on the load priority of the
```

```
 system, i.e. efficiency change of a furnace and then apply the leakage of the ducts.</
xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="id" type="xs:ID"/>
</xs:complexType>
```

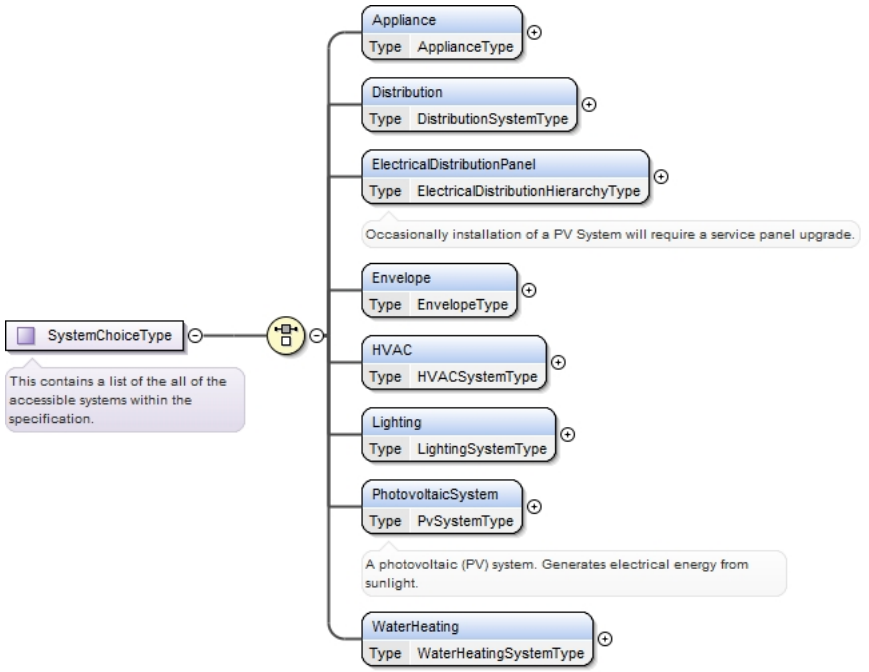
Complex Type `MeasureActionType`

Namespace	http://www.iepmodel.net
Annotations	Independent actions that make up a measure implementation (i.e. removing one piece of equipment, and adding another piece would be seperate MeasureActions within a single measure).
Diagram	
Used by	Element MeasureType/MeasureAction
Model	Addition | Modification | Removal | Replacement
Children	Addition, Modification, Removal, Replacement
Source	

```
<xs:complexType name="MeasureActionType">
  <xs:annotation>
    <xs:documentation>Independent actions that make up a measure implementation
 (i.e. removing one piece of equipment, and adding another piece would be seperate
 MeasureActions within a single measure).</xs:documentation>
  </xs:annotation>
  <xs:choice>
    <xs:element name="Addition" type="SystemChoiceType" maxOccurs="1" minOccurs="1"/>
    <xs:element name="Modification" type="ModificationType" maxOccurs="1" minOccurs="1"
 nillable="false"/>
    <xs:element name="Removal" type="xs:IDREF" maxOccurs="1" minOccurs="1"/>
    <xs:element name="Replacement" type="ReplacementType" maxOccurs="1" minOccurs="1"/>
  </xs:choice>
</xs:complexType>
```

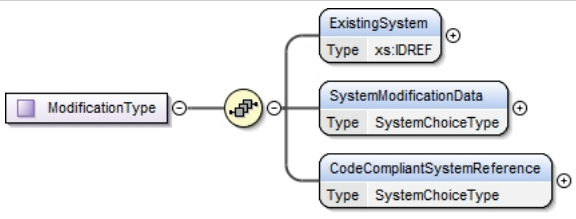
Complex Type `SystemChoiceType`

Namespace	http://www.iepmodel.net
Annotations	This contains a list of the all of the accessible systems within the specification.

Diagram	
Used by	Elements MeasureActionType/Addition, ModificationType/CodeCompliantSystemReference, ModificationType/SystemModificationData, ReplacementType/CodeCompliantSystemReference, ReplacementType/ProposedSystem
Model	Appliance | Distribution | ElectricalDistributionPanel | Envelope | HVAC | Lighting | PhotovoltaicSystem | WaterHeating
Children	Appliance, Distribution, ElectricalDistributionPanel, Envelope, HVAC, Lighting, PhotovoltaicSystem, WaterHeating
Source	

```
<xs:complexType name="SystemChoiceType">
  <xs:annotation>
    <xs:documentation>This contains a list of the all of the accessible systems within the
 specification.</xs:documentation>
  </xs:annotation>
  <xs:choice>
    <xs:element minOccurs="1" name="Appliance" type="ApplianceType"/>
    <xs:element form="unqualified" name="Distribution" type="DistributionSystemType"/>
    <xs:element maxOccurs="1" name="ElectricalDistributionPanel"
 type="ElectricalDistributionHierarchyType">
      <xs:annotation>
        <xs:documentation>Occasionally installation of a PV System will require a service
 panel upgrade.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Envelope" nillable="false" type="EnvelopeType"/>
    <xs:element name="HVAC" type="HVACSystemType"/>
    <xs:element name="Lighting" nillable="false" type="LightingSystemType"/>
    <xs:element name="PhotovoltaicSystem" type="PvSystemType">
      <xs:annotation>
        <xs:documentation>A photovoltaic (PV) system. Generates electrical energy from
 sunlight.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="WaterHeating" type="WaterHeatingSystemType"/>
  </xs:choice>
</xs:complexType>
```

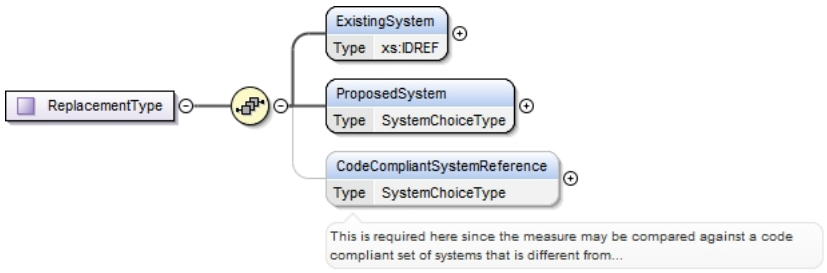
Complex Type `ModificationType`

Namespace	http://www.iepmodel.net
Diagram	

Used by	Element MeasureActionType/Modification
Model	ExistingSystem , SystemModificationData , CodeCompliantSystemReference
Children	CodeCompliantSystemReference, ExistingSystem, SystemModificationData
Source	

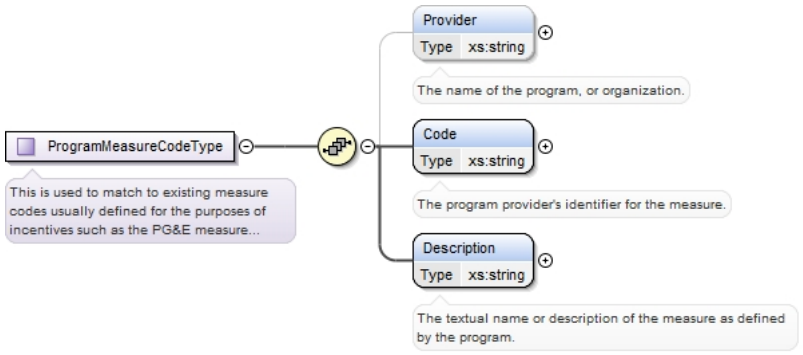
```
<xs:complexType name="ModificationType">
  <xs:sequence>
    <xs:element name="ExistingSystem" type="xs:IDREF"/>
    <xs:element name="SystemModificationData" type="SystemChoiceType"/>
    <xs:element name="CodeCompliantSystemReference" type="SystemChoiceType"/>
  </xs:sequence>
</xs:complexType>
```

Complex Type ReplacementType

Namespace	http://www.iepmodel.net
Diagram	
Used by	Element MeasureActionType/Replacement
Model	ExistingSystem , ProposedSystem , CodeCompliantSystemReference{0,1}
Children	CodeCompliantSystemReference, ExistingSystem, ProposedSystem
Source	


```
<xs:complexType name="ReplacementType">
  <xs:sequence>
    <xs:element name="ExistingSystem" type="xs:IDREF"/>
    <xs:element name="ProposedSystem" nillable="false" type="SystemChoiceType"/>
    <xs:element name="CodeCompliantSystemReference" type="SystemChoiceType" minOccurs="0">
      <xs:annotation>
        <xs:documentation>This is required here since the measure may be compared
 against a code compliant set of systems that is different from the existing baseline
 equipment. Specifically used for incentive calculations where incentives are only paid
 for incremental savings above code. For example: Building Energy code</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

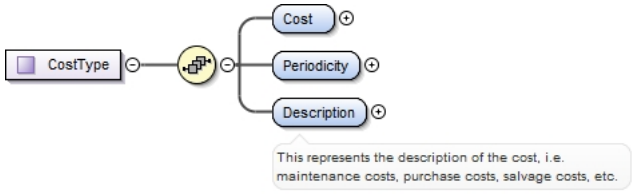
Complex Type ProgramMeasureCodeType

Namespace	http://www.iepmodel.net
Annotations	This is used to match to existing measure codes usually defined for the purposes of incentives such as the PG&E measure codes
Diagram	
Used by	Element MeasureType/ProgramMeasureCode
Model	Provider{0,1} , Code , Description
Children	Code, Description, Provider
Source	

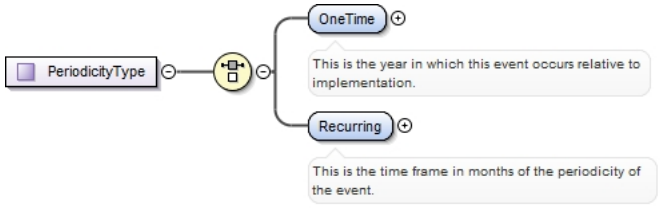

```
<xs:complexType name="ProgramMeasureCodeType">
  <xs:annotation>
```

```
    <xs:documentation>This is used to match to existing measure codes usually defined for
 the purposes of incentives such as the PG&E measure codes</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Provider" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The name of the program, or organization.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Code" type="xs:string" minOccurs="1" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The program provider's identifier for the measure.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Description" type="xs:string" minOccurs="1" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The textual name or description of the measure as defined by the
 program.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

Complex Type `CostType`

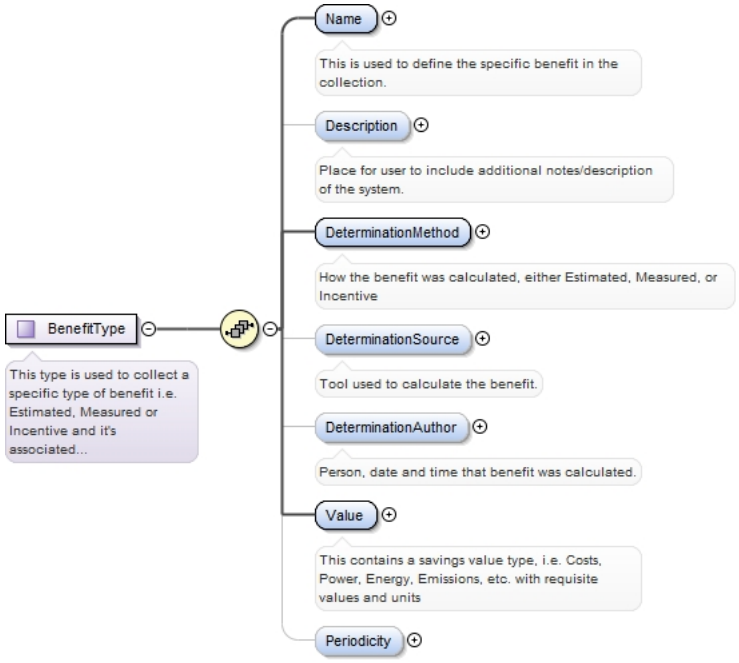
Namespace	http://www.iepmodel.net
Diagram	
Used by	Element MeasureType/Cost
Model	Cost , Periodicity , Description
Children	Cost, Description, Periodicity
Source	<xs:complexType name="CostType"> <xs:sequence> <xs:element name="Cost" type="xs:float" minOccurs="1" maxOccurs="1"/> <xs:element name="Periodicity" type="PeriodicityType" minOccurs="1" maxOccurs="1"/> <xs:element name="Description" type="xs:string" minOccurs="1" maxOccurs="1"> <xs:annotation> <xs:documentation>This represents the description of the cost, i.e. maintenance costs, purchase costs, salvage costs, etc.</xs:documentation> </xs:annotation> </xs:element> </xs:sequence> </xs:complexType>

Complex Type `PeriodicityType`

Namespace	http://www.iepmodel.net
Diagram	
Used by	Elements BenefitType/Periodicity, CostType/Periodicity
Model	OneTime | Recurring
Children	OneTime, Recurring
Source	<xs:complexType name="PeriodicityType"> <xs:choice> <xs:element name="OneTime" type="xs:integer"> <xs:annotation> <xs:documentation>This is the year in which this event occurs relative to implementation.</xs:documentation>

```
      </xs:annotation>
    </xs:element>
    <xs:element name="Recurring">
      <xs:annotation>
        <xs:documentation>This is the time frame in months of the periodicity of the
 event.</xs:documentation>
      </xs:annotation>
      <xs:complexType>
        <xs:sequence>
          <xs:element name="Duration" type="xs:integer">
            <xs:annotation>
              <xs:documentation>This is the duration in months</xs:documentation>
            </xs:annotation>
          </xs:element>
          <xs:element maxOccurs="1" name="Frequency" type="FrequencyEnumType">
            <xs:annotation>
              <xs:documentation>This is the frequency of the recurring event.</
xs:documentation>
            </xs:annotation>
          </xs:element>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:choice>
</xs:complexType>
```

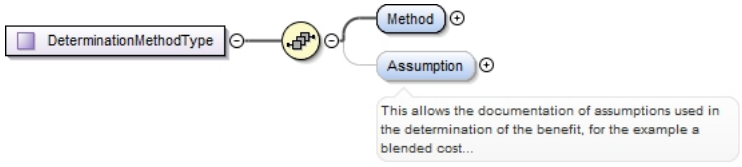
Complex Type `BenefitType`

Namespace	http://www.iepmodel.net
Annotations	This type is used to collect a specific type of benefit i.e. Estimated, Measured or Incentive and it's associated Method, source and Author
Diagram	
Used by	Elements MeasureType/Benefit, ScopeOfWorkType/TotalBenefits
Model	Name , Description{0,1} , DeterminationMethod , DeterminationSource{0,1} , DeterminationAuthor{0,1} , Value , Periodicity{0,1}
Children	Description, DeterminationAuthor, DeterminationMethod, DeterminationSource, Name, Periodicity, Value
Source	

```
<xs:complexType name="BenefitType">
  <xs:annotation>
    <xs:documentation>This type is used to collect a specific type of benefit i.e.
 Estimated, Measured or Incentive and it's associated Method, source and Author</
xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Name" type="xs:string">
      <xs:annotation>
        <xs:documentation>This is used to define the specific benefit in the collection.</
xs:documentation>
      </xs:annotation>
    </xs:element>
```

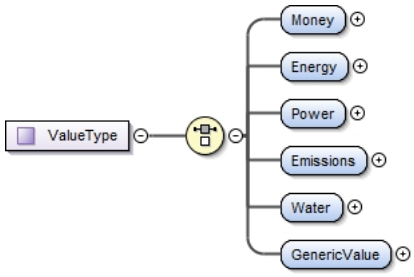
```
    <xs:element name="Description" type="xs:string" minOccurs="0">
      <xs:annotation>
        <xs:documentation>Place for user to include additional notes/description of the
 system.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="DeterminationMethod" type="DeterminationMethodType" minOccurs="1"
 maxOccurs="1">
      <xs:annotation>
        <xs:documentation>How the benefit was calculated, either Estimated, Measured, or
 Incentive</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="DeterminationSource" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Tool used to calculate the benefit.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="DeterminationAuthor" type="DataOriginatorType" minOccurs="0"
 maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Person, date and time that benefit was calculated.</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Value" type="ValueType">
      <xs:annotation>
        <xs:documentation>This contains a savings value type, i.e. Costs, Power, Energy,
 Emissions, etc. with requisite values and units</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Periodicity" type="PeriodicityType" minOccurs="0" maxOccurs="1"/>
  </xs:sequence>
</xs:complexType>
```

Complex Type `DeterminationMethodType`

Namespace	http://www.iepmodel.net
Diagram	
Used by	Element BenefitType/DeterminationMethod
Model	Method , Assumption{0,1}
Children	Assumption, Method
Source	

```
<xs:complexType name="DeterminationMethodType">
  <xs:sequence>
    <xs:element name="Method" type="DeterminationMethodEnumType"/>
    <xs:element name="Assumption" type="xs:string" minOccurs="0">
      <xs:annotation>
        <xs:documentation>This allows the documentation of assumptions used in the
 determination of the benefit, for the example a blended cost of energy instead of a
 detailed rate schedule analysis for determining energy cost savings</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

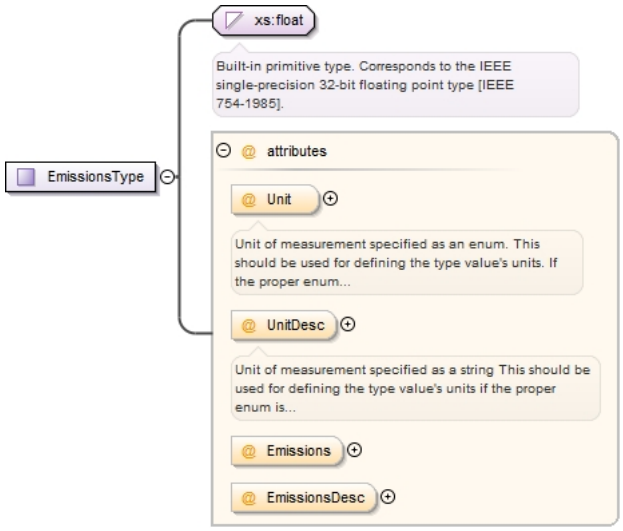
Complex Type `ValueType`

Namespace	http://www.iepmodel.net
Diagram	

Used by	Element BenefitType/Value
Model	Money | Energy | Power | Emissions | Water | GenericValue
Children	Emissions, Energy, GenericValue, Money, Power, Water
Source	

```
<xs:complexType name="ValueType">
  <xs:choice>
    <xs:element name="Money" type="MonetaryType"/>
    <xs:element name="Energy" type="EnergyType"/>
    <xs:element name="Power" type="PowerType"/>
    <xs:element name="Emissions" type="EmissionsType"/>
    <xs:element name="Water" type="VolumeType"/>
    <xs:element name="GenericValue" type="GenericValueType"/>
  </xs:choice>
</xs:complexType>
```

Complex Type `EmissionsType`

Namespace	http://www.iepmodel.net
Diagram	

Type	extension of xs:float
Used by	Element ValueType/Emissions

Attributes

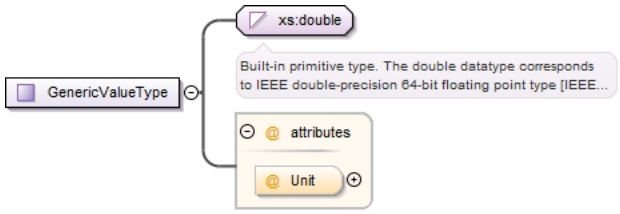
QName	Type	Fixed	Default	Use
Emissions	EmissionsEnumType			optional
EmissionsDesc	xs:string			optional
Unit	EmissionsUnitEnumType			optional
	Unit of measurement specified as an enum. This should be used for defining the type value's units. If the proper enum is not listed, please use the UnitDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			
UnitDesc	xs:string			optional
	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			

Source

```
<xs:complexType name="EmissionsType">
  <xs:simpleContent>
    <xs:extension base="xs:float">
      <xs:attribute name="Unit" type="EmissionsUnitEnumType">
        <xs:annotation>
          <xs:documentation>Unit of measurement specified as an enum. This should be used
for defining the type value's units. If the proper enum is not listed, please use the
UnitDesc field to specify the units. These are all optional attributes in order to allow
for a simplified value descriptions since these are used throughout the IEP schemas.
Additionally the UnitDesc may contain a default type.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
```

```
      <xs:attribute name="UnitDesc" type="xs:string">
        <xs:annotation>
          <xs:documentation>Unit of measurement specified as a string This should be used
 for defining the type value's units if the proper enum is not listed in Unit. These are
 all optional attributes in order to allow for a simplified value descriptions since these
 are used throughout the IEP schemas. Additionally the UnitDesc may contain a default
 type.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
      <xs:attribute name="Emissions" type="EmissionsEnumType"/>
      <xs:attribute name="EmissionsDesc" type="xs:string"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

Complex Type `GenericValueType`

Namespace	http://www.iepmodel.net
Diagram	
Type	extension of xs:double
Used by	Element ValueType/GenericValue

Attributes

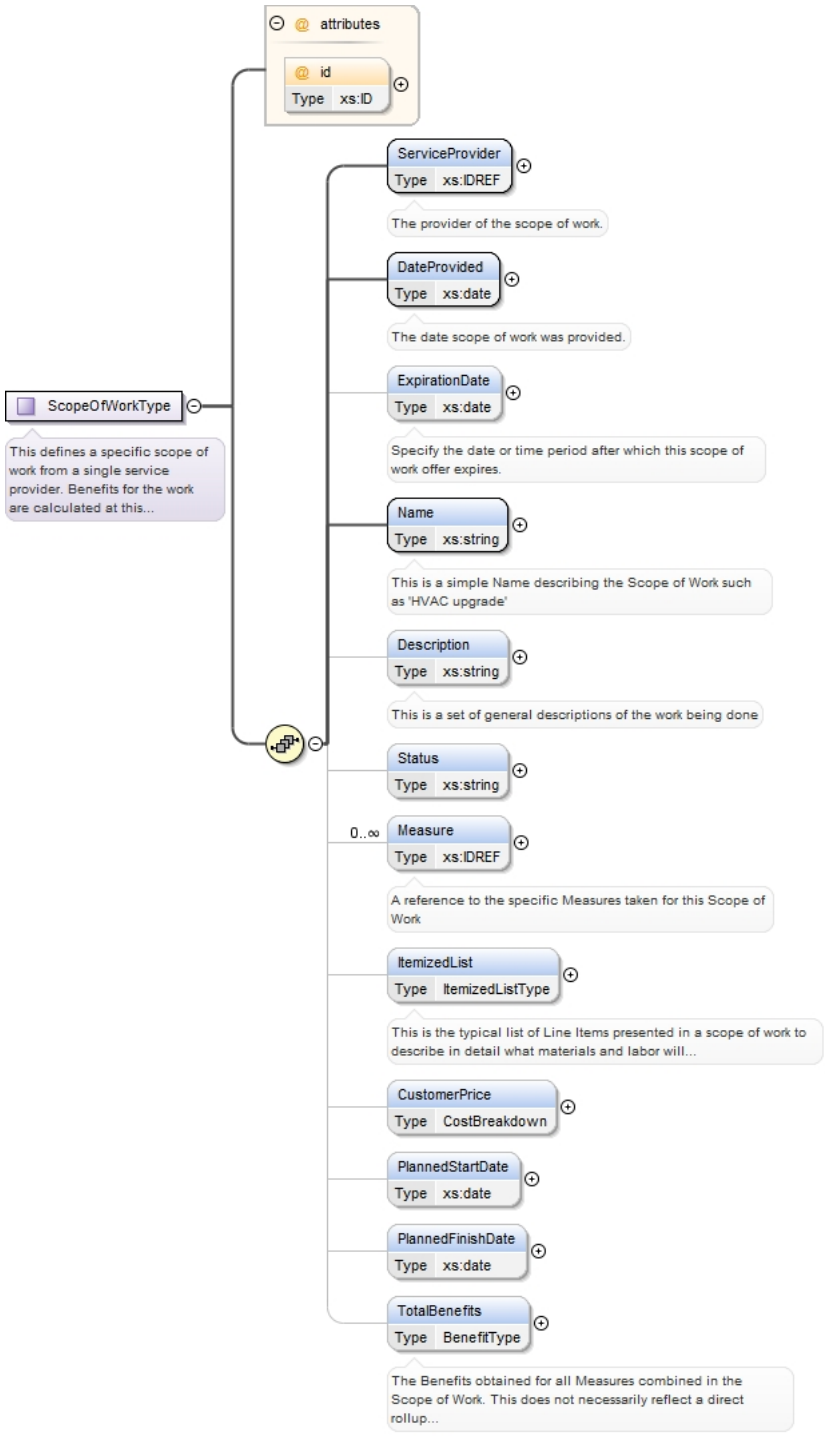
QName	Type	Fixed	Default	Use
Unit	xs:string			optional

Source

```
<xs:complexType name="GenericValueType">
  <xs:simpleContent>
    <xs:extension base="xs:double">
      <xs:attribute name="Unit" type="xs:string"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

Complex Type `ScopeOfWorkType`

Namespace	http://www.iepmodel.net
Annotations	This defines a specific scope of work from a single service provider. Benefits for the work are calculated at this level instead of at the Measure level since multiple Measures may impact a single Benefit. For example putting in a new high efficiency furnace and sealing the ducts will have different impact than the benefit for each measure taken independently.

Diagram	
Used by	Element ProjectType/ScopeOfWork
Model	ServiceProvider , DateProvided , ExpirationDate{0,1} , Name , Description{0,1} , Status{0,1} , Measure* , ItemizedList{0,1} , CustomerPrice{0,1} , PlannedStartDate{0,1} , PlannedFinishDate{0,1} , TotalBenefits{0,1}
Children	CustomerPrice, DateProvided, Description, ExpirationDate, ItemizedList, Measure, Name, PlannedFinishDate, PlannedStartDate, ServiceProvider, Status, TotalBenefits

Attributes

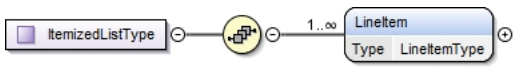
QName	Type	Fixed	Default	Use
id	xs:ID			optional

Source

```
<xs:complexType name="ScopeOfWorkType">
  <xs:annotation>
    <xs:documentation>This defines a specific scope of work from a single service
 provider. Benefits for the work are calculated at this level instead of at the Measure
 level since multiple Measures may impact a single Benefit. For example putting in a new
```

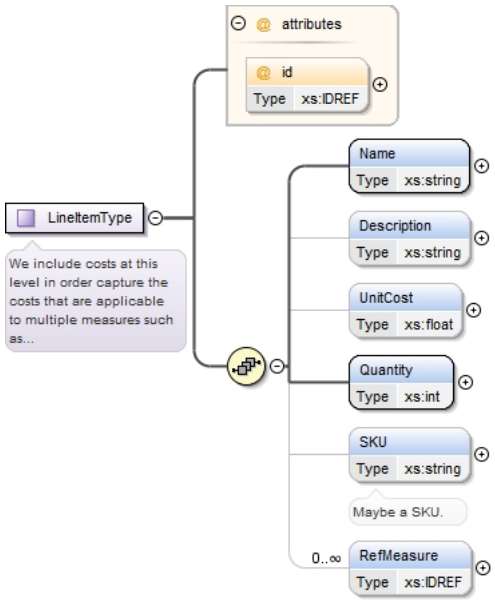
```
 high efficiency furnace and sealing the ducts will have different impact than the benefit
 for each measure taken independently.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="ServiceProvider" type="xs:IDREF" minOccurs="1" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The provider of the scope of work.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="DateProvided" type="xs:date" minOccurs="1" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The date scope of work was provided.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="ExpirationDate" type="xs:date" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Specify the date or time period after which this scope of work
 offer expires.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Name" type="xs:string" minOccurs="1" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is a simple Name describing the Scope of Work such as 'HVAC
 upgrade'</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>This is a set of general descriptions of the work being done</
xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="Status" type="xs:string" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Measure" type="xs:IDREF" minOccurs="0" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>A reference to the specific Measures taken for this Scope of
 Work</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="ItemizedList" type="ItemizedListType">
      <xs:annotation>
        <xs:documentation>This is the typical list of Line Items presented in a scope of
 work to describe in detail what materials and labor will be delivered for the contract
 price.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="CustomerPrice" type="CostBreakdown"/>
    <xs:element name="PlannedStartDate" type="xs:date" minOccurs="0" maxOccurs="1"/>
    <xs:element name="PlannedFinishDate" type="xs:date" minOccurs="0" maxOccurs="1"/>
    <xs:element name="TotalBenefits" type="BenefitType" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>The Benefits obtained for all Measures combined in the Scope of
 Work. This does not necessarily reflect a direct rollup of all of the individual measure
 benefits as some combination of measures may impact measure benefits. Individual measure
 benefits may be expressed independent of other measures. For example: The total benefit
 of a Lighting efficiency measure combined with a high efficiency HVAC measure would not
 equal the sum of the measures benefit if implemented independently.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="id" type="xs:ID"/>
</xs:complexType>
```

Complex Type `ItemizedListType`

Namespace	http://www.iepmodel.net
Diagram	
Used by	Element ScopeOfWorkType/ItemizedList
Model	LineItem+
Children	LineItem
Source	

```
<xs:complexType name="ItemizedListType">
  <xs:sequence>
    <xs:element maxOccurs="unbounded" minOccurs="1" name="LineItem" type="LineItemType"/>
  </xs:sequence>
</xs:complexType>
```

Complex Type `LineItemType`

Namespace	http://www.iepmodel.net
Annotations	`We include costs at this level in order capture the costs that are applicable to multiple measures such as administrative costs`
Diagram	
Used by	Element ItemizedListType/LineItem
Model	Name , Description{0,1} , UnitCost{0,1} , Quantity , SKU{0,1} , RefMeasure*
Children	Description, Name, Quantity, RefMeasure, SKU, UnitCost

Attributes

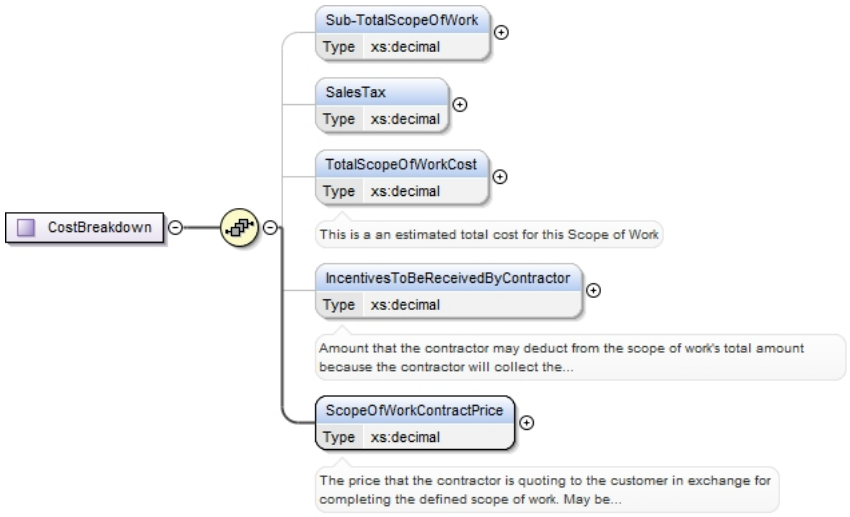
QName	Type	Fixed	Default	Use
id	xs:IDREF			optional

`Source`

```
<xs:complexType name="LineItemType">
  <xs:annotation>
    <xs:documentation>We include costs at this level in order capture the costs that are
 applicable to multiple measures such as administrative costs</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element maxOccurs="1" minOccurs="1" name="Name" type="xs:string"/>
    <xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"/>
    <xs:element name="UnitCost" type="xs:float" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Quantity" type="xs:int" maxOccurs="1" minOccurs="1"/>
    <xs:element name="SKU" type="xs:string" minOccurs="0" maxOccurs="1">
      <xs:annotation>
        <xs:documentation>Maybe a SKU.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="RefMeasure" type="xs:IDREF" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="id" use="optional" type="xs:IDREF"/>
</xs:complexType>
```

Complex Type `CostBreakdown`

Namespace	http://www.iepmodel.net

Diagram	
Used by	Element ScopeOfWorkType/CustomerPrice
Model	Sub-TotalScopeOfWork{0,1} , SalesTax{0,1} , TotalScopeOfWorkCost{0,1} , IncentivesToBeReceivedByContractor{0,1} , ScopeOfWorkContractPrice
Children	IncentivesToBeReceivedByContractor, SalesTax, ScopeOfWorkContractPrice, Sub-TotalScopeOfWork, TotalScopeOfWorkCost

Source	`<xs:complexType name="CostBreakdown">`
	`  <xs:sequence>`
	`  <xs:element maxOccurs="1" minOccurs="0" name="Sub-TotalScopeOfWork" type="xs:decimal"/>`
	`  <xs:element maxOccurs="1" minOccurs="0" name="SalesTax" type="xs:decimal"/>`
	`  <xs:element name="TotalScopeOfWorkCost" type="xs:decimal" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>This is a an estimated total cost for this Scope of Work</xs:documentation>`
	`  </xs:annotation>`
	`  </xs:element>`
	`  <xs:element maxOccurs="1" minOccurs="0" name="IncentivesToBeReceivedByContractor" type="xs:decimal">`
	`  <xs:annotation>`
	`  <xs:documentation>Amount that the contractor may deduct from the scope of work's total amount because the contractor will collect the incentive money rather than asking the customer to pay the contractor and acquire it themselves.</xs:documentation>`
	`  </xs:annotation>`
	`  </xs:element>`
	`  <xs:element maxOccurs="1" minOccurs="1" name="ScopeOfWorkContractPrice" type="xs:decimal">`
	`  <xs:annotation>`
	`  <xs:documentation>The price that the contractor is quoting to the customer in exchange for completing the defined scope of work. May be the the TotalScopeOfWorkCost less any IncentivesToBeReceivedByContractor.</xs:documentation>`
	`  </xs:annotation>`
	`  </xs:element>`
	`  </xs:sequence>`
	`</xs:complexType>`

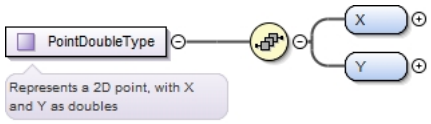
Complex Type ChangeLogType

Namespace	http://www.iepmodel.net
Diagram	
Model	Change*
Children	Change

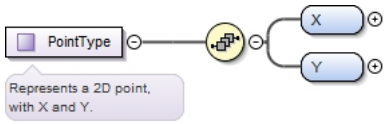
Source	`<xs:complexType name="ChangeLogType">`
	`  <xs:sequence>`
	`  <xs:element maxOccurs="unbounded" minOccurs="0" name="Change" type="ChangeType"/>`
	`  </xs:sequence>`
	`</xs:complexType>`

Complex Type PointDoubleType

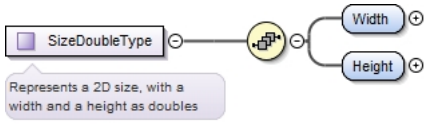
Namespace	http://www.iepmodel.net

Annotations	Represents a 2D point, with X and Y as doubles
Diagram	
Model	X , Y
Children	X, Y
Source	<xs:complexType name="PointDoubleType"> <xs:annotation> <xs:documentation>Represents a 2D point, with X and Y as doubles</xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="X" type="xs:double"/> <xs:element name="Y" type="xs:double"/> </xs:sequence> </xs:complexType>

Complex Type PointType

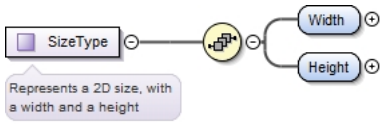
Namespace	http://www.iepmodel.net
Annotations	Represents a 2D point, with X and Y.
Diagram	
Model	X , Y
Children	X, Y
Source	<xs:complexType name="PointType"> <xs:annotation> <xs:documentation>Represents a 2D point, with X and Y.</xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="X" type="xs:int"/> <xs:element name="Y" type="xs:int"/> </xs:sequence> </xs:complexType>

Complex Type SizeDoubleType

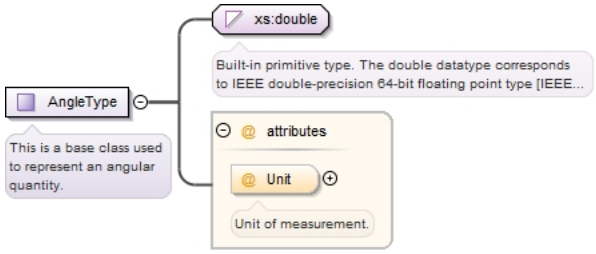
Namespace	http://www.iepmodel.net
Annotations	Represents a 2D size, with a width and a height as doubles
Diagram	
Model	Width , Height
Children	Height, Width
Source	<xs:complexType name="SizeDoubleType"> <xs:annotation> <xs:documentation>Represents a 2D size, with a width and a height as doubles</ xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="Width" type="xs:double"/> <xs:element name="Height" type="xs:double"/> </xs:sequence> </xs:complexType>

Complex Type SizeType

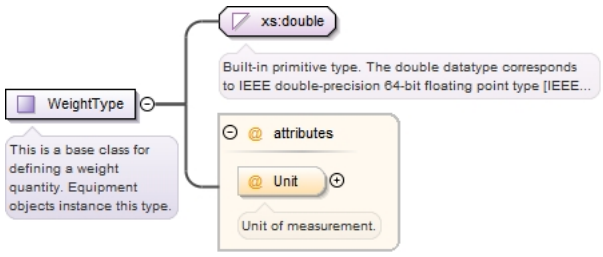
Namespace	http://www.iepmodel.net
Annotations	Represents a 2D size, with a width and a height

Diagram	
Model	Width , Height
Children	Height, Width
Source	<xs:complexType name="SizeType"> <xs:annotation> <xs:documentation>Represents a 2D size, with a width and a height</xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="Width" type="xs:int"/> <xs:element name="Height" type="xs:int"/> </xs:sequence> </xs:complexType>

Complex Type AngleType

Namespace	http://www.iepmodel.net
Annotations	This is a base class used to represent an angular quantity.
Diagram	
Type	extension of xs:double
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / AngularUnitEnumType / / degrees / optional Unit of measurement.
Source	<xs:complexType name="AngleType"> <xs:annotation> <xs:documentation>This is a base class used to represent an angular quantity.</ xs:documentation> </xs:annotation> <xs:simpleContent> <xs:extension base="xs:double"> <xs:attribute name="Unit" type="AngularUnitEnumType" use="optional" default="degrees"> <xs:annotation> <xs:documentation>Unit of measurement.</xs:documentation> </xs:annotation> </xs:attribute> </xs:extension> </xs:simpleContent> </xs:complexType>

Complex Type WeightType

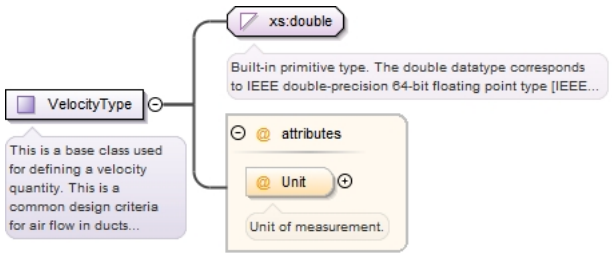
Namespace	http://www.iepmodel.net
Annotations	This is a base class for defining a weight quantity. Equipment objects instance this type.
Diagram	
Type	extension of xs:double

Attributes	QName	Type	Fixed	Default	Use
	Unit	WeightUnitEnumType			optional
		Unit of measurement.			

Source

```
<xs:complexType name="WeightType">
  <xs:annotation>
    <xs:documentation>This is a base class for defining a weight quantity. Equipment
 objects instance this type.</xs:documentation>
  </xs:annotation>
  <xs:simpleContent>
    <xs:extension base="xs:double">
      <xs:attribute name="Unit" type="WeightUnitEnumType" use="optional">
        <xs:annotation>
          <xs:documentation>Unit of measurement.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

Complex Type VelocityType

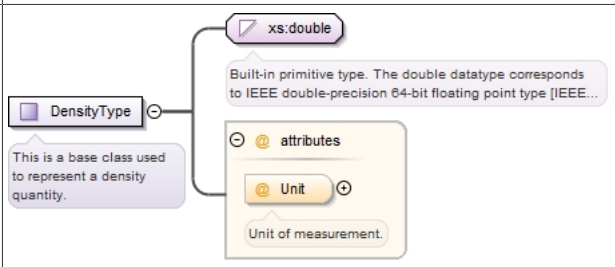
Namespace	http://www.iepmodel.net
Annotations	This is a base class used for defining a velocity quantity. This is a common design criteria for air flow in ducts (distribution systems).
Diagram	
Type	extension of xs:double

Attributes	QName	Type	Fixed	Default	Use
	Unit	VelocityUnitEnumType			optional
		Unit of measurement.			

Source

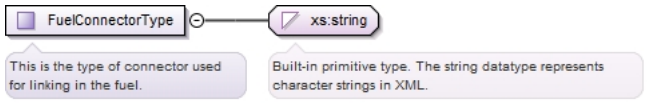
```
<xs:complexType name="VelocityType">
  <xs:annotation>
    <xs:documentation>This is a base class used for defining a velocity quantity. This is
 a common design criteria for air flow in ducts (distribution systems).</xs:documentation>
  </xs:annotation>
  <xs:simpleContent>
    <xs:extension base="xs:double">
      <xs:attribute name="Unit" type="VelocityUnitEnumType" use="optional">
        <xs:annotation>
          <xs:documentation>Unit of measurement.</xs:documentation>
        </xs:annotation>
      </xs:attribute>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

Complex Type DensityType

Namespace	http://www.iepmodel.net
Annotations	This is a base class used to represent a density quantity.
Diagram	

Type	extension of xs:double
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / DensityUnitEnumType / / / optional Unit of measurement.
Source	<xs:complexType name="DensityType"> <xs:annotation> <xs:documentation>This is a base class used to represent a density quantity.</xs:documentation> </xs:annotation> <xs:simpleContent> <xs:extension base="xs:double"> <xs:attribute name="Unit" type="DensityUnitEnumType" use="optional"> <xs:annotation> <xs:documentation>Unit of measurement.</xs:documentation> </xs:annotation> </xs:attribute> </xs:extension> </xs:simpleContent> </xs:complexType>

Complex Type FuelConnectorType

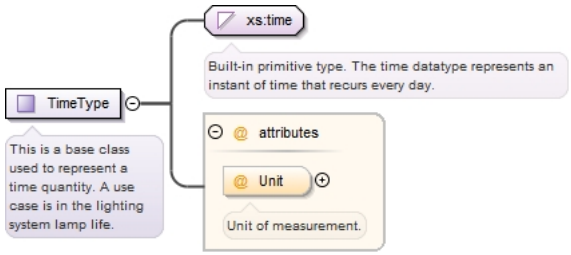
Namespace	http://www.iepmodel.net
Annotations	This is the type of connector used for linking in the fuel.
Diagram	
Type	extension of xs:string
Used by	Element InputPowerType/FuelConnector
Source	<xs:complexType name="FuelConnectorType"> <xs:annotation> <xs:documentation>This is the type of connector used for linking in the fuel.</xs:documentation> </xs:annotation> <xs:simpleContent> <xs:extension base="xs:string"> </xs:extension> </xs:simpleContent> </xs:complexType>

Complex Type InputPowerType

Namespace	http://www.iepmodel.net
Diagram	
Model	Power , FuelConnector{0,1}
Children	FuelConnector, Power
Source	<xs:complexType name="InputPowerType"> <xs:sequence> <xs:element name="Power" type="PowerType" minOccurs="1" maxOccurs="1"/> <xs:element name="FuelConnector" type="FuelConnectorType" minOccurs="0" maxOccurs="1"/> > </xs:sequence> </xs:complexType>

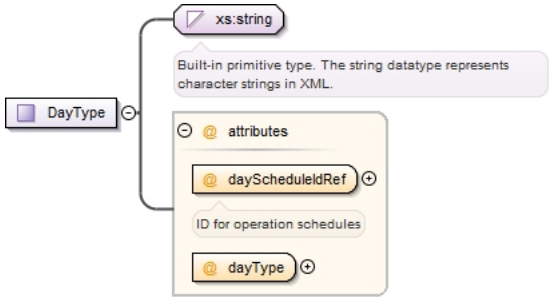
Complex Type TimeType

Namespace	http://www.iepmodel.net
Annotations	This is a base class used to represent a time quantity. A use case is in the lighting system lamp life.

Diagram	
Type	extension of xs:time
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / TimeUnitEnumType / / / optional Unit of measurement.

Source	`<xs:complexType name="TimeType">`
	`  <xs:annotation>`
	`  <xs:documentation>This is a base class used to represent a time quantity. A use case is in the lighting system lamp life.</xs:documentation>`
	`  </xs:annotation>`
	`  <xs:simpleContent>`
	`  <xs:extension base="xs:time">`
	`  <xs:attribute name="Unit" type="TimeUnitEnumType" use="optional">`
	`  <xs:annotation>`
	`  <xs:documentation>Unit of measurement.</xs:documentation>`
	`  </xs:annotation>`
	`  </xs:attribute>`
	`  </xs:extension>`
	`  </xs:simpleContent>`
	`</xs:complexType>`

Complex Type DayType

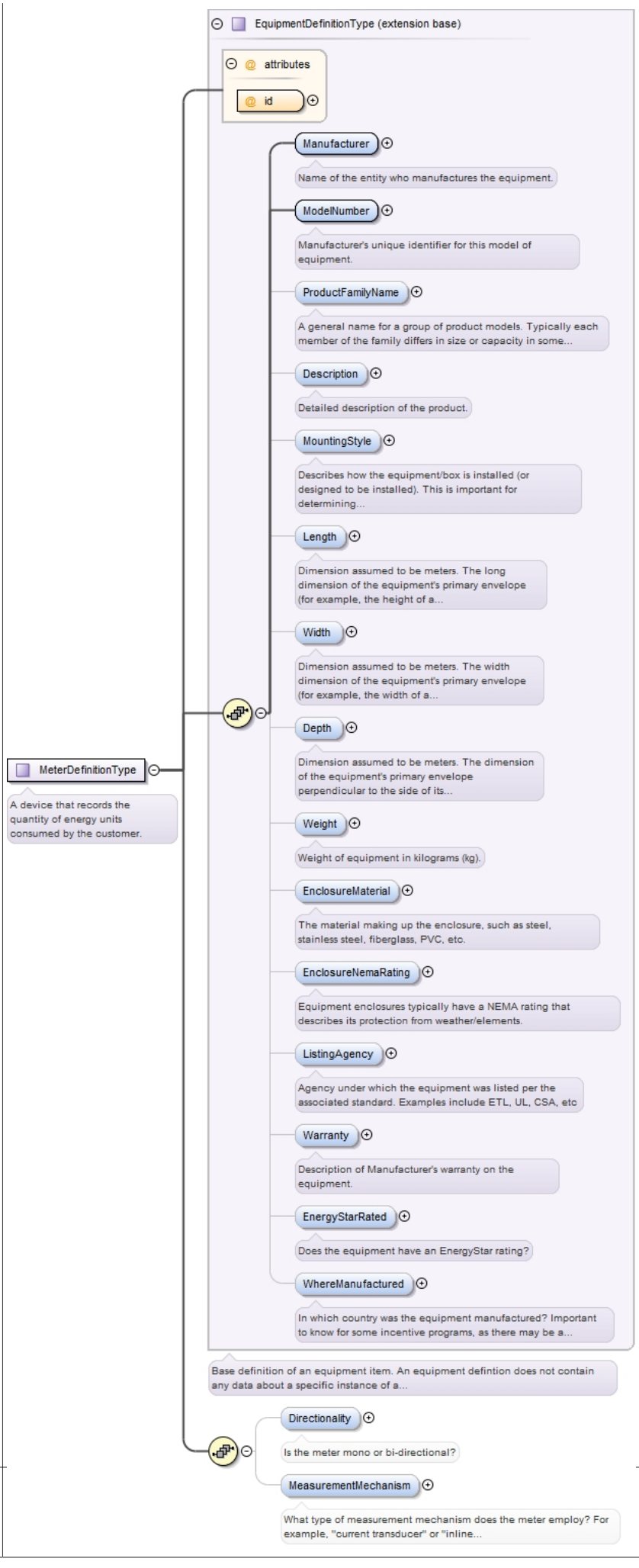
Namespace	http://www.iepmodel.net
Diagram	
Type	extension of xs:string
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **dayScheduleIdRef** / xs:IDREF / / / required ID for operation schedules **dayType** / dayEnumType / / / required

Source	`<xs:complexType name="DayType">`
	`  <xs:simpleContent>`
	`  <xs:extension base="xs:string">`
	`  <xs:attribute name="dayScheduleIdRef" use="required" type="xs:IDREF">`
	`  <xs:annotation>`
	`  <xs:documentation>ID for operation schedules</xs:documentation>`
	`  </xs:annotation>`
	`  </xs:attribute>`
	`  <xs:attribute name="dayType" use="required" type="dayEnumType"/>`
	`  </xs:extension>`
	`  </xs:simpleContent>`
	`</xs:complexType>`

Complex Type MeterDefinitionType

Namespace	http://www.iepmodel.net
Annotations	A device that records the quantity of energy units consumed by the customer.

Diagram


MeterDefinitionType
A device that records the quantity of energy units consumed by the customer.
EquipmentDefinitionType (extension base)
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...
Directionality
Is the meter mono or bi-directional?
MeasurementMechanism
What type of measurement mechanism does the meter employ? For example, "current transducer" or "inline...

Type	extension of EquipmentDefinitionType
Type hierarchy	• EquipmentDefinitionType • MeterDefinitionType
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1} , Directionality{0,1} , MeasurementMechanism{0,1}
Children	Depth, Description, Directionality, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, Length, ListingAgency, Manufacturer, MeasurementMechanism, ModelNumber, MountingStyle, ProductFamilyName, Warranty, Weight, WhereManufactured, Width

Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			required

Source

```
<xs:complexType name="MeterDefinitionType">
  <xs:annotation>
    <xs:documentation>A device that records the quantity of energy units consumed by the
 customer.</xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="EquipmentDefinitionType">
      <xs:sequence>
        <xs:element minOccurs="0" name="Directionality" type="xs:string">
          <xs:annotation>
            <xs:documentation>Is the meter mono or bi-directional?</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element minOccurs="0" name="MeasurementMechanism" type="xs:string">
          <xs:annotation>
            <xs:documentation>What type of measurement mechanism does the meter employ?
 For example, "current transducer" or "inline electro-mechanical"</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

Complex Type `StandAloneMeterSocketDefintionType`

Namespace	http://www.iepmodel.net

Diagram


StandAloneMeterSocketDefintionType
EquipmentDefinitionType (extension base)
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...

Type	extension of EquipmentDefinitionType
Type hierarchy	• EquipmentDefinitionType • StandAloneMeterSocketDefintionType
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1}
Children	Depth, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, Length, ListingAgency, Manufacturer, ModelNumber, MountingStyle, ProductFamilyName, Warranty, Weight, WhereManufactured, Width

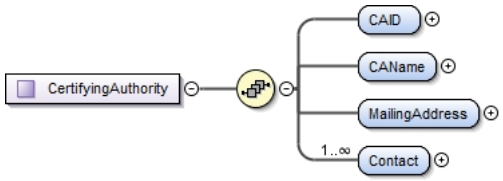
Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			required

Source

```
<xs:complexType name="StandAloneMeterSocketDefintionType">
  <xs:complexContent>
    <xs:extension base="EquipmentDefinitionType"/>
  </xs:complexContent>
</xs:complexType>
```

Complex Type `CertifyingAuthority`

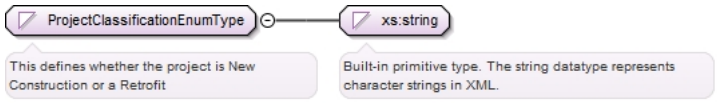
Namespace	http://www.iepmodel.net
Diagram	
Model	CAID , CAName , MailingAddress , Contact+
Children	CAID, CAName, Contact, MailingAddress

Source

```
<xs:complexType name="CertifyingAuthority">
  <xs:sequence>
    <xs:element name="CAID" type="xs:int" minOccurs="1" maxOccurs="1"/>
    <xs:element name="CAName" type="xs:string" minOccurs="1" maxOccurs="1"/>
    <xs:element name="MailingAddress" type="AddressType" minOccurs="1" maxOccurs="1"/>
    <xs:element name="Contact" type="ContactType" minOccurs="1" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
```

Simple Type(s)

Simple Type `ProjectClassificationEnumType`

Namespace	http://www.iepmodel.net
Annotations	This defines whether the project is New Construction or a Retrofit
Diagram	
Type	restriction of xs:string

Facets

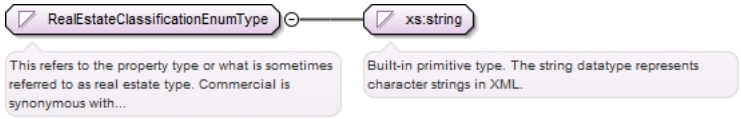
enumeration	Retrofit
enumeration	New Construction

Used by	Element ProjectType/ProjectClassification

Source

```
<xs:simpleType name="ProjectClassificationEnumType">
  <xs:annotation>
    <xs:documentation>This defines whether the project is New Construction or a Retrofit</
xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="Retrofit"/>
    <xs:enumeration value="New Construction"/>
  </xs:restriction>
</xs:simpleType>
```

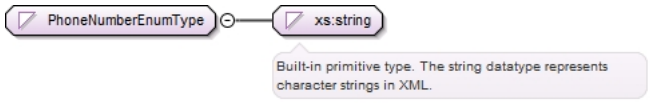
Simple Type `RealEstateClassificationEnumType`

Namespace	http://www.iepmodel.net
Annotations	This refers to the property type or what is sometimes referred to as real estate type. Commercial is synonymous with non-residential. This is also used for PowerClerk/CSI program
Diagram	
Type	restriction of xs:string
Facets	enumeration `Commercial` enumeration `Residential`
Used by	Element ProjectType/RealEstateClassification

Source

```
<xs:simpleType name="RealEstateClassificationEnumType">
  <xs:annotation>
    <xs:documentation>This refers to the property type or what is sometimes referred to as
 real estate type. Commercial is synonymous with non-residential. This is also used for
 PowerClerk/CSI program</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="Commercial"/>
    <xs:enumeration value="Residential"/>
  </xs:restriction>
</xs:simpleType>
```

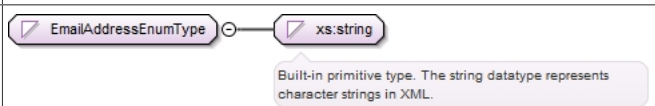
Simple Type `PhoneNumberEnumType`

Namespace	http://www.iepmodel.net
Diagram	
Type	restriction of xs:string
Facets	enumeration `Business` enumeration `Business Fax` enumeration `Home` enumeration `Home Fax` enumeration `Mobile` enumeration `Pager` enumeration `Skype`
Used by	Element PhoneNumberType/PhoneNumberUse

Source

```
<xs:simpleType name="PhoneNumberEnumType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Business"/>
    <xs:enumeration value="Business Fax"/>
    <xs:enumeration value="Home"/>
    <xs:enumeration value="Home Fax"/>
    <xs:enumeration value="Mobile"/>
    <xs:enumeration value="Pager"/>
    <xs:enumeration value="Skype"/>
  </xs:restriction>
</xs:simpleType>
```

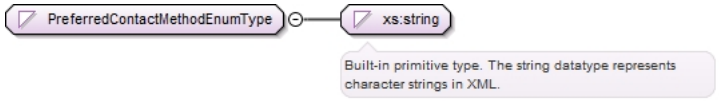
Simple Type `EmailAddressEnumType`

Namespace	http://www.iepmodel.net
Diagram	
Type	restriction of xs:string

Facets	enumeration	Work
	enumeration	Home
	enumeration	Alternate
Used by	Element	EmailAddressType/EmailAddressUse
Source		

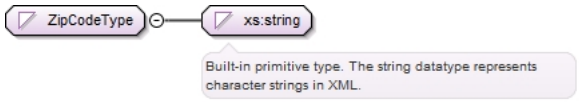
```
<xs:simpleType name="EmailAddressEnumType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Work"/>
    <xs:enumeration value="Home"/>
    <xs:enumeration value="Alternate"/>
  </xs:restriction>
</xs:simpleType>
```

Simple Type PreferredContactMethodEnumType

Namespace	http://www.iepmodel.net
Diagram	
Type	restriction of xs:string
Facets	enumeration: Home Phone enumeration: Work Phone enumeration: Cell Phone enumeration: Email
Used by	Element: ContactType/PreferredContactMethod
Source	


```
<xs:simpleType name="PreferredContactMethodEnumType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Home Phone"/>
    <xs:enumeration value="Work Phone"/>
    <xs:enumeration value="Cell Phone"/>
    <xs:enumeration value="Email"/>
  </xs:restriction>
</xs:simpleType>
```

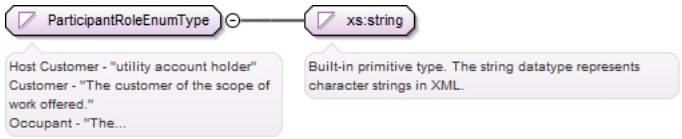
Simple Type ZipCodeType

Namespace	http://www.iepmodel.net
Diagram	
Type	restriction of xs:string
Facets	pattern: \d{5}|\d{5}-\d{4}
Used by	Element: AddressType/ZipCode
Source	


```
<xs:simpleType name="ZipCodeType">
  <xs:restriction base="xs:string">
    <xs:pattern value="\d{5}|\d{5}-\d{4}"/>
  </xs:restriction>
</xs:simpleType>
```

Simple Type ParticipantRoleEnumType

Namespace	http://www.iepmodel.net
Annotations	Host Customer - "utility account holder" Customer - "The customer of the scope of work offered." Occupant - "The organization or persons occupying a building specified in the project." PV System Owner - "The owner of the PV system may not necessarily the owber of the facility. As in the case of leasing the system." Incentive Payee - "Agency or business providing the incentive." Seller - "The party providing the defined system / scope of work"

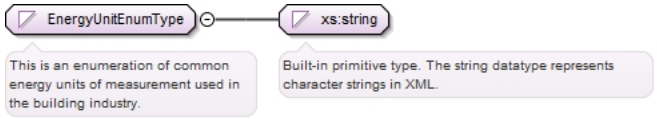
	Financer - "The party providing the financing for the work" General Contractor - "The general contractor overssing the work done." Installer - "The party installing the system. Typically this is a contractor." Referrer - "A party who referred the customer to the seller." Auditor - "A party who provides the site audit." Inspector - "A inspector for any of the work done." Engineer - "An engineer providing designs documents and specifications" Program Administrator - "A party who oversees any incentive or regulatory work."
Diagram	
Type	restriction of xs:string
Facets	enumeration Host Customer enumeration Customer enumeration Occupant enumeration PV System Owner enumeration Incentive Payee enumeration Seller enumeration Financer enumeration General Contractor enumeration Installer enumeration Referrer enumeration Auditor enumeration Inspector enumeration Engineer enumeration Program Administrator
Used by	Element ParticipantType/Role

Source

```
<xs:simpleType name="ParticipantRoleEnumType">
  <xs:annotation>
    <xs:documentation>Host Customer - "utility account holder"</xs:documentation>
    <xs:documentation>Customer - "The customer of the scope of work offered."</
xs:documentation>
    <xs:documentation>Occupant - "The organization or persons occupying a building
 specified in the project."</xs:documentation>
    <xs:documentation>PV System Owner - "The owner of the PV system may not necessarily
 the owber of the facility. As in the case of leasing the system."</xs:documentation>
    <xs:documentation>Incentive Payee - "Agency or business providing the incentive."</
xs:documentation>
    <xs:documentation>Seller - "The party providing the defined system / scope of work"</
xs:documentation>
    <xs:documentation>Financer - "The party providing the financing for the work"</
xs:documentation>
    <xs:documentation>General Contractor - "The general contractor overssing the work
 done."</xs:documentation>
    <xs:documentation>Installer - "The party installing the system. Typically this is a
 contractor."</xs:documentation>
    <xs:documentation>Referrer - "A party who referred the customer to the seller."</
xs:documentation>
    <xs:documentation>Auditor - "A party who provides the site audit."</xs:documentation>
    <xs:documentation>Inspector - "A inspector for any of the work done."</
xs:documentation>
    <xs:documentation>Engineer - "An engineer providing designs documents and
 specifications"</xs:documentation>
    <xs:documentation>Program Administrator - "A party who oversees any incentive or
 regulatory work."</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="Host Customer"/>
    <xs:enumeration value="Customer"/>
    <xs:enumeration value="Occupant"/>
```

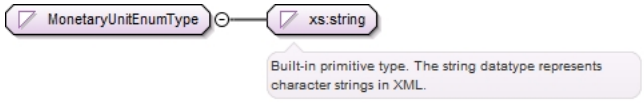
```
    <xs:enumeration value="PV System Owner"/>
    <xs:enumeration value="Incentive Payee"/>
    <xs:enumeration value="Seller"/>
    <xs:enumeration value="Financer"/>
    <xs:enumeration value="General Contractor"/>
    <xs:enumeration value="Installer"/>
    <xs:enumeration value="Referrer"/>
    <xs:enumeration value="Auditor"/>
    <xs:enumeration value="Inspector"/>
    <xs:enumeration value="Engineer"/>
    <xs:enumeration value="Program Administrator"/>
  </xs:restriction>
</xs:simpleType>
```

Simple Type `EnergyUnitEnumType`

Namespace	http://www.iepmodel.net
Annotations	This is an enumeration of common energy units of measurement used in the building industry.
Diagram	
Type	restriction of xs:string
Facets	enumeration: BTU enumeration: Joules enumeration: KilowattHours enumeration: Therms
Used by	Element: EnergyServiceType/EnergyType Attribute: EnergyType/@Unit
Source	

```
<xs:simpleType name="EnergyUnitEnumType">
  <xs:annotation>
    <xs:documentation>This is an enumeration of common energy units of measurement used in
 the building industry.</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="BTU"/>
    <xs:enumeration value="Joules"/>
    <xs:enumeration value="KilowattHours"/>
    <xs:enumeration value="Therms"/>
  </xs:restriction>
</xs:simpleType>
```

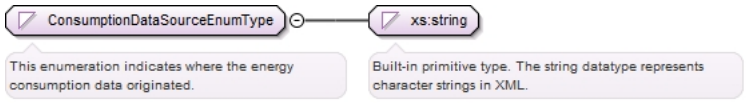
Simple Type `MonetaryUnitEnumType`

Namespace	http://www.iepmodel.net
Diagram	
Type	restriction of xs:string
Facets	enumeration: dollars enumeration: cents
Used by	Attribute: MonetaryType/@Unit
Source	

```
<xs:simpleType name="MonetaryUnitEnumType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="dollars"/>
    <xs:enumeration value="cents"/>
  </xs:restriction>
</xs:simpleType>
```

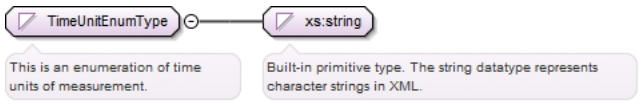
Simple Type `ConsumptionDataSourceEnumType`

Namespace	http://www.iepmodel.net
Annotations	This enumeration indicates where the energy consumption data originated.

Diagram	
Type	restriction of xs:string
Facets	enumeration `Utility Bill` enumeration `Simulated` enumeration `Rated` enumeration `Measured`
Used by	Element EnergyConsumptionType/DataSource

Source	`<xs:simpleType name="ConsumptionDataSourceEnumType">`
	`  <xs:annotation>`
	`  <xs:documentation>This enumeration indicates where the energy consumption data originated.</xs:documentation>`
	`  </xs:annotation>`
	`  <xs:restriction base="xs:string">`
	`  <xs:enumeration value="Utility Bill"/>`
	`  <xs:enumeration value="Simulated"/>`
	`  <xs:enumeration value="Rated"/>`
	`  <xs:enumeration value="Measured"/>`
	`  </xs:restriction>`
	`</xs:simpleType>`

Simple Type `TimeUnitEnumType`

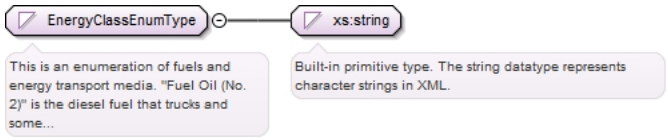
Namespace	http://www.iepmodel.net
Annotations	`This is an enumeration of time units of measurement.`
Diagram	
Type	restriction of xs:string
Facets	enumeration `Day` enumeration `Hour` enumeration `Minute` enumeration `Month` enumeration `Second` enumeration `Week` enumeration `Year`
Used by	Attributes TimePeriodType/@TimeUnits, TimeType/@Unit

Source	`<xs:simpleType name="TimeUnitEnumType">`
	`  <xs:annotation>`
	`  <xs:documentation>This is an enumeration of time units of measurement.</xs:documentation>`
	`  </xs:annotation>`
	`  <xs:restriction base="xs:string">`
	`  <xs:enumeration value="Day"/>`
	`  <xs:enumeration value="Hour"/>`
	`  <xs:enumeration value="Minute"/>`
	`  <xs:enumeration value="Month"/>`
	`  <xs:enumeration value="Second"/>`
	`  <xs:enumeration value="Week"/>`
	`  <xs:enumeration value="Year"/>`
	`  </xs:restriction>`
	`</xs:simpleType>`

Simple Type `EnergyClassEnumType`

Namespace	http://www.iepmodel.net

Annotations	`This is an enumeration of fuels and energy transport media.`
	
	`"Fuel Oil (No. 2)" is the diesel fuel that trucks and some cars run on, leading to the name "road diesel". It is the same thing as heating oil.`

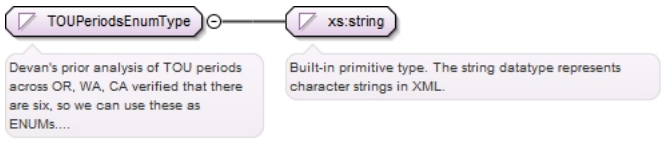
Diagram	
Type	restriction of xs:string
Facets	enumeration Coal (anthracite) enumeration Coal (bituminous) enumeration Coke enumeration Diesel enumeration District Chilled Water enumeration District Hot Water enumeration District Steam enumeration Electricity enumeration Fuel Oil (No. 1) — Number 1 is similar to kerosene and is the fraction that boils off right after gasoline. enumeration Fuel Oil (No. 2) enumeration Fuel Oil (No. 4) — Number 4 fuel oil is usually a blend of distillate and residual fuel oils, such as No. 2 and 6; however, sometimes it is just a heavy distillate. No. 4 may be classified as diesel, distillate or residual fuel oil. enumeration Fuel Oil (No. 5 and No. 6) — Number 5 fuel oil and Number 6 fuel oil are called residual fuel oils (RFO) or heavy fuel oils. More Number 6 oil is produced compared to Number 5 oil, the terms heavy fuel oil and residual fuel oil are sometimes used as names for Number 6. Number 5 and 6 are what remains of the crude oil after gasoline and the distillate fuel oils are extracted through distillation. Number 5 fuel oil is a mixture of 75-80 % Number 6 oil and 25-20% of Number 2 oil. Number 6 oil may also contain a small amount of No. 2 to get it to meet specifications. enumeration Geothermal enumeration Kerosene enumeration Liquid Propane enumeration Natural Gas enumeration Other enumeration Propane enumeration Steam enumeration Wood
Used by	Attributes EnergyType/@Fuel, PowerType/@Fuel

Source

```
<xs:simpleType name="EnergyClassEnumType">
  <xs:annotation>
    <xs:documentation>This is an enumeration of fuels and energy transport media. "Fuel
 Oil (No. 2)" is the diesel fuel that trucks and some cars run on, leading to the name
 "road diesel". It is the same thing as heating oil.</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="Coal (anthracite)"/>
    <xs:enumeration value="Coal (bituminous)"/>
    <xs:enumeration value="Coke"/>
    <xs:enumeration value="Diesel"/>
    <xs:enumeration value="District Chilled Water"/>
    <xs:enumeration value="District Hot Water"/>
    <xs:enumeration value="District Steam"/>
    <xs:enumeration value="Electricity"/>
    <xs:enumeration value="Fuel Oil (No. 1)">
      <xs:annotation>
        <xs:documentation>Number 1 is similar to kerosene and is the fraction that boils
 off right after gasoline.</xs:documentation>
```

```
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="Fuel Oil (No. 2)"/>
    <xs:enumeration value="Fuel Oil (No. 4)">
      <xs:annotation>
        <xs:documentation>Number 4 fuel oil is usually a blend of distillate and residual
 fuel oils, such as No. 2 and 6; however, sometimes it is just a heavy distillate. No. 4
 may be classified as diesel, distillate or residual fuel oil.</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="Fuel Oil (No. 5 and No. 6)">
      <xs:annotation>
        <xs:documentation>Number 5 fuel oil and Number 6 fuel oil are called residual fuel
 oils (RFO) or heavy fuel oils. More Number 6 oil is produced compared to Number 5 oil,
 the terms heavy fuel oil and residual fuel oil are sometimes used as names for Number 6.
 Number 5 and 6 are what remains of the crude oil after gasoline and the distillate fuel
 oils are extracted through distillation. Number 5 fuel oil is a mixture of 75-80 % Number
 6 oil and 25-20% of Number 2 oil. Number 6 oil may also contain a small amount of No. 2
 to get it to meet specifications.</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="Geothermal"/>
    <xs:enumeration value="Kerosene"/>
    <xs:enumeration value="Liquid Propane"/>
    <xs:enumeration value="Natural Gas"/>
    <xs:enumeration value="Other"/>
    <xs:enumeration value="Propane"/>
    <xs:enumeration value="Steam"/>
    <xs:enumeration value="Wood"/>
  </xs:restriction>
</xs:simpleType>
```

Simple Type `TOUPeriodsEnumType`

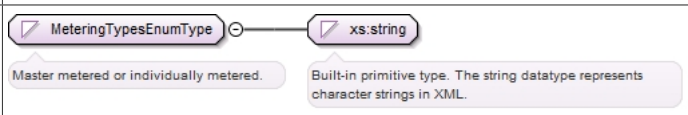
Namespace	http://www.iepmodel.net
Annotations	Devan's prior analysis of TOU periods across OR, WA, CA verified that there are six, so we can use these as ENUMs. However, its optional.
Diagram	
Type	restriction of xs:string
Facets	enumeration Base enumeration Off enumeration Off-Peak enumeration Off-Peak (P4) enumeration Pre-Peak enumeration Post-Peak enumeration Light Load enumeration Low Load enumeration Low Load A enumeration Low Load B enumeration Low Peak enumeration Part-Peak enumeration Partial Peak enumeration Intermediate Peak enumeration Semi-Peak enumeration Mid-Peak enumeration Mid-Peak (P2) enumeration On enumeration Peak enumeration On-Peak enumeration On-Peak (P1)

	enumeration	On-Peak (P3)
	enumeration	Shoulder-Peak
	enumeration	Super-Peak
	enumeration	Heavy Load
	enumeration	High Peak
	enumeration	New Period
	enumeration	Summer Off-Peak
	enumeration	Summer Part-Peak
	enumeration	Summer Peak
	enumeration	Winter Off-Peak
	enumeration	Winter Part-Peak
	enumeration	Winter Peak
Used by	Element	ConsumedEnergyType/TimeOfUsePeriod

Source

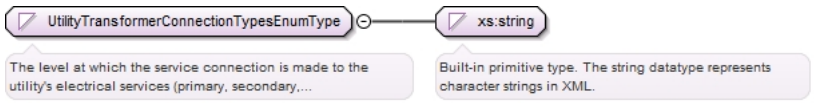
```
<xs:simpleType name="TOUPeriodsEnumType">
  <xs:annotation>
    <xs:documentation>Devan's prior analysis of TOU periods across OR, WA, CA
 verified that there are six, so we can use these as ENUMs. However, its optional.</
xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="Base"/>
    <xs:enumeration value="Off"/>
    <xs:enumeration value="Off-Peak"/>
    <xs:enumeration value="Off-Peak (P4)"/>
    <xs:enumeration value="Pre-Peak"/>
    <xs:enumeration value="Post-Peak"/>
    <xs:enumeration value="Light Load"/>
    <xs:enumeration value="Low Load"/>
    <xs:enumeration value="Low Load A"/>
    <xs:enumeration value="Low Load B"/>
    <xs:enumeration value="Low Peak"/>
    <xs:enumeration value="Part-Peak"/>
    <xs:enumeration value="Partial Peak"/>
    <xs:enumeration value="Intermediate Peak"/>
    <xs:enumeration value="Semi-Peak"/>
    <xs:enumeration value="Mid-Peak"/>
    <xs:enumeration value="Mid-Peak (P2)"/>
    <xs:enumeration value="On"/>
    <xs:enumeration value="Peak"/>
    <xs:enumeration value="On-Peak"/>
    <xs:enumeration value="On-Peak (P1)"/>
    <xs:enumeration value="On-Peak (P3)"/>
    <xs:enumeration value="Shoulder-Peak"/>
    <xs:enumeration value="Super-Peak"/>
    <xs:enumeration value="Heavy Load"/>
    <xs:enumeration value="High Peak"/>
    <xs:enumeration value="New Period"/>
    <xs:enumeration value="Summer Off-Peak"/>
    <xs:enumeration value="Summer Part-Peak"/>
    <xs:enumeration value="Summer Peak"/>
    <xs:enumeration value="Winter Off-Peak"/>
    <xs:enumeration value="Winter Part-Peak"/>
    <xs:enumeration value="Winter Peak"/>
  </xs:restriction>
</xs:simpleType>
```

Simple Type MeteringTypesEnumType

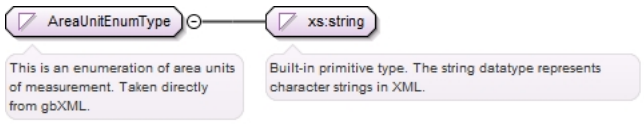
Namespace	http://www.iepmodel.net
Annotations	Master metered or individually metered.
Diagram	
Type	restriction of xs:string
Facets	enumeration: Individually Metered enumeration: Master Metered

Used by	Element	EnergyServiceType/Metering
Source	<xs:simpleType name="MeteringTypesEnumType"> <xs:annotation> <xs:documentation>Master metered or individually metered.</xs:documentation> </xs:annotation> <xs:restriction base="xs:string"> <xs:enumeration value="Individually Metered"/> <xs:enumeration value="Master Metered"/> </xs:restriction> </xs:simpleType>	

Simple Type `UtilityTransformerConnectionTypesEnumType`

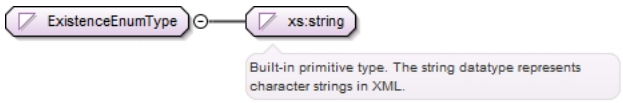
Namespace	http://www.iepmodel.net
Annotations	The level at which the service connection is made to the utility's electrical services (primary, secondary, transmission).
Diagram	
Type	restriction of xs:string
Facets	enumeration Secondary enumeration Transmission enumeration Primary
Used by	Element EnergyServiceType/UtilityTransformerConnection
Source	<xs:simpleType name="UtilityTransformerConnectionTypesEnumType"> <xs:annotation> <xs:documentation>The level at which the service connection is made to the utility's electrical services (primary, secondary, transmission).</xs:documentation> </xs:annotation> <xs:restriction base="xs:string"> <xs:enumeration value="Secondary"/> <xs:enumeration value="Transmission"/> <xs:enumeration value="Primary"/> </xs:restriction> </xs:simpleType>

Simple Type `AreaUnitEnumType`

Namespace	http://www.iepmodel.net
Annotations	This is an enumeration of area units of measurement. Taken directly from gbXML.
Diagram	
Type	restriction of xs:string
Facets	enumeration SquareCentimeters enumeration SquareFeet enumeration SquareInches enumeration SquareKilometers enumeration SquareMeters enumeration SquareMiles enumeration SquareMillimeters enumeration SquareYards
Used by	Attribute AreaType/@Unit
Source	<xs:simpleType name="AreaUnitEnumType"> <xs:annotation> <xs:documentation>This is an enumeration of area units of measurement. Taken directly from gbXML.</xs:documentation> </xs:annotation> <xs:restriction base="xs:string"> <xs:enumeration value="SquareCentimeters"/>

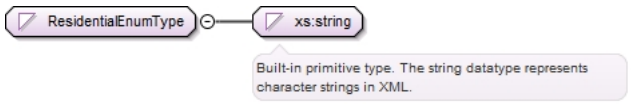
```
    <xs:enumeration value="SquareFeet"/>
    <xs:enumeration value="SquareInches"/>
    <xs:enumeration value="SquareKilometers"/>
    <xs:enumeration value="SquareMeters"/>
    <xs:enumeration value="SquareMiles"/>
    <xs:enumeration value="SquareMillimeters"/>
    <xs:enumeration value="SquareYards"/>
  </xs:restriction>
</xs:simpleType>
```

Simple Type `ExistenceEnumType`

Namespace	http://www.iepmodel.net
Diagram	
Type	restriction of xs:string
Facets	enumeration `Existing` enumeration `New` enumeration `Unknown`
Used by	Element SpaceType/NewExisting
Source	

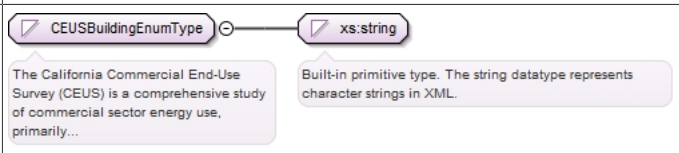
```
<xs:simpleType name="ExistenceEnumType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Existing"/>
    <xs:enumeration value="New"/>
    <xs:enumeration value="Unknown"/>
  </xs:restriction>
</xs:simpleType>
```

Simple Type `ResidentialEnumType`

Namespace	http://www.iepmodel.net
Diagram	
Type	restriction of xs:string
Facets	enumeration `Single-Family` enumeration `Multi-Family`
Used by	Element BuildingClassType/Residential
Source	

```
<xs:simpleType name="ResidentialEnumType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Single-Family"/>
    <xs:enumeration value="Multi-Family"/>
  </xs:restriction>
</xs:simpleType>
```

Simple Type `CEUSBuildingEnumType`

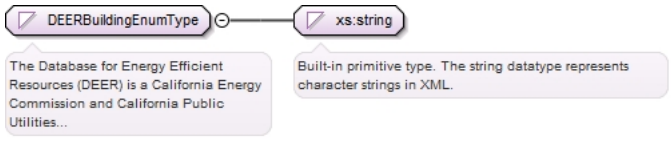
Namespace	http://www.iepmodel.net
Annotations	The California Commercial End-Use Survey (CEUS) is a comprehensive study of commercial sector energy use, primarily designed to support the state's energy demand forecasting activities. http://www.energy.ca.gov/ceus/ This enumeration lists the CEUS building types.
Diagram	
Type	restriction of xs:string
Facets	enumeration `College` enumeration `Food Store` enumeration `Health`

	enumeration	Large Office (>=30k ft2)
	enumeration	Lodging
	enumeration	Miscellaneous
	enumeration	Refrigerated Warehouse
	enumeration	Restaurant
	enumeration	Retail
	enumeration	School
	enumeration	Small Office (<30k ft2)
	enumeration	Unrefrigerated Warehouse
Used by	Element	CommercialBuildingClassType/CEUSClassification

Source

```
<xs:simpleType name="CEUSBuildingEnumType">
  <xs:annotation>
    <xs:documentation>The California Commercial End-Use Survey (CEUS) is a comprehensive
 study of commercial sector energy use, primarily designed to support the state's energy
 demand forecasting activities. http://www.energy.ca.gov/ceus/ This enumeration lists the
 CEUS building types.</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="College"/>
    <xs:enumeration value="Food Store"/>
    <xs:enumeration value="Health"/>
    <xs:enumeration value="Large Office (>=30k ft2)"/>
    <xs:enumeration value="Lodging"/>
    <xs:enumeration value="Miscellaneous"/>
    <xs:enumeration value="Refrigerated Warehouse"/>
    <xs:enumeration value="Restaurant"/>
    <xs:enumeration value="Retail"/>
    <xs:enumeration value="School"/>
    <xs:enumeration value="Small Office (<30k ft2)"/>
    <xs:enumeration value="Unrefrigerated Warehouse"/>
  </xs:restriction>
</xs:simpleType>
```

Simple Type DEERBuildingEnumType

Namespace	http://www.iepmodel.net
Annotations	The Database for Energy Efficient Resources (DEER) is a California Energy Commission and California Public Utilities Commission (CPUC) sponsored database designed to provide well-documented estimates of energy and peak demand savings values, measure costs, and effective useful life (EUL) all with one data source. http://www.energy.ca.gov/deer/ This list can be found in the "key" sheet of the excel file from the DEER website at the following link: http://www.deeresources.com/deer0911planning/downloads/DEER2008%20Database%20Description%20%28version%202.05%29.xls
Diagram	
Type	restriction of xs:string
Facets	enumeration: Education - Community College enumeration: Education - Primary School enumeration: Education - Secondary School enumeration: Education - University enumeration: Grocery enumeration: Health/Medical - Hospital

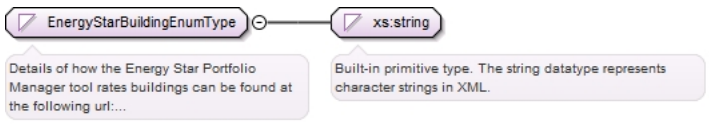
	enumeration	Health/Medical - Nursing Home
	enumeration	Lodging - Guest Rooms
	enumeration	Lodging - Hotel
	enumeration	Lodging - Motel
	enumeration	Manufacturing - Light Industrial
	enumeration	Office - Large
	enumeration	Office - Small
	enumeration	Residential - Indoor
	enumeration	Residential - Outdoor
	enumeration	Restaurant - Fast-Food
	enumeration	Restaurant - Sit-Down
	enumeration	Retail - 3-Story Large
	enumeration	Retail - Single-Story Large
	enumeration	Retail - Small
	enumeration	Storage - Conditioned
	enumeration	Storage - Unconditioned
	enumeration	Warehouse - Refrigerated
Used by	Element	CommercialBuildingClassType/DEERClassification

Source

```
<xs:simpleType name="DEERBuildingEnumType">
  <xs:annotation>
    <xs:documentation>The Database for Energy Efficient Resources (DEER) is a California
 Energy Commission and California Public Utilities Commission (CPUC) sponsored database
 designed to provide well-documented estimates of energy and peak demand savings values,
 measure costs, and effective useful life (EUL) all with one data source. http://
www.energy.ca.gov/deer/ This list can be found in the "key" sheet of the excel file from
 the DEER website at the following link: http://www.deeresources.com/deer0911planning/
downloads/DEER2008%20Database%20Description%20%28version%202.05%29.xls</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="Education - Community College"/>
    <xs:enumeration value="Education - Primary School"/>
    <xs:enumeration value="Education - Secondary School"/>
    <xs:enumeration value="Education - University"/>
    <xs:enumeration value="Grocery"/>
    <xs:enumeration value="Health/Medical - Hospital"/>
    <xs:enumeration value="Health/Medical - Nursing Home"/>
    <xs:enumeration value="Lodging - Guest Rooms"/>
    <xs:enumeration value="Lodging - Hotel"/>
    <xs:enumeration value="Lodging - Motel"/>
    <xs:enumeration value="Manufacturing - Light Industrial"/>
    <xs:enumeration value="Office - Large"/>
    <xs:enumeration value="Office - Small"/>
    <xs:enumeration value="Residential - Indoor"/>
    <xs:enumeration value="Residential - Outdoor"/>
    <xs:enumeration value="Restaurant - Fast-Food"/>
    <xs:enumeration value="Restaurant - Sit-Down"/>
    <xs:enumeration value="Retail - 3-Story Large"/>
    <xs:enumeration value="Retail - Single-Story Large"/>
    <xs:enumeration value="Retail - Small"/>
    <xs:enumeration value="Storage - Conditioned"/>
    <xs:enumeration value="Storage - Unconditioned"/>
    <xs:enumeration value="Warehouse - Refrigerated"/>
  </xs:restriction>
</xs:simpleType>
```

Simple Type EnergyStarBuildingEnumType

Namespace	http://www.iepmodel.net
Annotations	Details of how the Energy Star Portfolio Manager tool rates buildings can be found at the following url: http://www.energystar.gov/index.cfm?c=evaluate_performance.pt_neprs_learn

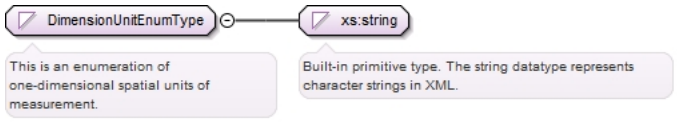
	When benchmarking a mixed-use building, Portfolio Recommends defining the building as the space type that accounts for 50% or more of the floor area to get an accurate benchmark. Details can be found at the following url: http://www.energystar.gov/index.cfm?c=eligibility.bus_portfoliomanager_eligibility_mixed
Diagram	
Type	restriction of xs:string
Facets	enumeration: Office enumeration: Bank/Financial Institution enumeration: Courthouse enumeration: Dormitory / Residence Hall enumeration: K-12 School enumeration: Hospital (Acute Care and Children's) enumeration: House of Worship enumeration: Hotel enumeration: Retail Store enumeration: Supermarket enumeration: Senior Care Facility enumeration: Residence Halls/ Dormitorie enumeration: Warehouse enumeration: Medical Office enumeration: Wastewater Facility enumeration: Data Center enumeration: Swimming Pool enumeration: Parking enumeration: Other
Used by	Element CommercialBuildingClassType/EnergyStarClassification

Source

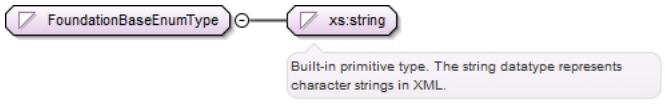
```
<xs:simpleType name="EnergyStarBuildingEnumType">
  <xs:annotation>
    <xs:documentation>Details of how the Energy Star Portfolio Manager tool
 rates buildings can be found at the following url: http://www.energystar.gov/
index.cfm?c=evaluate_performance.pt_neprs_learn When benchmarking a mixed-use
 building, Portfolio Recommends defining the building as the space type that
 accounts for 50% or more of the floor area to get an accurate benchmark.
 Details can be found at the following url: http://www.energystar.gov/index.cfm?
c=eligibility.bus_portfoliomanager_eligibility_mixed</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="Office"/>
    <xs:enumeration value="Bank/Financial Institution"/>
    <xs:enumeration value="Courthouse"/>
    <xs:enumeration value="Dormitory / Residence Hall"/>
    <xs:enumeration value="K-12 School"/>
    <xs:enumeration value="Hospital (Acute Care and Children's)"/>
    <xs:enumeration value="House of Worship"/>
    <xs:enumeration value="Hotel"/>
    <xs:enumeration value="Retail Store"/>
    <xs:enumeration value="Supermarket"/>
    <xs:enumeration value="Senior Care Facility"/>
    <xs:enumeration value="Residence Halls/Dormitorie"/>
    <xs:enumeration value="Warehouse"/>
    <xs:enumeration value="Medical Office"/>
    <xs:enumeration value="Wastewater Facility"/>
    <xs:enumeration value="Data Center"/>
    <xs:enumeration value="Swimming Pool"/>
    <xs:enumeration value="Parking"/>
    <xs:enumeration value="Other"/>
  </xs:restriction>
```

```
</xs:simpleType>
```

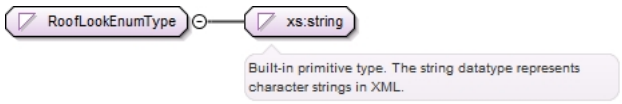
Simple Type DimensionUnitEnumType

Namespace	http://www.iepmodel.net
Annotations	This is an enumeration of one-dimensional spatial units of measurement.
Diagram	
Type	restriction of xs:string
Facets	enumeration Centimeters enumeration Feet enumeration Inches enumeration Kilometers enumeration Meters enumeration Miles enumeration Millimeters enumeration Yards
Used by	Attribute DimensionType/@Unit
Source	<xs:simpleType name="DimensionUnitEnumType"> <xs:annotation> <xs:documentation>This is an enumeration of one-dimensional spatial units of measurement.</xs:documentation> </xs:annotation> <xs:restriction base="xs:string"> <xs:enumeration value="Centimeters"/> <xs:enumeration value="Feet"/> <xs:enumeration value="Inches"/> <xs:enumeration value="Kilometers"/> <xs:enumeration value="Meters"/> <xs:enumeration value="Miles"/> <xs:enumeration value="Millimeters"/> <xs:enumeration value="Yards"/> </xs:restriction> </xs:simpleType>

Simple Type FoundationBaseEnumType

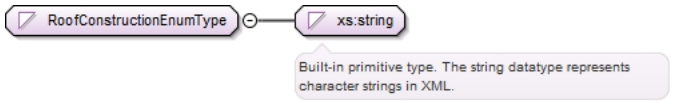
Namespace	http://www.iepmodel.net
Diagram	
Type	restriction of xs:string
Facets	enumeration Crawlspace enumeration Finished Basement enumeration Unfinished Basement enumeration SlabOnGrade enumeration Raised Floor
Used by	Element FoundationType/Base
Source	<xs:simpleType name="FoundationBaseEnumType"> <xs:restriction base="xs:string"> <xs:enumeration value="Crawlspace"/> <xs:enumeration value="Finished Basement"/> <xs:enumeration value="Unfinished Basement"/> <xs:enumeration value="SlabOnGrade"/> <xs:enumeration value="Raised Floor"/> </xs:restriction> </xs:simpleType>

Simple Type RoofLookEnumType

Namespace	http://www.iepmodel.net
Diagram	
Type	restriction of xs:string
Facets	enumeration Butterfly enumeration Combination enumeration Flat enumeration Gable enumeration Gambrel enumeration Hip enumeration Mansard enumeration Shed
Used by	Element RoofType/Look

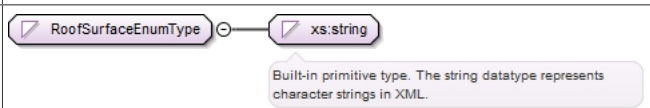
Source	`<xs:simpleType name="RoofLookEnumType">`
	`  <xs:restriction base="xs:string">`
	`  <xs:enumeration value="Butterfly"/>`
	`  <xs:enumeration value="Combination"/>`
	`  <xs:enumeration value="Flat"/>`
	`  <xs:enumeration value="Gable"/>`
	`  <xs:enumeration value="Gambrel"/>`
	`  <xs:enumeration value="Hip"/>`
	`  <xs:enumeration value="Mansard"/>`
	`  <xs:enumeration value="Shed"/>`
	`  </xs:restriction>`
	`</xs:simpleType>`

Simple Type RoofConstructionEnumType

Namespace	http://www.iepmodel.net
Diagram	
Type	restriction of xs:string
Facets	enumeration beams and purlins enumeration rafters with attic enumeration truss with attic enumeration vaulted 2x enumeration vaulted beams
Used by	Element RoofType/ConstructionStyle

Source	`<xs:simpleType name="RoofConstructionEnumType">`
	`  <xs:restriction base="xs:string">`
	`  <xs:enumeration value="beams and purlins"/>`
	`  <xs:enumeration value="rafters with attic"/>`
	`  <xs:enumeration value="truss with attic"/>`
	`  <xs:enumeration value="vaulted 2x"/>`
	`  <xs:enumeration value="vaulted beams"/>`
	`  </xs:restriction>`
	`</xs:simpleType>`

Simple Type RoofSurfaceEnumType

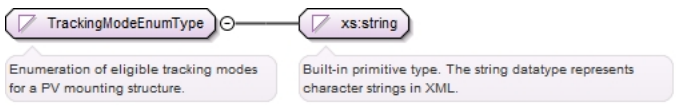
Namespace	http://www.iepmodel.net
Diagram	
Type	restriction of xs:string

Facets	enumeration	CalPac metal
	enumeration	composition roll
	enumeration	composition shingle
	enumeration	foam
	enumeration	heavy concrete tile
	enumeration	high-definition comp shingle
	enumeration	light weight concrete tile
	enumeration	single-ply membrane
	enumeration	slate
	enumeration	spanish barrel tile
	enumeration	standing seam metal
	enumeration	tar & gravel
	enumeration	wood shake
Used by	Element	RoofType/SurfaceType

Source

```
<xs:simpleType name="RoofSurfaceEnumType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="CalPac metal"/>
    <xs:enumeration value="composition roll"/>
    <xs:enumeration value="composition shingle"/>
    <xs:enumeration value="foam"/>
    <xs:enumeration value="heavy concrete tile"/>
    <xs:enumeration value="high-definition comp shingle"/>
    <xs:enumeration value="light weight concrete tile"/>
    <xs:enumeration value="single-ply membrane"/>
    <xs:enumeration value="slate"/>
    <xs:enumeration value="spanish barrel tile"/>
    <xs:enumeration value="standing seam metal"/>
    <xs:enumeration value="tar & gravel"/>
    <xs:enumeration value="wood shake"/>
  </xs:restriction>
</xs:simpleType>
```

Simple Type TrackingModeEnumType

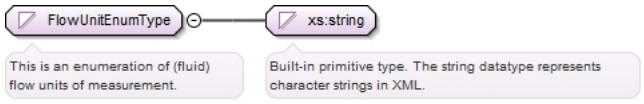
Namespace	http://www.iepmodel.net
Annotations	Enumeration of eligible tracking modes for a PV mounting structure.
Diagram	
Type	restriction of xs:string
Facets	enumeration: fixed
	enumeration: single-axis
	enumeration: dual-axis
Used by	Element: SolarExposureType/TrackingMode

Source

```
<xs:simpleType name="TrackingModeEnumType">
  <xs:annotation>
    <xs:documentation>Enumeration of eligible tracking modes for a PV mounting
 structure.</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="fixed"/>
    <xs:enumeration value="single-axis"/>
    <xs:enumeration value="dual-axis"/>
  </xs:restriction>
</xs:simpleType>
```

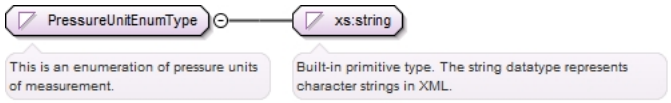
Simple Type FlowUnitEnumType

Namespace	http://www.iepmodel.net
Annotations	This is an enumeration of (fluid) flow units of measurement.

Diagram	
Type	restriction of xs:string
Facets	enumeration CFM enumeration CubicMPerHr enumeration CubicMPerMin enumeration GPH enumeration GPM enumeration LPerSec
Used by	Attribute FlowType/@Unit

Source	`<xs:simpleType name="FlowUnitEnumType">`
	`  <xs:annotation>`
	`  <xs:documentation>This is an enumeration of (fluid) flow units of measurement.</xs:documentation>`
	`  </xs:annotation>`
	`  <xs:restriction base="xs:string">`
	`  <xs:enumeration value="CFM"/>`
	`  <xs:enumeration value="CubicMPerHr"/>`
	`  <xs:enumeration value="CubicMPerMin"/>`
	`  <xs:enumeration value="GPH"/>`
	`  <xs:enumeration value="GPM"/>`
	`  <xs:enumeration value="LPerSec"/>`
	`  </xs:restriction>`
	`</xs:simpleType>`

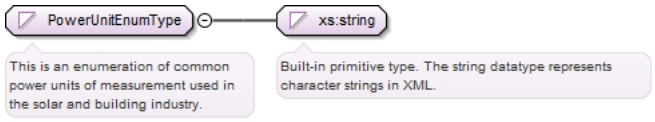
Simple Type `PressureUnitEnumType`

Namespace	http://www.iepmodel.net
Annotations	This is an enumeration of pressure units of measurement.
Diagram	
Type	restriction of xs:string
Facets	enumeration Atmospheres enumeration CentimetersOfH2O enumeration CentimetersOfMercury enumeration InchesOfH2O enumeration InchesOfMercury enumeration kPa kiloPascals enumeration MillimetersOfMercury enumeration Pascals enumeration PSI Pounds per Square Inch
Used by	Attribute PressureType/@Unit

Source	`<xs:simpleType name="PressureUnitEnumType">`
	`  <xs:annotation>`
	`  <xs:documentation>This is an enumeration of pressure units of measurement.</xs:documentation>`
	`  </xs:annotation>`
	`  <xs:restriction base="xs:string">`
	`  <xs:enumeration value="Atmospheres"/>`
	`  <xs:enumeration value="CentimetersOfH2O"/>`
	`  <xs:enumeration value="CentimetersOfMercury"/>`
	`  <xs:enumeration value="InchesOfH2O"/>`
	`  <xs:enumeration value="InchesOfMercury"/>`
	`  <xs:enumeration value="kPa">`
	`  <xs:annotation>`
	`  <xs:documentation>kiloPascals</xs:documentation>`
	`  </xs:annotation>`
	`  </xs:enumeration>`
	`  <xs:enumeration value="MillimetersOfMercury"/>`

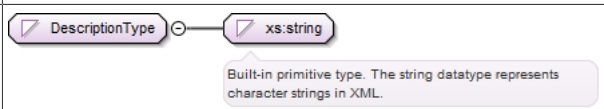
```
    <xs:enumeration value="Pascals"/>
    <xs:enumeration value="PSI">
      <xs:annotation>
        <xs:documentation>Pounds per Square Inch</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
  </xs:restriction>
</xs:simpleType>
```

Simple Type `PowerUnitEnumType`

Namespace	http://www.iepmodel.net
Annotations	This is an enumeration of common power units of measurement used in the solar and building industry.
Diagram	
Type	restriction of xs:string
Facets	enumeration `BtuPerHour` enumeration `BtuPerSecond` enumeration `Candela` enumeration `Footcandle` enumeration `FootPoundForcePerSecond` enumeration `Horsepower` enumeration `KilocaloriesPerSecond` enumeration `KilogramForceMeterPerSecond` enumeration `Kilowatt` enumeration `Lumen` enumeration `Watt`
Used by	Attribute PowerType/@Unit
Source	

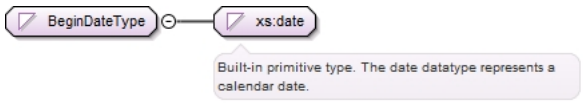
```
<xs:simpleType name="PowerUnitEnumType">
  <xs:annotation>
    <xs:documentation>This is an enumeration of common power units of measurement used in
 the solar and building industry.</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="BtuPerHour"/>
    <xs:enumeration value="BtuPerSecond"/>
    <xs:enumeration value="Candela"/>
    <xs:enumeration value="Footcandle"/>
    <xs:enumeration value="FootPoundForcePerSecond"/>
    <xs:enumeration value="Horsepower"/>
    <xs:enumeration value="KilocaloriesPerSecond"/>
    <xs:enumeration value="KilogramForceMeterPerSecond"/>
    <xs:enumeration value="Kilowatt"/>
    <xs:enumeration value="Lumen"/>
    <xs:enumeration value="Watt"/>
  </xs:restriction>
</xs:simpleType>
```

Simple Type `DescriptionType`

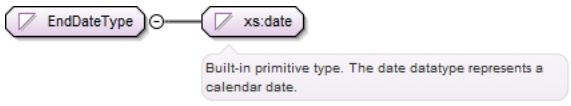
Namespace	http://www.iepmodel.net
Diagram	
Type	xs:string
Used by	Element Description
Source	

```
<xs:simpleType name="DescriptionType">
  <xs:restriction base="xs:string"/>
</xs:simpleType>
```

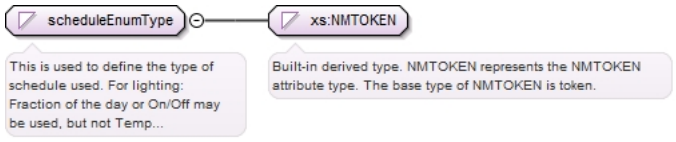
Simple Type `BeginDateType`

Namespace	http://www.iepmodel.net
Diagram	
Type	xs:date
Used by	Element BeginDate
Source	<xs:simpleType name="BeginDateType"> <xs:restriction base="xs:date"/> </xs:simpleType>

Simple Type `EndDateType`

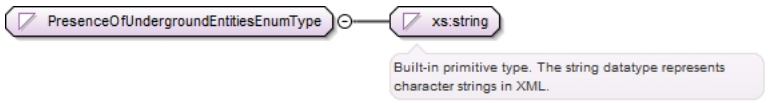
Namespace	http://www.iepmodel.net
Diagram	
Type	xs:date
Used by	Element EndDate
Source	<xs:simpleType name="EndDateType"> <xs:restriction base="xs:date"/> </xs:simpleType>

Simple Type `scheduleEnumType`

Namespace	http://www.iepmodel.net
Annotations	This is used to define the type of schedule used. For lighting: Fraction of the day or On/Off may be used, but not Temp For heating or cooling any of the three may be used to define the schedule
Diagram	
Type	restriction of xs:NMTOKEN
Facets	enumeration `Temp` This defines the a set temperature for a heating or cooling system enumeration `Fraction` Defines the fraction of use. Typically used for lighting and occupancy enumeration `OnOff` Used for schedules for fans and heating and cooling availability
Used by	Attributes DayScheduleType/@type, ScheduleType/@type, WeekScheduleType/@type
Source	<xs:simpleType name="scheduleEnumType"> <xs:annotation> <xs:documentation>This is used to define the type of schedule used. For lighting: Fraction of the day or On/Off may be used, but not Temp For heating or cooling any of the three may be used to define the schedule</xs:documentation> </xs:annotation> <xs:restriction base="xs:NMTOKEN"> <xs:enumeration value="Temp"> <xs:annotation> <xs:documentation>This defines the a set temperature for a heating or cooling system</xs:documentation> </xs:annotation> </xs:enumeration> <xs:enumeration value="Fraction"> <xs:annotation> <xs:documentation>Defines the fraction of use. Typically used for lighting and occupancy</xs:documentation> </xs:annotation> </xs:enumeration>

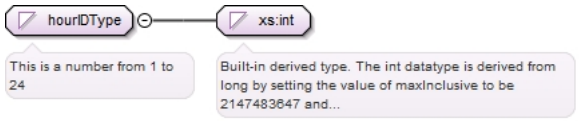
```
    <xs:enumeration value="OnOff">
      <xs:annotation>
        <xs:documentation>Used for schedules for fans and heating and cooling
 availability</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
  </xs:restriction>
</xs:simpleType>
```

Simple Type `PresenceOfUndergroundEntitiesEnumType`

Namespace	http://www.iepmodel.net
Diagram	
Type	restriction of xs:string
Facets	enumeration: `None` enumeration: `Yes (location marked)` enumeration: `Yes (location TBD)`
Used by	Elements: GroundAreaType/PresenceOfBuriedLines, GroundAreaType/PresenceOfSepticTanksAndLeachFields

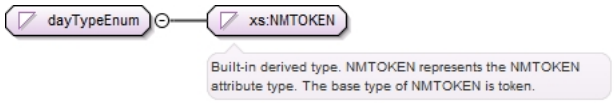
Source	`<xs:simpleType name="PresenceOfUndergroundEntitiesEnumType">`
	`  <xs:restriction base="xs:string">`
	`    <xs:enumeration value="None"/>`
	`    <xs:enumeration value="Yes (location marked)"/>`
	`    <xs:enumeration value="Yes (location TBD)"/>`
	`  </xs:restriction>`
	`</xs:simpleType>`

Simple Type `hourIDType`

Namespace	http://www.iepmodel.net
Annotations	`This is a number from 1 to 24`
Diagram	
Type	restriction of xs:int
Facets	maxInclusive: `24` minInclusive: `1`
Used by	Elements: ScheduleValueType/HourSpecified, hourID

Source	`<xs:simpleType name="hourIDType">`
	`  <xs:annotation>`
	`    <xs:documentation>This is a number from 1 to 24</xs:documentation>`
	`  </xs:annotation>`
	`  <xs:restriction base="xs:int">`
	`    <xs:maxInclusive value="24"/>`
	`    <xs:minInclusive value="1"/>`
	`  </xs:restriction>`
	`</xs:simpleType>`

Simple Type `dayTypeEnum`

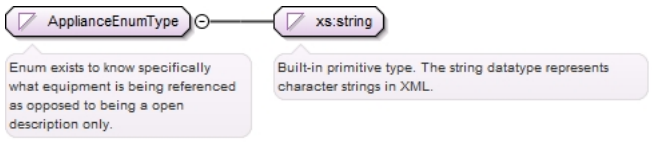
Namespace	http://www.iepmodel.net
Diagram	
Type	restriction of xs:NMTOKEN
Facets	enumeration: `Weekday` enumeration: `Weekend` enumeration: `Holiday`

	enumeration	WeekendOrHoliday
	enumeration	HeatingDesignDay
	enumeration	CoolingDesignDay
	enumeration	Sun
	enumeration	Mon
	enumeration	Tue
	enumeration	Wed
	enumeration	Thu
	enumeration	Fri
	enumeration	Sat
	enumeration	All
Used by	Attribute	Day/@dayType

Source

```
<xs:simpleType name="dayTypeEnum">
  <xs:restriction base="xs:NMTOKEN">
    <xs:enumeration value="Weekday"/>
    <xs:enumeration value="Weekend"/>
    <xs:enumeration value="Holiday"/>
    <xs:enumeration value="WeekendOrHoliday"/>
    <xs:enumeration value="HeatingDesignDay"/>
    <xs:enumeration value="CoolingDesignDay"/>
    <xs:enumeration value="Sun"/>
    <xs:enumeration value="Mon"/>
    <xs:enumeration value="Tue"/>
    <xs:enumeration value="Wed"/>
    <xs:enumeration value="Thu"/>
    <xs:enumeration value="Fri"/>
    <xs:enumeration value="Sat"/>
    <xs:enumeration value="All"/>
  </xs:restriction>
</xs:simpleType>
```

Simple Type ApplianceEnumType

Namespace	http://www.iepmodel.net
Annotations	Enum exists to know specifically what equipment is being referenced as opposed to being a open description only.
Diagram	
Type	restriction of xs:string

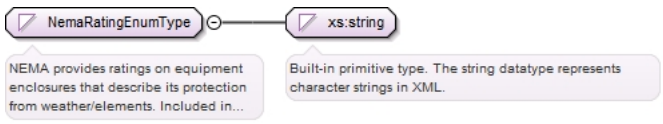
Facets		
	enumeration	Dishwasher
	enumeration	Dryer
	enumeration	Microwave
	enumeration	Stove
	enumeration	Range
	enumeration	Refrigerator
	enumeration	Stove
	enumeration	Washer
	enumeration	Computer
	enumeration	FishTank
	enumeration	Other
	enumeration	TV
	enumeration	DVR Digital Video Recorder
	enumeration	WellPump
Used by	Element	ApplianceType/Type

Source

```
<xs:simpleType name="ApplianceEnumType">
```

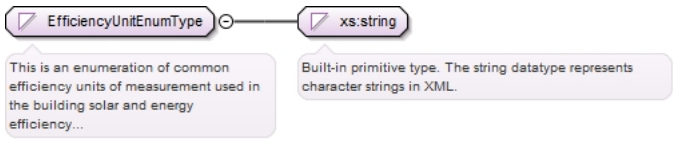
```
  <xs:annotation>
    <xs:documentation>Enum exists to know specifically what equipment is being referenced
 as opposed to being a open description only.</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="Dishwasher"/>
    <xs:enumeration value="Dryer"/>
    <xs:enumeration value="Microwave"/>
    <xs:enumeration value="Stove"/>
    <xs:enumeration value="Range"/>
    <xs:enumeration value="Refrigerator"/>
    <xs:enumeration value="Stove"/>
    <xs:enumeration value="Washer"/>
    <xs:enumeration value="Computer"/>
    <xs:enumeration value="FishTank"/>
    <xs:enumeration value="Other"/>
    <xs:enumeration value="TV"/>
    <xs:enumeration value="DVR">
      <xs:annotation>
        <xs:documentation>Digital Video Recorder</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="WellPump"/>
  </xs:restriction>
</xs:simpleType>
```

Simple Type `NemaRatingEnumType`

Namespace	http://www.iepmodel.net
Annotations	NEMA provides ratings on equipment enclosures that describe its protection from weather/ elements. Included in Common.xsd because EquipmentDefinitionType element uses it, else would be in CommonElectrical.xsd.
Diagram	
Type	restriction of xs:string
Facets	enumeration 3 enumeration 3R enumeration 4 enumeration 4X
Used by	Element EquipmentDefinitionType/EnclosureNemaRating
Source	

```
<xs:simpleType name="NemaRatingEnumType">
  <xs:annotation>
    <xs:documentation>NEMA provides ratings on equipment enclosures that describe its
 protection from weather/elements. Included in Common.xsd because EquipmentDefinitionType
 element uses it, else would be in CommonElectrical.xsd.</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="3"/>
    <xs:enumeration value="3R"/>
    <xs:enumeration value="4"/>
    <xs:enumeration value="4X"/>
  </xs:restriction>
</xs:simpleType>
```

Simple Type `EfficiencyUnitEnumType`

Namespace	http://www.iepmodel.net
Annotations	This is an enumeration of common efficiency units of measurement used in the building solar and energy efficiency industry.
Diagram	
Type	restriction of xs:string

Facets

enumeration	AFUE	The annual fuel utilization efficiency (AFUE; pronounced 'A'-'Few') is a thermal efficiency measure of combustion equipment like furnaces, boilers, and water heaters. The AFUE differs from the true 'thermal efficiency' in that it is not a steady-state, peak measure of conversion efficiency, but instead attempts to represent the actual, season-long, average efficiency of that piece of equipment, including the operating transients.
enumeration	BoilerEff	???
enumeration	COP	The coefficient of performance or COP (sometimes CP), of a heat pump is the ratio of the change in heat at the "output" (the heat reservoir of interest) to the supplied work.
enumeration	EER	The Energy Efficiency Ratio (EER) of a particular cooling device is the ratio of output cooling (in Btu/hr) to input electrical power (in Watts) at a given operating point (indoor and outdoor temperature and humidity conditions). The EER is related to the coefficient of performance (COP) commonly used in thermodynamics, with the primary difference being that the COP of a cooling device is unit-less: the cooling load and the electrical power needed to run the device are both measured using the same units, e.g. watts.
enumeration	effectiveness	???
enumeration	EnergyFactor	"Energy Factor is the ratio of useful energy output from the water heater to the total amount of energy delivered to the water heater. The higher the EF is, the more efficient the water heater." - http://www.energystar.gov/index.cfm?c=water_heat.pr_crit_water_heaters "Energy Factor is a metric that was previously used to compare relative efficiencies of clothes washers. The higher the Energy Factor is, the more efficient the clothes washer is. For clothes washers, Energy Factor is calculated using the following formula:[2]" Energy Factor = 392 x Volume (ft^3) / Annual Energy Usage (kWh) - http://www.energystar.gov/index.cfm?fuseaction=clotheswash.display_column_definitions
enumeration	FanEff	is this Specific Fan power?
enumeration	HSPF	HSPF (Heating Seasonal Performance Factor) is a term used in the heating and cooling industry. HSPF is specifically used to measure the efficiency of air source heat pumps. The efficiency of air conditioners are often rated by the Heating Seasonal Performance Factor (HSPF) as defined by the Air Conditioning, Heating, and Refrigeration Institute in its standard 210/240 Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment last updated in 2008.
enumeration	kWPerkW	???
enumeration	kWPerTon	kiloWatts per Ton - power to weight ratio of an engine
enumeration	LumensPerWatt	The ratio of luminous flux in lumens to power measured in watts.
enumeration	MechanicalEff	???
enumeration	MotorEff	???

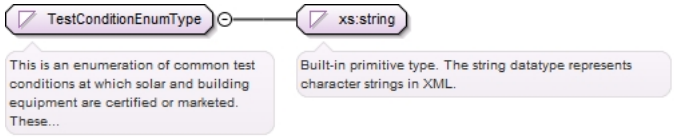
	enumeration	SEER	The Seasonal Energy Efficiency Ratio (SEER) has the same units of Btu/W·hr, but instead of being evaluated at a single operating condition, it represents the expected overall performance for a typical year's weather in a given location.
	enumeration	ThermalEff	In thermodynamics, the thermal efficiency is a dimensionless performance measure of a device that uses thermal energy, such as a boiler, a furnace, or a refrigerator.
Used by	Attribute	EfficiencyType/@Unit	

Source

```
<xs:simpleType name="EfficiencyUnitEnumType">
  <xs:annotation>
    <xs:documentation>This is an enumeration of common efficiency units of measurement
 used in the building solar and energy efficiency industry.</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="AFUE">
      <xs:annotation>
        <xs:documentation>The annual fuel utilization efficiency (AFUE; pronounced
 'A'-'Few') is a thermal efficiency measure of combustion equipment like furnaces,
 boilers, and water heaters. The AFUE differs from the true 'thermal efficiency' in that
 it is not a steady-state, peak measure of conversion efficiency, but instead attempts
 to represent the actual, season-long, average efficiency of that piece of equipment,
 including the operating transients.</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="BoilerEff">
      <xs:annotation>
        <xs:documentation>???</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="COP">
      <xs:annotation>
        <xs:documentation>The coefficient of performance or COP (sometimes CP), of a heat
 pump is the ratio of the change in heat at the "output" (the heat reservoir of interest)
 to the supplied work.</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="EER">
      <xs:annotation>
        <xs:documentation>The Energy Efficiency Ratio (EER) of a particular cooling device
 is the ratio of output cooling (in Btu/hr) to input electrical power (in Watts) at a
 given operating point (indoor and outdoor temperature and humidity conditions). The EER
 is related to the coefficient of performance (COP) commonly used in thermodynamics, with
 the primary difference being that the COP of a cooling device is unit-less: the cooling
 load and the electrical power needed to run the device are both measured using the same
 units, e.g. watts.</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="effectiveness">
      <xs:annotation>
        <xs:documentation>???</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="EnergyFactor">
      <xs:annotation>
        <xs:documentation>"Energy Factor is the ratio of useful energy output from
 the water heater to the total amount of energy delivered to the water heater. The
 higher the EF is, the more efficient the water heater." - http://www.energystar.gov/
index.cfm?c=water_heat.pr_crit_water_heaters "Energy Factor is a metric that was
 previously used to compare relative efficiencies of clothes washers. The higher the
 Energy Factor is, the more efficient the clothes washer is. For clothes washers,
 Energy Factor is calculated using the following formula:[2]" Energy Factor = 392
 x Volume (ft³) / Annual Energy Usage (kWh) - http://www.energystar.gov/index.cfm?
fuseaction=clotheswash.display_column_definitions</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="FanEff">
      <xs:annotation>
        <xs:documentation>is this Specific Fan power?</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="HSPF">
      <xs:annotation>
        <xs:documentation>HSPF (Heating Seasonal Performance Factor) is a term used in
 the heating and cooling industry. HSPF is specifically used to measure the efficiency
 of air source heat pumps. The efficiency of air conditioners are often rated by the
 Heating Seasonal Performance Factor (HSPF) as defined by the Air Conditioning, Heating,
```

```
 and Refrigeration Institute in its standard 210/240 Performance Rating of Unitary Air-
Conditioning and Air-Source Heat Pump Equipment last updated in 2008.</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="kWPerkW">
      <xs:annotation>
        <xs:documentation>???</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="kWPerTon">
      <xs:annotation>
        <xs:documentation>kiloWatts per Ton - power to weight ratio of an engine</
xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="LumensPerWatt">
      <xs:annotation>
        <xs:documentation>The ratio of luminous flux in lumens to power measured in
 watts.</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="MechanicalEff">
      <xs:annotation>
        <xs:documentation>???</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="MotorEff">
      <xs:annotation>
        <xs:documentation>???</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="SEER">
      <xs:annotation>
        <xs:documentation>The Seasonal Energy Efficiency Ratio (SEER) has the same
 units of Btu/W·hr, but instead of being evaluated at a single operating condition, it
 represents the expected overall performance for a typical year's weather in a given
 location.</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="ThermalEff">
      <xs:annotation>
        <xs:documentation>In thermodynamics, the thermal efficiency is a dimensionless
 performance measure of a device that uses thermal energy, such as a boiler, a furnace, or
 a refrigerator.</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
  </xs:restriction>
</xs:simpleType>
```

Simple Type `TestConditionEnumType`

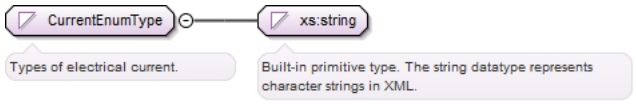
Namespace	http://www.iepmodel.net
Annotations	This is an enumeration of common test conditions at which solar and building equipment are certified or marketed. These include: AHRI - Air-Conditioning, Heating, and Refrigeration Institute http://www.ahrinet.org/ FullLoad - full load conditions of the equipment NEMA - National Electrical Manufacturers Association PTC - PV USA Test Conditions STC - Factory Standard Test Conditions http://www.sanfranciscosolar.com/stc4.html
Diagram	
Type	restriction of xs:string
Facets	enumeration AHRI — Air-Conditioning, Heating and Refrigeration Institute enumeration Full Load enumeration NEMA — National Electrical Manufacturers Association

	enumeration	PTC	???
	enumeration	STC	???
Used by	Attribute	EfficiencyType/@TestCondition	

Source

```
<xs:simpleType name="TestConditionEnumType">
  <xs:annotation>
    <xs:documentation>This is an enumeration of common test conditions at which
 solar and building equipment are certified or marketed. These include: AHRI - Air-
Conditioning, Heating, and Refrigeration Institute http://www.ahrinet.org/ FullLoad
 - full load conditions of the equipment NEMA - National Electrical Manufacturers
 Association PTC - PV USA Test Conditions STC - Factory Standard Test Conditions http://
www.sanfranciscosolar.com/stc4.html</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="AHRI">
      <xs:annotation>
        <xs:documentation>Air-Conditioning, Heating and Refrigeration Institute</
xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="Full Load"/>
    <xs:enumeration value="NEMA">
      <xs:annotation>
        <xs:documentation>National Electrical Manufacturers Association</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="PTC">
      <xs:annotation>
        <xs:documentation>???</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="STC">
      <xs:annotation>
        <xs:documentation>???</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
  </xs:restriction>
</xs:simpleType>
```

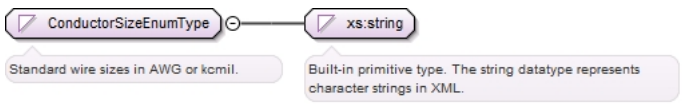
Simple Type `CurrentEnumType`

Namespace	http://www.iepmodel.net		
Annotations	Types of electrical current.		
Diagram			
Type	restriction of xs:string		
Facets	enumeration	AC	
	enumeration	DC	
Used by	Element	CircuitConnectionType/CurrentType	

Source

```
<xs:simpleType name="CurrentEnumType">
  <xs:annotation>
    <xs:documentation>Types of electrical current.</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="AC"/>
    <xs:enumeration value="DC"/>
  </xs:restriction>
</xs:simpleType>
```

Simple Type `ConductorSizeEnumType`

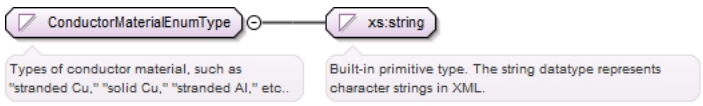
Namespace	http://www.iepmodel.net		
Annotations	Standard wire sizes in AWG or kcmil.		
Diagram			
Type	restriction of xs:string		

Facets	enumeration	12
	enumeration	10
	enumeration	8
	enumeration	6
	enumeration	4
	enumeration	3
	enumeration	2
	enumeration	1/0
	enumeration	2/0
	enumeration	3/0
	enumeration	4/0
	enumeration	250
	enumeration	350
	enumeration	400
	enumeration	500
Used by	Elements	CircuitConnectionConductorType/ConductorSize, DcCombinerDefinitionType/MaxInputConductorSize, DcCombinerDefinitionType/MaxOutputConductorSize, DcCombinerDefinitionType/MinInputConductorSize, DcCombinerDefinitionType/MinOutputConductorSize, EquipmentGroundingConductorType/EgcSize, GroundingElectrodeConductorType/Size

Source

```
<xs:simpleType name="ConductorSizeEnumType">
  <xs:annotation>
    <xs:documentation>Standard wire sizes in AWG or kcmil.</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="12"/>
    <xs:enumeration value="10"/>
    <xs:enumeration value="8"/>
    <xs:enumeration value="6"/>
    <xs:enumeration value="4"/>
    <xs:enumeration value="3"/>
    <xs:enumeration value="2"/>
    <xs:enumeration value="1/0"/>
    <xs:enumeration value="2/0"/>
    <xs:enumeration value="3/0"/>
    <xs:enumeration value="4/0"/>
    <xs:enumeration value="250"/>
    <xs:enumeration value="350"/>
    <xs:enumeration value="400"/>
    <xs:enumeration value="500"/>
  </xs:restriction>
</xs:simpleType>
```

Simple Type ConductorMaterialEnumType

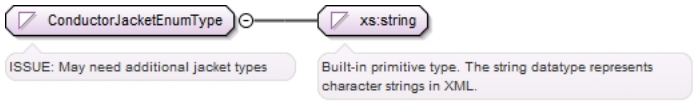
Namespace	http://www.iepmodel.net	
Annotations	Types of conductor material, such as "stranded Cu," "solid Cu," "stranded Al," etc..	
Diagram		
Type	restriction of xs:string	
Facets	enumeration	Stranded Cu
	enumeration	Solid Cu
	enumeration	Stranded Al
Used by	Elements	ConductorSegmentType/Material, EquipmentGroundingConductorType/Egc, GroundingElectrodeConductorType/Material

Source

```
<xs:simpleType name="ConductorMaterialEnumType">
  <xs:annotation>
    <xs:documentation>Types of conductor material, such as "stranded Cu," "solid Cu,"
 "stranded Al," etc..</xs:documentation>
  </xs:annotation>
```

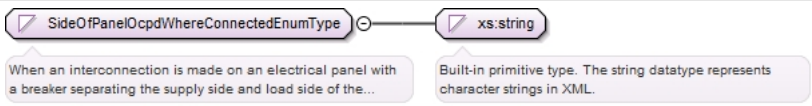
```
  <xs:restriction base="xs:string">
    <xs:enumeration value="Stranded Cu"/>
    <xs:enumeration value="Solid Cu"/>
    <xs:enumeration value="Stranded Al"/>
  </xs:restriction>
</xs:simpleType>
```

Simple Type ConductorJacketEnumType

Namespace	http://www.iepmodel.net
Annotations	ISSUE: May need additional jacket types
Diagram	
Type	restriction of xs:string
Facets	enumeration: bare enumeration: USE enumeration: USE-2 enumeration: THWN enumeration: THWN-2 enumeration: THHN enumeration: THHW enumeration: XHHW-2 enumeration: RHW-2 enumeration: PV Wire
Used by	Elements: ConductorSegmentType/Jacket, EquipmentGroundingConductorType/EgcJacket, GroundingElectrodeConductorType/Jacket
Source	

```
<xs:simpleType name="ConductorJacketEnumType">
  <xs:annotation>
    <xs:documentation>ISSUE: May need additional jacket types</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="bare"/>
    <xs:enumeration value="USE"/>
    <xs:enumeration value="USE-2"/>
    <xs:enumeration value="THWN"/>
    <xs:enumeration value="THWN-2"/>
    <xs:enumeration value="THHN"/>
    <xs:enumeration value="THHW"/>
    <xs:enumeration value="XHHW-2"/>
    <xs:enumeration value="RHW-2"/>
    <xs:enumeration value="PV Wire"/>
  </xs:restriction>
</xs:simpleType>
```

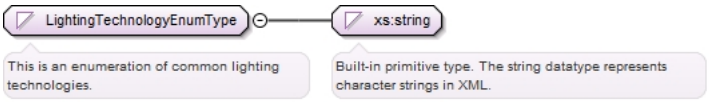
Simple Type SideOfPanelOcpdWhereConnectedEnumType

Namespace	http://www.iepmodel.net
Annotations	When an interconnection is made on an electrical panel with a breaker separating the supply side and load side of the panel, these list the two sides.
Diagram	
Type	restriction of xs:string
Facets	enumeration: supply-side enumeration: load-side
Used by	Element: CircuitConnectionType/SideOfPanelOcpdWhereConnected
Source	

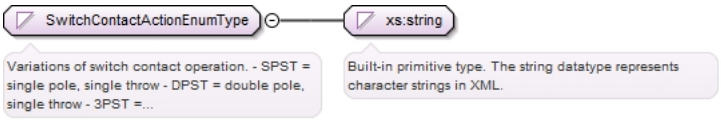
```
<xs:simpleType name="SideOfPanelOcpdWhereConnectedEnumType">
  <xs:annotation>
    <xs:documentation>When an interconnection is made on an electrical panel with a
breaker separating the supply side and load side of the panel, these list the two
sides.</xs:documentation>
```

```
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="supply-side"/>
    <xs:enumeration value="load-side"/>
  </xs:restriction>
</xs:simpleType>
```

Simple Type `LightingTechnologyEnumType`

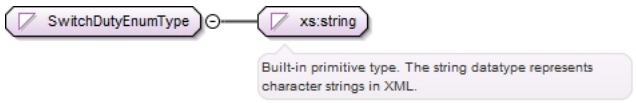
Namespace	http://www.iepmodel.net
Annotations	This is an enumeration of common lighting technologies.
Diagram	
Type	restriction of xs:string
Facets	enumeration: Incandescent enumeration: Halogen enumeration: Compact Fluorescent enumeration: Linear Fluorescent enumeration: High Intensity Discharge enumeration: LED enumeration: Induction enumeration: Plasma enumeration: Neon
Used by	Element LightingFixtureDefintionType/LightingTechnology
Source	<xs:simpleType name="LightingTechnologyEnumType"> <xs:annotation> <xs:documentation>This is an enumeration of common lighting technologies.</ xs:documentation> </xs:annotation> <xs:restriction base="xs:string"> <xs:enumeration value="Incandescent"/> <xs:enumeration value="Halogen"/> <xs:enumeration value="Compact Fluorescent"/> <xs:enumeration value="Linear Fluorescent"/> <xs:enumeration value="High Intensity Discharge"/> <xs:enumeration value="LED"/> <xs:enumeration value="Induction"/> <xs:enumeration value="Plasma"/> <xs:enumeration value="Neon"/> </xs:restriction> </xs:simpleType>

Simple Type `SwitchContactActionEnumType`

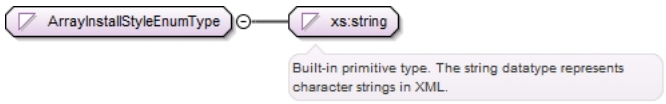
Namespace	http://www.iepmodel.net
Annotations	Variations of switch contact operation. - SPST = single pole, single throw - DPST = double pole, single throw - 3PST = triple pole, single throw - SPDT = single pole, double throw (aka "changover switch")
Diagram	
Type	restriction of xs:string
Facets	enumeration: SPST enumeration: DPST enumeration: 3PST enumeration: SPDT

Used by	Element DisconnectSwitchDefinitionType/SwitchContact
Source	<xs:simpleType name="SwitchContactActionEnumType"> <xs:annotation> <xs:documentation>Variations of switch contact operation. - SPST = single pole, single throw - DPST = double pole, single throw - 3PST = triple pole, single throw - SPDT = single pole, double throw (aka "changover switch")</xs:documentation> </xs:annotation> <xs:restriction base="xs:string"> <xs:enumeration value="SPST"/> <xs:enumeration value="DPST"/> <xs:enumeration value="3PST"/> <xs:enumeration value="SPDT"/> </xs:restriction> </xs:simpleType>

Simple Type SwitchDutyEnumType

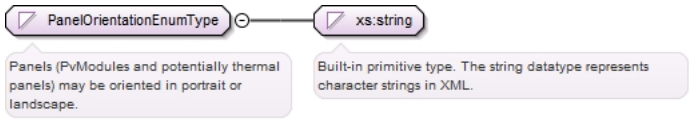
Namespace	http://www.iepmodel.net
Diagram	
Type	restriction of xs:string
Facets	enumeration General-Duty enumeration Heavy-Duty
Used by	Element DisconnectSwitchDefinitionType/Duty
Source	<xs:simpleType name="SwitchDutyEnumType"> <xs:restriction base="xs:string"> <xs:enumeration value="General-Duty"/> <xs:enumeration value="Heavy-Duty"/> </xs:restriction> </xs:simpleType>

Simple Type ArrayInstallStyleEnumType

Namespace	http://www.iepmodel.net
Diagram	
Type	restriction of xs:string
Facets	enumeration parallel to roof enumeration tilt-up roof enumeration ballasted tilt enumeration ground mount enumeration pole mount enumeration other
Used by	Element PvArrayType/InstallationStyle
Source	<xs:simpleType name="ArrayInstallStyleEnumType"> <xs:restriction base="xs:string"> <xs:enumeration value="parallel to roof"/> <xs:enumeration value="tilt-up roof"/> <xs:enumeration value="ballasted tilt"/> <xs:enumeration value="ground mount"/> <xs:enumeration value="pole mount"/> <xs:enumeration value="other"/> </xs:restriction> </xs:simpleType>

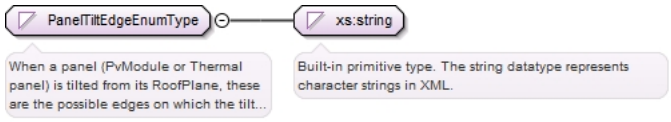
Simple Type PanelOrientationEnumType

Namespace	http://www.iepmodel.net
Annotations	Panels (PvModules and potentially thermal panels) may be oriented in portrait or landscape.

Diagram	
Type	restriction of xs:string
Facets	enumeration `portrait` enumeration `landscape`
Used by	Elements PvArrayType/CommonModuleOrientation, PvModuleType/IndividualModuleOrientation

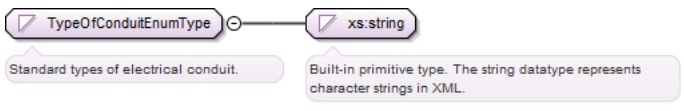
Source	`<xs:simpleType name="PanelOrientationEnumType">`
	`  <xs:annotation>`
	`  <xs:documentation>Panels (PvModules and potentially thermal panels) may be oriented in portrait or landscape.</xs:documentation>`
	`  </xs:annotation>`
	`  <xs:restriction base="xs:string">`
	`  <xs:enumeration value="portrait"/>`
	`  <xs:enumeration value="landscape"/>`
	`  </xs:restriction>`
	`</xs:simpleType>`

Simple Type `PanelTiltEdgeEnumType`

Namespace	http://www.iepmodel.net
Annotations	When a panel (PvModule or Thermal panel) is tilted from its RoofPlane, these are the possible edges on which the tilt can occur.
Diagram	
Type	restriction of xs:string
Facets	enumeration `bottom` enumeration `top` enumeration `left` enumeration `right`
Used by	Elements PvArrayType/CommonModuleTiltEdge, PvModuleType/IndividualModuleTiltEdge

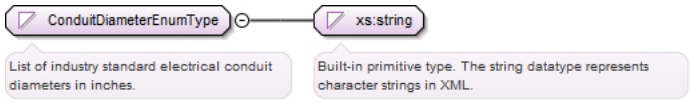
Source	`<xs:simpleType name="PanelTiltEdgeEnumType">`
	`  <xs:annotation>`
	`  <xs:documentation>When a panel (PvModule or Thermal panel) is tilted from its RoofPlane, these are the possible edges on which the tilt can occur.</xs:documentation>`
	`  </xs:annotation>`
	`  <xs:restriction base="xs:string">`
	`  <xs:enumeration value="bottom"/>`
	`  <xs:enumeration value="top"/>`
	`  <xs:enumeration value="left"/>`
	`  <xs:enumeration value="right"/>`
	`  </xs:restriction>`
	`</xs:simpleType>`

Simple Type `TypeOfConduitEnumType`

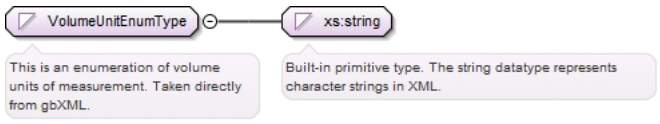
Namespace	http://www.iepmodel.net
Annotations	Standard types of electrical conduit.
Diagram	
Type	restriction of xs:string
Facets	enumeration `EMT` enumeration `PVC` enumeration `Rigid`
Used by	Element ConduitSegmentType/ConduitType

Source	<xs:simpleType name="TypeOfConduitEnumType"> <xs:annotation> <xs:documentation>Standard types of electrical conduit.</xs:documentation> </xs:annotation> <xs:restriction base="xs:string"> <xs:enumeration value="EMT"/> <xs:enumeration value="PVC"/> <xs:enumeration value="Rigid"/> </xs:restriction> </xs:simpleType>

Simple Type ConduitDiameterEnumType

Namespace	http://www.iepmodel.net
Annotations	List of industry standard electrical conduit diameters in inches.
Diagram	
Type	restriction of xs:string
Facets	enumeration 1/2 enumeration 3/4 enumeration 1 enumeration 1 1/4 enumeration 1 1/2 enumeration 2
Used by	Element ConduitSegmentType/ConduitDiameter
Source	<xs:simpleType name="ConduitDiameterEnumType"> <xs:annotation> <xs:documentation>List of industry standard electrical conduit diameters in inches.</xs:documentation> </xs:annotation> <xs:restriction base="xs:string"> <xs:enumeration value="1/2"/> <xs:enumeration value="3/4"/> <xs:enumeration value="1"/> <xs:enumeration value="1 1/4"/> <xs:enumeration value="1 1/2"/> <xs:enumeration value="2"/> </xs:restriction> </xs:simpleType>

Simple Type VolumeUnitEnumType

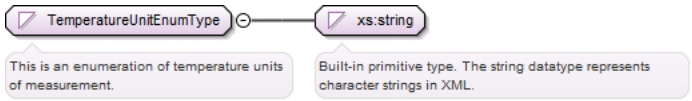
Namespace	http://www.iepmodel.net
Annotations	This is an enumeration of volume units of measurement. Taken directly from gbXML.
Diagram	
Type	restriction of xs:string
Facets	enumeration CubicCentimeters enumeration CubicFeet enumeration CubicInches enumeration CubicKilometers enumeration CubicMeters enumeration CubicMiles enumeration CubicMillimeters enumeration CubicYards enumeration Gallons enumeration Liters

	enumeration	Foot-Acres
Used by	Attribute	VolumeType/@Unit

Source

```
<xs:simpleType name="VolumeUnitEnumType">
  <xs:annotation>
    <xs:documentation>This is an enumeration of volume units of measurement. Taken
 directly from gbXML.</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="CubicCentimeters"/>
    <xs:enumeration value="CubicFeet"/>
    <xs:enumeration value="CubicInches"/>
    <xs:enumeration value="CubicKilometers"/>
    <xs:enumeration value="CubicMeters"/>
    <xs:enumeration value="CubicMiles"/>
    <xs:enumeration value="CubicMillimeters"/>
    <xs:enumeration value="CubicYards"/>
    <xs:enumeration value="Gallons"/>
    <xs:enumeration value="Liters"/>
    <xs:enumeration value="Foot-Acres"/>
  </xs:restriction>
</xs:simpleType>
```

Simple Type TemperatureUnitEnumType

Namespace	http://www.iepmodel.net
Annotations	This is an enumeration of temperature units of measurement.
Diagram	

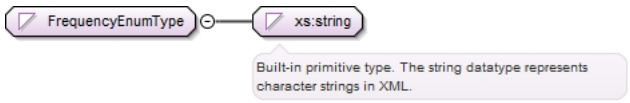
Type	restriction of xs:string		
Facets	enumeration	C	Celsius
	enumeration	F	Fahrenheit
	enumeration	K	Kelvin
	enumeration	R	Rankine A thermodynamic (absolute) temperature scale named after the Scottish engineer and physicist William John Macquorn Rankine, who proposed it in 1859.
	enumeration	Re	The Réaumur scale (°Ré, °Re, °R), also known as the "octogesimal division",[1] is a temperature scale in which the freezing and boiling points of water are set to 0 and 80 degrees respectively. The scale is named after René Antoine Ferchault de Réaumur, who first proposed something similar in 1730.[2] AT: why are we including this? Does someone have a use case?
Used by	Attribute	TemperatureType/@Unit	

Source

```
<xs:simpleType name="TemperatureUnitEnumType">
  <xs:annotation>
    <xs:documentation>This is an enumeration of temperature units of measurement.</
xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="C">
      <xs:annotation>
        <xs:documentation>Celsius</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="F">
      <xs:annotation>
        <xs:documentation>Fahrenheit</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="K">
      <xs:annotation>
        <xs:documentation>Kelvin</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
```

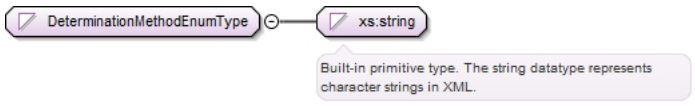
```
    <xs:enumeration value="R">
      <xs:annotation>
        <xs:documentation>Rankine A thermodynamic (absolute) temperature scale named after
 the Scottish engineer and physicist William John Macquorn Rankine, who proposed it in
 1859.</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="Re">
      <xs:annotation>
        <xs:documentation>The Réaumur scale (°Ré, °Re, °R), also known as the "octogesimal
 division",[1] is a temperature scale in which the freezing and boiling points of water
 are set to 0 and 80 degrees respectively. The scale is named after René Antoine Ferchault
 de Réaumur, who first proposed something similar in 1730.[2] AT: why are we including
 this? Does someone have a use case?</xs:documentation>
      </xs:annotation>
    </xs:enumeration>
  </xs:restriction>
</xs:simpleType>
```

Simple Type `FrequencyEnumType`

Namespace	http://www.iepmodel.net
Annotations	
Diagram	
Type	restriction of xs:string
Facets	enumeration `Daily` enumeration `Monthly` enumeration `Yearly`
Used by	Element PeriodicityType/Recurring/Frequency
Source	

```
<xs:simpleType name="FrequencyEnumType">
  <xs:annotation>
    <xs:documentation/>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="Daily"/>
    <xs:enumeration value="Monthly"/>
    <xs:enumeration value="Yearly"/>
  </xs:restriction>
</xs:simpleType>
```

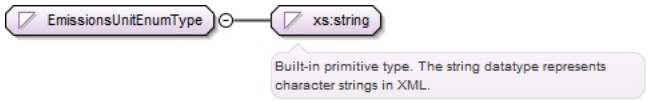
Simple Type `DeterminationMethodEnumType`

Namespace	http://www.iepmodel.net
Diagram	
Type	restriction of xs:string
Facets	enumeration `Estimated` enumeration `Measured` enumeration `Incentive`
Used by	Element DeterminationMethodType/Method
Source	

```
<xs:simpleType name="DeterminationMethodEnumType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Estimated"/>
    <xs:enumeration value="Measured"/>
    <xs:enumeration value="Incentive"/>
  </xs:restriction>
</xs:simpleType>
```

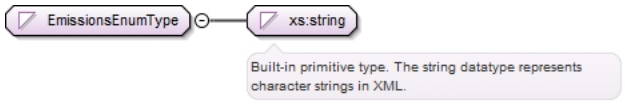
Simple Type `EmissionsUnitEnumType`

Namespace	http://www.iepmodel.net

Diagram	
Type	restriction of xs:string
Facets	enumeration `pounds` enumeration `tons` enumeration `kilograms`
Used by	Attribute EmissionsType/@Unit

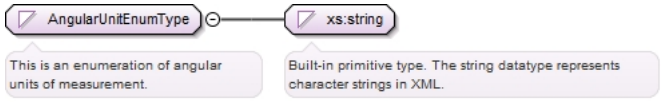
Source	`<xs:simpleType name="EmissionsUnitEnumType">`
	`  <xs:restriction base="xs:string">`
	`  <xs:enumeration value="pounds"/>`
	`  <xs:enumeration value="tons"/>`
	`  <xs:enumeration value="kilograms"/>`
	`  </xs:restriction>`
	`</xs:simpleType>`

Simple Type `EmissionsEnumType`

Namespace	http://www.iepmodel.net
Diagram	
Type	restriction of xs:string
Facets	enumeration `CO2` enumeration `NOX` enumeration `SOX` enumeration `Methane`
Used by	Attribute EmissionsType/@Emissions

Source	`<xs:simpleType name="EmissionsEnumType">`
	`  <xs:restriction base="xs:string">`
	`  <xs:enumeration value="CO2"/>`
	`  <xs:enumeration value="NOX"/>`
	`  <xs:enumeration value="SOX"/>`
	`  <xs:enumeration value="Methane"/>`
	`  </xs:restriction>`
	`</xs:simpleType>`

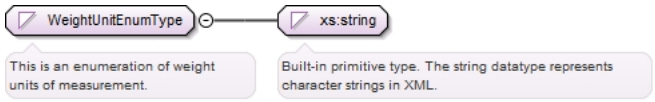
Simple Type `AngularUnitEnumType`

Namespace	http://www.iepmodel.net
Annotations	`This is an enumeration of angular units of measurement.`
Diagram	
Type	restriction of xs:string
Facets	enumeration `degrees` enumeration `"in 12"` enumeration `radians`
Used by	Attribute AngleType/@Unit

Source	`<xs:simpleType name="AngularUnitEnumType">`
	`  <xs:annotation>`
	`  <xs:documentation>This is an enumeration of angular units of measurement.</`
	`xs:documentation>`
	`  </xs:annotation>`
	`  <xs:restriction base="xs:string">`
	`  <xs:enumeration value="degrees"/>`
	`  <xs:enumeration value=""in 12""/>`
	`  <xs:enumeration value="radians"/>`
	`  </xs:restriction>`

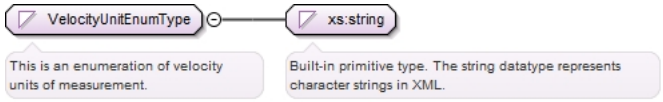
```
</xs:simpleType>
```

Simple Type `WeightUnitEnumType`

Namespace	http://www.iepmodel.net
Annotations	This is an enumeration of weight units of measurement.
Diagram	
Type	restriction of xs:string
Facets	enumeration: Kilograms enumeration: Pounds enumeration: Tons
Used by	Attribute: WeightType/@Unit

Source	`<xs:simpleType name="WeightUnitEnumType">`
	`  <xs:annotation>`
	`  <xs:documentation>This is an enumeration of weight units of measurement.</xs:documentation>`
	`  </xs:annotation>`
	`  <xs:restriction base="xs:string">`
	`  <xs:enumeration value="Kilograms"/>`
	`  <xs:enumeration value="Pounds"/>`
	`  <xs:enumeration value="Tons"/>`
	`  </xs:restriction>`
	`</xs:simpleType>`

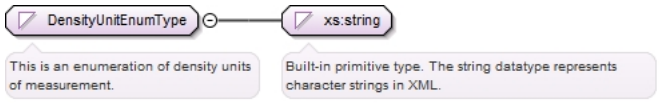
Simple Type `VelocityUnitEnumType`

Namespace	http://www.iepmodel.net
Annotations	This is an enumeration of velocity units of measurement.
Diagram	
Type	restriction of xs:string
Facets	enumeration: FeetPerMinute enumeration: FeetPerSecond enumeration: KilometerPerHour enumeration: Knots enumeration: MetersPerMinute enumeration: MetersPerSecond enumeration: MilesPerHour
Used by	Attribute: VelocityType/@Unit

Source	`<xs:simpleType name="VelocityUnitEnumType">`
	`  <xs:annotation>`
	`  <xs:documentation>This is an enumeration of velocity units of measurement.</xs:documentation>`
	`  </xs:annotation>`
	`  <xs:restriction base="xs:string">`
	`  <xs:enumeration value="FeetPerMinute"/>`
	`  <xs:enumeration value="FeetPerSecond"/>`
	`  <xs:enumeration value="KilometerPerHour"/>`
	`  <xs:enumeration value="Knots"/>`
	`  <xs:enumeration value="MetersPerMinute"/>`
	`  <xs:enumeration value="MetersPerSecond"/>`
	`  <xs:enumeration value="MilesPerHour"/>`
	`  </xs:restriction>`
	`</xs:simpleType>`

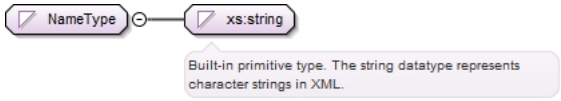
Simple Type `DensityUnitEnumType`

Namespace	http://www.iepmodel.net
Annotations	This is an enumeration of density units of measurement.

Diagram	
Type	restriction of xs:string
Facets	enumeration GramsPerCubicCm enumeration KgPerCubicM enumeration LbsPerCubicFt enumeration LbsPerCubicIn
Used by	Attribute DensityType/@Unit

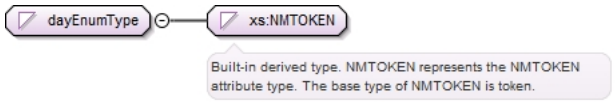
Source	`<xs:simpleType name="DensityUnitEnumType">`
	`  <xs:annotation>`
	`  <xs:documentation>This is an enumeration of density units of measurement.</`
	`xs:documentation>`
	`  </xs:annotation>`
	`  <xs:restriction base="xs:string">`
	`  <xs:enumeration value="GramsPerCubicCm"/>`
	`  <xs:enumeration value="KgPerCubicM"/>`
	`  <xs:enumeration value="LbsPerCubicFt"/>`
	`  <xs:enumeration value="LbsPerCubicIn"/>`
	`  </xs:restriction>`
	`</xs:simpleType>`

Simple Type NameType

Namespace	http://www.iepmodel.net
Diagram	
Type	xs:string

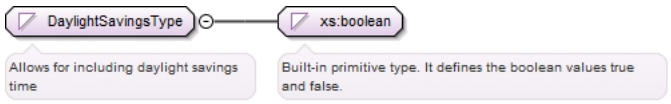
Source	`<xs:simpleType name="NameType">`
	`  <xs:restriction base="xs:string"/>`
	`</xs:simpleType>`

Simple Type dayEnumType

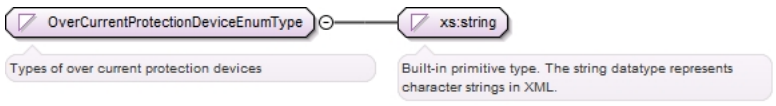
Namespace	http://www.iepmodel.net
Diagram	
Type	restriction of xs:NMTOKEN
Facets	enumeration Weekday enumeration Weekend enumeration Holiday enumeration WeekendOrHoliday enumeration HeatingDesignDay enumeration CoolingDesignDay enumeration Sun enumeration Mon enumeration Tue enumeration Wed enumeration Thu enumeration Fri enumeration Sat enumeration All
Used by	Attribute DayType/@dayType

Source	<xs:simpleType name="dayEnumType"> <xs:restriction base="xs:NMTOKEN"> <xs:enumeration value="Weekday"/> <xs:enumeration value="Weekend"/> <xs:enumeration value="Holiday"/> <xs:enumeration value="WeekendOrHoliday"/> <xs:enumeration value="HeatingDesignDay"/> <xs:enumeration value="CoolingDesignDay"/> <xs:enumeration value="Sun"/> <xs:enumeration value="Mon"/> <xs:enumeration value="Tue"/> <xs:enumeration value="Wed"/> <xs:enumeration value="Thu"/> <xs:enumeration value="Fri"/> <xs:enumeration value="Sat"/> <xs:enumeration value="All"/> </xs:restriction> </xs:simpleType>

Simple Type `DaylightSavingsType`

Namespace	http://www.iepmodel.net
Annotations	Allows for including daylight savings time
Diagram	
Type	xs:boolean
Used by	Element DaylightSavings
Source	<xs:simpleType name="DaylightSavingsType"> <xs:annotation> <xs:documentation>Allows for including daylight savings time</xs:documentation> </xs:annotation> <xs:restriction base="xs:boolean"/> </xs:simpleType>

Simple Type `OverCurrentProtectionDeviceEnumType`

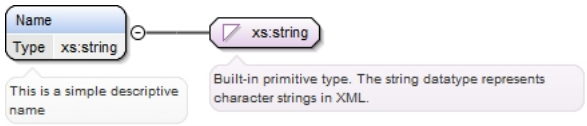
Namespace	http://www.iepmodel.net
Annotations	Types of over current protection devices
Diagram	
Type	restriction of xs:string
Facets	enumeration circuit breaker enumeration fuse enumeration none
Source	<xs:simpleType name="OverCurrentProtectionDeviceEnumType"> <xs:annotation> <xs:documentation>Types of over current protection devices</xs:documentation> </xs:annotation> <xs:restriction base="xs:string"> <xs:enumeration value="circuit breaker"/> <xs:enumeration value="fuse"/> <xs:enumeration value="none"/> </xs:restriction> </xs:simpleType>

Namespace: ""

Element(s)

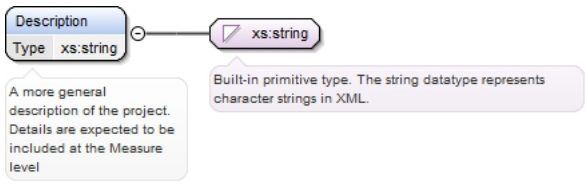
Element `ProjectType / Name`

Namespace	No namespace
Annotations	This is a simple descriptive name

Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1

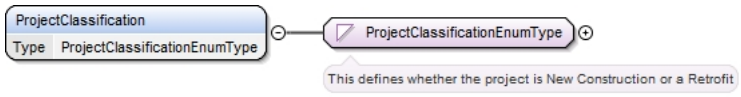
Source	`<xs:element name="Name" type="xs:string" minOccurs="1" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>This is a simple descriptive name</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element ProjectType / Description

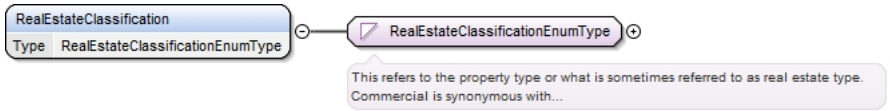
Namespace	No namespace
Annotations	A more general description of the project. Details are expected to be included at the Measure level
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1

Source	`<xs:element name="Description" type="xs:string" minOccurs="1" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>A more general description of the project. Details are expected to be included at the Measure level</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element ProjectType / ProjectClassification

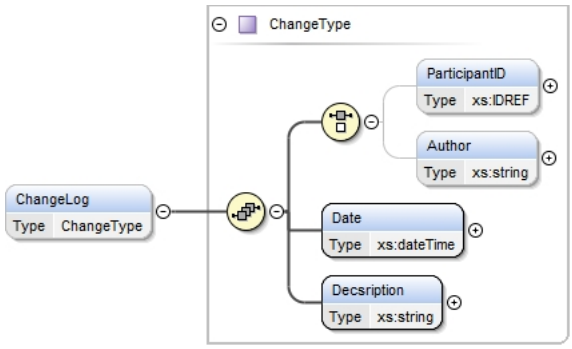
Namespace	No namespace
Diagram	
Type	ProjectClassificationEnumType
Properties	content: simple minOccurs: 1 maxOccurs: 1
Facets	enumeration: Retrofit enumeration: New Construction
Source	`<xs:element name="ProjectClassification" type="ProjectClassificationEnumType" minOccurs="1" maxOccurs="1"/>`

Element ProjectType / RealEstateClassification

Namespace	No namespace
Diagram	

Type	RealEstateClassificationEnumType
Properties	content: simple minOccurs: 1 maxOccurs: 1
Facets	enumeration Commercial enumeration Residential
Source	`<xs:element name="RealEstateClassification" type="RealEstateClassificationEnumType" maxOccurs="1" minOccurs="1"/>`

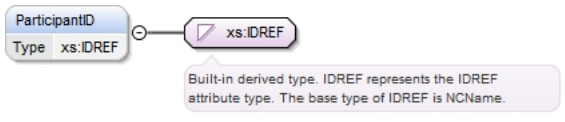
Element ProjectType / ChangeLog

Namespace	No namespace
Diagram	
Type	ChangeType
Properties	content: complex minOccurs: 0
Model	(ParticipantID{0,1} | Author{0,1}) , Date , Decsription
Children	Author, Date, Decsription, ParticipantID

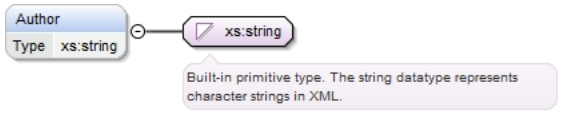
Instance	`<ChangeLog>`
	`  <ParticipantID>{0,1}</ParticipantID>`
	`  <Author>{0,1}</Author>`
	`  <Date>{1,1}</Date>`
	`  <Decsription>{1,1}</Decsription>`
	`</ChangeLog>`

Source	`<xs:element minOccurs="0" name="ChangeLog" type="ChangeType"/>`

Element ChangeType / ParticipantID

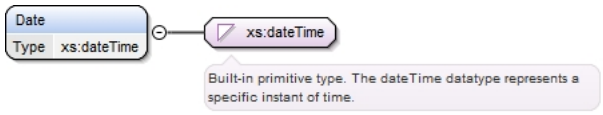
Namespace	No namespace
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 0
Source	`<xs:element minOccurs="0" name="ParticipantID" type="xs:IDREF"/>`

Element ChangeType / Author

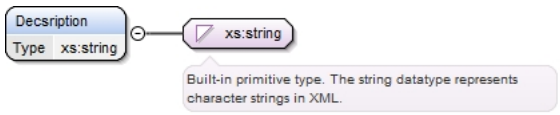
Namespace	No namespace
Diagram	
Type	xs:string

Properties	content:	simple
	minOccurs:	0
Source	<xs:element minOccurs="0" name="Author" type="xs:string"/>	

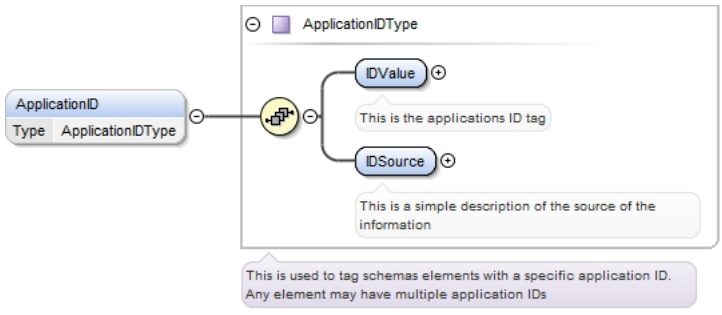
Element ChangeType / Date

Namespace	No namespace
Diagram	
Type	xs:dateTime
Properties	content: simple
Source	<xs:element name="Date" type="xs:dateTime"/>

Element ChangeType / Decsription

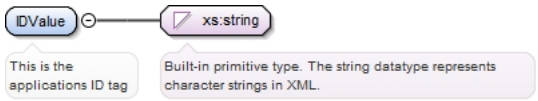
Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple
Source	<xs:element name="Decsription" type="xs:string"/>

Element ProjectType / ApplicationID

Namespace	No namespace
Diagram	
Type	ApplicationIDType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	IDValue , IDSource
Children	IDSource, IDValue
Instance	<ApplicationID> <IDValue>{1,1}</IDValue> <IDSource>{1,1}</IDSource> </ApplicationID>
Source	<xs:element maxOccurs="unbounded" minOccurs="0" name="ApplicationID" type="ApplicationIDType"/>

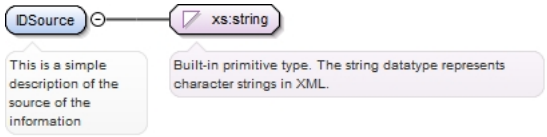
Element ApplicationIDType / IDValue

Namespace	No namespace
Annotations	This is the applications ID tag

Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1

Source	`<xs:element name="IDValue" type="xs:string" minOccurs="1" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>This is the applications ID tag</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

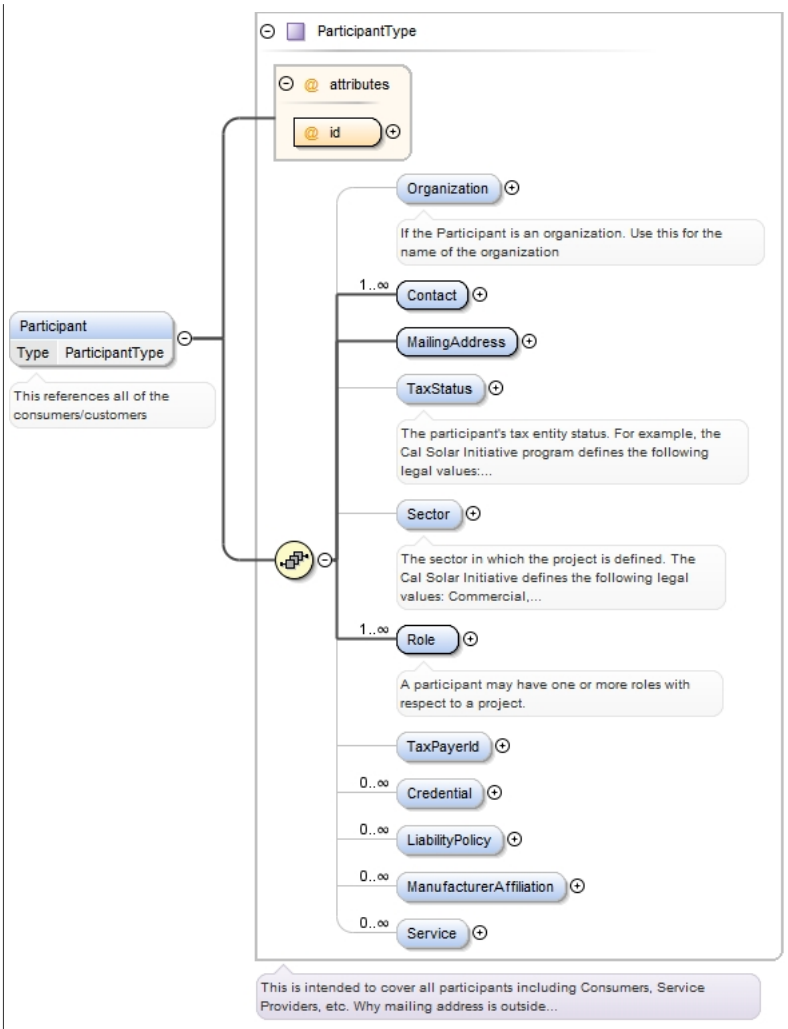
Element ApplicationIDType / IDSource

Namespace	No namespace
Annotations	This is a simple description of the source of the information
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1

Source	`<xs:element name="IDSource" type="xs:string" minOccurs="1" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>This is a simple description of the source of the information</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element ProjectType / Participant

Namespace	No namespace
Annotations	This references all of the consumers/customers

Diagram	
Type	ParticipantType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Organization{0,1} , Contact+ , MailingAddress , TaxStatus{0,1} , Sector{0,1} , Role+ , TaxPayerId{0,1} , Credential* , LiabilityPolicy* , ManufacturerAffiliation* , Service*
Children	Contact, Credential, LiabilityPolicy, MailingAddress, ManufacturerAffiliation, Organization, Role, Sector, Service, TaxPayerId, TaxStatus

Instance

```
<Participant id="">
  <Organization>{0,1}</Organization>
  <Contact>{1,unbounded}</Contact>
  <MailingAddress>{1,1}</MailingAddress>
  <TaxStatus>{0,1}</TaxStatus>
  <Sector>{0,1}</Sector>
  <Role>{1,unbounded}</Role>
  <TaxPayerId>{0,1}</TaxPayerId>
  <Credential>{0,unbounded}</Credential>
  <LiabilityPolicy>{0,unbounded}</LiabilityPolicy>
  <ManufacturerAffiliation>{0,unbounded}</ManufacturerAffiliation>
  <Service>{0,unbounded}</Service>
</Participant>
```

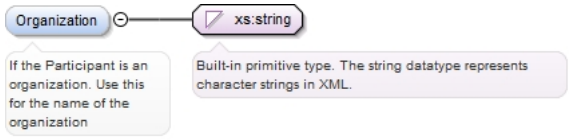
Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			required

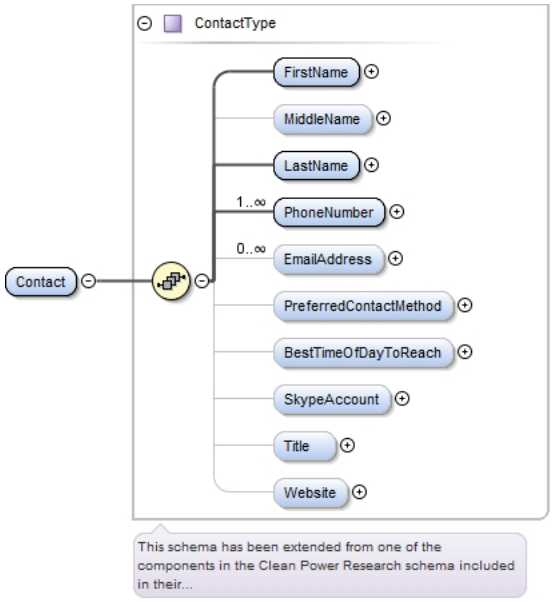
Source

```
<xs:element name="Participant" type="ParticipantType" minOccurs="0" maxOccurs="unbounded">
  <xs:annotation>
    <xs:documentation>This references all of the consumers/customers</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element ParticipantType / Organization

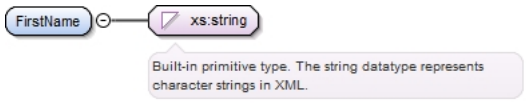
Namespace	No namespace
Annotations	If the Participant is an organization. Use this for the name of the organization
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Organization" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>If the Participant is an organization. Use this for the name of the organization</xs:documentation> </xs:annotation> </xs:element>

Element ParticipantType / Contact

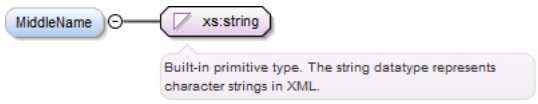
Namespace	No namespace
Diagram	
Type	ContactType
Properties	content: complex minOccurs: 1 maxOccurs: unbounded
Model	FirstName , MiddleName{0,1} , LastName , PhoneNumber+ , EmailAddress* , PreferredContactMethod{0,1} , BestTimeOfDayToReach{0,1} , SkypeAccount{0,1} , Title{0,1} , Website{0,1}
Children	BestTimeOfDayToReach, EmailAddress, FirstName, LastName, MiddleName, PhoneNumber, PreferredContactMethod, SkypeAccount, Title, Website
Instance	<Contact> <FirstName>{1,1}</FirstName> <MiddleName>{0,1}</MiddleName> <LastName>{1,1}</LastName> <PhoneNumber>{1,unbounded}</PhoneNumber> <EmailAddress>{0,unbounded}</EmailAddress> <PreferredContactMethod>{0,1}</PreferredContactMethod> <BestTimeOfDayToReach>{0,1}</BestTimeOfDayToReach> <SkypeAccount>{0,1}</SkypeAccount> <Title>{0,1}</Title> <Website>{0,1}</Website>

	`</Contact>`
Source	`<xs:element name="Contact" type="ContactType" minOccurs="1" maxOccurs="unbounded"/>`

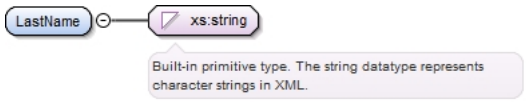
Element ContactType / FirstName

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	`<xs:element name="FirstName" type="xs:string" minOccurs="1" maxOccurs="1"/>`

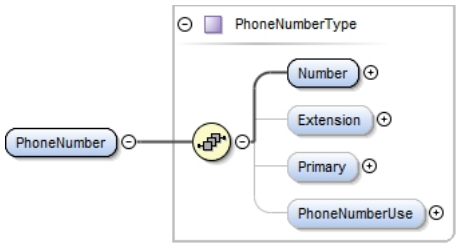
Element ContactType / MiddleName

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="MiddleName" type="xs:string" minOccurs="0" maxOccurs="1"/>`

Element ContactType / LastName

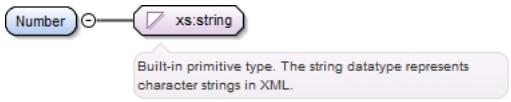
Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	`<xs:element name="LastName" type="xs:string" minOccurs="1" maxOccurs="1"/>`

Element ContactType / PhoneNumber

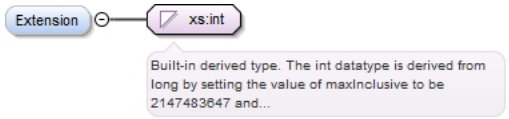
Namespace	No namespace
Diagram	
Type	PhoneNumberType
Properties	content: complex minOccurs: 1 maxOccurs: unbounded

Model	Number , Extension{0,1} , Primary{0,1} , PhoneNumberUse{0,1}
Children	Extension, Number, PhoneNumberUse, Primary
Instance	<PhoneNumber> <Number>{1,1}</Number> <Extension>{0,1}</Extension> <Primary>{0,1}</Primary> <PhoneNumberUse>{0,1}</PhoneNumberUse> </PhoneNumber>
Source	<xs:element name="PhoneNumber" type="PhoneNumberType" minOccurs="1" maxOccurs="unbounded"/> >

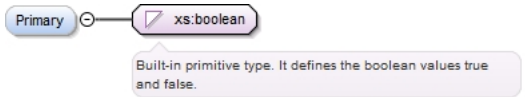
Element PhoneNumberType / Number

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="Number" type="xs:string" minOccurs="1" maxOccurs="1"/>

Element PhoneNumberType / Extension

Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1 nillable: true
Source	<xs:element name="Extension" type="xs:int" minOccurs="0" maxOccurs="1" nillable="true"/>

Element PhoneNumberType / Primary

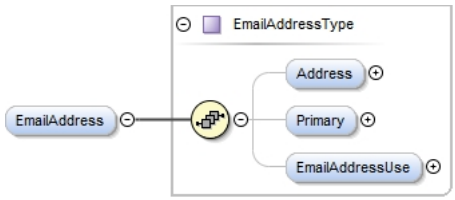
Namespace	No namespace
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Primary" type="xs:boolean" minOccurs="0" maxOccurs="1"/>

Element PhoneNumberType / PhoneNumberUse

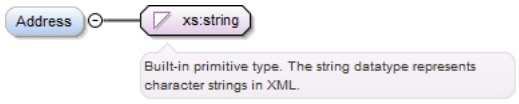
Namespace	No namespace
Diagram	
Type	PhoneNumberEnumType
Properties	content: simple

	minOccurs:	0
	maxOccurs:	1
Facets	enumeration	Business
	enumeration	Business Fax
	enumeration	Home
	enumeration	Home Fax
	enumeration	Mobile
	enumeration	Pager
	enumeration	Skype
Source	<xs:element name="PhoneNumberUse" type="PhoneNumberEnumType" minOccurs="0" maxOccurs="1"/>	

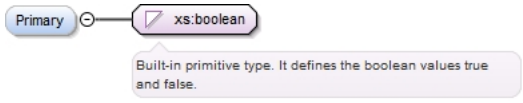
Element ContactType / EmailAddress

Namespace	No namespace
Diagram	
Type	EmailAddressType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Address{0,1} , Primary{0,1} , EmailAddressUse{0,1}
Children	Address, EmailAddressUse, Primary
Instance	<EmailAddress> <Address>{0,1}</Address> <Primary>{0,1}</Primary> <EmailAddressUse>{0,1}</EmailAddressUse> </EmailAddress>
Source	<xs:element name="EmailAddress" type="EmailAddressType" minOccurs="0" maxOccurs="unbounded"/>

Element EmailAddressType / Address

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Address" type="xs:string" minOccurs="0" maxOccurs="1"/>

Element EmailAddressType / Primary

Namespace	No namespace
Diagram	
Type	xs:boolean
Properties	content: simple

	minOccurs:	0
	maxOccurs:	1
Source	<xs:element name="Primary" type="xs:boolean" minOccurs="0" maxOccurs="1"/>	

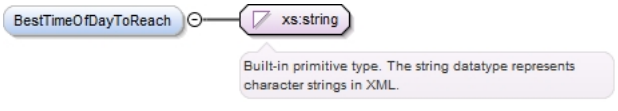
Element EmailAddressType / EmailAddressUse

Namespace	No namespace	
Diagram		
Type	EmailAddressEnumType	
Properties	content:	simple
	minOccurs:	0
	maxOccurs:	1
Facets	enumeration	Work
	enumeration	Home
	enumeration	Alternate
Source	<xs:element name="EmailAddressUse" type="EmailAddressEnumType" minOccurs="0" maxOccurs="1"/>	

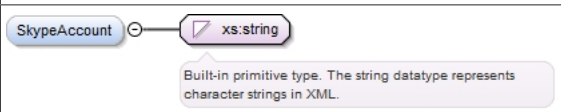
Element ContactType / PreferredContactMethod

Namespace	No namespace	
Diagram		
Type	PreferredContactMethodEnumType	
Properties	content:	simple
	minOccurs:	0
	maxOccurs:	1
Facets	enumeration	Home Phone
	enumeration	Work Phone
	enumeration	Cell Phone
	enumeration	Email
Source	<xs:element name="PreferredContactMethod" type="PreferredContactMethodEnumType" minOccurs="0" maxOccurs="1"/>	

Element ContactType / BestTimeOfDayToReach

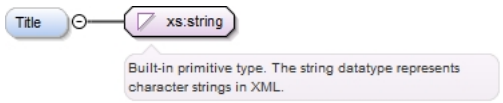
Namespace	No namespace	
Diagram		
Type	xs:string	
Properties	content:	simple
	minOccurs:	0
	maxOccurs:	1
Source	<xs:element name="BestTimeOfDayToReach" type="xs:string" minOccurs="0" maxOccurs="1"/>	

Element ContactType / SkypeAccount

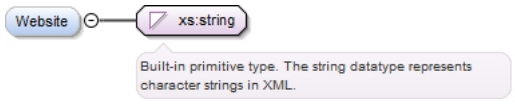
Namespace	No namespace
Diagram	
Type	xs:string

Properties	content:	simple
	minOccurs:	0
	maxOccurs:	1
Source	<xs:element name="SkypeAccount" type="xs:string" minOccurs="0" maxOccurs="1"/>	

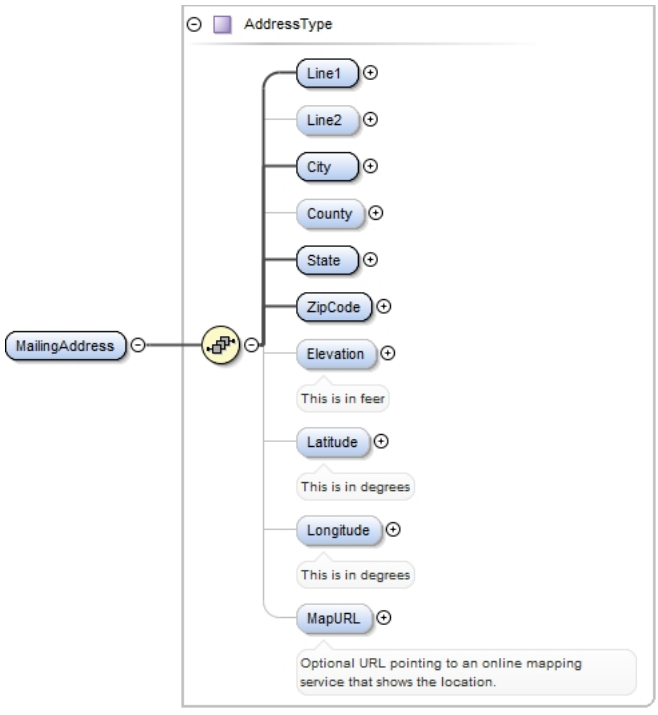
Element ContactType / Title

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Title" type="xs:string" minOccurs="0" maxOccurs="1"/>

Element ContactType / Website

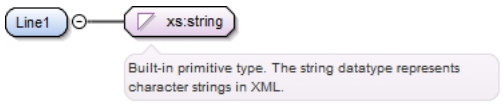
Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Website" type="xs:string" minOccurs="0" maxOccurs="1"/>

Element ParticipantType / MailingAddress

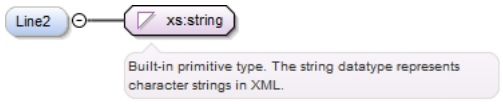
Namespace	No namespace
Diagram	

Type	AddressType
Properties	content: complex minOccurs: 1 maxOccurs: 1
Model	Line1 , Line2{0,1} , City , County{0,1} , State , ZipCode , Elevation{0,1} , Latitude{0,1} , Longitude{0,1} , MapURL{0,1}
Children	City, County, Elevation, Latitude, Line1, Line2, Longitude, MapURL, State, ZipCode
Instance	<MailingAddress> <Line1>{1,1}</Line1> <Line2>{0,1}</Line2> <City>{1,1}</City> <County>{0,1}</County> <State>{1,1}</State> <ZipCode>{1,1}</ZipCode> <Elevation>{0,1}</Elevation> <Latitude>{0,1}</Latitude> <Longitude>{0,1}</Longitude> <MapURL>{0,1}</MapURL> </MailingAddress>
Source	<xs:element name="MailingAddress" type="AddressType" minOccurs="1" maxOccurs="1"/>

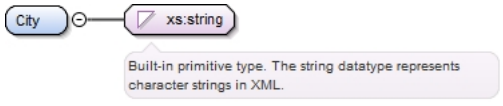
Element AddressType / Line1

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple
Source	<xs:element name="Line1" type="xs:string"/>

Element AddressType / Line2

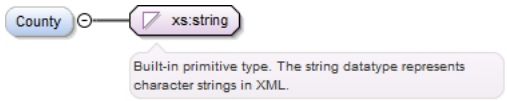
Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Line2" type="xs:string" minOccurs="0" maxOccurs="1"/>

Element AddressType / City

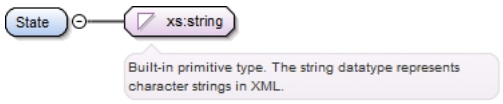
Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple
Source	<xs:element name="City" type="xs:string"/>

Element AddressType / County

Namespace	No namespace

Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="County" type="xs:string" minOccurs="0" maxOccurs="1"/>`

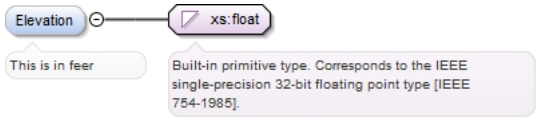
Element AddressType / State

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1
Source	`<xs:element name="State" type="xs:string" minOccurs="1"/>`

Element AddressType / ZipCode

Namespace	No namespace
Diagram	
Type	ZipCodeType
Properties	content: simple
Facets	pattern \d{5}|\d{5}-\d{4}
Source	`<xs:element name="ZipCode" type="ZipCodeType"/>`

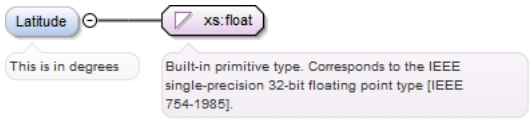
Element AddressType / Elevation

Namespace	No namespace
Annotations	This is in feer
Diagram	
Type	xs:float
Properties	content: simple minOccurs: 0 nillable: true

Source	`<xs:element name="Elevation" type="xs:float" minOccurs="0" nillable="true">`
	`  <xs:annotation>`
	`  <xs:documentation>This is in feer</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

