

Generic AEC/FM View Description

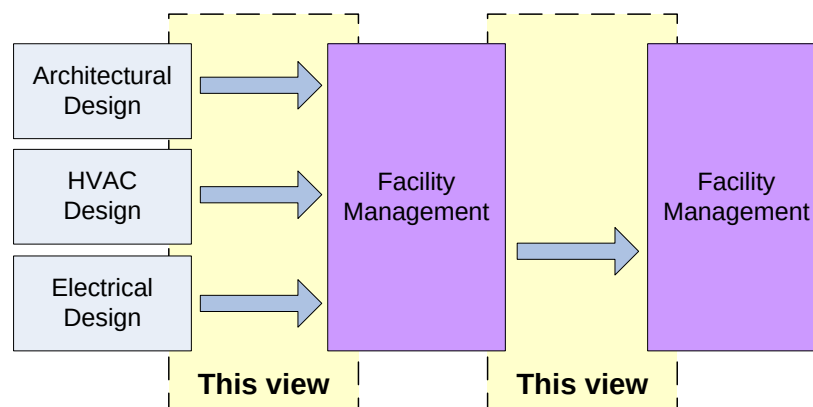
Facility management inventory data take-over

Reference	GSC-010	Version	1	Status	Proposal
History	Based on 'Facility Management Inventory Data' IFC Extension Project FM-10				
Authors	Thomas Liebich (tl@aec3.de)				
Document Owner	buildingSMART German Speaking				

Description

This view defines the complete scope of data exchanged in the combination of the following scenarios

- Architectural design to facility management
- HVAC design to facility management
- Electrical design to facility management
- Transfer from one FM system to another



The scope of the view is limited to alphanumerical information, i.e. no geometry data needs to be exchanged. Software implementing the view may optionally support the exchange of geometry but this is not required. In scope of the view are

- Spatial structure of the project, i.e. the location and spatial hierarchy of the project.
- Doors, windows, furniture, fixtures, HVAC components, electrical components
- Spaces, including surface finishes, space quantity information and properties
- Classification and catalog references for objects and properties of the exchange
- User and organization structures and hierarchies (groups, zones and systems)

The view must satisfy the alphanumeric requirements of the German 'BFR GBestand' specification.

Out of scope is geometry (both 3D and 2D) and building elements (walls, columns, beams, slabs etc.). Catalogues are not included in the data exchange, but the exchange may contain references to catalogs already in use in the industry using keys defined in such catalogues.

The underlying structure of this view is based on the Coordination View, which has already been implemented by most major AEC CAD vendors. This view might be further broken up into two sub views:

- BIM model (architecture, mechanical and plumbing and electrical) to CAFM model,
- CAFM model to CAFM model

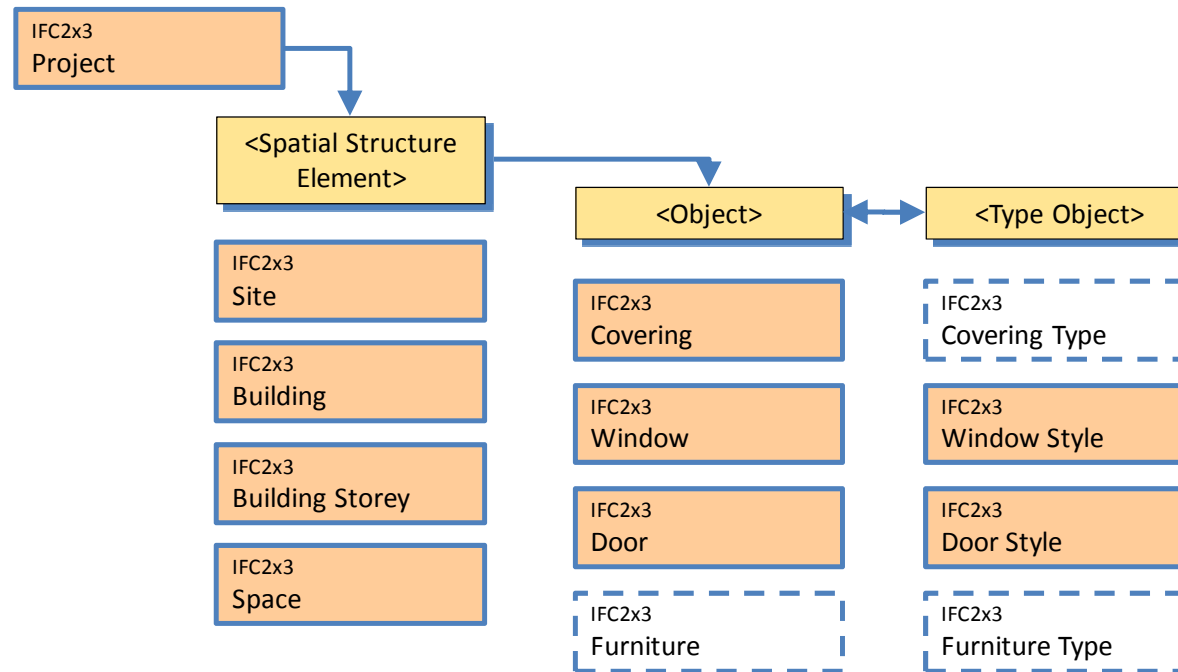


This work has been funded by the German Federal Office for Building and Regional Planning under the research initiative ZukunftBAU. The authors declare own responsibility for the content.

This document uses the official IFC Model View Definition Format version 1.1.0. of the IAI (www.iai-international.org)
The content of this document has to be certified by the IAI before becoming part of an official IFC Model View Definition.

IFC Model View Definition Diagram: **Overview**

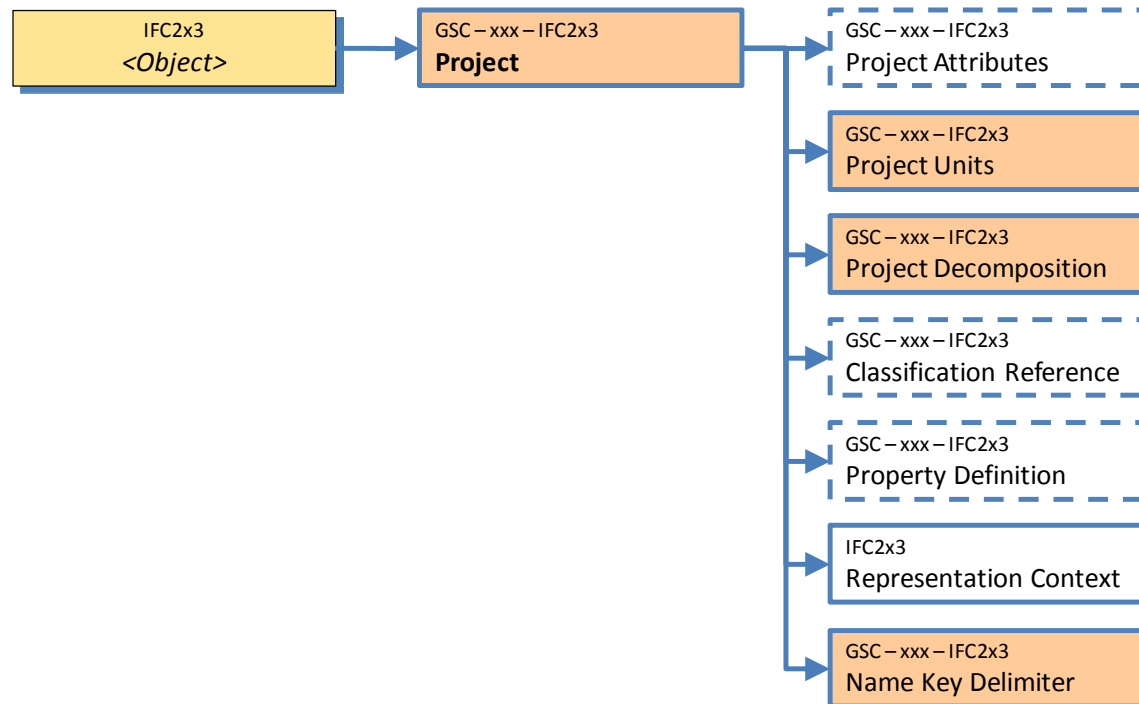
VIEW ID	VIEW NAME	IFC RELEASE	DIAGRAM STATUS	DIAGRAM VERSION	DIAGRAM DATE	DIAGRAM AUTHORS
GSC xxx - Overview	Facility management inventory data take-over	IFC2x3	Proposal	1.0	9 th June, 2008	Matthias Weise (mw@aec3.de)



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IFC Model View Definition Diagram: **Project**

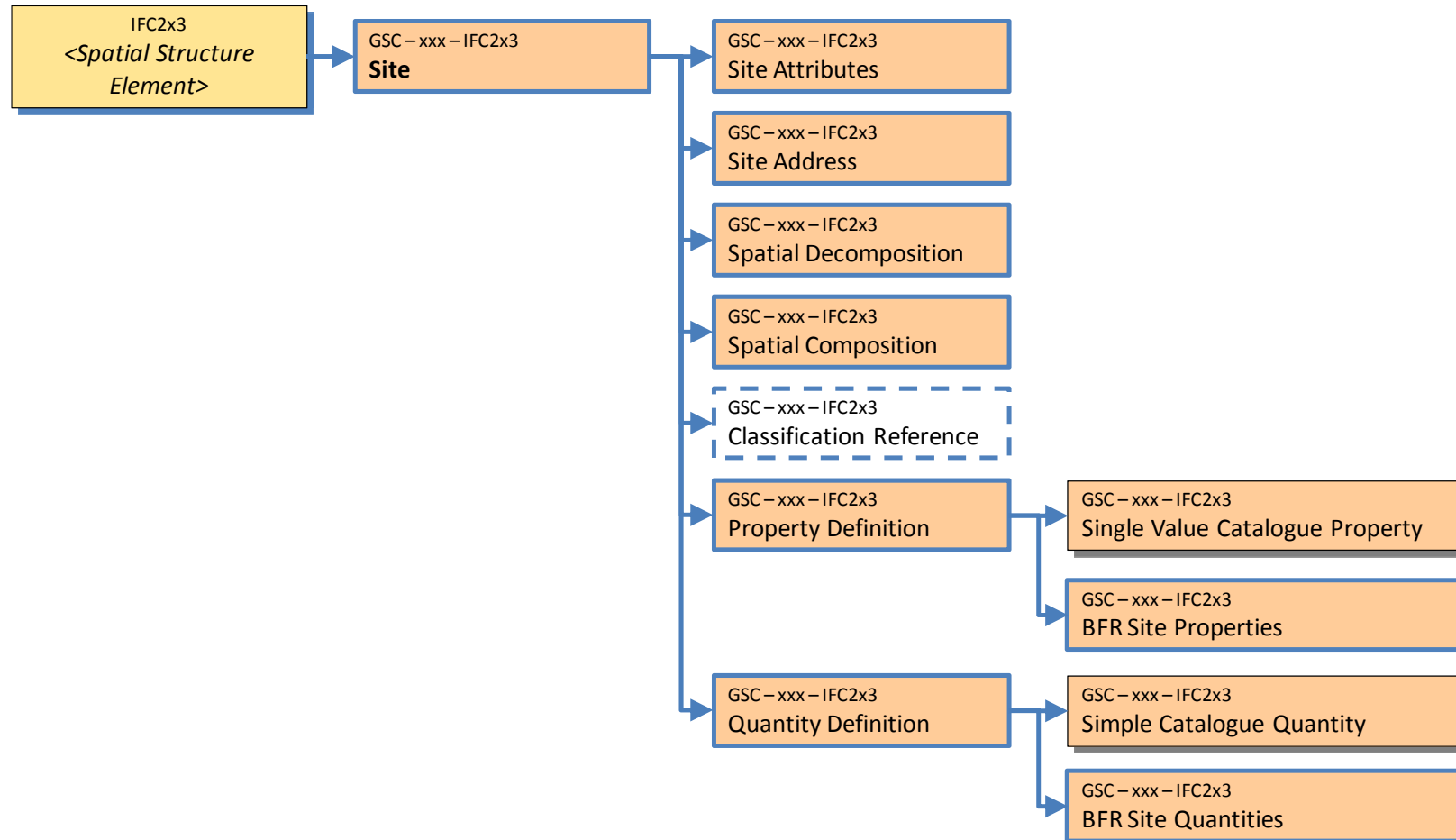
VIEW ID	VIEW NAME	IFC RELEASE	DIAGRAM STATUS	DIAGRAM VERSION	DIAGRAM DATE	DIAGRAM AUTHORS
GSC xxx - Project	Facility management inventory data take-over	IFC2x3	Proposal	1.0	9 th June, 2008	Matthias Weise (mw@aec3.de)



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IFC Model View Definition Diagram: **Site**

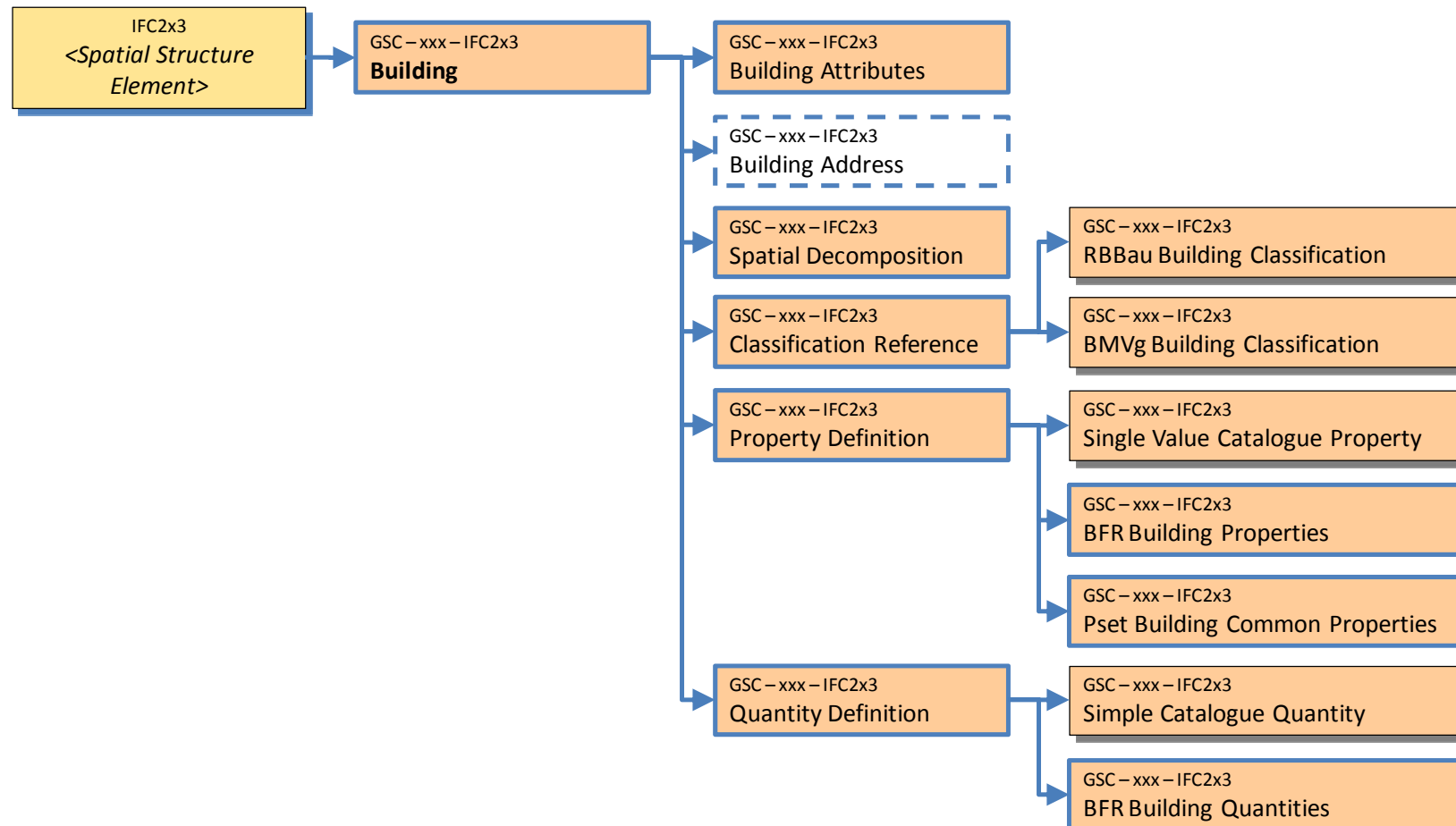
VIEW ID	VIEW NAME	IFC RELEASE	DIAGRAM STATUS	DIAGRAM VERSION	DIAGRAM DATE	DIAGRAM AUTHORS
GSC xxx - Site	Facility management inventory data take-over	IFC2x3	Proposal	1.0	9 th June, 2008	Matthias Weise (mw@aec3.de)



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IFC Model View Definition Diagram: **Building**

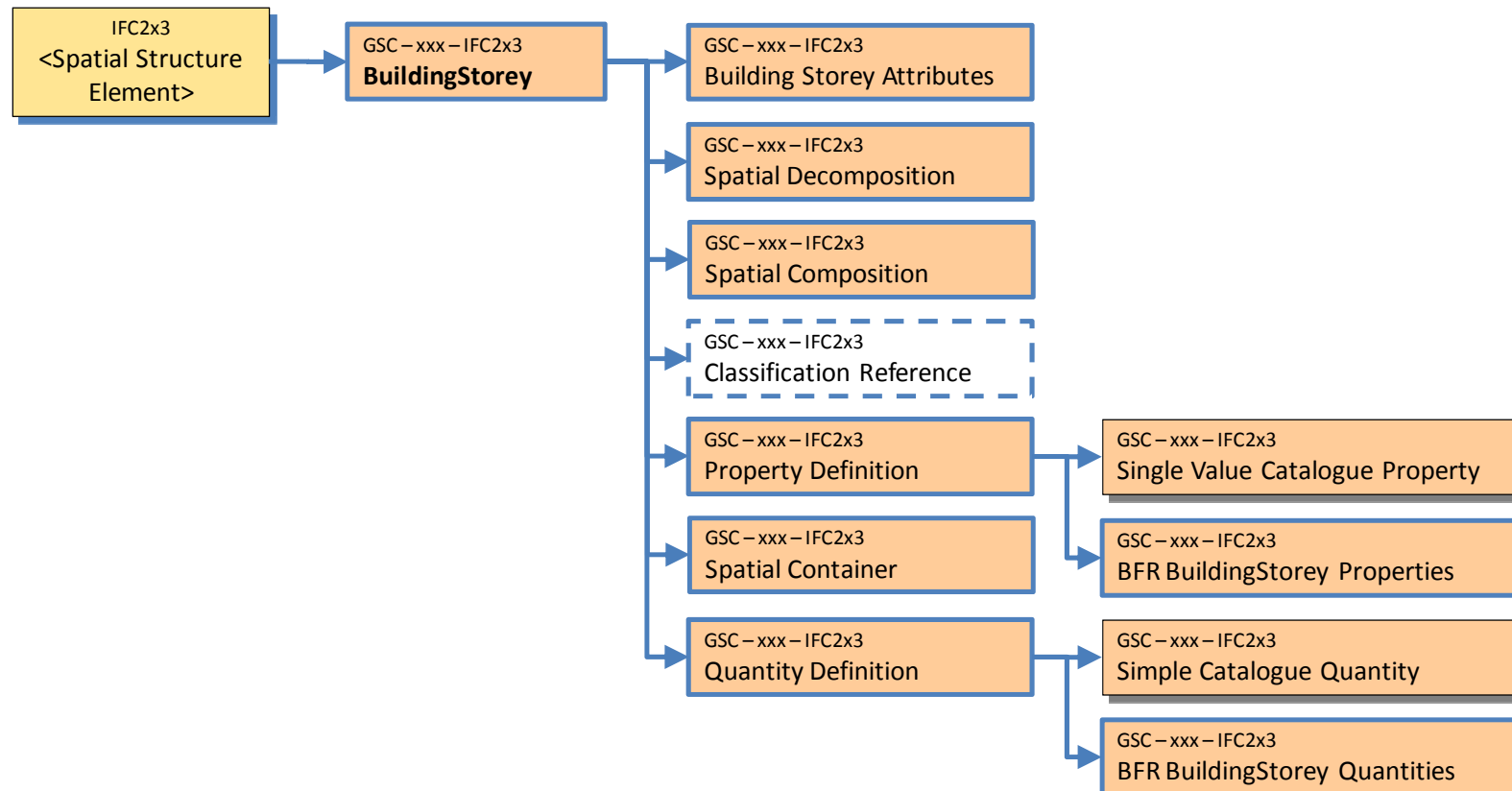
VIEW ID	VIEW NAME	IFC RELEASE	DIAGRAM STATUS	DIAGRAM VERSION	DIAGRAM DATE	DIAGRAM AUTHORS
GSC xxx - Building	Facility management inventory data take-over	IFC2x3	Proposal	1.0	9 th June, 2008	Matthias Weise (mw@aec3.de)



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IFC Model View Definition Diagram: **BuildingStorey**

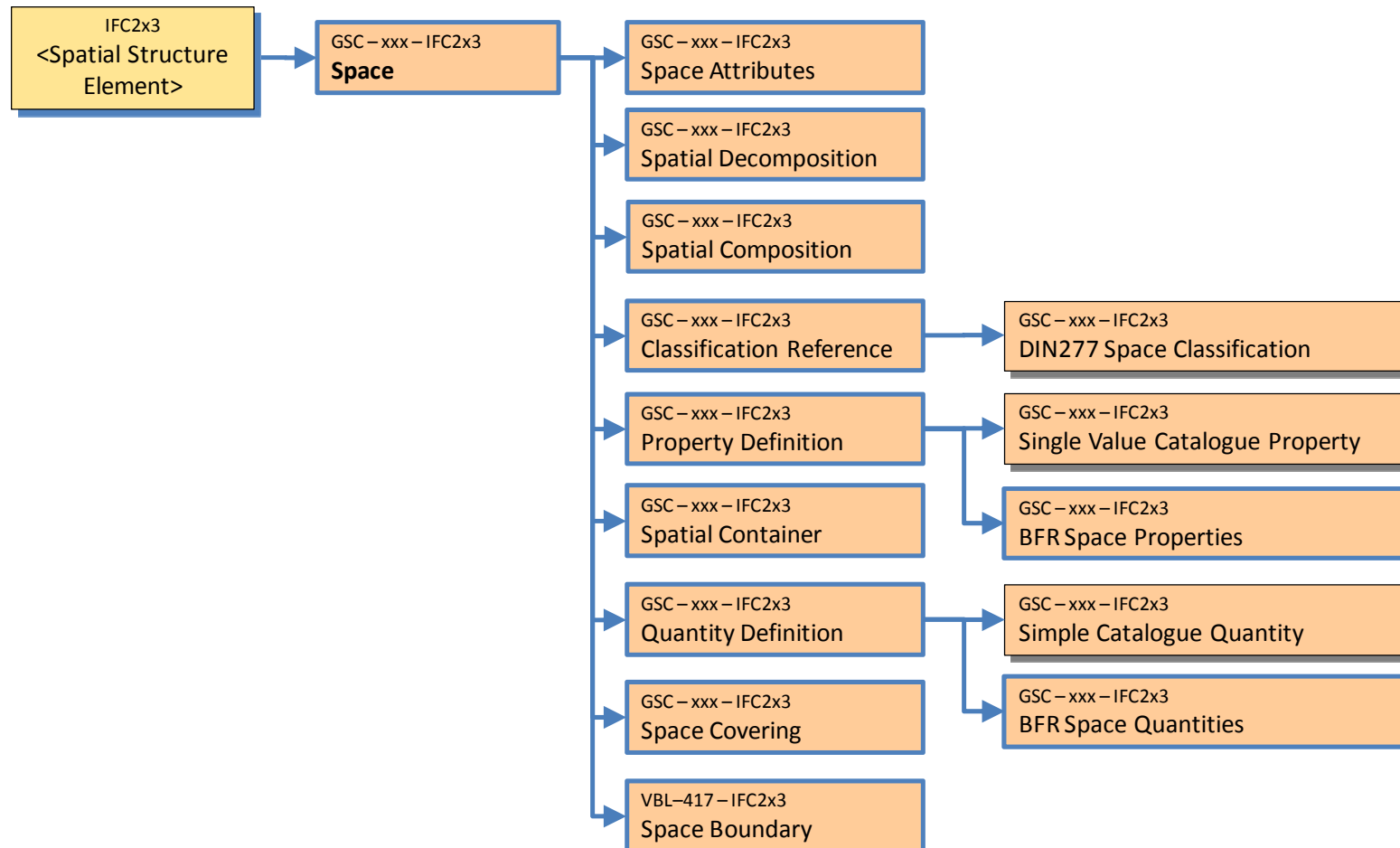
VIEW ID	VIEW NAME	IFC RELEASE	DIAGRAM STATUS	DIAGRAM VERSION	DIAGRAM DATE	DIAGRAM AUTHORS
GSC xxx - BuildingStorey	Facility management inventory data take-over	IFC2x3	Proposal	1.0	9 th June, 2008	Matthias Weise (mw@aec3.de)



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IFC Model View Definition Diagram: **Space**

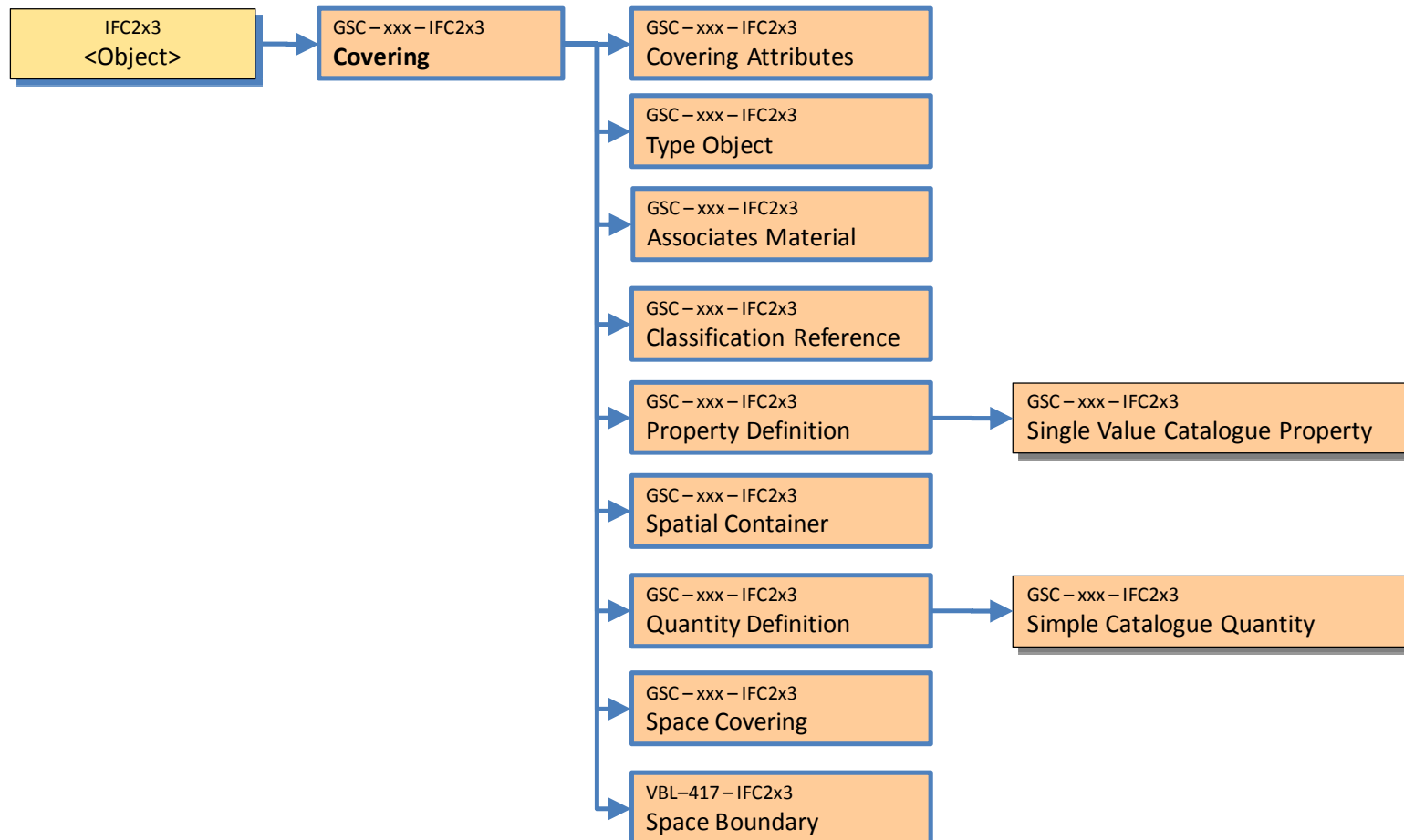
VIEW ID	VIEW NAME	IFC RELEASE	DIAGRAM STATUS	DIAGRAM VERSION	DIAGRAM DATE	DIAGRAM AUTHORS
GSC xxx - Space	Facility management inventory data take-over	IFC2x3	Proposal	1.0	9 th June, 2008	Matthias Weise (mw@aec3.de)



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IFC Model View Definition Diagram: **Covering**

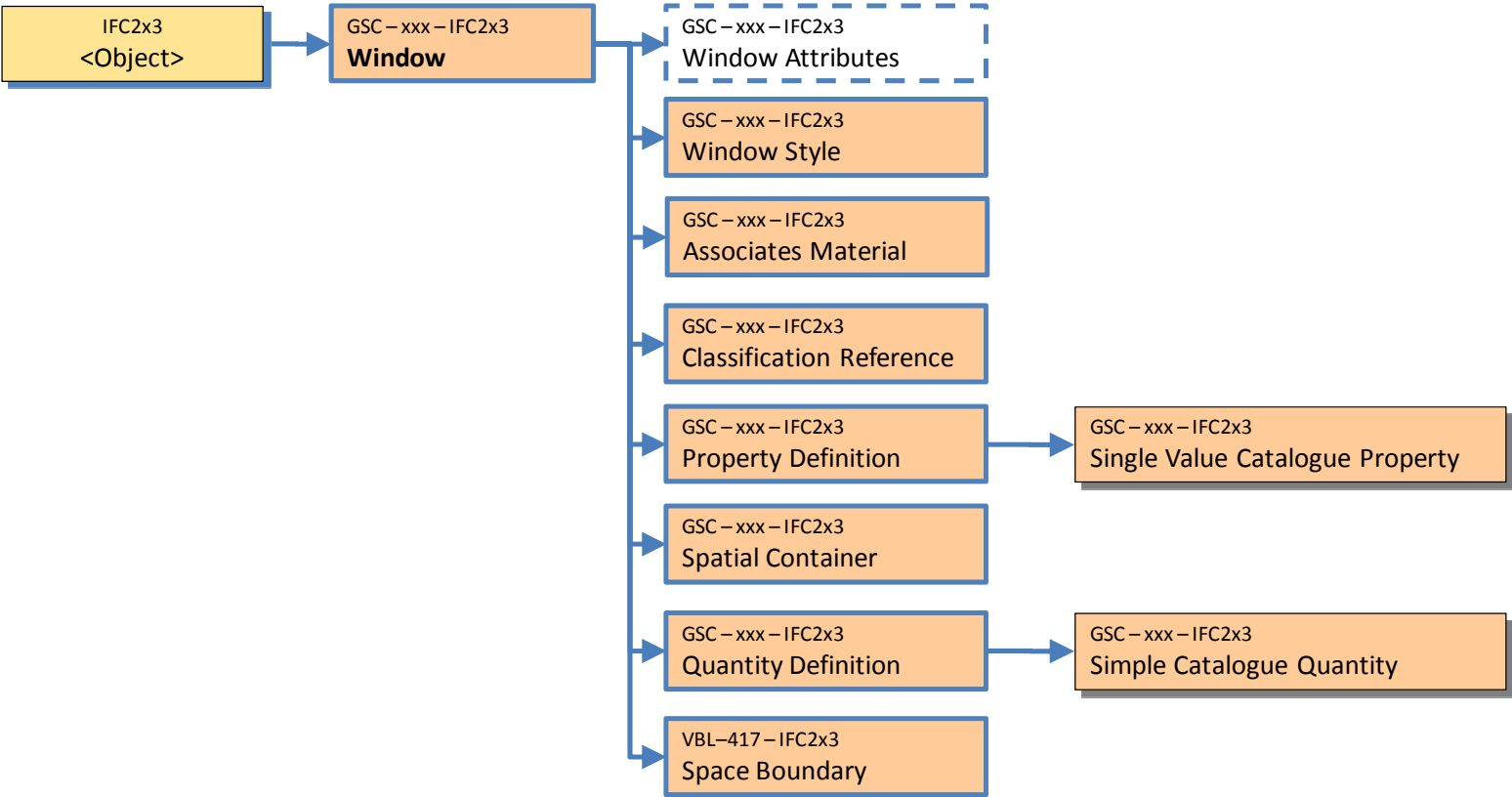
VIEW ID	VIEW NAME	IFC RELEASE	DIAGRAM STATUS	DIAGRAM VERSION	DIAGRAM DATE	DIAGRAM AUTHORS
GSC xxx - Covering	Facility management inventory data take-over	IFC2x3	Proposal	1.0	9 th June, 2008	Matthias Weise (mw@aec3.de)



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IFC Model View Definition Diagram: **Window**

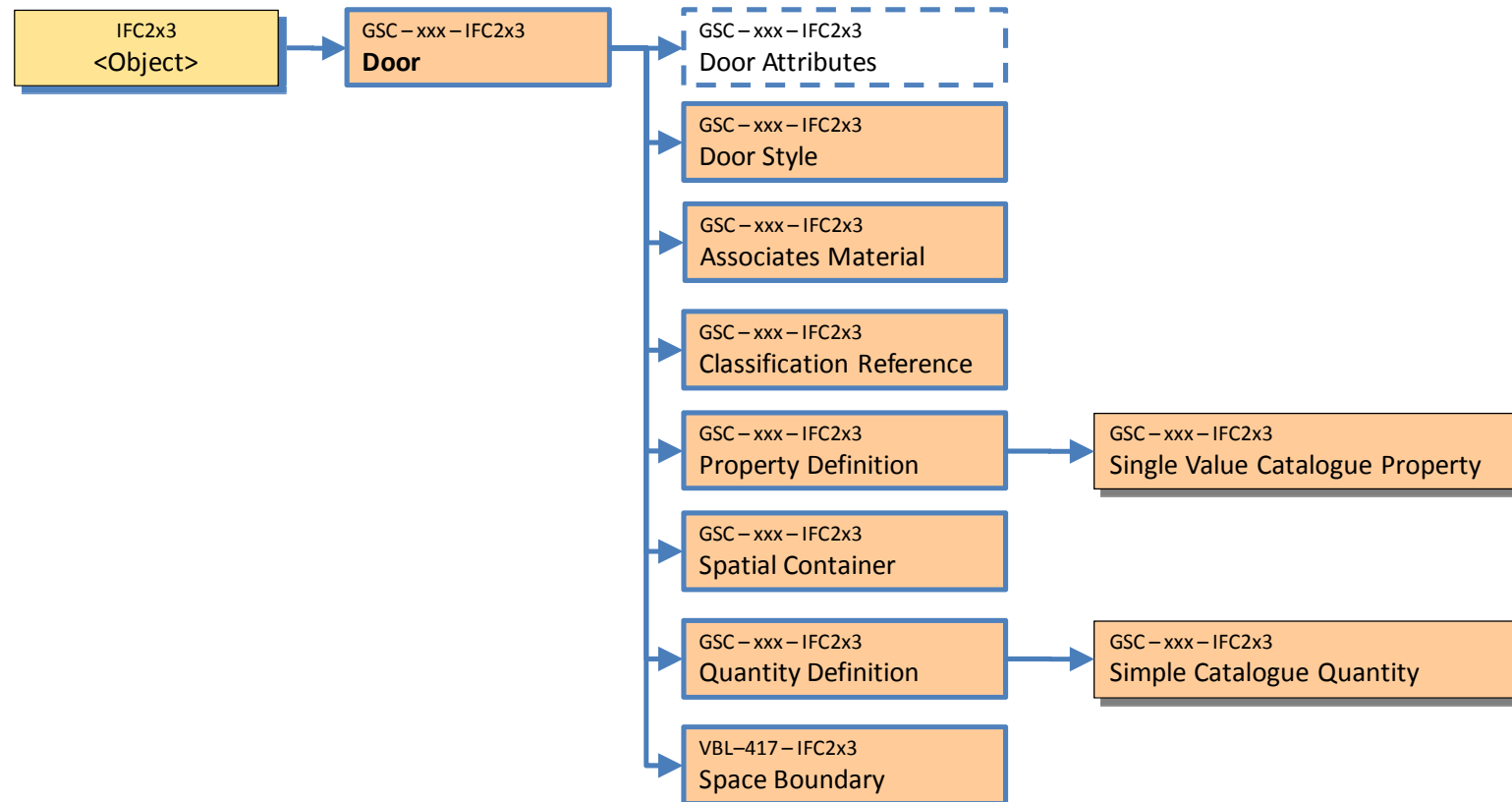
VIEW ID	VIEW NAME	IFC RELEASE	DIAGRAM STATUS	DIAGRAM VERSION	DIAGRAM DATE	DIAGRAM AUTHORS
GSC xxx - Window	Facility management inventory data take-over	IFC2x3	Proposal	1.0	9 th June, 2008	Matthias Weise (mw@aec3.de)



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IFC Model View Definition Diagram: **Door**