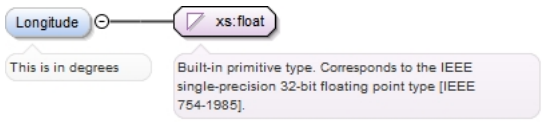
Element AddressType / Latitude

Namespace	No namespace
Annotations	This is in degrees

Diagram	
Type	xs:float
Properties	content: simple minOccurs: 0 nillable: true

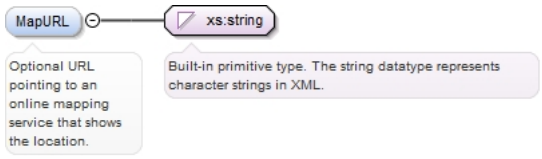
Source	`<xs:element name="Latitude" type="xs:float" minOccurs="0" nillable="true">`
	`  <xs:annotation>`
	`  <xs:documentation>This is in degrees</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element AddressType / Longitude

Namespace	No namespace
Annotations	This is in degrees
Diagram	
Type	xs:float
Properties	content: simple minOccurs: 0 nillable: true

Source	`<xs:element name="Longitude" type="xs:float" minOccurs="0" nillable="true">`
	`  <xs:annotation>`
	`  <xs:documentation>This is in degrees</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

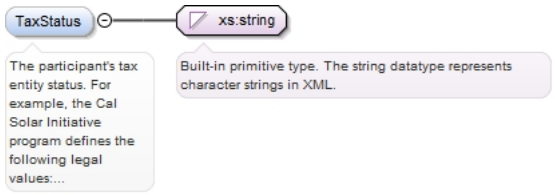
Element AddressType / MapURL

Namespace	No namespace
Annotations	Optional URL pointing to an online mapping service that shows the location.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

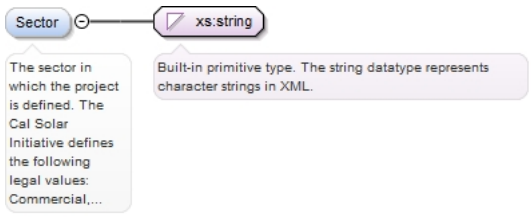
Source	`<xs:element name="MapURL" type="xs:string" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>Optional URL pointing to an online mapping service that shows the location.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element ParticipantType / TaxStatus

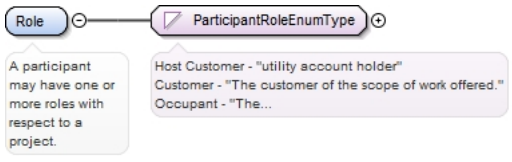
Namespace	No namespace
Annotations	The participant's tax entity status. For example, the Cal Solar Initiative program defines the following legal values: Corporation, Individual, LLC (Corporation), LLC

	(Non-Corporation), Partnership, Sole Proprietor, Tax Exempt. This may hold other values depending on the needs of the user.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="TaxStatus" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The participant's tax entity status. For example, the Cal Solar Initiative program defines the following legal values: Corporation, Individual, LLC (Corporation), LLC (Non-Corporation), Partnership, Sole Proprietor, Tax Exempt. This may hold other values depending on the needs of the user.</xs:documentation> </xs:annotation> </xs:element>

Element ParticipantType / Sector

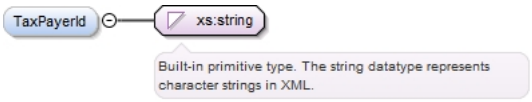
Namespace	No namespace
Annotations	The sector in which the project is defined. The Cal Solar Initiative defines the following legal values: Commercial, Government, Non-Profit, Residential. Other values can be used to support defined sectors used by other programs.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Sector" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The sector in which the project is defined. The Cal Solar Initiative defines the following legal values: Commercial, Government, Non-Profit, Residential. Other values can be used to support defined sectors used by other programs.</xs:documentation> </xs:annotation> </xs:element>

Element ParticipantType / Role

Namespace	No namespace
Annotations	A participant may have one or more roles with respect to a project.
Diagram	
Type	ParticipantRoleEnumType
Properties	content: simple minOccurs: 1

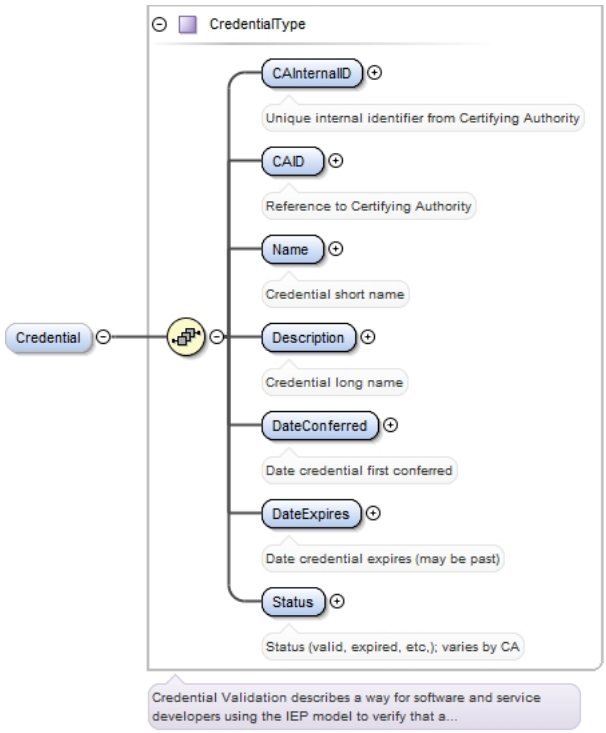
	maxOccurs:	unbounded
Facets	enumeration	Host Customer
	enumeration	Customer
	enumeration	Occupant
	enumeration	PV System Owner
	enumeration	Incentive Payee
	enumeration	Seller
	enumeration	Financer
	enumeration	General Contractor
	enumeration	Installer
	enumeration	Referrer
	enumeration	Auditor
	enumeration	Inspector
	enumeration	Engineer
	enumeration	Program Administrator
Source	<xs:element name="Role" type="ParticipantRoleEnumType" minOccurs="1" maxOccurs="unbounded"> <xs:annotation> <xs:documentation>A participant may have one or more roles with respect to a project.</xs:documentation> </xs:annotation> </xs:element>	

Element ParticipantType / TaxPayerId

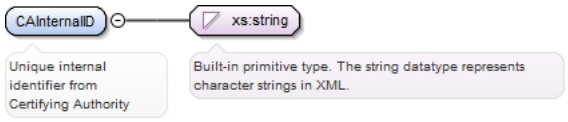
Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple
	minOccurs: 0
	maxOccurs: 1
Source	<xs:element name="TaxPayerId" type="xs:string" minOccurs="0" maxOccurs="1"/>

Element ParticipantType / Credential

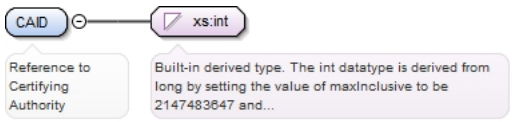
Namespace	No namespace

Diagram	
Type	CredentialType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	CAInternalID , CAID , Name , Description , DateConferred , DateExpires , Status
Children	CAID, CAInternalID, DateConferred, DateExpires, Description, Name, Status
Instance	<Credential> <CAInternalID>{1,1}</CAInternalID> <CAID>{1,1}</CAID> <Name>{1,1}</Name> <Description>{1,1}</Description> <DateConferred>{1,1}</DateConferred> <DateExpires>{1,1}</DateExpires> <Status>{1,1}</Status> </Credential>
Source	<xs:element name="Credential" type="CredentialType" minOccurs="0" maxOccurs="unbounded"/>

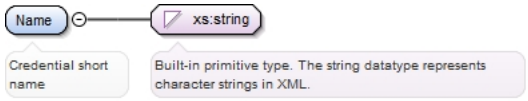
Element CredentialType / CAInternalID

Namespace	No namespace
Annotations	Unique internal identifier from Certifying Authority
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="CAInternalID" type="xs:string" minOccurs="1" maxOccurs="1"> <xs:annotation> <xs:documentation>Unique internal identifier from Certifying Authority</ xs:documentation> </xs:annotation> </xs:element>

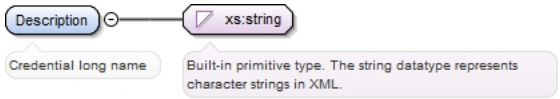
Element CredentialType / CAID

Namespace	No namespace
Annotations	Reference to Certifying Authority
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="CAID" type="xs:int" minOccurs="1" maxOccurs="1"> <xs:annotation> <xs:documentation>Reference to Certifying Authority</xs:documentation> </xs:annotation> </xs:element>

Element CredentialType / Name

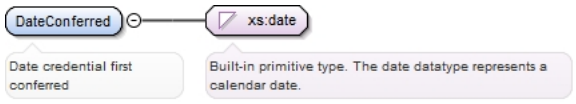
Namespace	No namespace
Annotations	Credential short name
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="Name" type="xs:string" minOccurs="1" maxOccurs="1"> <xs:annotation> <xs:documentation>Credential short name</xs:documentation> </xs:annotation> </xs:element>

Element CredentialType / Description

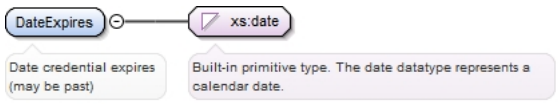
Namespace	No namespace
Annotations	Credential long name
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="1" maxOccurs="1"> <xs:annotation> <xs:documentation>Credential long name</xs:documentation> </xs:annotation> </xs:element>

Element CredentialType / DateConferred

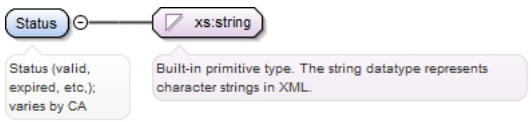
Namespace	No namespace
Annotations	Date credential first conferred

Diagram	
Type	xs:date
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="DateConferred" type="xs:date" minOccurs="1" maxOccurs="1"> <xs:annotation> <xs:documentation>Date credential first conferred</xs:documentation> </xs:annotation> </xs:element>

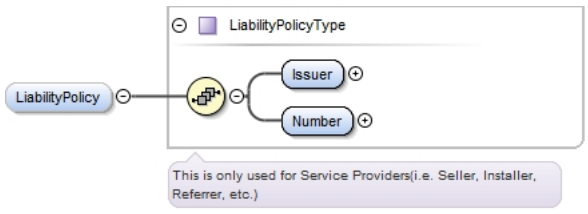
Element CredentialType / DateExpires

Namespace	No namespace
Annotations	Date credential expires (may be past)
Diagram	
Type	xs:date
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="DateExpires" type="xs:date" minOccurs="1" maxOccurs="1"> <xs:annotation> <xs:documentation>Date credential expires (may be past)</xs:documentation> </xs:annotation> </xs:element>

Element CredentialType / Status

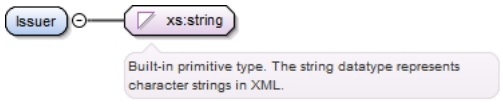
Namespace	No namespace
Annotations	Status (valid, expired, etc,); varies by CA
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="Status" type="xs:string" minOccurs="1" maxOccurs="1"> <xs:annotation> <xs:documentation>Status (valid, expired, etc,); varies by CA</xs:documentation> </xs:annotation> </xs:element>

Element ParticipantType / LiabilityPolicy

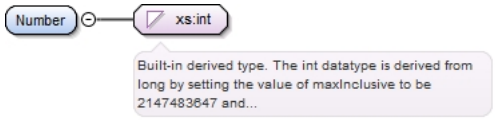
Namespace	No namespace
Diagram	

Type	LiabilityPolicyType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Issuer , Number
Children	Issuer, Number
Instance	<LiabilityPolicy> <Issuer>{1,1}</Issuer> <Number>{1,1}</Number> </LiabilityPolicy>
Source	<xs:element name="LiabilityPolicy" type="LiabilityPolicyType" minOccurs="0" maxOccurs="unbounded"/>

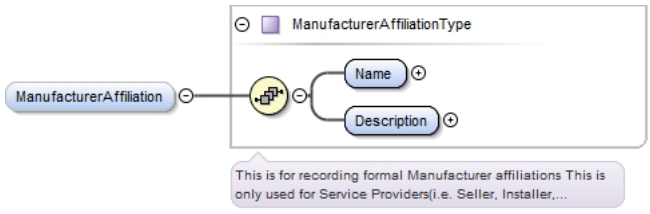
Element LiabilityPolicyType / Issuer

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="Issuer" type="xs:string" minOccurs="1" maxOccurs="1"/>

Element LiabilityPolicyType / Number

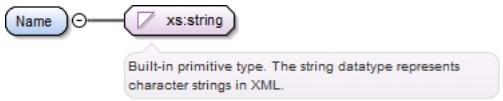
Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="Number" type="xs:int" minOccurs="1" maxOccurs="1"/>

Element ParticipantType / ManufacturerAffiliation

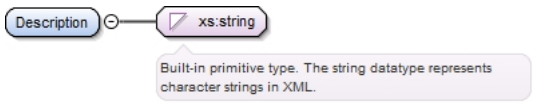
Namespace	No namespace
Diagram	
Type	ManufacturerAffiliationType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name , Description
Children	Description, Name

Instance	<ManufacturerAffiliation> <Name>{1,1}</Name> <Description>{1,1}</Description> </ManufacturerAffiliation>
Source	<xs:element name="ManufacturerAffiliation" type="ManufacturerAffiliationType" minOccurs="0" maxOccurs="unbounded"/>

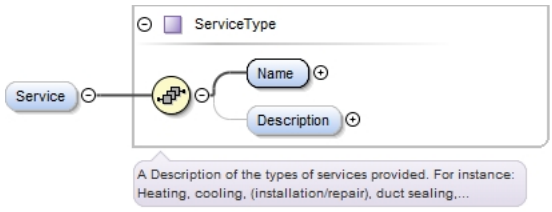
Element ManufacturerAffiliationType / Name

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="Name" type="xs:string" minOccurs="1" maxOccurs="1"/>

Element ManufacturerAffiliationType / Description

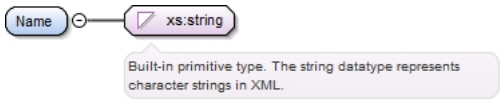
Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="1" maxOccurs="1"/>

Element ParticipantType / Service

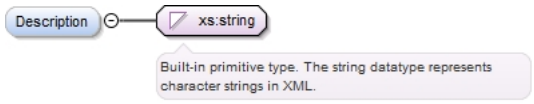
Namespace	No namespace
Diagram	
Type	ServiceType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name , Description{0,1}
Children	Description, Name
Instance	<Service> <Name>{1,1}</Name> <Description>{0,1}</Description> </Service>
Source	<xs:element name="Service" type="ServiceType" minOccurs="0" maxOccurs="unbounded"/>

Element ServiceType / Name

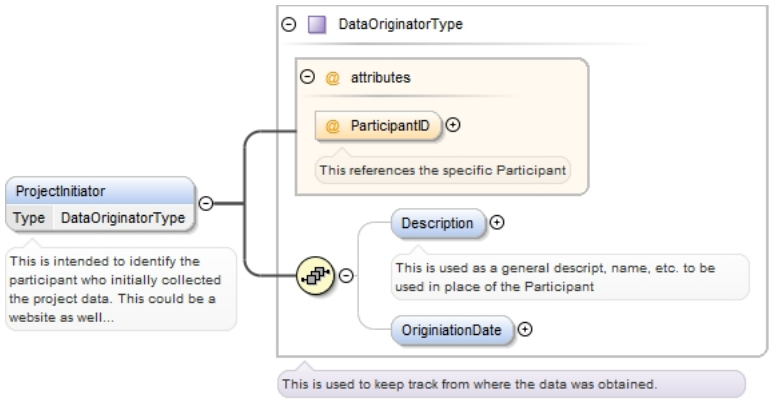
Namespace	No namespace

Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	`<xs:element name="Name" type="xs:string" minOccurs="1" maxOccurs="1"/>`

Element ServiceType / Description

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"/>`

Element ProjectType / ProjectInitiator

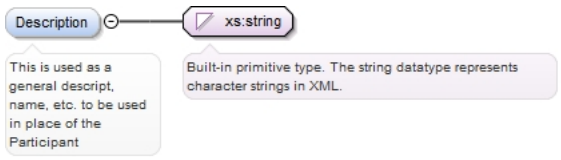
Namespace	No namespace
Annotations	This is intended to identify the participant who initially collected the project data. This could be a website as well as a person
Diagram	
Type	DataOriginatorType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Description{0,1} , OriginiationDate{0,1}
Children	Description, OriginiationDate

Instance	`<ProjectInitiator ParticipantID="">`
	`  <Description>{0,1}</Description>`
	`  <OriginiationDate>{0,1}</OriginiationDate>`
	`</ProjectInitiator>`

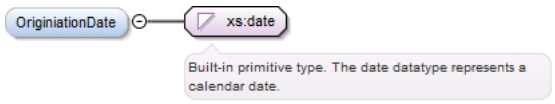
Attributes	**QName** | **Type** | **Fixed** | **Default** | **Use** **ParticipantID** | xs:IDREF | | | optional This references the specific Participant
Source	`<xs:element name="ProjectInitiator" type="DataOriginatorType" maxOccurs="1" minOccurs="0">` `  <xs:annotation>`

```
    <xs:documentation>This is intended to identify the participant who initially collected
 the project data. This could be a website as well as a person</xs:documentation>
  </xs:annotation>
</xs:element>
```

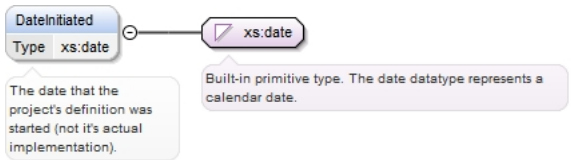
Element DataOriginatorType / Description

Namespace	No namespace
Annotations	This is used as a general descript, name, etc. to be used in place of the Participant
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is used as a general descript, name, etc. to be used in place of the Participant</xs:documentation> </xs:annotation> </xs:element>

Element DataOriginatorType / OriginiationDate

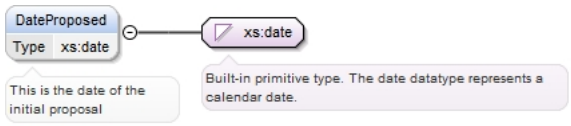
Namespace	No namespace
Diagram	
Type	xs:date
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="OriginiationDate" type="xs:date"/>

Element ProjectType / DateInitiated

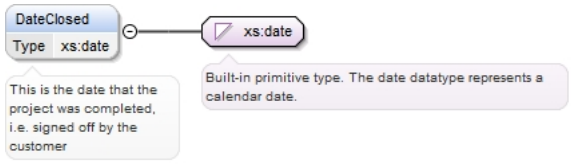
Namespace	No namespace
Annotations	The date that the project's definition was started (not it's actual implementation).
Diagram	
Type	xs:date
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="DateInitiated" type="xs:date" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The date that the project's definition was started (not it's actual implementation).</xs:documentation> </xs:annotation> </xs:element>

Element ProjectType / DateProposed

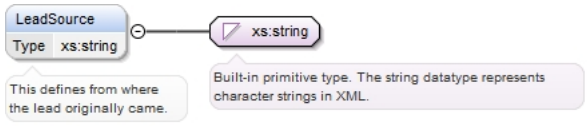
Namespace	No namespace

Annotations	This is the date of the initial proposal
Diagram	
Type	xs:date
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="DateProposed" type="xs:date" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is the date of the initial proposal</xs:documentation> </xs:annotation> </xs:element>

Element ProjectType / DateClosed

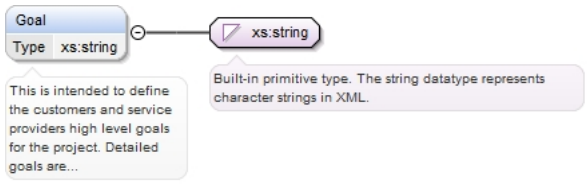
Namespace	No namespace
Annotations	This is the date that the project was completed, i.e. signed off by the customer
Diagram	
Type	xs:date
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="DateClosed" type="xs:date" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is the date that the project was completed, i.e. signed off by the customer</xs:documentation> </xs:annotation> </xs:element>

Element ProjectType / LeadSource

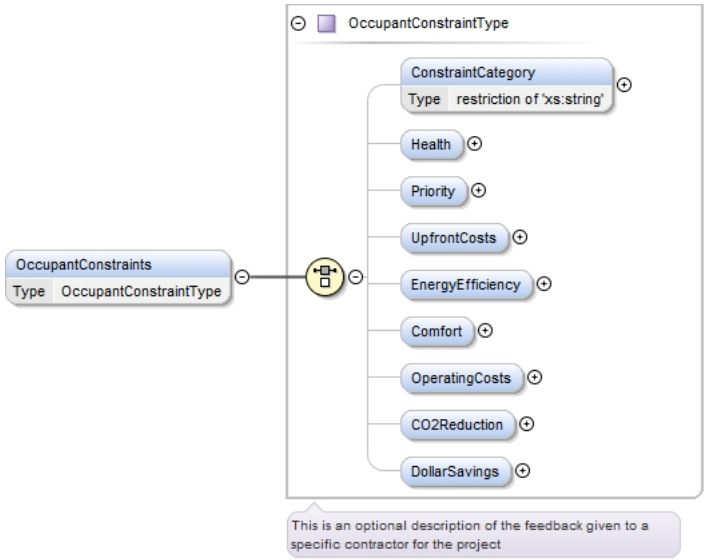
Namespace	No namespace
Annotations	This defines from where the lead originally came.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="LeadSource" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This defines from where the lead originally came.</xs:documentation> </xs:annotation> </xs:element>

Element ProjectType / Goal

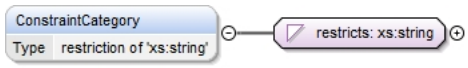
Namespace	No namespace
Annotations	This is intended to define the customers and service providers high level goals for the project. Detailed goals are expected to be recorded at the Measure level

Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: unbounded
Source	<xs:element name="Goal" type="xs:string" minOccurs="0" maxOccurs="unbounded"> <xs:annotation> <xs:documentation>This is intended to define the customers and service providers high level goals for the project. Detailed goals are expected to be recorded at the Measure level</xs:documentation> </xs:annotation> </xs:element>

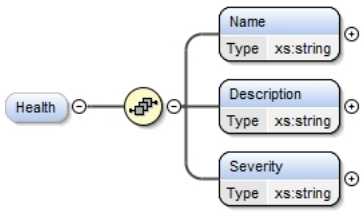
Element ProjectType / OccupantConstraints

Namespace	No namespace
Diagram	
Type	OccupantConstraintType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	ConstraintCategory{0,1} | Health{0,1} | Priority{0,1} | UpfrontCosts{0,1} | EnergyEfficiency{0,1} | Comfort{0,1} | OperatingCosts{0,1} | CO2Reduction{0,1} | DollarSavings{0,1}
Children	CO2Reduction, Comfort, ConstraintCategory, DollarSavings, EnergyEfficiency, Health, OperatingCosts, Priority, UpfrontCosts
Instance	<OccupantConstraints> <ConstraintCategory>{0,1}</ConstraintCategory> <Health>{0,1}</Health> <Priority>{0,1}</Priority> <UpfrontCosts>{0,1}</UpfrontCosts> <EnergyEfficiency>{0,1}</EnergyEfficiency> <Comfort>{0,1}</Comfort> <OperatingCosts>{0,1}</OperatingCosts> <CO2Reduction>{0,1}</CO2Reduction> <DollarSavings>{0,1}</DollarSavings> </OccupantConstraints>
Source	<xs:element name="OccupantConstraints" type="OccupantConstraintType" minOccurs="0" maxOccurs="unbounded"/>

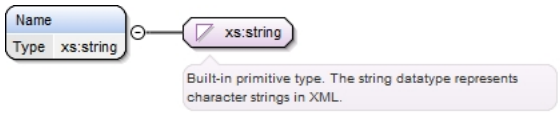
Element OccupantConstraintType / ConstraintCategory

Namespace	No namespace
Diagram	
Type	restriction of xs:string
Properties	content: simple minOccurs: 0
Facets	enumeration Health enumeration Comfort enumeration EnergyEfficiency enumeration UpfrontCosts enumeration OperatingCosts enumeration CO2Reduction enumeration DollarSavings
Source	<xs:element name="ConstraintCategory" minOccurs="0"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:enumeration value="Health"/> <xs:enumeration value="Comfort"/> <xs:enumeration value="EnergyEfficiency"/> <xs:enumeration value="UpfrontCosts"/> <xs:enumeration value="OperatingCosts"/> <xs:enumeration value="CO2Reduction"/> <xs:enumeration value="DollarSavings"/> </xs:restriction> </xs:simpleType> </xs:element>

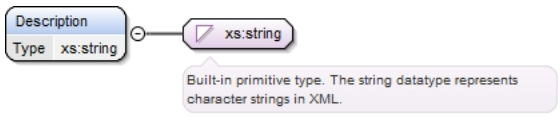
Element OccupantConstraintType / Health

Namespace	No namespace
Diagram	
Properties	content: complex minOccurs: 0
Model	Name , Description , Severity
Children	Description, Name, Severity
Instance	<Health> <Name>{1,1}</Name> <Description>{1,1}</Description> <Severity>{1,1}</Severity> </Health>
Source	<xs:element name="Health" minOccurs="0"> <xs:complexType> <xs:annotation> <xs:documentation>This is used to describe health constraints such as specific allergies</xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="Name" type="xs:string" minOccurs="1" maxOccurs="1"/> <xs:element name="Description" type="xs:string" minOccurs="1" maxOccurs="1"/> <xs:element name="Severity" type="xs:string" minOccurs="1" maxOccurs="1"/> </xs:sequence> </xs:complexType> </xs:element>

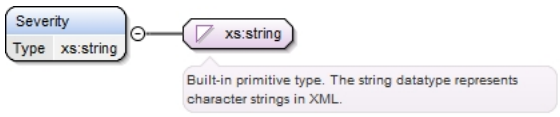
Element OccupantConstraintType / Health / Name

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	`<xs:element name="Name" type="xs:string" minOccurs="1" maxOccurs="1"/>`

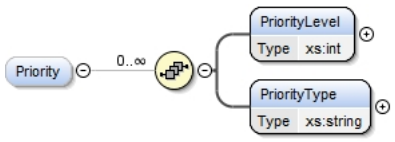
Element OccupantConstraintType / Health / Description

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	`<xs:element name="Description" type="xs:string" minOccurs="1" maxOccurs="1"/>`

Element OccupantConstraintType / Health / Severity

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	`<xs:element name="Severity" type="xs:string" minOccurs="1" maxOccurs="1"/>`

Element OccupantConstraintType / Priority

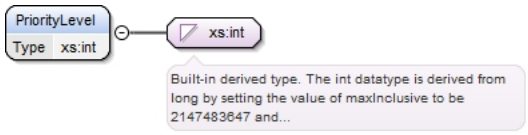
Namespace	No namespace
Diagram	
Properties	content: complex minOccurs: 0
Model	PriorityLevel , PriorityType
Children	PriorityLevel, PriorityType

Instance	`<Priority>`
	`  <PriorityLevel>{1,1}</PriorityLevel>`
	`  <PriorityType>{1,1}</PriorityType>`
	`</Priority>`

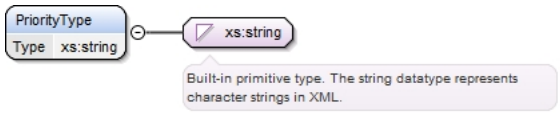
Source	`<xs:element name="Priority" minOccurs="0">`

```
  <xs:complexType>
    <xs:annotation>
      <xs:documentation>Scale of 1 to 10.</xs:documentation>
    </xs:annotation>
    <xs:sequence minOccurs="0" maxOccurs="unbounded">
      <xs:element name="PriorityLevel" type="xs:int" minOccurs="1" maxOccurs="1"/>
      <xs:element name="PriorityType" type="xs:string" minOccurs="1" maxOccurs="1"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

Element OccupantConstraintType / Priority / PriorityLevel

Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	`<xs:element name="PriorityLevel" type="xs:int" minOccurs="1" maxOccurs="1"/>`

Element OccupantConstraintType / Priority / PriorityType

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	`<xs:element name="PriorityType" type="xs:string" minOccurs="1" maxOccurs="1"/>`

Element OccupantConstraintType / UpfrontCosts

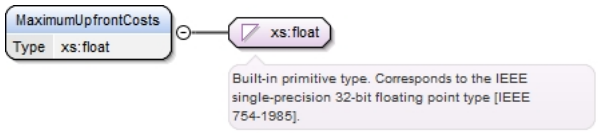
Namespace	No namespace
Diagram	
Properties	content: complex minOccurs: 0
Model	MaximumUpfrontCosts
Children	MaximumUpfrontCosts

Instance	`<UpfrontCosts>`
	`  <MaximumUpfrontCosts>{1,1}</MaximumUpfrontCosts>`
	`</UpfrontCosts>`

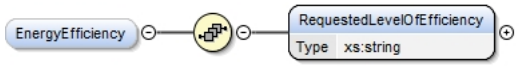
Source	`<xs:element name="UpfrontCosts" minOccurs="0">`
	`  <xs:complexType>`
	`  <xs:sequence>`
	`  <xs:element name="MaximumUpfrontCosts" type="xs:float" minOccurs="1" maxOccurs="1"/>`
	`  </xs:sequence>`
	`  </xs:complexType>`
	`</xs:element>`

Element OccupantConstraintType / UpfrontCosts / MaximumUpfrontCosts

Namespace	No namespace

Diagram	
Type	xs:float
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	`<xs:element name="MaximumUpfrontCosts" type="xs:float" minOccurs="1" maxOccurs="1"/>`

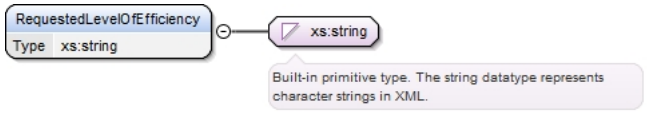
Element OccupantConstraintType / EnergyEfficiency

Namespace	No namespace
Diagram	
Properties	content: complex minOccurs: 0
Model	RequestedLevelOfEfficiency
Children	RequestedLevelOfEfficiency

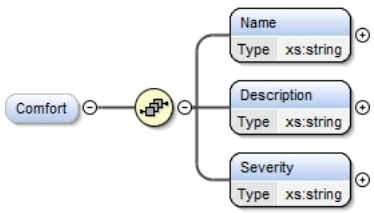
Instance	`<EnergyEfficiency>`
	`  <RequestedLevelOfEfficiency>{1,1}</RequestedLevelOfEfficiency>`
	`</EnergyEfficiency>`

Source	`<xs:element name="EnergyEfficiency" minOccurs="0">`
	`  <xs:complexType>`
	`  <xs:sequence>`
	`  <xs:element name="RequestedLevelOfEfficiency" type="xs:string" minOccurs="1"`
	` maxOccurs="1"/>`
	`  </xs:sequence>`
	`  </xs:complexType>`
	`</xs:element>`

Element OccupantConstraintType / EnergyEfficiency / RequestedLevelOfEfficiency

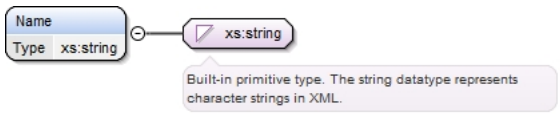
Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	`<xs:element name="RequestedLevelOfEfficiency" type="xs:string" minOccurs="1"` ` maxOccurs="1"/>`

Element OccupantConstraintType / Comfort

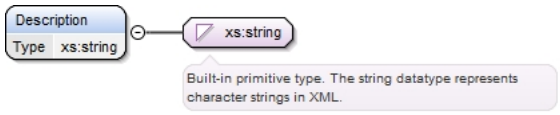
Namespace	No namespace
Diagram	
Properties	content: complex minOccurs: 0

Model	Name , Description , Severity
Children	Description, Name, Severity
Instance	<Comfort> <Name>{1,1}</Name> <Description>{1,1}</Description> <Severity>{1,1}</Severity> </Comfort>
Source	<xs:element name="Comfort" minOccurs="0"> <xs:complexType> <xs:annotation> <xs:documentation>This is used to describe specific comfort constraints in the building such as drafts, ventilation, hot and cold spots, etc.</xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="Name" type="xs:string" minOccurs="1" maxOccurs="1"/> <xs:element name="Description" type="xs:string" minOccurs="1" maxOccurs="1"/> <xs:element name="Severity" type="xs:string" minOccurs="1" maxOccurs="1"/> </xs:sequence> </xs:complexType> </xs:element>

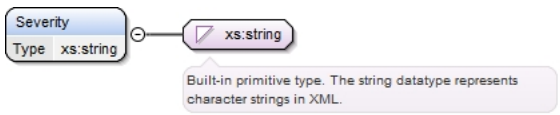
Element OccupantConstraintType / Comfort / Name

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="Name" type="xs:string" minOccurs="1" maxOccurs="1"/>

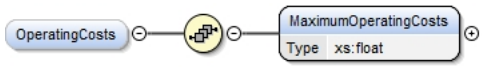
Element OccupantConstraintType / Comfort / Description

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="1" maxOccurs="1"/>

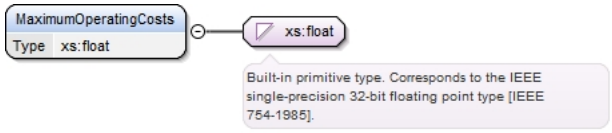
Element OccupantConstraintType / Comfort / Severity

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="Severity" type="xs:string" minOccurs="1" maxOccurs="1"/>

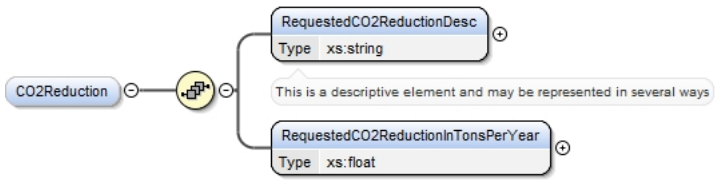
Element OccupantConstraintType / OperatingCosts

Namespace	No namespace
Diagram	
Properties	content: complex minOccurs: 0
Model	MaximumOperatingCosts
Children	MaximumOperatingCosts
Instance	<OperatingCosts> <MaximumOperatingCosts>{1,1}</MaximumOperatingCosts> </OperatingCosts>
Source	<xs:element name="OperatingCosts" minOccurs="0"> <xs:complexType> <xs:sequence> <xs:element name="MaximumOperatingCosts" type="xs:float" minOccurs="1" maxOccurs="1"/> </xs:sequence> </xs:complexType> </xs:element>

Element OccupantConstraintType / OperatingCosts / MaximumOperatingCosts

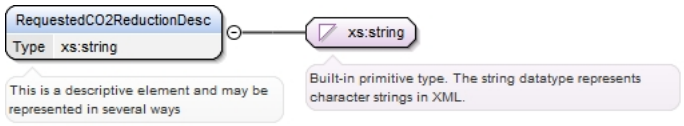
Namespace	No namespace
Diagram	
Type	xs:float
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="MaximumOperatingCosts" type="xs:float" minOccurs="1" maxOccurs="1"/>

Element OccupantConstraintType / CO2Reduction

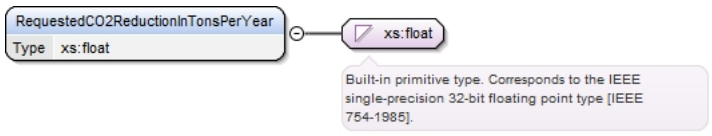
Namespace	No namespace
Diagram	
Properties	content: complex minOccurs: 0
Model	RequestedCO2ReductionDesc , RequestedCO2ReductionInTonsPerYear
Children	RequestedCO2ReductionDesc, RequestedCO2ReductionInTonsPerYear
Instance	<CO2Reduction> <RequestedCO2ReductionDesc>{1,1}</RequestedCO2ReductionDesc> <RequestedCO2ReductionInTonsPerYear>{1,1}</RequestedCO2ReductionInTonsPerYear> </CO2Reduction>
Source	<xs:element name="CO2Reduction" minOccurs="0"> <xs:complexType> <xs:sequence> <xs:element name="RequestedCO2ReductionDesc" type="xs:string" minOccurs="1" maxOccurs="1"> <xs:annotation> <xs:documentation>This is a descriptive element and may be represented in several ways</xs:documentation> </xs:annotation>

```
      </xs:element>
      <xs:element name="RequestedCO2ReductionInTonsPerYear" type="xs:float" minOccurs="1"
 maxOccurs="1"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

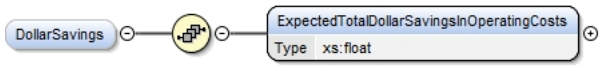
Element OccupantConstraintType / CO2Reduction / RequestedCO2ReductionDesc

Namespace	No namespace
Annotations	This is a descriptive element and may be represented in several ways
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="RequestedCO2ReductionDesc" type="xs:string" minOccurs="1" maxOccurs="1"> <xs:annotation> <xs:documentation>This is a descriptive element and may be represented in several ways</xs:documentation> </xs:annotation> </xs:element>

Element OccupantConstraintType / CO2Reduction / RequestedCO2ReductionInTonsPerYear

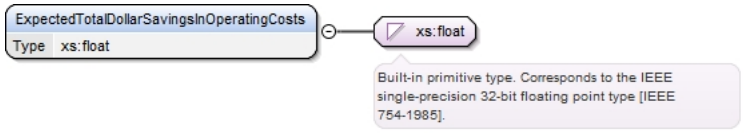
Namespace	No namespace
Diagram	
Type	xs:float
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="RequestedCO2ReductionInTonsPerYear" type="xs:float" minOccurs="1" maxOccurs="1"/>

Element OccupantConstraintType / DollarSavings

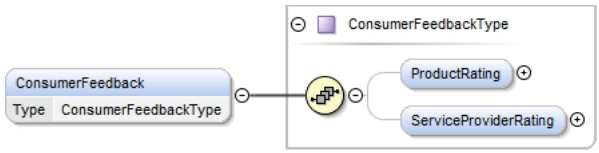
Namespace	No namespace
Diagram	
Properties	content: complex minOccurs: 0
Model	ExpectedTotalDollarSavingsInOperatingCosts
Children	ExpectedTotalDollarSavingsInOperatingCosts
Instance	<DollarSavings> <ExpectedTotalDollarSavingsInOperatingCosts>{1,1}</ ExpectedTotalDollarSavingsInOperatingCosts> </DollarSavings>
Source	<xs:element name="DollarSavings" minOccurs="0"> <xs:complexType> <xs:sequence> <xs:element name="ExpectedTotalDollarSavingsInOperatingCosts" type="xs:float" minOccurs="1" maxOccurs="1"/> </xs:sequence>

```
  </xs:complexType>
</xs:element>
```

Element OccupantConstraintType / DollarSavings / ExpectedTotalDollarSavingsInOperatingCosts

Namespace	No namespace
Diagram	
Type	xs:float
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	`<xs:element name="ExpectedTotalDollarSavingsInOperatingCosts" type="xs:float" minOccurs="1" maxOccurs="1"/>`

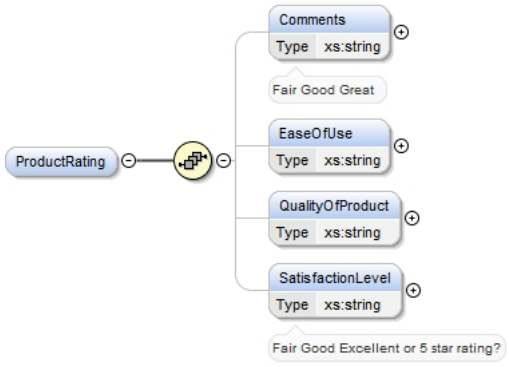
Element ProjectType / ConsumerFeedback

Namespace	No namespace
Diagram	
Type	ConsumerFeedbackType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	ProductRating{0,1} , ServiceProviderRating{0,1}
Children	ProductRating, ServiceProviderRating

Instance	`<ConsumerFeedback>`
	`  <ProductRating>{0,1}</ProductRating>`
	`  <ServiceProviderRating>{0,1}</ServiceProviderRating>`
	`</ConsumerFeedback>`

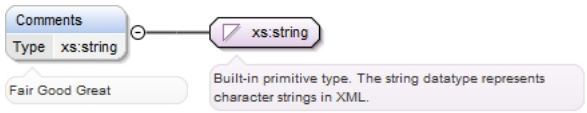
Source	`<xs:element name="ConsumerFeedback" type="ConsumerFeedbackType" minOccurs="0" maxOccurs="unbounded"/>`

Element ConsumerFeedbackType / ProductRating

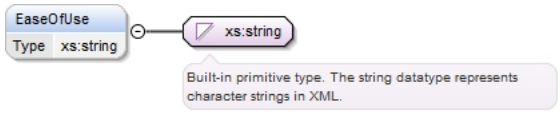
Namespace	No namespace
Diagram	
Properties	content: complex minOccurs: 0
Model	Comments{0,1} , EaseOfUse{0,1} , QualityOfProduct{0,1} , SatisfactionLevel{0,1}

Children	Comments, EaseOfUse, QualityOfProduct, SatisfactionLevel
Instance	<ProductRating> <Comments>{0,1}</Comments> <EaseOfUse>{0,1}</EaseOfUse> <QualityOfProduct>{0,1}</QualityOfProduct> <SatisfactionLevel>{0,1}</SatisfactionLevel> </ProductRating>
Source	<xs:element name="ProductRating" minOccurs="0"> <xs:complexType> <xs:sequence> <xs:element name="Comments" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Fair Good Great</xs:documentation> </xs:annotation> </xs:element> <xs:element name="EaseOfUse" type="xs:string" minOccurs="0" maxOccurs="1"/> <xs:element name="QualityOfProduct" type="xs:string" minOccurs="0" maxOccurs="1"/> <xs:element name="SatisfactionLevel" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Fair Good Excellent or 5 star rating?</xs:documentation> </xs:annotation> </xs:element> </xs:sequence> </xs:complexType> </xs:element>

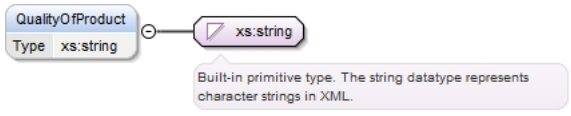
Element ConsumerFeedbackType / ProductRating / Comments

Namespace	No namespace
Annotations	Fair Good Great
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Comments" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Fair Good Great</xs:documentation> </xs:annotation> </xs:element>

Element ConsumerFeedbackType / ProductRating / EaseOfUse

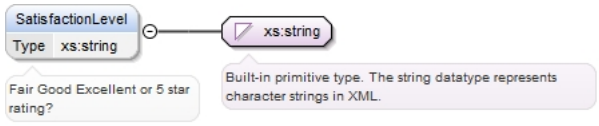
Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="EaseOfUse" type="xs:string" minOccurs="0" maxOccurs="1"/>

Element ConsumerFeedbackType / ProductRating / QualityOfProduct

Namespace	No namespace
Diagram	

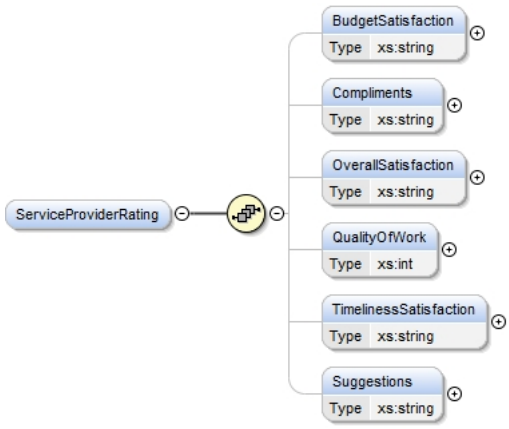
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="QualityOfProduct" type="xs:string" minOccurs="0" maxOccurs="1"/>`

Element ConsumerFeedbackType / ProductRating / SatisfactionLevel

Namespace	No namespace
Annotations	Fair Good Excellent or 5 star rating?
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	`<xs:element name="SatisfactionLevel" type="xs:string" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>Fair Good Excellent or 5 star rating?</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element ConsumerFeedbackType / ServiceProviderRating

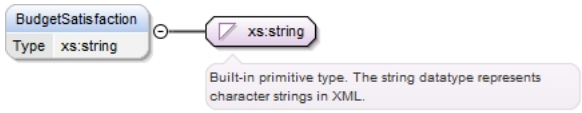
Namespace	No namespace
Diagram	
Properties	content: complex minOccurs: 0
Model	BudgetSatisfaction{0,1} , Compliments{0,1} , OverallSatisfaction{0,1} , QualityOfWork{0,1} , TimelinessSatisfaction{0,1} , Suggestions{0,1}
Children	BudgetSatisfaction, Compliments, OverallSatisfaction, QualityOfWork, Suggestions, TimelinessSatisfaction

Instance	`<ServiceProviderRating>`
	`  <BudgetSatisfaction>{0,1}</BudgetSatisfaction>`
	`  <Compliments>{0,1}</Compliments>`
	`  <OverallSatisfaction>{0,1}</OverallSatisfaction>`
	`  <QualityOfWork>{0,1}</QualityOfWork>`
	`  <TimelinessSatisfaction>{0,1}</TimelinessSatisfaction>`
	`  <Suggestions>{0,1}</Suggestions>`
	`</ServiceProviderRating>`

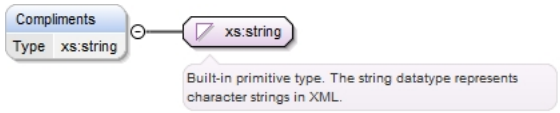
Source	`<xs:element name="ServiceProviderRating" minOccurs="0">`
	`  <xs:complexType>`
	`  <xs:sequence>`
	`  <xs:element name="BudgetSatisfaction" type="xs:string" minOccurs="0" maxOccurs="1"/>`
	`  <xs:element name="Compliments" type="xs:string" minOccurs="0" maxOccurs="1"/>`

```
      <xs:element name="OverallSatisfaction" type="xs:string" minOccurs="0" maxOccurs="1"/
>
      <xs:element name="QualityOfWork" type="xs:int" minOccurs="0" maxOccurs="1"/>
      <xs:element name="TimelinessSatisfaction" type="xs:string" minOccurs="0"
 maxOccurs="1"/>
      <xs:element name="Suggestions" type="xs:string" minOccurs="0" maxOccurs="1"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

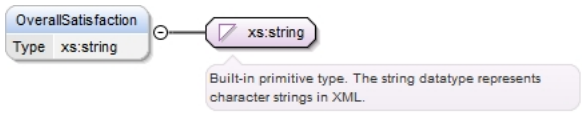
Element ConsumerFeedbackType / ServiceProviderRating / BudgetSatisfaction

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="BudgetSatisfaction" type="xs:string" minOccurs="0" maxOccurs="1"/>`

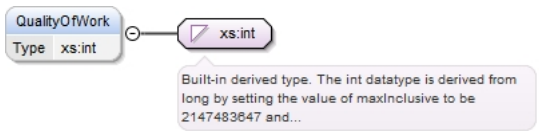
Element ConsumerFeedbackType / ServiceProviderRating / Compliments

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="Compliments" type="xs:string" minOccurs="0" maxOccurs="1"/>`

Element ConsumerFeedbackType / ServiceProviderRating / OverallSatisfaction

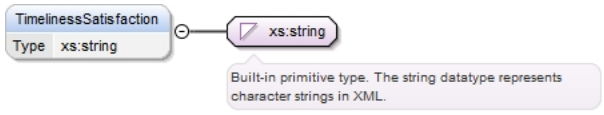
Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="OverallSatisfaction" type="xs:string" minOccurs="0" maxOccurs="1"/>`

Element ConsumerFeedbackType / ServiceProviderRating / QualityOfWork

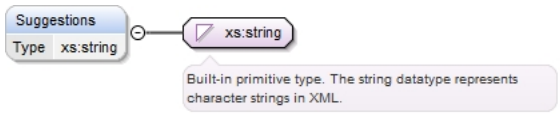
Namespace	No namespace
Diagram	

Type	xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="QualityOfWork" type="xs:int" minOccurs="0" maxOccurs="1"/>`

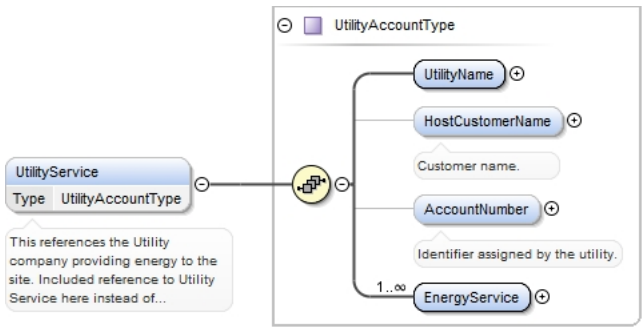
Element ConsumerFeedbackType / ServiceProviderRating / TimelinessSatisfaction

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="TimelinessSatisfaction" type="xs:string" minOccurs="0" maxOccurs="1"/>`

Element ConsumerFeedbackType / ServiceProviderRating / Suggestions

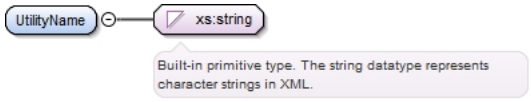
Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="Suggestions" type="xs:string" minOccurs="0" maxOccurs="1"/>`

Element ProjectType / UtilityService

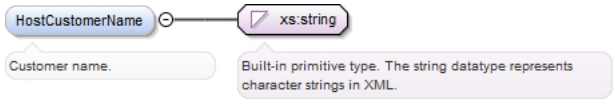
Namespace	No namespace
Annotations	This references the Utility company providing energy to the site. Included reference to Utility Service here instead of in Building since Project encapsulates building
Diagram	
Type	UtilityAccountType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	UtilityName , HostCustomerName{0,1} , AccountNumber{0,1} , EnergyService+

Children	AccountNumber, EnergyService, HostCustomerName, UtilityName
Instance	<UtilityService> <UtilityName>{1,1}</UtilityName> <HostCustomerName>{0,1}</HostCustomerName> <AccountNumber>{0,1}</AccountNumber> <EnergyService RevenueMeterIdRef="">{1,unbounded}</EnergyService> </UtilityService>
Source	<xs:element name="UtilityService" type="UtilityAccountType" minOccurs="0" maxOccurs="unbounded"> <xs:annotation> <xs:documentation>This references the Utility company providing energy to the site. Included reference to Utility Service here instead of in Building since Project encapsulates building</xs:documentation> </xs:annotation> </xs:element>

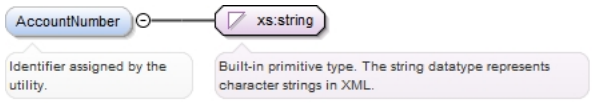
Element UtilityAccountType / UtilityName

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple
Source	<xs:element name="UtilityName" type="xs:string"/>

Element UtilityAccountType / HostCustomerName

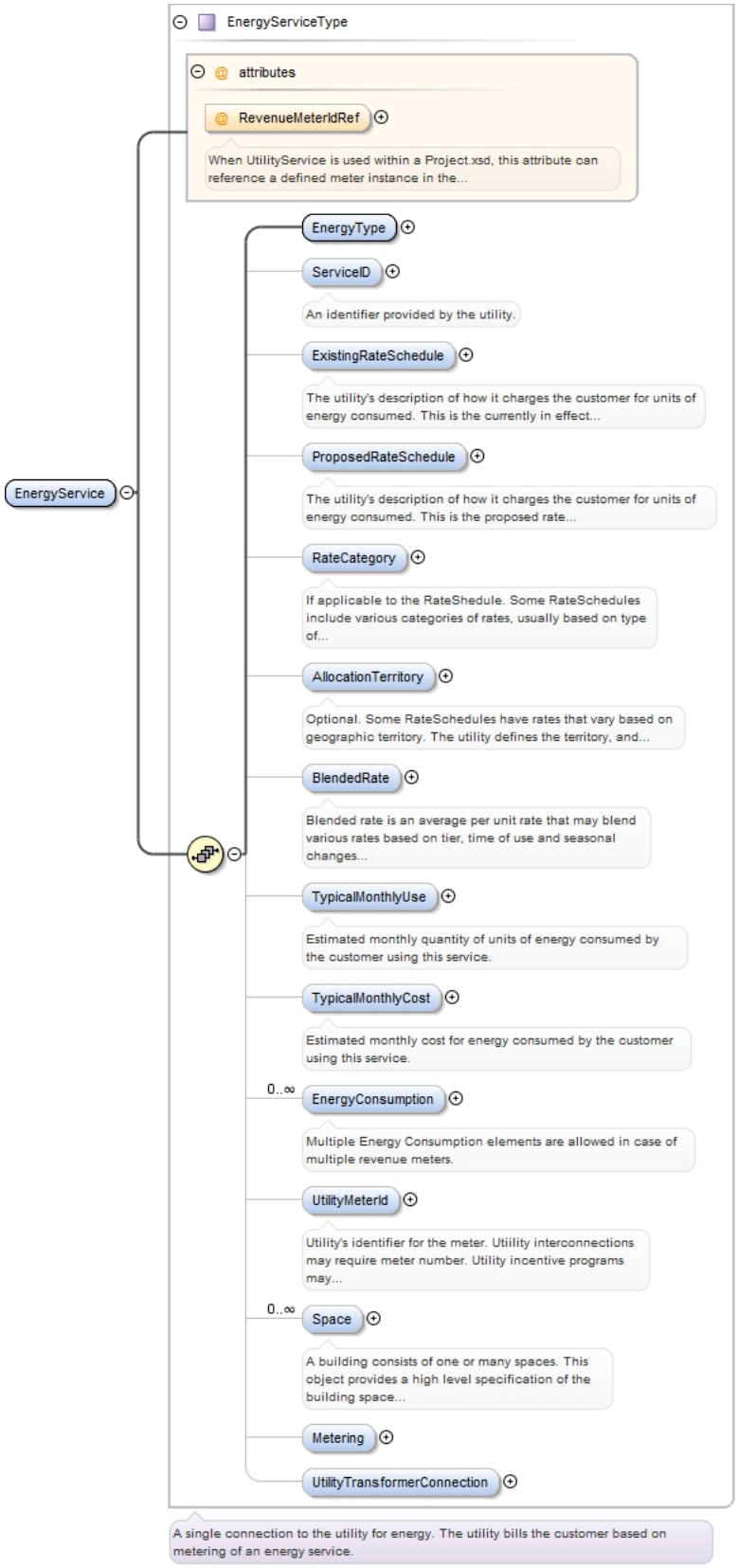
Namespace	No namespace
Annotations	Customer name.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="HostCustomerName" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Customer name.</xs:documentation> </xs:annotation> </xs:element>

Element UtilityAccountType / AccountNumber

Namespace	No namespace
Annotations	Identifier assigned by the utility.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="AccountNumber" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Identifier assigned by the utility.</xs:documentation> </xs:annotation>

	`</xs:element>`

Element `UtilityAccountType / EnergyService`

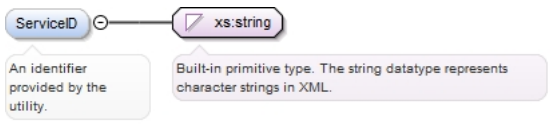
Namespace	No namespace
Diagram	
Type	EnergyServiceType

Properties	content: complex minOccurs: 1 maxOccurs: unbounded
Model	EnergyType , ServiceID{0,1} , ExistingRateSchedule{0,1} , ProposedRateSchedule{0,1} , RateCategory{0,1} , AllocationTerritory{0,1} , BlendedRate{0,1} , TypicalMonthlyUse{0,1} , TypicalMonthlyCost{0,1} , EnergyConsumption* , UtilityMeterId{0,1} , Space* , Metering{0,1} , UtilityTransformerConnection{0,1}
Children	AllocationTerritory, BlendedRate, EnergyConsumption, EnergyType, ExistingRateSchedule, Metering, ProposedRateSchedule, RateCategory, ServiceID, Space, TypicalMonthlyCost, TypicalMonthlyUse, UtilityMeterId, UtilityTransformerConnection
Instance	<EnergyService RevenueMeterIdRef=""> <EnergyType>{1,1}</EnergyType> <ServiceID>{0,1}</ServiceID> <ExistingRateSchedule>{0,1}</ExistingRateSchedule> <ProposedRateSchedule>{0,1}</ProposedRateSchedule> <RateCategory>{0,1}</RateCategory> <AllocationTerritory>{0,1}</AllocationTerritory> <BlendedRate Unit="">{0,1}</BlendedRate> <TypicalMonthlyUse RevenueMeterIdRef="">{0,1}</TypicalMonthlyUse> <TypicalMonthlyCost Unit="">{0,1}</TypicalMonthlyCost> <EnergyConsumption RevenueMeterIdRef="">{0,unbounded}</EnergyConsumption> <UtilityMeterId>{0,1}</UtilityMeterId> <Space>{0,unbounded}</Space> <Metering>{0,1}</Metering> <UtilityTransformerConnection>{0,1}</UtilityTransformerConnection> </EnergyService>
Attributes	**QName**: **RevenueMeterIdRef** — **Type**: xs:IDREF — **Fixed**: — **Default**: — **Use**: optional When UtilityService is used within a Project.xsd, this attribute can reference a defined meter instance in the ElectricalDistributionHierarchy, or within a PvSystem.
Source	<xs:element name="EnergyService" type="EnergyServiceType" minOccurs="1" maxOccurs="unbounded"/>

Element EnergyServiceType / EnergyType

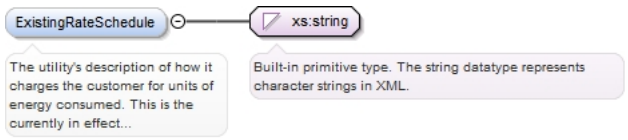
Namespace	No namespace
Diagram	
Type	EnergyUnitEnumType
Properties	content: simple
Facets	enumeration: BTU enumeration: Joules enumeration: KilowattHours enumeration: Therms
Source	<xs:element name="EnergyType" type="EnergyUnitEnumType"/>

Element EnergyServiceType / ServiceID

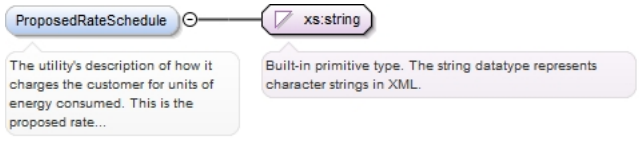
Namespace	No namespace
Annotations	An identifier provided by the utility.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element name="ServiceID" type="xs:string" minOccurs="0"> <xs:annotation>

```
    <xs:documentation>An identifier provided by the utility.</xs:documentation>
  </xs:annotation>
</xs:element>
```

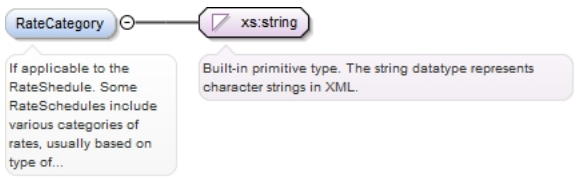
Element EnergyServiceType / ExistingRateSchedule

Namespace	No namespace
Annotations	The utility's description of how it charges the customer for units of energy consumed. This is the currently in effect rate schedule.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="ExistingRateSchedule" type="xs:string" maxOccurs="1" minOccurs="0"> <xs:annotation> <xs:documentation>The utility's description of how it charges the customer for units of energy consumed. This is the currently in effect rate schedule.</xs:documentation> </xs:annotation> </xs:element>

Element EnergyServiceType / ProposedRateSchedule

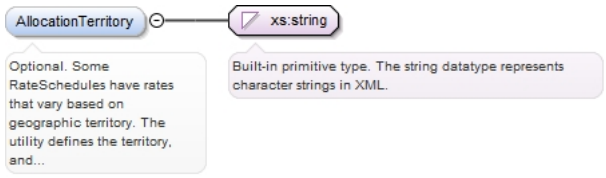
Namespace	No namespace
Annotations	The utility's description of how it charges the customer for units of energy consumed. This is the proposed rate schedule in cases where the project includes a change of rate schedule.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="ProposedRateSchedule" maxOccurs="1" minOccurs="0" type="xs:string"> <xs:annotation> <xs:documentation>The utility's description of how it charges the customer for units of energy consumed. This is the proposed rate schedule in cases where the project includes a change of rate schedule.</xs:documentation> </xs:annotation> </xs:element>

Element EnergyServiceType / RateCategory

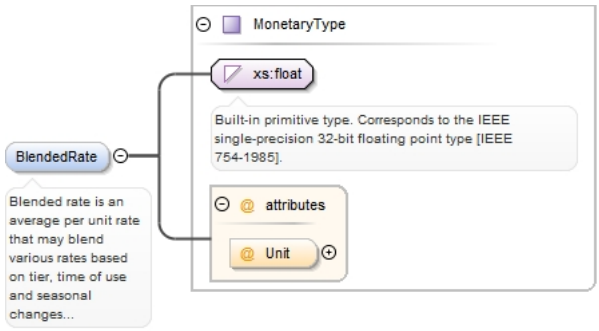
Namespace	No namespace
Annotations	If applicable to the RateShedule. Some RateSchedules include various categories of rates, usually based on type of customer (for example, "All Electric," "Low Income," etc).
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0

	maxOccurs: 1
Source	<xs:element name="RateCategory" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>If applicable to the RateShedule. Some RateSchedules include various categories of rates, usually based on type of customer (for example, "All Electric," "Low Income," etc).</xs:documentation> </xs:annotation> </xs:element>

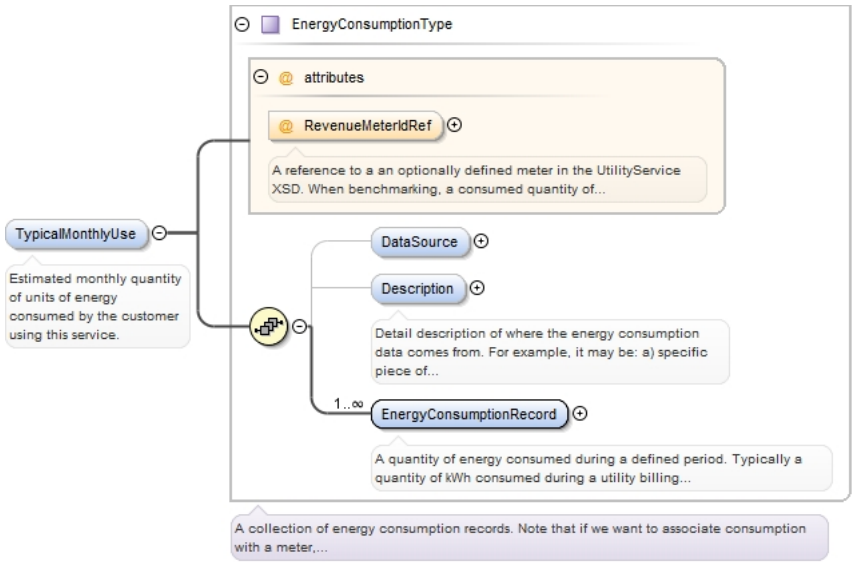
Element EnergyServiceType / AllocationTerritory

Namespace	No namespace
Annotations	Optional. Some RateSchedules have rates that vary based on geographic territory. The utility defines the territory, and this is their identifier. May be a name or a code.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="AllocationTerritory" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Optional. Some RateSchedules have rates that vary based on geographic territory. The utility defines the territory, and this is their identifier. May be a name or a code.</xs:documentation> </xs:annotation> </xs:element>

Element EnergyServiceType / BlendedRate

Namespace	No namespace
Annotations	Blended rate is an average per unit rate that may blend various rates based on tier, time of use and seasonal changes into a single rate. This will be in cents/kwh or dollars/therm
Diagram	
Type	MonetaryType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Attributes	**QName** | **Type** | **Fixed** | **Default** | **Use** **Unit** | MonetaryUnitEnumType | | | optional
Source	<xs:element name="BlendedRate" type="MonetaryType" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Blended rate is an average per unit rate that may blend various rates based on tier, time of use and seasonal changes into a single rate. This will be in cents/kwh or dollars/therm</xs:documentation> </xs:annotation> </xs:element>

Element EnergyServiceType / TypicalMonthlyUse

Namespace	No namespace
Annotations	Estimated monthly quantity of units of energy consumed by the customer using this service.
Diagram	
Type	EnergyConsumptionType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	DataSource{0,1} , Description{0,1} , EnergyConsumptionRecord+
Children	DataSource, Description, EnergyConsumptionRecord

Instance	`<TypicalMonthlyUse RevenueMeterIdRef="">`
	`  <DataSource>{0,1}</DataSource>`
	`  <Description>{0,1}</Description>`
	`  <EnergyConsumptionRecord>{1,unbounded}</EnergyConsumptionRecord>`
	`</TypicalMonthlyUse>`

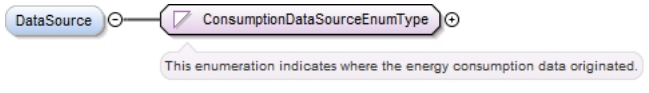
Attributes

QName	Type	Fixed	Default	Use
RevenueMeterIdRef	xs:IDREF			optional
	A reference to a an optionally defined meter in the UtilityService XSD. When benchmarking, a consumed quantity of energy must be associated to a defined revenue meter.			

Source

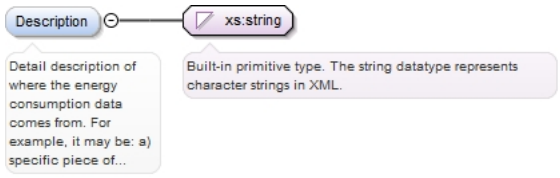
```
<xs:element name="TypicalMonthlyUse" type="EnergyConsumptionType" minOccurs="0"
 maxOccurs="1">
  <xs:annotation>
    <xs:documentation>Estimated monthly quantity of units of energy consumed by the
 customer using this service.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element EnergyConsumptionType / DataSource

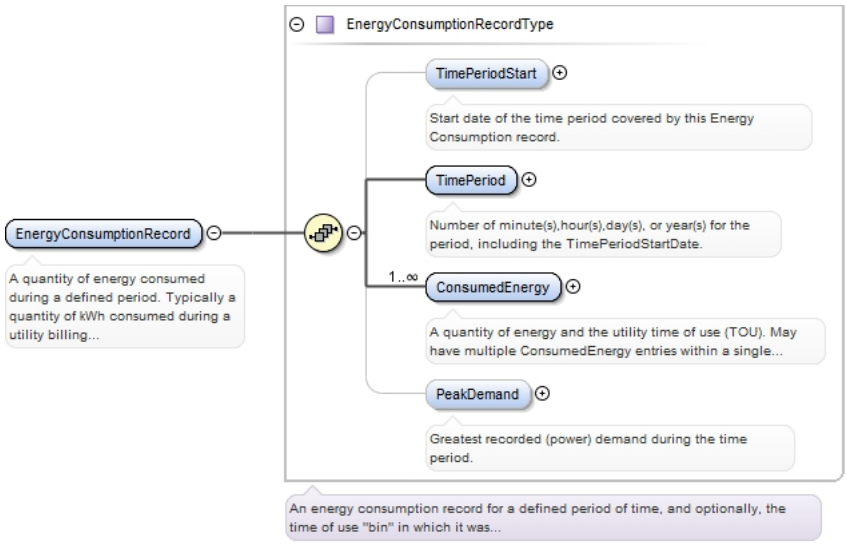
Namespace	No namespace
Diagram	
Type	ConsumptionDataSourceEnumType
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	enumeration: Utility Bill enumeration: Simulated

	enumeration	Rated
	enumeration	Measured
Source	<xs:element name="DataSource" type="ConsumptionDataSourceEnumType" minOccurs="0" maxOccurs="1"/>	

Element EnergyConsumptionType / Description

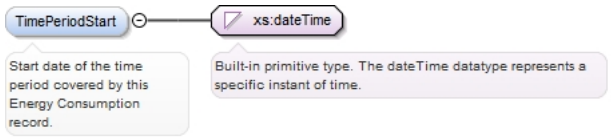
Namespace	No namespace
Annotations	Detail description of where the energy consumption data comes from. For example, it may be: a) specific piece of software, b) customer's bill, c) measurements, d) etc. This field may contain information about who captured the data.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Detail description of where the energy consumption data comes from. For example, it may be: a) specific piece of software, b) customer's bill, c) measurements, d) etc. This field may contain information about who captured the data.</xs:documentation> </xs:annotation> </xs:element>

Element EnergyConsumptionType / EnergyConsumptionRecord

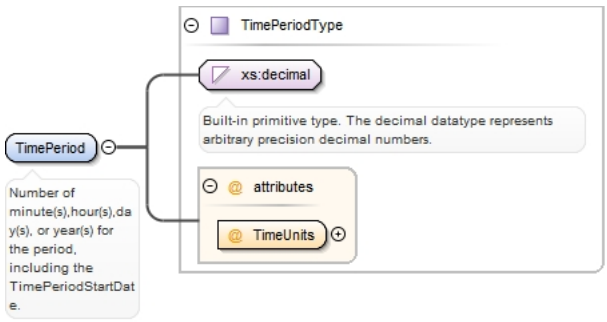
Namespace	No namespace
Annotations	A quantity of energy consumed during a defined period. Typically a quantity of kWh consumed during a utility billing period.
Diagram	
Type	EnergyConsumptionRecordType
Properties	content: complex minOccurs: 1 maxOccurs: unbounded
Model	TimePeriodStart{0,1} , TimePeriod , ConsumedEnergy+ , PeakDemand{0,1}
Children	ConsumedEnergy, PeakDemand, TimePeriod, TimePeriodStart
Instance	<EnergyConsumptionRecord>

	<TimePeriodStart>{0,1}</TimePeriodStart> <TimePeriod TimeUnits="">{1,1}</TimePeriod> <ConsumedEnergy>{1,unbounded}</ConsumedEnergy> <PeakDemand>{0,1}</PeakDemand> </EnergyConsumptionRecord>
Source	<xs:element name="EnergyConsumptionRecord" type="EnergyConsumptionRecordType" minOccurs="1" maxOccurs="unbounded"> <xs:annotation> <xs:documentation>A quantity of energy consumed during a defined period. Typically a quantity of kWh consumed during a utility billing period.</xs:documentation> </xs:annotation> </xs:element>

Element EnergyConsumptionRecordType / TimePeriodStart

Namespace	No namespace
Annotations	Start date of the time period covered by this Energy Consumption record.
Diagram	
Type	xs:dateTime
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="TimePeriodStart" type="xs:dateTime" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Start date of the time period covered by this Energy Consumption record.</xs:documentation> </xs:annotation> </xs:element>

Element EnergyConsumptionRecordType / TimePeriod

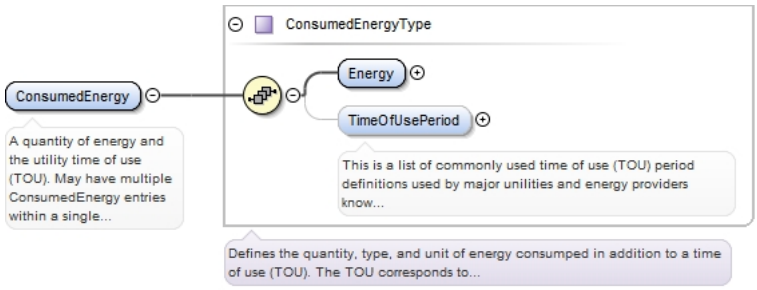
Namespace	No namespace
Annotations	Number of minute(s),hour(s),day(s), or year(s) for the period, including the TimePeriodStartDate.
Diagram	
Type	TimePeriodType
Properties	content: complex minOccurs: 1 maxOccurs: 1

Attributes

QName	Type	Fixed	Default	Use
TimeUnits	TimeUnitEnumType			required

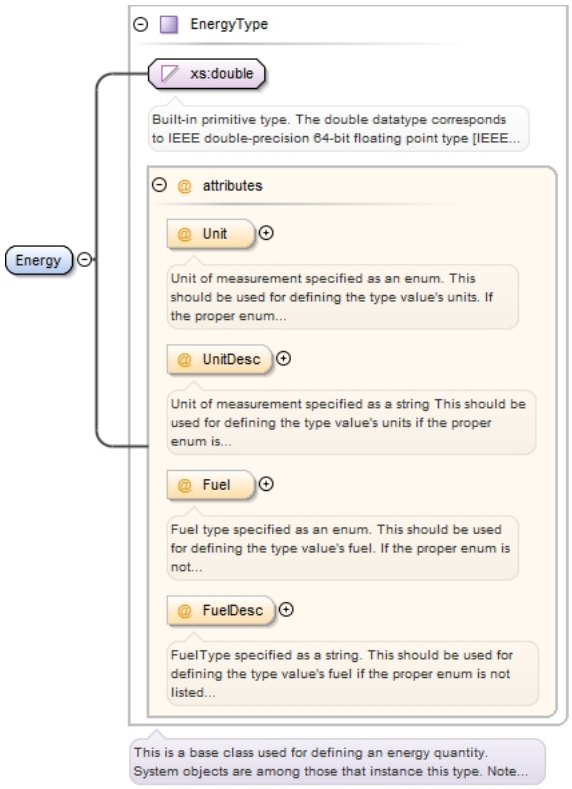
Source	<xs:element name="TimePeriod" minOccurs="1" maxOccurs="1" type="TimePeriodType"> <xs:annotation> <xs:documentation>Number of minute(s),hour(s),day(s), or year(s) for the period, including the TimePeriodStartDate.</xs:documentation> </xs:annotation> </xs:element>

Element EnergyConsumptionRecordType / ConsumedEnergy

Namespace	No namespace
Annotations	A quantity of energy and the utility time of use (TOU). May have multiple ConsumedEnergy entries within a single EnergyConsumptionRecord to account for different types of energy (for example, electrcity and natural gas), as well as to account for multiple time of use periods during the metered TimePeriod.
Diagram	
Type	ConsumedEnergyType
Properties	content: complex minOccurs: 1 maxOccurs: unbounded
Model	Energy , TimeOfUsePeriod{0,1}
Children	Energy, TimeOfUsePeriod
Instance	<ConsumedEnergy> <Energy Fuel="" FuelDesc="" Unit="" UnitDesc="">{1,1}</Energy> <TimeOfUsePeriod>{0,1}</TimeOfUsePeriod> </ConsumedEnergy>
Source	<xs:element name="ConsumedEnergy" type="ConsumedEnergyType" minOccurs="1" maxOccurs="unbounded"> <xs:annotation> <xs:documentation>A quantity of energy and the utility time of use (TOU). May have multiple ConsumedEnergy entries within a single EnergyConsumptionRecord to account for different types of energy (for example, electrcity and natural gas), as well as to account for multiple time of use periods during the metered TimePeriod.</xs:documentation> </xs:annotation> </xs:element>

Element ConsumedEnergyType / Energy

Namespace	No namespace

Diagram	
Type	EnergyType
Properties	content: `complex` minOccurs: `1` maxOccurs: `1`

Attributes

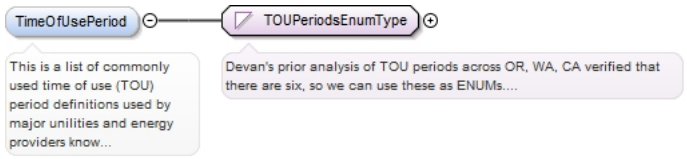
QName	Type	Fixed	Default	Use
Fuel	EnergyClassEnumType			optional
	`Fuel type specified as an enum. This should be used for defining the type value's fuel. If the proper enum is not listed, please use the FuelDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.`			
FuelDesc	xs:string			optional
	`FuelType specified as a string. This should be used for defining the type value's fuel if the proper enum is not listed in Fuel. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.`			
Unit	EnergyUnitEnumType			optional
	`Unit of measurement specified as an enum. This should be used for defining the type value's units. If the proper enum is not listed, please use the UnitDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.`			
UnitDesc	xs:string			optional
	`Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.`			

Source

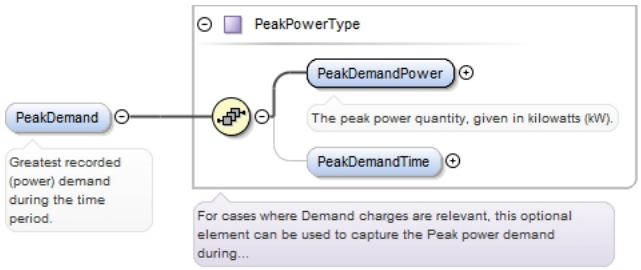
```
<xs:element name="Energy" type="EnergyType" minOccurs="1" maxOccurs="1"/>
```

Element `ConsumedEnergyType / TimeOfUsePeriod`

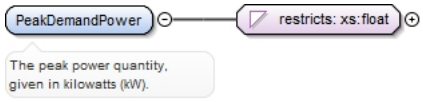
Namespace	No namespace

Annotations	This is a list of commonly used time of use (TOU) period definitions used by major unilities and energy providers know by the authors. Typically, the rate structure (cost per unit of energy) varies with TOU.
Diagram	
Type	TOUPeriodsEnumType
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	enumeration: Base enumeration: Off enumeration: Off-Peak enumeration: Off-Peak (P4) enumeration: Pre-Peak enumeration: Post-Peak enumeration: Light Load enumeration: Low Load enumeration: Low Load A enumeration: Low Load B enumeration: Low Peak enumeration: Part-Peak enumeration: Partial Peak enumeration: Intermediate Peak enumeration: Semi-Peak enumeration: Mid-Peak enumeration: Mid-Peak (P2) enumeration: On enumeration: Peak enumeration: On-Peak enumeration: On-Peak (P1) enumeration: On-Peak (P3) enumeration: Shoulder-Peak enumeration: Super-Peak enumeration: Heavy Load enumeration: High Peak enumeration: New Period enumeration: Summer Off-Peak enumeration: Summer Part-Peak enumeration: Summer Peak enumeration: Winter Off-Peak enumeration: Winter Part-Peak enumeration: Winter Peak
Source	<xs:element name="TimeOfUsePeriod" type="TOUPeriodsEnumType" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is a list of commonly used time of use (TOU) period definitions used by major unilities and energy providers know by the authors. Typically, the rate structure (cost per unit of energy) varies with TOU.</xs:documentation> </xs:annotation> </xs:element>

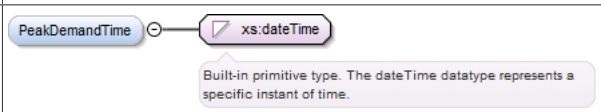
Element EnergyConsumptionRecordType / PeakDemand

Namespace	No namespace
Annotations	Greatest recorded (power) demand during the time period.
Diagram	
Type	PeakPowerType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	PeakDemandPower , PeakDemandTime{0,1}
Children	PeakDemandPower, PeakDemandTime
Instance	<PeakDemand> <PeakDemandPower>{1,1}</PeakDemandPower> <PeakDemandTime>{0,1}</PeakDemandTime> </PeakDemand>
Source	<xs:element name="PeakDemand" type="PeakPowerType" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Greatest recorded (power) demand during the time period.</xs:documentation> </xs:annotation> </xs:element>

Element PeakPowerType / PeakDemandPower

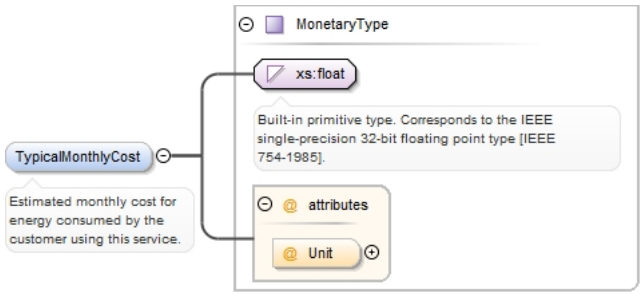
Namespace	No namespace
Annotations	The peak power quantity, given in kilowatts (kW).
Diagram	
Type	restriction of xs:float
Properties	content: simple minOccurs: 1 maxOccurs: 1
Facets	minInclusive 0
Source	<xs:element name="PeakDemandPower" minOccurs="1" maxOccurs="1"> <xs:annotation> <xs:documentation>The peak power quantity, given in kilowatts (kW).</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:float"> <xs:minInclusive value="0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PeakPowerType / PeakDemandTime

Namespace	No namespace
Diagram	
Type	xs:dateTime

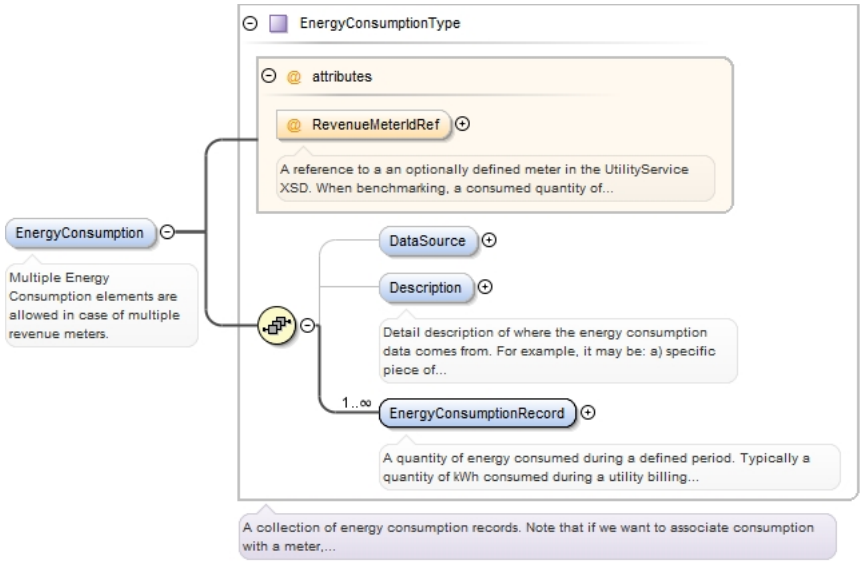
Properties	content:	simple
	minOccurs:	0
	maxOccurs:	1
Source	`<xs:element name="PeakDemandTime" type="xs:dateTime" minOccurs="0" maxOccurs="1"/>`	

Element EnergyServiceType / TypicalMonthlyCost

Namespace	No namespace
Annotations	Estimated monthly cost for energy consumed by the customer using this service.
Diagram	
Type	MonetaryType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / MonetaryUnitEnumType / / / optional

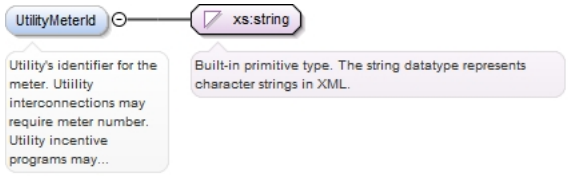
Source	`<xs:element name="TypicalMonthlyCost" type="MonetaryType" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>Estimated monthly cost for energy consumed by the customer using this service.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element EnergyServiceType / EnergyConsumption

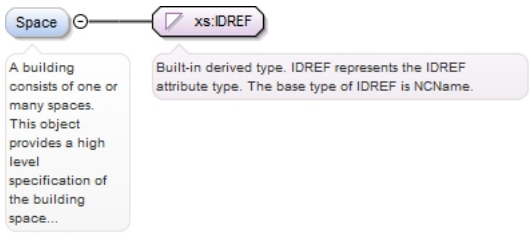
Namespace	No namespace
Annotations	Multiple Energy Consumption elements are allowed in case of multiple revenue meters.
Diagram	
Type	EnergyConsumptionType
Properties	content: complex minOccurs: 0

	maxOccurs: unbounded
Model	DataSource{0,1} , Description{0,1} , EnergyConsumptionRecord+
Children	DataSource, Description, EnergyConsumptionRecord
Instance	<EnergyConsumption RevenueMeterIdRef=""> <DataSource>{0,1}</DataSource> <Description>{0,1}</Description> <EnergyConsumptionRecord>{1,unbounded}</EnergyConsumptionRecord> </EnergyConsumption>
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **RevenueMeterIdRef** / xs:IDREF / / / optional A reference to a an optionally defined meter in the UtilityService XSD. When benchmarking, a consumed quantity of energy must be associated to a defined revenue meter.
Source	<xs:element name="EnergyConsumption" type="EnergyConsumptionType" minOccurs="0" maxOccurs="unbounded"> <xs:annotation> <xs:documentation>Multiple Energy Consumption elements are allowed in case of multiple revenue meters.</xs:documentation> </xs:annotation> </xs:element>

Element EnergyServiceType / UtilityMeterId

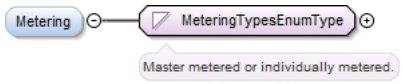
Namespace	No namespace
Annotations	Utility's identifier for the meter. Utiility interconnections may require meter number. Utility incentive programs may require meter id as well.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="UtilityMeterId" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Utility's identifier for the meter. Utiility interconnections may require meter number. Utility incentive programs may require meter id as well.</xs:documentation> </xs:annotation> </xs:element>

Element EnergyServiceType / Space

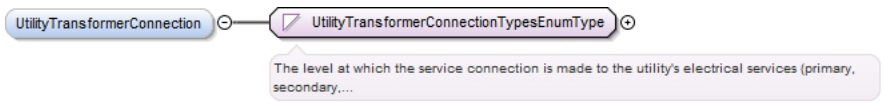
Namespace	No namespace
Annotations	A building consists of one or many spaces. This object provides a high level specification of the building space profile intended for use with Projects and simulations such as SaveEnergy123 and Portfolio Manager. https://saveenergy123.com/ http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager
Diagram	

Type	xs:IDREF
Properties	content: simple minOccurs: 0 maxOccurs: unbounded
Source	<xs:element name="Space" type="xs:IDREF" minOccurs="0" maxOccurs="unbounded"> <xs:annotation> <xs:documentation>A building consists of one or many spaces. This object provides a high level specification of the building space profile intended for use with Projects and simulations such as SaveEnergy123 and Portfolio Manager. https://saveenergy123.com/ http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager</xs:documentation> </xs:annotation> </xs:element>

Element EnergyServiceType / Metering

Namespace	No namespace
Diagram	
Type	MeteringTypesEnumType
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	enumeration Individually Metered enumeration Master Metered
Source	<xs:element name="Metering" type="MeteringTypesEnumType" minOccurs="0" maxOccurs="1"/>

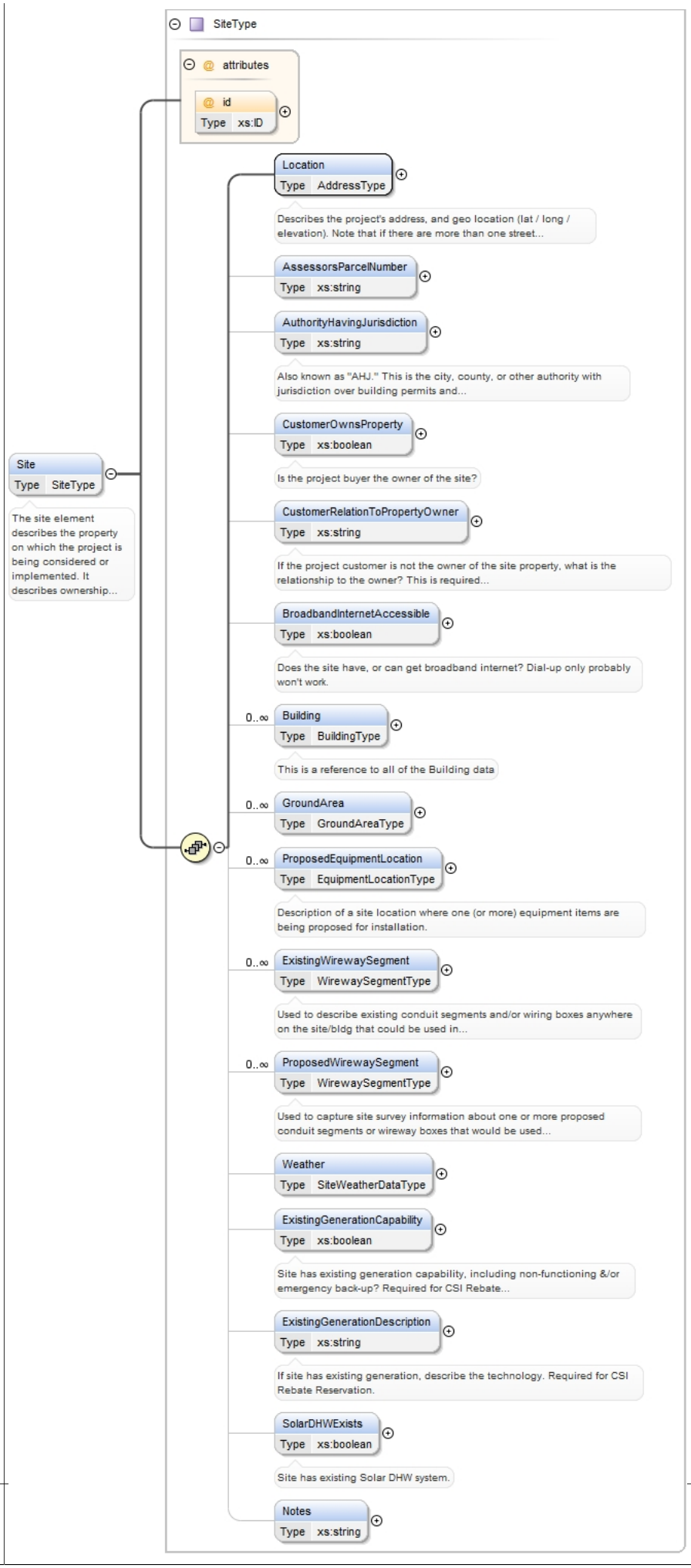
Element EnergyServiceType / UtilityTransformerConnection

Namespace	No namespace
Diagram	
Type	UtilityTransformerConnectionTypesEnumType
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	enumeration Secondary enumeration Transmission enumeration Primary
Source	<xs:element name="UtilityTransformerConnection" type="UtilityTransformerConnectionTypesEnumType" minOccurs="0" maxOccurs="1"/>

Element ProjectType / Site

Namespace	No namespace
Annotations	The site element describes the property on which the project is being considered or implemented. It describes ownership and jurisdictional information, as well as physical attributes. It inlcudes elements describing both buildings and grounds. The Site element is particularly useful for capturing site audit data prior to defining specific measures, including relevant data about locations for where proposed energy system equipment can be placed.

Diagram


Site
Type SiteType
The site element describes the property on which the project is being considered or implemented. It describes ownership...
SiteType
attributes
id
Type xs:ID
Location
Type AddressType
Describes the project's address, and geo location (lat / long / elevation). Note that if there are more than one street...
AssessorsParcelNumber
Type xs:string
AuthorityHavingJurisdiction
Type xs:string
Also known as "AHJ." This is the city, county, or other authority with jurisdiction over building permits and...
CustomerOwnsProperty
Type xs:boolean
Is the project buyer the owner of the site?
CustomerRelationToPropertyOwner
Type xs:string
If the project customer is not the owner of the site property, what is the relationship to the owner? This is required...
BroadbandInternetAccessible
Type xs:boolean
Does the site have, or can get broadband internet? Dial-up only probably won't work.
0..∞
Building
Type BuildingType
This is a reference to all of the Building data
0..∞
GroundArea
Type GroundAreaType
0..∞
ProposedEquipmentLocation
Type EquipmentLocationType
Description of a site location where one (or more) equipment items are being proposed for installation.
0..∞
ExistingWirewaySegment
Type WirewaySegmentType
Used to describe existing conduit segments and/or wiring boxes anywhere on the site/bldg that could be used in...
0..∞
ProposedWirewaySegment
Type WirewaySegmentType
Used to capture site survey information about one or more proposed conduit segments or wireway boxes that would be used...
Weather
Type SiteWeatherDataType
ExistingGenerationCapability
Type xs:boolean
Site has existing generation capability, including non-functioning &/or emergency back-up? Required for CSI Rebate...
ExistingGenerationDescription
Type xs:string
If site has existing generation, describe the technology. Required for CSI Rebate Reservation.
SolarDHWExists
Type xs:boolean
Site has existing Solar DHW system.
Notes
Type xs:string

Type	SiteType
Properties	content: complex minOccurs: 0
Model	Location , AssessorsParcelNumber{0,1} , AuthorityHavingJurisdiction{0,1} , CustomerOwnsProperty{0,1} , CustomerRelationToPropertyOwner{0,1} , BroadbandInternetAccessible{0,1} , Building* , GroundArea* , ProposedEquipmentLocation* , ExistingWirewaySegment* , ProposedWirewaySegment* , Weather{0,1} , ExistingGenerationCapability{0,1} , ExistingGenerationDescription{0,1} , SolarDHWExists{0,1} , Notes{0,1}
Children	AssessorsParcelNumber, AuthorityHavingJurisdiction, BroadbandInternetAccessible, Building, CustomerOwnsProperty, CustomerRelationToPropertyOwner, ExistingGenerationCapability, ExistingGenerationDescription, ExistingWirewaySegment, GroundArea, Location, Notes, ProposedEquipmentLocation, ProposedWirewaySegment, SolarDHWExists, Weather

Instance

```
<Site id="">
  <Location>{1,1}</Location>
  <AssessorsParcelNumber>{0,1}</AssessorsParcelNumber>
  <AuthorityHavingJurisdiction>{0,1}</AuthorityHavingJurisdiction>
  <CustomerOwnsProperty>{0,1}</CustomerOwnsProperty>
  <CustomerRelationToPropertyOwner>{0,1}</CustomerRelationToPropertyOwner>
  <BroadbandInternetAccessible>{0,1}</BroadbandInternetAccessible>
  <Building id="">{0,unbounded}</Building>
  <GroundArea id="">{0,unbounded}</GroundArea>
  <ProposedEquipmentLocation>{0,unbounded}</ProposedEquipmentLocation>
  <ExistingWirewaySegment EquipmentDefinitionIdRef="" id="">{0,unbounded}</
ExistingWirewaySegment>
  <ProposedWirewaySegment EquipmentDefinitionIdRef="" id="">{0,unbounded}</
ProposedWirewaySegment>
  <Weather>{0,1}</Weather>
  <ExistingGenerationCapability>{0,1}</ExistingGenerationCapability>
  <ExistingGenerationDescription>{0,1}</ExistingGenerationDescription>
  <SolarDHWExists>{0,1}</SolarDHWExists>
  <Notes>{0,1}</Notes>
</Site>
```

Attributes

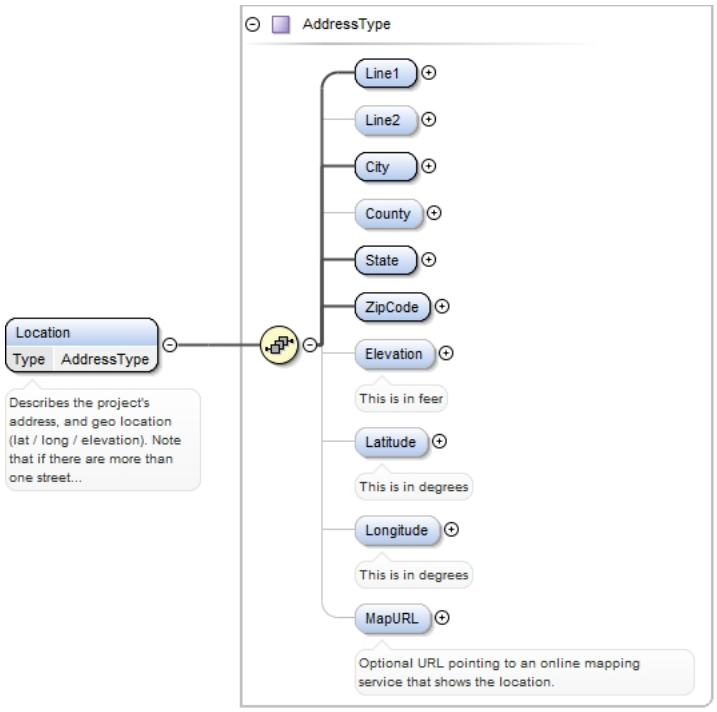
QName	Type	Fixed	Default	Use
id	xs:ID			optional

Source

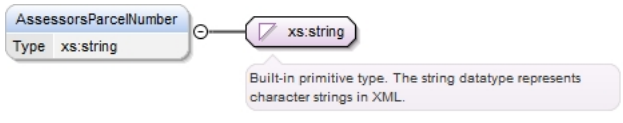
```
<xs:element name="Site" type="SiteType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>The site element describes the property on which the project is
 being considered or implemented. It describes ownership and jurisdictional information,
 as well as physical attributes. It inlcudes elements describing both buildings and
 grounds. The Site element is particularly useful for capturing site audit data prior to
 defining specific measures, including relevant data about locations for where proposed
 energy system equipment can be placed.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element SiteType / Location

Namespace	No namespace
Annotations	Describes the project's address, and geo location (lat / long / elevation). Note that if there are more than one street address, the model forces these to be separate Sites/Projects. If a Building on the project site has more than one street address, only one is required to identify the location.

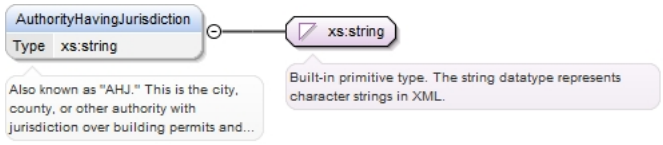
Diagram	
Type	AddressType
Properties	content: complex minOccurs: 1 maxOccurs: 1
Model	Line1 , Line2{0,1} , City , County{0,1} , State , ZipCode , Elevation{0,1} , Latitude{0,1} , Longitude{0,1} , MapURL{0,1}
Children	City, County, Elevation, Latitude, Line1, Line2, Longitude, MapURL, State, ZipCode
Instance	<Location> <Line1>{1,1}</Line1> <Line2>{0,1}</Line2> <City>{1,1}</City> <County>{0,1}</County> <State>{1,1}</State> <ZipCode>{1,1}</ZipCode> <Elevation>{0,1}</Elevation> <Latitude>{0,1}</Latitude> <Longitude>{0,1}</Longitude> <MapURL>{0,1}</MapURL> </Location>
Source	<xs:element maxOccurs="1" minOccurs="1" name="Location" type="AddressType"> <xs:annotation> <xs:documentation>Describes the project's address, and geo location (lat / long / elevation). Note that if there are more than one street address, the model forces these to be separate Sites/Projects. If a Building on the project site has more than one street address, only one is required to identify the location.</xs:documentation> </xs:annotation> </xs:element>

Element SiteType / AssessorsParcelNumber

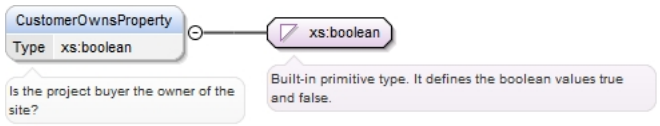
Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	<xs:element maxOccurs="1" minOccurs="0" name="AssessorsParcelNumber" type="xs:string"/>

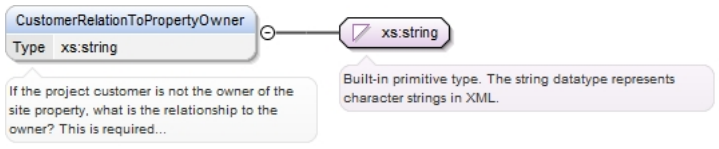
Element SiteType / AuthorityHavingJurisdiction

Namespace	No namespace
Annotations	Also known as "AHJ." This is the city, county, or other authority with jurisdiction over building permits and inspections.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="AuthorityHavingJurisdiction" type="xs:string"> <xs:annotation> <xs:documentation>Also known as "AHJ." This is the city, county, or other authority with jurisdiction over building permits and inspections.</xs:documentation> </xs:annotation> </xs:element>

Element SiteType / CustomerOwnsProperty

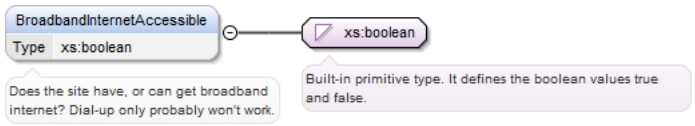
Namespace	No namespace
Annotations	Is the project buyer the owner of the site?
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="CustomerOwnsProperty" type="xs:boolean"> <xs:annotation> <xs:documentation>Is the project buyer the owner of the site?</xs:documentation> </xs:annotation> </xs:element>

Element SiteType / CustomerRelationToPropertyOwner

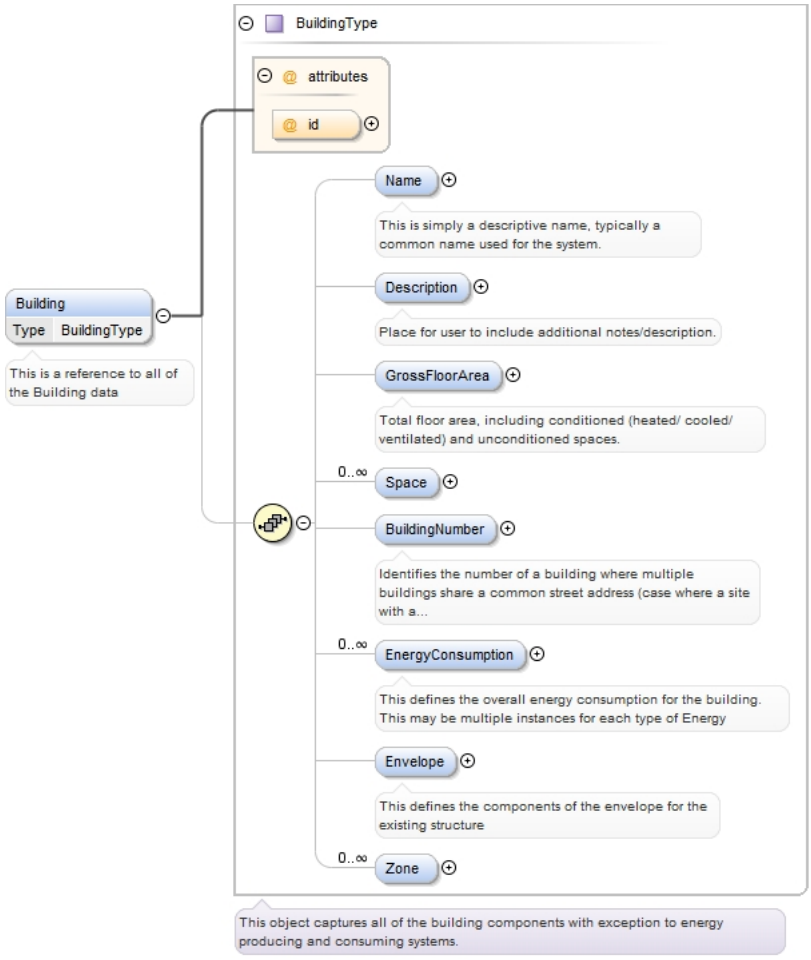
Namespace	No namespace
Annotations	If the project customer is not the owner of the site property, what is the relationship to the owner? This is required for CSI incentive application.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="CustomerRelationToPropertyOwner" type="xs:string"> <xs:annotation>

```
    <xs:documentation>If the project customer is not the owner of the site property,
 what is the relationship to the owner? This is required for CSI incentive application.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

Element SiteType / BroadbandInternetAccessible

Namespace	No namespace
Annotations	Does the site have, or can get broadband internet? Dial-up only probably won't work.
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="BroadbandInternetAccessible" type="xs:boolean"> <xs:annotation> <xs:documentation>Does the site have, or can get broadband internet? Dial-up only probably won't work.</xs:documentation> </xs:annotation> </xs:element>

Element SiteType / Building

Namespace	No namespace
Annotations	This is a reference to all of the Building data
Diagram	

Type	BuildingType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , Description{0,1} , GrossFloorArea{0,1} , Space* , BuildingNumber{0,1} , EnergyConsumption* , Envelope{0,1} , Zone*
Children	BuildingNumber, Description, EnergyConsumption, Envelope, GrossFloorArea, Name, Space, Zone
Instance	<Building id=""> <Name>{0,1}</Name> <Description>{0,1}</Description> <GrossFloorArea Unit="SquareMeters">{0,1}</GrossFloorArea> <Space id="">{0,unbounded}</Space> <BuildingNumber>{0,1}</BuildingNumber> <EnergyConsumption RevenueMeterIdRef="">{0,unbounded}</EnergyConsumption> <Envelope id="">{0,1}</Envelope> <Zone id="">{0,unbounded}</Zone> </Building>

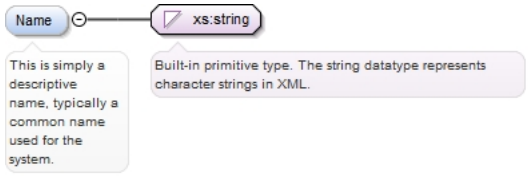
Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			optional

Source

```
<xs:element name="Building" type="BuildingType" minOccurs="0" maxOccurs="unbounded">
  <xs:annotation>
    <xs:documentation>This is a reference to all of the Building data</xs:documentation>
  </xs:annotation>
</xs:element>
```

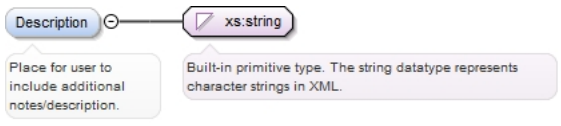
Element BuildingType / Name

Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source

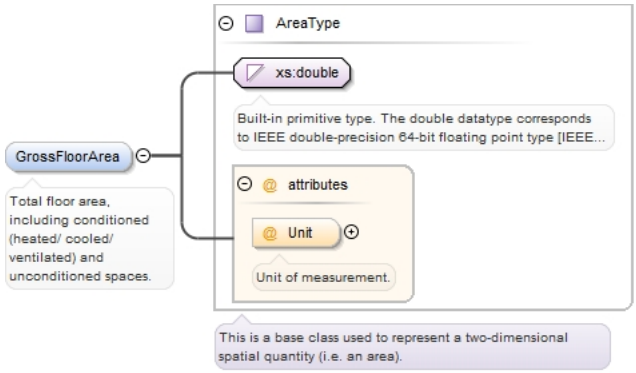
```
<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>This is simply a descriptive name, typically a common name used for
 the system.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element BuildingType / Description

Namespace	No namespace
Annotations	Place for user to include additional notes/description.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	<xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string"> <xs:annotation> <xs:documentation>Place for user to include additional notes/description.</ xs:documentation> </xs:annotation> </xs:element>

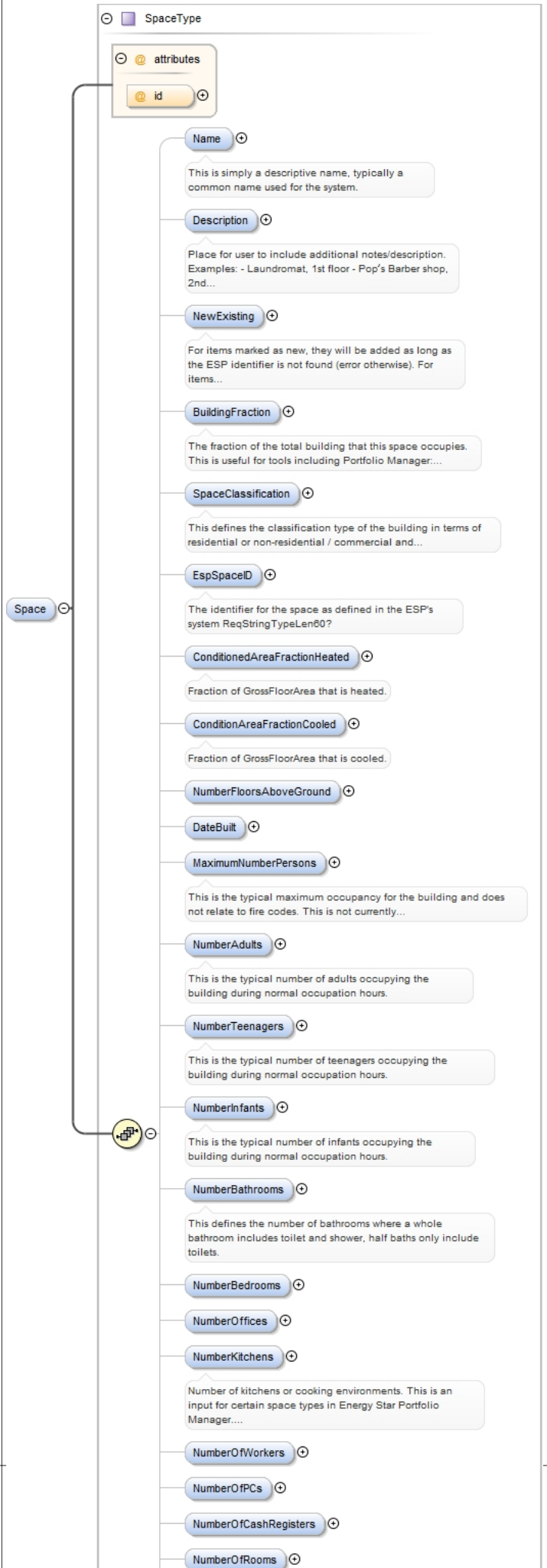
Element BuildingType / GrossFloorArea

Namespace	No namespace
Annotations	Total floor area, including conditioned (heated/ cooled/ ventilated) and unconditioned spaces.
Diagram	
Type	AreaType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / AreaUnitEnumType / / SquareMeters / optional Unit of measurement.
Source	<xs:element name="GrossFloorArea" type="AreaType" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Total floor area, including conditioned (heated/ cooled/ ventilated) and unconditioned spaces.</xs:documentation> </xs:annotation> </xs:element>

Element BuildingType / Space

Namespace	No namespace

Diagram


SpaceType
attributes
id
Space
Name
This is simply a descriptive name, typically a common name used for the system.
Description
Place for user to include additional notes/description. Examples: - Laundromat, 1st floor - Pop's Barber shop, 2nd...
NewExisting
For items marked as new, they will be added as long as the ESP identifier is not found (error otherwise). For items...
BuildingFraction
The fraction of the total building that this space occupies. This is useful for tools including Portfolio Manager:...
SpaceClassification
This defines the classification type of the building in terms of residential or non-residential / commercial and...
EspSpaceID
The identifier for the space as defined in the ESP's system ReqStringTypeLen60?
ConditionedAreaFractionHeated
Fraction of GrossFloorArea that is heated.
ConditionAreaFractionCooled
Fraction of GrossFloorArea that is cooled.
NumberFloorsAboveGround
DateBuilt
MaximumNumberPersons
This is the typical maximum occupancy for the building and does not relate to fire codes. This is not currently...
NumberAdults
This is the typical number of adults occupying the building during normal occupation hours.
NumberTeenagers
This is the typical number of teenagers occupying the building during normal occupation hours.
NumberInfants
This is the typical number of infants occupying the building during normal occupation hours.
NumberBathrooms
This defines the number of bathrooms where a whole bathroom includes toilet and shower, half baths only include toilets.
NumberBedrooms
NumberOffices
NumberKitchens
Number of kitchens or cooking environments. This is an input for certain space types in Energy Star Portfolio Manager....
NumberOfWorkers
NumberOfPCs
NumberOfCashRegisters
NumberOfRooms

Type	SpaceType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , Description{0,1} , NewExisting{0,1} , BuildingFraction{0,1} , SpaceClassification{0,1} , EspSpaceID{0,1} , ConditionedAreaFractionHeated{0,1} , ConditionAreaFractionCooled{0,1} , NumberFloorsAboveGround{0,1} , DateBuilt{0,1} , MaximumNumberPersons{0,1} , NumberAdults{0,1} , NumberTeenagers{0,1} , NumberInfants{0,1} , NumberBathrooms{0,1} , NumberBedrooms{0,1} , NumberOffices{0,1} , NumberKitchens{0,1} , NumberOfWorkers{0,1} , NumberOfPCs{0,1} , NumberOfCashRegisters{0,1} , NumberOfRooms{0,1} , NumberOfUnits{0,1} , newElement{0,1} , AverageNumberOfResidents{0,1} , ResidentCapacity{0,1} , SeatingCapacity{0,1} , PresenceOfCookingFacilities{0,1} , NumberOfReachInRefrigerators{0,1} , NumberOfWalkInRefrigerators{0,1} , NumberOfCommericalWashingMachines{0,1} , NumberOfResidentialWashingMachines{0,1} , NumberOfResidentialElectronicLifts{0,1} , AnnualITEnergy{0,1} , WeekdayOperation{0,1} , OpenWeekends{0,1} , ExteriorEntrance{0,1} , WeeklyOperatingHours{0,1}
Children	AnnualITEnergy, AverageNumberOfResidents, BuildingFraction, ConditionAreaFractionCooled, ConditionedAreaFractionHeated, DateBuilt, Description, EspSpaceID, ExteriorEntrance, MaximumNumberPersons, Name, NewExisting, NumberAdults, NumberBathrooms, NumberBedrooms, NumberFloorsAboveGround, NumberInfants, NumberKitchens, NumberOfCashRegisters, NumberOfCommericalWashingMachines, NumberOfPCs, NumberOfReachInRefrigerators, NumberOfResidentialElectronicLifts, NumberOfResidentialWashingMachines, NumberOfRooms, NumberOfUnits, NumberOfWalkInRefrigerators, NumberOfWorkers, NumberOffices, NumberTeenagers, OpenWeekends, PresenceOfCookingFacilities, ResidentCapacity, SeatingCapacity, SpaceClassification, WeekdayOperation, WeeklyOperatingHours, newElement

Instance

```
<Space id="">
  <Name>{0,1}</Name>
  <Description>{0,1}</Description>
  <NewExisting>{0,1}</NewExisting>
  <BuildingFraction>{0,1}</BuildingFraction>
  <SpaceClassification>{0,1}</SpaceClassification>
  <EspSpaceID>{0,1}</EspSpaceID>
  <ConditionedAreaFractionHeated>{0,1}</ConditionedAreaFractionHeated>
  <ConditionAreaFractionCooled>{0,1}</ConditionAreaFractionCooled>
  <NumberFloorsAboveGround>{0,1}</NumberFloorsAboveGround>
  <DateBuilt>{0,1}</DateBuilt>
  <MaximumNumberPersons>{0,1}</MaximumNumberPersons>
  <NumberAdults>{0,1}</NumberAdults>
  <NumberTeenagers>{0,1}</NumberTeenagers>
  <NumberInfants>{0,1}</NumberInfants>
  <NumberBathrooms>{0,1}</NumberBathrooms>
  <NumberBedrooms>{0,1}</NumberBedrooms>
  <NumberOffices>{0,1}</NumberOffices>
  <NumberKitchens>{0,1}</NumberKitchens>
  <NumberOfWorkers>{0,1}</NumberOfWorkers>
  <NumberOfPCs>{0,1}</NumberOfPCs>
  <NumberOfCashRegisters>{0,1}</NumberOfCashRegisters>
  <NumberOfRooms>{0,1}</NumberOfRooms>
  <NumberOfUnits>{0,1}</NumberOfUnits>
  <newElement>{0,1}</newElement>
  <AverageNumberOfResidents>{0,1}</AverageNumberOfResidents>
  <ResidentCapacity>{0,1}</ResidentCapacity>
  <SeatingCapacity>{0,1}</SeatingCapacity>
  <PresenceOfCookingFacilities>{0,1}</PresenceOfCookingFacilities>
  <NumberOfReachInRefrigerators>{0,1}</NumberOfReachInRefrigerators>
  <NumberOfWalkInRefrigerators>{0,1}</NumberOfWalkInRefrigerators>
  <NumberOfCommericalWashingMachines>{0,1}</NumberOfCommericalWashingMachines>
  <NumberOfResidentialWashingMachines>{0,1}</NumberOfResidentialWashingMachines>
  <NumberOfResidentialElectronicLifts>{0,1}</NumberOfResidentialElectronicLifts>
  <AnnualITEnergy>{0,1}</AnnualITEnergy>
  <WeekdayOperation>{0,1}</WeekdayOperation>
  <OpenWeekends>{0,1}</OpenWeekends>
  <ExteriorEntrance>{0,1}</ExteriorEntrance>
  <WeeklyOperatingHours>{0,1}</WeeklyOperatingHours>
</Space>
```

Attributes

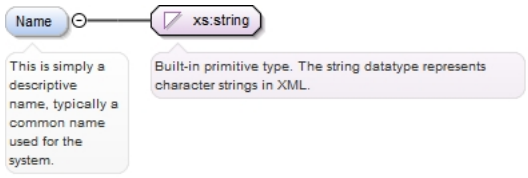
QName	Type	Fixed	Default	Use
id	xs:ID			optional

Source

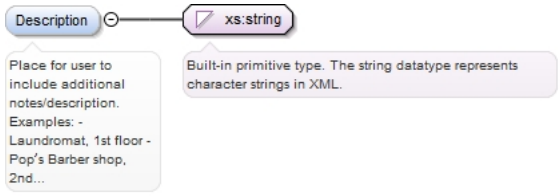
```
<xs:element name="Space" type="SpaceType" minOccurs="0" maxOccurs="unbounded"/>
```

Element SpaceType / Name

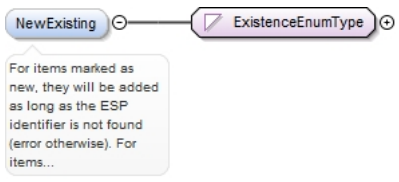
Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.

Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is simply a descriptive name, typically a common name used for the system.</xs:documentation> </xs:annotation> </xs:element>

Element SpaceType / Description

Namespace	No namespace
Annotations	Place for user to include additional notes/description. Examples: - Laundromat, 1st floor - Pop's Barber shop, 2nd floor - Apartments, floors 3-6
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string"> <xs:annotation> <xs:documentation>Place for user to include additional notes/description. Examples: - Laundromat, 1st floor - Pop's Barber shop, 2nd floor - Apartments, floors 3-6</ xs:documentation> </xs:annotation> </xs:element>

Element SpaceType / NewExisting

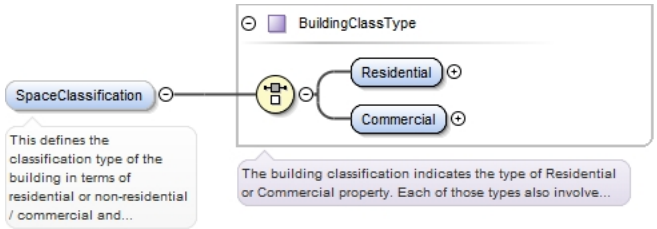
Namespace	No namespace
Annotations	For items marked as new, they will be added as long as the ESP identifier is not found (error otherwise). For items marked as existing, only updates will be performed if the ESP identifier is found (error otherwise). For items marked unknown, they will be created if the ESP identifier is not found and updated if the ESP identifier is found (similar to ABS 1.0)
Diagram	
Type	ExistenceEnumType
Properties	content: simple minOccurs: 0

Facets	enumeration: Existing enumeration: New enumeration: Unknown
Source	`<xs:element minOccurs="0" name="NewExisting" type="ExistenceEnumType"> <xs:annotation> <xs:documentation>For items marked as new, they will be added as long as the ESP identifier is not found (error otherwise). For items marked as existing, only updates will be performed if the ESP identifier is found (error otherwise). For items marked unknown, they will be created if the ESP identifier is not found and updated if the ESP identifier is found (similar to ABS 1.0)</xs:documentation> </xs:annotation> </xs:element>`

Element SpaceType / BuildingFraction

Namespace	No namespace
Annotations	The fraction of the total building that this space occupies. This is useful for tools including Portfolio Manager: http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager
Diagram	
Type	restriction of xs:float
Properties	content: simple minOccurs: 0
Facets	maxInclusive: 1 minInclusive: 0
Source	`<xs:element minOccurs="0" name="BuildingFraction"> <xs:annotation> <xs:documentation>The fraction of the total building that this space occupies. This is useful for tools including Portfolio Manager: http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:float"> <xs:minInclusive value="0"/> <xs:maxInclusive value="1"/> </xs:restriction> </xs:simpleType> </xs:element>`

Element SpaceType / SpaceClassification

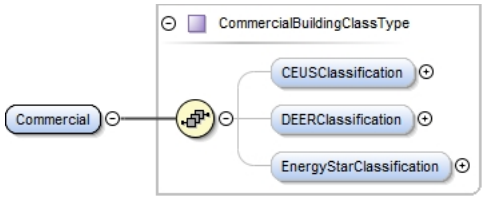
Namespace	No namespace
Annotations	This defines the classification type of the building in terms of residential or non-residential / commercial and further details where relevant.
Diagram	
Type	BuildingClassType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Residential | Commercial

Children	Commercial, Residential
Instance	<SpaceClassification> <Residential>{1,1}</Residential> <Commercial>{1,1}</Commercial> </SpaceClassification>
Source	<xs:element name="SpaceClassification" type="BuildingClassType" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This defines the classification type of the building in terms of residential or non-residential / commercial and further details where relevant.</ xs:documentation> </xs:annotation> </xs:element>

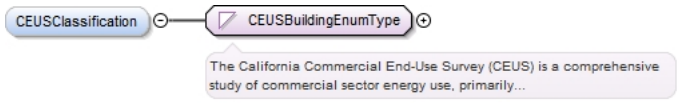
Element BuildingClassType / Residential

Namespace	No namespace	
Diagram		
Type	ResidentialEnumType	
Properties	content:	simple
Facets	enumeration	Single-Family
	enumeration	Multi-Family
Source	<xs:element name="Residential" type="ResidentialEnumType"> </xs:element>	

Element BuildingClassType / Commercial

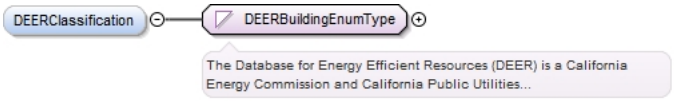
Namespace	No namespace	
Diagram		
Type	CommercialBuildingClassType	
Properties	content:	complex
Model	CEUSClassification{0,1} , DEERClassification{0,1} , EnergyStarClassification{0,1}	
Children	CEUSClassification, DEERClassification, EnergyStarClassification	
Instance	<Commercial> <CEUSClassification>{0,1}</CEUSClassification> <DEERClassification>{0,1}</DEERClassification> <EnergyStarClassification>{0,1}</EnergyStarClassification> </Commercial>	
Source	<xs:element name="Commercial" type="CommercialBuildingClassType"/>	

Element CommercialBuildingClassType / CEUSClassification

Namespace	No namespace	
Diagram		
Type	CEUSBuildingEnumType	
Properties	content:	simple
	minOccurs:	0
Facets	enumeration	College
	enumeration	Food Store
	enumeration	Health

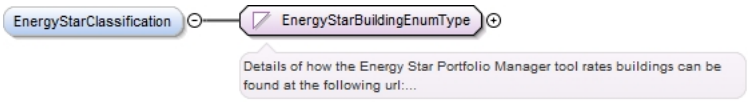
	enumeration	Large Office (>=30k ft2)
	enumeration	Lodging
	enumeration	Miscellaneous
	enumeration	Refrigerated Warehouse
	enumeration	Restaurant
	enumeration	Retail
	enumeration	School
	enumeration	Small Office (<30k ft2)
	enumeration	Unrefrigerated Warehouse
Source	<xs:element name="CEUSClassification" minOccurs="0" type="CEUSBuildingEnumType"> </xs:element>	

Element CommercialBuildingClassType / DEERClassification

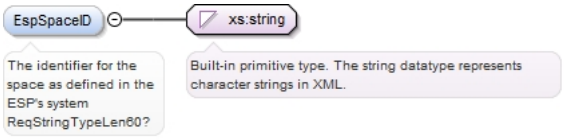
Namespace	No namespace	
Diagram		
Type	DEERBuildingEnumType	
Properties	content:	simple
	minOccurs:	0
Facets	enumeration	Education - Community College
	enumeration	Education - Primary School
	enumeration	Education - Secondary School
	enumeration	Education - University
	enumeration	Grocery
	enumeration	Health/Medical - Hospital
	enumeration	Health/Medical - Nursing Home
	enumeration	Lodging - Guest Rooms
	enumeration	Lodging - Hotel
	enumeration	Lodging - Motel
	enumeration	Manufacturing - Light Industrial
	enumeration	Office - Large
	enumeration	Office - Small
	enumeration	Residential - Indoor
	enumeration	Residential - Outdoor
	enumeration	Restaurant - Fast-Food
	enumeration	Restaurant - Sit-Down
	enumeration	Retail - 3-Story Large
	enumeration	Retail - Single-Story Large
	enumeration	Retail - Small
	enumeration	Storage - Conditioned
	enumeration	Storage - Unconditioned

	enumeration	Warehouse - Refrigerated
Source	<xs:element name="DEERClassification" minOccurs="0" type="DEERBuildingEnumType"> </xs:element>	

Element CommercialBuildingClassType / EnergyStarClassification

Namespace	No namespace	
Annotations		
Diagram		
Type	EnergyStarBuildingEnumType	
Properties	content:	simple
	minOccurs:	0
Facets	enumeration	Office
	enumeration	Bank/Financial Institution
	enumeration	Courthouse
	enumeration	Dormitory / Residence Hall
	enumeration	K-12 School
	enumeration	Hospital (Acute Care and Children's)
	enumeration	House of Worship
	enumeration	Hotel
	enumeration	Retail Store
	enumeration	Supermarket
	enumeration	Senior Care Facility
	enumeration	Residence Halls/ Dormitorie
	enumeration	Warehouse
	enumeration	Medical Office
	enumeration	Wastewater Facility
	enumeration	Data Center
	enumeration	Swimming Pool
	enumeration	Parking
	enumeration	Other
Source	<xs:element minOccurs="0" name="EnergyStarClassification" type="EnergyStarBuildingEnumType"> <xs:annotation> <xs:documentation/> </xs:annotation> </xs:element>	

Element SpaceType / EspSpaceID

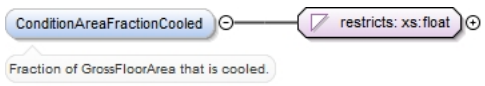
Namespace	No namespace
Annotations	The identifier for the space as defined in the ESP's system ReqStringTypeLen60?
Diagram	
Type	xs:string

Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="EspSpaceID" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The identifier for the space as defined in the ESP's system ReqStringTypeLen60?</xs:documentation> </xs:annotation> </xs:element>

Element SpaceType / ConditionedAreaFractionHeated

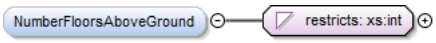
Namespace	No namespace
Annotations	Fraction of GrossFloorArea that is heated.
Diagram	
Type	restriction of xs:float
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 1 minInclusive 0
Source	<xs:element name="ConditionedAreaFractionHeated" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Fraction of GrossFloorArea that is heated.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:float"> <xs:minInclusive value="0"/> <xs:maxInclusive value="1"/> </xs:restriction> </xs:simpleType> </xs:element>

Element SpaceType / ConditionAreaFractionCooled

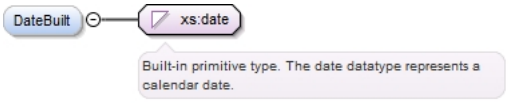
Namespace	No namespace
Annotations	Fraction of GrossFloorArea that is cooled.
Diagram	
Type	restriction of xs:float
Properties	content: simple minOccurs: 0
Facets	maxInclusive 1 minInclusive 0
Source	<xs:element name="ConditionAreaFractionCooled" minOccurs="0"> <xs:annotation> <xs:documentation>Fraction of GrossFloorArea that is cooled.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:float"> <xs:minInclusive value="0"/> <xs:maxInclusive value="1"/> </xs:restriction> </xs:simpleType> </xs:element>

Element SpaceType / NumberFloorsAboveGround

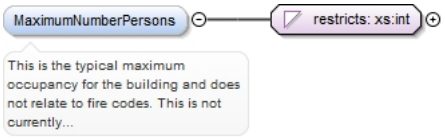
Namespace	No namespace

Diagram	
Type	restriction of xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	minInclusive 0
Source	<xs:element name="NumberFloorsAboveGround" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:int"> <xs:minInclusive value="0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element SpaceType / DateBuilt

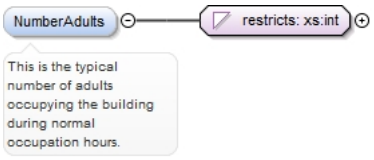
Namespace	No namespace
Diagram	
Type	xs:date
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="DateBuilt" type="xs:date" minOccurs="0" maxOccurs="1"/>

Element SpaceType / MaximumNumberPersons

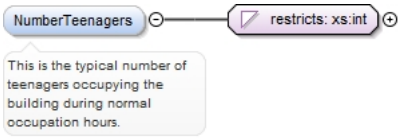
Namespace	No namespace
Annotations	This is the typical maximum occupancy for the building and does not relate to fire codes. This is not currently validated against the NumberAdults, NumberInfants and NumberTeenagers.
Diagram	
Type	restriction of xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	minInclusive 0
Source	<xs:element name="MaximumNumberPersons" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is the typical maximum occupancy for the building and does not relate to fire codes. This is not currently validated against the NumberAdults, NumberInfants and NumberTeenagers.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:int"> <xs:minInclusive value="0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element SpaceType / NumberAdults

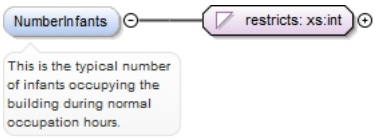
Namespace	No namespace
Annotations	This is the typical number of adults occupying the building during normal occupation hours.

Diagram	
Type	restriction of xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	minInclusive 0
Source	<xs:element name="NumberAdults" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is the typical number of adults occupying the building during normal occupation hours.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:int"> <xs:minInclusive value="0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element SpaceType / NumberTeenagers

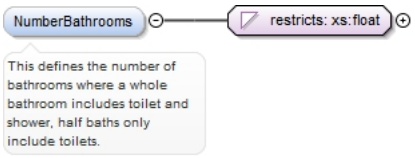
Namespace	No namespace
Annotations	This is the typical number of teenagers occupying the building during normal occupation hours.
Diagram	
Type	restriction of xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	minInclusive 0
Source	<xs:element name="NumberTeenagers" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is the typical number of teenagers occupying the building during normal occupation hours.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:int"> <xs:minInclusive value="0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element SpaceType / NumberInfants

Namespace	No namespace
Annotations	This is the typical number of infants occupying the building during normal occupation hours.
Diagram	
Type	restriction of xs:int
Properties	content: simple

	minOccurs: 0 maxOccurs: 1
Facets	minInclusive 0
Source	<xs:element name="NumberInfants" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is the typical number of infants occupying the building during normal occupation hours.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:int"> <xs:minInclusive value="0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element SpaceType / NumberBathrooms

Namespace	No namespace
Annotations	This defines the number of bathrooms where a whole bathroom includes toilet and shower, half baths only include toilets.
Diagram	
Type	restriction of xs:float
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	minInclusive 0
Source	<xs:element name="NumberBathrooms" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This defines the number of bathrooms where a whole bathroom includes toilet and shower, half baths only include toilets.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:float"> <xs:minInclusive value="0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element SpaceType / NumberBedrooms

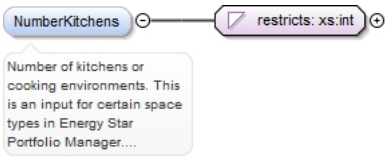
Namespace	No namespace
Diagram	
Type	restriction of xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	minInclusive 0
Source	<xs:element name="NumberBedrooms" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:int"> <xs:minInclusive value="0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element SpaceType / NumberOffices

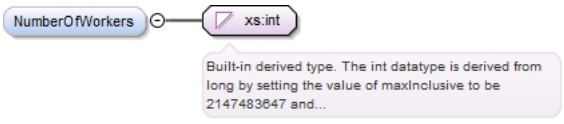
Namespace	No namespace

Diagram	
Type	restriction of xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	minInclusive 0
Source	<xs:element name="NumberOffices" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:int"> <xs:minInclusive value="0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element SpaceType / NumberKitchens

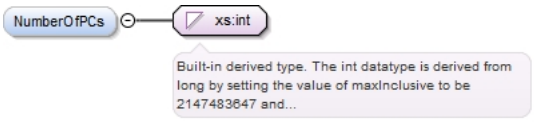
Namespace	No namespace
Annotations	Number of kitchens or cooking environments. This is an input for certain space types in Energy Star Portfolio Manager. http://www.energystar.gov/index.cfm?c=eligibility.bus_portfoliomanager_space_types#hotel
Diagram	
Type	restriction of xs:int
Properties	content: simple minOccurs: 0
Facets	minInclusive 0
Source	<xs:element minOccurs="0" name="NumberKitchens"> <xs:annotation> <xs:documentation>Number of kitchens or cooking environments. This is an input for certain space types in Energy Star Portfolio Manager. http://www.energystar.gov/ index.cfm?c=eligibility.bus_portfoliomanager_space_types#hotel</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:int"> <xs:minInclusive value="0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element SpaceType / NumberOfWorkers

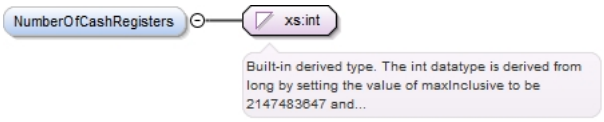
Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="NumberOfWorkers" type="xs:int"/>

Element SpaceType / NumberOfPCs

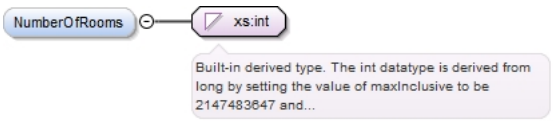
Namespace	No namespace

Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0
Source	`<xs:element minOccurs="0" name="NumberOfPCs" type="xs:int"/>`

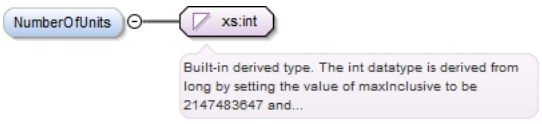
Element SpaceType / NumberOfCashRegisters

Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0
Source	`<xs:element minOccurs="0" name="NumberOfCashRegisters" type="xs:int"/>`

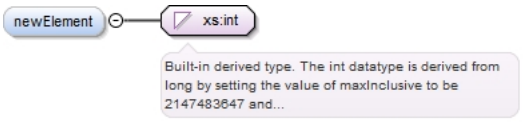
Element SpaceType / NumberOfRooms

Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0
Source	`<xs:element minOccurs="0" name="NumberOfRooms" type="xs:int"/>`

Element SpaceType / NumberOfUnits

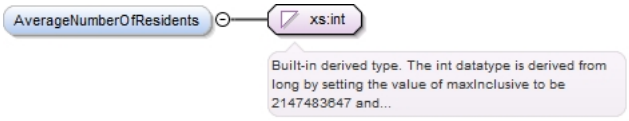
Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0
Source	`<xs:element minOccurs="0" name="NumberOfUnits" type="xs:int"/>`

Element SpaceType / newElement

Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple

	minOccurs: 0
Source	<xs:element minOccurs="0" name="newElement" type="xs:int"/>

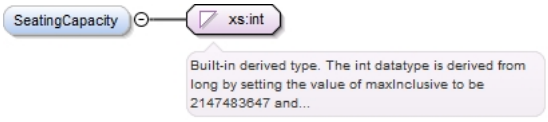
Element SpaceType / AverageNumberOfResidents

Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="AverageNumberOfResidents" type="xs:int"/>

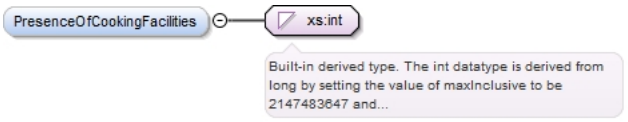
Element SpaceType / ResidentCapacity

Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="ResidentCapacity" type="xs:int"/>

Element SpaceType / SeatingCapacity

Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="SeatingCapacity" type="xs:int"/>

Element SpaceType / PresenceOfCookingFacilities

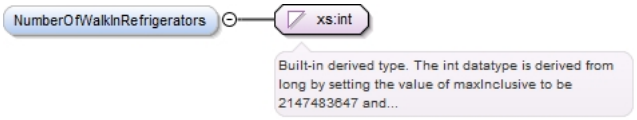
Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="PresenceOfCookingFacilities" type="xs:int"/>

Element SpaceType / NumberOfReachInRefrigerators

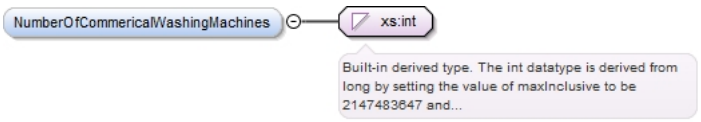
Namespace	No namespace

Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0
Source	`<xs:element minOccurs="0" name="NumberOfReachInRefrigerators" type="xs:int"/>`

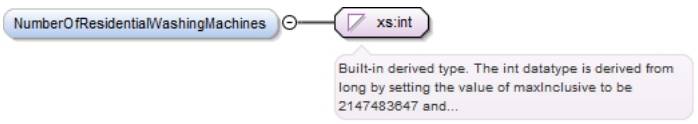
Element SpaceType / NumberOfWalkInRefrigerators

Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0
Source	`<xs:element minOccurs="0" name="NumberOfWalkInRefrigerators" type="xs:int"/>`

Element SpaceType / NumberOfCommericalWashingMachines

Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0
Source	`<xs:element minOccurs="0" name="NumberOfCommericalWashingMachines" type="xs:int"/>`

Element SpaceType / NumberOfResidentialWashingMachines

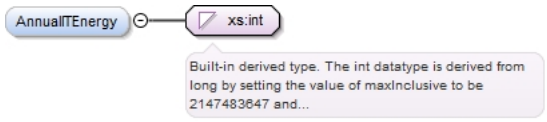
Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0
Source	`<xs:element minOccurs="0" name="NumberOfResidentialWashingMachines" type="xs:int"/>`

Element SpaceType / NumberOfResidentialElectronicLifts

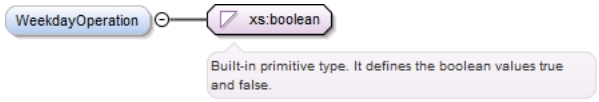
Namespace	No namespace
Diagram	
Type	xs:int

Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="NumberOfResidentialElectronicLifts" type="xs:int"/>

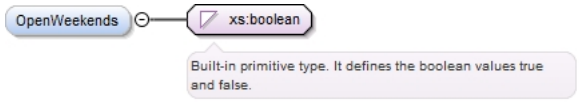
Element SpaceType / AnnualITEnergy

Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="AnnualITEnergy" type="xs:int"/>

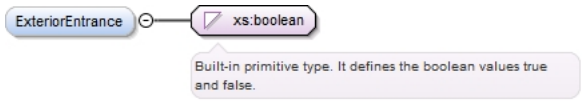
Element SpaceType / WeekdayOperation

Namespace	No namespace
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="WeekdayOperation " type="xs:boolean"/>

Element SpaceType / OpenWeekends

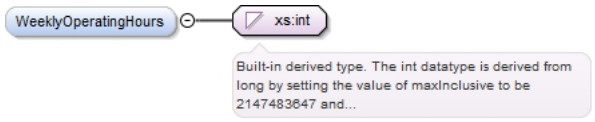
Namespace	No namespace
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="OpenWeekends " type="xs:boolean"/>

Element SpaceType / ExteriorEntrance

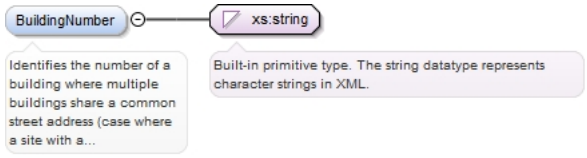
Namespace	No namespace
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="ExteriorEntrance " type="xs:boolean"/>

Element SpaceType / WeeklyOperatingHours

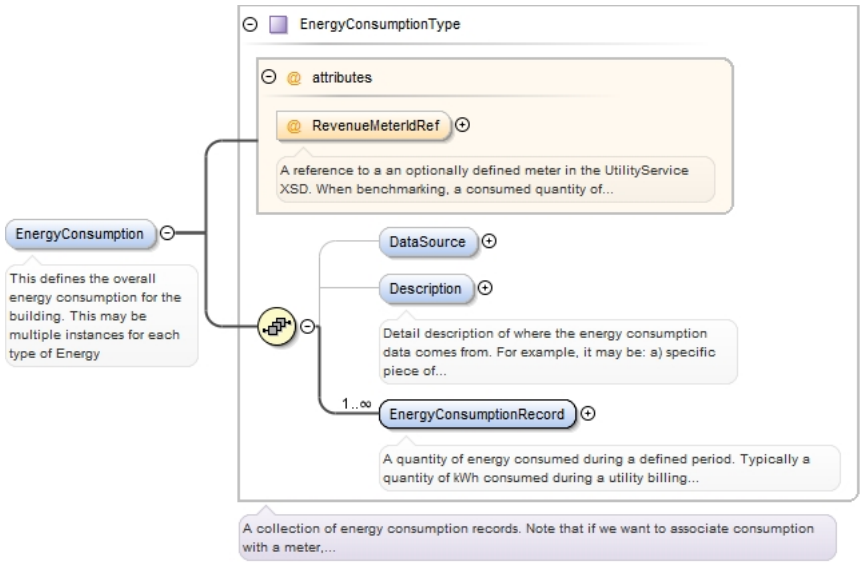
Namespace	No namespace

Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0
Source	`<xs:element minOccurs="0" name="WeeklyOperatingHours" type="xs:int"/>`

Element BuildingType / BuildingNumber

Namespace	No namespace
Annotations	Identifies the number of a building where multiple buildings share a common street address (case where a site with a single address contains multiple buildings). Note that if a single Building has more than one street address, only one is required to identify the location.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	`<xs:element minOccurs="0" name="BuildingNumber" type="xs:string">` `  <xs:annotation>` ` <xs:documentation>Identifies the number of a building where multiple buildings share a common street address (case where a site with a single address contains multiple buildings). Note that if a single Building has more than one street address, only one is required to identify the location.</xs:documentation>` ` </xs:annotation>` `</xs:element>`

Element BuildingType / EnergyConsumption

Namespace	No namespace
Annotations	This defines the overall energy consumption for the building. This may be multiple instances for each type of Energy
Diagram	
Type	EnergyConsumptionType
Properties	content: complex

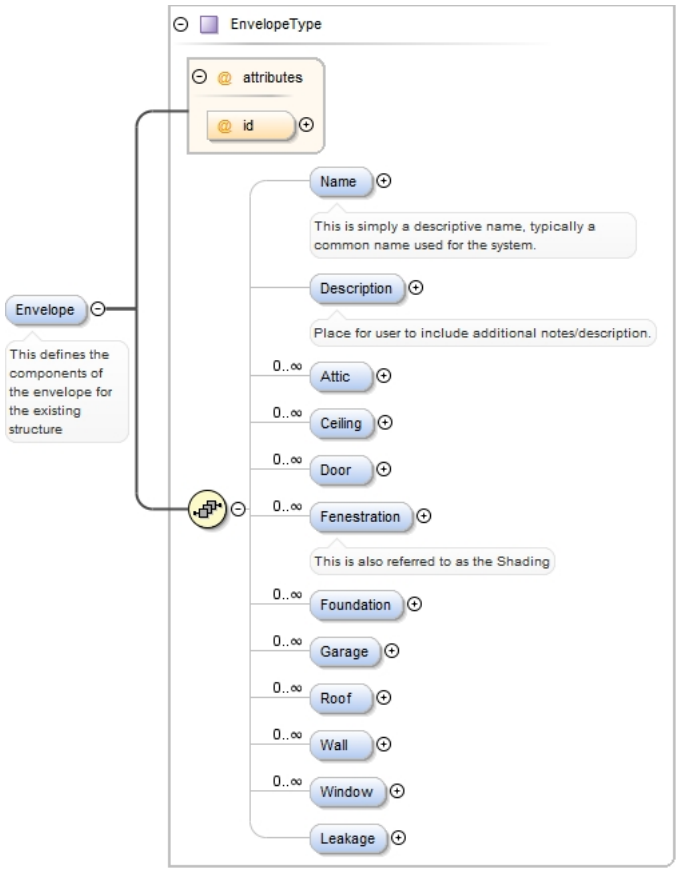
	minOccurs: 0 maxOccurs: unbounded
Model	DataSource{0,1} , Description{0,1} , EnergyConsumptionRecord+
Children	DataSource, Description, EnergyConsumptionRecord

Instance	`<EnergyConsumption RevenueMeterIdRef="">`
	`  <DataSource>{0,1}</DataSource>`
	`  <Description>{0,1}</Description>`
	`  <EnergyConsumptionRecord>{1,unbounded}</EnergyConsumptionRecord>`
	`</EnergyConsumption>`

Attributes	**QName** | **Type** | **Fixed** | **Default** | **Use** **RevenueMeterIdRef** | xs:IDREF | | | optional A reference to a an optionally defined meter in the UtilityService XSD. When benchmarking, a consumed quantity of energy must be associated to a defined revenue meter.

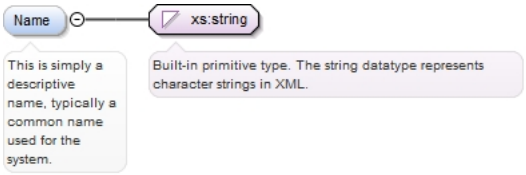
Source	`<xs:element name="EnergyConsumption" type="EnergyConsumptionType" minOccurs="0" maxOccurs="unbounded">`
	`  <xs:annotation>`
	`  <xs:documentation>This defines the overall energy consumption for the building. This may be multiple instances for each type of Energy</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element BuildingType / Envelope

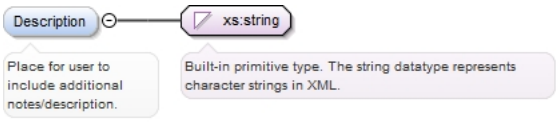
Namespace	No namespace
Annotations	This defines the components of the envelope for the existing structure
Diagram	
Type	EnvelopeType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Name{0,1} , Description{0,1} , Attic* , Ceiling* , Door* , Fenestration* , Foundation* , Garage* , Roof* , Wall* , Window* , Leakage{0,1}

Children	Attic, Ceiling, Description, Door, Fenestration, Foundation, Garage, Leakage, Name, Roof, Wall, Window
Instance	<Envelope id=""> <Name>{0,1}</Name> <Description>{0,1}</Description> <Attic id="">{0,unbounded}</Attic> <Ceiling id="">{0,unbounded}</Ceiling> <Door id="" UFactor="">{0,unbounded}</Door> <Fenestration id="">{0,unbounded}</Fenestration> <Foundation id="">{0,unbounded}</Foundation> <Garage id="">{0,unbounded}</Garage> <Roof id="">{0,unbounded}</Roof> <Wall id="">{0,unbounded}</Wall> <Window id="">{0,unbounded}</Window> <Leakage>{0,1}</Leakage> </Envelope>
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **id** / xs:ID / / / optional
Source	<xs:element name="Envelope" type="EnvelopeType" maxOccurs="1" minOccurs="0"> <xs:annotation> <xs:documentation>This defines the components of the envelope for the existing structure</xs:documentation> </xs:annotation> </xs:element>

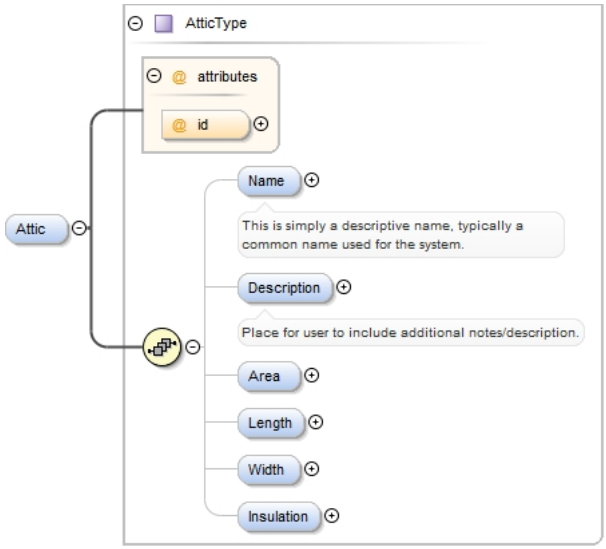
Element EnvelopeType / Name

Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is simply a descriptive name, typically a common name used for the system.</xs:documentation> </xs:annotation> </xs:element>

Element EnvelopeType / Description

Namespace	No namespace
Annotations	Place for user to include additional notes/description.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string"> <xs:annotation> <xs:documentation>Place for user to include additional notes/description.</xs:documentation> </xs:annotation> </xs:element>

Element EnvelopeType / Attic

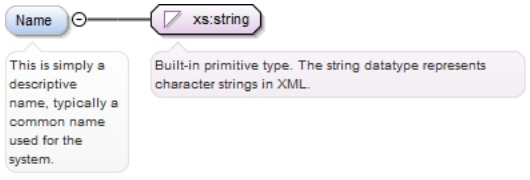
Namespace	No namespace
Diagram	
Type	AtticType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , Description{0,1} , Area{0,1} , Length{0,1} , Width{0,1} , Insulation{0,1}
Children	Area, Description, Insulation, Length, Name, Width

Instance	<pre><Attic id="">
	  <Name>{0,1}</Name>
	  <Description>{0,1}</Description>
	  <Area Unit="SquareMeters">{0,1}</Area>
	  <Length Unit="Meters">{0,1}</Length>
	  <Width Unit="Meters">{0,1}</Width>
	  <Insulation>{0,1}</Insulation>
	</Attic></pre>

Attributes	QName	Type	Fixed	Default	Use
	id	xs:IDREF			optional

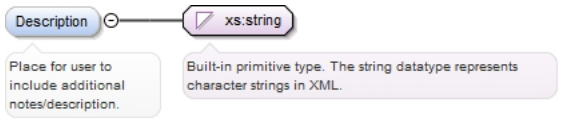
Source	<pre><xs:element name="Attic" type="AtticType" minOccurs="0" maxOccurs="unbounded"/></pre>

Element AtticType / Name

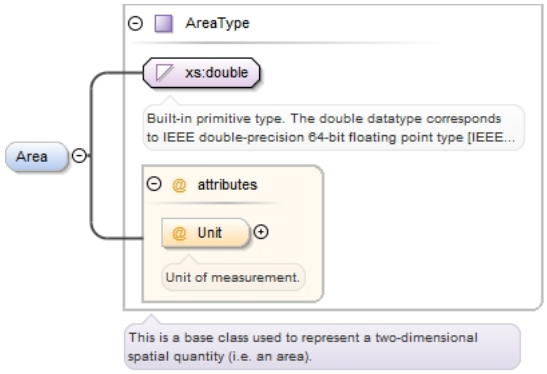
Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	<pre><xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
	  <xs:annotation>
	  <xs:documentation>This is simply a descriptive name, typically a common name used for the system.</xs:documentation>
	  </xs:annotation>
	</xs:element></pre>

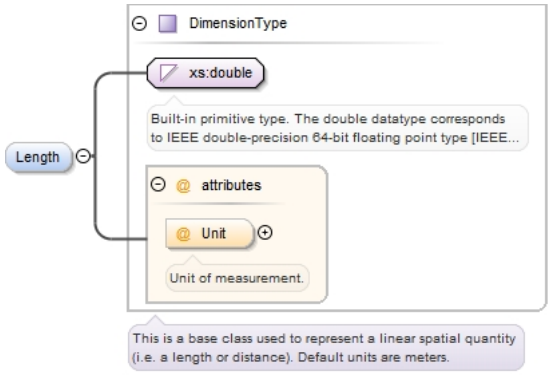
Element AtticType / Description

Namespace	No namespace
Annotations	Place for user to include additional notes/description.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string"> <xs:annotation> <xs:documentation>Place for user to include additional notes/description.</xs:documentation> </xs:annotation> </xs:element>

Element AtticType / Area

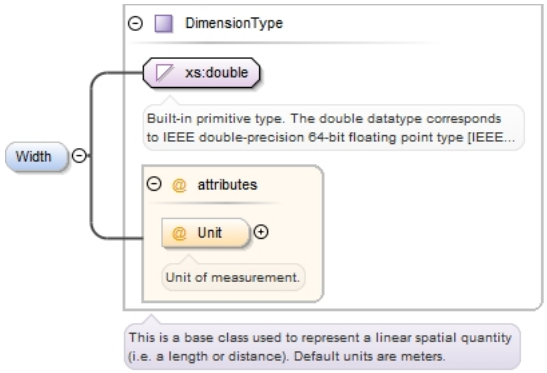
Namespace	No namespace
Diagram	
Type	AreaType
Properties	content: complex minOccurs: 0
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / AreaUnitEnumType / / SquareMeters / optional Unit of measurement.
Source	<xs:element name="Area" type="AreaType" minOccurs="0"/>

Element AtticType / Length

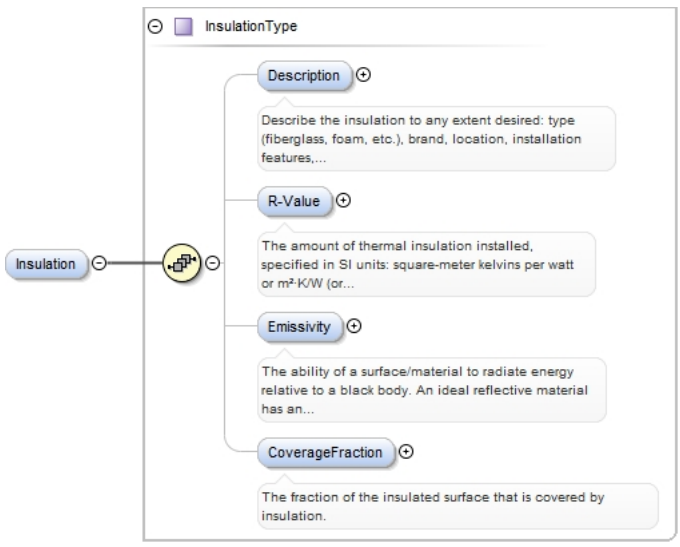
Namespace	No namespace
Diagram	

Type	DimensionType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / DimensionUnitEnumType / / Meters / optional Unit of measurement.
Source	`<xs:element name="Length" type="DimensionType" minOccurs="0" maxOccurs="1"/>`

Element AtticType / Width

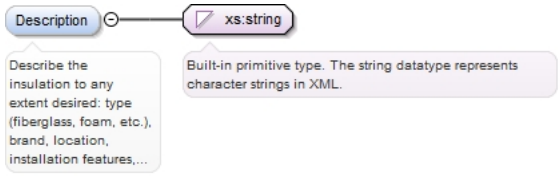
Namespace	No namespace
Diagram	
Type	DimensionType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / DimensionUnitEnumType / / Meters / optional Unit of measurement.
Source	`<xs:element name="Width" type="DimensionType" minOccurs="0" maxOccurs="1"/>`

Element AtticType / Insulation

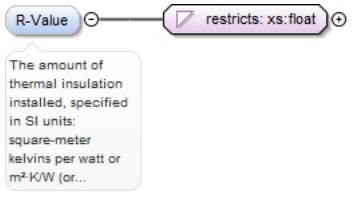
Namespace	No namespace
Diagram	
Type	InsulationType

Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Description{0,1} , R-Value{0,1} , Emissivity{0,1} , CoverageFraction{0,1}
Children	CoverageFraction, Description, Emissivity, R-Value
Instance	<Insulation> <Description>{0,1}</Description> <R-Value>{0,1}</R-Value> <Emissivity>{0,1}</Emissivity> <CoverageFraction>{0,1}</CoverageFraction> </Insulation>
Source	<xs:element name="Insulation" type="InsulationType" minOccurs="0" maxOccurs="1"/>

Element InsulationType / Description

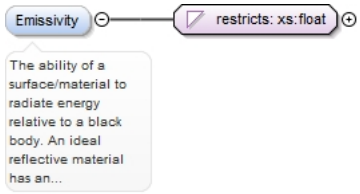
Namespace	No namespace
Annotations	Describe the insulation to any extent desired: type (fiberglass, foam, etc.), brand, location, installation features, etc. It is important to specify the units of measurement for R-value if one intends to use non-SI units. This is discouraged, as SI units are expected and indicated in the annotation of R-Value.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Describe the insulation to any extent desired: type (fiberglass, foam, etc.), brand, location, installation features, etc. It is important to specify the units of measurement for R-value if one intends to use non-SI units. This is discouraged, as SI units are expected and indicated in the annotation of R-Value.</xs:documentation> </xs:annotation> </xs:element>

Element InsulationType / R-Value

Namespace	No namespace
Annotations	The amount of thermal insulation installed, specified in SI units: square-meter kelvins per watt or m²·K/W (or equivalently to m²·°C/W). Note that if you intend to use different units then this should be noted in the Description.
Diagram	
Type	restriction of xs:float
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	minInclusive 0

Source	<xs:element name="R-Value" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The amount of thermal insulation installed, specified in SI units: square-meter kelvins per watt or m²·K/W (or equivalently to m²·°C/W). Note that if you intend to use different units then this should be noted in the Description.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:float"> <xs:minInclusive value="0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element InsulationType / Emissivity

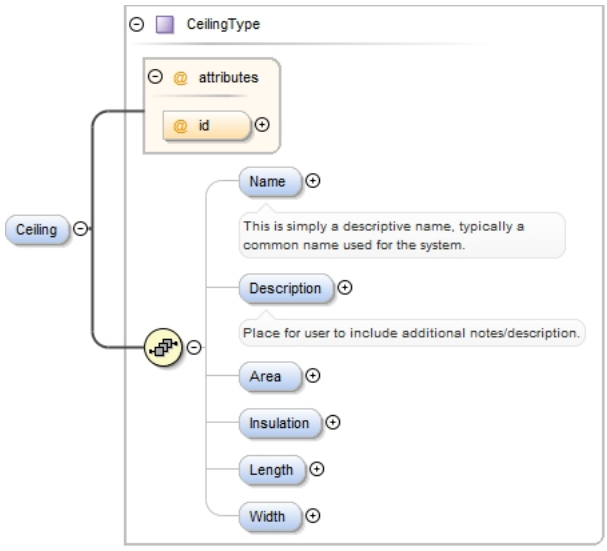
Namespace	No namespace
Annotations	The ability of a surface/material to radiate energy relative to a black body. An ideal reflective material has an emissivity close to zero. An ideal black body has an emissivity of one.
Diagram	
Type	restriction of xs:float
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 1 minInclusive 0
Source	<xs:element name="Emissivity" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The ability of a surface/material to radiate energy relative to a black body. An ideal reflective material has an emissivity close to zero. An ideal black body has an emissivity of one.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:float"> <xs:minInclusive value="0"/> <xs:maxInclusive value="1"/> </xs:restriction> </xs:simpleType> </xs:element>

Element InsulationType / CoverageFraction

Namespace	No namespace
Annotations	The fraction of the insulated surface that is covered by insulation.
Diagram	
Type	restriction of xs:float
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 1 minInclusive 0
Source	<xs:element name="CoverageFraction" minOccurs="0" maxOccurs="1">

```
  <xs:annotation>
    <xs:documentation>The fraction of the insulated surface that is covered by
 insulation.</xs:documentation>
  </xs:annotation>
  <xs:simpleType>
    <xs:restriction base="xs:float">
      <xs:minInclusive value="0"/>
      <xs:maxInclusive value="1"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

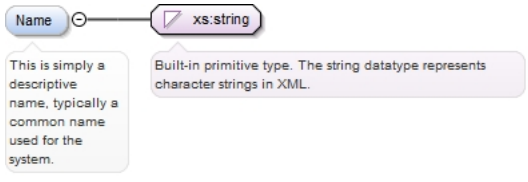
Element EnvelopeType / Ceiling

Namespace	No namespace
Diagram	
Type	CeilingType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , Description{0,1} , Area{0,1} , Insulation{0,1} , Length{0,1} , Width{0,1}
Children	Area, Description, Insulation, Length, Name, Width

Instance	`<Ceiling id="">`
	`  <Name>{0,1}</Name>`
	`  <Description>{0,1}</Description>`
	`  <Area Unit="SquareMeters">{0,1}</Area>`
	`  <Insulation>{0,1}</Insulation>`
	`  <Length Unit="Meters">{0,1}</Length>`
	`  <Width Unit="Meters">{0,1}</Width>`
	`</Ceiling>`

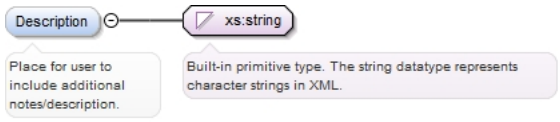
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **id** / xs:IDREF / / / optional
Source	`<xs:element name="Ceiling" type="CeilingType" minOccurs="0" maxOccurs="unbounded"/>`

Element CeilingType / Name

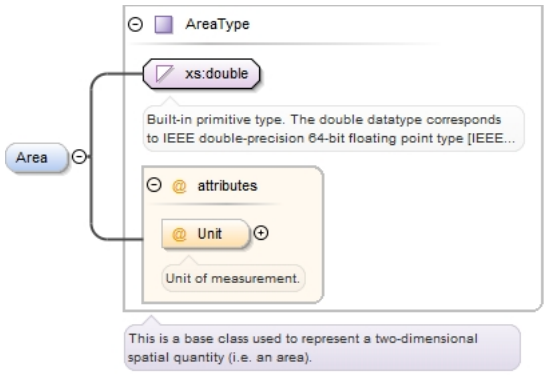
Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.
Diagram	

Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is simply a descriptive name, typically a common name used for the system.</xs:documentation> </xs:annotation> </xs:element>

Element CeilingType / Description

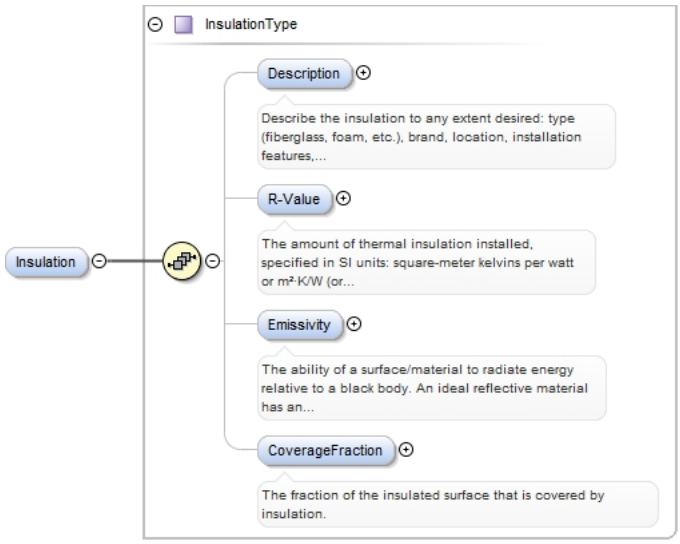
Namespace	No namespace
Annotations	Place for user to include additional notes/description.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string"> <xs:annotation> <xs:documentation>Place for user to include additional notes/description.</ xs:documentation> </xs:annotation> </xs:element>

Element CeilingType / Area

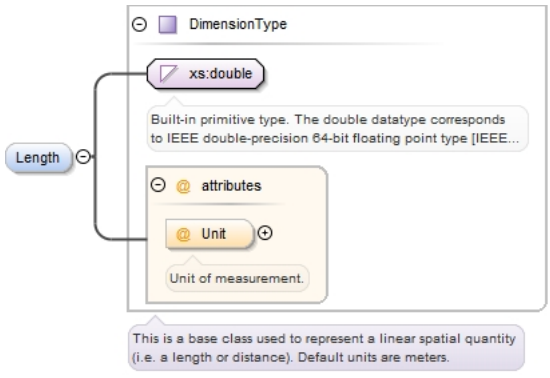
Namespace	No namespace
Diagram	
Type	AreaType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / AreaUnitEnumType / / SquareMeters / optional Unit of measurement.
Source	<xs:element name="Area" type="AreaType" minOccurs="0" maxOccurs="1"/>

Element CeilingType / Insulation

Namespace	No namespace

Diagram	
Type	InsulationType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Description{0,1} , R-Value{0,1} , Emissivity{0,1} , CoverageFraction{0,1}
Children	CoverageFraction, Description, Emissivity, R-Value
Instance	<Insulation> <Description>{0,1}</Description> <R-Value>{0,1}</R-Value> <Emissivity>{0,1}</Emissivity> <CoverageFraction>{0,1}</CoverageFraction> </Insulation>
Source	<xs:element name="Insulation" type="InsulationType" minOccurs="0" maxOccurs="1"/>

Element CeilingType / Length

Namespace	No namespace
Diagram	
Type	DimensionType
Properties	content: complex minOccurs: 0 maxOccurs: 1

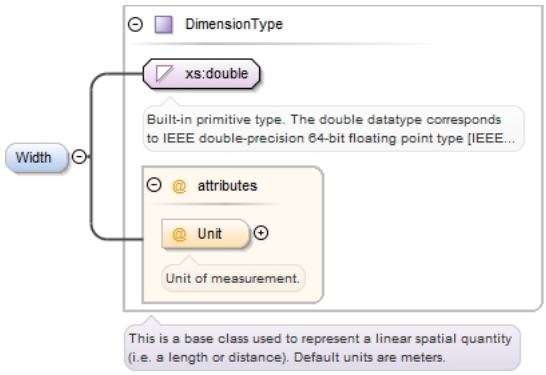
Attributes

QName	Type	Fixed	Default	Use
Unit	DimensionUnitEnumType		Meters	optional
	Unit of measurement.			

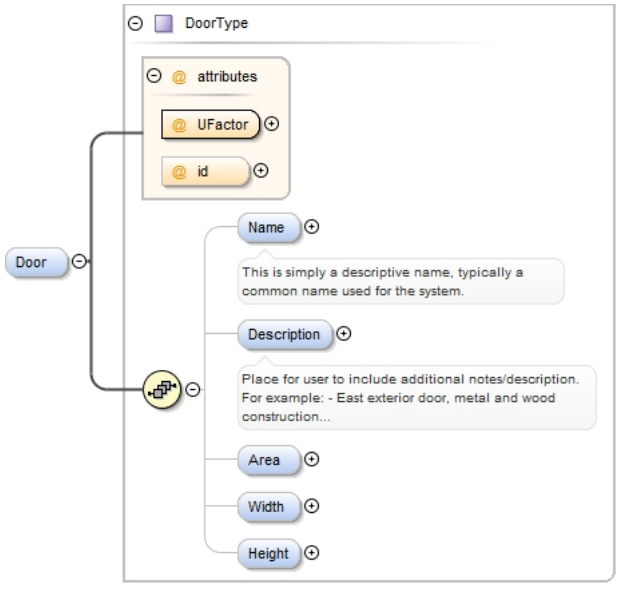
Source

```
<xs:element name="Length" type="DimensionType" minOccurs="0" maxOccurs="1"/>
```

Element CeilingType / Width

Namespace	No namespace
Diagram	
Type	DimensionType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / DimensionUnitEnumType / / Meters / optional Unit of measurement.
Source	`<xs:element name="Width" type="DimensionType" minOccurs="0" maxOccurs="1"/>`

Element EnvelopeType / Door

Namespace	No namespace
Diagram	
Type	DoorType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , Description{0,1} , Area{0,1} , Width{0,1} , Height{0,1}
Children	Area, Description, Height, Name, Width

Instance	`<Door id="" UFactor="">`
	`  <Name>{0,1}</Name>`
	`  <Description>{0,1}</Description>`

```
  <Area Unit="SquareMeters">{0,1}</Area>
  <Width Unit="Meters">{0,1}</Width>
  <Height Unit="Meters">{0,1}</Height>
</Door>
```

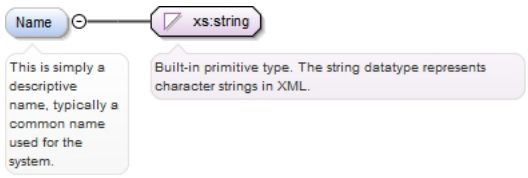
Attributes

QName	Type	Fixed	Default	Use
UFactor	xs:double			required
id	xs:IDREF			optional

Source

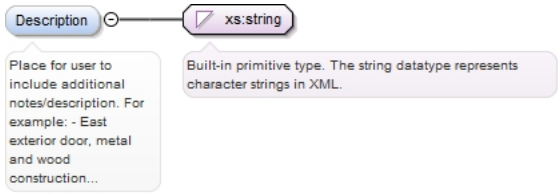
```
<xs:element name="Door" type="DoorType" minOccurs="0" maxOccurs="unbounded"/>
```

Element DoorType / Name

Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	`<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>This is simply a descriptive name, typically a common name used for the system.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

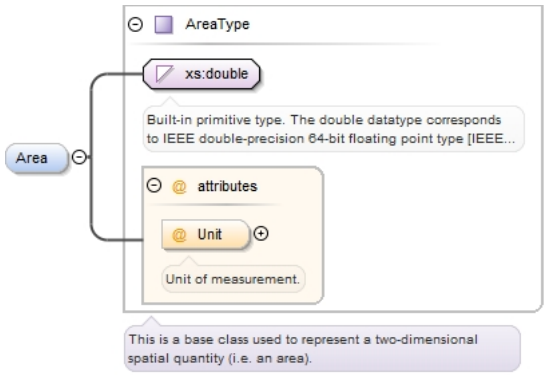
Element DoorType / Description

Namespace	No namespace
Annotations	Place for user to include additional notes/description. For example: - East exterior door, metal and wood construction - Interior, upstairs bathroom door, wood construction
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

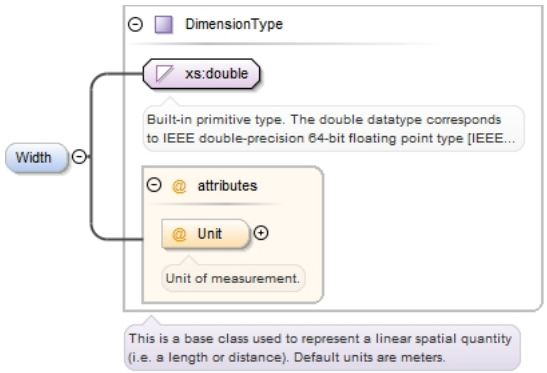
Source	`<xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string">`
	`  <xs:annotation>`
	`  <xs:documentation>Place for user to include additional notes/description. For example: - East exterior door, metal and wood construction - Interior, upstairs bathroom door, wood construction</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element DoorType / Area

Namespace	No namespace

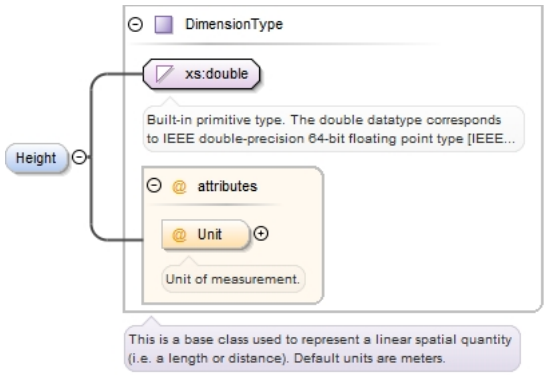
Diagram	
Type	AreaType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / AreaUnitEnumType / / SquareMeters / optional Unit of measurement.
Source	`<xs:element name="Area" type="AreaType" minOccurs="0" maxOccurs="1"/>`

Element DoorType / Width

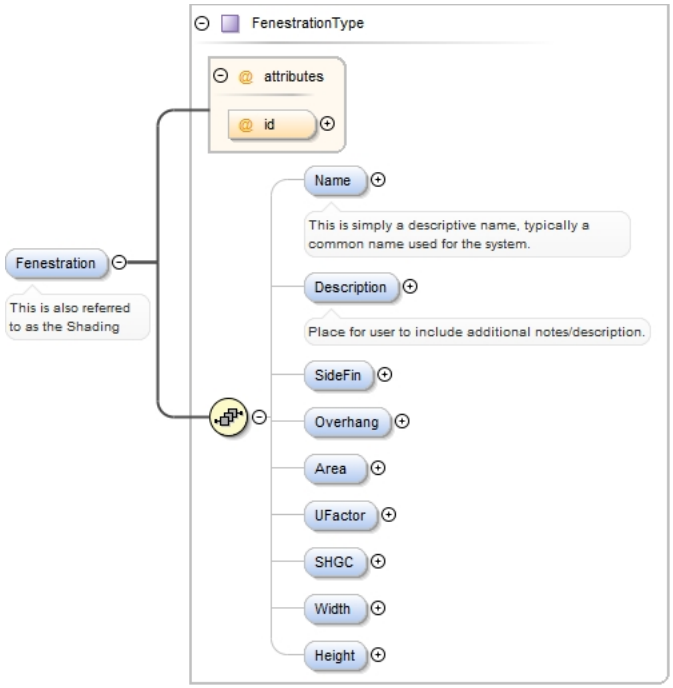
Namespace	No namespace
Diagram	
Type	DimensionType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / DimensionUnitEnumType / / Meters / optional Unit of measurement.
Source	`<xs:element name="Width" type="DimensionType" minOccurs="0" maxOccurs="1"/>`

Element DoorType / Height

Namespace	No namespace

Diagram	
Type	DimensionType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Attributes	QName: Unit; Type: DimensionUnitEnumType; Fixed: ; Default: Meters; Use: optional Unit of measurement.
Source	`<xs:element name="Height" type="DimensionType" minOccurs="0" maxOccurs="1"/>`

Element EnvelopeType / Fenestration

Namespace	No namespace
Annotations	This is also referred to as the Shading
Diagram	
Type	FenestrationType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , Description{0,1} , SideFin{0,1} , Overhang{0,1} , Area{0,1} , UFactor{0,1} , SHGC{0,1} , Width{0,1} , Height{0,1}
Children	Area, Description, Height, Name, Overhang, SHGC, SideFin, UFactor, Width
Instance	`<Fenestration id="">`

```
  <Name>{0,1}</Name>
  <Description>{0,1}</Description>
  <SideFin>{0,1}</SideFin>
  <Overhang>{0,1}</Overhang>
  <Area Unit="SquareMeters">{0,1}</Area>
  <UFactor>{0,1}</UFactor>
  <SHGC>{0,1}</SHGC>
  <Width Unit="Meters">{0,1}</Width>
  <Height Unit="Meters">{0,1}</Height>
</Fenestration>
```

Attributes

QName	Type	Fixed	Default	Use
id	xs:IDREF			optional

Source

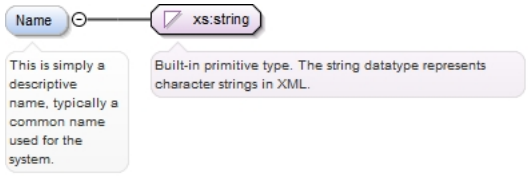
```
<xs:element name="Fenestration" type="FenestrationType" minOccurs="0"
 maxOccurs="unbounded">
  <xs:annotation>
    <xs:documentation>This is also referred to as the Shading</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element FenestrationType / Name

Namespace: No namespace

Annotations: This is simply a descriptive name, typically a common name used for the system.

Diagram



Type: xs:string

Properties

content:	simple
minOccurs:	0
maxOccurs:	1

Source

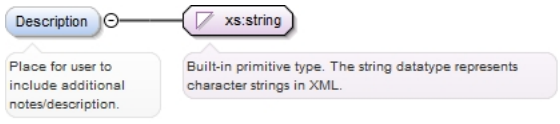
```
<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>This is simply a descriptive name, typically a common name used for
 the system.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element FenestrationType / Description

Namespace: No namespace

Annotations: Place for user to include additional notes/description.

Diagram



Type: xs:string

Properties

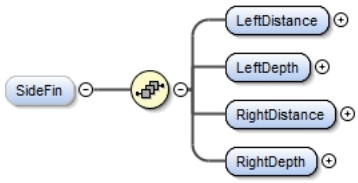
content:	simple
minOccurs:	0
maxOccurs:	1

Source

```
<xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string">
  <xs:annotation>
    <xs:documentation>Place for user to include additional notes/description.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

Element FenestrationType / SideFin

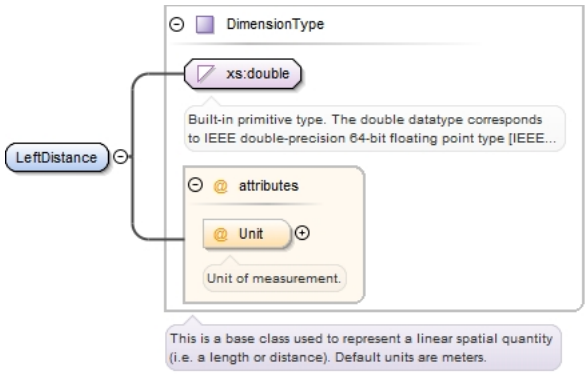
Namespace: No namespace

Diagram	
Properties	content: complex minOccurs: 0
Model	LeftDistance , LeftDepth , RightDistance , RightDepth
Children	LeftDepth, LeftDistance, RightDepth, RightDistance

Instance	`<SideFin>`
	`  <LeftDistance Unit="Meters">{1,1}</LeftDistance>`
	`  <LeftDepth Unit="Meters">{1,1}</LeftDepth>`
	`  <RightDistance Unit="Meters">{1,1}</RightDistance>`
	`  <RightDepth Unit="Meters">{1,1}</RightDepth>`
	`</SideFin>`

Source	`<xs:element name="SideFin" minOccurs="0">`
	`  <xs:complexType>`
	`  <xs:sequence>`
	`  <xs:element name="LeftDistance" type="DimensionType"/>`
	`  <xs:element name="LeftDepth" type="DimensionType"/>`
	`  <xs:element name="RightDistance" type="DimensionType"/>`
	`  <xs:element name="RightDepth" type="DimensionType"/>`
	`  </xs:sequence>`
	`  </xs:complexType>`
	`</xs:element>`

Element FenestrationType / SideFin / LeftDistance

Namespace	No namespace
Diagram	
Type	DimensionType
Properties	content: complex

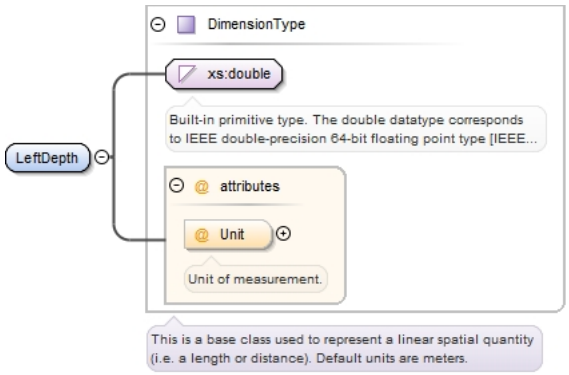
Attributes

QName	Type	Fixed	Default	Use
Unit	DimensionUnitEnumType		Meters	optional
	Unit of measurement.			

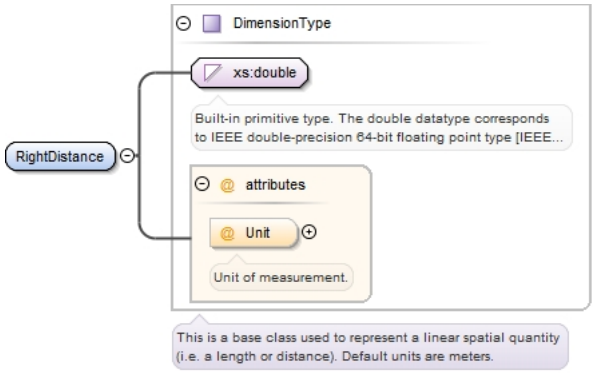
Source	`<xs:element name="LeftDistance" type="DimensionType"/>`

Element FenestrationType / SideFin / LeftDepth

Namespace	No namespace

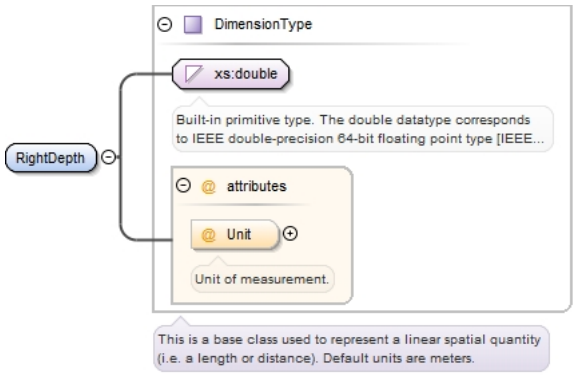
Diagram	
Type	DimensionType
Properties	content: complex
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / DimensionUnitEnumType / / Meters / optional Unit of measurement.
Source	`<xs:element name="LeftDepth" type="DimensionType"/>`

Element FenestrationType / SideFin / RightDistance

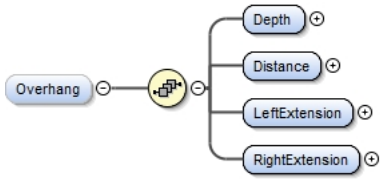
Namespace	No namespace
Diagram	
Type	DimensionType
Properties	content: complex
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / DimensionUnitEnumType / / Meters / optional Unit of measurement.
Source	`<xs:element name="RightDistance" type="DimensionType"/>`

Element FenestrationType / SideFin / RightDepth

Namespace	No namespace

Diagram	
Type	DimensionType
Properties	content: complex
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / DimensionUnitEnumType / / Meters / optional Unit of measurement.
Source	`<xs:element name="RightDepth" type="DimensionType"/>`

Element FenestrationType / Overhang

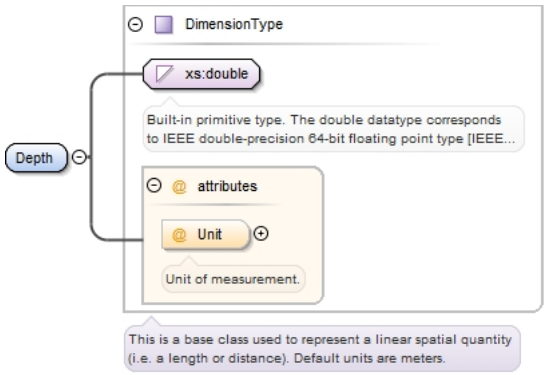
Namespace	No namespace
Diagram	
Properties	content: complex minOccurs: 0
Model	Depth , Distance , LeftExtension , RightExtension
Children	Depth, Distance, LeftExtension, RightExtension

Instance	`<Overhang>`
	`  <Depth Unit="Meters">{1,1}</Depth>`
	`  <Distance Unit="Meters">{1,1}</Distance>`
	`  <LeftExtension Unit="Meters">{1,1}</LeftExtension>`
	`  <RightExtension Unit="Meters">{1,1}</RightExtension>`
	`</Overhang>`

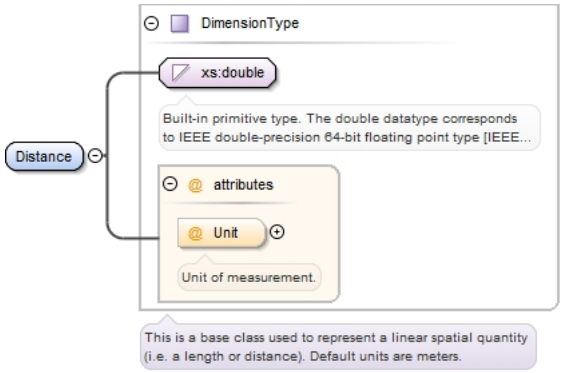
Source	`<xs:element name="Overhang" minOccurs="0">`
	`  <xs:complexType>`
	`  <xs:sequence>`
	`  <xs:element name="Depth" type="DimensionType"/>`
	`  <xs:element name="Distance" type="DimensionType"/>`
	`  <xs:element name="LeftExtension" type="DimensionType"/>`
	`  <xs:element name="RightExtension" type="DimensionType"/>`
	`  </xs:sequence>`
	`  </xs:complexType>`
	`</xs:element>`

Element FenestrationType / Overhang / Depth

Namespace	No namespace

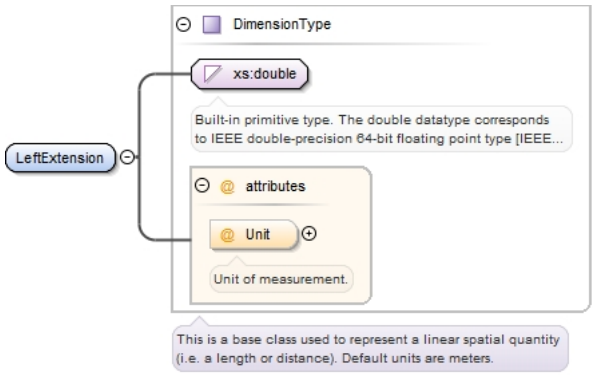
Diagram	
Type	DimensionType
Properties	content: complex
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / DimensionUnitEnumType / / Meters / optional Unit of measurement.
Source	`<xs:element name="Depth" type="DimensionType"/>`

Element FenestrationType / Overhang / Distance

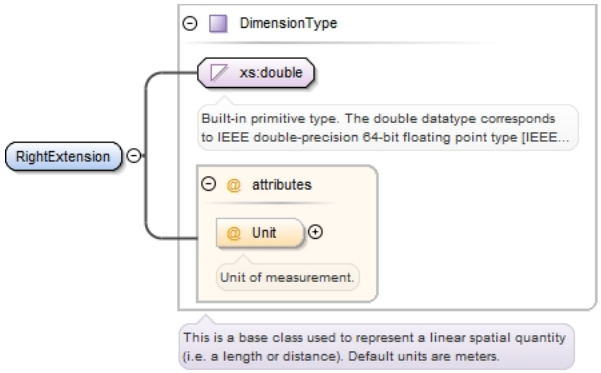
Namespace	No namespace
Diagram	
Type	DimensionType
Properties	content: complex
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / DimensionUnitEnumType / / Meters / optional Unit of measurement.
Source	`<xs:element name="Distance" type="DimensionType"/>`

Element FenestrationType / Overhang / LeftExtension

Namespace	No namespace

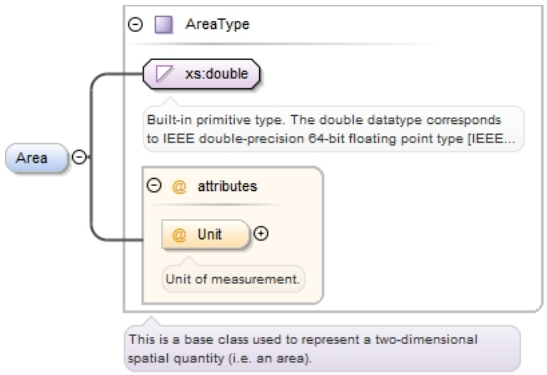
Diagram	
Type	DimensionType
Properties	content: complex
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / DimensionUnitEnumType / / Meters / optional Unit of measurement.
Source	`<xs:element name="LeftExtension" type="DimensionType"/>`

Element FenestrationType / Overhang / RightExtension

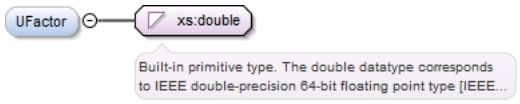
Namespace	No namespace
Diagram	
Type	DimensionType
Properties	content: complex
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / DimensionUnitEnumType / / Meters / optional Unit of measurement.
Source	`<xs:element name="RightExtension" type="DimensionType"/>`

Element FenestrationType / Area

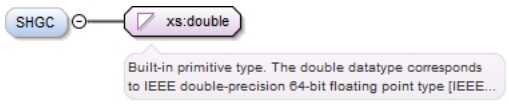
Namespace	No namespace

Diagram	
Type	AreaType
Properties	content: complex minOccurs: 0
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / AreaUnitEnumType / / SquareMeters / optional Unit of measurement.
Source	`<xs:element name="Area" type="AreaType" minOccurs="0"/>`

Element FenestrationType / UFactor

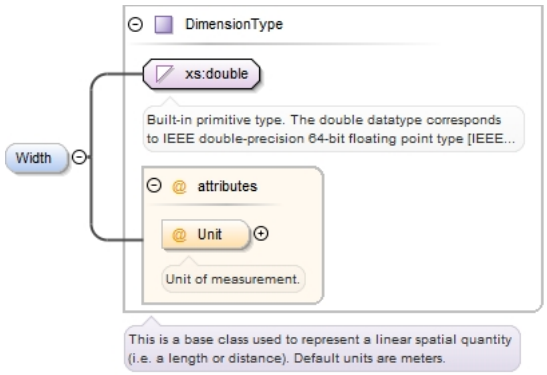
Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0
Source	`<xs:element name="UFactor" type="xs:double" minOccurs="0"/>`

Element FenestrationType / SHGC

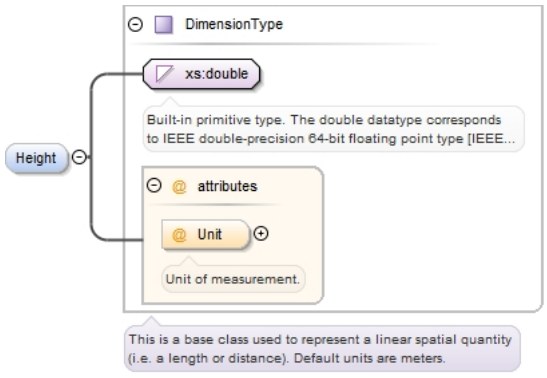
Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0
Source	`<xs:element name="SHGC" type="xs:double" minOccurs="0"/>`

Element FenestrationType / Width

Namespace	No namespace

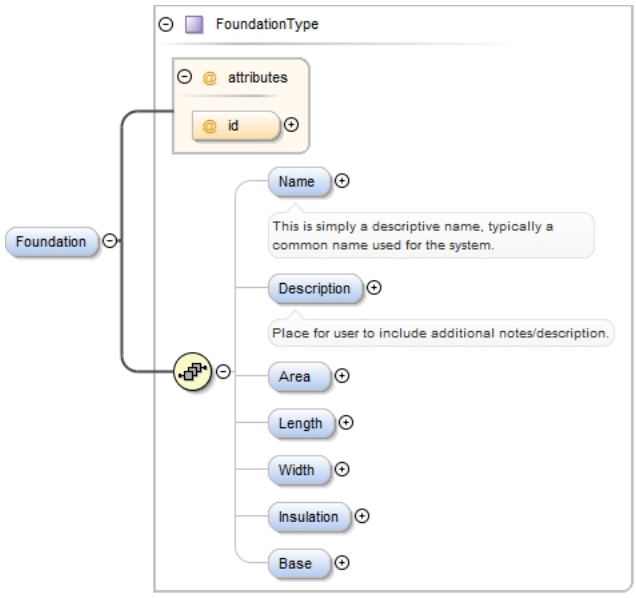
Diagram	
Type	DimensionType
Properties	content: complex minOccurs: 0
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / DimensionUnitEnumType / / Meters / optional Unit of measurement.
Source	`<xs:element name="Width" type="DimensionType" minOccurs="0"/>`

Element FenestrationType / Height

Namespace	No namespace
Diagram	
Type	DimensionType
Properties	content: complex minOccurs: 0
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / DimensionUnitEnumType / / Meters / optional Unit of measurement.
Source	`<xs:element name="Height" type="DimensionType" minOccurs="0"/>`

Element EnvelopeType / Foundation

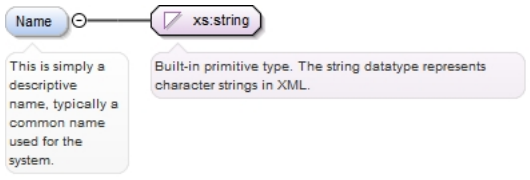
Namespace	No namespace

Diagram	
Type	FoundationType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , Description{0,1} , Area{0,1} , Length{0,1} , Width{0,1} , Insulation{0,1} , Base{0,1}
Children	Area, Base, Description, Insulation, Length, Name, Width

Instance	<pre><Foundation id="">
	  <Name>{0,1}</Name>
	  <Description>{0,1}</Description>
	  <Area Unit="SquareMeters">{0,1}</Area>
	  <Length Unit="Meters">{0,1}</Length>
	  <Width Unit="Meters">{0,1}</Width>
	  <Insulation>{0,1}</Insulation>
	  <Base>{0,1}</Base>
	</Foundation></pre>

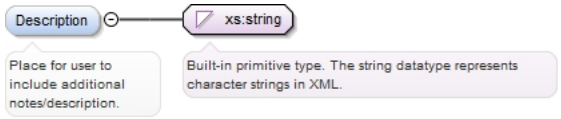
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **id** / xs:IDREF / / / optional
Source	<pre><xs:element name="Foundation" type="FoundationType" minOccurs="0" maxOccurs="unbounded"/></pre>

Element FoundationType / Name

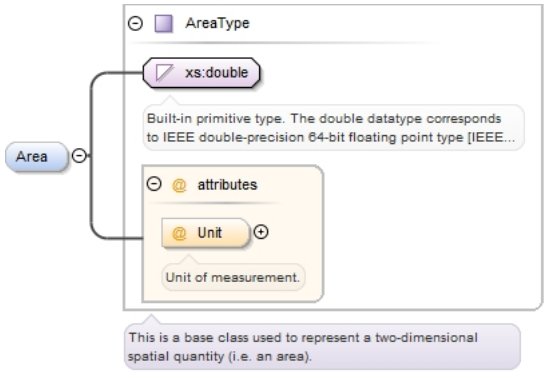
Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	<pre><xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
	  <xs:annotation>
	  <xs:documentation>This is simply a descriptive name, typically a common name used for the system.</xs:documentation>
	  </xs:annotation>
	</xs:element></pre>

Element FoundationType / Description

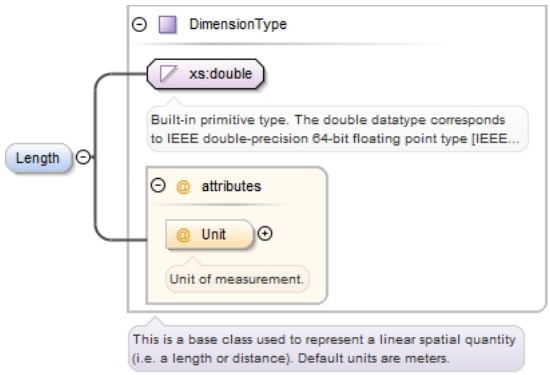
Namespace	No namespace
Annotations	Place for user to include additional notes/description.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string"> <xs:annotation> <xs:documentation>Place for user to include additional notes/description.</xs:documentation> </xs:annotation> </xs:element>

Element FoundationType / Area

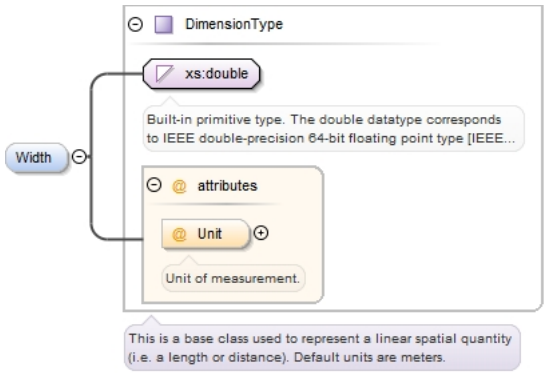
Namespace	No namespace
Diagram	
Type	AreaType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Attributes	QName: Unit; Type: AreaUnitEnumType; Fixed: ; Default: SquareMeters; Use: optional Unit of measurement.
Source	<xs:element name="Area" type="AreaType" minOccurs="0" maxOccurs="1"/>

Element FoundationType / Length

Namespace	No namespace

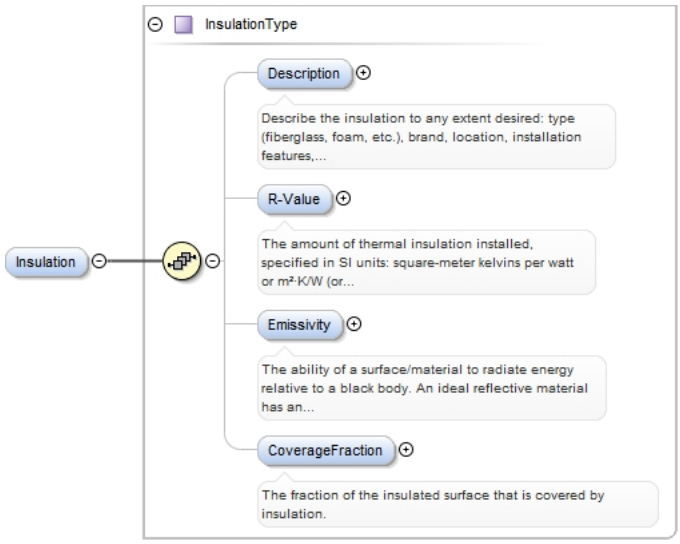
Diagram	
Type	DimensionType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / DimensionUnitEnumType / / Meters / optional Unit of measurement.
Source	`<xs:element name="Length" type="DimensionType" minOccurs="0" maxOccurs="1"/>`

Element FoundationType / Width

Namespace	No namespace
Diagram	
Type	DimensionType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / DimensionUnitEnumType / / Meters / optional Unit of measurement.
Source	`<xs:element name="Width" type="DimensionType" minOccurs="0" maxOccurs="1"/>`

Element FoundationType / Insulation

Namespace	No namespace

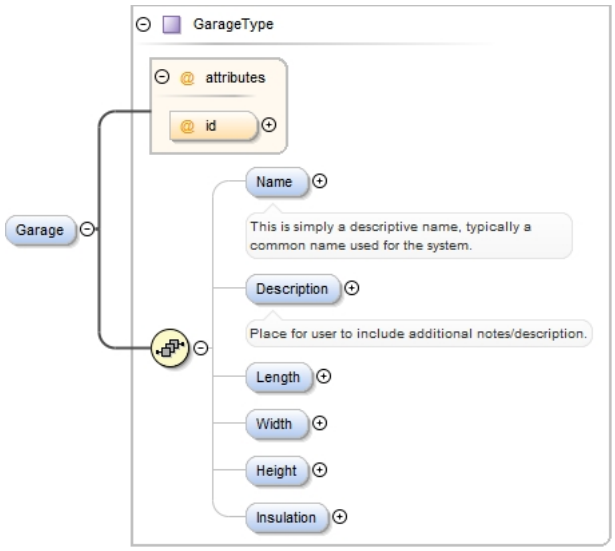
Diagram	
Type	InsulationType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Description{0,1} , R-Value{0,1} , Emissivity{0,1} , CoverageFraction{0,1}
Children	CoverageFraction, Description, Emissivity, R-Value
Instance	<Insulation> <Description>{0,1}</Description> <R-Value>{0,1}</R-Value> <Emissivity>{0,1}</Emissivity> <CoverageFraction>{0,1}</CoverageFraction> </Insulation>
Source	<xs:element name="Insulation" type="InsulationType" minOccurs="0" maxOccurs="1"/>

Element FoundationType / Base

Namespace	No namespace
Diagram	
Type	FoundationBaseEnumType
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	enumeration: Crawlspace enumeration: Finished Basement enumeration: Unfinished Basement enumeration: SlabOnGrade enumeration: Raised Floor
Source	<xs:element name="Base" type="FoundationBaseEnumType" minOccurs="0" maxOccurs="1"/>

Element EnvelopeType / Garage

Namespace	No namespace

Diagram	
Type	GarageType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , Description{0,1} , Length{0,1} , Width{0,1} , Height{0,1} , Insulation{0,1}
Children	Description, Height, Insulation, Length, Name, Width
Instance	<Garage id=""> <Name>{0,1}</Name> <Description>{0,1}</Description> <Length Unit="Meters">{0,1}</Length> <Width Unit="Meters">{0,1}</Width> <Height Unit="Meters">{0,1}</Height> <Insulation>{0,1}</Insulation> </Garage>

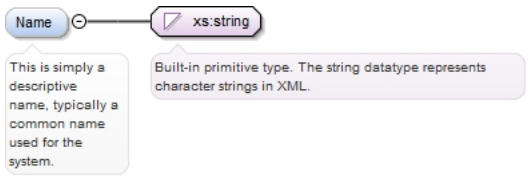
Attributes

QName	Type	Fixed	Default	Use
id	xs:IDREF			optional

Source

```
<xs:element name="Garage" type="GarageType" minOccurs="0" maxOccurs="unbounded"/>
```

Element GarageType / Name

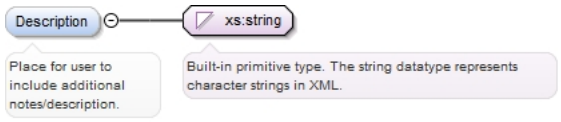
Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source

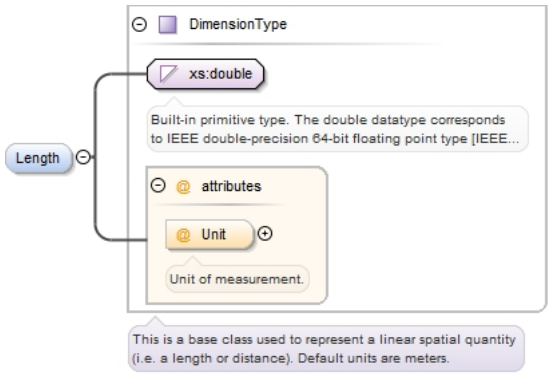
```
<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>This is simply a descriptive name, typically a common name used for
 the system.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element GarageType / Description

Namespace	No namespace

Annotations	Place for user to include additional notes/description.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string"> <xs:annotation> <xs:documentation>Place for user to include additional notes/description.</xs:documentation> </xs:annotation> </xs:element>

Element GarageType / Length

Namespace	No namespace
Diagram	
Type	DimensionType
Properties	content: complex minOccurs: 0 maxOccurs: 1

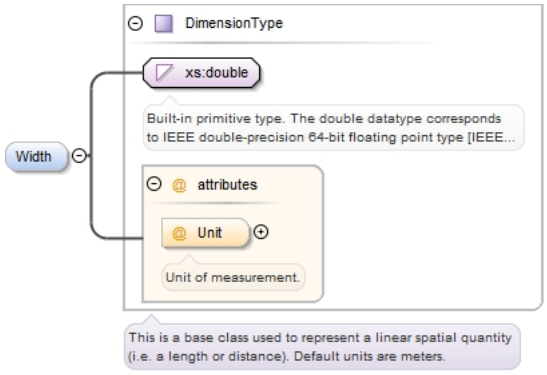
Attributes

QName	Type	Fixed	Default	Use
Unit	DimensionUnitEnumType		Meters	optional
	Unit of measurement.			

Source

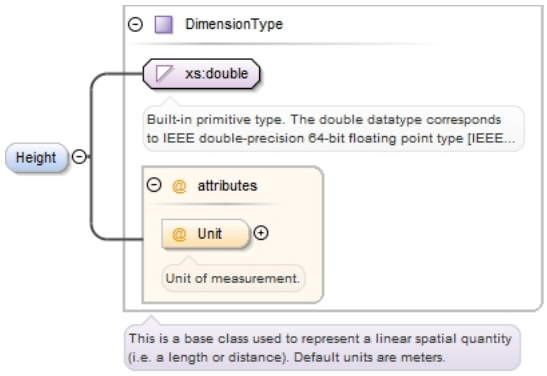
```
<xs:element name="Length" type="DimensionType" minOccurs="0" maxOccurs="1"/>
```

Element GarageType / Width

Namespace	No namespace
Diagram	
Type	DimensionType

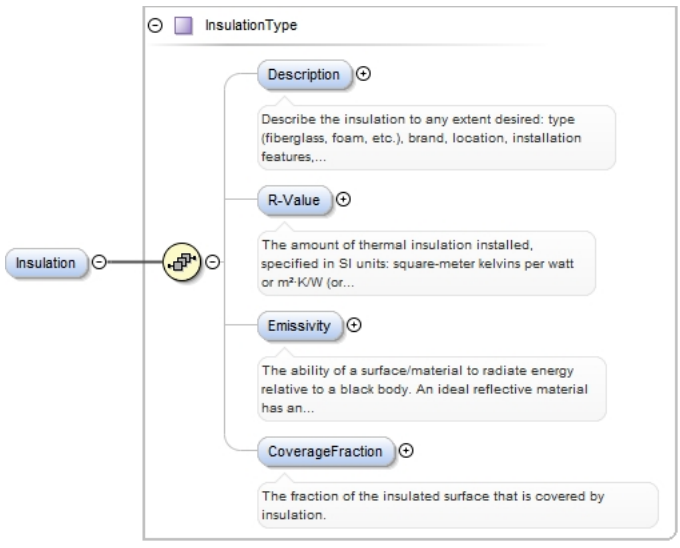
Properties	content:	complex			
	minOccurs:	0			
	maxOccurs:	1			
Attributes	**QName**	**Type**	**Fixed**	**Default**	**Use**
	Unit	DimensionUnitEnumType		Meters	optional
		Unit of measurement.			
Source	<xs:element name="Width" type="DimensionType" minOccurs="0" maxOccurs="1"/>				

Element GarageType / Height

Namespace	No namespace
Diagram	
Type	DimensionType

Properties	content:	complex			
	minOccurs:	0			
	maxOccurs:	1			
Attributes	**QName**	**Type**	**Fixed**	**Default**	**Use**
	Unit	DimensionUnitEnumType		Meters	optional
		Unit of measurement.			
Source	<xs:element name="Height" type="DimensionType" minOccurs="0" maxOccurs="1"/>				

Element GarageType / Insulation

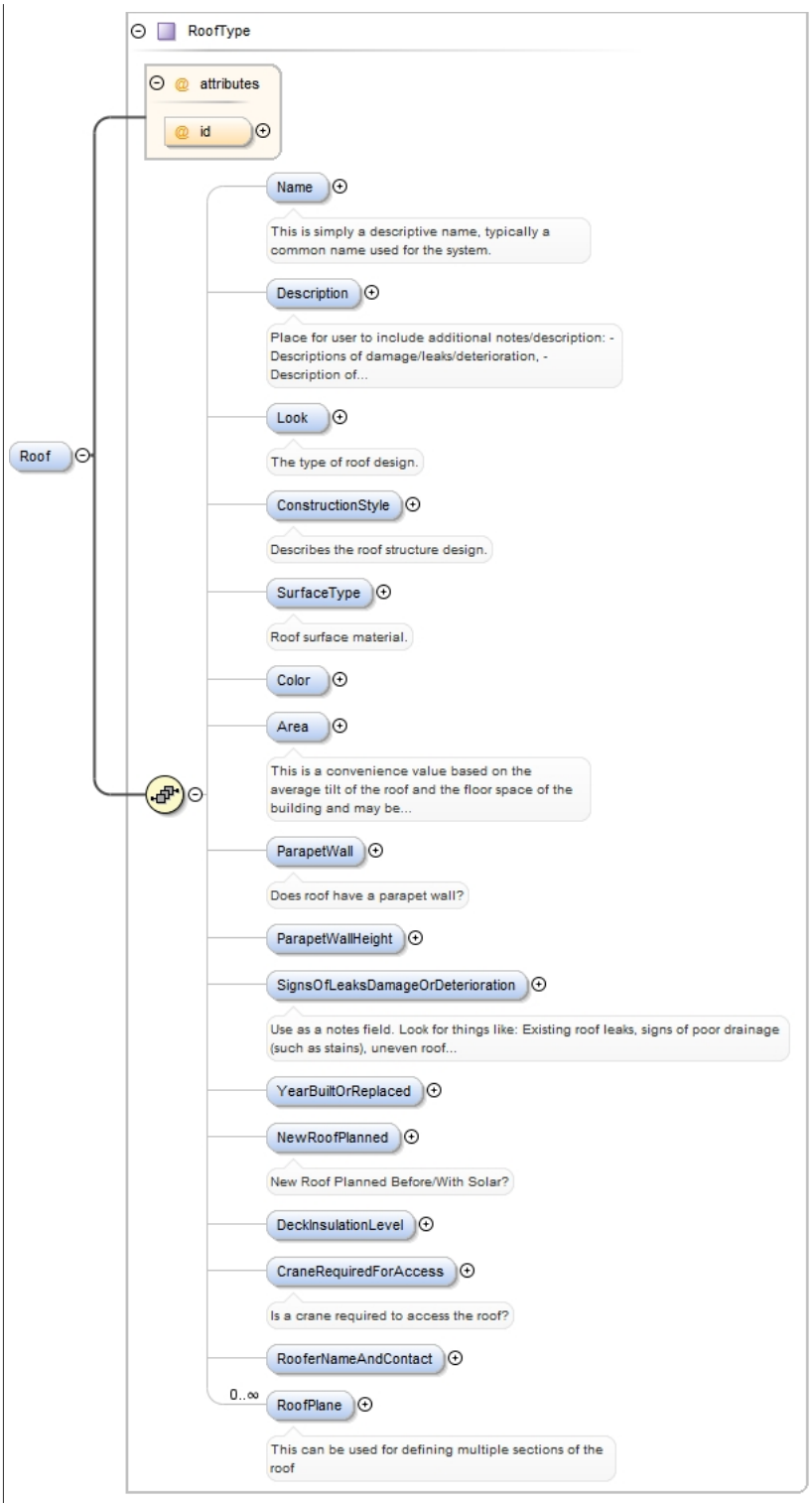
Namespace	No namespace
Diagram	
Type	InsulationType

Properties	content:	complex

	minOccurs: 0 maxOccurs: 1
Model	Description{0,1} , R-Value{0,1} , Emissivity{0,1} , CoverageFraction{0,1}
Children	CoverageFraction, Description, Emissivity, R-Value
Instance	<Insulation> <Description>{0,1}</Description> <R-Value>{0,1}</R-Value> <Emissivity>{0,1}</Emissivity> <CoverageFraction>{0,1}</CoverageFraction> </Insulation>
Source	<xs:element name="Insulation" type="InsulationType" minOccurs="0" maxOccurs="1"/>

Element EnvelopeType / Roof

Namespace	No namespace

Diagram	
Type	RoofType
Properties	content: `complex` minOccurs: `0` maxOccurs: `unbounded`
Model	Name{0,1} , Description{0,1} , Look{0,1} , ConstructionStyle{0,1} , SurfaceType{0,1} , Color{0,1} , Area{0,1} , ParapetWall{0,1} , ParapetWallHeight{0,1} , SignsOfLeaksDamageOrDeterioration{0,1} , YearBuiltOrReplaced{0,1} , NewRoofPlanned{0,1} , DeckInsulationLevel{0,1} , CraneRequiredForAccess{0,1} , RooferNameAndContact{0,1} , RoofPlane*

Children	Area, Color, ConstructionStyle, CraneRequiredForAccess, DeckInsulationLevel, Description, Look, Name, NewRoofPlanned, ParapetWall, ParapetWallHeight, RoofPlane, RooferNameAndContact, SignsOfLeaksDamageOrDeterioration, SurfaceType, YearBuiltOrReplaced

Instance

```
<Roof id="">
  <Name>{0,1}</Name>
  <Description>{0,1}</Description>
  <Look>{0,1}</Look>
  <ConstructionStyle>{0,1}</ConstructionStyle>
  <SurfaceType>{0,1}</SurfaceType>
  <Color>{0,1}</Color>
  <Area Unit="SquareMeters">{0,1}</Area>
  <ParapetWall>{0,1}</ParapetWall>
  <ParapetWallHeight Unit="Meters">{0,1}</ParapetWallHeight>
  <SignsOfLeaksDamageOrDeterioration>{0,1}</SignsOfLeaksDamageOrDeterioration>
  <YearBuiltOrReplaced>{0,1}</YearBuiltOrReplaced>
  <NewRoofPlanned>{0,1}</NewRoofPlanned>
  <DeckInsulationLevel>{0,1}</DeckInsulationLevel>
  <CraneRequiredForAccess>{0,1}</CraneRequiredForAccess>
  <RooferNameAndContact>{0,1}</RooferNameAndContact>
  <RoofPlane id="">{0,unbounded}</RoofPlane>
</Roof>
```

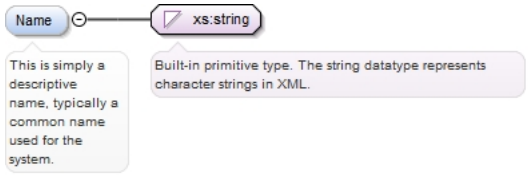
Attributes

QName	Type	Fixed	Default	Use
id	xs:IDREF			optional

Source

```
<xs:element name="Roof" type="RoofType" minOccurs="0" maxOccurs="unbounded"/>
```

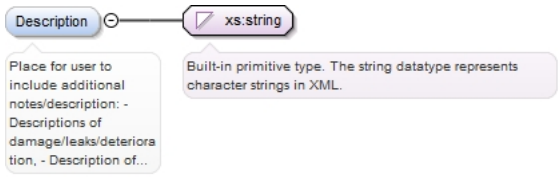
Element RoofType / Name

Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source

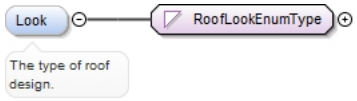
```
<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>This is simply a descriptive name, typically a common name used for
 the system.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element RoofType / Description

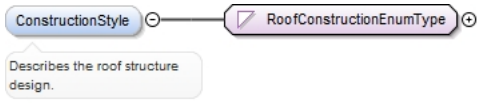
Namespace	No namespace
Annotations	Place for user to include additional notes/description: - Descriptions of damage/leaks/deterioration, - Description of access requirements to chillers / air handlers / etc. - Was the customer told of their options if solar will outlive roof? - Attic accessibility - special requirements? Crane? Key?
Diagram	
Type	xs:string
Properties	content: simple

	minOccurs:	0
	maxOccurs:	1
Source	<xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string"> <xs:annotation> <xs:documentation>Place for user to include additional notes/description: - Descriptions of damage/leaks/deterioration, - Description of access requirements to chillers / air handlers / etc. - Was the customer told of their options if solar will outlive roof? - Attic accessibility - special requirements? Crane? Key?</xs:documentation> </xs:annotation> </xs:element>	

Element RoofType / Look

Namespace	No namespace	
Annotations	The type of roof design.	
Diagram		
Type	RoofLookEnumType	
Properties	content:	simple
	minOccurs:	0
	maxOccurs:	1
Facets	enumeration	Butterfly
	enumeration	Combination
	enumeration	Flat
	enumeration	Gable
	enumeration	Gambrel
	enumeration	Hip
	enumeration	Mansard
	enumeration	Shed
Source	<xs:element name="Look" type="RoofLookEnumType" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The type of roof design.</xs:documentation> </xs:annotation> </xs:element>	

Element RoofType / ConstructionStyle

Namespace	No namespace	
Annotations	Describes the roof structure design.	
Diagram		
Type	RoofConstructionEnumType	
Properties	content:	simple
	minOccurs:	0
	maxOccurs:	1
Facets	enumeration	beams and purlins
	enumeration	rafters with attic
	enumeration	truss with attic
	enumeration	vaulted 2x
	enumeration	vaulted beams
Source	<xs:element name="ConstructionStyle" type="RoofConstructionEnumType" minOccurs="0" maxOccurs="1">	

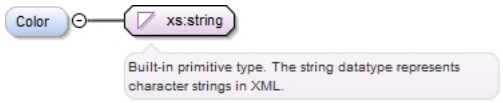
```
  <xs:annotation>
    <xs:documentation>Describes the roof structure design.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element RoofType / SurfaceType

Namespace	No namespace
Annotations	Roof surface material.
Diagram	
Type	RoofSurfaceEnumType
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	enumeration: CalPac metal enumeration: composition roll enumeration: composition shingle enumeration: foam enumeration: heavy concrete tile enumeration: high-definition comp shingle enumeration: light weight concrete tile enumeration: single-ply membrane enumeration: slate enumeration: spanish barrel tile enumeration: standing seam metal enumeration: tar & gravel enumeration: wood shake

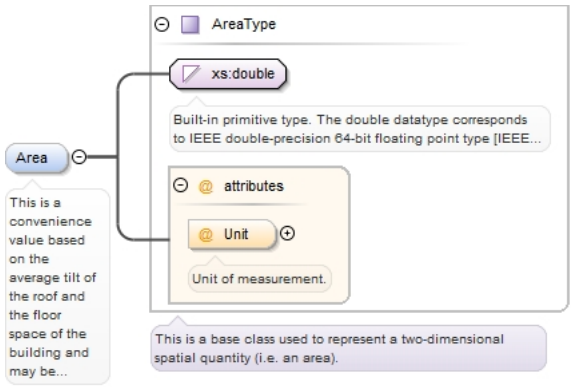
Source	`<xs:element name="SurfaceType" type="RoofSurfaceEnumType" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>Roof surface material.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element RoofType / Color

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="Color" type="xs:string" minOccurs="0" maxOccurs="1"/>`

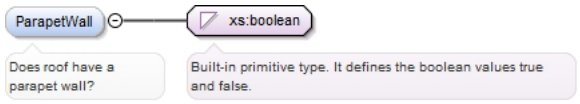
Element RoofType / Area

Namespace	No namespace
Annotations	This is a convenience value based on the average tilt of the roof and the floor space of the building and may be overridden by the LayoutPlane dimensions

Diagram	
Type	AreaType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / AreaUnitEnumType / / SquareMeters / optional Unit of measurement.

Source	`<xs:element name="Area" type="AreaType" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>This is a convenience value based on the average tilt of the roof and the floor space of the building and may be overridden by the LayoutPlane dimensions</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

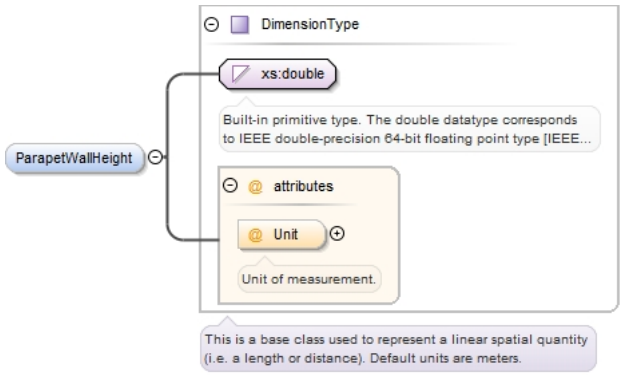
Element RoofType / ParapetWall

Namespace	No namespace
Annotations	Does roof have a parapet wall?
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0 maxOccurs: 1

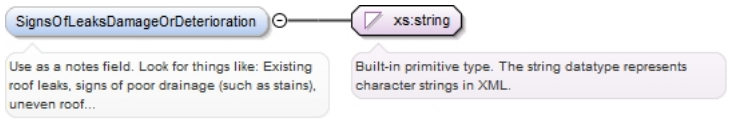
Source	`<xs:element name="ParapetWall" type="xs:boolean" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>Does roof have a parapet wall?</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element RoofType / ParapetWallHeight

Namespace	No namespace

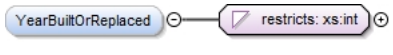
Diagram	
Type	DimensionType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Attributes	**QName** Unit; **Type** DimensionUnitEnumType; **Fixed**; **Default** Meters; **Use** optional Unit of measurement.
Source	`<xs:element name="ParapetWallHeight" type="DimensionType" minOccurs="0" maxOccurs="1"/>`

Element RoofType / SignsOfLeaksDamageOrDeterioration

Namespace	No namespace
Annotations	Use as a notes field. Look for things like: Existing roof leaks, signs of poor drainage (such as stains), uneven roof decks, etc
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	`<xs:element name="SignsOfLeaksDamageOrDeterioration" type="xs:string" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>Use as a notes field. Look for things like: Existing roof leaks, signs of poor drainage (such as stains), uneven roof decks, etc</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

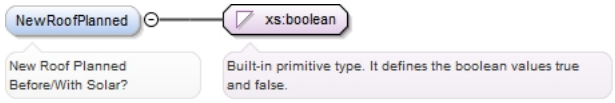
Element RoofType / YearBuiltOrReplaced

Namespace	No namespace
Diagram	
Type	restriction of xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	minInclusive 0

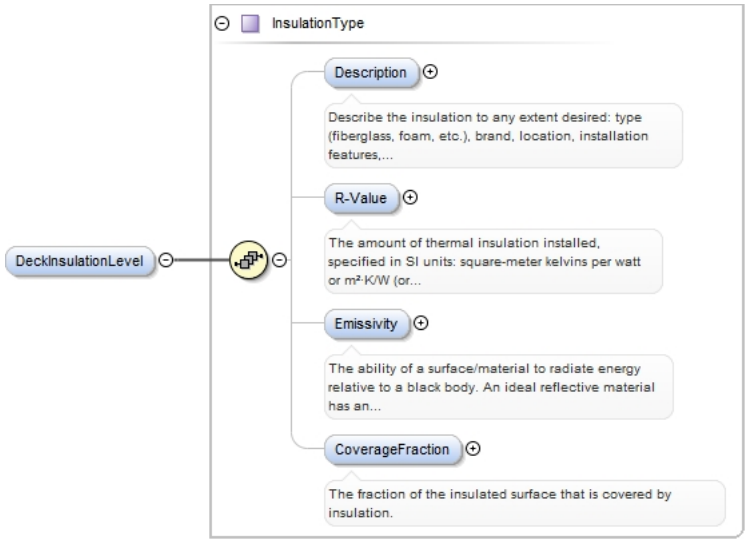
Source	`<xs:element name="YearBuiltOrReplaced" minOccurs="0" maxOccurs="1">`
	`  <xs:simpleType>`
	`  <xs:restriction base="xs:int">`
	`  <xs:minInclusive value="0"/>`
	`  </xs:restriction>`

```
  </xs:simpleType>
</xs:element>
```

Element RoofType / NewRoofPlanned

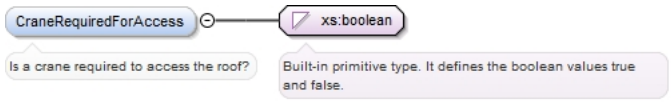
Namespace	No namespace
Annotations	New Roof Planned Before/With Solar?
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="NewRoofPlanned" type="xs:boolean" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>New Roof Planned Before/With Solar?</xs:documentation> </xs:annotation> </xs:element>

Element RoofType / DeckInsulationLevel

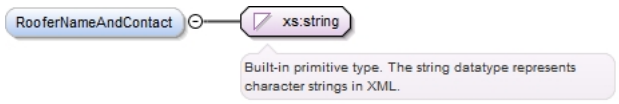
Namespace	No namespace
Diagram	
Type	InsulationType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Description{0,1} , R-Value{0,1} , Emissivity{0,1} , CoverageFraction{0,1}
Children	CoverageFraction, Description, Emissivity, R-Value
Instance	<DeckInsulationLevel> <Description>{0,1}</Description> <R-Value>{0,1}</R-Value> <Emissivity>{0,1}</Emissivity> <CoverageFraction>{0,1}</CoverageFraction> </DeckInsulationLevel>
Source	<xs:element name="DeckInsulationLevel" type="InsulationType" minOccurs="0" maxOccurs="1"/>

Element RoofType / CraneRequiredForAccess

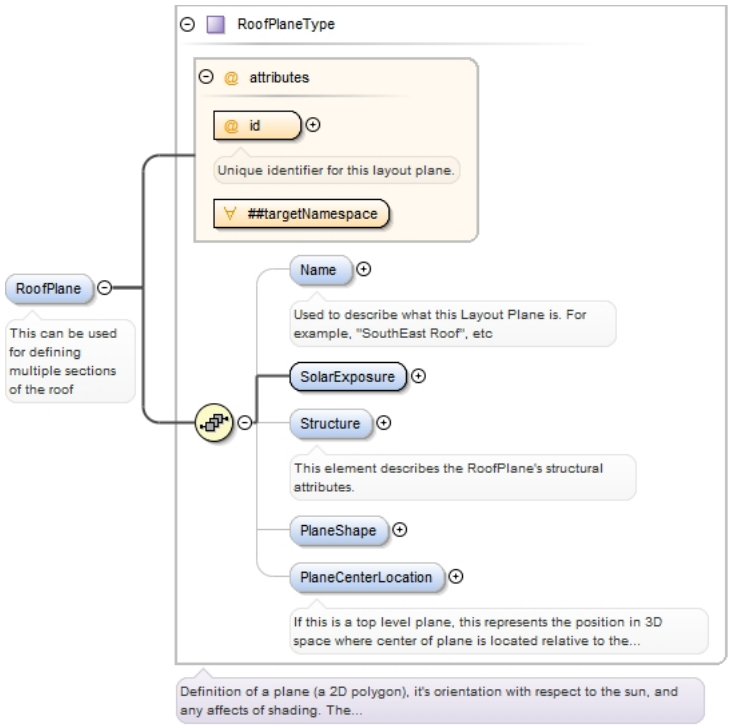
Namespace	No namespace
Annotations	Is a crane required to access the roof?

Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="CraneRequiredForAccess" type="xs:boolean" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Is a crane required to access the roof?</xs:documentation> </xs:annotation> </xs:element>

Element RoofType / RooferNameAndContact

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="RooferNameAndContact" type="xs:string" minOccurs="0" maxOccurs="1"/>

Element RoofType / RoofPlane

Namespace	No namespace
Annotations	This can be used for defining multiple sections of the roof
Diagram	
Type	RoofPlaneType
Properties	content: complex minOccurs: 0

	maxOccurs: unbounded
Model	Name{0,1} , SolarExposure , Structure{0,1} , PlaneShape{0,1} , PlaneCenterLocation{0,1}
Children	Name, PlaneCenterLocation, PlaneShape, SolarExposure, Structure
Instance	<RoofPlane id=""> <Name>{0,1}</Name> <SolarExposure>{1,1}</SolarExposure> <Structure>{0,1}</Structure> <PlaneShape>{0,1}</PlaneShape> <PlaneCenterLocation>{0,1}</PlaneCenterLocation> </RoofPlane>

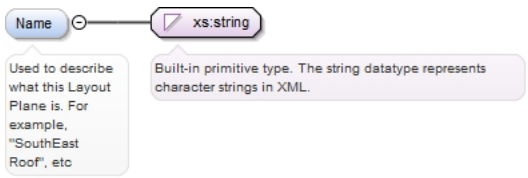
Attributes

QName	Type	Fixed	Default	Use
ANY attribute from TARGET namespace 'http://www.iepmodel.net'				
id	xs:ID			required
	Unique identifier for this layout plane.			

Source

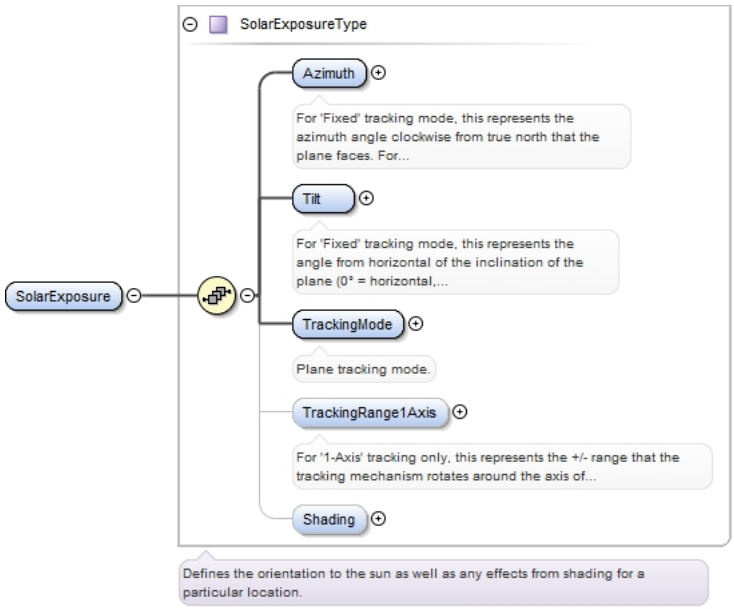
```
<xs:element name="RoofPlane" type="RoofPlaneType" minOccurs="0" maxOccurs="unbounded">
  <xs:annotation>
    <xs:documentation>This can be used for defining multiple sections of the roof</
xs:documentation>
  </xs:annotation>
</xs:element>
```

Element RoofPlaneType / Name

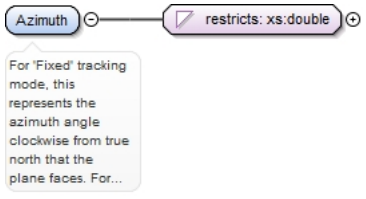
Namespace	No namespace
Annotations	Used to describe what this Layout Plane is. For example, "SouthEast Roof", etc
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element name="Name" type="xs:string" minOccurs="0" form="unqualified"> <xs:annotation> <xs:documentation>Used to describe what this Layout Plane is. For example, "SouthEast Roof", etc</xs:documentation> </xs:annotation> </xs:element>

Element RoofPlaneType / SolarExposure

Namespace	No namespace

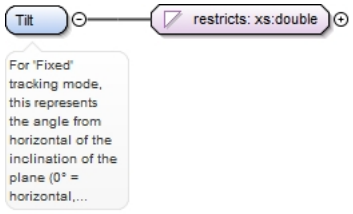
Diagram	
Type	SolarExposureType
Properties	content: complex
Model	Azimuth , Tilt , TrackingMode , TrackingRange1Axis{0,1} , Shading{0,1}
Children	Azimuth, Shading, Tilt, TrackingMode, TrackingRange1Axis
Instance	<SolarExposure> <Azimuth>{1,1}</Azimuth> <Tilt>{1,1}</Tilt> <TrackingMode>{1,1}</TrackingMode> <TrackingRange1Axis>{0,1}</TrackingRange1Axis> <Shading>{0,1}</Shading> </SolarExposure>
Source	<xs:element name="SolarExposure" type="SolarExposureType"/>

Element SolarExposureType / Azimuth

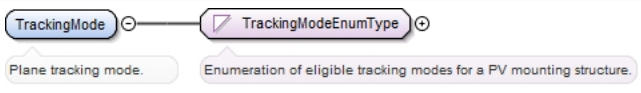
Namespace	No namespace
Annotations	For 'Fixed' tracking mode, this represents the azimuth angle clockwise from true north that the plane faces. For '1-Axis' tracking, this represents the azimuth angle clockwise from true north of the axis of rotation. If this is a child plane, instead of the angle representing azimuth relative to world space north, this represent the angle rotation about the z-axis relative to the parent plane of this child plane.
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 1 maxOccurs: 1 nillable: true
Facets	maxInclusive 360 minInclusive 0
Source	<xs:element maxOccurs="1" minOccurs="1" name="Azimuth" nillable="true" form="unqualified"> <xs:annotation> <xs:documentation>For 'Fixed' tracking mode, this represents the azimuth angle clockwise from true north that the plane faces. For '1-Axis' tracking, this represents the azimuth angle clockwise from true north of the axis of rotation. If this is a child

```
plane, instead of the angle representing azimuth relative to world space north, this
represent the angle rotation about the z-axis relative to the parent plane of this child
plane.</xs:documentation>
 </xs:annotation>
 <xs:simpleType>
   <xs:restriction base="xs:double">
     <xs:minInclusive value="0"/>
     <xs:maxInclusive value="360"/>
   </xs:restriction>
 </xs:simpleType>
</xs:element>
```

Element SolarExposureType / Tilt

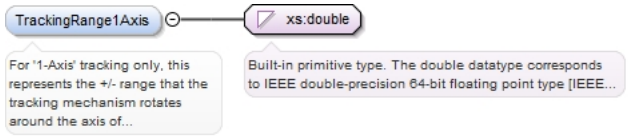
Namespace	No namespace
Annotations	For 'Fixed' tracking mode, this represents the angle from horizontal of the inclination of the plane (0° = horizontal, 90° = vertical). For '1-Axis' tracking, this represents the angle from horizontal of the inclination of the tracker axis. Units are degrees. If this is a child plane, instead of this angle being relative to the horizontal, it is relative to its parent plane.
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 1 maxOccurs: 1 nillable: true
Facets	maxInclusive 90 minInclusive 0
Source	<xs:element maxOccurs="1" minOccurs="1" name="Tilt" nillable="true" form="unqualified"> <xs:annotation> <xs:documentation>For 'Fixed' tracking mode, this represents the angle from horizontal of the inclination of the plane (0° = horizontal, 90° = vertical). For '1-Axis' tracking, this represents the angle from horizontal of the inclination of the tracker axis. Units are degrees. If this is a child plane, instead of this angle being relative to the horizontal, it is relative to its parent plane.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="0"/> <xs:maxInclusive value="90"/> </xs:restriction> </xs:simpleType> </xs:element>

Element SolarExposureType / TrackingMode

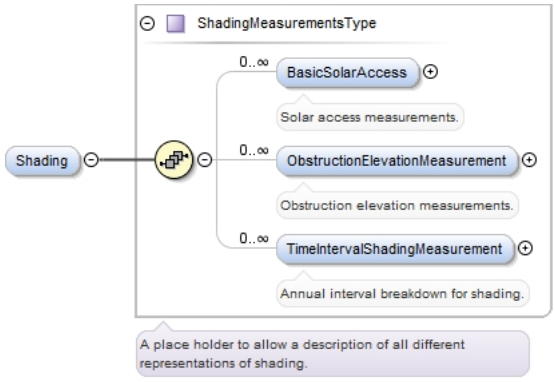
Namespace	No namespace
Annotations	Plane tracking mode.
Diagram	
Type	TrackingModeEnumType
Properties	content: simple minOccurs: 1 maxOccurs: 1 default: fixed
Facets	enumeration fixed

	enumeration	single-axis
	enumeration	dual-axis
Source	<xs:element default="fixed" maxOccurs="1" minOccurs="1" name="TrackingMode" type="TrackingModeEnumType" form="unqualified"> <xs:annotation> <xs:documentation>Plane tracking mode.</xs:documentation> </xs:annotation> </xs:element>	

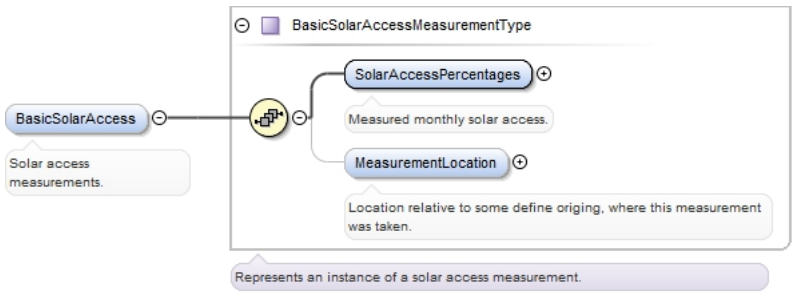
Element SolarExposureType / TrackingRange1Axis

Namespace	No namespace
Annotations	For '1-Axis' tracking only, this represents the +/- range that the tracking mechanism rotates around the axis of rotation.
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1 default: 45 nillable: true
Source	<xs:element default="45" maxOccurs="1" minOccurs="0" name="TrackingRange1Axis" nillable="true" type="xs:double" form="unqualified"> <xs:annotation> <xs:documentation>For '1-Axis' tracking only, this represents the +/- range that the tracking mechanism rotates around the axis of rotation.</xs:documentation> </xs:annotation> </xs:element>

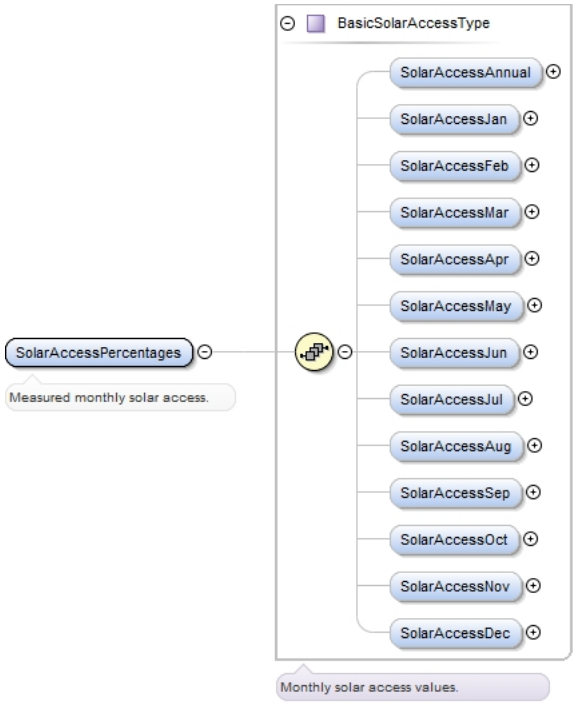
Element SolarExposureType / Shading

Namespace	No namespace
Diagram	
Type	ShadingMeasurementsType
Properties	content: complex minOccurs: 0
Model	BasicSolarAccess* , ObstructionElevationMeasurement* , TimeIntervalShadingMeasurement*
Children	BasicSolarAccess, ObstructionElevationMeasurement, TimeIntervalShadingMeasurement
Instance	<Shading> <BasicSolarAccess>{0,unbounded}</BasicSolarAccess> <ObstructionElevationMeasurement>{0,unbounded}</ObstructionElevationMeasurement> <TimeIntervalShadingMeasurement>{0,unbounded}</TimeIntervalShadingMeasurement> </Shading>
Source	<xs:element minOccurs="0" name="Shading" type="ShadingMeasurementsType" form="unqualified"/>

Element ShadingMeasurementsType / BasicSolarAccess

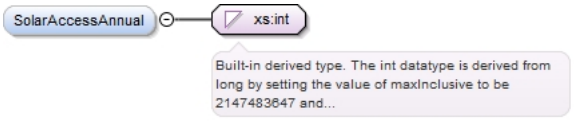
Namespace	No namespace
Annotations	Solar access measurements.
Diagram	
Type	BasicSolarAccessMeasurementType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	SolarAccessPercentages , MeasurementLocation{0,1}
Children	MeasurementLocation, SolarAccessPercentages
Instance	<BasicSolarAccess xmlns="http://www.iepmodel.net"> <SolarAccessPercentages>{1,1}</SolarAccessPercentages> <MeasurementLocation>{0,1}</MeasurementLocation> </BasicSolarAccess>
Source	<xs:element name="BasicSolarAccess" type="BasicSolarAccessMeasurementType" minOccurs="0" maxOccurs="unbounded" form="unqualified"> <xs:annotation> <xs:documentation>Solar access measurements.</xs:documentation> </xs:annotation> </xs:element>

Element BasicSolarAccessMeasurementType / SolarAccessPercentages

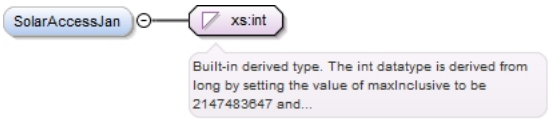
Namespace	No namespace
Annotations	Measured monthly solar access.
Diagram	
Type	BasicSolarAccessType

Properties	content: complex minOccurs: 1 maxOccurs: 1
Model	SolarAccessAnnual{0,1} , SolarAccessJan{0,1} , SolarAccessFeb{0,1} , SolarAccessMar{0,1} , SolarAccessApr{0,1} , SolarAccessMay{0,1} , SolarAccessJun{0,1} , SolarAccessJul{0,1} , SolarAccessAug{0,1} , SolarAccessSep{0,1} , SolarAccessOct{0,1} , SolarAccessNov{0,1} , SolarAccessDec{0,1}
Children	SolarAccessAnnual, SolarAccessApr, SolarAccessAug, SolarAccessDec, SolarAccessFeb, SolarAccessJan, SolarAccessJul, SolarAccessJun, SolarAccessMar, SolarAccessMay, SolarAccessNov, SolarAccessOct, SolarAccessSep
Instance	<SolarAccessPercentages> <SolarAccessAnnual>{0,1}</SolarAccessAnnual> <SolarAccessJan>{0,1}</SolarAccessJan> <SolarAccessFeb>{0,1}</SolarAccessFeb> <SolarAccessMar>{0,1}</SolarAccessMar> <SolarAccessApr>{0,1}</SolarAccessApr> <SolarAccessMay>{0,1}</SolarAccessMay> <SolarAccessJun>{0,1}</SolarAccessJun> <SolarAccessJul>{0,1}</SolarAccessJul> <SolarAccessAug>{0,1}</SolarAccessAug> <SolarAccessSep>{0,1}</SolarAccessSep> <SolarAccessOct>{0,1}</SolarAccessOct> <SolarAccessNov>{0,1}</SolarAccessNov> <SolarAccessDec>{0,1}</SolarAccessDec> </SolarAccessPercentages>
Source	<xs:element name="SolarAccessPercentages" type="BasicSolarAccessType" maxOccurs="1" minOccurs="1" form="unqualified"> <xs:annotation> <xs:documentation>Measured monthly solar access.</xs:documentation> </xs:annotation> </xs:element>

Element BasicSolarAccessType / SolarAccessAnnual

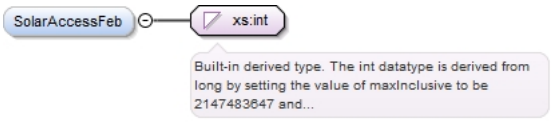
Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="SolarAccessAnnual" type="xs:int" minOccurs="0" maxOccurs="1" form="unqualified"/>

Element BasicSolarAccessType / SolarAccessJan

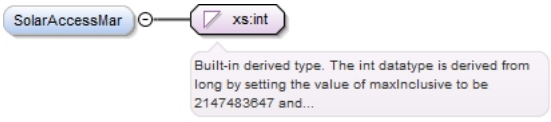
Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="SolarAccessJan" type="xs:int" minOccurs="0" maxOccurs="1" form="unqualified"/>

Element BasicSolarAccessType / SolarAccessFeb

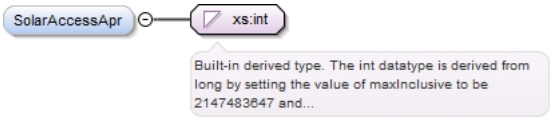
Namespace	No namespace

Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="SolarAccessFeb" type="xs:int" minOccurs="0" maxOccurs="1" form="unqualified"/>`

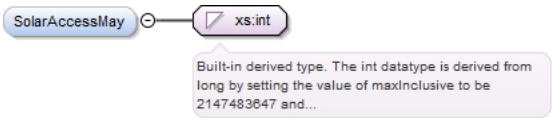
Element BasicSolarAccessType / SolarAccessMar

Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="SolarAccessMar" type="xs:int" minOccurs="0" maxOccurs="1" form="unqualified"/>`

Element BasicSolarAccessType / SolarAccessApr

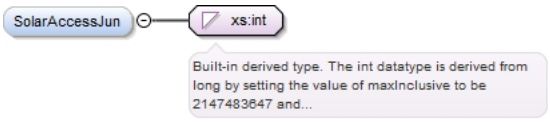
Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="SolarAccessApr" type="xs:int" minOccurs="0" maxOccurs="1" form="unqualified"/>`

Element BasicSolarAccessType / SolarAccessMay

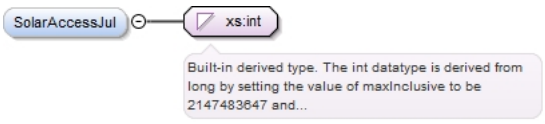
Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="SolarAccessMay" type="xs:int" minOccurs="0" maxOccurs="1" form="unqualified"/>`

Element BasicSolarAccessType / SolarAccessJun

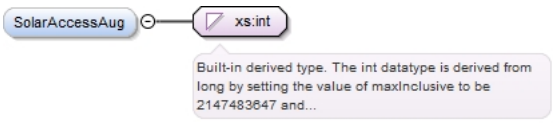
Namespace	No namespace

Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="SolarAccessJun" type="xs:int" minOccurs="0" maxOccurs="1" form="unqualified"/>`

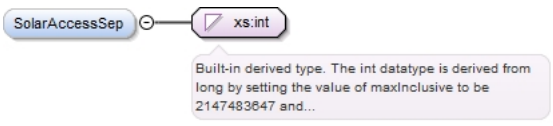
Element BasicSolarAccessType / SolarAccessJul

Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="SolarAccessJul" type="xs:int" minOccurs="0" maxOccurs="1" form="unqualified"/>`

Element BasicSolarAccessType / SolarAccessAug

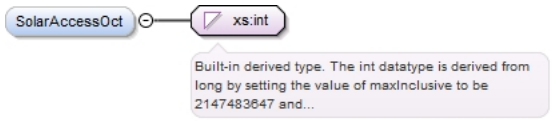
Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="SolarAccessAug" type="xs:int" minOccurs="0" maxOccurs="1" form="unqualified"/>`

Element BasicSolarAccessType / SolarAccessSep

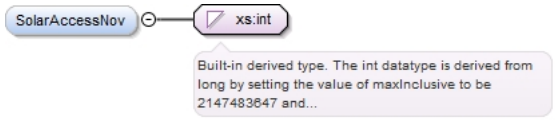
Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="SolarAccessSep" type="xs:int" minOccurs="0" maxOccurs="1" form="unqualified"/>`

Element BasicSolarAccessType / SolarAccessOct

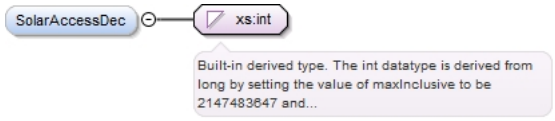
Namespace	No namespace

Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="SolarAccessOct" type="xs:int" minOccurs="0" maxOccurs="1" form="unqualified"/>`

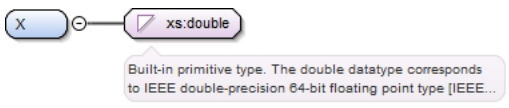
Element BasicSolarAccessType / SolarAccessNov

Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="SolarAccessNov" type="xs:int" minOccurs="0" maxOccurs="1" form="unqualified"/>`

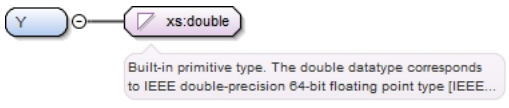
Element BasicSolarAccessType / SolarAccessDec

Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="SolarAccessDec" type="xs:int" minOccurs="0" maxOccurs="1" form="unqualified"/>`

Element Location3dType / X

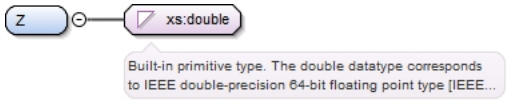
Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple
Source	`<xs:element name="X" type="xs:double"/>`

Element Location3dType / Y

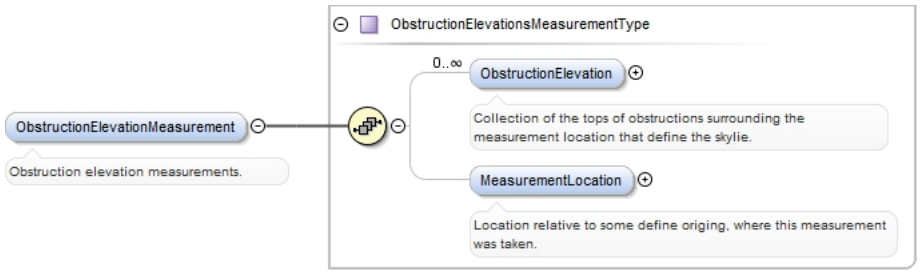
Namespace	No namespace
Diagram	

Type	xs:double
Properties	content: simple
Source	<xs:element name="Y" type="xs:double"/>

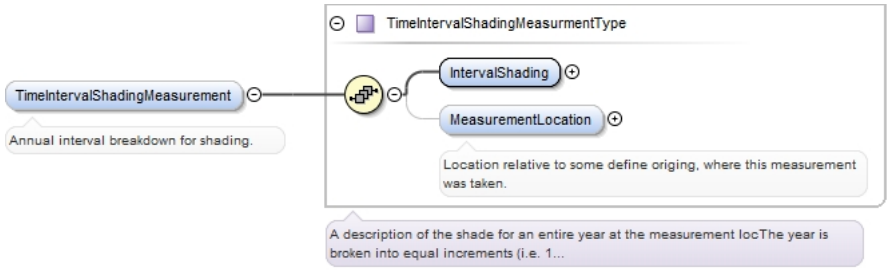
Element Location3dType / Z

Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple
Source	<xs:element name="Z" type="xs:double"/>

Element ShadingMeasurementsType / ObstructionElevationMeasurement

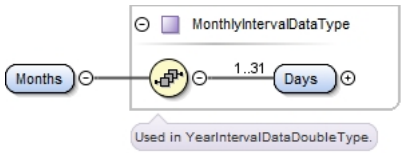
Namespace	No namespace
Annotations	Obstruction elevation measurements.
Diagram	
Type	ObstructionElevationsMeasurementType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	ObstructionElevation* , MeasurementLocation{0,1}
Children	MeasurementLocation, ObstructionElevation
Instance	<ObstructionElevationMeasurement xmlns="http://www.iepmodel.net"> <ObstructionElevation>{0,unbounded}</ObstructionElevation> <MeasurementLocation>{0,1}</MeasurementLocation> </ObstructionElevationMeasurement>
Source	<xs:element name="ObstructionElevationMeasurement" type="ObstructionElevationsMeasurementType" minOccurs="0" maxOccurs="unbounded" form="unqualified"> <xs:annotation> <xs:documentation>Obstruction elevation measurements.</xs:documentation> </xs:annotation> </xs:element>

Element ShadingMeasurementsType / TimeIntervalShadingMeasurement

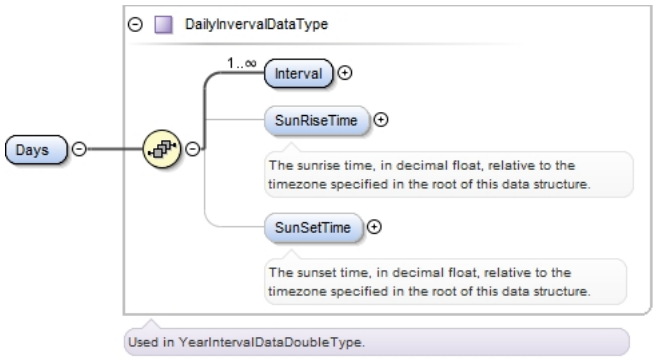
Namespace	No namespace
Annotations	Annual interval breakdown for shading.
Diagram	

Type	TimeIntervalShadingMeasurmentType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	IntervalShading , MeasurementLocation{0,1}
Children	IntervalShading, MeasurementLocation
Instance	<TimeIntervalShadingMeasurement xmlns="http://www.iepmodel.net"> <IntervalShading>{1,1}</IntervalShading> <MeasurementLocation>{0,1}</MeasurementLocation> </TimeIntervalShadingMeasurement>
Source	<xs:element name="TimeIntervalShadingMeasurement" type="TimeIntervalShadingMeasurmentType" minOccurs="0" maxOccurs="unbounded" form="unqualified"> <xs:annotation> <xs:documentation>Annual interval breakdown for shading.</xs:documentation> </xs:annotation> </xs:element>

Element YearIntervalDataDoubleType / Months

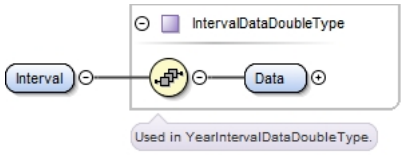
Namespace	No namespace
Diagram	
Type	MonthlyIntervalDataType
Properties	content: complex minOccurs: 12 maxOccurs: 12
Model	Days{1,31}
Children	Days
Instance	<Months> <Days>{1,31}</Days> </Months>
Source	<xs:element maxOccurs="12" minOccurs="12" name="Months" type="MonthlyIntervalDataType"/>

Element MonthlyIntervalDataType / Days

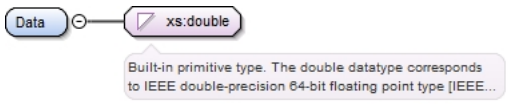
Namespace	No namespace
Diagram	
Type	DailyInvervalDataType
Properties	content: complex minOccurs: 1 maxOccurs: 31
Model	Interval+ , SunRiseTime{0,1} , SunSetTime{0,1}
Children	Interval, SunRiseTime, SunSetTime

Instance	<Days> <Interval>{1,unbounded}</Interval> <SunRiseTime>{0,1}</SunRiseTime> <SunSetTime>{0,1}</SunSetTime> </Days>
Source	<xs:element maxOccurs="31" minOccurs="1" name="Days" type="DailyInvervalDataType"/>

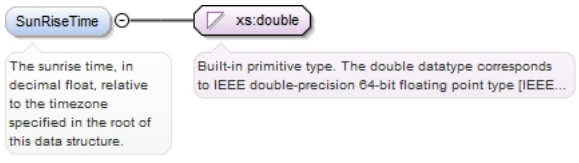
Element DailyInvervalDataType / Interval

Namespace	No namespace
Diagram	
Type	IntervalDataDoubleType
Properties	content: complex minOccurs: 1 maxOccurs: unbounded
Model	Data
Children	Data
Instance	<Interval> <Data>{1,1}</Data> </Interval>
Source	<xs:element maxOccurs="unbounded" minOccurs="1" name="Interval" type="IntervalDataDoubleType"/>

Element IntervalDataDoubleType / Data

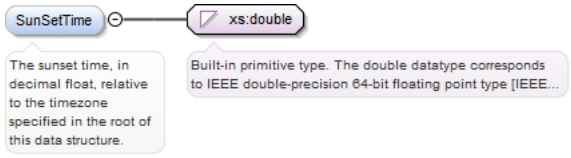
Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="1" name="Data" type="xs:double"/>

Element DailyInvervalDataType / SunRiseTime

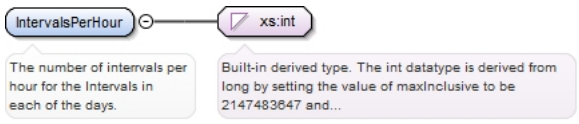
Namespace	No namespace
Annotations	The sunrise time, in decimal float, relative to the timezone specified in the root of this data structure.
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="SunRiseTime" type="xs:double">

```
  <xs:annotation>
    <xs:documentation>The sunrise time, in decimal float, relative to the timezone
 specified in the root of this data structure.</xs:documentation>
  </xs:annotation>
</xs:element>
```

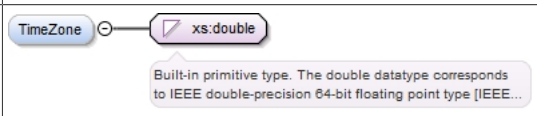
Element DailyInvervalDataType / SunSetTime

Namespace	No namespace
Annotations	The sunset time, in decimal float, relative to the timezone specified in the root of this data structure.
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="SunSetTime" type="xs:double"> <xs:annotation> <xs:documentation>The sunset time, in decimal float, relative to the timezone specified in the root of this data structure.</xs:documentation> </xs:annotation> </xs:element>

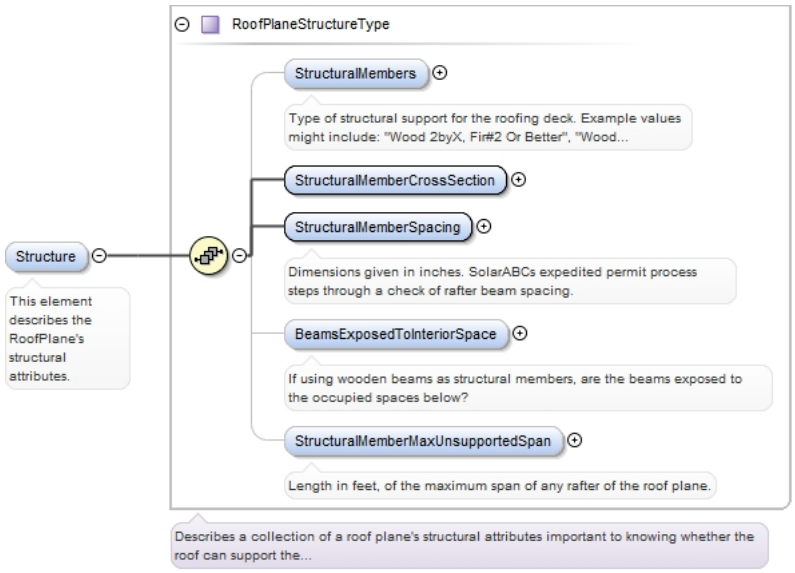
Element YearIntervalDataDoubleType / IntervalsPerHour

Namespace	No namespace
Annotations	The number of interrvals per hour for the Intervals in each of the days.
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="1" name="IntervalsPerHour" type="xs:int"> <xs:annotation> <xs:documentation>The number of interrvals per hour for the Intervals in each of the days.</xs:documentation> </xs:annotation> </xs:element>

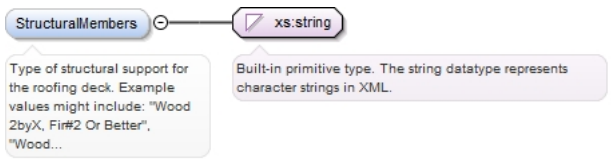
Element YearIntervalDataDoubleType / TimeZone

Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="TimeZone" type="xs:double"/>

Element RoofPlaneType / Structure

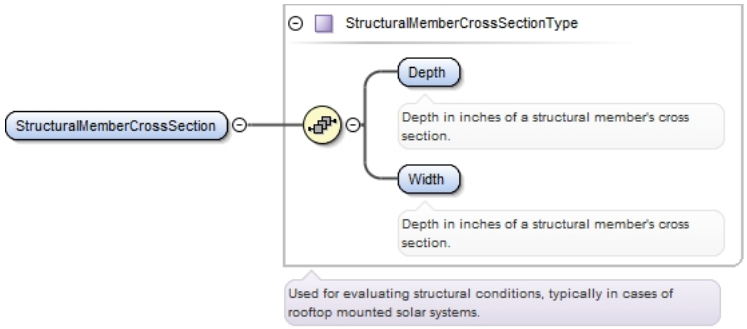
Namespace	No namespace
Annotations	This element describes the RoofPlane's structural attributes.
Diagram	
Type	RoofPlaneStructureType
Properties	content: complex minOccurs: 0
Model	StructuralMembers{0,1} , StructuralMemberCrossSection , StructuralMemberSpacing , BeamsExposedToInteriorSpace{0,1} , StructuralMemberMaxUnsupportedSpan{0,1}
Children	BeamsExposedToInteriorSpace, StructuralMemberCrossSection, StructuralMemberMaxUnsupportedSpan, StructuralMemberSpacing, StructuralMembers
Instance	<Structure> <StructuralMembers>{0,1}</StructuralMembers> <StructuralMemberCrossSection>{1,1}</StructuralMemberCrossSection> <StructuralMemberSpacing>{1,1}</StructuralMemberSpacing> <BeamsExposedToInteriorSpace>{0,1}</BeamsExposedToInteriorSpace> <StructuralMemberMaxUnsupportedSpan>{0,1}</StructuralMemberMaxUnsupportedSpan> </Structure>
Source	<xs:element minOccurs="0" name="Structure" type="RoofPlaneStructureType" form="unqualified"> <xs:annotation> <xs:documentation>This element describes the RoofPlane's structural attributes.</xs:documentation> </xs:annotation> </xs:element>

Element RoofPlaneStructureType / StructuralMembers

Namespace	No namespace
Annotations	Type of structural support for the roofing deck. Example values might include: "Wood 2byX, Fir#2 Or Better", "Wood 2byX", "Wood I-beam", "Steel I-beam", "Steel C-channel", etc
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="StructuralMembers" type="xs:string">

```
  <xs:annotation>
    <xs:documentation>Type of structural support for the roofing deck. Example values
 might include: "Wood 2byX, Fir#2 Or Better", "Wood 2byX", "Wood I-beam", "Steel I-beam",
 "Steel C-channel", etc</xs:documentation>
  </xs:annotation>
</xs:element>
```

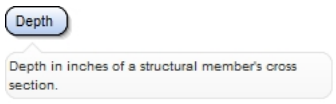
Element RoofPlaneStructureType / StructuralMemberCrossSection

Namespace	No namespace
Diagram	
Type	StructuralMemberCrossSectionType
Properties	content: complex minOccurs: 1 maxOccurs: 1
Model	Depth , Width
Children	Depth, Width

Instance	`<StructuralMemberCrossSection>`
	`  <Depth>{1,1}</Depth>`
	`  <Width>{1,1}</Width>`
	`</StructuralMemberCrossSection>`

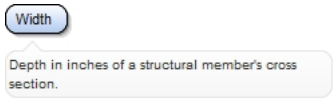
Source	`<xs:element maxOccurs="1" minOccurs="1" name="StructuralMemberCrossSection" type="StructuralMemberCrossSectionType"/>`

Element StructuralMemberCrossSectionType / Depth

Namespace	No namespace
Annotations	Depth in inches of a structural member's cross section.
Diagram	

Source	`<xs:element name="Depth">`
	`  <xs:annotation>`
	`  <xs:documentation>Depth in inches of a structural member's cross section.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

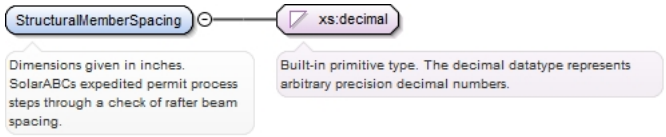
Element StructuralMemberCrossSectionType / Width

Namespace	No namespace
Annotations	Depth in inches of a structural member's cross section.
Diagram	

Source	`<xs:element name="Width">`
	`  <xs:annotation>`
	`  <xs:documentation>Depth in inches of a structural member's cross section.</xs:documentation>`
	`  </xs:annotation>`

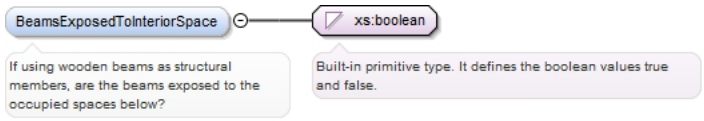
```
</xs:element>
```

Element RoofPlaneStructureType / StructuralMemberSpacing

Namespace	No namespace
Annotations	Dimensions given in inches. SolarABCs expedited permit process steps through a check of rafter beam spacing.
Diagram	
Type	xs:decimal
Properties	content: simple minOccurs: 1 maxOccurs: 1

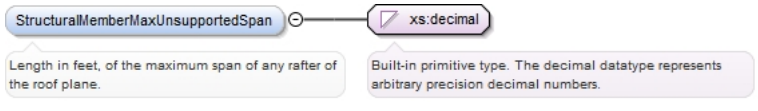
Source	`<xs:element maxOccurs="1" minOccurs="1" name="StructuralMemberSpacing" type="xs:decimal">`
	`  <xs:annotation>`
	`  <xs:documentation>Dimensions given in inches. SolarABCs expedited permit process steps through a check of rafter beam spacing.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element RoofPlaneStructureType / BeamsExposedToInteriorSpace

Namespace	No namespace
Annotations	If using wooden beams as structural members, are the beams exposed to the occupied spaces below?
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	`<xs:element maxOccurs="1" minOccurs="0" name="BeamsExposedToInteriorSpace"`
	`  type="xs:boolean">`
	`  <xs:annotation>`
	`  <xs:documentation>If using wooden beams as structural members, are the beams exposed to the occupied spaces below?</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

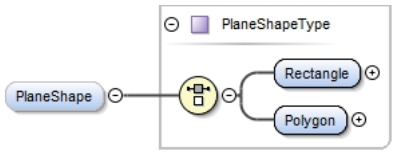
Element RoofPlaneStructureType / StructuralMemberMaxUnsupportedSpan

Namespace	No namespace
Annotations	Length in feet, of the maximum span of any rafter of the roof plane.
Diagram	
Type	xs:decimal
Properties	content: simple minOccurs: 0

Source	`<xs:element minOccurs="0" name="StructuralMemberMaxUnsupportedSpan" type="xs:decimal">`
	`  <xs:annotation>`
	`  <xs:documentation>Length in feet, of the maximum span of any rafter of the roof plane.</xs:documentation>`
	`  </xs:annotation>`

	`</xs:element>`

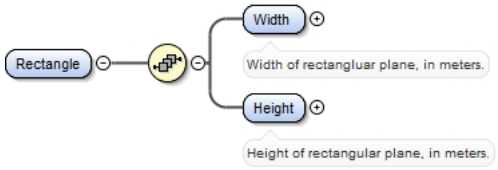
Element `RoofPlaneType / PlaneShape`

Namespace	No namespace
Diagram	
Type	PlaneShapeType
Properties	content: `complex` minOccurs: `0`
Model	Rectangle | Polygon
Children	Polygon, Rectangle

`Instance`	`<PlaneShape>`
	`  <Rectangle>{1,1}</Rectangle>`
	`  <Polygon>{1,1}</Polygon>`
	`</PlaneShape>`

`Source`	`<xs:element minOccurs="0" name="PlaneShape" type="PlaneShapeType" form="unqualified">` `</xs:element>`

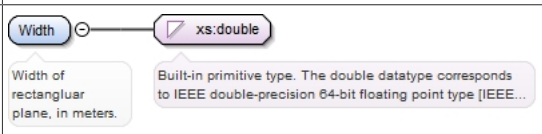
Element `PlaneShapeType / Rectangle`

Namespace	No namespace
Diagram	
Properties	content: `complex`
Model	Width , Height
Children	Height, Width

`Instance`	`<Rectangle>`
	`  <Width>{1,1}</Width>`
	`  <Height>{1,1}</Height>`
	`</Rectangle>`

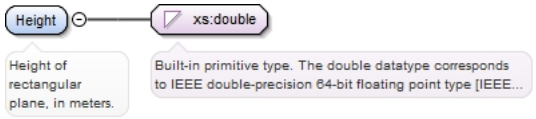
`Source`	`<xs:element name="Rectangle">`
	`  <xs:complexType>`
	`  <xs:sequence>`
	`  <xs:element name="Width" type="xs:double">`
	`  <xs:annotation>`
	`  <xs:documentation>Width of rectangluar plane, in meters.</xs:documentation>`
	`  </xs:annotation>`
	`  </xs:element>`
	`  <xs:element name="Height" type="xs:double">`
	`  <xs:annotation>`
	`  <xs:documentation>Height of rectangular plane, in meters.</xs:documentation>`
	`  </xs:annotation>`
	`  </xs:element>`
	`  </xs:sequence>`
	`  </xs:complexType>`
	`</xs:element>`

Element `PlaneShapeType / Rectangle / Width`

Namespace	No namespace
Annotations	`Width of rectangluar plane, in meters.`
Diagram	

Type	xs:double
Properties	content: simple
Source	<xs:element name="Width" type="xs:double"> <xs:annotation> <xs:documentation>Width of rectangluar plane, in meters.</xs:documentation> </xs:annotation> </xs:element>

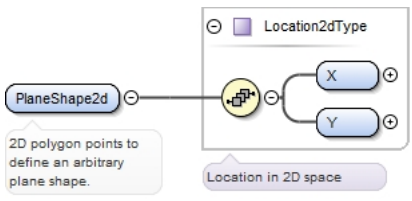
Element PlaneShapeType / Rectangle / Height

Namespace	No namespace
Annotations	Height of rectangular plane, in meters.
Diagram	
Type	xs:double
Properties	content: simple
Source	<xs:element name="Height" type="xs:double"> <xs:annotation> <xs:documentation>Height of rectangular plane, in meters.</xs:documentation> </xs:annotation> </xs:element>

Element PlaneShapeType / Polygon

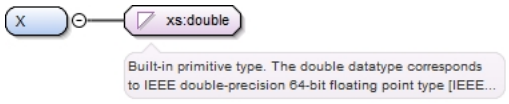
Namespace	No namespace
Diagram	
Properties	content: complex
Model	PlaneShape2d{3,unbounded}
Children	PlaneShape2d
Instance	<Polygon> <PlaneShape2d>{3,unbounded}</PlaneShape2d> </Polygon>
Source	<xs:element name="Polygon"> <xs:complexType> <xs:sequence> <xs:element name="PlaneShape2d" type="Location2dType" nillable="true" minOccurs="3" maxOccurs="unbounded"> <xs:annotation> <xs:documentation>2D polygon points to define an arbitrary plane shape.</xs:documentation> </xs:annotation> </xs:element> </xs:sequence> </xs:complexType> </xs:element>

Element PlaneShapeType / Polygon / PlaneShape2d

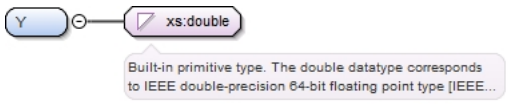
Namespace	No namespace
Annotations	2D polygon points to define an arbitrary plane shape.
Diagram	

Type	Location2dType
Properties	content: complex minOccurs: 3 maxOccurs: unbounded nillable: true
Model	X , Y
Children	X, Y
Instance	<PlaneShape2d> <X>{1,1}</X> <Y>{1,1}</Y> </PlaneShape2d>
Source	<xs:element name="PlaneShape2d" type="Location2dType" nillable="true" minOccurs="3" maxOccurs="unbounded"> <xs:annotation> <xs:documentation>2D polygon points to define an arbitrary plane shape.</xs:documentation> </xs:annotation> </xs:element>

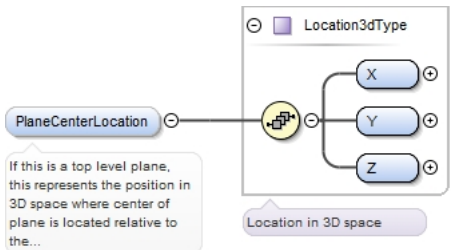
Element Location2dType / X

Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple
Source	<xs:element name="X" type="xs:double"/>

Element Location2dType / Y

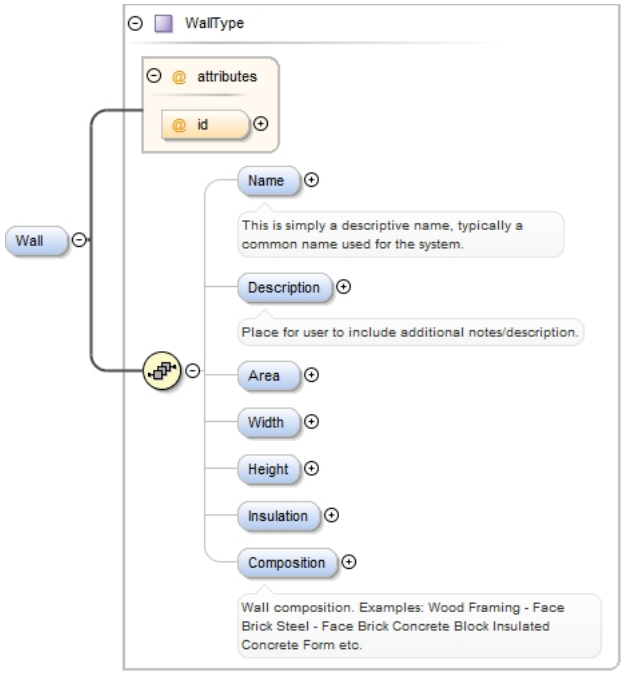
Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple
Source	<xs:element name="Y" type="xs:double"/>

Element RoofPlaneType / PlaneCenterLocation

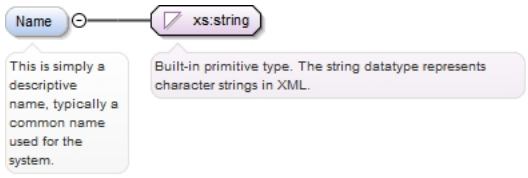
Namespace	No namespace
Annotations	If this is a top level plane, this represents the position in 3D space where center of plane is located relative to the scene origin. If this a child of another plane, this represents the center of this plane relative to its parent plane.
Diagram	
Type	Location3dType
Properties	content: complex

	minOccurs: 0 maxOccurs: 1
Model	X , Y , Z
Children	X, Y, Z
Instance	<PlaneCenterLocation> <X>{1,1}</X> <Y>{1,1}</Y> <Z>{1,1}</Z> </PlaneCenterLocation>
Source	<xs:element name="PlaneCenterLocation" type="Location3dType" maxOccurs="1" minOccurs="0"> <xs:annotation> <xs:documentation>If this is a top level plane, this represents the position in 3D space where center of plane is located relative to the scene origin. If this a child of another plane, this represents the center of this plane relative to its parent plane.</xs:documentation> </xs:annotation> </xs:element>

Element EnvelopeType / Wall

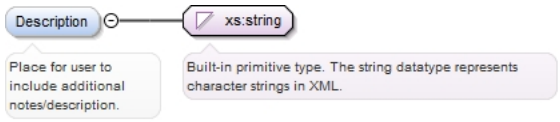
Namespace	No namespace
Diagram	
Type	WallType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , Description{0,1} , Area{0,1} , Width{0,1} , Height{0,1} , Insulation{0,1} , Composition{0,1}
Children	Area, Composition, Description, Height, Insulation, Name, Width
Instance	<Wall id=""> <Name>{0,1}</Name> <Description>{0,1}</Description> <Area Unit="SquareMeters">{0,1}</Area> <Width Unit="Meters">{0,1}</Width> <Height Unit="Meters">{0,1}</Height> <Insulation>{0,1}</Insulation> <Composition>{0,1}</Composition> </Wall>
Attributes	**QName** | **Type** | **Fixed** | **Default** | **Use** **id** | xs:IDREF | | | optional
Source	<xs:element name="Wall" type="WallType" minOccurs="0" maxOccurs="unbounded"/>

Element `WallType / Name`

Namespace	No namespace
Annotations	`This is simply a descriptive name, typically a common name used for the system.`
Diagram	
Type	xs:string
Properties	content: `simple` minOccurs: `0` maxOccurs: `1`

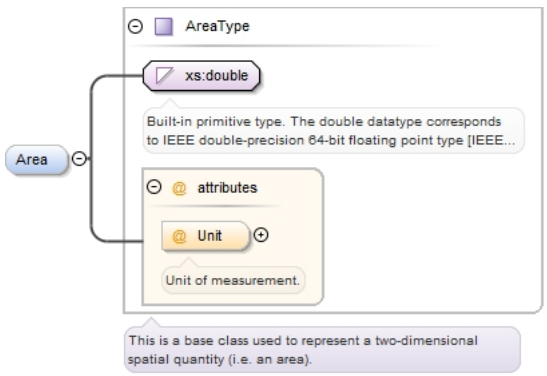
Source	`<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>This is simply a descriptive name, typically a common name used for the system.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element `WallType / Description`

Namespace	No namespace
Annotations	`Place for user to include additional notes/description.`
Diagram	
Type	xs:string
Properties	content: `simple` minOccurs: `0` maxOccurs: `1`

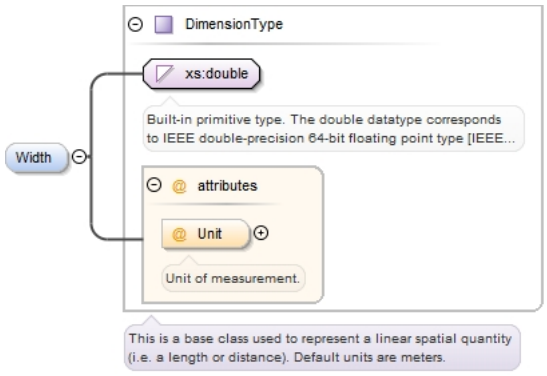
Source	`<xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string">`
	`  <xs:annotation>`
	`  <xs:documentation>Place for user to include additional notes/description.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element `WallType / Area`

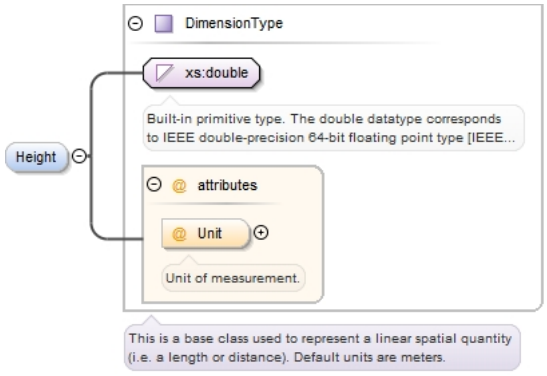
Namespace	No namespace
Diagram	
Type	AreaType
Properties	content: `complex`

	minOccurs:	0			
Attributes	**QName**	**Type**	**Fixed**	**Default**	**Use**
	Unit	AreaUnitEnumType		SquareMeters	optional
		Unit of measurement.			
Source	<xs:element name="Area" type="AreaType" minOccurs="0"/>				

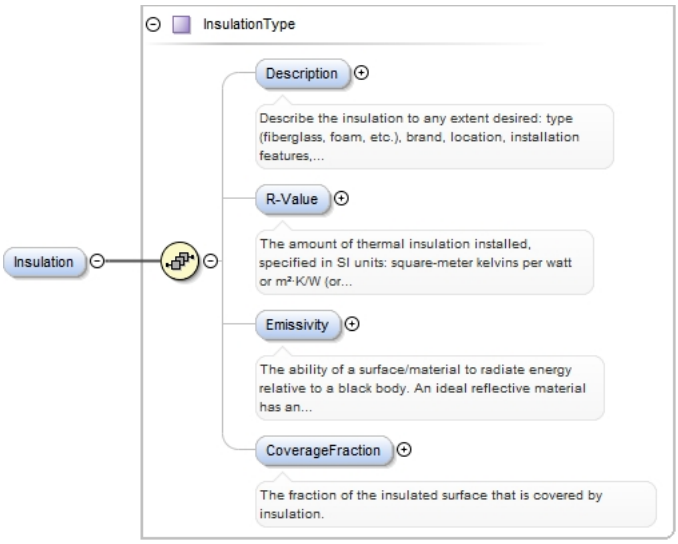
Element WallType / Width

Namespace	No namespace
Diagram	
Type	DimensionType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / DimensionUnitEnumType / / Meters / optional Unit of measurement.
Source	<xs:element name="Width" type="DimensionType" minOccurs="0" maxOccurs="1"/>

Element WallType / Height

Namespace	No namespace
Diagram	
Type	DimensionType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / DimensionUnitEnumType / / Meters / optional Unit of measurement.
Source	<xs:element name="Height" type="DimensionType" minOccurs="0" maxOccurs="1"/>

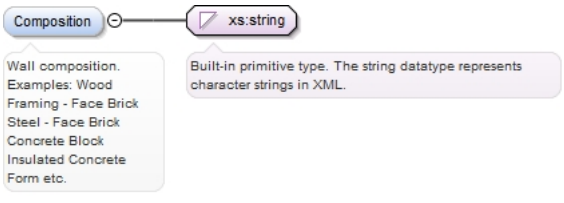
Element `WallType / Insulation`

Namespace	No namespace
Diagram	
Type	InsulationType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Description{0,1} , R-Value{0,1} , Emissivity{0,1} , CoverageFraction{0,1}
Children	CoverageFraction, Description, Emissivity, R-Value

Instance	`<Insulation>`
	`  <Description>{0,1}</Description>`
	`  <R-Value>{0,1}</R-Value>`
	`  <Emissivity>{0,1}</Emissivity>`
	`  <CoverageFraction>{0,1}</CoverageFraction>`
	`</Insulation>`

Source	`<xs:element name="Insulation" type="InsulationType" minOccurs="0" maxOccurs="1"/>`

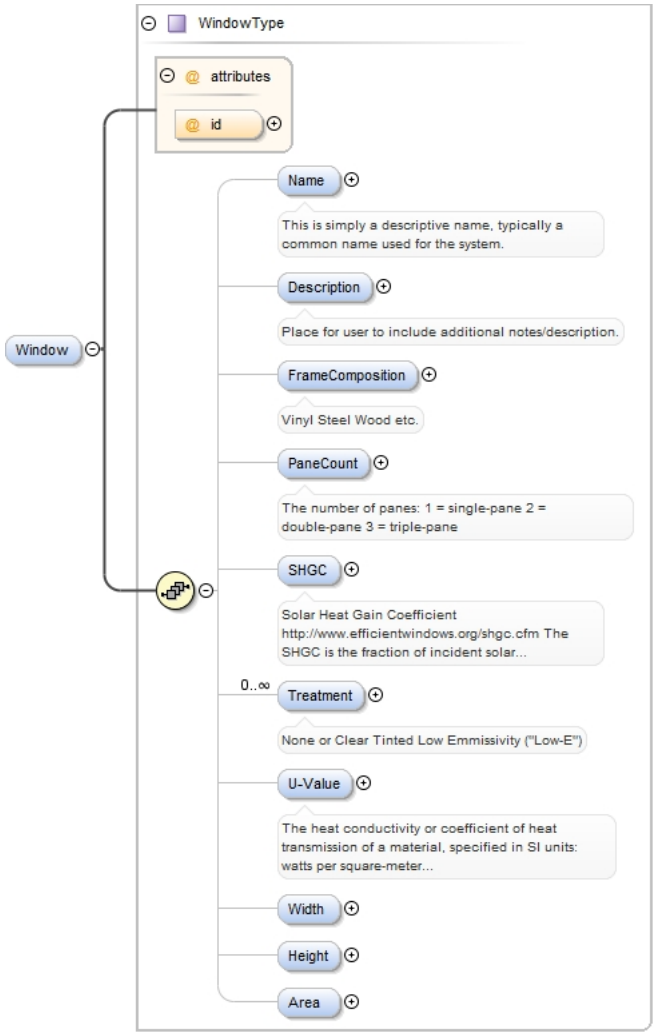
Element `WallType / Composition`

Namespace	No namespace
Annotations	Wall composition. Examples: Wood Framing - Face Brick Steel - Face Brick Concrete Block Insulated Concrete Form etc.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	`<xs:element name="Composition" type="xs:string" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>Wall composition. Examples: Wood Framing - Face Brick Steel - Face Brick Concrete Block Insulated Concrete Form etc.</xs:documentation>`
	`  </xs:annotation>`

	`</xs:element>`

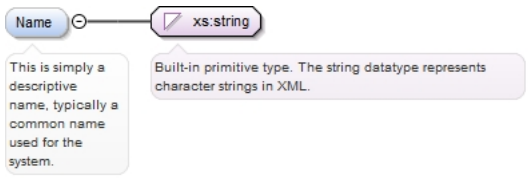
Element EnvelopeType / Window

Namespace	No namespace
Diagram	
Type	WindowType
Properties	content: `complex` minOccurs: `0` maxOccurs: `unbounded`
Model	Name{0,1} , Description{0,1} , FrameComposition{0,1} , PaneCount{0,1} , SHGC{0,1} , Treatment* , U-Value{0,1} , Width{0,1} , Height{0,1} , Area{0,1}
Children	Area, Description, FrameComposition, Height, Name, PaneCount, SHGC, Treatment, U-Value, Width

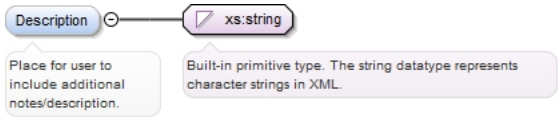
Instance	`<Window id="">`
	`  <Name>{0,1}</Name>`
	`  <Description>{0,1}</Description>`
	`  <FrameComposition>{0,1}</FrameComposition>`
	`  <PaneCount>{0,1}</PaneCount>`
	`  <SHGC>{0,1}</SHGC>`
	`  <Treatment>{0,unbounded}</Treatment>`
	`  <U-Value>{0,1}</U-Value>`
	`  <Width Unit="Meters">{0,1}</Width>`
	`  <Height Unit="Meters">{0,1}</Height>`
	`  <Area Unit="SquareMeters">{0,1}</Area>`
	`</Window>`

Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **id** / xs:IDREF / / / optional
Source	`<xs:element name="Window" type="WindowType" minOccurs="0" maxOccurs="unbounded"/>`

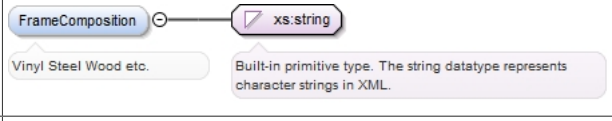
Element WindowType / Name

Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is simply a descriptive name, typically a common name used for the system.</xs:documentation> </xs:annotation> </xs:element>

Element WindowType / Description

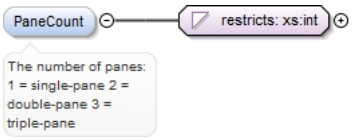
Namespace	No namespace
Annotations	Place for user to include additional notes/description.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="Description" type="xs:string"> <xs:annotation> <xs:documentation>Place for user to include additional notes/description.</xs:documentation> </xs:annotation> </xs:element>

Element WindowType / FrameComposition

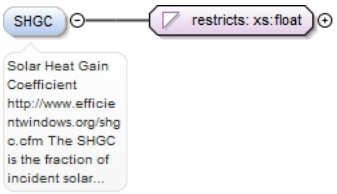
Namespace	No namespace
Annotations	Vinyl Steel Wood etc.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="FrameComposition" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Vinyl Steel Wood etc.</xs:documentation> </xs:annotation>

```
</xs:element>
```

Element WindowType / PaneCount

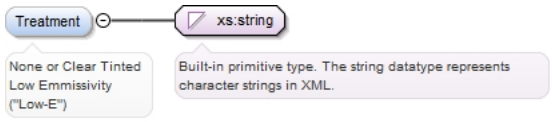
Namespace	No namespace
Annotations	The number of panes: 1 = single-pane 2 = double-pane 3 = triple-pane
Diagram	
Type	restriction of xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	minInclusive 1
Source	<xs:element name="PaneCount" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The number of panes: 1 = single-pane 2 = double-pane 3 = triple-pane</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:int"> <xs:minInclusive value="1"/> </xs:restriction> </xs:simpleType> </xs:element>

Element WindowType / SHGC

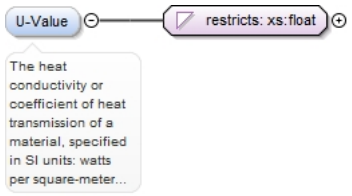
Namespace	No namespace
Annotations	Solar Heat Gain Coefficient http://www.efficientwindows.org/shgc.cfm The SHGC is the fraction of incident solar radiation admitted through a window, both directly transmitted and absorbed and subsequently released inward. SHGC is expressed as a number between 0 and 1. The lower a window's solar heat gain coefficient, the less solar heat it transmits.
Diagram	
Type	restriction of xs:float
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 1 minInclusive 0
Source	<xs:element name="SHGC" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Solar Heat Gain Coefficient http://www.efficientwindows.org/shgc.cfm The SHGC is the fraction of incident solar radiation admitted through a window, both directly transmitted and absorbed and subsequently released inward. SHGC is expressed as a number between 0 and 1. The lower a window's solar heat gain coefficient, the less solar heat it transmits.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:float">

```
      <xs:minInclusive value="0"/>
      <xs:maxInclusive value="1"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

Element WindowType / Treatment

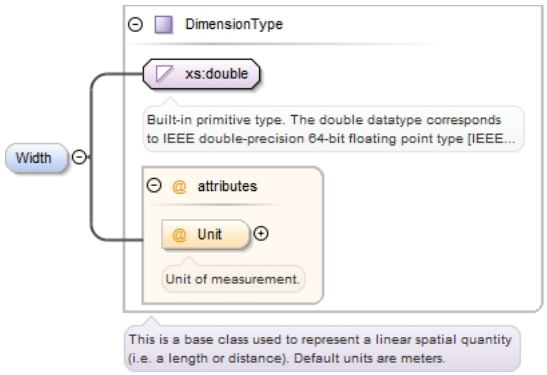
Namespace	No namespace
Annotations	None or Clear Tinted Low Emmissivity ("Low-E")
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: unbounded
Source	<xs:element name="Treatment" type="xs:string" minOccurs="0" maxOccurs="unbounded"> <xs:annotation> <xs:documentation>None or Clear Tinted Low Emmissivity ("Low-E")</xs:documentation> </xs:annotation> </xs:element>

Element WindowType / U-Value

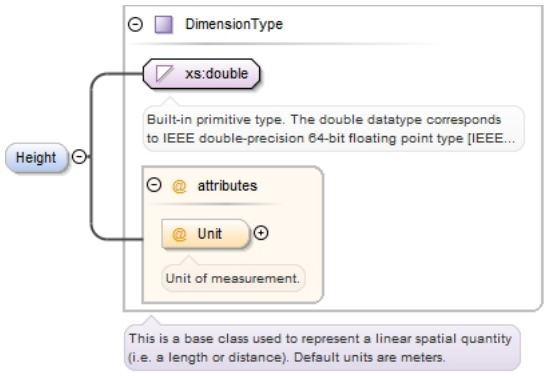
Namespace	No namespace
Annotations	The heat conductivity or coefficient of heat transmission of a material, specified in SI units: watts per square-meter kelvins W/(m²·K) or equivalently W/(m²·°C). Note that if you intend to use different units then this should be noted in the Description.
Diagram	
Type	restriction of xs:float
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	minInclusive 0
Source	<xs:element name="U-Value" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The heat conductivity or coefficient of heat transmission of a material, specified in SI units: watts per square-meter kelvins W/(m²·K) or equivalently W/(m²·°C). Note that if you intend to use different units then this should be noted in the Description.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:float"> <xs:minInclusive value="0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element WindowType / Width

Namespace	No namespace

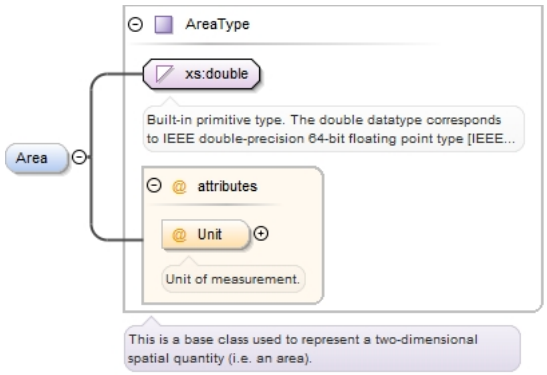
Diagram	
Type	DimensionType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Attributes	**QName** / **Unit**: **Type** DimensionUnitEnumType; **Fixed**; **Default** Meters; **Use** optional Unit of measurement.
Source	`<xs:element name="Width" type="DimensionType" minOccurs="0" maxOccurs="1"/>`

Element WindowType / Height

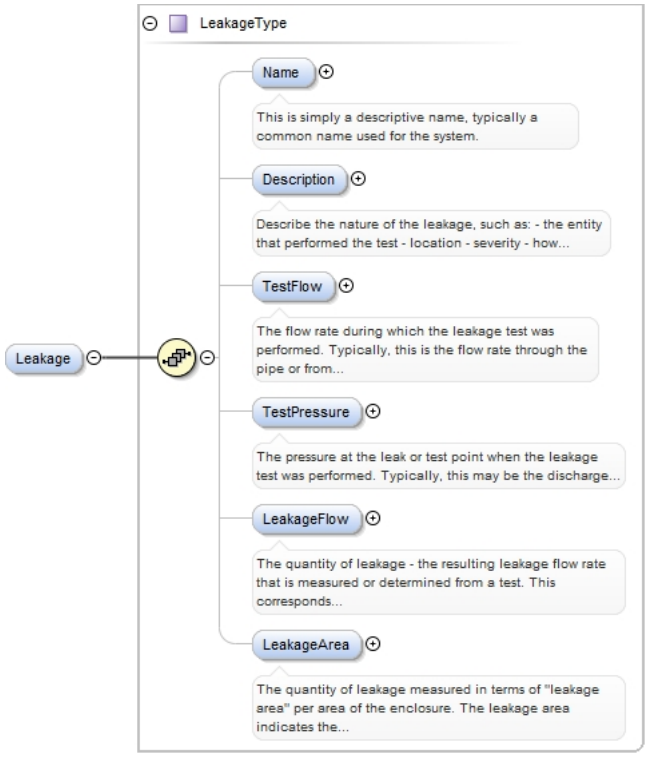
Namespace	No namespace
Diagram	
Type	DimensionType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Attributes	**QName** / **Unit**: **Type** DimensionUnitEnumType; **Fixed**; **Default** Meters; **Use** optional Unit of measurement.
Source	`<xs:element name="Height" type="DimensionType" minOccurs="0" maxOccurs="1"/>`

Element WindowType / Area

Namespace	No namespace

Diagram	
Type	AreaType
Properties	content: complex minOccurs: 0
Attributes	**QName** / **Unit**: **Type** AreaUnitEnumType; **Fixed**; **Default** SquareMeters; **Use** optional Unit of measurement.
Source	`<xs:element name="Area" type="AreaType" minOccurs="0"/>`

Element EnvelopeType / Leakage

Namespace	No namespace
Diagram	
Type	LeakageType
Properties	content: complex minOccurs: 0
Model	Name{0,1} , Description{0,1} , TestFlow{0,1} , TestPressure{0,1} , LeakageFlow{0,1} , LeakageArea{0,1}
Children	Description, LeakageArea, LeakageFlow, Name, TestFlow, TestPressure

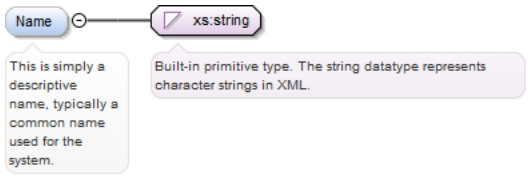
Instance	`<Leakage>`
	`  <Name>{0,1}</Name>`
	`  <Description>{0,1}</Description>`
	`  <TestFlow Unit="">{0,1}</TestFlow>`

```
  <TestPressure Unit="">{0,1}</TestPressure>
  <LeakageFlow Unit="">{0,1}</LeakageFlow>
  <LeakageArea Unit="SquareMeters">{0,1}</LeakageArea>
</Leakage>
```

Source

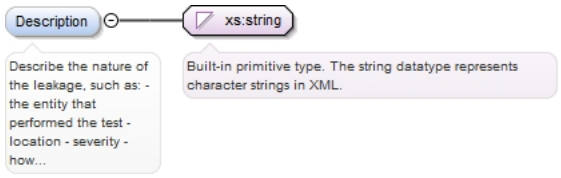
```
<xs:element minOccurs="0" name="Leakage" type="LeakageType"/>
```

Element LeakageType / Name

Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	`<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>This is simply a descriptive name, typically a common name used for the system.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

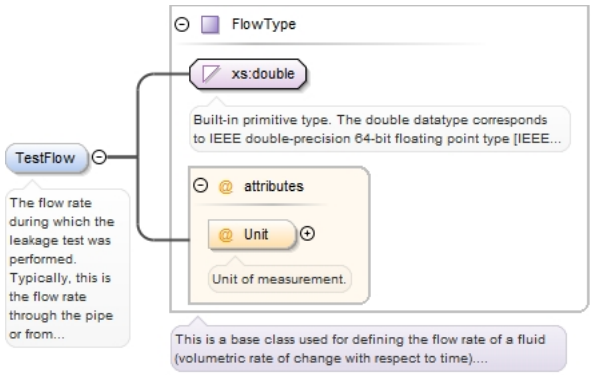
Element LeakageType / Description

Namespace	No namespace
Annotations	Describe the nature of the leakage, such as: - the entity that performed the test - location - severity - how discovered - systems, equipment affected - etc.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	`<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>Describe the nature of the leakage, such as: - the entity that performed the test - location - severity - how discovered - systems, equipment affected - etc.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

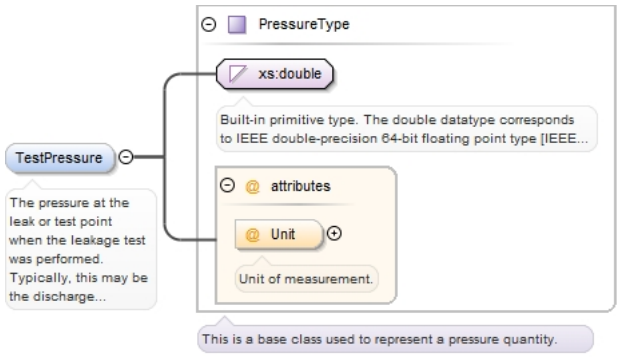
Element LeakageType / TestFlow

Namespace	No namespace
Annotations	The flow rate during which the leakage test was performed. Typically, this is the flow rate through the pipe or from the fan if a blower door or duct leakage test is performed. This flow rate correspondes to the Leakage Value.

Diagram	
Type	FlowType
Properties	content: complex minOccurs: 0
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / FlowUnitEnumType / / / optional Unit of measurement.

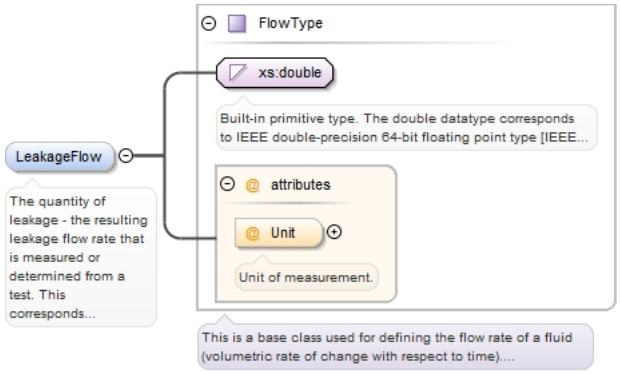
Source	`<xs:element minOccurs="0" name="TestFlow" type="FlowType">`
	`  <xs:annotation>`
	`  <xs:documentation>The flow rate during which the leakage test was performed. Typically, this is the flow rate through the pipe or from the fan if a blower door or duct leakage test is performed. This flow rate correspondes to the Leakage Value.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element LeakageType / TestPressure

Namespace	No namespace
Annotations	The pressure at the leak or test point when the leakage test was performed. Typically, this may be the discharge pressure of the fan if a blower door or duct leakage test is performed. This pressure corresponds to the Leakage Value.
Diagram	
Type	PressureType
Properties	content: complex minOccurs: 0
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / PressureUnitEnumType / / / optional Unit of measurement.

Source	`<xs:element minOccurs="0" name="TestPressure" type="PressureType">`
	`  <xs:annotation>`
	`  <xs:documentation>The pressure at the leak or test point when the leakage test was performed. Typically, this may be the discharge pressure of the fan if a blower door or duct leakage test is performed. This pressure corresponds to the Leakage Value.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element LeakageType / LeakageFlow

Namespace	No namespace
Annotations	The quantity of leakage - the resulting leakage flow rate that is measured or determined from a test. This corresponds to the Test Flow and Pressure.
Diagram	
Type	FlowType
Properties	content: complex minOccurs: 0

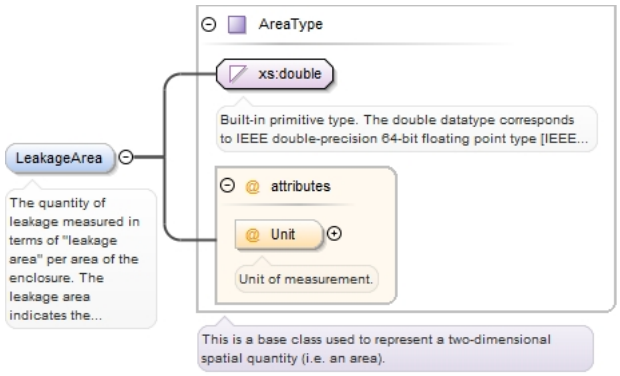
Attributes

QName	Type	Fixed	Default	Use
Unit	FlowUnitEnumType			optional
	Unit of measurement.			

Source

```
<xs:element minOccurs="0" name="LeakageFlow" type="FlowType">
  <xs:annotation>
    <xs:documentation>The quantity of leakage - the resulting leakage flow rate that is
 measured or determined from a test. This corresponds to the Test Flow and Pressure.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

Element LeakageType / LeakageArea

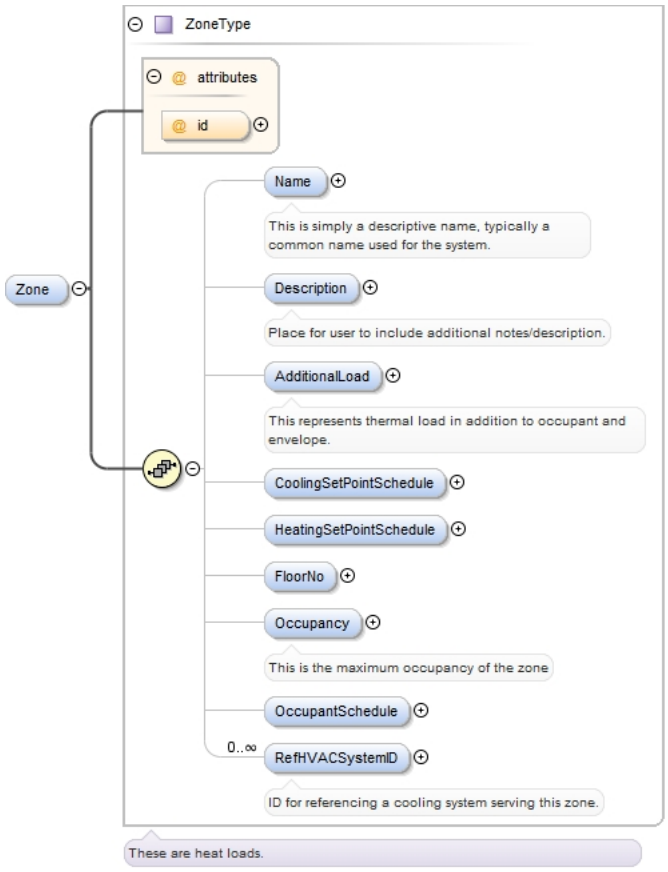
Namespace	No namespace
Annotations	The quantity of leakage measured in terms of "leakage area" per area of the enclosure. The leakage area indicates the effective net size (area) of the leak. The area of the enclosure typically refers to the floor-area of the enclosure being tested. This corresponds to the Test Flow and Pressure.
Diagram	
Type	AreaType
Properties	content: complex minOccurs: 0

Attributes

QName	Type	Fixed	Default	Use
Unit	AreaUnitEnumType		SquareMeters	optional
	Unit of measurement.			

Source	<xs:element minOccurs="0" name="LeakageArea" type="AreaType"> <xs:annotation> <xs:documentation>The quantity of leakage measured in terms of "leakage area" per area of the enclosure. The leakage area indicates the effective net size (area) of the leak. The area of the enclosure typically refers to the floor-area of the enclosure being tested. This corresponds to the Test Flow and Pressure.</xs:documentation> </xs:annotation> </xs:element>

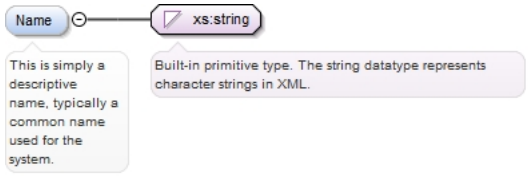
Element BuildingType / Zone

Namespace	No namespace
Diagram	
Type	ZoneType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , Description{0,1} , AdditionalLoad{0,1} , CoolingSetPointSchedule{0,1} , HeatingSetPointSchedule{0,1} , FloorNo{0,1} , Occupancy{0,1} , OccupantSchedule{0,1} , RefHVACSystemID*
Children	AdditionalLoad, CoolingSetPointSchedule, Description, FloorNo, HeatingSetPointSchedule, Name, Occupancy, OccupantSchedule, RefHVACSystemID
Instance	<Zone id=""> <Name>{0,1}</Name> <Description>{0,1}</Description> <AdditionalLoad Fuel="Electricity" FuelDesc="Electricity" TestCondition="" Unit="" UnitDesc="kwh">{0,1 AdditionalLoad> <CoolingSetPointSchedule id="" type="">{0,1}</CoolingSetPointSchedule> <HeatingSetPointSchedule id="" type="">{0,1}</HeatingSetPointSchedule> <FloorNo>{0,1}</FloorNo> <Occupancy>{0,1}</Occupancy> <OccupantSchedule id="" type="">{0,1}</OccupantSchedule> <RefHVACSystemID>{0,unbounded}</RefHVACSystemID> </Zone>

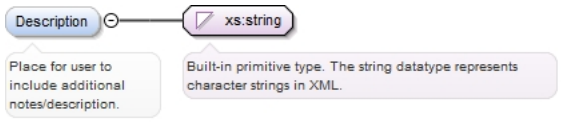
Attributes	QName	Type	Fixed	Default	Use
	id	xs:ID			optional

Source	<xs:element name="Zone" type="ZoneType" minOccurs="0" maxOccurs="unbounded"/>

Element ZoneType / Name

Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is simply a descriptive name, typically a common name used for the system.</xs:documentation> </xs:annotation> </xs:element>

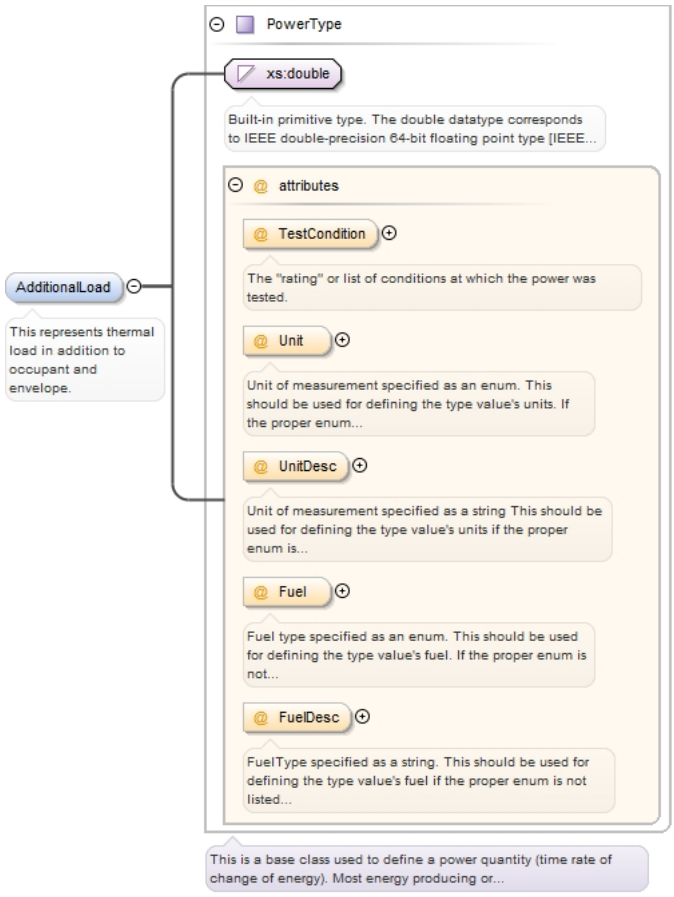
Element ZoneType / Description

Namespace	No namespace
Annotations	Place for user to include additional notes/description.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Place for user to include additional notes/description.</xs:documentation> </xs:annotation> </xs:element>

Element ZoneType / AdditionalLoad

Namespace	No namespace
Annotations	This represents thermal load in addition to occupant and envelope.

Diagram



Type: PowerType

Properties

content:	complex
minOccurs:	0
maxOccurs:	1

Attributes

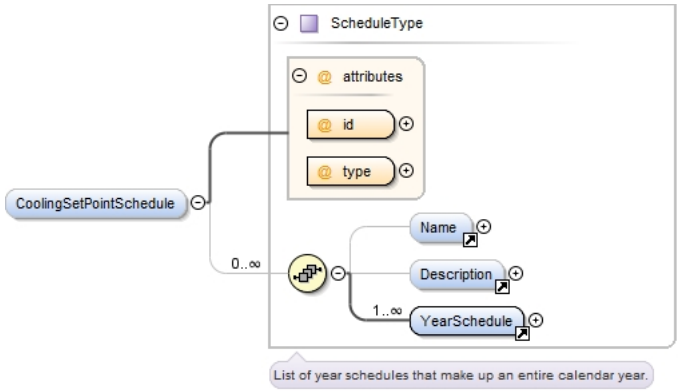
QName	Type	Fixed	Default	Use
Fuel	EnergyClassEnumType		Electricity	optional
	Fuel type specified as an enum. This should be used for defining the type value's fuel. If the proper enum is not listed, please use the FuelDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.			
FuelDesc	xs:string		Electricity	optional
	FuelType specified as a string. This should be used for defining the type value's fuel if the proper enum is not listed in Fuel. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.			
TestCondition	xs:string			optional
	The "rating" or list of conditions at which the power was tested.			
Unit	PowerUnitEnumType			optional
	Unit of measurement specified as an enum. This should be used for defining the type value's units. If the proper enum is not listed, please use the UnitDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			
UnitDesc	xs:string		kwh	optional
	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a			

	QName	Type	Fixed	Default	Use
		simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			

Source

```
<xs:element name="AdditionalLoad" type="PowerType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>This represents thermal load in addition to occupant and envelope.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

Element ZoneType / CoolingSetPointSchedule

Namespace	No namespace
Diagram	
Type	ScheduleType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Name{0,1} , Description{0,1} , YearSchedule+
Children	Description, Name, YearSchedule

Instance

```
<CoolingSetPointSchedule id="" type="" xmlns="http://www.iepmodel.net">
  <Name>{0,1}</Name>
  <Description>{0,1}</Description>
  <YearSchedule id="">{1,unbounded}</YearSchedule>
</CoolingSetPointSchedule>
```

Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			required
type	scheduleEnumType			required

Source

```
<xs:element name="CoolingSetPointSchedule" type="ScheduleType" minOccurs="0"
 maxOccurs="1"/>
```

Element YearScheduleType / WeekScheduleId

Namespace	No namespace
Diagram	
Properties	content: complex minOccurs: 1 maxOccurs: 1

Attributes

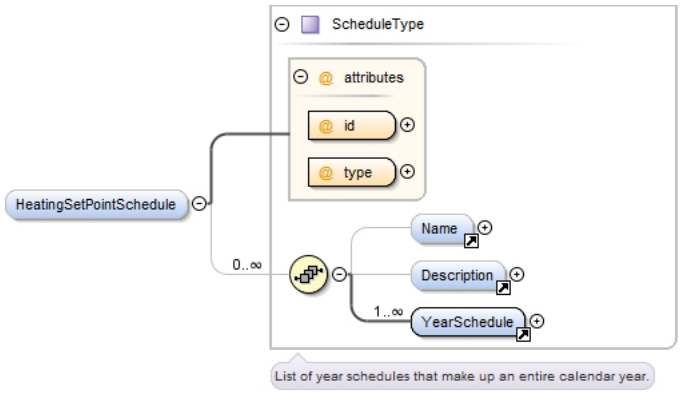
QName	Type	Fixed	Default	Use
weekScheduleIdRef	xs:IDREF			required

Source

```
<xs:element minOccurs="1" maxOccurs="1" name="WeekScheduleId">
  <xs:complexType>
    <xs:attribute name="weekScheduleIdRef" type="xs:IDREF" use="required"/>
  </xs:complexType>
```

```
</xs:element>
```

Element ZoneType / HeatingSetPointSchedule

Namespace	No namespace
Diagram	
Type	ScheduleType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Name{0,1} , Description{0,1} , YearSchedule+
Children	Description, Name, YearSchedule

Instance	`<HeatingSetPointSchedule id="" type="" xmlns="http://www.iepmodel.net">`
	`  <Name>{0,1}</Name>`
	`  <Description>{0,1}</Description>`
	`  <YearSchedule id="">{1,unbounded}</YearSchedule>`
	`</HeatingSetPointSchedule>`

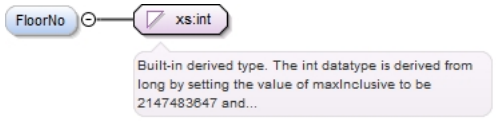
Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			required
type	scheduleEnumType			required

Source

```
<xs:element name="HeatingSetPointSchedule" type="ScheduleType" minOccurs="0"
 maxOccurs="1"/>
```

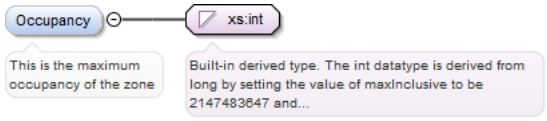
Element ZoneType / FloorNo

Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source

```
<xs:element name="FloorNo" type="xs:int" minOccurs="0" maxOccurs="1"/>
```

Element ZoneType / Occupancy

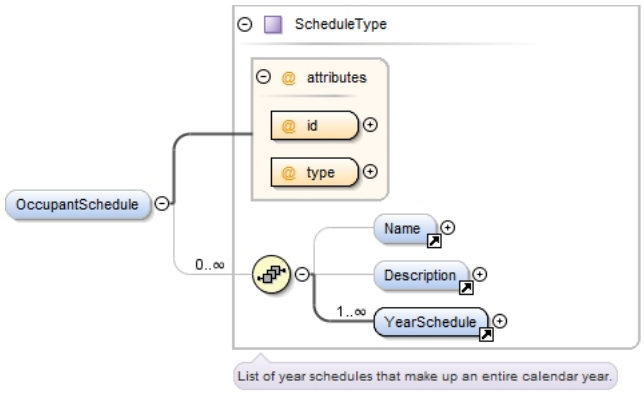
Namespace	No namespace
Annotations	This is the maximum occupancy of the zone
Diagram	
Type	xs:int

Properties	content:	simple
	minOccurs:	0
	maxOccurs:	1

Source

```
<xs:element name="Occupancy" type="xs:int" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>This is the maximum occupancy of the zone</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element ZoneType / OccupantSchedule

Namespace	No namespace
Diagram	

Type	ScheduleType	
Properties	content:	complex
	minOccurs:	0
	maxOccurs:	1
Model	Name{0,1} , Description{0,1} , YearSchedule+	
Children	Description, Name, YearSchedule	

Instance

```
<OccupantSchedule id="" type="" xmlns="http://www.iepmodel.net">
  <Name>{0,1}</Name>
  <Description>{0,1}</Description>
  <YearSchedule id="">{1,unbounded}</YearSchedule>
</OccupantSchedule>
```

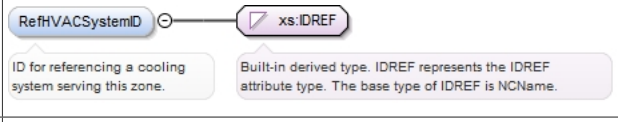
Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			required
type	scheduleEnumType			required

Source

```
<xs:element name="OccupantSchedule" type="ScheduleType" minOccurs="0" maxOccurs="1"/>
```

Element ZoneType / RefHVACSystemID

Namespace	No namespace
Annotations	ID for referencing a cooling system serving this zone.
Diagram	

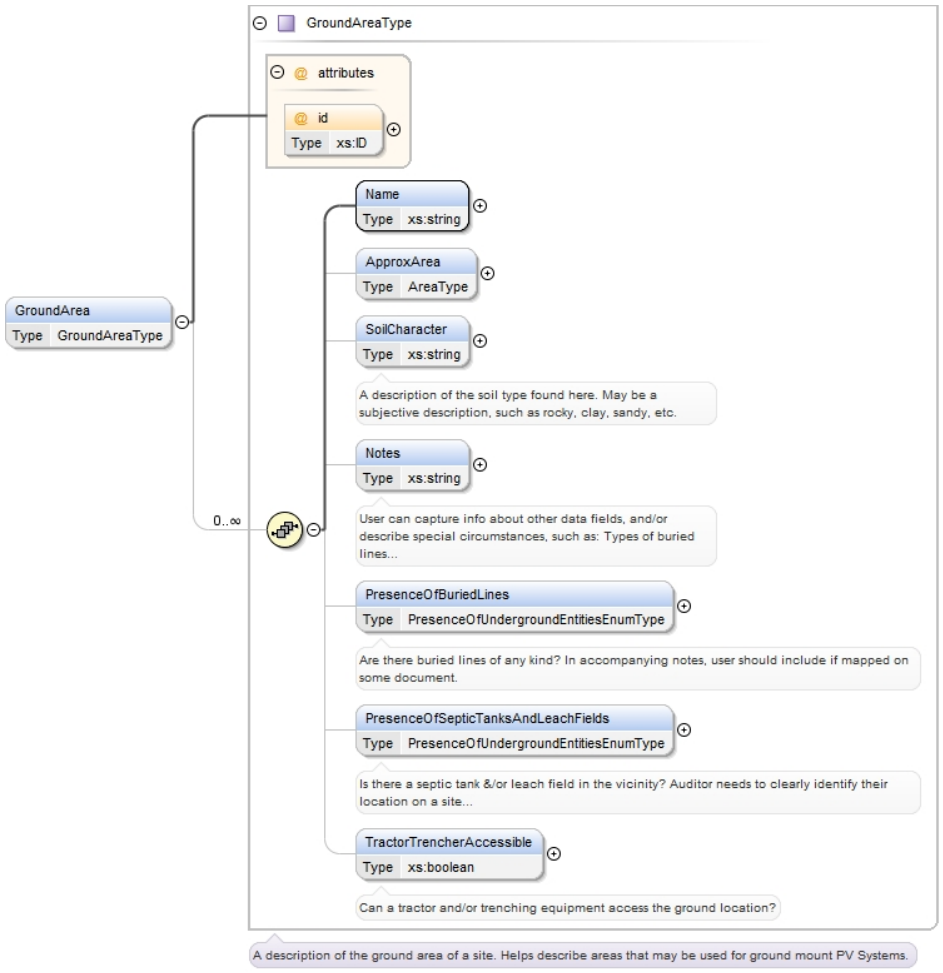
Type	xs:IDREF	
Properties	content:	simple
	minOccurs:	0
	maxOccurs:	unbounded

Source

```
<xs:element name="RefHVACSystemID" type="xs:IDREF" minOccurs="0" maxOccurs="unbounded">
  <xs:annotation>
    <xs:documentation>ID for referencing a cooling system serving this zone.</
xs:documentation>
  </xs:annotation>
```

```
</xs:element>
```

Element SiteType / GroundArea

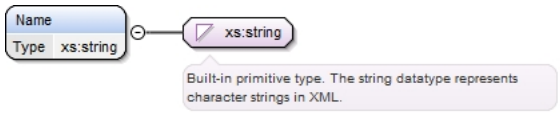
Namespace	No namespace
Diagram	
Type	GroundAreaType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name , ApproxArea{0,1} , SoilCharacter{0,1} , Notes{0,1} , PresenceOfBuriedLines{0,1} , PresenceOfSepticTanksAndLeachFields{0,1} , TractorTrencherAccessible{0,1}
Children	ApproxArea, Name, Notes, PresenceOfBuriedLines, PresenceOfSepticTanksAndLeachFields, SoilCharacter, TractorTrencherAccessible

Instance	`<GroundArea id="">`
	`<Name>{1,1}</Name>`
	`<ApproxArea Unit="SquareMeters">{0,1}</ApproxArea>`
	`<SoilCharacter>{0,1}</SoilCharacter>`
	`<Notes>{0,1}</Notes>`
	`<PresenceOfBuriedLines>{0,1}</PresenceOfBuriedLines>`
	`<PresenceOfSepticTanksAndLeachFields>{0,1}</PresenceOfSepticTanksAndLeachFields>`
	`<TractorTrencherAccessible>{0,1}</TractorTrencherAccessible>`
	`</GroundArea>`

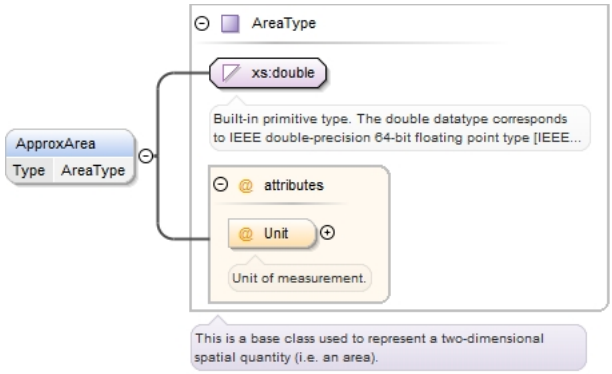
Attributes	**QName** id; **Type** xs:ID; **Fixed**; **Default**; **Use** optional
Source	`<xs:element maxOccurs="unbounded" minOccurs="0" name="GroundArea" type="GroundAreaType"/>`

Element GroundAreaType / Name

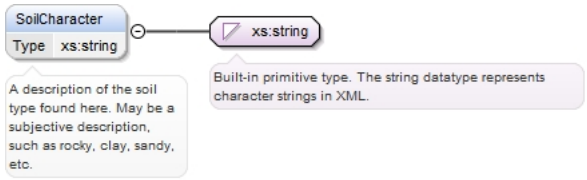
Namespace	No namespace

Diagram	
Type	xs:string
Properties	content: simple
Source	`<xs:element name="Name" type="xs:string"/>`

Element GroundAreaType / ApproxArea

Namespace	No namespace
Diagram	
Type	AreaType
Properties	content: complex minOccurs: 0
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **Unit** / AreaUnitEnumType / / SquareMeters / optional Unit of measurement.
Source	`<xs:element minOccurs="0" name="ApproxArea" type="AreaType"/>`

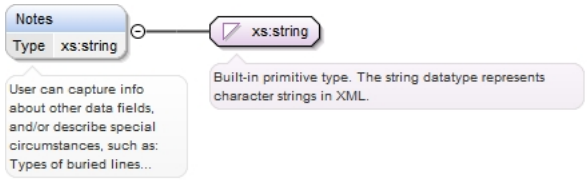
Element GroundAreaType / SoilCharacter

Namespace	No namespace
Annotations	A description of the soil type found here. May be a subjective description, such as rocky, clay, sandy, etc.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

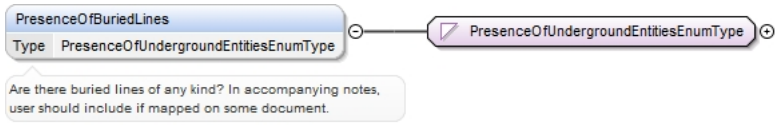
Source	`<xs:element maxOccurs="1" minOccurs="0" name="SoilCharacter" type="xs:string">`
	`  <xs:annotation>`
	`  <xs:documentation>A description of the soil type found here. May be a subjective description, such as rocky, clay, sandy, etc.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element GroundAreaType / Notes

Namespace	No namespace

Annotations	User can capture info about other data fields, and/or describe special circumstances, such as: Types of buried lines and how marked, Equipment &/or materials access issues, whether there is an existing professional soils report, if the site is in a biotic reserve (when applicable), &/or whether an environmental impact report has been done
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="Notes" type="xs:string"> <xs:annotation> <xs:documentation>User can capture info about other data fields, and/or describe special circumstances, such as: Types of buried lines and how marked, Equipment &/or materials access issues, whether there is an existing professional soils report, if the site is in a biotic reserve (when applicable), &/or whether an environmental impact report has been done</xs:documentation> </xs:annotation> </xs:element>

Element GroundAreaType / PresenceOfBuriedLines

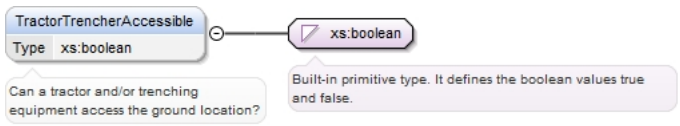
Namespace	No namespace
Annotations	Are there buried lines of any kind? In accompanying notes, user should include if mapped on some document.
Diagram	
Type	PresenceOfUndergroundEntitiesEnumType
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	enumeration None enumeration Yes (location marked) enumeration Yes (location TBD)
Source	<xs:element maxOccurs="1" minOccurs="0" name="PresenceOfBuriedLines" type="PresenceOfUndergroundEntitiesEnumType"> <xs:annotation> <xs:documentation>Are there buried lines of any kind? In accompanying notes, user should include if mapped on some document.</xs:documentation> </xs:annotation> </xs:element>

Element GroundAreaType / PresenceOfSepticTanksAndLeachFields

Namespace	No namespace
Annotations	Is there a septic tank &/or leach field in the vicinity? Auditor needs to clearly identify their location on a site schematic.
Diagram	
Type	PresenceOfUndergroundEntitiesEnumType
Properties	content: simple

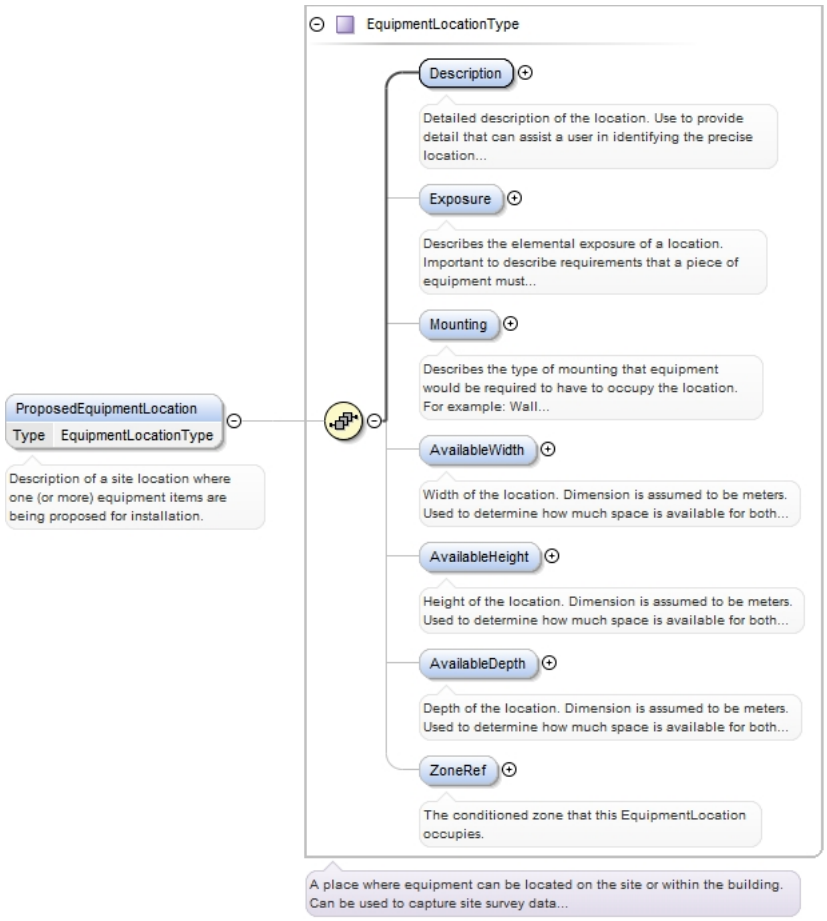
	minOccurs:	0
	maxOccurs:	1
Facets	enumeration	None
	enumeration	Yes (location marked)
	enumeration	Yes (location TBD)
Source	<xs:element maxOccurs="1" minOccurs="0" name="PresenceOfSepticTanksAndLeachFields" type="PresenceOfUndergroundEntitiesEnumType"> <xs:annotation> <xs:documentation>Is there a septic tank &/or leach field in the vicinity? Auditor needs to clearly identify their location on a site schematic.</xs:documentation> </xs:annotation> </xs:element>	

Element GroundAreaType / TractorTrencherAccessible

Namespace	No namespace
Annotations	Can a tractor and/or trenching equipment access the ground location?
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="TractorTrencherAccessible" type="xs:boolean"> <xs:annotation> <xs:documentation>Can a tractor and/or trenching equipment access the ground location?</xs:documentation> </xs:annotation> </xs:element>

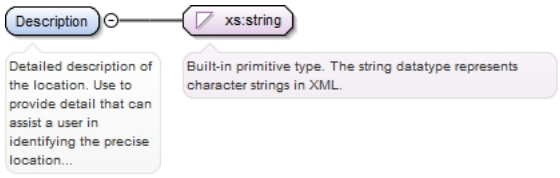
Element SiteType / ProposedEquipmentLocation

Namespace	No namespace
Annotations	Description of a site location where one (or more) equipment items are being proposed for installation.

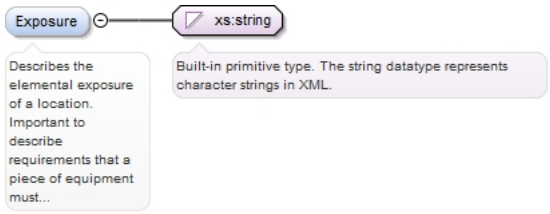
Diagram	
Type	EquipmentLocationType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Description , Exposure{0,1} , Mounting{0,1} , AvailableWidth{0,1} , AvailableHeight{0,1} , AvailableDepth{0,1} , ZoneRef{0,1}
Children	AvailableDepth, AvailableHeight, AvailableWidth, Description, Exposure, Mounting, ZoneRef
Instance	<ProposedEquipmentLocation> <Description>{1,1}</Description> <Exposure>{0,1}</Exposure> <Mounting>{0,1}</Mounting> <AvailableWidth>{0,1}</AvailableWidth> <AvailableHeight>{0,1}</AvailableHeight> <AvailableDepth>{0,1}</AvailableDepth> <ZoneRef>{0,1}</ZoneRef> </ProposedEquipmentLocation>
Source	<xs:element maxOccurs="unbounded" minOccurs="0" name="ProposedEquipmentLocation" type="EquipmentLocationType"> <xs:annotation> <xs:documentation>Description of a site location where one (or more) equipment items are being proposed for installation.</xs:documentation> </xs:annotation> </xs:element>

Element EquipmentLocationType / Description

Namespace	No namespace
Annotations	Detailed description of the location. Use to provide detail that can assist a user in identifying the precise location on a site, access information, etc. Typically use room names, compass directions, etc to identify the location to users. When used for site surveys, should include what types of equipment are envisioned to be placed here. For eaxample, in PV Systems, equipment might include: DC transition box, DC Combiner, DC Disconnect, Inverter.

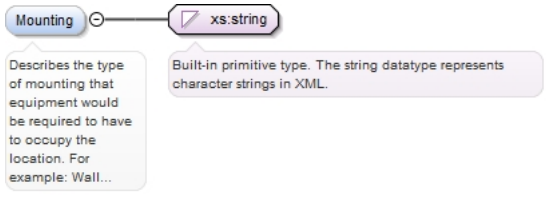
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	`<xs:element name="Description" type="xs:string" minOccurs="1" maxOccurs="1">` `<xs:annotation>` `<xs:documentation>Detailed description of the location. Use to provide detail that can assist a user in identifying the precise location on a site, access information, etc. Typically use room names, compass directions, etc to identify the location to users. When used for site surveys, should include what types of equipment are envisioned to be placed here. For eaxample, in PV Systems, equipment might include: DC transition box, DC Combiner, DC Disconnect, Inverter.</xs:documentation>` `</xs:annotation>` `</xs:element>`

Element EquipmentLocationType / Exposure

Namespace	No namespace
Annotations	Describes the elemental exposure of a location. Important to describe requirements that a piece of equipment must fulfill. Suggested values include: Indoor-Conditioned, Indoor-Unconditioned, Outdoor-Covered, Outdoor-Uncovered, Rooftop.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

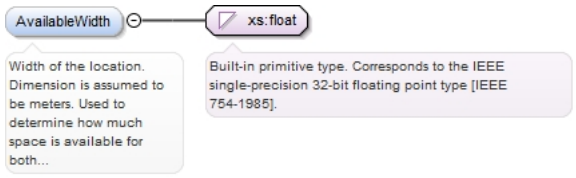
Source	`<xs:element name="Exposure" type="xs:string" minOccurs="0" maxOccurs="1">`
	`<xs:annotation>`
	`<xs:documentation>Describes the elemental exposure of a location. Important to describe requirements that a piece of equipment must fulfill. Suggested values include: Indoor-Conditioned, Indoor-Unconditioned, Outdoor-Covered, Outdoor-Uncovered, Rooftop.</xs:documentation>`
	`</xs:annotation>`
	`</xs:element>`

Element EquipmentLocationType / Mounting

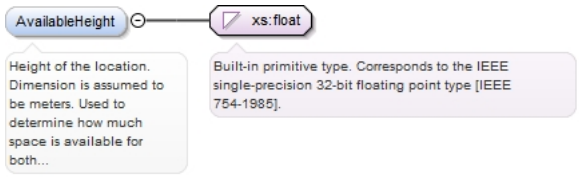
Namespace	No namespace
Annotations	Describes the type of mounting that equipment would be required to have to occupy the location. For example: Wall Mount, Wall Mount-Surface, Wall Mount-Flush, Pad Mount.
Diagram	
Type	xs:string
Properties	content: simple

	minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Mounting" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Describes the type of mounting that equipment would be required to have to occupy the location. For example: Wall Mount, Wall Mount-Surface, Wall Mount-Flush, Pad Mount.</xs:documentation> </xs:annotation> </xs:element>

Element EquipmentLocationType / AvailableWidth

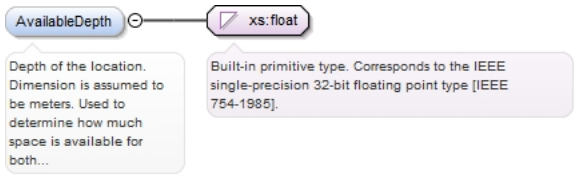
Namespace	No namespace
Annotations	Width of the location. Dimension is assumed to be meters. Used to determine how much space is available for both equipment and code mandated clearances.
Diagram	
Type	xs:float
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="AvailableWidth" type="xs:float" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Width of the location. Dimension is assumed to be meters. Used to determine how much space is available for both equipment and code mandated clearances.</xs:documentation> </xs:annotation> </xs:element>

Element EquipmentLocationType / AvailableHeight

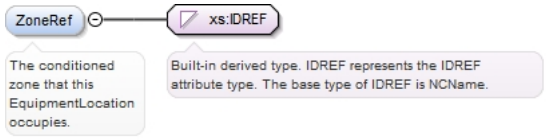
Namespace	No namespace
Annotations	Height of the location. Dimension is assumed to be meters. Used to determine how much space is available for both equipment and code mandated clearances.
Diagram	
Type	xs:float
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="AvailableHeight" type="xs:float" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Height of the location. Dimension is assumed to be meters. Used to determine how much space is available for both equipment and code mandated clearances.</xs:documentation> </xs:annotation> </xs:element>

Element EquipmentLocationType / AvailableDepth

Namespace	No namespace
Annotations	Depth of the location. Dimension is assumed to be meters. Used to determine how much space is available for both equipment and code mandated clearances.

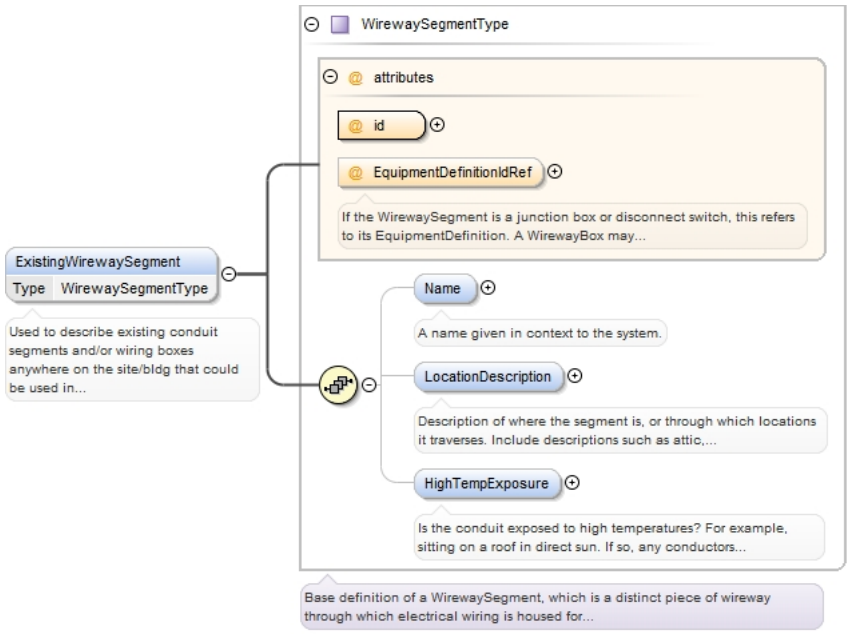
Diagram	
Type	xs:float
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="AvailableDepth" type="xs:float" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Depth of the location. Dimension is assumed to be meters. Used to determine how much space is available for both equipment and code mandated clearances.</xs:documentation> </xs:annotation> </xs:element>

Element EquipmentLocationType / ZoneRef

Namespace	No namespace
Annotations	The conditioned zone that this EquipmentLocation occupies.
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="ZoneRef" type="xs:IDREF"> <xs:annotation> <xs:documentation>The conditioned zone that this EquipmentLocation occupies.</xs:documentation> </xs:annotation> </xs:element>

Element SiteType / ExistingWirewaySegment

Namespace	No namespace
Annotations	Used to describe existing conduit segments and/or wiring boxes anywhere on the site/bldg that could be used in implementation of one or more measures.

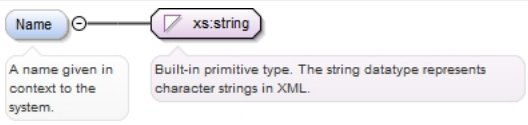
Diagram	
Type	WirewaySegmentType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , LocationDescription{0,1} , HighTempExposure{0,1}
Children	HighTempExposure, LocationDescription, Name

Instance	`<ExistingWirewaySegment EquipmentDefinitionIdRef="" id="">`
	`  <Name>{0,1}</Name>`
	`  <LocationDescription>{0,1}</LocationDescription>`
	`  <HighTempExposure>{0,1}</HighTempExposure>`
	`</ExistingWirewaySegment>`

Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **EquipmentDefinitionIdRef** IDREF / optional If the WirewaySegment is a junction box or disconnect switch, this refers to its EquipmentDefinition. A WirewayBox may be a pass through where multiple ConduitSegments are combined into a single ConduitSegment for example. A disconnect switch box may also be modeled as a WirewayBox, provided that the circuit(s) involved are simply disoconnected and not combined in any way. DO NOT use WirewayBox to represent a combiner, or distribution panel. **id** xs:ID / required

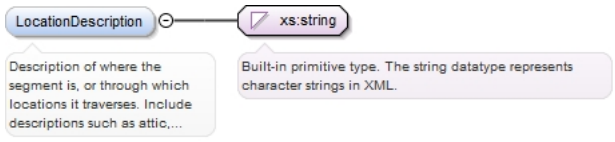
Source	`<xs:element maxOccurs="unbounded" minOccurs="0" name="ExistingWirewaySegment" type="WirewaySegmentType">`
	`  <xs:annotation>`
	`  <xs:documentation>Used to describe existing conduit segments and/or wiring boxes anywhere on the site/bldg that could be used in implementation of one or more measures.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element WirewaySegmentType / Name

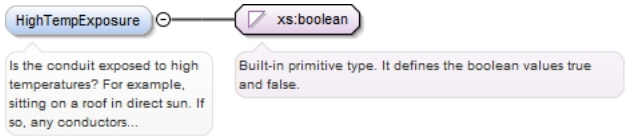
Namespace	No namespace
Annotations	A name given in context to the system.
Diagram	
Type	xs:string
Properties	content: simple

	minOccurs: 0
Source	<xs:element name="Name" type="xs:string" minOccurs="0"> <xs:annotation> <xs:documentation>A name given in context to the system.</xs:documentation> </xs:annotation> </xs:element>

Element WirewaySegmentType / LocationDescription

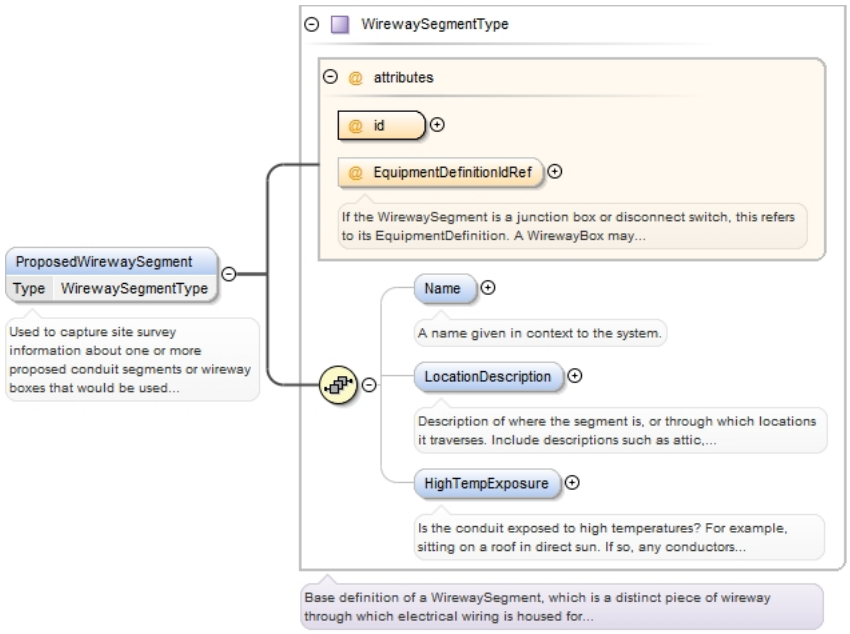
Namespace	No namespace
Annotations	Description of where the segment is, or through which locations it traverses. Include descriptions such as attic, interior, exterior, roof, or trench.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="LocationDescription" type="xs:string"> <xs:annotation> <xs:documentation>Description of where the segment is, or through which locations it traverses. Include descriptions such as attic, interior, exterior, roof, or trench.</xs:documentation> </xs:annotation> </xs:element>

Element WirewaySegmentType / HighTempExposure

Namespace	No namespace
Annotations	Is the conduit exposed to high temperatures? For example, sitting on a roof in direct sun. If so, any conductors contained within the segment may have to have their rated current carrying capacity derated.
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="HighTempExposure" type="xs:boolean" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Is the conduit exposed to high temperatures? For example, sitting on a roof in direct sun. If so, any conductors contained within the segment may have to have their rated current carrying capacity derated.</xs:documentation> </xs:annotation> </xs:element>

Element SiteType / ProposedWirewaySegment

Namespace	No namespace
Annotations	Used to capture site survey information about one or more proposed conduit segments or wireway boxes that would be used to support a new system.