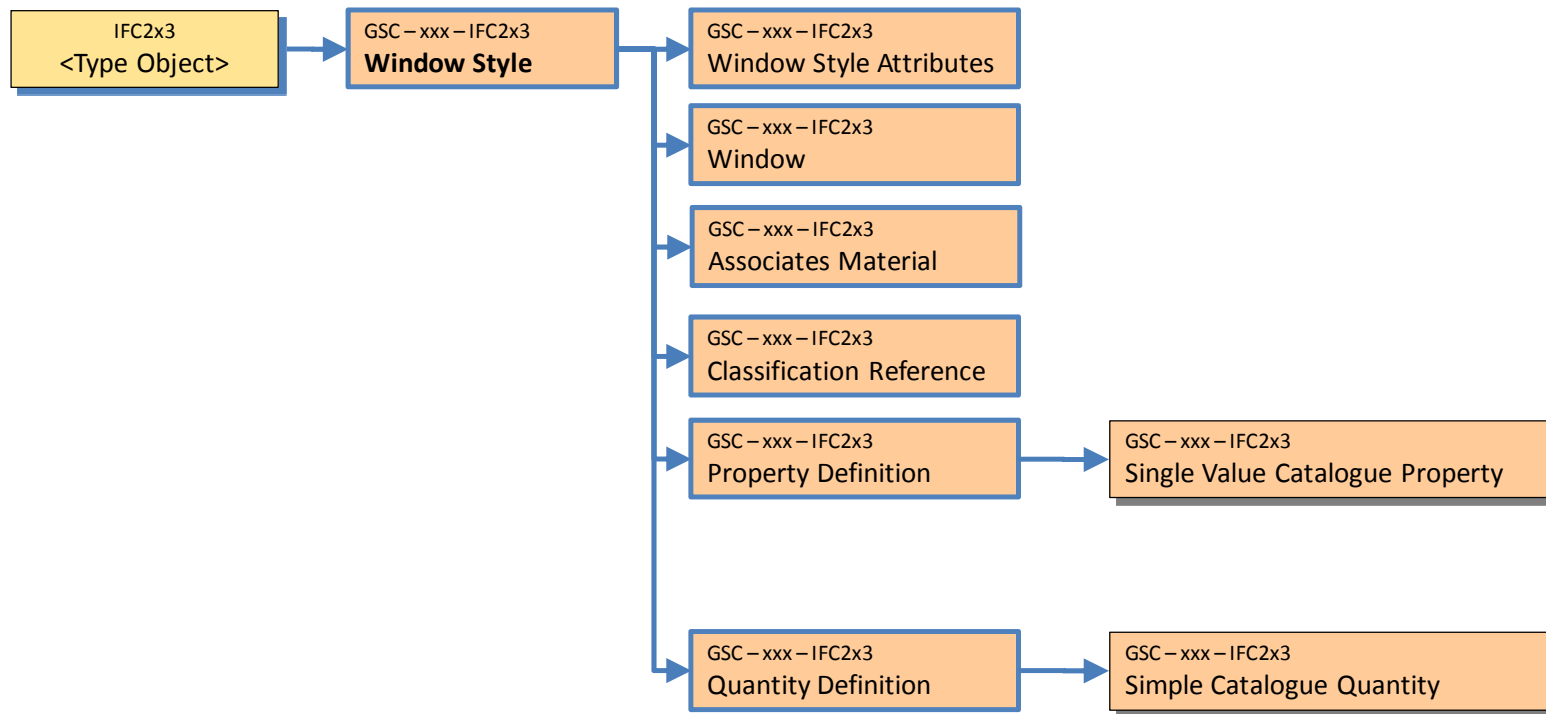
VIEW ID	VIEW NAME	IFC RELEASE	DIAGRAM STATUS	DIAGRAM VERSION	DIAGRAM DATE	DIAGRAM AUTHORS
GSC xxx - Door	Facility management inventory data take-over	IFC2x3	Proposal	1.0	9 th June, 2008	Matthias Weise (mw@aec3.de)



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IFC Model View Definition Diagram: **Window Style**

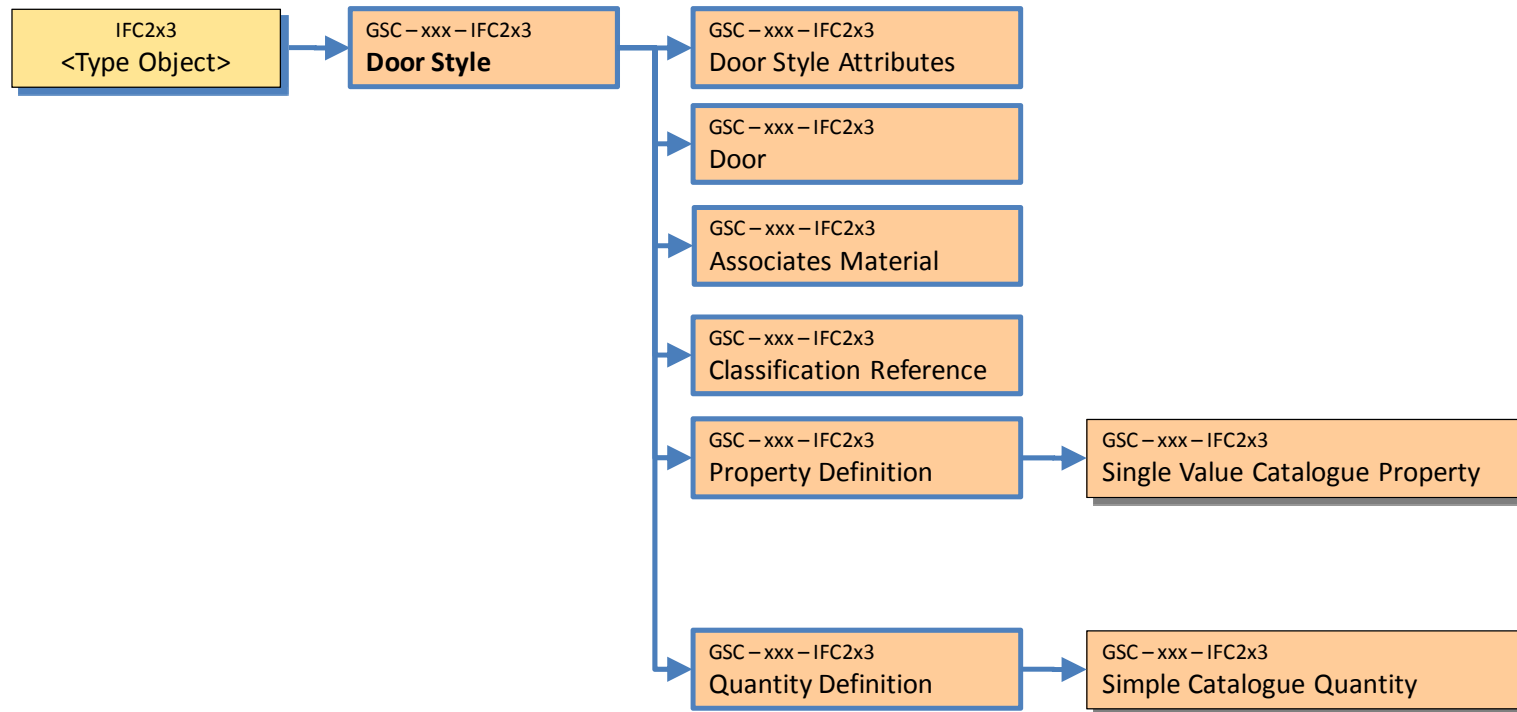
VIEW ID	VIEW NAME	IFC RELEASE	DIAGRAM STATUS	DIAGRAM VERSION	DIAGRAM DATE	DIAGRAM AUTHORS
GSC xxx – Window Style	Facility management inventory data take-over	IFC2x3	Proposal	1.0	9 th June, 2008	Matthias Weise (mw@aec3.de)



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IFC Model View Definition Diagram: **Door Style**

VIEW ID	VIEW NAME	IFC RELEASE	DIAGRAM STATUS	DIAGRAM VERSION	DIAGRAM DATE	DIAGRAM AUTHORS
GSC xxx – Door Style	Facility management inventory data take-over	IFC2x3	Proposal	1.0	9 th June, 2008	Matthias Weise (mw@aec3.de)



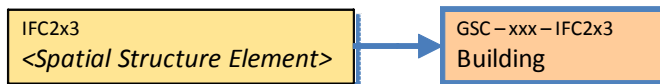
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IFC Release Specific Concept Description (IFC2x3)

Building

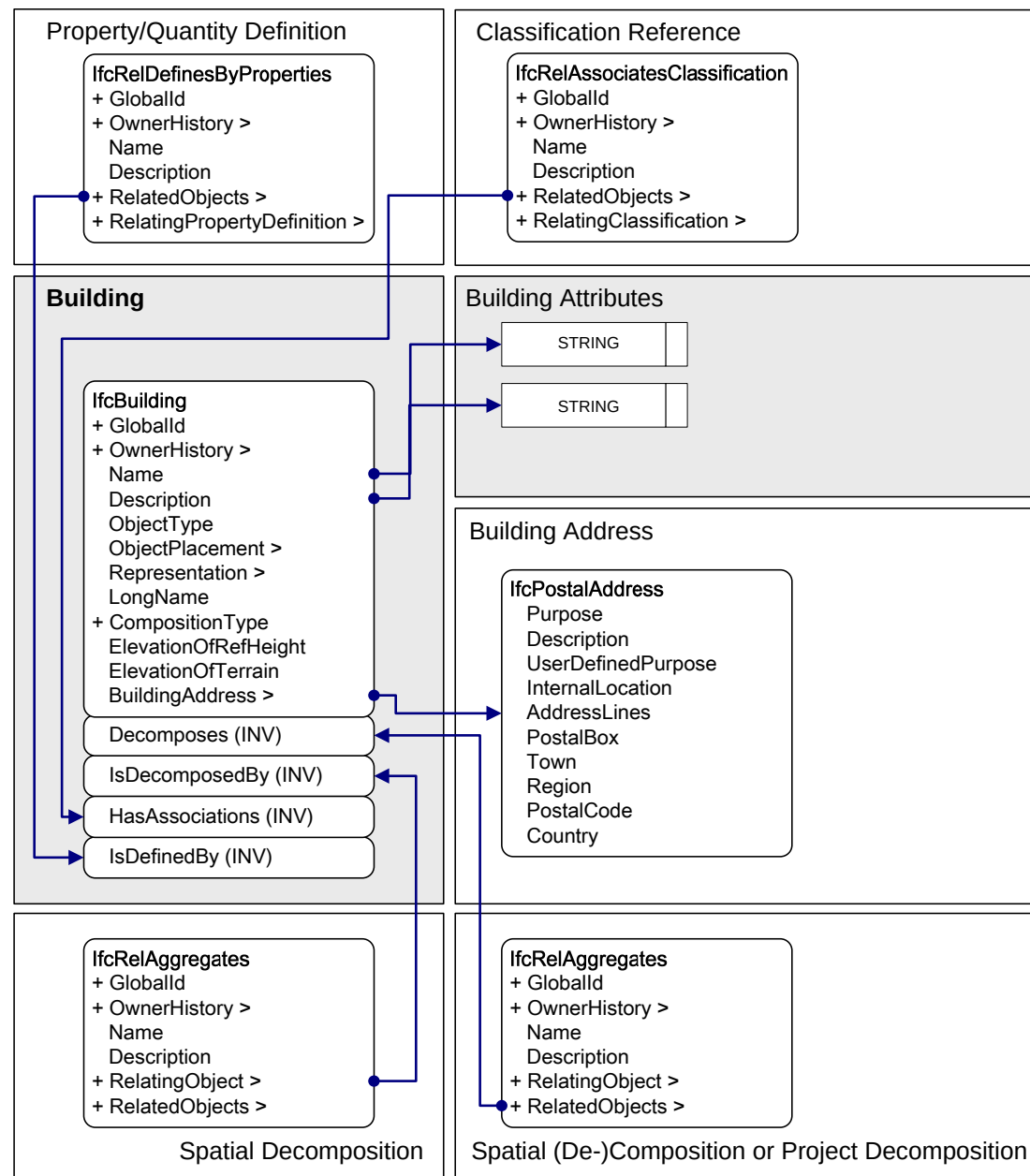
Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative "ZukunftBau")				

Usage in view definition diagram



Please note that there might be further agreements for the “*Building*” concept that are not shown here. In particular, there might be separate concept definitions for specific properties, quantities and classifications.

Instantiation diagram



Implementation agreements

IfcBuilding

Attribute	Implementation agreements
GlobalId	Must be provided
OwnerHistory	Must be provided
Name	Short name of the building (may follows specific coding rules)
Description	Human readable name
Object Type	Reserved
Object Placement	Reserved
Representation	Reserved
LongName	Reserved
Composition Type	Should be - COMPLEX, in case of a 'complex building' - ELEMENT, in case of an 'elementary building' - PARTIAL, in case of a 'partial building' Please note that the composition type restricts the spatial decomposition.
ElevationOfRefHeight	No agreements needed
ElevationOfTerrain	No agreements needed
BuildingAddress	No agreements needed
Decomposes (INV)	Reference to the parent building, site or the project
IsDecomposedBy (INV)	Reference to the child nodes (building or building storey) of the spatial structure
HasAssociations (INV)	Classification of the building (please see additional implementation agreements)
IsDefinedBy (INV)	Reference to properties or quantities

Example (spf)

```
#106= IFCBUILDING('30V5XJ5d5ApRzfhsGEj6Q2',#2,'NBH-Haus-J.1','Neues Bauen am Horn -
    Baufeld J - Haus 1',,$,$,$,$, .ELEMENT.,,$,$);
#107= IFCRELAGGREGATES('2kPxR9pkf4IhxH0hzu5khk',#2,'SiteContainer','SiteContainer
    For Buildings',#100, (#106));
#100= IFCSITE('1G217EQPv30ASE5ZNlFE5v',#2,'BF-J','Baufeld
    J',,$,$,$,$, .ELEMENT., (52,31,0), (13,24,0),,$,$);
#108= IFCRELAGGREGATES('3H0v58cYbDBAu7vMbay3W7',#2,'BuildingContainer',
    'BuildingContainer For Buildingstories',#106, (#109, #110, #111));
#109= IFCBUILDINGSTOREY('2mogSTPbEvEQPsrM_t2cN_',#2,
    'Basement',,$,$,$,$, .ELEMENT., -1.25);
#110= IFCBUILDINGSTOREY('3FJiQIfNPfLPIFsXmr3Ptc',#2,
    'Ground floor',,$,$,$,$, .ELEMENT.,0.);
#111= IFCBUILDINGSTOREY('2rAd0PG815zwRG$PbRquLR',#15,
    'First floor',,$,$,$,$, .ELEMENT.,3.1);
#2= IFCOWNERHISTORY(#5, #6, $, .ADDED., 0, $, $, 1207828354);
#3= IFCPERSON('Matthias Weise', '', '', $, $, $, $, $);
#4= IFCORGANIZATION('', '', '', $, $);
#5= IFCPERSONANDORGANIZATION(#3, #4, $);
#6= IFCAPPLICATION(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');
```

Example (ifcXML)

```
<IfcOwnerHistory id="ID2">
  <OwningUser>
    <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
  </OwningUser>
  <OwningApplication>
    <IfcApplication xsi:nil="true" ref="ID6"/>
  </OwningApplication>
  <ChangeAction>added</ChangeAction>
  <LastModifiedDate>0</LastModifiedDate>
</IfcOwnerHistory>
```

```

    <CreationDate>1207828354</CreationDate>
  </IfcOwnerHistory>
  <IfcPerson id="ID3">
    <Id>Matthias Weise</Id>
    <FamilyName></FamilyName>
    <GivenName></GivenName>
  </IfcPerson>
  <IfcOrganization id="ID4">
    <Id></Id>
    <Name></Name>
    <Description></Description>
  </IfcOrganization>
  <IfcPersonAndOrganization id="ID5">
    <ThePerson>
      <IfcPerson xsi:nil="true" ref="ID3"/>
    </ThePerson>
    <TheOrganization>
      <IfcOrganization xsi:nil="true" ref="ID4"/>
    </TheOrganization>
  </IfcPersonAndOrganization>
  <IfcApplication id="ID6">
    <ApplicationDeveloper>
      <IfcOrganization xsi:nil="true" ref="ID4"/>
    </ApplicationDeveloper>
    <Version>IFC-Application X</Version>
    <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
    <ApplicationIdentifier>Company Y</ApplicationIdentifier>
  </IfcApplication>
  <IfcSite id="ID100">
    <GlobalId>1G217EQPv30ASE5ZNlFE5v</GlobalId>
    <OwnerHistory>
      <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>BF-J</Name>
    <Description>Baufeld J</Description>
    <CompositionType>element</CompositionType>
    <RefLatitude ex:cType="list">
      <ex:long-wrapper pos="0">52</ex:long-wrapper>
      <ex:long-wrapper pos="1">31</ex:long-wrapper>
      <ex:long-wrapper pos="2">0</ex:long-wrapper>
    </RefLatitude>
    <RefLongitude ex:cType="list">
      <ex:long-wrapper pos="0">13</ex:long-wrapper>
      <ex:long-wrapper pos="1">24</ex:long-wrapper>
      <ex:long-wrapper pos="2">0</ex:long-wrapper>
    </RefLongitude>
  </IfcSite>
  <IfcBuilding id="ID106">
    <GlobalId>30V5XJ5d5ApRzfhsGEj6Q2</GlobalId>
    <OwnerHistory>
      <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>NBH-Haus-J.1</Name>
    <Description>Neues Bauen am Horn - Baufeld J - Haus 1</Description>
    <CompositionType>element</CompositionType>
  </IfcBuilding>
  <IfcRelAggregates id="ID107">
    <GlobalId>2kPxR9pkf4IhXH0hzu5khk</GlobalId>
    <OwnerHistory>
      <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>SiteContainer</Name>
    <Description>SiteContainer For Buildings</Description>
    <RelatingObject>
      <IfcSite xsi:nil="true" ref="ID100"/>
    </RelatingObject>
    <RelatedObjects ex:cType="set">
      <IfcBuilding pos="0" xsi:nil="true" ref="ID106"/>
    </RelatedObjects>
  </IfcRelAggregates>
  <IfcRelAggregates id="ID108">

```

```

<GlobalId>3H0v58cYbDBAu7vMbay3W7</GlobalId>
<OwnerHistory>
  <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
</OwnerHistory>
<Name>BuildingContainer</Name>
<Description>BuildingContainer For Buildingstories</Description>
<RelatingObject>
  <IfcBuilding xsi:nil="true" ref="ID106"/>
</RelatingObject>
<RelatedObjects ex:cType="set">
  <IfcBuildingStorey pos="0" xsi:nil="true" ref="ID109"/>
  <IfcBuildingStorey pos="1" xsi:nil="true" ref="ID110"/>
  <IfcBuildingStorey pos="2" xsi:nil="true" ref="ID111"/>
</RelatedObjects>
</IfcRelAggregates>
<IfcBuildingStorey id="ID109">
  <GlobalId>2mogSTpEvEQPsrM_t2cN_</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>Basement</Name>
  <CompositionType>element</CompositionType>
  <Elevation>-1.25</Elevation>
</IfcBuildingStorey>
<IfcBuildingStorey id="ID110">
  <GlobalId>3FJiQIfNPFLPIFsXmR3Ptc</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>Ground floor</Name>
  <CompositionType>element</CompositionType>
  <Elevation>0.</Elevation>
</IfcBuildingStorey>
<IfcBuildingStorey id="ID111">
  <GlobalId>2rAd0PG815zwRG$PbRquLR</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>First floor</Name>
  <CompositionType>element</CompositionType>
  <Elevation>3.1</Elevation>
</IfcBuildingStorey>

```

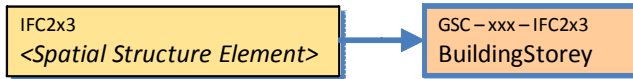
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IFC Release Specific Concept Description (IFC2x3)

BuildingStorey

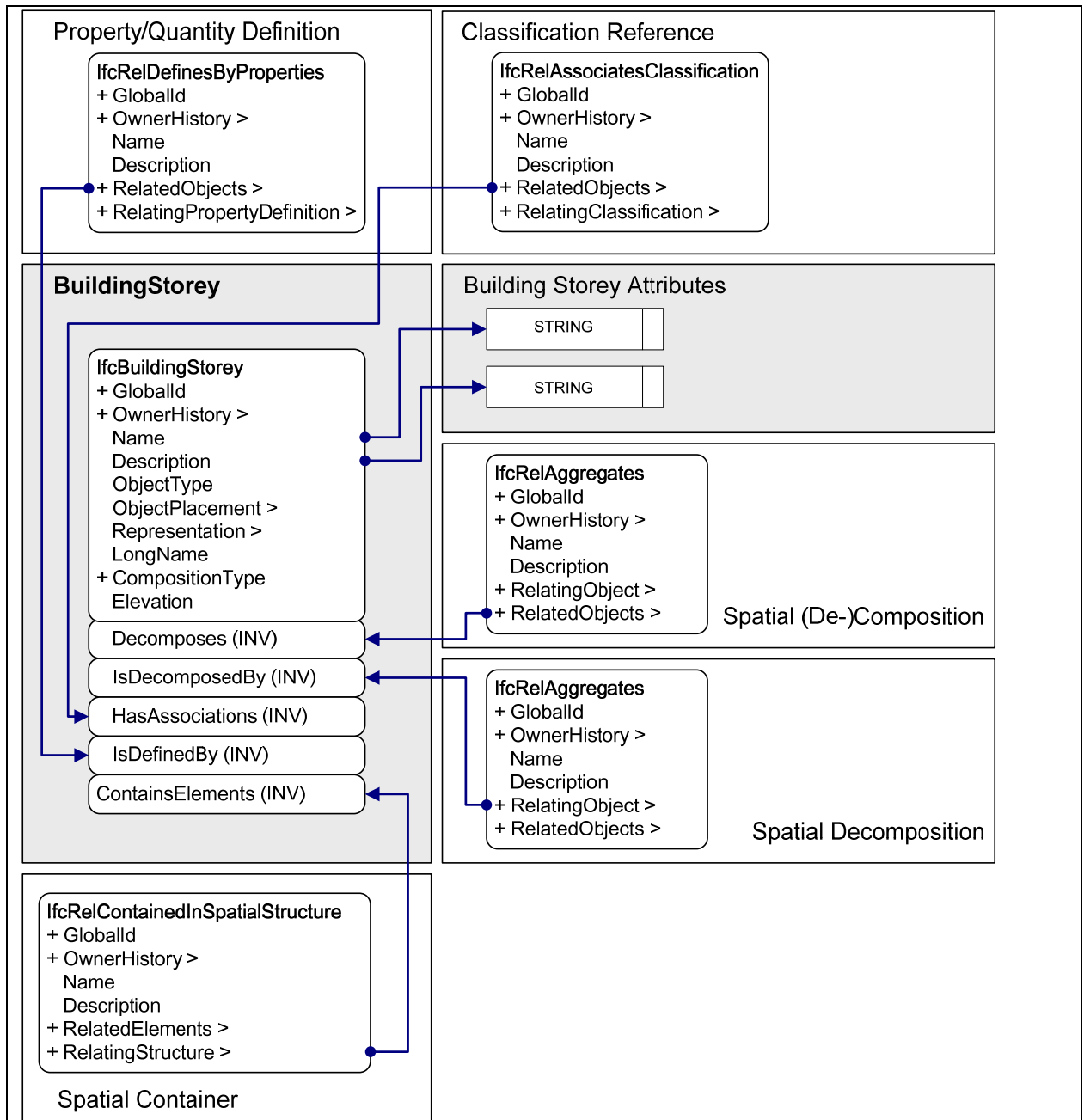
Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative “ZukunftBau”)				

Usage in view definition diagram



Please note that there might be further agreements for the “*Building*” concept that are not shown here. In particular, there might be separate concept definitions for specific properties, quantities and classifications.

Instantiation diagram



Implementation agreements

IfcBuildingStorey

Attribute	Implementation agreements
GlobalId	Must be provided
OwnerHistory	Must be provided
Name	Short name of the building storey (may follows specific coding rules)
Description	Human readable name
Object Type	Reserved
Object Placement	Reserved
Representation	Reserved
LongName	Reserved
Composition Type	Should be - COMPLEX, in case of a 'complex building storey' - ELEMENT, in case of an 'elementary building storey' - PARTIAL, in case of a 'partial building storey'

	Please note that the composition type restricts the spatial decomposition.
Elevation	No agreements needed
Decomposes (INV)	Reference to the parent building storey or building
IsDecomposedBy (INV)	Reference to the child nodes (building storey or space) of the spatial structure
HasAssociations (INV)	No agreements needed
IsDefinedBy (INV)	Reference to properties or quantities (please see additional implementation agreements)
ContainsElements (INV)	Reference to elements that are contained in the building storey (Further information can be found at the elements that might be contained in a spatial structure. Please also note the differences between containment and spatial decomposition.)

Example (spf)

```
#111= IFCBUILDINGSTOREY('2rAd0PG815zwRG$PbRquLR',#2,
  'First floor',$,$,$,$,$,ELEMENT.,3.1);
#106= IFCBUILDING('30V5XJ5d5ApRzfHSGEj6Q2',#2,'NBH-Haus-J.1',
  'Neues Bauen am Horn - Baufeld J - Haus 1',$,$,$,$,$,ELEMENT.,$,$,$);
#108= IFCRELAGGREGATES('3H0v58cYbDBAu7vMbay3W7',#2,'BuildingContainer',
  'BuildingContainer For Buildingstories',#106,(#111));
#112= IFCSPACE('3$f2p7VyLB7eox67SA_zKE',#2,'1',$,$,$,$,'Kitchen',
  ELEMENT.,INTERNAL.,$);
#113= IFCSPACE('4Tf2p7VyLB7eox67SA_zKE',#2,'2',$,$,$,$,'Living room',
  ELEMENT.,INTERNAL.,$);
#109= IFCRELAGGREGATES('6IOv58cYbDBAu7vMbay3W7',#2,'BuildingStoreyContainer',
  'BuildingContainer For Spaces',#111,(#112,#113));
#2= IFCOWNERHISTORY(#5, #6, $, .ADDED., 0, $, $, 1207828354);
#3= IFCPERSON('Matthias Weise',' ',' ','$,$,$,$,$,$);
#4= IFCORGANIZATION(' ',' ',' ','$,$,$,$,$);
#5= IFCPERSONANDORGANIZATION(#3, #4, $);
#6= IFCAPPLICATION(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');
```

Example (ifcXML)

```
<IfcBuilding id="ID106">
  <GlobalId>30V5XJ5d5ApRzfHSGEj6Q2</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>NBH-Haus-J.1</Name>
  <Description>Neues Bauen am Horn - Baufeld J - Haus 1</Description>
  <CompositionType>element</CompositionType>
</IfcBuilding>
<IfcRelAggregates id="ID108">
  <GlobalId>3H0v58cYbDBAu7vMbay3W7</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>BuildingContainer</Name>
  <Description>BuildingContainer For Buildingstories</Description>
  <RelatingObject>
    <IfcBuilding xsi:nil="true" ref="ID106"/>
  </RelatingObject>
  <RelatedObjects ex:cType="set">
    <IfcBuildingStorey pos="0" xsi:nil="true" ref="ID111"/>
  </RelatedObjects>
</IfcRelAggregates>
<IfcRelAggregates id="ID109">
  <GlobalId>6IOv58cYbDBAu7vMbay3W7</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>BuildingStoreyContainer</Name>
  <Description>BuildingContainer For Spaces</Description>
  <RelatingObject>
    <IfcBuildingStorey xsi:nil="true" ref="ID111"/>
  </RelatingObject>
</IfcRelAggregates>
```

```

    </RelatingObject>
    <RelatedObjects ex:cType="set">
        <IfcSpace pos="0" xsi:nil="true" ref="ID112"/>
        <IfcSpace pos="1" xsi:nil="true" ref="ID113"/>
    </RelatedObjects>
</IfcRelAggregates>
<IfcBuildingStorey id="ID111">
    <GlobalId>2rAd0PG815zwRG$PbRquLR</GlobalId>
    <OwnerHistory>
        <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>First floor</Name>
    <CompositionType>element</CompositionType>
    <Elevation>3.1</Elevation>
</IfcBuildingStorey>
<IfcSpace id="ID112">
    <GlobalId>3$f2p7VyLB7eox67SA_zKE</GlobalId>
    <OwnerHistory>
        <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>1</Name>
    <LongName>Kitchen</LongName>
    <CompositionType>element</CompositionType>
    <InteriorOrExteriorSpace>internal</InteriorOrExteriorSpace>
</IfcSpace>
<IfcSpace id="ID113">
    <GlobalId>4Tf2p7VyLB7eox67SA_zKE</GlobalId>
    <OwnerHistory>
        <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>2</Name>
    <LongName>Living room</LongName>
    <CompositionType>element</CompositionType>
    <InteriorOrExteriorSpace>internal</InteriorOrExteriorSpace>
</IfcSpace>
<IfcOwnerHistory id="ID2">
    <OwningUser>
        <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
    </OwningUser>
    <OwningApplication>
        <IfcApplication xsi:nil="true" ref="ID6"/>
    </OwningApplication>
    <ChangeAction>added</ChangeAction>
    <LastModifiedDate>0</LastModifiedDate>
    <CreationDate>1207828354</CreationDate>
</IfcOwnerHistory>
<IfcPerson id="ID3">
    <Id>Matthias Weise</Id>
    <FamilyName></FamilyName>
    <GivenName></GivenName>
</IfcPerson>
<IfcOrganization id="ID4">
    <Id></Id>
    <Name></Name>
    <Description></Description>
</IfcOrganization>
<IfcPersonAndOrganization id="ID5">
    <ThePerson>
        <IfcPerson xsi:nil="true" ref="ID3"/>
    </ThePerson>
    <TheOrganization>
        <IfcOrganization xsi:nil="true" ref="ID4"/>
    </TheOrganization>
</IfcPersonAndOrganization>
<IfcApplication id="ID6">
    <ApplicationDeveloper>
        <IfcOrganization xsi:nil="true" ref="ID4"/>
    </ApplicationDeveloper>
    <Version>IFC-Application X</Version>
    <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
    <ApplicationIdentifier>Company Y</ApplicationIdentifier>

```

</IfcApplication>

This document uses the official IFC Model View Definition Format version 1.1.0. of the IAI (www.iai-international.org)
The content of this document has to be certified by the IAI before becoming part of an official IFC Model View Definition.

IFC Release Specific Concept Description (IFC2x3)

Classification Reference

Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative "ZukunftBau")				

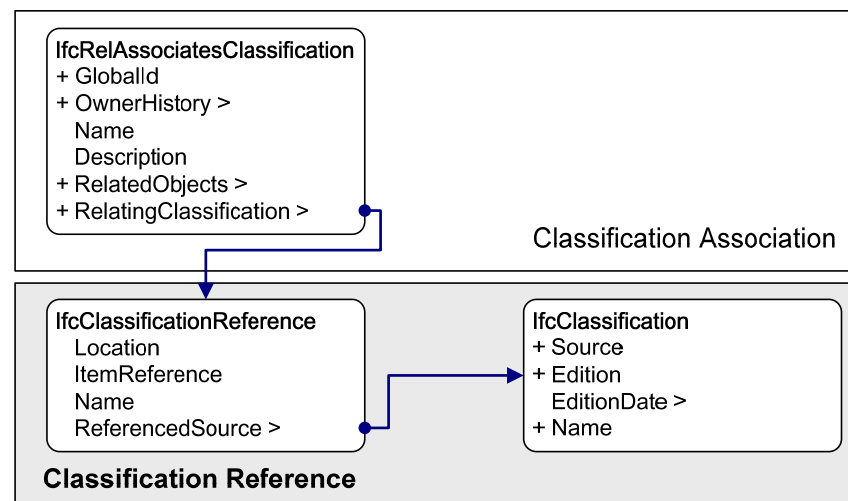
Usage in view definition diagram



Please note that the adapter concept "Classification Association" might not be shown when used by a variable concept, e.g. by Site etc.

Remark for MVD harmonization: see also VBL-259, VBL-262, VBL-263 (placeholder)

Instantiation diagram



Implementation agreements

IfcClassificationReference

Attribute	Implementation agreements
Location	Optional - Pointer or URL location of the classification (defined by the generating system)
ItemReference	Must be provided - Path (separated through "/") or GUID of the referenced item
Name	Must be provided - Human readable name
ReferencedSource	Must be provided - Reference to the classification

IfcClassification

Attribute	Implementation agreements
Source	Must be provided - GUID or standardized name of the classification/catalogue
Edition	Must be provided, but can be an empty String
EditionDate	Optional
Name	Must be provided - Human readable name

IfcRelAssociatesClassification

Attribute	Implementation agreements
GlobalId	Must be provided, but is allowed to change
OwnerHistory	Must be provided, but may contain (reusable) dummy value
Name	Reserved
Description	Reserved
RelatedObjects	A set of Objects or Object Types that are classified by the classification - further information will be provided by the variable concepts that use classification)
RelatingClassification	Reference to the Classification

Example (spf)

```
#100= IFCClassification('DIN', '', $, 'DIN277');
#101= IFCClassificationReference($, 'HNF1/1', 'Wohnen und Aufenthalt', #100);
#102= IFcRelAssociatesClassification('1dejvVx$X0Gxhf6JmbZRfh', #2, $, $,
    (#103, #203), #101);
#103= IFCSpace('38jgVeDoj3jRjcRE40dStf', #2, 'WE-01.001', $, $, $, $, 'Living
    room', .ELEMENT., .INTERNAL., $);
#203= IFCSpace('20jgVeDoj3jRjcRE40dStf', #2, 'WE-02.001', $, $, $, $, 'Living
    room', .ELEMENT., .INTERNAL., $);
#2= IFcOwnerHistory(#5, #6, $, .ADDED., 0, $, $, 1207828354);
#3= IFcPerson('Matthias Weise', '', '', $, $, $, $, $);
#4= IFcOrganization('', '', '', $, $);
#5= IFcPersonAndOrganization(#3, #4, $);
#6= IFcApplication(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');
```

All values that are needed for the classification of a concept are marked with bold letters.

The example shows the classification (#101) of two rooms (#103, #203) according to the German DIN 277 (#100). The rooms are defined by an instance of *IfcSpace*, which is an example for the “*Variable Concept*” and could be replaced by any other concept that can be associated by the relationship *IfcRelAssociatesClassification* (#102). As shown in the example it is possible and also recommended to associate the classification to a set of concepts that all belong to the same class.

Please note that there might be a request for the exchange of the classification only, i.e. without association to a concept. In that case there is no need to define a relationship to a dummy concept.

Example (ifcXML)

```
<IfcClassification id="ID100">
  <Source>DIN</Source>
  <Edition></Edition>
  <Name>DIN277</Name>
</IfcClassification>
<IfcClassificationReference id="ID101">
  <ItemReference>HNF1/1</ItemReference>
  <Name>Wohnen und Aufenthalt</Name>
  <ReferencedSource>
    <IfcClassification xsi:nil="true" ref="ID100"/>
  </ReferencedSource>
</IfcClassificationReference>
<IfcRelAssociatesClassification id="ID102">
  <GlobalId>1dejvVx$X0Gxhf6JmbZRfh</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <RelatedObjects ex:cType="set">
    <IfcSpace pos="0" xsi:nil="true" ref="ID103"/>
    <IfcSpace pos="1" xsi:nil="true" ref="ID203"/>
  </RelatedObjects>
  <RelatingClassification>
    <IfcClassificationReference xsi:nil="true" ref="ID101"/>
  </RelatingClassification>
</IfcRelAssociatesClassification>
<IfcSpace id="ID103">
  <GlobalId>38jgVeDoj3jRjcRE40dStf</GlobalId>
```

```

<Name>WE-01.001</Name>
<Description>
  <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
</Description>
<LongName>Living room</LongName>
<CompositionType>element</CompositionType>
<InteriorOrExteriorSpace>internal</InteriorOrExteriorSpace>
</IfcSpace>
<IfcSpace id="ID203">
  <GlobalId>20jgVeDoj3jRjcRE40dSTf</GlobalId>
  <Name>WE-02.001</Name>
  <Description>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </Description>
  <LongName>Living room</LongName>
  <CompositionType>element</CompositionType>
  <InteriorOrExteriorSpace>internal</InteriorOrExteriorSpace>
</IfcSpace>
<IfcOwnerHistory id="ID2">
  <OwningUser>
    <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
  </OwningUser>
  <OwningApplication>
    <IfcApplication xsi:nil="true" ref="ID6"/>
  </OwningApplication>
  <ChangeAction>added</ChangeAction>
  <LastModifiedDate>0</LastModifiedDate>
  <CreationDate>1207828354</CreationDate>
</IfcOwnerHistory>
<IfcPerson id="ID3">
  <Id>Matthias Weise</Id>
  <FamilyName></FamilyName>
  <GivenName></GivenName>
</IfcPerson>
<IfcOrganization id="ID4">
  <Id></Id>
  <Name></Name>
  <Description></Description>
</IfcOrganization>
<IfcPersonAndOrganization id="ID5">
  <ThePerson>
    <IfcPerson xsi:nil="true" ref="ID3"/>
  </ThePerson>
  <TheOrganization>
    <IfcOrganization xsi:nil="true" ref="ID4"/>
  </TheOrganization>
</IfcPersonAndOrganization>
<IfcApplication id="ID6">
  <ApplicationDeveloper>
    <IfcOrganization xsi:nil="true" ref="ID4"/>
  </ApplicationDeveloper>
  <Version>IFC-Application X</Version>
  <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
  <ApplicationIdentifier>Company Y</ApplicationIdentifier>
</IfcApplication>

```


IFC Release Specific Concept Description (IFC2x3) Covering

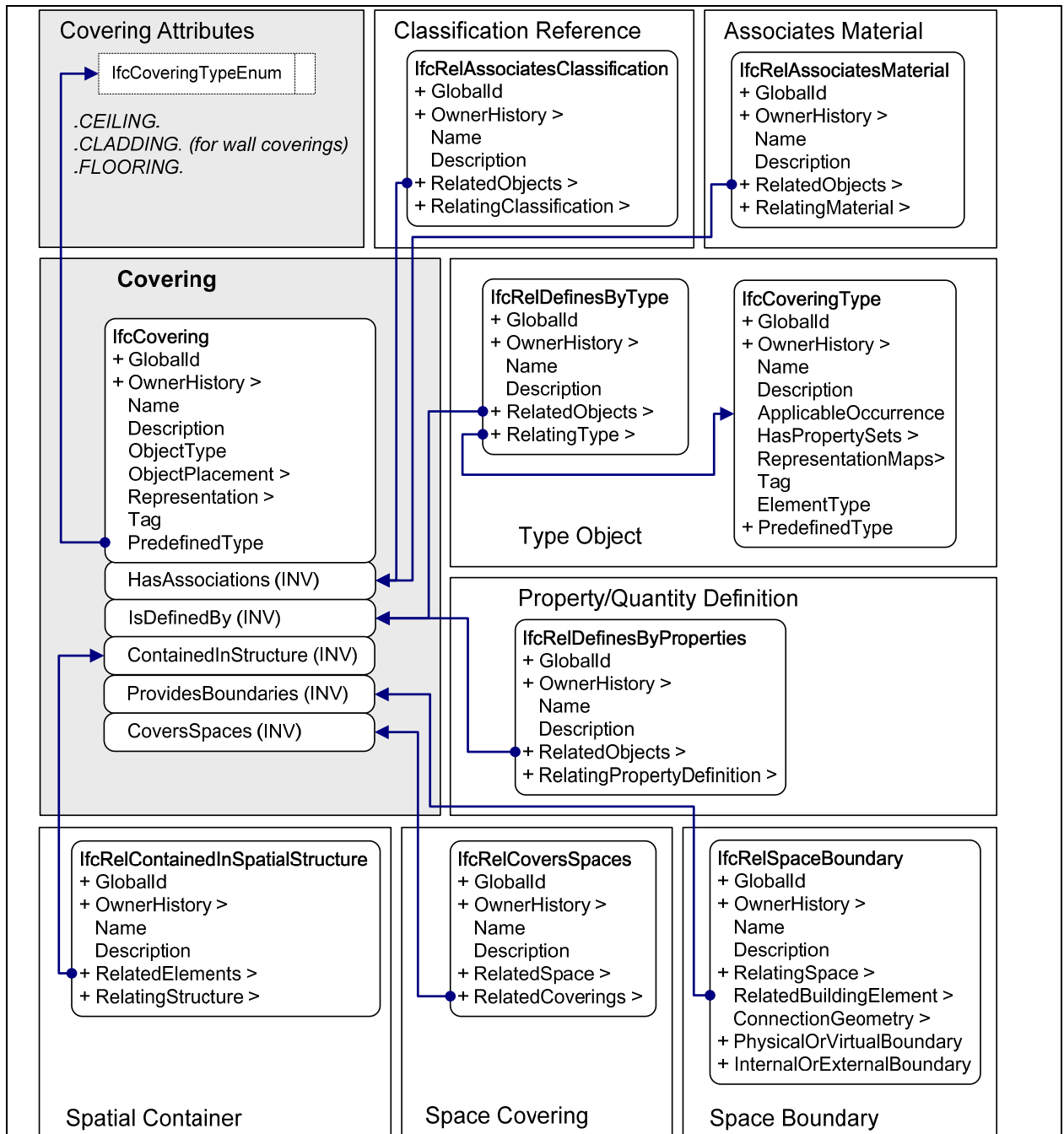
Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative “ZukunftBau”)				

Usage in view definition diagram



Please note that there might be further agreements for the “Covering” concept that are not shown here. In particular, there might be separate concept definitions for specific properties, quantities and classifications. There are also additional (inverse) relationships that are not shown here but might be used to add further information or to define specific relationships to other elements.