Diagram	
Type	WirewaySegmentType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , LocationDescription{0,1} , HighTempExposure{0,1}
Children	HighTempExposure, LocationDescription, Name

Instance	`<ProposedWirewaySegment EquipmentDefinitionIdRef="" id="">`
	`  <Name>{0,1}</Name>`
	`  <LocationDescription>{0,1}</LocationDescription>`
	`  <HighTempExposure>{0,1}</HighTempExposure>`
	`</ProposedWirewaySegment>`

Attributes

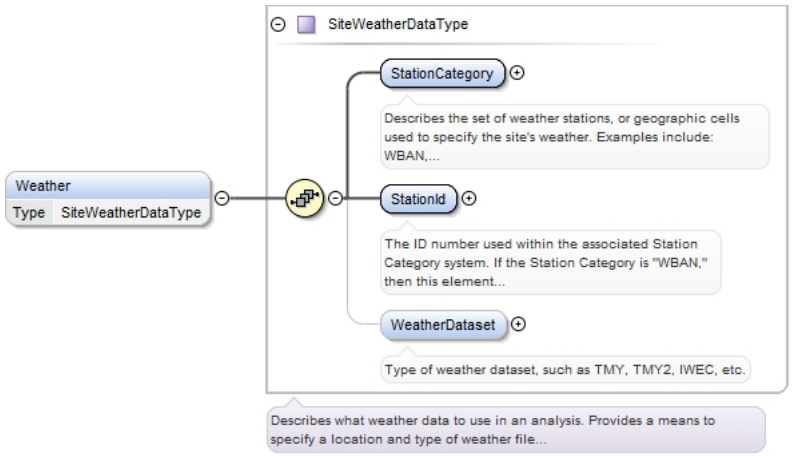
QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			optional
	If the WirewaySegment is a junction box or disconnect switch, this refers to its EquipmentDefinition. A WirewayBox may be a pass through where multiple ConduitSegments are combined into a single ConduitSegment for example. A disconnect switch box may also be modeled as a WirewayBox, provided that the circuit(s) involved are simply disoconnected and not combined in any way. DO NOT use WirewayBox to represent a combiner, or distribution panel.			
id	xs:ID			required

Source

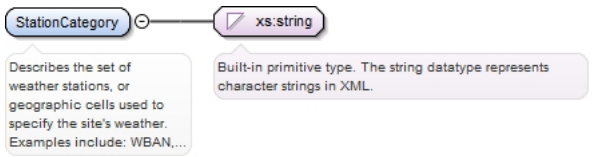
```
<xs:element maxOccurs="unbounded" minOccurs="0" name="ProposedWirewaySegment"
 type="WirewaySegmentType">
  <xs:annotation>
    <xs:documentation>Used to capture site survey information about one or more proposed
 conduit segments or wireway boxes that would be used to support a new system.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

Element SiteType / Weather

Namespace	No namespace

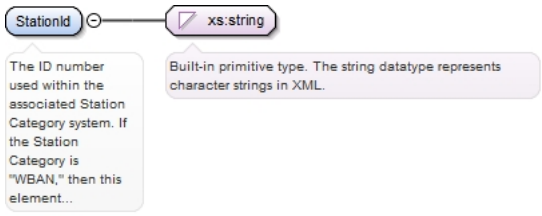
Diagram	
Type	SiteWeatherDataType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	StationCategory , StationId , WeatherDataset{0,1}
Children	StationCategory, StationId, WeatherDataset
Instance	<Weather> <StationCategory>{1,1}</StationCategory> <StationId>{1,1}</StationId> <WeatherDataset>{0,1}</WeatherDataset> </Weather>
Source	<xs:element maxOccurs="1" minOccurs="0" name="Weather" type="SiteWeatherDataType"/>

Element SiteWeatherDataType / StationCategory

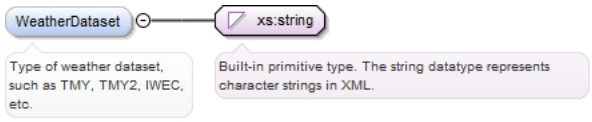
Namespace	No namespace
Annotations	Describes the set of weather stations, or geographic cells used to specify the site's weather. Examples include: WBAN, WMO, NREL 40km Monthly Grid Cell, etc.
Diagram	
Type	xs:string
Properties	content: simple
Source	<xs:element form="unqualified" name="StationCategory" type="xs:string"> <xs:annotation> <xs:documentation>Describes the set of weather stations, or geographic cells used to specify the site's weather. Examples include: WBAN, WMO, NREL 40km Monthly Grid Cell, etc.</xs:documentation> </xs:annotation> </xs:element>

Element SiteWeatherDataType / StationId

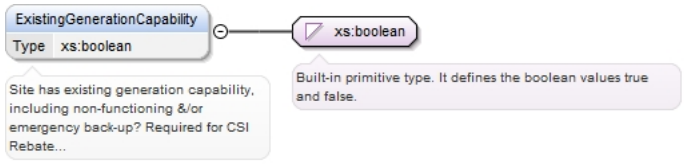
Namespace	No namespace
Annotations	The ID number used within the associated Station Category system. If the Station Category is "WBAN," then this element would contain the WBAN number for the desired station. For example, San Francisco, CA is WBAN "23234." And Cairo, Egypt is WMO "623660."

Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1
Source	<xs:element form="unqualified" minOccurs="1" name="StationId" type="xs:string"> <xs:annotation> <xs:documentation>The ID number used within the associated Station Category system. If the Station Category is "WBAN," then this element would contain the WBAN number for the desired station. For example, San Francisco, CA is WBAN "23234." And Cairo, Egypt is WMO "623660."</xs:documentation> </xs:annotation> </xs:element>

Element SiteWeatherDataType / WeatherDataset

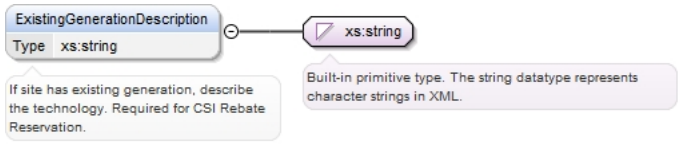
Namespace	No namespace
Annotations	Type of weather dataset, such as TMY, TMY2, IWEC, etc.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element form="unqualified" minOccurs="0" name="WeatherDataset" type="xs:string"> <xs:annotation> <xs:documentation>Type of weather dataset, such as TMY, TMY2, IWEC, etc.</xs:documentation> </xs:annotation> </xs:element>

Element SiteType / ExistingGenerationCapability

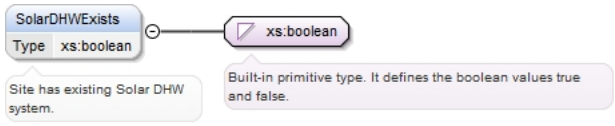
Namespace	No namespace
Annotations	Site has existing generation capability, including non-functioning &/or emergency back-up? Required for CSI Rebate Reservation.
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="ExistingGenerationCapability" type="xs:boolean"> <xs:annotation> <xs:documentation>Site has existing generation capability, including non-functioning &/or emergency back-up? Required for CSI Rebate Reservation.</xs:documentation> </xs:annotation> </xs:element>

Element SiteType / ExistingGenerationDescription

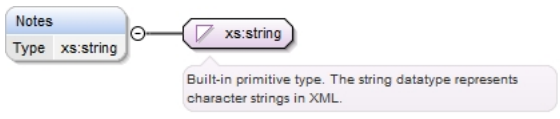
Namespace	No namespace

Annotations	If site has existing generation, describe the technology. Required for CSI Rebate Reservation.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="ExistingGenerationDescription" type="xs:string"> <xs:annotation> <xs:documentation>If site has existing generation, describe the technology. Required for CSI Rebate Reservation.</xs:documentation> </xs:annotation> </xs:element>

Element SiteType / SolarDHWExists

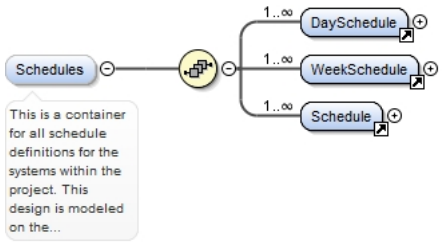
Namespace	No namespace
Annotations	Site has existing Solar DHW system.
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="SolarDHWExists" type="xs:boolean"> <xs:annotation> <xs:documentation>Site has existing Solar DHW system.</xs:documentation> </xs:annotation> </xs:element>

Element SiteType / Notes

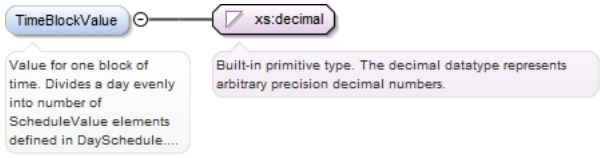
Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="Notes" type="xs:string"/>

Element ProjectType / Schedules

Namespace	No namespace
Annotations	This is a container for all schedule definitions for the systems within the project. This design is modeled on the gbxml Schedule. The organization is consistent in many energy management systems and programable controllers. Typically schedules for these are created first by creating the Day schedule and then build Week schedules upon Day schedules and Year schedules built off of Week schedules.

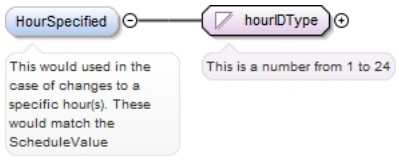
Diagram	
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	DaySchedule+ , WeekSchedule+ , Schedule+
Children	DaySchedule, Schedule, WeekSchedule
Instance	<Schedules xmlns="http://www.iepmodel.net"> <DaySchedule id="" type="">{1,unbounded}</DaySchedule> <WeekSchedule id="" type="">{1,unbounded}</WeekSchedule> <Schedule id="" type="">{1,unbounded}</Schedule> </Schedules>
Source	<xs:element maxOccurs="1" minOccurs="0" name="Schedules"> <xs:annotation> <xs:documentation>This is a container for all schedule definitions for the systems within the project. This design is modeled on the gbxml Schedule. The organization is consistent in many energy management systems and programable controllers. Typically schedules for these are created first by creating the Day schedule and then build Week schedules upon Day schedules and Year schedules built off of Week schedules.</xs:documentation> </xs:annotation> <xs:complexType> <xs:sequence> <xs:element maxOccurs="unbounded" minOccurs="1" ref="DaySchedule"/> <xs:element maxOccurs="unbounded" minOccurs="1" ref="WeekSchedule"/> <xs:element maxOccurs="unbounded" minOccurs="1" ref="Schedule"/> </xs:sequence> </xs:complexType> </xs:element>

Element ScheduleValueType / TimeBlockValue

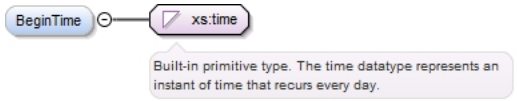
Namespace	No namespace
Annotations	Value for one block of time. Divides a day evenly into number of ScheduleValue elements defined in DaySchedule. Example: If 12 ScheduleValue elements are defined, each will represent two hours
Diagram	
Type	xs:decimal
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="TimeBlockValue" type="xs:decimal" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Value for one block of time. Divides a day evenly into number of ScheduleValue elements defined in DaySchedule. Example: If 12 ScheduleValue elements are defined, each will represent two hours</xs:documentation> </xs:annotation> </xs:element>

Element ScheduleValueType / HourSpecified

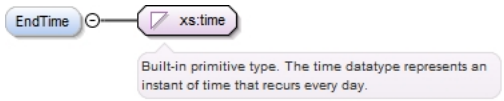
Namespace	No namespace
Annotations	This would used in the case of changes to a specific hour(s). These would match the ScheduleValue

Diagram	
Type	hourIDType
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 24 minInclusive 1
Source	<xs:element name="HourSpecified" type="hourIDType" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This would used in the case of changes to a specific hour(s). These would match the ScheduleValue</xs:documentation> </xs:annotation> </xs:element>

Element ScheduleValueType / BeginTime

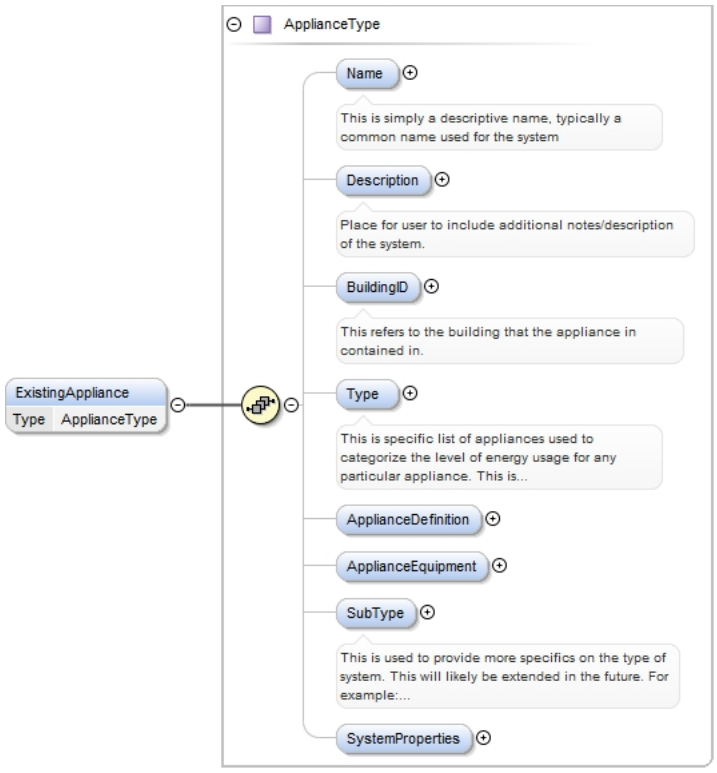
Namespace	No namespace
Diagram	
Type	xs:time
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="BeginTime" type="xs:time" minOccurs="0" maxOccurs="1"/>

Element ScheduleValueType / EndTime

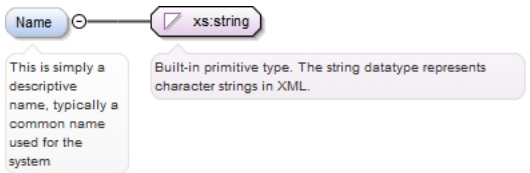
Namespace	No namespace
Diagram	
Type	xs:time
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="EndTime" type="xs:time" minOccurs="0" maxOccurs="1"/>

Element ProjectType / ExistingAppliance

Namespace	No namespace

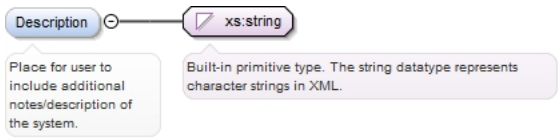
Diagram	
Type	ApplianceType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , Description{0,1} , BuildingID{0,1} , Type{0,1} , ApplianceDefinition{0,1} , ApplianceEquipment{0,1} , SubType{0,1} , SystemProperties{0,1}
Children	ApplianceDefinition, ApplianceEquipment, BuildingID, Description, Name, SubType, SystemProperties, Type
Instance	<ExistingAppliance> <Name>{0,1}</Name> <Description>{0,1}</Description> <BuildingID>{0,1}</BuildingID> <Type>{0,1}</Type> <ApplianceDefinition id="">{0,1}</ApplianceDefinition> <ApplianceEquipment EquipmentDefinitionIdRef="" id="">{0,1}</ApplianceEquipment> <SubType>{0,1}</SubType> <SystemProperties>{0,1}</SystemProperties> </ExistingAppliance>
Source	<xs:element maxOccurs="unbounded" minOccurs="0" name="ExistingAppliance" type="ApplianceType"/>

Element ApplianceType / Name

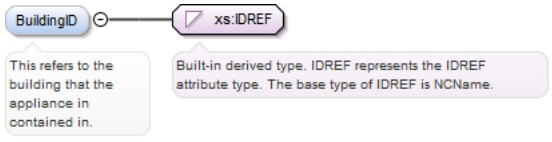
Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is simply a descriptive name, typically a common name used for the system</xs:documentation> </xs:annotation> </xs:element>

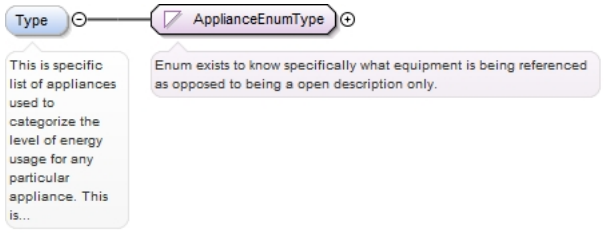
Element ApplianceType / Description

Namespace	No namespace
Annotations	Place for user to include additional notes/description of the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Place for user to include additional notes/description of the system.</xs:documentation> </xs:annotation> </xs:element>

Element ApplianceType / BuildingID

Namespace	No namespace
Annotations	This refers to the building that the appliance in contained in.
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 0 nillable: false
Source	<xs:element minOccurs="0" name="BuildingID" nillable="false" type="xs:IDREF"> <xs:annotation> <xs:documentation>This refers to the building that the appliance in contained in.</xs:documentation> </xs:annotation> </xs:element>

Element ApplianceType / Type

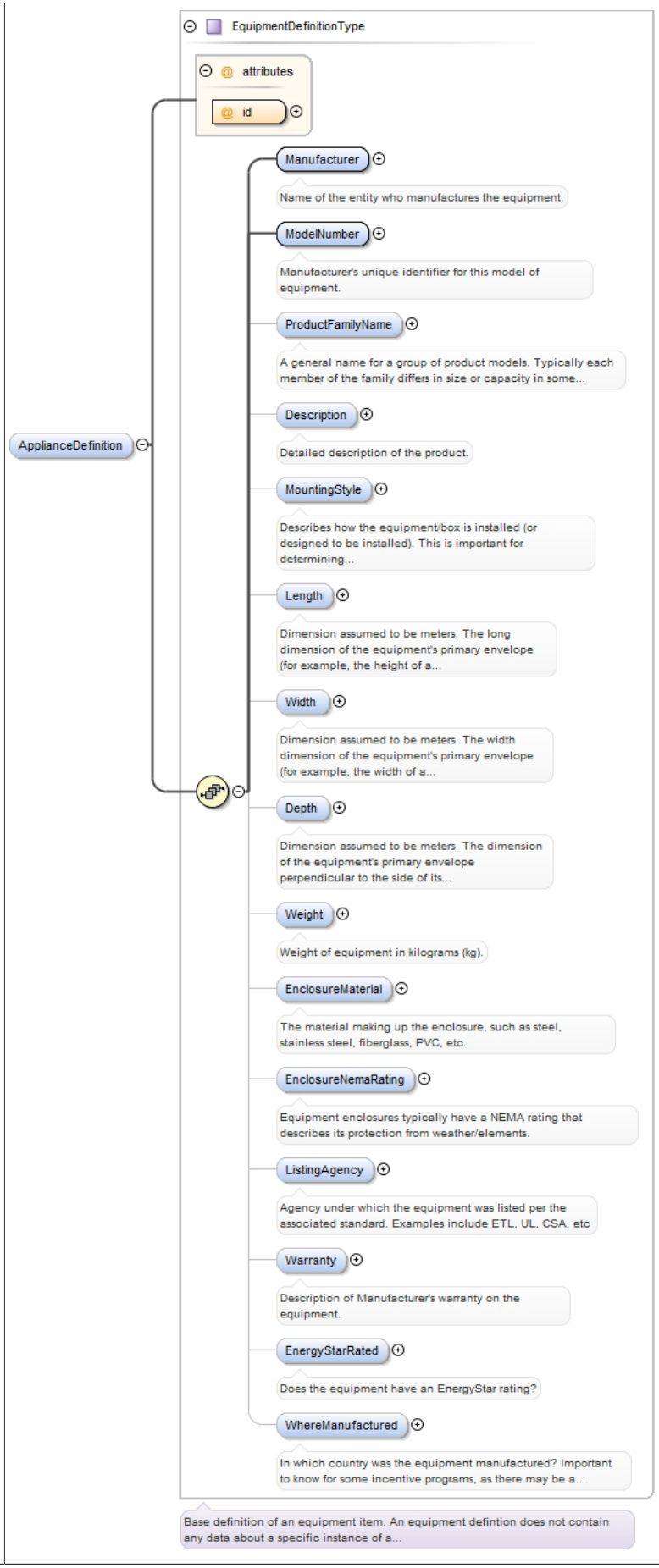
Namespace	No namespace
Annotations	This is specific list of appliances used to categorize the level of energy usage for any particular appliance. This is intended to be used as a simple description of the system and is suited for use with the SaveEnergy123 tool: https://saveenergy123.com/
Diagram	

Type	ApplianceEnumType	
Properties	content:	simple
	minOccurs:	0
	maxOccurs:	1
Facets	enumeration	Dishwasher
	enumeration	Dryer
	enumeration	Microwave
	enumeration	Stove
	enumeration	Range
	enumeration	Refrigerator
	enumeration	Stove
	enumeration	Washer
	enumeration	Computer
	enumeration	FishTank
	enumeration	Other
	enumeration	TV
	enumeration	DVR Digital Video Recorder
	enumeration	WellPump
Source	<xs:element name="Type" type="ApplianceEnumType" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is specific list of appliances used to categorize the level of energy usage for any particular appliance. This is intended to be used as a simple description of the system and is suited for use with the SaveEnergy123 tool: https://saveenergy123.com/</xs:documentation> </xs:annotation> </xs:element>	

Element ApplianceType / ApplianceDefinition

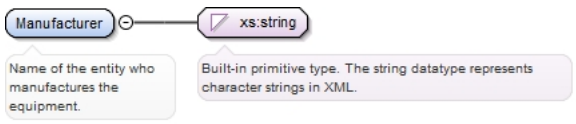
Namespace	No namespace

Diagram

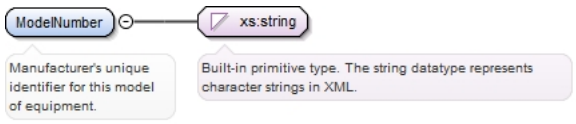

EquipmentDefinitionType
attributes
id
ApplianceDefinition
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...

Type	EquipmentDefinitionType
Properties	content: complex minOccurs: 0
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1}
Children	Depth, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, Length, ListingAgency, Manufacturer, ModelNumber, MountingStyle, ProductFamilyName, Warranty, Weight, WhereManufactured, Width
Instance	<ApplianceDefinition id=""> <Manufacturer>{1,1}</Manufacturer> <ModelNumber>{1,1}</ModelNumber> <ProductFamilyName>{0,1}</ProductFamilyName> <Description>{0,1}</Description> <MountingStyle>{0,1}</MountingStyle> <Length>{0,1}</Length> <Width>{0,1}</Width> <Depth>{0,1}</Depth> <Weight>{0,1}</Weight> <EnclosureMaterial>{0,1}</EnclosureMaterial> <EnclosureNemaRating>{0,1}</EnclosureNemaRating> <ListingAgency>{0,1}</ListingAgency> <Warranty>{0,1}</Warranty> <EnergyStarRated>{0,1}</EnergyStarRated> <WhereManufactured>{0,1}</WhereManufactured> </ApplianceDefinition>
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **id** / xs:ID / / / required
Source	<xs:element name="ApplianceDefinition" type="EquipmentDefinitionType" minOccurs="0"/>

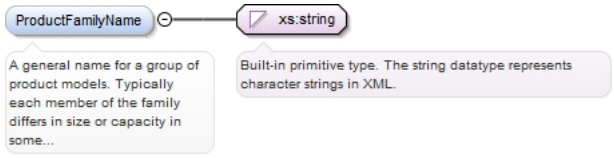
Element EquipmentDefinitionType / Manufacturer

Namespace	No namespace
Annotations	Name of the entity who manufactures the equipment.
Diagram	
Type	xs:string
Properties	content: simple
Source	<xs:element name="Manufacturer" type="xs:string"> <xs:annotation> <xs:documentation>Name of the entity who manufactures the equipment.</ xs:documentation> </xs:annotation> </xs:element>

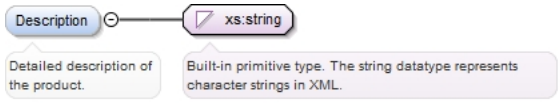
Element EquipmentDefinitionType / ModelNumber

Namespace	No namespace
Annotations	Manufacturer's unique identifier for this model of equipment.
Diagram	
Type	xs:string
Properties	content: simple
Source	<xs:element name="ModelNumber" type="xs:string"> <xs:annotation> <xs:documentation>Manufacturer's unique identifier for this model of equipment.</ xs:documentation> </xs:annotation> </xs:element>

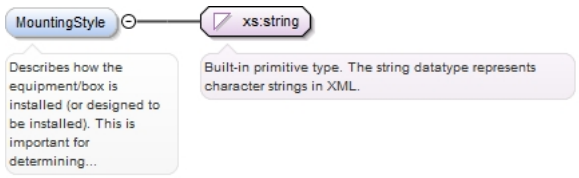
Element EquipmentDefinitionType / ProductFamilyName

Namespace	No namespace
Annotations	A general name for a group of product models. Typically each member of the family differs in size or capacity in some way.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="ProductFamilyName" type="xs:string"> <xs:annotation> <xs:documentation>A general name for a group of product models. Typically each member of the family differs in size or capacity in some way.</xs:documentation> </xs:annotation> </xs:element>

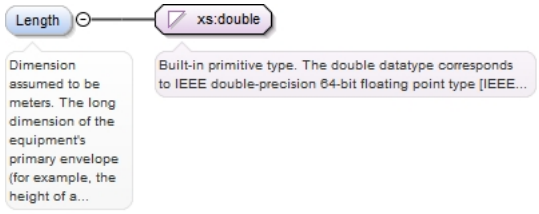
Element EquipmentDefinitionType / Description

Namespace	No namespace
Annotations	Detailed description of the product.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="Description" type="xs:string"> <xs:annotation> <xs:documentation>Detailed description of the product.</xs:documentation> </xs:annotation> </xs:element>

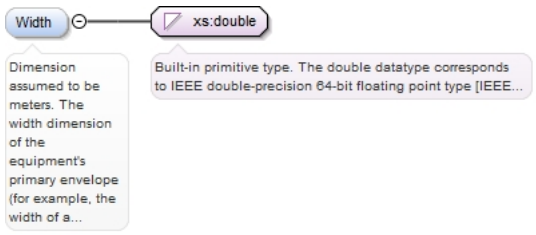
Element EquipmentDefinitionType / MountingStyle

Namespace	No namespace
Annotations	Describes how the equipment/box is installed (or designed to be installed). This is important for determining components required for interfacing with it. Suggested values include: Wall Mount, Wall Mount-Surface, Wall Mount-Flush, Pad Mount.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="MountingStyle" type="xs:string"> <xs:annotation> <xs:documentation>Describes how the equipment/box is installed (or designed to be installed). This is important for determining components required for interfacing with it. Suggested values include: Wall Mount, Wall Mount-Surface, Wall Mount-Flush, Pad Mount.</xs:documentation> </xs:annotation> </xs:element>

Element EquipmentDefinitionType / Length

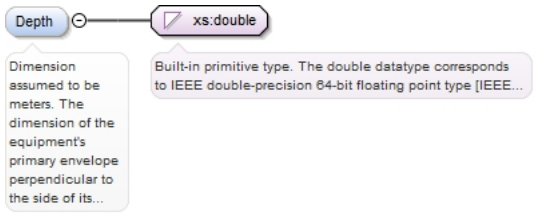
Namespace	No namespace
Annotations	Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a wall mounted inverter, or the long edge of a PV Module frame).
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="Length" type="xs:double"> <xs:annotation> <xs:documentation>Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a wall mounted inverter, or the long edge of a PV Module frame).</xs:documentation> </xs:annotation> </xs:element>

Element EquipmentDefinitionType / Width

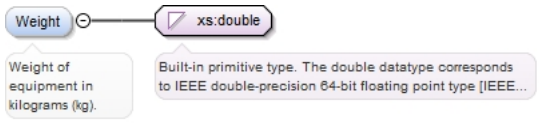
Namespace	No namespace
Annotations	Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a wall mounted inverter, or the short edge of a PV Module frame).
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="Width" type="xs:double"> <xs:annotation> <xs:documentation>Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a wall mounted inverter, or the short edge of a PV Module frame).</xs:documentation> </xs:annotation> </xs:element>

Element EquipmentDefinitionType / Depth

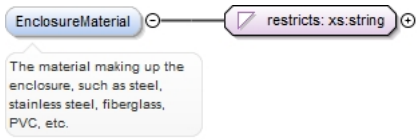
Namespace	No namespace
Annotations	Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its primary interface (for example the thickness of a PV module's frame, or the thickness of a wall mounted inverter from the wall to the front of the inverter.) Note: PV Module thickness with J-box would be given as part of PvModuleDefintion.

Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="Depth" type="xs:double"> <xs:annotation> <xs:documentation>Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its primary interface (for example the thickness of a PV module's frame, or the thickness of a wall mounted inverter from the wall to the front of the inverter.) Note: PV Module thickness with J-box would be given as part of PvModuleDefintion.</xs:documentation> </xs:annotation> </xs:element>

Element EquipmentDefinitionType / Weight

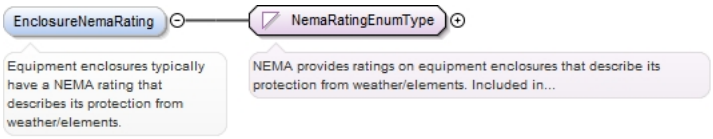
Namespace	No namespace
Annotations	Weight of equipment in kilograms (kg).
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="Weight" type="xs:double"> <xs:annotation> <xs:documentation>Weight of equipment in kilograms (kg).</xs:documentation> </xs:annotation> </xs:element>

Element EquipmentDefinitionType / EnclosureMaterial

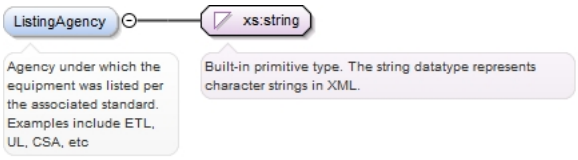
Namespace	No namespace
Annotations	The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
Diagram	
Type	restriction of xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxLength 255
Source	<xs:element name="EnclosureMaterial" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:string"> <xs:maxLength value="255"/> </xs:restriction>

```
  </xs:simpleType>
</xs:element>
```

Element EquipmentDefinitionType / EnclosureNemaRating

Namespace	No namespace
Annotations	Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
Diagram	
Type	NemaRatingEnumType
Properties	content: simple minOccurs: 0
Facets	enumeration 3 enumeration 3R enumeration 4 enumeration 4X
Source	<xs:element minOccurs="0" name="EnclosureNemaRating" type="NemaRatingEnumType"> <xs:annotation> <xs:documentation>Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.</xs:documentation> </xs:annotation> </xs:element>

Element EquipmentDefinitionType / ListingAgency

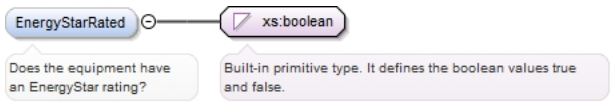
Namespace	No namespace
Annotations	Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="ListingAgency" type="xs:string"> <xs:annotation> <xs:documentation>Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc</xs:documentation> </xs:annotation> </xs:element>

Element EquipmentDefinitionType / Warranty

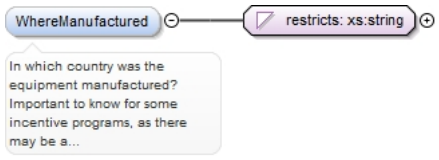
Namespace	No namespace
Annotations	Description of Manufacturer's warranty on the equipment.
Diagram	
Type	restriction of xs:string
Properties	content: simple minOccurs: 0

	maxOccurs:	1
Facets	maxLength	255
Source	<xs:element name="Warranty" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Description of Manufacturer's warranty on the equipment.</ xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:string"> <xs:maxLength value="255"/> </xs:restriction> </xs:simpleType> </xs:element>	

Element EquipmentDefinitionType / EnergyStarRated

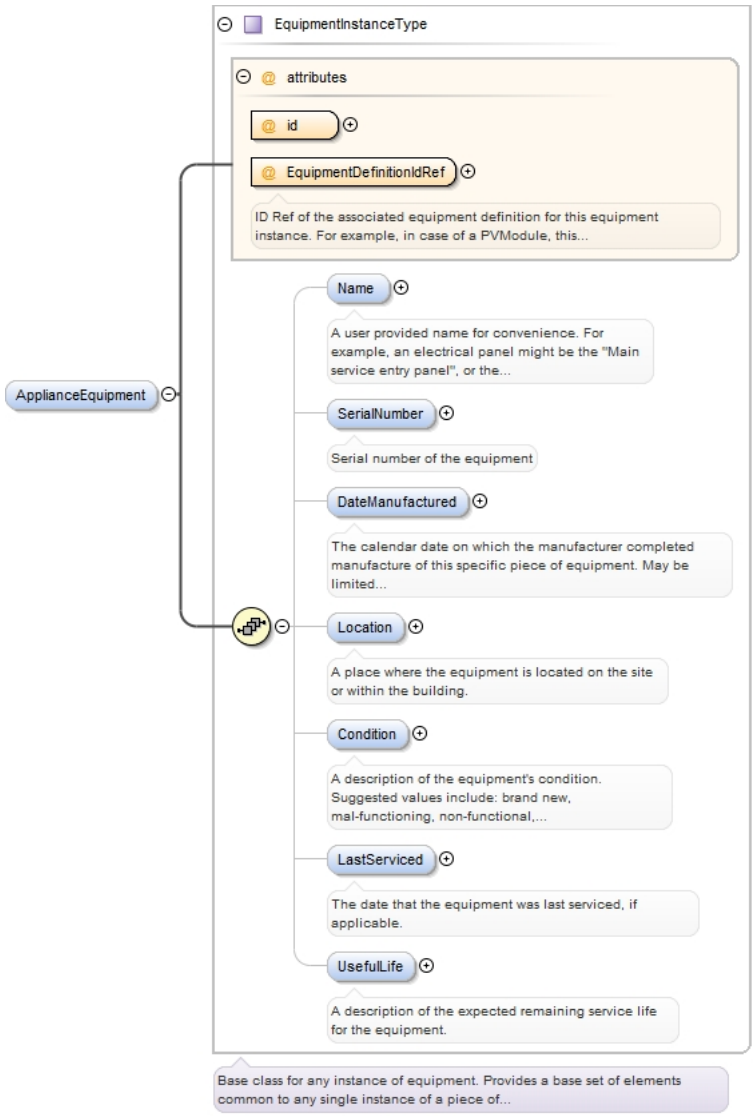
Namespace	No namespace
Annotations	Does the equipment have an EnergyStar rating?
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="EnergyStarRated" type="xs:boolean"> <xs:annotation> <xs:documentation>Does the equipment have an EnergyStar rating?</xs:documentation> </xs:annotation> </xs:element>

Element EquipmentDefinitionType / WhereManufactured

Namespace	No namespace
Annotations	In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a requirement for rebates to only be paid on domestically manufactured equipment.
Diagram	
Type	restriction of xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxLength 255
Source	<xs:element name="WhereManufactured" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a requirement for rebates to only be paid on domestically manufactured equipment.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:string"> <xs:maxLength value="255"/> </xs:restriction> </xs:simpleType> </xs:element>

Element ApplianceType / ApplianceEquipment

Namespace	No namespace

Diagram	
Type	EquipmentInstanceType
Properties	content: `complex` minOccurs: `0`
Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1}
Children	Condition, DateManufactured, LastServiced, Location, Name, SerialNumber, UsefulLife

`Instance`	`<ApplianceEquipment EquipmentDefinitionIdRef="" id="">`
	`  <Name>{0,1}</Name>`
	`  <SerialNumber>{0,1}</SerialNumber>`
	`  <DateManufactured>{0,1}</DateManufactured>`
	`  <Location>{0,1}</Location>`
	`  <Condition>{0,1}</Condition>`
	`  <LastServiced>{0,1}</LastServiced>`
	`  <UsefulLife>{0,1}</UsefulLife>`
	`</ApplianceEquipment>`

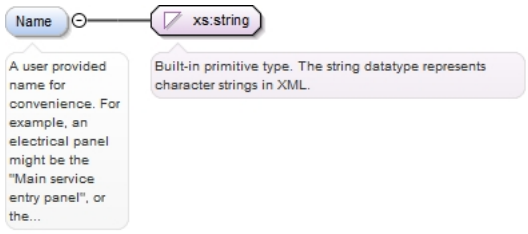
Attributes

QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			required
	`ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.`			
id	xs:ID			required

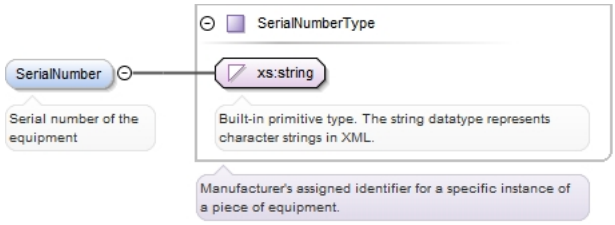
`Source`

```
<xs:element minOccurs="0" name="ApplianceEquipment" type="EquipmentInstanceType"/>
```

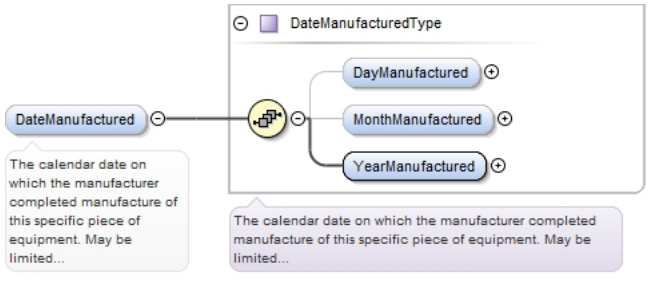
Element EquipmentInstanceType / Name

Namespace	No namespace
Annotations	A user provided name for convenience. For example, an electrical panel might be the "Main service entry panel", or the "AC combiner panel."
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="Name" type="xs:string"> <xs:annotation> <xs:documentation>A user provided name for convenience. For example, an electrical panel might be the "Main service entry panel", or the "AC combiner panel."</xs:documentation> </xs:annotation> </xs:element>

Element EquipmentInstanceType / SerialNumber

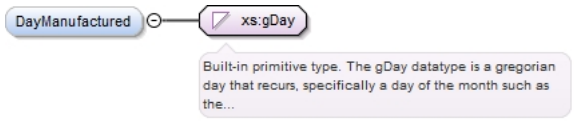
Namespace	No namespace
Annotations	Serial number of the equipment
Diagram	
Type	SerialNumberType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Source	<xs:element name="SerialNumber" type="SerialNumberType" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Serial number of the equipment</xs:documentation> </xs:annotation> </xs:element>

Element EquipmentInstanceType / DateManufactured

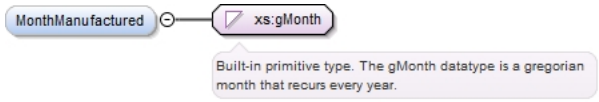
Namespace	No namespace
Annotations	The calendar date on which the manufacturer completed manufacture of this specific piece of equipment. May be limited to the year.
Diagram	

Type	DateManufacturedType
Properties	content: complex minOccurs: 0
Model	DayManufactured{0,1} , MonthManufactured{0,1} , YearManufactured
Children	DayManufactured, MonthManufactured, YearManufactured
Instance	<DateManufactured> <DayManufactured>{0,1}</DayManufactured> <MonthManufactured>{0,1}</MonthManufactured> <YearManufactured>{1,1}</YearManufactured> </DateManufactured>
Source	<xs:element minOccurs="0" name="DateManufactured" type="DateManufacturedType"> <xs:annotation> <xs:documentation>The calendar date on which the manufacturer completed manufacture of this specific piece of equipment. May be limited to the year.</xs:documentation> </xs:annotation> </xs:element>

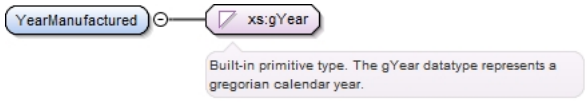
Element DateManufacturedType / DayManufactured

Namespace	No namespace
Diagram	
Type	xs:gDay
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="DayManufactured" type="xs:gDay"/>

Element DateManufacturedType / MonthManufactured

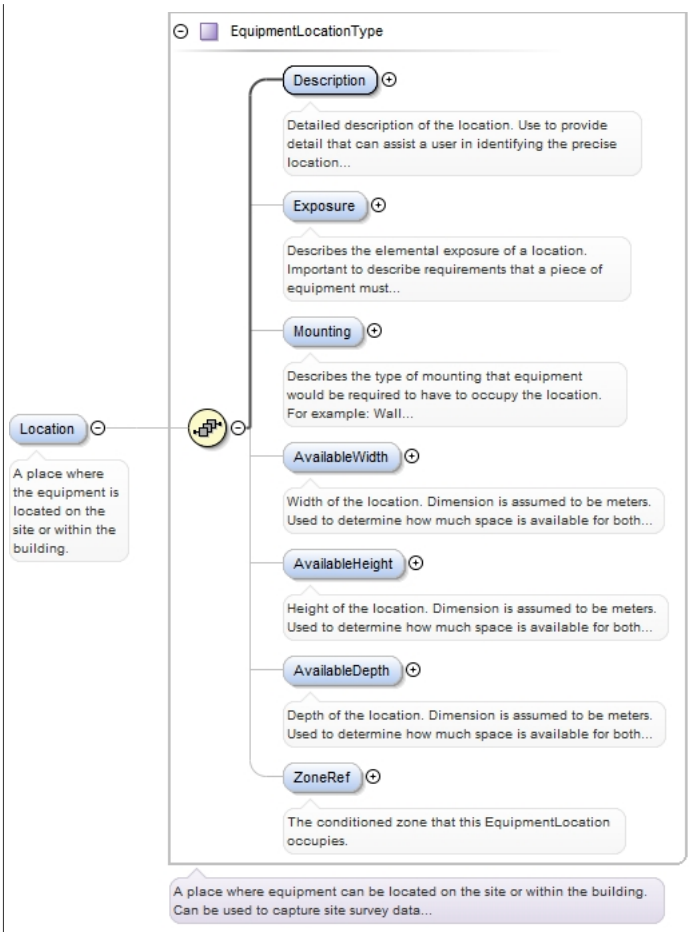
Namespace	No namespace
Diagram	
Type	xs:gMonth
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="MonthManufactured" type="xs:gMonth"/>

Element DateManufacturedType / YearManufactured

Namespace	No namespace
Diagram	
Type	xs:gYear
Properties	content: simple
Source	<xs:element name="YearManufactured" type="xs:gYear"/>

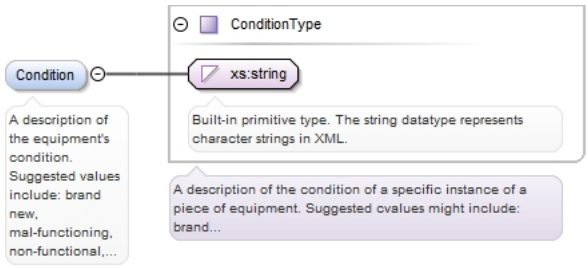
Element EquipmentInstanceType / Location

Namespace	No namespace
Annotations	A place where the equipment is located on the site or within the building.

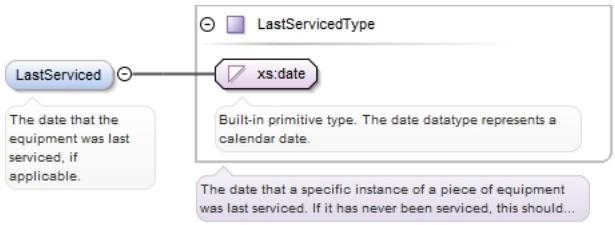
Diagram	
Type	EquipmentLocationType
Properties	content: complex minOccurs: 0
Model	Description , Exposure{0,1} , Mounting{0,1} , AvailableWidth{0,1} , AvailableHeight{0,1} , AvailableDepth{0,1} , ZoneRef{0,1}
Children	AvailableDepth, AvailableHeight, AvailableWidth, Description, Exposure, Mounting, ZoneRef
Instance	<Location> <Description>{1,1}</Description> <Exposure>{0,1}</Exposure> <Mounting>{0,1}</Mounting> <AvailableWidth>{0,1}</AvailableWidth> <AvailableHeight>{0,1}</AvailableHeight> <AvailableDepth>{0,1}</AvailableDepth> <ZoneRef>{0,1}</ZoneRef> </Location>
Source	<xs:element minOccurs="0" name="Location" type="EquipmentLocationType"> <xs:annotation> <xs:documentation>A place where the equipment is located on the site or within the building.</xs:documentation> </xs:annotation> </xs:element>

Element EquipmentInstanceType / Condition

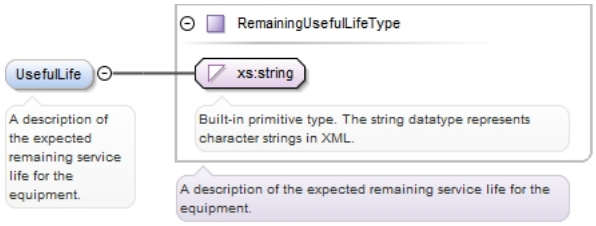
Namespace	No namespace
Annotations	A description of the equipment's condition. Suggested values include: brand new, mal-functioning, non-functional, normal wear, other.

Diagram	
Type	ConditionType
Properties	content: complex minOccurs: 0
Source	<xs:element minOccurs="0" name="Condition" type="ConditionType"> <xs:annotation> <xs:documentation>A description of the equipment's condition. Suggested values include: brand new, mal-functioning, non-functional, normal wear, other.</xs:documentation> </xs:annotation> </xs:element>

Element EquipmentInstanceType / LastServiced

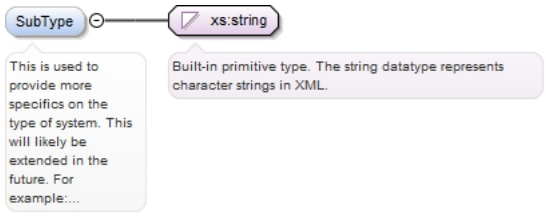
Namespace	No namespace
Annotations	The date that the equipment was last serviced, if applicable.
Diagram	
Type	LastServicedType
Properties	content: complex minOccurs: 0
Source	<xs:element minOccurs="0" name="LastServiced" type="LastServicedType"> <xs:annotation> <xs:documentation>The date that the equipment was last serviced, if applicable.</xs:documentation> </xs:annotation> </xs:element>

Element EquipmentInstanceType / UsefulLife

Namespace	No namespace
Annotations	A description of the expected remaining service life for the equipment.
Diagram	
Type	RemainingUsefulLifeType
Properties	content: complex minOccurs: 0
Source	<xs:element minOccurs="0" name="UsefulLife" type="RemainingUsefulLifeType"> <xs:annotation>

```
    <xs:documentation>A description of the expected remaining service life for the
 equipment.</xs:documentation>
  </xs:annotation>
</xs:element>
```

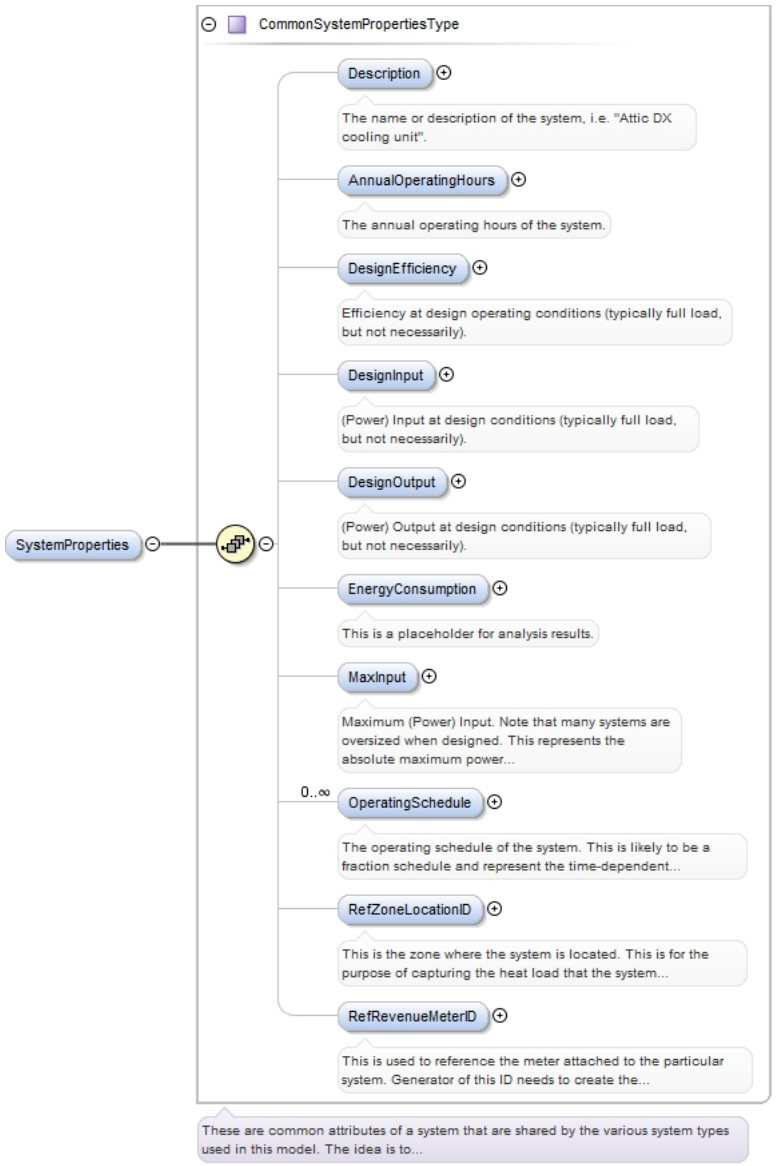
Element ApplianceType / SubType

Namespace	No namespace
Annotations	This is used to provide more specifics on the type of system. This will likely be extended in the future. For example: type of computer, type of TV, etc.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	`<xs:element name="SubType" type="xs:string" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>This is used to provide more specifics on the type of system. This will likely be extended in the future. For example: type of computer, type of TV, etc.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

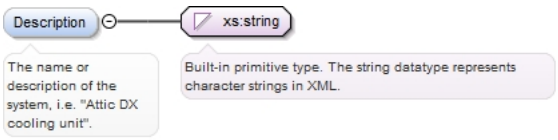
Element ApplianceType / SystemProperties

Namespace	No namespace

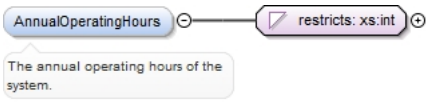
Diagram	
Type	CommonSystemPropertiesType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Description{0,1} , AnnualOperatingHours{0,1} , DesignEfficiency{0,1} , DesignInput{0,1} , DesignOutput{0,1} , EnergyConsumption{0,1} , MaxInput{0,1} , OperatingSchedule* , RefZoneLocationID{0,1} , RefRevenueMeterID{0,1}
Children	AnnualOperatingHours, Description, DesignEfficiency, DesignInput, DesignOutput, EnergyConsumption, MaxInput, OperatingSchedule, RefRevenueMeterID, RefZoneLocationID
Instance	<SystemProperties> <Description>{0,1}</Description> <AnnualOperatingHours>{0,1}</AnnualOperatingHours> <DesignEfficiency TestCondition="" Unit="" UnitDesc="">{0,1}</DesignEfficiency> <DesignInput Fuel="Electricity" FuelDesc="Electricity" TestCondition="" Unit="" UnitDesc="kwh">{0,1}</DesignInput> <DesignOutput Fuel="Electricity" FuelDesc="Electricity" TestCondition="" Unit="" UnitDesc="kwh">{0,1}</DesignOutput> <EnergyConsumption RevenueMeterIdRef="">{0,1}</EnergyConsumption> <MaxInput Fuel="Electricity" FuelDesc="Electricity" TestCondition="" Unit="" UnitDesc="kwh">{0,1}</MaxInput> <OperatingSchedule>{0,unbounded}</OperatingSchedule> <RefZoneLocationID>{0,1}</RefZoneLocationID> <RefRevenueMeterID>{0,1}</RefRevenueMeterID> </SystemProperties>

Source	<xs:element name="SystemProperties" type="CommonSystemPropertiesType" minOccurs="0" maxOccurs="1"/>

Element CommonSystemPropertiesType / Description

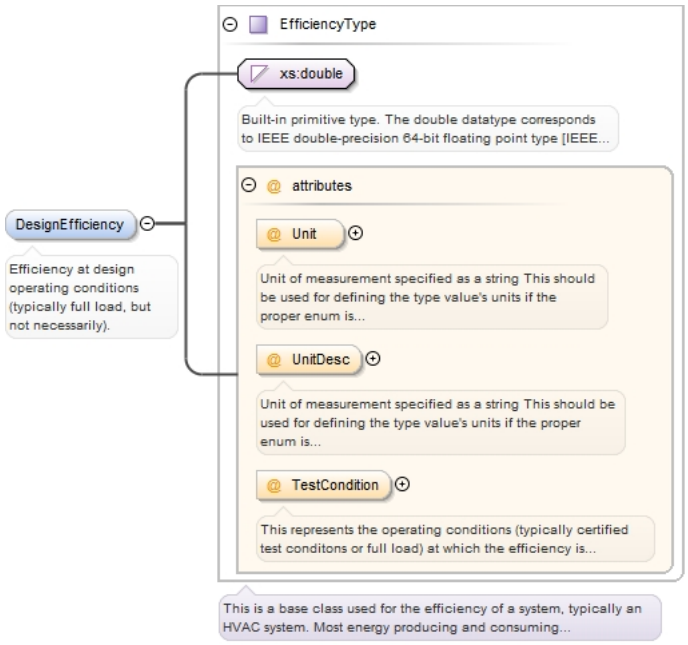
Namespace	No namespace
Annotations	The name or description of the system, i.e. "Attic DX cooling unit".
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The name or description of the system, i.e. "Attic DX cooling unit".</xs:documentation> </xs:annotation> </xs:element>

Element CommonSystemPropertiesType / AnnualOperatingHours

Namespace	No namespace
Annotations	The annual operating hours of the system.
Diagram	
Type	restriction of xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	minInclusive 0
Source	<xs:element name="AnnualOperatingHours" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The annual operating hours of the system.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:int"> <xs:minInclusive value="0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element CommonSystemPropertiesType / DesignEfficiency

Namespace	No namespace
Annotations	Efficiency at design operating conditions (typically full load, but not necessarily).

Diagram	
Type	EfficiencyType
Properties	content: `complex` minOccurs: `0` maxOccurs: `1`

Attributes

QName	Type	Fixed	Default	Use
TestCondition	TestConditionEnumType			optional
	This represents the operating conditions (typically certified test conditons or full load) at which the efficiency is realized. Note that at other conditions, the efficiency may be a different value.			
Unit	EfficiencyUnitEnumType			optional
	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			
UnitDesc	xs:string			optional
	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			

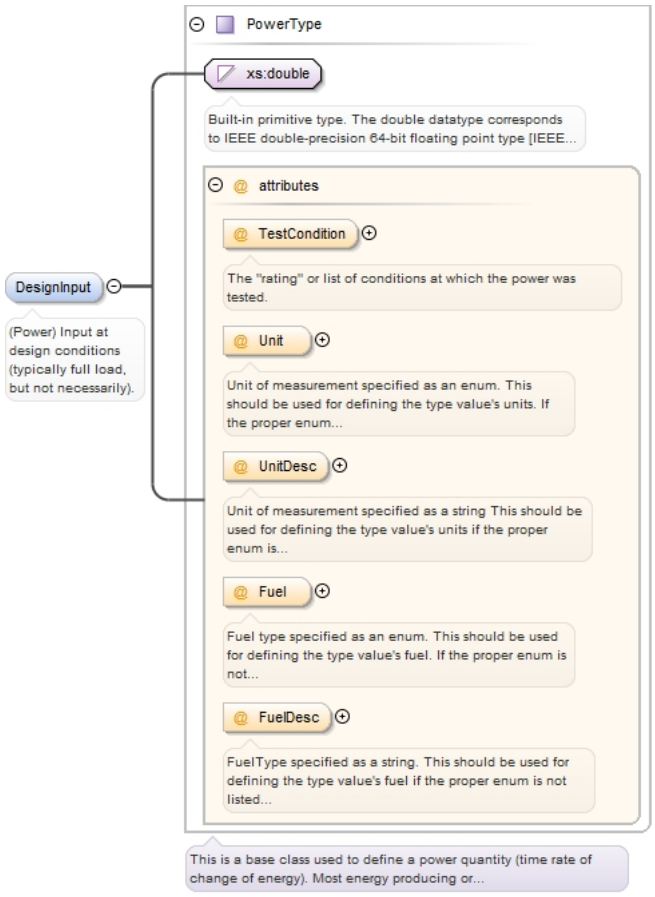
Source

```
<xs:element name="DesignEfficiency" type="EfficiencyType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>Efficiency at design operating conditions (typically full load, but
 not necessarily).</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element CommonSystemPropertiesType / DesignInput

Namespace	No namespace
Annotations	(Power) Input at design conditions (typically full load, but not necessarily).

Diagram



Type: PowerType

Properties

content:	complex
minOccurs:	0
maxOccurs:	1

Attributes

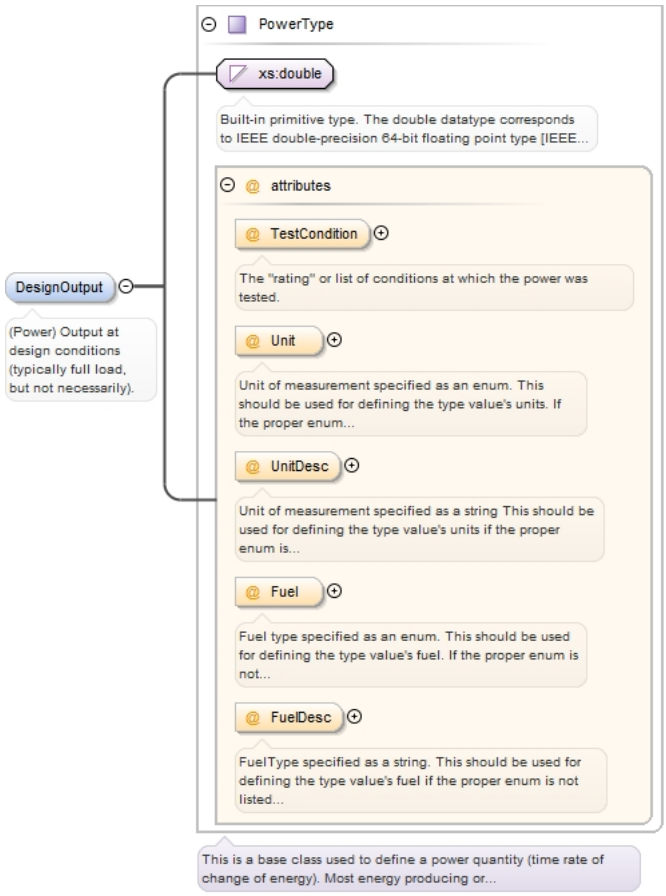
QName	Type	Fixed	Default	Use
Fuel	EnergyClassEnumType		Electricity	optional
	Fuel type specified as an enum. This should be used for defining the type value's fuel. If the proper enum is not listed, please use the FuelDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.			
FuelDesc	xs:string		Electricity	optional
	FuelType specified as a string. This should be used for defining the type value's fuel if the proper enum is not listed in Fuel. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.			
TestCondition	xs:string			optional
	The "rating" or list of conditions at which the power was tested.			
Unit	PowerUnitEnumType			optional
	Unit of measurement specified as an enum. This should be used for defining the type value's units. If the proper enum is not listed, please use the UnitDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			
UnitDesc	xs:string		kwh	optional
	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a			

	QName	Type	Fixed	Default	Use
		simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			

Source

```
<xs:element name="DesignInput" type="PowerType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>(Power) Input at design conditions (typically full load, but not
 necessarily).</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element CommonSystemPropertiesType / DesignOutput

Namespace	No namespace
Annotations	(Power) Output at design conditions (typically full load, but not necessarily).
Diagram	
Type	PowerType
Properties	content: complex minOccurs: 0 maxOccurs: 1

Attributes

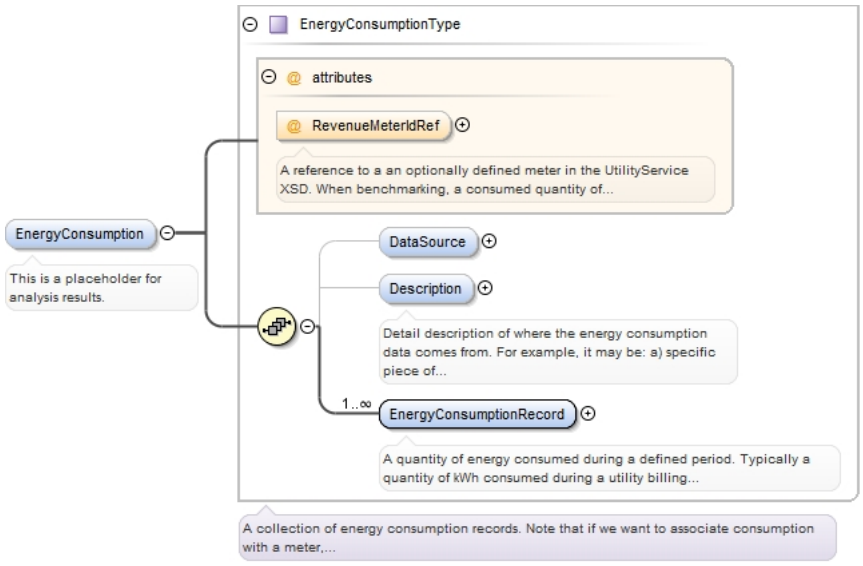
QName	Type	Fixed	Default	Use
Fuel	EnergyClassEnumType		Electricity	optional
	Fuel type specified as an enum. This should be used for defining the type value's fuel. If the proper enum is not listed, please use the FuelDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.			
FuelDesc	xs:string		Electricity	optional
	FuelType specified as a string. This should be used for defining the type value's fuel if the proper enum is not listed in Fuel. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.			

QName	Type	Fixed	Default	Use
TestCondition	xs:string			optional
	The "rating" or list of conditions at which the power was tested.			
Unit	PowerUnitEnumType			optional
	Unit of measurement specified as an enum. This should be used for defining the type value's units. If the proper enum is not listed, please use the UnitDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			
UnitDesc	xs:string		kwh	optional
	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			

Source

```
<xs:element name="DesignOutput" type="PowerType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>(Power) Output at design conditions (typically full load, but not
 necessarily).</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element CommonSystemPropertiesType / EnergyConsumption

Namespace	No namespace
Annotations	This is a placeholder for analysis results.
Diagram	

Type	EnergyConsumptionType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	DataSource{0,1} , Description{0,1} , EnergyConsumptionRecord+
Children	DataSource, Description, EnergyConsumptionRecord

Instance

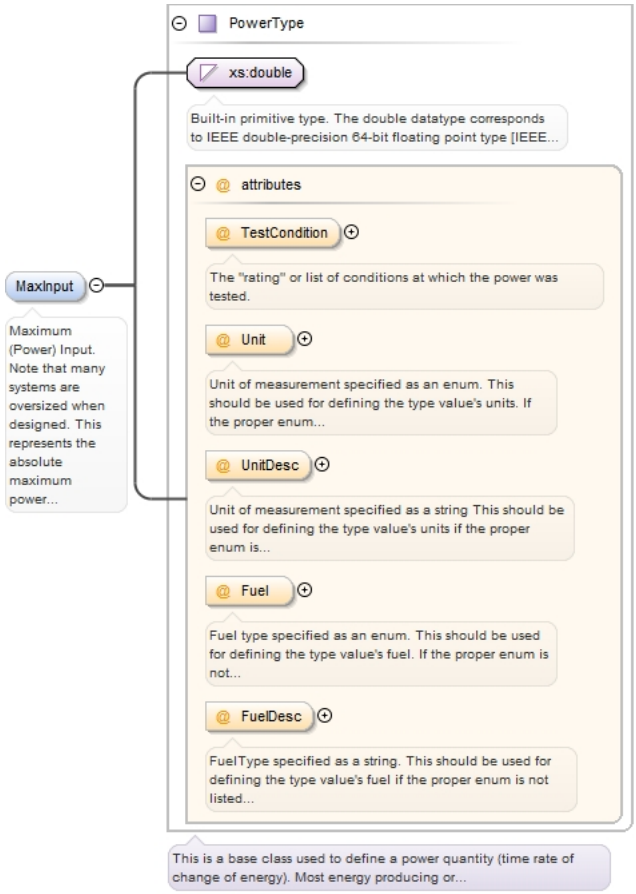
```
<EnergyConsumption RevenueMeterIdRef="">
  <DataSource>{0,1}</DataSource>
  <Description>{0,1}</Description>
  <EnergyConsumptionRecord>{1,unbounded}</EnergyConsumptionRecord>
</EnergyConsumption>
```

Attributes

QName	Type	Fixed	Default	Use
RevenueMeterIdRef	xs:IDREF			optional
	A reference to a an optionally defined meter in the UtilityService XSD. When benchmarking, a consumed quantity of energy must be associated to a defined revenue meter.			

Source	<xs:element name="EnergyConsumption" type="EnergyConsumptionType" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is a placeholder for analysis results.</xs:documentation> </xs:annotation> </xs:element>

Element CommonSystemPropertiesType / MaxInput

Namespace	No namespace
Annotations	Maximum (Power) Input. Note that many systems are oversized when designed. This represents the absolute maximum power consumption of the equipment.
Diagram	
Type	PowerType
Properties	content: complex minOccurs: 0 maxOccurs: 1

Attributes

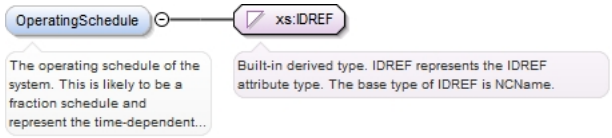
QName	Type	Fixed	Default	Use
Fuel	EnergyClassEnumType		Electricity	optional
	Fuel type specified as an enum. This should be used for defining the type value's fuel. If the proper enum is not listed, please use the FuelDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.			
FuelDesc	xs:string		Electricity	optional
	FuelType specified as a string. This should be used for defining the type value's fuel if the proper enum is not listed in Fuel. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.			
TestCondition	xs:string			optional
	The "rating" or list of conditions at which the power was tested.			

QName	Type	Fixed	Default	Use
Unit	PowerUnitEnumType			optional
	Unit of measurement specified as an enum. This should be used for defining the type value's units. If the proper enum is not listed, please use the UnitDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			
UnitDesc	xs:string		kwh	optional
	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			

Source

```
<xs:element name="MaxInput" type="PowerType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>Maximum (Power) Input. Note that many systems are oversized when
 designed. This represents the absolute maximum power consumption of the equipment.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

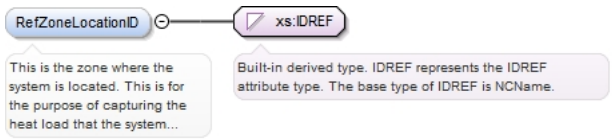
Element CommonSystemPropertiesType / OperatingSchedule

Namespace	No namespace
Annotations	The operating schedule of the system. This is likely to be a fraction schedule and represent the time-dependent capacity of the system. Note that particular systems, such as HVAC system, have additional schedules such as temperature schedules. This references the IDREF of a complete Schedules element at the Project level
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 0 maxOccurs: unbounded

Source

```
<xs:element name="OperatingSchedule" type="xs:IDREF" minOccurs="0" maxOccurs="unbounded">
  <xs:annotation>
    <xs:documentation>The operating schedule of the system. This is likely to be a
 fraction schedule and represent the time-dependent capacity of the system. Note that
 particular systems, such as HVAC system, have additional schedules such as temperature
 schedules. This references the IDREF of a complete Schedules element at the Project
 level</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element CommonSystemPropertiesType / RefZoneLocationID

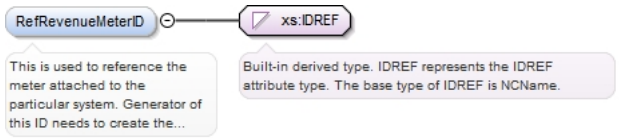
Namespace	No namespace
Annotations	This is the zone where the system is located. This is for the purpose of capturing the heat load that the system introduces to its environment.
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source

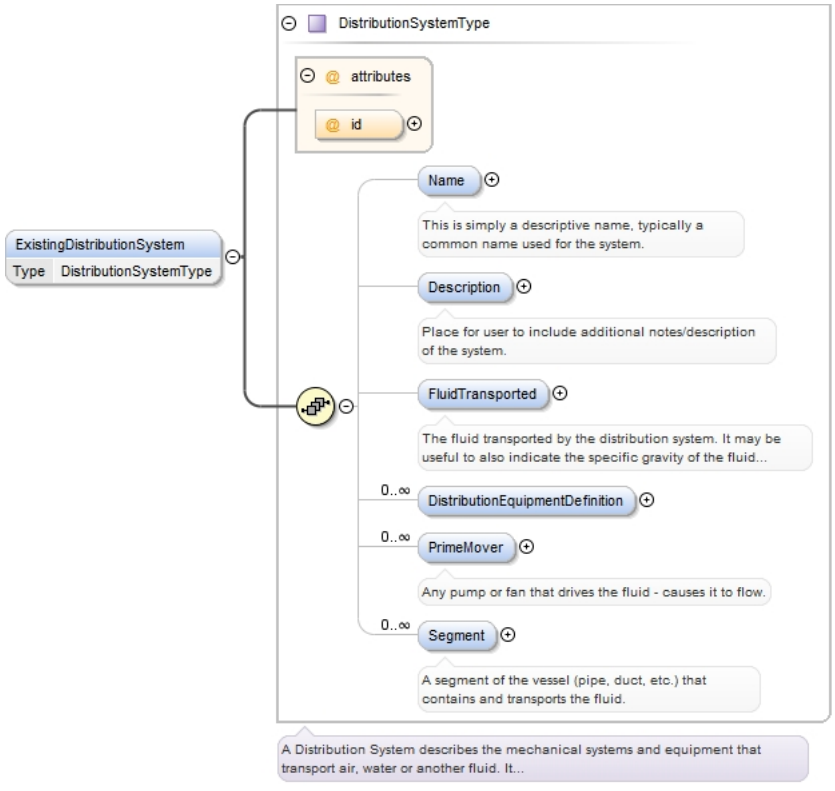
```
<xs:element name="RefZoneLocationID" type="xs:IDREF" minOccurs="0" maxOccurs="1">
```

```
  <xs:annotation>
    <xs:documentation>This is the zone where the system is located. This is for the
 purpose of capturing the heat load that the system introduces to its environment.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

Element CommonSystemPropertiesType / RefRevenueMeterID

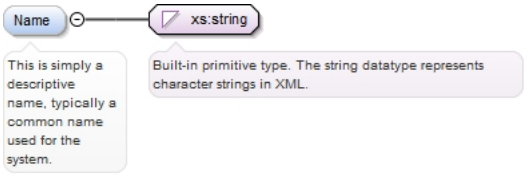
Namespace	No namespace
Annotations	This is used to reference the meter attached to the particular system. Generator of this ID needs to create the RevenueMeter first in the UtilityService schema in order to link back here.
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="RefRevenueMeterID" type="xs:IDREF"> <xs:annotation> <xs:documentation>This is used to reference the meter attached to the particular system. Generator of this ID needs to create the RevenueMeter first in the UtilityService schema in order to link back here.</xs:documentation> </xs:annotation> </xs:element>

Element ProjectType / ExistingDistributionSystem

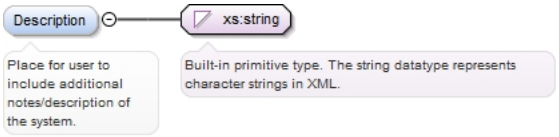
Namespace	No namespace
Diagram	
Type	DistributionSystemType
Properties	content: complex minOccurs: 0

	maxOccurs: unbounded
Model	Name{0,1} , Description{0,1} , FluidTransported{0,1} , DistributionEquipmentDefinition* , PrimeMover* , Segment*
Children	Description, DistributionEquipmentDefinition, FluidTransported, Name, PrimeMover, Segment
Instance	<ExistingDistributionSystem id=""> <Name>{0,1}</Name> <Description>{0,1}</Description> <FluidTransported>{0,1}</FluidTransported> <DistributionEquipmentDefinition id="">{0,unbounded}</DistributionEquipmentDefinition> <PrimeMover id="">{0,unbounded}</PrimeMover> {0,unbounded} </ExistingDistributionSystem>
Attributes	QName: id; Type: xs:ID; Fixed: ; Default: ; Use: optional
Source	<xs:element name="ExistingDistributionSystem" type="DistributionSystemType" minOccurs="0" maxOccurs="unbounded"/>

Element DistributionSystemType / Name

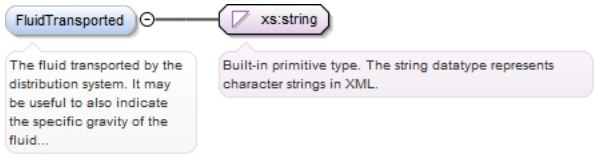
Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is simply a descriptive name, typically a common name used for the system.</xs:documentation> </xs:annotation> </xs:element>

Element DistributionSystemType / Description

Namespace	No namespace
Annotations	Place for user to include additional notes/description of the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Place for user to include additional notes/description of the system.</xs:documentation> </xs:annotation> </xs:element>

Element DistributionSystemType / FluidTransported

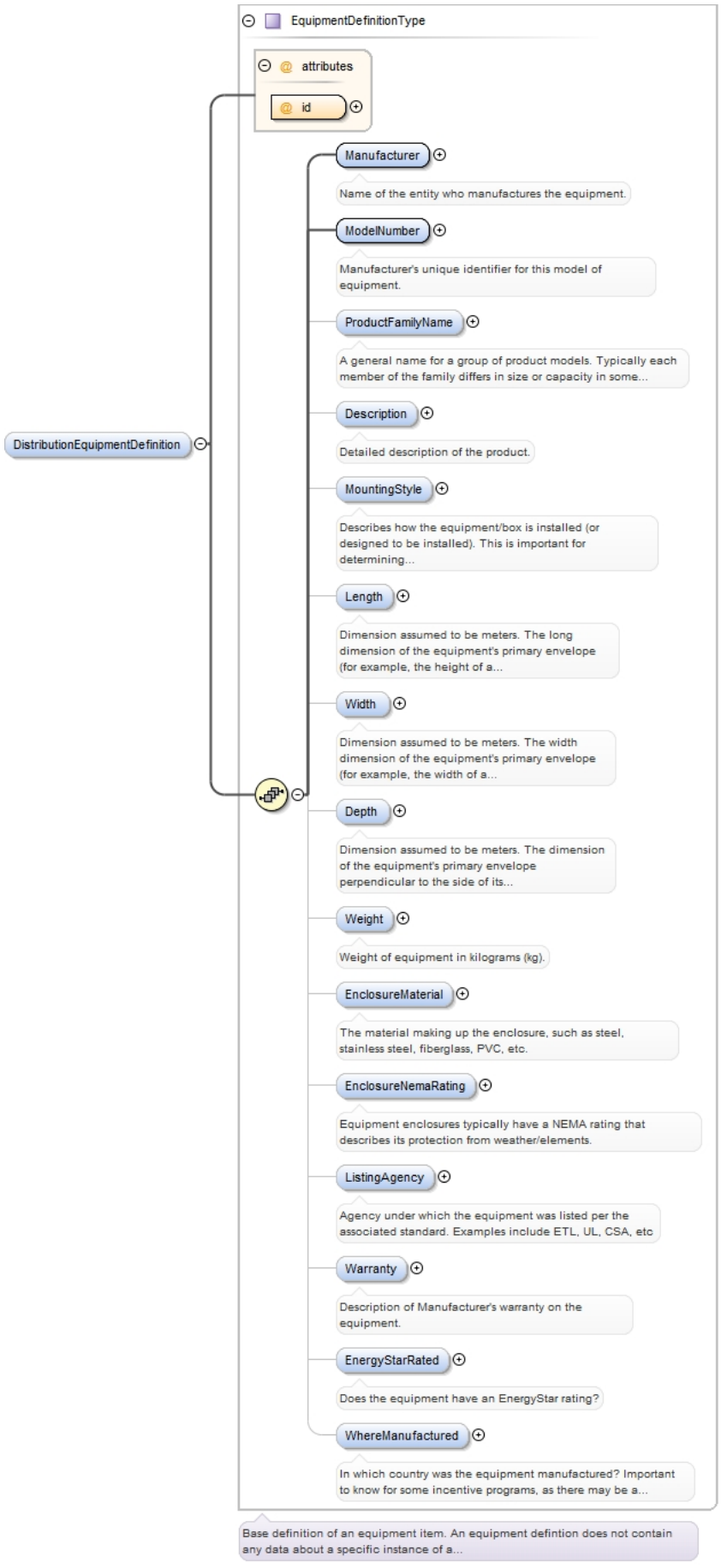
Namespace	No namespace

Annotations	The fluid transported by the distribution system. It may be useful to also indicate the specific gravity of the fluid if it is not a common one. Examples: Air Water Glycol Oil, specific gravity = 0.8 Heat Transfer Fluid
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="FluidTransported" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The fluid transported by the distribution system. It may be useful to also indicate the specific gravity of the fluid if it is not a common one. Examples: Air Water Glycol Oil, specific gravity = 0.8 Heat Transfer Fluid</xs:documentation> </xs:annotation> </xs:element>

Element DistributionSystemType / DistributionEquipmentDefinition

Namespace	No namespace

Diagram


EquipmentDefinitionType
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...
DistributionEquipmentDefinition

Type	EquipmentDefinitionType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1}
Children	Depth, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, Length, ListingAgency, Manufacturer, ModelNumber, MountingStyle, ProductFamilyName, Warranty, Weight, WhereManufactured, Width
Instance	<DistributionEquipmentDefinition id=""> <Manufacturer>{1,1}</Manufacturer> <ModelNumber>{1,1}</ModelNumber> <ProductFamilyName>{0,1}</ProductFamilyName> <Description>{0,1}</Description> <MountingStyle>{0,1}</MountingStyle> <Length>{0,1}</Length> <Width>{0,1}</Width> <Depth>{0,1}</Depth> <Weight>{0,1}</Weight> <EnclosureMaterial>{0,1}</EnclosureMaterial> <EnclosureNemaRating>{0,1}</EnclosureNemaRating> <ListingAgency>{0,1}</ListingAgency> <Warranty>{0,1}</Warranty> <EnergyStarRated>{0,1}</EnergyStarRated> <WhereManufactured>{0,1}</WhereManufactured> </DistributionEquipmentDefinition>

Attributes

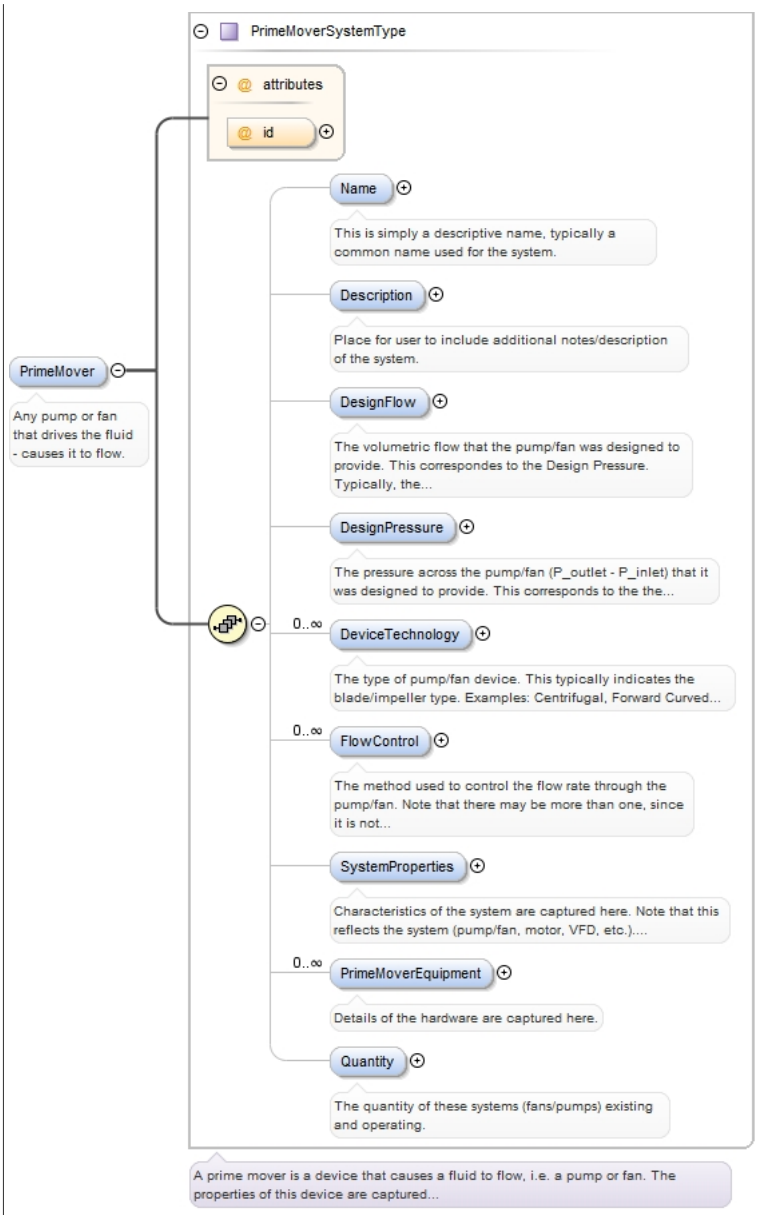
QName	Type	Fixed	Default	Use
id	xs:ID			required

Source

```
<xs:element maxOccurs="unbounded" minOccurs="0" name="DistributionEquipmentDefinition"
 type="EquipmentDefinitionType"/>
```

Element DistributionSystemType / PrimeMover

Namespace	No namespace
Annotations	Any pump or fan that drives the fluid - causes it to flow.

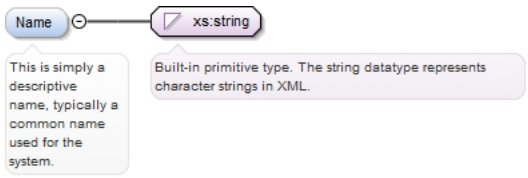
Diagram	
Type	PrimeMoverSystemType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , Description{0,1} , DesignFlow{0,1} , DesignPressure{0,1} , DeviceTechnology* , FlowControl* , SystemProperties{0,1} , PrimeMoverEquipment* , Quantity{0,1}
Children	Description, DesignFlow, DesignPressure, DeviceTechnology, FlowControl, Name, PrimeMoverEquipment, Quantity, SystemProperties
Instance	<PrimeMover id=""> <Name>{0,1}</Name> <Description>{0,1}</Description> <DesignFlow Unit="">{0,1}</DesignFlow> <DesignPressure Unit="">{0,1}</DesignPressure> <DeviceTechnology>{0,unbounded}</DeviceTechnology> <FlowControl>{0,unbounded}</FlowControl> <SystemProperties>{0,1}</SystemProperties> <PrimeMoverEquipment EquipmentDefinitionIdRef="" id="">{0,unbounded}</PrimeMoverEquipment> <Quantity>{0,1}</Quantity> </PrimeMover>

Attributes	QName	Type	Fixed	Default	Use
	id	xs:ID			optional

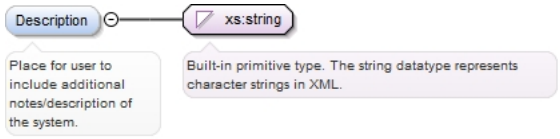
Source

```
<xs:element name="PrimeMover" type="PrimeMoverSystemType" minOccurs="0"
 maxOccurs="unbounded">
  <xs:annotation>
    <xs:documentation>Any pump or fan that drives the fluid - causes it to flow.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

Element PrimeMoverSystemType / Name

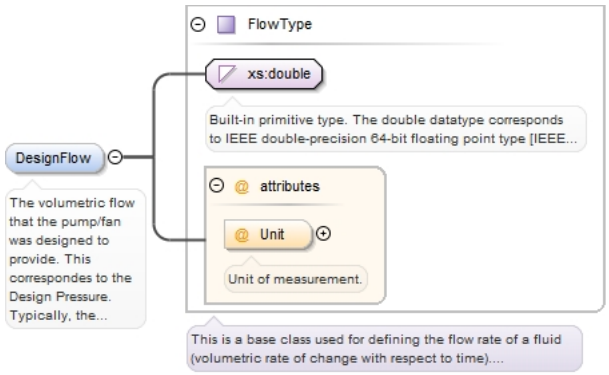
Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is simply a descriptive name, typically a common name used for the system.</xs:documentation> </xs:annotation> </xs:element>

Element PrimeMoverSystemType / Description

Namespace	No namespace
Annotations	Place for user to include additional notes/description of the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Place for user to include additional notes/description of the system.</xs:documentation> </xs:annotation> </xs:element>

Element PrimeMoverSystemType / DesignFlow

Namespace	No namespace
Annotations	The volumetric flow that the pump/fan was designed to provide. This correspondes to the Design Pressure. Typically, the design pressure and design flow represent the maximum efficiency point on the manufacturer fan/pump curve. Typically, this is not the maximum flow that the device can provide.

Diagram	
Type	FlowType
Properties	content: complex minOccurs: 0 maxOccurs: 1

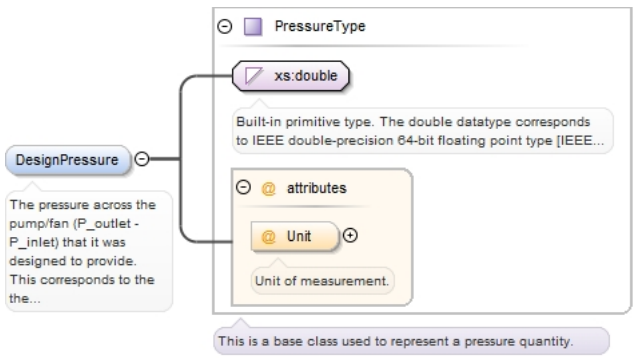
Attributes

QName	Type	Fixed	Default	Use
Unit	FlowUnitEnumType			optional
	Unit of measurement.			

Source

```
<xs:element name="DesignFlow" type="FlowType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>The volumetric flow that the pump/fan was designed to provide. This
 correspondes to the Design Pressure. Typically, the design pressure and design flow
 represent the maximum efficiency point on the manufacturer fan/pump curve. Typically,
 this is not the maximum flow that the device can provide.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element PrimeMoverSystemType / DesignPressure

Namespace	No namespace
Annotations	The pressure across the pump/fan (P_outlet - P_inlet) that it was designed to provide. This corresponds to the the Design Flow. Typically, the design pressure and design flow represent the maximum efficiency point on the manufacturer fan/pump curve. Typically, this is not the maximum pressure across the device.
Diagram	
Type	PressureType
Properties	content: complex minOccurs: 0 maxOccurs: 1

Attributes

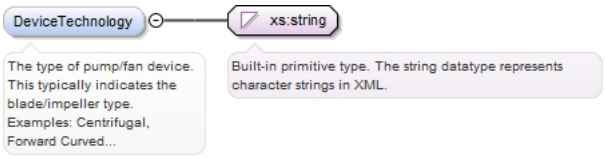
QName	Type	Fixed	Default	Use
Unit	PressureUnitEnumType			optional
	Unit of measurement.			

Source

```
<xs:element name="DesignPressure" type="PressureType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>The pressure across the pump/fan (P_outlet - P_inlet) that it was
 designed to provide. This corresponds to the the Design Flow. Typically, the design
```

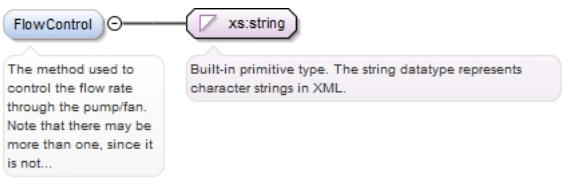
```
 pressure and design flow represent the maximum efficiency point on the manufacturer
 fan/pump curve. Typically, this is not the maximum pressure across the device.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

Element PrimeMoverSystemType / DeviceTechnology

Namespace	No namespace
Annotations	The type of pump/fan device. This typically indicates the blade/impeller type. Examples: Centrifugal, Forward Curved Centrifugal, Backward Curved Centrifugal, Radial Blade Centrifugal, Airfoil Centrifugal, Plenum Axial, Propeller Axial, Turbine
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: unbounded

Source	`<xs:element name="DeviceTechnology" type="xs:string" minOccurs="0" maxOccurs="unbounded">`
	`  <xs:annotation>`
	`  <xs:documentation>`The type of pump/fan device. This typically indicates the blade/impeller type. Examples: Centrifugal, Forward Curved Centrifugal, Backward Curved Centrifugal, Radial Blade Centrifugal, Airfoil Centrifugal, Plenum Axial, Propeller Axial, Turbine`</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

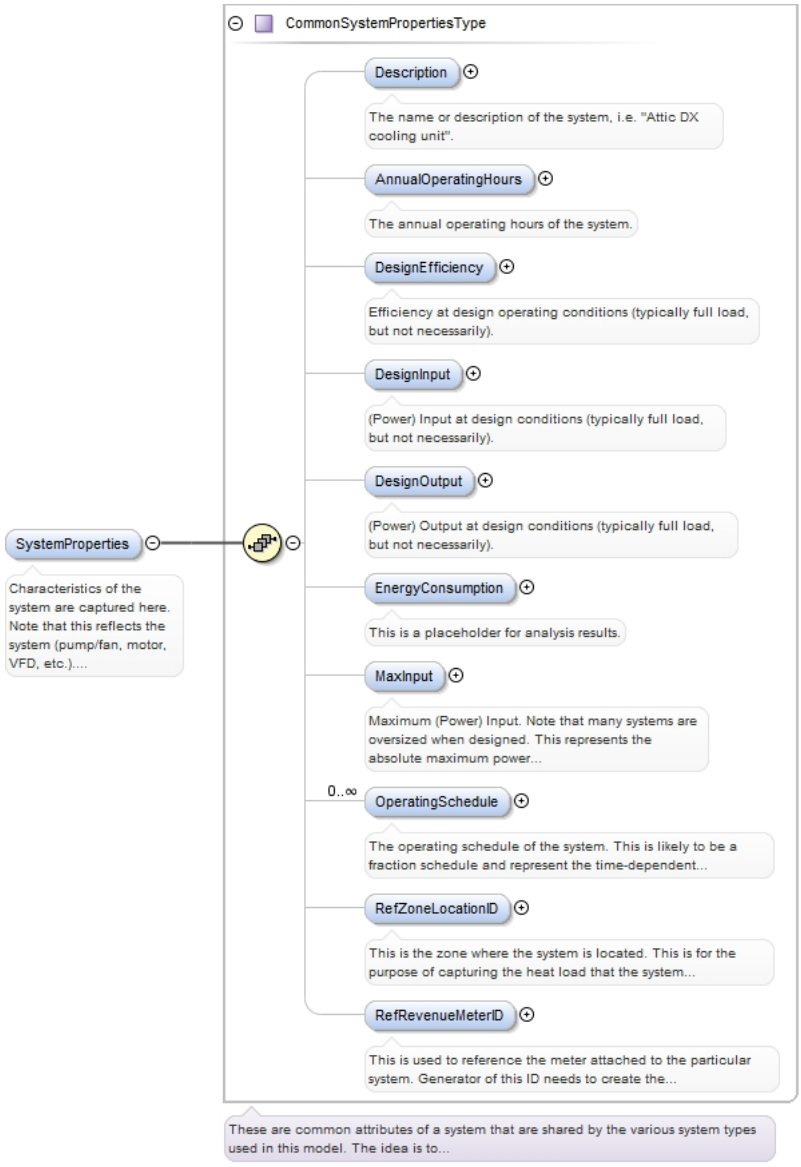
Element PrimeMoverSystemType / FlowControl

Namespace	No namespace
Annotations	The method used to control the flow rate through the pump/fan. Note that there may be more than one, since it is not uncommon (though somewhat inefficient) to find a VFD and throttle used. Examples: Valve-Manual/Automatic Damper-Manual/Automatic Variable Speed Variable Pitch Blade Inlet Guide Vane Outlet Damper
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: unbounded

Source	`<xs:element name="FlowControl" type="xs:string" minOccurs="0" maxOccurs="unbounded">`
	`  <xs:annotation>`
	`  <xs:documentation>`The method used to control the flow rate through the pump/fan. Note that there may be more than one, since it is not uncommon (though somewhat inefficient) to find a VFD and throttle used. Examples: Valve-Manual/Automatic Damper-Manual/Automatic Variable Speed Variable Pitch Blade Inlet Guide Vane Outlet Damper`</xs:documentation>`
	`  </xs:annotation>`

```
</xs:element>
```

Element PrimeMoverSystemType / SystemProperties

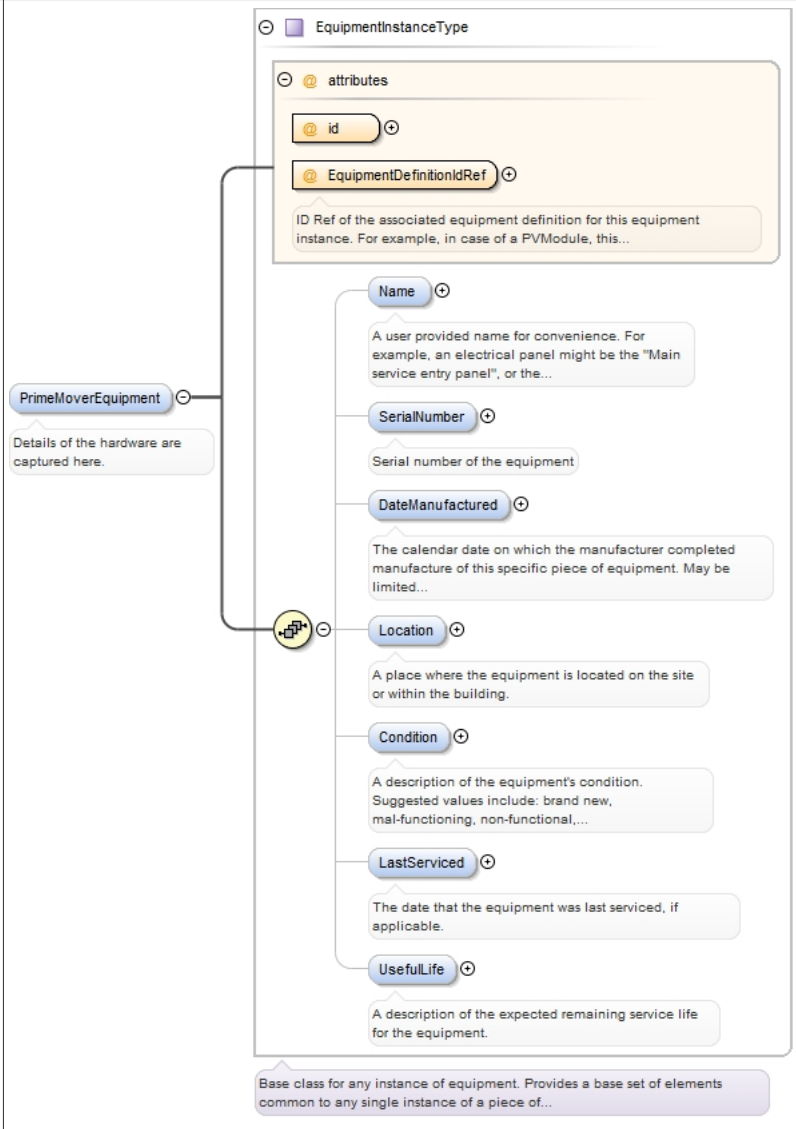
Namespace	No namespace
Annotations	Characteristics of the system are captured here. Note that this reflects the system (pump/fan, motor, VFD, etc.). Properties of the individual components may be captured in equipment attributes.
Diagram	
Type	CommonSystemPropertiesType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Description{0,1} , AnnualOperatingHours{0,1} , DesignEfficiency{0,1} , DesignInput{0,1} , DesignOutput{0,1} , EnergyConsumption{0,1} , MaxInput{0,1} , OperatingSchedule* , RefZoneLocationID{0,1} , RefRevenueMeterID{0,1}
Children	AnnualOperatingHours, Description, DesignEfficiency, DesignInput, DesignOutput, EnergyConsumption, MaxInput, OperatingSchedule, RefRevenueMeterID, RefZoneLocationID
Instance	<SystemProperties> <Description>{0,1}</Description> <AnnualOperatingHours>{0,1}</AnnualOperatingHours> <DesignEfficiency TestCondition="" Unit="" UnitDesc="">{0,1}</DesignEfficiency> <DesignInput Fuel="Electricity" FuelDesc="Electricity" TestCondition="" Unit="" UnitDesc="kwh">{0,1}</DesignInput>

```
  <DesignOutput Fuel="Electricity" FuelDesc="Electricity" TestCondition="" Unit="" UnitDesc="kwh">{0,1}<
DesignOutput>
  <EnergyConsumption RevenueMeterIdRef="">{0,1}</EnergyConsumption>
  <MaxInput Fuel="Electricity" FuelDesc="Electricity" TestCondition="" Unit="" UnitDesc="kwh">{0,1}</
MaxInput>
  <OperatingSchedule>{0,unbounded}</OperatingSchedule>
  <RefZoneLocationID>{0,1}</RefZoneLocationID>
  <RefRevenueMeterID>{0,1}</RefRevenueMeterID>
</SystemProperties>
```

Source

```
<xs:element name="SystemProperties" type="CommonSystemPropertiesType" minOccurs="0"
 maxOccurs="1">
  <xs:annotation>
    <xs:documentation>Characteristics of the system are captured here. Note that this
 reflects the system (pump/fan, motor, VFD, etc.). Properties of the individual components
 may be captured in equipment attributes.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element `PrimeMoverSystemType / PrimeMoverEquipment`

Namespace	No namespace
Annotations	`Details of the hardware are captured here.`
Diagram	
Type	EquipmentInstanceType
Properties	content: `complex` minOccurs: `0` maxOccurs: `unbounded`

Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1}
Children	Condition, DateManufactured, LastServiced, Location, Name, SerialNumber, UsefulLife
Instance	<PrimeMoverEquipment EquipmentDefinitionIdRef="" id=""> <Name>{0,1}</Name> <SerialNumber>{0,1}</SerialNumber> <DateManufactured>{0,1}</DateManufactured> <Location>{0,1}</Location> <Condition>{0,1}</Condition> <LastServiced>{0,1}</LastServiced> <UsefulLife>{0,1}</UsefulLife> </PrimeMoverEquipment>

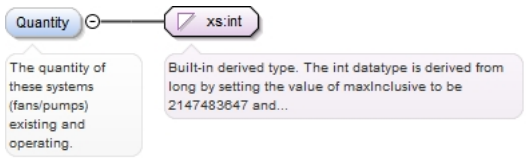
Attributes

QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			required
	ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.			
id	xs:ID			required

Source

```
<xs:element name="PrimeMoverEquipment" type="EquipmentInstanceType" minOccurs="0"
 maxOccurs="unbounded">
  <xs:annotation>
    <xs:documentation>Details of the hardware are captured here.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element PrimeMoverSystemType / Quantity

Namespace	No namespace
Annotations	The quantity of these systems (fans/pumps) existing and operating.
Diagram	
Type	xs:int

Properties

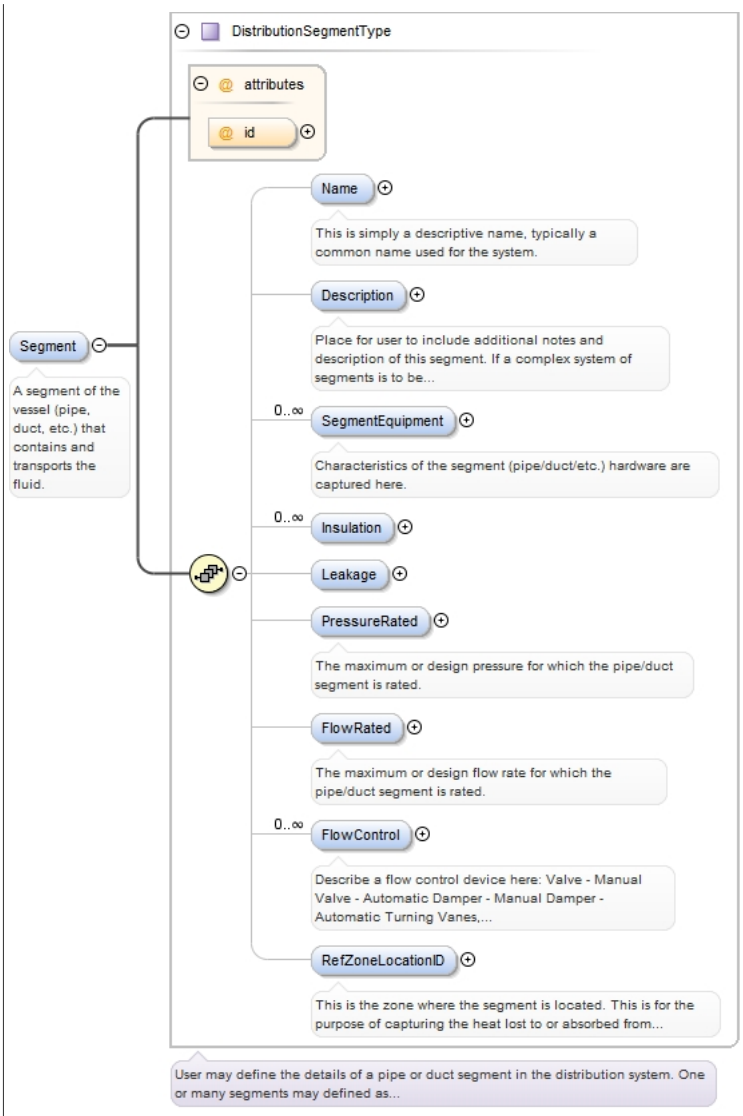
content:	simple
minOccurs:	0
maxOccurs:	1

Source

```
<xs:element name="Quantity" type="xs:int" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>The quantity of these systems (fans/pumps) existing and operating.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

Element DistributionSystemType / Segment

Namespace	No namespace
Annotations	A segment of the vessel (pipe, duct, etc.) that contains and transports the fluid.

Diagram	
Type	DistributionSegmentType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , Description{0,1} , SegmentEquipment* , Insulation* , Leakage{0,1} , PressureRated{0,1} , FlowRated{0,1} , FlowControl* , RefZoneLocationID{0,1}
Children	Description, FlowControl, FlowRated, Insulation, Leakage, Name, PressureRated, RefZoneLocationID, SegmentEquipment

Instance

```
<Segment id="">
  <Name>{0,1}</Name>
  <Description>{0,1}</Description>
  <SegmentEquipment EquipmentDefinitionIdRef="" id="">{0,unbounded}</SegmentEquipment>
  <Insulation>{0,unbounded}</Insulation>
  <Leakage>{0,1}</Leakage>
  <PressureRated Unit="">{0,1}</PressureRated>
  <FlowRated Unit="">{0,1}</FlowRated>
  <FlowControl>{0,unbounded}</FlowControl>
  <RefZoneLocationID>{0,1}</RefZoneLocationID>
</Segment>
```

Attributes

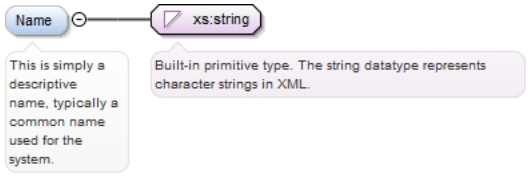
QName	Type	Fixed	Default	Use
id	xs:ID			optional

Source

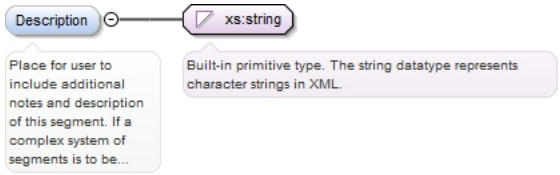
```
<xs:element maxOccurs="unbounded" minOccurs="0" name="Segment"
 type="DistributionSegmentType">
  <xs:annotation>
```

```
    <xs:documentation>A segment of the vessel (pipe, duct, etc.) that contains and
 transports the fluid.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element DistributionSegmentType / Name

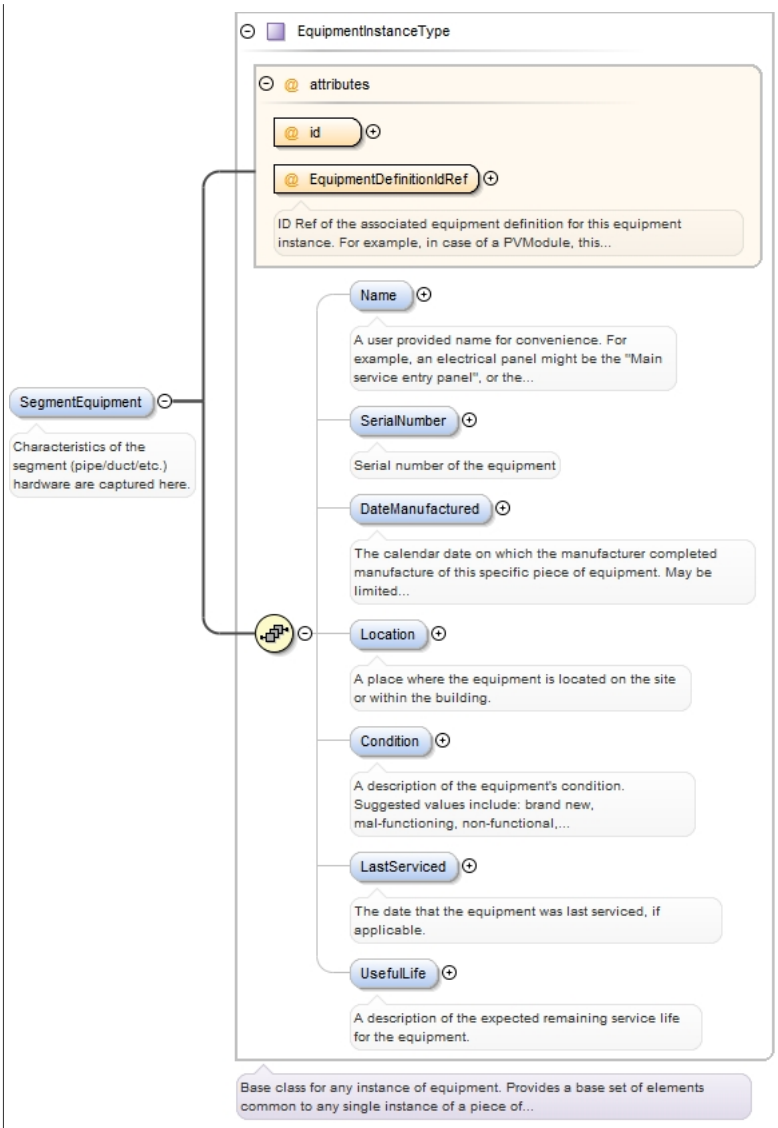
Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is simply a descriptive name, typically a common name used for the system.</xs:documentation> </xs:annotation> </xs:element>

Element DistributionSegmentType / Description

Namespace	No namespace
Annotations	Place for user to include additional notes and description of this segment. If a complex system of segments is to be defined, it would be useful to describe the system here. Other quantities or features may also be described here, such as the loss coefficient (i.e. pressure drop due to fluid friction).
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Place for user to include additional notes and description of this segment. If a complex system of segments is to be defined, it would be useful to describe the system here. Other quantities or features may also be described here, such as the loss coefficient (i.e. pressure drop due to fluid friction).</xs:documentation> </xs:annotation> </xs:element>

Element DistributionSegmentType / SegmentEquipment

Namespace	No namespace
Annotations	Characteristics of the segment (pipe/duct/etc.) hardware are captured here.

Diagram	
Type	EquipmentInstanceType
Properties	content: `complex` minOccurs: `0` maxOccurs: `unbounded`
Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1}
Children	Condition, DateManufactured, LastServiced, Location, Name, SerialNumber, UsefulLife

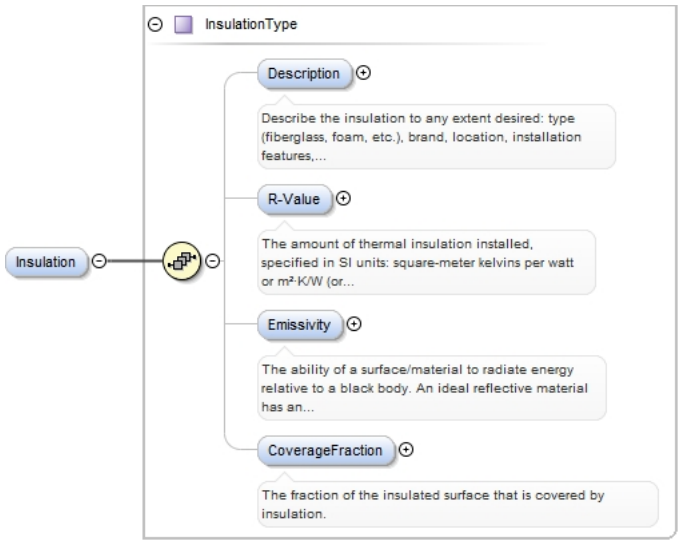
`Instance`	`<SegmentEquipment EquipmentDefinitionIdRef="" id="">`
	`  <Name>{0,1}</Name>`
	`  <SerialNumber>{0,1}</SerialNumber>`
	`  <DateManufactured>{0,1}</DateManufactured>`
	`  <Location>{0,1}</Location>`
	`  <Condition>{0,1}</Condition>`
	`  <LastServiced>{0,1}</LastServiced>`
	`  <UsefulLife>{0,1}</UsefulLife>`
	`</SegmentEquipment>`

Attributes

QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			required
	`ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.`			
id	xs:ID			required

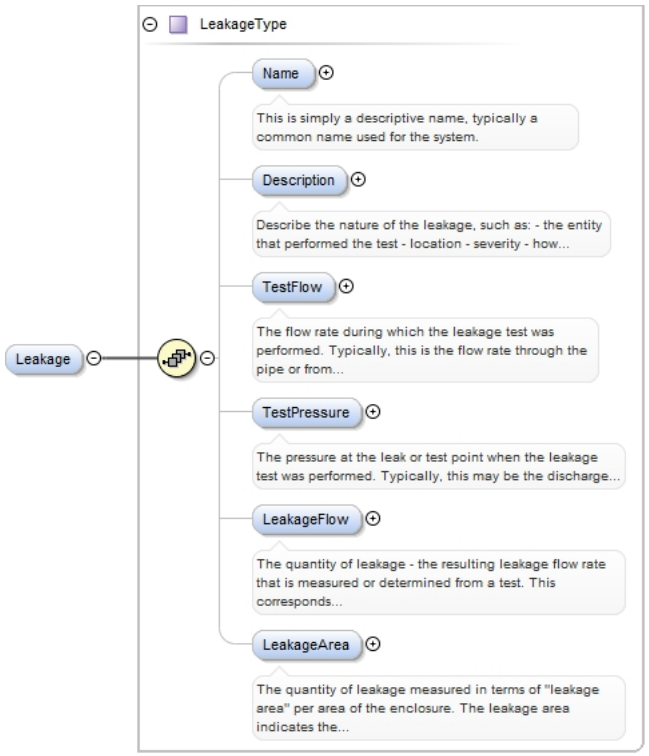
Source	<xs:element name="SegmentEquipment" type="EquipmentInstanceType" minOccurs="0" maxOccurs="unbounded"> <xs:annotation> <xs:documentation>Characteristics of the segment (pipe/duct/etc.) hardware are captured here.</xs:documentation> </xs:annotation> </xs:element>

Element DistributionSegmentType / Insulation

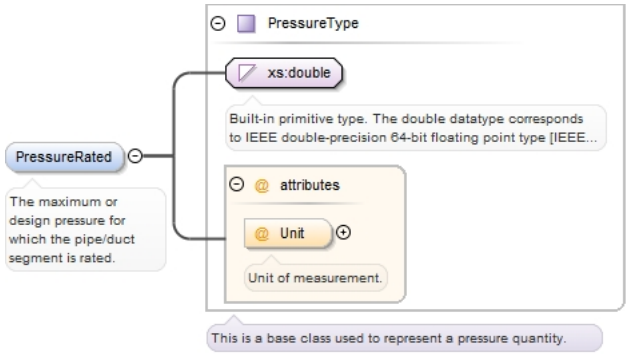
Namespace	No namespace
Diagram	
Type	InsulationType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Description{0,1} , R-Value{0,1} , Emissivity{0,1} , CoverageFraction{0,1}
Children	CoverageFraction, Description, Emissivity, R-Value
Instance	<Insulation> <Description>{0,1}</Description> <R-Value>{0,1}</R-Value> <Emissivity>{0,1}</Emissivity> <CoverageFraction>{0,1}</CoverageFraction> </Insulation>
Source	<xs:element maxOccurs="unbounded" minOccurs="0" name="Insulation" type="InsulationType"/>

Element DistributionSegmentType / Leakage

Namespace	No namespace

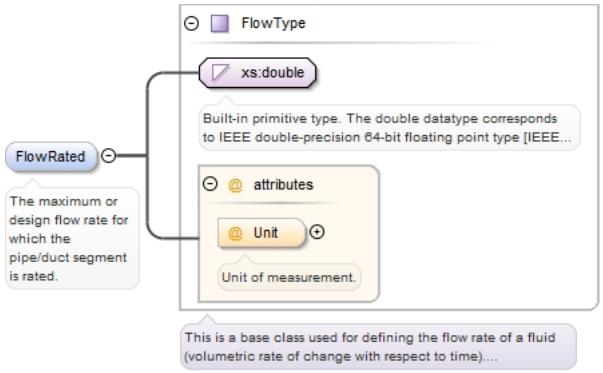
Diagram	
Type	LeakageType
Properties	content: complex minOccurs: 0
Model	Name{0,1} , Description{0,1} , TestFlow{0,1} , TestPressure{0,1} , LeakageFlow{0,1} , LeakageArea{0,1}
Children	Description, LeakageArea, LeakageFlow, Name, TestFlow, TestPressure
Instance	<Leakage> <Name>{0,1}</Name> <Description>{0,1}</Description> <TestFlow Unit="">{0,1}</TestFlow> <TestPressure Unit="">{0,1}</TestPressure> <LeakageFlow Unit="">{0,1}</LeakageFlow> <LeakageArea Unit="SquareMeters">{0,1}</LeakageArea> </Leakage>
Source	<xs:element minOccurs="0" name="Leakage" type="LeakageType"/>

Element DistributionSegmentType / PressureRated

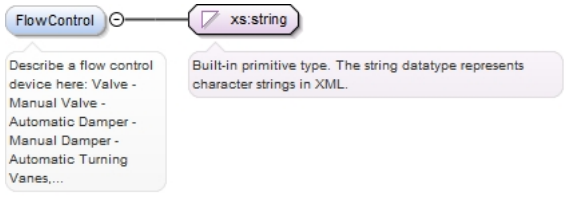
Namespace	No namespace
Annotations	The maximum or design pressure for which the pipe/duct segment is rated.
Diagram	
Type	PressureType
Properties	content: complex minOccurs: 0

	maxOccurs: 1
Attributes	QName: Unit; Type: PressureUnitEnumType; Fixed: ; Default: ; Use: optional Unit of measurement.
Source	<xs:element name="PressureRated" type="PressureType" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The maximum or design pressure for which the pipe/duct segment is rated.</xs:documentation> </xs:annotation> </xs:element>

Element DistributionSegmentType / FlowRated

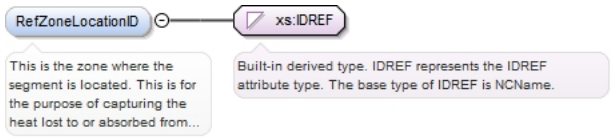
Namespace	No namespace
Annotations	The maximum or design flow rate for which the pipe/duct segment is rated.
Diagram	
Type	FlowType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Attributes	QName: Unit; Type: FlowUnitEnumType; Fixed: ; Default: ; Use: optional Unit of measurement.
Source	<xs:element name="FlowRated" type="FlowType" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The maximum or design flow rate for which the pipe/duct segment is rated.</xs:documentation> </xs:annotation> </xs:element>

Element DistributionSegmentType / FlowControl

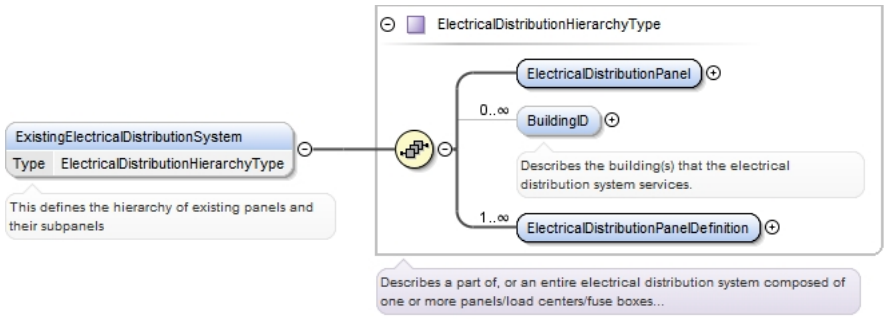
Namespace	No namespace
Annotations	Describe a flow control device here: Valve - Manual Valve - Automatic Damper - Manual Damper - Automatic Turning Vanes, loss coefficient 0.24
Diagram	
Type	xs:string
Properties	content: simple

	minOccurs: 0
	maxOccurs: unbounded
Source	<xs:element maxOccurs="unbounded" minOccurs="0" name="FlowControl" type="xs:string"> <xs:annotation> <xs:documentation>Describe a flow control device here: Valve - Manual Valve - Automatic Damper - Manual Damper - Automatic Turning Vanes, loss coefficient 0.24</xs:documentation> </xs:annotation> </xs:element>

Element DistributionSegmentType / RefZoneLocationID

Namespace	No namespace
Annotations	This is the zone where the segment is located. This is for the purpose of capturing the heat lost to or absorbed from the environment by the fluid in the segment.
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="RefZoneLocationID" type="xs:IDREF"> <xs:annotation> <xs:documentation>This is the zone where the segment is located. This is for the purpose of capturing the heat lost to or absorbed from the environment by the fluid in the segment.</xs:documentation> </xs:annotation> </xs:element>

Element ProjectType / ExistingElectricalDistributionSystem

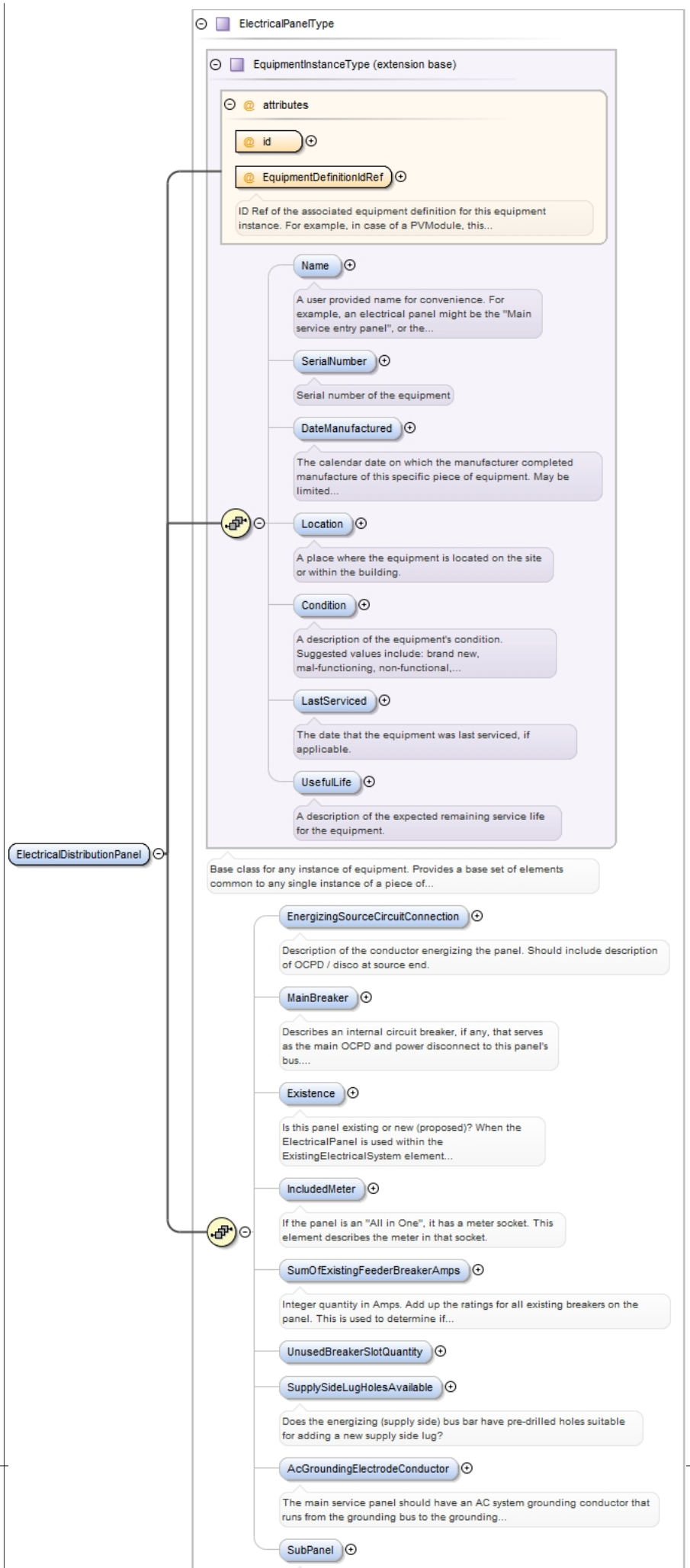
Namespace	No namespace
Annotations	This defines the hierarchy of existing panels and their subpanels
Diagram	
Type	ElectricalDistributionHierarchyType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	ElectricalDistributionPanel , BuildingID* , ElectricalDistributionPanelDefinition+
Children	BuildingID, ElectricalDistributionPanel, ElectricalDistributionPanelDefinition
Instance	<ExistingElectricalDistributionSystem> <ElectricalDistributionPanel EquipmentDefinitionIdRef="" id="">{1,1}</ElectricalDistributionPanel> <BuildingID>{0,unbounded}</BuildingID> <ElectricalDistributionPanelDefinition id="">{1,unbounded}</ElectricalDistributionPanelDefinition> </ExistingElectricalDistributionSystem>
Source	<xs:element minOccurs="0" name="ExistingElectricalDistributionSystem" type="ElectricalDistributionHierarchyType" maxOccurs="1">

	<xs:annotation> <xs:documentation>This defines the hierarchy of existing panels and their subpanels</xs:documentation> </xs:annotation> </xs:element>

Element ElectricalDistributionHierarchyType / ElectricalDistributionPanel

Namespace	No namespace

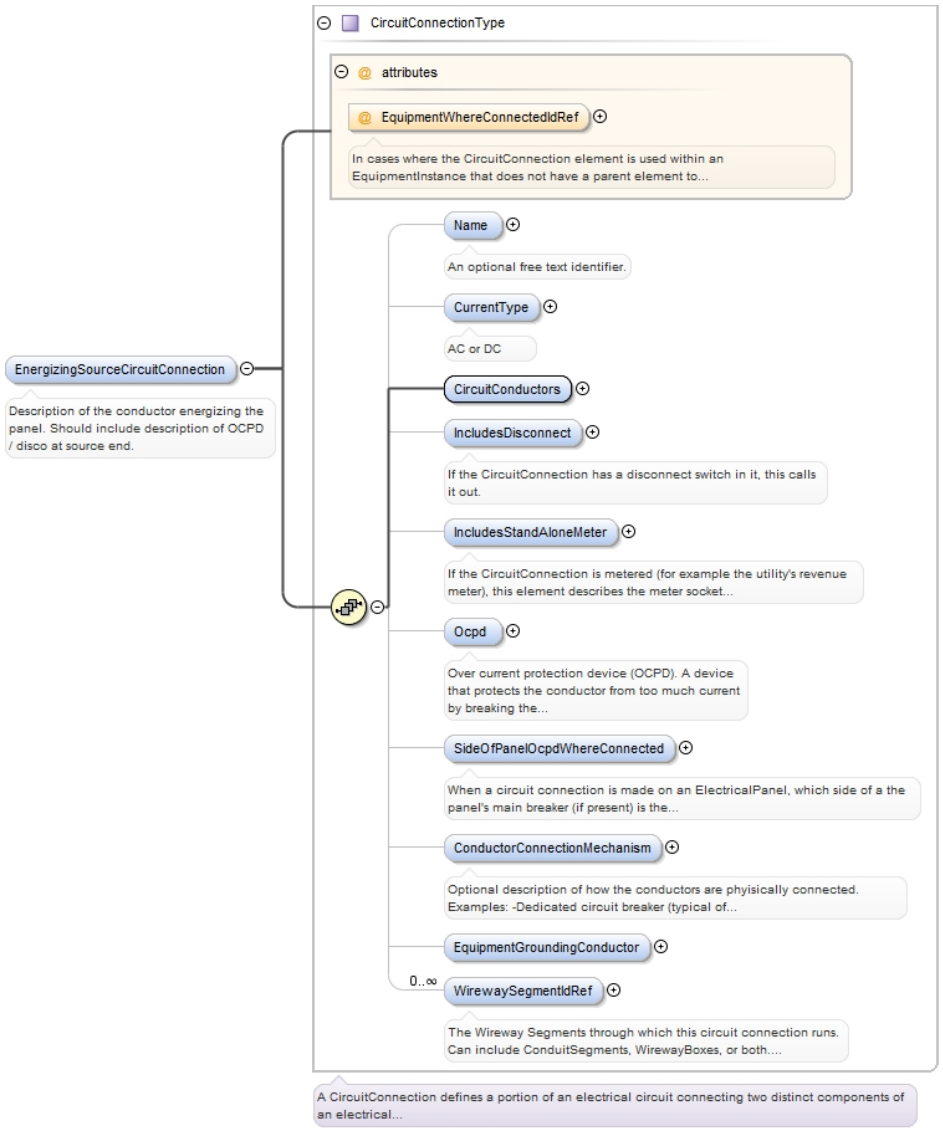
Diagram


ElectricalPanelType
EquipmentInstanceType (extension base)
attributes
id
EquipmentDefinitionIdRef
ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this...
Name
A user provided name for convenience. For example, an electrical panel might be the "Main service entry panel", or the...
SerialNumber
Serial number of the equipment
DateManufactured
The calendar date on which the manufacturer completed manufacture of this specific piece of equipment. May be limited...
Location
A place where the equipment is located on the site or within the building.
Condition
A description of the equipment's condition. Suggested values include: brand new, mal-functioning, non-functional,...
LastServiced
The date that the equipment was last serviced, if applicable.
UsefulLife
A description of the expected remaining service life for the equipment.
ElectricalDistributionPanel
Base class for any instance of equipment. Provides a base set of elements common to any single instance of a piece of...
EnergizingSourceCircuitConnection
Description of the conductor energizing the panel. Should include description of OCPD / disco at source end.
MainBreaker
Describes an internal circuit breaker, if any, that serves as the main OCPD and power disconnect to this panel's bus....
Existence
Is this panel existing or new (proposed)? When the ElectricalPanel is used within the ExistingElectricalSystem element...
IncludedMeter
If the panel is an "All in One", it has a meter socket. This element describes the meter in that socket.
SumOfExistingFeederBreakerAmps
Integer quantity in Amps. Add up the ratings for all existing breakers on the panel. This is used to determine if...
UnusedBreakerSlotQuantity
SupplySideLugHolesAvailable
Does the energizing (supply side) bus bar have pre-drilled holes suitable for adding a new supply side lug?
AcGroundingElectrodeConductor
The main service panel should have an AC system grounding conductor that runs from the grounding bus to the grounding...
SubPanel

Type	ElectricalPanelType
Type hierarchy	• EquipmentInstanceType • ElectricalPanelType
Properties	content: complex
Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1} , EnergizingSourceCircuitConnection{0,1} , MainBreaker{0,1} , Existence{0,1} , IncludedMeter{0,1} , SumOfExistingFeederBreakerAmps{0,1} , UnusedBreakerSlotQuantity{0,1} , SupplySideLugHolesAvailable{0,1} , AcGroundingElectrodeConductor{0,1} , SubPanel{0,1}
Children	AcGroundingElectrodeConductor, Condition, DateManufactured, EnergizingSourceCircuitConnection, Existence, IncludedMeter, LastServiced, Location, MainBreaker, Name, SerialNumber, SubPanel, SumOfExistingFeederBreakerAmps, SupplySideLugHolesAvailable, UnusedBreakerSlotQuantity, UsefulLife
Instance	<ElectricalDistributionPanel EquipmentDefinitionIdRef="" id=""> <Name>{0,1}</Name> <SerialNumber>{0,1}</SerialNumber> <DateManufactured>{0,1}</DateManufactured> <Location>{0,1}</Location> <Condition>{0,1}</Condition> <LastServiced>{0,1}</LastServiced> <UsefulLife>{0,1}</UsefulLife> <EnergizingSourceCircuitConnection EquipmentWhereConnectedIdRef="">{0,1}</EnergizingSourceCircuitConnection> <MainBreaker>{0,1}</MainBreaker> <Existence>{0,1}</Existence> <IncludedMeter EquipmentDefinitionIdRef="" id="">{0,1}</IncludedMeter> <SumOfExistingFeederBreakerAmps>{0,1}</SumOfExistingFeederBreakerAmps> <UnusedBreakerSlotQuantity>{0,1}</UnusedBreakerSlotQuantity> <SupplySideLugHolesAvailable>{0,1}</SupplySideLugHolesAvailable> <AcGroundingElectrodeConductor>{0,1}</AcGroundingElectrodeConductor> <SubPanel EquipmentDefinitionIdRef="" id="">{0,1}</SubPanel> </ElectricalDistributionPanel>
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **EquipmentDefinitionIdRef** / IDREF / / / required ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance. **id** / xs:ID / / / required
Source	<xs:element name="ElectricalDistributionPanel" type="ElectricalPanelType"/>

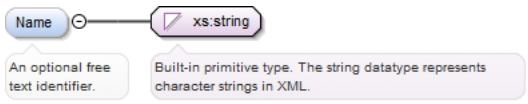
Element ElectricalPanelType / EnergizingSourceCircuitConnection

Namespace	No namespace
Annotations	Description of the conductor energizing the panel. Should include description of OCPD / disco at source end.

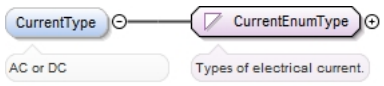
Diagram	
Type	CircuitConnectionType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Name{0,1} , CurrentType{0,1} , CircuitConductors , IncludesDisconnect{0,1} , IncludesStandAloneMeter{0,1} , Ocpd{0,1} , SideOfPanelOcpdWhereConnected{0,1} , ConductorConnectionMechanism{0,1} , EquipmentGroundingConductor{0,1} , WirewaySegmentIdRef*
Children	CircuitConductors, ConductorConnectionMechanism, CurrentType, EquipmentGroundingConductor, IncludesDisconnect, IncludesStandAloneMeter, Name, Ocpd, SideOfPanelOcpdWhereConnected, WirewaySegmentIdRef
Instance	<EnergizingSourceCircuitConnection EquipmentWhereConnectedIdRef=""> <Name>{0,1}</Name> <CurrentType>{0,1}</CurrentType> <CircuitConductors>{1,1}</CircuitConductors> <IncludesDisconnect ConductorSegmentIdRef="" WirewayBoxIdRef="">{0,1}</IncludesDisconnect> <IncludesStandAloneMeter ConductorSegmentIdRef="">{0,1}</IncludesStandAloneMeter> <Ocpd EquipmentWhereLocatedIdRef="">{0,1}</Ocpd> <SideOfPanelOcpdWhereConnected>{0,1}</SideOfPanelOcpdWhereConnected> <ConductorConnectionMechanism>{0,1}</ConductorConnectionMechanism> <EquipmentGroundingConductor>{0,1}</EquipmentGroundingConductor> <WirewaySegmentIdRef>{0,unbounded}</WirewaySegmentIdRef> </EnergizingSourceCircuitConnection>

Attributes	QName	Type	Fixed	Default	Use
	EquipmentWhereConnectedIDRef	IDREF			optional
	In cases where the CircuitConnection element is used within an EquipmentInstance that does not have a parent element to which the CircuitConnection is assumed to connect, a reference ID can be used to associate this CircuitConnection to another EquipmentInstance elsewhere in a document instance. For example, a PvSystem may have an AcPointOfConnection that uses a new ElectricalPanel as an AC combiner for more than one Inverter. The new electrical panel can be described by an ElectricalPanel element in the PvDesign (which in turn refers to an ElectricalPanelDefinition element). in the AcPointOfConnection's EquipmentWhereConnected element. That ElectricPanel's EnergizingCircuitConnection element may reference another ElectricPanel in an instance of the Project's ExistingElectricalHierarchy element.				
Source	<xs:element minOccurs="0" name="EnergizingSourceCircuitConnection" type="CircuitConnectionType" maxOccurs="1"> <xs:annotation> <xs:documentation>Description of the conductor energizing the panel. Should include description of OCPD / disco at source end.</xs:documentation> </xs:annotation> </xs:element>				

Element CircuitConnectionType / Name

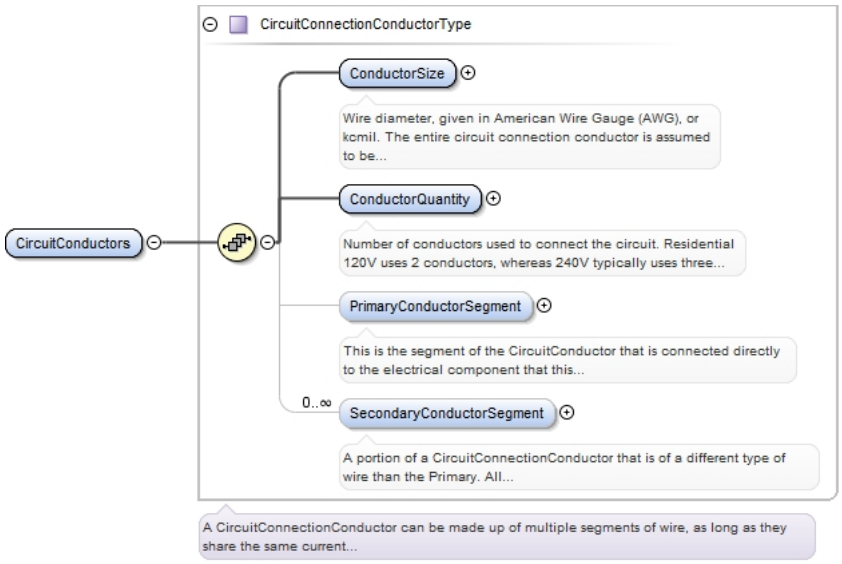
Namespace	No namespace
Annotations	An optional free text identifier.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="Name" type="xs:string"> <xs:annotation> <xs:documentation>An optional free text identifier.</xs:documentation> </xs:annotation> </xs:element>

Element CircuitConnectionType / CurrentType

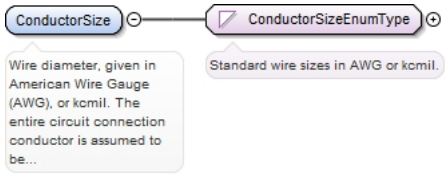
Namespace	No namespace
Annotations	AC or DC
Diagram	
Type	CurrentEnumType
Properties	content: simple minOccurs: 0
Facets	enumeration AC enumeration DC
Source	<xs:element name="CurrentType" minOccurs="0" type="CurrentEnumType"> <xs:annotation> <xs:documentation>AC or DC</xs:documentation> </xs:annotation> </xs:element>

Element CircuitConnectionType / CircuitConductors

Namespace	No namespace

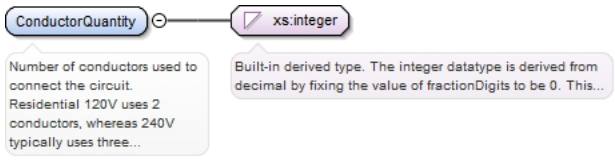
Diagram	
Type	CircuitConnectionConductorType
Properties	content: complex
Model	ConductorSize , ConductorQuantity , PrimaryConductorSegment{0,1} , SecondaryConductorSegment*
Children	ConductorQuantity, ConductorSize, PrimaryConductorSegment, SecondaryConductorSegment
Instance	<CircuitConductors> <ConductorSize>{1,1}</ConductorSize> <ConductorQuantity>{1,1}</ConductorQuantity> <PrimaryConductorSegment id="">{0,1}</PrimaryConductorSegment> <SecondaryConductorSegment ConnectsToConductorSegmentId="" id="" WirewaySegmentWhereConnectedId="">{0, SecondaryConductorSegment> </CircuitConductors>
Source	<xs:element name="CircuitConductors" type="CircuitConnectionConductorType"/>

Element CircuitConnectionConductorType / ConductorSize

Namespace	No namespace
Annotations	Wire diameter, given in American Wire Gauge (AWG), or kcmil. The entire circuit connection conductor is assumed to be the same size conductor, even if it is physically made up of multiple conductor segments that are different kinds of wire.
Diagram	
Type	ConductorSizeEnumType
Properties	content: simple
Facets	enumeration 12 enumeration 10 enumeration 8 enumeration 6 enumeration 4 enumeration 3 enumeration 2 enumeration 1/0 enumeration 2/0 enumeration 3/0 enumeration 4/0

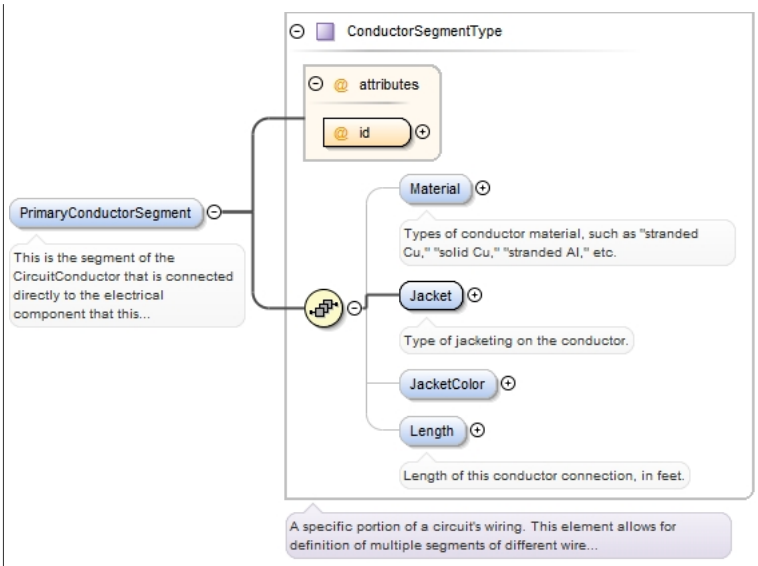
	enumeration 250
	enumeration 350
	enumeration 400
	enumeration 500
Source	<xs:element name="ConductorSize" type="ConductorSizeEnumType"> <xs:annotation> <xs:documentation>Wire diameter, given in American Wire Gauge (AWG), or kcmil. The entire circuit connection conductor is assumed to be the same size conductor, even if it is physically made up of multiple conductor segments that are different kinds of wire.</xs:documentation> </xs:annotation> </xs:element>

Element CircuitConnectionConductorType / ConductorQuantity

Namespace	No namespace
Annotations	Number of conductors used to connect the circuit. Residential 120V uses 2 conductors, whereas 240V typically uses three conductors, and commercial three phase typically is 4 conductors.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 1
Source	<xs:element minOccurs="1" name="ConductorQuantity" type="xs:integer"> <xs:annotation> <xs:documentation>Number of conductors used to connect the circuit. Residential 120V uses 2 conductors, whereas 240V typically uses three conductors, and commercial three phase typically is 4 conductors.</xs:documentation> </xs:annotation> </xs:element>

Element CircuitConnectionConductorType / PrimaryConductorSegment

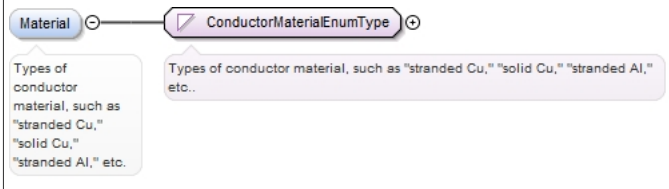
Namespace	No namespace
Annotations	This is the segment of the CircuitConductor that is connected directly to the electrical component that this CircuitConnection belongs to. For example, let's assume that this ConductorSegment is part of a CircuitConnection for a PvString. The PvString typically starts out as USE-2 wire from the PV Modules and may transition to THWN-2 wire once inside a J-box (modeled as a Wireway box in this schema). The USE-2 segment of the conductor is the Primary segment, while the THWN-2 wire is a secondary segment. All CircuitConnectionConductors have a primary segment, only some have any secondary instances. If there are more than one, then the splices made beween them are described by the ConnectsToConductorSegmentId and the WirewaySegmentWhereConnectedId attributes.

Diagram	
Type	ConductorSegmentType
Properties	content: complex minOccurs: 0
Model	Material{0,1} , Jacket , JacketColor{0,1} , Length{0,1}
Children	Jacket, JacketColor, Length, Material

Instance	`<PrimaryConductorSegment id="">`
	`  <Material>{0,1}</Material>`
	`  <Jacket>{1,1}</Jacket>`
	`  <JacketColor>{0,1}</JacketColor>`
	`  <Length>{0,1}</Length>`
	`</PrimaryConductorSegment>`

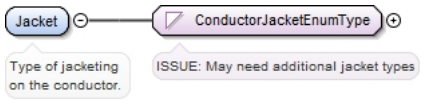
Attributes	**QName** | **Type** | **Fixed** | **Default** | **Use** **id** | xs:ID | | | required
Source	`<xs:element minOccurs="0" name="PrimaryConductorSegment" type="ConductorSegmentType">` `  <xs:annotation>` ` <xs:documentation>This is the segment of the CircuitConductor that is connected directly to the electrical component that this CircuitConnection belongs to. For example, let's assume that this ConductorSegment is part of a CircuitConnection for a PvString. The PvString typically starts out as USE-2 wire from the PV Modules and may transition to THWN-2 wire once inside a J-box (modeled as a Wireway box in this schema). The USE-2 segment of the conductor is the Primary segment, while the THWN-2 wire is a secondary segment. All CircuitConnectionConductors have a primary segment, only some have any secondary instances. If there are more than one, then the splices made beween them are described by the ConnectsToConductorSegmentId and the WirewaySegmentWhereConnectedId attributes.</xs:documentation>` ` </xs:annotation>` `</xs:element>`

Element ConductorSegmentType / Material

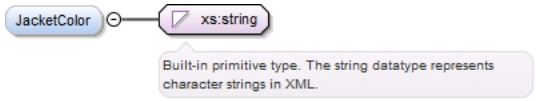
Namespace	No namespace
Annotations	Types of conductor material, such as "stranded Cu," "solid Cu," "stranded Al," etc.
Diagram	
Type	ConductorMaterialEnumType
Properties	content: simple minOccurs: 0
Facets	enumeration: Stranded Cu

	enumeration	Solid Cu
	enumeration	Stranded Al
Source	<xs:element minOccurs="0" name="Material" type="ConductorMaterialEnumType"> <xs:annotation> <xs:documentation>Types of conductor material, such as "stranded Cu," "solid Cu," "stranded Al," etc.</xs:documentation> </xs:annotation> </xs:element>	

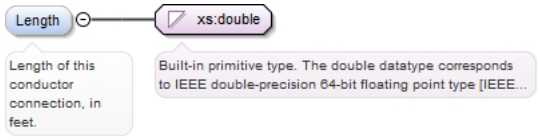
Element ConductorSegmentType / Jacket

Namespace	No namespace	
Annotations	Type of jacketing on the conductor.	
Diagram		
Type	ConductorJacketEnumType	
Properties	content:	simple
	minOccurs:	1
Facets	enumeration	bare
	enumeration	USE
	enumeration	USE-2
	enumeration	THWN
	enumeration	THWN-2
	enumeration	THHN
	enumeration	THHW
	enumeration	XHHW-2
	enumeration	RHW-2
	enumeration	PV Wire
Source	<xs:element minOccurs="1" name="Jacket" type="ConductorJacketEnumType"> <xs:annotation> <xs:documentation>Type of jacketing on the conductor.</xs:documentation> </xs:annotation> </xs:element>	

Element ConductorSegmentType / JacketColor

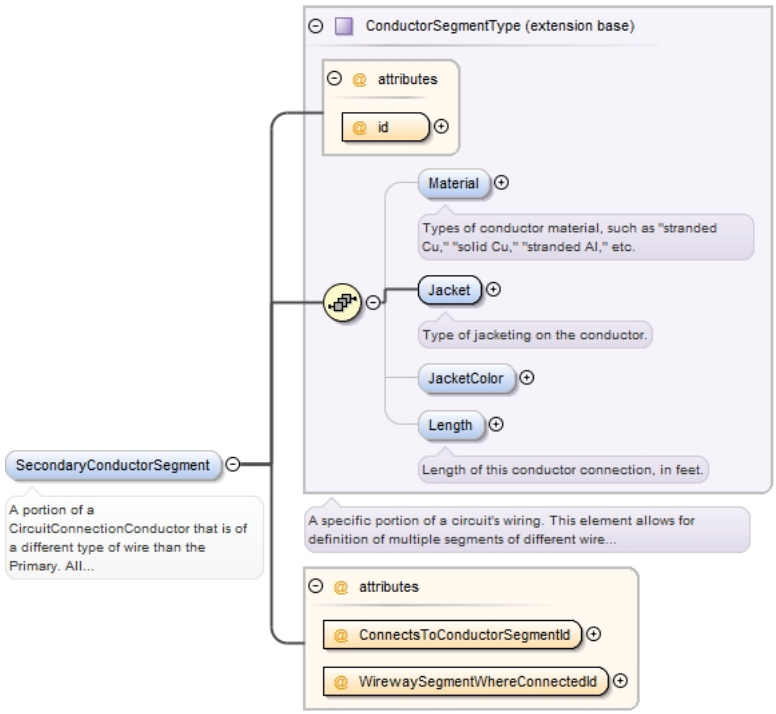
Namespace	No namespace	
Diagram		
Type	xs:string	
Properties	content:	simple
	minOccurs:	0
Source	<xs:element minOccurs="0" name="JacketColor" type="xs:string"/>	

Element ConductorSegmentType / Length

Namespace	No namespace	
Annotations	Length of this conductor connection, in feet.	
Diagram		
Type	xs:double	

Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Length" type="xs:double" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Length of this conductor connection, in feet.</xs:documentation> </xs:annotation> </xs:element>

Element CircuitConnectionConductorType / SecondaryConductorSegment

Namespace	No namespace
Annotations	A portion of a CircuitConnectionConductor that is of a different type of wire than the Primary. All CircuitConnectionConductors have a primary segment, only some have any secondary instances. If there are more than one, then the splices made beween them are described by the ConnectsToConductorSegmentId and the WirewaySegmentWhereConnectedId attributes.
Diagram	
Type	extension of ConductorSegmentType
Type hierarchy	• ConductorSegmentType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Material{0,1} , Jacket , JacketColor{0,1} , Length{0,1}
Children	Jacket, JacketColor, Length, Material
Instance	<SecondaryConductorSegment ConnectsToConductorSegmentId="" id="" WirewaySegmentWhereConnectedId=""> <Material>{0,1}</Material> <Jacket>{1,1}</Jacket> <JacketColor>{0,1}</JacketColor> <Length>{0,1}</Length> </SecondaryConductorSegment>

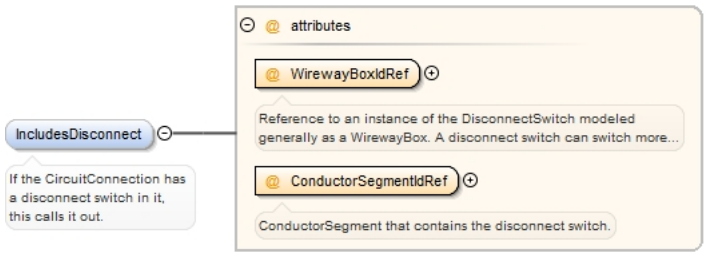
Attributes

QName	Type	Fixed	Default	Use
ConnectsToConductorSegmentId	IDREF			required
WirewaySegmentWhereConnectedId	IDREF			required
id	xs:ID			required

Source	<xs:element maxOccurs="unbounded" minOccurs="0" name="SecondaryConductorSegment"> <xs:annotation>

```
    <xs:documentation>A portion of a CircuitConnectionConductor that is of a different
 type of wire than the Primary. All CircuitConnectionConductors have a primary
 segment, only some have any secondary instances. If there are more than one, then the
 splices made beween them are described by the ConnectsToConductorSegmentId and the
 WirewaySegmentWhereConnectedId attributes.</xs:documentation>
  </xs:annotation>
  <xs:complexType>
    <xs:complexContent>
      <xs:extension base="ConductorSegmentType">
        <xs:attribute name="ConnectsToConductorSegmentId" type="xs:IDREF" use="required"/>
        <xs:attribute name="WirewaySegmentWhereConnectedId" type="xs:IDREF"
 use="required"/>
      </xs:extension>
    </xs:complexContent>
  </xs:complexType>
</xs:element>
```

Element CircuitConnectionType / IncludesDisconnect

Namespace	No namespace
Annotations	If the CircuitConnection has a disconnect switch in it, this calls it out.
Diagram	

Properties		
	content:	complex
	minOccurs:	0

Attributes

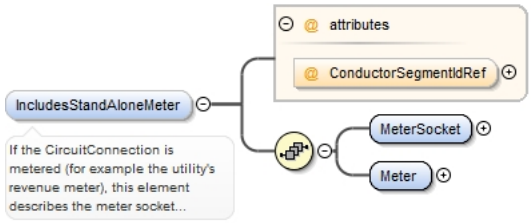
QName	Type	Fixed	Default	Use
ConductorSegmentIdRef	xs:IDREF			required
	ConductorSegment that contains the disconnect switch.			
WirewayBoxIdRef	xs:IDREF			required
	Reference to an instance of the DisconnectSwitch modeled generally as a WirewayBox. A disconnect switch can switch more than one CircuitConnection, so it is defined external to the CircuitConnection.			

Source

```
<xs:element minOccurs="0" name="IncludesDisconnect">
  <xs:annotation>
    <xs:documentation>If the CircuitConnection has a disconnect switch in it, this calls
 it out.</xs:documentation>
  </xs:annotation>
  <xs:complexType>
    <xs:attribute name="WirewayBoxIdRef" type="xs:IDREF" use="required">
      <xs:annotation>
        <xs:documentation>Reference to an instance of the DisconnectSwitch
 modeled generally as a WirewayBox. A disconnect switch can switch more than one
 CircuitConnection, so it is defined external to the CircuitConnection.</xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="ConductorSegmentIdRef" type="xs:IDREF" use="required">
      <xs:annotation>
        <xs:documentation>ConductorSegment that contains the disconnect switch.</
xs:documentation>
      </xs:annotation>
    </xs:attribute>
  </xs:complexType>
</xs:element>
```

Element CircuitConnectionType / IncludesStandAloneMeter

Namespace	No namespace
Annotations	If the CircuitConnection is metered (for example the utility's revenue meter), this element describes the meter socket and meter. The meter and socket are individual entities. The MeterSocket is modeled as a simple WirewayBox.

Diagram	
Properties	content: complex minOccurs: 0
Model	MeterSocket , Meter
Children	Meter, MeterSocket

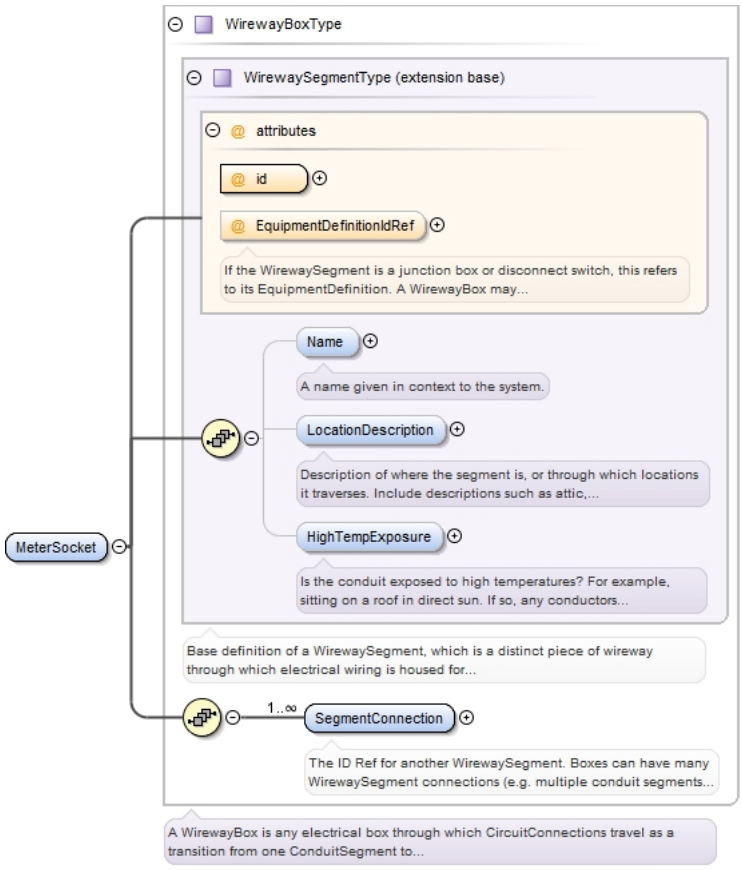
Instance	`<IncludesStandAloneMeter ConductorSegmentIdRef="">`
	`  <MeterSocket EquipmentDefinitionIdRef="" id="">{1,1}</MeterSocket>`
	`  <Meter EquipmentDefinitionIdRef="" id="">{1,1}</Meter>`
	`</IncludesStandAloneMeter>`

Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **ConductorSegmentIdRef** / IDREF / / / optional

Source	`<xs:element minOccurs="0" name="IncludesStandAloneMeter">`
	`  <xs:annotation>`
	`  <xs:documentation>If the CircuitConnection is metered (for example the utility's revenue meter), this element describes the meter socket and meter. The meter and socket are individual entities. The MeterSocket is modeled as a simple WirewayBox.</xs:documentation>`
	`  </xs:annotation>`
	`  <xs:complexType>`
	`  <xs:sequence>`
	`  <xs:element name="MeterSocket" type="WirewayBoxType"/>`
	`  <xs:element name="Meter" type="EquipmentInstanceType"/>`
	`  </xs:sequence>`
	`  <xs:attribute name="ConductorSegmentIdRef" type="xs:IDREF"/>`
	`  </xs:complexType>`
	`</xs:element>`

Element CircuitConnectionType / IncludesStandAloneMeter / MeterSocket

Namespace	No namespace

Diagram	
Type	WirewayBoxType
Type hierarchy	• WirewaySegmentType • WirewayBoxType
Properties	content: complex
Model	Name{0,1} , LocationDescription{0,1} , HighTempExposure{0,1} , SegmentConnection+
Children	HighTempExposure, LocationDescription, Name, SegmentConnection

Instance	`<MeterSocket EquipmentDefinitionIdRef="" id="">`
	`  <Name>{0,1}</Name>`
	`  <LocationDescription>{0,1}</LocationDescription>`
	`  <HighTempExposure>{0,1}</HighTempExposure>`
	`  <SegmentConnection>{1,unbounded}</SegmentConnection>`
	`</MeterSocket>`

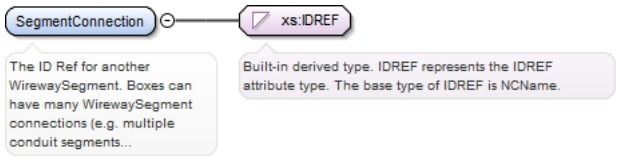
Attributes

QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			optional
	If the WirewaySegment is a junction box or disconnect switch, this refers to its EquipmentDefinition. A WirewayBox may be a pass through where multiple ConduitSegments are combined into a single ConduitSegment for example. A disconnect switch box may also be modeled as a WirewayBox, provided that the circuit(s) involved are simply disoconnected and not combined in any way. DO NOT use WirewayBox to represent a combiner, or distribution panel.			
id	xs:ID			required

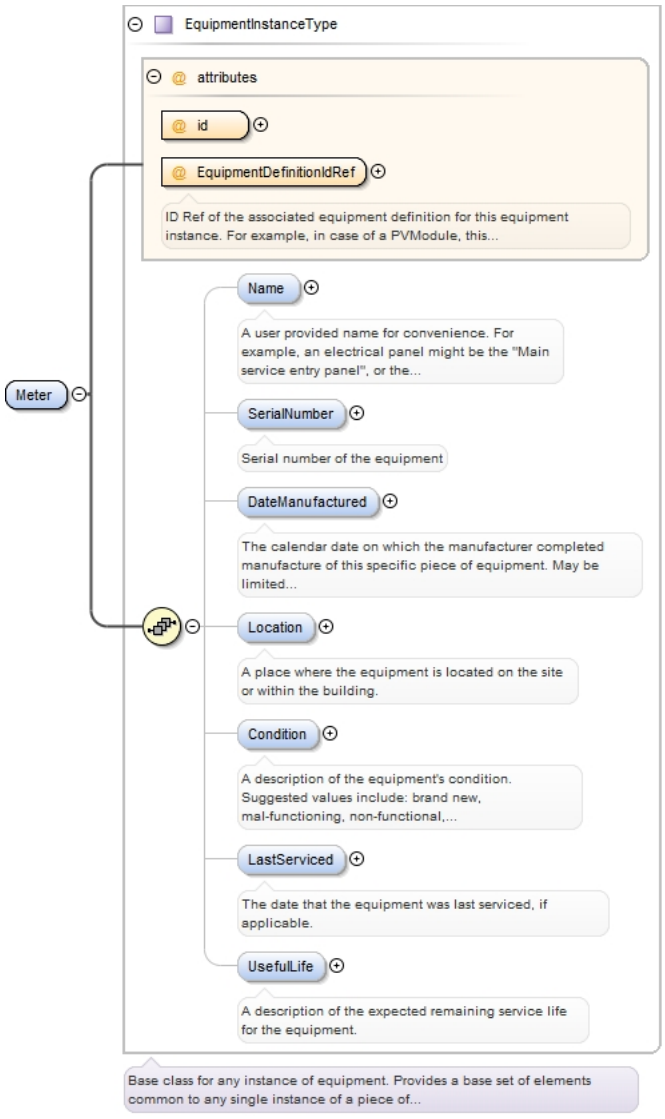
Source	`<xs:element name="MeterSocket" type="WirewayBoxType"/>`

Element WirewayBoxType / SegmentConnection

Namespace	No namespace
Annotations	The ID Ref for another WirewaySegment. Boxes can have many WirewaySegment connections (e.g. multiple conduit segments can terminate at a box). Conduit is a pipe with 2 ends, so it has a maximum of two WirewaySegments to which it connects.

Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 1 maxOccurs: unbounded
Source	<xs:element maxOccurs="unbounded" name="SegmentConnection" type="xs:IDREF" minOccurs="1"> <xs:annotation> <xs:documentation>The ID Ref for another WirewaySegment. Boxes can have many WirewaySegment connections (e.g. multiple conduit segments can terminate at a box). Conduit is a pipe with 2 ends, so it has a maximum of two WirewaySegments to which it connects.</xs:documentation> </xs:annotation> </xs:element>

Element CircuitConnectionType / IncludesStandAloneMeter / Meter

Namespace	No namespace
Diagram	
Type	EquipmentInstanceType
Properties	content: complex

Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1}
Children	Condition, DateManufactured, LastServiced, Location, Name, SerialNumber, UsefulLife
Instance	<Meter EquipmentDefinitionIdRef="" id=""> <Name>{0,1}</Name> <SerialNumber>{0,1}</SerialNumber> <DateManufactured>{0,1}</DateManufactured> <Location>{0,1}</Location> <Condition>{0,1}</Condition> <LastServiced>{0,1}</LastServiced> <UsefulLife>{0,1}</UsefulLife> </Meter>

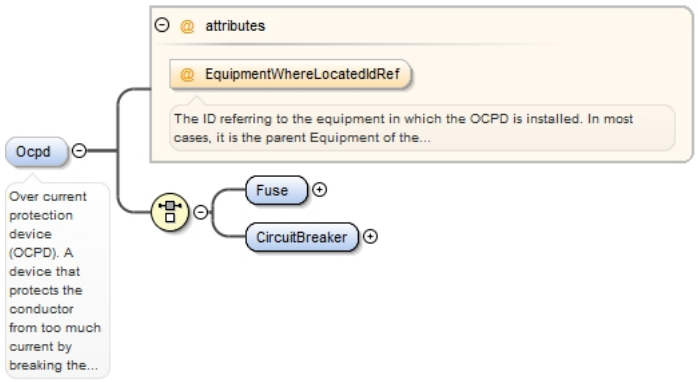
Attributes

QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			required
	ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.			
id	xs:ID			required

Source

```
<xs:element name="Meter" type="EquipmentInstanceType"/>
```

Element CircuitConnectionType / Ocpd

Namespace	No namespace
Annotations	Over current protection device (OCPD). A device that protects the conductor from too much current by breaking the circuit. Fuses and circuit breakers are OCPDs. In this schema, an OCPD is not a piece of equipment, but rather a component within a piece of equipment. It is not necessary to include a mfr and model in most cases, but knowing the type and rating is required.
Diagram	

Properties

content:	complex
minOccurs:	0

Model	Fuse | CircuitBreaker
Children	CircuitBreaker, Fuse
Instance	<Ocpd EquipmentWhereLocatedIdRef=""> <Fuse>{1,1}</Fuse> <CircuitBreaker>{1,1}</CircuitBreaker> </Ocpd>

Attributes

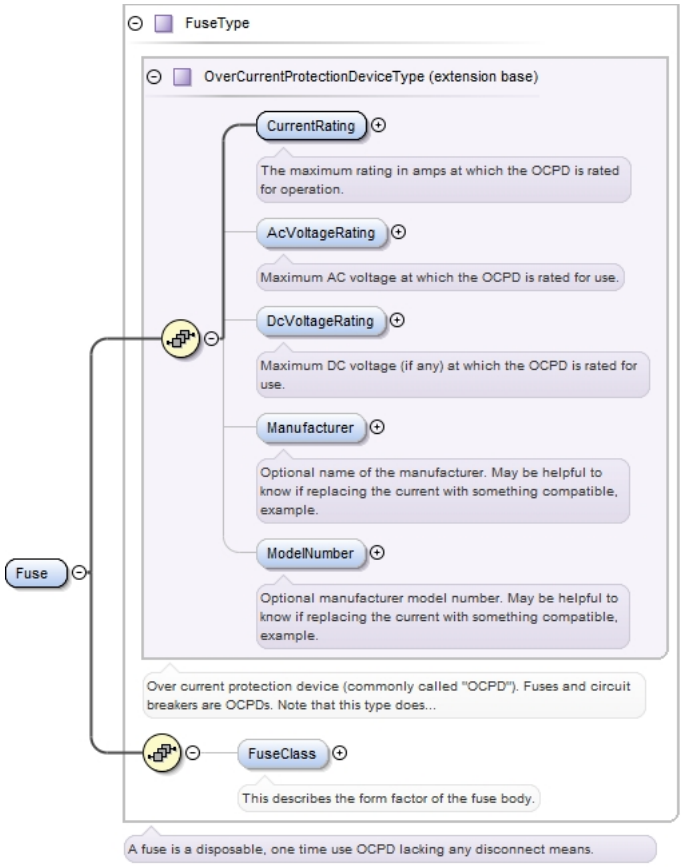
QName	Type	Fixed	Default	Use
EquipmentWhereLocatedIdRef				optional
	The ID referring to the equipment in which the OCPD is installed. In most cases, it is the parent Equipment of the CircuitConnection's immediate parent element. For example, if the CircuitConnection is within a StringInverter element, then the circuit breaker within the ElectricalPanel to which the Inverter connects will most like be the referenced OCPD.			

Source

```
<xs:element name="Ocpd" minOccurs="0" form="unqualified">
  <xs:annotation>
    <xs:documentation>Over current protection device (OCPD). A device that protects the conductor from too much current by breaking the circuit. Fuses and circuit breakers are OCPDs. In this schema, an OCPD is not a piece of equipment, but rather a component within a piece of equipment. It is not necessary to include a mfr and model in most cases, but knowing the type and rating is required.</xs:documentation>
```

```
  </xs:annotation>
  <xs:complexType>
    <xs:choice>
      <xs:element name="Fuse" type="FuseType"/>
      <xs:element name="CircuitBreaker" type="CircuitBreakerType"/>
    </xs:choice>
    <xs:attribute name="EquipmentWhereLocatedIdRef">
      <xs:annotation>
        <xs:documentation>The ID referring to the equipment in which the OCPD is
 installed. In most cases, it is the parent Equipment of the CircuitConnection's immediate
 parent element. For example, if the CircuitConnection is within a StringInverter element,
 then the circuit breaker within the ElectricalPanel to which the Inverter connects will
 most like be the referenced OCPD.</xs:documentation>
      </xs:annotation>
    </xs:attribute>
  </xs:complexType>
</xs:element>
```

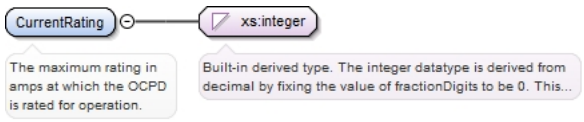
Element `CircuitConnectionType / Ocpd / Fuse`

Namespace	No namespace
Diagram	
Type	FuseType
Type hierarchy	• OverCurrentProtectionDeviceType • FuseType
Properties	content: `complex`
Model	CurrentRating , AcVoltageRating{0,1} , DcVoltageRating{0,1} , Manufacturer{0,1} , ModelNumber{0,1} , FuseClass{0,1}
Children	AcVoltageRating, CurrentRating, DcVoltageRating, FuseClass, Manufacturer, ModelNumber

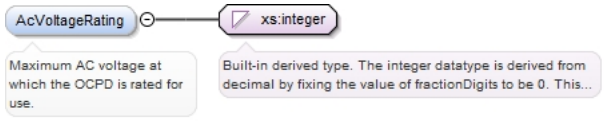
`Instance`	`<Fuse>`
	`  <CurrentRating>{1,1}</CurrentRating>`
	`  <AcVoltageRating>{0,1}</AcVoltageRating>`
	`  <DcVoltageRating>{0,1}</DcVoltageRating>`
	`  <Manufacturer>{0,1}</Manufacturer>`
	`  <ModelNumber>{0,1}</ModelNumber>`
	`  <FuseClass>{0,1}</FuseClass>`
	`</Fuse>`

Source	<xs:element name="Fuse" type="FuseType"/>

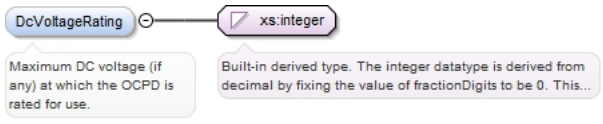
Element OverCurrentProtectionDeviceType / CurrentRating

Namespace	No namespace
Annotations	The maximum rating in amps at which the OCPD is rated for operation.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="CurrentRating" type="xs:integer" minOccurs="1" maxOccurs="1"> <xs:annotation> <xs:documentation>The maximum rating in amps at which the OCPD is rated for operation.</xs:documentation> </xs:annotation> </xs:element>

Element OverCurrentProtectionDeviceType / AcVoltageRating

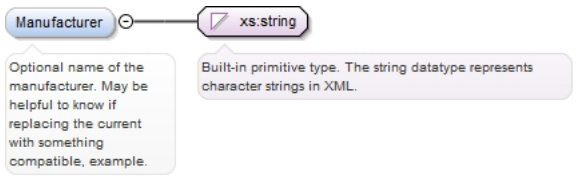
Namespace	No namespace
Annotations	Maximum AC voltage at which the OCPD is rated for use.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0
Source	<xs:element name="AcVoltageRating" type="xs:integer" minOccurs="0"> <xs:annotation> <xs:documentation>Maximum AC voltage at which the OCPD is rated for use.</xs:documentation> </xs:annotation> </xs:element>

Element OverCurrentProtectionDeviceType / DcVoltageRating

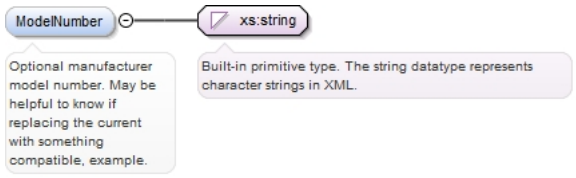
Namespace	No namespace
Annotations	Maximum DC voltage (if any) at which the OCPD is rated for use.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="DcVoltageRating" type="xs:integer"> <xs:annotation> <xs:documentation>Maximum DC voltage (if any) at which the OCPD is rated for use.</xs:documentation> </xs:annotation> </xs:element>

Element OverCurrentProtectionDeviceType / Manufacturer

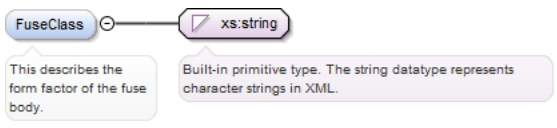
Namespace	No namespace

Annotations	Optional name of the manufacturer. May be helpful to know if replacing the current with something compatible, example.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="Manufacturer" type="xs:string"> <xs:annotation> <xs:documentation>Optional name of the manufacturer. May be helpful to know if replacing the current with something compatible, example.</xs:documentation> </xs:annotation> </xs:element>

Element OverCurrentProtectionDeviceType / ModelNumber

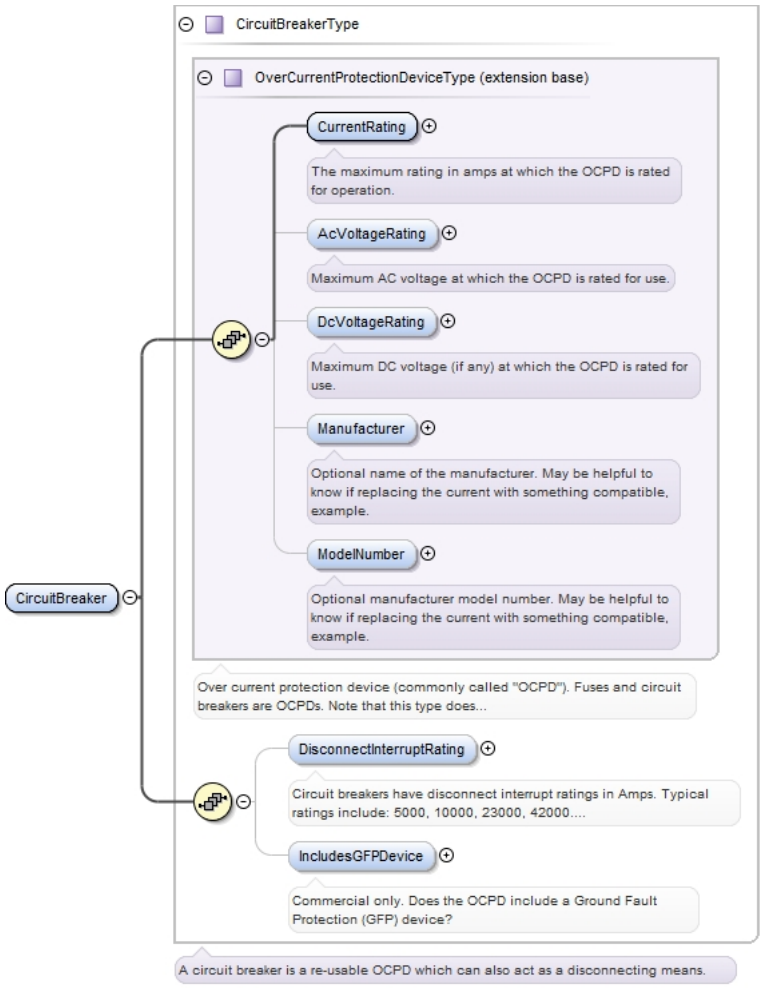
Namespace	No namespace
Annotations	Optional manufacturer model number. May be helpful to know if replacing the current with something compatible, example.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="ModelNumber" type="xs:string"> <xs:annotation> <xs:documentation>Optional manufacturer model number. May be helpful to know if replacing the current with something compatible, example.</xs:documentation> </xs:annotation> </xs:element>

Element FuseType / FuseClass

Namespace	No namespace
Annotations	This describes the form factor of the fuse body.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="FuseClass" type="xs:string"> <xs:annotation> <xs:documentation>This describes the form factor of the fuse body.</xs:documentation> </xs:annotation> </xs:element>

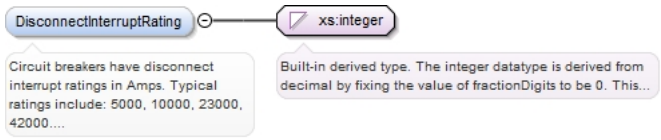
Element CircuitConnectionType / Ocpd / CircuitBreaker

Namespace	No namespace

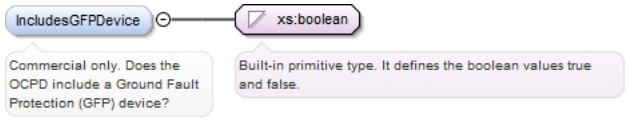
Diagram	
Type	CircuitBreakerType
Type hierarchy	• OverCurrentProtectionDeviceType • CircuitBreakerType
Properties	content: complex
Model	CurrentRating , AcVoltageRating{0,1} , DcVoltageRating{0,1} , Manufacturer{0,1} , ModelNumber{0,1} , DisconnectInterruptRating{0,1} , IncludesGFPDevice{0,1}
Children	AcVoltageRating, CurrentRating, DcVoltageRating, DisconnectInterruptRating, IncludesGFPDevice, Manufacturer, ModelNumber
Instance	<CircuitBreaker> <CurrentRating>{1,1}</CurrentRating> <AcVoltageRating>{0,1}</AcVoltageRating> <DcVoltageRating>{0,1}</DcVoltageRating> <Manufacturer>{0,1}</Manufacturer> <ModelNumber>{0,1}</ModelNumber> <DisconnectInterruptRating>{0,1}</DisconnectInterruptRating> <IncludesGFPDevice>{0,1}</IncludesGFPDevice> </CircuitBreaker>
Source	<xs:element name="CircuitBreaker" type="CircuitBreakerType"/>

Element CircuitBreakerType / DisconnectInterruptRating

Namespace	No namespace
Annotations	Circuit breakers have disconnect interrupt ratings in Amps. Typical ratings include: 5000, 10000, 23000, 42000. Typically if rating is not listed on a breaker, it is 5000.

Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element minOccurs="0" name="DisconnectInterruptRating" type="xs:integer" maxOccurs="1"> <xs:annotation> <xs:documentation>Circuit breakers have disconnect interrupt ratings in Amps. Typical ratings include: 5000, 10000, 23000, 42000. Typically if rating is not listed on a breaker, it is 5000.</xs:documentation> </xs:annotation> </xs:element>`

Element CircuitBreakerType / IncludesGFPDevice

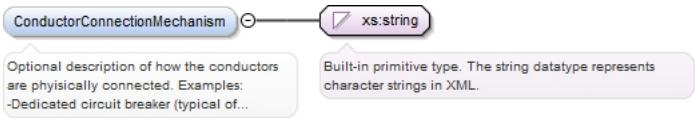
Namespace	No namespace
Annotations	Commercial only. Does the OCPD include a Ground Fault Protection (GFP) device?
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element minOccurs="0" name="IncludesGFPDevice" type="xs:boolean" maxOccurs="1"> <xs:annotation> <xs:documentation>Commercial only. Does the OCPD include a Ground Fault Protection (GFP) device?</xs:documentation> </xs:annotation> </xs:element>`

Element CircuitConnectionType / SideOfPanelOcpdWhereConnected

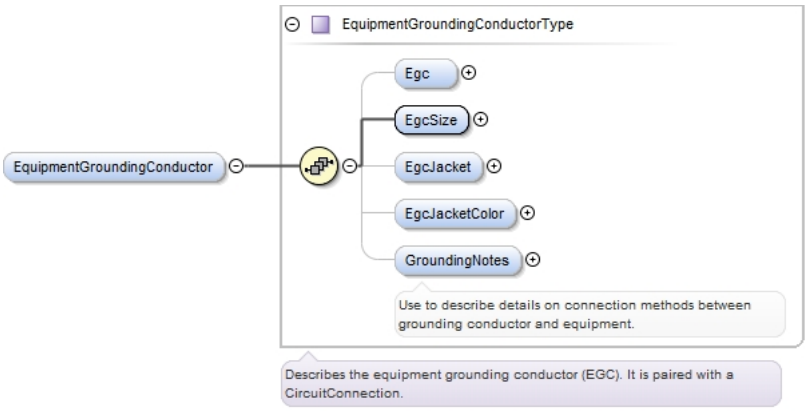
Namespace	No namespace
Annotations	When a circuit connection is made on an ElectricalPanel, which side of a the panel's main breaker (if present) is the interconnection made (supply or load side)? This is a very important consideration, as the NEC dictates the maximum allowable interconnected current, and it is very different for each side of the OCPD. For example, when tied to the load side of a panel's bus, the total of all circuits amperage can sum to 120% of the bus's current rating when using a backfed breaker. If tied to the supply side, the allowable PV circuit amperage can go up to the maximum rated amperage of the bus (as the main breaker protects the load side). Note that this also differs between residential and commercial systems. Most residential systems are interconnected on the load side. Conversely, most commercial systems are interconnected on the supply side because NEC 690 currently has no 120% rule on commercial load side tie-in (significantly limiting possible size), and also commercial system equipment is more likely to have connections available on the supply side (e.g. lugs).
Diagram	
Type	SideOfPanelOcpdWhereConnectedEnumType
Properties	content: simple minOccurs: 0 default: load-side
Facets	enumeration supply-side

	enumeration load-side
Source	<xs:element default="load-side" minOccurs="0" name="SideOfPanelOcpdWhereConnected" type="SideOfPanelOcpdWhereConnectedEnumType"> <xs:annotation> <xs:documentation>When a circuit connection is made on an ElectricalPanel, which side of a the panel's main breaker (if present) is the interconnection made (supply or load side)? This is a very important consideration, as the NEC dictates the maximum allowable interconnected current, and it is very different for each side of the OCPD. For example, when tied to the load side of a panel's bus, the total of all circuits amperage can sum to 120% of the bus's current rating when using a backfed breaker. If tied to the supply side, the allowable PV circuit amperage can go up to the maximum rated amperage of the bus (as the main breaker protects the load side). Note that this also differs between residential and commercial systems. Most residential systems are interconnected on the load side. Conversely, most commercial systems are interconnected on the supply side because NEC 690 currently has no 120% rule on commercial load side tie-in (significantly limiting possible size), and also commercial system equipment is more likely to have connections available on the supply side (e.g. lugs).</xs:documentation> </xs:annotation> </xs:element>

Element CircuitConnectionType / ConductorConnectionMechanism

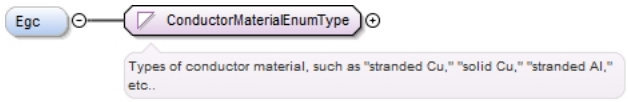
Namespace	No namespace
Annotations	Optional description of how the conductors are phyisically connected. Examples: -Dedicated circuit breaker (typical of load side, but breaker-can also be on service side if hot-bussed panel has breaker slot on the service side) -lugs (supply side typical) -wire taps (supply side typical)
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="ConductorConnectionMechanism" type="xs:string"> <xs:annotation> <xs:documentation>Optional description of how the conductors are phyisically connected. Examples: -Dedicated circuit breaker (typical of load side, but breaker-can also be on service side if hot-bussed panel has breaker slot on the service side) -lugs (supply side typical) -wire taps (supply side typical)</xs:documentation> </xs:annotation> </xs:element>

Element CircuitConnectionType / EquipmentGroundingConductor

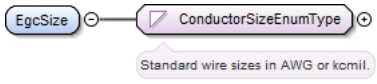
Namespace	No namespace
Diagram	
Type	EquipmentGroundingConductorType
Properties	content: complex minOccurs: 0
Model	Egc{0,1} , EgcSize , EgcJacket{0,1} , EgcJacketColor{0,1} , GroundingNotes{0,1}

Children	Egc, EgcJacket, EgcJacketColor, EgcSize, GroundingNotes
Instance	<EquipmentGroundingConductor> <Egc>{0,1}</Egc> <EgcSize>{1,1}</EgcSize> <EgcJacket>{0,1}</EgcJacket> <EgcJacketColor>{0,1}</EgcJacketColor> <GroundingNotes>{0,1}</GroundingNotes> </EquipmentGroundingConductor>
Source	<xs:element minOccurs="0" name="EquipmentGroundingConductor" type="EquipmentGroundingConductorType"/>

Element EquipmentGroundingConductorType / Egc

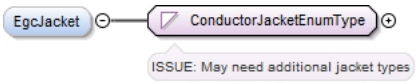
Namespace	No namespace	
Diagram		
Type	ConductorMaterialEnumType	
Properties	content:	simple
	minOccurs:	0
Facets	enumeration	Stranded Cu
	enumeration	Solid Cu
	enumeration	Stranded Al
Source	<xs:element minOccurs="0" name="Egc" type="ConductorMaterialEnumType"/>	

Element EquipmentGroundingConductorType / EgcSize

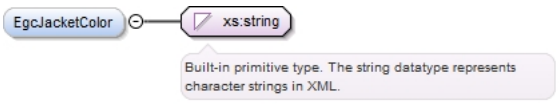
Namespace	No namespace	
Diagram		
Type	ConductorSizeEnumType	
Properties	content:	simple
Facets	enumeration	12
	enumeration	10
	enumeration	8
	enumeration	6
	enumeration	4
	enumeration	3
	enumeration	2
	enumeration	1/0
	enumeration	2/0
	enumeration	3/0
	enumeration	4/0
	enumeration	250
	enumeration	350
	enumeration	400
	enumeration	500
Source	<xs:element name="EgcSize" type="ConductorSizeEnumType"/>	

Element EquipmentGroundingConductorType / EgcJacket

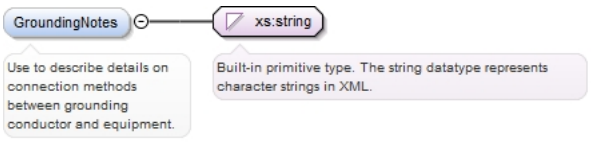
Namespace	No namespace

Diagram	
Type	ConductorJacketEnumType
Properties	content: simple minOccurs: 0
Facets	enumeration: bare enumeration: USE enumeration: USE-2 enumeration: THWN enumeration: THWN-2 enumeration: THHN enumeration: THHW enumeration: XHHW-2 enumeration: RHW-2 enumeration: PV Wire
Source	`<xs:element minOccurs="0" name="EgcJacket" type="ConductorJacketEnumType"/>`

Element EquipmentGroundingConductorType / EgcJacketColor

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 default: green
Source	`<xs:element default="green" minOccurs="0" name="EgcJacketColor" type="xs:string"/>`

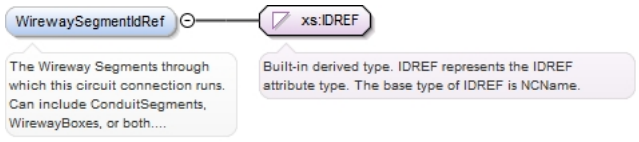
Element EquipmentGroundingConductorType / GroundingNotes

Namespace	No namespace
Annotations	Use to describe details on connection methods between grounding conductor and equipment.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0

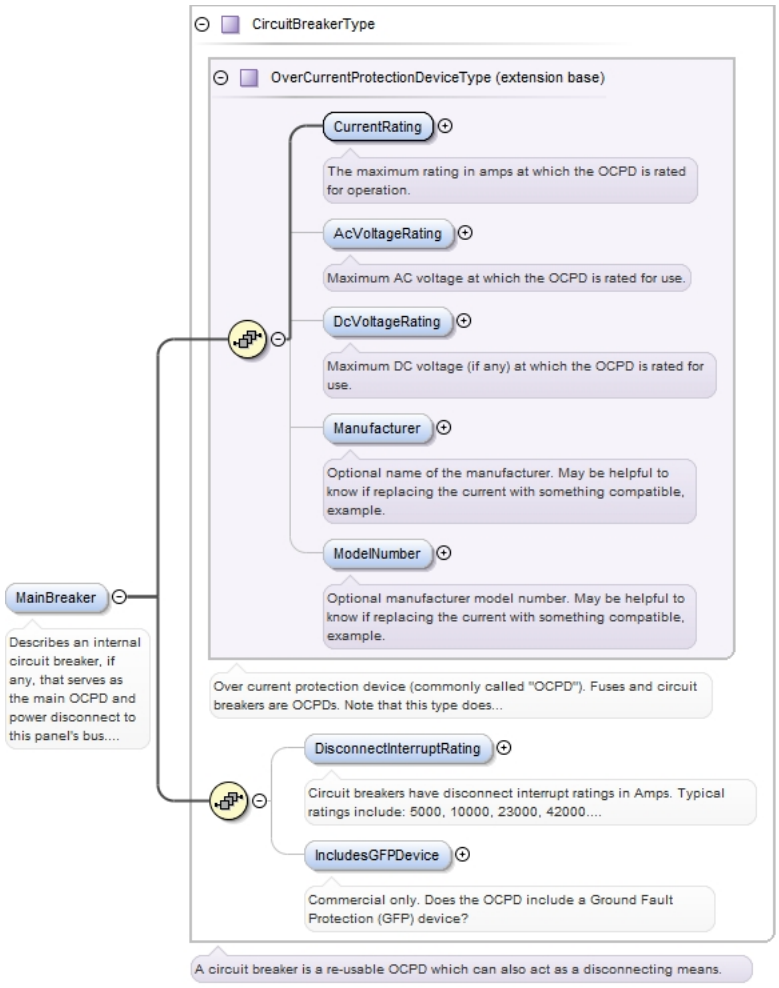
Source	`<xs:element minOccurs="0" name="GroundingNotes" type="xs:string">`
	`  <xs:annotation>`
	`  <xs:documentation>Use to describe details on connection methods between grounding conductor and equipment.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element CircuitConnectionType / WirewaySegmentIdRef

Namespace	No namespace
Annotations	The Wireway Segments through which this circuit connection runs. Can include ConduitSegments, WirewayBoxes, or both. Note that the CircuitConnection can be routed through a DisconnectSwitch or StandAloneMeterSocket without actually being switched or metered. If the CircuitConnection is disconnected or metered, it should be called out in a separate Disconnect or StandAloneMeter element within the CircuitConnection.