Instantiation diagram



Implementation agreements

IfcCovering

Attribute	Implementation agreements
GlobalId	Must be provided
OwnerHistory	Must be provided
Name	Reserved
Description	Reserved
ObjectType	Reserved
ObjectPlacement	No agreements needed
Representation	No agreements needed
Tag	Reserved
PredefinedType	Shall be selected according to the element type that it covers - CEILING (covering of IfcSlab that is the ceiling of a space) - CLADDING (covering of walls)

	- FLOORING (covering of IfcSlab that is the floor of a space) There more covering types, but only above three are considered to be used in this context.
HasAssociations (INV)	Optional, may contain instances of IfcRelAssociatesClassification that further classify the covering according to a classification system and/or IfcRelAssociatesMaterial that provides information about the material
IsDefinedBy (INV)	Optional, may contain instances of IfcRelDefinesByProperties that further define the covering with additional properties/quantities, and/or IfcRelDefinesByType that refers to a covering type
ContainedInStructure (INV)	Optional, may define the spatial structure (most likely the space or building storey) in which the covering is contained (see also ProvidesBoundaries and CoversSpaces)
ProvidesBoundaries (INV)	Optional, may define the space that is bounded by the covering
CoversSpaces (INV)	Optional, may define the space that is covered by the covering
...	

Example (spf)

```
#102= IFCCOVERING('$ns0eF_t4TobLUH6m0d8Fm', #2, 'Covering example', $, $, $, $, $,
    .CLADDING.);
#101= IFCRELCOVERSSPACES('cwqUeGRq4TsV1W5nm0d8F0', #2, $, $, #100, (#102));
#100= IFCSPACE('4Tf2p7VyLB7eox67SA_zKE', #2, '2', $, $, $, $,
    'Living room', .ELEMENT., .INTERNAL., $);
#103= IFCRELDEFINESBYTYPE('cwqFemRq4TsV1W5nm0d8F0', #2, $, $, (#100), #104);
#104= IFCCOVERINGTYPE('cwqFemRq4TsV1W5nm0d8F0', #2, 'Covering type example', $, $,
    $, $, ' ', $, .CLADDING.);
#105= IFCQUANTITYAREA('NetArea', $, #106, 16.5);
#106= IFCSIUNIT(*, .AREAUNIT., $, .SQUARE_METRE.);
#107= IFCELEMENTQUANTITY('1scWLSxSf3TOXzYi$H3NZC', #2, 'CoveringCommonQuantities',
    $, ' ', (#105));
#108= IFCRELDEFINESBYPROPERTIES('1DDDI0yW16bfZwIs31XdDs', #2, $, $, (#102), #107);
#109= IFCMATERIAL('Wall paper');
#110= IFCRELASSOCIATESMATERIAL('0iKTtg9xP6buf6Pf7_2fSN', #2, $, $, (#102), #109);
#111= IFCClassification('BFR', '2006', $, 'German Building Guidelines for the
    Documentation of Building Master Data');
#112= IFCClassificationReference($, 'Z/G3/45/3', 'wall covering type 3', #111);
#113= IFCRELASSOCIATESClassification('1dejvVx$X0Gxhf6JmbZRfh', #2, $, $, (#104), #112);
#2= IFCOWNERHISTORY(#5, #6, $, .ADDED., 0, $, $, 1207828354);
#3= IFCPERSON('Matthias Weise', '', '', $, $, $, $, $);
#4= IFCORGANIZATION('', '', '', $, $);
#5= IFCPERSONANDORGANIZATION(#3, #4, $);
#6= IFCAPPLICATION(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');
```

Example (ifcXML)

```
<IfcOwnerHistory id="ID2">
  <OwningUser>
    <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
  </OwningUser>
  <OwningApplication>
    <IfcApplication xsi:nil="true" ref="ID6"/>
  </OwningApplication>
  <ChangeAction>added</ChangeAction>
  <LastModifiedDate>0</LastModifiedDate>
  <CreationDate>1207828354</CreationDate>
</IfcOwnerHistory>
<IfcPerson id="ID3">
  <Id>Matthias Weise</Id>
  <FamilyName></FamilyName>
  <GivenName></GivenName>
</IfcPerson>
<IfcOrganization id="ID4">
  <Id></Id>
  <Name></Name>
  <Description></Description>
</IfcOrganization>
```

```

<IfcPersonAndOrganization id="ID5">
  <ThePerson>
    <IfcPerson xsi:nil="true" ref="ID3"/>
  </ThePerson>
  <TheOrganization>
    <IfcOrganization xsi:nil="true" ref="ID4"/>
  </TheOrganization>
</IfcPersonAndOrganization>
<IfcApplication id="ID6">
  <ApplicationDeveloper>
    <IfcOrganization xsi:nil="true" ref="ID4"/>
  </ApplicationDeveloper>
  <Version>IFC-Application X</Version>
  <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
  <ApplicationIdentifier>Company Y</ApplicationIdentifier>
</IfcApplication>
<IfcSpace id="ID100">
  <GlobalId>4Tf2p7VyLB7eox67SA_zKE</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>2</Name>
  <LongName>Living room</LongName>
  <CompositionType>element</CompositionType>
  <InteriorOrExteriorSpace>internal</InteriorOrExteriorSpace>
</IfcSpace>
<IfcRelCoversSpaces id="ID101">
  <GlobalId>cwqUeGRq4TsV1W5nm0d8F0</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <RelatedSpace>
    <IfcSpace xsi:nil="true" ref="ID100"/>
  </RelatedSpace>
  <RelatedCoverings ex:cType="set">
    <IfcCovering pos="0" xsi:nil="true" ref="ID102"/>
  </RelatedCoverings>
</IfcRelCoversSpaces>
<IfcCovering id="ID102">
  <GlobalId>$ns0eF_t4TobLUH6m0d8Fm</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>Covering example</Name>
  <PredefinedType>cladding</PredefinedType>
</IfcCovering>
<IfcRelDefinesByType id="ID103">
  <GlobalId>cwqFemRq4TsV1W5nm0d8F0</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <RelatedObjects ex:cType="set">
    <IfcSpace pos="0" xsi:nil="true" ref="ID100"/>
  </RelatedObjects>
  <RelatingType>
    <IfcCoveringType xsi:nil="true" ref="ID104"/>
  </RelatingType>
</IfcRelDefinesByType>
<IfcCoveringType id="ID104">
  <GlobalId>cwqFewRq4TsV1W5nm0d8F0</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>Covering type example</Name>
  <Tag> </Tag>
  <PredefinedType>cladding</PredefinedType>
</IfcCoveringType>
<IfcQuantityArea id="ID105">
  <Name>NetArea</Name>
  <Unit>
    <IfcSIUnit xsi:nil="true" ref="ID106"/>
  </Unit>
</IfcQuantityArea>

```

```

        </Unit>
        <AreaValue>16.5</AreaValue>
    </IfcQuantityArea>
    <IfcSIUnit id="ID106">
        <UnitType>areaunit</UnitType>
        <Name>square_metre</Name>
    </IfcSIUnit>
    <IfcElementQuantity id="ID107">
        <GlobalId>1scWLSxSf3TOXzYi$H3NZC</GlobalId>
        <OwnerHistory>
            <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
        </OwnerHistory>
        <Name>CoveringCommonQuantities</Name>
        <MethodOfMeasurement></MethodOfMeasurement>
        <Quantities ex:cType="set">
            <IfcQuantityArea pos="0" xsi:nil="true" ref="ID105"/>
        </Quantities>
    </IfcElementQuantity>
    <IfcRelDefinesByProperties id="ID108">
        <GlobalId>1DDDI0yW16bfZwIs31XdDs</GlobalId>
        <OwnerHistory>
            <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
        </OwnerHistory>
        <RelatedObjects ex:cType="set">
            <IfcCovering pos="0" xsi:nil="true" ref="ID102"/>
        </RelatedObjects>
        <RelatingPropertyDefinition>
            <IfcElementQuantity xsi:nil="true" ref="ID107"/>
        </RelatingPropertyDefinition>
    </IfcRelDefinesByProperties>
    <IfcMaterial id="ID109">
        <Name>Wall paper</Name>
    </IfcMaterial>
    <IfcRelAssociatesMaterial id="ID110">
        <GlobalId>0iKTtg9xP6buf6Pf7_2fSN</GlobalId>
        <OwnerHistory>
            <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
        </OwnerHistory>
        <RelatedObjects ex:cType="set">
            <IfcCovering pos="0" xsi:nil="true" ref="ID102"/>
        </RelatedObjects>
        <RelatingMaterial>
            <IfcMaterial xsi:nil="true" ref="ID109"/>
        </RelatingMaterial>
    </IfcRelAssociatesMaterial>
    <IfcClassification id="ID111">
        <Source>BFR</Source>
        <Edition>2006</Edition>
        <Name>German Building Guidelines for the Documentation of Building Master
        Data</Name>
    </IfcClassification>
    <IfcClassificationReference id="ID112">
        <ItemReference>Z/G3/45/3</ItemReference>
        <Name>wall covering type 3</Name>
        <ReferencedSource>
            <IfcClassification xsi:nil="true" ref="ID111"/>
        </ReferencedSource>
    </IfcClassificationReference>
    <IfcRelAssociatesClassification id="ID113">
        <GlobalId>1dejvVx$X0Gxhf6JmbZRfh</GlobalId>
        <OwnerHistory>
            <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
        </OwnerHistory>
        <RelatedObjects ex:cType="set">
            <IfcCoveringType pos="0" xsi:nil="true" ref="ID104"/>
        </RelatedObjects>
        <RelatingClassification>
            <IfcClassificationReference xsi:nil="true" ref="ID112"/>
        </RelatingClassification>
    </IfcRelAssociatesClassification>

```

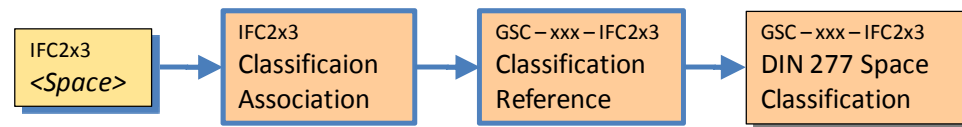
This document uses the official IFC Model View Definition Format version 1.1.0. of the IAI (www.iai-international.org)
The content of this document has to be certified by the IAI before becoming part of an official IFC Model View Definition.

IFC Release Specific Concept Description (IFC2x3)

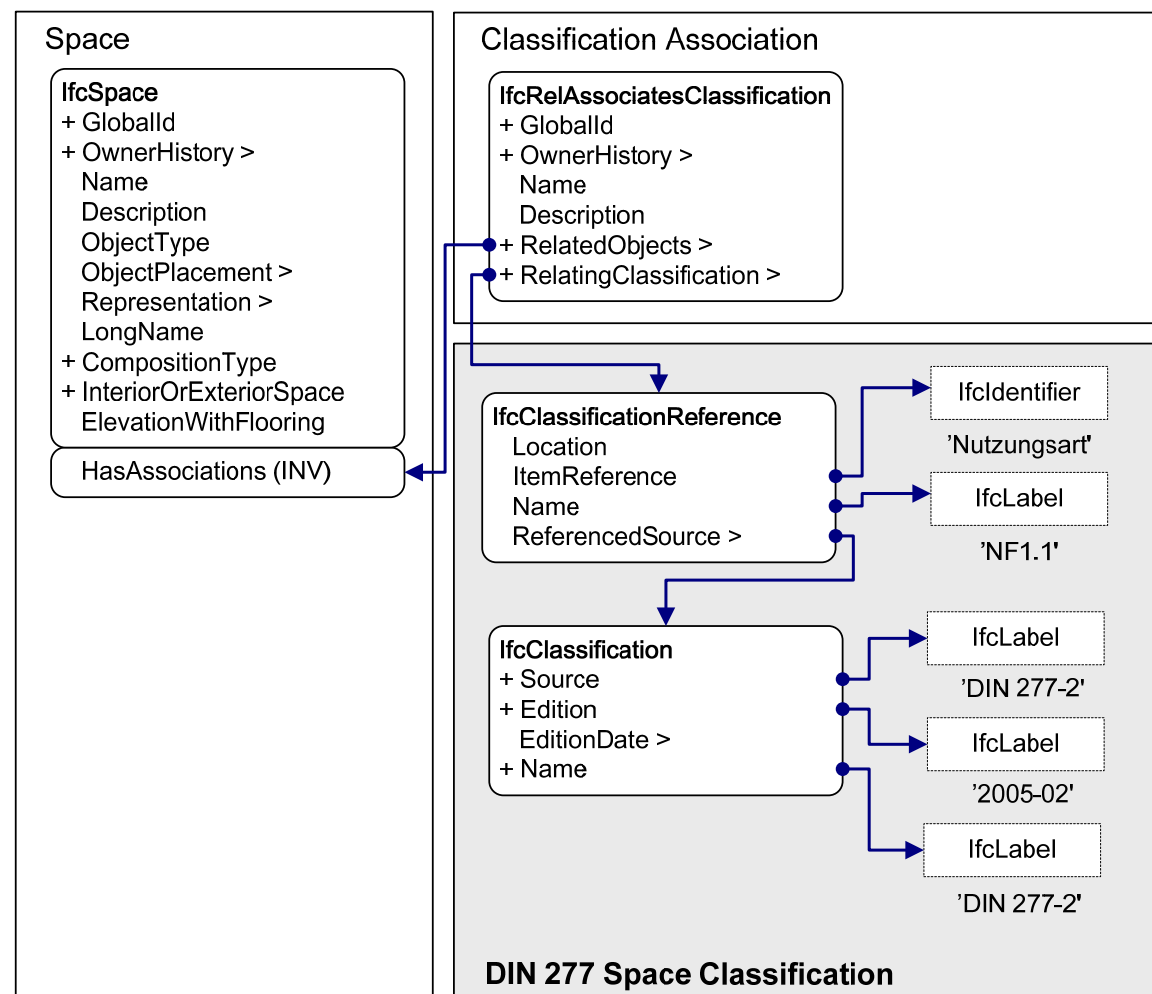
DIN277 Space Classification

Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative "ZukunftBau")				

Usage in view definition diagram



Instantiation diagram



Implementation agreements

IfcClassificationReference

Attribute	Implementation agreements
Location	Optional - Pointer or URL location of the classification (defined by the generating system)
ItemReference	Must be provided - Path (separated through "/") or GUID of the referenced item
Name	Must be provided - Human readable name

ReferencedSource Must be provided - Reference to the classification

IfcClassification

Attribute	Implementation agreements
Source	Must be provided - GUID or standardized name of the classification/catalogue
Edition	Must be provided, but can be an empty String
EditionDate	Optional
Name	Must be provided - Human readable name

IfcRelAssociatesClassification

Attribute	Implementation agreements
GlobalId	Must be provided, but is allowed to change
OwnerHistory	Must be provided, but may contain (reusable) dummy value
Name	Reserved
Description	Reserved
RelatedObjects	A set of buildings that are classified by the classification - further information will be provided by the variable concepts that use classification)
RelatingClassification	Reference to the Classification

Example (spf)

```
#100= IFCCLASSIFICATION('DIN 277-2','2005-02',$,'DIN 277-2');
#101= IFCCLASSIFICATIONREFERENCE($,'Nutzungsart','NF1.1',#100);
#102= IFCRELASSOCIATESCLASSIFICATION('1dejvVx$X0Gxhf6JmbZRfh',#2,$,$, (#103),#101);
#103= IFCSPACE('4Tf2p7VyLB7eox67SA_zKE',#2,'2',$,$,$,'Living room',.ELEMENT.,
    .INTERNAL.,$);
#2= IFCOWNERHISTORY(#5, #6, $, .ADDED., 0, $, $, 1207828354);
#3= IFCPERSON('Matthias Weise', '', '', $, $, $, $, $);
#4= IFCORGANIZATION('', '', '', $, $);
#5= IFCPERSONANDORGANIZATION(#3, #4, $);
#6= IFCAPPLICATION(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');
```

All values that are needed for the classification of a concept are marked with bold letters.

Example (ifcXML)

```
<IfcClassification id="ID100">
  <Source>DIN 277-2</Source>
  <Edition>2005-02</Edition>
  <Name>DIN 277-2</Name>
</IfcClassification>
<IfcClassificationReference id="ID101">
  <ItemReference>Nutzungsart</ItemReference>
  <Name>NF1.1</Name>
  <ReferencedSource>
    <IfcClassification xsi:nil="true" ref="ID100"/>
  </ReferencedSource>
</IfcClassificationReference>
<IfcRelAssociatesClassification id="ID102">
  <GlobalId>1dejvVx$X0Gxhf6JmbZRfh</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <RelatedObjects ex:cType="set">
    <IfcSpace pos="0" xsi:nil="true" ref="ID103"/>
  </RelatedObjects>
  <RelatingClassification>
    <IfcClassificationReference xsi:nil="true" ref="ID101"/>
  </RelatingClassification>
</IfcRelAssociatesClassification>
<IfcSpace id="ID103">
  <GlobalId>4Tf2p7VyLB7eox67SA_zKE</GlobalId>
```



```

    <OwnerHistory>
      <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>2</Name>
    <LongName>Living room</LongName>
    <CompositionType>element</CompositionType>
    <InteriorOrExteriorSpace>internal</InteriorOrExteriorSpace>
  </IfcSpace>
  <IfcOwnerHistory id="ID2">
    <OwningUser>
      <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
    </OwningUser>
    <OwningApplication>
      <IfcApplication xsi:nil="true" ref="ID6"/>
    </OwningApplication>
    <ChangeAction>added</ChangeAction>
    <LastModifiedDate>0</LastModifiedDate>
    <CreationDate>1207828354</CreationDate>
  </IfcOwnerHistory>
  <IfcPerson id="ID3">
    <Id>Matthias Weise</Id>
    <FamilyName></FamilyName>
    <GivenName></GivenName>
  </IfcPerson>
  <IfcOrganization id="ID4">
    <Id></Id>
    <Name></Name>
    <Description></Description>
  </IfcOrganization>
  <IfcPersonAndOrganization id="ID5">
    <ThePerson>
      <IfcPerson xsi:nil="true" ref="ID3"/>
    </ThePerson>
    <TheOrganization>
      <IfcOrganization xsi:nil="true" ref="ID4"/>
    </TheOrganization>
  </IfcPersonAndOrganization>
  <IfcApplication id="ID6">
    <ApplicationDeveloper>
      <IfcOrganization xsi:nil="true" ref="ID4"/>
    </ApplicationDeveloper>
    <Version>IFC-Application X</Version>
    <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
    <ApplicationIdentifier>Company Y</ApplicationIdentifier>
  </IfcApplication>

```

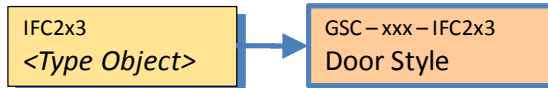
This document uses the official IFC Model View Definition Format version 1.1.0. of the IAI (www.iai-international.org)
 The content of this document has to be certified by the IAI before becoming part of an official IFC Model View Definition.

IFC Release Specific Concept Description (IFC2x3)

Door Style

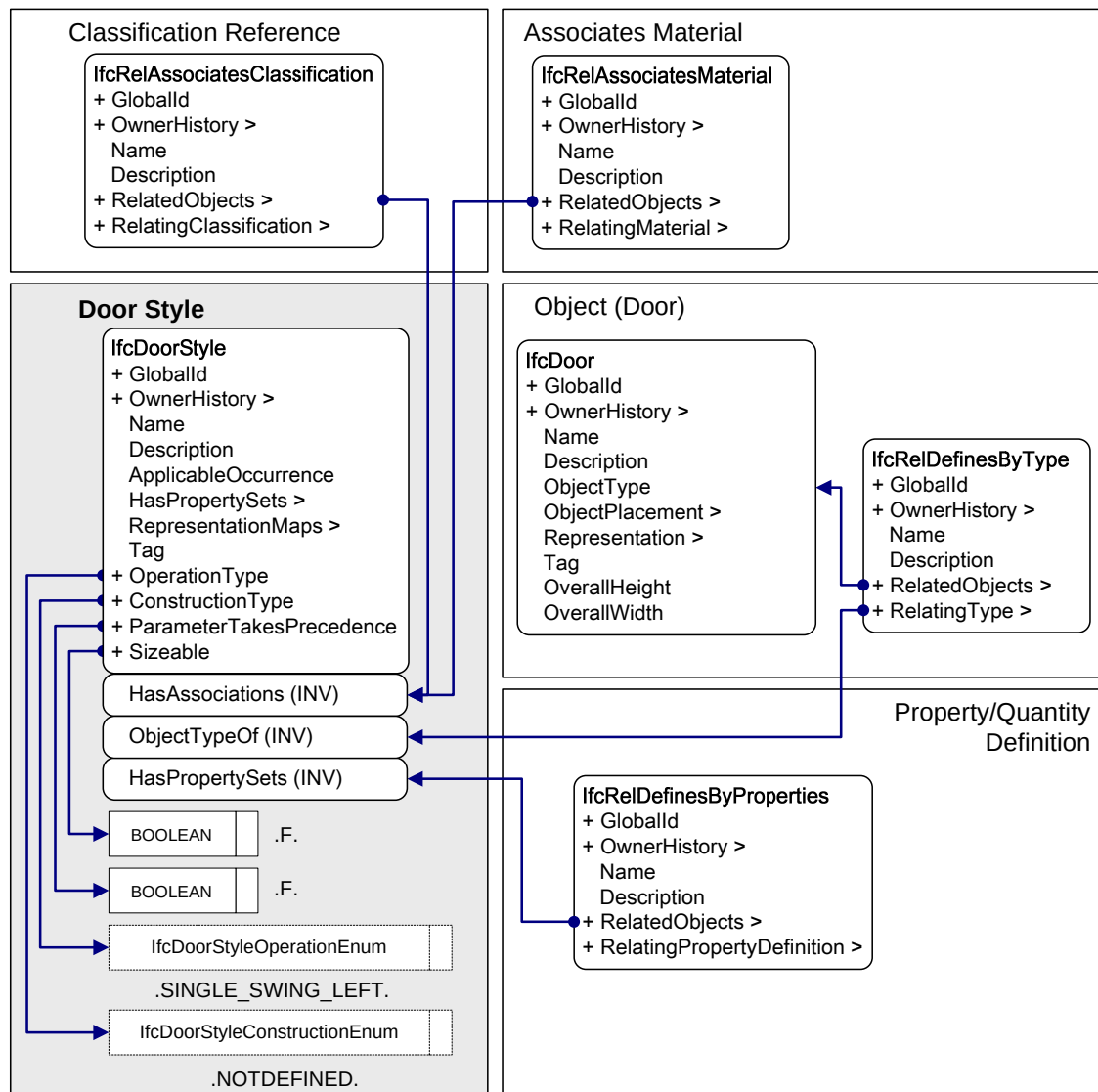
Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative "ZukunftBau")				

Usage in view definition diagram



Please note that there might be further agreements for the "Door Style" concept that are not shown here. In particular, there might be separate concept definitions for specific properties, quantities and classifications. There are also additional (inverse) relationships that are not shown here but might be used to add further information.

Instantiation diagram



Implementation agreements

IfcDoorStyle

Attribute	Implementation agreements
GlobalId	Must be provided
OwnerHistory	Must be provided
Name	Reserved
Description	Reserved
ObjectType	Reserved
ObjectPlacement	No agreements needed
Representation	No agreements needed
Tag	Reserved
ConstructionType	Must be provided
OperationType	Must be provided
ParameterTakes	Must be provided
Precedence	
Sizeable	Must be provided

Example (spf)

```
#100= IFCD00R('1N6AM49mPF_QLJuXpLNYt1',#2,'T103',$,$,$,$,$,2.01,0.75);
#101= IFCD00RLININGPROPERTIES('1WLuCO_IL5R9J0BIowj2uP',#2,$,$,0.23,0.05,
    $,$,$,$,$,$,$,$);
#102= IFCD00RPANELPROPERTIES('0eoUjtRrX12xDCFYg8Q2J5',#2,$,$,0.045,.SWINGING.,
    $,.MIDDLE.,$);
#103= IFCD00RSTYLE('20ZQafot53QR2V1VwPTKAn',#2,'Frame
    door',$,$,($101,$102),$,$,.SINGLE_SWING_LEFT,.NOTDEFINED,.F.,.F.);
#104= IFCRELDEFINESBYTYPE('0SuYMDmmH1Lv8fVlwq8_wV',#2,
    'Frame door type',$,($100),#103);
#109= IFCMATERIAL('Wood');
#110= IFCRELASSOCIATESMATERIAL('0iKtTg9xP6buf6Pf7_2fSN',#2,$,$,($100),#109);
#111= IFCPROPERTYSET('1KwmeMlorCeABBAQ0CbtFj',#2,'Pset_WindowCommon',$,
    ($113,$114,$115));
#112= IFCRELDEFINESBYPROPERTIES('1inGsaLULC78ImgdLZI9Kc',#2,$,$,($100),#111);
#113= IFCPROPERTYSINGLEVALUE('FireRating',$,IFCLABEL('F30')));
#114= IFCPROPERTYSINGLEVALUE('GlazingAreaFraction',$,
    IFCPOSITIVERATIOMEASURE(0.1),$);
#115= IFCPROPERTYSINGLEVALUE('IsExterior',$,IFCBOOLEAN(.T.),$);
#2= IFCOWNERHISTORY(#5, #6, $, .ADDED., 0, $, $, 1207828354);
#3= IFCPERSON('Matthias Weise', '', '', $, $, $, $, $);
#4= IFCORGANIZATION('', '', '', $, $);
#5= IFCPERSONANDORGANIZATION(#3, #4, $);
#6= IFCAPPLICATION(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');
```

Example (ifcXML)

```
<IfcOwnerHistory id="ID2">
  <OwningUser>
    <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
  </OwningUser>
  <OwningApplication>
    <IfcApplication xsi:nil="true" ref="ID6"/>
  </OwningApplication>
  <ChangeAction>added</ChangeAction>
  <LastModifiedDate>0</LastModifiedDate>
  <CreationDate>1207828354</CreationDate>
</IfcOwnerHistory>
<IfcPerson id="ID3">
  <Id>Matthias Weise</Id>
  <FamilyName></FamilyName>
  <GivenName></GivenName>
</IfcPerson>
<IfcOrganization id="ID4">
  <Id></Id>
  <Name></Name>
  <Description></Description>
```

```

</IfcOrganization>
<IfcPersonAndOrganization id="ID5">
  <ThePerson>
    <IfcPerson xsi:nil="true" ref="ID3"/>
  </ThePerson>
  <TheOrganization>
    <IfcOrganization xsi:nil="true" ref="ID4"/>
  </TheOrganization>
</IfcPersonAndOrganization>
<IfcApplication id="ID6">
  <ApplicationDeveloper>
    <IfcOrganization xsi:nil="true" ref="ID4"/>
  </ApplicationDeveloper>
  <Version>IFC-Application X</Version>
  <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
  <ApplicationIdentifier>Company Y</ApplicationIdentifier>
</IfcApplication>
<IfcDoor id="ID100">
  <GlobalId>1N6AM49mPF_QLJuXpLNYt1</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>T103</Name>
  <OverallHeight>2.01</OverallHeight>
  <OverallWidth>0.75</OverallWidth>
</IfcDoor>
<IfcDoorLiningProperties id="ID101">
  <GlobalId>1WLuCO_IL5R9J0BIowj2uP</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <LiningDepth>0.23</LiningDepth>
  <LiningThickness>0.05</LiningThickness>
</IfcDoorLiningProperties>
<IfcDoorPanelProperties id="ID102">
  <GlobalId>0eoUjtRrX12xDCFYg8Q2J5</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <PanelDepth>0.045</PanelDepth>
  <PanelOperation>swinging</PanelOperation>
  <PanelPosition>middle</PanelPosition>
</IfcDoorPanelProperties>
<IfcDoorStyle id="ID103">
  <GlobalId>20ZQafot53QR2V1VwPTKAn</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>Frame door</Name>
  <HasPropertySets ex:cType="set">
    <IfcDoorLiningProperties pos="0" xsi:nil="true" ref="ID101"/>
    <IfcDoorPanelProperties pos="1" xsi:nil="true" ref="ID102"/>
  </HasPropertySets>
  <OperationType>single_swing_left</OperationType>
  <ConstructionType>notdefined</ConstructionType>
  <ParameterTakesPrecedence>false</ParameterTakesPrecedence>
  <Sizeable>false</Sizeable>
</IfcDoorStyle>
<IfcRelDefinesByType id="ID104">
  <GlobalId>0SuYMDmmH1Lv8fVlwq8_wV</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>Frame door type</Name>
  <RelatedObjects ex:cType="set">
    <IfcDoor pos="0" xsi:nil="true" ref="ID100"/>
  </RelatedObjects>
  <RelatingType>
    <IfcDoorStyle xsi:nil="true" ref="ID103"/>
  </RelatingType>
</IfcRelDefinesByType>

```

```

<IfcMaterial id="ID109">
  <Name>Wood</Name>
</IfcMaterial>
<IfcRelAssociatesMaterial id="ID110">
  <GlobalId>0iKTtg9xP6buf6Pf7_2fSN</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <RelatedObjects ex:cType="set">
    <IfcDoor pos="0" xsi:nil="true" ref="ID100"/>
  </RelatedObjects>
  <RelatingMaterial>
    <IfcMaterial xsi:nil="true" ref="ID109"/>
  </RelatingMaterial>
</IfcRelAssociatesMaterial>
<IfcPropertySet id="ID111">
  <GlobalId>1KwmeMlorCeABBAQ0CbtFj</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>Pset_WindowCommon</Name>
  <HasProperties ex:cType="set">
    <IfcPropertySingleValue pos="0" xsi:nil="true" ref="ID113"/>
    <IfcPropertySingleValue pos="1" xsi:nil="true" ref="ID114"/>
    <IfcPropertySingleValue pos="2" xsi:nil="true" ref="ID115"/>
  </HasProperties>
</IfcPropertySet>
<IfcRelDefinesByProperties id="ID112">
  <GlobalId>1inGsaLULC78ImgdLZI9Kc</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <RelatedObjects ex:cType="set">
    <IfcDoor pos="0" xsi:nil="true" ref="ID100"/>
  </RelatedObjects>
  <RelatingPropertyDefinition>
    <IfcPropertySet xsi:nil="true" ref="ID111"/>
  </RelatingPropertyDefinition>
</IfcRelDefinesByProperties>
<IfcPropertySingleValue id="ID113">
  <Name>FireRating</Name>
  <NominalValue>
    <IfcLabel>F30</IfcLabel>
  </NominalValue>
</IfcPropertySingleValue>
<IfcPropertySingleValue id="ID114">
  <Name>GlazingAreaFraction</Name>
  <NominalValue>
    <IfcPositiveRatioMeasure>0.1</IfcPositiveRatioMeasure>
  </NominalValue>
</IfcPropertySingleValue>
<IfcPropertySingleValue id="ID115">
  <Name>IsExterior</Name>
  <NominalValue>
    <IfcBoolean>true</IfcBoolean>
  </NominalValue>
</IfcPropertySingleValue>

```

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The content of this document has to be certified by the IAI before becoming part of an official IFC Model View Definition.

IFC Release Specific Concept Description (IFC2x3)

Door

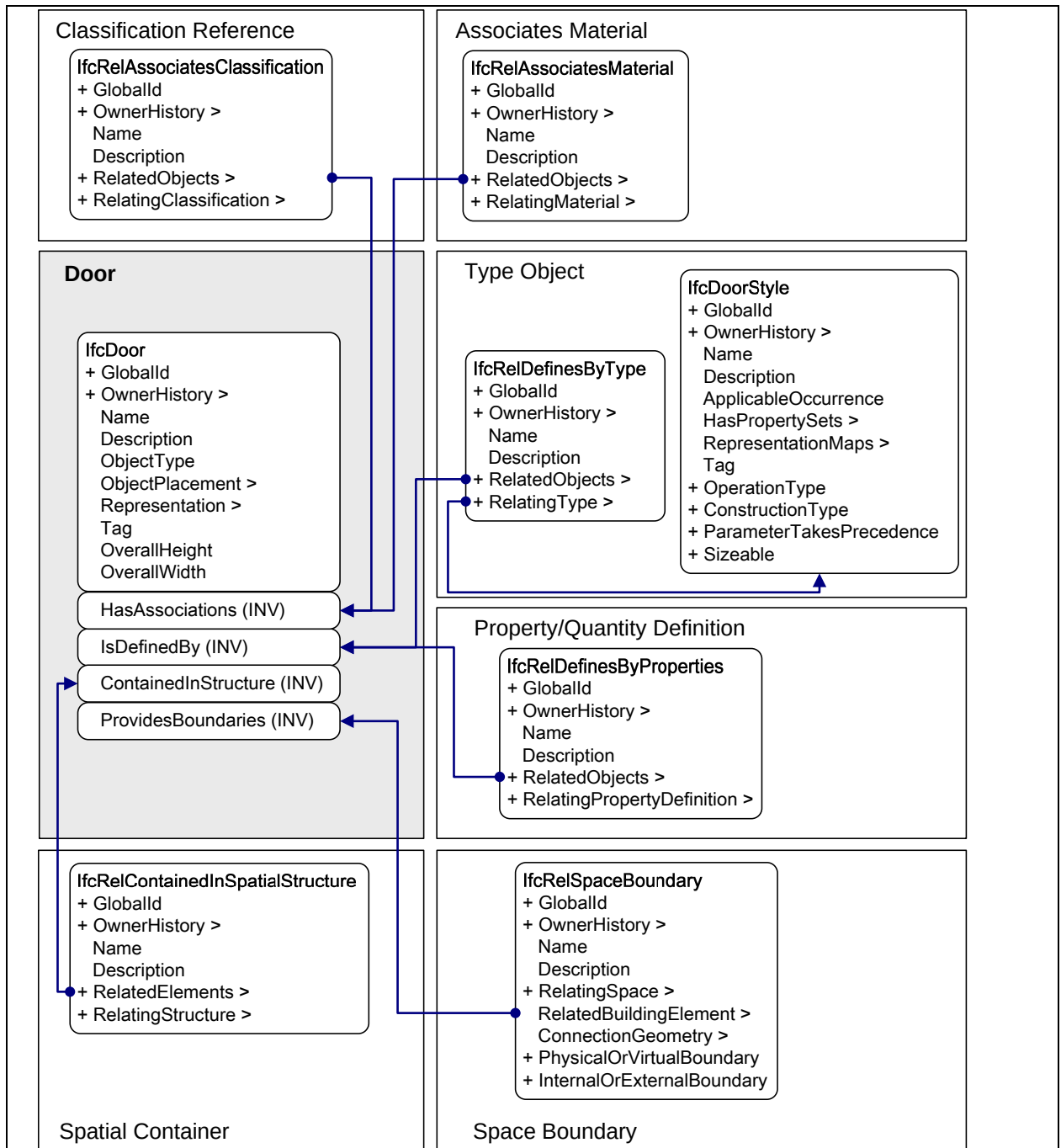
Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative “ZukunftBau”)				

Usage in view definition diagram



Please note that there might be further agreements for the “Door” concept that are not shown here. In particular, there might be separate concept definitions for specific properties, quantities and classifications. There are also additional (inverse) relationships that are not shown here but might be used to add further information or to define specific relationships to other elements.

Instantiation diagram



Implementation agreements

IfcDoor

Attribute	Implementation agreements
GlobalId	Must be provided
OwnerHistory	Must be provided
Name	Reserved
Description	Reserved
ObjectType	Reserved
ObjectPlacement	No agreements needed
Representation	No agreements needed
Tag	Reserved
OverallHeight	No agreements
OverallWidth	No agreements

HasAssociations (INV)	Optional, may contain instances of IfcRelAssociatesClassification that further classify the door according to a classification system and/or IfcRelAssociatesMaterial that provides information about the material
IsDefinedBy (INV)	Optional, may contain instances of IfcRelDefinesByProperties that further define the door with additional properties/quantities, and/or IfcRelDefinesByType that refers to the door style (type object)
ContainedInStructure (INV)	Optional, may define the spatial structure (most likely the space or building storey) in which the door is contained (see also ProvidesBoundaries) Please note that containment might also be defined via the wall to which the door belongs.
ProvidesBoundaries (INV)	Optional, may define the space that is bounded by the door
..	

Example (spf)

```
#100= IFCD00R('1N6AM49mPF_QlJuXpLNYt1',#15,'T103',$,$,$,$,$,2.01,0.75);
#101= IFCD00RLININGPROPERTIES('1WLuCO_IL5R9J0BIowj2uP',#15,$,$,0.23,0.05,$,$,$,$,$,$,$);
#102= IFCD00RPANELPROPERTIES('0eoUjtRrX12xDCFYg8Q2J5',#15,$,$,0.045,.SWINGING.,$, .MIDDLE.,$);
#103= IFCD00RSTYLE('20ZQafot53QR2V1VwPTKAn',#15,'Frame door',$,$,($101,$102),$,$,.SINGLE_SWING_LEFT.,.NOTDEFINED.,.F.,.F.);
#104= IFCRELDEFINESBYTYPE('0SuYMDmmH1Lv8fVlwq8_wV',#15,'Frame door type',$,($100,$103);
#109= IFCMATERIAL('Wood');
#110= IFCRELASSOCIATESMATERIAL('0iKTtg9xP6buf6Pf7_2fSN',#2,$,$,($100,$109);
#111= IFCPROPERTYSET('1KWmeMlorCeABBAQ0CbtFj',#2,'Pset_windowCommon',$,($113,$114,$115));
#112= IFCRELDEFINESBYPROPERTIES('1inGsaLULC78ImgdLZI9Kc',#2,$,$,($100,$111);
#113= IFCPROPERTYSINGLEVALUE('FireRating',$,IFCLABEL('F30'),$);
#114= IFCPROPERTYSINGLEVALUE('GlazingAreaFraction',$,IFCPOSITIVERATIOMEASURE(0.1),$);
#115= IFCPROPERTYSINGLEVALUE('IsExterior',$,IFCBOOLEAN(.T.),$);
#2= IFCOWNERHISTORY(#5, #6, $, .ADDED., 0, $, $, 1207828354);
#3= IFCPERSON('Matthias Weise', '', '', $, $, $, $, $);
#4= IFCORGANIZATION('', '', '', $, $);
#5= IFCPERSONANDORGANIZATION(#3, #4, $);
#6= IFCAPPLICATION(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');
```

Example (ifcXML)

```
<IfcOwnerHistory id="ID2">
  <OwningUser>
    <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
  </OwningUser>
  <OwningApplication>
    <IfcApplication xsi:nil="true" ref="ID6"/>
  </OwningApplication>
  <ChangeAction>added</ChangeAction>
  <LastModifiedDate>0</LastModifiedDate>
  <CreationDate>1207828354</CreationDate>
</IfcOwnerHistory>
<IfcPerson id="ID3">
  <Id>Matthias Weise</Id>
  <FamilyName></FamilyName>
  <GivenName></GivenName>
</IfcPerson>
<IfcOrganization id="ID4">
  <Id></Id>
  <Name></Name>
  <Description></Description>
</IfcOrganization>
<IfcPersonAndOrganization id="ID5">
  <ThePerson>
    <IfcPerson xsi:nil="true" ref="ID3"/>
  </ThePerson>
</IfcPersonAndOrganization>
```



```

    </ThePerson>
    <TheOrganization>
      <IfcOrganization xsi:nil="true" ref="ID4"/>
    </TheOrganization>
  </IfcPersonAndOrganization>
  <IfcApplication id="ID6">
    <ApplicationDeveloper>
      <IfcOrganization xsi:nil="true" ref="ID4"/>
    </ApplicationDeveloper>
    <Version>IFC-Application X</Version>
    <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
    <ApplicationIdentifier>Company Y</ApplicationIdentifier>
  </IfcApplication>
  <IfcDoor id="ID100">
    <GlobalId>1N6AM49mPF_QLJuXpLNYt1</GlobalId>
    <OwnerHistory>
      <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>T103</Name>
    <OverallHeight>2.01</OverallHeight>
    <OverallWidth>0.75</OverallWidth>
  </IfcDoor>
  <IfcDoorLiningProperties id="ID101">
    <GlobalId>1WLuCO_IL5R9J0BIowj2uP</GlobalId>
    <OwnerHistory>
      <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <LiningDepth>0.23</LiningDepth>
    <LiningThickness>0.05</LiningThickness>
  </IfcDoorLiningProperties>
  <IfcDoorPanelProperties id="ID102">
    <GlobalId>0eoUjtRrX12xDCFYg8Q2J5</GlobalId>
    <OwnerHistory>
      <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <PanelDepth>0.045</PanelDepth>
    <PanelOperation>swinging</PanelOperation>
    <PanelPosition>middle</PanelPosition>
  </IfcDoorPanelProperties>
  <IfcDoorStyle id="ID103">
    <GlobalId>20ZQafot53QR2V1VwPTKAn</GlobalId>
    <OwnerHistory>
      <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>Frame door</Name>
    <HasPropertySets ex:cType="set">
      <IfcDoorLiningProperties pos="0" xsi:nil="true" ref="ID101"/>
      <IfcDoorPanelProperties pos="1" xsi:nil="true" ref="ID102"/>
    </HasPropertySets>
    <OperationType>single_swing_left</OperationType>
    <ConstructionType>notdefined</ConstructionType>
    <ParameterTakesPrecedence>false</ParameterTakesPrecedence>
    <Sizeable>false</Sizeable>
  </IfcDoorStyle>
  <IfcRelDefinesByType id="ID104">
    <GlobalId>0SuYMDmmH1Lv8fVlwq8_wV</GlobalId>
    <OwnerHistory>
      <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>Frame door type</Name>
    <RelatedObjects ex:cType="set">
      <IfcDoor pos="0" xsi:nil="true" ref="ID100"/>
    </RelatedObjects>
    <RelatingType>
      <IfcDoorStyle xsi:nil="true" ref="ID103"/>
    </RelatingType>
  </IfcRelDefinesByType>
  <IfcMaterial id="ID109">
    <Name>Wood</Name>
  </IfcMaterial>
  <IfcRelAssociatesMaterial id="ID110">

```

```

<GlobalId>0iKTtg9xP6buf6Pf7_2fSN</GlobalId>
<OwnerHistory>
  <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
</OwnerHistory>
<RelatedObjects ex:cType="set">
  <IfcDoor pos="0" xsi:nil="true" ref="ID100"/>
</RelatedObjects>
<RelatingMaterial>
  <IfcMaterial xsi:nil="true" ref="ID109"/>
</RelatingMaterial>
</IfcRelAssociatesMaterial>
<IfcPropertySet id="ID111">
  <GlobalId>1KWmeMlorCeABBAQ0CbtFj</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>Pset_WindowCommon</Name>
  <HasProperties ex:cType="set">
    <IfcPropertySingleValue pos="0" xsi:nil="true" ref="ID113"/>
    <IfcPropertySingleValue pos="1" xsi:nil="true" ref="ID114"/>
    <IfcPropertySingleValue pos="2" xsi:nil="true" ref="ID115"/>
  </HasProperties>
</IfcPropertySet>
<IfcRelDefinesByProperties id="ID112">
  <GlobalId>1inGsaLULC78ImgdLZI9Kc</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <RelatedObjects ex:cType="set">
    <IfcDoor pos="0" xsi:nil="true" ref="ID100"/>
  </RelatedObjects>
  <RelatingPropertyDefinition>
    <IfcPropertySet xsi:nil="true" ref="ID111"/>
  </RelatingPropertyDefinition>
</IfcRelDefinesByProperties>
<IfcPropertySingleValue id="ID113">
  <Name>FireRating</Name>
  <NominalValue>
    <IfcLabel>F30</IfcLabel>
  </NominalValue>
</IfcPropertySingleValue>
<IfcPropertySingleValue id="ID114">
  <Name>GlazingAreaFraction</Name>
  <NominalValue>
    <IfcPositiveRatioMeasure>0.1</IfcPositiveRatioMeasure>
  </NominalValue>
</IfcPropertySingleValue>
<IfcPropertySingleValue id="ID115">
  <Name>IsExterior</Name>
  <NominalValue>
    <IfcBoolean>true</IfcBoolean>
  </NominalValue>
</IfcPropertySingleValue>

```

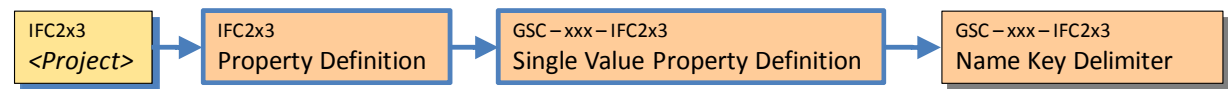
This document uses the official IFC Model View Definition Format version 1.1.0. of the IAI (www.iai-international.org)
The content of this document has to be certified by the IAI before becoming part of an official IFC Model View Definition.

IFC Release Specific Concept Description (IFC2x3)

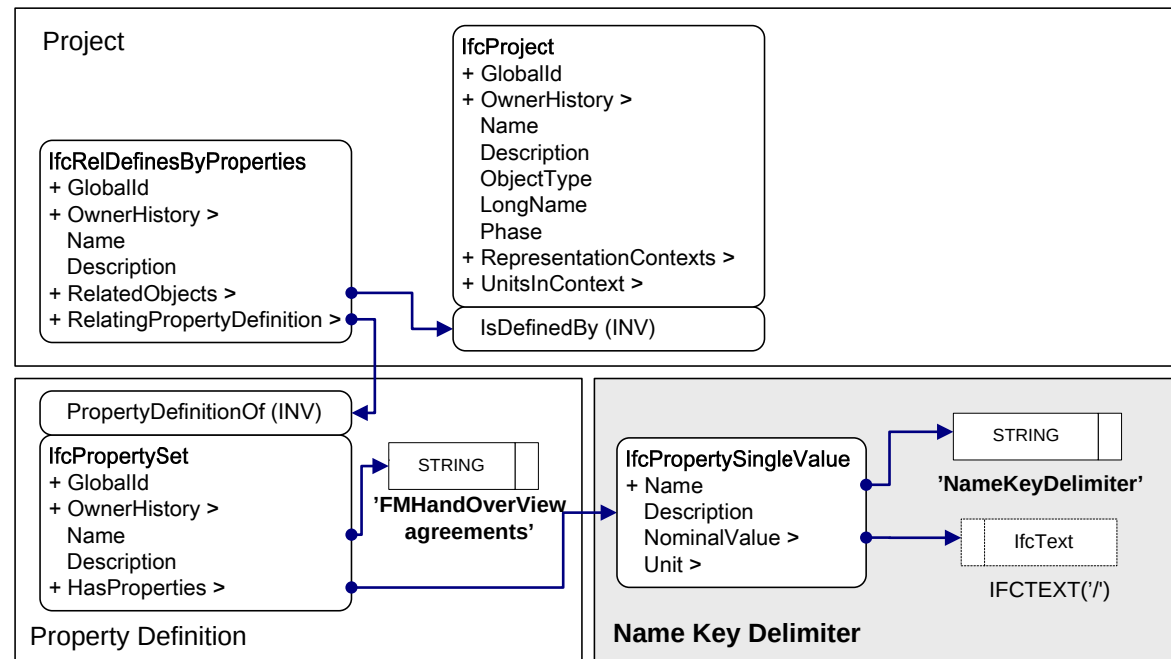
Name Key Delimiter

Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative "ZukunftBau")				

Usage in view definition diagram



Instantiation diagram



Implementation agreements

IfcPropertySet

Attribute	Implementation agreements
GlobalId	Must be provided, but is allowed to change
OwnerHistory	Must be provided, but may contain dummy value
Name	Must be provided, recommended to be 'FMHandOverView agreements'
Description	Reserved
HasProperties	Must be provided - set of project properties
PropertyDefinitionOf (INV)	Must be provided - link to the relationship that defines the connection to the building

IfcPropertySingleValue

Attribute	Implementation agreements
Name	Must be provided – shall enable to uniquely identify the property value
Description	Reserved
NominalValue	Must be provided
Unit	Not needed

Example (spf)

```
#100= IFCPROJECT('0J$yPqHBD12v72y4qF6XcD',#2,'WHD',$,$,'Wohnhaus  
Dresden','Entwurfsplanung',(#10),#11);  
#120= IFCPROPERTYSINGLEVALUE('NameKeyDelimiter', 'Delimiter for hierarchical  
catalogue data', IFCTEXT('/' ), $);  
#121= IFCPROPERTYSET('xxxn81LX4TsMZx0wr73ZJ0', #2, 'FMHandOverView agreements',  
$, (#120));  
#122= IFCRELDEFINESBYPROPERTIES('xxxn8HLX4TsMZx0wr73ZJ0', #2, $, $, (#100), #121);  
#10= IFCGEOMETRICREPRESENTATIONCONTEXT($, 'Model', 3, 1.00000000E-5, #20, $);  
#11= IFCUNITASSIGNMENT((#16, #17, #18));  
#16= IFCSIUNIT(*, .LENGTHUNIT., $, .METRE.);  
#17= IFCSIUNIT(*, .AREAUNIT., $, .SQUARE_METRE.);  
#18= IFCSIUNIT(*, .VOLUMEUNIT., $, .CUBIC_METRE.);  
#20= IFCAXIS2PLACEMENT3D(#21, #22, #23);  
#21= IFCCARTESIANPOINT((0., 0., 0.));  
#22= IFCDIRECTION((0., 0., 1.));  
#23= IFCDIRECTION((1., 0., 0.));  
#2= IFCOWNERHISTORY(#5, #6, $, .ADDED., 0, $, $, 1207828354);  
#3= IFCPERSON('Matthias Weise', '', '', $, $, $, $, $);  
#4= IFCORGANIZATION('', '', '', $, $);  
#5= IFCPERSONANDORGANIZATION(#3, #4, $);  
#6= IFCAPPLICATION(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');
```

All values that are needed to define the name key delimiter and to attach them to a “Project” are marked with bold letters.

Example (ifcXML)

```
<IfcProject id="ID100">  
  <GlobalId>0J$yPqHBD12v72y4qF6XcD</GlobalId>  
  <OwnerHistory>  
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>  
  </OwnerHistory>  
  <Name>WHD</Name>  
  <LongName>Wohnhaus Dresden</LongName>  
  <Phase>Entwurfsplanung</Phase>  
  <RepresentationContexts ex:cType="set">  
    <IfcGeometricRepresentationContext pos="0" xsi:nil="true" ref="ID10"/>  
  </RepresentationContexts>  
  <UnitsInContext>  
    <IfcUnitAssignment xsi:nil="true" ref="ID11"/>  
  </UnitsInContext>  
</IfcProject>  
<IfcPropertySingleValue id="ID120">  
  <Name>NameKeyDelimiter</Name>  
  <Description>Delimiter for hierarchical catalogue data</Description>  
  <NominalValue>  
    <IfcText></IfcText>  
  </NominalValue>  
</IfcPropertySingleValue>  
<IfcPropertySet id="ID121">  
  <GlobalId>xxxn81LX4TsMZx0wr73ZJ0</GlobalId>  
  <OwnerHistory>  
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>  
  </OwnerHistory>  
  <Name>FMHandOverView agreements</Name>  
  <HasProperties ex:cType="set">  
    <IfcPropertySingleValue pos="0" xsi:nil="true" ref="ID120"/>  
  </HasProperties>  
</IfcPropertySet>  
<IfcRelDefinesByProperties id="ID122">  
  <GlobalId>xxxn8HLX4TsMZx0wr73ZJ0</GlobalId>  
  <OwnerHistory>  
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>  
  </OwnerHistory>  
  <RelatedObjects ex:cType="set">  
    <IfcProject pos="0" xsi:nil="true" ref="ID100"/>  
  </RelatedObjects>
```

```

    <RelatingPropertyDefinition>
      <IfcPropertySet xsi:nil="true" ref="ID121"/>
    </RelatingPropertyDefinition>
  </IfcRelDefinesByProperties>
  <IfcOwnerHistory id="ID2">
    <OwningUser>
      <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
    </OwningUser>
    <OwningApplication>
      <IfcApplication xsi:nil="true" ref="ID6"/>
    </OwningApplication>
    <ChangeAction>added</ChangeAction>
    <LastModifiedDate>0</LastModifiedDate>
    <CreationDate>1207828354</CreationDate>
  </IfcOwnerHistory>
  <IfcPerson id="ID3">
    <Id>Matthias Weise</Id>
    <FamilyName></FamilyName>
    <GivenName></GivenName>
  </IfcPerson>
  <IfcOrganization id="ID4">
    <Id></Id>
    <Name></Name>
    <Description></Description>
  </IfcOrganization>
  <IfcPersonAndOrganization id="ID5">
    <ThePerson>
      <IfcPerson xsi:nil="true" ref="ID3"/>
    </ThePerson>
    <TheOrganization>
      <IfcOrganization xsi:nil="true" ref="ID4"/>
    </TheOrganization>
  </IfcPersonAndOrganization>
  <IfcApplication id="ID6">
    <ApplicationDeveloper>
      <IfcOrganization xsi:nil="true" ref="ID4"/>
    </ApplicationDeveloper>
    <Version>IFC-Application X</Version>
    <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
    <ApplicationIdentifier>Company Y</ApplicationIdentifier>
  </IfcApplication>
  <IfcGeometricRepresentationContext id="ID10">
    <ContextType>Model</ContextType>
    <CoordinateSpaceDimension>3</CoordinateSpaceDimension>
    <Precision>1.E-05</Precision>
    <WorldCoordinateSystem>
      <IfcAxis2Placement3D xsi:nil="true" ref="ID20"/>
    </WorldCoordinateSystem>
  </IfcGeometricRepresentationContext>
  <IfcUnitAssignment id="ID11">
    <Units ex:cType="set">
      <IfcSIUnit pos="0" xsi:nil="true" ref="ID16"/>
      <IfcSIUnit pos="1" xsi:nil="true" ref="ID17"/>
      <IfcSIUnit pos="2" xsi:nil="true" ref="ID18"/>
    </Units>
  </IfcUnitAssignment>
  <IfcSIUnit id="ID16">
    <UnitType>lengthunit</UnitType>
    <Name>metre</Name>
  </IfcSIUnit>
  <IfcSIUnit id="ID17">
    <UnitType>areaunit</UnitType>
    <Name>square_metre</Name>
  </IfcSIUnit>
  <IfcSIUnit id="ID18">
    <UnitType>volumeunit</UnitType>
    <Name>cubic_metre</Name>
  </IfcSIUnit>
  <IfcAxis2Placement3D id="ID20">
    <Location>
      <IfcCartesianPoint xsi:nil="true" ref="ID21"/>
    </Location>
  </IfcAxis2Placement3D>

```

```

</Location>
<Axis>
  <IfcDirection xsi:nil="true" ref="ID22"/>
</Axis>
<RefDirection>
  <IfcDirection xsi:nil="true" ref="ID23"/>
</RefDirection>
</IfcAxis2Placement3D>
<IfcCartesianPoint id="ID21">
  <Coordinates ex:cType="list">
    <IfcLengthMeasure pos="0">0.</IfcLengthMeasure>
    <IfcLengthMeasure pos="1">0.</IfcLengthMeasure>
    <IfcLengthMeasure pos="2">0.</IfcLengthMeasure>
  </Coordinates>
</IfcCartesianPoint>
<IfcDirection id="ID22">
  <DirectionRatios ex:cType="list">
    <ex:double-wrapper pos="0">0.</ex:double-wrapper>
    <ex:double-wrapper pos="1">0.</ex:double-wrapper>
    <ex:double-wrapper pos="2">1.</ex:double-wrapper>
  </DirectionRatios>
</IfcDirection>
<IfcDirection id="ID23">
  <DirectionRatios ex:cType="list">
    <ex:double-wrapper pos="0">1.</ex:double-wrapper>
    <ex:double-wrapper pos="1">0.</ex:double-wrapper>
    <ex:double-wrapper pos="2">0.</ex:double-wrapper>
  </DirectionRatios>
</IfcDirection>

```

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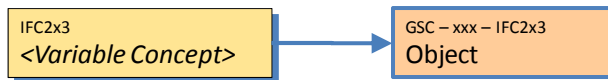
The content of this document has to be certified by the IAI before becoming part of an official IFC Model View Definition.

IFC Release Specific Concept Description (IFC2x3)

Object

Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative "ZukunftBau")				

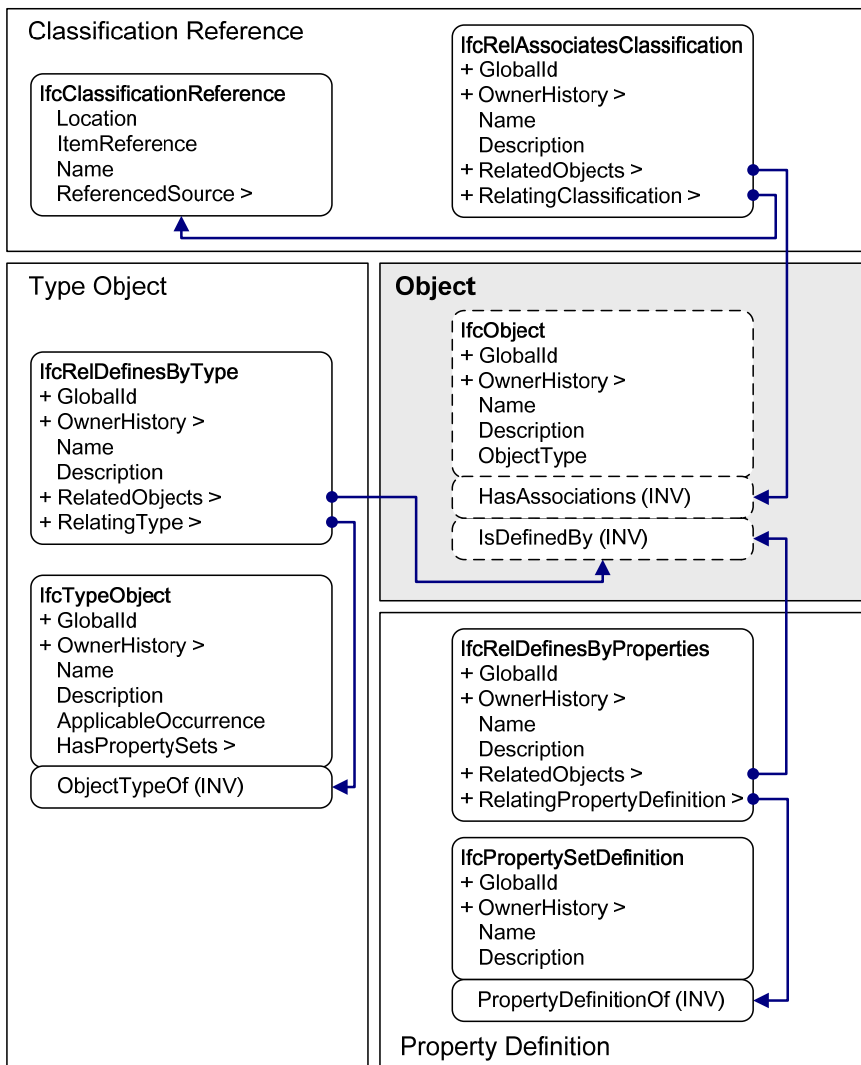
Usage in view definition diagram



Please note that the “*Object*” concept is an adapter concept that cannot be instantiated and will be refined by other (adapter and static) concept definitions. The purpose of “*Object*” is to have one concept that can be used as a place holder for refined concepts and to specify generic functionality, e.g. the *generic – specific – occurrence* modeling paradigm. Thus, it follows the principle of classification.

Remark for MVD harmonization: It currently concentrates on functionality that is needed for one specific view. Thus, it might be necessary to extend this concept to be re-used by other views, other types of association, assignment etc.

Instantiation diagram



Implementation agreements

IfcObject

Attribute	Implementation agreements
GlobalId	Must be provided
OwnerHistory	Must be provided, but may contain dummy value
Name	Reserved
Description	Reserved
ObjectType	Reserved
HasAssociations (INV)	May contain instances of IfcRelAssociatesClassification that further classify the element according to a classification system
IsDefinedBy (INV)	May contain instances of IfcRelDefinesByType or IfcRelDefinesByProperties that further define the element

Example

IfcObject cannot be instantiated. Therefore, examples are given in the refined concepts.

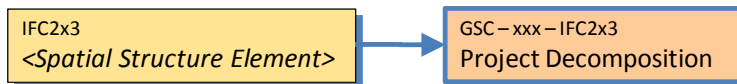
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The content of this document has to be certified by the IAI before becoming part of an official IFC Model View Definition.

IFC Release Specific Concept Description (IFC2x3)

Project Decomposition

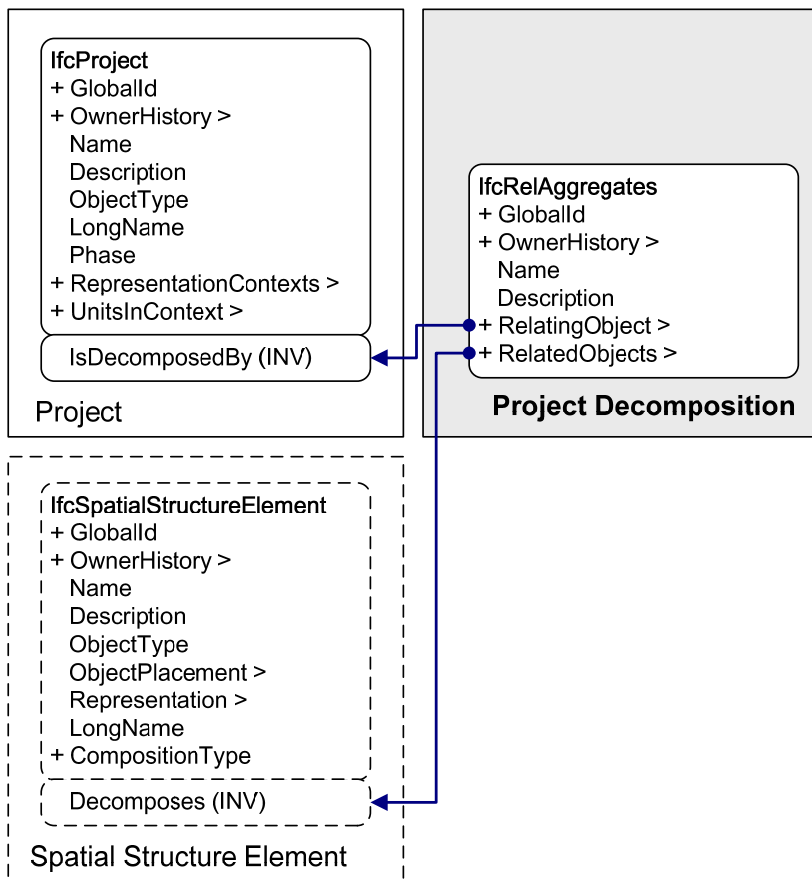
Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative "ZukunftBau")				

Usage in view definition diagram



Remark for MVD harmonization: see also VBL-404, VBL-405

Instantiation diagram



Please note that *IfcSpatialStructureElement* is an abstract supertype of the concepts "Site", "Building", "BuildingStorey" and "Space". Thus, it cannot be instantiated as suggested in the instantiation diagram.

Implementation agreements

IfcRelAggregates

Attribute	Implementation agreements
GlobalId	Must be provided, but is allowed to change
OwnerHistory	Must be provided, but may contain (reusable) dummy value
Name	Reserved
Description	Reserved
RelatingObject	Must be provided - reference to the project

RelatedObjects

Must be provided - top-level nodes of the spatial structure

Example (spf)

```
#24= IFCRELAGGREGATES('cwgUeGRq4TsV1W5nm0d8F0', #2, $, $, #18, (#22));
#18= IFCPROJECT('cwfta0Rq4TsV1W5nm0d8F0', #2, 'Decomposition example project', '',
$, $, $, (#17), #12);
#22= IFCBUILDING('sISCCgKx4TkF9N05m0d8oG', #2, '1056', $, $, $, $, 'Building',
.ELEMENT., $, $, $);
#12= IFCUNITASSIGNMENT((#7, #8, #9, #10, #11));
#7= IFCSIUNIT(*, .AREAUNIT., $, .SQUARE_METRE.);
#8= IFCSIUNIT(*, .VOLUMEUNIT., $, .CUBIC_METRE.);
#9= IFCSIUNIT(*, .MASSUNIT., $, .GRAM.);
#10= IFCSIUNIT(*, .TIMEUNIT., $, .SECOND.);
#11= IFCSIUNIT(*, .LENGTHUNIT., $, .METRE.);
#17= IFCGEOMETRICREPRESENTATIONCONTEXT('DummyGeometricContext', 'DummyGeometry', 3,
0.0, #16, $);
#16= IFCAXIS2PLACEMENT3D(#13, #14, #15);
#13= IFCCARTESIANPOINT((0.0, 0.0, 0.0));
#14= IFCDIRECTION((0.0, 0.0, 1.0));
#15= IFCDIRECTION((1.0, 0.0, 0.0));
#2= IFCOWNERHISTORY(#5, #6, $, .ADDED., 0, $, $, 1207828354);
#3= IFCPERSON('Matthias Weise', '', '', $, $, $, $, $);
#4= IFCORGANIZATION('', '', '', $, $);
#5= IFCPERSONANDORGANIZATION(#3, #4, $);
#6= IFCAPPLICATION(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');
```

All values that are needed to decompose a project are marked with bold letters.

The example shows a project (#18) that is decomposed by a building (#22), whereas the building is an example for the concept *"Spatial Structure Element"*. Both elements are connected by the relationship *IfcRelAggregates* (#24).

Example (ifcXML)

```
<IfcRelAggregates id="ID24">
  <GlobalId>cwgUeGRq4TsV1W5nm0d8F0</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <RelatingObject>
    <IfcProject xsi:nil="true" ref="ID18"/>
  </RelatingObject>
  <RelatedObjects ex:cType="set">
    <IfcBuilding pos="0" xsi:nil="true" ref="ID22"/>
  </RelatedObjects>
</IfcRelAggregates>
<IfcProject id="ID18">
  <GlobalId>cwfta0Rq4TsV1W5nm0d8F0</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>Decomposition example project</Name>
  <Description></Description>
  <RepresentationContexts ex:cType="set">
    <IfcGeometricRepresentationContext pos="0" xsi:nil="true" ref="ID17"/>
  </RepresentationContexts>
  <UnitsInContext>
    <IfcUnitAssignment xsi:nil="true" ref="ID12"/>
  </UnitsInContext>
</IfcProject>
<IfcBuilding id="ID22">
  <GlobalId>sISCCgKx4TkF9N05m0d8oG</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>1056</Name>
  <LongName>Bauwerk</LongName>
  <CompositionType>element</CompositionType>
</IfcBuilding>
```

```

<IfcSIUnit id="ID7">
  <UnitType>areaunit</UnitType>
  <Name>square_metre</Name>
</IfcSIUnit>
<IfcSIUnit id="ID8">
  <UnitType>volumeunit</UnitType>
  <Name>cubic_metre</Name>
</IfcSIUnit>
<IfcSIUnit id="ID9">
  <UnitType>massunit</UnitType>
  <Name>gram</Name>
</IfcSIUnit>
<IfcSIUnit id="ID10">
  <UnitType>timeunit</UnitType>
  <Name>second</Name>
</IfcSIUnit>
<IfcSIUnit id="ID11">
  <UnitType>lengthunit</UnitType>
  <Name>metre</Name>
</IfcSIUnit>
<IfcUnitAssignment id="ID12">
  <Units ex:cType="set">
    <IfcSIUnit pos="0" xsi:nil="true" ref="ID7"/>
    <IfcSIUnit pos="1" xsi:nil="true" ref="ID8"/>
    <IfcSIUnit pos="2" xsi:nil="true" ref="ID9"/>
    <IfcSIUnit pos="3" xsi:nil="true" ref="ID10"/>
    <IfcSIUnit pos="4" xsi:nil="true" ref="ID11"/>
  </Units>
</IfcUnitAssignment>
<IfcCartesianPoint id="ID13">
  <Coordinates ex:cType="list">
    <IfcLengthMeasure pos="0">0.</IfcLengthMeasure>
    <IfcLengthMeasure pos="1">0.</IfcLengthMeasure>
    <IfcLengthMeasure pos="2">0.</IfcLengthMeasure>
  </Coordinates>
</IfcCartesianPoint>
<IfcDirection id="ID14">
  <DirectionRatios ex:cType="list">
    <ex:double-wrapper pos="0">0.</ex:double-wrapper>
    <ex:double-wrapper pos="1">0.</ex:double-wrapper>
    <ex:double-wrapper pos="2">1.</ex:double-wrapper>
  </DirectionRatios>
</IfcDirection>
<IfcDirection id="ID15">
  <DirectionRatios ex:cType="list">
    <ex:double-wrapper pos="0">1.</ex:double-wrapper>
    <ex:double-wrapper pos="1">0.</ex:double-wrapper>
    <ex:double-wrapper pos="2">0.</ex:double-wrapper>
  </DirectionRatios>
</IfcDirection>
<IfcAxis2Placement3D id="ID16">
  <Location>
    <IfcCartesianPoint xsi:nil="true" ref="ID13"/>
  </Location>
  <Axis>
    <IfcDirection xsi:nil="true" ref="ID14"/>
  </Axis>
  <RefDirection>
    <IfcDirection xsi:nil="true" ref="ID15"/>
  </RefDirection>
</IfcAxis2Placement3D>
<IfcGeometricRepresentationContext id="ID17">
  <ContextIdentifier>DummyGeometricContext</ContextIdentifier>
  <ContextType>DummyGeometry</ContextType>
  <CoordinateSpaceDimension>3</CoordinateSpaceDimension>
  <Precision>0.</Precision>
  <WorldCoordinateSystem>
    <IfcAxis2Placement3D xsi:nil="true" ref="ID16"/>
  </WorldCoordinateSystem>
</IfcGeometricRepresentationContext>

```

```

<IfcOwnerHistory id="ID2">
  <OwningUser>
    <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
  </OwningUser>
  <OwningApplication>
    <IfcApplication xsi:nil="true" ref="ID6"/>
  </OwningApplication>
  <ChangeAction>added</ChangeAction>
  <LastModifiedDate>0</LastModifiedDate>
  <CreationDate>1207828354</CreationDate>
</IfcOwnerHistory>
<IfcPerson id="ID3">
  <Id>Matthias Weise</Id>
  <FamilyName></FamilyName>
  <GivenName></GivenName>
</IfcPerson>
<IfcOrganization id="ID4">
  <Id></Id>
  <Name></Name>
  <Description></Description>
</IfcOrganization>
<IfcPersonAndOrganization id="ID5">
  <ThePerson>
    <IfcPerson xsi:nil="true" ref="ID3"/>
  </ThePerson>
  <TheOrganization>
    <IfcOrganization xsi:nil="true" ref="ID4"/>
  </TheOrganization>
</IfcPersonAndOrganization>
<IfcApplication id="ID6">
  <ApplicationDeveloper>
    <IfcOrganization xsi:nil="true" ref="ID4"/>
  </ApplicationDeveloper>
  <Version>IFC-Application X</Version>
  <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
  <ApplicationIdentifier>Company Y</ApplicationIdentifier>
</IfcApplication>

```

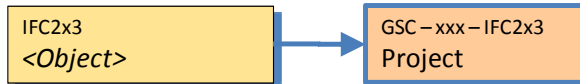
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IFC Release Specific Concept Description (IFC2x3)

Project

Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative "ZukunftBau")				

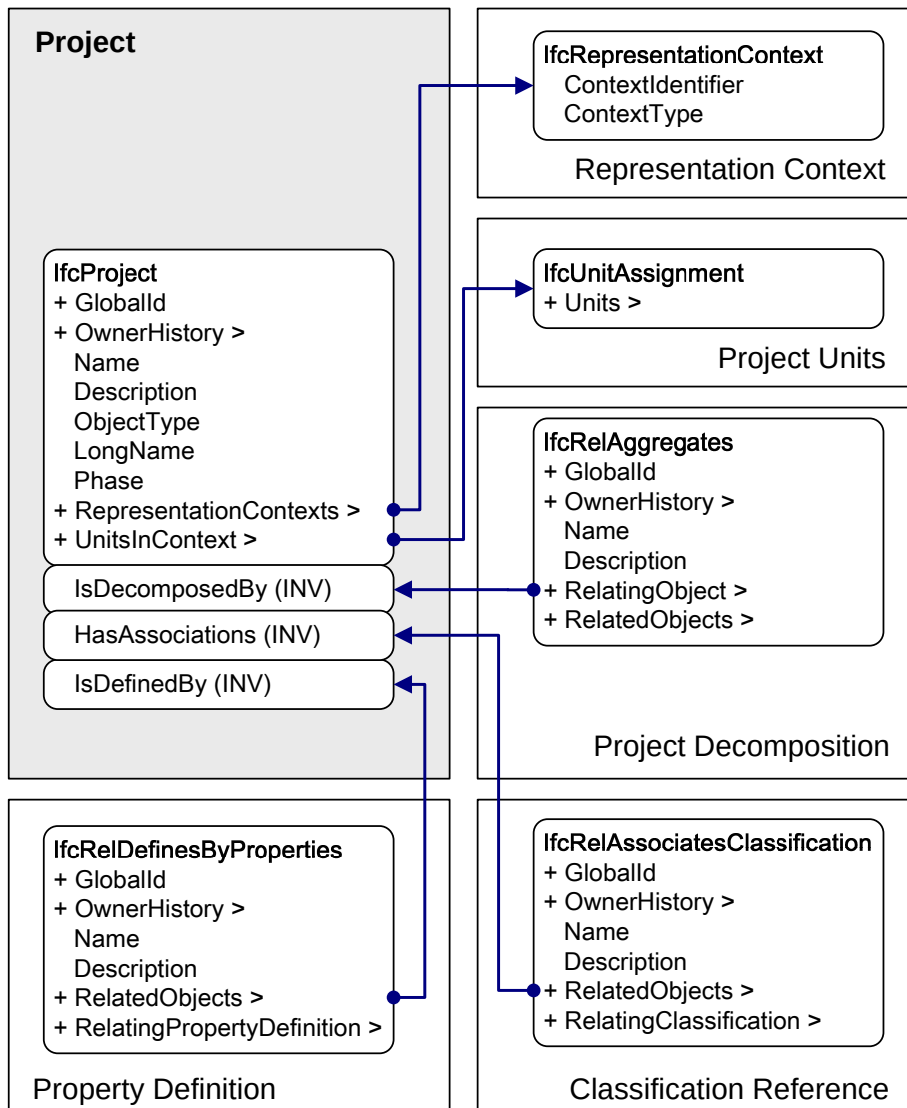
Usage in view definition diagram



Please note that there might be further agreements for the “*Project*” concept that are not shown here. In particular, there might be separate concept definitions for specific properties and classifications.