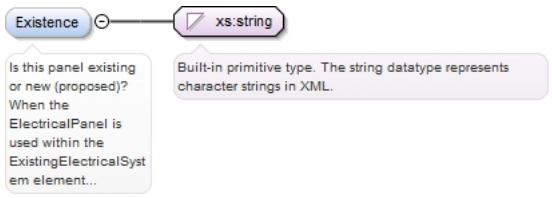
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 0 maxOccurs: unbounded
Source	<xs:element name="WirewaySegmentIdRef" type="xs:IDREF" minOccurs="0" maxOccurs="unbounded"> <xs:annotation> <xs:documentation>The Wireway Segments through which this circuit connection runs. Can include ConduitSegments, WirewayBoxes, or both. Note that the CircuitConnection can be routed through a DisconnectSwitch or StandAloneMeterSocket without actually being switched or metered. If the CircuitConnection is disconnected or metered, it should be called out in a separate Disconnect or StandAloneMeter element within the CircuitConnection.</xs:documentation> </xs:annotation> </xs:element>

Element ElectricalPanelType / MainBreaker

Namespace	No namespace
Annotations	Describes an internal circuit breaker, if any, that serves as the main OCPD and power disconnect to this panel's bus. Note that the ElectricPanel may or may not have an internal main breaker. Panels with or without a main internal breaker may also have an OCPD on the ElectricPanel's CircuitConnection element which serves as the energizing source for this panel.
Diagram	
Type	CircuitBreakerType

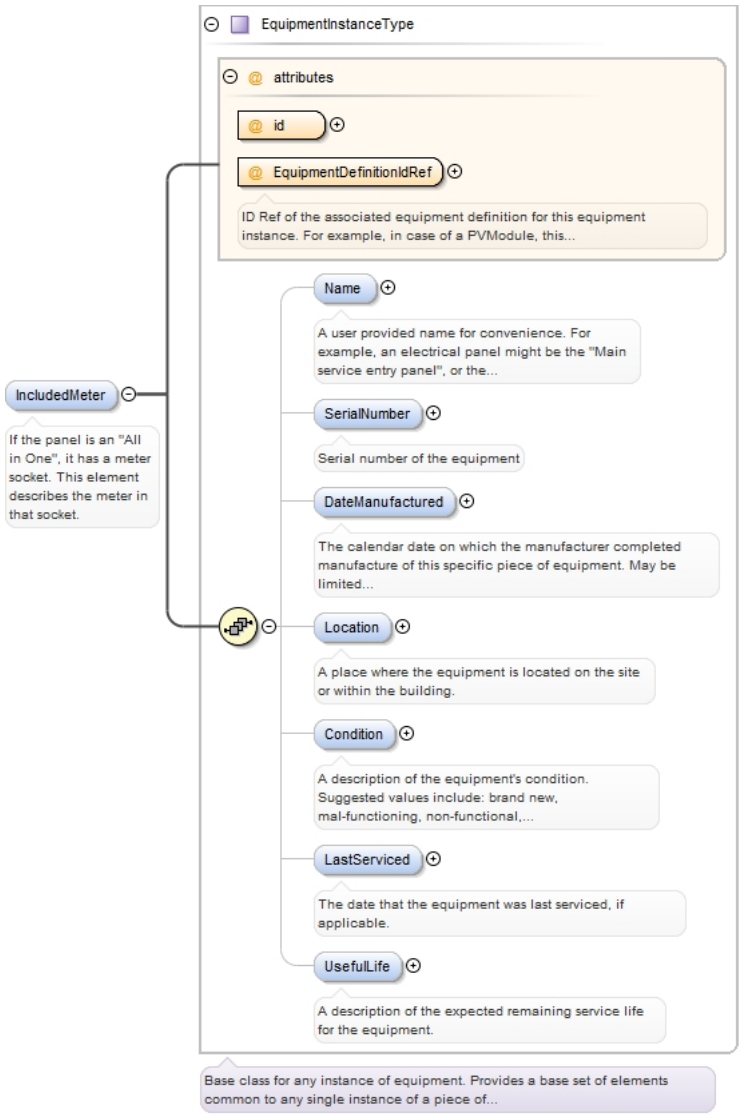
Type hierarchy	• OverCurrentProtectionDeviceType • CircuitBreakerType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	CurrentRating , AcVoltageRating{0,1} , DcVoltageRating{0,1} , Manufacturer{0,1} , ModelNumber{0,1} , DisconnectInterruptRating{0,1} , IncludesGFPDevice{0,1}
Children	AcVoltageRating, CurrentRating, DcVoltageRating, DisconnectInterruptRating, IncludesGFPDevice, Manufacturer, ModelNumber
Instance	<MainBreaker> <CurrentRating>{1,1}</CurrentRating> <AcVoltageRating>{0,1}</AcVoltageRating> <DcVoltageRating>{0,1}</DcVoltageRating> <Manufacturer>{0,1}</Manufacturer> <ModelNumber>{0,1}</ModelNumber> <DisconnectInterruptRating>{0,1}</DisconnectInterruptRating> <IncludesGFPDevice>{0,1}</IncludesGFPDevice> </MainBreaker>
Source	<xs:element minOccurs="0" name="MainBreaker" type="CircuitBreakerType" maxOccurs="1"> <xs:annotation> <xs:documentation>Describes an internal circuit breaker, if any, that serves as the main OCPD and power disconnect to this panel's bus. Note that the ElectricPanel may or may not have an internal main breaker. Panels with or without a main internal breaker may also have an OCPD on the ElectricPanel's CircuitConnection element which serves as the energizing source for this panel.</xs:documentation> </xs:annotation> </xs:element>

Element ElectricalPanelType / Existence

Namespace	No namespace
Annotations	Is this panel existing or new (proposed)? When the ElectricalPanel is used within the ExistingElectricalSystem element inside of a Project's Site element, this is assumed to be an existing panel. However, if the panel is just being defined within a PvDesign's AcTie-InPanel element, then its important to know if the panel being described already exists or is new (and therefore part of the scope of work).
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="Existence" type="xs:string"> <xs:annotation> <xs:documentation>Is this panel existing or new (proposed)? When the ElectricalPanel is used within the ExistingElectricalSystem element inside of a Project's Site element, this is assumed to be an existing panel. However, if the panel is just being defined within a PvDesign's AcTie-InPanel element, then its important to know if the panel being described already exists or is new (and therefore part of the scope of work).</xs:documentation> </xs:annotation> </xs:element>

Element ElectricalPanelType / IncludedMeter

Namespace	No namespace
Annotations	If the panel is an "All in One", it has a meter socket. This element describes the meter in that socket.

Diagram	
Type	EquipmentInstanceType
Properties	content: `complex` minOccurs: `0`
Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1}
Children	Condition, DateManufactured, LastServiced, Location, Name, SerialNumber, UsefulLife

Instance	`<IncludedMeter EquipmentDefinitionIdRef="" id="">`
	`  <Name>{0,1}</Name>`
	`  <SerialNumber>{0,1}</SerialNumber>`
	`  <DateManufactured>{0,1}</DateManufactured>`
	`  <Location>{0,1}</Location>`
	`  <Condition>{0,1}</Condition>`
	`  <LastServiced>{0,1}</LastServiced>`
	`  <UsefulLife>{0,1}</UsefulLife>`
	`</IncludedMeter>`

Attributes

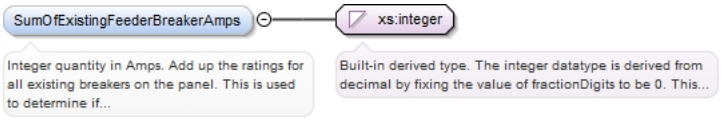
QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			required
	ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.			
id	xs:ID			required

Source

```
<xs:element minOccurs="0" name="IncludedMeter" type="EquipmentInstanceType">
  <xs:annotation>
```

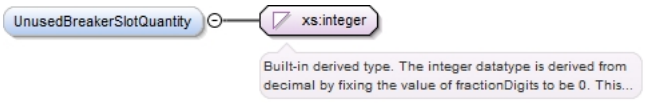
```
    <xs:documentation>If the panel is an "All in One", it has a meter socket. This element
 describes the meter in that socket.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element ElectricalPanelType / SumOfExistingFeederBreakerAmps

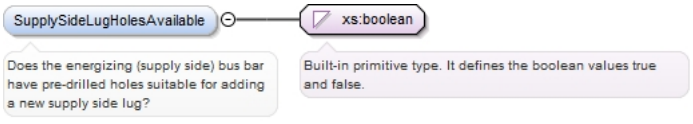
Namespace	No namespace
Annotations	Integer quantity in Amps. Add up the ratings for all existing breakers on the panel. This is used to determine if existing panel configuration meets code, and if additional breakers can be added.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	`<xs:element maxOccurs="1" minOccurs="0" name="SumOfExistingFeederBreakerAmps" type="xs:integer">`
	`  <xs:annotation>`
	`  <xs:documentation>Integer quantity in Amps. Add up the ratings for all existing breakers on the panel. This is used to determine if existing panel configuration meets code, and if additional breakers can be added.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element ElectricalPanelType / UnusedBreakerSlotQuantity

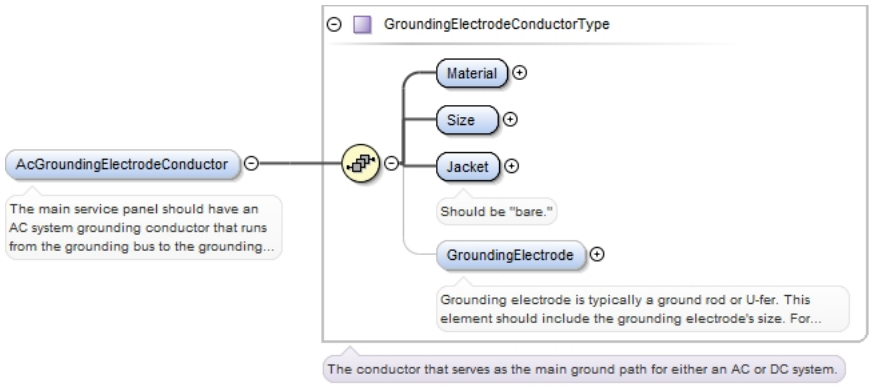
Namespace	No namespace
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element minOccurs="0" name="UnusedBreakerSlotQuantity" type="xs:integer" maxOccurs="1"/>`

Element ElectricalPanelType / SupplySideLugHolesAvailable

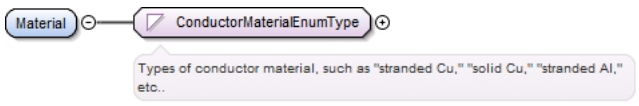
Namespace	No namespace
Annotations	Does the energizing (supply side) bus bar have pre-drilled holes suitable for adding a new supply side lug?
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0

Source	`<xs:element minOccurs="0" name="SupplySideLugHolesAvailable" type="xs:boolean">`
	`  <xs:annotation>`
	`  <xs:documentation>Does the energizing (supply side) bus bar have pre-drilled holes suitable for adding a new supply side lug?</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element ElectricalPanelType / AcGroundingElectrodeConductor

Namespace	No namespace
Annotations	The main service panel should have an AC system grounding conductor that runs from the grounding bus to the grounding electrode. The grounding electrode is a ground rod, or U-fer, for example.
Diagram	
Type	GroundingElectrodeConductorType
Properties	content: complex minOccurs: 0
Model	Material , Size , Jacket , GroundingElectrode{0,1}
Children	GroundingElectrode, Jacket, Material, Size
Instance	<AcGroundingElectrodeConductor> <Material>{1,1}</Material> <Size>{1,1}</Size> <Jacket>{1,1}</Jacket> <GroundingElectrode>{0,1}</GroundingElectrode> </AcGroundingElectrodeConductor>
Source	<xs:element minOccurs="0" name="AcGroundingElectrodeConductor" type="GroundingElectrodeConductorType"> <xs:annotation> <xs:documentation>The main service panel should have an AC system grounding conductor that runs from the grounding bus to the grounding electrode. The grounding electrode is a ground rod, or U-fer, for example.</xs:documentation> </xs:annotation> </xs:element>

Element GroundingElectrodeConductorType / Material

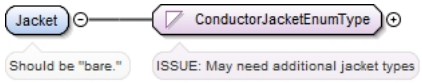
Namespace	No namespace
Diagram	
Type	ConductorMaterialEnumType
Properties	content: simple default: Solid Cu
Facets	enumeration: Stranded Cu enumeration: Solid Cu enumeration: Stranded Al
Source	<xs:element default="Solid Cu" name="Material" type="ConductorMaterialEnumType"/>

Element GroundingElectrodeConductorType / Size

Namespace	No namespace
Diagram	

Type	ConductorSizeEnumType
Properties	content: simple
Facets	enumeration 12 enumeration 10 enumeration 8 enumeration 6 enumeration 4 enumeration 3 enumeration 2 enumeration 1/0 enumeration 2/0 enumeration 3/0 enumeration 4/0 enumeration 250 enumeration 350 enumeration 400 enumeration 500
Source	`<xs:element name="Size" type="ConductorSizeEnumType"/>`

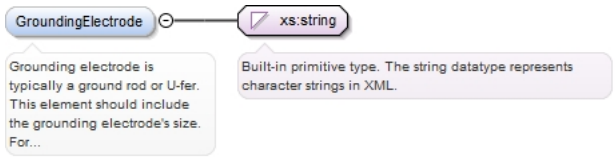
Element GroundingElectrodeConductorType / Jacket

Namespace	No namespace
Annotations	Should be "bare."
Diagram	
Type	ConductorJacketEnumType
Properties	content: simple default: bare
Facets	enumeration bare enumeration USE enumeration USE-2 enumeration THWN enumeration THWN-2 enumeration THHN enumeration THHW enumeration XHHW-2 enumeration RHW-2 enumeration PV Wire

Source	`<xs:element default="bare" name="Jacket" type="ConductorJacketEnumType">`
	`  <xs:annotation>`
	`  <xs:documentation>Should be "bare."</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element GroundingElectrodeConductorType / GroundingElectrode

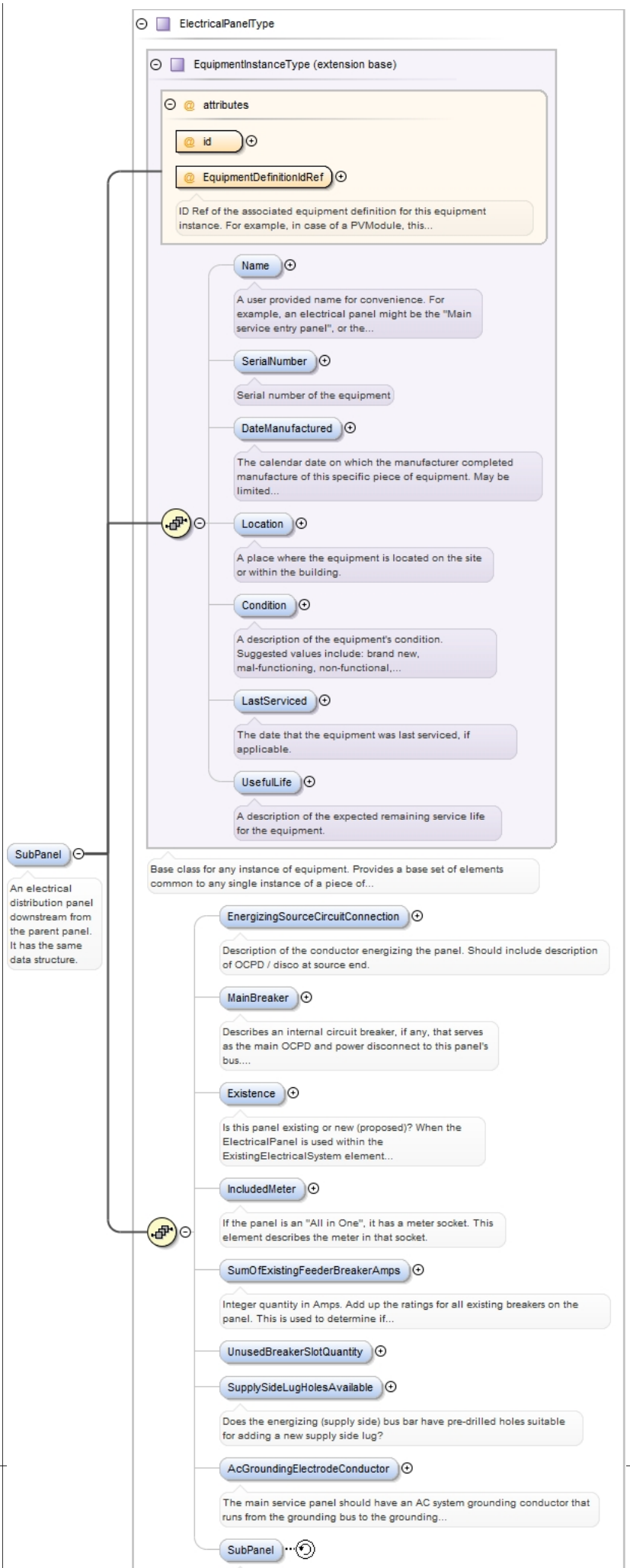
Namespace	No namespace
Annotations	Grounding electrode is typically a ground rod or U-fer. This element should include the grounding electrode's size. For example "3/4 in ground rod."

Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="GroundingElectrode" type="xs:string"> <xs:annotation> <xs:documentation>Grounding electrode is typically a ground rod or U-fer. This element should include the grounding electrode's size. For example "3/4 in ground rod."</xs:documentation> </xs:annotation> </xs:element>

Element ElectricalPanelType / SubPanel

Namespace	No namespace
Annotations	An electrical distribution panel downstream from the parent panel. It has the same data structure.

Diagram


ElectricalPanelType
EquipmentInstanceType (extension base)
attributes
id
EquipmentDefinitionIdRef
ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this...
Name
A user provided name for convenience. For example, an electrical panel might be the "Main service entry panel", or the...
SerialNumber
Serial number of the equipment
DateManufactured
The calendar date on which the manufacturer completed manufacture of this specific piece of equipment. May be limited...
Location
A place where the equipment is located on the site or within the building.
Condition
A description of the equipment's condition. Suggested values include: brand new, mal-functioning, non-functional,...
LastServiced
The date that the equipment was last serviced, if applicable.
UsefulLife
A description of the expected remaining service life for the equipment.
SubPanel
An electrical distribution panel downstream from the parent panel. It has the same data structure.
Base class for any instance of equipment. Provides a base set of elements common to any single instance of a piece of...
EnergizingSourceCircuitConnection
Description of the conductor energizing the panel. Should include description of OCPD / disco at source end.
MainBreaker
Describes an internal circuit breaker, if any, that serves as the main OCPD and power disconnect to this panel's bus....
Existence
Is this panel existing or new (proposed)? When the ElectricalPanel is used within the ExistingElectricalSystem element...
IncludedMeter
If the panel is an "All in One", it has a meter socket. This element describes the meter in that socket.
SumOfExistingFeederBreakerAmps
Integer quantity in Amps. Add up the ratings for all existing breakers on the panel. This is used to determine if...
UnusedBreakerSlotQuantity
SupplySideLugHolesAvailable
Does the energizing (supply side) bus bar have pre-drilled holes suitable for adding a new supply side lug?
AcGroundingElectrodeConductor
The main service panel should have an AC system grounding conductor that runs from the grounding bus to the grounding...
SubPanel

Type	ElectricalPanelType
Type hierarchy	• EquipmentInstanceType • ElectricalPanelType
Properties	content: complex minOccurs: 0
Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1} , EnergizingSourceCircuitConnection{0,1} , MainBreaker{0,1} , Existence{0,1} , IncludedMeter{0,1} , SumOfExistingFeederBreakerAmps{0,1} , UnusedBreakerSlotQuantity{0,1} , SupplySideLugHolesAvailable{0,1} , AcGroundingElectrodeConductor{0,1} , SubPanel{0,1}
Children	AcGroundingElectrodeConductor, Condition, DateManufactured, EnergizingSourceCircuitConnection, Existence, IncludedMeter, LastServiced, Location, MainBreaker, Name, SerialNumber, SubPanel, SumOfExistingFeederBreakerAmps, SupplySideLugHolesAvailable, UnusedBreakerSlotQuantity, UsefulLife

Instance

```
<SubPanel EquipmentDefinitionIdRef="" id="">
  <Name>{0,1}</Name>
  <SerialNumber>{0,1}</SerialNumber>
  <DateManufactured>{0,1}</DateManufactured>
  <Location>{0,1}</Location>
  <Condition>{0,1}</Condition>
  <LastServiced>{0,1}</LastServiced>
  <UsefulLife>{0,1}</UsefulLife>
  <EnergizingSourceCircuitConnection EquipmentWhereConnectedIdRef="">{0,1}</
EnergizingSourceCircuitConnection>
  <MainBreaker>{0,1}</MainBreaker>
  <Existence>{0,1}</Existence>
  <IncludedMeter EquipmentDefinitionIdRef="" id="">{0,1}</IncludedMeter>
  <SumOfExistingFeederBreakerAmps>{0,1}</SumOfExistingFeederBreakerAmps>
  <UnusedBreakerSlotQuantity>{0,1}</UnusedBreakerSlotQuantity>
  <SupplySideLugHolesAvailable>{0,1}</SupplySideLugHolesAvailable>
  <AcGroundingElectrodeConductor>{0,1}</AcGroundingElectrodeConductor>
  <SubPanel EquipmentDefinitionIdRef="" id="">{0,1}</SubPanel>
</SubPanel>
```

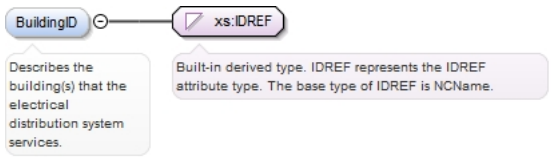
Attributes

QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	xs:IDREF			required
	ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.			
id	xs:ID			required

Source

```
<xs:element minOccurs="0" name="SubPanel" type="ElectricalPanelType">
  <xs:annotation>
    <xs:documentation>An electrical distribution panel downstream from the parent panel.
 It has the same data structure.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element ElectricalDistributionHierarchyType / BuildingID

Namespace	No namespace
Annotations	Describes the building(s) that the electrical distribution system services.
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 0 maxOccurs: unbounded

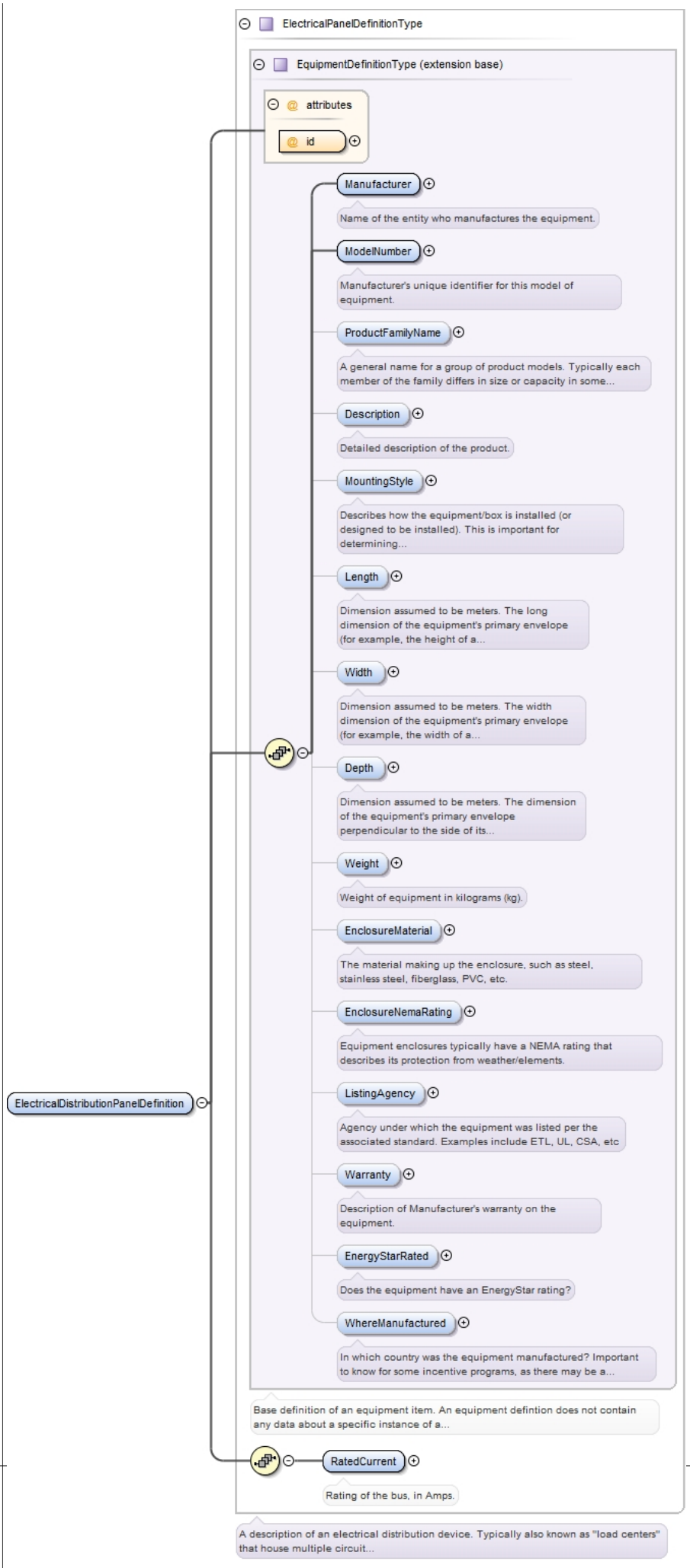
Source

```
<xs:element maxOccurs="unbounded" minOccurs="0" name="BuildingID" type="xs:IDREF">
  <xs:annotation>
    <xs:documentation>Describes the building(s) that the electrical distribution system
 services.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element ElectricalDistributionHierarchyType / ElectricalDistributionPanelDefinition

Namespace	No namespace

Diagram


ElectricalPanelDefinitionType
EquipmentDefinitionType (extension base)
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...
RatedCurrent
Rating of the bus, in Amps.
ElectricalDistributionPanelDefinition
A description of an electrical distribution device. Typically also known as "load centers" that house multiple circuit...

Type	ElectricalPanelDefinitionType
Type hierarchy	• EquipmentDefinitionType • ElectricalPanelDefinitionType
Properties	content: complex maxOccurs: unbounded
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1} , RatedCurrent
Children	Depth, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, Length, ListingAgency, Manufacturer, ModelNumber, MountingStyle, ProductFamilyName, RatedCurrent, Warranty, Weight, WhereManufactured, Width

Instance

```
<ElectricalDistributionPanelDefinition id="">
  <Manufacturer>{1,1}</Manufacturer>
  <ModelNumber>{1,1}</ModelNumber>
  <ProductFamilyName>{0,1}</ProductFamilyName>
  <Description>{0,1}</Description>
  <MountingStyle>{0,1}</MountingStyle>
  <Length>{0,1}</Length>
  <Width>{0,1}</Width>
  <Depth>{0,1}</Depth>
  <Weight>{0,1}</Weight>
  <EnclosureMaterial>{0,1}</EnclosureMaterial>
  <EnclosureNemaRating>{0,1}</EnclosureNemaRating>
  <ListingAgency>{0,1}</ListingAgency>
  <Warranty>{0,1}</Warranty>
  <EnergyStarRated>{0,1}</EnergyStarRated>
  <WhereManufactured>{0,1}</WhereManufactured>
  <RatedCurrent>{1,1}</RatedCurrent>
</ElectricalDistributionPanelDefinition>
```

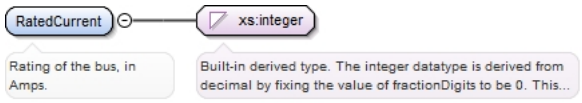
Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			required

Source

```
<xs:element maxOccurs="unbounded" name="ElectricalDistributionPanelDefinition"
 type="ElectricalPanelDefinitionType"/>
```

Element ElectricalPanelDefinitionType / RatedCurrent

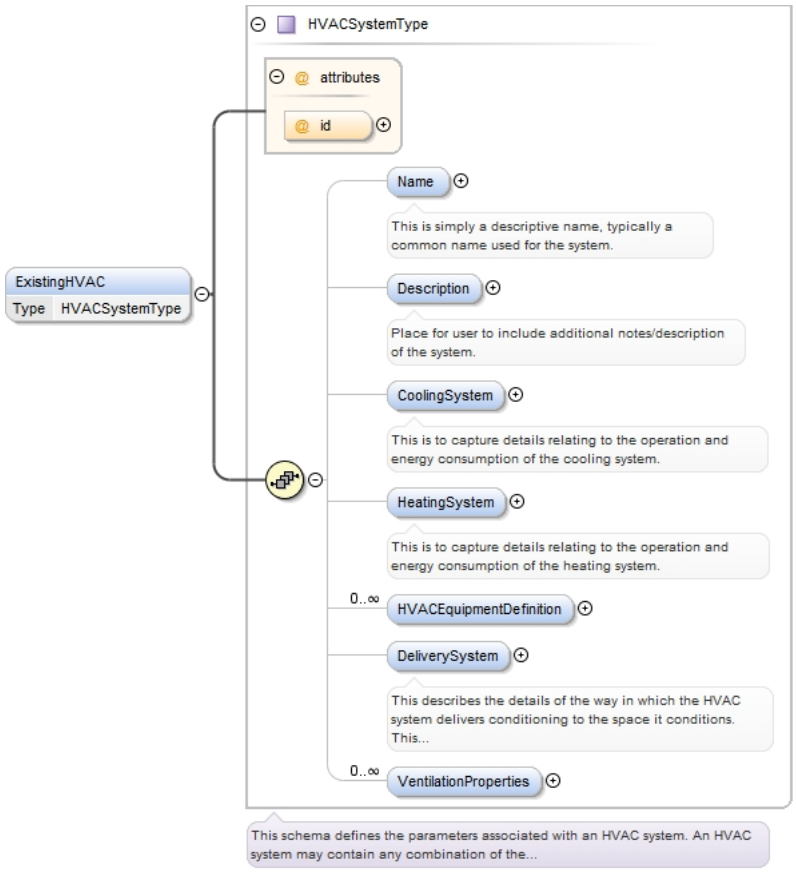
Namespace	No namespace
Annotations	Rating of the bus, in Amps.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 1 maxOccurs: 1

Source

```
<xs:element name="RatedCurrent" type="xs:integer" minOccurs="1" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>Rating of the bus, in Amps.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element ProjectType / ExistingHVAC

Namespace	No namespace

Diagram	
Type	HVACSystemType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , Description{0,1} , CoolingSystem{0,1} , HeatingSystem{0,1} , HVACEquipmentDefinition* , DeliverySystem{0,1} , VentilationProperties*
Children	CoolingSystem, DeliverySystem, Description, HVACEquipmentDefinition, HeatingSystem, Name, VentilationProperties

Instance	`<ExistingHVAC id="">`
	`  <Name>{0,1}</Name>`
	`  <Description>{0,1}</Description>`
	`  <CoolingSystem>{0,1}</CoolingSystem>`
	`  <HeatingSystem>{0,1}</HeatingSystem>`
	`  <HVACEquipmentDefinition id="">{0,unbounded}</HVACEquipmentDefinition>`
	`  <DeliverySystem>{0,1}</DeliverySystem>`
	`  <VentilationProperties>{0,unbounded}</VentilationProperties>`
	`</ExistingHVAC>`

Attributes

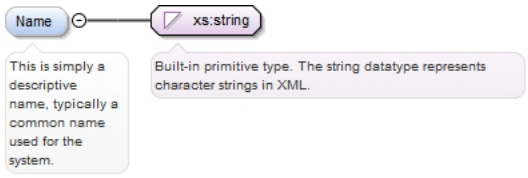
QName	Type	Fixed	Default	Use
id	xs:ID			optional

Source

```
<xs:element name="ExistingHVAC" type="HVACSystemType" minOccurs="0" maxOccurs="unbounded"/
>
```

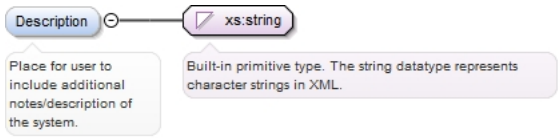
Element HVACSystemType / Name

Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.

Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	`<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>This is simply a descriptive name, typically a common name used for the system.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

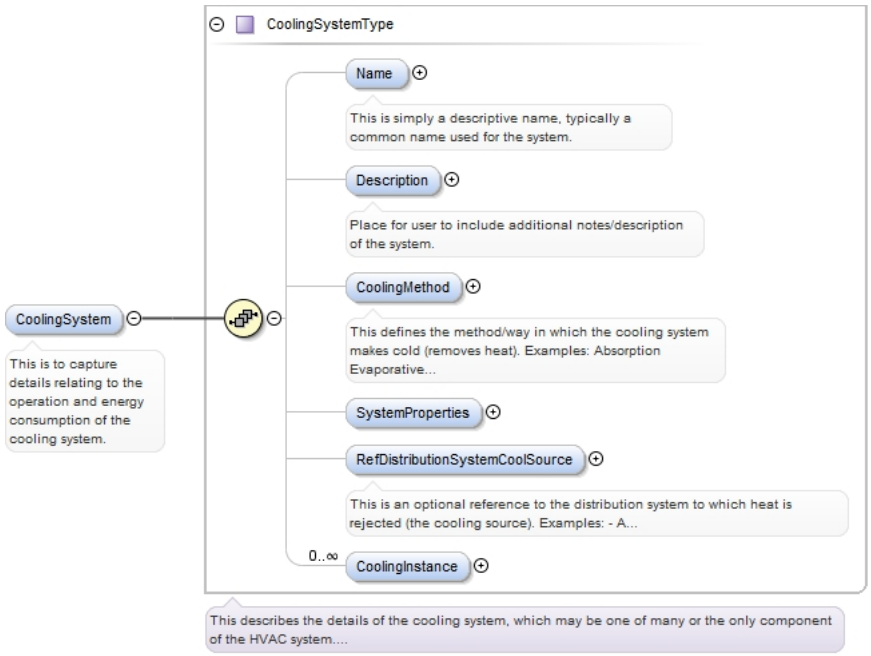
Element HVACSystemType / Description

Namespace	No namespace
Annotations	Place for user to include additional notes/description of the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	`<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>Place for user to include additional notes/description of the system.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element HVACSystemType / CoolingSystem

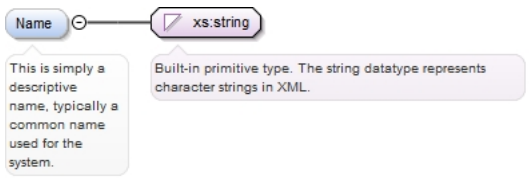
Namespace	No namespace
Annotations	This is to capture details relating to the operation and energy consumption of the cooling system.

Diagram	
Type	CoolingSystemType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Name{0,1} , Description{0,1} , CoolingMethod{0,1} , SystemProperties{0,1} , RefDistributionSystemCoolSource{0,1} , CoolingInstance*
Children	CoolingInstance, CoolingMethod, Description, Name, RefDistributionSystemCoolSource, SystemProperties

Instance	`<CoolingSystem>`
	`  <Name>{0,1}</Name>`
	`  <Description>{0,1}</Description>`
	`  <CoolingMethod>{0,1}</CoolingMethod>`
	`  <SystemProperties>{0,1}</SystemProperties>`
	`  <RefDistributionSystemCoolSource>{0,1}</RefDistributionSystemCoolSource>`
	`  <CoolingInstance EquipmentDefinitionIdRef="" id="">{0,unbounded}</CoolingInstance>`
	`</CoolingSystem>`

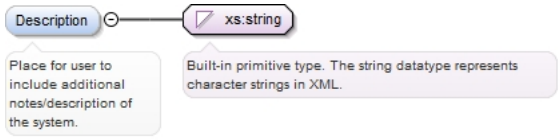
Source	`<xs:element name="CoolingSystem" type="CoolingSystemType" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>This is to capture details relating to the operation and energy consumption of the cooling system.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element CoolingSystemType / Name

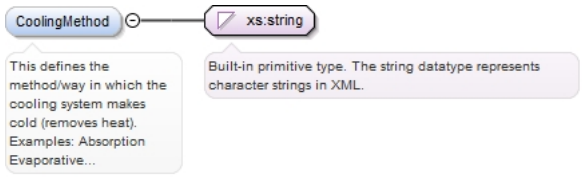
Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1">` `  <xs:annotation>`

```
    <xs:documentation>This is simply a descriptive name, typically a common name used for
 the system.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element CoolingSystemType / Description

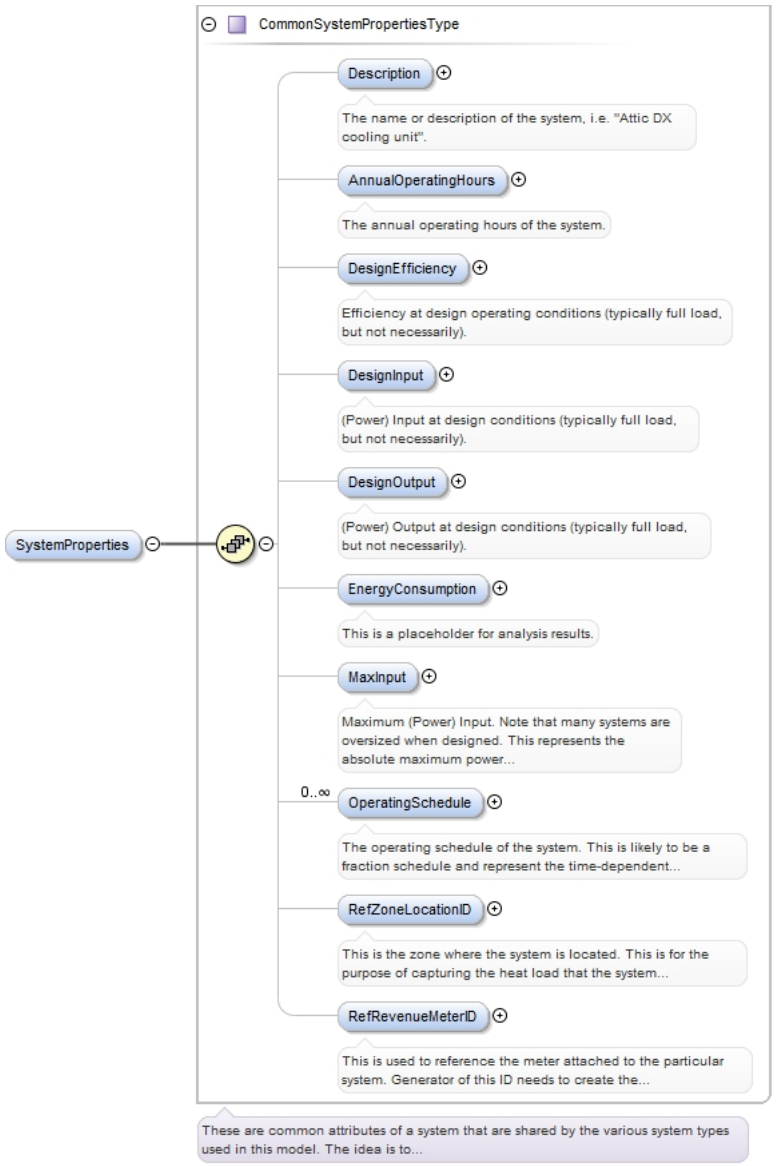
Namespace	No namespace
Annotations	Place for user to include additional notes/description of the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Place for user to include additional notes/description of the system.</xs:documentation> </xs:annotation> </xs:element>

Element CoolingSystemType / CoolingMethod

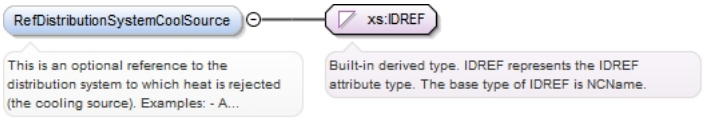
Namespace	No namespace
Annotations	This defines the method/way in which the cooling system makes cold (removes heat). Examples: Absorption Evaporative Refrigeration – Air Rejection Refrigeration – Water Rejection Hydronic Coils Refrigerant (Direct Expansion, DX) Coils
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="CoolingMethod" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This defines the method/way in which the cooling system makes cold (removes heat). Examples: Absorption Evaporative Refrigeration – Air Rejection Refrigeration – Water Rejection Hydronic Coils Refrigerant (Direct Expansion, DX) Coils</xs:documentation> </xs:annotation> </xs:element>

Element CoolingSystemType / SystemProperties

Namespace	No namespace

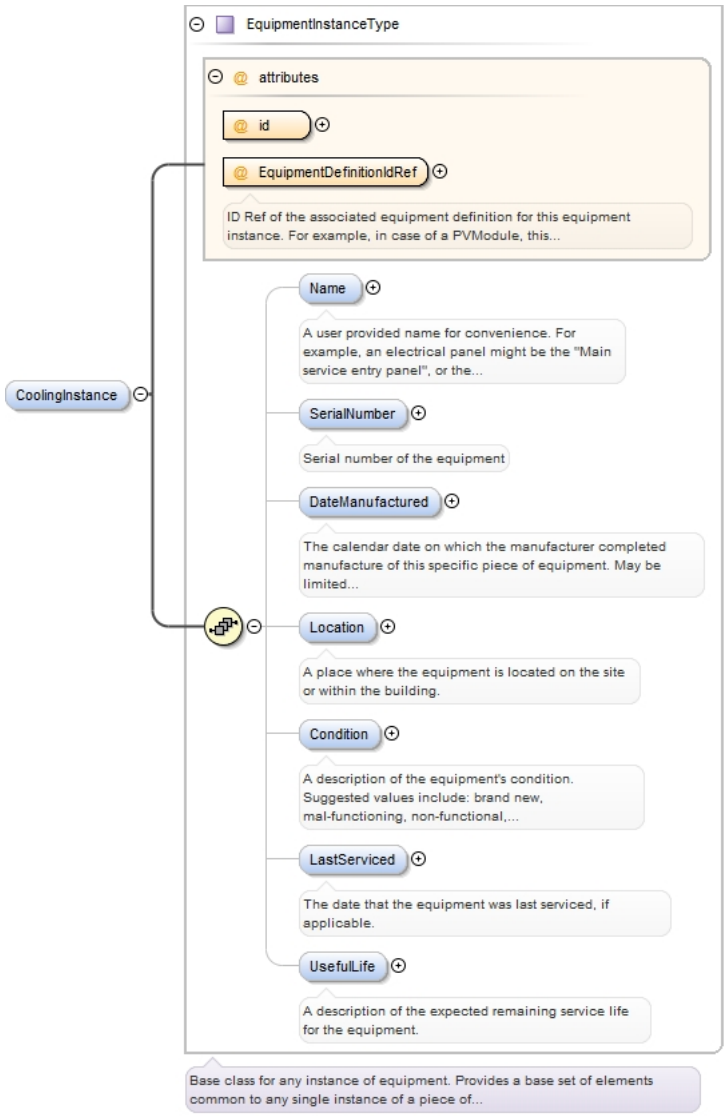
Diagram	
Type	CommonSystemPropertiesType
Properties	content: complex minOccurs: 0
Model	Description{0,1} , AnnualOperatingHours{0,1} , DesignEfficiency{0,1} , DesignInput{0,1} , DesignOutput{0,1} , EnergyConsumption{0,1} , MaxInput{0,1} , OperatingSchedule* , RefZoneLocationID{0,1} , RefRevenueMeterID{0,1}
Children	AnnualOperatingHours, Description, DesignEfficiency, DesignInput, DesignOutput, EnergyConsumption, MaxInput, OperatingSchedule, RefRevenueMeterID, RefZoneLocationID
Instance	<SystemProperties> <Description>{0,1}</Description> <AnnualOperatingHours>{0,1}</AnnualOperatingHours> <DesignEfficiency TestCondition="" Unit="" UnitDesc="">{0,1}</DesignEfficiency> <DesignInput Fuel="Electricity" FuelDesc="Electricity" TestCondition="" Unit="" UnitDesc="kwh">{0,1}</DesignInput> <DesignOutput Fuel="Electricity" FuelDesc="Electricity" TestCondition="" Unit="" UnitDesc="kwh">{0,1}</DesignOutput> <EnergyConsumption RevenueMeterIdRef="">{0,1}</EnergyConsumption> <MaxInput Fuel="Electricity" FuelDesc="Electricity" TestCondition="" Unit="" UnitDesc="kwh">{0,1}</MaxInput> <OperatingSchedule>{0,unbounded}</OperatingSchedule> <RefZoneLocationID>{0,1}</RefZoneLocationID> <RefRevenueMeterID>{0,1}</RefRevenueMeterID> </SystemProperties>
Source	<xs:element name="SystemProperties" type="CommonSystemPropertiesType" minOccurs="0"/>

Element CoolingSystemType / RefDistributionSystemCoolSource

Namespace	No namespace
Annotations	This is an optional reference to the distribution system to which heat is rejected (the cooling source). Examples: - A geothermal heat pump may reference a water loop that cycles to a pond or to piping in the ground. - An air handler with chilled water coils would reference the chilled water loop that serves the coils. - A water-cooled chiller or condenser would reference a condenser water loop.
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="RefDistributionSystemCoolSource" type="xs:IDREF"> <xs:annotation> <xs:documentation>This is an optional reference to the distribution system to which heat is rejected (the cooling source). Examples: - A geothermal heat pump may reference a water loop that cycles to a pond or to piping in the ground. - An air handler with chilled water coils would reference the chilled water loop that serves the coils. - A water-cooled chiller or condenser would reference a condenser water loop.</xs:documentation> </xs:annotation> </xs:element>

Element CoolingSystemType / CoolingInstance

Namespace	No namespace

Diagram	
Type	EquipmentInstanceType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded nillable: false
Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1}
Children	Condition, DateManufactured, LastServiced, Location, Name, SerialNumber, UsefulLife

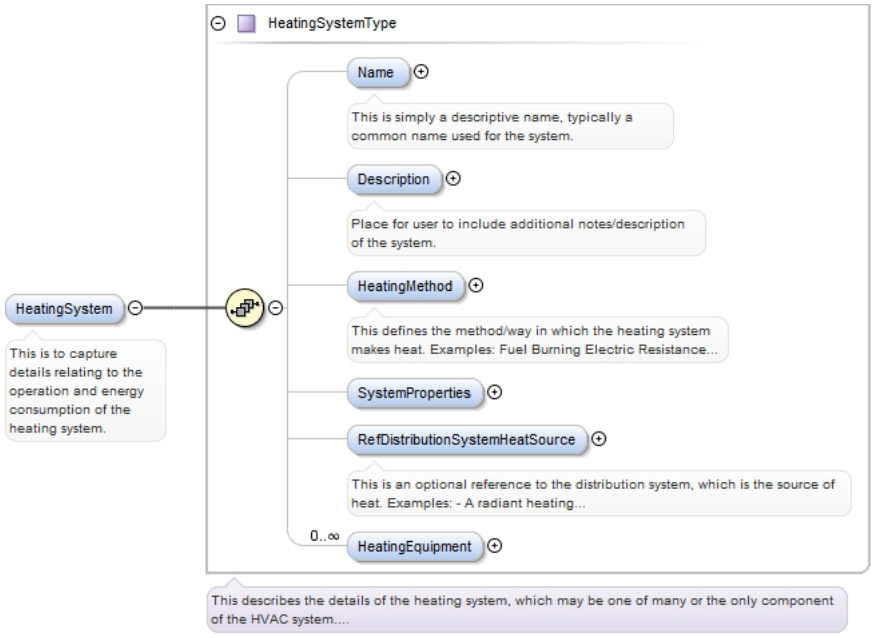
Instance	`<CoolingInstance EquipmentDefinitionIdRef="" id="">`
	`  <Name>{0,1}</Name>`
	`  <SerialNumber>{0,1}</SerialNumber>`
	`  <DateManufactured>{0,1}</DateManufactured>`
	`  <Location>{0,1}</Location>`
	`  <Condition>{0,1}</Condition>`
	`  <LastServiced>{0,1}</LastServiced>`
	`  <UsefulLife>{0,1}</UsefulLife>`
	`</CoolingInstance>`

Attributes

QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			required
	ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.			

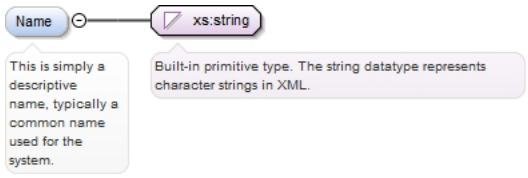
	QName	Type	Fixed	Default	Use
	id	xs:ID			required
Source	<xs:element maxOccurs="unbounded" minOccurs="0" name="CoolingInstance" nillable="false" type="EquipmentInstanceType"/>				

Element HVACSystemType / HeatingSystem

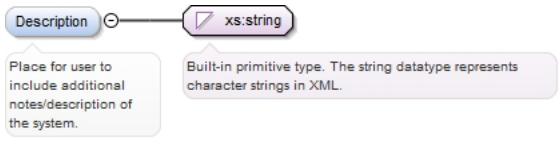
Namespace	No namespace
Annotations	This is to capture details relating to the operation and energy consumption of the heating system.
Diagram	
Type	HeatingSystemType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Name{0,1} , Description{0,1} , HeatingMethod{0,1} , SystemProperties{0,1} , RefDistributionSystemHeatSource{0,1} , HeatingEquipment*
Children	Description, HeatingEquipment, HeatingMethod, Name, RefDistributionSystemHeatSource, SystemProperties
Instance	<HeatingSystem> <Name>{0,1}</Name> <Description>{0,1}</Description> <HeatingMethod>{0,1}</HeatingMethod> <SystemProperties>{0,1}</SystemProperties> <RefDistributionSystemHeatSource>{0,1}</RefDistributionSystemHeatSource> <HeatingEquipment EquipmentDefinitionIdRef="" id="">{0,unbounded}</HeatingEquipment> </HeatingSystem>
Source	<xs:element name="HeatingSystem" type="HeatingSystemType" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is to capture details relating to the operation and energy consumption of the heating system.</xs:documentation> </xs:annotation> </xs:element>

Element HeatingSystemType / Name

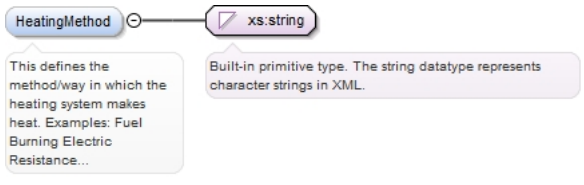
Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.

Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is simply a descriptive name, typically a common name used for the system.</xs:documentation> </xs:annotation> </xs:element>

Element HeatingSystemType / Description

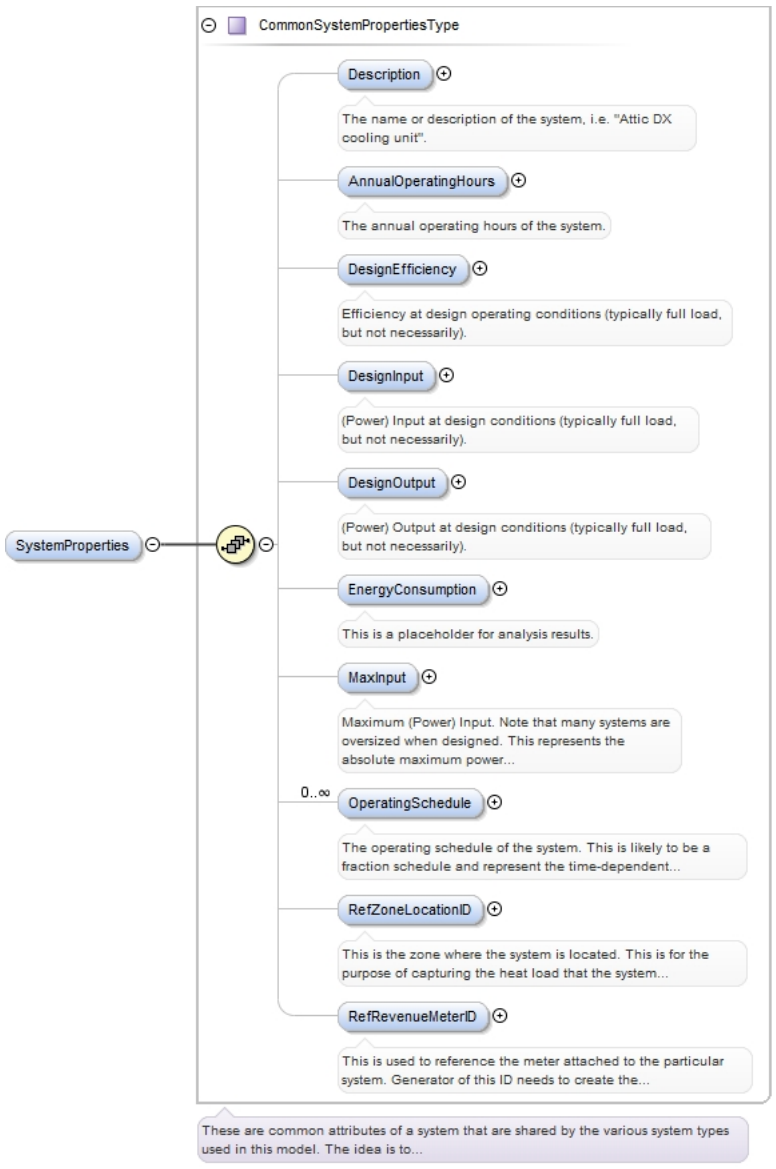
Namespace	No namespace
Annotations	Place for user to include additional notes/description of the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Place for user to include additional notes/description of the system.</xs:documentation> </xs:annotation> </xs:element>

Element HeatingSystemType / HeatingMethod

Namespace	No namespace
Annotations	This defines the method/way in which the heating system makes heat. Examples: Fuel Burning Electric Resistance Refrigeration – Air-Source Refrigeration – Water-Source Hydronic Coils
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="HeatingMethod" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This defines the method/way in which the heating system makes heat. Examples: Fuel Burning Electric Resistance Refrigeration – Air-Source Refrigeration – Water-Source Hydronic Coils</xs:documentation>

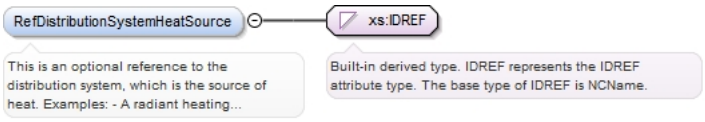
```
  </xs:annotation>
</xs:element>
```

Element HeatingSystemType / SystemProperties

Namespace	No namespace
Diagram	
Type	CommonSystemPropertiesType
Properties	content: complex minOccurs: 0
Model	Description{0,1} , AnnualOperatingHours{0,1} , DesignEfficiency{0,1} , DesignInput{0,1} , DesignOutput{0,1} , EnergyConsumption{0,1} , MaxInput{0,1} , OperatingSchedule* , RefZoneLocationID{0,1} , RefRevenueMeterID{0,1}
Children	AnnualOperatingHours, Description, DesignEfficiency, DesignInput, DesignOutput, EnergyConsumption, MaxInput, OperatingSchedule, RefRevenueMeterID, RefZoneLocationID
Instance	<SystemProperties> <Description>{0,1}</Description> <AnnualOperatingHours>{0,1}</AnnualOperatingHours> <DesignEfficiency TestCondition="" Unit="" UnitDesc="">{0,1}</DesignEfficiency> <DesignInput Fuel="Electricity" FuelDesc="Electricity" TestCondition="" Unit="" UnitDesc="kwh">{0,1}</DesignInput> <DesignOutput Fuel="Electricity" FuelDesc="Electricity" TestCondition="" Unit="" UnitDesc="kwh">{0,1}</DesignOutput> <EnergyConsumption RevenueMeterIdRef="">{0,1}</EnergyConsumption> <MaxInput Fuel="Electricity" FuelDesc="Electricity" TestCondition="" Unit="" UnitDesc="kwh">{0,1}</MaxInput>

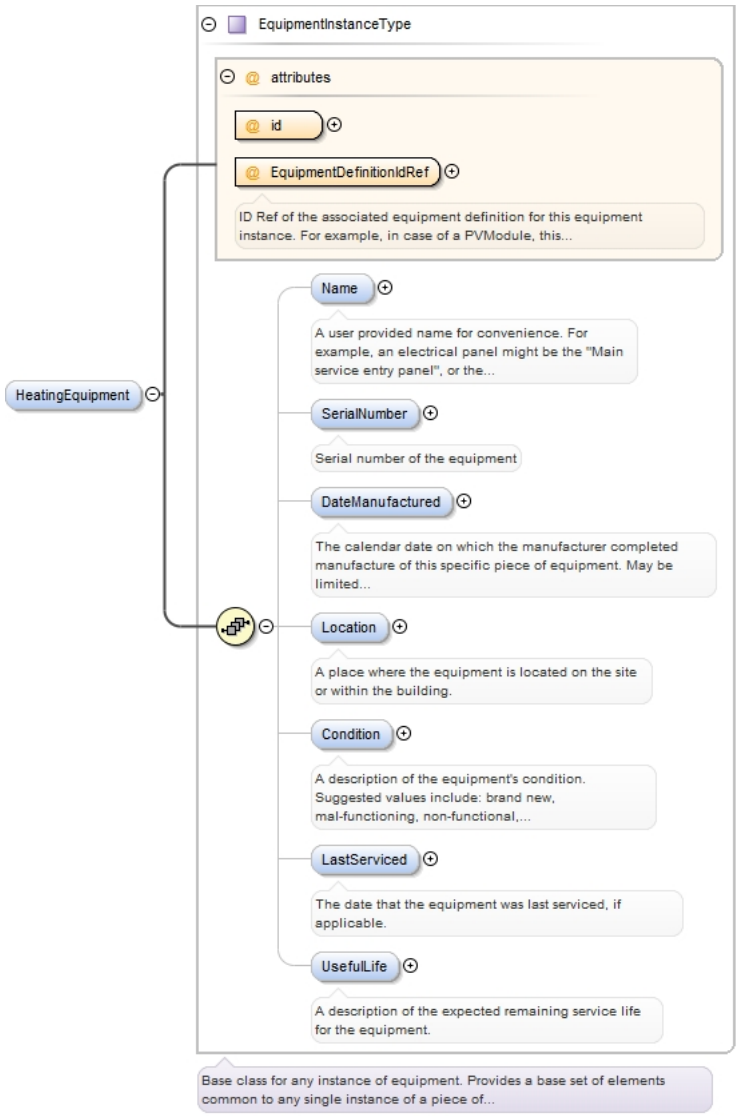
	<OperatingSchedule>{0,unbounded}</OperatingSchedule> <RefZoneLocationID>{0,1}</RefZoneLocationID> <RefRevenueMeterID>{0,1}</RefRevenueMeterID> </SystemProperties>
Source	<xs:element name="SystemProperties" type="CommonSystemPropertiesType" minOccurs="0"/>

Element HeatingSystemType / RefDistributionSystemHeatSource

Namespace	No namespace
Annotations	This is an optional reference to the distribution system, which is the source of heat. Examples: - A radiant heating system may consist of "radiators" and this references the hot water loop that serves it. - An air handler with hot water coils may reference the hot water loop that serves the coils. - A heat pump would reference the water loop from which it absorbs heat when it is in heating mode.
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="RefDistributionSystemHeatSource" type="xs:IDREF"> <xs:annotation> <xs:documentation>This is an optional reference to the distribution system, which is the source of heat. Examples: - A radiant heating system may consist of "radiators" and this references the hot water loop that serves it. - An air handler with hot water coils may reference the hot water loop that serves the coils. - A heat pump would reference the water loop from which it absorbs heat when it is in heating mode.</xs:documentation> </xs:annotation> </xs:element>

Element HeatingSystemType / HeatingEquipment

Namespace	No namespace

Diagram	
Type	EquipmentInstanceType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded nillable: false
Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1}
Children	Condition, DateManufactured, LastServiced, Location, Name, SerialNumber, UsefulLife

Instance	`<HeatingEquipment EquipmentDefinitionIdRef="" id="">`
	`  <Name>{0,1}</Name>`
	`  <SerialNumber>{0,1}</SerialNumber>`
	`  <DateManufactured>{0,1}</DateManufactured>`
	`  <Location>{0,1}</Location>`
	`  <Condition>{0,1}</Condition>`
	`  <LastServiced>{0,1}</LastServiced>`
	`  <UsefulLife>{0,1}</UsefulLife>`
	`</HeatingEquipment>`

Attributes

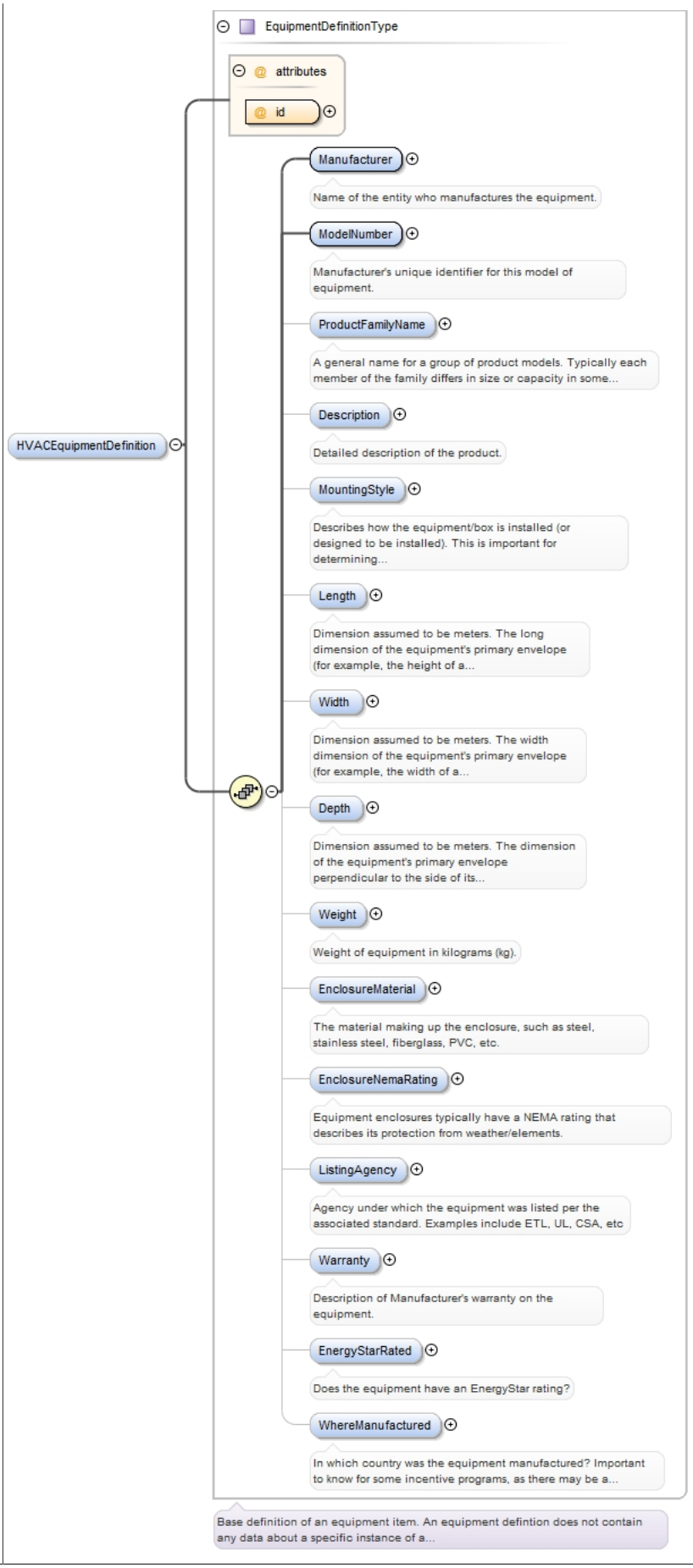
QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			required
	ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.			

	QName	Type	Fixed	Default	Use
	id	xs:ID			required
Source	<xs:element name="HeatingEquipment" maxOccurs="unbounded" minOccurs="0" nillable="false" type="EquipmentInstanceType"/>				

Element HVACSystemType / HVACEquipmentDefinition

Namespace	No namespace

Diagram


EquipmentDefinitionType
attributes
id
HVACEquipmentDefinition
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...

Type	EquipmentDefinitionType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1}
Children	Depth, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, Length, ListingAgency, Manufacturer, ModelNumber, MountingStyle, ProductFamilyName, Warranty, Weight, WhereManufactured, Width

Instance

```
<HVACEquipmentDefinition id="">
  <Manufacturer>{1,1}</Manufacturer>
  <ModelNumber>{1,1}</ModelNumber>
  <ProductFamilyName>{0,1}</ProductFamilyName>
  <Description>{0,1}</Description>
  <MountingStyle>{0,1}</MountingStyle>
  <Length>{0,1}</Length>
  <Width>{0,1}</Width>
  <Depth>{0,1}</Depth>
  <Weight>{0,1}</Weight>
  <EnclosureMaterial>{0,1}</EnclosureMaterial>
  <EnclosureNemaRating>{0,1}</EnclosureNemaRating>
  <ListingAgency>{0,1}</ListingAgency>
  <Warranty>{0,1}</Warranty>
  <EnergyStarRated>{0,1}</EnergyStarRated>
  <WhereManufactured>{0,1}</WhereManufactured>
</HVACEquipmentDefinition>
```

Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			required

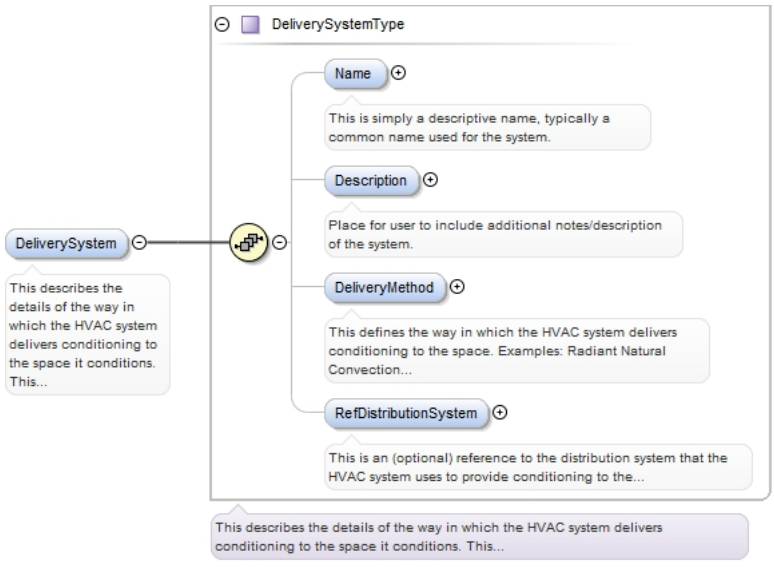
Source

```
<xs:element maxOccurs="unbounded" minOccurs="0" name="HVACEquipmentDefinition"
 type="EquipmentDefinitionType"/>
```

Element HVACSystemType / DeliverySystem

Namespace	No namespace
Annotations	This describes the details of the way in which the HVAC system delivers conditioning to the space it conditions. This allows the user to define ducting or piping etc. This includes an optional reference to a distribution system.

Diagram



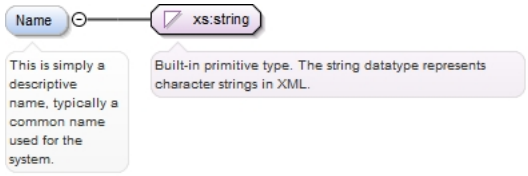
Type	DeliverySystemType
Properties	content: complex minOccurs: 0
Model	Name{0,1} , Description{0,1} , DeliveryMethod{0,1} , RefDistributionSystem{0,1}
Children	DeliveryMethod, Description, Name, RefDistributionSystem

Instance

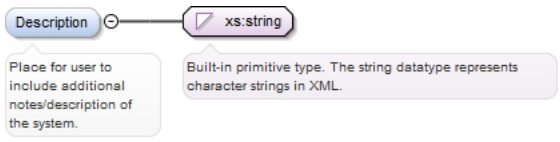
```
<DeliverySystem>
```

	<Name>{0,1}</Name> <Description>{0,1}</Description> <DeliveryMethod>{0,1}</DeliveryMethod> <RefDistributionSystem>{0,1}</RefDistributionSystem> </DeliverySystem>
Source	<xs:element minOccurs="0" name="DeliverySystem" type="DeliverySystemType"> <xs:annotation> <xs:documentation>This describes the details of the way in which the HVAC system delivers conditioning to the space it conditions. This allows the user to define ducting or piping etc. This includes an optional reference to a distribution system.</xs:documentation> </xs:annotation> </xs:element>

Element DeliverySystemType / Name

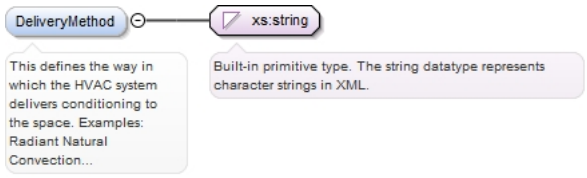
Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is simply a descriptive name, typically a common name used for the system.</xs:documentation> </xs:annotation> </xs:element>

Element DeliverySystemType / Description

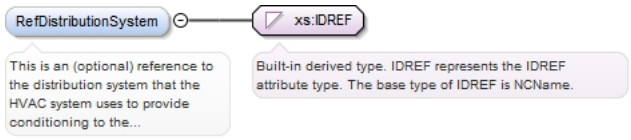
Namespace	No namespace
Annotations	Place for user to include additional notes/description of the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Place for user to include additional notes/description of the system.</xs:documentation> </xs:annotation> </xs:element>

Element DeliverySystemType / DeliveryMethod

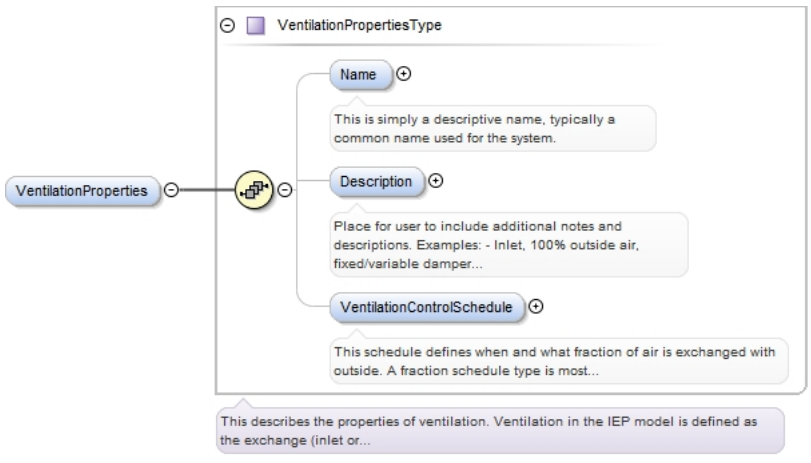
Namespace	No namespace
Annotations	This defines the way in which the HVAC system delivers conditioning to the space. Examples: Radiant Natural Convection

	Forced Convection
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="DeliveryMethod" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This defines the way in which the HVAC system delivers conditioning to the space. Examples: Radiant Natural Convection Forced Convection</xs:documentation> </xs:annotation> </xs:element>

Element DeliverySystemType / RefDistributionSystem

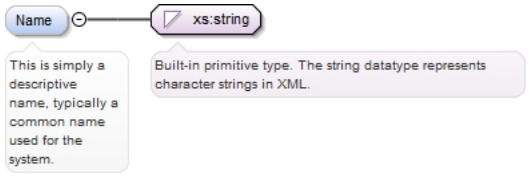
Namespace	No namespace
Annotations	This is an (optional) reference to the distribution system that the HVAC system uses to provide conditioning to the space.
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="RefDistributionSystem" type="xs:IDREF"> <xs:annotation> <xs:documentation>This is an (optional) reference to the distribution system that the HVAC system uses to provide conditioning to the space.</xs:documentation> </xs:annotation> </xs:element>

Element HVACSystemType / VentilationProperties

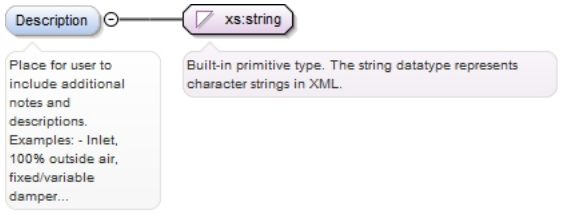
Namespace	No namespace
Diagram	
Type	VentilationPropertiesType
Properties	content: complex

	minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , Description{0,1} , VentilationControlSchedule{0,1}
Children	Description, Name, VentilationControlSchedule
Instance	<VentilationProperties> <Name>{0,1}</Name> <Description>{0,1}</Description> <VentilationControlSchedule>{0,1}</VentilationControlSchedule> </VentilationProperties>
Source	<xs:element maxOccurs="unbounded" minOccurs="0" name="VentilationProperties" type="VentilationPropertiesType"/>

Element VentilationPropertiesType / Name

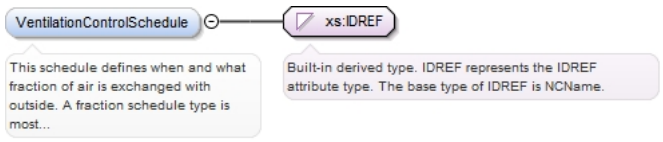
Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is simply a descriptive name, typically a common name used for the system.</xs:documentation> </xs:annotation> </xs:element>

Element VentilationPropertiesType / Description

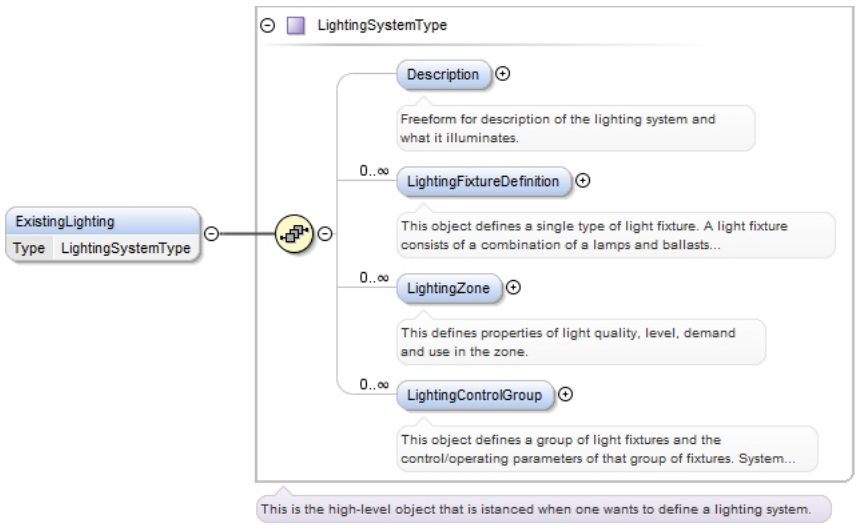
Namespace	No namespace
Annotations	Place for user to include additional notes and descriptions. Examples: - Inlet, 100% outside air, fixed/variable damper - Exhaust, fixed/variable damper - Outside air economizer system - Natural: Windows, manual/auto control - Exhaust, relief vent - Whole house fan It may be appropriate to define the nominal (maximum, 100%) outside air flow rate, particularly when the Ventilation Control Schedule is a fraction schedule type. This would be useful when the ventilation type is natural or if no Delivery System is defined. It may be appropriate to define the flow rate units (cubic-feet per minute) if the Ventilation Control Schedule type is a value schedule.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Place for user to include additional notes and descriptions. Examples: - Inlet, 100% outside air, fixed/variable damper - Exhaust, fixed/variable damper - Outside air economizer system - Natural: Windows, manual/auto control - Exhaust, relief vent - Whole house fan It may be appropriate to define the nominal (maximum, 100%) outside air flow rate, particularly when the Ventilation Control Schedule is a fraction schedule type. This would be useful when the ventilation type is natural or if no Delivery System is defined. It may be appropriate to define the flow rate units (cubic-feet per minute) if the Ventilation Control Schedule type is a value schedule.</xs:documentation> </xs:annotation> </xs:element>

Element VentilationPropertiesType / VentilationControlSchedule

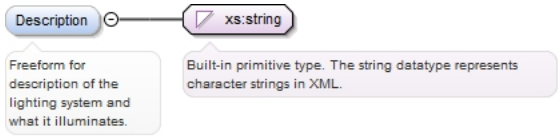
Namespace	No namespace
Annotations	This schedule defines when and what fraction of air is exchanged with outside. A fraction schedule type is most appropriate. The nominal (100%) flow rate would reflect the Delivery System flow rate at the given conditions. Alternatively, if the ventilation type is natural, the user may define the maximum flow rate in the Description. Another option would be to define a value schedule and indicate in the description what the units of the schedule values represent (i.e. cubic-feet per minute).
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="VentilationControlSchedule" type="xs:IDREF"> <xs:annotation> <xs:documentation>This schedule defines when and what fraction of air is exchanged with outside. A fraction schedule type is most appropriate. The nominal (100%) flow rate would reflect the Delivery System flow rate at the given conditions. Alternatively, if the ventilation type is natural, the user may define the maximum flow rate in the Description. Another option would be to define a value schedule and indicate in the description what the units of the schedule values represent (i.e. cubic-feet per minute).</xs:documentation> </xs:annotation> </xs:element>

Element ProjectType / ExistingLighting

Namespace	No namespace
Diagram	

Type	LightingSystemType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Description{0,1} , LightingFixtureDefinition* , LightingZone* , LightingControlGroup*
Children	Description, LightingControlGroup, LightingFixtureDefinition, LightingZone
Instance	<ExistingLighting> <Description>{0,1}</Description> <LightingFixtureDefinition id="">{0,unbounded}</LightingFixtureDefinition> <LightingZone id="">{0,unbounded}</LightingZone> <LightingControlGroup id="">{0,unbounded}</LightingControlGroup> </ExistingLighting>
Source	<xs:element name="ExistingLighting" type="LightingSystemType" minOccurs="0" maxOccurs="unbounded"/>

Element LightingSystemType / Description

Namespace	No namespace
Annotations	Freeform for description of the lighting system and what it illuminates.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Freeform for description of the lighting system and what it illuminates.</xs:documentation> </xs:annotation> </xs:element>

Element LightingSystemType / LightingFixtureDefinition

Namespace	No namespace
Annotations	This object defines a single type of light fixture. A light fixture consists of a combination of a lamps and ballasts (optional) as well as the container and mounting accessories.

Diagram


LightingFixtureDefintionType
EquipmentDefinitionType (extension base)
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...
FixtureEfficiency
Fixture Efficiency The fraction of light created by the lamp and ballast combination that escapes the light fixture.
FixtureUplight
LightingFixtureDefinition
This object defines a single type of light fixture. A light fixture consists of a combination of a lamps and ballasts...

Type	LightingFixtureDefintionType
Type hierarchy	• EquipmentDefinitionType • LightingFixtureDefintionType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1} , FixtureEfficiency{0,1} , FixtureUplight{0,1} , FixtureDownlight{0,1} , FixtureIESFile* , LightingTechnology{0,1} , LampProperties{0,1} , BallastProperties{0,1}
Children	BallastProperties, Depth, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, FixtureDownlight, FixtureEfficiency, FixtureIESFile, FixtureUplight, LampProperties, Length, LightingTechnology, ListingAgency, Manufacturer, ModelNumber, MountingStyle, ProductFamilyName, Warranty, Weight, WhereManufactured, Width

Instance

```
<LightingFixtureDefinition id="">
  <Manufacturer>{1,1}</Manufacturer>
  <ModelNumber>{1,1}</ModelNumber>
  <ProductFamilyName>{0,1}</ProductFamilyName>
  <Description>{0,1}</Description>
  <MountingStyle>{0,1}</MountingStyle>
  <Length>{0,1}</Length>
  <Width>{0,1}</Width>
  <Depth>{0,1}</Depth>
  <Weight>{0,1}</Weight>
  <EnclosureMaterial>{0,1}</EnclosureMaterial>
  <EnclosureNemaRating>{0,1}</EnclosureNemaRating>
  <ListingAgency>{0,1}</ListingAgency>
  <Warranty>{0,1}</Warranty>
  <EnergyStarRated>{0,1}</EnergyStarRated>
  <WhereManufactured>{0,1}</WhereManufactured>
  <FixtureEfficiency>{0,1}</FixtureEfficiency>
  <FixtureUplight>{0,1}</FixtureUplight>
  <FixtureDownlight>{0,1}</FixtureDownlight>
  <FixtureIESFile>{0,unbounded}</FixtureIESFile>
  <LightingTechnology>{0,1}</LightingTechnology>
  <LampProperties id="">{0,1}</LampProperties>
  <BallastProperties id="">{0,1}</BallastProperties>
</LightingFixtureDefinition>
```

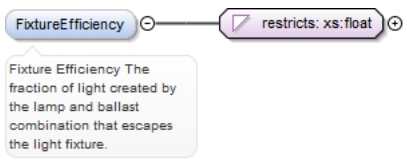
Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			required

Source

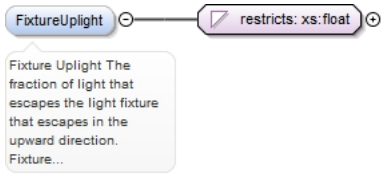
```
<xs:element maxOccurs="unbounded" minOccurs="0" name="LightingFixtureDefinition"
 type="LightingFixtureDefintionType">
  <xs:annotation>
    <xs:documentation>This object defines a single type of light fixture. A light fixture
 consists of a combination of a lamps and ballasts (optional) as well as the container and
 mounting accessories.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element LightingFixtureDefintionType / FixtureEfficiency

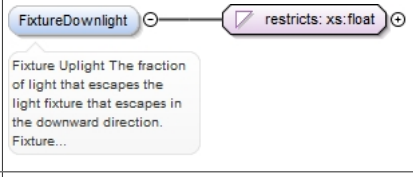
Namespace	No namespace
Annotations	Fixture Efficiency The fraction of light created by the lamp and ballast combination that escapes the light fixture.
Diagram	
Type	restriction of xs:float
Properties	content: simple minOccurs: 0
Facets	maxInclusive 1

	minInclusive 0
Source	<xs:element minOccurs="0" name="FixtureEfficiency"> <xs:annotation> <xs:documentation>Fixture Efficiency The fraction of light created by the lamp and ballast combination that escapes the light fixture.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:float"> <xs:minInclusive value="0"/> <xs:maxInclusive value="1"/> </xs:restriction> </xs:simpleType> </xs:element>

Element LightingFixtureDefintionType / FixtureUplight

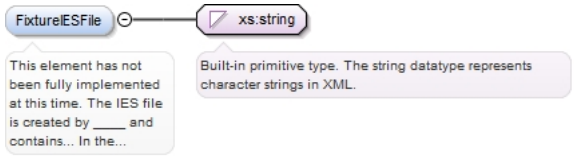
Namespace	No namespace
Annotations	Fixture Uplight The fraction of light that escapes the light fixture that escapes in the upward direction. Fixture uplight and fixture downlight should sum to 1.
Diagram	
Type	restriction of xs:float
Properties	content: simple minOccurs: 0
Facets	maxInclusive 1 minInclusive 0
Source	<xs:element minOccurs="0" name="FixtureUplight"> <xs:annotation> <xs:documentation>Fixture Uplight The fraction of light that escapes the light fixture that escapes in the upward direction. Fixture uplight and fixture downlight should sum to 1.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:float"> <xs:minInclusive value="0"/> <xs:maxInclusive value="1"/> </xs:restriction> </xs:simpleType> </xs:element>

Element LightingFixtureDefintionType / FixtureDownlight

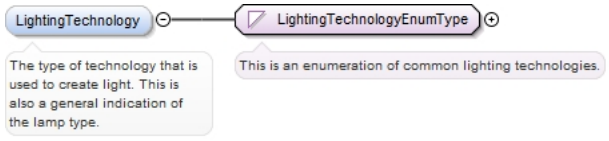
Namespace	No namespace
Annotations	Fixture Uplight The fraction of light that escapes the light fixture that escapes in the downward direction. Fixture uplight and fixture downlight should sum to 1.
Diagram	
Type	restriction of xs:float
Properties	content: simple minOccurs: 0
Facets	maxInclusive 1 minInclusive 0
Source	<xs:element minOccurs="0" name="FixtureDownlight">

```
  <xs:annotation>
    <xs:documentation>Fixture Uplight The fraction of light that escapes the light fixture
 that escapes in the downward direction. Fixture uplight and fixture downlight should sum
 to 1.</xs:documentation>
  </xs:annotation>
  <xs:simpleType>
    <xs:restriction base="xs:float">
      <xs:minInclusive value="0"/>
      <xs:maxInclusive value="1"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

Element LightingFixtureDefintionType / FixtureIESFile

Namespace	No namespace
Annotations	This element has not been fully implemented at this time. The IES file is created by ____ and contains... In the future, this element may contain the actual IES file converted to a suitable format such as text or binary.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: unbounded
Source	<xs:element maxOccurs="unbounded" minOccurs="0" name="FixtureIESFile" type="xs:string"> <xs:annotation> <xs:documentation>This element has not been fully implemented at this time. The IES file is created by ____ and contains... In the future, this element may contain the actual IES file converted to a suitable format such as text or binary.</xs:documentation> </xs:annotation> </xs:element>

Element LightingFixtureDefintionType / LightingTechnology

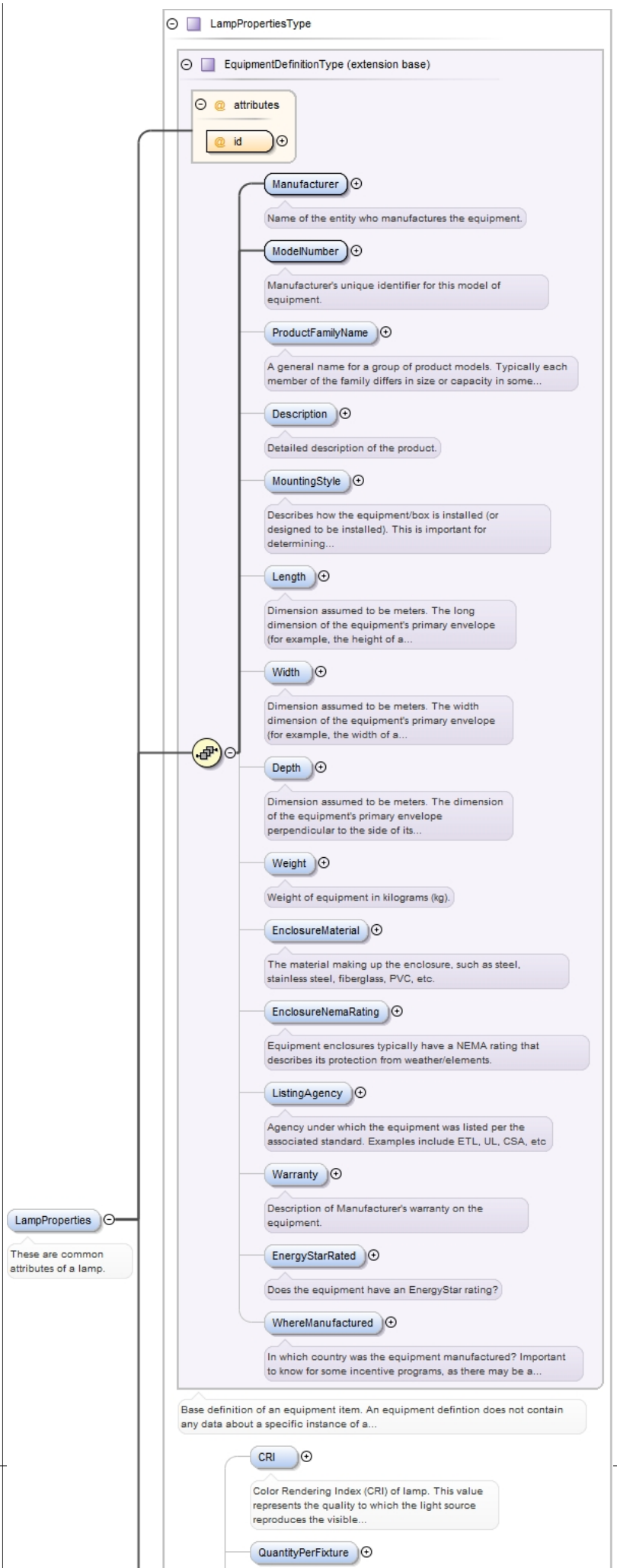
Namespace	No namespace
Annotations	The type of technology that is used to create light. This is also a general indication of the lamp type.
Diagram	
Type	LightingTechnologyEnumType
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	enumeration: Incandescent enumeration: Halogen enumeration: Compact Fluorescent enumeration: Linear Fluorescent enumeration: High Intensity Discharge enumeration: LED enumeration: Induction

	enumeration	Plasma
	enumeration	Neon
Source	<xs:element name="LightingTechnology" type="LightingTechnologyEnumType" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The type of technology that is used to create light. This is also a general indication of the lamp type.</xs:documentation> </xs:annotation> </xs:element>	

Element LightingFixtureDefintionType / LampProperties

Namespace	No namespace
Annotations	These are common attributes of a lamp.

Diagram


LampPropertiesType
EquipmentDefinitionType (extension base)
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...
CRI
Color Rendering Index (CRI) of lamp. This value represents the quality to which the light source reproduces the visible...
QuantityPerFixture
LampProperties
These are common attributes of a lamp.

Type	LampPropertiesType
Type hierarchy	• EquipmentDefinitionType • LampPropertiesType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1} , CRI{0,1} , QuantityPerFixture{0,1} , WattsNominal{0,1} , ColorTemperature{0,1} , InitialLumens{0,1} , MeanLumens{0,1} , SPRatio{0,1}
Children	CRI, ColorTemperature, Depth, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, InitialLumens, Length, ListingAgency, Manufacturer, MeanLumens, ModelNumber, MountingStyle, ProductFamilyName, QuantityPerFixture, SPRatio, Warranty, WattsNominal, Weight, WhereManufactured, Width

Instance

```
<LampProperties id="">
  <Manufacturer>{1,1}</Manufacturer>
  <ModelNumber>{1,1}</ModelNumber>
  <ProductFamilyName>{0,1}</ProductFamilyName>
  <Description>{0,1}</Description>
  <MountingStyle>{0,1}</MountingStyle>
  <Length>{0,1}</Length>
  <Width>{0,1}</Width>
  <Depth>{0,1}</Depth>
  <Weight>{0,1}</Weight>
  <EnclosureMaterial>{0,1}</EnclosureMaterial>
  <EnclosureNemaRating>{0,1}</EnclosureNemaRating>
  <ListingAgency>{0,1}</ListingAgency>
  <Warranty>{0,1}</Warranty>
  <EnergyStarRated>{0,1}</EnergyStarRated>
  <WhereManufactured>{0,1}</WhereManufactured>
  <CRI>{0,1}</CRI>
  <QuantityPerFixture>{0,1}</QuantityPerFixture>
  <WattsNominal>{0,1}</WattsNominal>
  <ColorTemperature>{0,1}</ColorTemperature>
  <InitialLumens>{0,1}</InitialLumens>
  <MeanLumens>{0,1}</MeanLumens>
  <SPRatio>{0,1}</SPRatio>
</LampProperties>
```

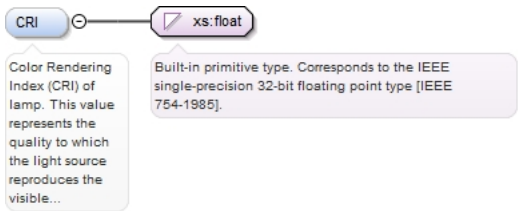
Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			required

Source

```
<xs:element name="LampProperties" type="LampPropertiesType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>These are common attributes of a lamp.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element LampPropertiesType / CRI

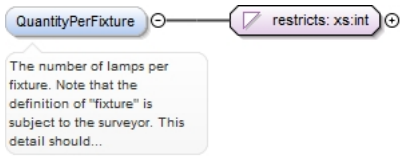
Namespace	No namespace
Annotations	Color Rendering Index (CRI) of lamp. This value represents the quality to which the light source reproduces the visible light spectrum.
Diagram	
Type	xs:float
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source

```
<xs:element name="CRI" type="xs:float" minOccurs="0" maxOccurs="1">
  <xs:annotation>
```

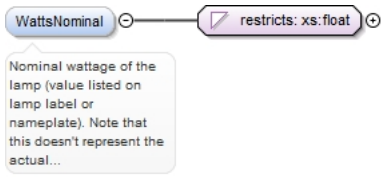
```
    <xs:documentation>Color Rendering Index (CRI) of lamp. This value represents
 the quality to which the light source reproduces the visible light spectrum.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

Element LampPropertiesType / QuantityPerFixture

Namespace	No namespace
Annotations	The number of lamps per fixture. Note that the definition of "fixture" is subject to the surveyor. This detail should be described included in the Description element of Lighting Fixture Type.
Diagram	
Type	restriction of xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	minInclusive 0
Source	

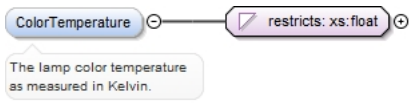
```
<xs:element name="QuantityPerFixture" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>The number of lamps per fixture. Note that the definition of
 "fixture" is subject to the surveyor. This detail should be described included in the
 Description element of Lighting Fixture Type.</xs:documentation>
  </xs:annotation>
  <xs:simpleType>
    <xs:restriction base="xs:int">
      <xs:minInclusive value="0"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

Element LampPropertiesType / WattsNominal

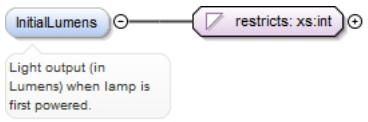
Namespace	No namespace
Annotations	Nominal wattage of the lamp (value listed on lamp label or nameplate). Note that this doesn't represent the actual input power of a ballasted fixture.
Diagram	
Type	restriction of xs:float
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	minExclusive 0
Source	

```
<xs:element name="WattsNominal" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>Nominal wattage of the lamp (value listed on lamp label or
 nameplate). Note that this doesn't represent the actual input power of a ballasted
 fixture.</xs:documentation>
  </xs:annotation>
  <xs:simpleType>
    <xs:restriction base="xs:float">
      <xs:minExclusive value="0"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

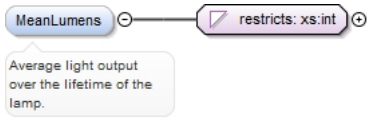
Element LampPropertiesType / ColorTemperature

Namespace	No namespace
Annotations	The lamp color temperature as measured in Kelvin.
Diagram	
Type	restriction of xs:float
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	minInclusive 0
Source	<xs:element name="ColorTemperature" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The lamp color temperature as measured in Kelvin.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:float"> <xs:minInclusive value="0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element LampPropertiesType / InitialLumens

Namespace	No namespace
Annotations	Light output (in Lumens) when lamp is first powered.
Diagram	
Type	restriction of xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	minInclusive 0
Source	<xs:element name="InitialLumens" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Light output (in Lumens) when lamp is first powered.</ xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:int"> <xs:minInclusive value="0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element LampPropertiesType / MeanLumens

Namespace	No namespace
Annotations	Average light output over the lifetime of the lamp.
Diagram	
Type	restriction of xs:int
Properties	content: simple

	minOccurs:	0
	maxOccurs:	1
Facets	minInclusive	0

Source

```
<xs:element name="MeanLumens" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>Average light output over the lifetime of the lamp.</
xs:documentation>
  </xs:annotation>
  <xs:simpleType>
    <xs:restriction base="xs:int">
      <xs:minInclusive value="0"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

Element LampPropertiesType / SPRatio

Namespace	No namespace	
Annotations	SP Ratio.	
Diagram		
Type	restriction of xs:float	
Properties	content:	simple
	minOccurs:	0
	maxOccurs:	1
Facets	minInclusive	0

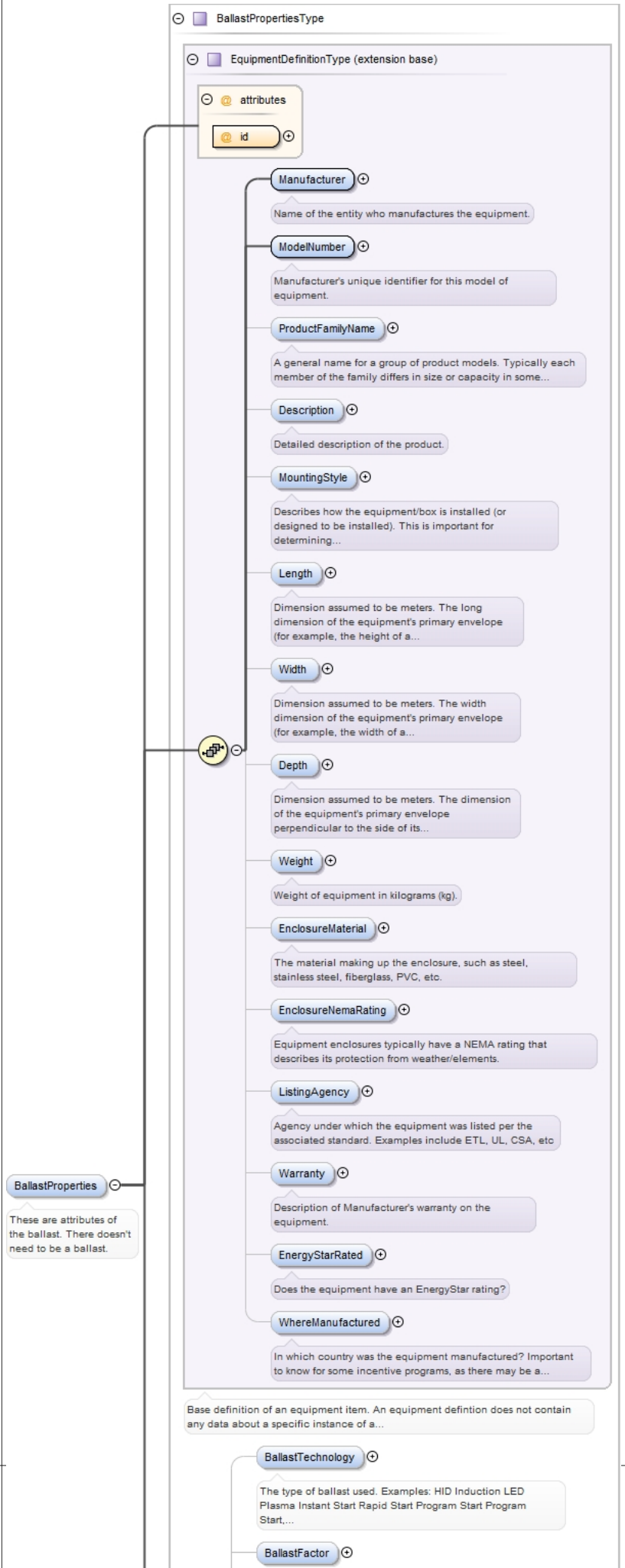
Source

```
<xs:element name="SPRatio" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>SP Ratio.</xs:documentation>
  </xs:annotation>
  <xs:simpleType>
    <xs:restriction base="xs:float">
      <xs:minInclusive value="0"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

Element LightingFixtureDefintionType / BallastProperties

Namespace	No namespace
Annotations	These are attributes of the ballast. There doesn't need to be a ballast.

Diagram


BallastPropertiesType
EquipmentDefinitionType (extension base)
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...
BallastTechnology
The type of ballast used. Examples: HID Induction LED Plasma Instant Start Rapid Start Program Start Program Start,...
BallastFactor
BallastProperties
These are attributes of the ballast. There doesn't need to be a ballast.

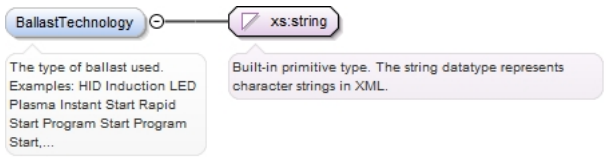
Type	BallastPropertiesType
Type hierarchy	• EquipmentDefinitionType • BallastPropertiesType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1} , BallastTechnology{0,1} , BallastFactor{0,1} , QuantityPerFixture{0,1} , PowerFactor{0,1} , THD{0,1}
Children	BallastFactor, BallastTechnology, Depth, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, Length, ListingAgency, Manufacturer, ModelNumber, MountingStyle, PowerFactor, ProductFamilyName, QuantityPerFixture, THD, Warranty, Weight, WhereManufactured, Width
Instance	<BallastProperties id=""> <Manufacturer>{1,1}</Manufacturer> <ModelNumber>{1,1}</ModelNumber> <ProductFamilyName>{0,1}</ProductFamilyName> <Description>{0,1}</Description> <MountingStyle>{0,1}</MountingStyle> <Length>{0,1}</Length> <Width>{0,1}</Width> <Depth>{0,1}</Depth> <Weight>{0,1}</Weight> <EnclosureMaterial>{0,1}</EnclosureMaterial> <EnclosureNemaRating>{0,1}</EnclosureNemaRating> <ListingAgency>{0,1}</ListingAgency> <Warranty>{0,1}</Warranty> <EnergyStarRated>{0,1}</EnergyStarRated> <WhereManufactured>{0,1}</WhereManufactured> <BallastTechnology>{0,1}</BallastTechnology> <BallastFactor>{0,1}</BallastFactor> <QuantityPerFixture>{0,1}</QuantityPerFixture> <PowerFactor>{0,1}</PowerFactor> <THD>{0,1}</THD> </BallastProperties>

Attributes	QName	Type	Fixed	Default	Use
	id	xs:ID			required

Source

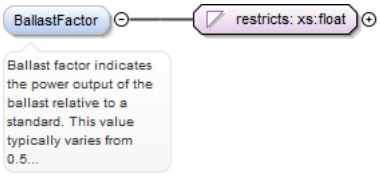
```
<xs:element name="BallastProperties" type="BallastPropertiesType" minOccurs="0"
 maxOccurs="1">
  <xs:annotation>
    <xs:documentation>These are attributes of the ballast. There doesn't need to be a
 ballast.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element BallastPropertiesType / BallastTechnology

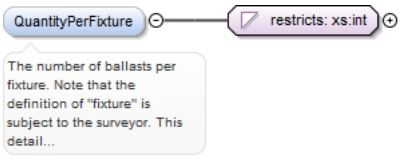
Namespace	No namespace
Annotations	The type of ballast used. Examples: HID Induction LED Plasma Instant Start Rapid Start Program Start Program Start, Dimming Program Start, Bi-Level Program Start, Multi-Level
Diagram	
Type	xs:string
Properties	content: simple

	minOccurs: 0 maxOccurs: 1
Source	<xs:element name="BallastTechnology" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The type of ballast used. Examples: HID Induction LED Plasma Instant Start Rapid Start Program Start Program Start, Dimming Program Start, Bi-Level Program Start, Multi-Level</xs:documentation> </xs:annotation> </xs:element>

Element BallastPropertiesType / BallastFactor

Namespace	No namespace
Annotations	Ballast factor indicates the power output of the ballast relative to a standard. This value typically varies from 0.5 to 1.5 and is typically falls 0.75 to 1.2. A value of zero may indicate that no ballast is used.
Diagram	
Type	restriction of xs:float
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	minInclusive 0
Source	<xs:element name="BallastFactor" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Ballast factor indicates the power output of the ballast relative to a standard. This value typically varies from 0.5 to 1.5 and is typically falls 0.75 to 1.2. A value of zero may indicate that no ballast is used.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:float"> <xs:minInclusive value="0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element BallastPropertiesType / QuantityPerFixture

Namespace	No namespace
Annotations	The number of ballasts per fixture. Note that the definition of "fixture" is subject to the surveyor. This detail should be described included in the Description element of Lighting System.
Diagram	
Type	restriction of xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	minInclusive 0
Source	<xs:element name="QuantityPerFixture" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The number of ballasts per fixture. Note that the definition of "fixture" is subject to the surveyor. This detail should be described included in the Description element of Lighting System.</xs:documentation>

```
  </xs:annotation>
  <xs:simpleType>
    <xs:restriction base="xs:int">
      <xs:minInclusive value="0"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

Element BallastPropertiesType / PowerFactor

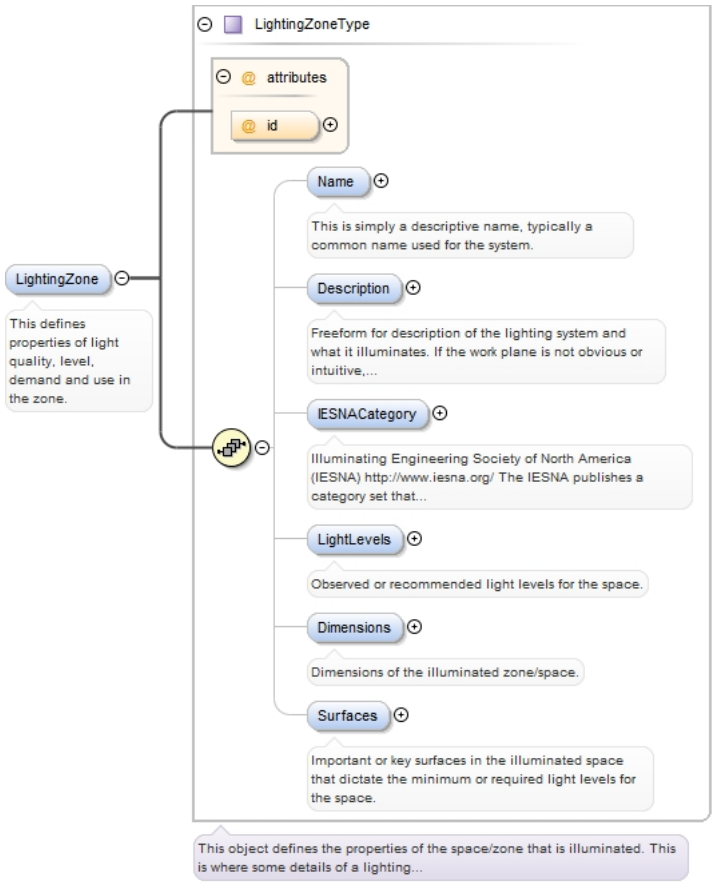
Namespace	No namespace
Annotations	This is the power factor of the ballast.
Diagram	
Type	restriction of xs:float
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	minInclusive 0
Source	<xs:element name="PowerFactor" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is the power factor of the ballast.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:float"> <xs:minInclusive value="0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element BallastPropertiesType / THD

Namespace	No namespace
Annotations	Total Harmonic Distortion
Diagram	
Type	restriction of xs:float
Properties	content: simple minOccurs: 0
Facets	maxInclusive 1 minInclusive 0
Source	<xs:element minOccurs="0" name="THD"> <xs:annotation> <xs:documentation>Total Harmonic Distortion</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:float"> <xs:minInclusive value="0"/> <xs:maxInclusive value="1"/> </xs:restriction> </xs:simpleType> </xs:element>

Element LightingSystemType / LightingZone

Namespace	No namespace
Annotations	This defines properties of light quality, level, demand and use in the zone.

Diagram	
Type	LightingZoneType
Properties	content: `complex` minOccurs: `0` maxOccurs: `unbounded`
Model	Name{0,1} , Description{0,1} , IESNACategory{0,1} , LightLevels{0,1} , Dimensions{0,1} , Surfaces{0,1}
Children	Description, Dimensions, IESNACategory, LightLevels, Name, Surfaces

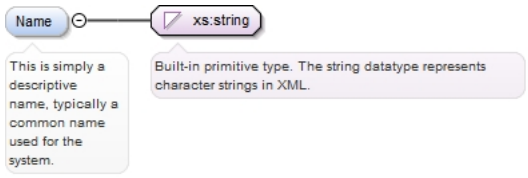
`Instance`	`<LightingZone id="">`
	`  <Name>{0,1}</Name>`
	`  <Description>{0,1}</Description>`
	`  <IESNACategory>{0,1}</IESNACategory>`
	`  <LightLevels>{0,1}</LightLevels>`
	`  <Dimensions>{0,1}</Dimensions>`
	`  <Surfaces>{0,1}</Surfaces>`
	`</LightingZone>`

Attributes	**QName** | **Type** | **Fixed** | **Default** | **Use** **id** | xs:ID | | | optional

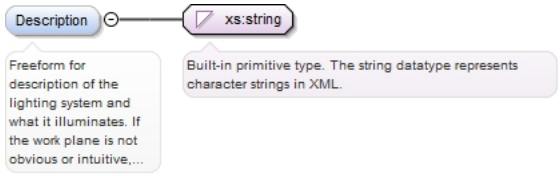
`Source`	`<xs:element maxOccurs="unbounded" minOccurs="0" name="LightingZone"`
	` type="LightingZoneType">`
	`  <xs:annotation>`
	`  <xs:documentation>This defines properties of light quality, level, demand and use in the zone.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element `LightingZoneType / Name`

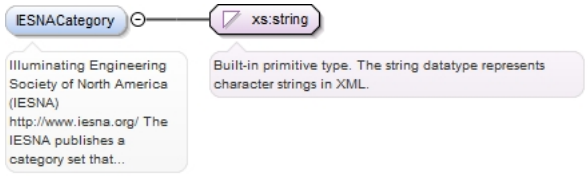
Namespace	No namespace
Annotations	`This is simply a descriptive name, typically a common name used for the system.`

Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is simply a descriptive name, typically a common name used for the system.</xs:documentation> </xs:annotation> </xs:element>

Element LightingZoneType / Description

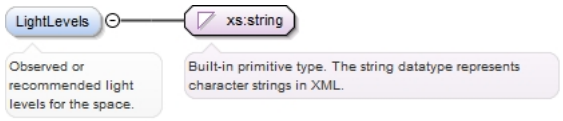
Namespace	No namespace
Annotations	Freeform for description of the lighting system and what it illuminates. If the work plane is not obvious or intuitive, it should be defined here.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Freeform for description of the lighting system and what it illuminates. If the work plane is not obvious or intuitive, it should be defined here.</xs:documentation> </xs:annotation> </xs:element>

Element LightingZoneType / IESNACategory

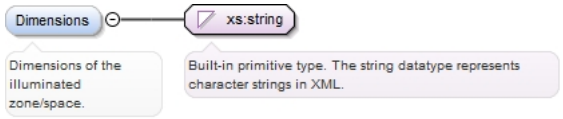
Namespace	No namespace
Annotations	Illuminating Engineering Society of North America (IESNA) http://www.iesna.org/ The IESNA publishes a category set that describes the use case for lighting in a space. This listing can be found here:
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="IESNACategory" type="xs:string"> <xs:annotation> <xs:documentation>Illuminating Engineering Society of North America (IESNA) http://www.iesna.org/ The IESNA publishes a category set that describes the use case for lighting in a space. This listing can be found here:</xs:documentation>

```
  </xs:annotation>
</xs:element>
```

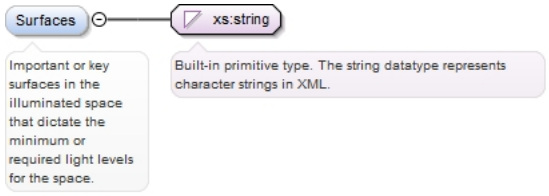
Element LightingZoneType / LightLevels

Namespace	No namespace
Annotations	Observed or recommended light levels for the space.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="LightLevels" type="xs:string"> <xs:annotation> <xs:documentation>Observed or recommended light levels for the space.</ xs:documentation> </xs:annotation> </xs:element>

Element LightingZoneType / Dimensions

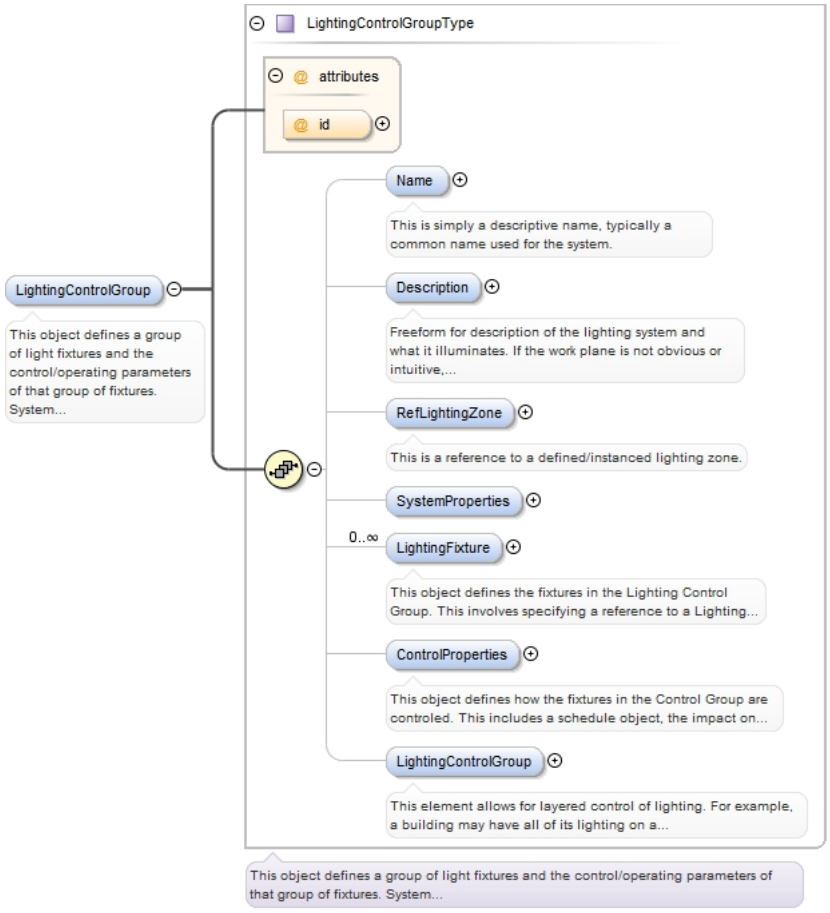
Namespace	No namespace
Annotations	Dimensions of the illuminated zone/space.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="Dimensions" type="xs:string"> <xs:annotation> <xs:documentation>Dimensions of the illuminated zone/space.</xs:documentation> </xs:annotation> </xs:element>

Element LightingZoneType / Surfaces

Namespace	No namespace
Annotations	Important or key surfaces in the illuminated space that dictate the minimum or required light levels for the space.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="Surfaces" type="xs:string"> <xs:annotation> <xs:documentation>Important or key surfaces in the illuminated space that dictate the minimum or required light levels for the space.</xs:documentation> </xs:annotation> </xs:element>

Element LightingSystemType / LightingControlGroup

Namespace	No namespace

Annotations	`This object defines a group of light fixtures and the control/operating parameters of that group of fixtures. System properties are contained here.`
Diagram	
Type	LightingControlGroupType
Properties	content: `complex` minOccurs: `0` maxOccurs: `unbounded`
Model	Name{0,1} , Description{0,1} , RefLightingZone{0,1} , SystemProperties{0,1} , LightingFixture* , ControlProperties{0,1} , LightingControlGroup{0,1}
Children	ControlProperties, Description, LightingControlGroup, LightingFixture, Name, RefLightingZone, SystemProperties

`Instance`	`<LightingControlGroup id="">`
	`  <Name>{0,1}</Name>`
	`  <Description>{0,1}</Description>`
	`  <RefLightingZone>{0,1}</RefLightingZone>`
	`  <SystemProperties>{0,1}</SystemProperties>`
	`  <LightingFixture EquipmentDefinitionIdRef="" id="">{0,unbounded}</LightingFixture>`
	`  <ControlProperties>{0,1}</ControlProperties>`
	`  <LightingControlGroup id="">{0,1}</LightingControlGroup>`
	`</LightingControlGroup>`

Attributes

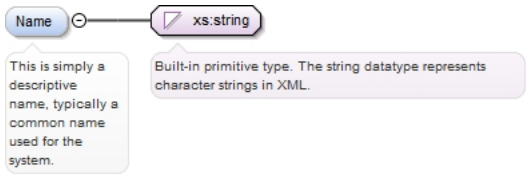
QName	Type	Fixed	Default	Use
id	xs:ID			optional

`Source`

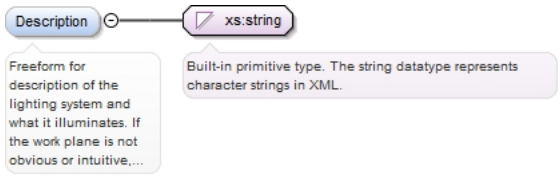
```
<xs:element maxOccurs="unbounded" minOccurs="0" name="LightingControlGroup"
 type="LightingControlGroupType">
  <xs:annotation>
    <xs:documentation>This object defines a group of light fixtures and the control/
operating parameters of that group of fixtures. System properties are contained here.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

Element `LightingControlGroupType / Name`

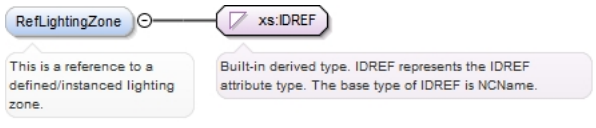
Namespace	No namespace

Annotations	This is simply a descriptive name, typically a common name used for the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is simply a descriptive name, typically a common name used for the system.</xs:documentation> </xs:annotation> </xs:element>

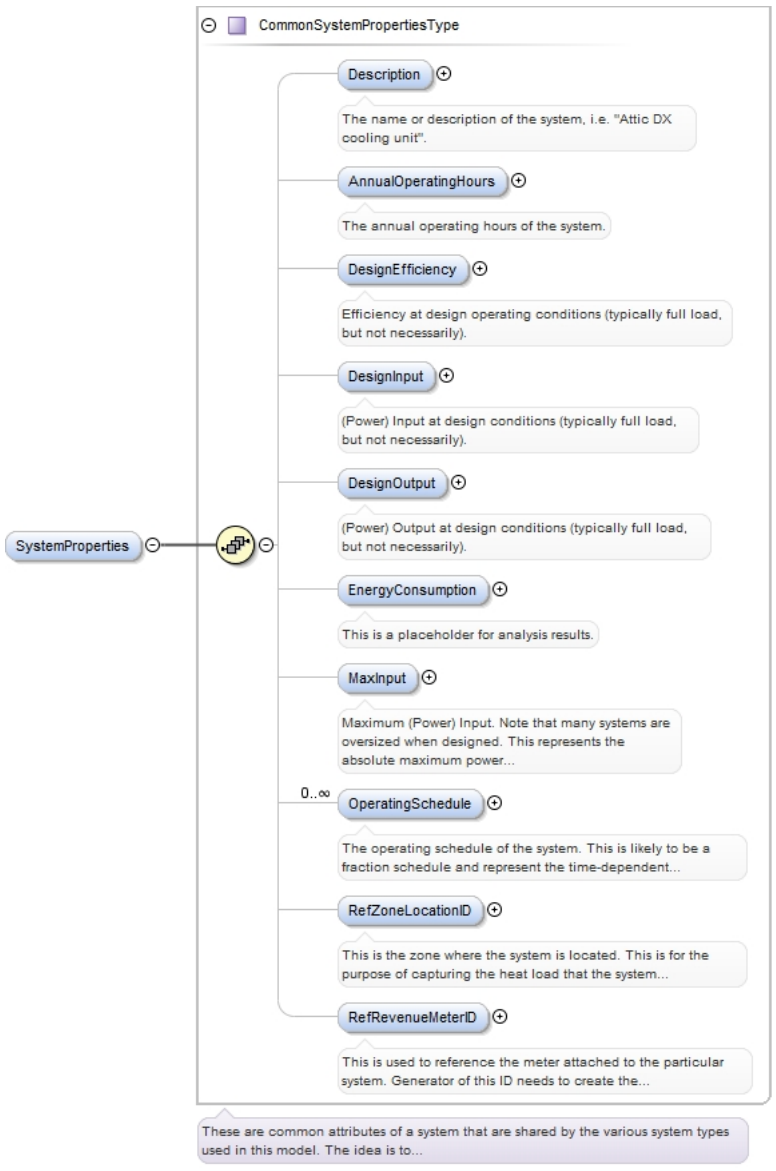
Element LightingControlGroupType / Description

Namespace	No namespace
Annotations	Freeform for description of the lighting system and what it illuminates. If the work plane is not obvious or intuitive, it should be defined here.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Freeform for description of the lighting system and what it illuminates. If the work plane is not obvious or intuitive, it should be defined here.</xs:documentation> </xs:annotation> </xs:element>

Element LightingControlGroupType / RefLightingZone

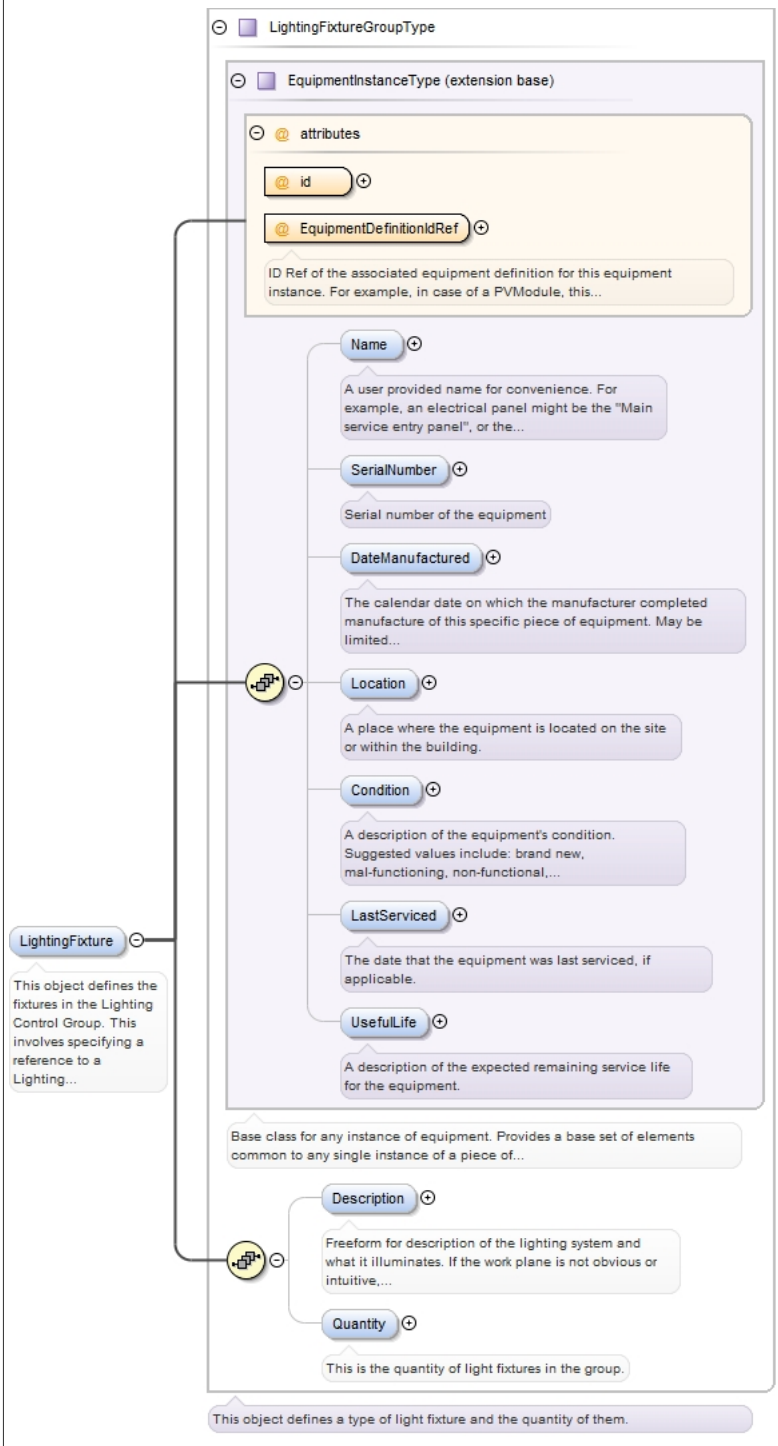
Namespace	No namespace
Annotations	This is a reference to a defined/instanced lighting zone.
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="RefLightingZone" type="xs:IDREF"> <xs:annotation> <xs:documentation>This is a reference to a defined/instanced lighting zone.</xs:documentation> </xs:annotation> </xs:element>

Element LightingControlGroupType / SystemProperties

Namespace	No namespace
Diagram	
Type	CommonSystemPropertiesType
Properties	content: complex minOccurs: 0
Model	Description{0,1} , AnnualOperatingHours{0,1} , DesignEfficiency{0,1} , DesignInput{0,1} , DesignOutput{0,1} , EnergyConsumption{0,1} , MaxInput{0,1} , OperatingSchedule* , RefZoneLocationID{0,1} , RefRevenueMeterID{0,1}
Children	AnnualOperatingHours, Description, DesignEfficiency, DesignInput, DesignOutput, EnergyConsumption, MaxInput, OperatingSchedule, RefRevenueMeterID, RefZoneLocationID
Instance	<SystemProperties> <Description>{0,1}</Description> <AnnualOperatingHours>{0,1}</AnnualOperatingHours> <DesignEfficiency TestCondition="" Unit="" UnitDesc="">{0,1}</DesignEfficiency> <DesignInput Fuel="Electricity" FuelDesc="Electricity" TestCondition="" Unit="" UnitDesc="kwh">{0,1}</DesignInput> <DesignOutput Fuel="Electricity" FuelDesc="Electricity" TestCondition="" Unit="" UnitDesc="kwh">{0,1}</DesignOutput> <EnergyConsumption RevenueMeterIdRef="">{0,1}</EnergyConsumption> <MaxInput Fuel="Electricity" FuelDesc="Electricity" TestCondition="" Unit="" UnitDesc="kwh">{0,1}</MaxInput> <OperatingSchedule>{0,unbounded}</OperatingSchedule> <RefZoneLocationID>{0,1}</RefZoneLocationID>

	<RefRevenueMeterID>{0,1}</RefRevenueMeterID> </SystemProperties>
Source	<xs:element minOccurs="0" name="SystemProperties" type="CommonSystemPropertiesType"/>

Element LightingControlGroupType / LightingFixture

Namespace	No namespace
Annotations	This object defines the fixtures in the Lighting Control Group. This involves specifying a reference to a Lighting Fixture Type defined in the Lighting System and a quantity of the Fixture Type.
Diagram	
Type	LightingFixtureGroupType
Type hierarchy	• EquipmentInstanceType • LightingFixtureGroupType

Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1} , Description{0,1} , Quantity{0,1}
Children	Condition, DateManufactured, Description, LastServiced, Location, Name, Quantity, SerialNumber, UsefulLife

Instance

```
<LightingFixture EquipmentDefinitionIdRef="" id="">
  <Name>{0,1}</Name>
  <SerialNumber>{0,1}</SerialNumber>
  <DateManufactured>{0,1}</DateManufactured>
  <Location>{0,1}</Location>
  <Condition>{0,1}</Condition>
  <LastServiced>{0,1}</LastServiced>
  <UsefulLife>{0,1}</UsefulLife>
  <Description>{0,1}</Description>
  <Quantity>{0,1}</Quantity>
</LightingFixture>
```

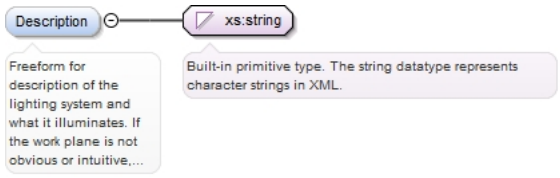
Attributes

QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			required
	ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.			
id	xs:ID			required

Source

```
<xs:element maxOccurs="unbounded" minOccurs="0" name="LightingFixture"
 type="LightingFixtureGroupType">
  <xs:annotation>
    <xs:documentation>This object defines the fixtures in the Lighting Control Group. This
 involves specifying a reference to a Lighting Fixture Type defined in the Lighting System
 and a quantity of the Fixture Type.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element LightingFixtureGroupType / Description

Namespace	No namespace
Annotations	Freeform for description of the lighting system and what it illuminates. If the work plane is not obvious or intuitive, it should be defined here.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source

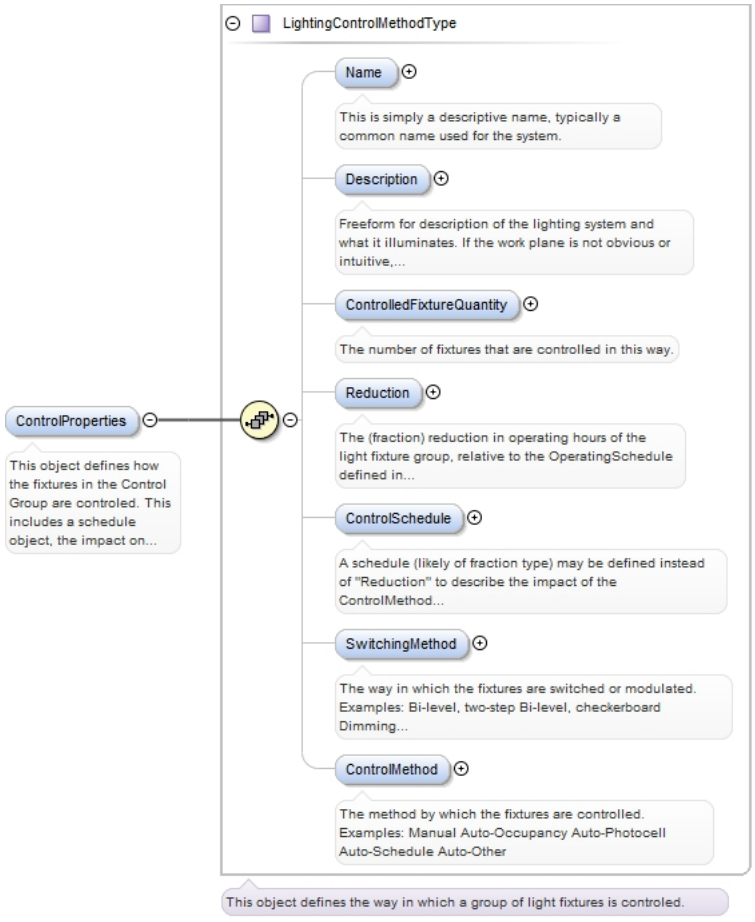
```
<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>Freeform for description of the lighting system and what it
 illuminates. If the work plane is not obvious or intuitive, it should be defined here.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

Element LightingFixtureGroupType / Quantity

Namespace	No namespace
Annotations	This is the quantity of light fixtures in the group.
Diagram	

Type	restriction of xs:int
Properties	content: simple minOccurs: 0
Facets	minInclusive 0
Source	<xs:element minOccurs="0" name="Quantity"> <xs:annotation> <xs:documentation>This is the quantity of light fixtures in the group.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:int"> <xs:minInclusive value="0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element LightingControlGroupType / ControlProperties

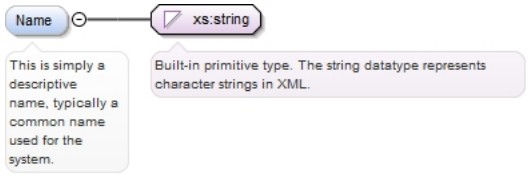
Namespace	No namespace
Annotations	This object defines how the fixtures in the Control Group are controled. This includes a schedule object, the impact on the operating hours if an automatic control type is defined, the way in which the fixtures are controled (auto, manual, etc.), and the switching method (the way that the light output is modulated - dimming, on/off, bi-level...).
Diagram	
Type	LightingControlMethodType
Properties	content: complex minOccurs: 0
Model	Name{0,1} , Description{0,1} , ControlledFixtureQuantity{0,1} , Reduction{0,1} , ControlSchedule{0,1} , SwitchingMethod{0,1} , ControlMethod{0,1}
Children	ControlMethod, ControlSchedule, ControlledFixtureQuantity, Description, Name, Reduction, SwitchingMethod
Instance	<ControlProperties>

```
  <Name>{0,1}</Name>
  <Description>{0,1}</Description>
  <ControlledFixtureQuantity>{0,1}</ControlledFixtureQuantity>
  <Reduction>{0,1}</Reduction>
  <ControlSchedule>{0,1}</ControlSchedule>
  <SwitchingMethod>{0,1}</SwitchingMethod>
  <ControlMethod>{0,1}</ControlMethod>
</ControlProperties>
```

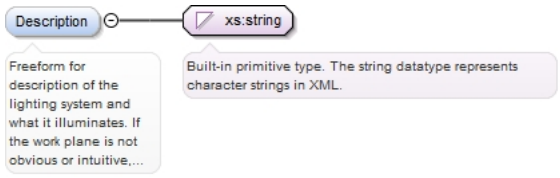
Source

```
<xs:element name="ControlProperties" type="LightingControlMethodType" minOccurs="0">
  <xs:annotation>
    <xs:documentation>This object defines how the fixtures in the Control Group are
 controled. This includes a schedule object, the impact on the operating hours if an
 automatic control type is defined, the way in which the fixtures are controled (auto,
 manual, etc.), and the switching method (the way that the light output is modulated -
 dimming, on/off, bi-level...).</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element LightingControlMethodType / Name

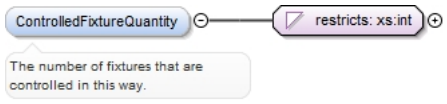
Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is simply a descriptive name, typically a common name used for the system.</xs:documentation> </xs:annotation> </xs:element>

Element LightingControlMethodType / Description

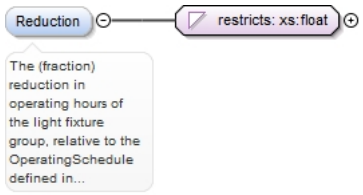
Namespace	No namespace
Annotations	Freeform for description of the lighting system and what it illuminates. If the work plane is not obvious or intuitive, it should be defined here.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Freeform for description of the lighting system and what it illuminates. If the work plane is not obvious or intuitive, it should be defined here.</xs:documentation> </xs:annotation> </xs:element>

Element LightingControlMethodType / ControlledFixtureQuantity

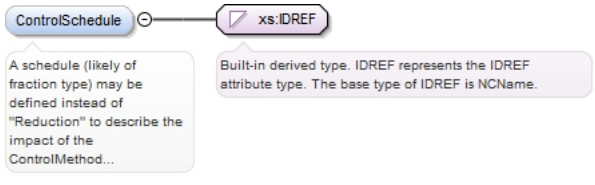
Namespace	No namespace
Annotations	The number of fixtures that are controlled in this way.

Diagram	
Type	restriction of xs:int
Properties	content: simple minOccurs: 0
Facets	minInclusive 0
Source	<xs:element minOccurs="0" name="ControlledFixtureQuantity"> <xs:annotation> <xs:documentation>The number of fixtures that are controlled in this way.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:int"> <xs:minInclusive value="0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element LightingControlMethodType / Reduction

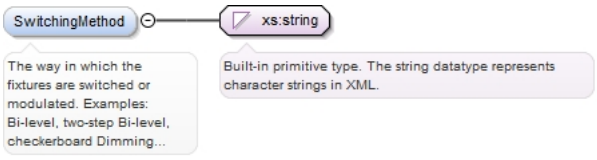
Namespace	No namespace
Annotations	The (fraction) reduction in operating hours of the light fixture group, relative to the OperatingSchedule defined in SystemProperties, that results from the ControlMethod and SwitchingMethod.
Diagram	
Type	restriction of xs:float
Properties	content: simple minOccurs: 0
Facets	maxInclusive 1 minInclusive 0
Source	<xs:element minOccurs="0" name="Reduction"> <xs:annotation> <xs:documentation>The (fraction) reduction in operating hours of the light fixture group, relative to the OperatingSchedule defined in SystemProperties, that results from the ControlMethod and SwitchingMethod.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:float"> <xs:minInclusive value="0"/> <xs:maxInclusive value="1"/> </xs:restriction> </xs:simpleType> </xs:element>

Element LightingControlMethodType / ControlSchedule

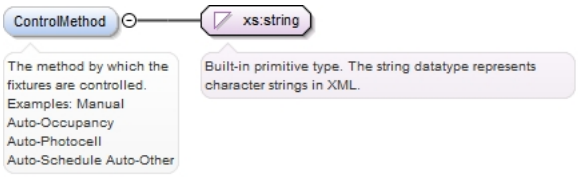
Namespace	No namespace
Annotations	A schedule (likely of fraction type) may be defined instead of "Reduction" to describe the impact of the ControlMethod and SwitchingMethod on the operation/operating-hours of the Fixtures.
Diagram	

Type	xs:IDREF
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="ControlSchedule" type="xs:IDREF"> <xs:annotation> <xs:documentation>A schedule (likely of fraction type) may be defined instead of "Reduction" to describe the impact of the ControlMethod and SwitchingMethod on the operation/operating-hours of the Fixtures.</xs:documentation> </xs:annotation> </xs:element>

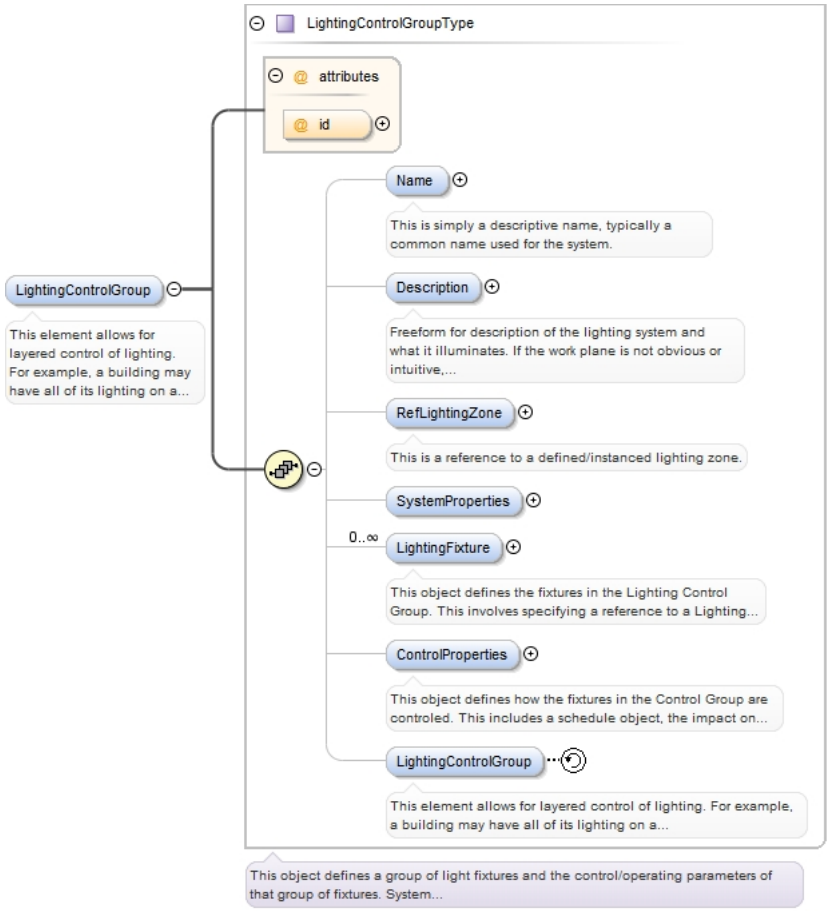
Element LightingControlMethodType / SwitchingMethod

Namespace	No namespace
Annotations	The way in which the fixtures are switched or modulated. Examples: Bi-level, two-step Bi-level, checkerboard Dimming Three Position Switch On/Off Other
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="SwitchingMethod" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The way in which the fixtures are switched or modulated. Examples: Bi-level, two-step Bi-level, checkerboard Dimming Three Position Switch On/Off Other</xs:documentation> </xs:annotation> </xs:element>

Element LightingControlMethodType / ControlMethod

Namespace	No namespace
Annotations	The method by which the fixtures are controlled. Examples: Manual Auto-Occupancy Auto-Photocell Auto-Schedule Auto-Other
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="ControlMethod" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The method by which the fixtures are controlled. Examples: Manual Auto-Occupancy Auto-Photocell Auto-Schedule Auto-Other</xs:documentation> </xs:annotation> </xs:element>

Element `LightingControlGroupType / LightingControlGroup`

Namespace	No namespace
Annotations	`This element allows for layered control of lighting. For example, a building may have all of its lighting on a timeclock that turns off power to all of the lighting system at night. In addition, the light fixtures in an open office area may be manually switched. The light fixtures in another exterior office are may be on an occupancy and/or daylight sensor. In this example, some light fixtures have multiple layers of control.`
Diagram	
Type	LightingControlGroupType
Properties	content: `complex` minOccurs: `0`
Model	Name{0,1} , Description{0,1} , RefLightingZone{0,1} , SystemProperties{0,1} , LightingFixture* , ControlProperties{0,1} , LightingControlGroup{0,1}
Children	ControlProperties, Description, LightingControlGroup, LightingFixture, Name, RefLightingZone, SystemProperties

`Instance`	`<LightingControlGroup id="">`
	`  <Name>{0,1}</Name>`
	`  <Description>{0,1}</Description>`
	`  <RefLightingZone>{0,1}</RefLightingZone>`
	`  <SystemProperties>{0,1}</SystemProperties>`
	`  <LightingFixture EquipmentDefinitionIdRef="" id="">{0,unbounded}</LightingFixture>`
	`  <ControlProperties>{0,1}</ControlProperties>`
	`  <LightingControlGroup id="">{0,1}</LightingControlGroup>`
	`</LightingControlGroup>`

Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			optional

`Source`

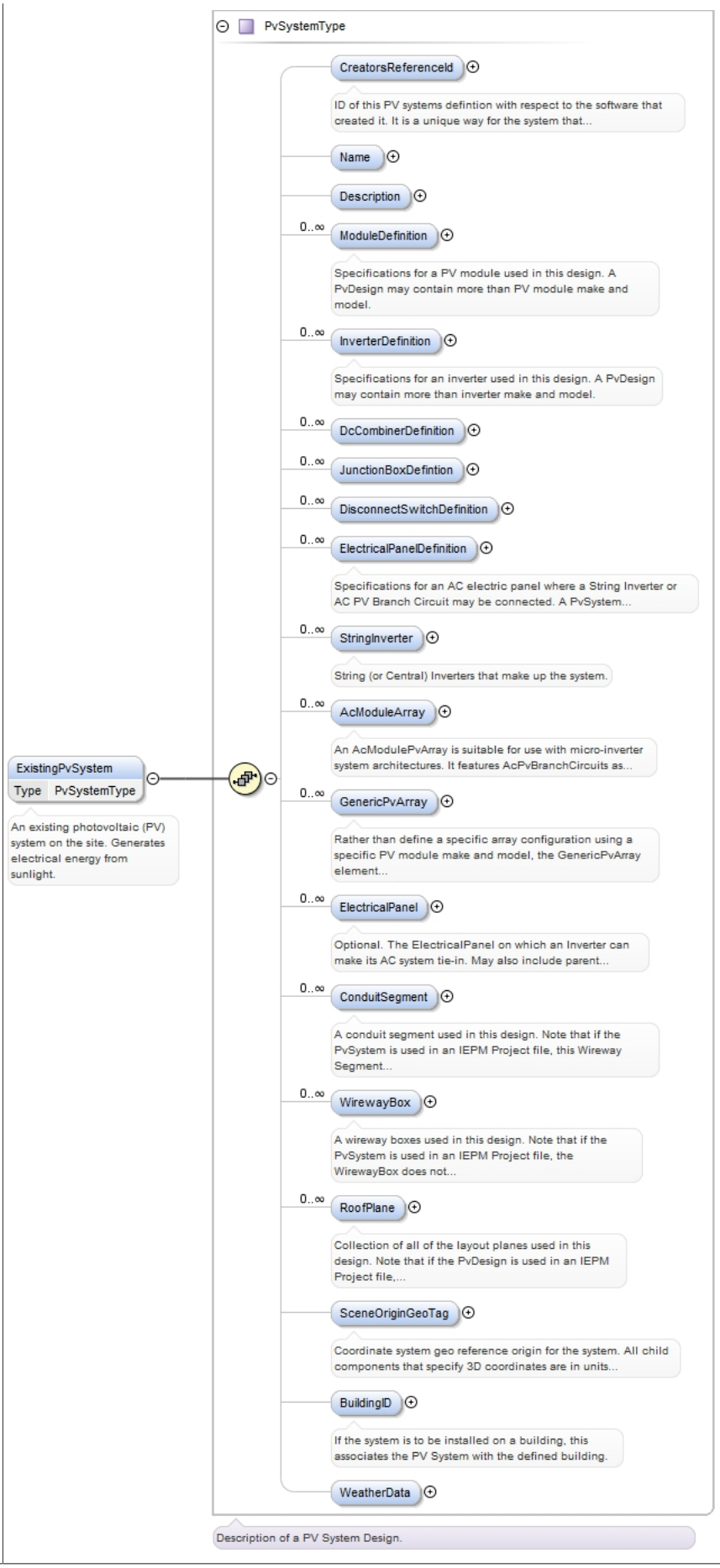
```
<xs:element minOccurs="0" name="LightingControlGroup" type="LightingControlGroupType">
  <xs:annotation>
    <xs:documentation>This element allows for layered control of lighting. For example,
 a building may have all of its lighting on a timeclock that turns off power to all of
 the lighting system at night. In addition, the light fixtures in an open office area
 may be manually switched. The light fixtures in another exterior office are may be on
 an occupancy and/or daylight sensor. In this example, some light fixtures have multiple
 layers of control.</xs:documentation>
```

```
  </xs:annotation>
</xs:element>
```

Element `ProjectType / ExistingPvSystem`

Namespace	No namespace
Annotations	`An existing photovoltaic (PV) system on the site. Generates electrical energy from sunlight.`

Diagram

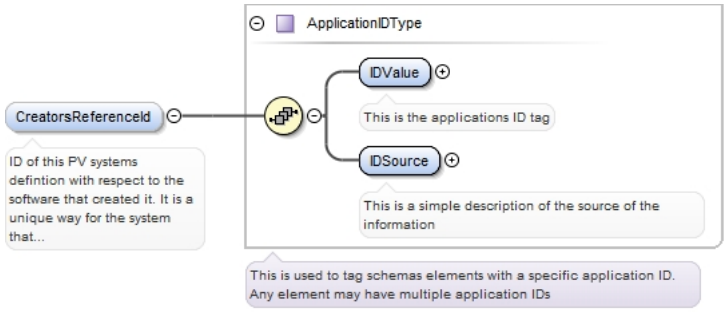

PvSystemType
CreatorsReferenceId
ID of this PV systems defintion with respect to the software that created it. It is a unique way for the system that...
Name
Description
0..∞
ModuleDefinition
Specifications for a PV module used in this design. A PvDesign may contain more than PV module make and model.
0..∞
InverterDefinition
Specifications for an inverter used in this design. A PvDesign may contain more than inverter make and model.
0..∞
DcCombinerDefinition
0..∞
JunctionBoxDefintion
0..∞
DisconnectSwitchDefinition
0..∞
ElectricalPanelDefinition
Specifications for an AC electric panel where a String Inverter or AC PV Branch Circuit may be connected. A PvSystem...
0..∞
StringInverter
String (or Central) Inverters that make up the system.
0..∞
AcModuleArray
An AcModulePvArray is suitable for use with micro-inverter system architectures. It features AcPvBranchCircuits as...
0..∞
GenericPvArray
Rather than define a specific array configuration using a specific PV module make and model, the GenericPvArray element...
0..∞
ElectricalPanel
Optional. The ElectricalPanel on which an Inverter can make its AC system tie-in. May also include parent...
0..∞
ConduitSegment
A conduit segment used in this design. Note that if the PvSystem is used in an IEPM Project file, this Wireway Segment...
0..∞
WirewayBox
A wireway boxes used in this design. Note that if the PvSystem is used in an IEPM Project file, the WirewayBox does not...
0..∞
RoofPlane
Collection of all of the layout planes used in this design. Note that if the PvDesign is used in an IEPM Project file,...
SceneOriginGeoTag
Coordinate system geo reference origin for the system. All child components that specify 3D coordinates are in units...
BuildingID
If the system is to be installed on a building, this associates the PV System with the defined building.
WeatherData
Description of a PV System Design.
ExistingPvSystem
Type
PvSystemType
An existing photovoltaic (PV) system on the site. Generates electrical energy from sunlight.

Type	PvSystemType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded nillable: false
Model	CreatorsReferenceId{0,1} , Name{0,1} , Description{0,1} , ModuleDefinition* , InverterDefinition* , DcCombinerDefinition* , JunctionBoxDefintion* , DisconnectSwitchDefinition* , ElectricalPanelDefinition* , StringInverter* , AcModuleArray* , GenericPvArray* , ElectricalPanel* , ConduitSegment* , WirewayBox* , RoofPlane* , SceneOriginGeoTag{0,1} , BuildingID{0,1} , WeatherData{0,1}
Children	AcModuleArray, BuildingID, ConduitSegment, CreatorsReferenceId, DcCombinerDefinition, Description, DisconnectSwitchDefinition, ElectricalPanel, ElectricalPanelDefinition, GenericPvArray, InverterDefinition, JunctionBoxDefintion, ModuleDefinition, Name, RoofPlane, SceneOriginGeoTag, StringInverter, WeatherData, WirewayBox

Instance	<pre><ExistingPvSystem>
	  <CreatorsReferenceId>{0,1}</CreatorsReferenceId>
	  <Name>{0,1}</Name>
	  <Description>{0,1}</Description>
	  <ModuleDefinition id="">{0,unbounded}</ModuleDefinition>
	  <InverterDefinition id="">{0,unbounded}</InverterDefinition>
	  <DcCombinerDefinition id="">{0,unbounded}</DcCombinerDefinition>
	  <JunctionBoxDefintion id="">{0,unbounded}</JunctionBoxDefintion>
	  <DisconnectSwitchDefinition id="">{0,unbounded}</DisconnectSwitchDefinition>
	  <ElectricalPanelDefinition id="">{0,unbounded}</ElectricalPanelDefinition>
	  <StringInverter EquipmentDefinitionIdRef="" id="">{0,unbounded}</StringInverter>
	  <AcModuleArray Id="" MicroInverterDefinitionIdRef="" PvModuleDefinitionIdRef="">{0,unbounded}</
	AcModuleArray>
	  <GenericPvArray Id="">{0,unbounded}</GenericPvArray>
	  <ElectricalPanel EquipmentDefinitionIdRef="" id="">{0,unbounded}</ElectricalPanel>
	  <ConduitSegment EquipmentDefinitionIdRef="" id="">{0,unbounded}</ConduitSegment>
	  <WirewayBox EquipmentDefinitionIdRef="" id="">{0,unbounded}</WirewayBox>
	  <RoofPlane id="">{0,unbounded}</RoofPlane>
	  <SceneOriginGeoTag>{0,1}</SceneOriginGeoTag>
	  <BuildingID>{0,1}</BuildingID>
	  <WeatherData>{0,1}</WeatherData>
	</ExistingPvSystem></pre>

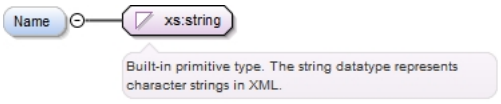
Source	<pre><xs:element name="ExistingPvSystem" nillable="false" minOccurs="0" maxOccurs="unbounded"
	 type="PvSystemType">
	  <xs:annotation>
	  <xs:documentation>An existing photovoltaic (PV) system on the site. Generates
	 electrical energy from sunlight.</xs:documentation>
	  </xs:annotation>
	</xs:element></pre>

Element PvSystemType / CreatorsReferenceId

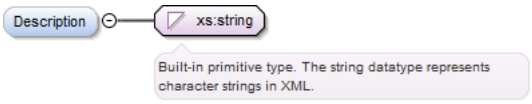
Namespace	No namespace
Annotations	ID of this PV systems defintion with respect to the software that created it. It is a unique way for the system that created it to know what data in its database that this PV System XML instance refers to.
Diagram	
Type	ApplicationIDType
Properties	content: complex minOccurs: 0
Model	IDValue , IDSource
Children	IDSource, IDValue
Instance	<pre><CreatorsReferenceId></pre>

	<IDValue>{1,1}</IDValue> <IDSource>{1,1}</IDSource> </CreatorsReferenceId>
Source	<xs:element minOccurs="0" name="CreatorsReferenceId" type="ApplicationIDType"> <xs:annotation> <xs:documentation>ID of this PV systems defintion with respect to the software that created it. It is a unique way for the system that created it to know what data in its database that this PV System XML instance refers to.</xs:documentation> </xs:annotation> </xs:element>

Element PvSystemType / Name

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element minOccurs="0" name="Name" type="xs:string" maxOccurs="1"/>

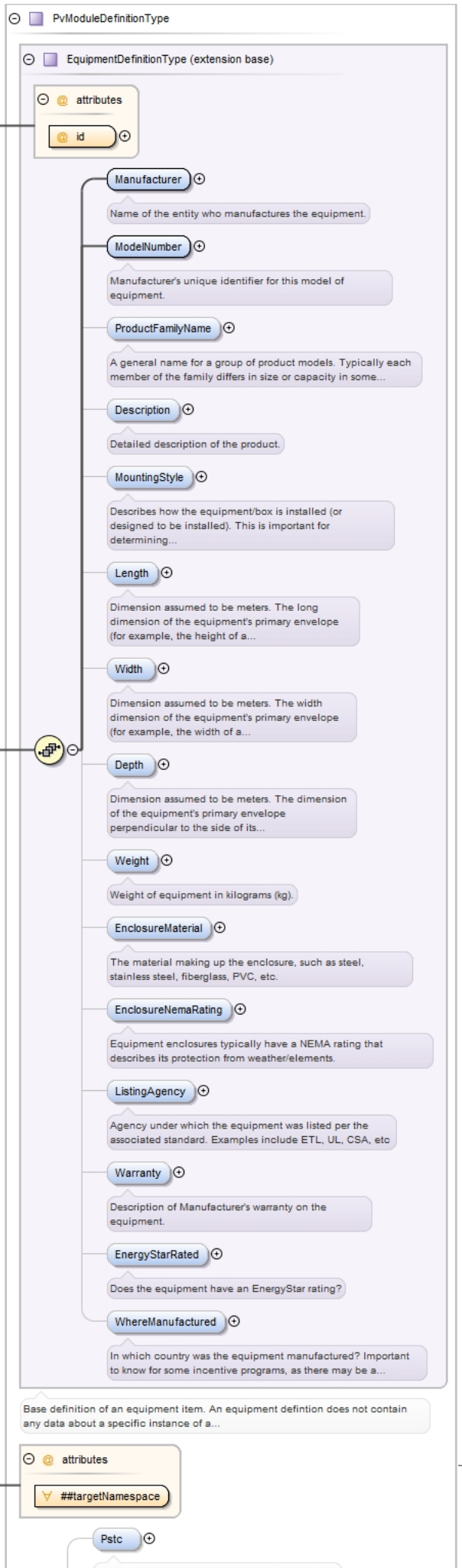
Element PvSystemType / Description

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element minOccurs="0" name="Description" type="xs:string" maxOccurs="1"/>

Element PvSystemType / ModuleDefinition

Namespace	No namespace
Annotations	Specifications for a PV module used in this design. A PvDesign may contain more than PV module make and model.

Diagram


PvModuleDefinitionType
EquipmentDefinitionType (extension base)
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...
attributes
##targetNamespace
Pstc

Type	PvModuleDefinitionType
Type hierarchy	• EquipmentDefinitionType • PvModuleDefinitionType
Properties	content: `complex` minOccurs: `0` maxOccurs: `unbounded`
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1} , Pstc{0,1} , PstcToleranceHighPercent{0,1} , PstcToleranceLowPercent{0,1} , Pptc{0,1} , Vmpp{0,1} , Impp{0,1} , Voc{0,1} , Isc{0,1} , MaxSystemVoltage{0,1} , MaxSystemCurrent{0,1} , FuseRating{0,1} , Noct{0,1} , VocTempCoefficient{0,1} , IscTempCoefficient{0,1} , MaxPowerTempCoefficient{0,1} , ModuleEfficiency{0,1} , CellEfficiency{0,1} , CellTechnology{0,1} , ModuleConstruction{0,1} , BIPV{0,1} , CableConnector{0,1} , CableDiameter{0,1} , ConnectorCableLength{0,1} , CellDimensions{0,1} , CellCount{0,1} , BypassDiodeCount{0,1} , ParallelSubstrings{0,1} , DepthWithJunctionBox{0,1} , FrameMaterial{0,1} , FrameColor{0,1} , BacksheetColor{0,1} , PowerWarranty* , Compliances{0,1} , UL1703Compliant{0,1} , NrtlCertifyingUl1703Compliance{0,1} , CsiApproved{0,1} , CecVmppLowLight{0,1} , CecImppLowLight{0,1} , CecVmppNoct{0,1} , CecImppNoct{0,1} , CecGeometricMultipl{0,1} , MeasurementDate{0,1} , FiveParamAref{0,1} , FiveParamILref{0,1} , FiveParamIoref{0,1} , FiveParamRs{0,1} , FiveParamRshref{0,1} , FiveParamAdjust{0,1} , SandiaIxo{0,1} , SandiaIxxo{0,1} , SandiaDiodeFactor{0,1} , SandiaThermalVoltage{0,1} , SandiaMbVoc{0,1} , SandiaMbVmpp{0,1} , GammaPmppPercent{0,1} , BetaVocPercent{0,1} , BetaMppPercent{0,1} , AlphaIscPercent{0,1} , AlphaImppPercent{0,1} , SandiaTempFactorA{0,1} , SandiaTempFactorB{0,1} , SandiaCoefA0{0,1} , SandiaCoefA1{0,1} , SandiaCoefA2{0,1} , SandiaCoefA3{0,1} , SandiaCoefA4{0,1} , SandiaCoefB0{0,1} , SandiaCoefB1{0,1} , SandiaCoefB2{0,1} , SandiaCoefB3{0,1} , SandiaCoefB4{0,1} , SandiaCoefB5{0,1} , SandiaCoefC0{0,1} , SandiaCoefC1{0,1} , SandiaCoefC2{0,1} , SandiaCoefC3{0,1} , SandiaCoefC4{0,1} , SandiaCoefC5{0,1} , SandiaCoefC6{0,1} , SandiaCoefC7{0,1} , SandiaDiffuseAcceptanceFactor{0,1} , Notes{0,1}
Children	AlphaImppPercent, AlphaIscPercent, BIPV, BacksheetColor, BetaMppPercent, BetaVocPercent, BypassDiodeCount, CableConnector, CableDiameter, CecGeometricMultipl, CecImppLowLight, CecImppNoct, CecVmppLowLight, CecVmppNoct, CellCount, CellDimensions, CellEfficiency, CellTechnology, Compliances, ConnectorCableLength, CsiApproved, Depth, DepthWithJunctionBox, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, FiveParamAdjust, FiveParamAref, FiveParamILref, FiveParamIoref, FiveParamRs, FiveParamRshref, FrameColor, FrameMaterial, FuseRating, GammaPmppPercent, Impp, Isc, IscTempCoefficient, Length, ListingAgency, Manufacturer, MaxPowerTempCoefficient, MaxSystemCurrent, MaxSystemVoltage, MeasurementDate, ModelNumber, ModuleConstruction, ModuleEfficiency, MountingStyle, Noct, Notes, NrtlCertifyingUl1703Compliance, ParallelSubstrings, PowerWarranty, Pptc, ProductFamilyName, Pstc, PstcToleranceHighPercent, PstcToleranceLowPercent, SandiaCoefA0, SandiaCoefA1, SandiaCoefA2, SandiaCoefA3, SandiaCoefA4, SandiaCoefB0, SandiaCoefB1, SandiaCoefB2, SandiaCoefB3, SandiaCoefB4, SandiaCoefB5, SandiaCoefC0, SandiaCoefC1, SandiaCoefC2, SandiaCoefC3, SandiaCoefC4, SandiaCoefC5, SandiaCoefC6, SandiaCoefC7, SandiaDiffuseAcceptanceFactor, SandiaDiodeFactor, SandiaIxo, SandiaIxxo, SandiaMbVmpp, SandiaMbVoc, SandiaTempFactorA, SandiaTempFactorB, SandiaThermalVoltage, UL1703Compliant, Vmpp, Voc, VocTempCoefficient, Warranty, Weight, WhereManufactured, Width

`Instance`	`<ModuleDefinition id="">`
	`  <Manufacturer>{1,1}</Manufacturer>`
	`  <ModelNumber>{1,1}</ModelNumber>`
	`  <ProductFamilyName>{0,1}</ProductFamilyName>`
	`  <Description>{0,1}</Description>`
	`  <MountingStyle>{0,1}</MountingStyle>`
	`  <Length>{0,1}</Length>`
	`  <Width>{0,1}</Width>`
	`  <Depth>{0,1}</Depth>`
	`  <Weight>{0,1}</Weight>`
	`  <EnclosureMaterial>{0,1}</EnclosureMaterial>`
	`  <EnclosureNemaRating>{0,1}</EnclosureNemaRating>`
	`  <ListingAgency>{0,1}</ListingAgency>`
	`  <Warranty>{0,1}</Warranty>`
	`  <EnergyStarRated>{0,1}</EnergyStarRated>`
	`  <WhereManufactured>{0,1}</WhereManufactured>`
	`  <Pstc>{0,1}</Pstc>`
	`  <PstcToleranceHighPercent>{0,1}</PstcToleranceHighPercent>`
	`  <PstcToleranceLowPercent>{0,1}</PstcToleranceLowPercent>`
	`  <Pptc>{0,1}</Pptc>`
	`  <Vmpp>{0,1}</Vmpp>`
	`  <Impp>{0,1}</Impp>`
	`  <Voc>{0,1}</Voc>`
	`  <Isc>{0,1}</Isc>`
	`  <MaxSystemVoltage>{0,1}</MaxSystemVoltage>`
	`  <MaxSystemCurrent>{0,1}</MaxSystemCurrent>`
	`  <FuseRating>{0,1}</FuseRating>`
	`  <Noct>{0,1}</Noct>`
	`  <VocTempCoefficient>{0,1}</VocTempCoefficient>`

```
  <IscTempCoefficient>{0,1}</IscTempCoefficient>
  <MaxPowerTempCoefficient>{0,1}</MaxPowerTempCoefficient>
  <ModuleEfficiency>{0,1}</ModuleEfficiency>
  <CellEfficiency>{0,1}</CellEfficiency>
  <CellTechnology>{0,1}</CellTechnology>
  <ModuleConstruction>{0,1}</ModuleConstruction>
  <BIPV>{0,1}</BIPV>
  <CableConnector>{0,1}</CableConnector>
  <CableDiameter>{0,1}</CableDiameter>
  <ConnectorCableLength>{0,1}</ConnectorCableLength>
  <CellDimensions>{0,1}</CellDimensions>
  <CellCount>{0,1}</CellCount>
  <BypassDiodeCount>{0,1}</BypassDiodeCount>
  <ParallelSubstrings>{0,1}</ParallelSubstrings>
  <DepthWithJunctionBox>{0,1}</DepthWithJunctionBox>
  <FrameMaterial>{0,1}</FrameMaterial>
  <FrameColor>{0,1}</FrameColor>
  <BacksheetColor>{0,1}</BacksheetColor>
  <PowerWarranty>{0,unbounded}</PowerWarranty>
  <Compliances>{0,1}</Compliances>
  <UL1703Compliant>{0,1}</UL1703Compliant>
  <NrtlCertifyingUl1703Compliance>{0,1}</NrtlCertifyingUl1703Compliance>
  <CsiApproved>{0,1}</CsiApproved>
  <CecVmppLowLight>{0,1}</CecVmppLowLight>
  <CecImppLowLight>{0,1}</CecImppLowLight>
  <CecVmppNoct>{0,1}</CecVmppNoct>
  <CecImppNoct>{0,1}</CecImppNoct>
  <CecGeometricMultipl>{0,1}</CecGeometricMultipl>
  <MeasurementDate>{0,1}</MeasurementDate>
  <FiveParamAref>{0,1}</FiveParamAref>
  <FiveParamILref>{0,1}</FiveParamILref>
  <FiveParamIoref>{0,1}</FiveParamIoref>
  <FiveParamRs>{0,1}</FiveParamRs>
  <FiveParamRshref>{0,1}</FiveParamRshref>
  <FiveParamAdjust>{0,1}</FiveParamAdjust>
  <SandiaIxo>{0,1}</SandiaIxo>
  <SandiaIxxo>{0,1}</SandiaIxxo>
  <SandiaDiodeFactor>{0,1}</SandiaDiodeFactor>
  <SandiaThermalVoltage>{0,1}</SandiaThermalVoltage>
  <SandiaMbVoc>{0,1}</SandiaMbVoc>
  <SandiaMbVmpp>{0,1}</SandiaMbVmpp>
  <GammaPmppPercent>{0,1}</GammaPmppPercent>
  <BetaVocPercent>{0,1}</BetaVocPercent>
  <BetaMppPercent>{0,1}</BetaMppPercent>
  <AlphaIscPercent>{0,1}</AlphaIscPercent>
  <AlphaImppPercent>{0,1}</AlphaImppPercent>
  <SandiaTempFactorA>{0,1}</SandiaTempFactorA>
  <SandiaTempFactorB>{0,1}</SandiaTempFactorB>
  <SandiaCoefA0>{0,1}</SandiaCoefA0>
  <SandiaCoefA1>{0,1}</SandiaCoefA1>
  <SandiaCoefA2>{0,1}</SandiaCoefA2>
  <SandiaCoefA3>{0,1}</SandiaCoefA3>
  <SandiaCoefA4>{0,1}</SandiaCoefA4>
  <SandiaCoefB0>{0,1}</SandiaCoefB0>
  <SandiaCoefB1>{0,1}</SandiaCoefB1>
  <SandiaCoefB2>{0,1}</SandiaCoefB2>
  <SandiaCoefB3>{0,1}</SandiaCoefB3>
  <SandiaCoefB4>{0,1}</SandiaCoefB4>
  <SandiaCoefB5>{0,1}</SandiaCoefB5>
  <SandiaCoefC0>{0,1}</SandiaCoefC0>
  <SandiaCoefC1>{0,1}</SandiaCoefC1>
  <SandiaCoefC2>{0,1}</SandiaCoefC2>
  <SandiaCoefC3>{0,1}</SandiaCoefC3>
  <SandiaCoefC4>{0,1}</SandiaCoefC4>
  <SandiaCoefC5>{0,1}</SandiaCoefC5>
  <SandiaCoefC6>{0,1}</SandiaCoefC6>
  <SandiaCoefC7>{0,1}</SandiaCoefC7>
  <SandiaDiffuseAcceptanceFactor>{0,1}</SandiaDiffuseAcceptanceFactor>
  <Notes>{0,1}</Notes>
</ModuleDefinition>
```

Attributes

QName	Type	Fixed	Default	Use
ANY attribute from TARGET namespace 'http://www.iepmodel.net'				
id	xs:ID			required

Source

```
<xs:element name="ModuleDefinition" type="PvModuleDefinitionType" minOccurs="0"
 maxOccurs="unbounded">
  <xs:annotation>
```

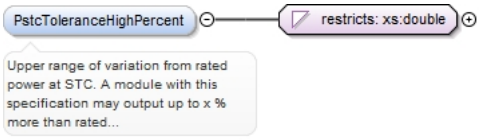
```
    <xs:documentation>Specifications for a PV module used in this design. A PvDesign may
 contain more than PV module make and model.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element PvModuleDefinitionType / Pstc

Namespace	No namespace
Annotations	Rated power output at Standard Test Conditions (stc).
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 800.0 minInclusive 1.0
Source	

```
<xs:element name="Pstc" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>Rated power output at Standard Test Conditions (stc).</
xs:documentation>
  </xs:annotation>
  <xs:simpleType>
    <xs:restriction base="xs:double">
      <xs:minInclusive value="1.0"/>
      <xs:maxInclusive value="800.0"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

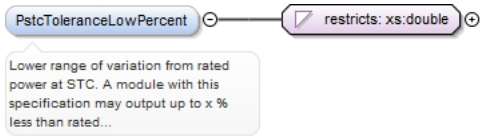
Element PvModuleDefinitionType / PstcToleranceHighPercent

Namespace	No namespace
Annotations	Upper range of variation from rated power at STC. A module with this specification may output up to x % more than rated Pstc.
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 20.0 minInclusive 0.0
Source	

```
<xs:element name="PstcToleranceHighPercent" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>Upper range of variation from rated power at STC. A module with this
 specification may output up to x % more than rated Pstc.</xs:documentation>
  </xs:annotation>
  <xs:simpleType>
    <xs:restriction base="xs:double">
      <xs:minInclusive value="0.0"/>
      <xs:maxInclusive value="20.0"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

Element PvModuleDefinitionType / PstcToleranceLowPercent

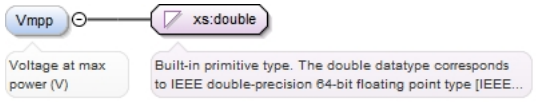
Namespace	No namespace

Annotations	Lower range of variation from rated power at STC. A module with this specification may output up to x % less than rated Pstc.
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 0.0 minInclusive -20.0
Source	<xs:element name="PstcToleranceLowPercent" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Lower range of variation from rated power at STC. A module with this specification may output up to x % less than rated Pstc.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="-20.0"/> <xs:maxInclusive value="0.0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / Pptc

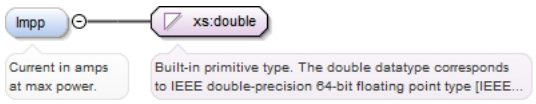
Namespace	No namespace
Annotations	Rated power at PVUSA test conditions (PTC).
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 800.0 minInclusive 1.0
Source	<xs:element name="Pptc" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Rated power at PVUSA test conditions (PTC).</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="1.0"/> <xs:maxInclusive value="800.0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / Vmpp

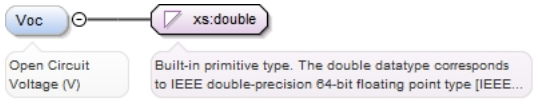
Namespace	No namespace
Annotations	Voltage at max power (V)
Diagram	
Type	xs:double

Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Vmpp" minOccurs="0" maxOccurs="1" type="xs:double"> <xs:annotation> <xs:documentation>Voltage at max power (V)</xs:documentation> </xs:annotation> </xs:element>

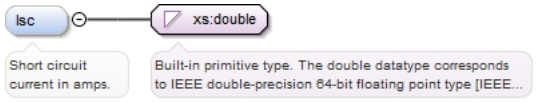
Element PvModuleDefinitionType / Impp

Namespace	No namespace
Annotations	Current in amps at max power.
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Impp" minOccurs="0" maxOccurs="1" type="xs:double"> <xs:annotation> <xs:documentation>Current in amps at max power.</xs:documentation> </xs:annotation> </xs:element>

Element PvModuleDefinitionType / Voc

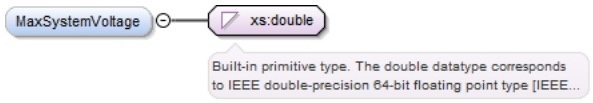
Namespace	No namespace
Annotations	Open Circuit Voltage (V)
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Voc" minOccurs="0" maxOccurs="1" type="xs:double"> <xs:annotation> <xs:documentation>Open Circuit Voltage (V)</xs:documentation> </xs:annotation> </xs:element>

Element PvModuleDefinitionType / Isc

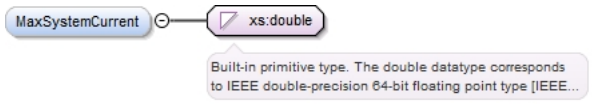
Namespace	No namespace
Annotations	Short circuit current in amps.
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Isc" minOccurs="0" maxOccurs="1" type="xs:double"> <xs:annotation>

```
    <xs:documentation>Short circuit current in amps.</xs:documentation>
  </xs:annotation>
</xs:element>
```

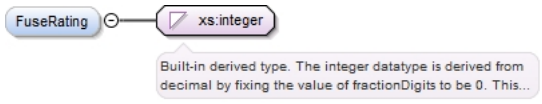
Element PvModuleDefinitionType / MaxSystemVoltage

Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="MaxSystemVoltage" minOccurs="0" maxOccurs="1" type="xs:double">` `</xs:element>`

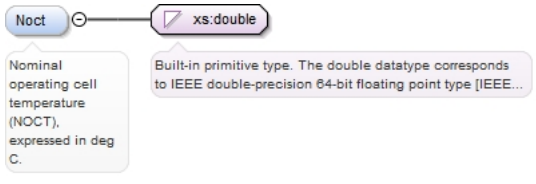
Element PvModuleDefinitionType / MaxSystemCurrent

Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="MaxSystemCurrent" minOccurs="0" maxOccurs="1" type="xs:double">` `</xs:element>`

Element PvModuleDefinitionType / FuseRating

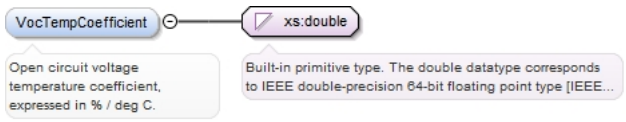
Namespace	No namespace
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="FuseRating" minOccurs="0" maxOccurs="1" type="xs:integer">` `</xs:element>`

Element PvModuleDefinitionType / Noct

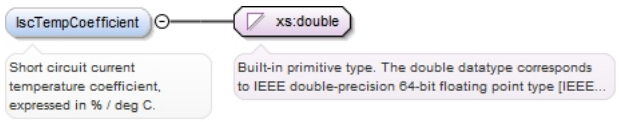
Namespace	No namespace
Annotations	Nominal operating cell temperature (NOCT), expressed in deg C.
Diagram	
Type	xs:double
Properties	content: simple

	minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Noct" minOccurs="0" maxOccurs="1" type="xs:double"> <xs:annotation> <xs:documentation>Nominal operating cell temperature (NOCT), expressed in deg C.</xs:documentation> </xs:annotation> </xs:element>

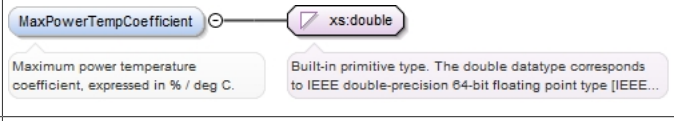
Element PvModuleDefinitionType / VocTempCoefficient

Namespace	No namespace
Annotations	Open circuit voltage temperature coefficient, expressed in % / deg C.
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="VocTempCoefficient" type="xs:double"> <xs:annotation> <xs:documentation>Open circuit voltage temperature coefficient, expressed in % / deg C.</xs:documentation> </xs:annotation> </xs:element>

Element PvModuleDefinitionType / IscTempCoefficient

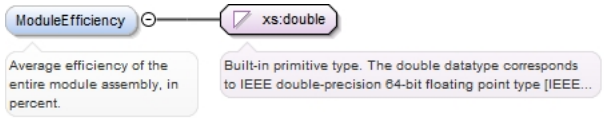
Namespace	No namespace
Annotations	Short circuit current temperature coefficient, expressed in % / deg C.
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="IscTempCoefficient" type="xs:double"> <xs:annotation> <xs:documentation>Short circuit current temperature coefficient, expressed in % / deg C.</xs:documentation> </xs:annotation> </xs:element>

Element PvModuleDefinitionType / MaxPowerTempCoefficient

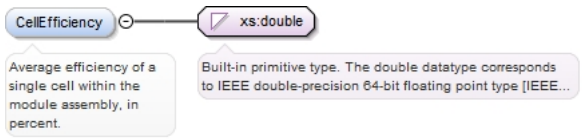
Namespace	No namespace
Annotations	Maximum power temperature coefficient, expressed in % / deg C.
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="MaxPowerTempCoefficient" type="xs:double"> <xs:annotation> <xs:documentation>Maximum power temperature coefficient, expressed in % / deg C.</xs:documentation>

```
  </xs:annotation>
</xs:element>
```

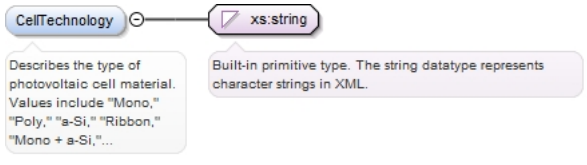
Element PvModuleDefinitionType / ModuleEfficiency

Namespace	No namespace
Annotations	Average efficiency of the entire module assembly, in percent.
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="ModuleEfficiency" type="xs:double"> <xs:annotation> <xs:documentation>Average efficiency of the entire module assembly, in percent.</xs:documentation> </xs:annotation> </xs:element>

Element PvModuleDefinitionType / CellEfficiency

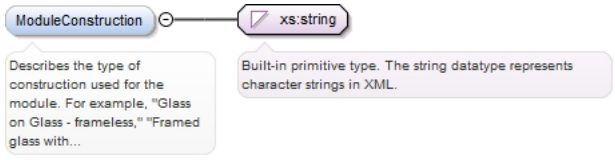
Namespace	No namespace
Annotations	Average efficiency of a single cell within the module assembly, in percent.
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="CellEfficiency" minOccurs="0" maxOccurs="1" type="xs:double"> <xs:annotation> <xs:documentation>Average efficiency of a single cell within the module assembly, in percent.</xs:documentation> </xs:annotation> </xs:element>

Element PvModuleDefinitionType / CellTechnology

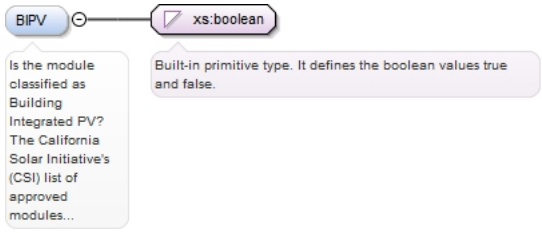
Namespace	No namespace
Annotations	Describes the type of photovoltaic cell material. Values include "Mono," "Poly," "a-Si," "Ribbon," "Mono + a-Si," "CdTe," "CIGS," "a-Si + micro-c," and "CIS"
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="CellTechnology" minOccurs="0" maxOccurs="1" type="xs:string"> <xs:annotation> <xs:documentation>Describes the type of photovoltaic cell material. Values include "Mono," "Poly," "a-Si," "Ribbon," "Mono + a-Si," "CdTe," "CIGS," "a-Si + micro-c," and "CIS"</xs:documentation>

```
  </xs:annotation>
</xs:element>
```

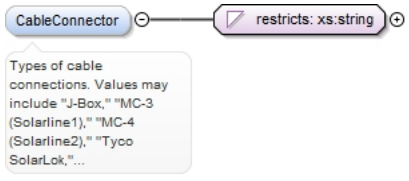
Element PvModuleDefinitionType / ModuleConstruction

Namespace	No namespace
Annotations	Describes the type of construction used for the module. For example, "Glass on Glass - frameless," "Framed glass with backsheet," etc.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="ModuleConstruction" minOccurs="0" maxOccurs="1" type="xs:string"> <xs:annotation> <xs:documentation>Describes the type of construction used for the module. For example, "Glass on Glass - frameless," "Framed glass with backsheet," etc.</xs:documentation> </xs:annotation> </xs:element>

Element PvModuleDefinitionType / BIPV

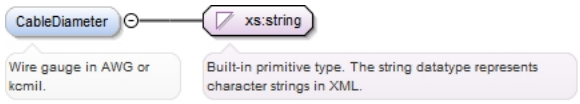
Namespace	No namespace
Annotations	Is the module classified as Building Integrated PV? The California Solar Initiative's (CSI) list of approved modules maintains such a classification. TRUE means that it is.
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="BIPV" minOccurs="0" maxOccurs="1" type="xs:boolean"> <xs:annotation> <xs:documentation>Is the module classified as Building Integrated PV? The California Solar Initiative's (CSI) list of approved modules maintains such a classification. TRUE means that it is.</xs:documentation> </xs:annotation> </xs:element>

Element PvModuleDefinitionType / CableConnector

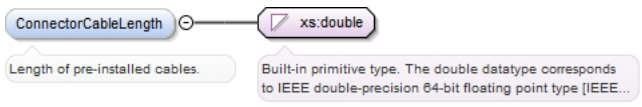
Namespace	No namespace
Annotations	Types of cable connections. Values may include "J-Box," "MC-3 (Solarline1)," "MC-4 (Solarline2)," "Tyco SolarLok," "Terminals," "MC (unspecified)"
Diagram	

Type	restriction of xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxLength 255
Source	<xs:element name="CableConnector" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Types of cable connections. Values may include "J-Box," "MC-3 (Solarline1)," "MC-4 (Solarline2)," "Tyco SolarLok," "Terminals," "MC (unspecified)"</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:string"> <xs:maxLength value="255"/> </xs:restriction> </xs:simpleType> </xs:element>

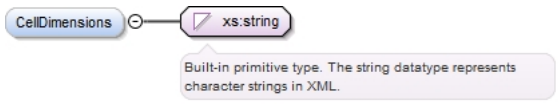
Element PvModuleDefinitionType / CableDiameter

Namespace	No namespace
Annotations	Wire gauge in AWG or kcmil.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="CableDiameter" minOccurs="0" maxOccurs="1" type="xs:string"> <xs:annotation> <xs:documentation>Wire gauge in AWG or kcmil.</xs:documentation> </xs:annotation> </xs:element>

Element PvModuleDefinitionType / ConnectorCableLength

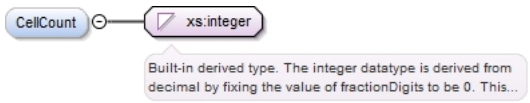
Namespace	No namespace
Annotations	Length of pre-installed cables.
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="ConnectorCableLength" type="xs:double"> <xs:annotation> <xs:documentation>Length of pre-installed cables.</xs:documentation> </xs:annotation> </xs:element>

Element PvModuleDefinitionType / CellDimensions

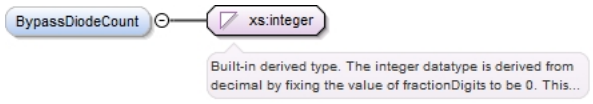
Namespace	No namespace
Diagram	

Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="CellDimensions" minOccurs="0" maxOccurs="1" type="xs:string"> </xs:element>

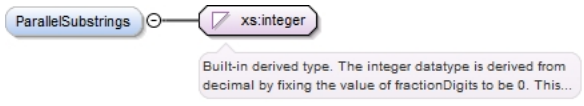
Element PvModuleDefinitionType / CellCount

Namespace	No namespace
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="CellCount" minOccurs="0" maxOccurs="1" type="xs:integer"> </xs:element>

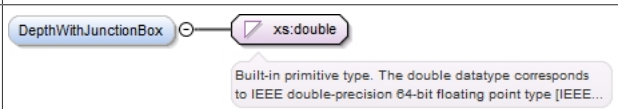
Element PvModuleDefinitionType / BypassDiodeCount

Namespace	No namespace
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="BypassDiodeCount" minOccurs="0" maxOccurs="1" type="xs:integer"> </xs:element>

Element PvModuleDefinitionType / ParallelSubstrings

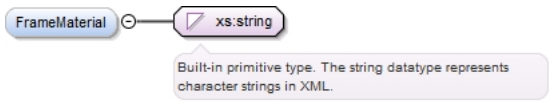
Namespace	No namespace
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="ParallelSubstrings" minOccurs="0" maxOccurs="1" type="xs:integer"> </xs:element>

Element PvModuleDefinitionType / DepthWithJunctionBox

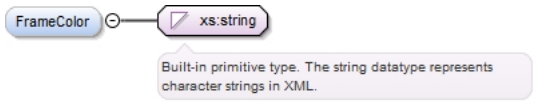
Namespace	No namespace
Diagram	

Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="DepthWithJunctionBox" minOccurs="0" maxOccurs="1" type="xs:double"> </xs:element>

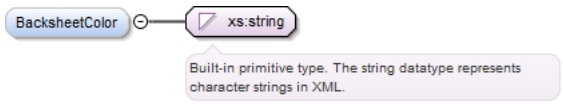
Element PvModuleDefinitionType / FrameMaterial

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="FrameMaterial" minOccurs="0" maxOccurs="1" type="xs:string"> </xs:element>

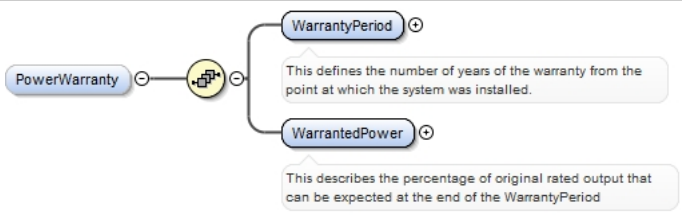
Element PvModuleDefinitionType / FrameColor

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="FrameColor" type="xs:string"/>

Element PvModuleDefinitionType / BacksheetColor

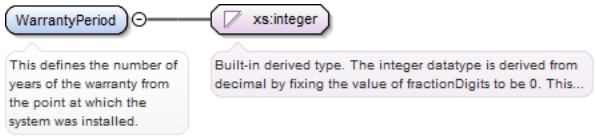
Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="BacksheetColor" type="xs:string"/>

Element PvModuleDefinitionType / PowerWarranty

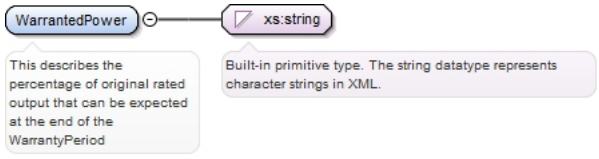
Namespace	No namespace
Diagram	

Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	WarrantyPeriod , WarrantedPower
Children	WarrantedPower, WarrantyPeriod
Instance	<PowerWarranty> <WarrantyPeriod>{1,1}</WarrantyPeriod> <WarrantedPower>{1,1}</WarrantedPower> </PowerWarranty>
Source	<xs:element name="PowerWarranty" minOccurs="0" maxOccurs="unbounded"> <xs:complexType> <xs:sequence> <xs:element name="WarrantyPeriod" type="xs:integer"> <xs:annotation> <xs:documentation>This defines the number of years of the warranty from the point at which the system was installed.</xs:documentation> </xs:annotation> </xs:element> <xs:element name="WarrantedPower" type="xs:string"> <xs:annotation> <xs:documentation>This describes the percentage of original rated output that can be expected at the end of the WarrantyPeriod</xs:documentation> </xs:annotation> </xs:element> </xs:sequence> </xs:complexType> </xs:element>

Element PvModuleDefinitionType / PowerWarranty / WarrantyPeriod

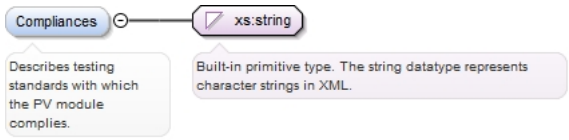
Namespace	No namespace
Annotations	This defines the number of years of the warranty from the point at which the system was installed.
Diagram	
Type	xs:integer
Properties	content: simple
Source	<xs:element name="WarrantyPeriod" type="xs:integer"> <xs:annotation> <xs:documentation>This defines the number of years of the warranty from the point at which the system was installed.</xs:documentation> </xs:annotation> </xs:element>

Element PvModuleDefinitionType / PowerWarranty / WarrantedPower

Namespace	No namespace
Annotations	This describes the percentage of original rated output that can be expected at the end of the WarrantyPeriod
Diagram	
Type	xs:string
Properties	content: simple
Source	<xs:element name="WarrantedPower" type="xs:string"> <xs:annotation> <xs:documentation>This describes the percentage of original rated output that can be expected at the end of the WarrantyPeriod</xs:documentation> </xs:annotation>

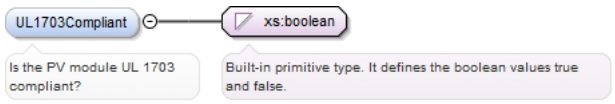
```
</xs:element>
```

Element PvModuleDefinitionType / Compliances

Namespace	No namespace
Annotations	Describes testing standards with which the PV module complies.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0

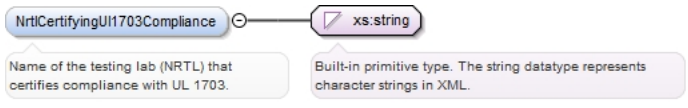
Source	`<xs:element minOccurs="0" name="Compliances" type="xs:string">`
	`  <xs:annotation>`
	`  <xs:documentation>Describes testing standards with which the PV module complies.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element PvModuleDefinitionType / UL1703Compliant

Namespace	No namespace
Annotations	Is the PV module UL 1703 compliant?
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0

Source	`<xs:element minOccurs="0" name="UL1703Compliant" type="xs:boolean">`
	`  <xs:annotation>`
	`  <xs:documentation>Is the PV module UL 1703 compliant?</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

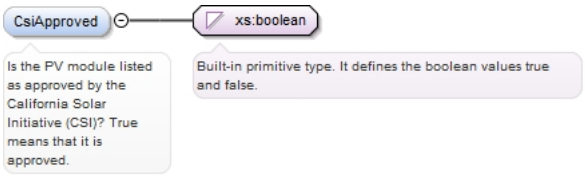
Element PvModuleDefinitionType / NrtlCertifyingUl1703Compliance

Namespace	No namespace
Annotations	Name of the testing lab (NRTL) that certifies compliance with UL 1703.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0

Source	`<xs:element minOccurs="0" name="NrtlCertifyingUl1703Compliance" type="xs:string">`
	`  <xs:annotation>`
	`  <xs:documentation>Name of the testing lab (NRTL) that certifies compliance with UL 1703.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element PvModuleDefinitionType / CsiApproved

Namespace	No namespace
Annotations	Is the PV module listed as approved by the California Solar Initiative (CSI)? True means that it is approved.

Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0

Source	`<xs:element minOccurs="0" name="CsiApproved" type="xs:boolean">`
	`  <xs:annotation>`
	`  <xs:documentation>Is the PV module listed as approved by the California Solar Initiative (CSI)? True means that it is approved.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element PvModuleDefinitionType / CecVmppLowLight

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 500.0 minInclusive .1

Source	`<xs:element name="CecVmppLowLight" minOccurs="0" maxOccurs="1">`
	`  <xs:simpleType>`
	`  <xs:restriction base="xs:double">`
	`  <xs:minInclusive value=".1"/>`
	`  <xs:maxInclusive value="500.0"/>`
	`  </xs:restriction>`
	`  </xs:simpleType>`
	`</xs:element>`

Element PvModuleDefinitionType / CecImppLowLight

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 50.0 minInclusive .1

Source	`<xs:element name="CecImppLowLight" minOccurs="0" maxOccurs="1">`
	`  <xs:simpleType>`
	`  <xs:restriction base="xs:double">`
	`  <xs:minInclusive value=".1"/>`
	`  <xs:maxInclusive value="50.0"/>`
	`  </xs:restriction>`
	`  </xs:simpleType>`
	`</xs:element>`

Element PvModuleDefinitionType / CecVmppNoct

Namespace	No namespace
Diagram	

Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 500.0 minInclusive 1.0
Source	<xs:element name="CecVmppNoct" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="1.0"/> <xs:maxInclusive value="500.0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / CecImppNoct

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 50.0 minInclusive .1
Source	<xs:element name="CecImppNoct" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value=".1"/> <xs:maxInclusive value="50.0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / CecGeometricMultipl

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 1.0 minInclusive .10
Source	<xs:element name="CecGeometricMultipl" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value=".10"/> <xs:maxInclusive value="1.0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / MeasurementDate

Namespace	No namespace
Diagram	

Type	restriction of xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxLength 255
Source	<xs:element name="MeasurementDate" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:maxLength value="255"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / FiveParamAref

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 10.0 minInclusive .1
Source	<xs:element name="FiveParamAref" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value=".1"/> <xs:maxInclusive value="10.0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / FiveParamILref

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 20.0 minInclusive .1
Source	<xs:element name="FiveParamILref" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value=".1"/> <xs:maxInclusive value="20.0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / FiveParamIoref

Namespace	No namespace
Diagram	
Type	restriction of xs:double

Properties	content:	simple
	minOccurs:	0
	maxOccurs:	1
Facets	maxInclusive	1.0e-6
	minInclusive	1.0e-13
Source		

```
<xs:element name="FiveParamIoref" minOccurs="0" maxOccurs="1">
  <xs:simpleType>
    <xs:restriction base="xs:double">
      <xs:minInclusive value="1.0e-13"/>
      <xs:maxInclusive value="1.0e-6"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

Element PvModuleDefinitionType / FiveParamRs

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 100.0 minInclusive 1.0e-3
Source	


```
<xs:element name="FiveParamRs" minOccurs="0" maxOccurs="1">
  <xs:simpleType>
    <xs:restriction base="xs:double">
      <xs:minInclusive value="1.0e-3"/>
      <xs:maxInclusive value="100.0"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

Element PvModuleDefinitionType / FiveParamRshref

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 1000000.00 minInclusive 10.0
Source	


```
<xs:element name="FiveParamRshref" minOccurs="0" maxOccurs="1">
  <xs:simpleType>
    <xs:restriction base="xs:double">
      <xs:minInclusive value="10.0"/>
      <xs:maxInclusive value="1000000.00"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

Element PvModuleDefinitionType / FiveParamAdjust

Namespace	No namespace
Diagram	
Type	restriction of xs:double

Properties	content:	simple
	minOccurs:	0
	maxOccurs:	1
Facets	maxInclusive	100.0
	minInclusive	-100.0
Source		

```
<xs:element name="FiveParamAdjust" minOccurs="0" maxOccurs="1">
  <xs:simpleType>
    <xs:restriction base="xs:double">
      <xs:minInclusive value="-100.0"/>
      <xs:maxInclusive value="100.0"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

Element PvModuleDefinitionType / SandiaIxo

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 50.0 minInclusive .1
Source	


```
<xs:element name="SandiaIxo" minOccurs="0" maxOccurs="1">
  <xs:simpleType>
    <xs:restriction base="xs:double">
      <xs:minInclusive value=".1"/>
      <xs:maxInclusive value="50.0"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

Element PvModuleDefinitionType / SandiaIxxo

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 50.0 minInclusive .1
Source	


```
<xs:element name="SandiaIxxo" minOccurs="0" maxOccurs="1">
  <xs:simpleType>
    <xs:restriction base="xs:double">
      <xs:minInclusive value=".1"/>
      <xs:maxInclusive value="50.0"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

Element PvModuleDefinitionType / SandiaDiodeFactor

Namespace	No namespace
Diagram	
Type	restriction of xs:double

Properties	content:	simple
	minOccurs:	0
	maxOccurs:	1
Facets	maxInclusive	10.0
	minInclusive	.1

Source

```
<xs:element name="SandiaDiodeFactor" minOccurs="0" maxOccurs="1">
  <xs:simpleType>
    <xs:restriction base="xs:double">
      <xs:minInclusive value=".1"/>
      <xs:maxInclusive value="10.0"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

Element PvModuleDefinitionType / SandiaThermalVoltage

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple
	minOccurs: 0
	maxOccurs: 1
Facets	maxInclusive 10.0
	minInclusive .1

Source

```
<xs:element name="SandiaThermalVoltage" minOccurs="0" maxOccurs="1">
  <xs:simpleType>
    <xs:restriction base="xs:double">
      <xs:minInclusive value=".1"/>
      <xs:maxInclusive value="10.0"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

Element PvModuleDefinitionType / SandiaMbVoc

Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple
	minOccurs: 0
	maxOccurs: 1

Source

```
<xs:element name="SandiaMbVoc" minOccurs="0" maxOccurs="1">
  <xs:simpleType>
    <xs:restriction base="xs:double"/>
  </xs:simpleType>
</xs:element>
```

Element PvModuleDefinitionType / SandiaMbVmpp

Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple
	minOccurs: 0
	maxOccurs: 1

Source	<xs:element name="SandiaMbVmpp" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"/> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / GammaPmppPercent

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 10.0 minInclusive -10.0
Source	<xs:element name="GammaPmppPercent" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="-10.0"/> <xs:maxInclusive value="10.0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / BetaVocPercent

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 2.0 minInclusive -2.0
Source	<xs:element name="BetaVocPercent" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="-2.0"/> <xs:maxInclusive value="2.0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / BetaMppPercent

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 2.0 minInclusive -2.0
Source	<xs:element name="BetaMppPercent" minOccurs="0" maxOccurs="1"> <xs:simpleType>

```
    <xs:restriction base="xs:double">
      <xs:minInclusive value="-2.0"/>
      <xs:maxInclusive value="2.0"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

Element PvModuleDefinitionType / AlphaIscPercent

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 2.0 minInclusive -2.0

Source	`<xs:element name="AlphaIscPercent" minOccurs="0" maxOccurs="1">`
	`  <xs:simpleType>`
	`  <xs:restriction base="xs:double">`
	`  <xs:minInclusive value="-2.0"/>`
	`  <xs:maxInclusive value="2.0"/>`
	`  </xs:restriction>`
	`  </xs:simpleType>`
	`</xs:element>`

Element PvModuleDefinitionType / AlphaImppPercent

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 2.0 minInclusive -2.0

Source	`<xs:element name="AlphaImppPercent" minOccurs="0" maxOccurs="1">`
	`  <xs:simpleType>`
	`  <xs:restriction base="xs:double">`
	`  <xs:minInclusive value="-2.0"/>`
	`  <xs:maxInclusive value="2.0"/>`
	`  </xs:restriction>`
	`  </xs:simpleType>`
	`</xs:element>`

Element PvModuleDefinitionType / SandiaTempFactorA

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive -1.0 minInclusive -5.0
Source	`<xs:element name="SandiaTempFactorA" minOccurs="0" maxOccurs="1">`

```
  <xs:simpleType>
    <xs:restriction base="xs:double">
      <xs:minInclusive value="-5.0"/>
      <xs:maxInclusive value="-1.0"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

Element PvModuleDefinitionType / SandiaTempFactorB

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive -0.01 minInclusive -1.0
Source	<xs:element name="SandiaTempFactorB" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="-1.0"/> <xs:maxInclusive value="-0.01"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / SandiaCoefA0

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 100.0 minInclusive -100.0
Source	<xs:element name="SandiaCoefA0" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="-100.0"/> <xs:maxInclusive value="100.0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / SandiaCoefA1

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 100.0 minInclusive -100.0

Source	<xs:element name="SandiaCoefA1" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="-100.0"/> <xs:maxInclusive value="100.0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / SandiaCoefA2

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 100.0 minInclusive -100.0
Source	<xs:element name="SandiaCoefA2" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="-100.0"/> <xs:maxInclusive value="100.0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / SandiaCoefA3

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 100.0 minInclusive -100.0
Source	<xs:element name="SandiaCoefA3" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="-100.0"/> <xs:maxInclusive value="100.0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / SandiaCoefA4

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 100.0

	minInclusive -100.0
Source	<xs:element name="SandiaCoefA4" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="-100.0"/> <xs:maxInclusive value="100.0"/> </xs:restriction> </xs:simpleType> </xs:element>

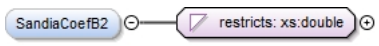
Element PvModuleDefinitionType / SandiaCoefB0

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 100.0 minInclusive -100.0
Source	<xs:element name="SandiaCoefB0" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="-100.0"/> <xs:maxInclusive value="100.0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / SandiaCoefB1

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 100.0 minInclusive -100.0
Source	<xs:element name="SandiaCoefB1" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="-100.0"/> <xs:maxInclusive value="100.0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / SandiaCoefB2

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1

Facets	maxInclusive 100.0 minInclusive -100.0
Source	<xs:element name="SandiaCoefB2" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="-100.0"/> <xs:maxInclusive value="100.0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / SandiaCoefB3

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 100.0 minInclusive -100.0
Source	<xs:element name="SandiaCoefB3" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="-100.0"/> <xs:maxInclusive value="100.0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / SandiaCoefB4

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 100.0 minInclusive -100.0
Source	<xs:element name="SandiaCoefB4" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="-100.0"/> <xs:maxInclusive value="100.0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / SandiaCoefB5

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0

	maxOccurs:	1
Facets	maxInclusive	100.0
	minInclusive	-100.0
Source	<xs:element name="SandiaCoefB5" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="-100.0"/> <xs:maxInclusive value="100.0"/> </xs:restriction> </xs:simpleType> </xs:element>	

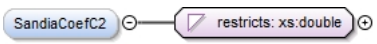
Element PvModuleDefinitionType / SandiaCoefC0

Namespace	No namespace	
Diagram		
Type	restriction of xs:double	
Properties	content:	simple
	minOccurs:	0
	maxOccurs:	1
Facets	maxInclusive	100.0
	minInclusive	-100.0
Source	<xs:element name="SandiaCoefC0" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="-100.0"/> <xs:maxInclusive value="100.0"/> </xs:restriction> </xs:simpleType> </xs:element>	

Element PvModuleDefinitionType / SandiaCoefC1

Namespace	No namespace	
Diagram		
Type	restriction of xs:double	
Properties	content:	simple
	minOccurs:	0
	maxOccurs:	1
Facets	maxInclusive	100.0
	minInclusive	-100.0
Source	<xs:element name="SandiaCoefC1" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="-100.0"/> <xs:maxInclusive value="100.0"/> </xs:restriction> </xs:simpleType> </xs:element>	

Element PvModuleDefinitionType / SandiaCoefC2

Namespace	No namespace	
Diagram		
Type	restriction of xs:double	
Properties	content:	simple

	minOccurs:	0
	maxOccurs:	1
Facets	maxInclusive	100.0
	minInclusive	-100.0
Source	<xs:element name="SandiaCoefC2" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="-100.0"/> <xs:maxInclusive value="100.0"/> </xs:restriction> </xs:simpleType> </xs:element>	

Element PvModuleDefinitionType / SandiaCoefC3

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 100.0 minInclusive -100.0
Source	<xs:element name="SandiaCoefC3" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="-100.0"/> <xs:maxInclusive value="100.0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / SandiaCoefC4

Namespace	No namespace
Diagram	
Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 100.0 minInclusive -100.0
Source	<xs:element name="SandiaCoefC4" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value="-100.0"/> <xs:maxInclusive value="100.0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvModuleDefinitionType / SandiaCoefC5

Namespace	No namespace
Diagram	
Type	restriction of xs:double

Properties	content:	simple
	minOccurs:	0
	maxOccurs:	1
Facets	maxInclusive	100.0
	minInclusive	-100.0
Source		

```
<xs:element name="SandiaCoefC5" minOccurs="0" maxOccurs="1">
  <xs:simpleType>
    <xs:restriction base="xs:double">
      <xs:minInclusive value="-100.0"/>
      <xs:maxInclusive value="100.0"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

Element PvModuleDefinitionType / SandiaCoefC6

Namespace	No namespace	
Diagram		
Type	restriction of xs:double	
Properties	content:	simple
	minOccurs:	0
	maxOccurs:	1
Facets	maxInclusive	100.0
	minInclusive	-100.0
Source		

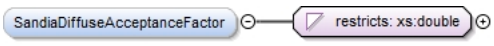

```
<xs:element name="SandiaCoefC6" minOccurs="0" maxOccurs="1">
  <xs:simpleType>
    <xs:restriction base="xs:double">
      <xs:minInclusive value="-100.0"/>
      <xs:maxInclusive value="100.0"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

Element PvModuleDefinitionType / SandiaCoefC7

Namespace	No namespace	
Diagram		
Type	restriction of xs:double	
Properties	content:	simple
	minOccurs:	0
	maxOccurs:	1
Facets	maxInclusive	100.0
	minInclusive	-100.0
Source		


```
<xs:element name="SandiaCoefC7" minOccurs="0" maxOccurs="1">
  <xs:simpleType>
    <xs:restriction base="xs:double">
      <xs:minInclusive value="-100.0"/>
      <xs:maxInclusive value="100.0"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
```

Element PvModuleDefinitionType / SandiaDiffuseAcceptanceFactor

Namespace	No namespace
Diagram	

Type	restriction of xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxInclusive 1.0 minInclusive .1
Source	<xs:element name="SandiaDiffuseAcceptanceFactor" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:double"> <xs:minInclusive value=".1"/> <xs:maxInclusive value="1.0"/> </xs:restriction> </xs:simpleType> </xs:element>

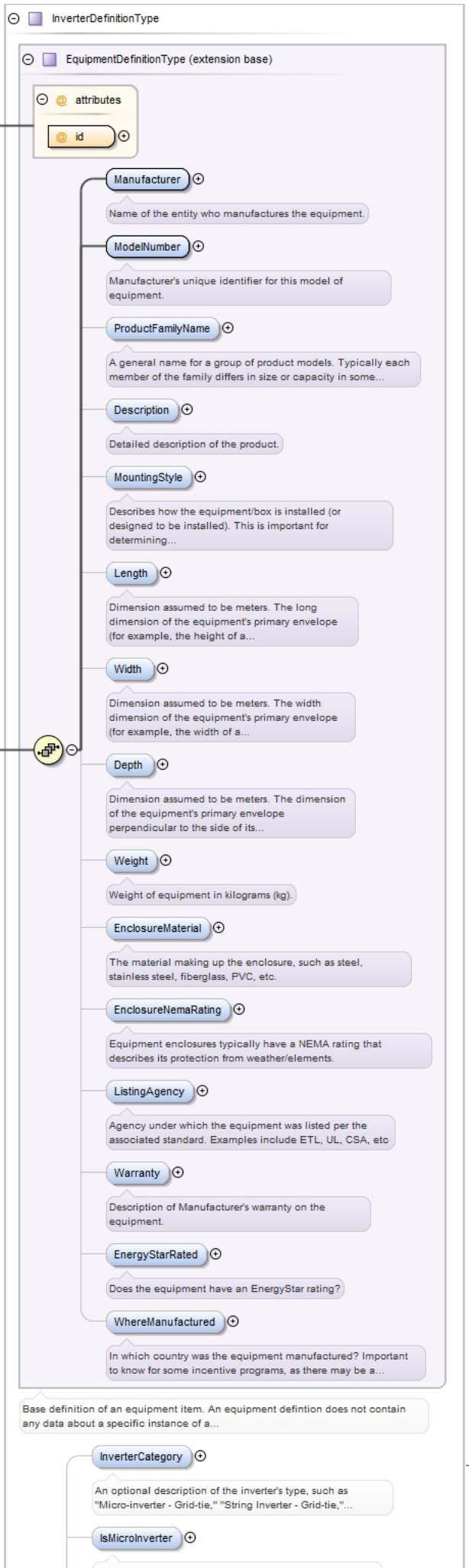
Element PvModuleDefinitionType / Notes

Namespace	No namespace
Diagram	
Type	restriction of xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	maxLength 255
Source	<xs:element name="Notes" minOccurs="0" maxOccurs="1"> <xs:simpleType> <xs:restriction base="xs:string"> <xs:maxLength value="255"/> </xs:restriction> </xs:simpleType> </xs:element>

Element PvSystemType / InverterDefinition

Namespace	No namespace
Annotations	Specifications for an inverter used in this design. A PvDesign may contain more than inverter make and model.

Diagram


InverterDefinitionType
EquipmentDefinitionType (extension base)
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...
InverterCategory
An optional description of the inverter's type, such as "Micro-inverter - Grid-tie," "String Inverter - Grid-tie,"...
IsMicroInverter

Type	InverterDefinitionType
Type hierarchy	• EquipmentDefinitionType • InverterDefinitionType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1} , InverterCategory{0,1} , IsMicroInverter{0,1} , MppTrackerQuantity{0,1} , MinMpptVoltage{0,1} , MaxMpptVoltage{0,1} , MaxDcInputPower{0,1} , NominalDcVoltage{0,1} , MaxDcVoltage{0,1} , PvDcStartVoltage{0,1} , NominalDcCurrent{0,1} , MaxDcCurrent{0,1} , DcTerminalQuantity{0,1} , DcTerminalMechanism{0,1} , DcTerminalWireRange{0,1} , IntegratedDcDisconnect{0,1} , IntegratedDcDisconnectRating{0,1} , IntegratedCombiner{0,1} , IntegratedCombinerFuses{0,1} , IntegratedCombinerMaxFuse{0,1} , NominalAcPower{0,1} , NominalAcVoltage{0,1} , GridVoltageRange{0,1} , GridFrequency{0,1} , MaxAcCurrent{0,1} , AcOcpdRating{0,1} , AcOcpdInterruptCapacity{0,1} , IntegratedAcDisconnect{0,1} , IntegratedAcDisconnectRating{0,1} , NeutralSizingRequirement{0,1} , AcTerminalQuantity{0,1} , AcTerminalWireRange{0,1} , GecTerminalQuantity{0,1} , GecTerminalWireRange{0,1} , MaxEfficiency{0,1} , CecWeightedEfficiency{0,1} , EuroEtaEffeciency{0,1} , Transformer{0,1} , PositiveGroundOption{0,1} , Cooling{0,1} , CSIApprovedBuiltInMeter{0,1} , CSINightTareLoss{0,1} , AmbientTempRange{0,1} , DataInterfaceOptions{0,1} , ConduitEntryZones{0,1} , Compliances{0,1} , UL1741Compliant{0,1} , NrtlCertifyingUL1741{0,1} , CsiApproved{0,1} , Notes{0,1}
Children	AcOcpdInterruptCapacity, AcOcpdRating, AcTerminalQuantity, AcTerminalWireRange, AmbientTempRange, CSIApprovedBuiltInMeter, CSINightTareLoss, CecWeightedEfficiency, Compliances, ConduitEntryZones, Cooling, CsiApproved, DataInterfaceOptions, DcTerminalMechanism, DcTerminalQuantity, DcTerminalWireRange, Depth, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, EuroEtaEffeciency, GecTerminalQuantity, GecTerminalWireRange, GridFrequency, GridVoltageRange, IntegratedAcDisconnect, IntegratedAcDisconnectRating, IntegratedCombiner, IntegratedCombinerFuses, IntegratedCombinerMaxFuse, IntegratedDcDisconnect, IntegratedDcDisconnectRating, InverterCategory, IsMicroInverter, Length, ListingAgency, Manufacturer, MaxAcCurrent, MaxDcCurrent, MaxDcInputPower, MaxDcVoltage, MaxEfficiency, MaxMpptVoltage, MinMpptVoltage, ModelNumber, MountingStyle, MppTrackerQuantity, NeutralSizingRequirement, NominalAcPower, NominalAcVoltage, NominalDcCurrent, NominalDcVoltage, Notes, NrtlCertifyingUL1741, PositiveGroundOption, ProductFamilyName, PvDcStartVoltage, Transformer, UL1741Compliant, Warranty, Weight, WhereManufactured, Width
Instance	<InverterDefinition id=""> <Manufacturer>{1,1}</Manufacturer> <ModelNumber>{1,1}</ModelNumber> <ProductFamilyName>{0,1}</ProductFamilyName> <Description>{0,1}</Description> <MountingStyle>{0,1}</MountingStyle> <Length>{0,1}</Length> <Width>{0,1}</Width> <Depth>{0,1}</Depth> <Weight>{0,1}</Weight> <EnclosureMaterial>{0,1}</EnclosureMaterial> <EnclosureNemaRating>{0,1}</EnclosureNemaRating> <ListingAgency>{0,1}</ListingAgency> <Warranty>{0,1}</Warranty> <EnergyStarRated>{0,1}</EnergyStarRated> <WhereManufactured>{0,1}</WhereManufactured> <InverterCategory>{0,1}</InverterCategory> <IsMicroInverter>{0,1}</IsMicroInverter> <MppTrackerQuantity>{0,1}</MppTrackerQuantity> <MinMpptVoltage>{0,1}</MinMpptVoltage> <MaxMpptVoltage>{0,1}</MaxMpptVoltage> <MaxDcInputPower>{0,1}</MaxDcInputPower> <NominalDcVoltage>{0,1}</NominalDcVoltage> <MaxDcVoltage>{0,1}</MaxDcVoltage> <PvDcStartVoltage>{0,1}</PvDcStartVoltage> <NominalDcCurrent>{0,1}</NominalDcCurrent> <MaxDcCurrent>{0,1}</MaxDcCurrent> <DcTerminalQuantity>{0,1}</DcTerminalQuantity> <DcTerminalMechanism>{0,1}</DcTerminalMechanism> <DcTerminalWireRange>{0,1}</DcTerminalWireRange> <IntegratedDcDisconnect>{0,1}</IntegratedDcDisconnect> <IntegratedDcDisconnectRating>{0,1}</IntegratedDcDisconnectRating> <IntegratedCombiner>{0,1}</IntegratedCombiner> <IntegratedCombinerFuses>{0,1}</IntegratedCombinerFuses> <IntegratedCombinerMaxFuse>{0,1}</IntegratedCombinerMaxFuse> <NominalAcPower>{0,1}</NominalAcPower> <NominalAcVoltage>{0,1}</NominalAcVoltage> <GridVoltageRange>{0,1}</GridVoltageRange>

```
  <GridFrequency>{0,1}</GridFrequency>
  <MaxAcCurrent>{0,1}</MaxAcCurrent>
  <AcOcpdRating>{0,1}</AcOcpdRating>
  <AcOcpdInterruptCapacity>{0,1}</AcOcpdInterruptCapacity>
  <IntegratedAcDisconnect>{0,1}</IntegratedAcDisconnect>
  <IntegratedAcDisconnectRating>{0,1}</IntegratedAcDisconnectRating>
  <NeutralSizingRequirement>{0,1}</NeutralSizingRequirement>
  <AcTerminalQuantity>{0,1}</AcTerminalQuantity>
  <AcTerminalWireRange>{0,1}</AcTerminalWireRange>
  <GecTerminalQuantity>{0,1}</GecTerminalQuantity>
  <GecTerminalWireRange>{0,1}</GecTerminalWireRange>
  <MaxEfficiency>{0,1}</MaxEfficiency>
  <CecWeightedEfficiency>{0,1}</CecWeightedEfficiency>
  <EuroEtaEffeciency>{0,1}</EuroEtaEffeciency>
  <Transformer>{0,1}</Transformer>
  <PositiveGroundOption>{0,1}</PositiveGroundOption>
  <Cooling>{0,1}</Cooling>
  <CSIApprovedBuiltInMeter>{0,1}</CSIApprovedBuiltInMeter>
  <CSINightTareLoss>{0,1}</CSINightTareLoss>
  <AmbientTempRange>{0,1}</AmbientTempRange>
  <DataInterfaceOptions>{0,1}</DataInterfaceOptions>
  <ConduitEntryZones>{0,1}</ConduitEntryZones>
  <Compliances>{0,1}</Compliances>
  <UL1741Compliant>{0,1}</UL1741Compliant>
  <NrtlCertifyingUL1741>{0,1}</NrtlCertifyingUL1741>
  <CsiApproved>{0,1}</CsiApproved>
  <Notes>{0,1}</Notes>
</InverterDefinition>
```

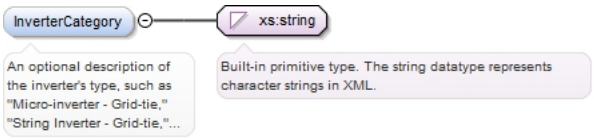
Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			required

Source

```
<xs:element name="InverterDefinition" type="InverterDefinitionType" minOccurs="0"
 maxOccurs="unbounded">
  <xs:annotation>
    <xs:documentation>Specifications for an inverter used in this design. A PvDesign may
 contain more than inverter make and model.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element InverterDefinitionType / InverterCategory

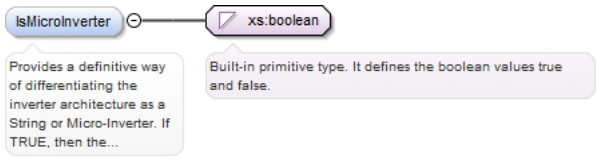
Namespace	No namespace
Annotations	An optional description of the inverter's type, such as "Micro-inverter - Grid-tie," "String Inverter - Grid-tie," "Battery-based Inverter - Grid-tie/Off-grid," "Battery-based Inverter - Off-grid," "Centraal Inverter"
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0

Source

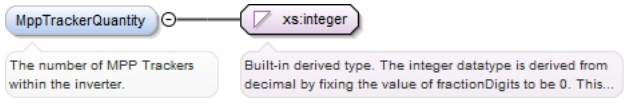
```
<xs:element minOccurs="0" name="InverterCategory" type="xs:string">
  <xs:annotation>
    <xs:documentation>An optional description of the inverter's type, such as "Micro-
inverter - Grid-tie," "String Inverter - Grid-tie," "Battery-based Inverter - Grid-tie/
Off-grid," "Battery-based Inverter - Off-grid," "Centraal Inverter"</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element InverterDefinitionType / IsMicroInverter

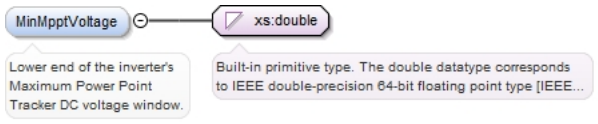
Namespace	No namespace
Annotations	Provides a definitive way of differentiating the inverter architecture as a String or Micro-Inverter. If TRUE, then the inverter is intended to be placed in series into an AC PV branch circuit. All other inverters essentially conform to a string architecture.

Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="IsMicroInverter" type="xs:boolean"> <xs:annotation> <xs:documentation>Provides a definitive way of differentiating the inverter architecture as a String or Micro-Inverter. If TRUE, then the inverter is intended to be placed in series into an AC PV branch circuit. All other inverters essentially conform to a string architecture.</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / MppTrackerQuantity

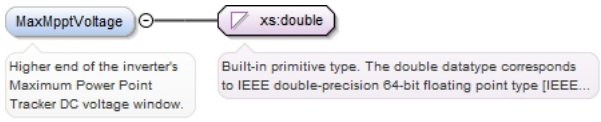
Namespace	No namespace
Annotations	The number of MPP Trackers within the inverter.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="MppTrackerQuantity" type="xs:integer" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The number of MPP Trackers within the inverter.</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / MinMpptVoltage

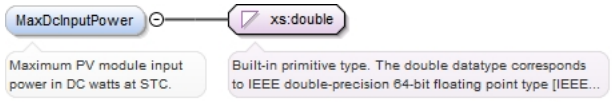
Namespace	No namespace
Annotations	Lower end of the inverter's Maximum Power Point Tracker DC voltage window.
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="MinMpptVoltage" type="xs:double" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Lower end of the inverter's Maximum Power Point Tracker DC voltage window.</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / MaxMpptVoltage

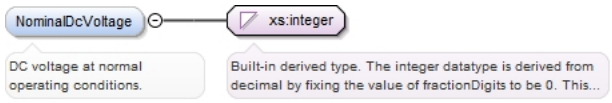
Namespace	No namespace
Annotations	Higher end of the inverter's Maximum Power Point Tracker DC voltage window.

Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="MaxMpptVoltage" type="xs:double" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Higher end of the inverter's Maximum Power Point Tracker DC voltage window.</xs:documentation> </xs:annotation> </xs:element>

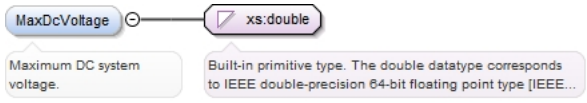
Element InverterDefinitionType / MaxDcInputPower

Namespace	No namespace
Annotations	Maximum PV module input power in DC watts at STC.
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="MaxDcInputPower" type="xs:double" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Maximum PV module input power in DC watts at STC.</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / NominalDcVoltage

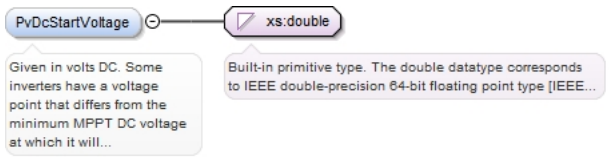
Namespace	No namespace
Annotations	DC voltage at normal operating conditions.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="NominalDcVoltage" type="xs:integer"> <xs:annotation> <xs:documentation>DC voltage at normal operating conditions.</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / MaxDcVoltage

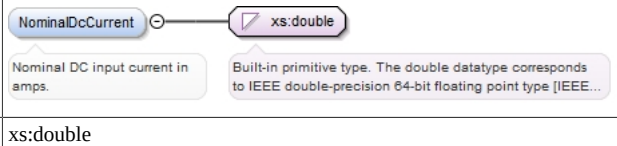
Namespace	No namespace
Annotations	Maximum DC system voltage.
Diagram	
Type	xs:double

Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="MaxDcVoltage" type="xs:double" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Maximum DC system voltage.</xs:documentation> </xs:annotation> </xs:element>

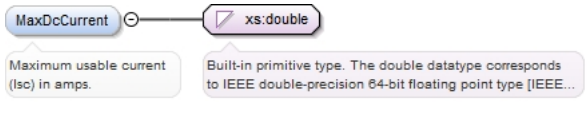
Element InverterDefinitionType / PvDcStartVoltage

Namespace	No namespace
Annotations	Given in volts DC. Some inverters have a voltage point that differs from the minimum MPPT DC voltage at which it will start operation. This is typically higher than the minimum MPPT voltage.
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="PvDcStartVoltage" type="xs:double"> <xs:annotation> <xs:documentation>Given in volts DC. Some inverters have a voltage point that differs from the minimum MPPT DC voltage at which it will start operation. This is typically higher than the minimum MPPT voltage.</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / NominalDcCurrent

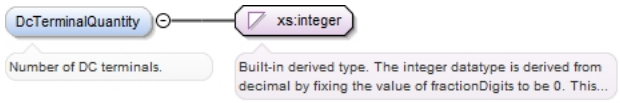
Namespace	No namespace
Annotations	Nominal DC input current in amps.
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="NominalDcCurrent" type="xs:double" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Nominal DC input current in amps.</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / MaxDcCurrent

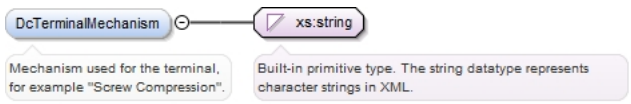
Namespace	No namespace
Annotations	Maximum usable current (Isc) in amps.
Diagram	
Type	xs:double
Properties	content: simple

	minOccurs: 0
Source	<xs:element minOccurs="0" name="MaxDcCurrent" type="xs:double"> <xs:annotation> <xs:documentation>Maximum usable current (Isc) in amps.</xs:documentation> </xs:annotation> </xs:element>

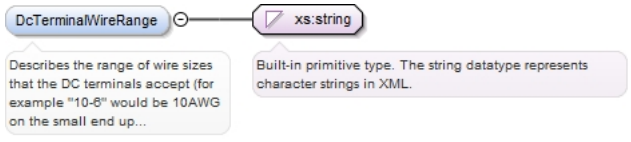
Element InverterDefinitionType / DcTerminalQuantity

Namespace	No namespace
Annotations	Number of DC terminals.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="DcTerminalQuantity" type="xs:integer" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Number of DC terminals.</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / DcTerminalMechanism

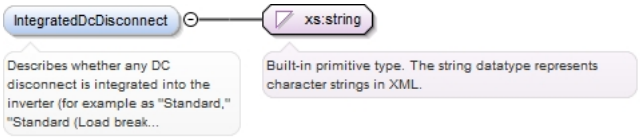
Namespace	No namespace
Annotations	Mechanism used for the terminal, for example "Screw Compression".
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="DcTerminalMechanism" type="xs:string"> <xs:annotation> <xs:documentation>Mechanism used for the terminal, for example "Screw Compression".</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / DcTerminalWireRange

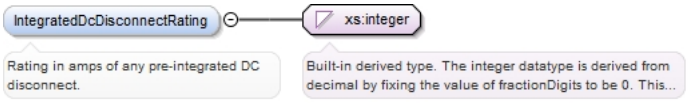
Namespace	No namespace
Annotations	Describes the range of wire sizes that the DC terminals accept (for example "10-6" would be 10AWG on the small end up to 6AWG).
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="DcTerminalWireRange" type="xs:string"> <xs:annotation> <xs:documentation>Describes the range of wire sizes that the DC terminals accept (for example "10-6" would be 10AWG on the small end up to 6AWG).</xs:documentation>

```
  </xs:annotation>
</xs:element>
```

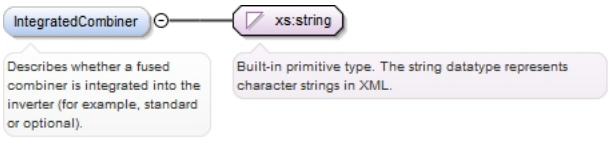
Element InverterDefinitionType / IntegratedDcDisconnect

Namespace	No namespace
Annotations	Describes whether any DC disconnect is integrated into the inverter (for example as "Standard," "Standard (Load break rated)," "Optional," or "None").
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="IntegratedDcDisconnect" type="xs:string"> <xs:annotation> <xs:documentation>Describes whether any DC disconnect is integrated into the inverter (for example as "Standard," "Standard (Load break rated)," "Optional," or "None").</xs:documentation> </xs:annotation> </xs:element>

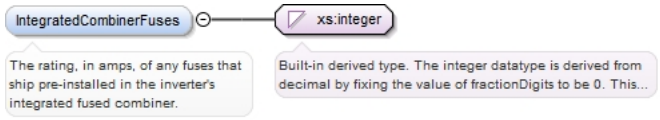
Element InverterDefinitionType / IntegratedDcDisconnectRating

Namespace	No namespace
Annotations	Rating in amps of any pre-integrated DC disconnect.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="IntegratedDcDisconnectRating" type="xs:integer"> <xs:annotation> <xs:documentation>Rating in amps of any pre-integrated DC disconnect.</xs:documentation> </xs:annotation> </xs:element>

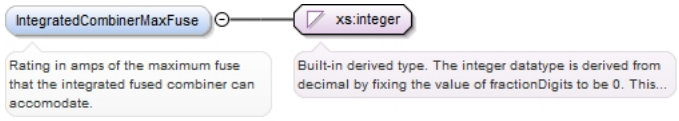
Element InverterDefinitionType / IntegratedCombiner

Namespace	No namespace
Annotations	Describes whether a fused combiner is integrated into the inverter (for example, standard or optional).
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="IntegratedCombiner" type="xs:string"> <xs:annotation> <xs:documentation>Describes whether a fused combiner is integrated into the inverter (for example, standard or optional).</xs:documentation> </xs:annotation> </xs:element>

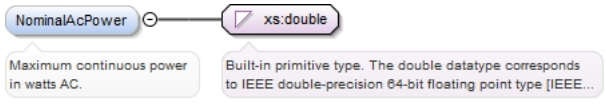
Element InverterDefinitionType / IntegratedCombinerFuses

Namespace	No namespace
Annotations	The rating, in amps, of any fuses that ship pre-installed in the inverter's integrated fused combiner.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="IntegratedCombinerFuses" type="xs:integer"> <xs:annotation> <xs:documentation>The rating, in amps, of any fuses that ship pre-installed in the inverter's integrated fused combiner.</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / IntegratedCombinerMaxFuse

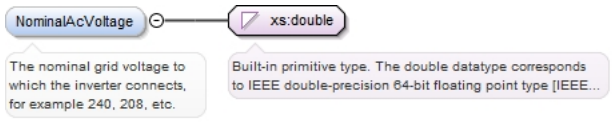
Namespace	No namespace
Annotations	Rating in amps of the maximum fuse that the integrated fused combiner can accomodate.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="IntegratedCombinerMaxFuse" type="xs:integer"> <xs:annotation> <xs:documentation>Rating in amps of the maximum fuse that the integrated fused combiner can accomodate.</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / NominalAcPower

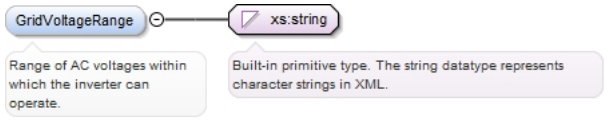
Namespace	No namespace
Annotations	Maximum continuous power in watts AC.
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="NominalAcPower" type="xs:double" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Maximum continuous power in watts AC.</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / NominalAcVoltage

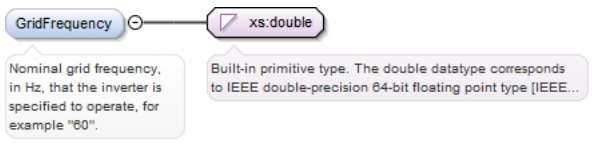
Namespace	No namespace
Annotations	The nominal grid voltage to which the inverter connects, for example 240, 208, etc.

Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="NominalAcVoltage" type="xs:double" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The nominal grid voltage to which the inverter connects, for example 240, 208, etc.</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / GridVoltageRange

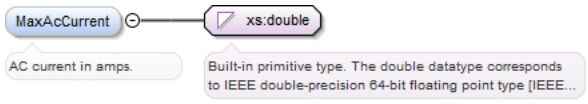
Namespace	No namespace
Annotations	Range of AC voltages within which the inverter can operate.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="GridVoltageRange" minOccurs="0" maxOccurs="1" type="xs:string"> <xs:annotation> <xs:documentation>Range of AC voltages within which the inverter can operate.</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / GridFrequency

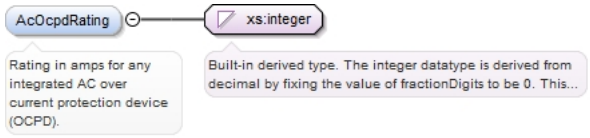
Namespace	No namespace
Annotations	Nominal grid frequency, in Hz, that the inverter is specified to operate, for example "60".
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="GridFrequency" type="xs:double" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Nominal grid frequency, in Hz, that the inverter is specified to operate, for example "60".</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / MaxAcCurrent

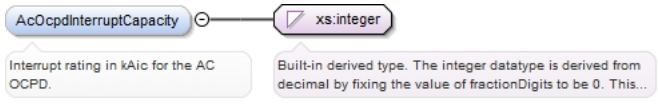
Namespace	No namespace
Annotations	AC current in amps.

Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="MaxAcCurrent" type="xs:double"> <xs:annotation> <xs:documentation>AC current in amps.</xs:documentation> </xs:annotation> </xs:element>

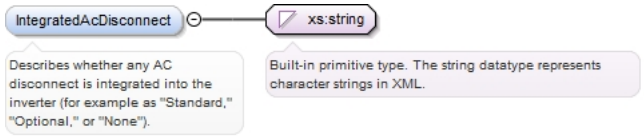
Element InverterDefinitionType / AcOcpdRating

Namespace	No namespace
Annotations	Rating in amps for any integrated AC over current protection device (OCPD).
Diagram	 AcOcpdRating xs:integer Rating in amps for any integrated AC over current protection device (OCPD). Built-in derived type. The integer datatype is derived from decimal by fixing the value of fractionDigits to be 0. This...
Type	xs:integer
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="AcOcpdRating" minOccurs="0" maxOccurs="1" type="xs:integer"> <xs:annotation> <xs:documentation>Rating in amps for any integrated AC over current protection device (OCPD).</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / AcOcpdInterruptCapacity

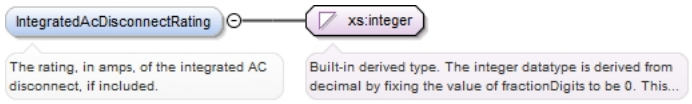
Namespace	No namespace
Annotations	Interrupt rating in kAic for the AC OCPD.
Diagram	 AcOcpdInterruptCapacity xs:integer Interrupt rating in kAic for the AC OCPD. Built-in derived type. The integer datatype is derived from decimal by fixing the value of fractionDigits to be 0. This...
Type	xs:integer
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="AcOcpdInterruptCapacity" type="xs:integer"> <xs:annotation> <xs:documentation>Interrupt rating in kAic for the AC OCPD.</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / IntegratedAcDisconnect

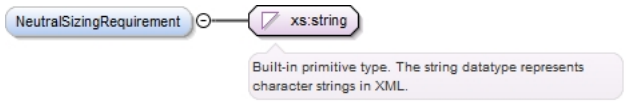
Namespace	No namespace
Annotations	Describes whether any AC disconnect is integrated into the inverter (for example as "Standard," "Optional," or "None").
Diagram	 IntegratedAcDisconnect xs:string Describes whether any AC disconnect is integrated into the inverter (for example as "Standard," "Optional," or "None"). Built-in primitive type. The string datatype represents character strings in XML.
Type	xs:string

Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="IntegratedAcDisconnect" type="xs:string"> <xs:annotation> <xs:documentation>Describes whether any AC disconnect is integrated into the inverter (for example as "Standard," "Optional," or "None").</xs:documentation> </xs:annotation> </xs:element>

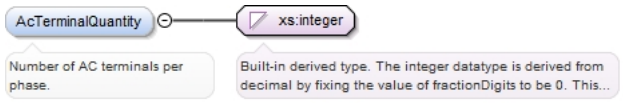
Element InverterDefinitionType / IntegratedAcDisconnectRating

Namespace	No namespace
Annotations	The rating, in amps, of the integrated AC disconnect, if included.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="IntegratedAcDisconnectRating" type="xs:integer"> <xs:annotation> <xs:documentation>The rating, in amps, of the integrated AC disconnect, if included.</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / NeutralSizingRequirement

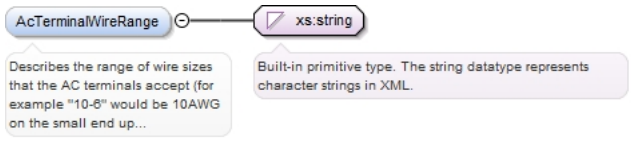
Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="NeutralSizingRequirement" type="xs:string"/>

Element InverterDefinitionType / AcTerminalQuantity

Namespace	No namespace
Annotations	Number of AC terminals per phase.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="AcTerminalQuantity" type="xs:integer"> <xs:annotation> <xs:documentation>Number of AC terminals per phase.</xs:documentation> </xs:annotation> </xs:element>

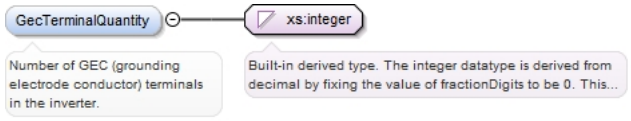
Element InverterDefinitionType / AcTerminalWireRange

Namespace	No namespace
Annotations	Describes the range of wire sizes that the AC terminals accept (for example "10-6" would be 10AWG on the small end up to 6AWG).

Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

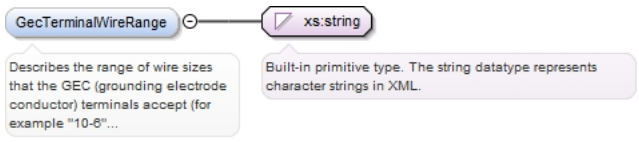
Source	`<xs:element name="AcTerminalWireRange" type="xs:string" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>Describes the range of wire sizes that the AC terminals accept (for example "10-6" would be 10AWG on the small end up to 6AWG).</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element InverterDefinitionType / GecTerminalQuantity

Namespace	No namespace
Annotations	Number of GEC (grounding electrode conductor) terminals in the inverter.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	`<xs:element name="GecTerminalQuantity" minOccurs="0" maxOccurs="1" type="xs:integer">`
	`  <xs:annotation>`
	`  <xs:documentation>Number of GEC (grounding electrode conductor) terminals in the inverter.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

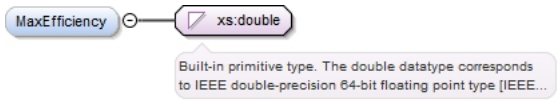
Element InverterDefinitionType / GecTerminalWireRange

Namespace	No namespace
Annotations	Describes the range of wire sizes that the GEC (grounding electrode conductor) terminals accept (for example "10-6" would be 10AWG on the small end up to 6AWG).
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

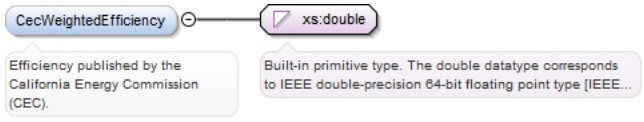
Source	`<xs:element name="GecTerminalWireRange" minOccurs="0" maxOccurs="1" type="xs:string">`
	`  <xs:annotation>`
	`  <xs:documentation>Describes the range of wire sizes that the GEC (grounding electrode conductor) terminals accept (for example "10-6" would be 10AWG on the small end up to 6AWG).</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element InverterDefinitionType / MaxEfficiency

Namespace	No namespace

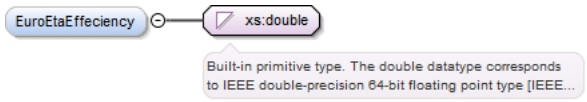
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="MaxEfficiency" type="xs:double" minOccurs="0" maxOccurs="1"/>`

Element InverterDefinitionType / CecWeightedEfficiency

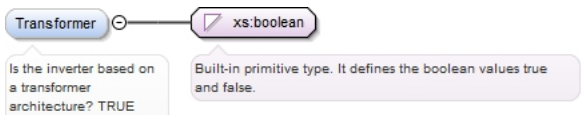
Namespace	No namespace
Annotations	Efficiency published by the California Energy Commission (CEC).
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	`<xs:element name="CecWeightedEfficiency" type="xs:double" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>Efficiency published by the California Energy Commission (CEC).</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element InverterDefinitionType / EuroEtaEffeciency

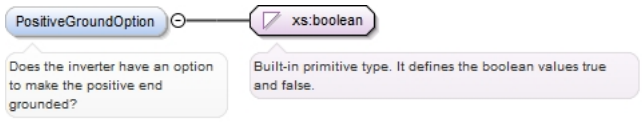
Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="EuroEtaEffeciency" type="xs:double" minOccurs="0" maxOccurs="1"/>`

Element InverterDefinitionType / Transformer

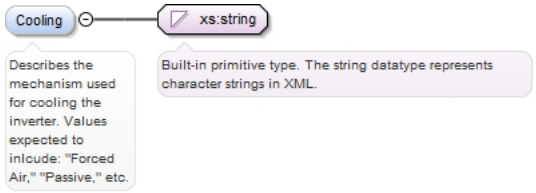
Namespace	No namespace
Annotations	Is the inverter based on a transformer architecture? TRUE indicates there is a transformer.
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0

	maxOccurs: 1
Source	<xs:element name="Transformer" minOccurs="0" maxOccurs="1" type="xs:boolean"> <xs:annotation> <xs:documentation>Is the inverter based on a transformer architecture? TRUE indicates there is a transformer.</xs:documentation> </xs:annotation> </xs:element>

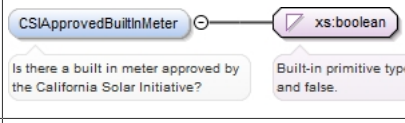
Element InverterDefinitionType / PositiveGroundOption

Namespace	No namespace
Annotations	Does the inverter have an option to make the positive end grounded?
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="PositiveGroundOption" type="xs:boolean"> <xs:annotation> <xs:documentation>Does the inverter have an option to make the positive end grounded?</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / Cooling

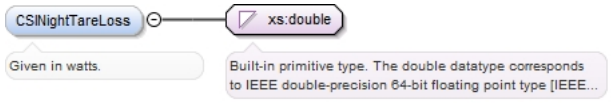
Namespace	No namespace
Annotations	Describes the mechanism used for cooling the inverter. Values expected to inlcude: "Forced Air," "Passive," etc.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Cooling" minOccurs="0" maxOccurs="1" type="xs:string"> <xs:annotation> <xs:documentation>Describes the mechanism used for cooling the inverter. Values expected to inlcude: "Forced Air," "Passive," etc.</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / CSIApprovedBuiltInMeter

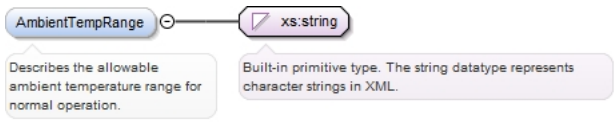
Namespace	No namespace
Annotations	Is there a built in meter approved by the California Solar Initiative?
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0

Source	<xs:element minOccurs="0" name="CSIApprovedBuiltInMeter" type="xs:boolean"> <xs:annotation> <xs:documentation>Is there a built in meter approved by the California Solar Initiative?</xs:documentation> </xs:annotation> </xs:element>

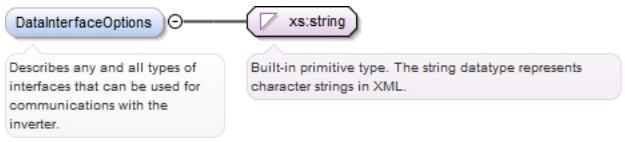
Element InverterDefinitionType / CSINightTareLoss

Namespace	No namespace
Annotations	Given in watts.
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="CSINightTareLoss" type="xs:double"> <xs:annotation> <xs:documentation>Given in watts.</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / AmbientTempRange

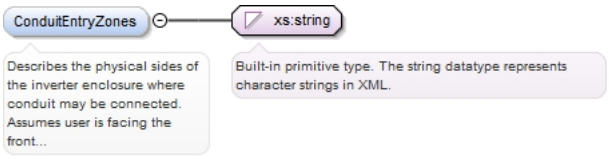
Namespace	No namespace
Annotations	Describes the allowable ambient temperature range for normal operation.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="AmbientTempRange" type="xs:string"> <xs:annotation> <xs:documentation>Describes the allowable ambient temperature range for normal operation.</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / DataInterfaceOptions

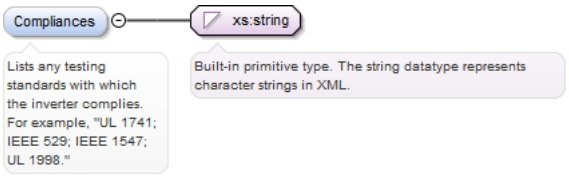
Namespace	No namespace
Annotations	Describes any and all types of interfaces that can be used for communications with the inverter.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="DataInterfaceOptions" minOccurs="0" maxOccurs="1" type="xs:string"> <xs:annotation> <xs:documentation>Describes any and all types of interfaces that can be used for communications with the inverter.</xs:documentation> </xs:annotation>

```
</xs:element>
```

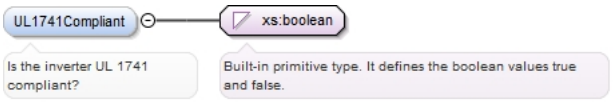
Element InverterDefinitionType / ConduitEntryZones

Namespace	No namespace
Annotations	Describes the physical sides of the inverter enclosure where conduit may be connected. Assumes user is facing the front of the inverter. For example, "bottom, back, both sides."
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="ConduitEntryZones" type="xs:string"> <xs:annotation> <xs:documentation>Describes the physical sides of the inverter enclosure where conduit may be connected. Assumes user is facing the front of the inverter. For example, "bottom, back, both sides."</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / Compliances

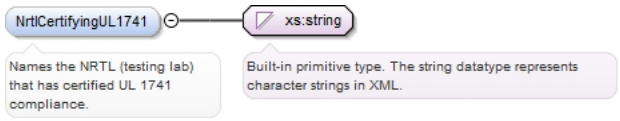
Namespace	No namespace
Annotations	Lists any testing standards with which the inverter complies. For example, "UL 1741; IEEE 529; IEEE 1547; UL 1998."
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Compliances" minOccurs="0" maxOccurs="1" type="xs:string"> <xs:annotation> <xs:documentation>Lists any testing standards with which the inverter complies. For example, "UL 1741; IEEE 529; IEEE 1547; UL 1998."</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / UL1741Compliant

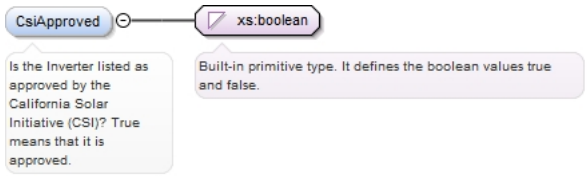
Namespace	No namespace
Annotations	Is the inverter UL 1741 compliant?
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="UL1741Compliant" type="xs:boolean"> <xs:annotation> <xs:documentation>Is the inverter UL 1741 compliant?</xs:documentation> </xs:annotation>

```
</xs:element>
```

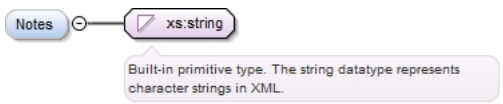
Element InverterDefinitionType / NrtlCertifyingUL1741

Namespace	No namespace
Annotations	Names the NRTL (testing lab) that has certified UL 1741 compliance.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="NrtlCertifyingUL1741" minOccurs="0" maxOccurs="1" type="xs:string"> <xs:annotation> <xs:documentation>Names the NRTL (testing lab) that has certified UL 1741 compliance.</xs:documentation> </xs:annotation> </xs:element>

Element InverterDefinitionType / CsiApproved

Namespace	No namespace
Annotations	Is the Inverter listed as approved by the California Solar Initiative (CSI)? True means that it is approved.
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="CsiApproved" type="xs:boolean"> <xs:annotation> <xs:documentation>Is the Inverter listed as approved by the California Solar Initiative (CSI)? True means that it is approved.</xs:documentation> </xs:annotation> </xs:element>

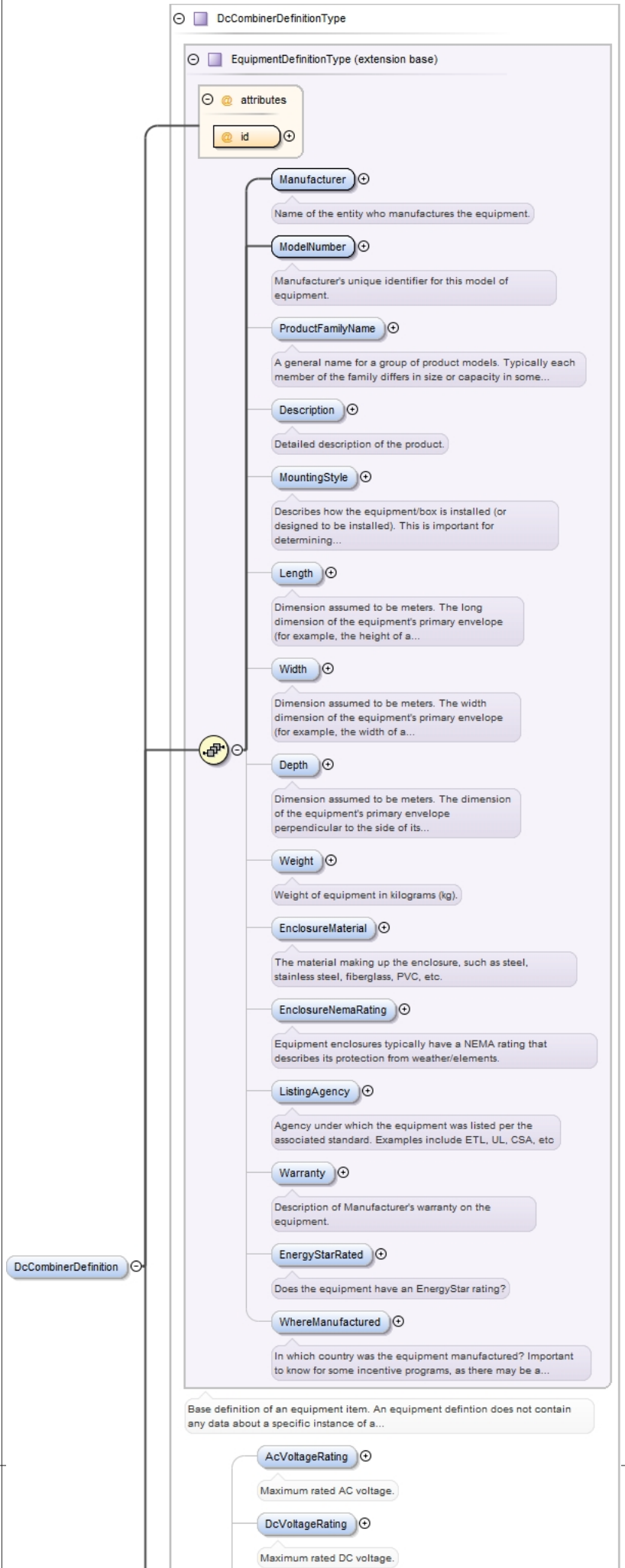
Element InverterDefinitionType / Notes

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Notes" minOccurs="0" maxOccurs="1" type="xs:string"> </xs:element>

Element PvSystemType / DcCombinerDefinition

Namespace	No namespace

Diagram


DcCombinerDefinitionType
EquipmentDefinitionType (extension base)
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...
AcVoltageRating
Maximum rated AC voltage.
DcVoltageRating
Maximum rated DC voltage.
DcCombinerDefinition

Type	DcCombinerDefinitionType
Type hierarchy	• EquipmentDefinitionType • DcCombinerDefinitionType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1} , AcVoltageRating{0,1} , DcVoltageRating{0,1} , MaxContinuousCurrent{0,1} , QtyInputCircuits{0,1} , MaxOcpdRating{0,1} , MinInputConductorSize{0,1} , MaxInputConductorSize{0,1} , QtyOutputConductors{0,1} , MinOutputConductorSize{0,1} , MaxOutputConductorSize{0,1} , IntegratedDisconnectIncluded{0,1} , IntegratedDisconnectRating{0,1} , MonitoringAvailable{0,1} , RevenueGradeMonitoring{0,1}
Children	AcVoltageRating, DcVoltageRating, Depth, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, IntegratedDisconnectIncluded, IntegratedDisconnectRating, Length, ListingAgency, Manufacturer, MaxContinuousCurrent, MaxInputConductorSize, MaxOcpdRating, MaxOutputConductorSize, MinInputConductorSize, MinOutputConductorSize, ModelNumber, MonitoringAvailable, MountingStyle, ProductFamilyName, QtyInputCircuits, QtyOutputConductors, RevenueGradeMonitoring, Warranty, Weight, WhereManufactured, Width

Instance

```
<DcCombinerDefinition id="">
  <Manufacturer>{1,1}</Manufacturer>
  <ModelNumber>{1,1}</ModelNumber>
  <ProductFamilyName>{0,1}</ProductFamilyName>
  <Description>{0,1}</Description>
  <MountingStyle>{0,1}</MountingStyle>
  <Length>{0,1}</Length>
  <Width>{0,1}</Width>
  <Depth>{0,1}</Depth>
  <Weight>{0,1}</Weight>
  <EnclosureMaterial>{0,1}</EnclosureMaterial>
  <EnclosureNemaRating>{0,1}</EnclosureNemaRating>
  <ListingAgency>{0,1}</ListingAgency>
  <Warranty>{0,1}</Warranty>
  <EnergyStarRated>{0,1}</EnergyStarRated>
  <WhereManufactured>{0,1}</WhereManufactured>
  <AcVoltageRating>{0,1}</AcVoltageRating>
  <DcVoltageRating>{0,1}</DcVoltageRating>
  <MaxContinuousCurrent>{0,1}</MaxContinuousCurrent>
  <QtyInputCircuits>{0,1}</QtyInputCircuits>
  <MaxOcpdRating>{0,1}</MaxOcpdRating>
  <MinInputConductorSize>{0,1}</MinInputConductorSize>
  <MaxInputConductorSize>{0,1}</MaxInputConductorSize>
  <QtyOutputConductors>{0,1}</QtyOutputConductors>
  <MinOutputConductorSize>{0,1}</MinOutputConductorSize>
  <MaxOutputConductorSize>{0,1}</MaxOutputConductorSize>
  <IntegratedDisconnectIncluded>{0,1}</IntegratedDisconnectIncluded>
  <IntegratedDisconnectRating>{0,1}</IntegratedDisconnectRating>
  <MonitoringAvailable>{0,1}</MonitoringAvailable>
  <RevenueGradeMonitoring>{0,1}</RevenueGradeMonitoring>
</DcCombinerDefinition>
```

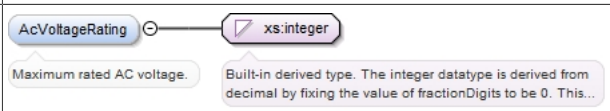
Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			required

Source

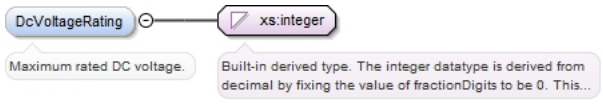
```
<xs:element maxOccurs="unbounded" minOccurs="0" name="DcCombinerDefinition"
 type="DcCombinerDefinitionType"/>
```

Element DcCombinerDefinitionType / AcVoltageRating

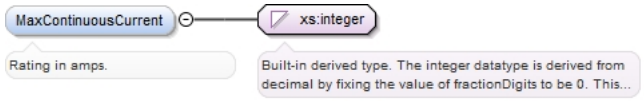
Namespace	No namespace
Annotations	Maximum rated AC voltage.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0

Source	<xs:element minOccurs="0" name="AcVoltageRating" type="xs:integer"> <xs:annotation> <xs:documentation>Maximum rated AC voltage.</xs:documentation> </xs:annotation> </xs:element>

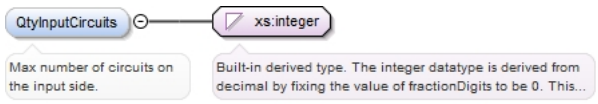
Element DcCombinerDefinitionType / DcVoltageRating

Namespace	No namespace
Annotations	Maximum rated DC voltage.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="DcVoltageRating" type="xs:integer"> <xs:annotation> <xs:documentation>Maximum rated DC voltage.</xs:documentation> </xs:annotation> </xs:element>

Element DcCombinerDefinitionType / MaxContinuousCurrent

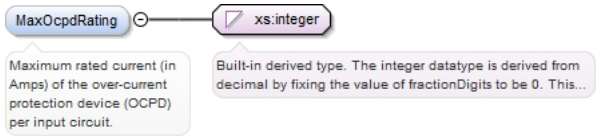
Namespace	No namespace
Annotations	Rating in amps.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="MaxContinuousCurrent" type="xs:integer"> <xs:annotation> <xs:documentation>Rating in amps.</xs:documentation> </xs:annotation> </xs:element>

Element DcCombinerDefinitionType / QtyInputCircuits

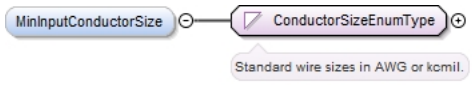
Namespace	No namespace
Annotations	Max number of circuits on the input side.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0
Source	<xs:element name="QtyInputCircuits" minOccurs="0" type="xs:integer"> <xs:annotation> <xs:documentation>Max number of circuits on the input side.</xs:documentation> </xs:annotation> </xs:element>

Element DcCombinerDefinitionType / MaxOcpdRating

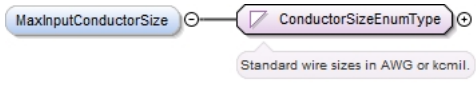
Namespace	No namespace

Annotations	Maximum rated current (in Amps) of the over-current protection device (OCPD) per input circuit.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="MaxOcpdRating" type="xs:integer"> <xs:annotation> <xs:documentation>Maximum rated current (in Amps) of the over-current protection device (OCPD) per input circuit.</xs:documentation> </xs:annotation> </xs:element>

Element DcCombinerDefinitionType / MinInputConductorSize

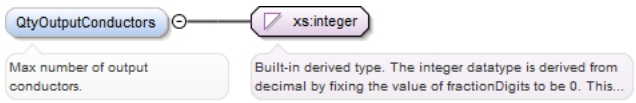
Namespace	No namespace
Diagram	
Type	ConductorSizeEnumType
Properties	content: simple minOccurs: 0
Facets	enumeration 12 enumeration 10 enumeration 8 enumeration 6 enumeration 4 enumeration 3 enumeration 2 enumeration 1/0 enumeration 2/0 enumeration 3/0 enumeration 4/0 enumeration 250 enumeration 350 enumeration 400 enumeration 500
Source	<xs:element minOccurs="0" name="MinInputConductorSize" type="ConductorSizeEnumType"/>

Element DcCombinerDefinitionType / MaxInputConductorSize

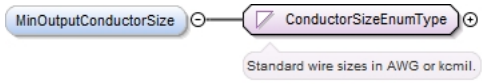
Namespace	No namespace
Diagram	
Type	ConductorSizeEnumType
Properties	content: simple minOccurs: 0
Facets	enumeration 12

	enumeration	10
	enumeration	8
	enumeration	6
	enumeration	4
	enumeration	3
	enumeration	2
	enumeration	1/0
	enumeration	2/0
	enumeration	3/0
	enumeration	4/0
	enumeration	250
	enumeration	350
	enumeration	400
	enumeration	500
Source	<xs:element minOccurs="0" name="MaxInputConductorSize" type="ConductorSizeEnumType"/>	

Element DcCombinerDefinitionType / QtyOutputConductors

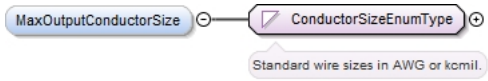
Namespace	No namespace
Annotations	Max number of output conductors.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0
Source	<xs:element name="QtyOutputConductors" minOccurs="0" type="xs:integer"> <xs:annotation> <xs:documentation>Max number of output conductors.</xs:documentation> </xs:annotation> </xs:element>

Element DcCombinerDefinitionType / MinOutputConductorSize

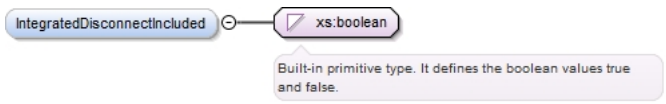
Namespace	No namespace	
Diagram		
Type	ConductorSizeEnumType	
Properties	content: simple minOccurs: 0	
Facets	enumeration	12
	enumeration	10
	enumeration	8
	enumeration	6
	enumeration	4
	enumeration	3
	enumeration	2
	enumeration	1/0
	enumeration	2/0
	enumeration	3/0
	enumeration	4/0

	enumeration	250
	enumeration	350
	enumeration	400
	enumeration	500
Source	<xs:element minOccurs="0" name="MinOutputConductorSize" type="ConductorSizeEnumType"/>	

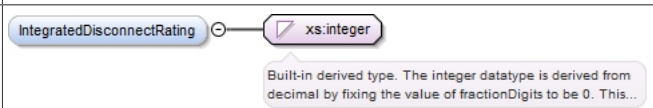
Element DcCombinerDefinitionType / MaxOutputConductorSize

Namespace	No namespace	
Diagram		
Type	ConductorSizeEnumType	
Properties	content:	simple
	minOccurs:	0
Facets	enumeration	12
	enumeration	10
	enumeration	8
	enumeration	6
	enumeration	4
	enumeration	3
	enumeration	2
	enumeration	1/0
	enumeration	2/0
	enumeration	3/0
	enumeration	4/0
	enumeration	250
	enumeration	350
	enumeration	400
	enumeration	500
Source	<xs:element minOccurs="0" name="MaxOutputConductorSize" type="ConductorSizeEnumType"/>	

Element DcCombinerDefinitionType / IntegratedDisconnectIncluded

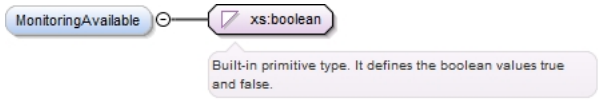
Namespace	No namespace	
Diagram		
Type	xs:boolean	
Properties	content:	simple
	minOccurs:	0
Source	<xs:element minOccurs="0" name="IntegratedDisconnectIncluded" type="xs:boolean"/>	

Element DcCombinerDefinitionType / IntegratedDisconnectRating

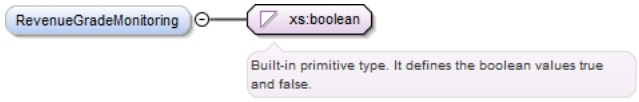
Namespace	No namespace
Diagram	
Type	xs:integer

Properties	content: simple minOccurs: 0
Source	`<xs:element minOccurs="0" name="IntegratedDisconnectRating" type="xs:integer"/>`

Element DcCombinerDefinitionType / MonitoringAvailable

Namespace	No namespace
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0
Source	`<xs:element minOccurs="0" name="MonitoringAvailable" type="xs:boolean"/>`

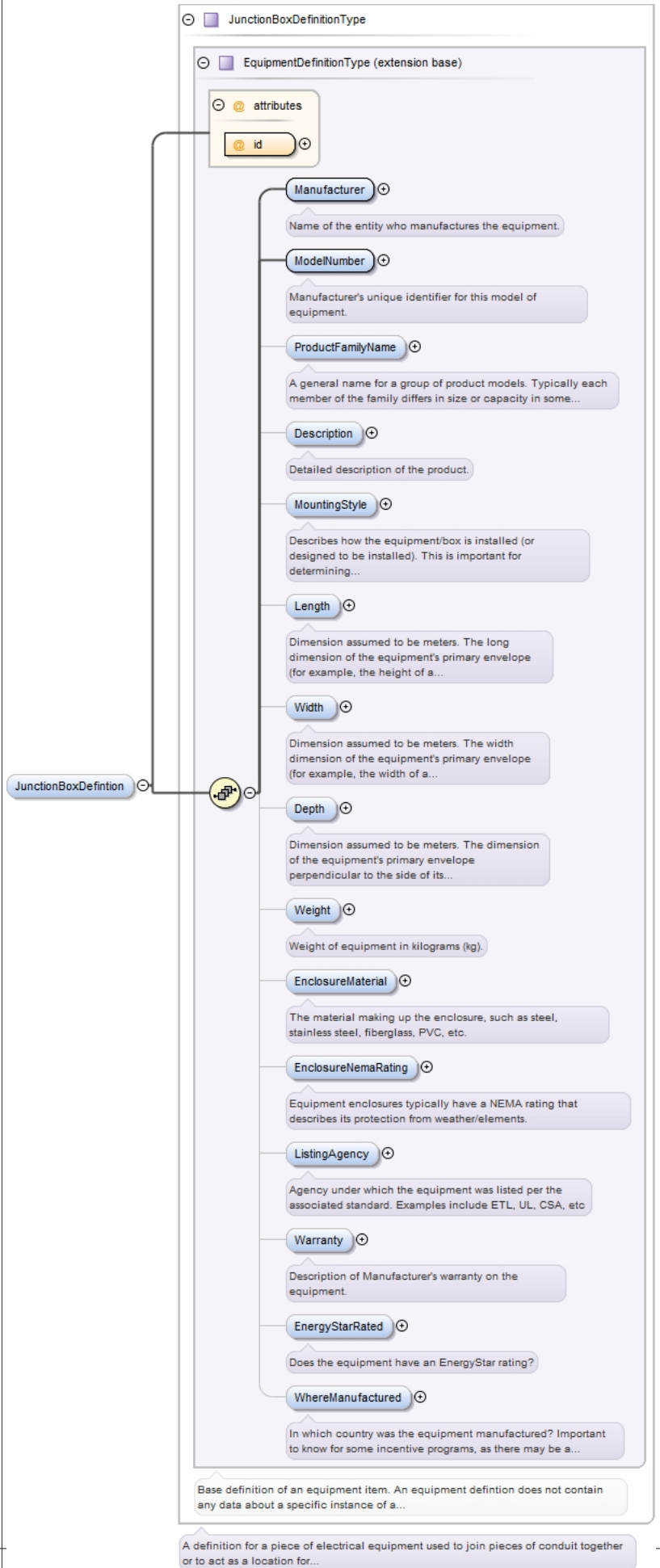
Element DcCombinerDefinitionType / RevenueGradeMonitoring

Namespace	No namespace
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0
Source	`<xs:element minOccurs="0" name="RevenueGradeMonitoring" type="xs:boolean"/>`

Element PvSystemType / JunctionBoxDefintion

Namespace	No namespace

Diagram


JunctionBoxDefinitionType
EquipmentDefinitionType (extension base)
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...
JunctionBoxDefintion
A definition for a piece of electrical equipment used to join pieces of conduit together or to act as a location for...

Type	JunctionBoxDefinitionType
Type hierarchy	• EquipmentDefinitionType • JunctionBoxDefinitionType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1}
Children	Depth, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, Length, ListingAgency, Manufacturer, ModelNumber, MountingStyle, ProductFamilyName, Warranty, Weight, WhereManufactured, Width
Instance	<JunctionBoxDefintion id=""> <Manufacturer>{1,1}</Manufacturer> <ModelNumber>{1,1}</ModelNumber> <ProductFamilyName>{0,1}</ProductFamilyName> <Description>{0,1}</Description> <MountingStyle>{0,1}</MountingStyle> <Length>{0,1}</Length> <Width>{0,1}</Width> <Depth>{0,1}</Depth> <Weight>{0,1}</Weight> <EnclosureMaterial>{0,1}</EnclosureMaterial> <EnclosureNemaRating>{0,1}</EnclosureNemaRating> <ListingAgency>{0,1}</ListingAgency> <Warranty>{0,1}</Warranty> <EnergyStarRated>{0,1}</EnergyStarRated> <WhereManufactured>{0,1}</WhereManufactured> </JunctionBoxDefintion>

Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			required

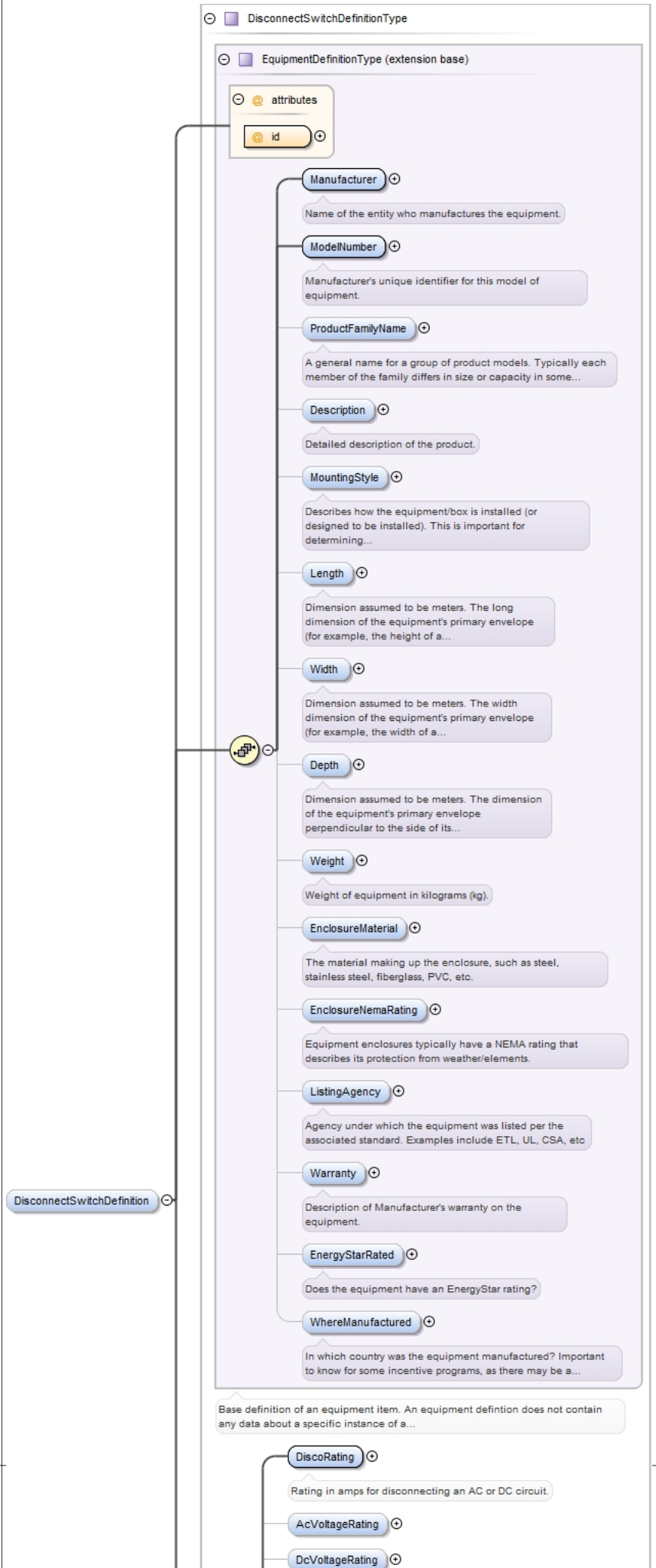
Source

```
<xs:element maxOccurs="unbounded" minOccurs="0" name="JunctionBoxDefintion"
 type="JunctionBoxDefinitionType"/>
```

Element PvSystemType / DisconnectSwitchDefinition

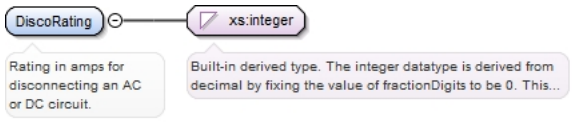
Namespace	No namespace

Diagram


DisconnectSwitchDefinitionType
EquipmentDefinitionType (extension base)
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...
DiscoRating
Rating in amps for disconnecting an AC or DC circuit.
AcVoltageRating
DcVoltageRating
DisconnectSwitchDefinition

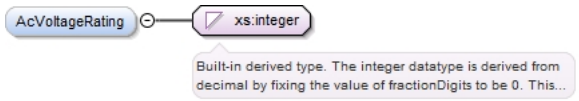
Type	DisconnectSwitchDefinitionType
Type hierarchy	• EquipmentDefinitionType • DisconnectSwitchDefinitionType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1} , DiscoRating , AcVoltageRating{0,1} , DcVoltageRating{0,1} , SwitchContact{0,1} , Duty{0,1} , VisibleLock{0,1} , Fusible{0,1} , Fuse{0,1}
Children	AcVoltageRating, DcVoltageRating, Depth, Description, DiscoRating, Duty, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, Fuse, Fusible, Length, ListingAgency, Manufacturer, ModelNumber, MountingStyle, ProductFamilyName, SwitchContact, VisibleLock, Warranty, Weight, WhereManufactured, Width
Instance	<DisconnectSwitchDefinition id=""> <Manufacturer>{1,1}</Manufacturer> <ModelNumber>{1,1}</ModelNumber> <ProductFamilyName>{0,1}</ProductFamilyName> <Description>{0,1}</Description> <MountingStyle>{0,1}</MountingStyle> <Length>{0,1}</Length> <Width>{0,1}</Width> <Depth>{0,1}</Depth> <Weight>{0,1}</Weight> <EnclosureMaterial>{0,1}</EnclosureMaterial> <EnclosureNemaRating>{0,1}</EnclosureNemaRating> <ListingAgency>{0,1}</ListingAgency> <Warranty>{0,1}</Warranty> <EnergyStarRated>{0,1}</EnergyStarRated> <WhereManufactured>{0,1}</WhereManufactured> <DiscoRating>{1,1}</DiscoRating> <AcVoltageRating>{0,1}</AcVoltageRating> <DcVoltageRating>{0,1}</DcVoltageRating> <SwitchContact>{0,1}</SwitchContact> <Duty>{0,1}</Duty> <VisibleLock>{0,1}</VisibleLock> <Fusible>{0,1}</Fusible> <Fuse>{0,1}</Fuse> </DisconnectSwitchDefinition>
Attributes	**QName** | **Type** | **Fixed** | **Default** | **Use** **id** | xs:ID | | | required
Source	<xs:element maxOccurs="unbounded" minOccurs="0" name="DisconnectSwitchDefinition" type="DisconnectSwitchDefinitionType"/>

Element DisconnectSwitchDefinitionType / DiscoRating

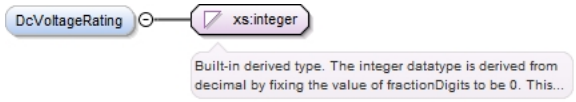
Namespace	No namespace
Annotations	Rating in amps for disconnecting an AC or DC circuit.
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 1
Source	<xs:element minOccurs="1" name="DiscoRating" type="xs:integer"> <xs:annotation> <xs:documentation>Rating in amps for disconnecting an AC or DC circuit.</ xs:documentation> </xs:annotation> </xs:element>

Element DisconnectSwitchDefinitionType / AcVoltageRating

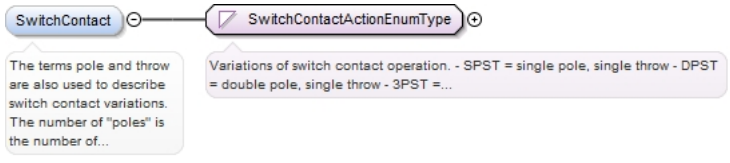
Namespace	No namespace

Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0
Source	`<xs:element minOccurs="0" name="AcVoltageRating" type="xs:integer"/>`

Element DisconnectSwitchDefinitionType / DcVoltageRating

Namespace	No namespace
Diagram	
Type	xs:integer
Properties	content: simple minOccurs: 0
Source	`<xs:element minOccurs="0" name="DcVoltageRating" type="xs:integer"/>`

Element DisconnectSwitchDefinitionType / SwitchContact

Namespace	No namespace
Annotations	The terms pole and throw are also used to describe switch contact variations. The number of "poles" is the number of separate circuits which are controlled by a switch. For example, a "2-pole" switch has two separate identical sets of contacts controlled by the same knob. The number of "throws" is the number of separate positions that the switch can adopt. A single-throw switch has one pair of contacts that can either be closed or open. A double-throw switch has a contact that can be connected to either of two other contacts, a triple-throw has a contact which can be connected to one of three other contacts, etc
Diagram	
Type	SwitchContactActionEnumType
Properties	content: simple minOccurs: 0
Facets	enumeration: SPST enumeration: DPST enumeration: 3PST enumeration: SPDT

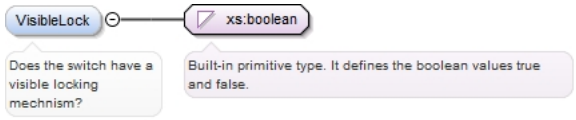
Source	`<xs:element name="SwitchContact" minOccurs="0" type="SwitchContactActionEnumType">`
	`  <xs:annotation>`
	`  <xs:documentation>`The terms pole and throw are also used to describe switch contact variations. The number of "poles" is the number of separate circuits which are controlled by a switch. For example, a "2-pole" switch has two separate identical sets of contacts controlled by the same knob. The number of "throws" is the number of separate positions that the switch can adopt. A single-throw switch has one pair of contacts that can either be closed or open. A double-throw switch has a contact that can be connected to either of two other contacts, a triple-throw has a contact which can be connected to one of three other contacts, etc`</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element DisconnectSwitchDefinitionType / Duty

Namespace	No namespace

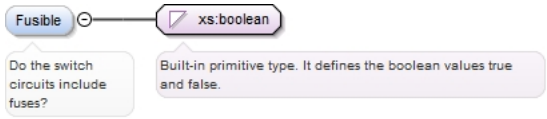
Diagram	
Type	SwitchDutyEnumType
Properties	content: simple minOccurs: 0
Facets	enumeration General-Duty enumeration Heavy-Duty
Source	`<xs:element minOccurs="0" name="Duty" type="SwitchDutyEnumType"/>`

Element DisconnectSwitchDefinitionType / VisibleLock

Namespace	No namespace
Annotations	Does the switch have a visible locking mechnism?
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0

Source	`<xs:element minOccurs="0" name="VisibleLock" type="xs:boolean">`
	`  <xs:annotation>`
	`  <xs:documentation>Does the switch have a visible locking mechnism?</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

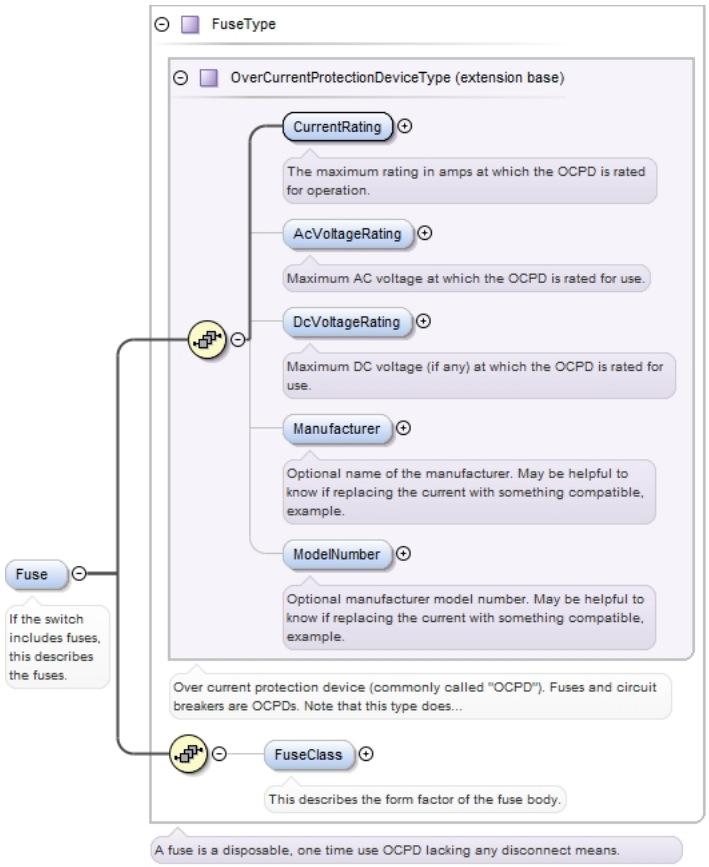
Element DisconnectSwitchDefinitionType / Fusible

Namespace	No namespace
Annotations	Do the switch circuits include fuses?
Diagram	
Type	xs:boolean
Properties	content: simple minOccurs: 0

Source	`<xs:element minOccurs="0" name="Fusible" type="xs:boolean">`
	`  <xs:annotation>`
	`  <xs:documentation>Do the switch circuits include fuses?</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element DisconnectSwitchDefinitionType / Fuse

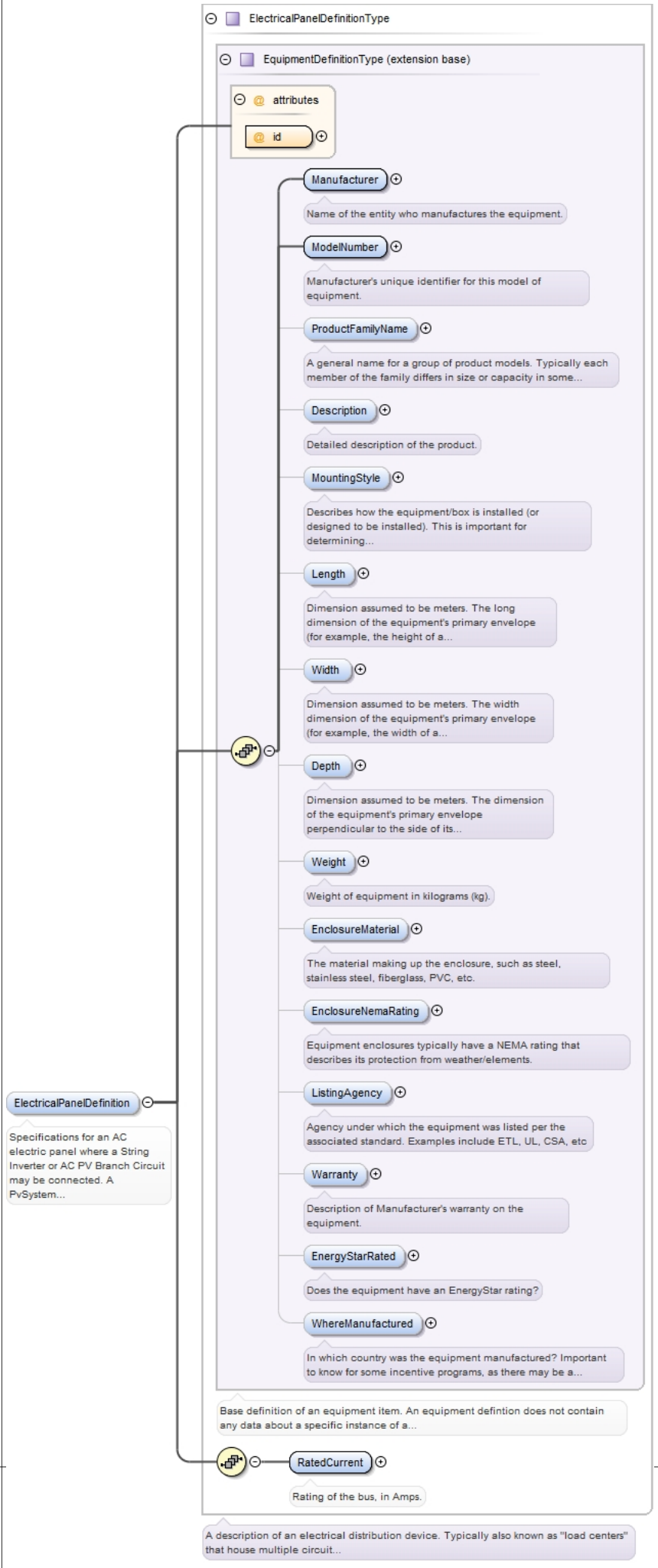
Namespace	No namespace
Annotations	If the switch includes fuses, this describes the fuses.

Diagram	
Type	FuseType
Type hierarchy	• OverCurrentProtectionDeviceType • FuseType
Properties	content: complex minOccurs: 0
Model	CurrentRating , AcVoltageRating{0,1} , DcVoltageRating{0,1} , Manufacturer{0,1} , ModelNumber{0,1} , FuseClass{0,1}
Children	AcVoltageRating, CurrentRating, DcVoltageRating, FuseClass, Manufacturer, ModelNumber
Instance	<Fuse> <CurrentRating>{1,1}</CurrentRating> <AcVoltageRating>{0,1}</AcVoltageRating> <DcVoltageRating>{0,1}</DcVoltageRating> <Manufacturer>{0,1}</Manufacturer> <ModelNumber>{0,1}</ModelNumber> <FuseClass>{0,1}</FuseClass> </Fuse>
Source	<xs:element minOccurs="0" name="Fuse" type="FuseType"> <xs:annotation> <xs:documentation>If the switch includes fuses, this describes the fuses.</ xs:documentation> </xs:annotation> </xs:element>

Element PvSystemType / ElectricalPanelDefinition

Namespace	No namespace
Annotations	Specifications for an AC electric panel where a String Inverter or AC PV Branch Circuit may be connected. A PvSystem may contain more than one AC electric panel make and model (each Inverter or AC PV Branch Circuit can connect to different equipment).

Diagram


ElectricalPanelDefinitionType
EquipmentDefinitionType (extension base)
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...
RatedCurrent
Rating of the bus, in Amps.
A description of an electrical distribution device. Typically also known as "load centers" that house multiple circuit...
ElectricalPanelDefinition
Specifications for an AC electric panel where a String Inverter or AC PV Branch Circuit may be connected. A PvSystem...

Type	ElectricalPanelDefinitionType
Type hierarchy	• EquipmentDefinitionType • ElectricalPanelDefinitionType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1} , RatedCurrent
Children	Depth, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, Length, ListingAgency, Manufacturer, ModelNumber, MountingStyle, ProductFamilyName, RatedCurrent, Warranty, Weight, WhereManufactured, Width

Instance

```
<ElectricalPanelDefinition id="">
  <Manufacturer>{1,1}</Manufacturer>
  <ModelNumber>{1,1}</ModelNumber>
  <ProductFamilyName>{0,1}</ProductFamilyName>
  <Description>{0,1}</Description>
  <MountingStyle>{0,1}</MountingStyle>
  <Length>{0,1}</Length>
  <Width>{0,1}</Width>
  <Depth>{0,1}</Depth>
  <Weight>{0,1}</Weight>
  <EnclosureMaterial>{0,1}</EnclosureMaterial>
  <EnclosureNemaRating>{0,1}</EnclosureNemaRating>
  <ListingAgency>{0,1}</ListingAgency>
  <Warranty>{0,1}</Warranty>
  <EnergyStarRated>{0,1}</EnergyStarRated>
  <WhereManufactured>{0,1}</WhereManufactured>
  <RatedCurrent>{1,1}</RatedCurrent>
</ElectricalPanelDefinition>
```

Attributes

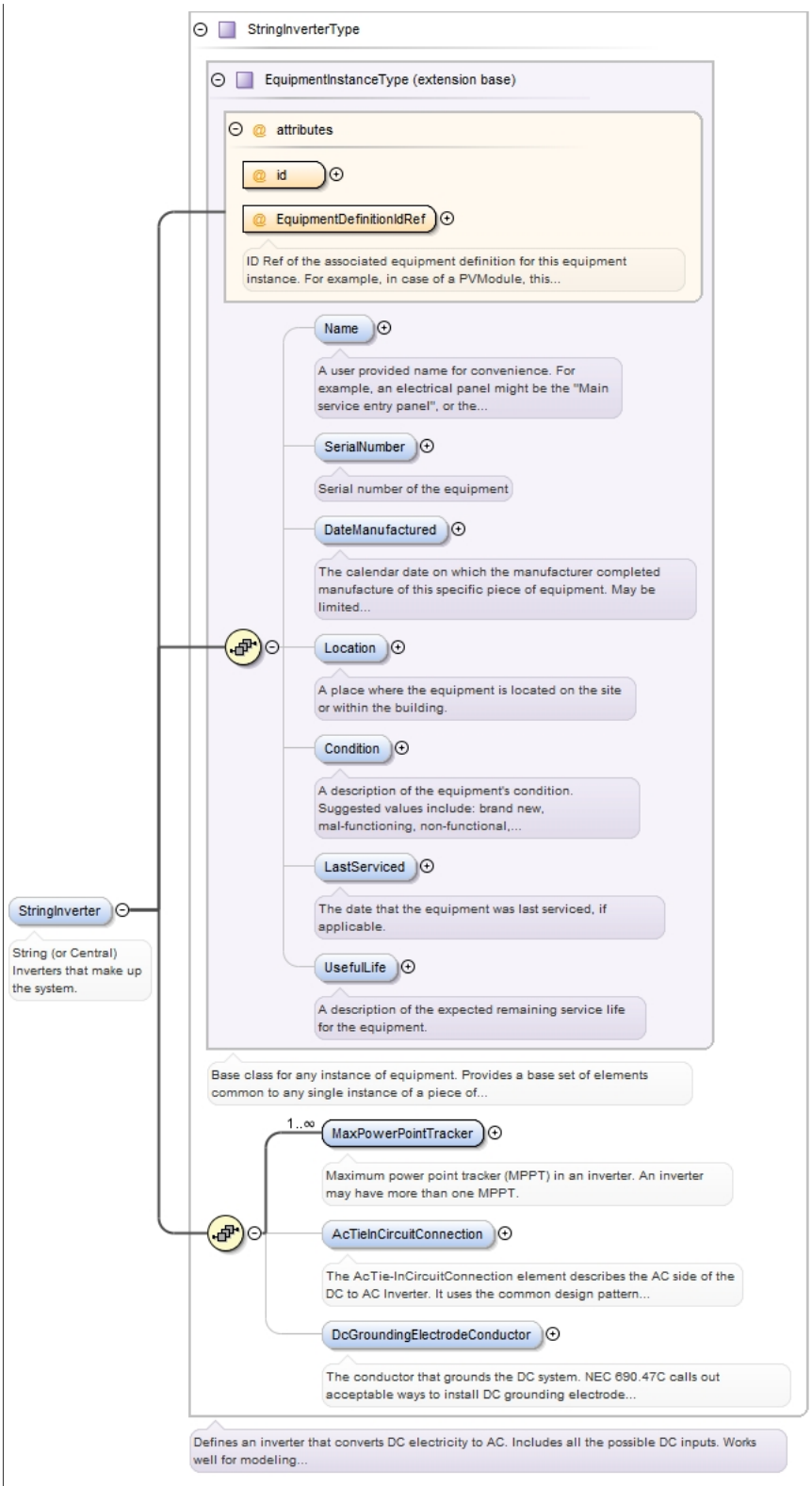
QName	Type	Fixed	Default	Use
id	xs:ID			required

Source

```
<xs:element maxOccurs="unbounded" minOccurs="0" name="ElectricalPanelDefinition"
 type="ElectricalPanelDefinitionType">
  <xs:annotation>
    <xs:documentation>Specifications for an AC electric panel where a String Inverter or
 AC PV Branch Circuit may be connected. A PvSystem may contain more than one AC electric
 panel make and model (each Inverter or AC PV Branch Circuit can connect to different
 equipment).</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element PvSystemType / StringInverter

Namespace	No namespace
Annotations	String (or Central) Inverters that make up the system.

Diagram	
Type	StringInverterType
Type hierarchy	• EquipmentInstanceType • StringInverterType
Properties	content: `complex` minOccurs: `0` maxOccurs: `unbounded`

Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1} , MaxPowerPointTracker+ , AcTieInCircuitConnection{0,1} , DcGroundingElectrodeConductor{0,1}
Children	AcTieInCircuitConnection, Condition, DateManufactured, DcGroundingElectrodeConductor, LastServiced, Location, MaxPowerPointTracker, Name, SerialNumber, UsefulLife

Instance

```
<StringInverter EquipmentDefinitionIdRef="" id="">
  <Name>{0,1}</Name>
  <SerialNumber>{0,1}</SerialNumber>
  <DateManufactured>{0,1}</DateManufactured>
  <Location>{0,1}</Location>
  <Condition>{0,1}</Condition>
  <LastServiced>{0,1}</LastServiced>
  <UsefulLife>{0,1}</UsefulLife>
  <MaxPowerPointTracker>{1,unbounded}</MaxPowerPointTracker>
  <AcTieInCircuitConnection EquipmentWhereConnectedIdRef="">{0,1}</
AcTieInCircuitConnection>
  <DcGroundingElectrodeConductor>{0,1}</DcGroundingElectrodeConductor>
</StringInverter>
```

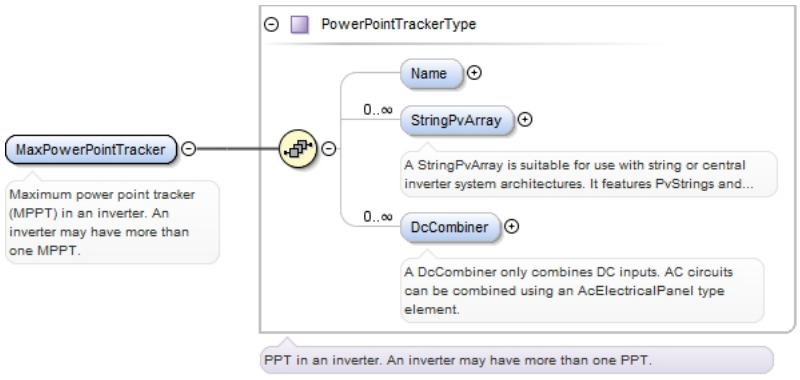
Attributes

QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			required
	ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.			
id	xs:ID			required

Source

```
<xs:element name="StringInverter" type="StringInverterType" minOccurs="0"
 maxOccurs="unbounded">
  <xs:annotation>
    <xs:documentation>String (or Central) Inverters that make up the system.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

Element StringInverterType / MaxPowerPointTracker

Namespace	No namespace
Annotations	Maximum power point tracker (MPPT) in an inverter. An inverter may have more than one MPPT.
Diagram	
Type	PowerPointTrackerType

Properties		
	content:	complex
	maxOccurs:	unbounded
Model	Name{0,1} , StringPvArray* , DcCombiner*	
Children	DcCombiner, Name, StringPvArray	

Instance

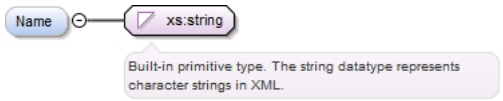
```
<MaxPowerPointTracker>
  <Name>{0,1}</Name>
  <StringPvArray Id="" PvModuleDefinitionIdRef="">{0,unbounded}</StringPvArray>
  <DcCombiner EquipmentDefinitionIdRef="" id="">{0,unbounded}</DcCombiner>
</MaxPowerPointTracker>
```

Source

```
<xs:element maxOccurs="unbounded" name="MaxPowerPointTracker"
 type="PowerPointTrackerType">
  <xs:annotation>
    <xs:documentation>Maximum power point tracker (MPPT) in an inverter. An inverter may
 have more than one MPPT.</xs:documentation>
```

```
  </xs:annotation>
</xs:element>
```

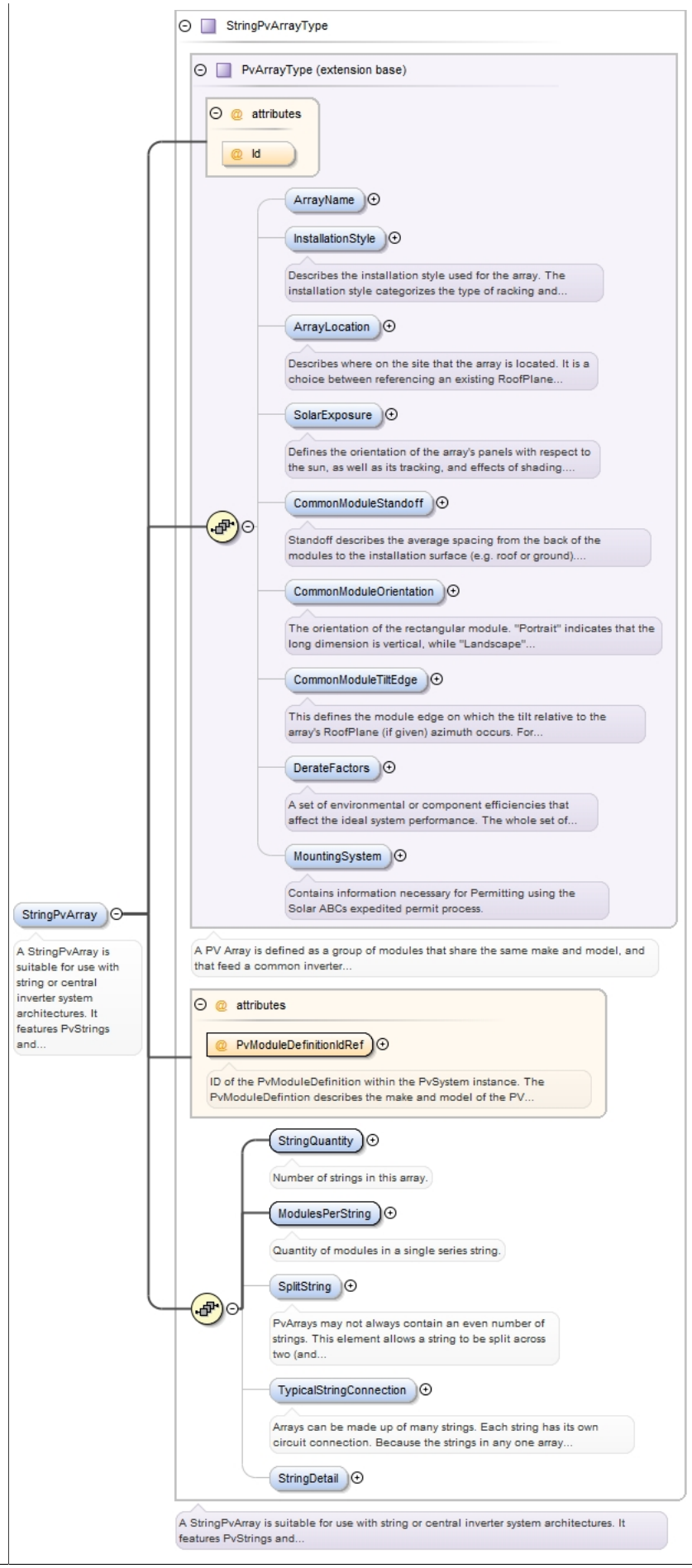
Element PowerPointTrackerType / Name

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	`<xs:element name="Name" minOccurs="0" type="xs:string"/>`

Element PowerPointTrackerType / StringPvArray

Namespace	No namespace
Annotations	A StringPvArray is suitable for use with string or central inverter system architectures. It features PvStrings and DcCombiners as building blocks.

Diagram


StringPvArrayType
PvArrayType (extension base)
attributes
Id
ArrayName
InstallationStyle
Describes the installation style used for the array. The installation style categorizes the type of racking and...
ArrayLocation
Describes where on the site that the array is located. It is a choice between referencing an existing RoofPlane...
SolarExposure
Defines the orientation of the array's panels with respect to the sun, as well as its tracking, and effects of shading....
CommonModuleStandoff
Standoff describes the average spacing from the back of the modules to the installation surface (e.g. roof or ground)....
CommonModuleOrientation
The orientation of the rectangular module. "Portrait" indicates that the long dimension is vertical, while "Landscape"...
CommonModuleTiltEdge
This defines the module edge on which the tilt relative to the array's RoofPlane (if given) azimuth occurs. For...
DerateFactors
A set of environmental or component efficiencies that affect the ideal system performance. The whole set of...
MountingSystem
Contains information necessary for Permitting using the Solar ABCs expedited permit process.
StringPvArray
A StringPvArray is suitable for use with string or central inverter system architectures. It features PvStrings and...
A PV Array is defined as a group of modules that share the same make and model, and that feed a common inverter...
attributes
PvModuleDefinitionIdRef
ID of the PvModuleDefinition within the PvSystem instance. The PvModuleDefintion describes the make and model of the PV...
StringQuantity
Number of strings in this array.
ModulesPerString
Quantity of modules in a single series string.
SplitString
PvArrays may not always contain an even number of strings. This element allows a string to be split across two (and...
TypicalStringConnection
Arrays can be made up of many strings. Each string has its own circuit connection. Because the strings in any one array...
StringDetail
A StringPvArray is suitable for use with string or central inverter system architectures. It features PvStrings and...

Type	StringPvArrayType
Type hierarchy	• PvArrayType • StringPvArrayType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	ArrayName{0,1} , InstallationStyle{0,1} , ArrayLocation{0,1} , SolarExposure{0,1} , CommonModuleStandoff{0,1} , CommonModuleOrientation{0,1} , CommonModuleTiltEdge{0,1} , DerateFactors{0,1} , MountingSystem{0,1} , StringQuantity , ModulesPerString , SplitString{0,1} , TypicalStringConnection{0,1} , StringDetail{0,1}
Children	ArrayLocation, ArrayName, CommonModuleOrientation, CommonModuleStandoff, CommonModuleTiltEdge, DerateFactors, InstallationStyle, ModulesPerString, MountingSystem, SolarExposure, SplitString, StringDetail, StringQuantity, TypicalStringConnection

Instance

```
<StringPvArray Id="" PvModuleDefinitionIdRef="">
  <ArrayName>{0,1}</ArrayName>
  <InstallationStyle>{0,1}</InstallationStyle>
  <ArrayLocation>{0,1}</ArrayLocation>
  <SolarExposure>{0,1}</SolarExposure>
  <CommonModuleStandoff>{0,1}</CommonModuleStandoff>
  <CommonModuleOrientation>{0,1}</CommonModuleOrientation>
  <CommonModuleTiltEdge>{0,1}</CommonModuleTiltEdge>
  <DerateFactors>{0,1}</DerateFactors>
  <MountingSystem>{0,1}</MountingSystem>
  <StringQuantity>{1,1}</StringQuantity>
  <ModulesPerString>{1,1}</ModulesPerString>
  <SplitString>{0,1}</SplitString>
  <TypicalStringConnection EquipmentWhereConnectedIdRef="">{0,1}</TypicalStringConnection>
  <StringDetail>{0,1}</StringDetail>
</StringPvArray>
```

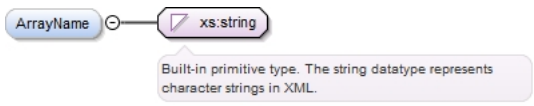
Attributes

QName	Type	Fixed	Default	Use
Id				optional
PvModuleDefinitionIdRef	IDREF			required
	ID of the PvModuleDefinition within the PvSystem instance. The PvModuleDefintion describes the make and model of the PV module. The PvArray is assumed to use the same module for the entire array.			

Source

```
<xs:element maxOccurs="unbounded" minOccurs="0" name="StringPvArray"
 type="StringPvArrayType">
  <xs:annotation>
    <xs:documentation>A StringPvArray is suitable for use with string or central inverter
 system architectures. It features PvStrings and DcCombiners as building blocks.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

Element PvArrayType / ArrayName

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0

Source

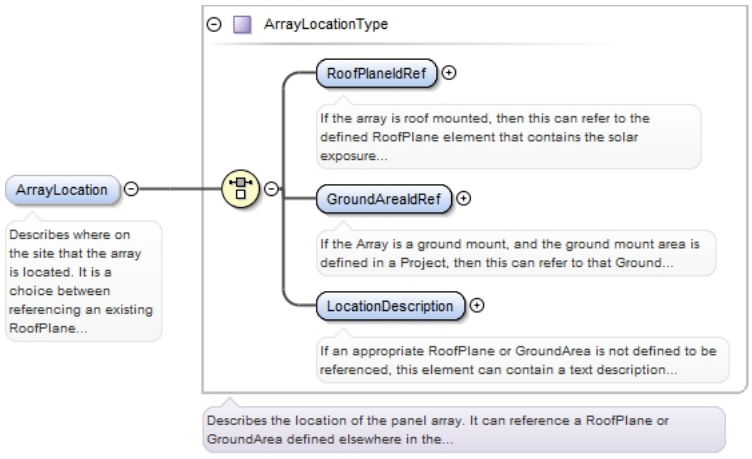
```
<xs:element minOccurs="0" name="ArrayName" type="xs:string"/>
```

Element PvArrayType / InstallationStyle

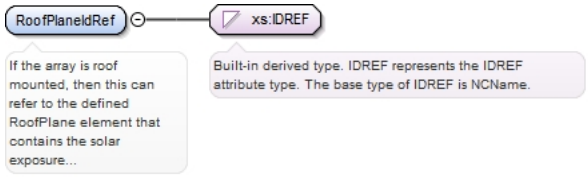
Namespace	No namespace
Annotations	Describes the installation style used for the array. The installation style categorizes the type of racking and mounting equipment used.

Diagram	
Type	ArrayInstallStyleEnumType
Properties	content: simple minOccurs: 0
Facets	enumeration: parallel to roof enumeration: tilt-up roof enumeration: ballasted tilt enumeration: ground mount enumeration: pole mount enumeration: other
Source	<xs:element minOccurs="0" name="InstallationStyle" type="ArrayInstallStyleEnumType"> <xs:annotation> <xs:documentation>Describes the installation style used for the array. The installation style categorizes the type of racking and mounting equipment used.</xs:documentation> </xs:annotation> </xs:element>

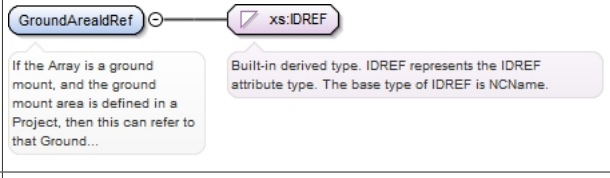
Element PvArrayType / ArrayLocation

Namespace	No namespace
Annotations	Describes where on the site that the array is located. It is a choice between referencing an existing RoofPlane element, an existing GroundArea element, or a text description.
Diagram	
Type	ArrayLocationType
Properties	content: complex minOccurs: 0
Model	RoofPlaneIdRef | GroundAreaIdRef | LocationDescription
Children	GroundAreaIdRef, LocationDescription, RoofPlaneIdRef
Instance	<ArrayLocation> <RoofPlaneIdRef>{1,1}</RoofPlaneIdRef> <GroundAreaIdRef>{1,1}</GroundAreaIdRef> <LocationDescription>{1,1}</LocationDescription> </ArrayLocation>
Source	<xs:element minOccurs="0" name="ArrayLocation" type="ArrayLocationType"> <xs:annotation> <xs:documentation>Describes where on the site that the array is located. It is a choice between referencing an existing RoofPlane element, an existing GroundArea element, or a text description.</xs:documentation> </xs:annotation> </xs:element>

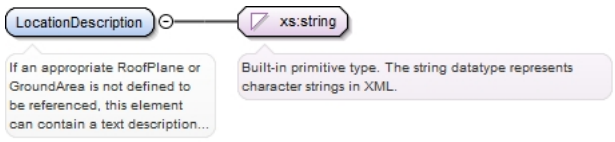
Element ArrayLocationType / RoofPlaneIdRef

Namespace	No namespace
Annotations	If the array is roof mounted, then this can refer to the defined RoofPlane element that contains the solar exposure attributes (note, this is because a single RoofPlane can have multiple arrays).
Diagram	
Type	xs:IDREF
Properties	content: simple
Source	<xs:element form="unqualified" name="RoofPlaneIdRef" type="xs:IDREF"> <xs:annotation> <xs:documentation>If the array is roof mounted, then this can refer to the defined RoofPlane element that contains the solar exposure attributes (note, this is because a single RoofPlane can have multiple arrays).</xs:documentation> </xs:annotation> </xs:element>

Element ArrayLocationType / GroundAreaIdRef

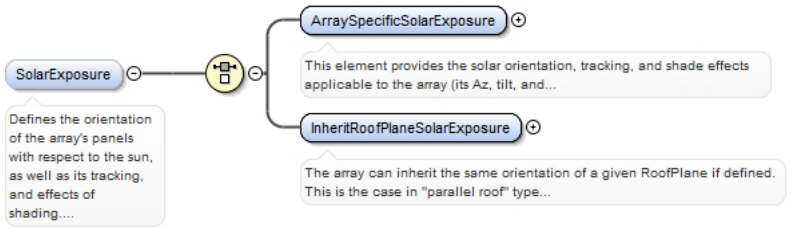
Namespace	No namespace
Annotations	If the Array is a ground mount, and the ground mount area is defined in a Project, then this can refer to that Ground Area element.
Diagram	
Type	xs:IDREF
Properties	content: simple
Source	<xs:element form="unqualified" name="GroundAreaIdRef" type="xs:IDREF"> <xs:annotation> <xs:documentation>If the Array is a ground mount, and the ground mount area is defined in a Project, then this can refer to that Ground Area element.</xs:documentation> </xs:annotation> </xs:element>

Element ArrayLocationType / LocationDescription

Namespace	No namespace
Annotations	If an appropriate RoofPlane or GroundArea is not defined to be referenced, this element can contain a text description of the location.
Diagram	
Type	xs:string
Properties	content: simple
Source	<xs:element form="unqualified" name="LocationDescription" type="xs:string"> <xs:annotation> <xs:documentation>If an appropriate RoofPlane or GroundArea is not defined to be referenced, this element can contain a text description of the location.</ xs:documentation> </xs:annotation> </xs:element>

Element PvArrayType / SolarExposure

Namespace	No namespace

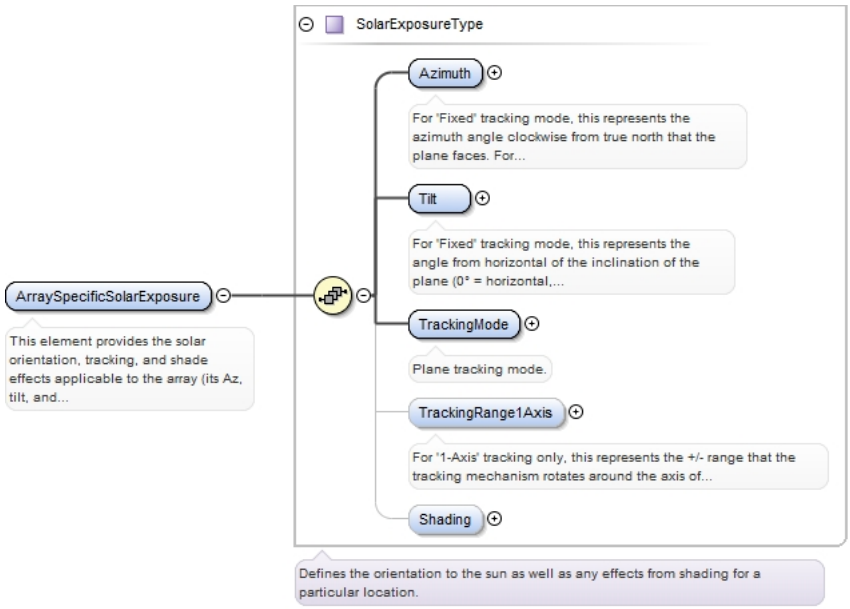
Annotations	Defines the orientation of the array's panels with respect to the sun, as well as its tracking, and effects of shading. This is a choice. If a roof RoofPlane is defined, and the array will be mounted parallel to that RoofPlane, then the array can simply inherit the roof's solar exposure via referring to its ID. Even if the array is mounted on a RoofPlane, it is not required to use that RoofPlane's ID. If the orientation is different from the RoofPlane (a tilt-up rack for example), or if no RoofPlane is used, use the effective exposure to include all the solar exposure attributes.
Diagram	
Properties	content: complex minOccurs: 0
Model	ArraySpecificSolarExposure | InheritRoofPlaneSolarExposure
Children	ArraySpecificSolarExposure, InheritRoofPlaneSolarExposure

Instance	`<SolarExposure>`
	`  <ArraySpecificSolarExposure>{1,1}</ArraySpecificSolarExposure>`
	`  <InheritRoofPlaneSolarExposure>{1,1}</InheritRoofPlaneSolarExposure>`
	`</SolarExposure>`

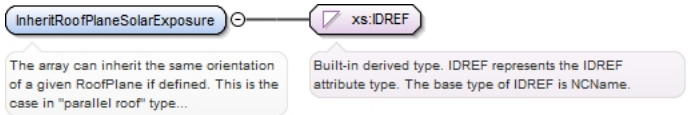
Source	`<xs:element name="SolarExposure" minOccurs="0">` `  <xs:annotation>` ` <xs:documentation>Defines the orientation of the array's panels with respect to the sun, as well as its tracking, and effects of shading. This is a choice. If a roof RoofPlane is defined, and the array will be mounted parallel to that RoofPlane, then the array can simply inherit the roof's solar exposure via referring to its ID. Even if the array is mounted on a RoofPlane, it is not required to use that RoofPlane's ID. If the orientation is different from the RoofPlane (a tilt-up rack for example), or if no RoofPlane is used, use the effective exposure to include all the solar exposure attributes.</xs:documentation>` ` </xs:annotation>` ` <xs:complexType>` ` <xs:choice>` ` <xs:element name="ArraySpecificSolarExposure" type="SolarExposureType">` ` <xs:annotation>` ` <xs:documentation>This element provides the solar orientation, tracking, and shade effects applicable to the array (its Az, tilt, and tracking). This reflects the racking orientation, which could be the roof's orientation if a RoofPlane element is not defined.</xs:documentation>` ` </xs:annotation>` ` </xs:element>` ` <xs:element minOccurs="1" name="InheritRoofPlaneSolarExposure" type="xs:IDREF">` ` <xs:annotation>` ` <xs:documentation>The array can inherit the same orientation of a given RoofPlane if defined. This is the case in "parallel roof" type installations.</xs:documentation>` ` </xs:annotation>` ` </xs:element>` ` </xs:choice>` ` </xs:complexType>` `</xs:element>`

Element PvArrayType / SolarExposure / ArraySpecificSolarExposure

Namespace	No namespace
Annotations	This element provides the solar orientation, tracking, and shade effects applicable to the array (its Az, tilt, and tracking). This reflects the racking orientation, which could be the roof's orientation if a RoofPlane element is not defined.

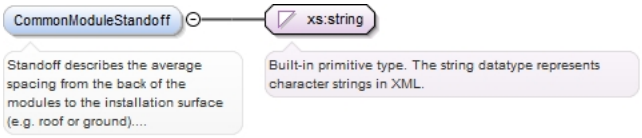
Diagram	
Type	SolarExposureType
Properties	content: complex
Model	Azimuth , Tilt , TrackingMode , TrackingRange1Axis{0,1} , Shading{0,1}
Children	Azimuth, Shading, Tilt, TrackingMode, TrackingRange1Axis
Instance	<ArraySpecificSolarExposure> <Azimuth>{1,1}</Azimuth> <Tilt>{1,1}</Tilt> <TrackingMode>{1,1}</TrackingMode> <TrackingRange1Axis>{0,1}</TrackingRange1Axis> <Shading>{0,1}</Shading> </ArraySpecificSolarExposure>
Source	<xs:element name="ArraySpecificSolarExposure" type="SolarExposureType"> <xs:annotation> <xs:documentation>This element provides the solar orientation, tracking, and shade effects applicable to the array (its Az, tilt, and tracking). This reflects the racking orientation, which could be the roof's orientation if a RoofPlane element is not defined.</xs:documentation> </xs:annotation> </xs:element>

Element PvArrayType / SolarExposure / InheritRoofPlaneSolarExposure

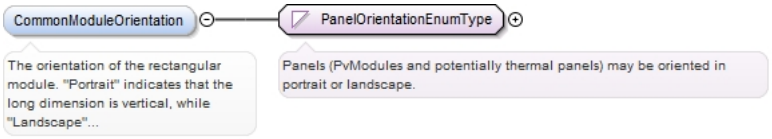
Namespace	No namespace
Annotations	The array can inherit the same orientation of a given RoofPlane if defined. This is the case in "parallel roof" type installations.
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 1
Source	<xs:element minOccurs="1" name="InheritRoofPlaneSolarExposure" type="xs:IDREF"> <xs:annotation> <xs:documentation>The array can inherit the same orientation of a given RoofPlane if defined. This is the case in "parallel roof" type installations.</xs:documentation> </xs:annotation> </xs:element>

Element PvArrayType / CommonModuleStandoff

Namespace	No namespace

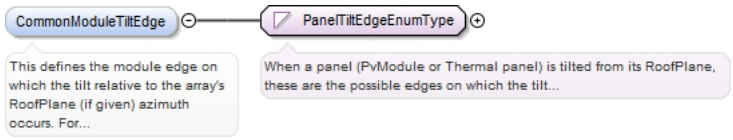
Annotations	Standoff describes the average spacing from the back of the modules to the installation surface (e.g. roof or ground). Standoff is used in calculating system output when the calculator considers heat effects of reduced air circulation to the back of the modules. Many incentive programs reduce incentive payments when air circulation is minimal.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="CommonModuleStandoff" type="xs:string"> <xs:annotation> <xs:documentation>Standoff describes the average spacing from the back of the modules to the installation surface (e.g. roof or ground). Standoff is used in calculating system output when the calculator considers heat effects of reduced air circulation to the back of the modules. Many incentive programs reduce incentive payments when air circulation is minimal.</xs:documentation> </xs:annotation> </xs:element>

Element PvArrayType / CommonModuleOrientation

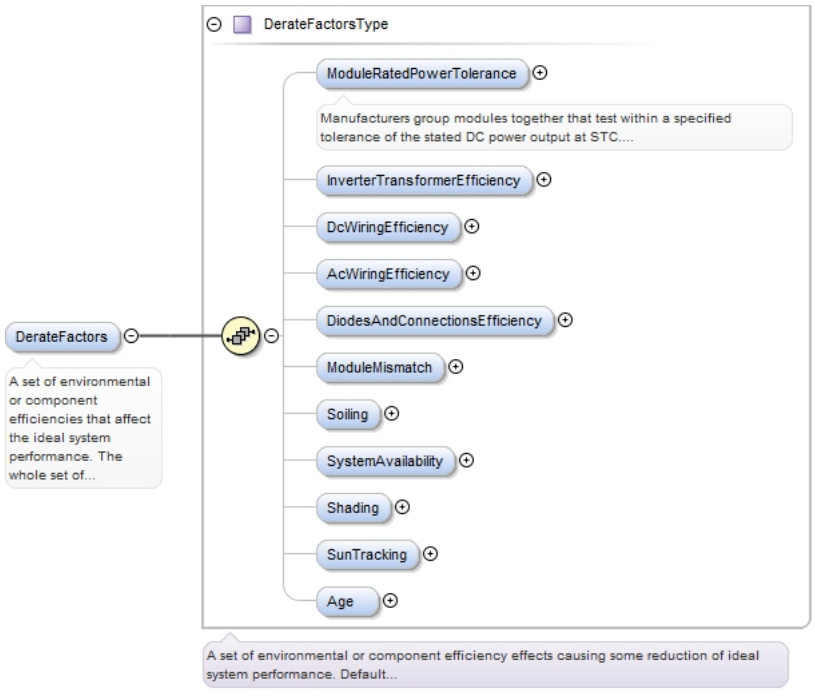
Namespace	No namespace
Annotations	The orientation of the rectangular module. "Portrait" indicates that the long dimension is vertical, while "Landscape" indicates that the long dimension is horizontal. If an individual module has an orientation different from the common value, that orientation can be called out in that particular module's detail element. That value can override the common value provided here.
Diagram	
Type	PanelOrientationEnumType
Properties	content: simple minOccurs: 0
Facets	enumeration: portrait enumeration: landscape
Source	<xs:element minOccurs="0" name="CommonModuleOrientation" type="PanelOrientationEnumType"> <xs:annotation> <xs:documentation>The orientation of the rectangular module. "Portrait" indicates that the long dimension is vertical, while "Landscape" indicates that the long dimension is horizontal. If an individual module has an orientation different from the common value, that orientation can be called out in that particular module's detail element. That value can override the common value provided here.</xs:documentation> </xs:annotation> </xs:element>

Element PvArrayType / CommonModuleTiltEdge

Namespace	No namespace
Annotations	This defines the module edge on which the tilt relative to the array's RoofPlane (if given) azimuth occurs. For example, a "top" edge tilt is routinely used on a north roof to tilt the module to face south (aka "reverse tilt"). "Bottom edge" is the edge toward the azimuth direction of the LayoutPlane. If an individual module has a tilt edge different from the common value, that tilt edge can be called out in that particular module's detail element. That value can override the common value provided here.

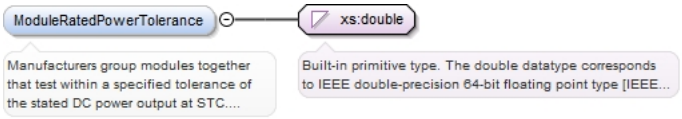
Diagram	
Type	PanelTiltEdgeEnumType
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	enumeration: bottom enumeration: top enumeration: left enumeration: right
Source	`<xs:element name="CommonModuleTiltEdge" maxOccurs="1" minOccurs="0" type="PanelTiltEdgeEnumType"> <xs:annotation> <xs:documentation>This defines the module edge on which the tilt relative to the array's RoofPlane (if given) azimuth occurs. For example, a "top" edge tilt is routinely used on a north roof to tilt the module to face south (aka "reverse tilt"). "Bottom edge" is the edge toward the azimuth direction of the LayoutPlane. If an individual module has a tilt edge different from the common value, that tilt edge can be called out in that particular module's detail element. That value can override the common value provided here.</xs:documentation> </xs:annotation> </xs:element>`

Element PvArrayType / DerateFactors

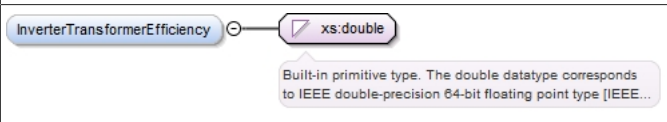
Namespace	No namespace
Annotations	A set of environmental or component efficiencies that affect the ideal system performance. The whole set of DerateFactors is assumed to apply to the entire PvArray. Used as inputs to NREL's PVWatts and potentially other software that runs output estimations. Default values correspond to NREL's PVWatts default values.
Diagram	
Type	DerateFactorsType
Properties	content: complex minOccurs: 0

Model	ModuleRatedPowerTolerance{0,1} , InverterTransformerEfficiency{0,1} , DcWiringEfficiency{0,1} , AcWiringEfficiency{0,1} , DiodesAndConnectionsEfficiency{0,1} , ModuleMismatch{0,1} , Soiling{0,1} , SystemAvailability{0,1} , Shading{0,1} , SunTracking{0,1} , Age{0,1}
Children	AcWiringEfficiency, Age, DcWiringEfficiency, DiodesAndConnectionsEfficiency, InverterTransformerEfficiency, ModuleMismatch, ModuleRatedPowerTolerance, Shading, Soiling, SunTracking, SystemAvailability
Instance	<DerateFactors> <ModuleRatedPowerTolerance>{0,1}</ModuleRatedPowerTolerance> <InverterTransformerEfficiency>{0,1}</InverterTransformerEfficiency> <DcWiringEfficiency>{0,1}</DcWiringEfficiency> <AcWiringEfficiency>{0,1}</AcWiringEfficiency> <DiodesAndConnectionsEfficiency>{0,1}</DiodesAndConnectionsEfficiency> <ModuleMismatch>{0,1}</ModuleMismatch> <Soiling>{0,1}</Soiling> <SystemAvailability>{0,1}</SystemAvailability> <Shading>{0,1}</Shading> <SunTracking>{0,1}</SunTracking> <Age>{0,1}</Age> </DerateFactors>
Source	<xs:element minOccurs="0" name="DerateFactors" type="DerateFactorsType"> <xs:annotation> <xs:documentation>A set of environmental or component efficiencies that affect the ideal system performance. The whole set of DerateFactors is assumed to apply to the entire PvArray. Used as inputs to NREL's PVWatts and potentially other software that runs output estimations. Default values correspond to NREL's PVWatts default values.</xs:documentation> </xs:annotation> </xs:element>

Element DerateFactorsType / ModuleRatedPowerTolerance

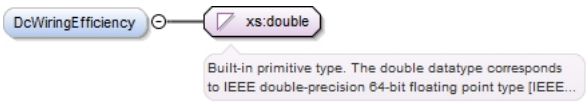
Namespace	No namespace
Annotations	Manufacturers group modules together that test within a specified tolerance of the stated DC power output at STC. Depending on how they define the group, the actual expected power of the modules may be lower than the STC ratings. For example, if the module is rated at 200Wstc, but it has a lower power tolerance of -5%, then the assumption should be made that the modules will only output 190Wstc, and have a derate of 0.95. If the module's lower tolerance is 0%, then the derate would be 1.0.
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 default: 0.95
Source	<xs:element default="0.95" minOccurs="0" name="ModuleRatedPowerTolerance" type="xs:double"> <xs:annotation> <xs:documentation>Manufacturers group modules together that test within a specified tolerance of the stated DC power output at STC. Depending on how they define the group, the actual expected power of the modules may be lower than the STC ratings. For example, if the module is rated at 200Wstc, but it has a lower power tolerance of -5%, then the assumption should be made that the modules will only output 190Wstc, and have a derate of 0.95. If the module's lower tolerance is 0%, then the derate would be 1.0.</xs:documentation> </xs:annotation> </xs:element>

Element DerateFactorsType / InverterTransformerEfficiency

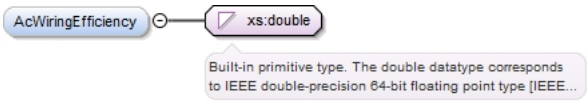
Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0

	maxOccurs:	1
	default:	0.92
Source	<xs:element default="0.92" name="InverterTransformerEfficiency" type="xs:double" maxOccurs="1" minOccurs="0"/>	

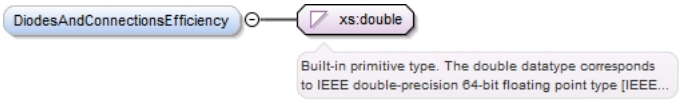
Element DerateFactorsType / DcWiringEfficiency

Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1 default: 0.98
Source	<xs:element default="0.98" name="DcWiringEfficiency" type="xs:double" maxOccurs="1" minOccurs="0"/>

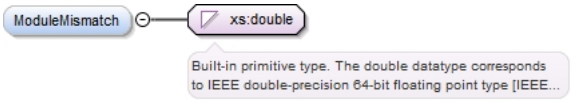
Element DerateFactorsType / AcWiringEfficiency

Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1 default: 0.99
Source	<xs:element default="0.99" name="AcWiringEfficiency" type="xs:double" maxOccurs="1" minOccurs="0"/>

Element DerateFactorsType / DiodesAndConnectionsEfficiency

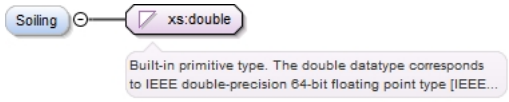
Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1 default: 0.995
Source	<xs:element default="0.995" name="DiodesAndConnectionsEfficiency" type="xs:double" maxOccurs="1" minOccurs="0"/>

Element DerateFactorsType / ModuleMismatch

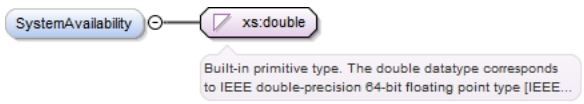
Namespace	No namespace
Diagram	

Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1 default: 0.98
Source	`<xs:element name="ModuleMismatch" default="0.98" type="xs:double" maxOccurs="1" minOccurs="0"/>`

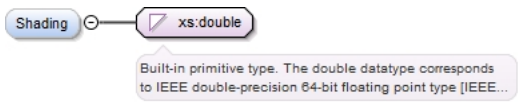
Element DerateFactorsType / Soiling

Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1 default: 0.95
Source	`<xs:element default="0.95" name="Soiling" type="xs:double" maxOccurs="1" minOccurs="0"/>`

Element DerateFactorsType / SystemAvailability

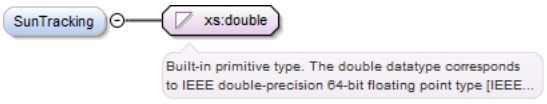
Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1 default: 0.98
Source	`<xs:element default="0.98" name="SystemAvailability" type="xs:double" maxOccurs="1" minOccurs="0"/>`

Element DerateFactorsType / Shading

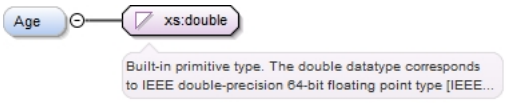
Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1 default: 1.0
Source	`<xs:element name="Shading" default="1.0" type="xs:double" maxOccurs="1" minOccurs="0"/>`

Element DerateFactorsType / SunTracking

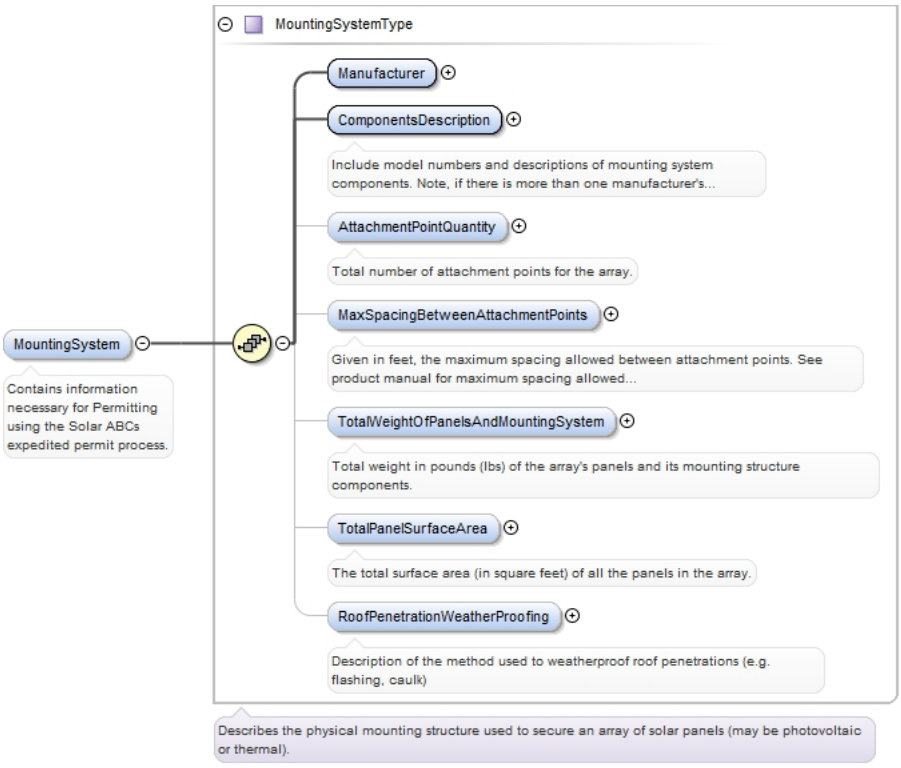
Namespace	No namespace

Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1 default: 1.0
Source	`<xs:element default="1.0" name="SunTracking" type="xs:double" form="unqualified" maxOccurs="1" minOccurs="0"/>`

Element DerateFactorsType / Age

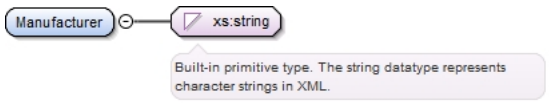
Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0 maxOccurs: 1 default: 1.0
Source	`<xs:element default="1.0" name="Age" type="xs:double" maxOccurs="1" minOccurs="0"/>`

Element PvArrayType / MountingSystem

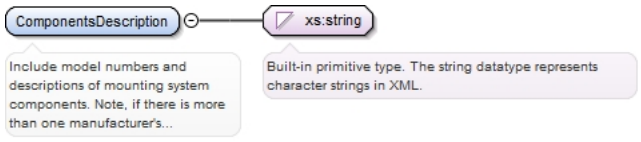
Namespace	No namespace
Annotations	Contains information necessary for Permitting using the Solar ABCs expedited permit process.
Diagram	
Type	MountingSystemType

Properties	content: complex minOccurs: 0
Model	Manufacturer , ComponentsDescription , AttachmentPointQuantity{0,1} , MaxSpacingBetweenAttachmentPoints{0,1} , TotalWeightOfPanelsAndMountingSystem{0,1} , TotalPanelSurfaceArea{0,1} , RoofPenetrationWeatherProofing{0,1}
Children	AttachmentPointQuantity, ComponentsDescription, Manufacturer, MaxSpacingBetweenAttachmentPoints, RoofPenetrationWeatherProofing, TotalPanelSurfaceArea, TotalWeightOfPanelsAndMountingSystem
Instance	<MountingSystem> <Manufacturer>{1,1}</Manufacturer> <ComponentsDescription>{1,1}</ComponentsDescription> <AttachmentPointQuantity>{0,1}</AttachmentPointQuantity> <MaxSpacingBetweenAttachmentPoints>{0,1}</MaxSpacingBetweenAttachmentPoints> <TotalWeightOfPanelsAndMountingSystem>{0,1}</TotalWeightOfPanelsAndMountingSystem> <TotalPanelSurfaceArea>{0,1}</TotalPanelSurfaceArea> <RoofPenetrationWeatherProofing>{0,1}</RoofPenetrationWeatherProofing> </MountingSystem>
Source	<xs:element minOccurs="0" name="MountingSystem" type="MountingSystemType"> <xs:annotation> <xs:documentation>Contains information necessary for Permitting using the Solar ABCs expedited permit process.</xs:documentation> </xs:annotation> </xs:element>

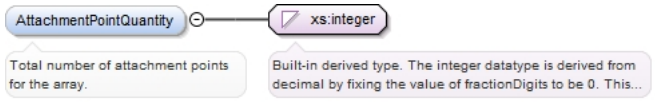
Element MountingSystemType / Manufacturer

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple
Source	<xs:element name="Manufacturer" type="xs:string" form="unqualified"/>

Element MountingSystemType / ComponentsDescription

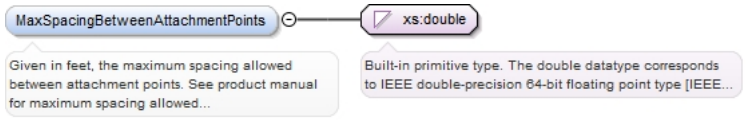
Namespace	No namespace
Annotations	Include model numbers and descriptions of mounting system components. Note, if there is more than one manufacturer's parts used, list the secondary mfr's name here with its component.
Diagram	
Type	xs:string
Properties	content: simple
Source	<xs:element name="ComponentsDescription" type="xs:string" form="unqualified"> <xs:annotation> <xs:documentation>Include model numbers and descriptions of mounting system components. Note, if there is more than one manufacturer's parts used, list the secondary mfr's name here with its component.</xs:documentation> </xs:annotation> </xs:element>

Element MountingSystemType / AttachmentPointQuantity

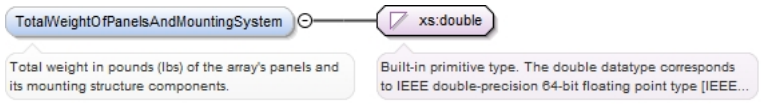
Namespace	No namespace
Annotations	Total number of attachment points for the array.
Diagram	

Type	xs:integer
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="AttachmentPointQuantity" type="xs:integer" form="unqualified"> <xs:annotation> <xs:documentation>Total number of attachment points for the array.</xs:documentation> </xs:annotation> </xs:element>

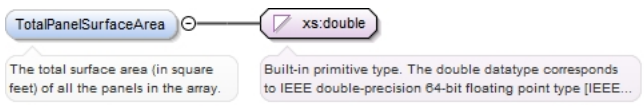
Element MountingSystemType / MaxSpacingBetweenAttachmentPoints

Namespace	No namespace
Annotations	Given in feet, the maximum spacing allowed between attachment points. See product manual for maximum spacing allowed based on maximum design wind speed.
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="MaxSpacingBetweenAttachmentPoints" type="xs:double" form="unqualified"> <xs:annotation> <xs:documentation>Given in feet, the maximum spacing allowed between attachment points. See product manual for maximum spacing allowed based on maximum design wind speed.</xs:documentation> </xs:annotation> </xs:element>

Element MountingSystemType / TotalWeightOfPanelsAndMountingSystem

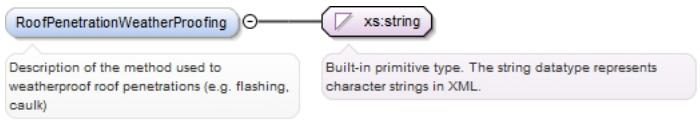
Namespace	No namespace
Annotations	Total weight in pounds (lbs) of the array's panels and its mounting structure components.
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="TotalWeightOfPanelsAndMountingSystem" type="xs:double" form="unqualified"> <xs:annotation> <xs:documentation>Total weight in pounds (lbs) of the array's panels and its mounting structure components.</xs:documentation> </xs:annotation> </xs:element>

Element MountingSystemType / TotalPanelSurfaceArea

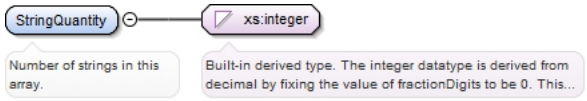
Namespace	No namespace
Annotations	The total surface area (in square feet) of all the panels in the array.
Diagram	
Type	xs:double
Properties	content: simple minOccurs: 0

Source	<xs:element minOccurs="0" name="TotalPanelSurfaceArea" type="xs:double" form="unqualified"><xs:annotation><xs:documentation>The total surface area (in square feet) of all the panels in the array.</xs:documentation></xs:annotation></xs:element>

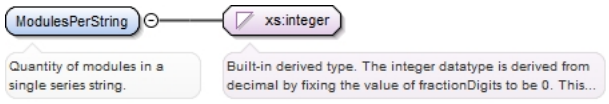
Element MountingSystemType / RoofPenetrationWeatherProofing

Namespace	No namespace
Annotations	Description of the method used to weatherproof roof penetrations (e.g. flashing, caulk)
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="RoofPenetrationWeatherProofing" type="xs:string" form="unqualified"><xs:annotation><xs:documentation>Description of the method used to weatherproof roof penetrations (e.g. flashing, caulk)</xs:documentation></xs:annotation></xs:element>

Element StringPvArrayType / StringQuantity

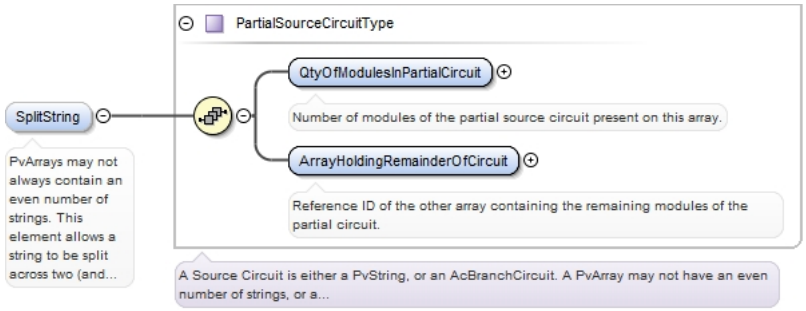
Namespace	No namespace
Annotations	Number of strings in this array.
Diagram	
Type	xs:integer
Properties	content: simple
Source	<xs:element name="StringQuantity" type="xs:integer"><xs:annotation><xs:documentation>Number of strings in this array.</xs:documentation></xs:annotation></xs:element>

Element StringPvArrayType / ModulesPerString

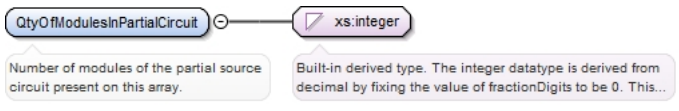
Namespace	No namespace
Annotations	Quantity of modules in a single series string.
Diagram	
Type	xs:integer
Properties	content: simple
Source	<xs:element name="ModulesPerString" type="xs:integer"><xs:annotation><xs:documentation>Quantity of modules in a single series string.</xs:documentation></xs:annotation></xs:element>

Element StringPvArrayType / SplitString

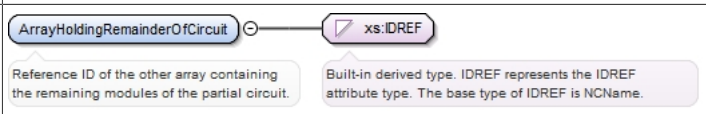
Namespace	No namespace

Annotations	PvArrays may not always contain an even number of strings. This element allows a string to be split across two (and only two) arrays. It includes how many modules of the total string length are in this array, and refers to another array where the remainder of the string is included.
Diagram	
Type	PartialSourceCircuitType
Properties	content: complex minOccurs: 0
Model	QtyOfModulesInPartialCircuit , ArrayHoldingRemainderOfCircuit
Children	ArrayHoldingRemainderOfCircuit, QtyOfModulesInPartialCircuit
Instance	<SplitString> <QtyOfModulesInPartialCircuit>{1,1}</QtyOfModulesInPartialCircuit> <ArrayHoldingRemainderOfCircuit>{1,1}</ArrayHoldingRemainderOfCircuit> </SplitString>
Source	<xs:element minOccurs="0" name="SplitString" type="PartialSourceCircuitType"> <xs:annotation> <xs:documentation>PvArrays may not always contain an even number of strings. This element allows a string to be split across two (and only two) arrays. It includes how many modules of the total string length are in this array, and refers to another array where the remainder of the string is included.</xs:documentation> </xs:annotation> </xs:element>

Element PartialSourceCircuitType / QtyOfModulesInPartialCircuit

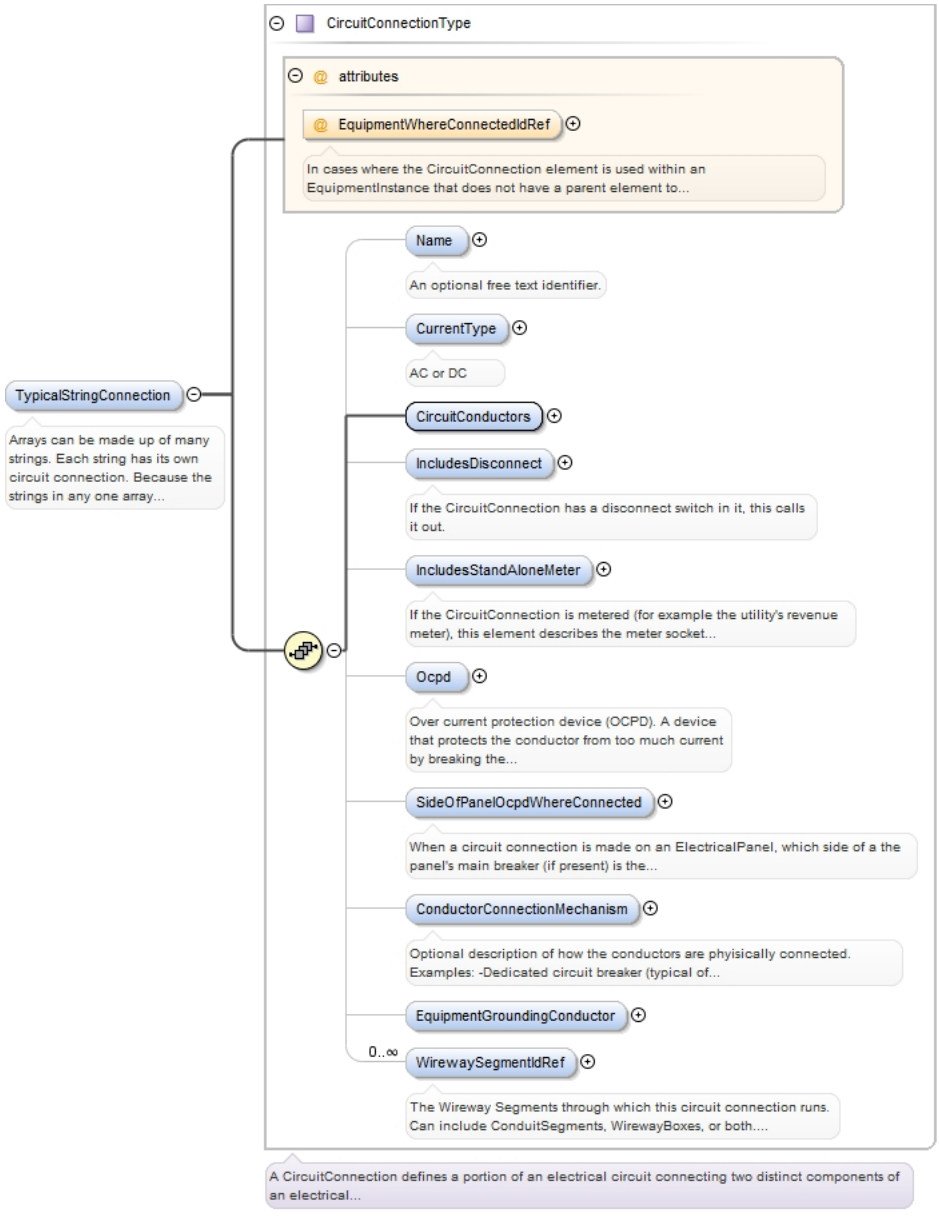
Namespace	No namespace
Annotations	Number of modules of the partial source circuit present on this array.
Diagram	
Type	xs:integer
Properties	content: simple
Source	<xs:element name="QtyOfModulesInPartialCircuit" type="xs:integer"> <xs:annotation> <xs:documentation>Number of modules of the partial source circuit present on this array.</xs:documentation> </xs:annotation> </xs:element>

Element PartialSourceCircuitType / ArrayHoldingRemainderOfCircuit

Namespace	No namespace
Annotations	Reference ID of the other array containing the remaining modules of the partial circuit.
Diagram	
Type	xs:IDREF
Properties	content: simple
Source	<xs:element name="ArrayHoldingRemainderOfCircuit" type="xs:IDREF">

```
  <xs:annotation>
    <xs:documentation>Reference ID of the other array containing the remaining modules of
 the partial circuit.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element StringPvArrayType / TypicalStringConnection

Namespace	No namespace
Annotations	Arrays can be made up of many strings. Each string has its own circuit connection. Because the strings in any one array are almost always connected to their parent element in a common way, this TypicalCircuitConnection element defines the commonly used connection approach from any one of the strings to the parent element (a combiner, or inverter). If circuit connections vary between strings, this element should not be used. Instead, use the IndividualString element which contains its own CircuitConnection element.
Diagram	
Type	CircuitConnectionType
Properties	content: complex minOccurs: 0
Model	Name{0,1} , CurrentType{0,1} , CircuitConductors , IncludesDisconnect{0,1} , IncludesStandAloneMeter{0,1} , Ocpd{0,1} , SideOfPanelOcpdWhereConnected{0,1} , ConductorConnectionMechanism{0,1} , EquipmentGroundingConductor{0,1} , WirewaySegmentIdRef*

Children	CircuitConductors, ConductorConnectionMechanism, CurrentType, EquipmentGroundingConductor, IncludesDisconnect, IncludesStandAloneMeter, Name, Ocpd, SideOfPanelOcpdWhereConnected, WirewaySegmentIdRef

Instance

```
<TypicalStringConnection EquipmentWhereConnectedIdRef="">
  <Name>{0,1}</Name>
  <CurrentType>{0,1}</CurrentType>
  <CircuitConductors>{1,1}</CircuitConductors>
  <IncludesDisconnect ConductorSegmentIdRef="" WirewayBoxIdRef="">{0,1}</
IncludesDisconnect>
  <IncludesStandAloneMeter ConductorSegmentIdRef="">{0,1}</IncludesStandAloneMeter>
  <Ocpd EquipmentWhereLocatedIdRef="">{0,1}</Ocpd>
  <SideOfPanelOcpdWhereConnected>{0,1}</SideOfPanelOcpdWhereConnected>
  <ConductorConnectionMechanism>{0,1}</ConductorConnectionMechanism>
  <EquipmentGroundingConductor>{0,1}</EquipmentGroundingConductor>
  <WirewaySegmentIdRef>{0,unbounded}</WirewaySegmentIdRef>
</TypicalStringConnection>
```

Attributes

QName	Type	Fixed	Default	Use
EquipmentWhereConnectedIdRef	xs:IDREF			optional

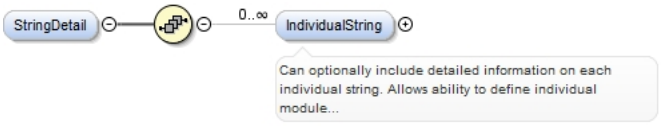
In cases where the CircuitConnection element is used within an EquipmentInstance that does not have a parent element to which the CircuitConnection is assumed to connect, a reference ID can be used to associate this CircuitConnection to another EquipmentInstance elsewhere in a document instance. For example, a PvSystem may have an AcPointOfConnection that uses a new ElectricalPanel as an AC combiner for more than one Inverter. The new electrical panel can be described by an ElectricalPanel element in the PvDesign (which in turn refers to an ElectricalPanelDefinition element).

in the AcPointOfConnection's EquipmentWhereConnected element. That ElectricPanel's EnergizingCircuitConnection element may reference another ElectricPanel in an instance of the Project's ExistingElectricalHierarchy element.

Source

```
<xs:element name="TypicalStringConnection" minOccurs="0" type="CircuitConnectionType">
  <xs:annotation>
    <xs:documentation>Arrays can be made up of many strings. Each string has its own
 circuit connection. Because the strings in any one array are almost always connected
 to their parent element in a common way, this TypicalCircuitConnection element defines
 the commonly used connection approach from any one of the strings to the parent element
 (a combiner, or inverter). If circuit connections vary between strings, this element
 should not be used. Instead, use the IndividualString element which contains its own
 CircuitConnection element.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element StringPvArrayType / StringDetail

Namespace	No namespace
Diagram	

Properties		
	content:	complex
	minOccurs:	0
Model	IndividualString*	
Children	IndividualString	

Instance

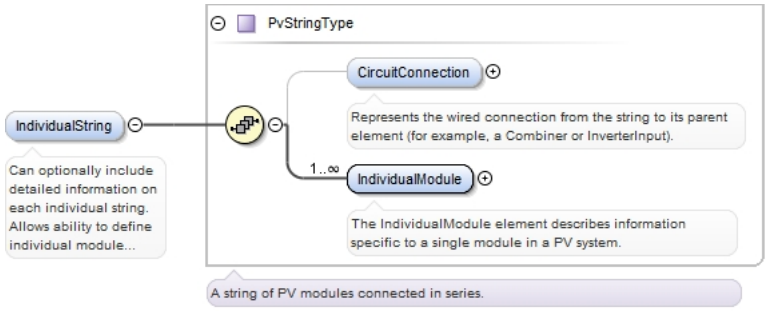
```
<StringDetail>
  <IndividualString>{0,unbounded}</IndividualString>
</StringDetail>
```

Source

```
<xs:element minOccurs="0" name="StringDetail">
  <xs:complexType>
    <xs:sequence>
      <xs:element maxOccurs="unbounded" name="IndividualString" type="PvStringType"
 minOccurs="0">
        <xs:annotation>
          <xs:documentation>Can optionally include detailed information on each individual
 string. Allows ability to define individual module properties within each string,
 including x/y locations on layout planes, serial numbers, shading affects, etc. This
 element is typically used by design software for detailed calculation of system output.</
xs:documentation>
        </xs:annotation>
```

```
      </xs:element>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

Element StringPvArrayType / StringDetail / IndividualString

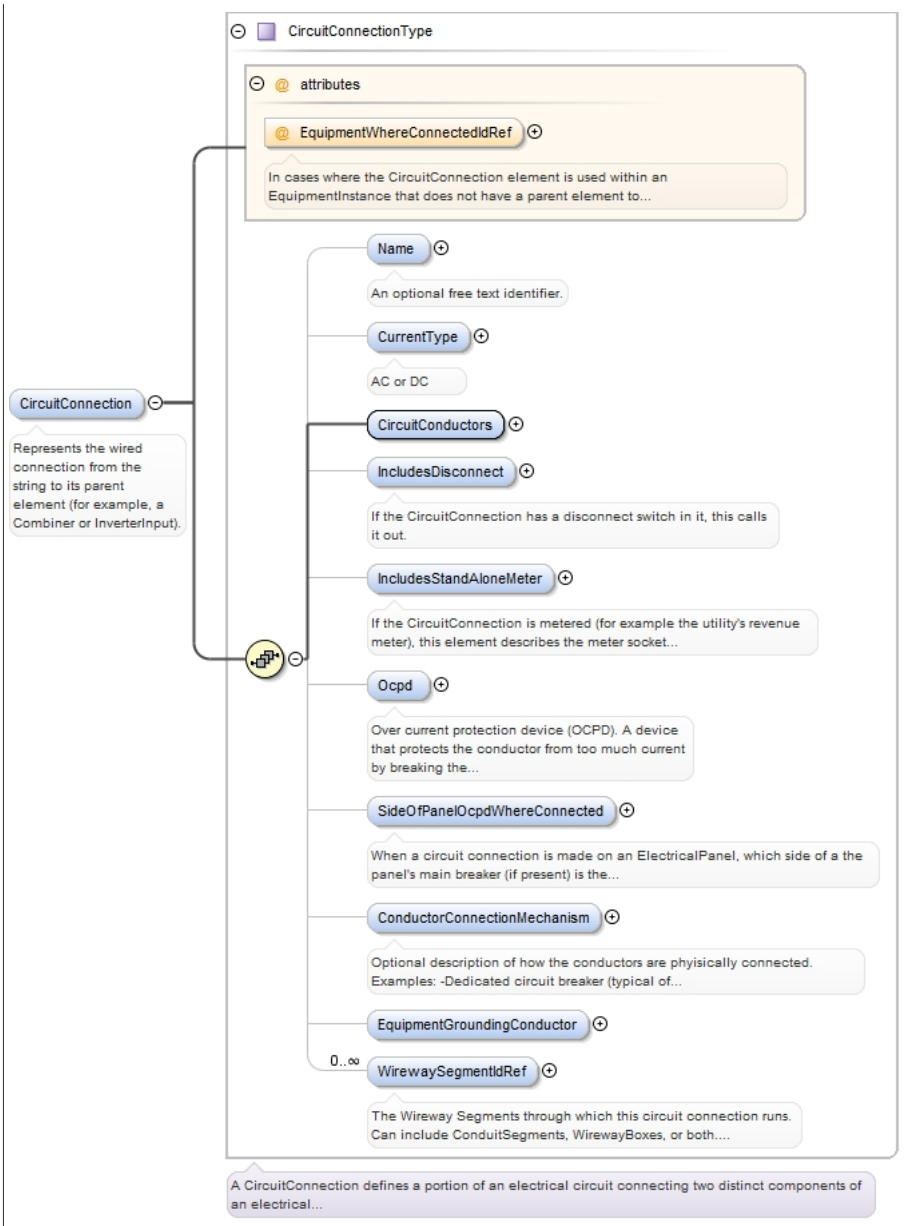
Namespace	No namespace
Annotations	Can optionally include detailed information on each individual string. Allows ability to define individual module properties within each string, including x/y locations on layout planes, serial numbers, shading affects, etc. This element is typically used by design software for detailed calculation of system output.
Diagram	
Type	PvStringType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	CircuitConnection{0,1} , IndividualModule+
Children	CircuitConnection, IndividualModule

Instance	`<IndividualString>`
	`  <CircuitConnection EquipmentWhereConnectedIdRef="">{0,1}</CircuitConnection>`
	`  <IndividualModule EquipmentDefinitionIdRef="" id="">{1,unbounded}</IndividualModule>`
	`</IndividualString>`

Source	`<xs:element maxOccurs="unbounded" name="IndividualString" type="PvStringType"` `  minOccurs="0">` `  <xs:annotation>` ` <xs:documentation>Can optionally include detailed information on each individual string. Allows ability to define individual module properties within each string, including x/y locations on layout planes, serial numbers, shading affects, etc. This element is typically used by design software for detailed calculation of system output.</xs:documentation>` ` </xs:annotation>` `</xs:element>`

Element PvStringType / CircuitConnection

Namespace	No namespace
Annotations	Represents the wired connection from the string to its parent element (for example, a Combiner or InverterInput).