Remark for MVD harmonization: see also VBL-296, VBL-403, VBL-359, required concept description for Representation Context (VBL-132)

Instantiation diagram



Implementation agreements

IfcProject

Attribute	Implementation agreements
GlobalId	Must be provided
OwnerHistory	Must be provided
Name	Reserved
Description	Reserved
ObjectType	No agreements needed
LongName	Reserved
Phase	No agreements needed
RepresentationContext	Must be provided according to #CV-06-106 (context type should be 'Model')
UnitsInContext	Must be provided, at least for - Length unit - Area unit - Volume unit
IsDecomposedBy (INV)	Must be provided, aggregates the top-level nodes of the spatial structure
HasAssociations (INV)	Optional, may contain instances of IfcRelAssociatesClassification that further classify the project according to a classification system
IsDefinedBy (INV)	Optional, may contain instances of IfcRelDefinesByProperties that further define the project

Example (spf)

```
#100= IFCPROJECT('0J$yPqHBD12v72y4qF6XcD',#2,'WHD',$,$,
'Wohnhaus Dresden','Entwurfsplanung',(#10),#11);
#101= IFCRELAGGREGATES('3H0v58cYbDBAu7vMbay3W7',#2,'ProjectContainer',
'ProjectContainer for Sites',#100,(#102));
#102= IFCSITE('1G217EQPv30ASE5ZNlFE5v',#2,'BF-J',
'Baufeld J',$,$,$,$,ELEMENT.,(52,31,0),(13,24,0),$,$,$);
#10= IFCGEOMETRICREPRESENTATIONCONTEXT($,'Model',3,1.00000000E-5,#20,$);
#11= IFCUNITASSIGNMENT((#16,#17,#18));
#16= IFCSIUNIT(*,.LENGTHUNIT.,$,.METRE.);
#17= IFCSIUNIT(*,.AREAUNIT.,$,.SQUARE_METRE.);
#18= IFCSIUNIT(*,.VOLUMEUNIT.,$,.CUBIC_METRE.);
#20= IFCAXIS2PLACEMENT3D(#21,#22,#23);
#21= IFCCARTESIANPOINT((0.,0.,0.));
#22= IFCDIRECTION((0.,0.,1.));
#23= IFCDIRECTION((1.,0.,0.));
#2= IFCOWNERHISTORY(#5,#6,$,.ADDED.,0,$,$,1207828354);
#3= IFCPERSON('Matthias Weise','','',$,$,$,$);
#4= IFCORGANIZATION('','',$,$);
#5= IFCPERSONANDORGANIZATION(#3,#4,$);
#6= IFCAPPLICATION(#4,'IFC-Application X','IFC-Exporter V2.3','Company Y');
```

Example (ifcXML)

```
<IfcProject id="ID100">
  <GlobalId>0J$yPqHBD12v72y4qF6XcD</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>WHD</Name>
  <LongName>Wohnhaus Dresden</LongName>
  <Phase>Entwurfsplanung</Phase>
  <RepresentationContexts ex:cType="set">
    <IfcGeometricRepresentationContext pos="0" xsi:nil="true" ref="ID10"/>
  </RepresentationContexts>
  <UnitsInContext>
    <IfcUnitAssignment xsi:nil="true" ref="ID11"/>
  </UnitsInContext>
</IfcProject>
<IfcRelAggregates id="ID101">
  <GlobalId>3H0v58cYbDBAu7vMbay3W7</GlobalId>
  <OwnerHistory>
```

```

        <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>ProjectContainer</Name>
    <Description>ProjectContainer for Sites</Description>
    <RelatingObject>
        <IfcProject xsi:nil="true" ref="ID100"/>
    </RelatingObject>
    <RelatedObjects ex:cType="set">
        <IfcSite pos="0" xsi:nil="true" ref="ID102"/>
    </RelatedObjects>
</IfcRelAggregates>
<IfcSite id="ID102">
    <GlobalId>1G217EQPv30ASE5ZNlFE5v</GlobalId>
    <OwnerHistory>
        <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>BF-J</Name>
    <Description>Baufeld J</Description>
    <CompositionType>element</CompositionType>
    <RefLatitude ex:cType="list">
        <ex:long-wrapper pos="0">52</ex:long-wrapper>
        <ex:long-wrapper pos="1">31</ex:long-wrapper>
        <ex:long-wrapper pos="2">0</ex:long-wrapper>
    </RefLatitude>
    <RefLongitude ex:cType="list">
        <ex:long-wrapper pos="0">13</ex:long-wrapper>
        <ex:long-wrapper pos="1">24</ex:long-wrapper>
        <ex:long-wrapper pos="2">0</ex:long-wrapper>
    </RefLongitude>
</IfcSite>
<IfcGeometricRepresentationContext id="ID10">
    <ContextType>Model</ContextType>
    <CoordinateSpaceDimension>3</CoordinateSpaceDimension>
    <Precision>1.E-05</Precision>
    <WorldCoordinateSystem>
        <IfcAxis2Placement3D xsi:nil="true" ref="ID20"/>
    </WorldCoordinateSystem>
</IfcGeometricRepresentationContext>
<IfcUnitAssignment id="ID11">
    <Units ex:cType="set">
        <IfcSIUnit pos="0" xsi:nil="true" ref="ID16"/>
        <IfcSIUnit pos="1" xsi:nil="true" ref="ID17"/>
        <IfcSIUnit pos="2" xsi:nil="true" ref="ID18"/>
    </Units>
</IfcUnitAssignment>
<IfcSIUnit id="ID16">
    <UnitType>lengthunit</UnitType>
    <Name>metre</Name>
</IfcSIUnit>
<IfcSIUnit id="ID17">
    <UnitType>areaunit</UnitType>
    <Name>square_metre</Name>
</IfcSIUnit>
<IfcSIUnit id="ID18">
    <UnitType>volumeunit</UnitType>
    <Name>cubic_metre</Name>
</IfcSIUnit>
<IfcAxis2Placement3D id="ID20">
    <Location>
        <IfcCartesianPoint xsi:nil="true" ref="ID21"/>
    </Location>
    <Axis>
        <IfcDirection xsi:nil="true" ref="ID22"/>
    </Axis>
    <RefDirection>
        <IfcDirection xsi:nil="true" ref="ID23"/>
    </RefDirection>
</IfcAxis2Placement3D>
<IfcCartesianPoint id="ID21">
    <Coordinates ex:cType="list">
        <IfcLengthMeasure pos="0">0.</IfcLengthMeasure>

```

```

        <IfcLengthMeasure pos="1">0.</IfcLengthMeasure>
        <IfcLengthMeasure pos="2">0.</IfcLengthMeasure>
    </Coordinates>
</IfcCartesianPoint>
<IfcDirection id="ID22">
    <DirectionRatios ex:cType="list">
        <ex:double-wrapper pos="0">0.</ex:double-wrapper>
        <ex:double-wrapper pos="1">0.</ex:double-wrapper>
        <ex:double-wrapper pos="2">1.</ex:double-wrapper>
    </DirectionRatios>
</IfcDirection>
<IfcDirection id="ID23">
    <DirectionRatios ex:cType="list">
        <ex:double-wrapper pos="0">1.</ex:double-wrapper>
        <ex:double-wrapper pos="1">0.</ex:double-wrapper>
        <ex:double-wrapper pos="2">0.</ex:double-wrapper>
    </DirectionRatios>
</IfcDirection>
<IfcOwnerHistory id="ID2">
    <OwningUser>
        <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
    </OwningUser>
    <OwningApplication>
        <IfcApplication xsi:nil="true" ref="ID6"/>
    </OwningApplication>
    <ChangeAction>added</ChangeAction>
    <LastModifiedDate>0</LastModifiedDate>
    <CreationDate>1207828354</CreationDate>
</IfcOwnerHistory>
<IfcPerson id="ID3">
    <Id>Matthias Weise</Id>
    <FamilyName></FamilyName>
    <GivenName></GivenName>
</IfcPerson>
<IfcOrganization id="ID4">
    <Id></Id>
    <Name></Name>
    <Description></Description>
</IfcOrganization>
<IfcPersonAndOrganization id="ID5">
    <ThePerson>
        <IfcPerson xsi:nil="true" ref="ID3"/>
    </ThePerson>
    <TheOrganization>
        <IfcOrganization xsi:nil="true" ref="ID4"/>
    </TheOrganization>
</IfcPersonAndOrganization>
<IfcApplication id="ID6">
    <ApplicationDeveloper>
        <IfcOrganization xsi:nil="true" ref="ID4"/>
    </ApplicationDeveloper>
    <Version>IFC-Application X</Version>
    <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
    <ApplicationIdentifier>Company Y</ApplicationIdentifier>
</IfcApplication>

```

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IFC Release Specific Concept Description (IFC2x3)

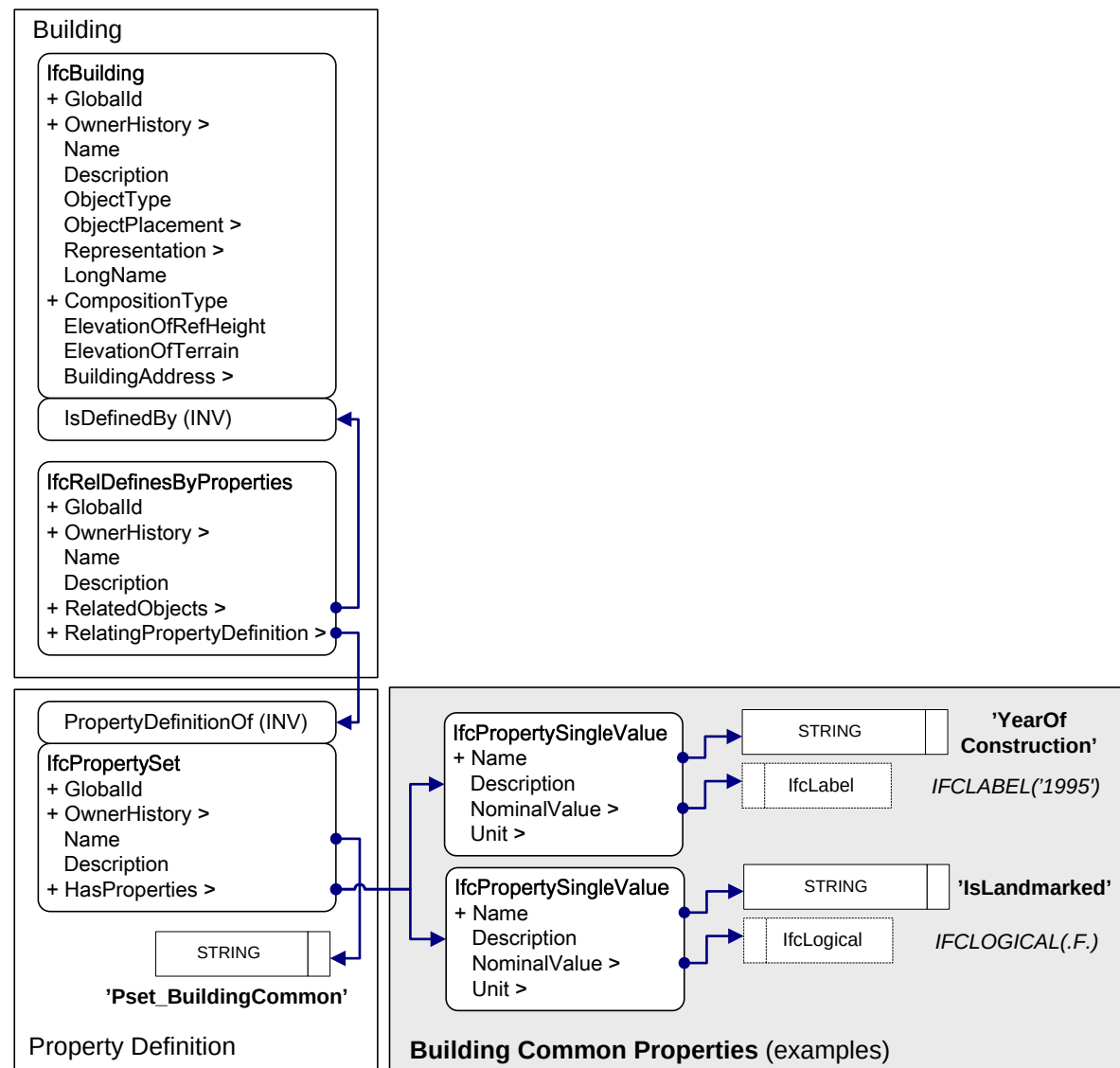
Pset Building Common Properties

Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative "ZukunftBau")				

Usage in view definition diagram



Instantiation diagram



Implementation agreements

IfcPropertySet

Attribute	Implementation agreements
GlobalId	Must be provided, but is allowed to change

OwnerHistory	Must be provided, but may contain dummy value
Name	Must be 'Pset_BuildingCommon'
Description	Reserved
HasProperties	Must be provided - set of common building properties
PropertyDefinitionOf (INV)	Must be provided - link to the relationship that defines the connection to the building

IfcPropertySingleValue

Attribute	Implementation agreements
Name	Must be provided – shall enable to uniquely identify the property value (A list of common building properties is given in the table below.)
Description	Reserved
NominalValue	Must be provided
Unit	Optional – only necessary if the property requires a unit and the project unit is not suitable

Pset Building Common Property Definitions

PropertySet	Property	Type/Description
Pset_BuildingCommon	BuildingID	IfcIdentifier
	..	..
Pset_BuildingCommon	YearOfConstruction	IfcLabel
Pset_BuildingCommon	IsLandmarked	IfcLogical

Example (spf)

```
#100= IFCBUILDING('sISCCgKx4TkF9N05m0d8oG', #2, '1056', $, $, $, $, 'Bauwerk',
.ELEMENT., $, $, $);
#101= IFCRELDEFINESBYPROPERTIES('2K5FvWlVz8BewqgTQUfMYL', #2, $, $, (#100), #102);
#102= IFCPROPERTYSET('09000kRDDnuATp7E65iLQ', #2, 'Pset_BuildingCommon', $, (#103,
#104));
#103= IFCPROPERTYSINGLEVALUE('YearOfConstruction', $, IFCLABEL('1995'), $);
#104= IFCPROPERTYSINGLEVALUE('IsLandmarked', $, IFCLOGICAL(.F.), $);
#2= IFCOWNERHISTORY(#5, #6, $, .ADDED., 0, $, $, 1207828354);
#3= IFCPERSON('Matthias Weise', '', '', $, $, $, $, $);
#4= IFCORGANIZATION('', '', '', $, $);
#5= IFCPERSONANDORGANIZATION(#3, #4, $);
#6= IFCAPPLICATION(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');
```

All values that are needed to define common building properties and to attach them to a “Building” are marked with bold letters.

The example shows the definition of a set of common properties of a building (#100). It is collected by a 'property set object' (#102) that is attached to the building by *IfcRelDefinesByProperties* (#101).

Example (ifcXML)

```
<IfcBuilding id="ID100">
  <GlobalId>sISCCgKx4TkF9N05m0d8oG</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>1056</Name>
  <LongName>Bauwerk</LongName>
  <CompositionType>element</CompositionType>
</IfcBuilding>
<IfcRelDefinesByProperties id="ID101">
  <GlobalId>2K5FvWlVz8BewqgTQUfMYL</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <RelatedObjects ex:cType="set">
    <IfcBuilding pos="0" xsi:nil="true" ref="ID100"/>
  </RelatedObjects>
```

```

    <RelatingPropertyDefinition>
      <IfcPropertySet xsi:nil="true" ref="ID102"/>
    </RelatingPropertyDefinition>
  </IfcRelDefinesByProperties>
  <IfcPropertySet id="ID102">
    <GlobalId>09000kRDDDnuATp7E65iLQ</GlobalId>
    <OwnerHistory>
      <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>Pset_BuildingCommon</Name>
    <HasProperties ex:cType="set">
      <IfcPropertySingleValue pos="0" xsi:nil="true" ref="ID103"/>
      <IfcPropertySingleValue pos="1" xsi:nil="true" ref="ID104"/>
    </HasProperties>
  </IfcPropertySet>
  <IfcPropertySingleValue id="ID103">
    <Name>YearOfConstruction</Name>
    <NominalValue>
      <IfcLabel>1995</IfcLabel>
    </NominalValue>
  </IfcPropertySingleValue>
  <IfcPropertySingleValue id="ID104">
    <Name>IsLandmarked</Name>
    <NominalValue>
      <IfcLogical>false</IfcLogical>
    </NominalValue>
  </IfcPropertySingleValue>
  <IfcOwnerHistory id="ID2">
    <OwningUser>
      <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
    </OwningUser>
    <OwningApplication>
      <IfcApplication xsi:nil="true" ref="ID6"/>
    </OwningApplication>
    <ChangeAction>added</ChangeAction>
    <LastModifiedDate>0</LastModifiedDate>
    <CreationDate>1207828354</CreationDate>
  </IfcOwnerHistory>
  <IfcPerson id="ID3">
    <Id>Matthias Weise</Id>
    <FamilyName></FamilyName>
    <GivenName></GivenName>
  </IfcPerson>
  <IfcOrganization id="ID4">
    <Id></Id>
    <Name></Name>
    <Description></Description>
  </IfcOrganization>
  <IfcPersonAndOrganization id="ID5">
    <ThePerson>
      <IfcPerson xsi:nil="true" ref="ID3"/>
    </ThePerson>
    <TheOrganization>
      <IfcOrganization xsi:nil="true" ref="ID4"/>
    </TheOrganization>
  </IfcPersonAndOrganization>
  <IfcApplication id="ID6">
    <ApplicationDeveloper>
      <IfcOrganization xsi:nil="true" ref="ID4"/>
    </ApplicationDeveloper>
    <Version>IFC-Application X</Version>
    <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
    <ApplicationIdentifier>Company Y</ApplicationIdentifier>
  </IfcApplication>

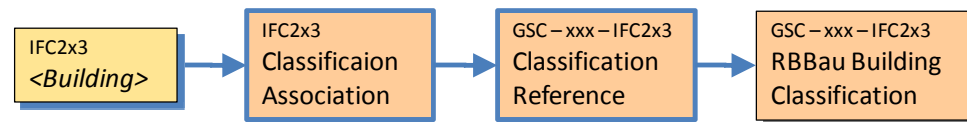
```

IFC Release Specific Concept Description (IFC2x3)

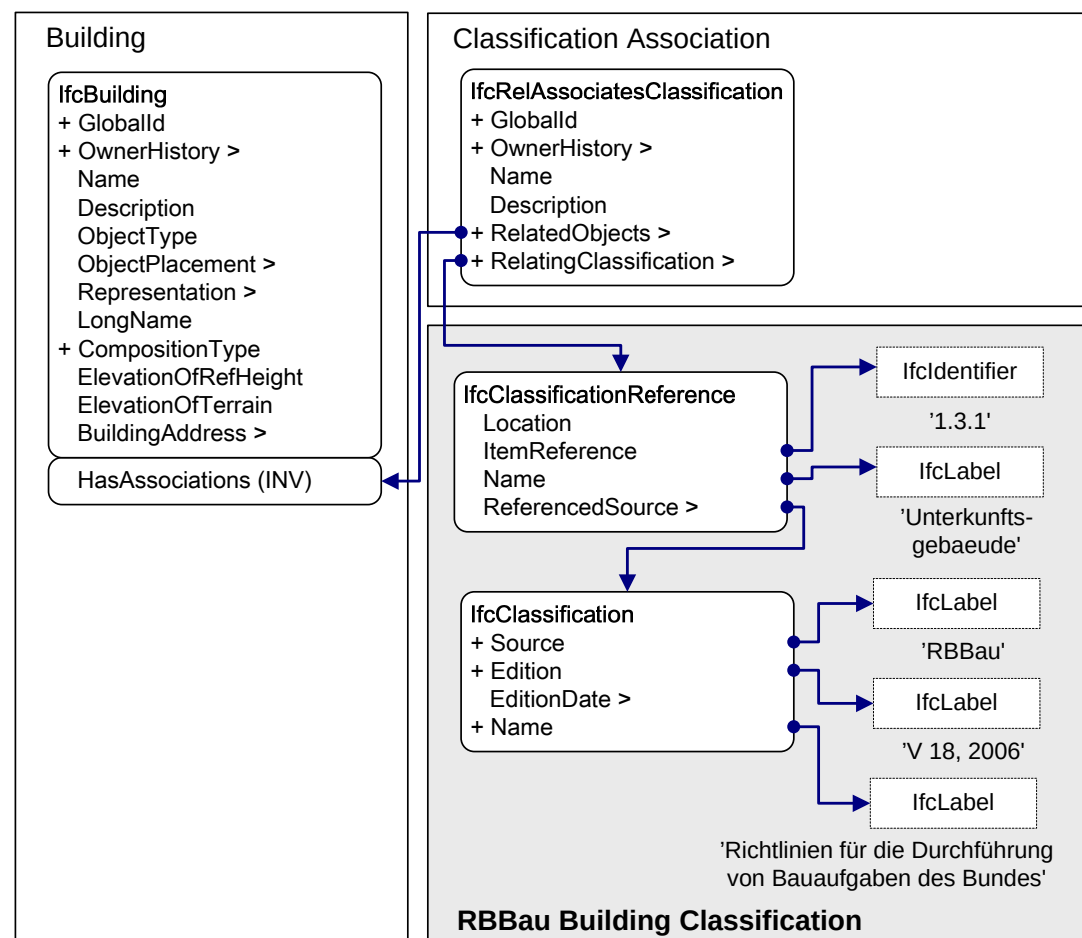
RBBau Building Classification

Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative "ZukunftBau")				

Usage in view definition diagram



Instantiation diagram



Implementation agreements

IfcClassificationReference

Attribute	Implementation agreements
Location	Optional - Pointer or URL location of the classification (defined by the generating system)
ItemReference	Must be provided - Path (separated through "/") or GUID of the referenced item
Name	Must be provided - Human readable name
ReferencedSource	Must be provided - Reference to the classification

IfcClassification

Attribute	Implementation agreements
Source	Must be provided - GUID or standardized name of the classification/catalogue
Edition	Must be provided, but can be an empty String
EditionDate	Optional
Name	Must be provided - Human readable name

IfcRelAssociatesClassification

Attribute	Implementation agreements
GlobalId	Must be provided, but is allowed to change
OwnerHistory	Must be provided, but may contain (reusable) dummy value
Name	Reserved
Description	Reserved
RelatedObjects	A set of buildings that are classified by the classification - further information will be provided by the variable concepts that use classification)
RelatingClassification	Reference to the Classification

Example (spf)

```
#100= IFCClassification('RBBau', 'V 18, 2006', $,
    'Richtlinien fuer die Durchfuehrung von Bauaufgaben des Bundes');
#101= IFCClassificationReference($, '1.3.1', 'Unterkunftsgebaeude', #100);
#102= IFcRelAssociatesClassification('1dejvVx$X0Gxhf6JmbZRfh', #2, $, $, (#103), #101);
#103= IFcBuilding('sISCCgKx4TkF9N05m0d8oG', #2, '1056', $, $, $, $, 'Bauwerk',
    .ELEMENT., $, $, $);
#2= IFcOwnerHistory(#5, #6, $, .ADDED., 0, $, $, 1207828354);
#3= IFcPerson('Matthias Weise', '', '', $, $, $, $, $);
#4= IFcOrganization('', '', '', $, $);
#5= IFcPersonAndOrganization(#3, #4, $);
#6= IFcApplication(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');
```

All values that are needed for the classification of a concept are marked with bold letters.

Example (ifcXML)

```
<IfcClassification id="ID100">
  <Source>RBBau</Source>
  <Edition>V 18, 2006</Edition>
  <Name>Richtlinien fuer die Durchfuehrung von Bauaufgaben des Bundes</Name>
</IfcClassification>
<IfcClassificationReference id="ID101">
  <ItemReference>1.3.1</ItemReference>
  <Name>Unterkunftsgebaeude</Name>
  <ReferencedSource>
    <IfcClassification xsi:nil="true" ref="ID100"/>
  </ReferencedSource>
</IfcClassificationReference>
<IfcRelAssociatesClassification id="ID102">
  <GlobalId>1dejvVx$X0Gxhf6JmbZRfh</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <RelatedObjects ex:cType="set">
    <IfcBuilding pos="0" xsi:nil="true" ref="ID103"/>
  </RelatedObjects>
  <RelatingClassification>
    <IfcClassificationReference xsi:nil="true" ref="ID101"/>
  </RelatingClassification>
</IfcRelAssociatesClassification>
<IfcBuilding id="ID103">
  <GlobalId>sISCCgKx4TkF9N05m0d8oG</GlobalId>
```

```

    <OwnerHistory>
      <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>1056</Name>
    <LongName>Bauwerk</LongName>
    <CompositionType>element</CompositionType>
  </IfcBuilding>
  <IfcOwnerHistory id="ID2">
    <OwningUser>
      <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
    </OwningUser>
    <OwningApplication>
      <IfcApplication xsi:nil="true" ref="ID6"/>
    </OwningApplication>
    <ChangeAction>added</ChangeAction>
    <LastModifiedDate>0</LastModifiedDate>
    <CreationDate>1207828354</CreationDate>
  </IfcOwnerHistory>
  <IfcPerson id="ID3">
    <Id>Matthias Weise</Id>
    <FamilyName></FamilyName>
    <GivenName></GivenName>
  </IfcPerson>
  <IfcOrganization id="ID4">
    <Id></Id>
    <Name></Name>
    <Description></Description>
  </IfcOrganization>
  <IfcPersonAndOrganization id="ID5">
    <ThePerson>
      <IfcPerson xsi:nil="true" ref="ID3"/>
    </ThePerson>
    <TheOrganization>
      <IfcOrganization xsi:nil="true" ref="ID4"/>
    </TheOrganization>
  </IfcPersonAndOrganization>
  <IfcApplication id="ID6">
    <ApplicationDeveloper>
      <IfcOrganization xsi:nil="true" ref="ID4"/>
    </ApplicationDeveloper>
    <Version>IFC-Application X</Version>
    <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
    <ApplicationIdentifier>Company Y</ApplicationIdentifier>
  </IfcApplication>

```

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IFC Release Specific Concept Description (IFC2x3)

Simple Catalogue Quantity

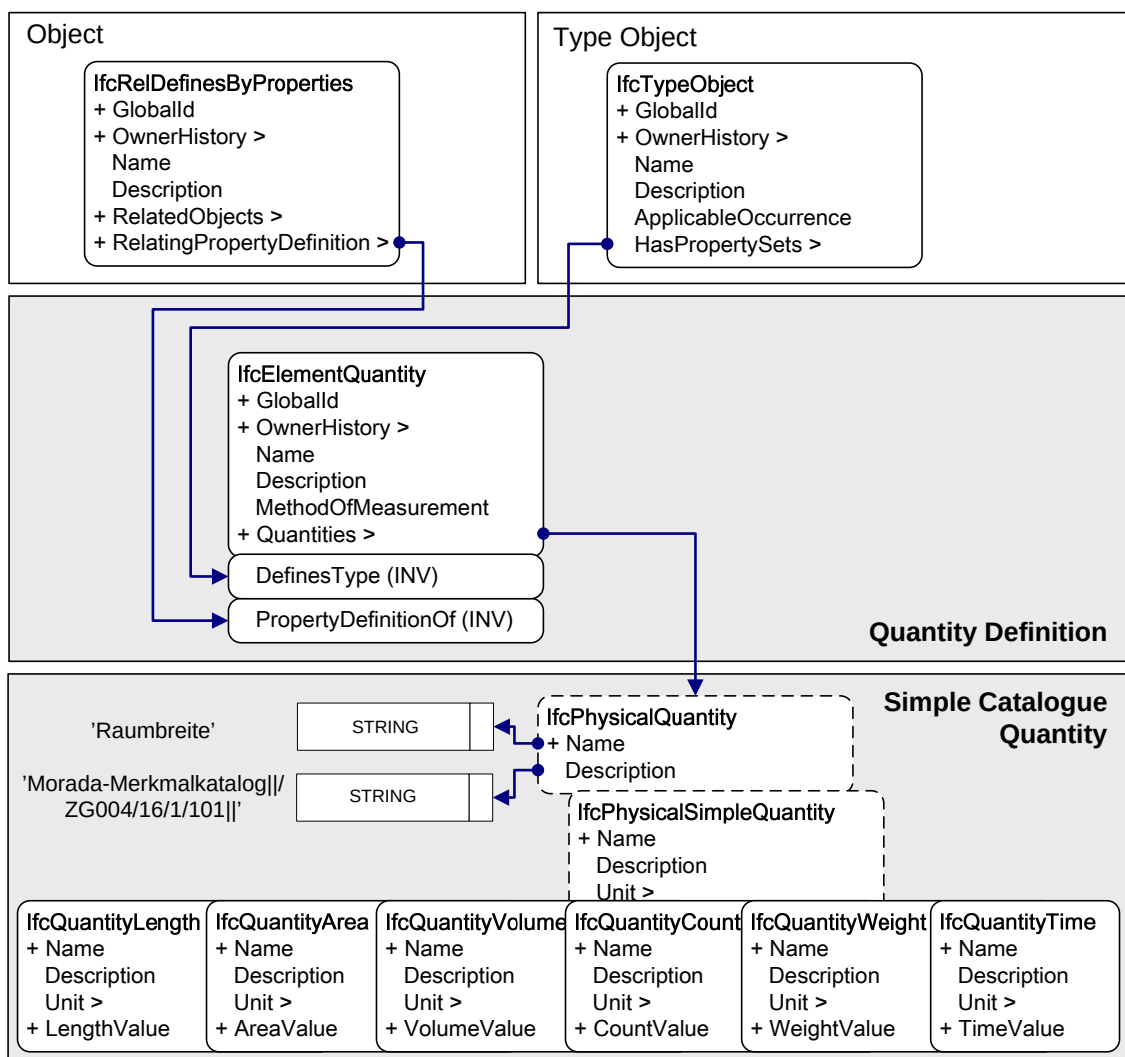
Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative "ZukunftBau")				

Usage in view definition diagram



Remark for MVD harmonization: see also VBL-241; It might be suitable to omit the differentiation between simple and complex properties.

Instantiation diagram



Implementation agreements

IfcElementQuantity

Attribute	Implementation agreements
GlobalId	Must be provided, but is allowed to change
OwnerHistory	Must be provided, but may contain dummy value

Name	Optional, but shall not be in conflict with standardized quantity definitions such as identified by 'BaseQuantities' or other known quantity definitions.
Description	Reserved
MethodeOfMeasurement	Reserved
Quantities	Must be provided - set of simple quantities (subtype of IfcPhysicalSimpleQuantities)
DefinesType(INV)	Provided, if it describes element quantities of a "Type Object"
PropertyDefinitionOf (INV)	Provided, if it describes element quantities of an "Object"

IfcPhysicalSimpleQuantity (ABS)

Attribute	Implementation agreements
Name	Must be provided – shall enable to uniquely identify the quantity
Description	Must be provided – the used catalogue or classification system and the described item shall be coded here. As such item is typically coded in a hierarchical structure the whole hierarchy must be provided to identify the item. Each hierarchy is separated through a special character – the 'NameKeyDelimiter', which is defined in the property set of the project.
Unit	Optional – only necessary if the project unit is not suitable

Example (spf)

```
#100= IFCSPACE('1EqtzHFkPC2fAeNGBFZ0_$', #2, 'OG1-107', $, $, $, $,
  'Bath', .ELEMENT., .INTERNAL., $);
#101= IFCQUANTITYLENGTH('Raumbreite',
  'Morada-Merkmalkatalog||/ZG004/16/1/101||', $, 5.0);
#102= IFCELEMENTQUANTITY('1scWLSxSf3TOXzYi$H3NZC', #2,
  'Space Quantities', $, '', (#101));
#103= IFCRELDEFINESBYPROPERTIES('1DDDI0yW16bfZwIs31Xds', #2, $, $, (#100), #102);
#2= IFCOWNERHISTORY(#5, #6, $, .ADDED., 0, $, $, 1207828354);
#3= IFCPERSON('Matthias Weise', '', '', $, $, $, $, $);
#4= IFCORGANIZATION('', '', '', $, $);
#5= IFCPERSONANDORGANIZATION(#3, #4, $);
#6= IFCAPPLICATION(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');
```

All values that are needed to define simple catalogue quantities and to attach them to "Objects" are marked with bold letters.

The example shows a simple catalogue quantity of a room (#100). It is collected by an 'element quantity object' (#102) that is attached to the room by *IfcRelDefinesByProperties* (#103).

Example (ifcXML)

```
<IfcSpace id="ID100">
  <GlobalId>1EqtzHFkPC2fAeNGBFZ0_$</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>OG1-107</Name>
  <LongName>Bath</LongName>
  <CompositionType>element</CompositionType>
  <InteriorOrExteriorSpace>internal</InteriorOrExteriorSpace>
</IfcSpace>
<IfcQuantityLength id="ID101">
  <Name>Raumbreite</Name>
  <Description>Morada-Merkmalkatalog||/ZG004/16/1/101||</Description>
  <LengthValue>5.</LengthValue>
</IfcQuantityLength>
<IfcElementQuantity id="ID102">
  <GlobalId>1scWLSxSf3TOXzYi$H3NZC</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
</IfcElementQuantity>
```



```

<Name>Space Quantities</Name>
<MethodOfMeasurement></MethodOfMeasurement>
<Quantities ex:cType="set">
  <IfcQuantityLength pos="0" xsi:nil="true" ref="ID101"/>
</Quantities>
</IfcElementQuantity>
<IfcRelDefinesByProperties id="ID103">
  <GlobalId>1DDDI0yW16bfZwIs31XdDs</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <RelatedObjects ex:cType="set">
    <IfcSpace pos="0" xsi:nil="true" ref="ID100"/>
  </RelatedObjects>
  <RelatingPropertyDefinition>
    <IfcElementQuantity xsi:nil="true" ref="ID102"/>
  </RelatingPropertyDefinition>
</IfcRelDefinesByProperties>
<IfcOwnerHistory id="ID2">
  <OwningUser>
    <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
  </OwningUser>
  <OwningApplication>
    <IfcApplication xsi:nil="true" ref="ID6"/>
  </OwningApplication>
  <ChangeAction>added</ChangeAction>
  <LastModifiedDate>0</LastModifiedDate>
  <CreationDate>1207828354</CreationDate>
</IfcOwnerHistory>
<IfcPerson id="ID3">
  <Id>Matthias Weise</Id>
  <FamilyName></FamilyName>
  <GivenName></GivenName>
</IfcPerson>
<IfcOrganization id="ID4">
  <Id></Id>
  <Name></Name>
  <Description></Description>
</IfcOrganization>
<IfcPersonAndOrganization id="ID5">
  <ThePerson>
    <IfcPerson xsi:nil="true" ref="ID3"/>
  </ThePerson>
  <TheOrganization>
    <IfcOrganization xsi:nil="true" ref="ID4"/>
  </TheOrganization>
</IfcPersonAndOrganization>
<IfcApplication id="ID6">
  <ApplicationDeveloper>
    <IfcOrganization xsi:nil="true" ref="ID4"/>
  </ApplicationDeveloper>
  <Version>IFC-Application X</Version>
  <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
  <ApplicationIdentifier>Company Y</ApplicationIdentifier>
</IfcApplication>

```

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IFC Release Specific Concept Description (IFC2x3)

Simple Quantity

Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative "ZukunftBau")				

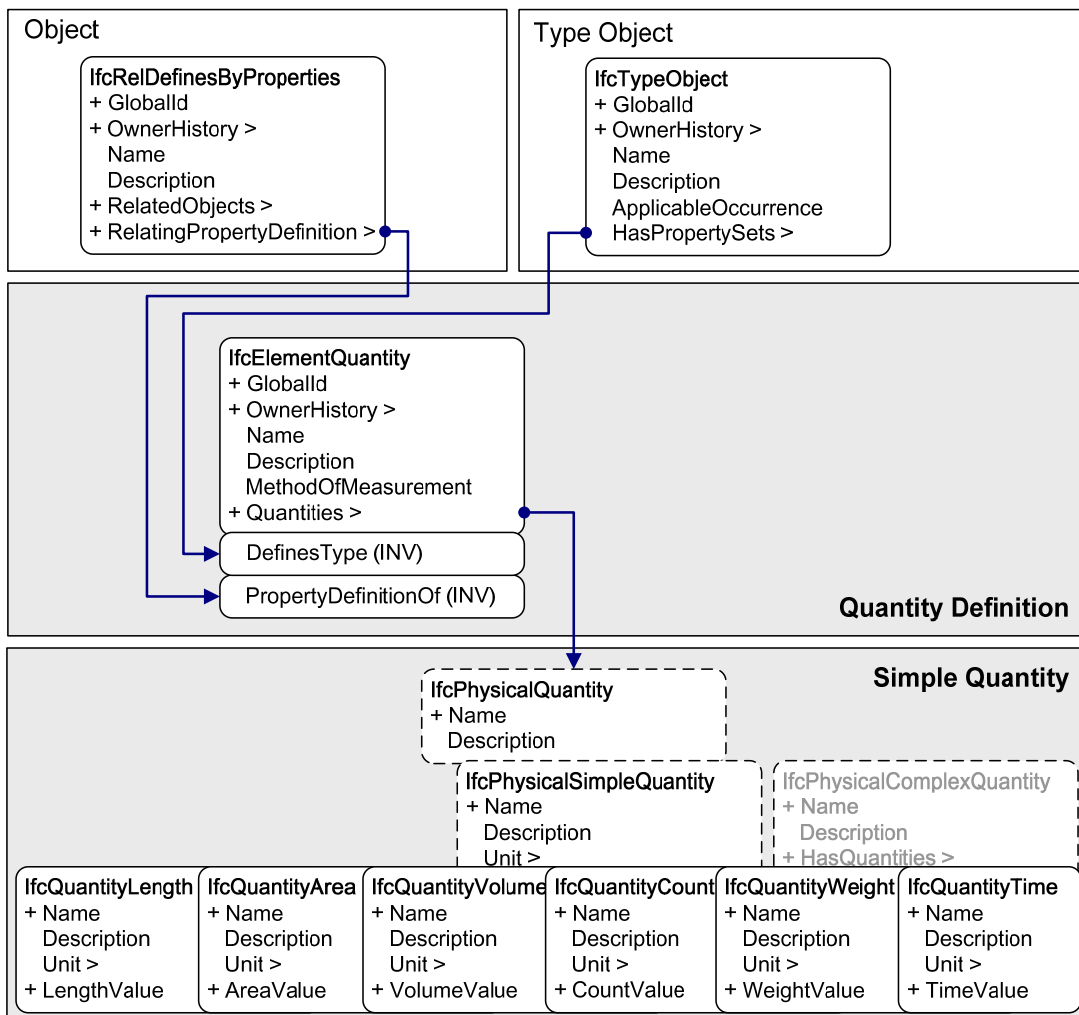
Usage in view definition diagram



Please note that the "Simple Quantity" concept is an adapter concept that will be refined by other concept definitions. The purpose of "Simple Quantity" is to specify the definition of simple quantities that can be attached to "Objects" and "Type Objects".

Remark for MVD harmonization: see also VBL-241; It might be suitable to omit the differentiation between simple and complex properties.

Instantiation diagram



Implementation agreements

IfcElementQuantity

Attribute

Implementation agreements

GlobalId	Must be provided, but is allowed to change
OwnerHistory	Must be provided, but may contain dummy value
Name	Must be provided - in case of base quantities it should be 'BaseQuantities' in any other case it should be an unique name enables to identify the type of quantities, e.g. 'BFRQuantities'
Description	Reserved
MethodOfMeasurement	Reserved
Quantities	Must be provided - set of simple quantities (subtype of IfcPhysicalSimpleQuantities)
DefinesType(INV)	Provided, if it describes element quantities of a "Type Object"
PropertyDefinitionOf (INV)	Provided, if it describes element quantities of an "Object"

IfcPhysicalSimpleQuantity (ABS)

Attribute	Implementation agreements
Name	Must be provided – shall enable to uniquely identify the quantity
Description	Reserved
Unit	Optional – only necessary if the project unit is not suitable

Example (spf)

```
#100= IFCSPACE('1EqtzHFkPC2fAeNGBFZ0_$', #2, 'OG1-107', $, $, $, $, 'Bath', .ELEMENT.,
    .INTERNAL., $);
#101= IFCQUANTITYLENGTH('Height', $, $, 2.5);
#102= IFCQUANTITYLENGTH('Perimeter', $, $, 35.667246);
#103= IFCQUANTITYVOLUME('GrossVolume', $, $, 16.4);
#104= IFCQUANTITYVOLUME('NetVolume', $, $, 16.4);
#105= IFCQUANTITYAREA('GrossFloorArea', $, $, 6.56);
#106= IFCQUANTITYAREA('NetFloorArea', $, $, 6.56);
#107= IFCQUANTITYAREA('GrossWallArea', $, $, 28.5);
#108= IFCQUANTITYAREA('NetWallArea', $, $, 28.5);
#109= IFCELEMENTQUANTITY('1scWLSxSf3TOXzYi$H3NZC', #2, 'BaseQuantities', $, '',
    (#101, #102, #103, #104, #105, #106, #107, #108));
#110= IFCRELDEFINESBYPROPERTIES('1DDDI0yW16bfZwIs31XdDs', #2, $, $, (#100), #109);
#2= IFCOWNERHISTORY(#5, #6, $, .ADDED., 0, $, $, 1207828354);
#3= IFCPERSON('Matthias Weise', '', '', $, $, $, $, $);
#4= IFCORGANIZATION('', '', '', $, $);
#5= IFCPERSONANDORGANIZATION(#3, #4, $);
#6= IFCAPPLICATION(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');
```

All values that are needed to define simple quantities and to attach them to "Objects" are marked with bold letters.

The example shows a set of simple quantities of a room (#100). They are collected by an 'element quantity object' (#109) that is attached to the room by *IfcRelDefinesByProperties* (#110).

Further examples are given in the refined concepts.

Example (ifcXML)

```
<IfcSpace id="ID100">
  <GlobalId>1EqtzHFkPC2fAeNGBFZ0_$</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>OG1-107</Name>
  <LongName>Bath</LongName>
  <CompositionType>element</CompositionType>
  <InteriorOrExteriorSpace>internal</InteriorOrExteriorSpace>
</IfcSpace>
<IfcQuantityLength id="ID101">
  <Name>Height</Name>
  <LengthValue>2.5</LengthValue>
</IfcQuantityLength>
```

```

<IfcQuantityLength id="ID102">
  <Name>Perimeter</Name>
  <LengthValue>35.667246</LengthValue>
</IfcQuantityLength>
<IfcQuantityVolume id="ID103">
  <Name>GrossVolume</Name>
  <VolumeValue>16.4</VolumeValue>
</IfcQuantityVolume>
<IfcQuantityVolume id="ID104">
  <Name>NetVolume</Name>
  <VolumeValue>16.4</VolumeValue>
</IfcQuantityVolume>
<IfcQuantityArea id="ID105">
  <Name>GrossFloorArea</Name>
  <AreaValue>6.56</AreaValue>
</IfcQuantityArea>
<IfcQuantityArea id="ID106">
  <Name>NetFloorArea</Name>
  <AreaValue>6.56</AreaValue>
</IfcQuantityArea>
<IfcQuantityArea id="ID107">
  <Name>GrossWallArea</Name>
  <AreaValue>28.5</AreaValue>
</IfcQuantityArea>
<IfcQuantityArea id="ID108">
  <Name>NetWallArea</Name>
  <AreaValue>28.5</AreaValue>
</IfcQuantityArea>
<IfcElementQuantity id="ID109">
  <GlobalId>1scwLSxSf3TOXzYi$H3NZC</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>BaseQuantities</Name>
  <MethodOfMeasurement></MethodOfMeasurement>
  <Quantities ex:cType="set">
    <IfcQuantityLength pos="0" xsi:nil="true" ref="ID101"/>
    <IfcQuantityLength pos="1" xsi:nil="true" ref="ID102"/>
    <IfcQuantityVolume pos="2" xsi:nil="true" ref="ID103"/>
    <IfcQuantityVolume pos="3" xsi:nil="true" ref="ID104"/>
    <IfcQuantityArea pos="4" xsi:nil="true" ref="ID105"/>
    <IfcQuantityArea pos="5" xsi:nil="true" ref="ID106"/>
    <IfcQuantityArea pos="6" xsi:nil="true" ref="ID107"/>
    <IfcQuantityArea pos="7" xsi:nil="true" ref="ID108"/>
  </Quantities>
</IfcElementQuantity>
<IfcRelDefinesByProperties id="ID110">
  <GlobalId>1DDDI0yW16bfZwIs31XdDs</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <RelatedObjects ex:cType="set">
    <IfcSpace pos="0" xsi:nil="true" ref="ID100"/>
  </RelatedObjects>
  <RelatingPropertyDefinition>
    <IfcElementQuantity xsi:nil="true" ref="ID109"/>
  </RelatingPropertyDefinition>
</IfcRelDefinesByProperties>
<IfcOwnerHistory id="ID2">
  <OwningUser>
    <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
  </OwningUser>
  <OwningApplication>
    <IfcApplication xsi:nil="true" ref="ID6"/>
  </OwningApplication>
  <ChangeAction>added</ChangeAction>
  <LastModifiedDate>0</LastModifiedDate>
  <CreationDate>1207828354</CreationDate>
</IfcOwnerHistory>
<IfcPerson id="ID3">
  <Id>Matthias Weise</Id>

```

```

        <FamilyName></FamilyName>
        <GivenName></GivenName>
    </IfcPerson>
    <IfcOrganization id="ID4">
        <Id></Id>
        <Name></Name>
        <Description></Description>
    </IfcOrganization>
    <IfcPersonAndOrganization id="ID5">
        <ThePerson>
            <IfcPerson xsi:nil="true" ref="ID3"/>
        </ThePerson>
        <TheOrganization>
            <IfcOrganization xsi:nil="true" ref="ID4"/>
        </TheOrganization>
    </IfcPersonAndOrganization>
    <IfcApplication id="ID6">
        <ApplicationDeveloper>
            <IfcOrganization xsi:nil="true" ref="ID4"/>
        </ApplicationDeveloper>
        <Version>IFC-Application X</Version>
        <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
        <ApplicationIdentifier>Company Y</ApplicationIdentifier>
    </IfcApplication>

```

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IFC Release Specific Concept Description (IFC2x3)

Single Value Catalogue Property

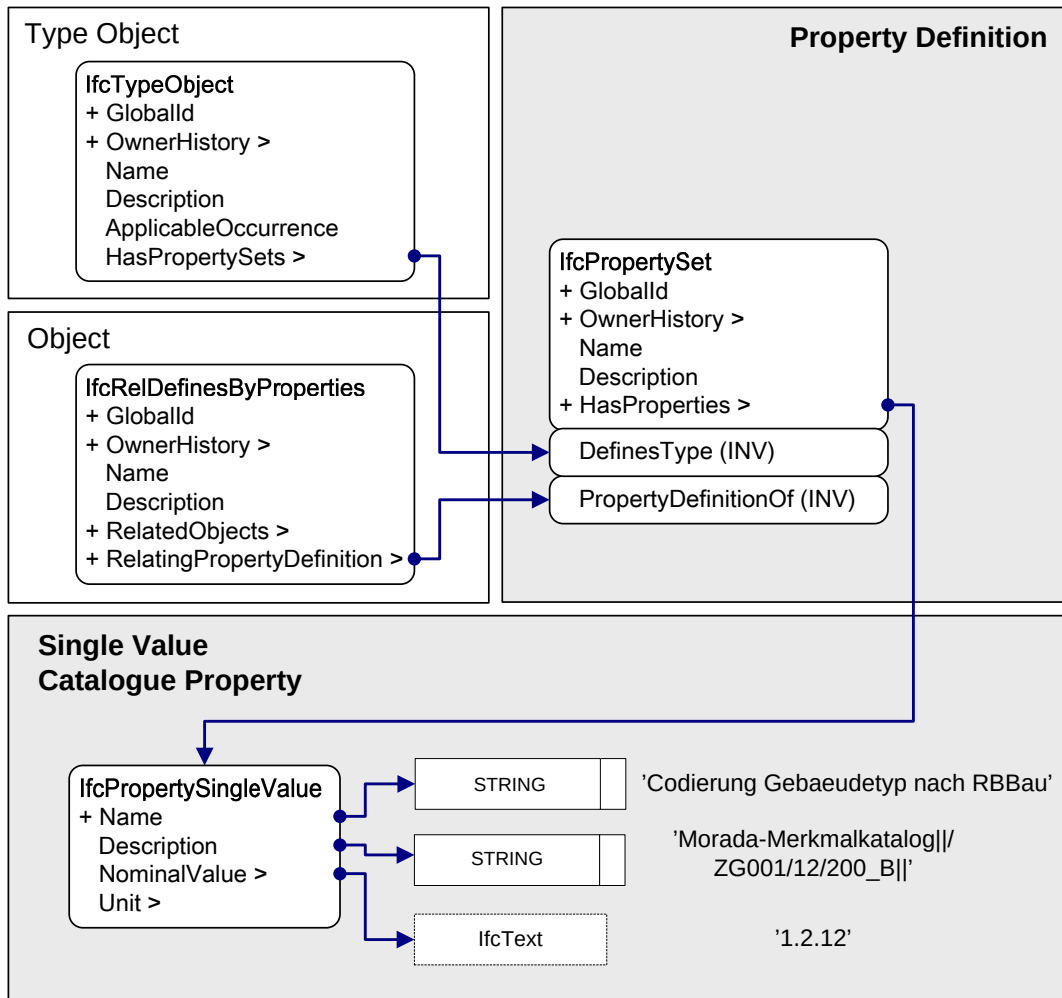
Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative "ZukunftBau")				

Usage in view definition diagram



Remark for MVD harmonization: see also VBL-239; It might be suitable to omit the differentiation between simple and complex properties.

Instantiation diagram



Implementation agreements

IfcPropertySet

Attribute	Implementation agreements
GlobalId	Must be provided, but is allowed to change
OwnerHistory	Must be provided, but may contain dummy value

Name	Optional, but shall not be in conflict with standardized properties as identified by the prefix 'Pset_' or other known property sets.
Description	Reserved
HasProperties	Must be provided - set of single value properties (subtype of IfcPropertySingleValue)
DefinesType(INV)	Provided, if it describes a quantity of a Type Object
PropertyDefinitionOf (INV)	Provided, if it describes a quantity of an Object

IfcPropertySingleValue

Attribute	Implementation agreements
Name	Must be provided – name of the property value
Description	Must be provided – the used catalogue or classification system and the described item shall be coded here. As such item is typically coded in a hierarchical structure the whole hierarchy must be provided to identify the item. Each hierarchy is separated through a special character – the 'NameKeyDelimiter', which is defined in the property set of the project.
NominalValue	Must be provided
Unit	Optional – only necessary if the property requires a unit and the project unit is not suitable

Example (user defined property)

```
#22=IFCBUILDING('ngmBalj04ToZeBFyr73ZJ0', #2, 'G01', '', $, $, $,
  'Gesamtgebaeude (20 Raeume ohne Ausstattungen)', .ELEMENT., $, $, $);
#36=IFCPROPERTYSINGLEVALUE('Codierung Gebaeudetyp nach RBBau',
  'Morada-Merkmalkatalog||/ZG001/12/200_B||', IFCTEXT('1.2.12'), $);
#39=IFCPROPERTYSET('yAsri1LX4TSMZx0wr73ZJ0', #2, 'Gebaedemerkmale', $, (#36));
#40=IFCRELDEFINESBYPROPERTIES('yAu3q1LX4TSMZx0wr73ZJ0', #2, $, $, (#22), #39);
#2= IFCOWNERHISTORY(#5, #6, $, .ADDED., 0, $, $, 1207828354);
#3= IFCPERSON('Matthias Weise', '', '', $, $, $, $, $);
#4= IFCORGANIZATION('', '', '', $, $);
#5= IFCPERSONANDORGANIZATION(#3, #4, $);
#6= IFCAPPLICATION(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');
```

All values that are needed to define 'single value catalogue properties' and to attach them to "Objects" are marked with bold letters.

The example shows a 'single value catalogue property' (#36) of a building (#22). It is collected by a 'property set object' (#39) that is attached to the building by *IfcRelDefinesByProperties* (#40).

Example (ifcXML)

```
<IfcBuilding id="ID22">
  <GlobalId>ngmBalj04ToZeBFyr73ZJ0</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>G01</Name>
  <Description></Description>
  <LongName>Gesamtgebaeude (20 Raeume ohne Ausstattungen)</LongName>
  <CompositionType>element</CompositionType>
</IfcBuilding>
<IfcPropertySingleValue id="ID36">
  <Name>Codierung Gebaeudetyp nach RBBau</Name>
  <Description>Morada-Merkmalkatalog||/ZG001/12/200_B||</Description>
  <NominalValue>
    <IfcText>1.2.12</IfcText>
  </NominalValue>
</IfcPropertySingleValue>
<IfcPropertySet id="ID39">
  <GlobalId>yAsri1LX4TSMZx0wr73ZJ0</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>Gebaedemerkmale</Name>
```

```

    <HasProperties ex:cType="set">
      <IfcPropertySingleValue pos="0" xsi:nil="true" ref="ID36"/>
    </HasProperties>
  </IfcPropertySet>
  <IfcRelDefinesByProperties id="ID40">
    <GlobalId>yAu3q1LX4TsMZx0wr73ZJ0</GlobalId>
    <OwnerHistory>
      <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <RelatedObjects ex:cType="set">
      <IfcBuilding pos="0" xsi:nil="true" ref="ID22"/>
    </RelatedObjects>
    <RelatingPropertyDefinition>
      <IfcPropertySet xsi:nil="true" ref="ID39"/>
    </RelatingPropertyDefinition>
  </IfcRelDefinesByProperties>
  <IfcOwnerHistory id="ID2">
    <OwningUser>
      <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
    </OwningUser>
    <OwningApplication>
      <IfcApplication xsi:nil="true" ref="ID6"/>
    </OwningApplication>
    <ChangeAction>added</ChangeAction>
    <LastModifiedDate>0</LastModifiedDate>
    <CreationDate>1207828354</CreationDate>
  </IfcOwnerHistory>
  <IfcPerson id="ID3">
    <Id>Matthias Weise</Id>
    <FamilyName></FamilyName>
    <GivenName></GivenName>
  </IfcPerson>
  <IfcOrganization id="ID4">
    <Id></Id>
    <Name></Name>
    <Description></Description>
  </IfcOrganization>
  <IfcPersonAndOrganization id="ID5">
    <ThePerson>
      <IfcPerson xsi:nil="true" ref="ID3"/>
    </ThePerson>
    <TheOrganization>
      <IfcOrganization xsi:nil="true" ref="ID4"/>
    </TheOrganization>
  </IfcPersonAndOrganization>
  <IfcApplication id="ID6">
    <ApplicationDeveloper>
      <IfcOrganization xsi:nil="true" ref="ID4"/>
    </ApplicationDeveloper>
    <Version>IFC-Application X</Version>
    <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
    <ApplicationIdentifier>Company Y</ApplicationIdentifier>
  </IfcApplication>

```

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The content of this document has to be certified by the IAI before becoming part of an official IFC Model View Definition.

IFC Release Specific Concept Description (IFC2x3)

Single Value Property Definition

Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative "ZukunftBau")				

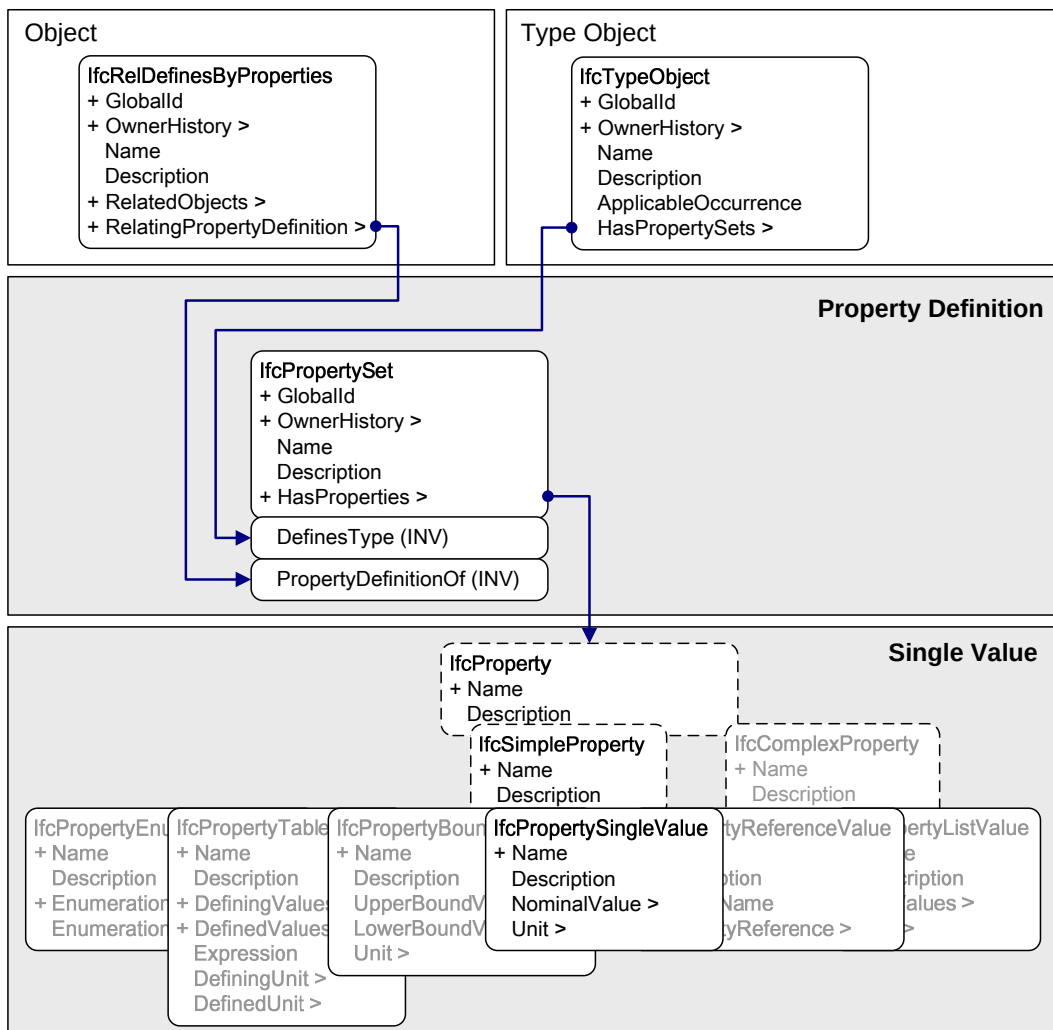
Usage in view definition diagram



Please note that the "Single Value Property Definition" concept is an adapter concept that will be refined by other concept definitions. The purpose of "Single Value Property Definition" is to specify the definition of properties that can be attached to "Objects" and "Type Objects".

Remark for MVD harmonization: see also VBL-239; It might be suitable to omit the differentiation between simple and complex properties.

Instantiation diagram



Implementation agreements

IfcPropertySet

Attribute	Implementation agreements
GlobalId	Must be provided, but is allowed to change
OwnerHistory	Must be provided, but may contain dummy value
Name	Must be provided - in case of predefined properties they should start with the prefix 'Pset_' in any other case they should start with another unique prefix that identifies the type of properties, e.g. 'BFR_'
Description	Reserved
HasProperties	Must be provided - set of single value properties (subtype of IfcPropertySingleValue)
DefinesType(INV)	Provided, if it describes a quantity of a Type Object
PropertyDefinitionOf (INV)	Provided, if it describes a quantity of an Object

IfcPropertySingleValue

Attribute	Implementation agreements
Name	Must be provided – shall enable to uniquely identify the property value
Description	In case that the property value is defined according to a catalogue or classification system the used catalogue or classification system and the described item shall be coded here. As such item is typically coded in a hierarchical structure the whole hierarchy must be provided to identify the item. Each hierarchy is separated through a special character – the 'NameKeyDelimiter', which is defined in property set of the project.
NominalValue	Must be provided
Unit	Optional – only necessary if the property requires a unit and the project unit is not suitable

Example (user defined property)

```
#100= IFCWINDOW('3CitK4CcvAsg$wb9M9IRkH',#2,'F108',$,$,$,$,
'551AD3C3-A8C3-4199-A4-81-BD6279342FF4',2.5,0.75);
#105= IFCPROPERTYSET('231j_uqLjE68vZCU88NGXV',#2,'Pset_WindowCommon',$,
(#107,#108,#109));
#106= IFCRELDEFINESBYPROPERTIES('3$xtB9ZE17dRVzAdr8gFZB',#2,$,$,(#100),#105);
#107= IFCPROPERTYSINGLEVALUE('FireRating',$,IFCLABEL('F30'),$);
#108= IFCPROPERTYSINGLEVALUE('GlazingAreaFraction',$,
IFCPOSITIVERATIONMEASURE(0.8),$);
#109= IFCPROPERTYSINGLEVALUE('IsExterior',$,IFCBOOLEAN(.T.),$);
#2= IFCOWNERHISTORY(#5, #6, $, .ADDED., 0, $, $, 1207828354);
#3= IFCPERSON('Matthias Weise', '', '', $, $, $, $, $);
#4= IFCORGANIZATION('', '', '', $, $);
#5= IFCPERSONANDORGANIZATION(#3, #4, $);
#6= IFCAPPLICATION(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');
```

All values that are needed to define 'single value properties' and to attach them to "Objects" are marked with bold letters.

The example shows a set of 'single value properties' of a window (#100). They are collected by a 'property set object' (#105) that is attached to the window by *IfcRelDefinesByProperties* (#106). The window is an example for the variable concept of "Objects". Further examples are given in the refined concepts.

Example (ifcXML)

```
<IfcWindow id="ID100">
  <GlobalId>3CitK4CcvAsg$wb9M9IRkH</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>F108</Name>
```

```

    <Tag>551AD3C3-A8C3-4199-A4-81-BD6279342FF4</Tag>
    <OverallHeight>2.5</OverallHeight>
    <OverallWidth>0.75</OverallWidth>
  </IfcWindow>
  <IfcPropertySet id="ID105">
    <GlobalId>231j_uqLjE68vZCU88NGXV</GlobalId>
    <OwnerHistory>
      <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>Pset_WindowCommon</Name>
    <HasProperties ex:cType="set">
      <IfcPropertySingleValue pos="0" xsi:nil="true" ref="ID107"/>
      <IfcPropertySingleValue pos="1" xsi:nil="true" ref="ID108"/>
      <IfcPropertySingleValue pos="2" xsi:nil="true" ref="ID109"/>
    </HasProperties>
  </IfcPropertySet>
  <IfcRelDefinesByProperties id="ID106">
    <GlobalId>3$xtB9ZE17dRVzAdr8gFZB</GlobalId>
    <OwnerHistory>
      <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <RelatedObjects ex:cType="set">
      <IfcWindow pos="0" xsi:nil="true" ref="ID100"/>
    </RelatedObjects>
    <RelatingPropertyDefinition>
      <IfcPropertySet xsi:nil="true" ref="ID105"/>
    </RelatingPropertyDefinition>
  </IfcRelDefinesByProperties>
  <IfcPropertySingleValue id="ID107">
    <Name>FireRating</Name>
    <NominalValue>
      <IfcLabel>F30</IfcLabel>
    </NominalValue>
  </IfcPropertySingleValue>
  <IfcPropertySingleValue id="ID108">
    <Name>GlazingAreaFraction</Name>
    <NominalValue>
      <IfcPositiveRatioMeasure>0.8</IfcPositiveRatioMeasure>
    </NominalValue>
  </IfcPropertySingleValue>
  <IfcPropertySingleValue id="ID109">
    <Name>IsExterior</Name>
    <NominalValue>
      <IfcBoolean>true</IfcBoolean>
    </NominalValue>
  </IfcPropertySingleValue>
  <IfcOwnerHistory id="ID2">
    <OwningUser>
      <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
    </OwningUser>
    <OwningApplication>
      <IfcApplication xsi:nil="true" ref="ID6"/>
    </OwningApplication>
    <ChangeAction>added</ChangeAction>
    <LastModifiedDate>0</LastModifiedDate>
    <CreationDate>1207828354</CreationDate>
  </IfcOwnerHistory>
  <IfcPerson id="ID3">
    <Id>Matthias Weise</Id>
    <FamilyName></FamilyName>
    <GivenName></GivenName>
  </IfcPerson>
  <IfcOrganization id="ID4">
    <Id></Id>
    <Name></Name>
    <Description></Description>
  </IfcOrganization>
  <IfcPersonAndOrganization id="ID5">
    <ThePerson>
      <IfcPerson xsi:nil="true" ref="ID3"/>
    </ThePerson>

```

```
<TheOrganization>
  <IfcOrganization xsi:nil="true" ref="ID4"/>
</TheOrganization>
</IfcPersonAndOrganization>
<IfcApplication id="ID6">
  <ApplicationDeveloper>
    <IfcOrganization xsi:nil="true" ref="ID4"/>
  </ApplicationDeveloper>
  <Version>IFC-Application X</Version>
  <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
  <ApplicationIdentifier>Company Y</ApplicationIdentifier>
</IfcApplication>
```

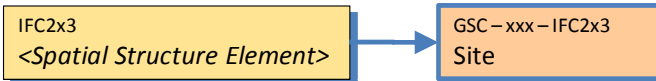
This document uses the official IFC Model View Definition Format version 1.1.0. of the IAI (www.iai-international.org)
The content of this document has to be certified by the IAI before becoming part of an official IFC Model View Definition.

IFC Release Specific Concept Description (IFC2x3)

Site

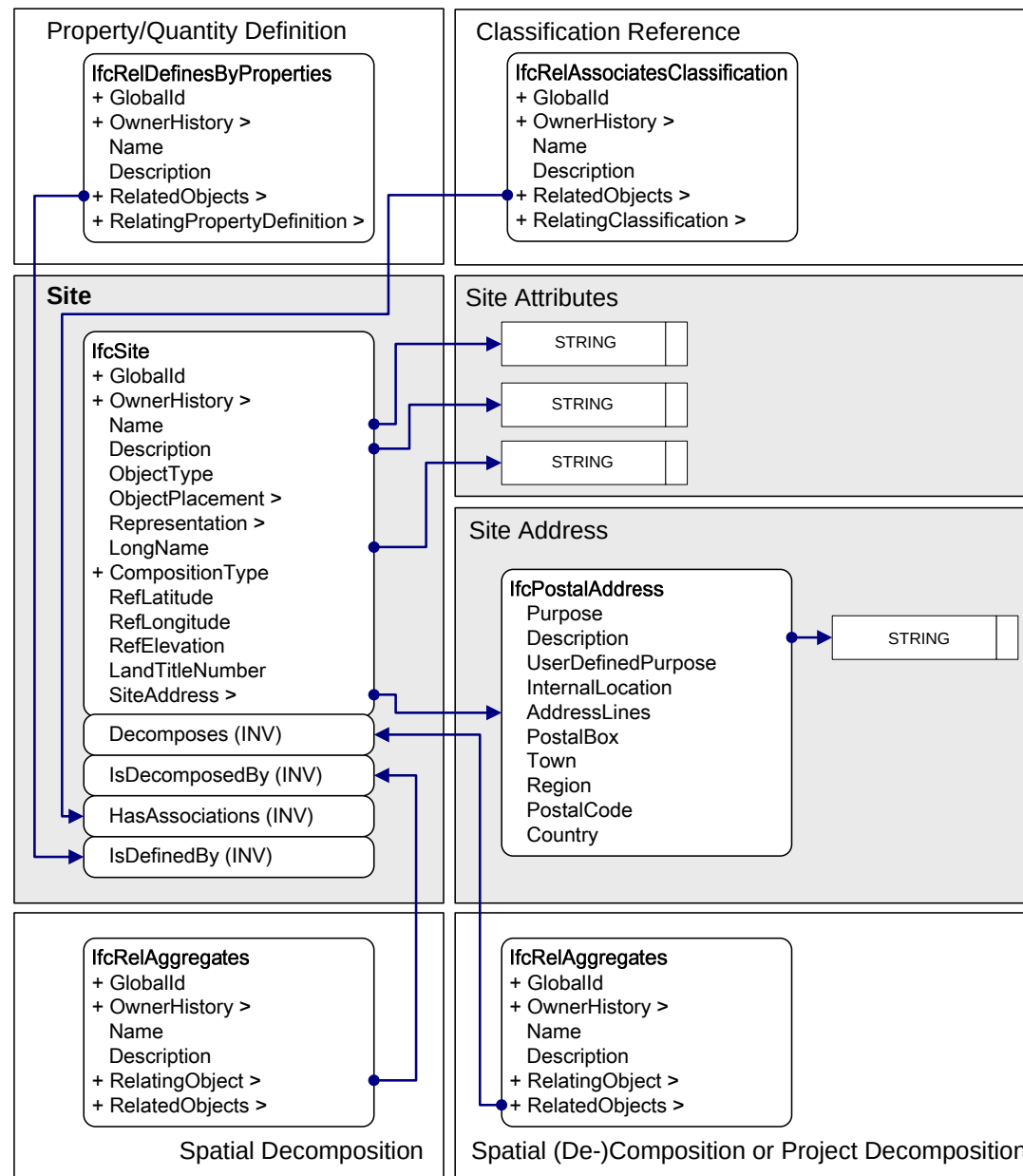
Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative "ZukunftBau")				

Usage in view definition diagram



Please note that there might be further agreements for the “Site” concept that are not shown here. In particular, there might be separate concept definitions for specific properties, quantities and classifications.

Instantiation diagram



Implementation agreements

IfcSite

Attribute	Implementation agreements
GlobalId	Must be provided
OwnerHistory	Must be provided
Name	Short name of the site (may follows specific coding rules)
Description	Human readable name
Object Type	Reserved
Object Placement	Reserved
Representation	Reserved
LongName	Unique key of the site (full/long name)
Composition Type	Should be - COMPLEX, in case of a 'complex site' - ELEMENT, in case of an 'elementary site' - PARTIAL, in case of a 'partial site' Please note that the composition type restricts the spatial decomposition.
RefLatitude	No agreements needed
RefLongitude	No agreements needed
RefElevation	No agreements needed
LandTitleNumber	Reserved
SiteAddress	Postal address of the site (defined by IfcPostalAddress)
Decomposes (INV)	Reference to the parent site or the project
IsDecomposedBy (INV)	Reference to the child nodes (site or building) of the spatial structure
HasAssociations (INV)	Reserved
IsDefinedBy (INV)	Reference to properties or quantities

IfcPostalAddress

Attribute	Implementation agreements
Purpose	No agreements needed
Description	No agreements needed
UserDefinedPurpose	No agreements needed
InternalLocation	No agreements needed
AddressLines	No agreements needed
PostalBox	No agreements needed
Town	No agreements needed
Region	No agreements needed
PostalCode	No agreements needed
Country	No agreements needed

Example (spf)

```
#100= IFCSITE('1G217EQPv30ASE5ZNlFE5v',#2,'BF-J','Baufeld J',,$,$,$,$,
.ELEMENT.,(52,31,0),(13,24,0),,$,$,#101);
#101= IFCPOSTALADDRESS(.SITE.,,$,$,$,
('Dresdner Str.10','01199 Dresden'),$,'Dresden',,$,$,$);
#105= IFCPROJECT('0J$yPqHBD12v72y4qF6XcD',#2,'WHD',,$,$,
'Wohnhaus Dresden','Entwurfssplanung',(#10),#11);
#106= IFCBUILDING('30V5XJ5d5ApRzfHSGEj6Q2',#2,'NBH-Haus-J.1','Neues Bauen am Horn -
Baufeld J - Haus 1',,$,$,$,$.ELEMENT.,,$,$,$);
#107= IFCRELAGGREGATES('2kPxR9pkf4IhXH0hzu5khk',#2,'SiteContainer','SiteContainer
For Buildings',#100,(#106));
#108= IFCRELAGGREGATES('3H0v58cYbDBAu7vMbay3W7',#2,'ProjectContainer',
```

```

'ProjectContainer for Sites',#105,(#100));
#2= IFCOWNERHISTORY(#5, #6, $, .ADDED., 0, $, $, 1207828354);
#3= IFCPERSON('Matthias Weise', '', '', $, $, $, $, $);
#4= IFCORGANIZATION('', '', '', $, $);
#5= IFCPERSONANDORGANIZATION(#3, #4, $);
#6= IFCAPPLICATION(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');
#10= IFCGEOMETRICREPRESENTATIONCONTEXT('Plan', 'Design', 3, 1.00000000E-5, #20, $);
#11= IFCUNITASSIGNMENT((#16, #17, #18));
#16= IFCSIUNIT(*, .LENGTHUNIT., $, .METRE.);
#17= IFCSIUNIT(*, .AREAUNIT., $, .SQUARE_METRE.);
#18= IFCSIUNIT(*, .VOLUMEUNIT., $, .CUBIC_METRE.);
#20= IFCAXIS2PLACEMENT3D(#21, #22, #23);
#21= IFCCARTESIANPOINT((0., 0., 0.));
#22= IFCDIRECTION((0., 0., 1.));
#23= IFCDIRECTION((1., 0., 0.));

```

Example (ifcXML)

```

<IfcSite id="ID100">
  <GlobalId>16217EQPv30ASE5ZNlFE5v</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>BF-J</Name>
  <Description>Baufeld J</Description>
  <CompositionType>element</CompositionType>
  <RefLatitude ex:cType="list">
    <ex:long-wrapper pos="0">52</ex:long-wrapper>
    <ex:long-wrapper pos="1">31</ex:long-wrapper>
    <ex:long-wrapper pos="2">0</ex:long-wrapper>
  </RefLatitude>
  <RefLongitude ex:cType="list">
    <ex:long-wrapper pos="0">13</ex:long-wrapper>
    <ex:long-wrapper pos="1">24</ex:long-wrapper>
    <ex:long-wrapper pos="2">0</ex:long-wrapper>
  </RefLongitude>
  <SiteAddress>
    <IfcPostalAddress xsi:nil="true" ref="ID101"/>
  </SiteAddress >
</IfcSite>
<IfcPostalAddress id="ID101">
  <Purpose>site</Purpose>
  <AddressLines ex:cType="list">
    <IfcLabel pos="0">Dresdner Str.10</IfcLabel>
    <IfcLabel pos="1">01199 Dresden</IfcLabel>
  </AddressLines>
  <Town>Dresden</Town>
</IfcPostalAddress>
<IfcProject id="ID105">
  <GlobalId>0J$yPqHBD12v72y4qF6XcD</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>WHD</Name>
  <LongName>Wohnhaus Dresden</LongName>
  <Phase>Entwurfsplanung</Phase>
  <RepresentationContexts ex:cType="set">
    <IfcGeometricRepresentationContext pos="0" xsi:nil="true" ref="ID10"/>
  </RepresentationContexts>
  <UnitsInContext>
    <IfcUnitAssignment xsi:nil="true" ref="ID11"/>
  </UnitsInContext>
</IfcProject>
<IfcBuilding id="ID106">
  <GlobalId>30V5XJ5d5ApRzfhsGEj6Q2</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>NBH-Haus-J.1</Name>
  <Description>Neues Bauen am Horn - Baufeld J - Haus 1</Description>
  <CompositionType>element</CompositionType>

```

```

</IfcBuilding>
<IfcRelAggregates id="ID107">
  <GlobalId>2kPxR9pkf4IhXH0hzu5khk</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>SiteContainer</Name>
  <Description>SiteContainer For Buildings</Description>
  <RelatingObject>
    <IfcSite xsi:nil="true" ref="ID100"/>
  </RelatingObject>
  <RelatedObjects ex:cType="set">
    <IfcBuilding pos="0" xsi:nil="true" ref="ID106"/>
  </RelatedObjects>
</IfcRelAggregates>
<IfcRelAggregates id="ID108">
  <GlobalId>3H0v58cYbDBAu7vMbay3W7</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>ProjectContainer</Name>
  <Description>ProjectContainer for Sites</Description>
  <RelatingObject>
    <IfcProject xsi:nil="true" ref="ID105"/>
  </RelatingObject>
  <RelatedObjects ex:cType="set">
    <IfcSite pos="0" xsi:nil="true" ref="ID100"/>
  </RelatedObjects>
</IfcRelAggregates>
<IfcOwnerHistory id="ID2">
  <OwningUser>
    <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
  </OwningUser>
  <OwningApplication>
    <IfcApplication xsi:nil="true" ref="ID6"/>
  </OwningApplication>
  <ChangeAction>added</ChangeAction>
  <LastModifiedDate>0</LastModifiedDate>
  <CreationDate>1207828354</CreationDate>
</IfcOwnerHistory>
<IfcPerson id="ID3">
  <Id>Matthias Weise</Id>
  <FamilyName></FamilyName>
  <GivenName></GivenName>
</IfcPerson>
<IfcOrganization id="ID4">
  <Id></Id>
  <Name></Name>
  <Description></Description>
</IfcOrganization>
<IfcPersonAndOrganization id="ID5">
  <ThePerson>
    <IfcPerson xsi:nil="true" ref="ID3"/>
  </ThePerson>
  <TheOrganization>
    <IfcOrganization xsi:nil="true" ref="ID4"/>
  </TheOrganization>
</IfcPersonAndOrganization>
<IfcApplication id="ID6">
  <ApplicationDeveloper>
    <IfcOrganization xsi:nil="true" ref="ID4"/>
  </ApplicationDeveloper>
  <Version>IFC-Application X</Version>
  <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
  <ApplicationIdentifier>Company Y</ApplicationIdentifier>
</IfcApplication>
<IfcGeometricRepresentationContext id="ID10">
  <ContextIdentifier>Plan</ContextIdentifier>
  <ContextType>Design</ContextType>
  <CoordinateSpaceDimension>3</CoordinateSpaceDimension>
  <Precision>1.E-05</Precision>

```



```

    <WorldCoordinateSystem>
      <IfcAxis2Placement3D xsi:nil="true" ref="ID20"/>
    </WorldCoordinateSystem>
  </IfcGeometricRepresentationContext>
  <IfcUnitAssignment id="ID11">
    <Units ex:cType="set">
      <IfcSIUnit pos="0" xsi:nil="true" ref="ID16"/>
      <IfcSIUnit pos="1" xsi:nil="true" ref="ID17"/>
      <IfcSIUnit pos="2" xsi:nil="true" ref="ID18"/>
    </Units>
  </IfcUnitAssignment>
  <IfcSIUnit id="ID16">
    <UnitType>lengthunit</UnitType>
    <Name>metre</Name>
  </IfcSIUnit>
  <IfcSIUnit id="ID17">
    <UnitType>areaunit</UnitType>
    <Name>square_metre</Name>
  </IfcSIUnit>
  <IfcSIUnit id="ID18">
    <UnitType>volumeunit</UnitType>
    <Name>cubic_metre</Name>
  </IfcSIUnit>
  <IfcAxis2Placement3D id="ID20">
    <Location>
      <IfcCartesianPoint xsi:nil="true" ref="ID21"/>
    </Location>
    <Axis>
      <IfcDirection xsi:nil="true" ref="ID22"/>
    </Axis>
    <RefDirection>
      <IfcDirection xsi:nil="true" ref="ID23"/>
    </RefDirection>
  </IfcAxis2Placement3D>
  <IfcCartesianPoint id="ID21">
    <Coordinates ex:cType="list">
      <IfcLengthMeasure pos="0">0.</IfcLengthMeasure>
      <IfcLengthMeasure pos="1">0.</IfcLengthMeasure>
      <IfcLengthMeasure pos="2">0.</IfcLengthMeasure>
    </Coordinates>
  </IfcCartesianPoint>
  <IfcDirection id="ID22">
    <DirectionRatios ex:cType="list">
      <ex:double-wrapper pos="0">0.</ex:double-wrapper>
      <ex:double-wrapper pos="1">0.</ex:double-wrapper>
      <ex:double-wrapper pos="2">1.</ex:double-wrapper>
    </DirectionRatios>
  </IfcDirection>
  <IfcDirection id="ID23">
    <DirectionRatios ex:cType="list">
      <ex:double-wrapper pos="0">1.</ex:double-wrapper>
      <ex:double-wrapper pos="1">0.</ex:double-wrapper>
      <ex:double-wrapper pos="2">0.</ex:double-wrapper>
    </DirectionRatios>
  </IfcDirection>

```

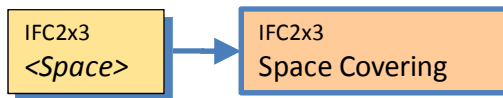
This document uses the official IFC Model View Definition Format version 1.1.0. of the IAI (www.iai-international.org)
 The content of this document has to be certified by the IAI before becoming part of an official IFC Model View Definition.