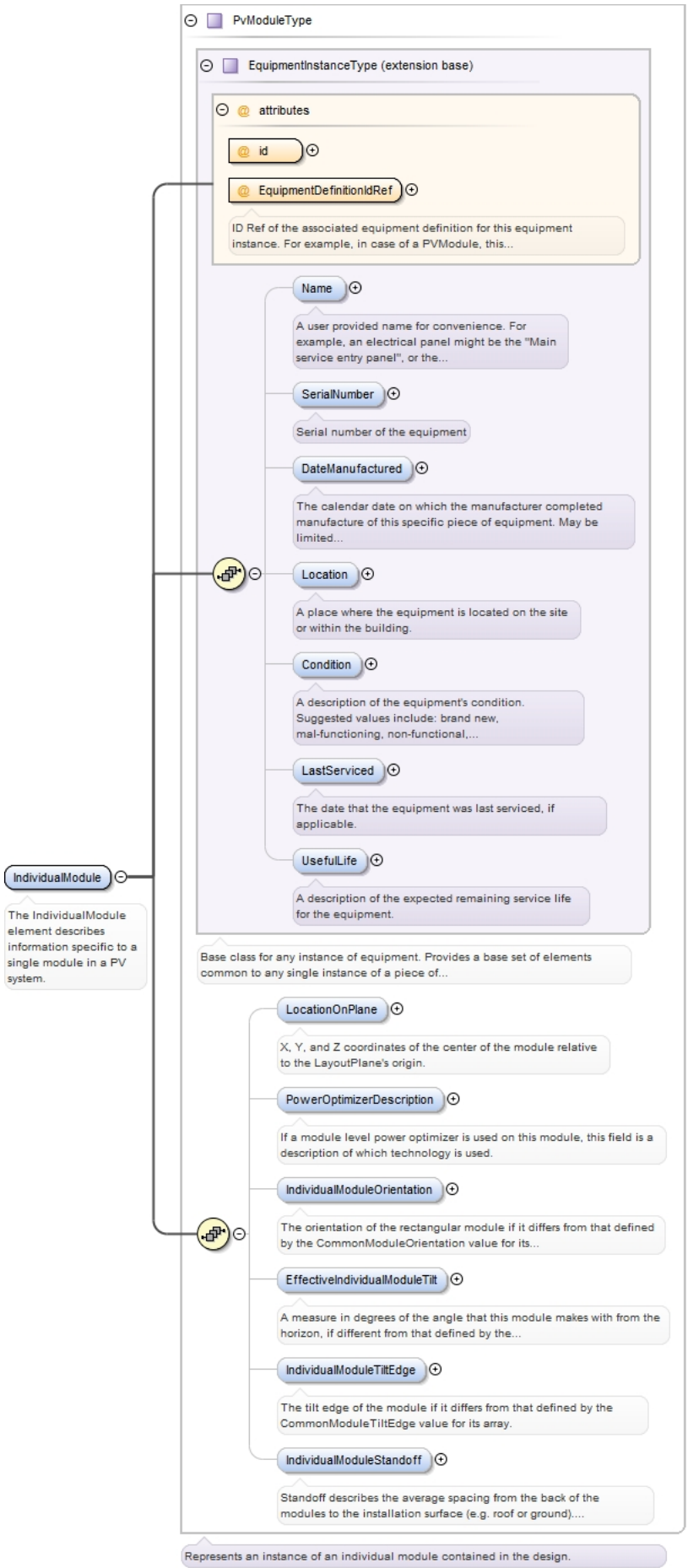
Diagram	
Type	CircuitConnectionType
Properties	content: complex minOccurs: 0
Model	Name{0,1} , CurrentType{0,1} , CircuitConductors , IncludesDisconnect{0,1} , IncludesStandAloneMeter{0,1} , Ocpd{0,1} , SideOfPanelOcpdWhereConnected{0,1} , ConductorConnectionMechanism{0,1} , EquipmentGroundingConductor{0,1} , WirewaySegmentIdRef*
Children	CircuitConductors, ConductorConnectionMechanism, CurrentType, EquipmentGroundingConductor, IncludesDisconnect, IncludesStandAloneMeter, Name, Ocpd, SideOfPanelOcpdWhereConnected, WirewaySegmentIdRef
Instance	<CircuitConnection EquipmentWhereConnectedIdRef=""> <Name>{0,1}</Name> <CurrentType>{0,1}</CurrentType> <CircuitConductors>{1,1}</CircuitConductors> <IncludesDisconnect ConductorSegmentIdRef="" WirewayBoxIdRef="">{0,1}</IncludesDisconnect> <IncludesStandAloneMeter ConductorSegmentIdRef="">{0,1}</IncludesStandAloneMeter> <Ocpd EquipmentWhereLocatedIdRef="">{0,1}</Ocpd> <SideOfPanelOcpdWhereConnected>{0,1}</SideOfPanelOcpdWhereConnected> <ConductorConnectionMechanism>{0,1}</ConductorConnectionMechanism> <EquipmentGroundingConductor>{0,1}</EquipmentGroundingConductor> <WirewaySegmentIdRef>{0,unbounded}</WirewaySegmentIdRef> </CircuitConnection>

Attributes	**QName**	**Type**	**Fixed**	**Default**	**Use**
	EquipmentWhereConnectedIDRef	xs:IDREF			optional
		In cases where the CircuitConnection element is used within an EquipmentInstance that does not have a parent element to which the CircuitConnection is assumed to connect, a reference ID can be used to associate this CircuitConnection to another EquipmentInstance elsewhere in a document instance. For example, a PvSystem may have an AcPointOfConnection that uses a new ElectricalPanel as an AC combiner for more than one Inverter. The new electrical panel can be described by an ElectricalPanel element in the PvDesign (which in turn refers to an ElectricalPanelDefinition element). in the AcPointOfConnection's EquipmentWhereConnected element. That ElectricPanel's EnergizingCircuitConnection element may reference another ElectricPanel in an instance of the Project's ExistingElectricalHierarchy element.			
Source	<xs:element name="CircuitConnection" type="CircuitConnectionType" minOccurs="0"> <xs:annotation> <xs:documentation>Represents the wired connection from the string to its parent element (for example, a Combiner or InverterInput).</xs:documentation> </xs:annotation> </xs:element>				

Element PvStringType / IndividualModule

Namespace	No namespace
Annotations	The IndividualModule element describes information specific to a single module in a PV system.

Diagram


PvModuleType
EquipmentInstanceType (extension base)
attributes
id
EquipmentDefinitionIdRef
ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this...
Name
A user provided name for convenience. For example, an electrical panel might be the "Main service entry panel", or the...
SerialNumber
Serial number of the equipment
DateManufactured
The calendar date on which the manufacturer completed manufacture of this specific piece of equipment. May be limited...
Location
A place where the equipment is located on the site or within the building.
Condition
A description of the equipment's condition. Suggested values include: brand new, mal-functioning, non-functional,...
LastServiced
The date that the equipment was last serviced, if applicable.
UsefulLife
A description of the expected remaining service life for the equipment.
IndividualModule
The IndividualModule element describes information specific to a single module in a PV system.
Base class for any instance of equipment. Provides a base set of elements common to any single instance of a piece of...
LocationOnPlane
X, Y, and Z coordinates of the center of the module relative to the LayoutPlane's origin.
PowerOptimizerDescription
If a module level power optimizer is used on this module, this field is a description of which technology is used.
IndividualModuleOrientation
The orientation of the rectangular module if it differs from that defined by the CommonModuleOrientation value for its...
EffectiveIndividualModuleTilt
A measure in degrees of the angle that this module makes with from the horizon, if different from that defined by the...
IndividualModuleTiltEdge
The tilt edge of the module if it differs from that defined by the CommonModuleTiltEdge value for its array.
IndividualModuleStandoff
Standoff describes the average spacing from the back of the modules to the installation surface (e.g. roof or ground)....
Represents an instance of an individual module contained in the design.

Type	PvModuleType
Type hierarchy	• EquipmentInstanceType • PvModuleType
Properties	content: complex minOccurs: 1 maxOccurs: unbounded
Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1} , LocationOnPlane{0,1} , PowerOptimizerDescription{0,1} , IndividualModuleOrientation{0,1} , EffectiveIndividualModuleTilt{0,1} , IndividualModuleTiltEdge{0,1} , IndividualModuleStandoff{0,1}
Children	Condition, DateManufactured, EffectiveIndividualModuleTilt, IndividualModuleOrientation, IndividualModuleStandoff, IndividualModuleTiltEdge, LastServiced, Location, LocationOnPlane, Name, PowerOptimizerDescription, SerialNumber, UsefulLife

Instance

```
<IndividualModule EquipmentDefinitionIdRef="" id="">
  <Name>{0,1}</Name>
  <SerialNumber>{0,1}</SerialNumber>
  <DateManufactured>{0,1}</DateManufactured>
  <Location>{0,1}</Location>
  <Condition>{0,1}</Condition>
  <LastServiced>{0,1}</LastServiced>
  <UsefulLife>{0,1}</UsefulLife>
  <LocationOnPlane>{0,1}</LocationOnPlane>
  <PowerOptimizerDescription>{0,1}</PowerOptimizerDescription>
  <IndividualModuleOrientation>{0,1}</IndividualModuleOrientation>
  <EffectiveIndividualModuleTilt>{0,1}</EffectiveIndividualModuleTilt>
  <IndividualModuleTiltEdge>{0,1}</IndividualModuleTiltEdge>
  <IndividualModuleStandoff>{0,1}</IndividualModuleStandoff>
</IndividualModule>
```

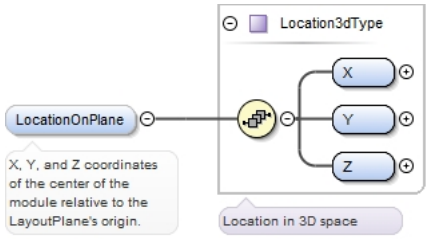
Attributes

QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	xs:IDREF			required
	ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.			
id	xs:ID			required

Source

```
<xs:element maxOccurs="unbounded" minOccurs="1" name="IndividualModule"
 type="PvModuleType">
  <xs:annotation>
    <xs:documentation>The IndividualModule element describes information specific to a
 single module in a PV system.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element PvModuleType / LocationOnPlane

Namespace	No namespace
Annotations	X, Y, and Z coordinates of the center of the module relative to the LayoutPlane's origin.
Diagram	
Type	Location3dType
Properties	content: complex minOccurs: 0
Model	X , Y , Z
Children	X, Y, Z

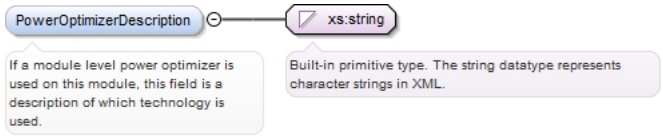
Instance

```
<LocationOnPlane>
  <X>{1,1}</X>
  <Y>{1,1}</Y>
  <Z>{1,1}</Z>
```

	`</LocationOnPlane>`

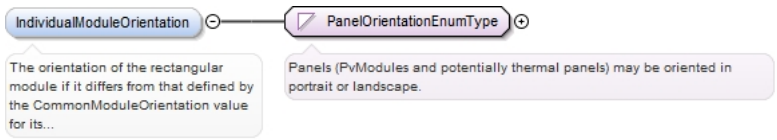
Source	`<xs:element minOccurs="0" name="LocationOnPlane" type="Location3dType">`
	`  <xs:annotation>`
	`  <xs:documentation>X, Y, and Z coordinates of the center of the module relative to the LayoutPlane's origin.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element PvModuleType / PowerOptimizerDescription

Namespace	No namespace
Annotations	If a module level power optimizer is used on this module, this field is a description of which technology is used.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0

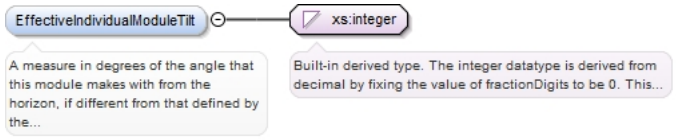
Source	`<xs:element minOccurs="0" name="PowerOptimizerDescription" type="xs:string">`
	`  <xs:annotation>`
	`  <xs:documentation>If a module level power optimizer is used on this module, this field is a description of which technology is used.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element PvModuleType / IndividualModuleOrientation

Namespace	No namespace
Annotations	The orientation of the rectangular module if it differs from that defined by the CommonModuleOrientation value for its array.
Diagram	
Type	PanelOrientationEnumType
Properties	content: simple minOccurs: 0
Facets	enumeration portrait enumeration landscape

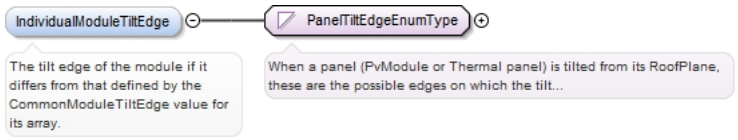
Source	`<xs:element minOccurs="0" name="IndividualModuleOrientation"`
	`  type="PanelOrientationEnumType">`
	`  <xs:annotation>`
	`  <xs:documentation>The orientation of the rectangular module if it differs from that defined by the CommonModuleOrientation value for its array.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element PvModuleType / EffectiveIndividualModuleTilt

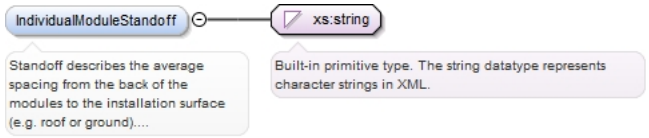
Namespace	No namespace
Annotations	A measure in degrees of the angle that this module makes with from the horizon, if different from that defined by the SolarResource element for the array.
Diagram	
Type	xs:integer

Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="EffectiveIndividualModuleTilt" type="xs:integer"> <xs:annotation> <xs:documentation>A measure in degrees of the angle that this module makes with from the horizon, if different from that defined by the SolarResource element for the array.</xs:documentation> </xs:annotation> </xs:element>

Element PvModuleType / IndividualModuleTiltEdge

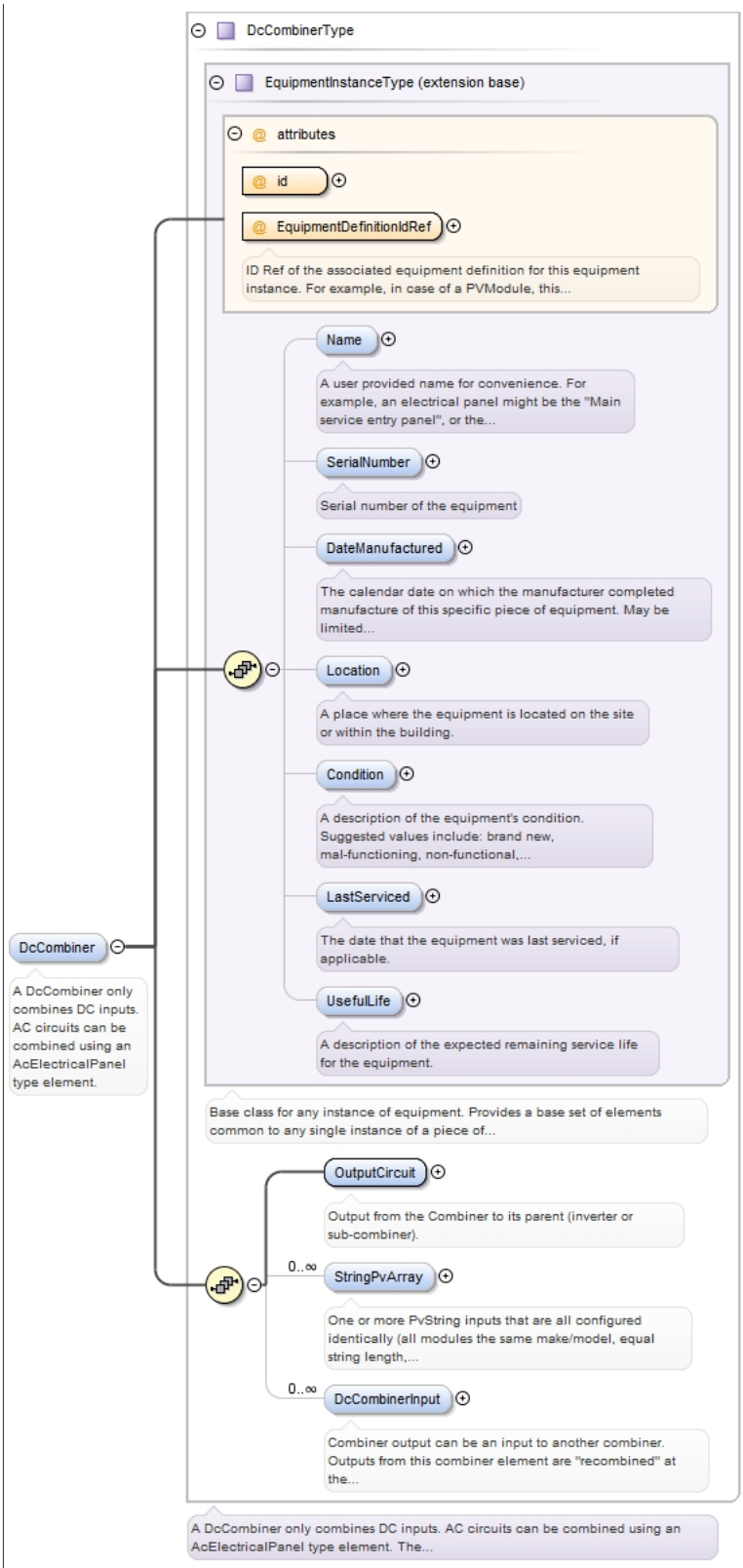
Namespace	No namespace
Annotations	The tilt edge of the module if it differs from that defined by the CommonModuleTiltEdge value for its array.
Diagram	
Type	PanelTiltEdgeEnumType
Properties	content: simple minOccurs: 0
Facets	enumeration: bottom enumeration: top enumeration: left enumeration: right
Source	<xs:element minOccurs="0" name="IndividualModuleTiltEdge" type="PanelTiltEdgeEnumType"> <xs:annotation> <xs:documentation>The tilt edge of the module if it differs from that defined by the CommonModuleTiltEdge value for its array.</xs:documentation> </xs:annotation> </xs:element>

Element PvModuleType / IndividualModuleStandoff

Namespace	No namespace
Annotations	Standoff describes the average spacing from the back of the modules to the installation surface (e.g. roof or ground). Use IndividualModuleStandoff only if it differs from the CommonModuleStandoff defined for the array.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="IndividualModuleStandoff" type="xs:string"> <xs:annotation> <xs:documentation>Standoff describes the average spacing from the back of the modules to the installation surface (e.g. roof or ground). Use IndividualModuleStandoff only if it differs from the CommonModuleStandoff defined for the array.</xs:documentation> </xs:annotation> </xs:element>

Element PowerPointTrackerType / DcCombiner

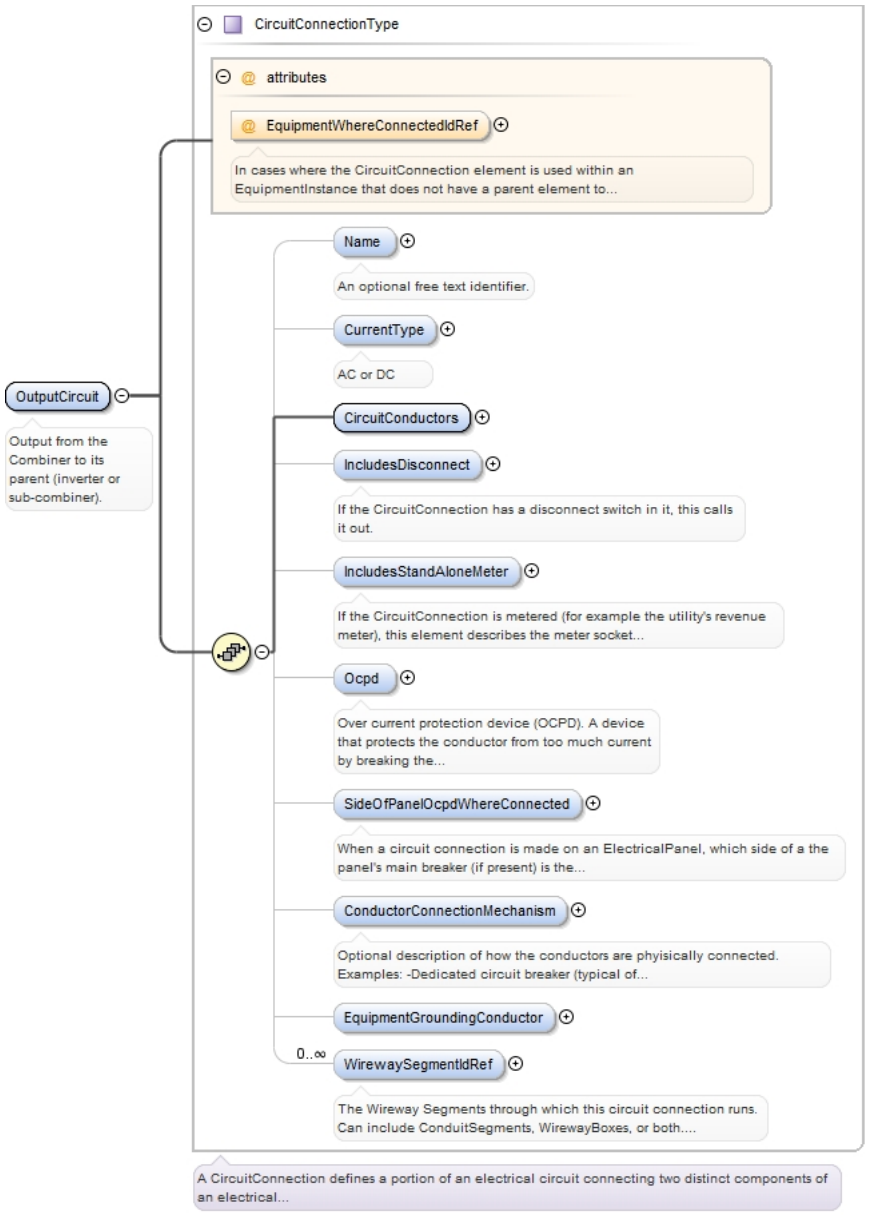
Namespace	No namespace
Annotations	A DcCombiner only combines DC inputs. AC circuits can be combined using an AcElectricalPanel type element.

Diagram	
Type	DcCombinerType
Type hierarchy	• EquipmentInstanceType • DcCombinerType
Properties	content: `complex` minOccurs: `0` maxOccurs: `unbounded`

Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1} , OutputCircuit , StringPvArray* , DcCombinerInput*
Children	Condition, DateManufactured, DcCombinerInput, LastServiced, Location, Name, OutputCircuit, SerialNumber, StringPvArray, UsefulLife
Instance	<DcCombiner EquipmentDefinitionIdRef="" id=""> <Name>{0,1}</Name> <SerialNumber>{0,1}</SerialNumber> <DateManufactured>{0,1}</DateManufactured> <Location>{0,1}</Location> <Condition>{0,1}</Condition> <LastServiced>{0,1}</LastServiced> <UsefulLife>{0,1}</UsefulLife> <OutputCircuit EquipmentWhereConnectedIdRef="">{1,1}</OutputCircuit> <StringPvArray Id="" PvModuleDefinitionIdRef="">{0,unbounded}</StringPvArray> <DcCombinerInput EquipmentDefinitionIdRef="" id="">{0,unbounded}</DcCombinerInput> </DcCombiner>
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **EquipmentDefinitionIdRef** / IDREF / / / required ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance. **id** / xs:ID / / / required
Source	<xs:element maxOccurs="unbounded" minOccurs="0" name="DcCombiner" type="DcCombinerType"> <xs:annotation> <xs:documentation>A DcCombiner only combines DC inputs. AC circuits can be combined using an AcElectricalPanel type element.</xs:documentation> </xs:annotation> </xs:element>

Element DcCombinerType / OutputCircuit

Namespace	No namespace
Annotations	Output from the Combiner to its parent (inverter or sub-combiner).

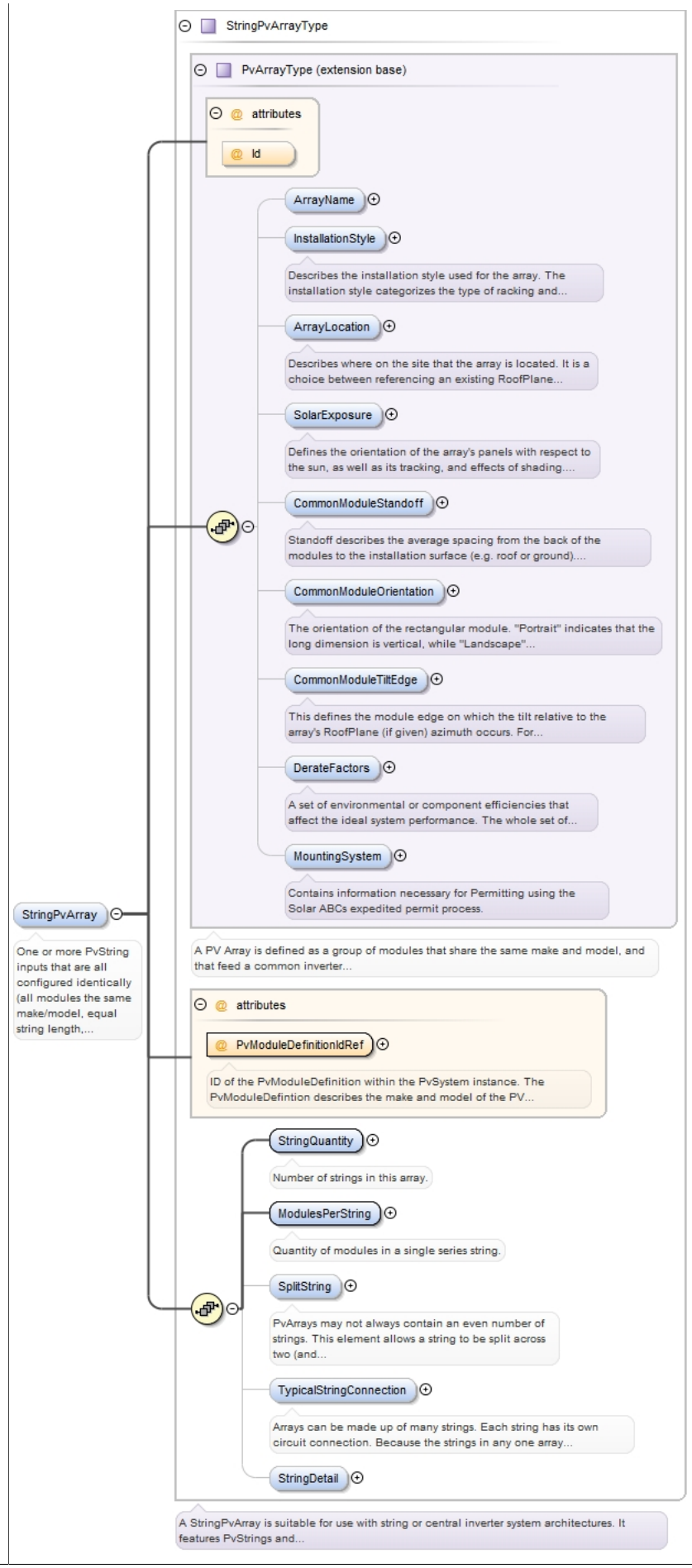
Diagram	
Type	CircuitConnectionType
Properties	content: complex
Model	Name{0,1} , CurrentType{0,1} , CircuitConductors , IncludesDisconnect{0,1} , IncludesStandAloneMeter{0,1} , Ocpd{0,1} , SideOfPanelOcpdWhereConnected{0,1} , ConductorConnectionMechanism{0,1} , EquipmentGroundingConductor{0,1} , WirewaySegmentIdRef*
Children	CircuitConductors, ConductorConnectionMechanism, CurrentType, EquipmentGroundingConductor, IncludesDisconnect, IncludesStandAloneMeter, Name, Ocpd, SideOfPanelOcpdWhereConnected, WirewaySegmentIdRef
Instance	<OutputCircuit EquipmentWhereConnectedIdRef=""> <Name>{0,1}</Name> <CurrentType>{0,1}</CurrentType> <CircuitConductors>{1,1}</CircuitConductors> <IncludesDisconnect ConductorSegmentIdRef="" WirewayBoxIdRef="">{0,1}</IncludesDisconnect> <IncludesStandAloneMeter ConductorSegmentIdRef="">{0,1}</IncludesStandAloneMeter> <Ocpd EquipmentWhereLocatedIdRef="">{0,1}</Ocpd> <SideOfPanelOcpdWhereConnected>{0,1}</SideOfPanelOcpdWhereConnected> <ConductorConnectionMechanism>{0,1}</ConductorConnectionMechanism> <EquipmentGroundingConductor>{0,1}</EquipmentGroundingConductor> <WirewaySegmentIdRef>{0,unbounded}</WirewaySegmentIdRef> </OutputCircuit>

Attributes	**QName**	**Type**	**Fixed**	**Default**	**Use**
	EquipmentWhereConnectedIDRef	xs:IDREF			optional
		In cases where the CircuitConnection element is used within an EquipmentInstance that does not have a parent element to which the CircuitConnection is assumed to connect, a reference ID can be used to associate this CircuitConnection to another EquipmentInstance elsewhere in a document instance. For example, a PvSystem may have an AcPointOfConnection that uses a new ElectricalPanel as an AC combiner for more than one Inverter. The new electrical panel can be described by an ElectricalPanel element in the PvDesign (which in turn refers to an ElectricalPanelDefinition element). in the AcPointOfConnection's EquipmentWhereConnected element. That ElectricPanel's EnergizingCircuitConnection element may reference another ElectricPanel in an instance of the Project's ExistingElectricalHierarchy element.			
Source	<xs:element name="OutputCircuit" type="CircuitConnectionType"> <xs:annotation> <xs:documentation>Output from the Combiner to its parent (inverter or sub-combiner).</xs:documentation> </xs:annotation> </xs:element>				

Element DcCombinerType / StringPvArray

Namespace	No namespace
Annotations	One or more PvString inputs that are all configured identically (all modules the same make/model, equal string length, and share the same LayoutPlane). The PvArray element provides an alternate, and simpler means of defining a set of identical strings than using the PvString element which lists every module individually, making it quite verbose. The PvArray defines a single string and how many of them there are. NOTE: Must consider total number of strings to be separate inputs into the combiner.

Diagram


StringPvArrayType
PvArrayType (extension base)
attributes
Id
ArrayName
InstallationStyle
Describes the installation style used for the array. The installation style categorizes the type of racking and...
ArrayLocation
Describes where on the site that the array is located. It is a choice between referencing an existing RoofPlane...
SolarExposure
Defines the orientation of the array's panels with respect to the sun, as well as its tracking, and effects of shading....
CommonModuleStandoff
Standoff describes the average spacing from the back of the modules to the installation surface (e.g. roof or ground)....
CommonModuleOrientation
The orientation of the rectangular module. "Portrait" indicates that the long dimension is vertical, while "Landscape"...
CommonModuleTiltEdge
This defines the module edge on which the tilt relative to the array's RoofPlane (if given) azimuth occurs. For...
DerateFactors
A set of environmental or component efficiencies that affect the ideal system performance. The whole set of...
MountingSystem
Contains information necessary for Permitting using the Solar ABCs expedited permit process.
StringPvArray
One or more PvString inputs that are all configured identically (all modules the same make/model, equal string length,...
A PV Array is defined as a group of modules that share the same make and model, and that feed a common inverter...
attributes
PvModuleDefinitionIdRef
ID of the PvModuleDefinition within the PvSystem instance. The PvModuleDefintion describes the make and model of the PV...
StringQuantity
Number of strings in this array.
ModulesPerString
Quantity of modules in a single series string.
SplitString
PvArrays may not always contain an even number of strings. This element allows a string to be split across two (and...
TypicalStringConnection
Arrays can be made up of many strings. Each string has its own circuit connection. Because the strings in any one array...
StringDetail
A StringPvArray is suitable for use with string or central inverter system architectures. It features PvStrings and...

Type	StringPvArrayType
Type hierarchy	• PvArrayType • StringPvArrayType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	ArrayName{0,1} , InstallationStyle{0,1} , ArrayLocation{0,1} , SolarExposure{0,1} , CommonModuleStandoff{0,1} , CommonModuleOrientation{0,1} , CommonModuleTiltEdge{0,1} , DerateFactors{0,1} , MountingSystem{0,1} , StringQuantity , ModulesPerString , SplitString{0,1} , TypicalStringConnection{0,1} , StringDetail{0,1}
Children	ArrayLocation, ArrayName, CommonModuleOrientation, CommonModuleStandoff, CommonModuleTiltEdge, DerateFactors, InstallationStyle, ModulesPerString, MountingSystem, SolarExposure, SplitString, StringDetail, StringQuantity, TypicalStringConnection

Instance

```
<StringPvArray Id="" PvModuleDefinitionIdRef="">
  <ArrayName>{0,1}</ArrayName>
  <InstallationStyle>{0,1}</InstallationStyle>
  <ArrayLocation>{0,1}</ArrayLocation>
  <SolarExposure>{0,1}</SolarExposure>
  <CommonModuleStandoff>{0,1}</CommonModuleStandoff>
  <CommonModuleOrientation>{0,1}</CommonModuleOrientation>
  <CommonModuleTiltEdge>{0,1}</CommonModuleTiltEdge>
  <DerateFactors>{0,1}</DerateFactors>
  <MountingSystem>{0,1}</MountingSystem>
  <StringQuantity>{1,1}</StringQuantity>
  <ModulesPerString>{1,1}</ModulesPerString>
  <SplitString>{0,1}</SplitString>
  <TypicalStringConnection EquipmentWhereConnectedIdRef="">{0,1}</TypicalStringConnection>
  <StringDetail>{0,1}</StringDetail>
</StringPvArray>
```

Attributes

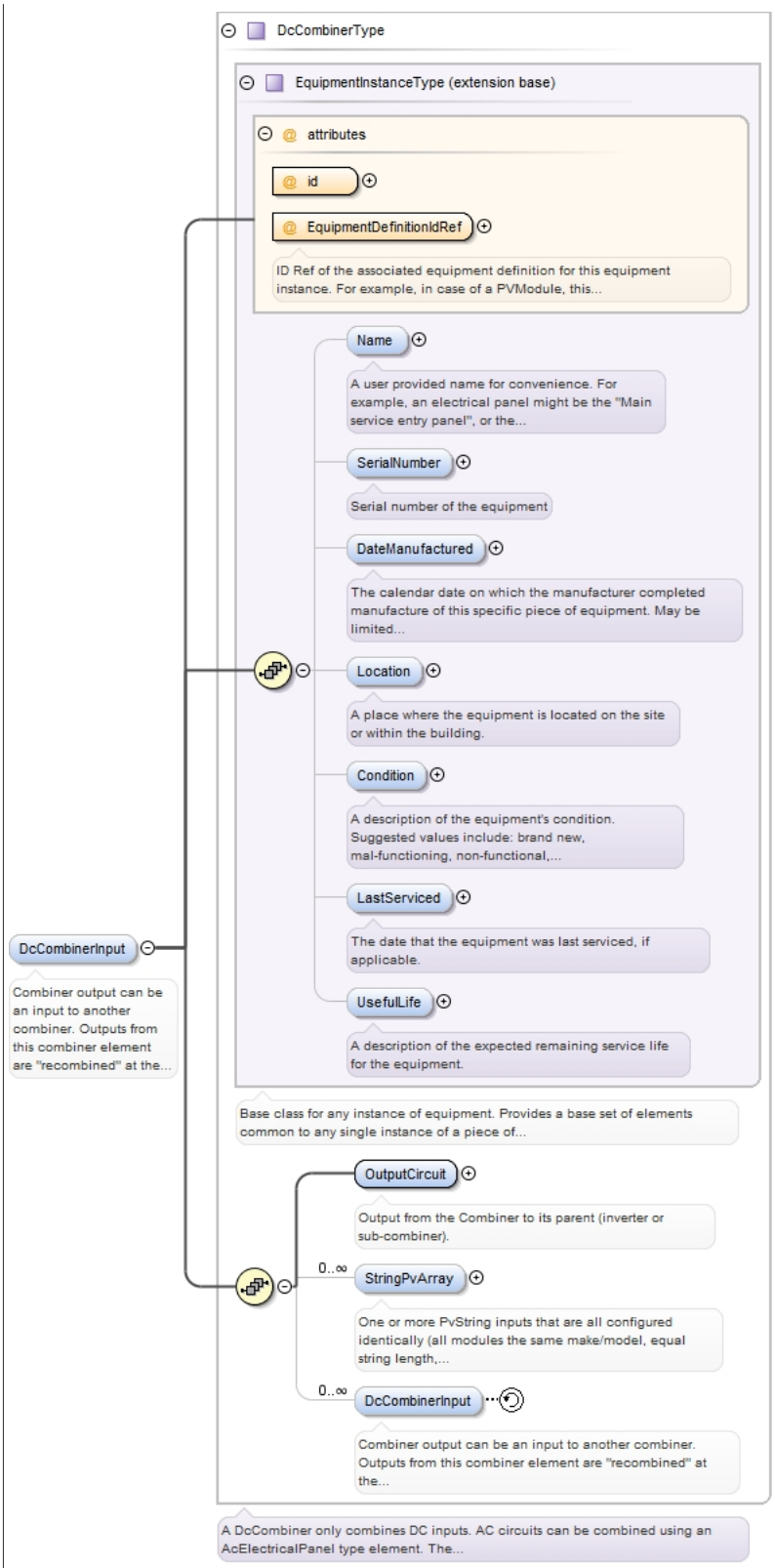
QName	Type	Fixed	Default	Use
Id				optional
PvModuleDefinitionIdRef	IDREF			required
	ID of the PvModuleDefinition within the PvSystem instance. The PvModuleDefintion describes the make and model of the PV module. The PvArray is assumed to use the same module for the entire array.			

Source

```
<xs:element name="StringPvArray" type="StringPvArrayType" maxOccurs="unbounded"
 minOccurs="0">
  <xs:annotation>
    <xs:documentation>One or more PvString inputs that are all configured identically (all
 modules the same make/model, equal string length, and share the same LayoutPlane). The
 PvArray element provides an alternate, and simpler means of defining a set of identical
 strings than using the PvString element which lists every module individually, making
 it quite verbose. The PvArray defines a single string and how many of them there are.
 NOTE: Must consider total number of strings to be separate inputs into the combiner.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

Element DcCombinerType / DcCombinerInput

Namespace	No namespace
Annotations	Combiner output can be an input to another combiner. Outputs from this combiner element are "recombined" at the combiner in which this element is found.

Diagram	
Type	DcCombinerType
Type hierarchy	• EquipmentInstanceType • DcCombinerType
Properties	content: `complex` minOccurs: `0` maxOccurs: `unbounded`

Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1} , OutputCircuit , StringPvArray* , DcCombinerInput*
Children	Condition, DateManufactured, DcCombinerInput, LastServiced, Location, Name, OutputCircuit, SerialNumber, StringPvArray, UsefulLife

Instance

```
<DcCombinerInput EquipmentDefinitionIdRef="" id="">
  <Name>{0,1}</Name>
  <SerialNumber>{0,1}</SerialNumber>
  <DateManufactured>{0,1}</DateManufactured>
  <Location>{0,1}</Location>
  <Condition>{0,1}</Condition>
  <LastServiced>{0,1}</LastServiced>
  <UsefulLife>{0,1}</UsefulLife>
  <OutputCircuit EquipmentWhereConnectedIdRef="">{1,1}</OutputCircuit>
  <StringPvArray Id="" PvModuleDefinitionIdRef="">{0,unbounded}</StringPvArray>
  <DcCombinerInput EquipmentDefinitionIdRef="" id="">{0,unbounded}</DcCombinerInput>
</DcCombinerInput>
```

Attributes

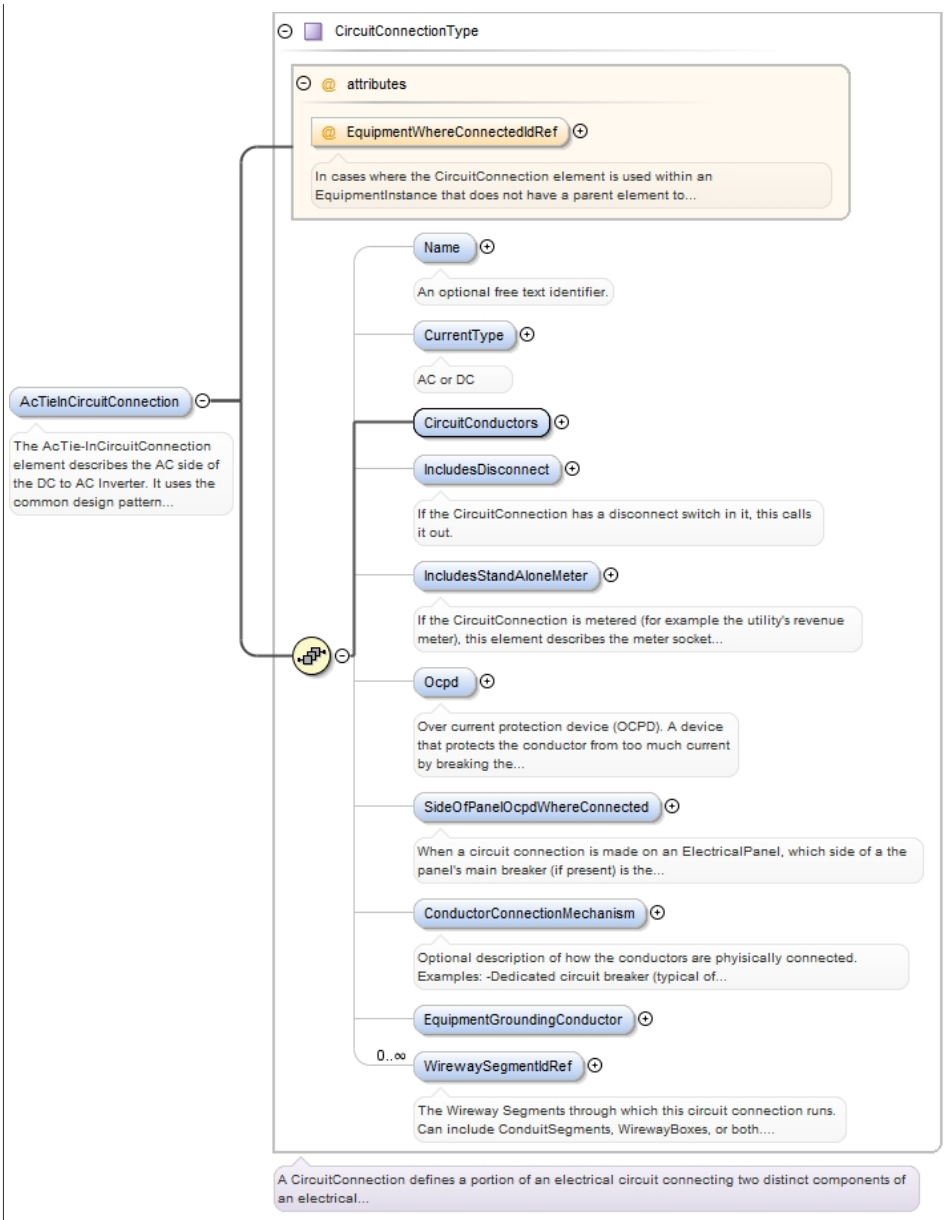
QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			required
	ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.			
id	xs:ID			required

Source

```
<xs:element maxOccurs="unbounded" minOccurs="0" name="DcCombinerInput"
 type="DcCombinerType">
  <xs:annotation>
    <xs:documentation>Combiner output can be an input to another combiner. Outputs from
 this combiner element are "recombined" at the combiner in which this element is found.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

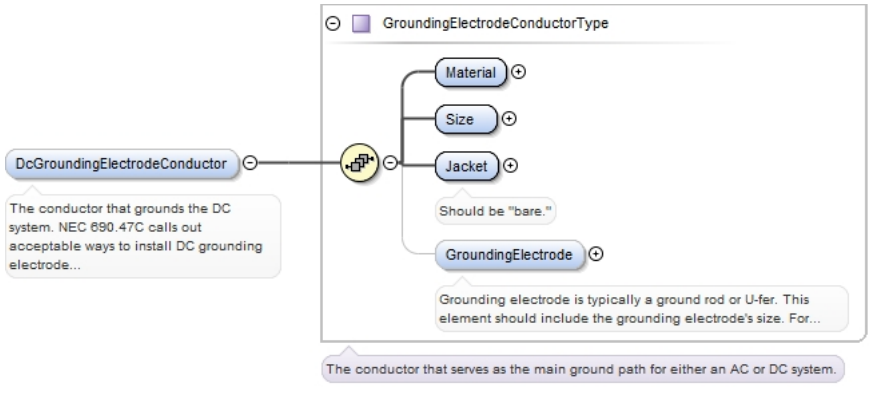
Element StringInverterType / AcTieInCircuitConnection

Namespace	No namespace
Annotations	The AcTie-InCircuitConnection element describes the AC side of the DC to AC Inverter. It uses the common design pattern of each electrical equipment instance having a single CircuitConnection element that describes its electrical connection to upstream electrical equipment (for example, Combiners, ElectricalPanels, etc). However, Inverters do not have a parent element to which the CircuitConnection refers. Instead, it relies on its optional EquipmentWhereConnectedIdRef attribute to describe the EquipmentInstance to which it is connected. For string inverters, the EquipmentWhereConnectedIdRef attribute should reference the ElectricalPanel element that represents the electrical panel where the Inverter will be (or already is) connected. In micro-inverter case, the EquipmentWhereConnectedIdRef attribute should reference the ID of the next micro-inverter in the circuit. The last inverter in the circuit will reference the electrical panel where interconnected. If the PvDesign is used independently (a PvDesign document) then the EquipmentWhereConnectedIdRef attribute should reference an ElectricalPanel element within the PvDesign element. The referenced ElectricalPanel can represent an existing electrical panel on the site, or a new panel (perhaps serving as an AC Combiner). If the PvDesign is used within a Project.xml document, and the PvDesign calls for the connection of the Inverter to an existing ElectricalPanel, the EquipmentWhereConnectedIdRef attribute should reference an ElectricalPanel element within the ExistingElectricalDistributionHierarchy element of the Site. If the PvDesign calls for the inverter to connect to a new ElectricPanel, then the EquipmentWhereConnectedIdRef attribute should reference an ElectricalPanel instance within the PvDesign itself. NOTE: If an external AC Disconnect Switch is required, it is a part of this CircuitConnection's WirewaySegments. One segment can be a disconnect type.

Diagram	
Type	CircuitConnectionType
Properties	content: complex minOccurs: 0
Model	Name{0,1} , CurrentType{0,1} , CircuitConductors , IncludesDisconnect{0,1} , IncludesStandAloneMeter{0,1} , Ocpd{0,1} , SideOfPanelOcpdWhereConnected{0,1} , ConductorConnectionMechanism{0,1} , EquipmentGroundingConductor{0,1} , WirewaySegmentIdRef*
Children	CircuitConductors, ConductorConnectionMechanism, CurrentType, EquipmentGroundingConductor, IncludesDisconnect, IncludesStandAloneMeter, Name, Ocpd, SideOfPanelOcpdWhereConnected, WirewaySegmentIdRef
Instance	<AcTieInCircuitConnection EquipmentWhereConnectedIdRef=""> <Name>{0,1}</Name> <CurrentType>{0,1}</CurrentType> <CircuitConductors>{1,1}</CircuitConductors> <IncludesDisconnect ConductorSegmentIdRef="" WirewayBoxIdRef="">{0,1}</IncludesDisconnect> <IncludesStandAloneMeter ConductorSegmentIdRef="">{0,1}</IncludesStandAloneMeter> <Ocpd EquipmentWhereLocatedIdRef="">{0,1}</Ocpd> <SideOfPanelOcpdWhereConnected>{0,1}</SideOfPanelOcpdWhereConnected> <ConductorConnectionMechanism>{0,1}</ConductorConnectionMechanism> <EquipmentGroundingConductor>{0,1}</EquipmentGroundingConductor> <WirewaySegmentIdRef>{0,unbounded}</WirewaySegmentIdRef> </AcTieInCircuitConnection>

Attributes	QName	Type	Fixed	Default	Use
	EquipmentWhereConnectedIdRef	IDREF			optional
	In cases where the CircuitConnection element is used within an EquipmentInstance that does not have a parent element to which the CircuitConnection is assumed to connect, a reference ID can be used to associate this CircuitConnection to another EquipmentInstance elsewhere in a document instance. For example, a PvSystem may have an AcPointOfConnection that uses a new ElectricalPanel as an AC combiner for more than one Inverter. The new electrical panel can be described by an ElectricalPanel element in the PvDesign (which in turn refers to an ElectricalPanelDefinition element). in the AcPointOfConnection's EquipmentWhereConnected element. That ElectricPanel's EnergizingCircuitConnection element may reference another ElectricPanel in an instance of the Project's ExistingElectricalHierarchy element.				
Source	<xs:element name="AcTieInCircuitConnection" type="CircuitConnectionType" minOccurs="0"> <xs:annotation> <xs:documentation>The AcTie-InCircuitConnection element describes the AC side of the DC to AC Inverter. It uses the common design pattern of each electrical equipment instance having a single CircuitConnection element that describes its electrical connection to upstream electrical equipment (for example, Combiners, ElectricalPanels, etc). However, Inverters do not have a parent element to which the CircuitConnection refers. Instead, it relies on its optional EquipmentWhereConnectedIdRef attribute to describe the EquipmentInstance to which it is connected. For string inverters, the EquipmentWhereConnectedIdRef attribute should reference the ElectricalPanel element that represents the electrical panel where the Inverter will be (or already is) connected. In micro-inverter case, the EquipmentWhereConnectedIdRef attribute should reference the ID of the next micro-inverter in the circuit. The last inverter in the circuit will reference the electrical panel where interconnected. If the PvDesign is used independently (a PvDesign document) then the EquipmentWhereConnectedIdRef attribute should reference an ElectricalPanel element within the PvDesign element. The referenced ElectricalPanel can represent an existing electrical panel on the site, or a new panel (perhaps serving as an AC Combiner). If the PvDesign is used within a Project.xml document, and the PvDesign calls for the connection of the Inverter to an existing ElectricalPanel, the EquipmentWhereConnectedIdRef attribute should reference an ElectricalPanel element within the ExistingElectricalDistributionHierarchy element of the Site. If the PvDesign calls for the inverter to connect to a new ElectricPanel, then the EquipmentWhereConnectedIdRef attribute should reference an ElectricalPanel instance within the PvDesign itself. NOTE: If an external AC Disconnect Switch is required, it is a part of this CircuitConnection's WirewaySegments. One segment can be a disconnect type.</xs:documentation> </xs:annotation> </xs:element>				

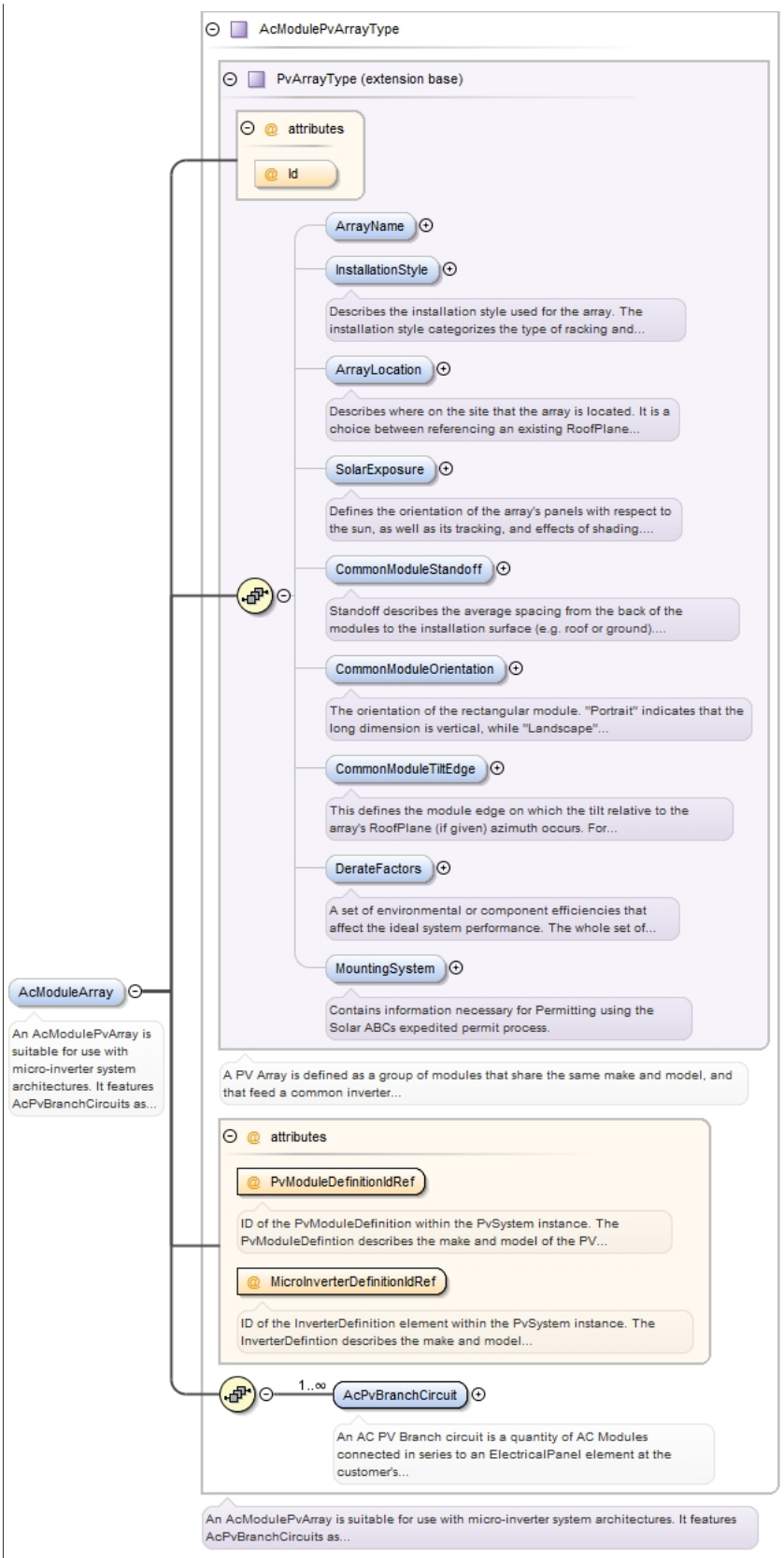
Element StringInverterType / DcGroundingElectrodeConductor

Namespace	No namespace
Annotations	The conductor that grounds the DC system. NEC 690.47C calls out acceptable ways to install DC grounding electrode conductors.
Diagram	
Type	GroundingElectrodeConductorType
Properties	content: complex minOccurs: 0
Model	Material , Size , Jacket , GroundingElectrode{0,1}
Children	GroundingElectrode, Jacket, Material, Size
Instance	<DcGroundingElectrodeConductor>

	<Material>{1,1}</Material> <Size>{1,1}</Size> <Jacket>{1,1}</Jacket> <GroundingElectrode>{0,1}</GroundingElectrode> </DcGroundingElectrodeConductor>
Source	<xs:element minOccurs="0" name="DcGroundingElectrodeConductor" type="GroundingElectrodeConductorType"> <xs:annotation> <xs:documentation>The conductor that grounds the DC system. NEC 690.47C calls out acceptable ways to install DC grounding electrode conductors.</xs:documentation> </xs:annotation> </xs:element>

Element PvSystemType / AcModuleArray

Namespace	No namespace
Annotations	An AcModulePvArray is suitable for use with micro-inverter system architectures. It features AcPvBranchCircuits as building blocks. NOTE: An AC Module is assumed to be either: 1) an integrated micro-inverter and PV module, OR 2) an independent PV module and micro-inverter pair.

Diagram	
Type	AcModulePvArrayType
Type hierarchy	• PvArrayType • AcModulePvArrayType
Properties	content: complex

	minOccurs: 0 maxOccurs: unbounded
Model	ArrayName{0,1} , InstallationStyle{0,1} , ArrayLocation{0,1} , SolarExposure{0,1} , CommonModuleStandoff{0,1} , CommonModuleOrientation{0,1} , CommonModuleTiltEdge{0,1} , DerateFactors{0,1} , MountingSystem{0,1} , AcPvBranchCircuit+
Children	AcPvBranchCircuit, ArrayLocation, ArrayName, CommonModuleOrientation, CommonModuleStandoff, CommonModuleTiltEdge, DerateFactors, InstallationStyle, MountingSystem, SolarExposure

Instance

```
<AcModuleArray Id="" MicroInverterDefinitionIdRef="" PvModuleDefinitionIdRef="">
  <ArrayName>{0,1}</ArrayName>
  <InstallationStyle>{0,1}</InstallationStyle>
  <ArrayLocation>{0,1}</ArrayLocation>
  <SolarExposure>{0,1}</SolarExposure>
  <CommonModuleStandoff>{0,1}</CommonModuleStandoff>
  <CommonModuleOrientation>{0,1}</CommonModuleOrientation>
  <CommonModuleTiltEdge>{0,1}</CommonModuleTiltEdge>
  <DerateFactors>{0,1}</DerateFactors>
  <MountingSystem>{0,1}</MountingSystem>
  <AcPvBranchCircuit>{1,unbounded}</AcPvBranchCircuit>
</AcModuleArray>
```

Attributes

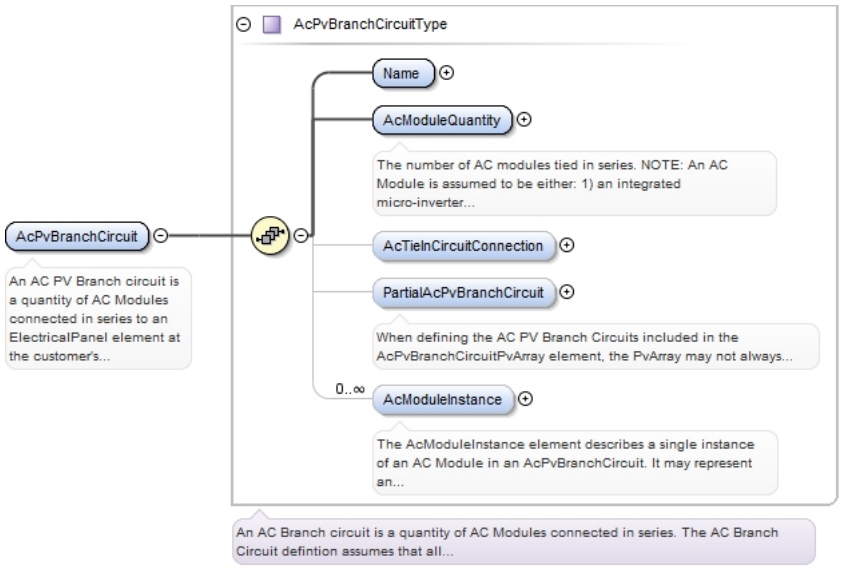
QName	Type	Fixed	Default	Use
Id				optional
MicroInverterDefinitionIdRef				required
	ID of the InverterDefinition element within the PvSystem instance. The InverterDefintion describes the make and model of the micro-inverter used in all the AC Modules within this array. Note that in case of an AC Module, the PvModuleDefinition and the MicroInverterDefinition may share the same make and model number.			
PvModuleDefinitionIdRef				required
	ID of the PvModuleDefinition within the PvSystem instance. The PvModuleDefintion describes the make and model of the PV module. The PvArray is assumed to use the same module for the entire array. Note that in case of an AC Module, the PvModuleDefinition and the MicroInverterDefinition may share the same make and model number.			

Source

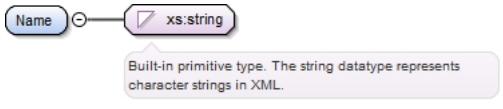
```
<xs:element maxOccurs="unbounded" minOccurs="0" name="AcModuleArray"
 type="AcModulePvArrayType">
  <xs:annotation>
    <xs:documentation>An AcModulePvArray is suitable for use with micro-inverter system
 architectures. It features AcPvBranchCircuits as building blocks. NOTE: An AC Module is
 assumed to be either: 1) an integrated micro-inverter and PV module, OR 2) an independent
 PV module and micro-inverter pair.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element AcModulePvArrayType / AcPvBranchCircuit

Namespace	No namespace
Annotations	An AC PV Branch circuit is a quantity of AC Modules connected in series to an ElectricalPanel element at the customer's site. The AC PV Branch Circuit defintion assumes that all AC modules in the circuit share the same PvModule and Inverter Definitions. Although micro-inverter technology allows an AC Branch to contain different makes and models in series, this is a highly unusual use case not supported by this schema. Such a case would typically come about in a remove and replace scenario well after the project was implemented.

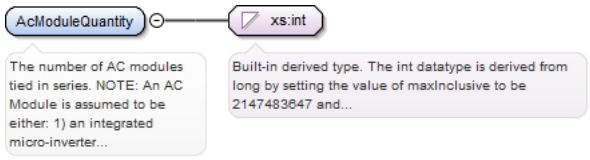
Diagram	
Type	AcPvBranchCircuitType
Properties	content: complex maxOccurs: unbounded
Model	Name , AcModuleQuantity , AcTieInCircuitConnection{0,1} , PartialAcPvBranchCircuit{0,1} , AcModuleInstance*
Children	AcModuleInstance, AcModuleQuantity, AcTieInCircuitConnection, Name, PartialAcPvBranchCircuit
Instance	<AcPvBranchCircuit> <Name>{1,1}</Name> <AcModuleQuantity>{1,1}</AcModuleQuantity> <AcTieInCircuitConnection EquipmentWhereConnectedIdRef="">{0,1}</AcTieInCircuitConnection> <PartialAcPvBranchCircuit>{0,1}</PartialAcPvBranchCircuit> <AcModuleInstance>{0,unbounded}</AcModuleInstance> </AcPvBranchCircuit>
Source	<xs:element maxOccurs="unbounded" name="AcPvBranchCircuit" type="AcPvBranchCircuitType"> <xs:annotation> <xs:documentation>An AC PV Branch circuit is a quantity of AC Modules connected in series to an ElectricalPanel element at the customer's site. The AC PV Branch Circuit defintion assumes that all AC modules in the circuit share the same PvModule and Inverter Definitions. Although micro-inverter technology allows an AC Branch to contain different makes and models in series, this is a highly unusual use case not supported by this schema. Such a case would typically come about in a remove and replace scenario well after the project was implemented.</xs:documentation> </xs:annotation> </xs:element>

Element AcPvBranchCircuitType / Name

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple
Source	<xs:element name="Name" type="xs:string"/>

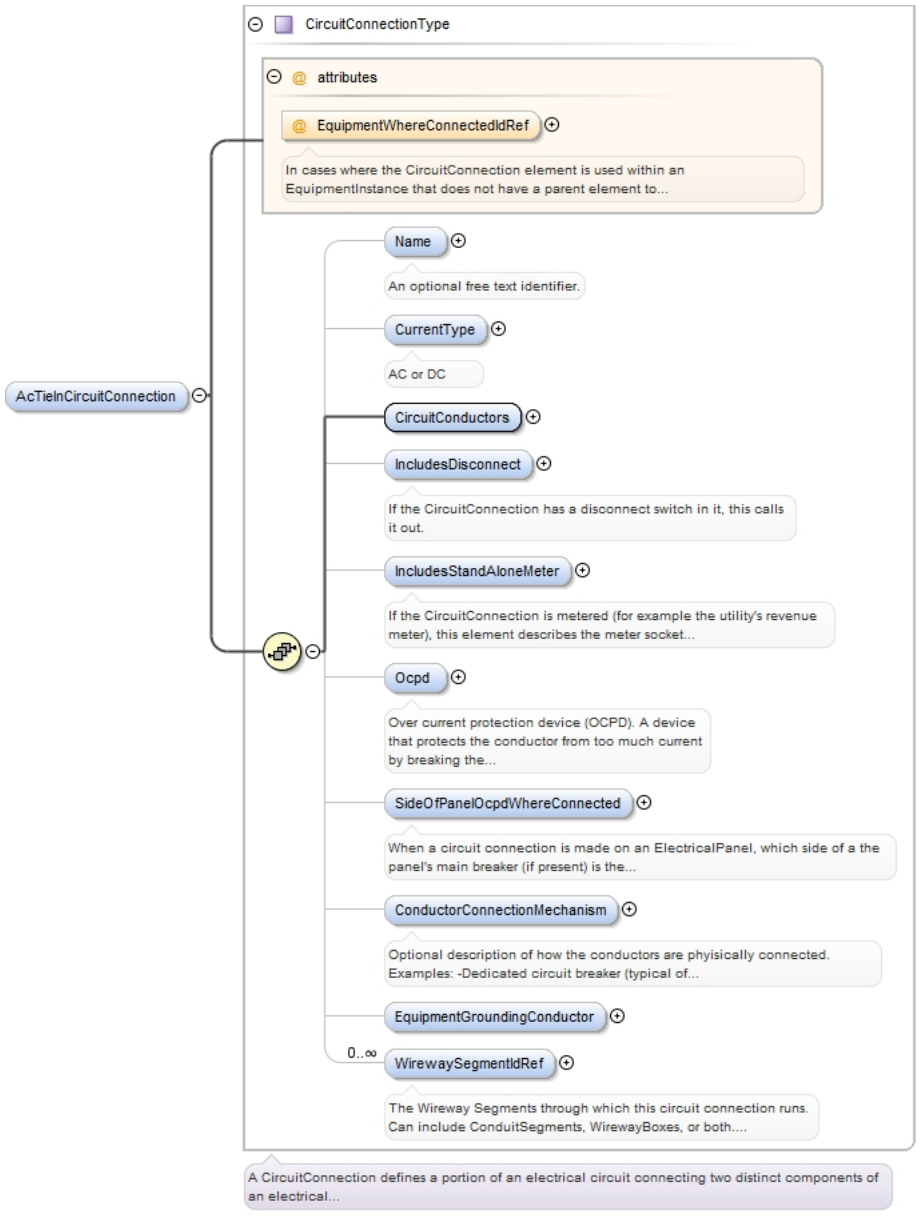
Element AcPvBranchCircuitType / AcModuleQuantity

Namespace	No namespace
Annotations	The number of AC modules tied in series. NOTE: An AC Module is assumed to be either: 1) an integrated micro-inverter and PV module, OR 2) an independent PV module and micro-inverter pair.

Diagram	
Type	xs:int
Properties	content: simple

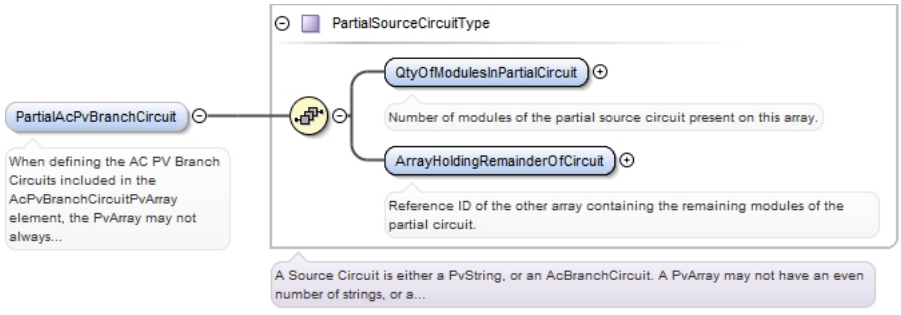
Source	`<xs:element name="AcModuleQuantity" type="xs:int">`
	`<xs:annotation>`
	`<xs:documentation>The number of AC modules tied in series. NOTE: An AC Module is assumed to be either: 1) an integrated micro-inverter and PV module, OR 2) an independent PV module and micro-inverter pair.</xs:documentation>`
	`</xs:annotation>`
	`</xs:element>`

Element AcPvBranchCircuitType / AcTieInCircuitConnection

Namespace	No namespace
Diagram	
Type	CircuitConnectionType
Properties	content: complex

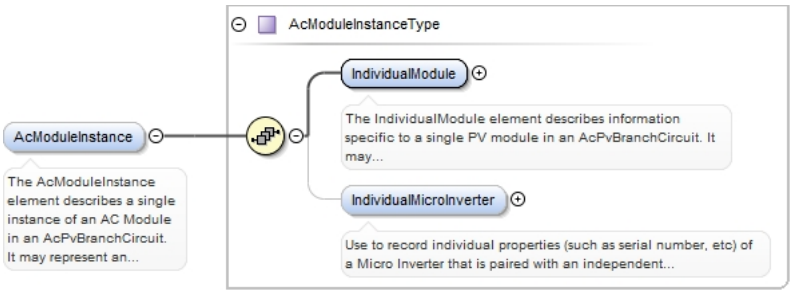
	minOccurs: 0
Model	Name{0,1} , CurrentType{0,1} , CircuitConductors , IncludesDisconnect{0,1} , IncludesStandAloneMeter{0,1} , Ocpd{0,1} , SideOfPanelOcpdWhereConnected{0,1} , ConductorConnectionMechanism{0,1} , EquipmentGroundingConductor{0,1} , WirewaySegmentIdRef*
Children	CircuitConductors, ConductorConnectionMechanism, CurrentType, EquipmentGroundingConductor, IncludesDisconnect, IncludesStandAloneMeter, Name, Ocpd, SideOfPanelOcpdWhereConnected, WirewaySegmentIdRef
Instance	<AcTieInCircuitConnection EquipmentWhereConnectedIdRef=""> <Name>{0,1}</Name> <CurrentType>{0,1}</CurrentType> <CircuitConductors>{1,1}</CircuitConductors> <IncludesDisconnect ConductorSegmentIdRef="" WirewayBoxIdRef="">{0,1}</IncludesDisconnect> <IncludesStandAloneMeter ConductorSegmentIdRef="">{0,1}</IncludesStandAloneMeter> <Ocpd EquipmentWhereLocatedIdRef="">{0,1}</Ocpd> <SideOfPanelOcpdWhereConnected>{0,1}</SideOfPanelOcpdWhereConnected> <ConductorConnectionMechanism>{0,1}</ConductorConnectionMechanism> <EquipmentGroundingConductor>{0,1}</EquipmentGroundingConductor> <WirewaySegmentIdRef>{0,unbounded}</WirewaySegmentIdRef> </AcTieInCircuitConnection>
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **EquipmentWhereConnectedIdRef** / IDREF / / / optional In cases where the CircuitConnection element is used within an EquipmentInstance that does not have a parent element to which the CircuitConnection is assumed to connect, a reference ID can be used to associate this CircuitConnection to another EquipmentInstance elsewhere in a document instance. For example, a PvSystem may have an AcPointOfConnection that uses a new ElectricalPanel as an AC combiner for more than one Inverter. The new electrical panel can be described by an ElectricalPanel element in the PvDesign (which in turn refers to an ElectricalPanelDefinition element). in the AcPointOfConnection's EquipmentWhereConnected element. That ElectricPanel's EnergizingCircuitConnection element may reference another ElectricPanel in an instance of the Project's ExistingElectricalHierarchy element.
Source	<xs:element name="AcTieInCircuitConnection" type="CircuitConnectionType" minOccurs="0"/>

Element AcPvBranchCircuitType / PartialAcPvBranchCircuit

Namespace	No namespace
Annotations	When defining the AC PV Branch Circuits included in the AcPvBranchCircuitPvArray element, the PvArray may not always have an even number of circuits. This type allows a partial branch circuit to be included in an array, noting how many modules of the total circuit length are in this array, and setting a reference to another array where the remainder of the branch circuit is included.
Diagram	
Type	PartialSourceCircuitType
Properties	content: complex minOccurs: 0
Model	QtyOfModulesInPartialCircuit , ArrayHoldingRemainderOfCircuit
Children	ArrayHoldingRemainderOfCircuit, QtyOfModulesInPartialCircuit
Instance	<PartialAcPvBranchCircuit> <QtyOfModulesInPartialCircuit>{1,1}</QtyOfModulesInPartialCircuit> <ArrayHoldingRemainderOfCircuit>{1,1}</ArrayHoldingRemainderOfCircuit> </PartialAcPvBranchCircuit>

Source	<xs:element minOccurs="0" name="PartialAcPvBranchCircuit" type="PartialSourceCircuitType"> <xs:annotation> <xs:documentation>When defining the AC PV Branch Circuits included in the AcPvBranchCircuitPvArray element, the PvArray may not always have an even number of circuits. This type allows a partial branch circuit to be included in an array, noting how many modules of the total circuit length are in this array, and setting a reference to another array where the remainder of the branch circuit is included.</xs:documentation> </xs:annotation> </xs:element>

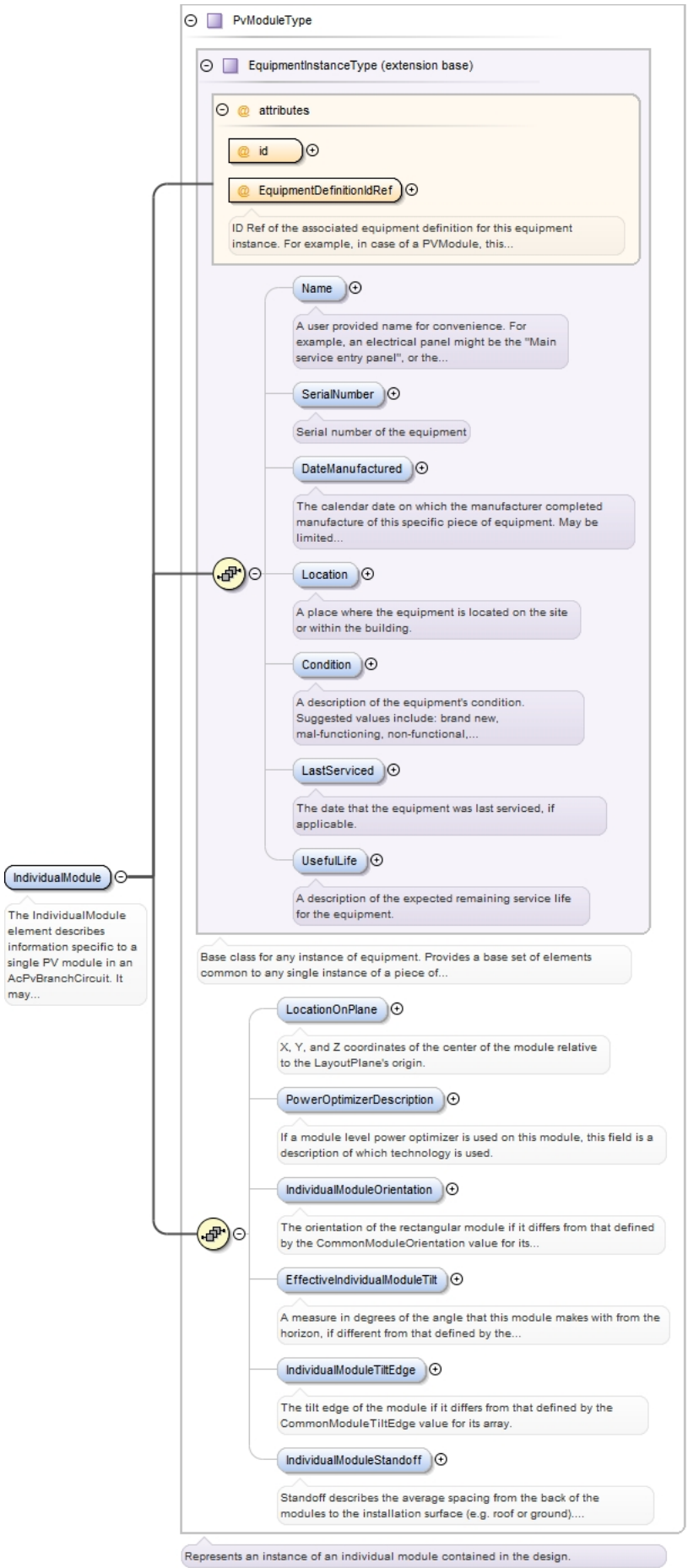
Element AcPvBranchCircuitType / AcModuleInstance

Namespace	No namespace
Annotations	The AcModuleInstance element describes a single instance of an AC Module in an AcPvBranchCircuit. It may represent an integrated module / micro-inverter assembly (common make/model) or a an independent PV module paired with an independent micro-inverter.
Diagram	
Type	AcModuleInstanceType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	IndividualModule , IndividualMicroInverter{0,1}
Children	IndividualMicroInverter, IndividualModule
Instance	<AcModuleInstance> <IndividualModule EquipmentDefinitionIdRef="" id="">{1,1}</IndividualModule> <IndividualMicroInverter EquipmentDefinitionIdRef="" id="">{0,1}</IndividualMicroInverter> </AcModuleInstance>
Source	<xs:element maxOccurs="unbounded" minOccurs="0" name="AcModuleInstance" type="AcModuleInstanceType"> <xs:annotation> <xs:documentation>The AcModuleInstance element describes a single instance of an AC Module in an AcPvBranchCircuit. It may represent an integrated module / micro-inverter assembly (common make/model) or a an independent PV module paired with an independent micro-inverter.</xs:documentation> </xs:annotation> </xs:element>

Element AcModuleInstanceType / IndividualModule

Namespace	No namespace
Annotations	The IndividualModule element describes information specific to a single PV module in an AcPvBranchCircuit. It may represent an integrated module / micro-inverter assembly (common make/model) or an individual module that can be paired with an independent micro-inverter (described by the IndividualMicroInverter element).

Diagram


PvModuleType
EquipmentInstanceType (extension base)
attributes
id
EquipmentDefinitionIdRef
ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this...
Name
A user provided name for convenience. For example, an electrical panel might be the "Main service entry panel", or the...
SerialNumber
Serial number of the equipment
DateManufactured
The calendar date on which the manufacturer completed manufacture of this specific piece of equipment. May be limited...
Location
A place where the equipment is located on the site or within the building.
Condition
A description of the equipment's condition. Suggested values include: brand new, mal-functioning, non-functional,...
LastServiced
The date that the equipment was last serviced, if applicable.
UsefulLife
A description of the expected remaining service life for the equipment.
IndividualModule
The IndividualModule element describes information specific to a single PV module in an AcPvBranchCircuit. It may...
Base class for any instance of equipment. Provides a base set of elements common to any single instance of a piece of...
LocationOnPlane
X, Y, and Z coordinates of the center of the module relative to the LayoutPlane's origin.
PowerOptimizerDescription
If a module level power optimizer is used on this module, this field is a description of which technology is used.
IndividualModuleOrientation
The orientation of the rectangular module if it differs from that defined by the CommonModuleOrientation value for its...
EffectiveIndividualModuleTilt
A measure in degrees of the angle that this module makes with from the horizon, if different from that defined by the...
IndividualModuleTiltEdge
The tilt edge of the module if it differs from that defined by the CommonModuleTiltEdge value for its array.
IndividualModuleStandoff
Standoff describes the average spacing from the back of the modules to the installation surface (e.g. roof or ground)....
Represents an instance of an individual module contained in the design.

Type	PvModuleType
Type hierarchy	• EquipmentInstanceType • PvModuleType
Properties	content: complex minOccurs: 1 maxOccurs: 1
Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1} , LocationOnPlane{0,1} , PowerOptimizerDescription{0,1} , IndividualModuleOrientation{0,1} , EffectiveIndividualModuleTilt{0,1} , IndividualModuleTiltEdge{0,1} , IndividualModuleStandoff{0,1}
Children	Condition, DateManufactured, EffectiveIndividualModuleTilt, IndividualModuleOrientation, IndividualModuleStandoff, IndividualModuleTiltEdge, LastServiced, Location, LocationOnPlane, Name, PowerOptimizerDescription, SerialNumber, UsefulLife

Instance

```
<IndividualModule EquipmentDefinitionIdRef="" id="">
  <Name>{0,1}</Name>
  <SerialNumber>{0,1}</SerialNumber>
  <DateManufactured>{0,1}</DateManufactured>
  <Location>{0,1}</Location>
  <Condition>{0,1}</Condition>
  <LastServiced>{0,1}</LastServiced>
  <UsefulLife>{0,1}</UsefulLife>
  <LocationOnPlane>{0,1}</LocationOnPlane>
  <PowerOptimizerDescription>{0,1}</PowerOptimizerDescription>
  <IndividualModuleOrientation>{0,1}</IndividualModuleOrientation>
  <EffectiveIndividualModuleTilt>{0,1}</EffectiveIndividualModuleTilt>
  <IndividualModuleTiltEdge>{0,1}</IndividualModuleTiltEdge>
  <IndividualModuleStandoff>{0,1}</IndividualModuleStandoff>
</IndividualModule>
```

Attributes

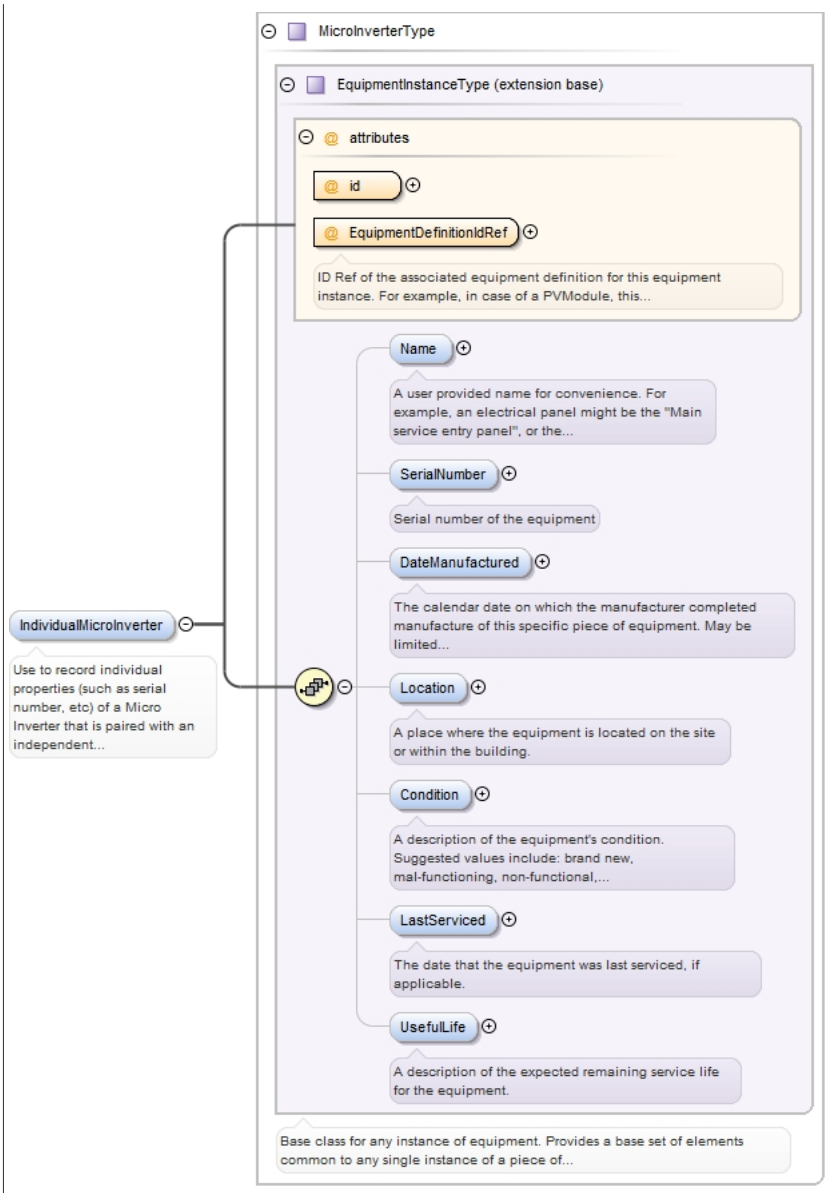
QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			required
	ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.			
id	xs:ID			required

Source

```
<xs:element maxOccurs="1" minOccurs="1" name="IndividualModule" type="PvModuleType">
  <xs:annotation>
    <xs:documentation>The IndividualModule element describes information specific to a
 single PV module in an AcPvBranchCircuit. It may represent an integrated module / micro-
inverter assembly (common make/model) or an individual module that can be paired with
 an independent micro-inverter (described by the IndividualMicroInverter element).</
xs:documentation>
  </xs:annotation>
</xs:element>
```

Element AcModuleInstanceType / IndividualMicroInverter

Namespace	No namespace
Annotations	Use to record individual properties (such as serial number, etc) of a Micro Inverter that is paired with an independent PV module. Together they form the AC Module.

Diagram	
Type	MicroInverterType
Type hierarchy	• EquipmentInstanceType • MicroInverterType
Properties	content: `complex` minOccurs: `0`
Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1}
Children	Condition, DateManufactured, LastServiced, Location, Name, SerialNumber, UsefulLife

`Instance`	`<IndividualMicroInverter EquipmentDefinitionIdRef="" id="">`
	`  <Name>{0,1}</Name>`
	`  <SerialNumber>{0,1}</SerialNumber>`
	`  <DateManufactured>{0,1}</DateManufactured>`
	`  <Location>{0,1}</Location>`
	`  <Condition>{0,1}</Condition>`
	`  <LastServiced>{0,1}</LastServiced>`
	`  <UsefulLife>{0,1}</UsefulLife>`
	`</IndividualMicroInverter>`

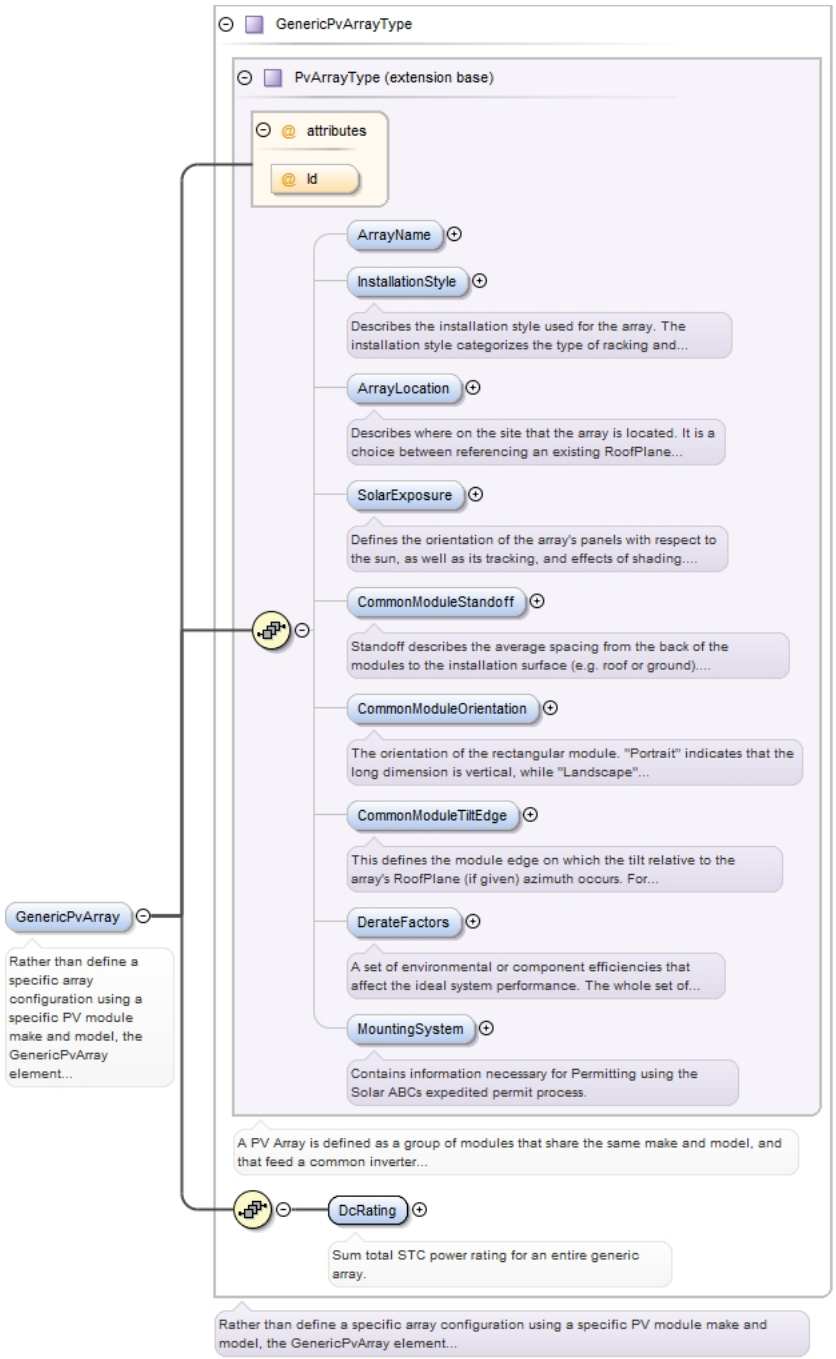
Attributes

QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			required
	ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID			

	QName	Type	Fixed	Default	Use
		of the PvModuleDefinition element that describes this particular PV module instance.			
	id	xs:ID			required
Source	<xs:element minOccurs="0" name="IndividualMicroInverter" type="MicroInverterType"> <xs:annotation> <xs:documentation>Use to record individual properties (such as serial number, etc) of a Micro Inverter that is paired with an independent PV module. Together they form the AC Module.</xs:documentation> </xs:annotation> </xs:element>				

Element PvSystemType / GenericPvArray

Namespace	No namespace
Annotations	Rather than define a specific array configuration using a specific PV module make and model, the GenericPvArray element allows an array to be defined simply as a total DC power output. The PvArray Base Type provides all the orientation, derate, and solar access parameters necessary to evaluate this "generic" array using a tool like NREL's PVWatts. The GenericPvArray element is useful for feasibility studies where specific designs are not required.

Diagram	
Type	GenericPvArrayType
Type hierarchy	• PvArrayType • GenericPvArrayType
Properties	content: `complex` minOccurs: `0` maxOccurs: `unbounded`
Model	ArrayName{0,1} , InstallationStyle{0,1} , ArrayLocation{0,1} , SolarExposure{0,1} , CommonModuleStandoff{0,1} , CommonModuleOrientation{0,1} , CommonModuleTiltEdge{0,1} , DerateFactors{0,1} , MountingSystem{0,1} , DcRating
Children	ArrayLocation, ArrayName, CommonModuleOrientation, CommonModuleStandoff, CommonModuleTiltEdge, DcRating, DerateFactors, InstallationStyle, MountingSystem, SolarExposure

`Instance`	`<GenericPvArray Id="">`
	`  <ArrayName>{0,1}</ArrayName>`
	`  <InstallationStyle>{0,1}</InstallationStyle>`

```
  <ArrayLocation>{0,1}</ArrayLocation>
  <SolarExposure>{0,1}</SolarExposure>
  <CommonModuleStandoff>{0,1}</CommonModuleStandoff>
  <CommonModuleOrientation>{0,1}</CommonModuleOrientation>
  <CommonModuleTiltEdge>{0,1}</CommonModuleTiltEdge>
  <DerateFactors>{0,1}</DerateFactors>
  <MountingSystem>{0,1}</MountingSystem>
  <DcRating>{1,1}</DcRating>
</GenericPvArray>
```

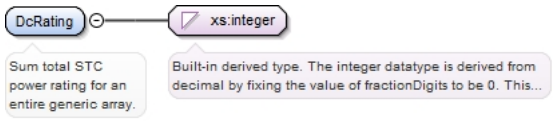
Attributes

QName	Type	Fixed	Default	Use
Id				optional

Source

```
<xs:element maxOccurs="unbounded" minOccurs="0" name="GenericPvArray"
 type="GenericPvArrayType">
  <xs:annotation>
    <xs:documentation>Rather than define a specific array configuration using a specific
 PV module make and model, the GenericPvArray element allows an array to be defined simply
 as a total DC power output. The PvArray Base Type provides all the orientation, derate,
 and solar access parameters necessary to evaluate this "generic" array using a tool
 like NREL's PVWatts. The GenericPvArray element is useful for feasibility studies where
 specific designs are not required.</xs:documentation>
  </xs:annotation>
</xs:element>
```

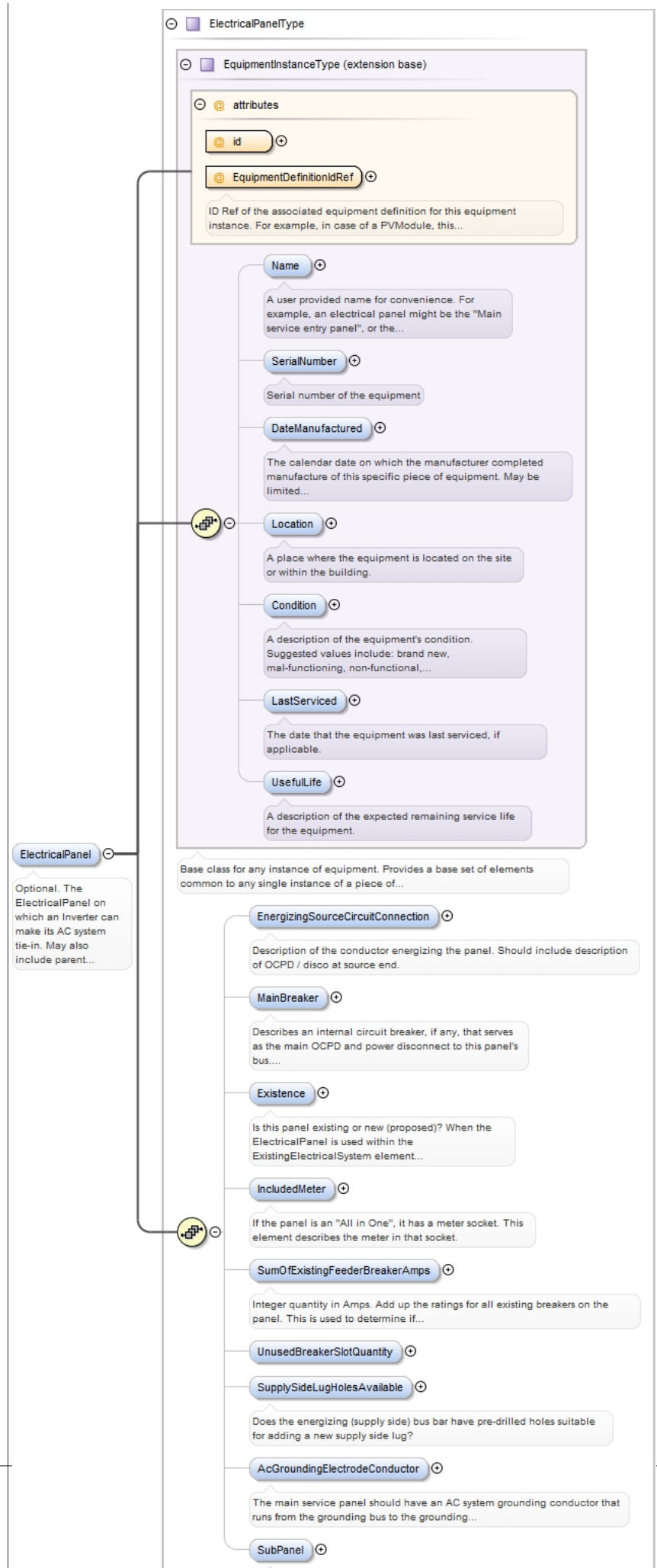
Element GenericPvArrayType / DcRating

Namespace	No namespace
Annotations	Sum total STC power rating for an entire generic array.
Diagram	
Type	xs:integer
Properties	content: simple
Source	<xs:element name="DcRating" type="xs:integer"> <xs:annotation> <xs:documentation>Sum total STC power rating for an entire generic array.</ xs:documentation> </xs:annotation> </xs:element>

Element PvSystemType / ElectricalPanel

Namespace	No namespace
Annotations	Optional. The ElectricalPanel on which an Inverter can make its AC system tie-in. May also include parent ElectricalPanels. Use of this element is somewhat dependent on what XSDs are used. This element is always used to describe a new electrical panel which will be added to a site to accommodate the addition of a PV system (perhaps serving as an AC Combiner). If PvDesign xml document is used independently from a broader Project XML document, then this element can also be used to define existing ElectricalPanel(s) where the PV system may be interconnected. This element is not required when the PvDesign is used within a broader Project XML instance that contains an ExistingElectricalDitributionHierarchy and the PvDesign's Inverter(s) are to be connected to the ElectricalPanel(s) defined there. NOTE: The EquipmentWhereConnectedIdRef within the Inverter's AcCircuitConnection should reference either this element, or a similar ElectricalPanel instance within an ExistingElectricalDistributionHierarchy element of a Project.xml. NOTE: A PvDesign cannot be used within an ElectricalDistributionHierarchy element. It can only be associated with an ElectricalDistributionHierarchy via EquipmentWhereConnectedIdRef attribute of the Inverter's AcTie-InCircuitConnection element.

Diagram


ElectricalPanelType
EquipmentInstanceType (extension base)
attributes
id
EquipmentDefinitionIdRef
ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this...
Name
A user provided name for convenience. For example, an electrical panel might be the "Main service entry panel", or the...
SerialNumber
Serial number of the equipment
DateManufactured
The calendar date on which the manufacturer completed manufacture of this specific piece of equipment. May be limited...
Location
A place where the equipment is located on the site or within the building.
Condition
A description of the equipment's condition. Suggested values include: brand new, mal-functioning, non-functional,...
LastServiced
The date that the equipment was last serviced, if applicable.
UsefulLife
A description of the expected remaining service life for the equipment.
ElectricalPanel
Optional. The ElectricalPanel on which an Inverter can make its AC system tie-in. May also include parent...
Base class for any instance of equipment. Provides a base set of elements common to any single instance of a piece of...
EnergizingSourceCircuitConnection
Description of the conductor energizing the panel. Should include description of OCPD / disco at source end.
MainBreaker
Describes an internal circuit breaker, if any, that serves as the main OCPD and power disconnect to this panel's bus....
Existence
Is this panel existing or new (proposed)? When the ElectricalPanel is used within the ExistingElectricalSystem element...
IncludedMeter
If the panel is an "All in One", it has a meter socket. This element describes the meter in that socket.
SumOfExistingFeederBreakerAmps
Integer quantity in Amps. Add up the ratings for all existing breakers on the panel. This is used to determine if...
UnusedBreakerSlotQuantity
SupplySideLugHolesAvailable
Does the energizing (supply side) bus bar have pre-drilled holes suitable for adding a new supply side lug?
AcGroundingElectrodeConductor
The main service panel should have an AC system grounding conductor that runs from the grounding bus to the grounding...
SubPanel

Type	ElectricalPanelType
Type hierarchy	• EquipmentInstanceType • ElectricalPanelType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1} , EnergizingSourceCircuitConnection{0,1} , MainBreaker{0,1} , Existence{0,1} , IncludedMeter{0,1} , SumOfExistingFeederBreakerAmps{0,1} , UnusedBreakerSlotQuantity{0,1} , SupplySideLugHolesAvailable{0,1} , AcGroundingElectrodeConductor{0,1} , SubPanel{0,1}
Children	AcGroundingElectrodeConductor, Condition, DateManufactured, EnergizingSourceCircuitConnection, Existence, IncludedMeter, LastServiced, Location, MainBreaker, Name, SerialNumber, SubPanel, SumOfExistingFeederBreakerAmps, SupplySideLugHolesAvailable, UnusedBreakerSlotQuantity, UsefulLife

Instance

```
<ElectricalPanel EquipmentDefinitionIdRef="" id="">
  <Name>{0,1}</Name>
  <SerialNumber>{0,1}</SerialNumber>
  <DateManufactured>{0,1}</DateManufactured>
  <Location>{0,1}</Location>
  <Condition>{0,1}</Condition>
  <LastServiced>{0,1}</LastServiced>
  <UsefulLife>{0,1}</UsefulLife>
  <EnergizingSourceCircuitConnection EquipmentWhereConnectedIdRef="">{0,1}</
EnergizingSourceCircuitConnection>
  <MainBreaker>{0,1}</MainBreaker>
  <Existence>{0,1}</Existence>
  <IncludedMeter EquipmentDefinitionIdRef="" id="">{0,1}</IncludedMeter>
  <SumOfExistingFeederBreakerAmps>{0,1}</SumOfExistingFeederBreakerAmps>
  <UnusedBreakerSlotQuantity>{0,1}</UnusedBreakerSlotQuantity>
  <SupplySideLugHolesAvailable>{0,1}</SupplySideLugHolesAvailable>
  <AcGroundingElectrodeConductor>{0,1}</AcGroundingElectrodeConductor>
  <SubPanel EquipmentDefinitionIdRef="" id="">{0,1}</SubPanel>
</ElectricalPanel>
```

Attributes

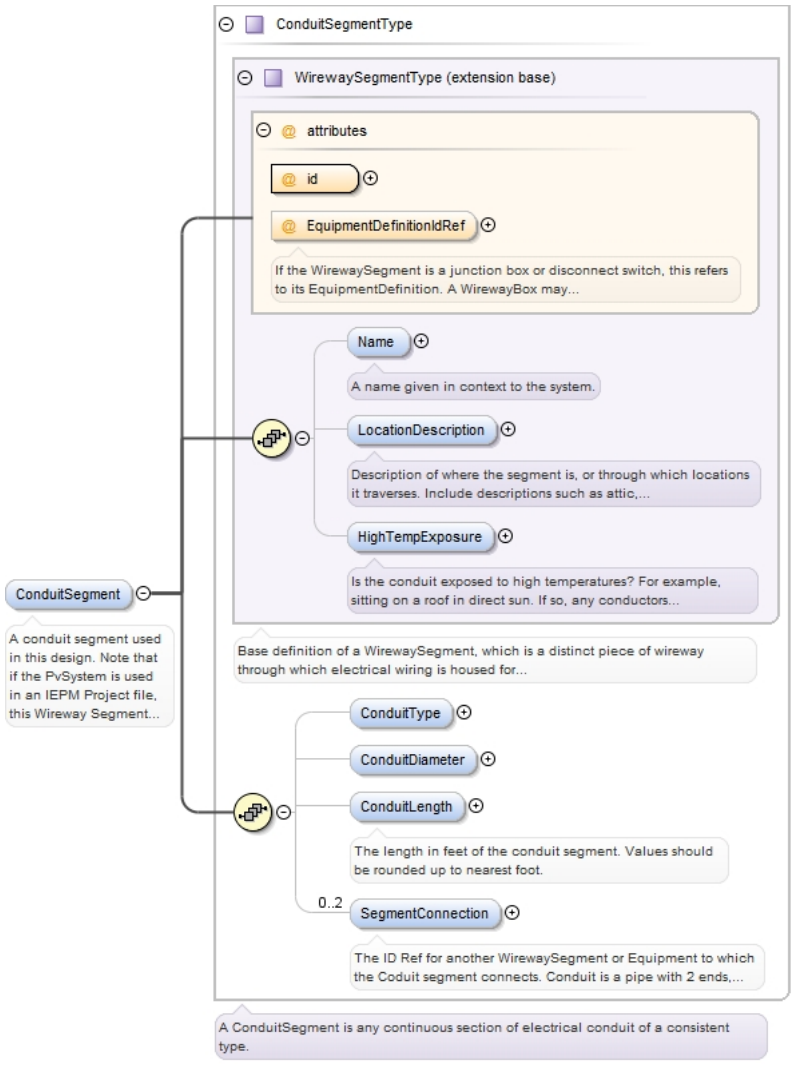
QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			required
	ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.			
id	xs:ID			required

Source

```
<xs:element maxOccurs="unbounded" minOccurs="0" name="ElectricalPanel"
 type="ElectricalPanelType">
  <xs:annotation>
    <xs:documentation>Optional. The ElectricalPanel on which an Inverter can make its
 AC system tie-in. May also include parent ElectricalPanels. Use of this element is
 somewhat dependent on what XSDs are used. This element is always used to describe a new
 electrical panel which will be added to a site to accommodate the addition of a PV system
 (perhaps serving as an AC Combiner). If PvDesign xml document is used independently from
 a broader Project XML document, then this element can also be used to define existing
 ElectricalPanel(s) where the PV system may be interconnected. This element is not
 required when the PvDesign is used within a broader Project XML instance that contains an
 ExistingElectricalDitributionHierarchy and the PvDesign's Inverter(s) are to be connected
 to the ElectricalPanel(s) defined there. NOTE: The EquipmentWhereConnectedIdRef within
 the Inverter's AcCircuitConnection should reference either this element, or a similar
 ElectricalPanel instance within an ExistingElectricalDistributionHierarchy element of a
 Project.xml. NOTE: A PvDesign cannot be used within an ElectricalDistributionHierarchy
 element. It can only be associated with an ElectricalDistributionHierarchy via
 EquipmentWhereConnectedIdRef attribute of the Inverter's AcTie-InCircuitConnection
 element.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element PvSystemType / ConduitSegment

Namespace	No namespace
Annotations	A conduit segment used in this design. Note that if the PvSystem is used in an IEPM Project file, this Wireway Segment does not reference any ExistingWirewaySegments or ProposedWirewaySegments defined in the Site element. Those elements are used for site survey data collection, not system definition.

Diagram	
Type	ConduitSegmentType
Type hierarchy	• WirewaySegmentType • ConduitSegmentType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , LocationDescription{0,1} , HighTempExposure{0,1} , ConduitType{0,1} , ConduitDiameter{0,1} , ConduitLength{0,1} , SegmentConnection{0,2}
Children	ConduitDiameter, ConduitLength, ConduitType, HighTempExposure, LocationDescription, Name, SegmentConnection

Instance	`<ConduitSegment EquipmentDefinitionIdRef="" id="">`
	`  <Name>{0,1}</Name>`
	`  <LocationDescription>{0,1}</LocationDescription>`
	`  <HighTempExposure>{0,1}</HighTempExposure>`
	`  <ConduitType>{0,1}</ConduitType>`
	`  <ConduitDiameter>{0,1}</ConduitDiameter>`
	`  <ConduitLength>{0,1}</ConduitLength>`
	`  <SegmentConnection>{0,2}</SegmentConnection>`
	`</ConduitSegment>`

Attributes

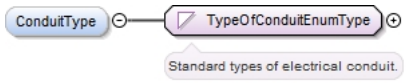
QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			optional
	If the WirewaySegment is a junction box or disconnect switch, this refers to its EquipmentDefinition. A WirewayBox may be a pass through where multiple ConduitSegments are combined into a single ConduitSegment for example. A disconnect switch box may also be			

	QName	Type	Fixed	Default	Use
		modeled as a WirewayBox, provided that the circuit(s) involved are simply disoconnected and not combined in any way. DO NOT use WirewayBox to represent a combiner, or distribution panel.			
	id	xs:ID			required

Source

```
<xs:element name="ConduitSegment" type="ConduitSegmentType" minOccurs="0"
 maxOccurs="unbounded">
  <xs:annotation>
    <xs:documentation>A conduit segment used in this design. Note that if the
 PvSystem is used in an IEPM Project file, this Wireway Segment does not reference
 any ExistingWirewaySegments or ProposedWirewaySegments defined in the Site element.
 Those elements are used for site survey data collection, not system definition.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

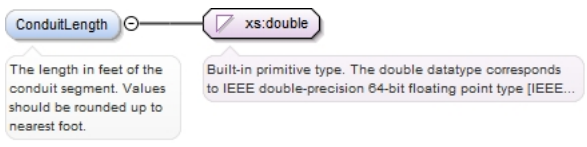
Element ConduitSegmentType / ConduitType

Namespace	No namespace
Diagram	
Type	TypeOfConduitEnumType
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	enumeration EMT enumeration PVC enumeration Rigid
Source	`<xs:element name="ConduitType" type="TypeOfConduitEnumType" minOccurs="0" maxOccurs="1"/>`

Element ConduitSegmentType / ConduitDiameter

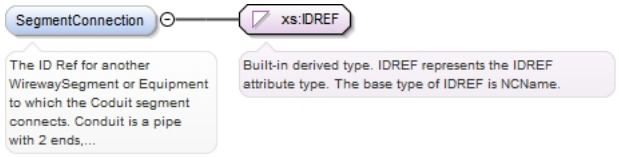
Namespace	No namespace
Diagram	
Type	ConduitDiameterEnumType
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	enumeration 1/2 enumeration 3/4 enumeration 1 enumeration 1 1/4 enumeration 1 1/2 enumeration 2
Source	`<xs:element name="ConduitDiameter" type="ConduitDiameterEnumType" minOccurs="0" maxOccurs="1"/>`

Element ConduitSegmentType / ConduitLength

Namespace	No namespace
Annotations	The length in feet of the conduit segment. Values should be rounded up to nearest foot.
Diagram	

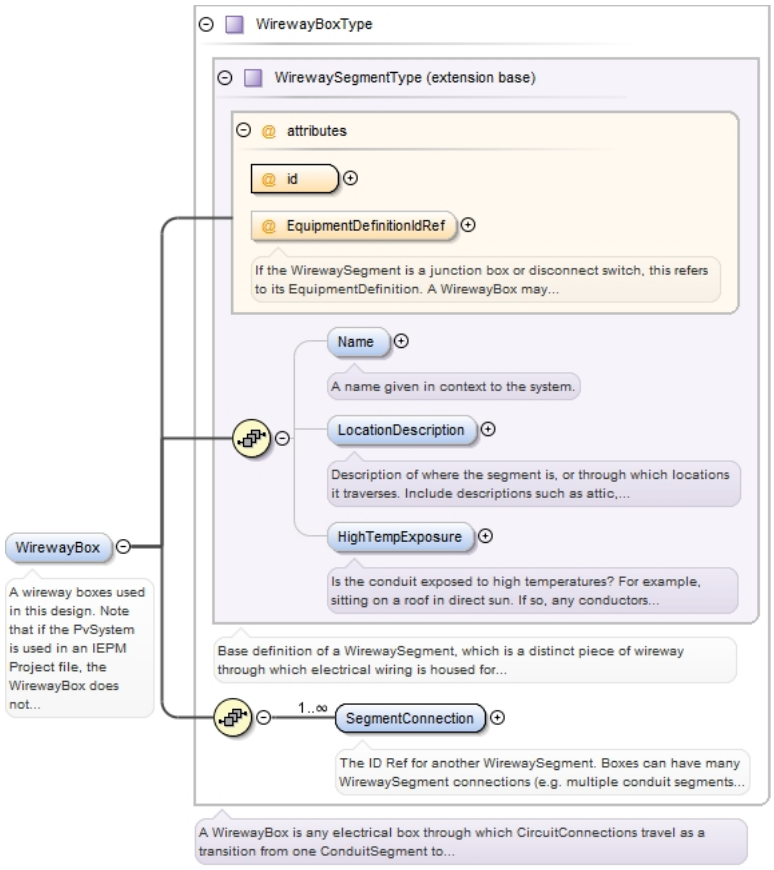
Type	xs:double
Properties	content: simple minOccurs: 0
Source	<xs:element name="ConduitLength" type="xs:double" minOccurs="0"> <xs:annotation> <xs:documentation>The length in feet of the conduit segment. Values should be rounded up to nearest foot.</xs:documentation> </xs:annotation> </xs:element>

Element ConduitSegmentType / SegmentConnection

Namespace	No namespace
Annotations	The ID Ref for another WirewaySegment or Equipment to which the Coduit segment connects. Conduit is a pipe with 2 ends, so it has a maximum of two WirewaySegments or Equipment to which it connects. Boxes can have many WirewaySegment connections.
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 0 maxOccurs: 2
Source	<xs:element maxOccurs="2" name="SegmentConnection" type="xs:IDREF" minOccurs="0"> <xs:annotation> <xs:documentation>The ID Ref for another WirewaySegment or Equipment to which the Coduit segment connects. Conduit is a pipe with 2 ends, so it has a maximum of two WirewaySegments or Equipment to which it connects. Boxes can have many WirewaySegment connections.</xs:documentation> </xs:annotation> </xs:element>

Element PvSystemType / WirewayBox

Namespace	No namespace
Annotations	A wireway boxes used in this design. Note that if the PvSystem is used in an IEPM Project file, the WirewayBox does not reference any ExistingWirewaySegments or ProposedWirewaySegments defined in the Site element. Those elements are used for site survey data collection, not system definition.

Diagram	
Type	WirewayBoxType
Type hierarchy	• WirewaySegmentType • WirewayBoxType
Properties	content: `complex` minOccurs: `0` maxOccurs: `unbounded`
Model	Name{0,1} , LocationDescription{0,1} , HighTempExposure{0,1} , SegmentConnection+
Children	HighTempExposure, LocationDescription, Name, SegmentConnection

Instance

```
<WirewayBox EquipmentDefinitionIdRef="" id="">
  <Name>{0,1}</Name>
  <LocationDescription>{0,1}</LocationDescription>
  <HighTempExposure>{0,1}</HighTempExposure>
  <SegmentConnection>{1,unbounded}</SegmentConnection>
</WirewayBox>
```

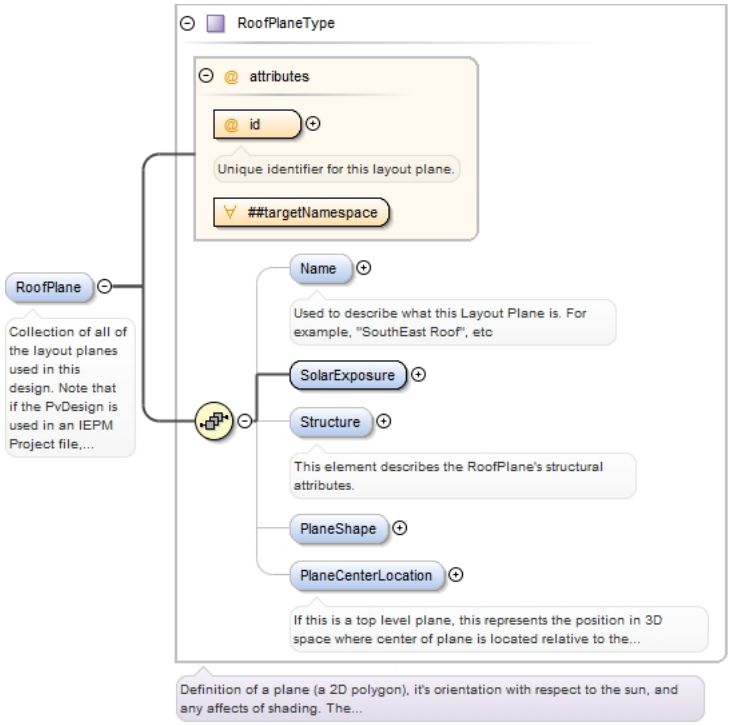
Attributes

QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			optional
	If the WirewaySegment is a junction box or disconnect switch, this refers to its EquipmentDefinition. A WirewayBox may be a pass through where multiple ConduitSegments are combined into a single ConduitSegment for example. A disconnect switch box may also be modeled as a WirewayBox, provided that the circuit(s) involved are simply disoconnected and not combined in any way. DO NOT use WirewayBox to represent a combiner, or distribution panel.			
id	xs:ID			required

Source

```
<xs:element maxOccurs="unbounded" minOccurs="0" name="WirewayBox" type="WirewayBoxType">
  <xs:annotation>
    <xs:documentation>A wireway boxes used in this design. Note that if the
 PvSystem is used in an IEPM Project file, the WirewayBox does not reference any
 ExistingWirewaySegments or ProposedWirewaySegments defined in the Site element.
 Those elements are used for site survey data collection, not system definition.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

Element PvSystemType / RoofPlane

Namespace	No namespace
Annotations	Collection of all of the layout planes used in this design. Note that if the PvDesign is used in an IEPM Project file, this collection of LayoutPlanes does not reference any LayoutPlane defined in the Site-Building-Envelope-Roof element. LayoutPlane element(s) defined for a Roof element can be used in a PvDesign as the plane on which modules are installed. The PvDesign would include those LayoutPlane elements here, rather than referencing them as a part of the Building's Roof inside the Project's Site element. The LayoutPlane elements in the Roof are primarily used for site survey data collection, not system definition.
Diagram	
Type	RoofPlaneType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , SolarExposure , Structure{0,1} , PlaneShape{0,1} , PlaneCenterLocation{0,1}
Children	Name, PlaneCenterLocation, PlaneShape, SolarExposure, Structure

Instance

```
<RoofPlane id="">
  <Name>{0,1}</Name>
  <SolarExposure>{1,1}</SolarExposure>
  <Structure>{0,1}</Structure>
  <PlaneShape>{0,1}</PlaneShape>
  <PlaneCenterLocation>{0,1}</PlaneCenterLocation>
</RoofPlane>
```

Attributes

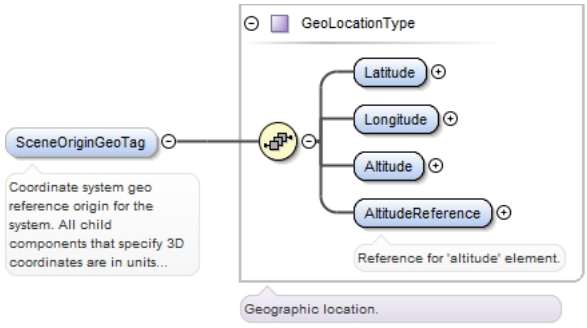
QName	Type	Fixed	Default	Use
ANY attribute from TARGET namespace 'http://www.iepmodel.net'				
id	xs:ID			required
	Unique identifier for this layout plane.			

Source

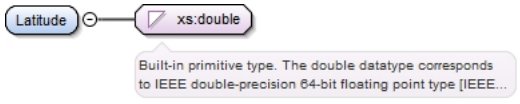
```
<xs:element name="RoofPlane" type="RoofPlaneType" minOccurs="0" maxOccurs="unbounded">
  <xs:annotation>
    <xs:documentation>Collection of all of the layout planes used in this design. Note
 that if the PvDesign is used in an IEPM Project file, this collection of LayoutPlanes
 does not reference any LayoutPlane defined in the Site-Building-Envelope-Roof element.
 LayoutPlane element(s) defined for a Roof element can be used in a PvDesign as the plane
 on which modules are installed. The PvDesign would include those LayoutPlane elements
 here, rather than referencing them as a part of the Building's Roof inside the Project's
```

```
 Site element. The LayoutPlane elements in the Roof are primarily used for site survey
 data collection, not system definition.</xs:documentation>
  </xs:annotation>
</xs:element>
```

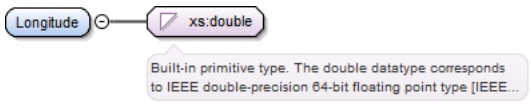
Element PvSystemType / SceneOriginGeoTag

Namespace	No namespace
Annotations	Coordinate system geo reference origin for the system. All child components that specify 3D coordinates are in units meters relative to this location. The 3D coordinate of this origin is (0,0,0).
Diagram	
Type	GeoLocationType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Latitude , Longitude , Altitude , AltitudeReference
Children	Altitude, AltitudeReference, Latitude, Longitude
Instance	<SceneOriginGeoTag> <Latitude>{1,1}</Latitude> <Longitude>{1,1}</Longitude> <Altitude>{1,1}</Altitude> <AltitudeReference>{1,1}</AltitudeReference> </SceneOriginGeoTag>
Source	<xs:element name="SceneOriginGeoTag" type="GeoLocationType" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Coordinate system geo reference origin for the system. All child components that specify 3D coordinates are in units meters relative to this location. The 3D coordinate of this origin is (0,0,0).</xs:documentation> </xs:annotation> </xs:element>

Element GeoLocationType / Latitude

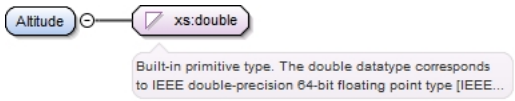
Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple
Source	<xs:element name="Latitude" type="xs:double"/>

Element GeoLocationType / Longitude

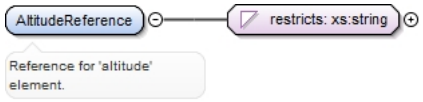
Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple

Source	<xs:element name="Longitude" type="xs:double"/>

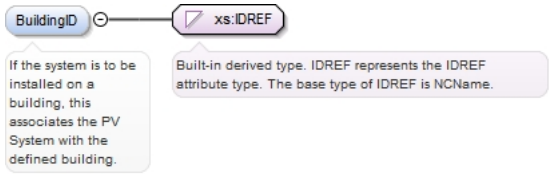
Element GeoLocationType / Altitude

Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple
Source	<xs:element name="Altitude" type="xs:double"/>

Element GeoLocationType / AltitudeReference

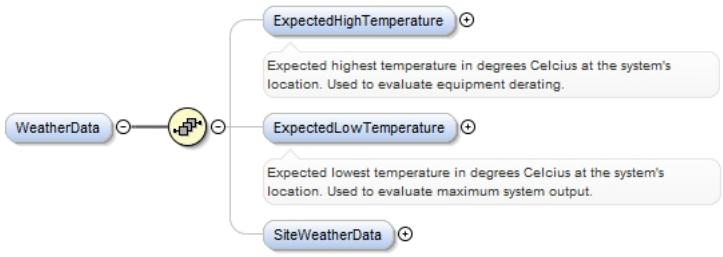
Namespace	No namespace
Annotations	Reference for 'altitude' element.
Diagram	
Type	restriction of xs:string
Properties	content: simple default: Ground
Facets	enumeration Ground — The altitude is measured from the ground. enumeration Ellipsoid — The altitude is measured from the ellipsoid. enumeration SeaLevel — The altitude is measured from sea level.
Source	<xs:element name="AltitudeReference" default="Ground"> <xs:annotation> <xs:documentation>Reference for 'altitude' element.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:string"> <xs:enumeration value="Ground"> <xs:annotation> <xs:documentation>The altitude is measured from the ground.</xs:documentation> </xs:annotation> </xs:enumeration> <xs:enumeration value="Ellipsoid"> <xs:annotation> <xs:documentation>The altitude is measured from the ellipsoid.</ xs:documentation> </xs:annotation> </xs:enumeration> <xs:enumeration value="SeaLevel"> <xs:annotation> <xs:documentation>The altitude is measured from sea level.</xs:documentation> </xs:annotation> </xs:enumeration> </xs:restriction> </xs:simpleType> </xs:element>

Element PvSystemType / BuildingID

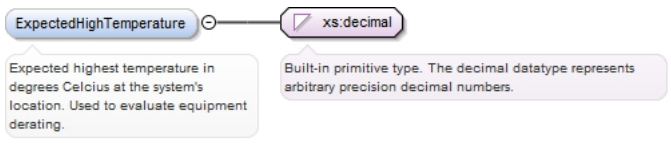
Namespace	No namespace
Annotations	If the system is to be installed on a building, this associates the PV System with the defined building.
Diagram	

Type	xs:IDREF
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element minOccurs="0" name="BuildingID" type="xs:IDREF" maxOccurs="1"> <xs:annotation> <xs:documentation>If the system is to be installed on a building, this associates the PV System with the defined building.</xs:documentation> </xs:annotation> </xs:element>

Element PvSystemType / WeatherData

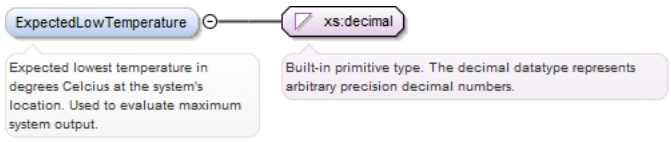
Namespace	No namespace
Diagram	
Properties	content: complex minOccurs: 0
Model	ExpectedHighTemperature{0,1} , ExpectedLowTemperature{0,1} , SiteWeatherData{0,1}
Children	ExpectedHighTemperature, ExpectedLowTemperature, SiteWeatherData
Instance	<WeatherData> <ExpectedHighTemperature>{0,1}</ExpectedHighTemperature> <ExpectedLowTemperature>{0,1}</ExpectedLowTemperature> <SiteWeatherData>{0,1}</SiteWeatherData> </WeatherData>
Source	<xs:element minOccurs="0" name="WeatherData"> <xs:complexType> <xs:sequence> <xs:element minOccurs="0" name="ExpectedHighTemperature" type="xs:decimal"> <xs:annotation> <xs:documentation>Expected highest temperature in degrees Celcius at the system's location. Used to evaluate equipment derating.</xs:documentation> </xs:annotation> </xs:element> <xs:element minOccurs="0" name="ExpectedLowTemperature" type="xs:decimal"> <xs:annotation> <xs:documentation>Expected lowest temperature in degrees Celcius at the system's location. Used to evaluate maximum system output.</xs:documentation> </xs:annotation> </xs:element> <xs:element minOccurs="0" name="SiteWeatherData" type="SiteWeatherDataType"/> </xs:sequence> </xs:complexType> </xs:element>

Element PvSystemType / WeatherData / ExpectedHighTemperature

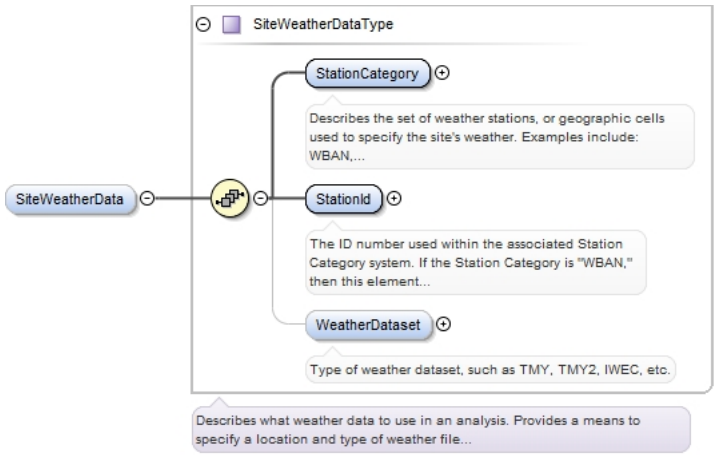
Namespace	No namespace
Annotations	Expected highest temperature in degrees Celcius at the system's location. Used to evaluate equipment derating.
Diagram	
Type	xs:decimal
Properties	content: simple

	minOccurs: 0
Source	<xs:element minOccurs="0" name="ExpectedHighTemperature" type="xs:decimal"> <xs:annotation> <xs:documentation>Expected highest temperature in degrees Celcius at the system's location. Used to evaluate equipment derating.</xs:documentation> </xs:annotation> </xs:element>

Element PvSystemType / WeatherData / ExpectedLowTemperature

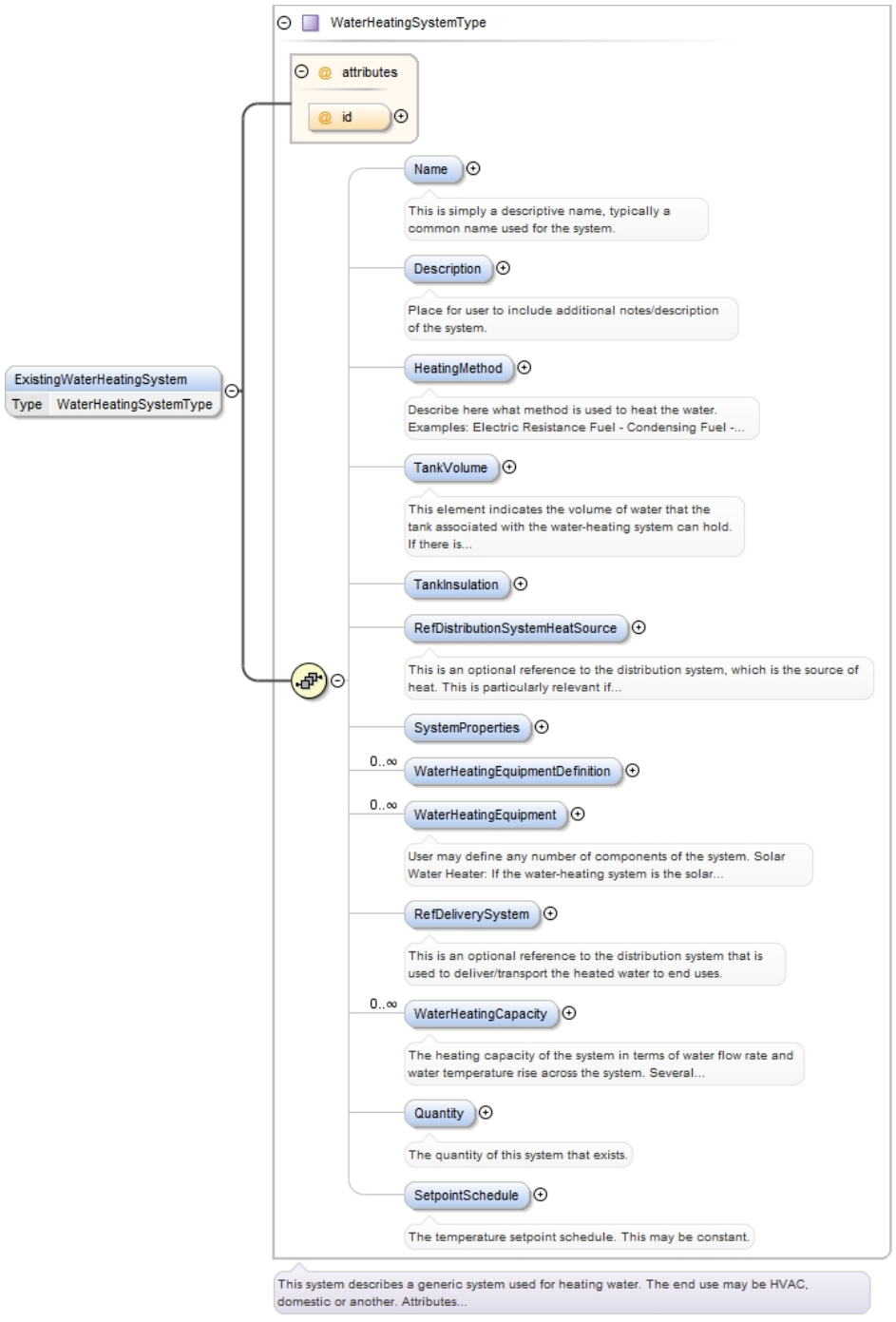
Namespace	No namespace
Annotations	Expected lowest temperature in degrees Celcius at the system's location. Used to evaluate maximum system output.
Diagram	
Type	xs:decimal
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="ExpectedLowTemperature" type="xs:decimal"> <xs:annotation> <xs:documentation>Expected lowest temperature in degrees Celcius at the system's location. Used to evaluate maximum system output.</xs:documentation> </xs:annotation> </xs:element>

Element PvSystemType / WeatherData / SiteWeatherData

Namespace	No namespace
Diagram	
Type	SiteWeatherDataType
Properties	content: complex minOccurs: 0
Model	StationCategory , StationId , WeatherDataset{0,1}
Children	StationCategory, StationId, WeatherDataset
Instance	<SiteWeatherData> <StationCategory>{1,1}</StationCategory> <StationId>{1,1}</StationId> <WeatherDataset>{0,1}</WeatherDataset> </SiteWeatherData>
Source	<xs:element minOccurs="0" name="SiteWeatherData" type="SiteWeatherDataType"/>

Element ProjectType / ExistingWaterHeatingSystem

Namespace	No namespace

Diagram	
Type	WaterHeatingSystemType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name{0,1} , Description{0,1} , HeatingMethod{0,1} , TankVolume{0,1} , TankInsulation{0,1} , RefDistributionSystemHeatSource{0,1} , SystemProperties{0,1} , WaterHeatingEquipmentDefinition* , WaterHeatingEquipment* , RefDeliverySystem{0,1} , WaterHeatingCapacity* , Quantity{0,1} , SetpointSchedule{0,1}
Children	Description, HeatingMethod, Name, Quantity, RefDeliverySystem, RefDistributionSystemHeatSource, SetpointSchedule, SystemProperties, TankInsulation, TankVolume, WaterHeatingCapacity, WaterHeatingEquipment, WaterHeatingEquipmentDefinition

Instance	`<ExistingWaterHeatingSystem id="">`
	`  <Name>{0,1}</Name>`
	`  <Description>{0,1}</Description>`

```
  <HeatingMethod>{0,1}</HeatingMethod>
  <TankVolume Unit="" UnitDesc="">{0,1}</TankVolume>
  <TankInsulation>{0,1}</TankInsulation>
  <RefDistributionSystemHeatSource>{0,1}</RefDistributionSystemHeatSource>
  <SystemProperties>{0,1}</SystemProperties>
  <WaterHeatingEquipmentDefinition id="">{0,unbounded}</WaterHeatingEquipmentDefinition>
  <WaterHeatingEquipment EquipmentDefinitionIdRef="" id="">{0,unbounded}</
WaterHeatingEquipment>
  <RefDeliverySystem>{0,1}</RefDeliverySystem>
  <WaterHeatingCapacity>{0,unbounded}</WaterHeatingCapacity>
  <Quantity>{0,1}</Quantity>
  <SetpointSchedule>{0,1}</SetpointSchedule>
</ExistingWaterHeatingSystem>
```

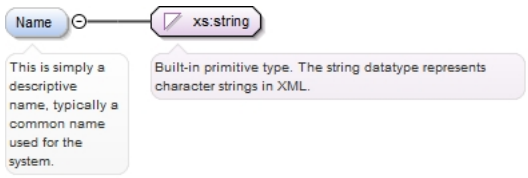
Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			optional

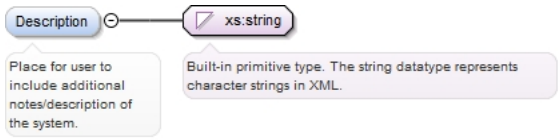
Source

```
<xs:element name="ExistingWaterHeatingSystem" type="WaterHeatingSystemType" minOccurs="0"
 maxOccurs="unbounded"/>
```

Element WaterHeatingSystemType / Name

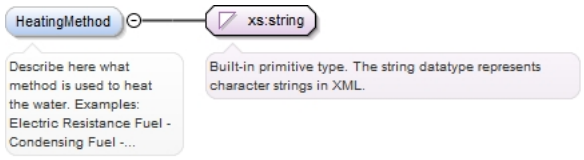
Namespace	No namespace
Annotations	This is simply a descriptive name, typically a common name used for the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is simply a descriptive name, typically a common name used for the system.</xs:documentation> </xs:annotation> </xs:element>

Element WaterHeatingSystemType / Description

Namespace	No namespace
Annotations	Place for user to include additional notes/description of the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Place for user to include additional notes/description of the system.</xs:documentation> </xs:annotation> </xs:element>

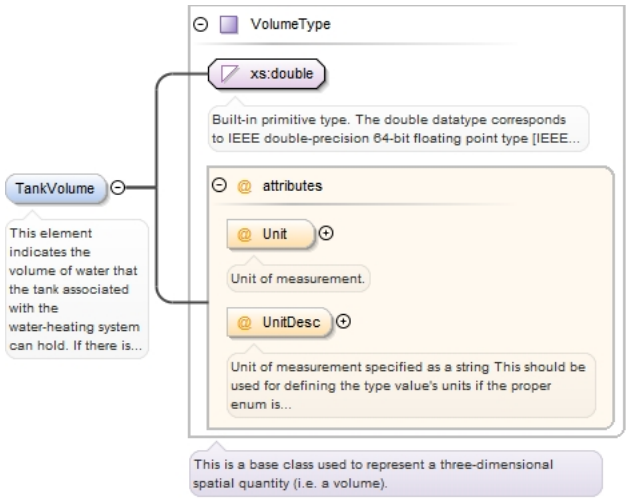
Element WaterHeatingSystemType / HeatingMethod

Namespace	No namespace

Annotations	Describe here what method is used to heat the water. Examples: Electric Resistance Fuel - Condensing Fuel - Non-Condensing Heat Pump – Air Source Heat Pump – Water Source Hybrid Heat Exchanger Solar Note, that some of the examples above require additional objects to be defined. For example: - If the heating type is Heat Exchanger, a reference to a distribution system that is the heat source is needed. - If solar, then additional details regarding the solar heating system are needed. This may simply be a reference to the distribution system that transfers heat from the solar panels to the water heating system. It may be an instance of Equipment Properties.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="HeatingMethod" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Describe here what method is used to heat the water. Examples: Electric Resistance Fuel - Condensing Fuel - Non-Condensing Heat Pump – Air Source Heat Pump – Water Source Hybrid Heat Exchanger Solar Note, that some of the examples above require additional objects to be defined. For example: - If the heating type is Heat Exchanger, a reference to a distribution system that is the heat source is needed. - If solar, then additional details regarding the solar heating system are needed. This may simply be a reference to the distribution system that transfers heat from the solar panels to the water heating system. It may be an instance of Equipment Properties.</xs:documentation> </xs:annotation> </xs:element>

Element WaterHeatingSystemType / TankVolume

Namespace	No namespace
Annotations	This element indicates the volume of water that the tank associated with the water-heating system can hold. If there is no tank, then this should have the value zero. Water heating systems wtih zero volume (no) tanks are commonly referred to as: - tankless - direct - instantaneous - boiler (typical in a large facility; used for space heating) Note that a hot water tank is not necessarily and does not have to be integrated with the water heating equipment. The water heater and the storage tank may be separate entities.

Diagram	
Type	VolumeType
Properties	content: complex minOccurs: 0 maxOccurs: 1

Attributes

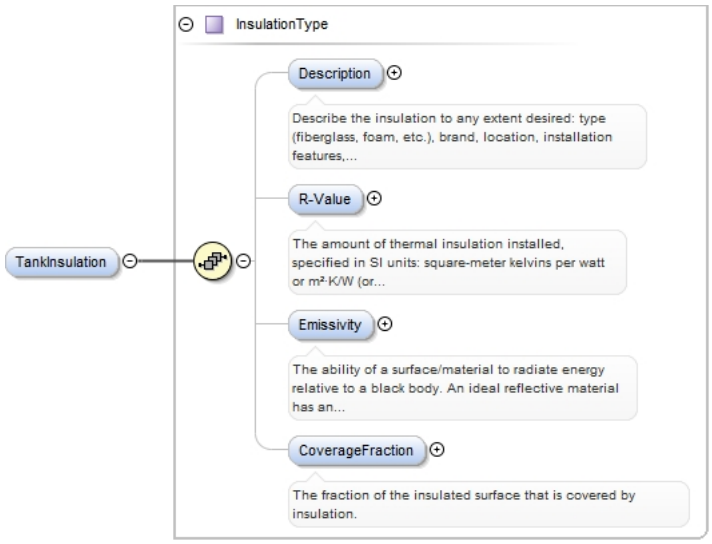
QName	Type	Fixed	Default	Use
Unit	VolumeUnitEnumType			optional
	Unit of measurement.			
UnitDesc	xs:string			optional
	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			

Source

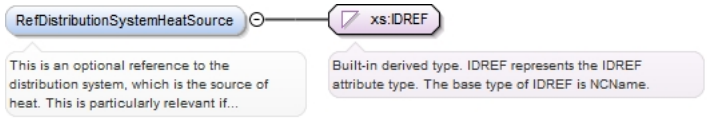
```
<xs:element name="TankVolume" type="VolumeType" minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>This element indicates the volume of water that the tank associated
 with the water-heating system can hold. If there is no tank, then this should have the
 value zero. Water heating systems wtih zero volume (no) tanks are commonly referred to
 as: - tankless - direct - instantaneous - boiler (typical in a large facility; used for
 space heating) Note that a hot water tank is not necessarily and does not have to be
 integrated with the water heating equipment. The water heater and the storage tank may be
 separate entities.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element WaterHeatingSystemType / TankInsulation

Namespace	No namespace

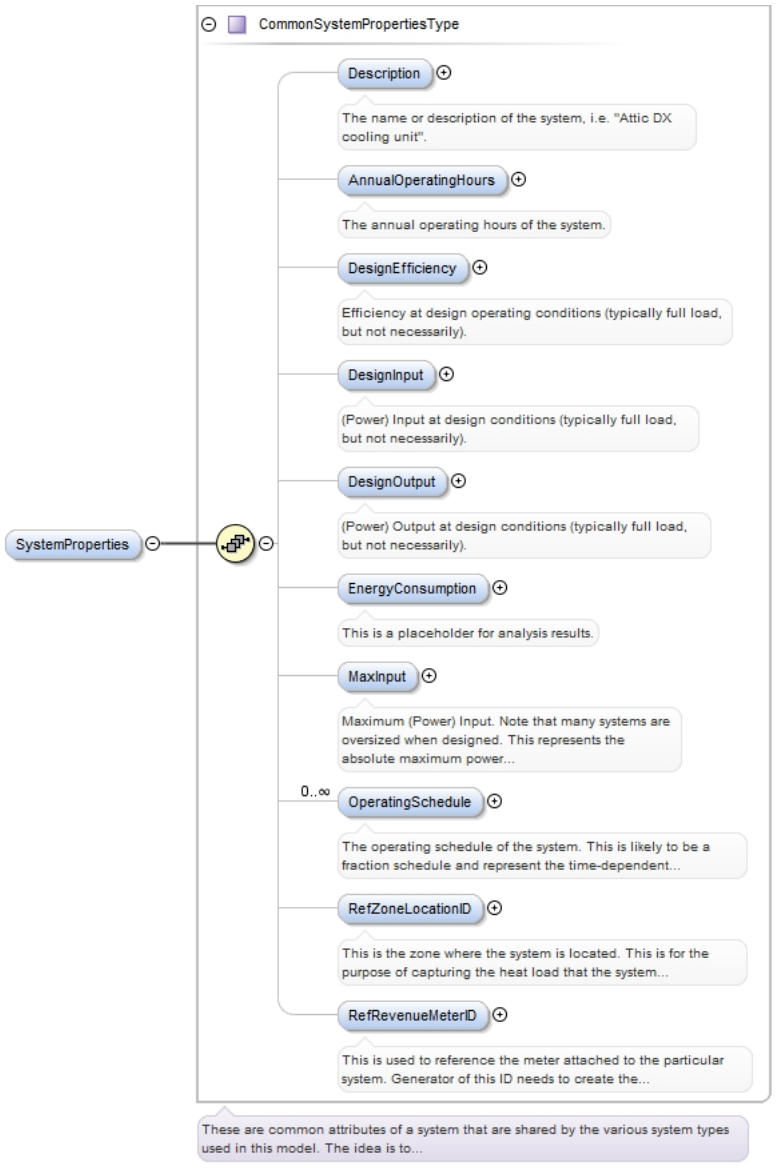
Diagram	
Type	InsulationType
Properties	content: complex minOccurs: 0
Model	Description{0,1} , R-Value{0,1} , Emissivity{0,1} , CoverageFraction{0,1}
Children	CoverageFraction, Description, Emissivity, R-Value
Instance	<TankInsulation> <Description>{0,1}</Description> <R-Value>{0,1}</R-Value> <Emissivity>{0,1}</Emissivity> <CoverageFraction>{0,1}</CoverageFraction> </TankInsulation>
Source	<xs:element minOccurs="0" name="TankInsulation" type="InsulationType"/>

Element WaterHeatingSystemType / RefDistributionSystemHeatSource

Namespace	No namespace
Annotations	This is an optional reference to the distribution system, which is the source of heat. This is particularly relevant if the heating method is a heat exchanger. For example, a facility may use hot water at multiple temperatures. One boiler may heat water to 180 degF to use for space heating. A heat exchanger may be used to extract heat from the 180degF water loop and heat another water loop to only 120 degF to be used as domestic hot water. Another use case is when multiple water heaters are used in series. The first heaters may heat water to 130 degF for one purpose, such as domestic hot water. Another heater may boost the water to a higher temperature for another use such as laundry or dish washing. Multiple hot water loops are often advantageous when the end uses are very far apart. The less distance that the hotter water has to travel, the less heat that will lost through the piping into the environment. It is then advantageous to boost the water temperature nearby the end use.
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="RefDistributionSystemHeatSource" type="xs:IDREF"> <xs:annotation> <xs:documentation>This is an optional reference to the distribution system, which is the source of heat. This is particularly relevant if the heating method is a heat exchanger. For example, a facility may use hot water at multiple temperatures. One boiler

```
may heat water to 180 degF to use for space heating. A heat exchanger may be used to
extract heat from the 180degF water loop and heat another water loop to only 120 degF to
be used as domestic hot water. Another use case is when multiple water heaters are used
in series. The first heaters may heat water to 130 degF for one purpose, such as domestic
hot water. Another heater may boost the water to a higher temperature for another use
such as laundry or dish washing. Multiple hot water loops are often advantageous when the
end uses are very far apart. The less distance that the hotter water has to travel, the
less heat that will lost through the piping into the environment. It is then advantageous
to boost the water temperature nearby the end use.</xs:documentation>
 </xs:annotation>
</xs:element>
```

Element `WaterHeatingSystemType / SystemProperties`

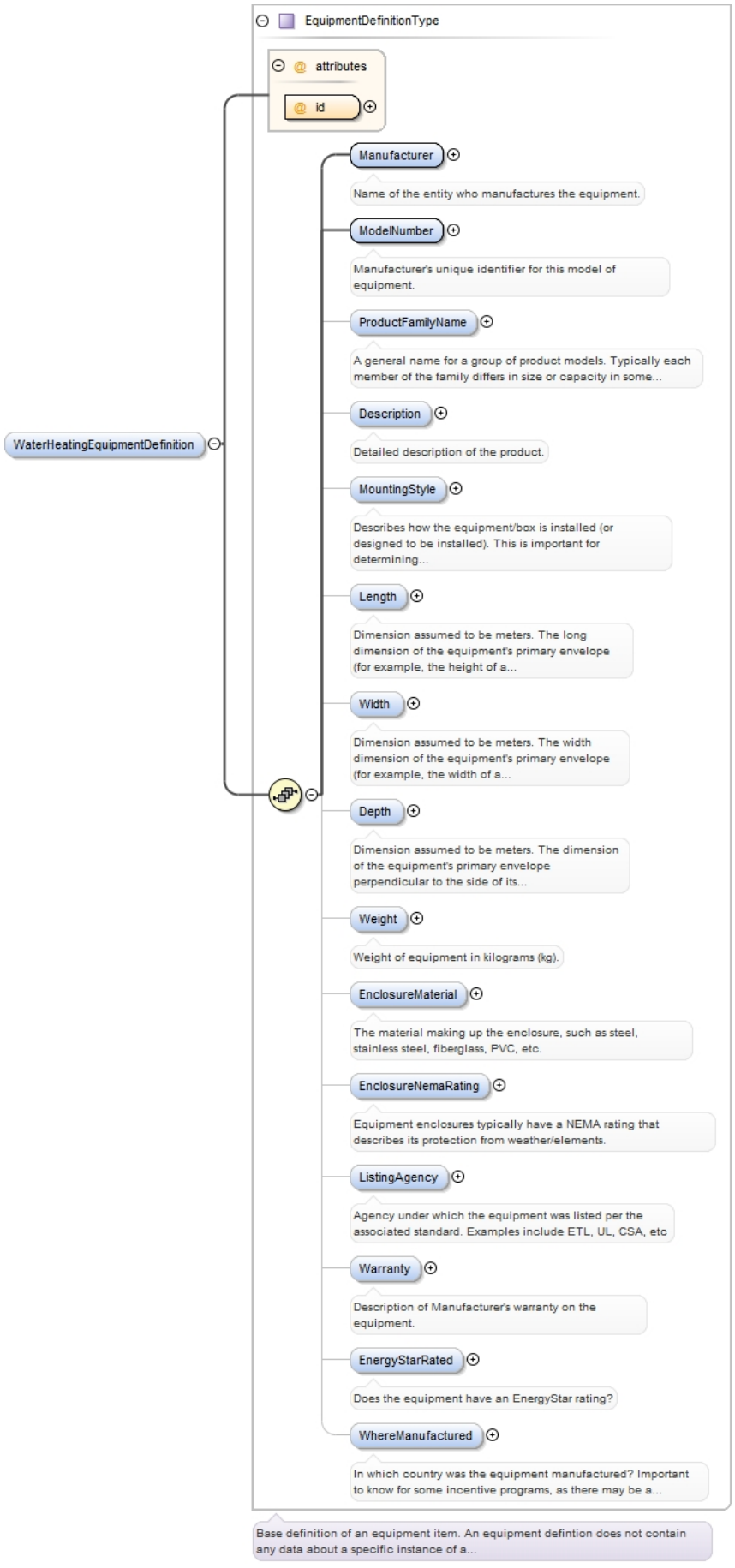
Namespace	No namespace
Diagram	
Type	CommonSystemPropertiesType
Properties	content: `complex` minOccurs: `0` maxOccurs: `1`
Model	Description{0,1} , AnnualOperatingHours{0,1} , DesignEfficiency{0,1} , DesignInput{0,1} , DesignOutput{0,1} , EnergyConsumption{0,1} , MaxInput{0,1} , OperatingSchedule* , RefZoneLocationID{0,1} , RefRevenueMeterID{0,1}
Children	AnnualOperatingHours, Description, DesignEfficiency, DesignInput, DesignOutput, EnergyConsumption, MaxInput, OperatingSchedule, RefRevenueMeterID, RefZoneLocationID

Instance	<SystemProperties> <Description>{0,1}</Description> <AnnualOperatingHours>{0,1}</AnnualOperatingHours> <DesignEfficiency TestCondition="" Unit="" UnitDesc="">{0,1}</DesignEfficiency> <DesignInput Fuel="Electricity" FuelDesc="Electricity" TestCondition="" Unit="" UnitDesc="kwh">{0,1}</DesignInput> <DesignOutput Fuel="Electricity" FuelDesc="Electricity" TestCondition="" Unit="" UnitDesc="kwh">{0,1}</DesignOutput> <EnergyConsumption RevenueMeterIdRef="">{0,1}</EnergyConsumption> <MaxInput Fuel="Electricity" FuelDesc="Electricity" TestCondition="" Unit="" UnitDesc="kwh">{0,1}</MaxInput> <OperatingSchedule>{0,unbounded}</OperatingSchedule> <RefZoneLocationID>{0,1}</RefZoneLocationID> <RefRevenueMeterID>{0,1}</RefRevenueMeterID> </SystemProperties>
Source	<xs:element name="SystemProperties" type="CommonSystemPropertiesType" minOccurs="0" maxOccurs="1"/>

Element WaterHeatingSystemType / WaterHeatingEquipmentDefinition

Namespace	No namespace

Diagram


WaterHeatingEquipmentDefinition
EquipmentDefinitionType
attributes
id
Manufacturer
Name of the entity who manufactures the equipment.
ModelNumber
Manufacturer's unique identifier for this model of equipment.
ProductFamilyName
A general name for a group of product models. Typically each member of the family differs in size or capacity in some...
Description
Detailed description of the product.
MountingStyle
Describes how the equipment/box is installed (or designed to be installed). This is important for determining...
Length
Dimension assumed to be meters. The long dimension of the equipment's primary envelope (for example, the height of a...
Width
Dimension assumed to be meters. The width dimension of the equipment's primary envelope (for example, the width of a...
Depth
Dimension assumed to be meters. The dimension of the equipment's primary envelope perpendicular to the side of its...
Weight
Weight of equipment in kilograms (kg).
EnclosureMaterial
The material making up the enclosure, such as steel, stainless steel, fiberglass, PVC, etc.
EnclosureNemaRating
Equipment enclosures typically have a NEMA rating that describes its protection from weather/elements.
ListingAgency
Agency under which the equipment was listed per the associated standard. Examples include ETL, UL, CSA, etc
Warranty
Description of Manufacturer's warranty on the equipment.
EnergyStarRated
Does the equipment have an EnergyStar rating?
WhereManufactured
In which country was the equipment manufactured? Important to know for some incentive programs, as there may be a...
Base definition of an equipment item. An equipment defintion does not contain any data about a specific instance of a...

Type	EquipmentDefinitionType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Manufacturer , ModelNumber , ProductFamilyName{0,1} , Description{0,1} , MountingStyle{0,1} , Length{0,1} , Width{0,1} , Depth{0,1} , Weight{0,1} , EnclosureMaterial{0,1} , EnclosureNemaRating{0,1} , ListingAgency{0,1} , Warranty{0,1} , EnergyStarRated{0,1} , WhereManufactured{0,1}
Children	Depth, Description, EnclosureMaterial, EnclosureNemaRating, EnergyStarRated, Length, ListingAgency, Manufacturer, ModelNumber, MountingStyle, ProductFamilyName, Warranty, Weight, WhereManufactured, Width
Instance	<WaterHeatingEquipmentDefinition id=""> <Manufacturer>{1,1}</Manufacturer> <ModelNumber>{1,1}</ModelNumber> <ProductFamilyName>{0,1}</ProductFamilyName> <Description>{0,1}</Description> <MountingStyle>{0,1}</MountingStyle> <Length>{0,1}</Length> <Width>{0,1}</Width> <Depth>{0,1}</Depth> <Weight>{0,1}</Weight> <EnclosureMaterial>{0,1}</EnclosureMaterial> <EnclosureNemaRating>{0,1}</EnclosureNemaRating> <ListingAgency>{0,1}</ListingAgency> <Warranty>{0,1}</Warranty> <EnergyStarRated>{0,1}</EnergyStarRated> <WhereManufactured>{0,1}</WhereManufactured> </WaterHeatingEquipmentDefinition>

Attributes

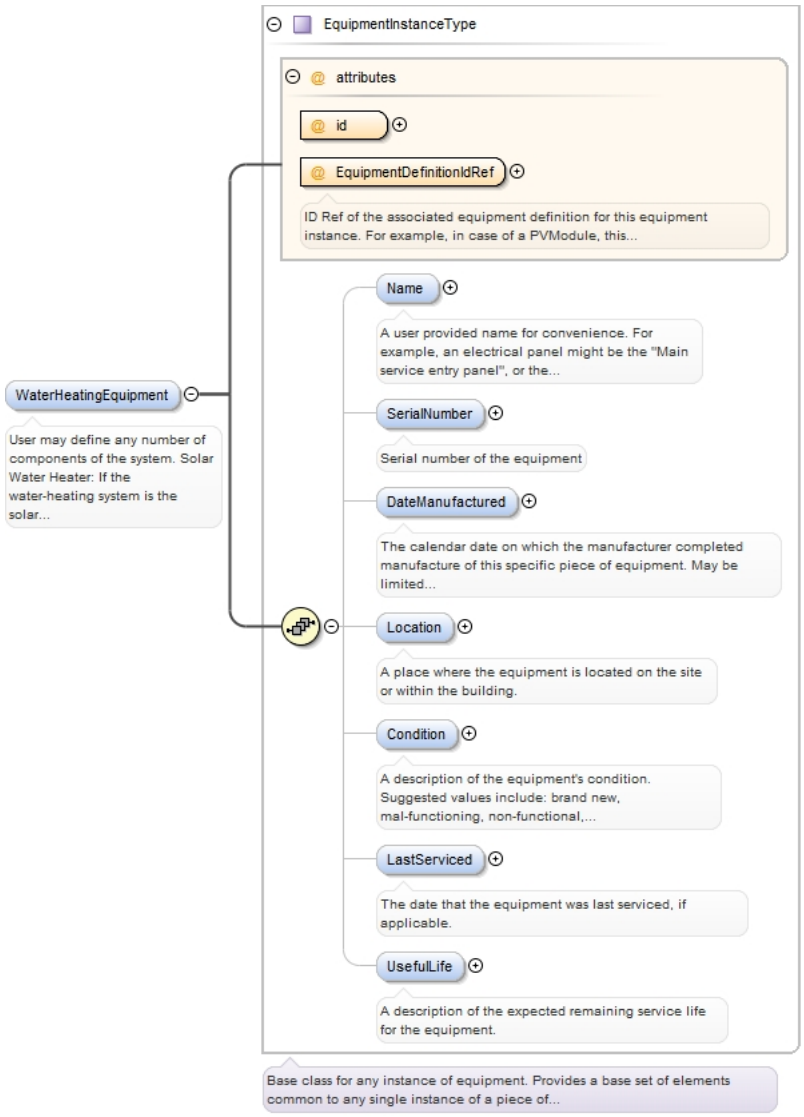
QName	Type	Fixed	Default	Use
id	xs:ID			required

Source

```
<xs:element maxOccurs="unbounded" minOccurs="0" name="WaterHeatingEquipmentDefinition"
 type="EquipmentDefinitionType"/>
```

Element WaterHeatingSystemType / WaterHeatingEquipment

Namespace	No namespace
Annotations	User may define any number of components of the system. Solar Water Heater: If the water-heating system is the solar type, it may be useful to describe the properties of the solar system with an instance of this object.

Diagram	
Type	EquipmentInstanceType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded nillable: false
Model	Name{0,1} , SerialNumber{0,1} , DateManufactured{0,1} , Location{0,1} , Condition{0,1} , LastServiced{0,1} , UsefulLife{0,1}
Children	Condition, DateManufactured, LastServiced, Location, Name, SerialNumber, UsefulLife

Instance	`<WaterHeatingEquipment EquipmentDefinitionIdRef="" id="">`
	`  <Name>{0,1}</Name>`
	`  <SerialNumber>{0,1}</SerialNumber>`
	`  <DateManufactured>{0,1}</DateManufactured>`
	`  <Location>{0,1}</Location>`
	`  <Condition>{0,1}</Condition>`
	`  <LastServiced>{0,1}</LastServiced>`
	`  <UsefulLife>{0,1}</UsefulLife>`
	`</WaterHeatingEquipment>`

Attributes

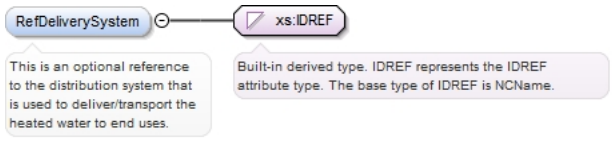
QName	Type	Fixed	Default	Use
EquipmentDefinitionIdRef	IDREF			required
	ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.			