IFC Release Specific Concept Description (IFC2x3)

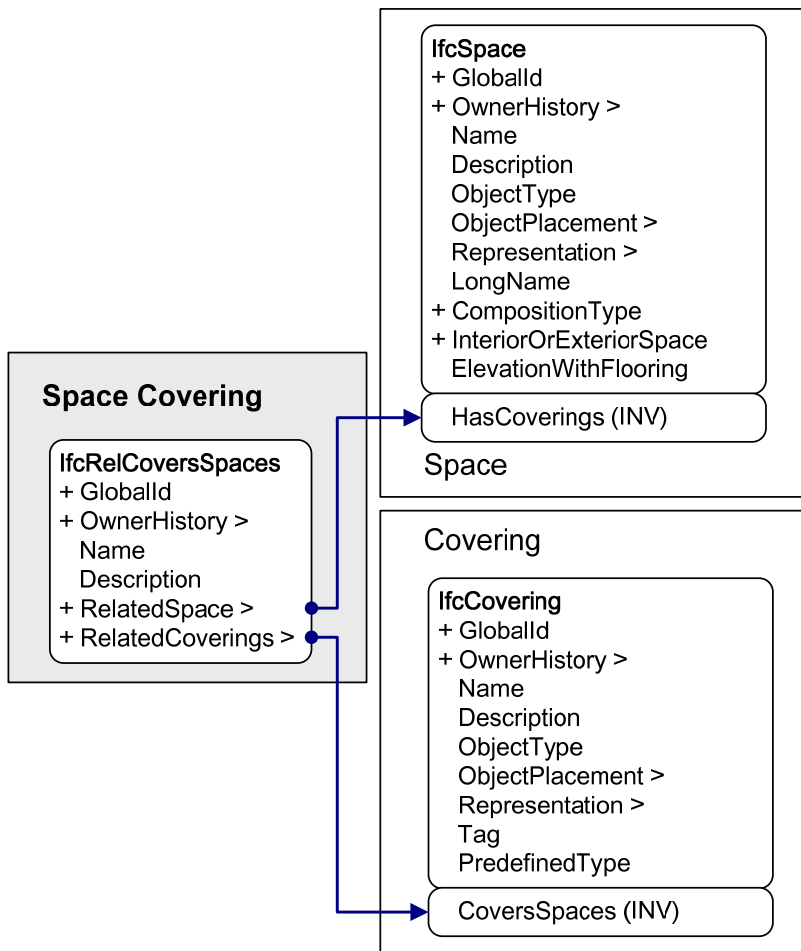
Space Covering

Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative "ZukunftBau")				

Usage in view definition diagram



Instantiation diagram



Implementation agreements

IfcRelCoversSpaces

Attribute	Implementation agreements
GlobalId	Must be provided, but is allowed to change
OwnerHistory	Must be provided, but may contain (reusable) dummy value
Name	Reserved
Description	Reserved
RelatedSpace	Must be provided - reference to the space that is covered by the coverings

RelatedCoverings

Must be provided – reference to a set of coverings

Example (spf)

```
#100= IFCSPACE('4Tf2p7VyLB7eox67SA_zKE', #2, '2', $, $, $, $,
  'Living room', .ELEMENT., .INTERNAL., $);
#101= IFCRELCOVERSSPACES('cwGueGRq4TsV1W5nm0d8F0', #2, $, $, #100, (#102));
#102= IFCCOVERING('$ns0eF_t4TobLUH6m0d8Fm', #2, 'Space Covering Example',
  $, $, $, $, $, .NOTDEFINED.);
#2= IFCOWNERHISTORY(#5, #6, $, .ADDED., 0, $, $, 1207828354);
#3= IFCPERSON('Matthias Weise', '', '', $, $, $, $, $);
#4= IFCORGANIZATION('', '', '', $, $);
#5= IFCPERSONANDORGANIZATION(#3, #4, $);
#6= IFCAPPLICATION(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');
```

All values that are needed to connect coverings with spaces are marked with bold letters.

The example shows a space (#100) that is covered by a covering (#102). Both elements are connected by the relationship *IfcRelCoversSpaces* (#101).

Example (ifcXML)

```
<IfcSpace id="ID100">
  <GlobalId>4Tf2p7VyLB7eox67SA_zKE</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>2</Name>
  <LongName>Living room</LongName>
  <CompositionType>element</CompositionType>
  <InteriorOrExteriorSpace>internal</InteriorOrExteriorSpace>
</IfcSpace>
<IfcRelCoversSpaces id="ID101">
  <GlobalId>cwGueGRq4TsV1W5nm0d8F0</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <RelatedSpace>
    <IfcSpace xsi:nil="true" ref="ID100"/>
  </RelatedSpace>
  <RelatedCoverings ex:cType="set">
    <IfcCovering pos="0" xsi:nil="true" ref="ID102"/>
  </RelatedCoverings>
</IfcRelCoversSpaces>
<IfcCovering id="ID102">
  <GlobalId>$ns0eF_t4TobLUH6m0d8Fm</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>Space Covering Example</Name>
  <PredefinedType>notdefined</PredefinedType>
</IfcCovering>
<IfcOwnerHistory id="ID2">
  <OwningUser>
    <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
  </OwningUser>
  <OwningApplication>
    <IfcApplication xsi:nil="true" ref="ID6"/>
  </OwningApplication>
  <ChangeAction>added</ChangeAction>
  <LastModifiedDate>0</LastModifiedDate>
  <CreationDate>1207828354</CreationDate>
</IfcOwnerHistory>
<IfcPerson id="ID3">
  <Id>Matthias Weise</Id>
  <FamilyName></FamilyName>
  <GivenName></GivenName>
</IfcPerson>
<IfcOrganization id="ID4">
  <Id></Id>
```

```
<Name></Name>
<Description></Description>
</IfcOrganization>
<IfcPersonAndOrganization id="ID5">
  <ThePerson>
    <IfcPerson xsi:nil="true" ref="ID3"/>
  </ThePerson>
  <TheOrganization>
    <IfcOrganization xsi:nil="true" ref="ID4"/>
  </TheOrganization>
</IfcPersonAndOrganization>
<IfcApplication id="ID6">
  <ApplicationDeveloper>
    <IfcOrganization xsi:nil="true" ref="ID4"/>
  </ApplicationDeveloper>
  <Version>IFC-Application X</Version>
  <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
  <ApplicationIdentifier>Company Y</ApplicationIdentifier>
</IfcApplication>
```

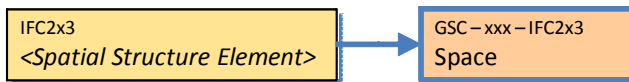
This document uses the official IFC Model View Definition Format version 1.1.0. of the IAI (www.iai-international.org)
The content of this document has to be certified by the IAI before becoming part of an official IFC Model View Definition.

IFC Release Specific Concept Description (IFC2x3)

Space

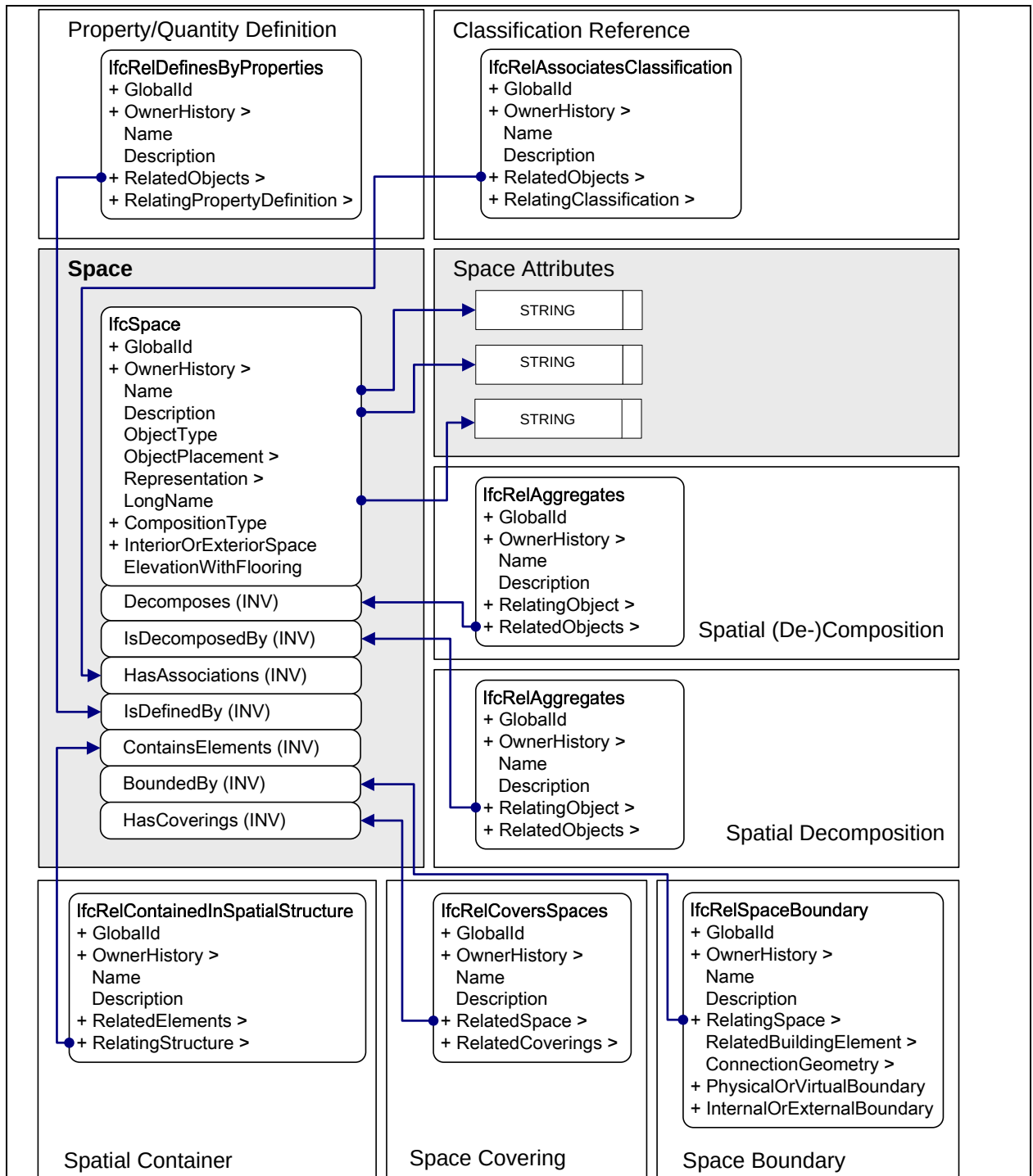
Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative “ZukunftBau”)				

Usage in view definition diagram



Please note that there might be further agreements for the “*Space*” concept that are not shown here. In particular, there might be separate concept definitions for specific properties, quantities and classifications.

Instantiation diagram



Implementation agreements

IfcSpace

Attribute	Implementation agreements
GlobalId	Must be provided
OwnerHistory	Must be provided
Name	Short name of the space (may follows specific coding rules)
Description	Human readable name
Object Type	Reserved
Object Placement	Reserved
Representation	Reserved
LongName	Long name

Composition Type	Should be - COMPLEX, in case of a 'complex space' - ELEMENT, in case of an 'elementary space' - PARTIAL, in case of a 'partial space' Please note that the composition type restricts the spatial decomposition.
InteriorOrExteriorSpace	No agreements needed
ElevationWithFlooring	No agreements needed
Decomposes (INV)	Reference to the parent space or building storey
IsDecomposedBy (INV)	Reference to the child nodes (space) of the spatial structure
HasAssociations (INV)	Classification of the space (please see additional implementation agreements)
IsDefinedBy (INV)	Reference to properties or quantities (please see additional implementation agreements)
ContainsElements (INV)	Reference to elements that are contained in the space
BoundedBy (INV)	Reference to space boundaries
HasCoverings (INV)	Reference to space coverings

Example (spf)

```
#113= IFCSPACE('4Tf2p7VyLB7eox67SA_zKE',#2,'2',$,$,$,$,
'Living room',.ELEMENT.,.INTERNAL.,$);
#111= IFCBUILDINGSTOREY('2rAd0PG815zwRG$PbRquLR',#2,
'First floor',$,$,$,$,$,.ELEMENT.,3.1);
#106= IFCBUILDING('30V5XJ5d5ApRzfHSGEj6Q2',#2,'NBH-Haus-J.1',
'Neues Bauen am Horn - Baufeld J - Haus 1',$,$,$,$,$,.ELEMENT.,$,$,$);
#108= IFCRELAGGREGATES('3H0v58cYbDBAu7vMbay3W7',#2,'BuildingContainer',
'BuildingContainer For Buildingstories',#106,(#111));
#109= IFCRELAGGREGATES('6IOv58cYbDBAu7vMbay3W7',#2,'BuildingStoreyContainer',
'BuildingContainer For Spaces',#111,(#113));
#2= IFCOWNERHISTORY(#5, #6, $, .ADDED., 0, $, $, 1207828354);
#3= IFCPERSON('Matthias Weise', '', '', $, $, $, $, $);
#4= IFCORGANIZATION('', '', '', $, $);
#5= IFCPERSONANDORGANIZATION(#3, #4, $);
#6= IFCAPPLICATION(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');
```

Example (ifcXML)

```
<IfcOwnerHistory id="ID2">
  <OwningUser>
    <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
  </OwningUser>
  <OwningApplication>
    <IfcApplication xsi:nil="true" ref="ID6"/>
  </OwningApplication>
  <ChangeAction>added</ChangeAction>
  <LastModifiedDate>0</LastModifiedDate>
  <CreationDate>1207828354</CreationDate>
</IfcOwnerHistory>
<IfcPerson id="ID3">
  <Id>Matthias Weise</Id>
  <FamilyName></FamilyName>
  <GivenName></GivenName>
</IfcPerson>
<IfcOrganization id="ID4">
  <Id></Id>
  <Name></Name>
  <Description></Description>
</IfcOrganization>
<IfcPersonAndOrganization id="ID5">
  <ThePerson>
    <IfcPerson xsi:nil="true" ref="ID3"/>
  </ThePerson>
  <TheOrganization>
    <IfcOrganization xsi:nil="true" ref="ID4"/>
  </TheOrganization>
</IfcPersonAndOrganization>
```

```

</IfcPersonAndOrganization>
<IfcApplication id="ID6">
  <ApplicationDeveloper>
    <IfcOrganization xsi:nil="true" ref="ID4"/>
  </ApplicationDeveloper>
  <Version>IFC-Application X</Version>
  <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
  <ApplicationIdentifier>Company Y</ApplicationIdentifier>
</IfcApplication>
<IfcBuilding id="ID106">
  <GlobalId>30V5XJ5d5ApRzfhSGEj6Q2</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>NBH-Haus-J.1</Name>
  <Description>Neues Bauen am Horn - Baufeld J - Haus 1</Description>
  <CompositionType>element</CompositionType>
</IfcBuilding>
<IfcRelAggregates id="ID108">
  <GlobalId>3H0v58cYbDBAu7vMbAY3W7</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>BuildingContainer</Name>
  <Description>BuildingContainer For Buildingstories</Description>
  <RelatingObject>
    <IfcBuilding xsi:nil="true" ref="ID106"/>
  </RelatingObject>
  <RelatedObjects ex:cType="set">
    <IfcBuildingStorey pos="0" xsi:nil="true" ref="ID111"/>
  </RelatedObjects>
</IfcRelAggregates>
<IfcRelAggregates id="ID109">
  <GlobalId>6IOv58cYbDBAu7vMbAY3W7</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>BuildingStoreyContainer</Name>
  <Description>BuildingContainer For Spaces</Description>
  <RelatingObject>
    <IfcBuildingStorey xsi:nil="true" ref="ID111"/>
  </RelatingObject>
  <RelatedObjects ex:cType="set">
    <IfcSpace pos="0" xsi:nil="true" ref="ID113"/>
  </RelatedObjects>
</IfcRelAggregates>
<IfcBuildingStorey id="ID111">
  <GlobalId>2rAd0PG815zwRG$PbRquLR</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>First floor</Name>
  <CompositionType>element</CompositionType>
  <Elevation>3.1</Elevation>
</IfcBuildingStorey>
<IfcSpace id="ID113">
  <GlobalId>4Tf2p7VyLB7eox67SA_zKE</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>2</Name>
  <LongName>Living room</LongName>
  <CompositionType>element</CompositionType>
  <InteriorOrExteriorSpace>internal</InteriorOrExteriorSpace>
</IfcSpace>

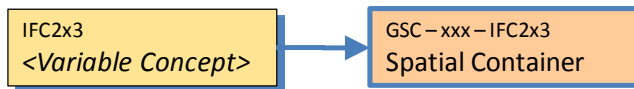
```


IFC Release Specific Concept Description (IFC2x3)

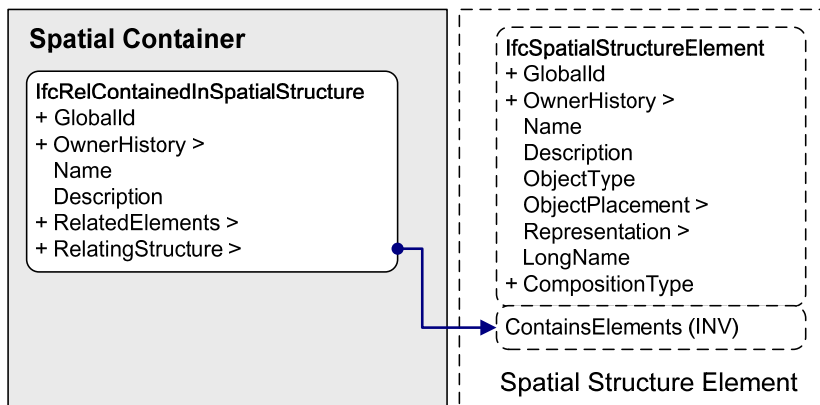
Spatial Container

Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative "ZukunftBau")				

Usage in view definition diagram



Instantiation diagram



Please note that *IfcSpatialStructureElement* is an abstract supertype of the concepts "Site", "Building", "BuildingStorey" and "Space". Thus, it cannot be instantiated as suggested in the instantiation diagram.

Implementation agreements

IfcRelContainedInSpatialStructure

Attribute	Implementation agreements
GlobalId	Must be provided, but is allowed to change
OwnerHistory	Must be provided, but may contain (reusable) dummy value
Name	Reserved
Description	Reserved
RelatedElements	Must be provided - set of products (subtype of <i>IfcProduct</i>) that are contained in the relating structure
RelatingStructure	Must be provided – the spatial structure element that contains the elements

Example (spf)

```
#10=IFCSPACE('sIYIqQKx4TkF9N05m0d8oG', #2, 'EG.001', $, 'Room', $, $, 'Room 001',
.ELEMENT., .INTERNAL., 0.0);
#11=IFCBUILDINGELEMENTPROXY('AfvlGfOy4ToAltbzm0d8Fm', #2, 'Sun protection', $, $,
$, $, $, $);
#12=IFCRELCONTAINEDINSPATIALSTRUCTURE('cwpeaWRq4TsV1W5nm0d8F0', #2, $, $,
(#11), #10);
#2=IFCOWNERHISTORY(#5, #6, $, .ADDED., 0, $, $, 1207828354);
#3=IFCPERSON('Matthias Weise', '', '', $, $, $, $, $);
#4=IFCORGANIZATION('', '', '', $, $);
#5=IFCPERSONANDORGANIZATION(#3, #4, $);
#6=IFCAPPLICATION(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');
```

All values that are needed to define a spatial container are marked with bold letters.

The example shows a proxy element (#11) that is contained in a room (#10), whereas the proxy element is an example for the “*Variable Concept*” and the room is an example for the “*Spatial Structure Element*”. Both elements are connected by the relationship *IfcRelContainedInSpatialStructure* (#12).

Example (ifcXML)

```
<IfcSpace id="ID10">
  <GlobalId>sIYIqQKx4TkF9N05m0d8oG</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>EG.001</Name>
  <ObjectType>Room</ObjectType>
  <LongName>Room 001</LongName>
  <CompositionType>element</CompositionType>
  <InteriorOrExteriorSpace>internal</InteriorOrExteriorSpace>
  <ElevationWithFlooring>0.</ElevationWithFlooring>
</IfcSpace>
<IfcBuildingElementProxy id="ID11">
  <GlobalId>AfvlGFoY4ToALtbzm0d8Fm</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>Sun protection</Name>
</IfcBuildingElementProxy>
<IfcRelContainedInSpatialStructure id="ID12">
  <GlobalId>cwpeaWRq4TsV1W5nm0d8F0</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <RelatedElements ex:cType="set">
    <IfcBuildingElementProxy pos="0" xsi:nil="true" ref="ID11"/>
  </RelatedElements>
  <RelatingStructure>
    <IfcSpace xsi:nil="true" ref="ID10"/>
  </RelatingStructure>
</IfcRelContainedInSpatialStructure>
<IfcOwnerHistory id="ID2">
  <OwningUser>
    <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
  </OwningUser>
  <OwningApplication>
    <IfcApplication xsi:nil="true" ref="ID6"/>
  </OwningApplication>
  <ChangeAction>added</ChangeAction>
  <LastModifiedDate>0</LastModifiedDate>
  <CreationDate>1207828354</CreationDate>
</IfcOwnerHistory>
<IfcPerson id="ID3">
  <Id>Matthias Weise</Id>
  <FamilyName></FamilyName>
  <GivenName></GivenName>
</IfcPerson>
<IfcOrganization id="ID4">
  <Id></Id>
  <Name></Name>
  <Description></Description>
</IfcOrganization>
<IfcPersonAndOrganization id="ID5">
  <ThePerson>
    <IfcPerson xsi:nil="true" ref="ID3"/>
  </ThePerson>
  <TheOrganization>
    <IfcOrganization xsi:nil="true" ref="ID4"/>
  </TheOrganization>
</IfcPersonAndOrganization>
<IfcApplication id="ID6">
  <ApplicationDeveloper>
    <IfcOrganization xsi:nil="true" ref="ID4"/>
  </ApplicationDeveloper>
</IfcApplication>
```

```
<Version>IFC-Application X</Version>  
<ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>  
<ApplicationIdentifier>Company Y</ApplicationIdentifier>  
</IfcApplication>
```

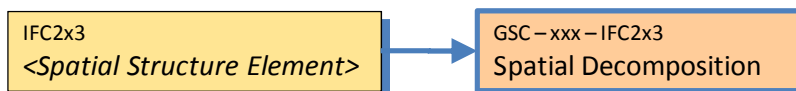
This document uses the official IFC Model View Definition Format version 1.1.0. of the IAI (www.iai-international.org)
The content of this document has to be certified by the IAI before becoming part of an official IFC Model View Definition.

IFC Release Specific Concept Description (IFC2x3)

Spatial Decomposition

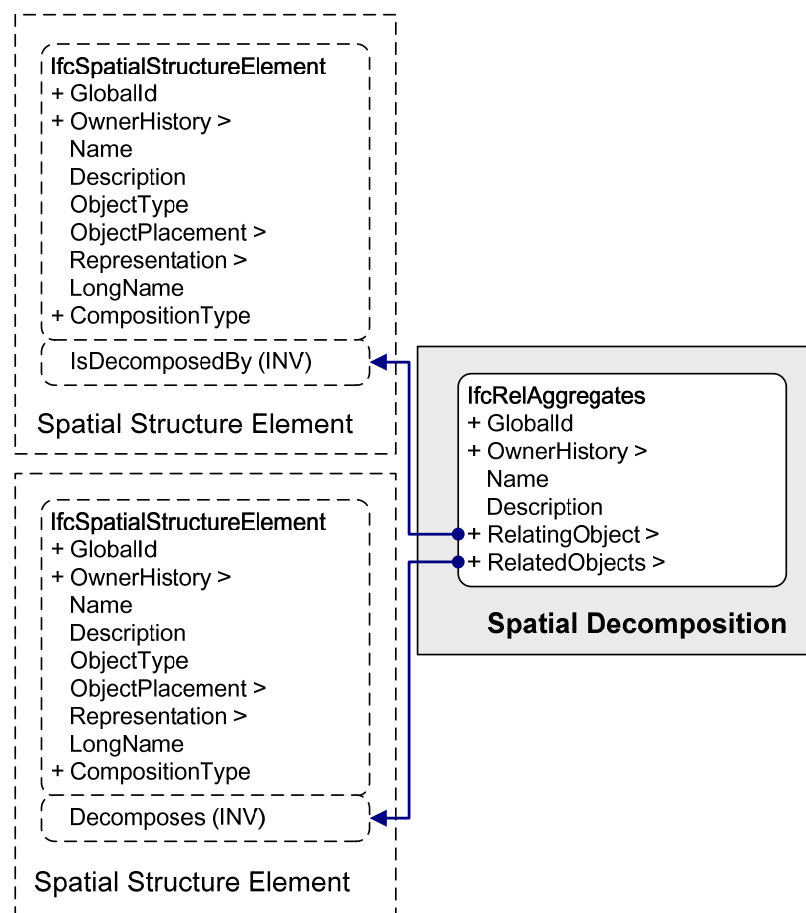
Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative "ZukunftBau")				

Usage in view definition diagram



Remark for MVD harmonization: see also VBL-404, VBL-405

Instantiation diagram



Please note that *IfcSpatialStructureElement* is an abstract supertype of the concepts "Site", "Building", "BuildingStorey" and "Space". Thus, it cannot be instantiated as suggested in the instantiation diagram.

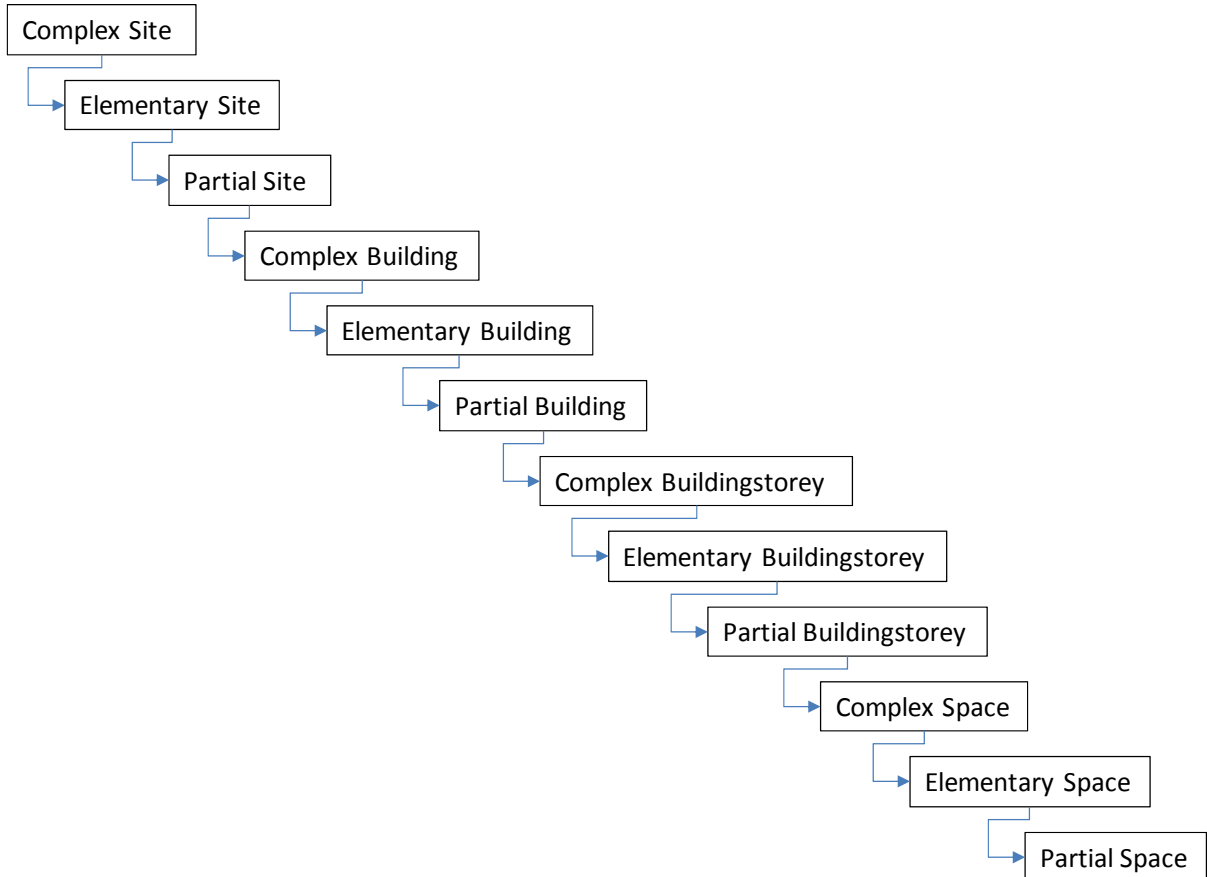
Implementation agreements

IfcRelAggregates

Attribute	Implementation agreements
GlobalId	Must be provided, but is allowed to change
OwnerHistory	Must be provided, but may contain (reusable) dummy value
Name	Reserved
Description	Reserved

RelatingObject	Must be provided – reference to the parent node of the spatial structure
RelatedObjects	Must be provided – reference to the child node of the spatial structure

There are 4 types of spatial structure elements, namely site, building, building storey and space. Additionally, each of these types can be classified as complex, element or partial. Thus, there are 12 types of spatial structure elements that can be used to define a spatial structure as shown in the figure below. But not all types are necessary to define a spatial structure. However, the hierarchy is not allowed to change, i.e. an element that is shown below another element can never be its parent node in the spatial structure (direct or indirect).



Example

```

#10= IFCRELAGGREGATES('cwgUeGRq4TsV1W5nm0d8F0', #2, $, $, #11, (#12));
#11= IFCSITE('0KmpiAlnb52RgQuM1CwVfd', #2, 'Site', 'Plane
      site', 'LandUse', $, $, $, .ELEMENT., (52,31,0), (13,24,0), $, $, $);
#12= IFCBUILDING('sISCCgKx4TkF9N05m0d8oG', #2, '1056', $, $, $, $, 'Building',
      .ELEMENT., $, $, $);
#20= IFCRELAGGREGATES('cwK90GRq4TsV1W5nm0d8F0', #2, $, $, #12, (#21));
#21= IFCBUILDINGSTOREY('sIYIqAKx4TkF9N05m0d8oG', #2, 'EG', $, $, $, $, 'First
      floor', .ELEMENT., $);
#31= IFCRELAGGREGATES('cwnp0mRq4TsV1W5nm0d8F0', #2, $, $, #21, (#32, #33));
#32= IFCSPACE('weYIqQKx4TkF9N05m0d8oG', #2, 'EG.001', $, 'Raum', $, $, 'Raum 001',
      .ELEMENT., .INTERNAL., 0.0);
#33= IFCSPACE('sIYIqQKx4TkF9N05m0d8oG', #2, 'EG.002', $, 'Raum', $, $, 'Raum 002',
      .ELEMENT., .INTERNAL., 0.0);
#2= IFCOWNERHISTORY(#5, #6, $, .ADDED., 0, $, $, 1207828354);
#3= IFCPERSON('Matthias Weise', '', '', $, $, $, $, $);
#4= IFCORGANIZATION('', '', '', $, $);
#5= IFCPERSONANDORGANIZATION(#3, #4, $);
#6= IFCAPPLICATION(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');

```

All values that are needed to define the spatial structure are marked with bold letters.

The example shows a site (#11) that is decomposed by a building (#12), which itself is decomposed by a building storey (#21). The building storey is finally decomposed by two rooms (#32, #33). All elements are classified as “element” and are an example for the concept “*Spatial Structure Element*”.

They are connected by relationships of the type *IfcRelAggregates* (#10, #20, #31).

Example (ifcXML)

```
<IfcRelAggregates id="ID10">
  <GlobalId>cwGueGRq4TsV1W5nm0d8F0</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <RelatingObject>
    <IfcSite xsi:nil="true" ref="ID11"/>
  </RelatingObject>
  <RelatedObjects ex:cType="set">
    <IfcBuilding pos="0" xsi:nil="true" ref="ID12"/>
  </RelatedObjects>
</IfcRelAggregates>
<IfcSite id="ID11">
  <GlobalId>0KMpiAlnb52RgQuM1CwVfd</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>Site</Name>
  <Description>Plane site</Description>
  <ObjectType>LandUse</ObjectType>
  <CompositionType>element</CompositionType>
  <RefLatitude ex:cType="list">
    <ex:long-wrapper pos="0">52</ex:long-wrapper>
    <ex:long-wrapper pos="1">31</ex:long-wrapper>
    <ex:long-wrapper pos="2">0</ex:long-wrapper>
  </RefLatitude>
  <RefLongitude ex:cType="list">
    <ex:long-wrapper pos="0">13</ex:long-wrapper>
    <ex:long-wrapper pos="1">24</ex:long-wrapper>
    <ex:long-wrapper pos="2">0</ex:long-wrapper>
  </RefLongitude>
</IfcSite>
<IfcBuilding id="ID12">
  <GlobalId>sISCCgKx4TkF9N05m0d8oG</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>1056</Name>
  <LongName>Building</LongName>
  <CompositionType>element</CompositionType>
</IfcBuilding>
<IfcRelAggregates id="ID20">
  <GlobalId>cwK90GRq4TsV1W5nm0d8F0</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <RelatingObject>
    <IfcBuilding xsi:nil="true" ref="ID12"/>
  </RelatingObject>
  <RelatedObjects ex:cType="set">
    <IfcBuildingStorey pos="0" xsi:nil="true" ref="ID21"/>
  </RelatedObjects>
</IfcRelAggregates>
<IfcBuildingStorey id="ID21">
  <GlobalId>sIYIqAKx4TkF9N05m0d8oG</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>EG</Name>
  <LongName>First floor</LongName>
  <CompositionType>element</CompositionType>
</IfcBuildingStorey>
<IfcRelAggregates id="ID31">
  <GlobalId>cwnp0mRq4TsV1W5nm0d8F0</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
```

```

    <RelatingObject>
      <IfcBuildingStorey xsi:nil="true" ref="ID21"/>
    </RelatingObject>
    <RelatedObjects ex:cType="set">
      <IfcSpace pos="0" xsi:nil="true" ref="ID32"/>
      <IfcSpace pos="1" xsi:nil="true" ref="ID33"/>
    </RelatedObjects>
  </IfcRelAggregates>
  <IfcSpace id="ID32">
    <GlobalId>weYIqQKx4TkF9N05m0d8oG</GlobalId>
    <OwnerHistory>
      <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>EG.001</Name>
    <ObjectType>Raum</ObjectType>
    <LongName>Raum 001</LongName>
    <CompositionType>element</CompositionType>
    <InteriorOrExteriorSpace>internal</InteriorOrExteriorSpace>
    <ElevationWithFlooring>0.</ElevationWithFlooring>
  </IfcSpace>
  <IfcSpace id="ID33">
    <GlobalId>sIYIqQKx4TkF9N05m0d8oG</GlobalId>
    <OwnerHistory>
      <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>EG.002</Name>
    <ObjectType>Raum</ObjectType>
    <LongName>Raum 002</LongName>
    <CompositionType>element</CompositionType>
    <InteriorOrExteriorSpace>internal</InteriorOrExteriorSpace>
    <ElevationWithFlooring>0.</ElevationWithFlooring>
  </IfcSpace>
  <IfcOwnerHistory id="ID2">
    <OwningUser>
      <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
    </OwningUser>
    <OwningApplication>
      <IfcApplication xsi:nil="true" ref="ID6"/>
    </OwningApplication>
    <ChangeAction>added</ChangeAction>
    <LastModifiedDate>0</LastModifiedDate>
    <CreationDate>1207828354</CreationDate>
  </IfcOwnerHistory>
  <IfcPerson id="ID3">
    <Id>Matthias Weise</Id>
    <FamilyName></FamilyName>
    <GivenName></GivenName>
  </IfcPerson>
  <IfcOrganization id="ID4">
    <Id></Id>
    <Name></Name>
    <Description></Description>
  </IfcOrganization>
  <IfcPersonAndOrganization id="ID5">
    <ThePerson>
      <IfcPerson xsi:nil="true" ref="ID3"/>
    </ThePerson>
    <TheOrganization>
      <IfcOrganization xsi:nil="true" ref="ID4"/>
    </TheOrganization>
  </IfcPersonAndOrganization>
  <IfcApplication id="ID6">
    <ApplicationDeveloper>
      <IfcOrganization xsi:nil="true" ref="ID4"/>
    </ApplicationDeveloper>
    <Version>IFC-Application X</Version>
    <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
    <ApplicationIdentifier>Company Y</ApplicationIdentifier>
  </IfcApplication>

```

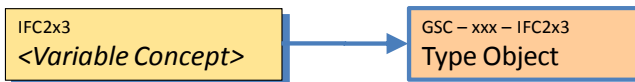
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IFC Release Specific Concept Description (IFC2x3)

Type Object

Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative "ZukunftBau")				

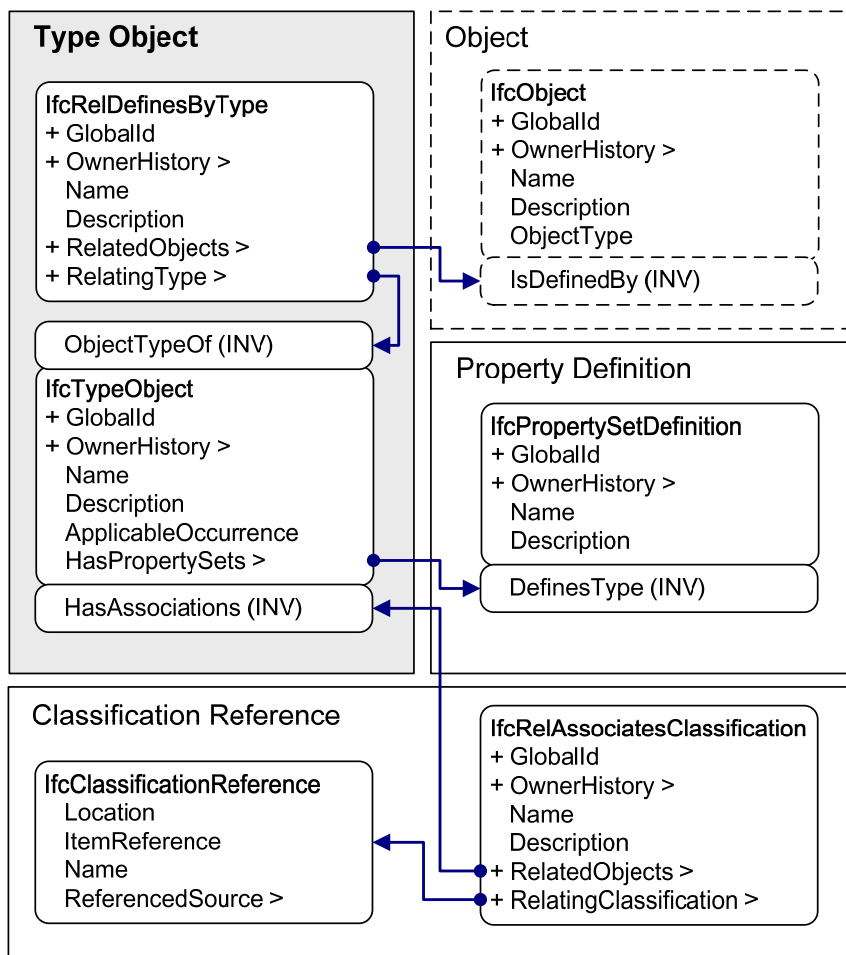
Usage in view definition diagram



Please note that the “*Type Object*” concept is an adapter concept that will be refined by other (adapter and static) concept definitions. The purpose of “*Type Object*” is to have one concept that can be used as a place holder for refined concepts and to specify generic functionality, e.g. the property definition. Thus, it follows the principle of classification.

Remark for MVD harmonization: It currently concentrates on functionality that is needed for one specific view. Thus, it might be necessary to extend this concept to be re-used by other views, other types of association, assignment etc.

Instantiation diagram



Implementation agreements

IfcTypeObject

Attribute

Implementation agreements

GlobalId	Must be provided
OwnerHistory	Must be provided, but may contain dummy value
Name	Reserved
Description	Reserved
ApplicationOccurrence	N/A
HasPropertySets	Optional - May set a reference to property definitions that further define the element
HasAssociations (INV)	Optional - May contain instances of <i>IfcRelAssociatesClassification</i> that further classify the element according to a classification system
ObjectTypeOf (INV)	Optional - May contain an instance of <i>IfcRelDefinesByType</i> that defines a connection to objects of that type
IfcRelDefinesByType	
Attribute	Implementation agreements
GlobalId	Must be provided, but is allowed to change
OwnerHistory	Must be provided, but may contain dummy value
Name	Reserved
Description	Reserved
RelatedObjects	A set of Objects that are defined by a “ <i>Type Object</i> ”
RelatingType	Reference to the “ <i>Type Object</i> ”, which defines the Objects
Example	
Examples are given in the refined concepts.	
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IFC Release Specific Concept Description (IFC2x3)

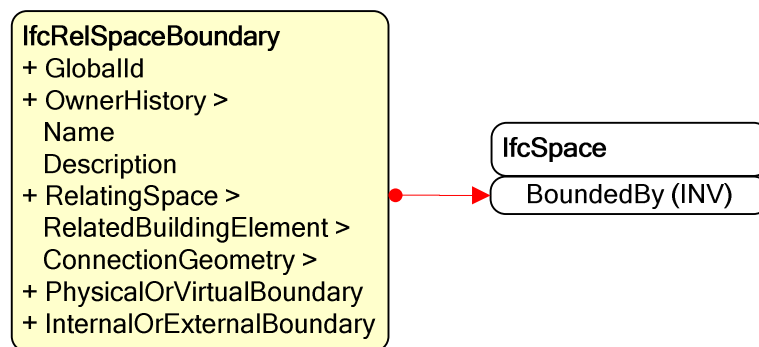
Space Boundary

Reference	VBL-417	Version	3	Status	Proposal
Relationships	Implements generic concept VBL-364 Space Boundary				
History	Created 07.10.2007 Additional information added 10.10.2007 Version 3 – 25.2.2008				
Authors	Jiri Hietanen				
Document Owner	Virtual Building Laboratory @ TUT (jiri.hietanen@tut.fi)				

Usage in view definition diagram



Instantiation diagram



Implementation agreements

IfcRelSpaceBoundary

Attribute	Implementation agreements
GlobalId	Must be given, but may change
OwnerHistory	Must be given, but may contain dummy data
Name	No agreements at this point
Description	Reserved
RelatingSpace	No agreements needed
RelatedBuildingElement	No agreements at this point
ConnectionGeometry	No agreements at this point
PhysicalOrVirtualBoundary	No agreements at this point
InternalOrExternalBoundary	No agreements at this point

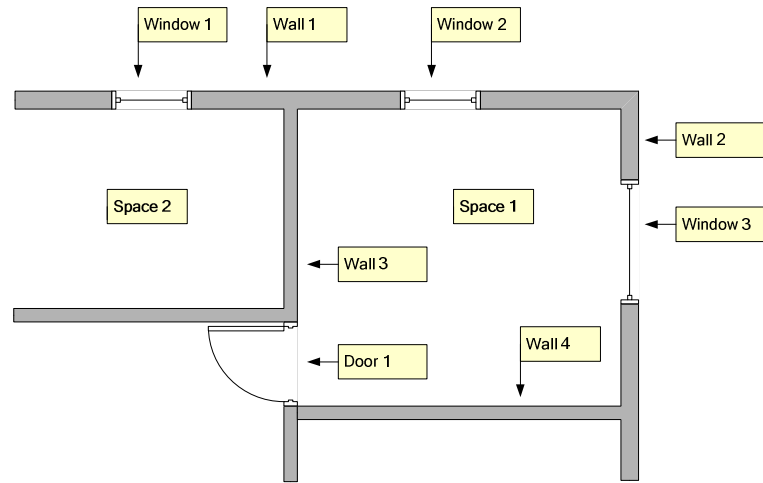
Additional information

Using space boundaries

In the usage of space boundaries it is important to be able to connect the boundaries of openings, doors and windows to the boundaries of the walls, slabs etc. that contain the openings and fillings. The geometry definition of boundaries is ignorant of any such relationships, e.g. a wall object may generate a rectangular boundary even if that wall contains a window.

The relationships of the different space boundaries of a specific space can be extracted from two collections.

1. Each space has a collection of space boundaries: `IfcSpace.BoundedBy` (inverse), which in turn reference the building element: `IfcRelSpaceBoundary.RelatedBuildingElement`
2. Each building element has a collection of openings: `IfcElement.HasOpenings` (inverse), which in turn has a collection of fillers: `IfcOpeningElement.HasFillings` (inverse)



In the example above space1 has the following space boundaries: wall1, wall2, wall3, wall4, door1, window2, window3.

In the example above wall1 has the following fillings: window1, window2

Because only window2 appears in both lists we can reason that only window2 is related to the wall1 space boundary of space1. Consequently the area of window2 can be deducted from the wall1 space boundary of space1 in order to get the net area needed in analysis.

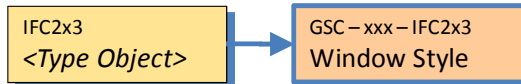
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IFC Release Specific Concept Description (IFC2x3)

Window Style

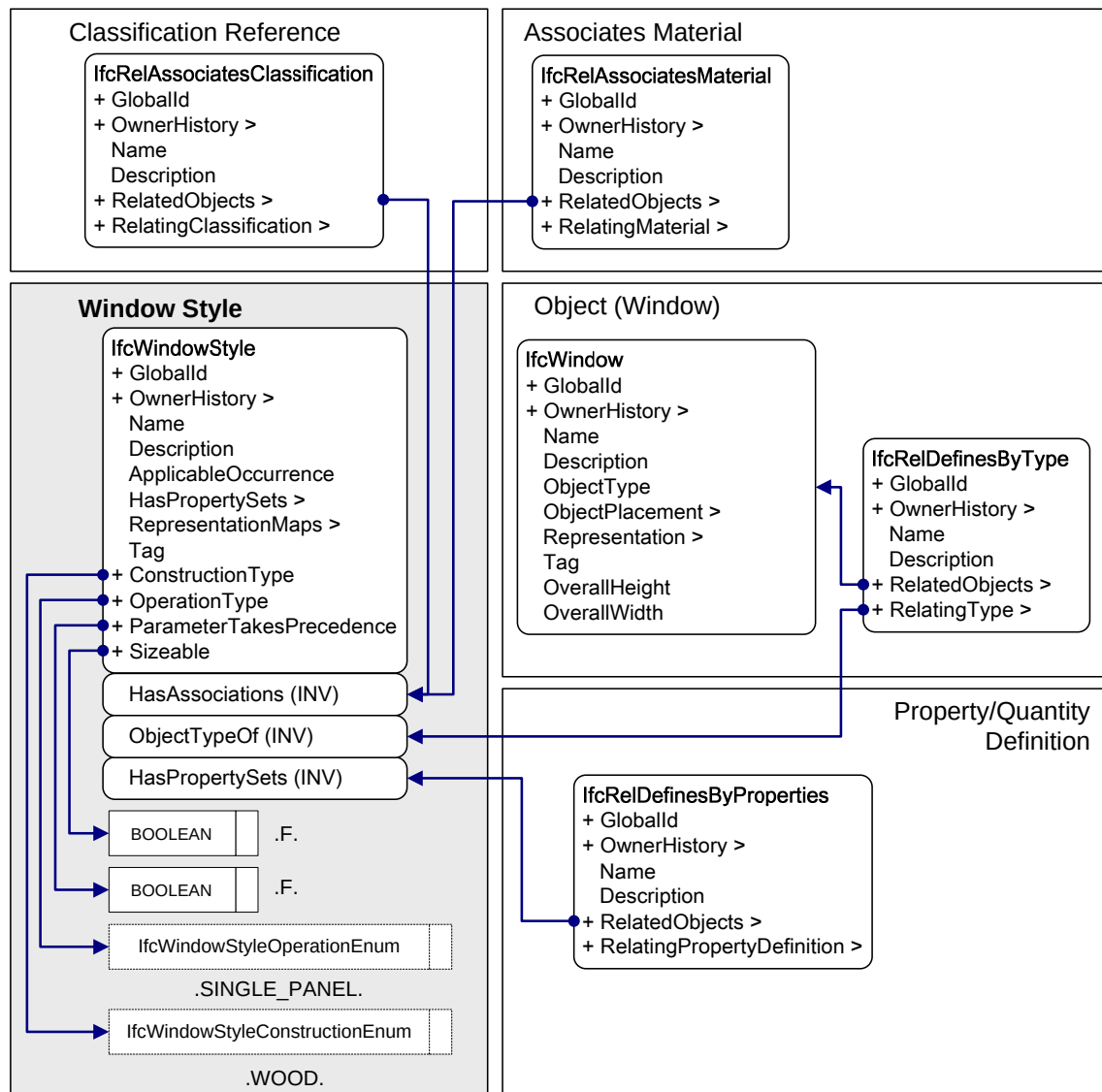
Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative "ZukunftBau")				

Usage in view definition diagram



Please note that there might be further agreements for the “Window Style” concept that are not shown here. In particular, there might be separate concept definitions for specific properties, quantities and classifications. There are also additional (inverse) relationships that are not shown here but might be used to add further information.

Instantiation diagram



Implementation agreements

IfcWindowStyle

Attribute	Implementation agreements
GlobalId	Must be provided
OwnerHistory	Must be provided
Name	Reserved
Description	Reserved
ObjectType	Reserved
ObjectPlacement	No agreements needed
Representation	No agreements needed
Tag	Reserved
ConstructionType	Must be provided
OperationType	Must be provided
ParameterTakes	Must be provided
Precedence	
Sizeable	Must be provided

Example (spf)

```
#100= IFCWINDOW('1bu0salk59WxAUSvt$0hEp',#2,'F202',$,$,$,$,2.5,0.75);
#101= IFCWINDOWLININGPROPERTIES('1uHCCCUgP6906NuIcicx8q',#2,$,$,0.05,0.05,
    $,$,$,$,$,$);
#102= IFCWINDOWPANELPROPERTIES('19sUYzCDP0lxD1q0utVF91',#2,$,$,.NOTDEFINED.,
    .MIDDLE.,0.05,0.07,$);
#103= IFCWINDOWSTYLE('3o$XIFpmD5swrz0hGSrTy8',#2,
    'Fixed glazing',$,$,(#101,#102),$,$,.NOTDEFINED.,.SINGLE_PANEL.,.F.,.F.);
#104= IFCRELDEFINESBYTYPE('348C6GbJb7Thki5llQxQ$z',#2,
    'Fixed glazing',$,$,(#100),#103);
#109= IFCMATERIAL('Wood');
#110= IFCRELASSOCIATESMATERIAL('0iKTtg9xP6buf6Pf7_2fSN',#2,$,$,(#100),#109);
#111= IFCPROPERTYSET('1KwmeMlorCeABBAQ0CbtFj',#2,'Pset_WindowCommon',$,
    (#113,#114,#115));
#112= IFCRELDEFINESBYPROPERTIES('1inGsaLULC78ImgdLZI9Kc',#2,$,$,(#100),#111);
#113= IFCPROPERTYSINGLEVALUE('FireRating',$,IFCLABEL('F30')),$);
#114= IFCPROPERTYSINGLEVALUE('GlazingAreaFraction',$,
    IFCPOSITIVERATIOMEASURE(0.8)),$);
#115= IFCPROPERTYSINGLEVALUE('IsExterior',$,IFCBOOLEAN(.T.)),$);
#2= IFCOWNERHISTORY(#5, #6, $, .ADDED., 0, $, $, 1207828354);
#3= IFCPERSON('Matthias Weise', '', '', $, $, $, $, $);
#4= IFCORGANIZATION('', '', '', $, $);
#5= IFCPERSONANDORGANIZATION(#3, #4, $);
#6= IFCAPPLICATION(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');
```

Example (ifcXML)

```
<IfcWindow id="ID100">
  <GlobalId>1bu0salk59WxAUSvt$0hEp</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>F202</Name>
  <OverallHeight>2.5</OverallHeight>
  <OverallWidth>0.75</OverallWidth>
</IfcWindow>
<IfcWindowLiningProperties id="ID101">
  <GlobalId>1uHCCCUgP6906NuIcicx8q</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <LiningDepth>0.05</LiningDepth>
  <LiningThickness>0.05</LiningThickness>
</IfcWindowLiningProperties>
<IfcWindowPanelProperties id="ID102">
  <GlobalId>19sUYzCDP0lxD1q0utVF91</GlobalId>
  <OwnerHistory>
```

```

        <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <OperationType>notdefined</OperationType>
    <PanelPosition>middle</PanelPosition>
    <FrameDepth>0.05</FrameDepth>
    <FrameThickness>0.07</FrameThickness>
</IfcWindowPanelProperties>
<IfcWindowStyle id="ID103">
    <GlobalId>3o$XIFpmD5swrz0hGSrTy8</GlobalId>
    <OwnerHistory>
        <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>Fixed glazing</Name>
    <HasPropertySets ex:cType="set">
        <IfcWindowLiningProperties pos="0" xsi:nil="true" ref="ID101"/>
        <IfcWindowPanelProperties pos="1" xsi:nil="true" ref="ID102"/>
    </HasPropertySets>
    <ConstructionType>notdefined</ConstructionType>
    <OperationType>single_panel</OperationType>
    <ParameterTakesPrecedence>false</ParameterTakesPrecedence>
    <Sizeable>false</Sizeable>
</IfcWindowStyle>
<IfcRelDefinesByType id="ID104">
    <GlobalId>348C6GbJb7Thki5llQxQ$z</GlobalId>
    <OwnerHistory>
        <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>Fixed glazing</Name>
    <RelatedObjects ex:cType="set">
        <IfcWindow pos="0" xsi:nil="true" ref="ID100"/>
    </RelatedObjects>
    <RelatingType>
        <IfcWindowStyle xsi:nil="true" ref="ID103"/>
    </RelatingType>
</IfcRelDefinesByType>
<IfcMaterial id="ID109">
    <Name>Wood</Name>
</IfcMaterial>
<IfcRelAssociatesMaterial id="ID110">
    <GlobalId>0iKTtg9xP6buf6Pf7_2fSN</GlobalId>
    <OwnerHistory>
        <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <RelatedObjects ex:cType="set">
        <IfcWindowPanelProperties pos="0" xsi:nil="true" ref="ID100"/>
    </RelatedObjects>
    <RelatingMaterial>
        <IfcMaterial xsi:nil="true" ref="ID109"/>
    </RelatingMaterial>
</IfcRelAssociatesMaterial>
<IfcPropertySet id="ID111">
    <GlobalId>1KWmeMlorCeABBAQ0CbtFj</GlobalId>
    <OwnerHistory>
        <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>Pset_WindowCommon</Name>
    <HasProperties ex:cType="set">
        <IfcPropertySingleValue pos="0" xsi:nil="true" ref="ID113"/>
        <IfcPropertySingleValue pos="1" xsi:nil="true" ref="ID114"/>
        <IfcPropertySingleValue pos="2" xsi:nil="true" ref="ID115"/>
    </HasProperties>
</IfcPropertySet>
<IfcRelDefinesByProperties id="ID112">
    <GlobalId>1inGsaLULC78ImgdLZI9Kc</GlobalId>
    <OwnerHistory>
        <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <RelatedObjects ex:cType="set">
        <IfcWindow pos="0" xsi:nil="true" ref="ID100"/>
    </RelatedObjects>
    <RelatingPropertyDefinition>

```

```

        <IfcPropertySet xsi:nil="true" ref="ID111"/>
    </RelatingPropertyDefinition>
</IfcRelDefinesByProperties>
<IfcPropertySingleValue id="ID113">
    <Name>FireRating</Name>
    <NominalValue>
        <IfcLabel>F30</IfcLabel>
    </NominalValue>
</IfcPropertySingleValue>
<IfcPropertySingleValue id="ID114">
    <Name>GlazingAreaFraction</Name>
    <NominalValue>
        <IfcPositiveRatioMeasure>0.8</IfcPositiveRatioMeasure>
    </NominalValue>
</IfcPropertySingleValue>
<IfcPropertySingleValue id="ID115">
    <Name>IsExterior</Name>
    <NominalValue>
        <IfcBoolean>true</IfcBoolean>
    </NominalValue>
</IfcPropertySingleValue>
<IfcOwnerHistory id="ID2">
    <OwningUser>
        <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
    </OwningUser>
    <OwningApplication>
        <IfcApplication xsi:nil="true" ref="ID6"/>
    </OwningApplication>
    <ChangeAction>added</ChangeAction>
    <LastModifiedDate>0</LastModifiedDate>
    <CreationDate>1207828354</CreationDate>
</IfcOwnerHistory>
<IfcPerson id="ID3">
    <Id>Matthias Weise</Id>
    <FamilyName></FamilyName>
    <GivenName></GivenName>
</IfcPerson>
<IfcOrganization id="ID4">
    <Id></Id>
    <Name></Name>
    <Description></Description>
</IfcOrganization>
<IfcPersonAndOrganization id="ID5">
    <ThePerson>
        <IfcPerson xsi:nil="true" ref="ID3"/>
    </ThePerson>
    <TheOrganization>
        <IfcOrganization xsi:nil="true" ref="ID4"/>
    </TheOrganization>
</IfcPersonAndOrganization>
<IfcApplication id="ID6">
    <ApplicationDeveloper>
        <IfcOrganization xsi:nil="true" ref="ID4"/>
    </ApplicationDeveloper>
    <Version>IFC-Application X</Version>
    <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
    <ApplicationIdentifier>Company Y</ApplicationIdentifier>
</IfcApplication>

```

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IFC Release Specific Concept Description (IFC2x3)

Window

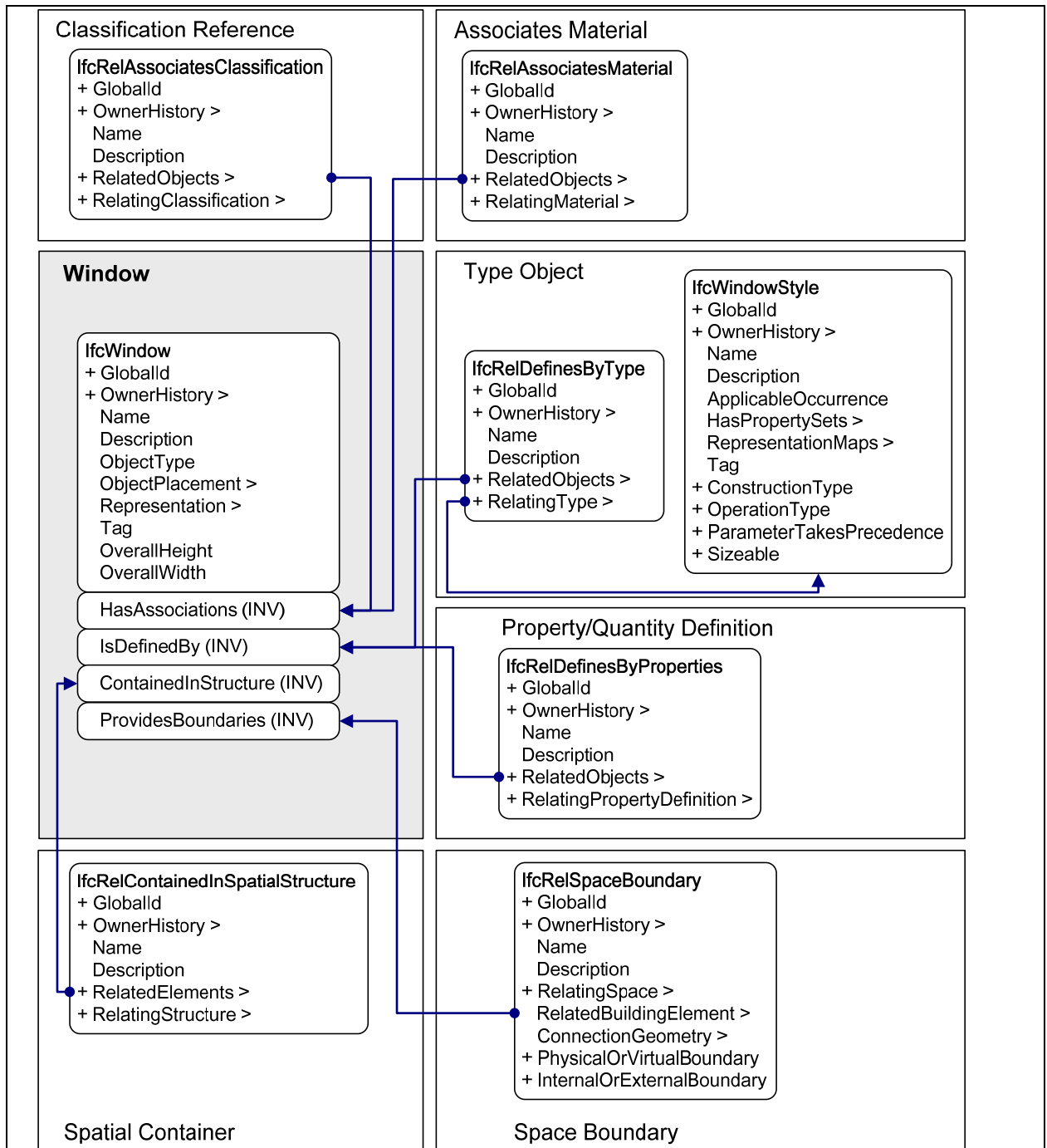
Reference		Version	1.0	Status	Proposal
Relationships					
History	9 th June, 2008				
Authors	Matthias Weise (mw@aec3.de)				
Document Owner	AEC3 (with friendly support by the German research initiative “ZukunftBau”)				

Usage in view definition diagram



Please note that there might be further agreements for the “*Window*” concept that are not shown here. In particular, there might be separate concept definitions for specific properties, quantities and classifications. There are also additional (inverse) relationships that are not shown here but might be used to add further information or to define specific relationships to other elements.

Instantiation diagram



Implementation agreements

IfcWindow

Attribute	Implementation agreements
GlobalId	Must be provided
OwnerHistory	Must be provided
Name	Reserved
Description	Reserved
ObjectType	Reserved
ObjectPlacement	No agreements needed
Representation	No agreements needed
Tag	Reserved
OverallHeight	No agreements

OverallWidth	No agreements
HasAssociations (INV)	Optional, may contain instances of IfcRelAssociatesClassification that further classify the window according to a classification system and/or IfcRelAssociatesMaterial that provides information about the material
IsDefinedBy (INV)	Optional, may contain instances of IfcRelDefinesByProperties that further define the window with additional properties/quantities, and/or IfcRelDefinesByType that refers to the window style (type object)
ContainedInStructure (INV)	Optional, may define the spatial structure (most likely the space or building storey) in which the window is contained (see also ProvidesBoundaries) Please note that containment might also be defined via the wall to which the window belongs.
ProvidesBoundaries (INV)	Optional, may define the space that is bounded by the window

..

Example (spf)

```
#100= IFCWINDOW('1bu0salk59WxAUsVt$0hEp',#2,'F202',$,$,$,$,2.5,0.75);
#101= IFCWINDOWLININGPROPERTIES('1uHCCCUgP6906NuIcicx8q',#2,$,$,0.05,0.05,$,$,$,$,$,$);
#102= IFCWINDOWPANELPROPERTIES('19sUYzCDP0lxD1q0utVF91',#2,$,$,.NOTDEFINED.,.MIDDLE.,0.05,0.07,$);
#103= IFCWINDOWSTYLE('3o$XIFpmD5swrz0hGSrTy8',#2,'Fixed glazing',$,$,($101,$102),$,$,.NOTDEFINED.,.SINGLE_PANEL.,.F.,.F.);
#104= IFCRELDEFINESBYTYPE('348C6GbJb7Thki5llQxQ$z',#2,'Fixed glazing',$,($100),$103);
#109= IFCMATERIAL('Wood');
#110= IFCRELASSOCIATESMATERIAL('0iKtTg9xP6buf6Pf7_2fSN',#2,$,$,($100),$109);
#111= IFCPROPERTYSET('1KwmeMlorCeABBAQ0CbtFj',#2,'Pset_WindowCommon',$,($113,$114,$115));
#112= IFCRELDEFINESBYPROPERTIES('1inGsaLULC78ImgdLZI9Kc',#2,$,$,($100),$111);
#113= IFCPROPERTYSINGLEVALUE('FireRating',$,IFCLABEL('F30'),$);
#114= IFCPROPERTYSINGLEVALUE('GlazingAreaFraction',$,IFCPOSITIVERATIOMEASURE(0.8),$);
#115= IFCPROPERTYSINGLEVALUE('IsExterior',$,IFCBOOLEAN(.T.),$);
#2= IFCOWNERHISTORY(#5, #6, $, .ADDED., 0, $, $, 1207828354);
#3= IFCPERSON('Matthias Weise', '', '', $, $, $, $, $);
#4= IFCORGANIZATION('', '', '', $, $);
#5= IFCPERSONANDORGANIZATION(#3, #4, $);
#6= IFCAPPLICATION(#4, 'IFC-Application X', 'IFC-Exporter V2.3', 'Company Y');
```

Example (ifcXML)

```
<IfcWindow id="ID100">
  <GlobalId>1bu0salk59WxAUsVt$0hEp</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <Name>F202</Name>
  <OverallHeight>2.5</OverallHeight>
  <OverallWidth>0.75</OverallWidth>
</IfcWindow>
<IfcWindowLiningProperties id="ID101">
  <GlobalId>1uHCCCUgP6906NuIcicx8q</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <LiningDepth>0.05</LiningDepth>
  <LiningThickness>0.05</LiningThickness>
</IfcWindowLiningProperties>
<IfcWindowPanelProperties id="ID102">
  <GlobalId>19sUYzCDP0lxD1q0utVF91</GlobalId>
  <OwnerHistory>
    <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
  </OwnerHistory>
  <OperationType>notdefined</OperationType>
```

```

    <PanelPosition>middle</PanelPosition>
    <FrameDepth>0.05</FrameDepth>
    <FrameThickness>0.07</FrameThickness>
  </IfcWindowPanelProperties>
  <IfcWindowStyle id="ID103">
    <GlobalId>3o$XIFpmD5swrz0hGSrTy8</GlobalId>
    <OwnerHistory>
      <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>Fixed glazing</Name>
    <HasPropertySets ex:cType="set">
      <IfcWindowLiningProperties pos="0" xsi:nil="true" ref="ID101"/>
      <IfcWindowPanelProperties pos="1" xsi:nil="true" ref="ID102"/>
    </HasPropertySets>
    <ConstructionType>notdefined</ConstructionType>
    <OperationType>single_panel</OperationType>
    <ParameterTakesPrecedence>false</ParameterTakesPrecedence>
    <Sizeable>false</Sizeable>
  </IfcWindowStyle>
  <IfcRelDefinesByType id="ID104">
    <GlobalId>348C6GbJb7Thki5llQxQ$z</GlobalId>
    <OwnerHistory>
      <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>Fixed glazing</Name>
    <RelatedObjects ex:cType="set">
      <IfcWindow pos="0" xsi:nil="true" ref="ID100"/>
    </RelatedObjects>
    <RelatingType>
      <IfcWindowStyle xsi:nil="true" ref="ID103"/>
    </RelatingType>
  </IfcRelDefinesByType>
  <IfcMaterial id="ID109">
    <Name>Wood</Name>
  </IfcMaterial>
  <IfcRelAssociatesMaterial id="ID110">
    <GlobalId>0iKTtg9xP6buf6Pf7_2fSN</GlobalId>
    <OwnerHistory>
      <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <RelatedObjects ex:cType="set">
      <IfcWindowPanelProperties pos="0" xsi:nil="true" ref="ID100"/>
    </RelatedObjects>
    <RelatingMaterial>
      <IfcMaterial xsi:nil="true" ref="ID109"/>
    </RelatingMaterial>
  </IfcRelAssociatesMaterial>
  <IfcPropertySet id="ID111">
    <GlobalId>1KWmeMlorCeABBAQ0CbtFj</GlobalId>
    <OwnerHistory>
      <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <Name>Pset_WindowCommon</Name>
    <HasProperties ex:cType="set">
      <IfcPropertySingleValue pos="0" xsi:nil="true" ref="ID113"/>
      <IfcPropertySingleValue pos="1" xsi:nil="true" ref="ID114"/>
      <IfcPropertySingleValue pos="2" xsi:nil="true" ref="ID115"/>
    </HasProperties>
  </IfcPropertySet>
  <IfcRelDefinesByProperties id="ID112">
    <GlobalId>1inGsaLULC78ImgdLZI9Kc</GlobalId>
    <OwnerHistory>
      <IfcOwnerHistory xsi:nil="true" ref="ID2"/>
    </OwnerHistory>
    <RelatedObjects ex:cType="set">
      <IfcWindow pos="0" xsi:nil="true" ref="ID100"/>
    </RelatedObjects>
    <RelatingPropertyDefinition>
      <IfcPropertySet xsi:nil="true" ref="ID111"/>
    </RelatingPropertyDefinition>
  </IfcRelDefinesByProperties>

```

```

<IfcPropertySingleValue id="ID113">
  <Name>FireRating</Name>
  <NominalValue>
    <IfcLabel>F30</IfcLabel>
  </NominalValue>
</IfcPropertySingleValue>
<IfcPropertySingleValue id="ID114">
  <Name>GlazingAreaFraction</Name>
  <NominalValue>
    <IfcPositiveRatioMeasure>0.8</IfcPositiveRatioMeasure>
  </NominalValue>
</IfcPropertySingleValue>
<IfcPropertySingleValue id="ID115">
  <Name>IsExterior</Name>
  <NominalValue>
    <IfcBoolean>true</IfcBoolean>
  </NominalValue>
</IfcPropertySingleValue>
<IfcOwnerHistory id="ID2">
  <OwningUser>
    <IfcPersonAndOrganization xsi:nil="true" ref="ID5"/>
  </OwningUser>
  <OwningApplication>
    <IfcApplication xsi:nil="true" ref="ID6"/>
  </OwningApplication>
  <ChangeAction>added</ChangeAction>
  <LastModifiedDate>0</LastModifiedDate>
  <CreationDate>1207828354</CreationDate>
</IfcOwnerHistory>
<IfcPerson id="ID3">
  <Id>Matthias Weise</Id>
  <FamilyName></FamilyName>
  <GivenName></GivenName>
</IfcPerson>
<IfcOrganization id="ID4">
  <Id></Id>
  <Name></Name>
  <Description></Description>
</IfcOrganization>
<IfcPersonAndOrganization id="ID5">
  <ThePerson>
    <IfcPerson xsi:nil="true" ref="ID3"/>
  </ThePerson>
  <TheOrganization>
    <IfcOrganization xsi:nil="true" ref="ID4"/>
  </TheOrganization>
</IfcPersonAndOrganization>
<IfcApplication id="ID6">
  <ApplicationDeveloper>
    <IfcOrganization xsi:nil="true" ref="ID4"/>
  </ApplicationDeveloper>
  <Version>IFC-Application X</Version>
  <ApplicationFullName>IFC-Exporter V2.3</ApplicationFullName>
  <ApplicationIdentifier>Company Y</ApplicationIdentifier>
</IfcApplication>

```

This document uses the official IFC Model View Definition Format version 1.1.0. of the IAI (www.iai-international.org)
The content of this document has to be certified by the IAI before becoming part of an official IFC Model View Definition.