	QName	Type	Fixed	Default	Use
	id	xs:ID			required

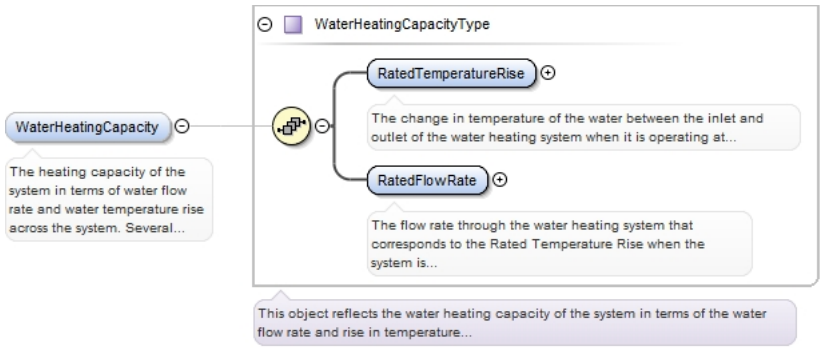
Source

```
<xs:element maxOccurs="unbounded" minOccurs="0" name="WaterHeatingEquipment"
 nillable="false" type="EquipmentInstanceType">
  <xs:annotation>
    <xs:documentation>User may define any number of components of the system. Solar Water
 Heater: If the water-heating system is the solar type, it may be useful to describe the
 properties of the solar system with an instance of this object.</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element WaterHeatingSystemType / RefDeliverySystem

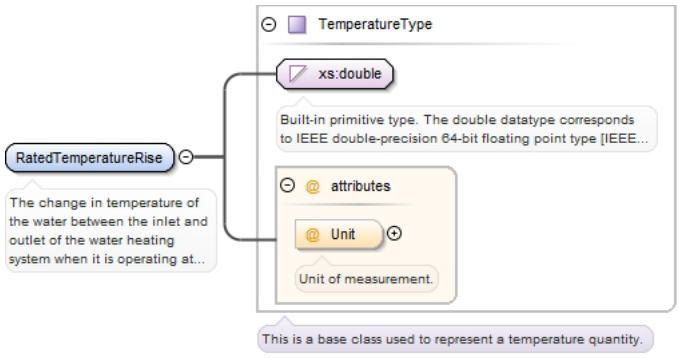
Namespace	No namespace
Annotations	This is an optional reference to the distribution system that is used to deliver/transport the heated water to end uses.
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="RefDeliverySystem" type="xs:IDREF"> <xs:annotation> <xs:documentation>This is an optional reference to the distribution system that is used to deliver/transport the heated water to end uses.</xs:documentation> </xs:annotation> </xs:element>

Element WaterHeatingSystemType / WaterHeatingCapacity

Namespace	No namespace
Annotations	The heating capacity of the system in terms of water flow rate and water temperature rise across the system. Several are allowed because it is not uncommon for manufacturers to specify the temperature rise at various flow rates.
Diagram	
Type	WaterHeatingCapacityType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	RatedTemperatureRise , RatedFlowRate
Children	RatedFlowRate, RatedTemperatureRise
Instance	<WaterHeatingCapacity> <RatedTemperatureRise Unit="">{1,1}</RatedTemperatureRise> <RatedFlowRate Unit="">{1,1}</RatedFlowRate> </WaterHeatingCapacity>
Source	<xs:element name="WaterHeatingCapacity" type="WaterHeatingCapacityType" minOccurs="0" maxOccurs="unbounded">

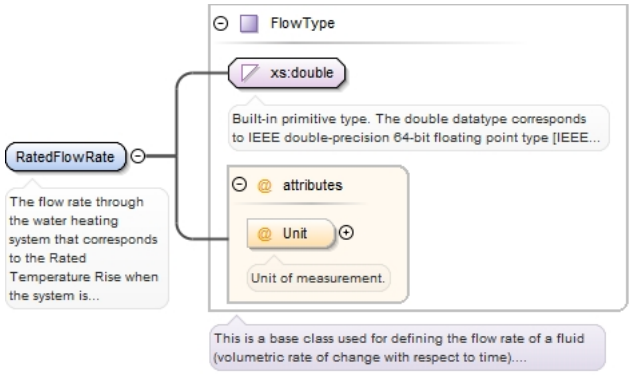
```
  <xs:annotation>
    <xs:documentation>The heating capacity of the system in terms of water flow rate
 and water temperature rise across the system. Several are allowed because it is not
 uncommon for manufacturers to specify the temperature rise at various flow rates.</
xs:documentation>
  </xs:annotation>
</xs:element>
```

Element WaterHeatingCapacityType / RatedTemperatureRise

Namespace	No namespace
Annotations	The change in temperature of the water between the inlet and outlet of the water heating system when it is operating at full load (maximum heat output or firing rate). This Rated Temperature Rise corresponds to the Rated Flow Rate.
Diagram	
Type	TemperatureType
Properties	content: complex minOccurs: 1 maxOccurs: 1
Attributes	QName: Unit Type: TemperatureUnitEnumType Fixed: Default: Use: optional Unit of measurement.

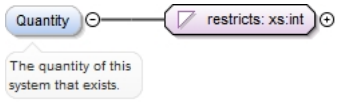
Source	`<xs:element name="RatedTemperatureRise" type="TemperatureType" minOccurs="1" maxOccurs="1">`
	`<xs:annotation>`
	`<xs:documentation>The change in temperature of the water between the inlet and outlet of the water heating system when it is operating at full load (maximum heat output or firing rate). This Rated Temperature Rise corresponds to the Rated Flow Rate.</xs:documentation>`
	`</xs:annotation>`
	`</xs:element>`

Element WaterHeatingCapacityType / RatedFlowRate

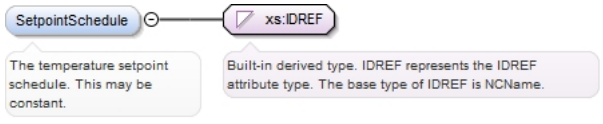
Namespace	No namespace
Annotations	The flow rate through the water heating system that corresponds to the Rated Temperature Rise when the system is operating at full load (maximum heat output or firing rate).
Diagram	
Type	FlowType

Properties	content: complex minOccurs: 1 maxOccurs: 1
Attributes	**QName**: **Unit**; **Type**: FlowUnitEnumType; **Fixed**: ; **Default**: ; **Use**: optional Unit of measurement.
Source	<xs:element name="RatedFlowRate" type="FlowType" minOccurs="1" maxOccurs="1"> <xs:annotation> <xs:documentation>The flow rate through the water heating system that corresponds to the Rated Temperature Rise when the system is operating at full load (maximum heat output or firing rate).</xs:documentation> </xs:annotation> </xs:element>

Element WaterHeatingSystemType / Quantity

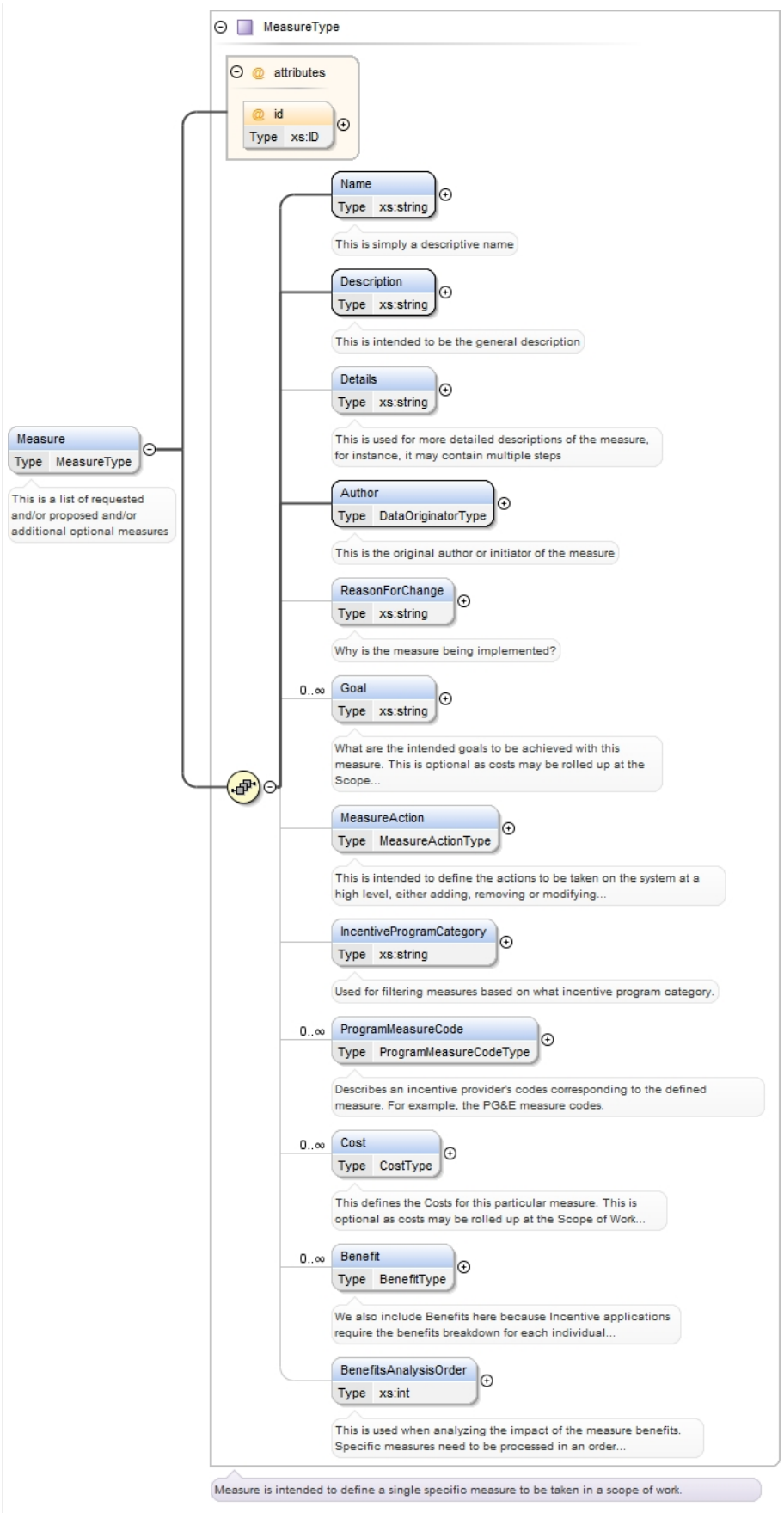
Namespace	No namespace
Annotations	The quantity of this system that exists.
Diagram	
Type	restriction of xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1
Facets	minInclusive 0
Source	<xs:element name="Quantity" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The quantity of this system that exists.</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:int"> <xs:minInclusive value="0"/> </xs:restriction> </xs:simpleType> </xs:element>

Element WaterHeatingSystemType / SetpointSchedule

Namespace	No namespace
Annotations	The temperature setpoint schedule. This may be constant.
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="SetpointSchedule" type="xs:IDREF" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The temperature setpoint schedule. This may be constant.</xs:documentation> </xs:annotation> </xs:element>

Element ProjectType / Measure

Namespace	No namespace
Annotations	This is a list of requested and/or proposed and/or additional optional measures

Diagram	
Type	MeasureType
Properties	content: complex

	minOccurs: 0 maxOccurs: unbounded
Model	Name , Description , Details{0,1} , Author , ReasonForChange{0,1} , Goal* , MeasureAction{0,1} , IncentiveProgramCategory{0,1} , ProgramMeasureCode* , Cost* , Benefit* , BenefitsAnalysisOrder{0,1}
Children	Author, Benefit, BenefitsAnalysisOrder, Cost, Description, Details, Goal, IncentiveProgramCategory, MeasureAction, Name, ProgramMeasureCode, ReasonForChange

Instance

```
<Measure id="">
  <Name>{1,1}</Name>
  <Description>{1,1}</Description>
  <Details>{0,1}</Details>
  <Author ParticipantID="">{1,1}</Author>
  <ReasonForChange>{0,1}</ReasonForChange>
  <Goal>{0,unbounded}</Goal>
  <MeasureAction>{0,1}</MeasureAction>
  <IncentiveProgramCategory>{0,1}</IncentiveProgramCategory>
  <ProgramMeasureCode>{0,unbounded}</ProgramMeasureCode>
  <Cost>{0,unbounded}</Cost>
  <Benefit>{0,unbounded}</Benefit>
  <BenefitsAnalysisOrder>{0,1}</BenefitsAnalysisOrder>
</Measure>
```

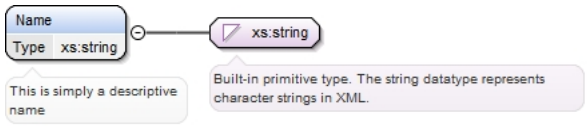
Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			optional

Source

```
<xs:element maxOccurs="unbounded" minOccurs="0" name="Measure" type="MeasureType">
  <xs:annotation>
    <xs:documentation>This is a list of requested and/or proposed and/or additional
 optional measures</xs:documentation>
  </xs:annotation>
</xs:element>
```

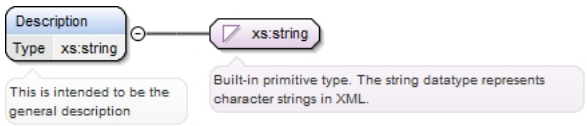
Element MeasureType / Name

Namespace	No namespace
Annotations	This is simply a descriptive name
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1

Source

```
<xs:element name="Name" type="xs:string" minOccurs="1" maxOccurs="1">
  <xs:annotation>
    <xs:documentation>This is simply a descriptive name</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element MeasureType / Description

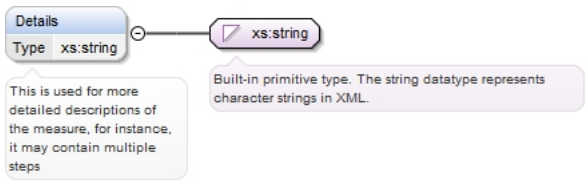
Namespace	No namespace
Annotations	This is intended to be the general description
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1

Source

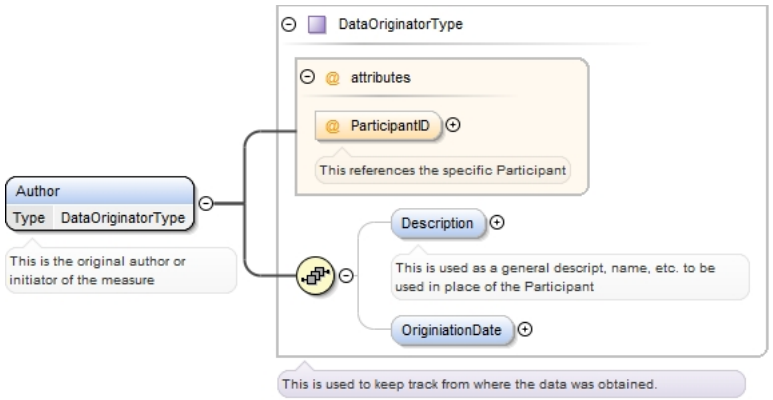
```
<xs:element name="Description" type="xs:string" minOccurs="1" maxOccurs="1">
  <xs:annotation>
```

```
    <xs:documentation>This is intended to be the general description</xs:documentation>
  </xs:annotation>
</xs:element>
```

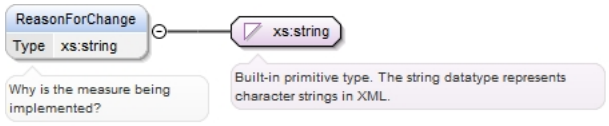
Element MeasureType / Details

Namespace	No namespace
Annotations	This is used for more detailed descriptions of the measure, for instance, it may contain multiple steps
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Details" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is used for more detailed descriptions of the measure, for instance, it may contain multiple steps</xs:documentation> </xs:annotation> </xs:element>

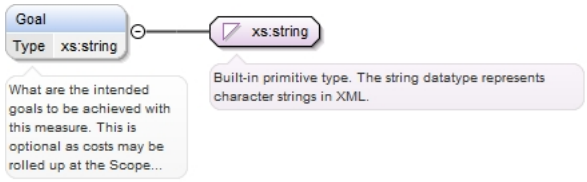
Element MeasureType / Author

Namespace	No namespace
Annotations	This is the original author or initiator of the measure
Diagram	
Type	DataOriginatorType
Properties	content: complex
Model	Description{0,1} , OriginiationDate{0,1}
Children	Description, OriginiationDate
Instance	<Author ParticipantID=""> <Description>{0,1}</Description> <OriginiationDate>{0,1}</OriginiationDate> </Author>
Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **ParticipantID** / xs:IDREF / / / optional This references the specific Participant
Source	<xs:element name="Author" type="DataOriginatorType"> <xs:annotation> <xs:documentation>This is the original author or initiator of the measure</xs:documentation> </xs:annotation> </xs:element>

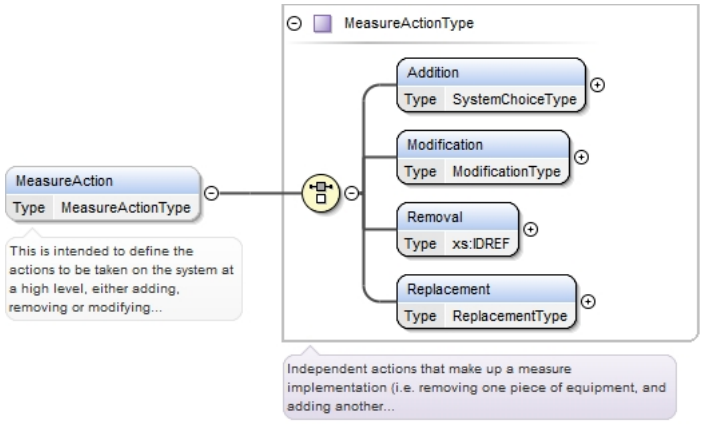
Element MeasureType / ReasonForChange

Namespace	No namespace
Annotations	Why is the measure being implemented?
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="ReasonForChange" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Why is the measure being implemented?</xs:documentation> </xs:annotation> </xs:element>

Element MeasureType / Goal

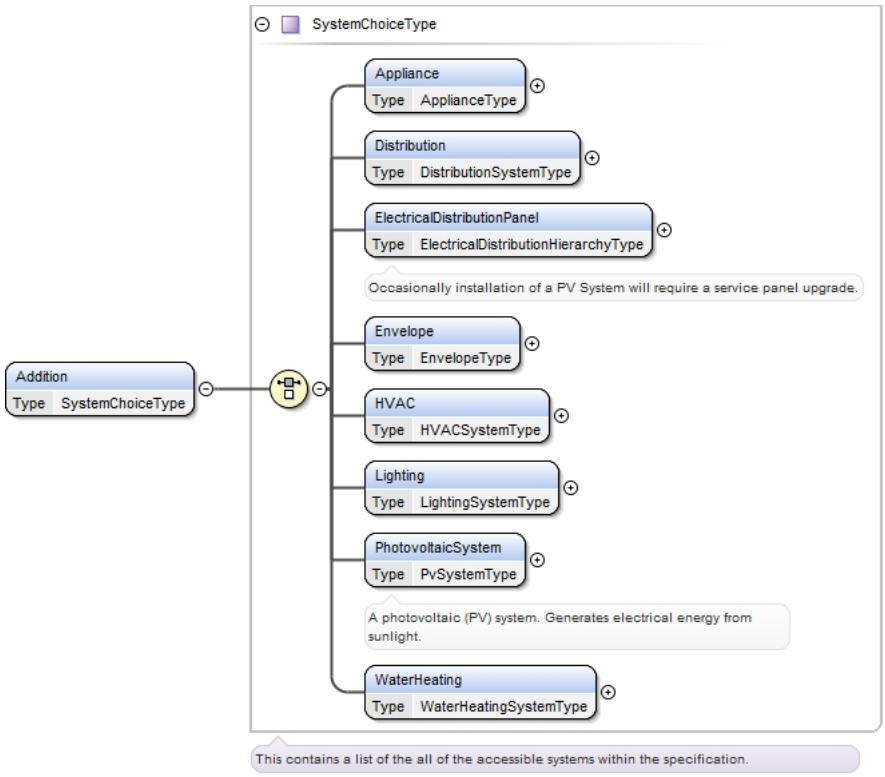
Namespace	No namespace
Annotations	What are the intended goals to be achieved with this measure. This is optional as costs may be rolled up at the Scope of Work level
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: unbounded
Source	<xs:element name="Goal" type="xs:string" minOccurs="0" maxOccurs="unbounded"> <xs:annotation> <xs:documentation>What are the intended goals to be achieved with this measure. This is optional as costs may be rolled up at the Scope of Work level</xs:documentation> </xs:annotation> </xs:element>

Element MeasureType / MeasureAction

Namespace	No namespace
Annotations	This is intended to define the actions to be taken on the system at a high level, either adding, removing or modifying the system
Diagram	

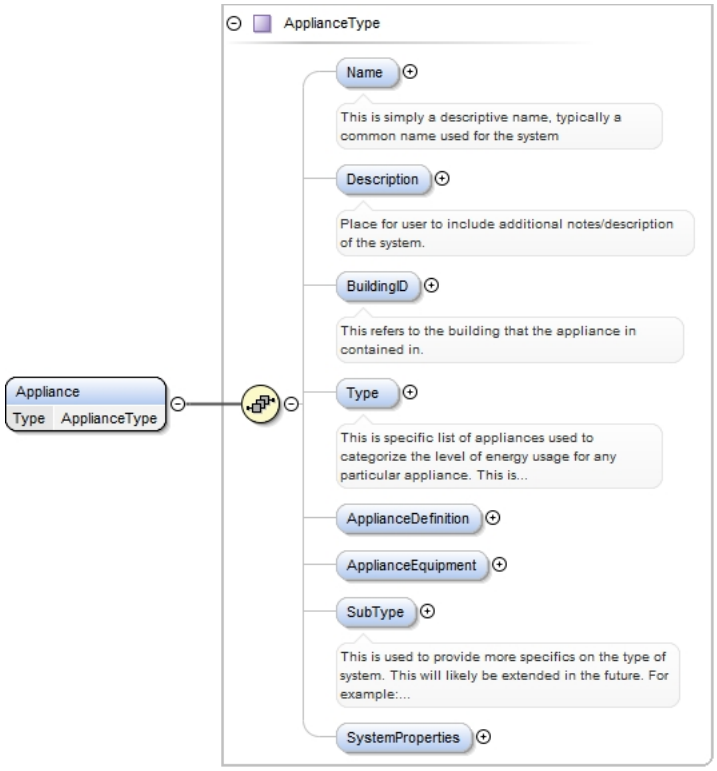
Type	MeasureActionType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Addition | Modification | Removal | Replacement
Children	Addition, Modification, Removal, Replacement
Instance	<MeasureAction> <Addition>{1,1}</Addition> <Modification>{1,1}</Modification> <Removal>{1,1}</Removal> <Replacement>{1,1}</Replacement> </MeasureAction>
Source	<xs:element name="MeasureAction" type="MeasureActionType" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is intended to define the actions to be taken on the system at a high level, either adding, removing or modifying the system</xs:documentation> </xs:annotation> </xs:element>

Element MeasureActionType / Addition

Namespace	No namespace
Diagram	
Type	SystemChoiceType
Properties	content: complex minOccurs: 1 maxOccurs: 1
Model	Appliance | Distribution | ElectricalDistributionPanel | Envelope | HVAC | Lighting | PhotovoltaicSystem | WaterHeating
Children	Appliance, Distribution, ElectricalDistributionPanel, Envelope, HVAC, Lighting, PhotovoltaicSystem, WaterHeating
Instance	<Addition> <Appliance>{1,1}</Appliance> <Distribution id="">{1,1}</Distribution> <ElectricalDistributionPanel>{1,1}</ElectricalDistributionPanel> <Envelope id="">{1,1}</Envelope> <HVAC id="">{1,1}</HVAC>

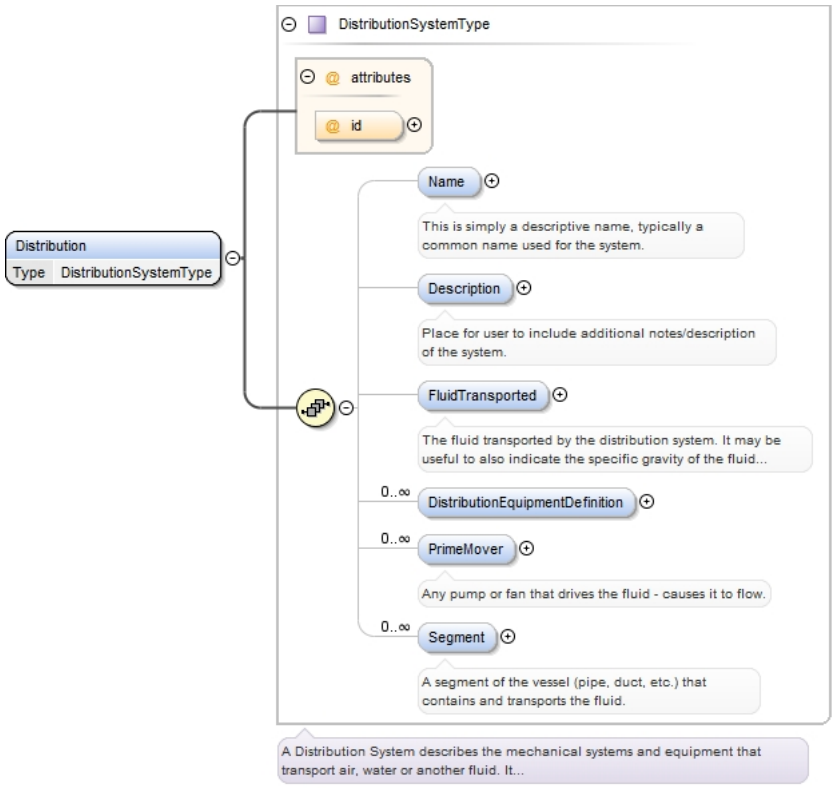
	<Lighting>{1,1}</Lighting> <PhotovoltaicSystem>{1,1}</PhotovoltaicSystem> <WaterHeating id="">{1,1}</WaterHeating> </Addition>
Source	<xs:element name="Addition" type="SystemChoiceType" maxOccurs="1" minOccurs="1"/>

Element SystemChoiceType / Appliance

Namespace	No namespace
Diagram	
Type	ApplianceType
Properties	content: complex minOccurs: 1
Model	Name{0,1} , Description{0,1} , BuildingID{0,1} , Type{0,1} , ApplianceDefinition{0,1} , ApplianceEquipment{0,1} , SubType{0,1} , SystemProperties{0,1}
Children	ApplianceDefinition, ApplianceEquipment, BuildingID, Description, Name, SubType, SystemProperties, Type
Instance	<Appliance> <Name>{0,1}</Name> <Description>{0,1}</Description> <BuildingID>{0,1}</BuildingID> <Type>{0,1}</Type> <ApplianceDefinition id="">{0,1}</ApplianceDefinition> <ApplianceEquipment EquipmentDefinitionIdRef="" id="">{0,1}</ApplianceEquipment> <SubType>{0,1}</SubType> <SystemProperties>{0,1}</SystemProperties> </Appliance>
Source	<xs:element minOccurs="1" name="Appliance" type="ApplianceType"/>

Element SystemChoiceType / Distribution

Namespace	No namespace

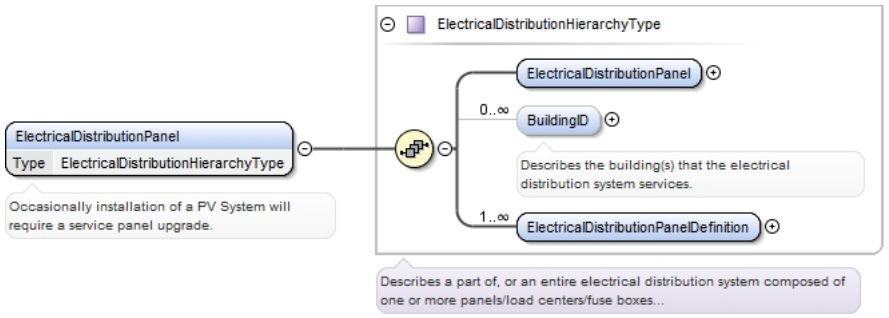
Diagram	
Type	DistributionSystemType
Properties	content: complex
Model	Name{0,1} , Description{0,1} , FluidTransported{0,1} , DistributionEquipmentDefinition* , PrimeMover* , Segment*
Children	Description, DistributionEquipmentDefinition, FluidTransported, Name, PrimeMover, Segment

Instance	`<Distribution id="">`
	`  <Name>{0,1}</Name>`
	`  <Description>{0,1}</Description>`
	`  <FluidTransported>{0,1}</FluidTransported>`
	`  <DistributionEquipmentDefinition id="">{0,unbounded}</DistributionEquipmentDefinition>`
	`  <PrimeMover id="">{0,unbounded}</PrimeMover>`
	`  <Segment id="">{0,unbounded}</Segment>`
	`</Distribution>`

Attributes	QName	Type	Fixed	Default	Use
	id	xs:ID			optional

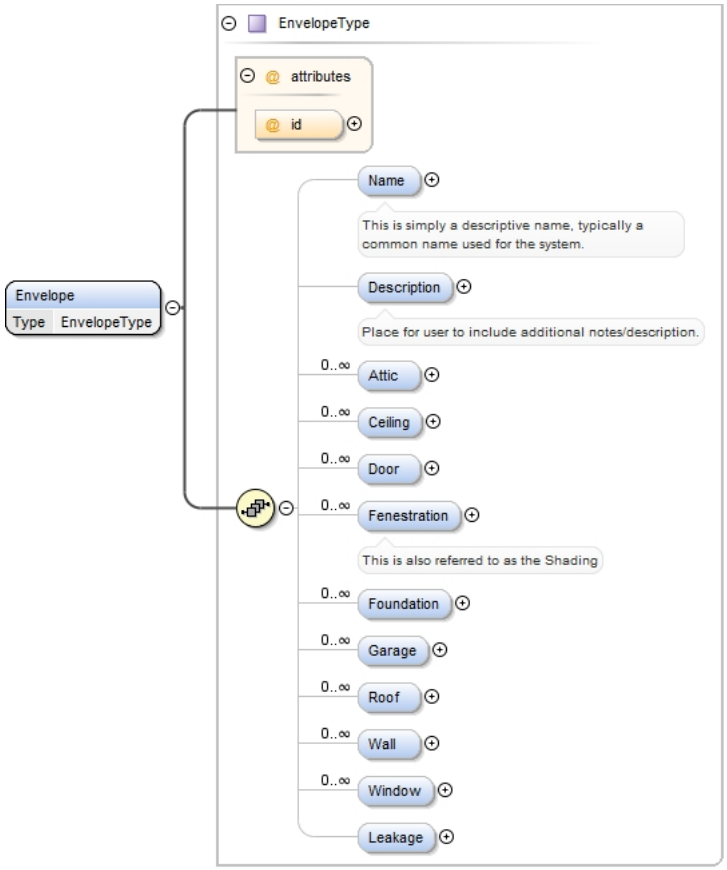
Source	`<xs:element form="unqualified" name="Distribution" type="DistributionSystemType"/>`

Element SystemChoiceType / ElectricalDistributionPanel

Namespace	No namespace
Annotations	Occasionally installation of a PV System will require a service panel upgrade.
Diagram	
Type	ElectricalDistributionHierarchyType
Properties	content: complex

	maxOccurs: 1
Model	ElectricalDistributionPanel , BuildingID* , ElectricalDistributionPanelDefinition+
Children	BuildingID, ElectricalDistributionPanel, ElectricalDistributionPanelDefinition
Instance	<ElectricalDistributionPanel> <ElectricalDistributionPanel EquipmentDefinitionIdRef="" id="">{1,1}</ ElectricalDistributionPanel> <BuildingID>{0,unbounded}</BuildingID> <ElectricalDistributionPanelDefinition id="">{1,unbounded}</ ElectricalDistributionPanelDefinition> </ElectricalDistributionPanel>
Source	<xs:element maxOccurs="1" name="ElectricalDistributionPanel" type="ElectricalDistributionHierarchyType"> <xs:annotation> <xs:documentation>Occasionally installation of a PV System will require a service panel upgrade.</xs:documentation> </xs:annotation> </xs:element>

Element SystemChoiceType / Envelope

Namespace	No namespace
Diagram	
Type	EnvelopeType
Properties	content: complex nillable: false
Model	Name{0,1} , Description{0,1} , Attic* , Ceiling* , Door* , Fenestration* , Foundation* , Garage* , Roof* , Wall* , Window* , Leakage{0,1}
Children	Attic, Ceiling, Description, Door, Fenestration, Foundation, Garage, Leakage, Name, Roof, Wall, Window
Instance	<Envelope id=""> <Name>{0,1}</Name> <Description>{0,1}</Description> <Attic id="">{0,unbounded}</Attic> <Ceiling id="">{0,unbounded}</Ceiling> <Door id="" UFactor="">{0,unbounded}</Door> <Fenestration id="">{0,unbounded}</Fenestration>

```
  <Foundation id="">{0,unbounded}</Foundation>
  <Garage id="">{0,unbounded}</Garage>
  <Roof id="">{0,unbounded}</Roof>
  <Wall id="">{0,unbounded}</Wall>
  <Window id="">{0,unbounded}</Window>
  <Leakage>{0,1}</Leakage>
</Envelope>
```

Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			optional

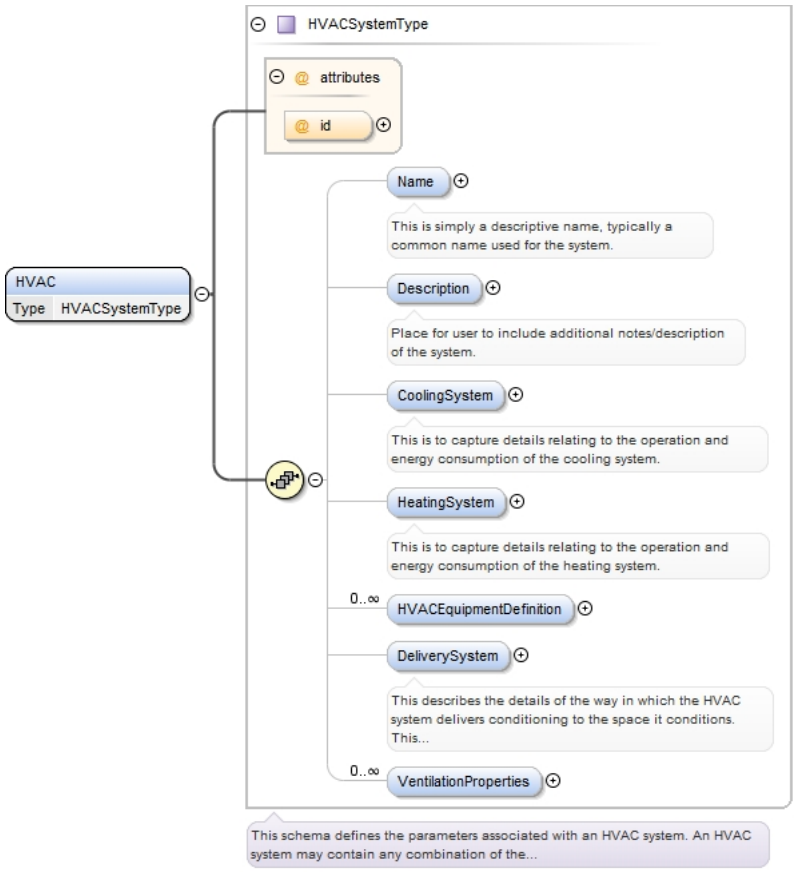
Source

```
<xs:element name="Envelope" nillable="false" type="EnvelopeType"/>
```

Element SystemChoiceType / HVAC

Namespace: No namespace

Diagram



Type: HVACSystemType

Properties: content: complex

Model: Name{0,1} , Description{0,1} , CoolingSystem{0,1} , HeatingSystem{0,1} , HVACEquipmentDefinition* , DeliverySystem{0,1} , VentilationProperties*

Children: CoolingSystem, DeliverySystem, Description, HVACEquipmentDefinition, HeatingSystem, Name, VentilationProperties

Instance

```
<HVAC id="">
  <Name>{0,1}</Name>
  <Description>{0,1}</Description>
  <CoolingSystem>{0,1}</CoolingSystem>
  <HeatingSystem>{0,1}</HeatingSystem>
  <HVACEquipmentDefinition id="">{0,unbounded}</HVACEquipmentDefinition>
  <DeliverySystem>{0,1}</DeliverySystem>
  <VentilationProperties>{0,unbounded}</VentilationProperties>
</HVAC>
```

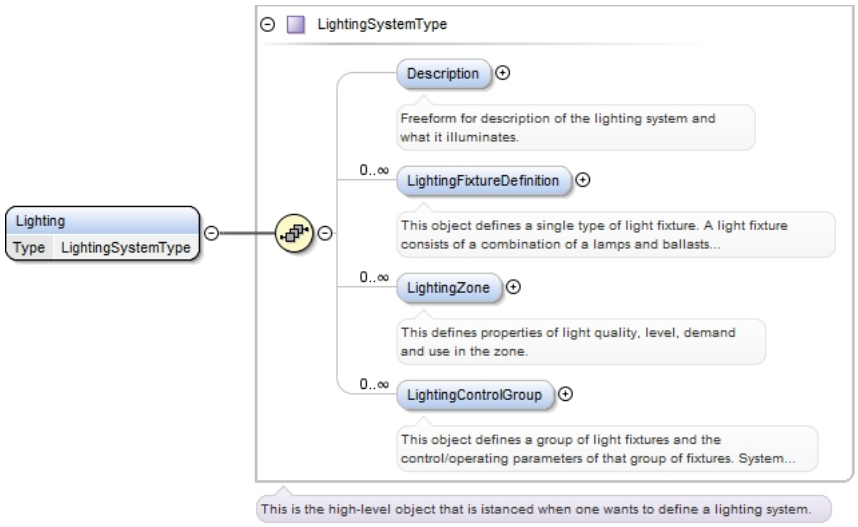
Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			optional

Source

```
<xs:element name="HVAC" type="HVACSystemType"/>
```

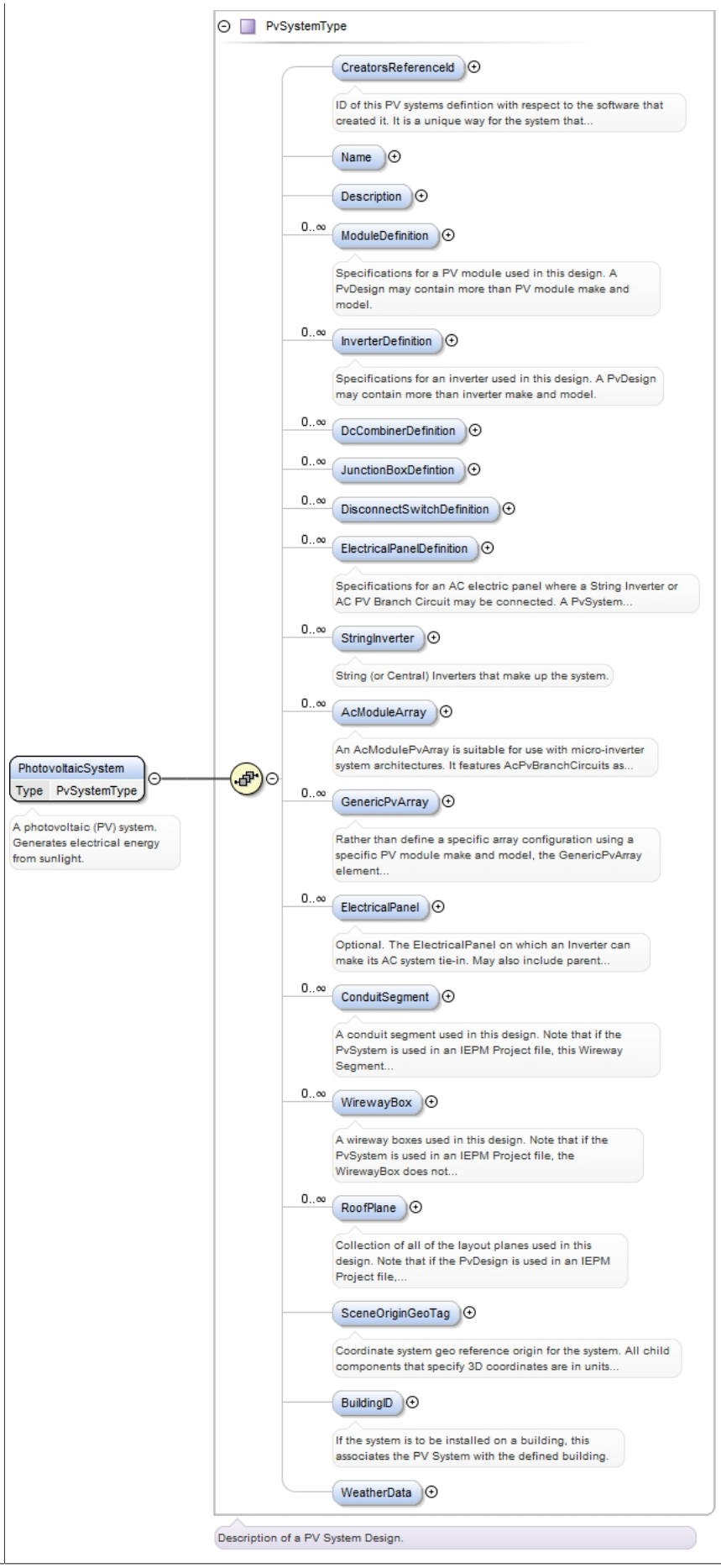
Element SystemChoiceType / Lighting

Namespace	No namespace
Diagram	
Type	LightingSystemType
Properties	content: complex nillable: false
Model	Description{0,1} , LightingFixtureDefinition* , LightingZone* , LightingControlGroup*
Children	Description, LightingControlGroup, LightingFixtureDefinition, LightingZone
Instance	<Lighting> <Description>{0,1}</Description> <LightingFixtureDefinition id="">{0,unbounded}</LightingFixtureDefinition> <LightingZone id="">{0,unbounded}</LightingZone> <LightingControlGroup id="">{0,unbounded}</LightingControlGroup> </Lighting>
Source	<xs:element name="Lighting" nillable="false" type="LightingSystemType"/>

Element SystemChoiceType / PhotovoltaicSystem

Namespace	No namespace
Annotations	A photovoltaic (PV) system. Generates electrical energy from sunlight.

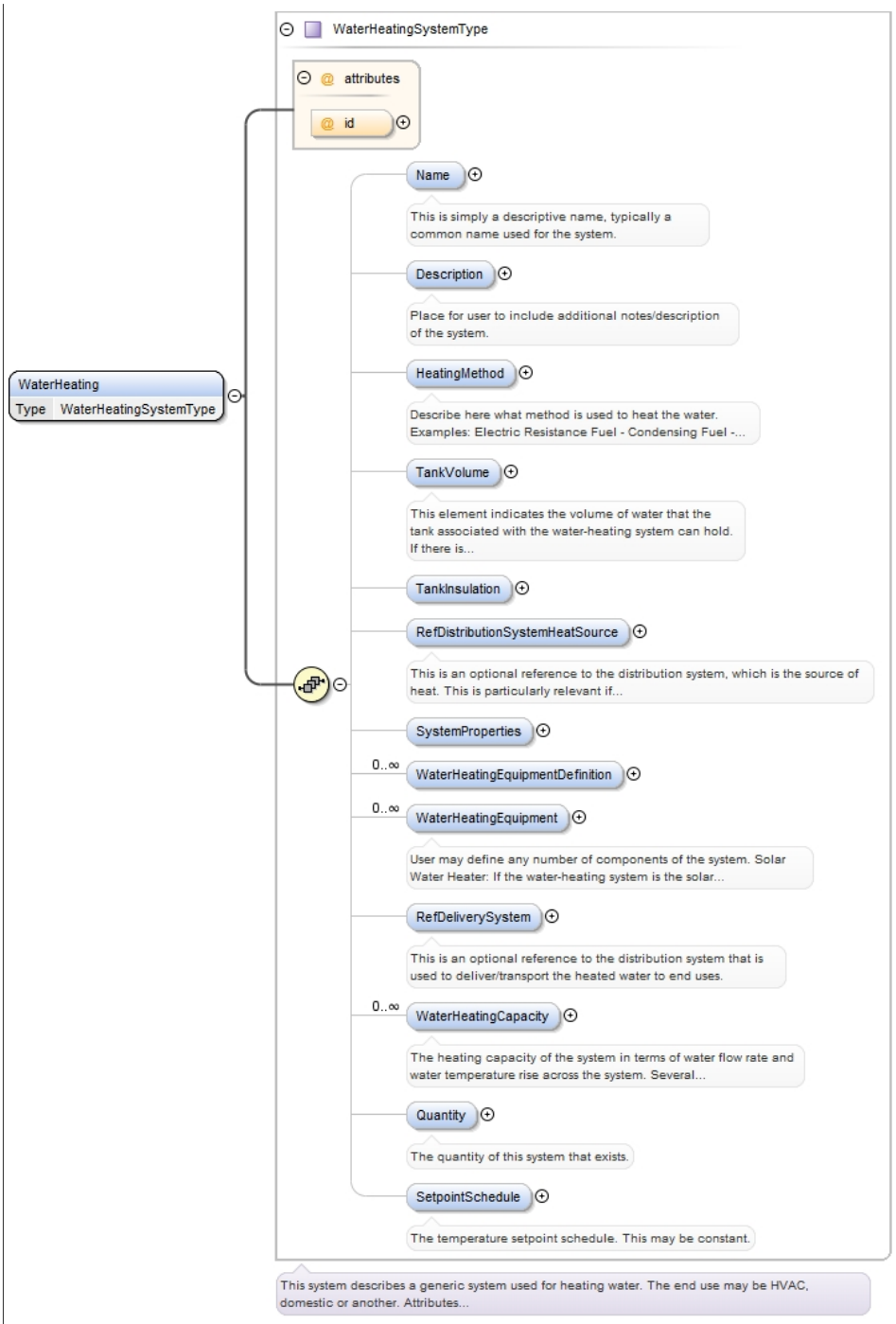
Diagram


PvSystemType
CreatorsReferenceId
ID of this PV systems defintion with respect to the software that created it. It is a unique way for the system that...
Name
Description
0..∞
ModuleDefinition
Specifications for a PV module used in this design. A PvDesign may contain more than PV module make and model.
0..∞
InverterDefinition
Specifications for an inverter used in this design. A PvDesign may contain more than inverter make and model.
0..∞
DcCombinerDefinition
0..∞
JunctionBoxDefintion
0..∞
DisconnectSwitchDefinition
0..∞
ElectricalPanelDefinition
Specifications for an AC electric panel where a String Inverter or AC PV Branch Circuit may be connected. A PvSystem...
0..∞
StringInverter
String (or Central) Inverters that make up the system.
0..∞
AcModuleArray
An AcModulePvArray is suitable for use with micro-inverter system architectures. It features AcPvBranchCircuits as...
0..∞
GenericPvArray
Rather than define a specific array configuration using a specific PV module make and model, the GenericPvArray element...
0..∞
ElectricalPanel
Optional. The ElectricalPanel on which an Inverter can make its AC system tie-in. May also include parent...
0..∞
ConduitSegment
A conduit segment used in this design. Note that if the PvSystem is used in an IEPM Project file, this Wireway Segment...
0..∞
WirewayBox
A wireway boxes used in this design. Note that if the PvSystem is used in an IEPM Project file, the WirewayBox does not...
0..∞
RoofPlane
Collection of all of the layout planes used in this design. Note that if the PvDesign is used in an IEPM Project file,...
SceneOriginGeoTag
Coordinate system geo reference origin for the system. All child components that specify 3D coordinates are in units...
BuildingID
If the system is to be installed on a building, this associates the PV System with the defined building.
WeatherData
Description of a PV System Design.
PhotovoltaicSystem
Type
PvSystemType
A photovoltaic (PV) system. Generates electrical energy from sunlight.

Type	PvSystemType
Properties	content: complex
Model	CreatorsReferenceId{0,1} , Name{0,1} , Description{0,1} , ModuleDefinition* , InverterDefinition* , DcCombinerDefinition* , JunctionBoxDefintion* , DisconnectSwitchDefinition* , ElectricalPanelDefinition* , StringInverter* , AcModuleArray* , GenericPvArray* , ElectricalPanel* , ConduitSegment* , WirewayBox* , RoofPlane* , SceneOriginGeoTag{0,1} , BuildingID{0,1} , WeatherData{0,1}
Children	AcModuleArray, BuildingID, ConduitSegment, CreatorsReferenceId, DcCombinerDefinition, Description, DisconnectSwitchDefinition, ElectricalPanel, ElectricalPanelDefinition, GenericPvArray, InverterDefinition, JunctionBoxDefintion, ModuleDefinition, Name, RoofPlane, SceneOriginGeoTag, StringInverter, WeatherData, WirewayBox
Instance	<PhotovoltaicSystem> <CreatorsReferenceId>{0,1}</CreatorsReferenceId> <Name>{0,1}</Name> <Description>{0,1}</Description> <ModuleDefinition id="">{0,unbounded}</ModuleDefinition> <InverterDefinition id="">{0,unbounded}</InverterDefinition> <DcCombinerDefinition id="">{0,unbounded}</DcCombinerDefinition> <JunctionBoxDefintion id="">{0,unbounded}</JunctionBoxDefintion> <DisconnectSwitchDefinition id="">{0,unbounded}</DisconnectSwitchDefinition> <ElectricalPanelDefinition id="">{0,unbounded}</ElectricalPanelDefinition> <StringInverter EquipmentDefinitionIdRef="" id="">{0,unbounded}</StringInverter> <AcModuleArray Id="" MicroInverterDefinitionIdRef="" PvModuleDefinitionIdRef="">{0,unbounded}</AcModuleArray> <GenericPvArray Id="">{0,unbounded}</GenericPvArray> <ElectricalPanel EquipmentDefinitionIdRef="" id="">{0,unbounded}</ElectricalPanel> <ConduitSegment EquipmentDefinitionIdRef="" id="">{0,unbounded}</ConduitSegment> <WirewayBox EquipmentDefinitionIdRef="" id="">{0,unbounded}</WirewayBox> <RoofPlane id="">{0,unbounded}</RoofPlane> <SceneOriginGeoTag>{0,1}</SceneOriginGeoTag> <BuildingID>{0,1}</BuildingID> <WeatherData>{0,1}</WeatherData> </PhotovoltaicSystem>
Source	<xs:element name="PhotovoltaicSystem" type="PvSystemType"> <xs:annotation> <xs:documentation>A photovoltaic (PV) system. Generates electrical energy from sunlight.</xs:documentation> </xs:annotation> </xs:element>

Element SystemChoiceType / WaterHeating

Namespace	No namespace

Diagram	
Type	WaterHeatingSystemType
Properties	content: complex
Model	Name{0,1} , Description{0,1} , HeatingMethod{0,1} , TankVolume{0,1} , TankInsulation{0,1} , RefDistributionSystemHeatSource{0,1} , SystemProperties{0,1} , WaterHeatingEquipmentDefinition* , WaterHeatingEquipment* , RefDeliverySystem{0,1} , WaterHeatingCapacity* , Quantity{0,1} , SetpointSchedule{0,1}
Children	Description, HeatingMethod, Name, Quantity, RefDeliverySystem, RefDistributionSystemHeatSource, SetpointSchedule, SystemProperties, TankInsulation, TankVolume, WaterHeatingCapacity, WaterHeatingEquipment, WaterHeatingEquipmentDefinition
Instance	<WaterHeating id=""> <Name>{0,1}</Name> <Description>{0,1}</Description> <HeatingMethod>{0,1}</HeatingMethod> <TankVolume Unit="" UnitDesc="">{0,1}</TankVolume> <TankInsulation>{0,1}</TankInsulation> <RefDistributionSystemHeatSource>{0,1}</RefDistributionSystemHeatSource>

```
  <SystemProperties>{0,1}</SystemProperties>
  <WaterHeatingEquipmentDefinition id="">{0,unbounded}</WaterHeatingEquipmentDefinition>
  <WaterHeatingEquipment EquipmentDefinitionIdRef="" id="">{0,unbounded}</
WaterHeatingEquipment>
  <RefDeliverySystem>{0,1}</RefDeliverySystem>
  <WaterHeatingCapacity>{0,unbounded}</WaterHeatingCapacity>
  <Quantity>{0,1}</Quantity>
  <SetpointSchedule>{0,1}</SetpointSchedule>
</WaterHeating>
```

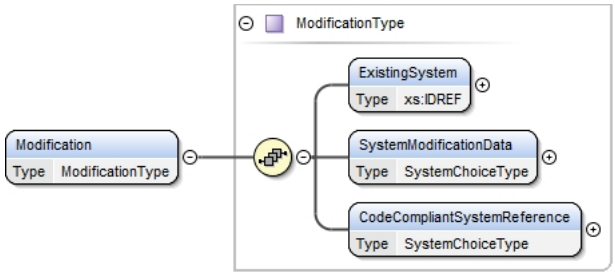
Attributes

QName	Type	Fixed	Default	Use
id	xs:ID			optional

Source

```
<xs:element name="WaterHeating" type="WaterHeatingSystemType"/>
```

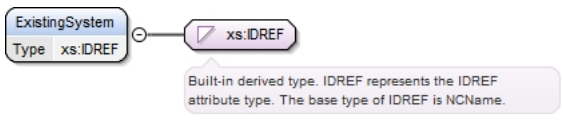
Element MeasureActionType / Modification

Namespace	No namespace
Diagram	
Type	ModificationType
Properties	content: complex minOccurs: 1 maxOccurs: 1 nillable: false
Model	ExistingSystem , SystemModificationData , CodeCompliantSystemReference
Children	CodeCompliantSystemReference, ExistingSystem, SystemModificationData

Instance	`<Modification>`
	`  <ExistingSystem>{1,1}</ExistingSystem>`
	`  <SystemModificationData>{1,1}</SystemModificationData>`
	`  <CodeCompliantSystemReference>{1,1}</CodeCompliantSystemReference>`
	`</Modification>`

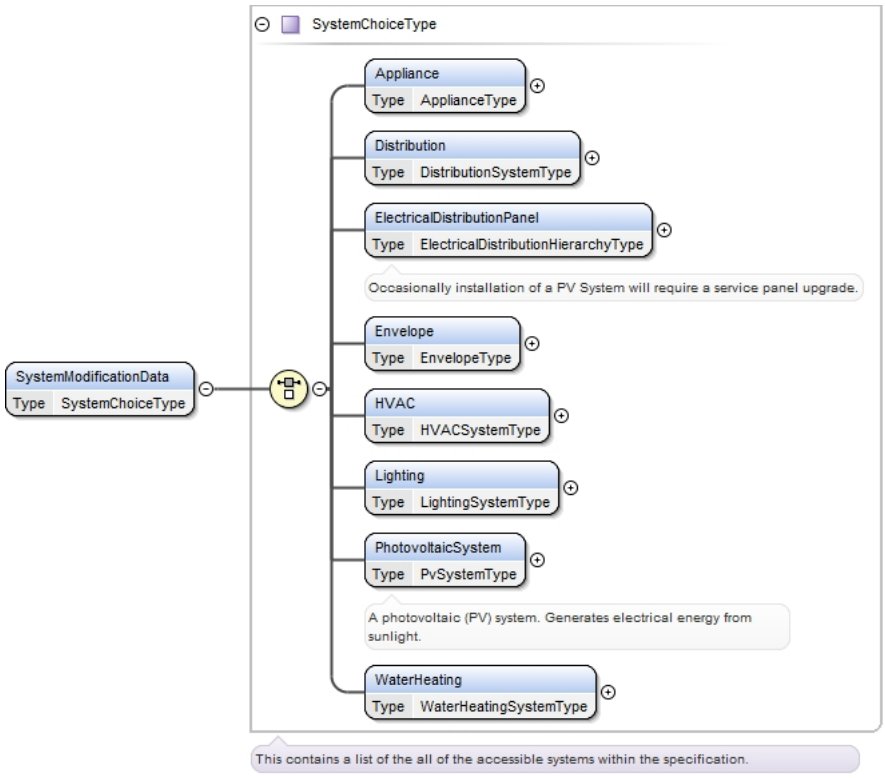
Source	`<xs:element name="Modification" type="ModificationType" maxOccurs="1" minOccurs="1" nillable="false"/>`

Element ModificationType / ExistingSystem

Namespace	No namespace
Diagram	
Type	xs:IDREF
Properties	content: simple
Source	`<xs:element name="ExistingSystem" type="xs:IDREF"/>`

Element ModificationType / SystemModificationData

Namespace	No namespace

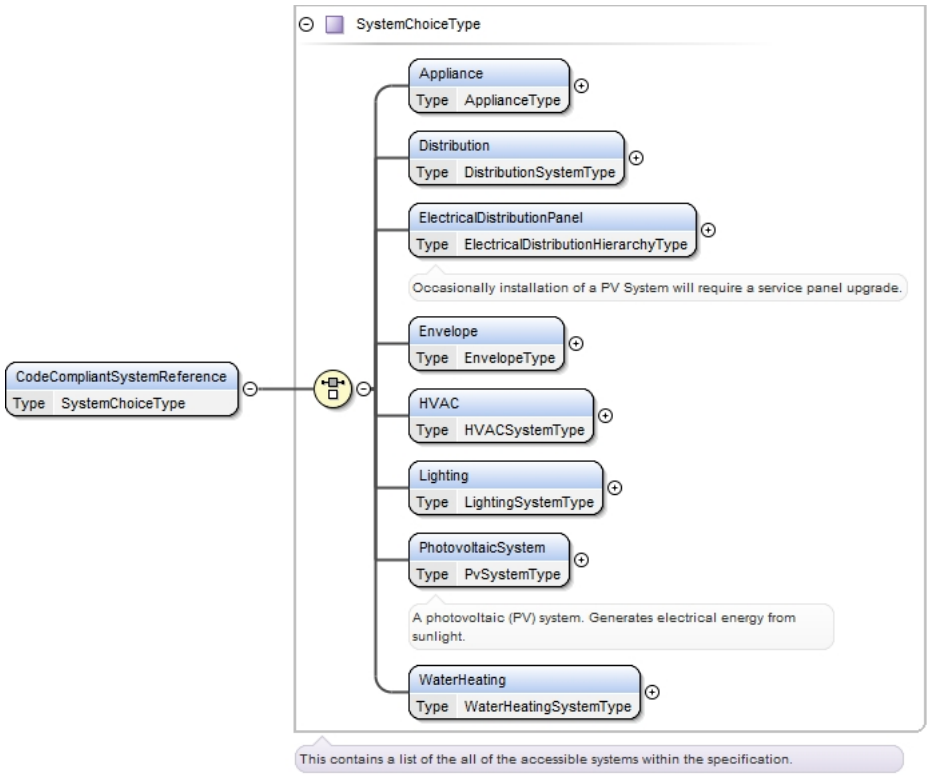
Diagram	
Type	SystemChoiceType
Properties	content: complex
Model	Appliance | Distribution | ElectricalDistributionPanel | Envelope | HVAC | Lighting | PhotovoltaicSystem | WaterHeating
Children	Appliance, Distribution, ElectricalDistributionPanel, Envelope, HVAC, Lighting, PhotovoltaicSystem, WaterHeating

Instance	`<SystemModificationData>`
	`  <Appliance>{1,1}</Appliance>`
	`  <Distribution id="">{1,1}</Distribution>`
	`  <ElectricalDistributionPanel>{1,1}</ElectricalDistributionPanel>`
	`  <Envelope id="">{1,1}</Envelope>`
	`  <HVAC id="">{1,1}</HVAC>`
	`  <Lighting>{1,1}</Lighting>`
	`  <PhotovoltaicSystem>{1,1}</PhotovoltaicSystem>`
	`  <WaterHeating id="">{1,1}</WaterHeating>`
	`</SystemModificationData>`

Source	`<xs:element name="SystemModificationData" type="SystemChoiceType"/>`

Element ModificationType / CodeCompliantSystemReference

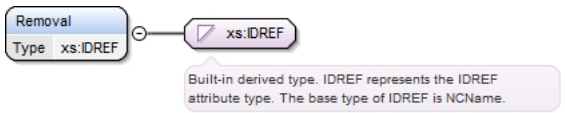
Namespace	No namespace

Diagram	
Type	SystemChoiceType
Properties	content: complex
Model	Appliance | Distribution | ElectricalDistributionPanel | Envelope | HVAC | Lighting | PhotovoltaicSystem | WaterHeating
Children	Appliance, Distribution, ElectricalDistributionPanel, Envelope, HVAC, Lighting, PhotovoltaicSystem, WaterHeating

Instance	`<CodeCompliantSystemReference>`
	`  <Appliance>{1,1}</Appliance>`
	`  <Distribution id="">{1,1}</Distribution>`
	`  <ElectricalDistributionPanel>{1,1}</ElectricalDistributionPanel>`
	`  <Envelope id="">{1,1}</Envelope>`
	`  <HVAC id="">{1,1}</HVAC>`
	`  <Lighting>{1,1}</Lighting>`
	`  <PhotovoltaicSystem>{1,1}</PhotovoltaicSystem>`
	`  <WaterHeating id="">{1,1}</WaterHeating>`
	`</CodeCompliantSystemReference>`

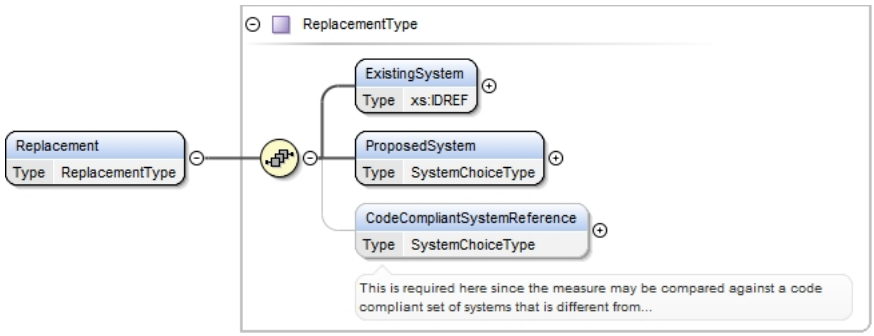
Source	`<xs:element name="CodeCompliantSystemReference" type="SystemChoiceType"/>`

Element MeasureActionType / Removal

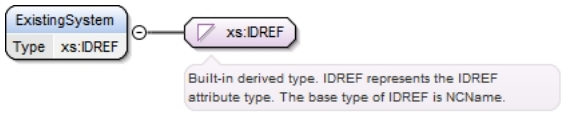
Namespace	No namespace
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	`<xs:element name="Removal" type="xs:IDREF" maxOccurs="1" minOccurs="1"/>`

Element MeasureActionType / Replacement

Namespace	No namespace

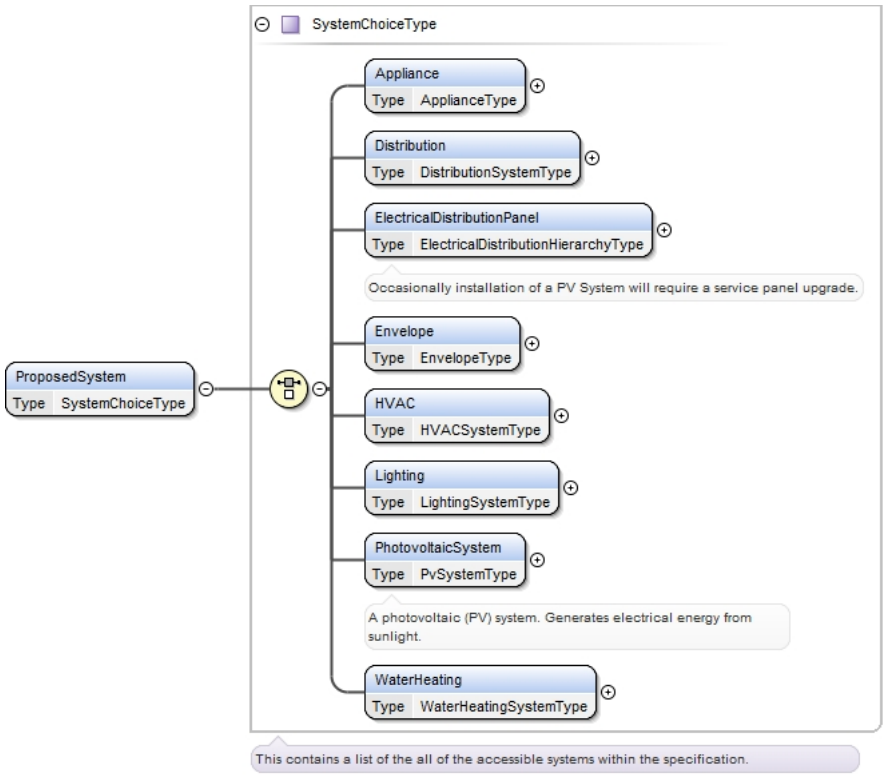
Diagram	
Type	ReplacementType
Properties	content: complex minOccurs: 1 maxOccurs: 1
Model	ExistingSystem , ProposedSystem , CodeCompliantSystemReference{0,1}
Children	CodeCompliantSystemReference, ExistingSystem, ProposedSystem
Instance	<Replacement> <ExistingSystem>{1,1}</ExistingSystem> <ProposedSystem>{1,1}</ProposedSystem> <CodeCompliantSystemReference>{0,1}</CodeCompliantSystemReference> </Replacement>
Source	<xs:element name="Replacement" type="ReplacementType" maxOccurs="1" minOccurs="1"/>

Element ReplacementType / ExistingSystem

Namespace	No namespace
Diagram	
Type	xs:IDREF
Properties	content: simple
Source	<xs:element name="ExistingSystem" type="xs:IDREF"/>

Element ReplacementType / ProposedSystem

Namespace	No namespace

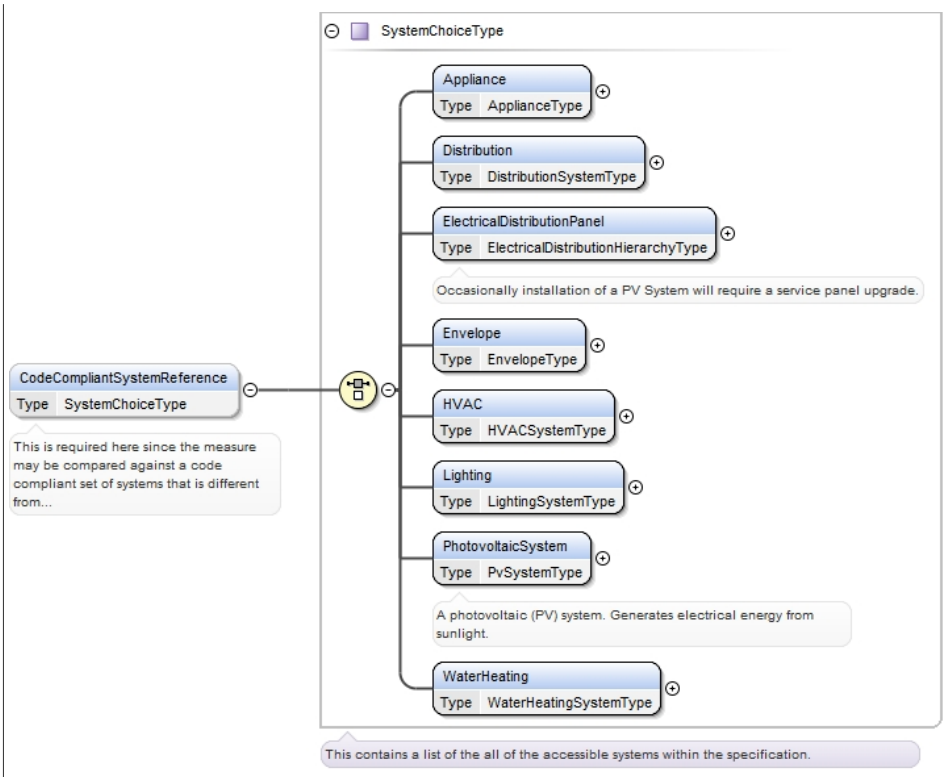
Diagram	
Type	SystemChoiceType
Properties	content: complex nillable: false
Model	Appliance | Distribution | ElectricalDistributionPanel | Envelope | HVAC | Lighting | PhotovoltaicSystem | WaterHeating
Children	Appliance, Distribution, ElectricalDistributionPanel, Envelope, HVAC, Lighting, PhotovoltaicSystem, WaterHeating

Instance	`<ProposedSystem>`
	`  <Appliance>{1,1}</Appliance>`
	`  <Distribution id="">{1,1}</Distribution>`
	`  <ElectricalDistributionPanel>{1,1}</ElectricalDistributionPanel>`
	`  <Envelope id="">{1,1}</Envelope>`
	`  <HVAC id="">{1,1}</HVAC>`
	`  <Lighting>{1,1}</Lighting>`
	`  <PhotovoltaicSystem>{1,1}</PhotovoltaicSystem>`
	`  <WaterHeating id="">{1,1}</WaterHeating>`
	`</ProposedSystem>`

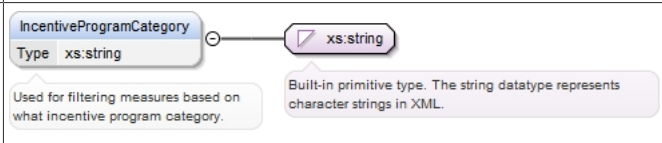
Source	`<xs:element name="ProposedSystem" nillable="false" type="SystemChoiceType"/>`

Element ReplacementType / CodeCompliantSystemReference

Namespace	No namespace
Annotations	This is required here since the measure may be compared against a code compliant set of systems that is different from the existing baseline equipment. Specifically used for incentive calculations where incentives are only paid for incremental savings above code. For example: Building Energy code

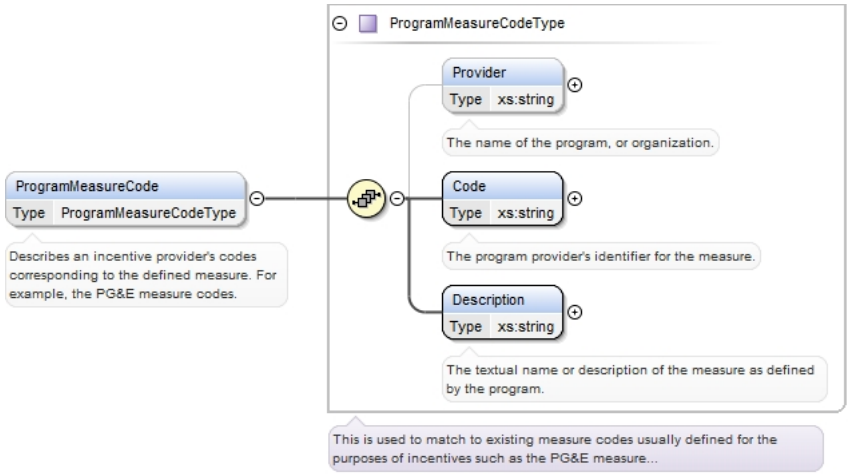
Diagram	
Type	SystemChoiceType
Properties	content: complex minOccurs: 0
Model	Appliance | Distribution | ElectricalDistributionPanel | Envelope | HVAC | Lighting | PhotovoltaicSystem | WaterHeating
Children	Appliance, Distribution, ElectricalDistributionPanel, Envelope, HVAC, Lighting, PhotovoltaicSystem, WaterHeating
Instance	<CodeCompliantSystemReference> <Appliance>{1,1}</Appliance> <Distribution id="">{1,1}</Distribution> <ElectricalDistributionPanel>{1,1}</ElectricalDistributionPanel> <Envelope id="">{1,1}</Envelope> <HVAC id="">{1,1}</HVAC> <Lighting>{1,1}</Lighting> <PhotovoltaicSystem>{1,1}</PhotovoltaicSystem> <WaterHeating id="">{1,1}</WaterHeating> </CodeCompliantSystemReference>
Source	<xs:element name="CodeCompliantSystemReference" type="SystemChoiceType" minOccurs="0"> <xs:annotation> <xs:documentation>This is required here since the measure may be compared against a code compliant set of systems that is different from the existing baseline equipment. Specifically used for incentive calculations where incentives are only paid for incremental savings above code. For example: Building Energy code</xs:documentation> </xs:annotation> </xs:element>

Element MeasureType / IncentiveProgramCategory

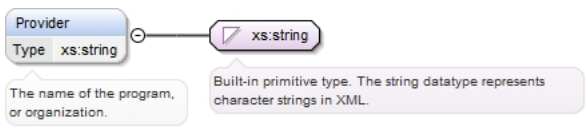
Namespace	No namespace
Annotations	Used for filtering measures based on what incentive program category.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0

	maxOccurs: 1
Source	<xs:element name="IncentiveProgramCategory" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Used for filtering measures based on what incentive program category.</xs:documentation> </xs:annotation> </xs:element>

Element MeasureType / ProgramMeasureCode

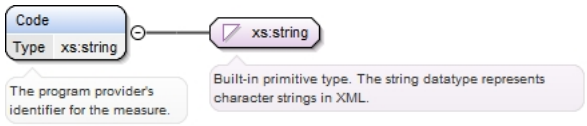
Namespace	No namespace
Annotations	Describes an incentive provider's codes corresponding to the defined measure. For example, the PG&E measure codes.
Diagram	
Type	ProgramMeasureCodeType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Provider{0,1} , Code , Description
Children	Code, Description, Provider
Instance	<ProgramMeasureCode> <Provider>{0,1}</Provider> <Code>{1,1}</Code> <Description>{1,1}</Description> </ProgramMeasureCode>
Source	<xs:element name="ProgramMeasureCode" type="ProgramMeasureCodeType" minOccurs="0" maxOccurs="unbounded"> <xs:annotation> <xs:documentation>Describes an incentive provider's codes corresponding to the defined measure. For example, the PG&E measure codes.</xs:documentation> </xs:annotation> </xs:element>

Element ProgramMeasureCodeType / Provider

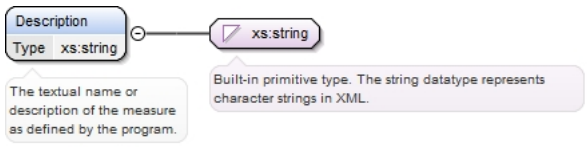
Namespace	No namespace
Annotations	The name of the program, or organization.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	<xs:element name="Provider" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The name of the program, or organization.</xs:documentation> </xs:annotation> </xs:element>

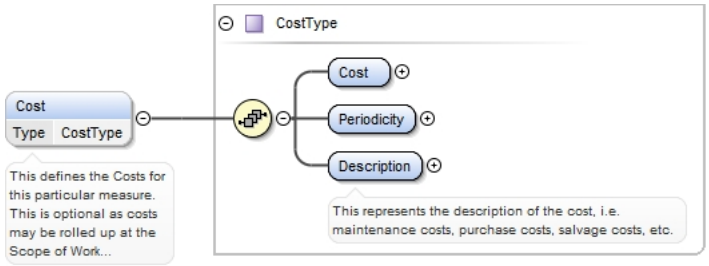
Element ProgramMeasureCodeType / Code

Namespace	No namespace
Annotations	The program provider's identifier for the measure.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="Code" type="xs:string" minOccurs="1" maxOccurs="1"> <xs:annotation> <xs:documentation>The program provider's identifier for the measure.</ xs:documentation> </xs:annotation> </xs:element>

Element ProgramMeasureCodeType / Description

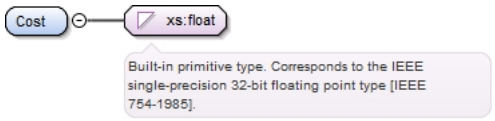
Namespace	No namespace
Annotations	The textual name or description of the measure as defined by the program.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="1" maxOccurs="1"> <xs:annotation> <xs:documentation>The textual name or description of the measure as defined by the program.</xs:documentation> </xs:annotation> </xs:element>

Element MeasureType / Cost

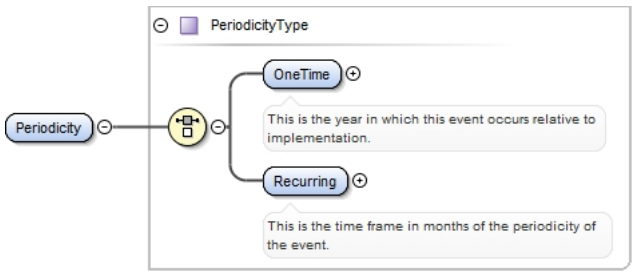
Namespace	No namespace
Annotations	This defines the Costs for this particular measure. This is optional as costs may be rolled up at the Scope of Work level
Diagram	
Type	CostType

Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Cost , Periodicity , Description
Children	Cost, Description, Periodicity
Instance	<Cost> <Cost>{1,1}</Cost> <Periodicity>{1,1}</Periodicity> <Description>{1,1}</Description> </Cost>
Source	<xs:element name="Cost" type="CostType" minOccurs="0" maxOccurs="unbounded"> <xs:annotation> <xs:documentation>This defines the Costs for this particular measure. This is optional as costs may be rolled up at the Scope of Work level</xs:documentation> </xs:annotation> </xs:element>

Element CostType / Cost

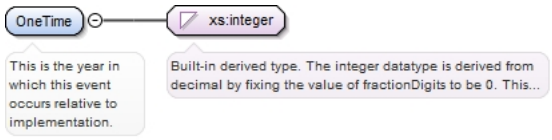
Namespace	No namespace
Diagram	
Type	xs:float
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="Cost" type="xs:float" minOccurs="1" maxOccurs="1"/>

Element CostType / Periodicity

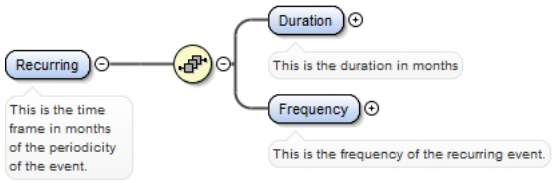
Namespace	No namespace
Diagram	
Type	PeriodicityType
Properties	content: complex minOccurs: 1 maxOccurs: 1
Model	OneTime | Recurring
Children	OneTime, Recurring
Instance	<Periodicity> <OneTime>{1,1}</OneTime> <Recurring>{1,1}</Recurring> </Periodicity>
Source	<xs:element name="Periodicity" type="PeriodicityType" minOccurs="1" maxOccurs="1"/>

Element PeriodicityType / OneTime

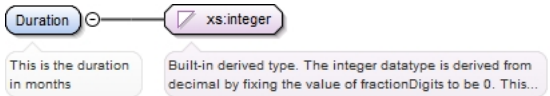
Namespace	No namespace

Annotations	This is the year in which this event occurs relative to implementation.
Diagram	
Type	xs:integer
Properties	content: simple
Source	<xs:element name="OneTime" type="xs:integer"> <xs:annotation> <xs:documentation>This is the year in which this event occurs relative to implementation.</xs:documentation> </xs:annotation> </xs:element>

Element PeriodicityType / Recurring

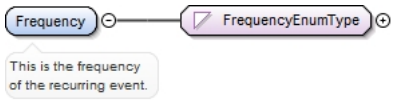
Namespace	No namespace
Annotations	This is the time frame in months of the periodicity of the event.
Diagram	
Properties	content: complex
Model	Duration , Frequency
Children	Duration, Frequency
Instance	<Recurring> <Duration>{1,1}</Duration> <Frequency>{1,1}</Frequency> </Recurring>
Source	<xs:element name="Recurring"> <xs:annotation> <xs:documentation>This is the time frame in months of the periodicity of the event.</xs:documentation> </xs:annotation> <xs:complexType> <xs:sequence> <xs:element name="Duration" type="xs:integer"> <xs:annotation> <xs:documentation>This is the duration in months</xs:documentation> </xs:annotation> </xs:element> <xs:element maxOccurs="1" name="Frequency" type="FrequencyEnumType"> <xs:annotation> <xs:documentation>This is the frequency of the recurring event.</xs:documentation> </xs:annotation> </xs:element> </xs:sequence> </xs:complexType> </xs:element>

Element PeriodicityType / Recurring / Duration

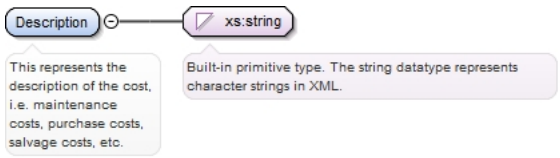
Namespace	No namespace
Annotations	This is the duration in months
Diagram	
Type	xs:integer
Properties	content: simple

Source	<xs:element name="Duration" type="xs:integer"> <xs:annotation> <xs:documentation>This is the duration in months</xs:documentation> </xs:annotation> </xs:element>

Element PeriodicityType / Recurring / Frequency

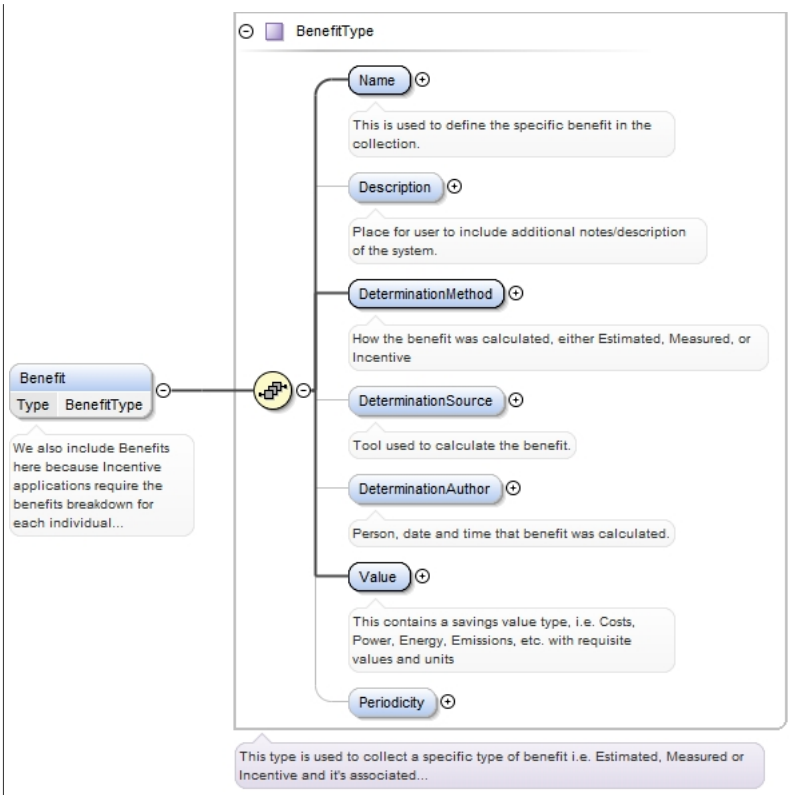
Namespace	No namespace
Annotations	This is the frequency of the recurring event.
Diagram	
Type	FrequencyEnumType
Properties	content: simple maxOccurs: 1
Facets	enumeration Daily enumeration Monthly enumeration Yearly
Source	<xs:element maxOccurs="1" name="Frequency" type="FrequencyEnumType"> <xs:annotation> <xs:documentation>This is the frequency of the recurring event.</xs:documentation> </xs:annotation> </xs:element>

Element CostType / Description

Namespace	No namespace
Annotations	This represents the description of the cost, i.e. maintenance costs, purchase costs, salvage costs, etc.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="1" maxOccurs="1"> <xs:annotation> <xs:documentation>This represents the description of the cost, i.e. maintenance costs, purchase costs, salvage costs, etc.</xs:documentation> </xs:annotation> </xs:element>

Element MeasureType / Benefit

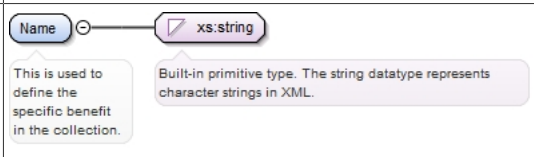
Namespace	No namespace
Annotations	We also include Benefits here because Incentive applications require the benefits breakdown for each individual measure. This is optional as costs may be rolled up at the Scope of Work level. If BenefitsAnalysisOrder is defined then benefits are incremental relative to that order.

Diagram	
Type	BenefitType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	Name , Description{0,1} , DeterminationMethod , DeterminationSource{0,1} , DeterminationAuthor{0,1} , Value , Periodicity{0,1}
Children	Description, DeterminationAuthor, DeterminationMethod, DeterminationSource, Name, Periodicity, Value

Instance	`<Benefit>`
	`  <Name>{1,1}</Name>`
	`  <Description>{0,1}</Description>`
	`  <DeterminationMethod>{1,1}</DeterminationMethod>`
	`  <DeterminationSource>{0,1}</DeterminationSource>`
	`  <DeterminationAuthor ParticipantID="">{0,1}</DeterminationAuthor>`
	`  <Value>{1,1}</Value>`
	`  <Periodicity>{0,1}</Periodicity>`
	`</Benefit>`

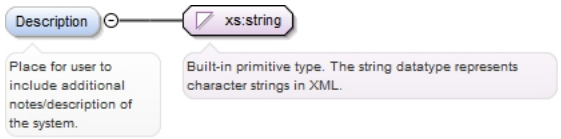
Source	`<xs:element name="Benefit" type="BenefitType" minOccurs="0" maxOccurs="unbounded">` `  <xs:annotation>` ` <xs:documentation>We also include Benefits here because Incentive applications require the benefits breakdown for each individual measure. This is optional as costs may be rolled up at the Scope of Work level. If BenefitsAnalysisOrder is defined then benefits are incremental relative to that order.</xs:documentation>` ` </xs:annotation>` `</xs:element>`

Element BenefitType / Name

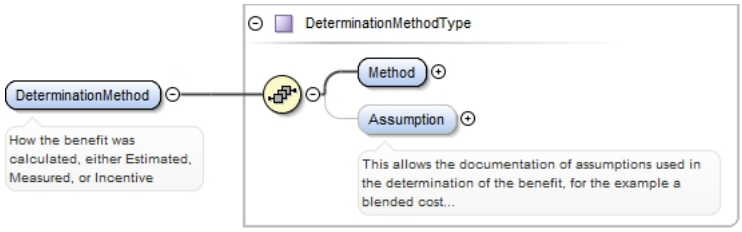
Namespace	No namespace
Annotations	This is used to define the specific benefit in the collection.
Diagram	
Type	xs:string
Properties	content: simple

Source	<xs:element name="Name" type="xs:string"> <xs:annotation> <xs:documentation>This is used to define the specific benefit in the collection.</ xs:documentation> </xs:annotation> </xs:element>

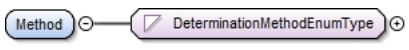
Element BenefitType / Description

Namespace	No namespace
Annotations	Place for user to include additional notes/description of the system.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element name="Description" type="xs:string" minOccurs="0"> <xs:annotation> <xs:documentation>Place for user to include additional notes/description of the system.</xs:documentation> </xs:annotation> </xs:element>

Element BenefitType / DeterminationMethod

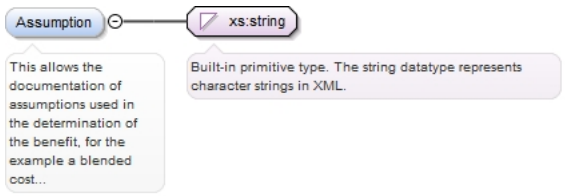
Namespace	No namespace
Annotations	How the benefit was calculated, either Estimated, Measured, or Incentive
Diagram	
Type	DeterminationMethodType
Properties	content: complex minOccurs: 1 maxOccurs: 1
Model	Method , Assumption{0,1}
Children	Assumption, Method
Instance	<DeterminationMethod> <Method>{1,1}</Method> <Assumption>{0,1}</Assumption> </DeterminationMethod>
Source	<xs:element name="DeterminationMethod" type="DeterminationMethodType" minOccurs="1" maxOccurs="1"> <xs:annotation> <xs:documentation>How the benefit was calculated, either Estimated, Measured, or Incentive</xs:documentation> </xs:annotation> </xs:element>

Element DeterminationMethodType / Method

Namespace	No namespace
Diagram	

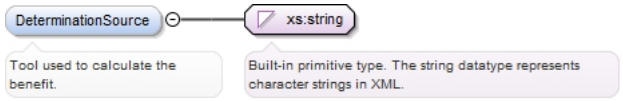
Type	DeterminationMethodEnumType
Properties	content: simple
Facets	enumeration: Estimated enumeration: Measured enumeration: Incentive
Source	`<xs:element name="Method" type="DeterminationMethodEnumType"/>`

Element DeterminationMethodType / Assumption

Namespace	No namespace
Annotations	This allows the documentation of assumptions used in the determination of the benefit, for the example a blended cost of energy instead of a detailed rate schedule analysis for determining energy cost savings
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0

Source	`<xs:element name="Assumption" type="xs:string" minOccurs="0">`
	`  <xs:annotation>`
	`  <xs:documentation>This allows the documentation of assumptions used in the determination of the benefit, for the example a blended cost of energy instead of a detailed rate schedule analysis for determining energy cost savings</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

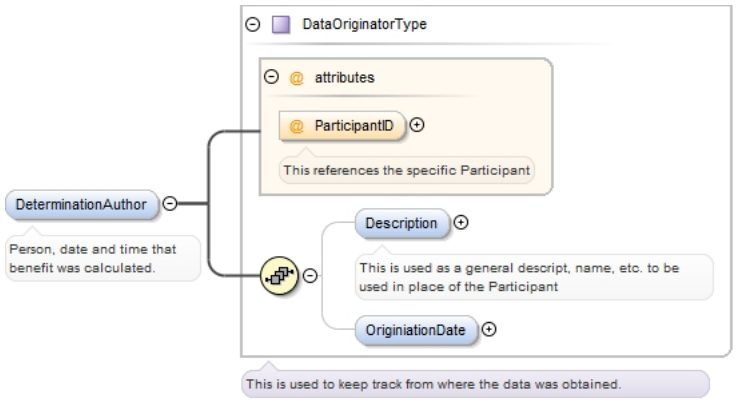
Element BenefitType / DeterminationSource

Namespace	No namespace
Annotations	Tool used to calculate the benefit.
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	`<xs:element name="DeterminationSource" type="xs:string" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>Tool used to calculate the benefit.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element BenefitType / DeterminationAuthor

Namespace	No namespace
Annotations	Person, date and time that benefit was calculated.

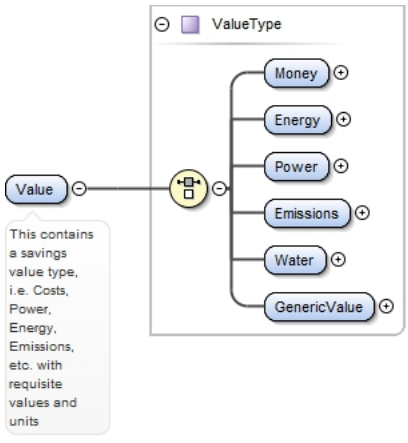
Diagram	
Type	DataOriginatorType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Description{0,1} , OriginiationDate{0,1}
Children	Description, OriginiationDate

Instance	`<DeterminationAuthor ParticipantID="">`
	`  <Description>{0,1}</Description>`
	`  <OriginiationDate>{0,1}</OriginiationDate>`
	`</DeterminationAuthor>`

Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **ParticipantID** / xs:IDREF / / / optional This references the specific Participant

Source	`<xs:element name="DeterminationAuthor" type="DataOriginatorType" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>Person, date and time that benefit was calculated.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element BenefitType / Value

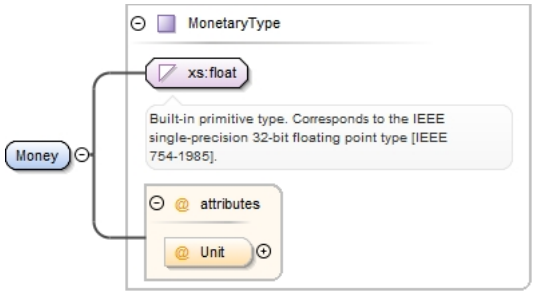
Namespace	No namespace
Annotations	This contains a savings value type, i.e. Costs, Power, Energy, Emissions, etc. with requisite values and units
Diagram	
Type	ValueType
Properties	content: complex
Model	Money | Energy | Power | Emissions | Water | GenericValue
Children	Emissions, Energy, GenericValue, Money, Power, Water
Instance	`<Value>`

```
  <Money Unit="">{1,1}</Money>
  <Energy Fuel="" FuelDesc="" Unit="" UnitDesc="">{1,1}</Energy>
  <Power Fuel="Electricity" FuelDesc="Electricity" TestCondition="" Unit="" UnitDesc="kwh">{1,1}</
Power>
  <Emissions Emissions="" EmissionsDesc="" Unit="" UnitDesc="">{1,1}</Emissions>
  <Water Unit="" UnitDesc="">{1,1}</Water>
  <GenericValue Unit="">{1,1}</GenericValue>
</Value>
```

Source

```
<xs:element name="Value" type="ValueType">
  <xs:annotation>
    <xs:documentation>This contains a savings value type, i.e. Costs, Power, Energy,
 Emissions, etc. with requisite values and units</xs:documentation>
  </xs:annotation>
</xs:element>
```

Element ValueType / Money

Namespace	No namespace
Diagram	
Type	MonetaryType
Properties	content: complex

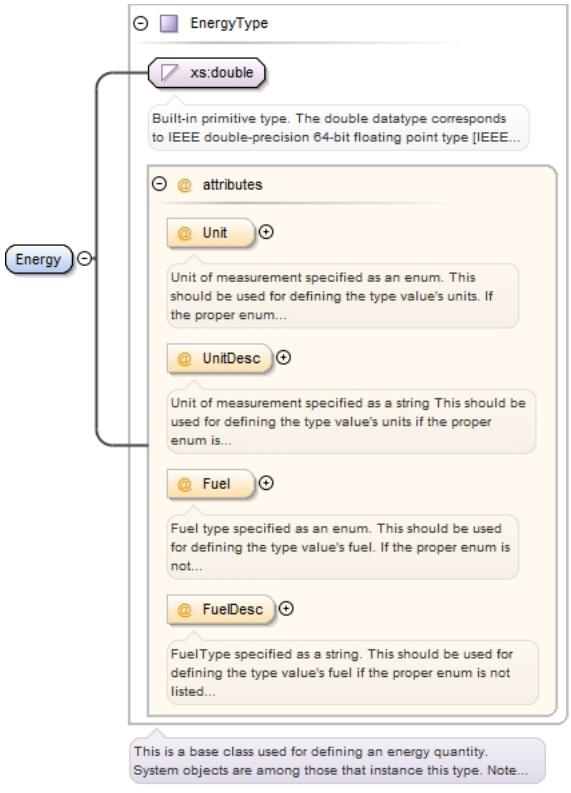
Attributes

QName	Type	Fixed	Default	Use
Unit	MonetaryUnitEnumType			optional

Source

```
<xs:element name="Money" type="MonetaryType"/>
```

Element ValueType / Energy

Namespace	No namespace
Diagram	

Type	EnergyType
Properties	content: complex

Attributes

QName	Type	Fixed	Default	Use
Fuel	EnergyClassEnumType			optional
	Fuel type specified as an enum. This should be used for defining the type value's fuel. If the proper enum is not listed, please use the FuelDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.			
FuelDesc	xs:string			optional
	FuelType specified as a string. This should be used for defining the type value's fuel if the proper enum is not listed in Fuel. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.			
Unit	EnergyUnitEnumType			optional
	Unit of measurement specified as an enum. This should be used for defining the type value's units. If the proper enum is not listed, please use the UnitDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			
UnitDesc	xs:string			optional
	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			

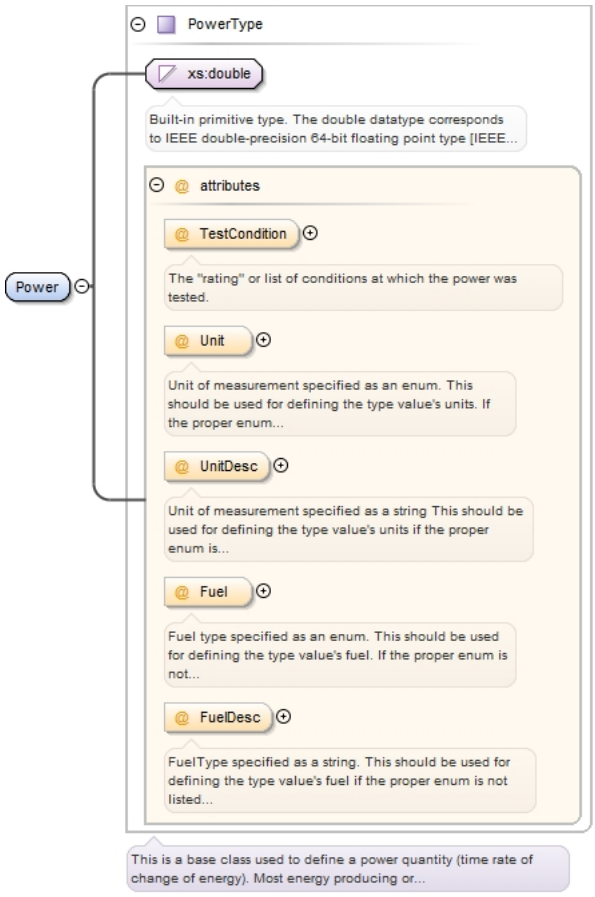
Source

```
<xs:element name="Energy" type="EnergyType"/>
```

Element ValueType / Power

Namespace	No namespace

Diagram



Type: PowerType

Properties: content: complex

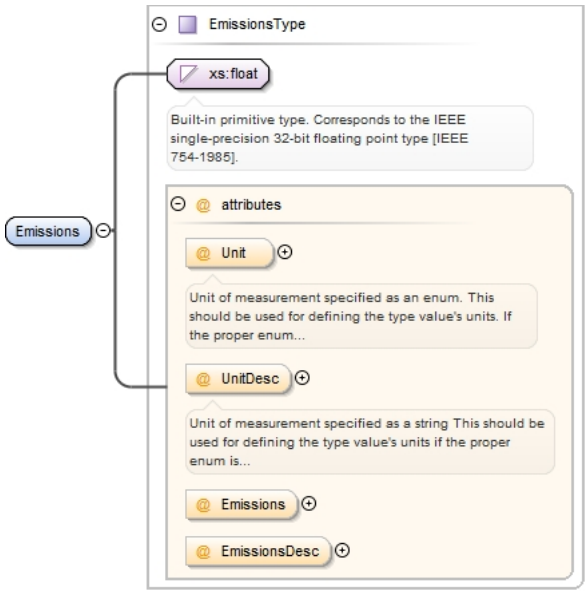
Attributes

QName	Type	Fixed	Default	Use
Fuel	EnergyClassEnumType		Electricity	optional
	Fuel type specified as an enum. This should be used for defining the type value's fuel. If the proper enum is not listed, please use the FuelDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.			
FuelDesc	xs:string		Electricity	optional
	FuelType specified as a string. This should be used for defining the type value's fuel if the proper enum is not listed in Fuel. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.			
TestCondition	xs:string			optional
	The "rating" or list of conditions at which the power was tested.			
Unit	PowerUnitEnumType			optional
	Unit of measurement specified as an enum. This should be used for defining the type value's units. If the proper enum is not listed, please use the UnitDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			
UnitDesc	xs:string		kwh	optional
	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			

Source

```
<xs:element name="Power" type="PowerType"/>
```

Element ValueType / Emissions

Namespace	No namespace
Diagram	
Type	EmissionsType
Properties	content: complex

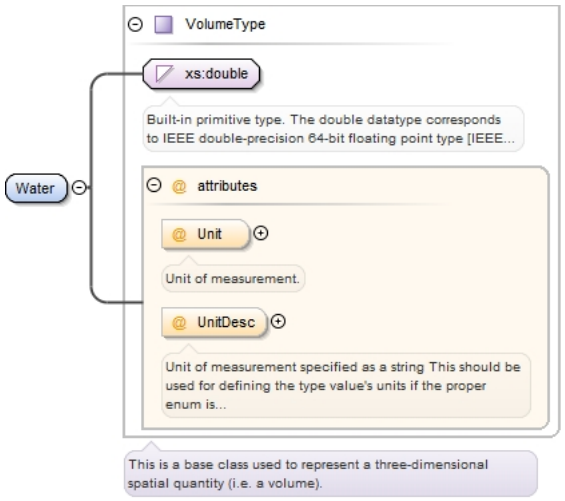
Attributes

QName	Type	Fixed	Default	Use
Emissions	EmissionsEnumType			optional
EmissionsDesc	xs:string			optional
Unit	EmissionsUnitEnumType			optional
	Unit of measurement specified as an enum. This should be used for defining the type value's units. If the proper enum is not listed, please use the UnitDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			
UnitDesc	xs:string			optional
	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			

Source	`<xs:element name="Emissions" type="EmissionsType"/>`

Element ValueType / Water

Namespace	No namespace

Diagram	
Type	VolumeType
Properties	content: complex

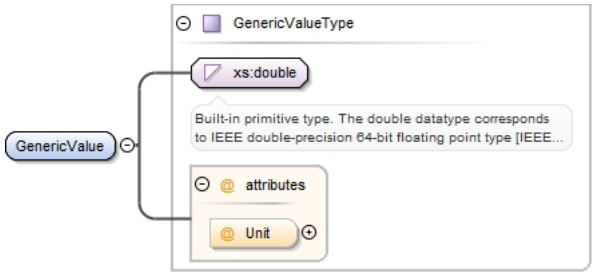
Attributes

QName	Type	Fixed	Default	Use
Unit	VolumeUnitEnumType			optional
	Unit of measurement.			
UnitDesc	xs:string			optional
	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			

Source

```
<xs:element name="Water" type="VolumeType"/>
```

Element ValueType / GenericValue

Namespace	No namespace
Diagram	
Type	GenericValueType
Properties	content: complex

Attributes

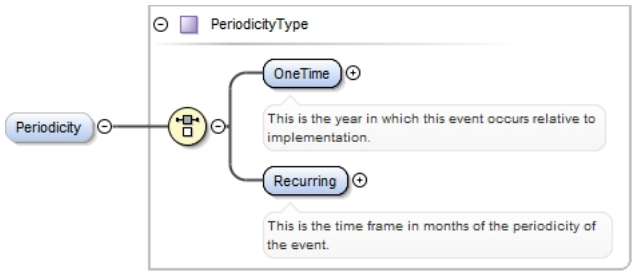
QName	Type	Fixed	Default	Use
Unit	xs:string			optional

Source

```
<xs:element name="GenericValue" type="GenericValueType"/>
```

Element BenefitType / Periodicity

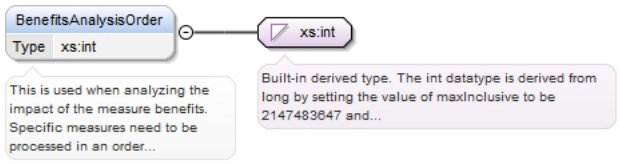
Namespace	No namespace

Diagram	
Type	PeriodicityType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	OneTime | Recurring
Children	OneTime, Recurring

Instance	`<Periodicity>`
	`  <OneTime>{1,1}</OneTime>`
	`  <Recurring>{1,1}</Recurring>`
	`</Periodicity>`

Source	`<xs:element name="Periodicity" type="PeriodicityType" minOccurs="0" maxOccurs="1"/>`

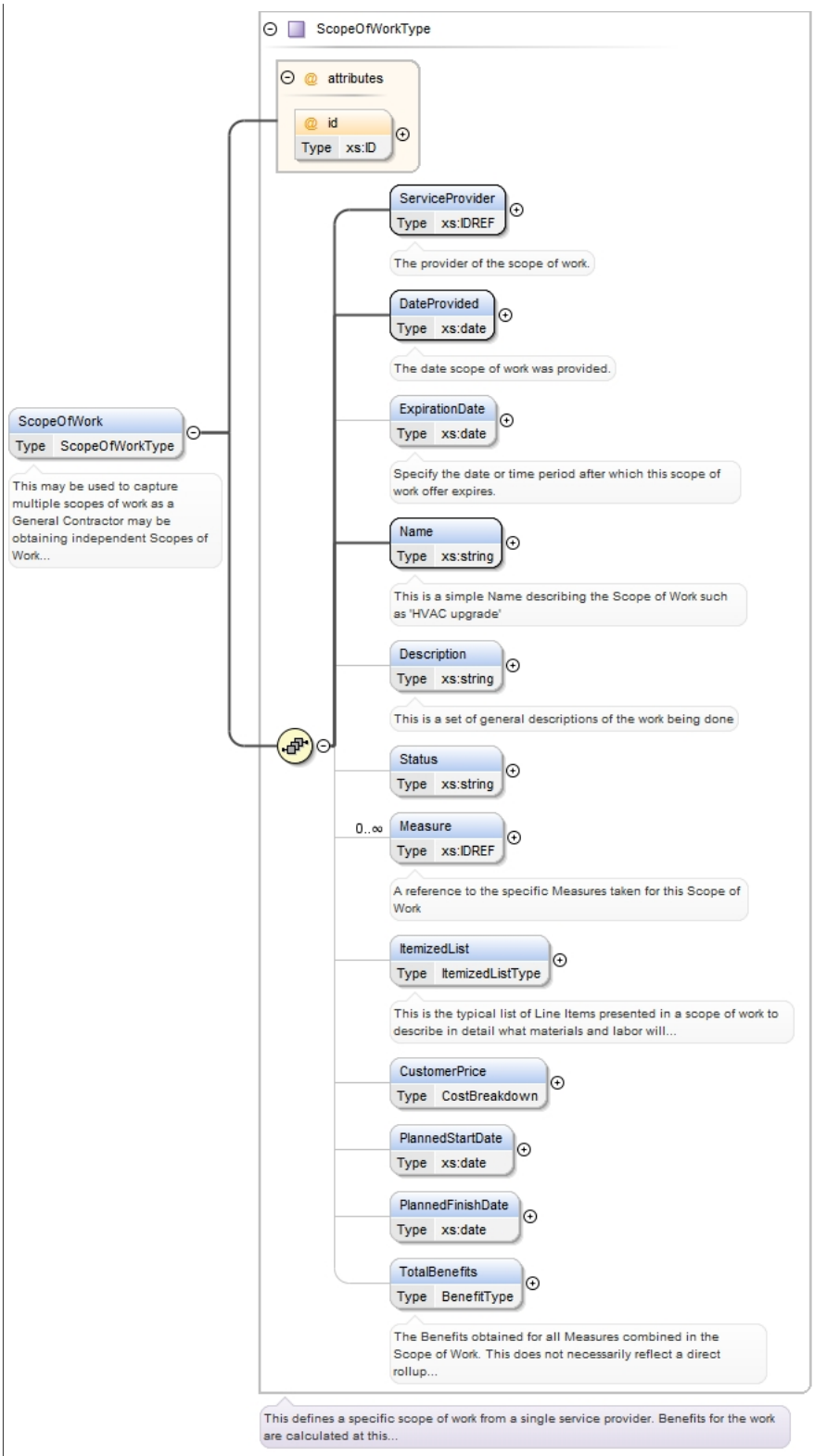
Element MeasureType / BenefitsAnalysisOrder

Namespace	No namespace
Annotations	This is used when analyzing the impact of the measure benefits. Specific measures need to be processed in an order based on the load priority of the system, i.e. efficiency change of a furnace and then apply the leakage of the ducts.
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	`<xs:element name="BenefitsAnalysisOrder" type="xs:int" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>This is used when analyzing the impact of the measure benefits. Specific measures need to be processed in an order based on the load priority of the system, i.e. efficiency change of a furnace and then apply the leakage of the ducts.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element ProjectType / ScopeOfWork

Namespace	No namespace
Annotations	This may be used to capture multiple scopes of work as a General Contractor may be obtaining independent Scopes of Work from multiple contractors. Each of those scopes of work would be captured in an independent Project.

Diagram	
Type	ScopeOfWorkType
Properties	content: `complex` minOccurs: `0` maxOccurs: `unbounded`
Model	ServiceProvider , DateProvided , ExpirationDate{0,1} , Name , Description{0,1} , Status{0,1} , Measure* , ItemizedList{0,1} , CustomerPrice{0,1} , PlannedStartDate{0,1} , PlannedFinishDate{0,1} , TotalBenefits{0,1}

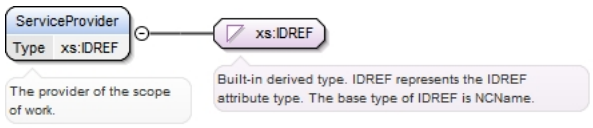
Children	CustomerPrice, DateProvided, Description, ExpirationDate, ItemizedList, Measure, Name, PlannedFinishDate, PlannedStartDate, ServiceProvider, Status, TotalBenefits

Instance	<pre><ScopeOfWork id="">
	  <ServiceProvider>{1,1}</ServiceProvider>
	  <DateProvided>{1,1}</DateProvided>
	  <ExpirationDate>{0,1}</ExpirationDate>
	  <Name>{1,1}</Name>
	  <Description>{0,1}</Description>
	  <Status>{0,1}</Status>
	  <Measure>{0,unbounded}</Measure>
	  <ItemizedList>{0,1}</ItemizedList>
	  <CustomerPrice>{0,1}</CustomerPrice>
	  <PlannedStartDate>{0,1}</PlannedStartDate>
	  <PlannedFinishDate>{0,1}</PlannedFinishDate>
	  <TotalBenefits>{0,1}</TotalBenefits>
	</ScopeOfWork></pre>

Attributes	**QName** / **Type** / **Fixed** / **Default** / **Use** **id** / xs:ID / / / optional

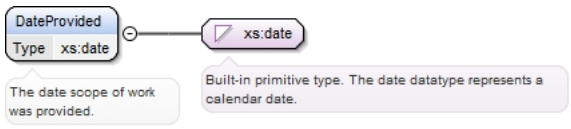
Source	<pre><xs:element name="ScopeOfWork" type="ScopeOfWorkType" minOccurs="0" maxOccurs="unbounded">
	  <xs:annotation>
	  <xs:documentation>This may be used to capture multiple scopes of work as a General Contractor may be obtaining independent Scopes of Work from multiple contractors. Each of those scopes of work would be captured in an independent Project.</xs:documentation>
	  </xs:annotation>
	</xs:element></pre>

Element ScopeOfWorkType / ServiceProvider

Namespace	No namespace
Annotations	The provider of the scope of work.
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 1 maxOccurs: 1

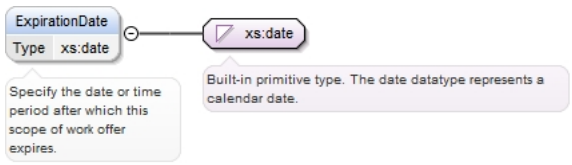
Source	<pre><xs:element name="ServiceProvider" type="xs:IDREF" minOccurs="1" maxOccurs="1">
	  <xs:annotation>
	  <xs:documentation>The provider of the scope of work.</xs:documentation>
	  </xs:annotation>
	</xs:element></pre>

Element ScopeOfWorkType / DateProvided

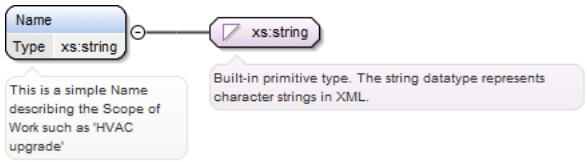
Namespace	No namespace
Annotations	The date scope of work was provided.
Diagram	
Type	xs:date
Properties	content: simple minOccurs: 1 maxOccurs: 1

Source	<pre><xs:element name="DateProvided" type="xs:date" minOccurs="1" maxOccurs="1">
	  <xs:annotation>
	  <xs:documentation>The date scope of work was provided.</xs:documentation>
	  </xs:annotation>
	</xs:element></pre>

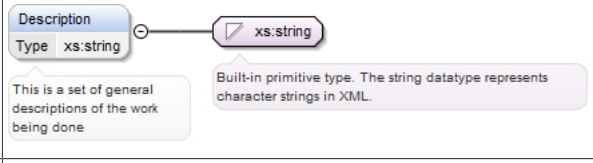
Element ScopeOfWorkType / ExpirationDate

Namespace	No namespace
Annotations	Specify the date or time period after which this scope of work offer expires.
Diagram	
Type	xs:date
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="ExpirationDate" type="xs:date" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Specify the date or time period after which this scope of work offer expires.</xs:documentation> </xs:annotation> </xs:element>

Element ScopeOfWorkType / Name

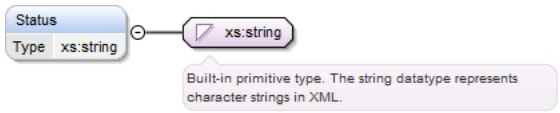
Namespace	No namespace
Annotations	This is a simple Name describing the Scope of Work such as 'HVAC upgrade'
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element name="Name" type="xs:string" minOccurs="1" maxOccurs="1"> <xs:annotation> <xs:documentation>This is a simple Name describing the Scope of Work such as 'HVAC upgrade'</xs:documentation> </xs:annotation> </xs:element>

Element ScopeOfWorkType / Description

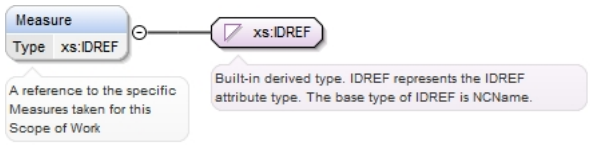
Namespace	No namespace
Annotations	This is a set of general descriptions of the work being done
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>This is a set of general descriptions of the work being done</xs:documentation> </xs:annotation>

```
</xs:element>
```

Element ScopeOfWorkType / Status

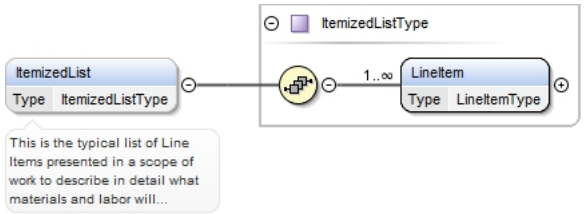
Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="Status" type="xs:string" minOccurs="0" maxOccurs="1"/>`

Element ScopeOfWorkType / Measure

Namespace	No namespace
Annotations	A reference to the specific Measures taken for this Scope of Work
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 0 maxOccurs: unbounded

Source	`<xs:element name="Measure" type="xs:IDREF" minOccurs="0" maxOccurs="unbounded">`
	`  <xs:annotation>`
	`  <xs:documentation>A reference to the specific Measures taken for this Scope of Work</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element ScopeOfWorkType / ItemizedList

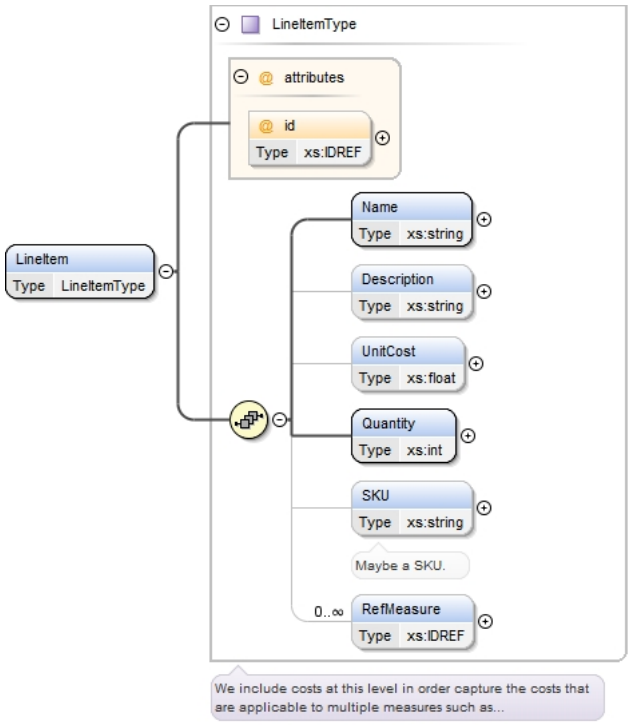
Namespace	No namespace
Annotations	This is the typical list of Line Items presented in a scope of work to describe in detail what materials and labor will be delivered for the contract price.
Diagram	
Type	ItemizedListType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	LineItem+
Children	LineItem

Instance	`<ItemizedList>`
	`  <LineItem id="">{1,unbounded}</LineItem>`
	`</ItemizedList>`

Source	`<xs:element maxOccurs="1" minOccurs="0" name="ItemizedList" type="ItemizedListType">` `  <xs:annotation>`

```
    <xs:documentation>This is the typical list of Line Items presented in a scope of
 work to describe in detail what materials and labor will be delivered for the contract
 price.</xs:documentation>
  </xs:annotation>
</xs:element>
```

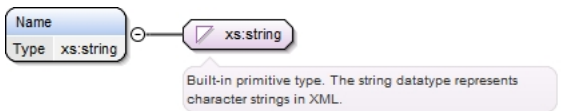
Element `ItemizedListType / LineItem`

Namespace	No namespace
Diagram	
Type	LineItemType
Properties	content: `complex` minOccurs: `1` maxOccurs: `unbounded`
Model	Name , Description{0,1} , UnitCost{0,1} , Quantity , SKU{0,1} , RefMeasure*
Children	Description, Name, Quantity, RefMeasure, SKU, UnitCost

`Instance`	`<LineItem id="">`
	`  <Name>{1,1}</Name>`
	`  <Description>{0,1}</Description>`
	`  <UnitCost>{0,1}</UnitCost>`
	`  <Quantity>{1,1}</Quantity>`
	`  <SKU>{0,1}</SKU>`
	`  <RefMeasure>{0,unbounded}</RefMeasure>`
	`</LineItem>`

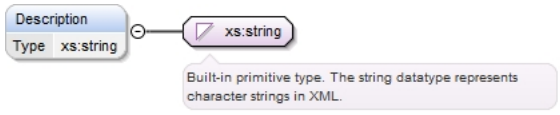
Attributes	**QName** | **Type** | **Fixed** | **Default** | **Use** **id** | xs:IDREF | | | optional
`Source`	`<xs:element maxOccurs="unbounded" minOccurs="1" name="LineItem" type="LineItemType"/>`

Element `LineItemType / Name`

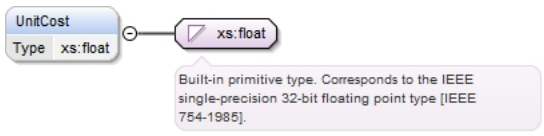
Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: `simple`

	minOccurs: 1 maxOccurs: 1
Source	`<xs:element maxOccurs="1" minOccurs="1" name="Name" type="xs:string"/>`

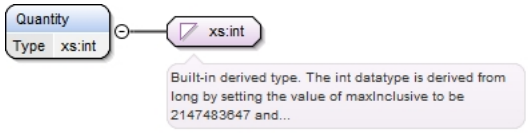
Element `LineItemType / Description`

Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="Description" type="xs:string" minOccurs="0" maxOccurs="1"/>`

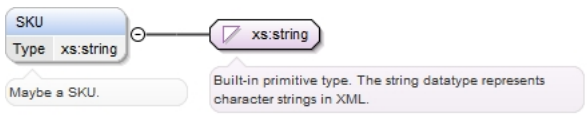
Element `LineItemType / UnitCost`

Namespace	No namespace
Diagram	
Type	xs:float
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element name="UnitCost" type="xs:float" minOccurs="0" maxOccurs="1"/>`

Element `LineItemType / Quantity`

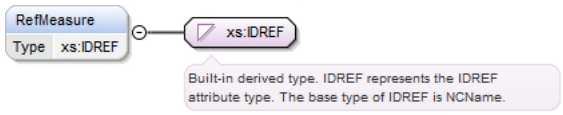
Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	`<xs:element name="Quantity" type="xs:int" maxOccurs="1" minOccurs="1"/>`

Element `LineItemType / SKU`

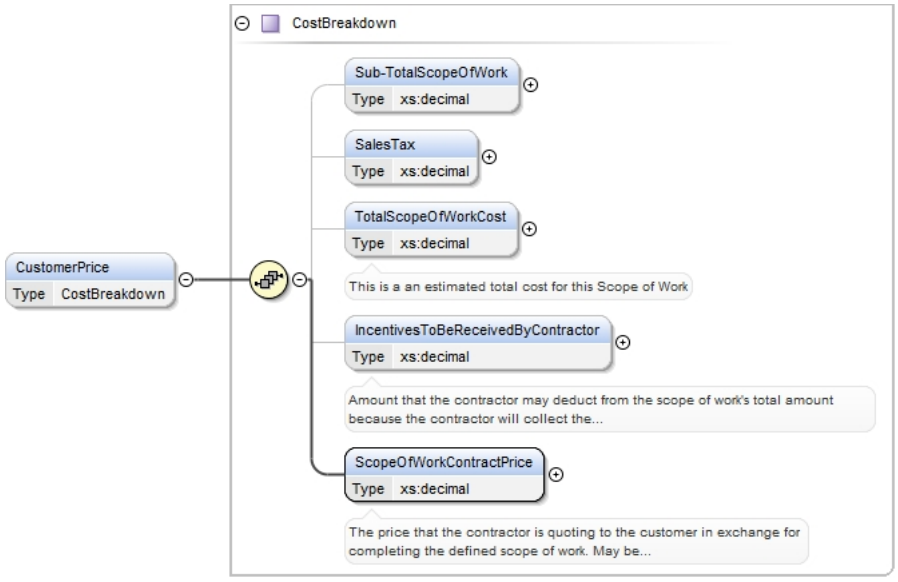
Namespace	No namespace
Annotations	Maybe a SKU.
Diagram	
Type	xs:string
Properties	content: simple

	minOccurs:	0
	maxOccurs:	1
Source	<xs:element name="SKU" type="xs:string" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>Maybe a SKU.</xs:documentation> </xs:annotation> </xs:element>	

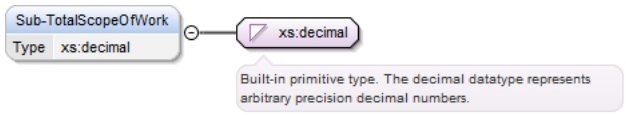
Element LineItemType / RefMeasure

Namespace	No namespace
Diagram	
Type	xs:IDREF
Properties	content: simple minOccurs: 0 maxOccurs: unbounded
Source	<xs:element name="RefMeasure" type="xs:IDREF" minOccurs="0" maxOccurs="unbounded"/>

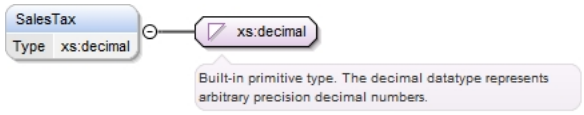
Element ScopeOfWorkType / CustomerPrice

Namespace	No namespace
Diagram	
Type	CostBreakdown
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Sub-TotalScopeOfWork{0,1} , SalesTax{0,1} , TotalScopeOfWorkCost{0,1} , IncentivesToBeReceivedByContractor{0,1} , ScopeOfWorkContractPrice
Children	IncentivesToBeReceivedByContractor, SalesTax, ScopeOfWorkContractPrice, Sub-TotalScopeOfWork, TotalScopeOfWorkCost
Instance	<CustomerPrice> <Sub-TotalScopeOfWork>{0,1}</Sub-TotalScopeOfWork> <SalesTax>{0,1}</SalesTax> <TotalScopeOfWorkCost>{0,1}</TotalScopeOfWorkCost> <IncentivesToBeReceivedByContractor>{0,1}</IncentivesToBeReceivedByContractor> <ScopeOfWorkContractPrice>{1,1}</ScopeOfWorkContractPrice> </CustomerPrice>
Source	<xs:element maxOccurs="1" minOccurs="0" name="CustomerPrice" type="CostBreakdown"/>

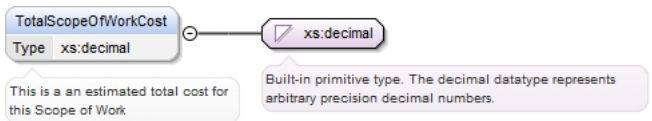
Element CostBreakdown / Sub-TotalScopeOfWork

Namespace	No namespace
Diagram	
Type	xs:decimal
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element maxOccurs="1" minOccurs="0" name="Sub-TotalScopeOfWork" type="xs:decimal"/>`

Element CostBreakdown / SalesTax

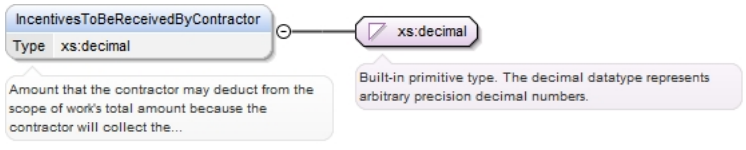
Namespace	No namespace
Diagram	
Type	xs:decimal
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	`<xs:element maxOccurs="1" minOccurs="0" name="SalesTax" type="xs:decimal"/>`

Element CostBreakdown / TotalScopeOfWorkCost

Namespace	No namespace
Annotations	This is a an estimated total cost for this Scope of Work
Diagram	
Type	xs:decimal
Properties	content: simple minOccurs: 0 maxOccurs: 1

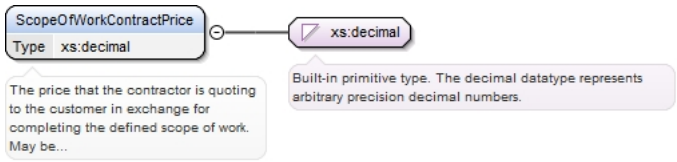
Source	`<xs:element name="TotalScopeOfWorkCost" type="xs:decimal" minOccurs="0" maxOccurs="1">`
	`  <xs:annotation>`
	`  <xs:documentation>This is a an estimated total cost for this Scope of Work</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

Element CostBreakdown / IncentivesToBeReceivedByContractor

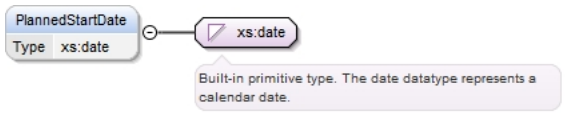
Namespace	No namespace
Annotations	Amount that the contractor may deduct from the scope of work's total amount because the contractor will collect the incentive money rather than asking the customer to pay the contractor and acquire it themselves.
Diagram	
Type	xs:decimal

Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="0" name="IncentivesToBeReceivedByContractor" type="xs:decimal"> <xs:annotation> <xs:documentation>Amount that the contractor may deduct from the scope of work's total amount because the contractor will collect the incentive money rather than asking the customer to pay the contractor and acquire it themselves.</xs:documentation> </xs:annotation> </xs:element>

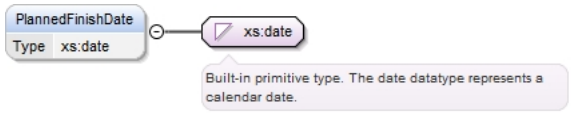
Element CostBreakdown / ScopeOfWorkContractPrice

Namespace	No namespace
Annotations	The price that the contractor is quoting to the customer in exchange for completing the defined scope of work. May be the the TotalScopeOfWorkCost less any IncentivesToBeReceivedByContractor.
Diagram	
Type	xs:decimal
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	<xs:element maxOccurs="1" minOccurs="1" name="ScopeOfWorkContractPrice" type="xs:decimal"> <xs:annotation> <xs:documentation>The price that the contractor is quoting to the customer in exchange for completing the defined scope of work. May be the the TotalScopeOfWorkCost less any IncentivesToBeReceivedByContractor.</xs:documentation> </xs:annotation> </xs:element>

Element ScopeOfWorkType / PlannedStartDate

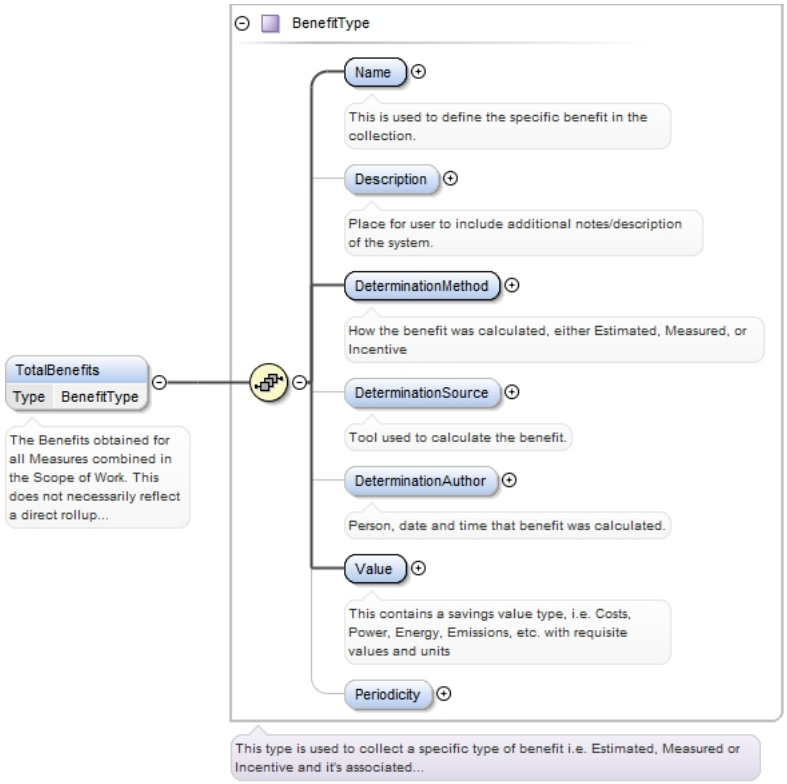
Namespace	No namespace
Diagram	
Type	xs:date
Properties	content: simple minOccurs: 0 maxOccurs: 1
Source	<xs:element name="PlannedStartDate" type="xs:date" minOccurs="0" maxOccurs="1"/>

Element ScopeOfWorkType / PlannedFinishDate

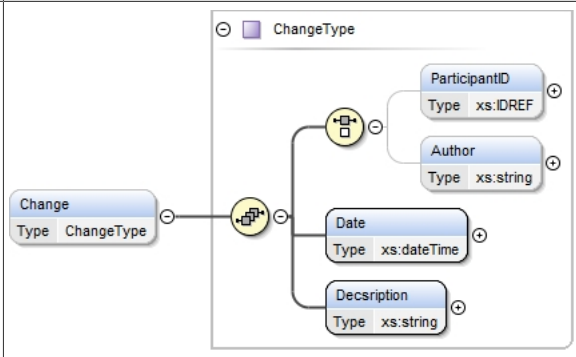
Namespace	No namespace
Diagram	
Type	xs:date
Properties	content: simple minOccurs: 0 maxOccurs: 1

Source	<xs:element name="PlannedFinishDate" type="xs:date" minOccurs="0" maxOccurs="1"/>

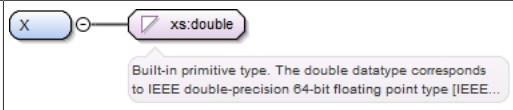
Element ScopeOfWorkType / TotalBenefits

Namespace	No namespace
Annotations	The Benefits obtained for all Measures combined in the Scope of Work. This does not necessarily reflect a direct rollup of all of the individual measure benefits as some combination of measures may impact measure benefits. Individual measure benefits may be expressed independent of other measures. For example: The total benefit of a Lighting efficiency measure combined with a high efficiency HVAC measure would not equal the sum of the measures benefit if implemented independently.
Diagram	
Type	BenefitType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Model	Name , Description{0,1} , DeterminationMethod , DeterminationSource{0,1} , DeterminationAuthor{0,1} , Value , Periodicity{0,1}
Children	Description, DeterminationAuthor, DeterminationMethod, DeterminationSource, Name, Periodicity, Value
Instance	<TotalBenefits> <Name>{1,1}</Name> <Description>{0,1}</Description> <DeterminationMethod>{1,1}</DeterminationMethod> <DeterminationSource>{0,1}</DeterminationSource> <DeterminationAuthor ParticipantID="">{0,1}</DeterminationAuthor> <Value>{1,1}</Value> <Periodicity>{0,1}</Periodicity> </TotalBenefits>
Source	<xs:element name="TotalBenefits" type="BenefitType" minOccurs="0" maxOccurs="1"> <xs:annotation> <xs:documentation>The Benefits obtained for all Measures combined in the Scope of Work. This does not necessarily reflect a direct rollup of all of the individual measure benefits as some combination of measures may impact measure benefits. Individual measure benefits may be expressed independent of other measures. For example: The total benefit of a Lighting efficiency measure combined with a high efficiency HVAC measure would not equal the sum of the measures benefit if implemented independently.</xs:documentation> </xs:annotation> </xs:element>

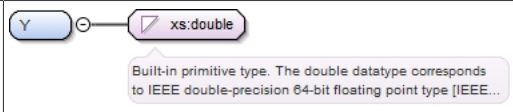
Element ChangeLogType / Change

Namespace	No namespace
Diagram	
Type	ChangeType
Properties	content: complex minOccurs: 0 maxOccurs: unbounded
Model	(ParticipantID{0,1} | Author{0,1}) , Date , Decsription
Children	Author, Date, Decsription, ParticipantID
Instance	<Change> <ParticipantID>{0,1}</ParticipantID> <Author>{0,1}</Author> <Date>{1,1}</Date> <Decsription>{1,1}</Decsription> </Change>
Source	<xs:element maxOccurs="unbounded" minOccurs="0" name="Change" type="ChangeType"/>

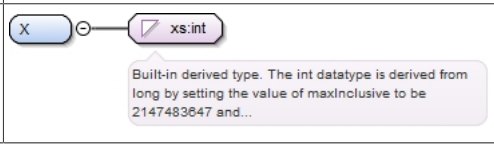
Element PointDoubleType / X

Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple
Source	<xs:element name="X" type="xs:double"/>

Element PointDoubleType / Y

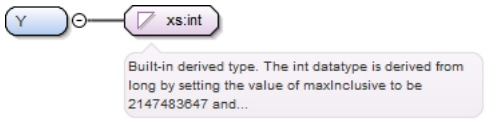
Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple
Source	<xs:element name="Y" type="xs:double"/>

Element PointType / X

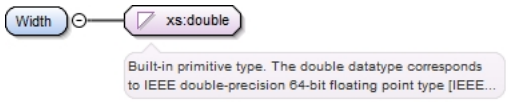
Namespace	No namespace
Diagram	

Type	xs:int
Properties	content: simple
Source	<xs:element name="X" type="xs:int"/>

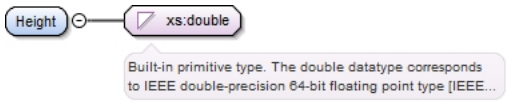
Element PointType / Y

Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple
Source	<xs:element name="Y" type="xs:int"/>

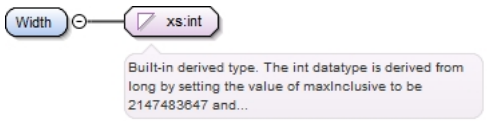
Element SizeDoubleType / Width

Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple
Source	<xs:element name="Width" type="xs:double"/>

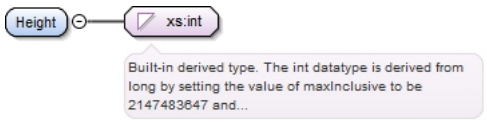
Element SizeDoubleType / Height

Namespace	No namespace
Diagram	
Type	xs:double
Properties	content: simple
Source	<xs:element name="Height" type="xs:double"/>

Element SizeType / Width

Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple
Source	<xs:element name="Width" type="xs:int"/>

Element SizeType / Height

Namespace	No namespace
Diagram	
Type	xs:int

Properties	content: simple
Source	<xs:element name="Height" type="xs:int"/>

Element InputPowerType / Power

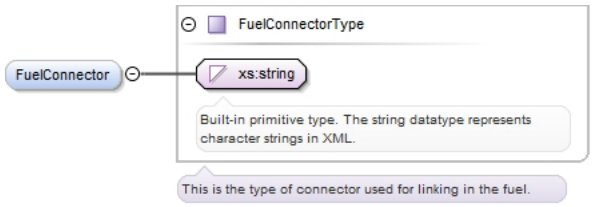
Namespace	No namespace
Diagram	
Type	PowerType
Properties	content: complex minOccurs: 1 maxOccurs: 1

Attributes

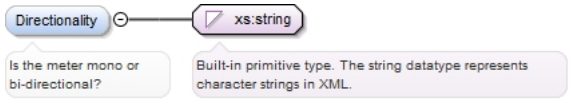
QName	Type	Fixed	Default	Use
Fuel	EnergyClassEnumType		Electricity	optional
	Fuel type specified as an enum. This should be used for defining the type value's fuel. If the proper enum is not listed, please use the FuelDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.			
FuelDesc	xs:string		Electricity	optional
	FuelType specified as a string. This should be used for defining the type value's fuel if the proper enum is not listed in Fuel. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.			
TestCondition	xs:string			optional
	The "rating" or list of conditions at which the power was tested.			
Unit	PowerUnitEnumType			optional
	Unit of measurement specified as an enum. This should be used for defining the type value's units. If the proper enum is not listed, please use the UnitDesc field to specify the units. These are all optional attributes in order to allow for a simplified value			

	QName	Type	Fixed	Default	Use
		descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			
	UnitDesc	xs:string		kwh	optional
		Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.			
Source	<xs:element name="Power" type="PowerType" minOccurs="1" maxOccurs="1"/>				

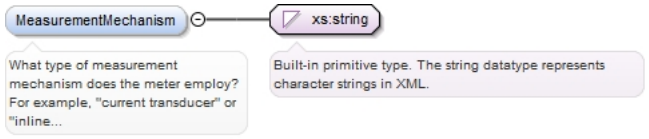
Element InputPowerType / FuelConnector

Namespace	No namespace
Diagram	
Type	FuelConnectorType
Properties	content: complex minOccurs: 0 maxOccurs: 1
Source	<xs:element name="FuelConnector" type="FuelConnectorType" minOccurs="0" maxOccurs="1"/>

Element MeterDefinitionType / Directionality

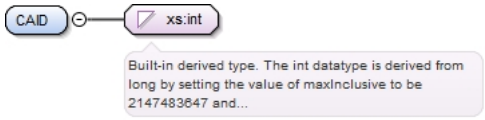
Namespace	No namespace
Annotations	Is the meter mono or bi-directional?
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="Directionality" type="xs:string"> <xs:annotation> <xs:documentation>Is the meter mono or bi-directional?</xs:documentation> </xs:annotation> </xs:element>

Element MeterDefinitionType / MeasurementMechanism

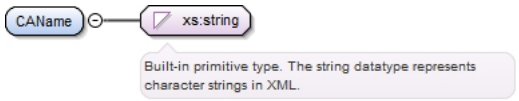
Namespace	No namespace
Annotations	What type of measurement mechanism does the meter employ? For example, "current transducer" or "inline electro-mechanical"
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 0
Source	<xs:element minOccurs="0" name="MeasurementMechanism" type="xs:string"> <xs:annotation>

```
    <xs:documentation>What type of measurement mechanism does the meter employ? For
 example, "current transducer" or "inline electro-mechanical"</xs:documentation>
  </xs:annotation>
</xs:element>
```

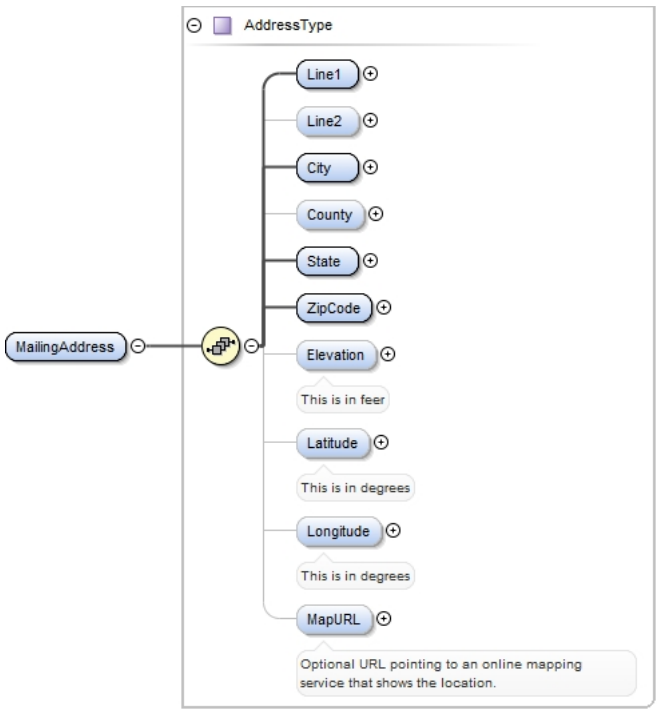
Element CertifyingAuthority / CAID

Namespace	No namespace
Diagram	
Type	xs:int
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	`<xs:element name="CAID" type="xs:int" minOccurs="1" maxOccurs="1"/>`

Element CertifyingAuthority / CAName

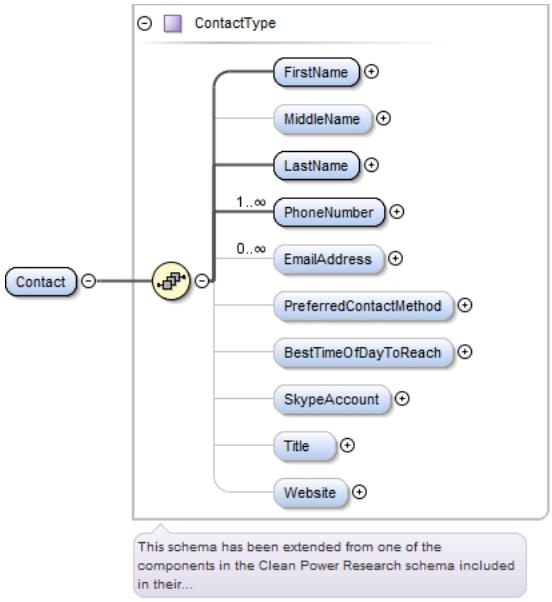
Namespace	No namespace
Diagram	
Type	xs:string
Properties	content: simple minOccurs: 1 maxOccurs: 1
Source	`<xs:element name="CAName" type="xs:string" minOccurs="1" maxOccurs="1"/>`

Element CertifyingAuthority / MailingAddress

Namespace	No namespace
Diagram	
Type	AddressType

Properties	content: complex minOccurs: 1 maxOccurs: 1
Model	Line1 , Line2{0,1} , City , County{0,1} , State , ZipCode , Elevation{0,1} , Latitude{0,1} , Longitude{0,1} , MapURL{0,1}
Children	City, County, Elevation, Latitude, Line1, Line2, Longitude, MapURL, State, ZipCode
Instance	<MailingAddress> <Line1>{1,1}</Line1> <Line2>{0,1}</Line2> <City>{1,1}</City> <County>{0,1}</County> <State>{1,1}</State> <ZipCode>{1,1}</ZipCode> <Elevation>{0,1}</Elevation> <Latitude>{0,1}</Latitude> <Longitude>{0,1}</Longitude> <MapURL>{0,1}</MapURL> </MailingAddress>
Source	<xs:element name="MailingAddress" type="AddressType" minOccurs="1" maxOccurs="1"/>

Element CertifyingAuthority / Contact

Namespace	No namespace
Diagram	
Type	ContactType
Properties	content: complex minOccurs: 1 maxOccurs: unbounded
Model	FirstName , MiddleName{0,1} , LastName , PhoneNumber+ , EmailAddress* , PreferredContactMethod{0,1} , BestTimeOfDayToReach{0,1} , SkypeAccount{0,1} , Title{0,1} , Website{0,1}
Children	BestTimeOfDayToReach, EmailAddress, FirstName, LastName, MiddleName, PhoneNumber, PreferredContactMethod, SkypeAccount, Title, Website
Instance	<Contact> <FirstName>{1,1}</FirstName> <MiddleName>{0,1}</MiddleName> <LastName>{1,1}</LastName> <PhoneNumber>{1,unbounded}</PhoneNumber> <EmailAddress>{0,unbounded}</EmailAddress> <PreferredContactMethod>{0,1}</PreferredContactMethod> <BestTimeOfDayToReach>{0,1}</BestTimeOfDayToReach> <SkypeAccount>{0,1}</SkypeAccount> <Title>{0,1}</Title> <Website>{0,1}</Website> </Contact>

Source	`<xs:element name="Contact" type="ContactType" minOccurs="1" maxOccurs="unbounded"/>`

Attribute(s)

Attribute `ParticipantType / @id`

Namespace	No namespace	
Type	xs:ID	
Properties	use:	required
Used by	Complex Type	ParticipantType
Source	`<xs:attribute name="id" use="required" type="xs:ID"/>`	

Attribute `DataOriginatorType / @ParticipantID`

Namespace	No namespace	
Annotations	This references the specific Participant	
Type	xs:IDREF	
Properties	content:	simple
Used by	Complex Type	DataOriginatorType

Source	`<xs:attribute name="ParticipantID" type="xs:IDREF">`
	`  <xs:annotation>`
	`  <xs:documentation>This references the specific Participant</xs:documentation>`
	`  </xs:annotation>`
	`</xs:attribute>`	

Attribute `MonetaryType / @Unit`

Namespace	No namespace	
Type	MonetaryUnitEnumType	
Properties	content:	simple
Facets	enumeration	dollars
	enumeration	cents
Used by	Complex Type	MonetaryType
Source	`<xs:attribute name="Unit" type="MonetaryUnitEnumType"/>`	

Attribute `TimePeriodType / @TimeUnits`

Namespace	No namespace	
Type	TimeUnitEnumType	
Properties	use:	required
Facets	enumeration	Day
	enumeration	Hour
	enumeration	Minute
	enumeration	Month
	enumeration	Second
	enumeration	Week
	enumeration	Year
Used by	Complex Type	TimePeriodType
Source	`<xs:attribute name="TimeUnits" type="TimeUnitEnumType" use="required"/>`	

Attribute `EnergyType / @Unit`

Namespace	No namespace
Annotations	Unit of measurement specified as an enum. This should be used for defining the type value's units. If the proper enum is not listed, please use the UnitDesc field to specify

	the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.
Type	EnergyUnitEnumType
Properties	use: optional
Facets	enumeration: BTU enumeration: Joules enumeration: KilowattHours enumeration: Therms
Used by	Complex Type: EnergyType
Source	<xs:attribute name="Unit" type="EnergyUnitEnumType" use="optional"> <xs:annotation> <xs:documentation>Unit of measurement specified as an enum. This should be used for defining the type value's units. If the proper enum is not listed, please use the UnitDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.</xs:documentation> </xs:annotation> </xs:attribute>

Attribute EnergyType / @UnitDesc

Namespace	No namespace
Annotations	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.
Type	xs:string
Properties	content: simple
Used by	Complex Type: EnergyType
Source	<xs:attribute name="UnitDesc" type="xs:string"> <xs:annotation> <xs:documentation>Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.</xs:documentation> </xs:annotation> </xs:attribute>

Attribute EnergyType / @Fuel

Namespace	No namespace
Annotations	Fuel type specified as an enum. This should be used for defining the type value's fuel. If the proper enum is not listed, please use the FuelDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.
Type	EnergyClassEnumType
Properties	use: optional
Facets	enumeration: Coal (anthracite) enumeration: Coal (bituminous) enumeration: Coke enumeration: Diesel enumeration: District Chilled Water enumeration: District Hot Water enumeration: District Steam enumeration: Electricity enumeration: Fuel Oil (No. 1) — Number 1 is similar to kerosene and is the fraction that boils off right after gasoline.

	enumeration	Fuel Oil (No. 2)	
	enumeration	Fuel Oil (No. 4)	Number 4 fuel oil is usually a blend of distillate and residual fuel oils, such as No. 2 and 6; however, sometimes it is just a heavy distillate. No. 4 may be classified as diesel, distillate or residual fuel oil.
	enumeration	Fuel Oil (No. 5 and No. 6)	Number 5 fuel oil and Number 6 fuel oil are called residual fuel oils (RFO) or heavy fuel oils. More Number 6 oil is produced compared to Number 5 oil, the terms heavy fuel oil and residual fuel oil are sometimes used as names for Number 6. Number 5 and 6 are what remains of the crude oil after gasoline and the distillate fuel oils are extracted through distillation. Number 5 fuel oil is a mixture of 75-80 % Number 6 oil and 25-20% of Number 2 oil. Number 6 oil may also contain a small amount of No. 2 to get it to meet specifications.
	enumeration	Geothermal	
	enumeration	Kerosene	
	enumeration	Liquid Propane	
	enumeration	Natural Gas	
	enumeration	Other	
	enumeration	Propane	
	enumeration	Steam	
	enumeration	Wood	
Used by	Complex Type	EnergyType	
Source	`<xs:attribute name="Fuel" type="EnergyClassEnumType" use="optional"> <xs:annotation> <xs:documentation>Fuel type specified as an enum. This should be used for defining the type value's fuel. If the proper enum is not listed, please use the FuelDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.</xs:documentation> </xs:annotation> </xs:attribute>`		

Attribute EnergyType / @FuelDesc

Namespace	No namespace	
Annotations	FuelType specified as a string. This should be used for defining the type value's fuel if the proper enum is not listed in Fuel. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.	
Type	xs:string	
Properties	content:	simple
Used by	Complex Type	EnergyType
Source	`<xs:attribute name="FuelDesc" type="xs:string"> <xs:annotation> <xs:documentation>FuelType specified as a string. This should be used for defining the type value's fuel if the proper enum is not listed in Fuel. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.</ xs:documentation> </xs:annotation> </xs:attribute>`	

Attribute EnergyConsumptionType / @RevenueMeterIdRef

Namespace	No namespace	
Annotations	A reference to a an optionally defined meter in the UtilityService XSD. When benchmarking, a consumed quantity of energy must be associated to a defined revenue meter.	
Type	xs:IDREF	
Properties	content:	simple

Used by	Complex Type EnergyConsumptionType
Source	<xs:attribute name="RevenueMeterIdRef" type="xs:IDREF"> <xs:annotation> <xs:documentation>A reference to a an optionally defined meter in the UtilityService XSD. When benchmarking, a consumed quantity of energy must be associated to a defined revenue meter.</xs:documentation> </xs:annotation> </xs:attribute>

Attribute EnergyServiceType / @RevenueMeterIdRef

Namespace	No namespace
Annotations	When UtilityService is used within a Project.xsd, this attribute can reference a defined meter instance in the ElectricalDistributionHierarchy, or within a PvSystem.
Type	xs:IDREF
Properties	content: simple
Used by	Complex Type EnergyServiceType
Source	<xs:attribute name="RevenueMeterIdRef" type="xs:IDREF"> <xs:annotation> <xs:documentation>When UtilityService is used within a Project.xsd, this attribute can reference a defined meter instance in the ElectricalDistributionHierarchy, or within a PvSystem.</xs:documentation> </xs:annotation> </xs:attribute>

Attribute AreaType / @Unit

Namespace	No namespace
Annotations	Unit of measurement.
Type	AreaUnitEnumType
Properties	use: optional default: SquareMeters
Facets	enumeration SquareCentimeters enumeration SquareFeet enumeration SquareInches enumeration SquareKilometers enumeration SquareMeters enumeration SquareMiles enumeration SquareMillimeters enumeration SquareYards
Used by	Complex Type AreaType
Source	<xs:attribute name="Unit" type="AreaUnitEnumType" use="optional" default="SquareMeters"> <xs:annotation> <xs:documentation>Unit of measurement.</xs:documentation> </xs:annotation> </xs:attribute>

Attribute SpaceType / @id

Namespace	No namespace
Type	xs:ID
Properties	content: simple
Used by	Complex Type SpaceType
Source	<xs:attribute name="id" type="xs:ID"/>

Attribute DimensionType / @Unit

Namespace	No namespace
Annotations	Unit of measurement.

Type	DimensionUnitEnumType	
Properties	use:	optional
	default:	Meters
Facets	enumeration	Centimeters
	enumeration	Feet
	enumeration	Inches
	enumeration	Kilometers
	enumeration	Meters
	enumeration	Miles
	enumeration	Millimeters
	enumeration	Yards
Used by	Complex Type	DimensionType
Source	<xs:attribute name="Unit" type="DimensionUnitEnumType" use="optional" default="Meters"> <xs:annotation> <xs:documentation>Unit of measurement.</xs:documentation> </xs:annotation> </xs:attribute>	

Attribute AtticType / @id

Namespace	No namespace	
Type	xs:IDREF	
Properties	content:	simple
Used by	Complex Type	AtticType
Source	<xs:attribute name="id" type="xs:IDREF"/>	

Attribute CeilingType / @id

Namespace	No namespace	
Type	xs:IDREF	
Properties	content:	simple
Used by	Complex Type	CeilingType
Source	<xs:attribute name="id" type="xs:IDREF"/>	

Attribute DoorType / @UFactor

Namespace	No namespace	
Type	xs:double	
Properties	use:	required
Used by	Complex Type	DoorType
Source	<xs:attribute name="UFactor" use="required" type="xs:double"/>	

Attribute DoorType / @id

Namespace	No namespace	
Type	xs:IDREF	
Properties	content:	simple
Used by	Complex Type	DoorType
Source	<xs:attribute name="id" type="xs:IDREF"/>	

Attribute FenestrationType / @id

Namespace	No namespace

Type	xs:IDREF
Properties	content: simple
Used by	Complex Type FenestrationType
Source	`<xs:attribute name="id" type="xs:IDREF"/>`

Attribute FoundationType / @id

Namespace	No namespace
Type	xs:IDREF
Properties	content: simple
Used by	Complex Type FoundationType
Source	`<xs:attribute name="id" type="xs:IDREF"/>`

Attribute GarageType / @id

Namespace	No namespace
Type	xs:IDREF
Properties	content: simple
Used by	Complex Type GarageType
Source	`<xs:attribute name="id" type="xs:IDREF"/>`

Attribute RoofPlaneType / @id

Namespace	No namespace
Annotations	Unique identifier for this layout plane.
Type	xs:ID
Properties	use: required
Used by	Complex Type RoofPlaneType

Source	`<xs:attribute name="id" type="xs:ID" use="required">`
	`  <xs:annotation>`
	`  <xs:documentation>Unique identifier for this layout plane.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:attribute>`

Attribute RoofType / @id

Namespace	No namespace
Type	xs:IDREF
Properties	content: simple
Used by	Complex Type RoofType
Source	`<xs:attribute name="id" type="xs:IDREF"/>`

Attribute WallType / @id

Namespace	No namespace
Type	xs:IDREF
Properties	content: simple
Used by	Complex Type WallType
Source	`<xs:attribute name="id" type="xs:IDREF"/>`

Attribute WindowType / @id

Namespace	No namespace

Type	xs:IDREF
Properties	content: simple
Used by	Complex Type WindowType
Source	`<xs:attribute name="id" type="xs:IDREF"/>`

Attribute FlowType / @Unit

Namespace	No namespace
Annotations	Unit of measurement.
Type	FlowUnitEnumType
Properties	use: optional
Facets	enumeration CFM enumeration CubicMPerHr enumeration CubicMPerMin enumeration GPH enumeration GPM enumeration LPerSec
Used by	Complex Type FlowType

Source	`<xs:attribute name="Unit" type="FlowUnitEnumType" use="optional">`
	`  <xs:annotation>`
	`  <xs:documentation>Unit of measurement.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:attribute>`

Attribute PressureType / @Unit

Namespace	No namespace
Annotations	Unit of measurement.
Type	PressureUnitEnumType
Properties	use: optional
Facets	enumeration Atmospheres enumeration CentimetersOfH2O enumeration CentimetersOfMercury enumeration InchesOfH2O enumeration InchesOfMercury enumeration kPa kiloPascals enumeration MillimetersOfMercury enumeration Pascals enumeration PSI Pounds per Square Inch
Used by	Complex Type PressureType

Source	`<xs:attribute name="Unit" type="PressureUnitEnumType" use="optional">`
	`  <xs:annotation>`
	`  <xs:documentation>Unit of measurement.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:attribute>`

Attribute EnvelopeType / @id

Namespace	No namespace
Type	xs:ID
Properties	content: simple
Used by	Complex Type EnvelopeType

Source	<xs:attribute name="id" type="xs:ID"/>

Attribute PowerType / @TestCondition

Namespace	No namespace	
Annotations	The "rating" or list of conditions at which the power was tested.	
Type	xs:string	
Properties	use:	optional
Used by	Complex Type	PowerType
Source	<xs:attribute name="TestCondition" type="xs:string" use="optional"> <xs:annotation> <xs:documentation>The "rating" or list of conditions at which the power was tested.</xs:documentation> </xs:annotation> </xs:attribute>	

Attribute PowerType / @Unit

Namespace	No namespace	
Annotations	Unit of measurement specified as an enum. This should be used for defining the type value's units. If the proper enum is not listed, please use the UnitDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.	
Type	PowerUnitEnumType	
Properties	use:	optional
Facets	enumeration	BtuPerHour
	enumeration	BtuPerSecond
	enumeration	Candela
	enumeration	Footcandle
	enumeration	FootPoundForcePerSecond
	enumeration	Horsepower
	enumeration	KilocaloriesPerSecond
	enumeration	KilogramForceMeterPerSecond
	enumeration	Kilowatt
	enumeration	Lumen
	enumeration	Watt
Used by	Complex Type	PowerType
Source	<xs:attribute name="Unit" type="PowerUnitEnumType" use="optional"> <xs:annotation> <xs:documentation>Unit of measurement specified as an enum. This should be used for defining the type value's units. If the proper enum is not listed, please use the UnitDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.</xs:documentation> </xs:annotation> </xs:attribute>	

Attribute PowerType / @UnitDesc

Namespace	No namespace	
Annotations	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.	
Type	xs:string	
Properties	default:	kwh
Used by	Complex Type	PowerType

Source	<xs:attribute default="kwh" name="UnitDesc" type="xs:string"> <xs:annotation> <xs:documentation>Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.</xs:documentation> </xs:annotation> </xs:attribute>

Attribute PowerType / @Fuel

Namespace	No namespace		
Annotations	Fuel type specified as an enum. This should be used for defining the type value's fuel. If the proper enum is not listed, please use the FuelDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.		
Type	EnergyClassEnumType		
Properties	use:	optional	
	default:	Electricity	
Facets	enumeration	Coal (anthracite)	
	enumeration	Coal (bituminous)	
	enumeration	Coke	
	enumeration	Diesel	
	enumeration	District Chilled Water	
	enumeration	District Hot Water	
	enumeration	District Steam	
	enumeration	Electricity	
	enumeration	Fuel Oil (No. 1)	Number 1 is similar to kerosene and is the fraction that boils off right after gasoline.
	enumeration	Fuel Oil (No. 2)	
	enumeration	Fuel Oil (No. 4)	Number 4 fuel oil is usually a blend of distillate and residual fuel oils, such as No. 2 and 6; however, sometimes it is just a heavy distillate. No. 4 may be classified as diesel, distillate or residual fuel oil.
	enumeration	Fuel Oil (No. 5 and No. 6)	Number 5 fuel oil and Number 6 fuel oil are called residual fuel oils (RFO) or heavy fuel oils. More Number 6 oil is produced compared to Number 5 oil, the terms heavy fuel oil and residual fuel oil are sometimes used as names for Number 6. Number 5 and 6 are what remains of the crude oil after gasoline and the distillate fuel oils are extracted through distillation. Number 5 fuel oil is a mixture of 75-80 % Number 6 oil and 25-20% of Number 2 oil. Number 6 oil may also contain a small amount of No. 2 to get it to meet specifications.
	enumeration	Geothermal	
	enumeration	Kerosene	
	enumeration	Liquid Propane	
	enumeration	Natural Gas	
	enumeration	Other	
	enumeration	Propane	
	enumeration	Steam	
	enumeration	Wood	
Used by	Complex Type	PowerType	
Source	<xs:attribute name="Fuel" type="EnergyClassEnumType" use="optional" default="Electricity"> <xs:annotation>		

```
    <xs:documentation>Fuel type specified as an enum. This should be used for defining the
 type value's fuel. If the proper enum is not listed, please use the FuelDesc field to
 specify the units. These are all optional attributes in order to allow for a simplified
 value descriptions since these are used throughout the IEP schemas. Additionally the
 FuelDesc may contain a default type.</xs:documentation>
  </xs:annotation>
</xs:attribute>
```

Attribute `PowerType / @FuelDesc`

Namespace	No namespace
Annotations	`FuelType specified as a string. This should be used for defining the type value's fuel if the proper enum is not listed in Fuel. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the FuelDesc may contain a default type.`
Type	xs:string
Properties	default: `Electricity`
Used by	Complex Type PowerType
Source	

```
<xs:attribute default="Electricity" name="FuelDesc" type="xs:string">
  <xs:annotation>
    <xs:documentation>FuelType specified as a string. This should be used for defining
 the type value's fuel if the proper enum is not listed in Fuel. These are all optional
 attributes in order to allow for a simplified value descriptions since these are used
 throughout the IEP schemas. Additionally the FuelDesc may contain a default type.</
xs:documentation>
  </xs:annotation>
</xs:attribute>
```

Attribute `YearScheduleType / WeekScheduleId / @weekScheduleIdRef`

Namespace	No namespace
Type	xs:IDREF
Properties	use: `required`
Used by	Element YearScheduleType/WeekScheduleId
Source	

```
<xs:attribute name="weekScheduleIdRef" type="xs:IDREF" use="required"/>
```

Attribute `YearScheduleType / @id`

Namespace	No namespace
Type	xs:ID
Properties	use: `required`
Used by	Complex Type YearScheduleType
Source	

```
<xs:attribute name="id" use="required" type="xs:ID"/>
```

Attribute `ScheduleType / @id`

Namespace	No namespace
Type	xs:ID
Properties	use: `required`
Used by	Complex Type ScheduleType
Source	

```
<xs:attribute name="id" use="required" type="xs:ID"/>
```

Attribute `ScheduleType / @type`

Namespace	No namespace	
Type	scheduleEnumType	
Properties	use: `required`	
Facets	enumeration `Temp`	`This defines the a set temperature for a heating or cooling system`

	enumeration	Fraction	Defines the fraction of use. Typically used for lighting and occupancy
	enumeration	OnOff	Used for schedules for fans and heating and cooling availability
Used by	Complex Type	ScheduleType	
Source	<xs:attribute name="type" use="required" type="scheduleEnumType"/>		

Attribute ZoneType / @id

Namespace	No namespace	
Type	xs:ID	
Properties	use:	optional
Used by	Complex Type	ZoneType
Source	<xs:attribute name="id" type="xs:ID" use="optional"/>	

Attribute BuildingType / @id

Namespace	No namespace	
Type	xs:ID	
Properties	content:	simple
Used by	Complex Type	BuildingType
Source	<xs:attribute name="id" type="xs:ID"/>	

Attribute GroundAreaType / @id

Namespace	No namespace	
Type	xs:ID	
Properties	content:	simple
Used by	Complex Type	GroundAreaType
Source	<xs:attribute name="id" type="xs:ID"/>	

Attribute WirewaySegmentType / @id

Namespace	No namespace	
Type	xs:ID	
Properties	use:	required
Used by	Complex Type	WirewaySegmentType
Source	<xs:attribute name="id" type="xs:ID" use="required"/>	

Attribute WirewaySegmentType / @EquipmentDefinitionIdRef

Namespace	No namespace
Annotations	If the WirewaySegment is a junction box or disconnect switch, this refers to its EquipmentDefinition. A WirewayBox may be a pass through where multiple ConduitSegments are combined into a single ConduitSegment for example. A disconnect switch box may also be modeled as a WirewayBox, provided that the circuit(s) involved are simply disoconnected and not combined in any way. DO NOT use WirewayBox to represent a combiner, or distribution panel.
Type	xs:IDREF
Properties	content: simple
Used by	Complex Type WirewaySegmentType
Source	<xs:attribute name="EquipmentDefinitionIdRef" type="xs:IDREF"> <xs:annotation> <xs:documentation>If the WirewaySegment is a junction box or disconnect switch, this refers to its EquipmentDefinition. A WirewayBox may be a pass through where multiple ConduitSegments are combined into a single ConduitSegment for example. A disconnect

	switch box may also be modeled as a WirewayBox, provided that the circuit(s) involved are simply disoconnected and not combined in any way. DO NOT use WirewayBox to represent a combiner, or distribution panel.</xs:documentation> </xs:annotation> </xs:attribute>

Attribute SiteType / @id

Namespace	No namespace	
Type	xs:ID	
Properties	content:	simple
Used by	Complex Type	SiteType
Source	<xs:attribute name="id" type="xs:ID"/>	

Attribute DayScheduleType / @id

Namespace	No namespace	
Type	xs:ID	
Properties	use:	required
Used by	Complex Type	DayScheduleType
Source	<xs:attribute name="id" use="required" type="xs:ID"/>	

Attribute DayScheduleType / @type

Namespace	No namespace	
Type	scheduleEnumType	
Properties	use:	required
Facets	enumeration	Temp — This defines the a set temperature for a heating or cooling system
	enumeration	Fraction — Defines the fraction of use. Typically used for lighting and occupancy
	enumeration	OnOff — Used for schedules for fans and heating and cooling availability
Used by	Complex Type	DayScheduleType
Source	<xs:attribute name="type" use="required" type="scheduleEnumType"/>	

Attribute Day / @dayScheduleIdRef

Namespace	No namespace
Annotations	ID for operation schedules
Type	xs:IDREF
Properties	use: required
Used by	Element Day
Source	<xs:attribute name="dayScheduleIdRef" type="xs:IDREF" use="required"> <xs:annotation> <xs:documentation>ID for operation schedules</xs:documentation> </xs:annotation> </xs:attribute>

Attribute Day / @dayType

Namespace	No namespace	
Type	dayTypeEnum	
Properties	use:	required
Facets	enumeration	Weekday
	enumeration	Weekend

	enumeration	Holiday
	enumeration	WeekendOrHoliday
	enumeration	HeatingDesignDay
	enumeration	CoolingDesignDay
	enumeration	Sun
	enumeration	Mon
	enumeration	Tue
	enumeration	Wed
	enumeration	Thu
	enumeration	Fri
	enumeration	Sat
	enumeration	All
Used by	Element	Day
Source	<xs:attribute name="dayType" type="dayTypeEnum" use="required"/>	

Attribute WeekScheduleType / @id

Namespace	No namespace	
Type	xs:ID	
Properties	use:	required
Used by	Complex Type	WeekScheduleType
Source	<xs:attribute name="id" use="required" type="xs:ID"/>	

Attribute WeekScheduleType / @type

Namespace	No namespace		
Type	scheduleEnumType		
Properties	use:	required	
Facets	enumeration	Temp	This defines the a set temperature for a heating or cooling system
	enumeration	Fraction	Defines the fraction of use. Typically used for lighting and occupancy
	enumeration	OnOff	Used for schedules for fans and heating and cooling availability
Used by	Complex Type	WeekScheduleType	
Source	<xs:attribute name="type" use="required" type="scheduleEnumType"/>		

Attribute EquipmentDefinitionType / @id

Namespace	No namespace	
Type	xs:ID	
Properties	use:	required
Used by	Complex Type	EquipmentDefinitionType
Source	<xs:attribute name="id" type="xs:ID" use="required"/>	

Attribute EquipmentInstanceType / @id

Namespace	No namespace	
Type	xs:ID	
Properties	use:	required
Used by	Complex Type	EquipmentInstanceType
Source	<xs:attribute name="id" type="xs:ID" use="required"/>	

Attribute EquipmentInstanceType / @EquipmentDefinitionIdRef

Namespace	No namespace
Annotations	ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.
Type	xs:IDREF
Properties	use: required
Used by	Complex Type EquipmentInstanceType
Source	<xs:attribute name="EquipmentDefinitionIdRef" type="xs:IDREF" use="required"> <xs:annotation> <xs:documentation>ID Ref of the associated equipment definition for this equipment instance. For example, in case of a PVModule, this would be the ID of the PvModuleDefinition element that describes this particular PV module instance.</xs:documentation> </xs:annotation> </xs:attribute>

Attribute EfficiencyType / @Unit

Namespace	No namespace		
Annotations	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.		
Type	EfficiencyUnitEnumType		
Properties	use: optional		
Facets	enumeration	AFUE	The annual fuel utilization efficiency (AFUE; pronounced 'A'-'Few') is a thermal efficiency measure of combustion equipment like furnaces, boilers, and water heaters. The AFUE differs from the true 'thermal efficiency' in that it is not a steady-state, peak measure of conversion efficiency, but instead attempts to represent the actual, season-long, average efficiency of that piece of equipment, including the operating transients.
	enumeration	BoilerEff	???
	enumeration	COP	The coefficient of performance or COP (sometimes CP), of a heat pump is the ratio of the change in heat at the "output" (the heat reservoir of interest) to the supplied work.
	enumeration	EER	The Energy Efficiency Ratio (EER) of a particular cooling device is the ratio of output cooling (in Btu/hr) to input electrical power (in Watts) at a given operating point (indoor and outdoor temperature and humidity conditions). The EER is related to the coefficient of performance (COP) commonly used in thermodynamics, with the primary difference being that the COP of a cooling device is unit-less: the cooling load and the electrical power needed to run the device are both measured using the same units, e.g. watts.
	enumeration	effectiveness	???
	enumeration	EnergyFactor	"Energy Factor is the ratio of useful energy output from the water heater to the total amount of energy delivered to the water heater. The higher the EF is, the more efficient the water heater." - http://www.energystar.gov/index.cfm?c=water_heat.pr_crit_water_heaters "Energy Factor is a metric that was previously used to compare relative efficiencies of clothes washers. The higher the Energy Factor is, the more efficient

			the clothes washer is. For clothes washers, Energy Factor is calculated using the following formula:[2]" Energy Factor = 392 x Volume (ft^3) / Annual Energy Usage (kWh) - http://www.energystar.gov/index.cfm?fuseaction=clotheswash.display_column_definitions
	enumeration	FanEff	is this Specific Fan power?
	enumeration	HSPF	HSPF (Heating Seasonal Performance Factor) is a term used in the heating and cooling industry. HSPF is specifically used to measure the efficiency of air source heat pumps. The efficiency of air conditioners are often rated by the Heating Seasonal Performance Factor (HSPF) as defined by the Air Conditioning, Heating, and Refrigeration Institute in its standard 210/240 Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment last updated in 2008.
	enumeration	kWPerkW	???
	enumeration	kWPerTon	kiloWatts per Ton - power to weight ratio of an engine
	enumeration	LumensPerWatt	The ratio of luminous flux in lumens to power measured in watts.
	enumeration	MechanicalEff	???
	enumeration	MotorEff	???
	enumeration	SEER	The Seasonal Energy Efficiency Ratio (SEER) has the same units of Btu/W·hr, but instead of being evaluated at a single operating condition, it represents the expected overall performance for a typical year's weather in a given location.
	enumeration	ThermalEff	In thermodynamics, the thermal efficiency is a dimensionless performance measure of a device that uses thermal energy, such as a boiler, a furnace, or a refrigerator.
Used by	Complex Type	EfficiencyType	
Source	<xs:attribute name="Unit" type="EfficiencyUnitEnumType" use="optional"> <xs:annotation> <xs:documentation>Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.</xs:documentation> </xs:annotation> </xs:attribute>		

Attribute `EfficiencyType / @UnitDesc`

Namespace	No namespace	
Annotations	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.	
Type	xs:string	
Properties	content:	simple
Used by	Complex Type	EfficiencyType
Source	<xs:attribute name="UnitDesc" type="xs:string"> <xs:annotation> <xs:documentation>Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.</xs:documentation> </xs:annotation> </xs:attribute>	

Attribute `EfficiencyType / @TestCondition`

Namespace	No namespace		
Annotations	This represents the operating conditions (typically certified test conditons or full load) at which the efficiency is realized. Note that at other conditions, the efficiency may be a different value.		
Type	TestConditionEnumType		
Properties	use:	optional	
Facets	enumeration	AHRI	Air-Conditioning, Heating and Refrigeration Institute
	enumeration	Full Load	
	enumeration	NEMA	National Electrical Manufacturers Association
	enumeration	PTC	???
	enumeration	STC	???
Used by	Complex Type	EfficiencyType	
Source	<xs:attribute name="TestCondition" type="TestConditionEnumType" use="optional"> <xs:annotation> <xs:documentation>This represents the operating conditions (typically certified test conditons or full load) at which the efficiency is realized. Note that at other conditions, the efficiency may be a different value.</xs:documentation> </xs:annotation> </xs:attribute>		

Attribute `PrimeMoverSystemType / @id`

Namespace	No namespace	
Type	xs:ID	
Properties	content:	simple
Used by	Complex Type	PrimeMoverSystemType
Source	<xs:attribute name="id" type="xs:ID"/>	

Attribute `DistributionSegmentType / @id`

Namespace	No namespace	
Type	xs:ID	
Properties	content:	simple
Used by	Complex Type	DistributionSegmentType
Source	<xs:attribute name="id" type="xs:ID"/>	

Attribute `DistributionSystemType / @id`

Namespace	No namespace	
Type	xs:ID	
Properties	content:	simple
Used by	Complex Type	DistributionSystemType
Source	<xs:attribute name="id" type="xs:ID"/>	

Attribute `ConductorSegmentType / @id`

Namespace	No namespace	
Type	xs:ID	
Properties	use:	required
Used by	Complex Type	ConductorSegmentType
Source	<xs:attribute name="id" use="required" type="xs:ID"/>	

Attribute CircuitConnectionConductorType / SecondaryConductorSegment / @ConnectsToConductorSegmentId

Namespace	No namespace
Type	xs:IDREF
Properties	use: required
Used by	Element CircuitConnectionConductorType/SecondaryConductorSegment
Source	`<xs:attribute name="ConnectsToConductorSegmentId" type="xs:IDREF" use="required"/>`

Attribute CircuitConnectionConductorType / SecondaryConductorSegment / @WirewaySegmentWhereConnectedId

Namespace	No namespace
Type	xs:IDREF
Properties	use: required
Used by	Element CircuitConnectionConductorType/SecondaryConductorSegment
Source	`<xs:attribute name="WirewaySegmentWhereConnectedId" type="xs:IDREF" use="required"/>`

Attribute CircuitConnectionType / IncludesDisconnect / @WirewayBoxIdRef

Namespace	No namespace
Annotations	Reference to an instance of the DisconnectSwitch modeled generally as a WirewayBox. A disconnect switch can switch more than one CircuitConnection, so it is defined external to the CircuitConnection.
Type	xs:IDREF
Properties	use: required
Used by	Element CircuitConnectionType/IncludesDisconnect

Source	`<xs:attribute name="WirewayBoxIdRef" type="xs:IDREF" use="required">`
	`  <xs:annotation>`
	`  <xs:documentation>Reference to an instance of the DisconnectSwitch modeled generally as a WirewayBox. A disconnect switch can switch more than one CircuitConnection, so it is defined external to the CircuitConnection.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:attribute>`

Attribute CircuitConnectionType / IncludesDisconnect / @ConductorSegmentIdRef

Namespace	No namespace
Annotations	ConductorSegment that contains the disconnect switch.
Type	xs:IDREF
Properties	use: required
Used by	Element CircuitConnectionType/IncludesDisconnect

Source	`<xs:attribute name="ConductorSegmentIdRef" type="xs:IDREF" use="required">`
	`  <xs:annotation>`
	`  <xs:documentation>ConductorSegment that contains the disconnect switch.</`
	`xs:documentation>`
	`  </xs:annotation>`
	`</xs:attribute>`

Attribute CircuitConnectionType / IncludesStandAloneMeter / @ConductorSegmentIdRef

Namespace	No namespace
Type	xs:IDREF
Properties	content: simple
Used by	Element CircuitConnectionType/IncludesStandAloneMeter
Source	`<xs:attribute name="ConductorSegmentIdRef" type="xs:IDREF"/>`

Attribute `CircuitConnectionType / Ocpd / @EquipmentWhereLocatedIdRef`

Namespace	No namespace
Annotations	The ID referring to the equipment in which the OCPD is installed. In most cases, it is the parent Equipment of the CircuitConnection's immediate parent element. For example, if the CircuitConnection is within a StringInverter element, then the circuit breaker within the ElectricalPanel to which the Inverter connects will most like be the referenced OCPD.
Used by	Element CircuitConnectionType/Ocpd
Source	`<xs:attribute name="EquipmentWhereLocatedIdRef">` `  <xs:annotation>` ` <xs:documentation>The ID referring to the equipment in which the OCPD is installed. In most cases, it is the parent Equipment of the CircuitConnection's immediate parent element. For example, if the CircuitConnection is within a StringInverter element, then the circuit breaker within the ElectricalPanel to which the Inverter connects will most like be the referenced OCPD.</xs:documentation>` ` </xs:annotation>` `</xs:attribute>`

Attribute `CircuitConnectionType / @EquipmentWhereConnectedIdRef`

Namespace	No namespace
Annotations	In cases where the CircuitConnection element is used within an EquipmentInstance that does not have a parent element to which the CircuitConnection is assumed to connect, a reference ID can be used to associate this CircuitConnection to another EquipmentInstance elsewhere in a document instance. For example, a PvSystem may have an AcPointOfConnection that uses a new ElectricalPanel as an AC combiner for more than one Inverter. The new electrical panel can be described by an ElectricalPanel element in the PvDesign (which in turn refers to an ElectricalPanelDefinition element). in the AcPointOfConnection's EquipmentWhereConnected element. That ElectricPanel's EnergizingCircuitConnection element may reference another ElectricPanel in an instance of the Project's ExistingElectricalHierarchy element.
Type	xs:IDREF
Properties	content: simple
Used by	Complex Type CircuitConnectionType
Source	`<xs:attribute name="EquipmentWhereConnectedIdRef" type="xs:IDREF">` `  <xs:annotation>` ` <xs:documentation>In cases where the CircuitConnection element is used within an EquipmentInstance that does not have a parent element to which the CircuitConnection is assumed to connect, a reference ID can be used to associate this CircuitConnection to another EquipmentInstance elsewhere in a document instance. For example, a PvSystem may have an AcPointOfConnection that uses a new ElectricalPanel as an AC combiner for more than one Inverter. The new electrical panel can be described by an ElectricalPanel element in the PvDesign (which in turn refers to an ElectricalPanelDefinition element). in the AcPointOfConnection's EquipmentWhereConnected element. That ElectricPanel's EnergizingCircuitConnection element may reference another ElectricPanel in an instance of the Project's ExistingElectricalHierarchy element.</xs:documentation>` ` </xs:annotation>` `</xs:attribute>`

Attribute `HVACSystemType / @id`

Namespace	No namespace
Type	xs:ID
Properties	content: simple
Used by	Complex Type HVACSystemType
Source	`<xs:attribute form="unqualified" name="id" type="xs:ID"/>`

Attribute `LightingZoneType / @id`

Namespace	No namespace
Type	xs:ID
Properties	content: simple
Used by	Complex Type LightingZoneType
Source	`<xs:attribute name="id" type="xs:ID"/>`

Attribute LightingControlGroupType / @id

Namespace	No namespace
Type	xs:ID
Properties	content: simple
Used by	Complex Type LightingControlGroupType
Source	<xs:attribute name="id" type="xs:ID"/>

Attribute PvArrayType / @Id

Namespace	No namespace
Properties	use: optional
Used by	Complex Type PvArrayType
Source	<xs:attribute name="Id" use="optional"/>

Attribute StringPvArrayType / @PvModuleDefinitionIdRef

Namespace	No namespace
Annotations	ID of the PvModuleDefinition within the PvSystem instance. The PvModuleDefintion describes the make and model of the PV module. The PvArray is assumed to use the same module for the entire array.
Type	xs:IDREF
Properties	use: required
Used by	Complex Type StringPvArrayType
Source	<xs:attribute name="PvModuleDefinitionIdRef" type="xs:IDREF" use="required"> <xs:annotation> <xs:documentation>ID of the PvModuleDefinition within the PvSystem instance. The PvModuleDefintion describes the make and model of the PV module. The PvArray is assumed to use the same module for the entire array.</xs:documentation> </xs:annotation> </xs:attribute>

Attribute AcModulePvArrayType / @PvModuleDefinitionIdRef

Namespace	No namespace
Annotations	ID of the PvModuleDefinition within the PvSystem instance. The PvModuleDefintion describes the make and model of the PV module. The PvArray is assumed to use the same module for the entire array. Note that in case of an AC Module, the PvModuleDefinition and the MicroInverterDefinition may share the same make and model number.
Properties	use: required
Used by	Complex Type AcModulePvArrayType
Source	<xs:attribute name="PvModuleDefinitionIdRef" use="required"> <xs:annotation> <xs:documentation>ID of the PvModuleDefinition within the PvSystem instance. The PvModuleDefintion describes the make and model of the PV module. The PvArray is assumed to use the same module for the entire array. Note that in case of an AC Module, the PvModuleDefinition and the MicroInverterDefinition may share the same make and model number.</xs:documentation> </xs:annotation> </xs:attribute>

Attribute AcModulePvArrayType / @MicroInverterDefinitionIdRef

Namespace	No namespace
Annotations	ID of the InverterDefinition element within the PvSystem instance. The InverterDefintion describes the make and model of the micro-inverter used in all the AC Modules within this array. Note that in case of an AC Module, the PvModuleDefinition and the MicroInverterDefinition may share the same make and model number.

Properties	use:	required
Used by	Complex Type	AcModulePvArrayType
Source	<xs:attribute name="MicroInverterDefinitionIdRef" use="required"> <xs:annotation> <xs:documentation>ID of the InverterDefinition element within the PvSystem instance. The InverterDefintion describes the make and model of the micro-inverter used in all the AC Modules within this array. Note that in case of an AC Module, the PvModuleDefinition and the MicroInverterDefinition may share the same make and model number.</xs:documentation> </xs:annotation> </xs:attribute>	

Attribute VolumeType / @Unit

Namespace	No namespace	
Annotations	Unit of measurement.	
Type	VolumeUnitEnumType	
Properties	use:	optional
Facets	enumeration	CubicCentimeters
	enumeration	CubicFeet
	enumeration	CubicInches
	enumeration	CubicKilometers
	enumeration	CubicMeters
	enumeration	CubicMiles
	enumeration	CubicMillimeters
	enumeration	CubicYards
	enumeration	Gallons
	enumeration	Liters
	enumeration	Foot-Acres
Used by	Complex Type	VolumeType
Source	<xs:attribute name="Unit" type="VolumeUnitEnumType" use="optional"> <xs:annotation> <xs:documentation>Unit of measurement.</xs:documentation> </xs:annotation> </xs:attribute>	

Attribute VolumeType / @UnitDesc

Namespace	No namespace
Annotations	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.
Type	xs:string
Properties	content: simple
Used by	Complex Type VolumeType
Source	<xs:attribute name="UnitDesc" type="xs:string"> <xs:annotation> <xs:documentation>Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.</xs:documentation> </xs:annotation> </xs:attribute>

Attribute TemperatureType / @Unit

Namespace	No namespace
Annotations	Unit of measurement.

Type	TemperatureUnitEnumType		
Properties	use:	optional	
Facets	enumeration	C	Celsius
	enumeration	F	Fahrenheit
	enumeration	K	Kelvin
	enumeration	R	Rankine A thermodynamic (absolute) temperature scale named after the Scottish engineer and physicist William John Macquorn Rankine, who proposed it in 1859.
	enumeration	Re	The Réaumur scale (°Ré, °Re, °R), also known as the "octogesimal division",[1] is a temperature scale in which the freezing and boiling points of water are set to 0 and 80 degrees respectively. The scale is named after René Antoine Ferchault de Réaumur, who first proposed something similar in 1730.[2] AT: why are we including this? Does someone have a use case?
Used by	Complex Type	TemperatureType	
Source	<xs:attribute name="Unit" type="TemperatureUnitEnumType" use="optional"> <xs:annotation> <xs:documentation>Unit of measurement.</xs:documentation> </xs:annotation> </xs:attribute>		

Attribute WaterHeatingSystemType / @id

Namespace	No namespace	
Type	xs:ID	
Properties	use:	optional
Used by	Complex Type	WaterHeatingSystemType
Source	<xs:attribute name="id" type="xs:ID" use="optional"/>	

Attribute EmissionsType / @Unit

Namespace	No namespace	
Annotations	Unit of measurement specified as an enum. This should be used for defining the type value's units. If the proper enum is not listed, please use the UnitDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.	
Type	EmissionsUnitEnumType	
Properties	content:	simple
Facets	enumeration	pounds
	enumeration	tons
	enumeration	kilograms
Used by	Complex Type	EmissionsType
Source	<xs:attribute name="Unit" type="EmissionsUnitEnumType"> <xs:annotation> <xs:documentation>Unit of measurement specified as an enum. This should be used for defining the type value's units. If the proper enum is not listed, please use the UnitDesc field to specify the units. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.</xs:documentation> </xs:annotation> </xs:attribute>	

Attribute EmissionsType / @UnitDesc

Namespace	No namespace

Annotations	Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.
Type	xs:string
Properties	content: simple
Used by	Complex Type EmissionsType
Source	<xs:attribute name="UnitDesc" type="xs:string"> <xs:annotation> <xs:documentation>Unit of measurement specified as a string This should be used for defining the type value's units if the proper enum is not listed in Unit. These are all optional attributes in order to allow for a simplified value descriptions since these are used throughout the IEP schemas. Additionally the UnitDesc may contain a default type.</xs:documentation> </xs:annotation> </xs:attribute>

Attribute EmissionsType / @Emissions

Namespace	No namespace
Type	EmissionsEnumType
Properties	content: simple
Facets	enumeration CO2 enumeration NOX enumeration SOX enumeration Methane
Used by	Complex Type EmissionsType
Source	<xs:attribute name="Emissions" type="EmissionsEnumType"/>

Attribute EmissionsType / @EmissionsDesc

Namespace	No namespace
Type	xs:string
Properties	content: simple
Used by	Complex Type EmissionsType
Source	<xs:attribute name="EmissionsDesc" type="xs:string"/>

Attribute GenericValueType / @Unit

Namespace	No namespace
Type	xs:string
Properties	content: simple
Used by	Complex Type GenericValueType
Source	<xs:attribute name="Unit" type="xs:string"/>

Attribute MeasureType / @id

Namespace	No namespace
Type	xs:ID
Properties	content: simple
Used by	Complex Type MeasureType
Source	<xs:attribute name="id" type="xs:ID"/>

Attribute LineItemType / @id

Namespace	No namespace

Type	xs:IDREF
Properties	use: optional
Used by	Complex Type LineItemType
Source	`<xs:attribute name="id" use="optional" type="xs:IDREF"/>`

Attribute ScopeOfWorkType / @id

Namespace	No namespace
Type	xs:ID
Properties	content: simple
Used by	Complex Type ScopeOfWorkType
Source	`<xs:attribute name="id" type="xs:ID"/>`

Attribute ProjectType / @id

Namespace	No namespace
Type	xs:ID
Properties	content: simple
Used by	Complex Type ProjectType
Source	`<xs:attribute name="id" type="xs:ID"/>`

Attribute AngleType / @Unit

Namespace	No namespace
Annotations	Unit of measurement.
Type	AngularUnitEnumType
Properties	use: optional default: degrees
Facets	enumeration degrees enumeration "in 12" enumeration radians
Used by	Complex Type AngleType

Source	`<xs:attribute name="Unit" type="AngularUnitEnumType" use="optional" default="degrees">`
	`  <xs:annotation>`
	`  <xs:documentation>Unit of measurement.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:attribute>`

Attribute WeightType / @Unit

Namespace	No namespace
Annotations	Unit of measurement.
Type	WeightUnitEnumType
Properties	use: optional
Facets	enumeration Kilograms enumeration Pounds enumeration Tons
Used by	Complex Type WeightType

Source	`<xs:attribute name="Unit" type="WeightUnitEnumType" use="optional">`
	`  <xs:annotation>`
	`  <xs:documentation>Unit of measurement.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:attribute>`

Attribute `VelocityType / @Unit`

Namespace	No namespace	
Annotations	`Unit of measurement.`	
Type	VelocityUnitEnumType	
Properties	use:	`optional`
Facets	enumeration	`FeetPerMinute`
	enumeration	`FeetPerSecond`
	enumeration	`KilometerPerHour`
	enumeration	`Knots`
	enumeration	`MetersPerMinute`
	enumeration	`MetersPerSecond`
	enumeration	`MilesPerHour`
Used by	Complex Type	VelocityType
Source	<xs:attribute name="Unit" type="VelocityUnitEnumType" use="optional"> <xs:annotation> <xs:documentation>Unit of measurement.</xs:documentation> </xs:annotation> </xs:attribute>	

Attribute `DensityType / @Unit`

Namespace	No namespace	
Annotations	`Unit of measurement.`	
Type	DensityUnitEnumType	
Properties	use:	`optional`
Facets	enumeration	`GramsPerCubicCm`
	enumeration	`KgPerCubicM`
	enumeration	`LbsPerCubicFt`
	enumeration	`LbsPerCubicIn`
Used by	Complex Type	DensityType
Source	<xs:attribute name="Unit" type="DensityUnitEnumType" use="optional"> <xs:annotation> <xs:documentation>Unit of measurement.</xs:documentation> </xs:annotation> </xs:attribute>	

Attribute `TimeType / @Unit`

Namespace	No namespace	
Annotations	`Unit of measurement.`	
Type	TimeUnitEnumType	
Properties	use:	`optional`
Facets	enumeration	`Day`
	enumeration	`Hour`
	enumeration	`Minute`
	enumeration	`Month`
	enumeration	`Second`
	enumeration	`Week`
	enumeration	`Year`
Used by	Complex Type	TimeType
Source	<xs:attribute name="Unit" type="TimeUnitEnumType" use="optional"> <xs:annotation> <xs:documentation>Unit of measurement.</xs:documentation>	

```
  </xs:annotation>
</xs:attribute>
```

Attribute DayType / @dayScheduleIdRef

Namespace	No namespace
Annotations	ID for operation schedules
Type	xs:IDREF
Properties	use: required
Used by	Complex Type DayType
Source	<xs:attribute name="dayScheduleIdRef" use="required" type="xs:IDREF"> <xs:annotation> <xs:documentation>ID for operation schedules</xs:documentation> </xs:annotation> </xs:attribute>

Attribute DayType / @dayType

Namespace	No namespace
Type	dayEnumType
Properties	use: required
Facets	enumeration Weekday enumeration Weekend enumeration Holiday enumeration WeekendOrHoliday enumeration HeatingDesignDay enumeration CoolingDesignDay enumeration Sun enumeration Mon enumeration Tue enumeration Wed enumeration Thu enumeration Fri enumeration Sat enumeration All
Used by	Complex Type DayType
Source	<xs:attribute name="dayType" use="required" type="dayEnumType"/>