

IFC Release Specific Concept Description (IFC 2x3)

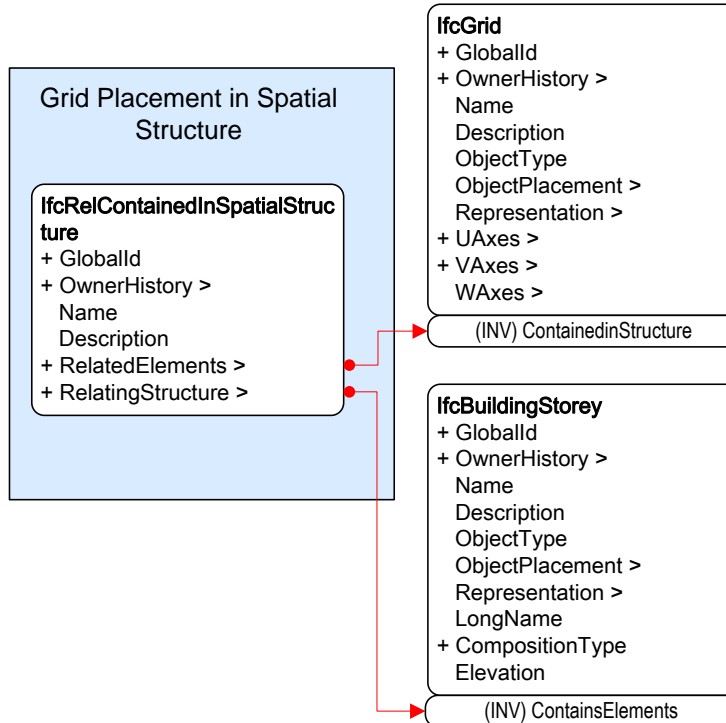
Grid Placement in Spatial Structure

Reference	PCI-049	Version	1.1	Status	Draft
Relationships	PCI-048, PCI-050				
History	Revised Nov 13, 2012				
Authors	Manu Venugopal				
Document Owner	GA Tech and Technion Precast NBIMS Team				

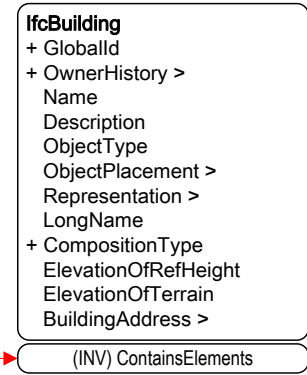
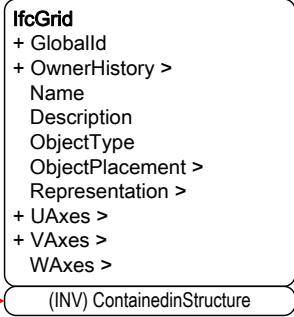
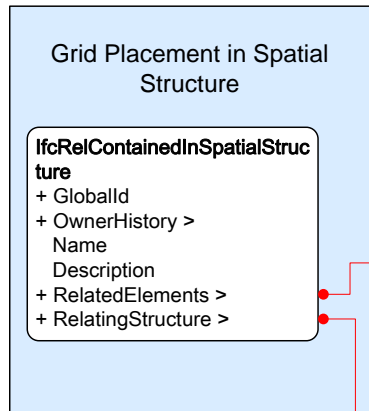
Usage in view definition diagram



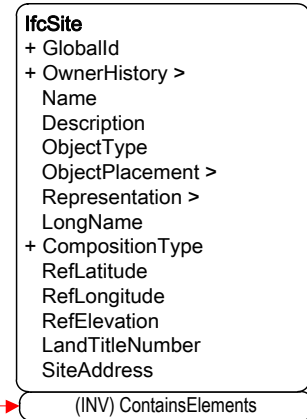
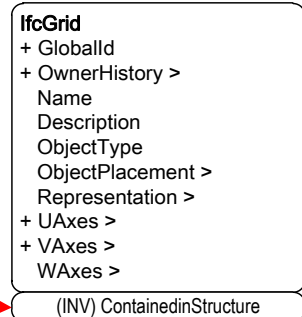
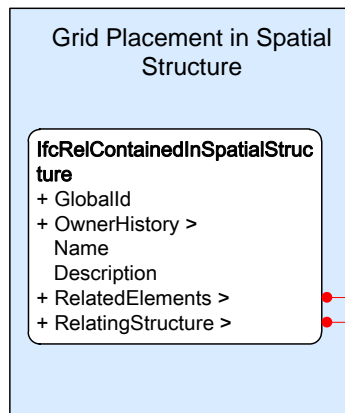
Instantiation diagram Grid associated with Building Storey



Grid associated with Building



Grid associated with Site



Implementation agreements

[IfcRelContainedInSpatialStructure](#)

IfcRelContainedInSpatialStructure is used to assign grid to a spatial structure element (either to a building storey or directly to a building to which the grid is primarily associated).

Attribute	Implementation agreements
GlobalId	Must be provided
OwnerHistory	Must be provided, but may contain dummy data
Name	<Open>
Description	<Open>
RelatedElements	Must be an IfcGrid Entity
RelatingStructure	Must be a subtype of IfcSpatialStructureElement (IfcBuilding and IfcBuildingStorey are the valid options)

[IfcGrid](#):

The design grid can be used in plan, section or in any position relative to the world. (Refer: ObjectPlacement w.r.t [GridAxis](#)) e.g. on floor level in building storey or on façade at building level.

Attribute	Implementation agreements
GlobalId	Must be provided
OwnerHistory	Must be provided, but may contain dummy data
Name	Space.Name should be assigned.
Description	<Open>
ObjectType	Optional
ObjectPlacement	Optional
Representation	Is a subtype of IfcProductRepresentation
UAxes	LIST [1:?] OF UNIQUE IfcGridAxis . (List of grid axes defining the first row of grid lines)
VAxes	LIST [1:?] OF UNIQUE IfcGridAxis . (List of grid axes defining the second row of grid lines.)
Waxes	OPTIONAL LIST [1:?] OF UNIQUE IfcGridAxis . (List of grid axes defining the third row of grid lines. It may be given in the case of a triangular grid.)

[IfcBuildingStorey](#)

Attribute	Implementation agreements
GlobalId	Must be provided
OwnerHistory	Must be provided, but may contain dummy data

Name	Optional
Description	<Open>
ObjectType	Optional
ObjectPlacement	Optional
Representation	Is a subtype of IfcProductRepresentation
LongName	Optional. IfcLabel
CompositionType	Subtype of IfcElementCompositionEnum
Elevation	Optional. Elevation of the base of this storey, relative to the 0,00 internal reference height of the building. The 0.00 level is given by the absolute above sea level height by the ElevationOfRefHeight attribute given at IfcBuilding.

[IfcBuilding](#)

Attribute	Implementation agreements
GlobalId	Must be provided
OwnerHistory	Must be provided, but may contain dummy data
Name	Optional
Description	<Open>
ObjectType	Optional
ObjectPlacement	Optional
Representation	Is a subtype of IfcProductRepresentation
LongName	Optional. IfcLabel
CompositionType	Subtype of IfcElementCompositionEnum
ElevationOfRefHeight	Elevation above sea level of the reference height used for all storey elevation measures, equals to height 0.0. It is usually the ground floor level. Must be IfcLengthMeasure
ElevationOfTerrain	Elevation above the minimal terrain level around the foot print of the building, given in elevation above sea level. Must be IfcLengthMeasure
BuildingAddress	Address given to the building for postal purposes. Must be IfcPostalAddress

Example: Part21 file

```
#15=IFCBUILDING('3CXhJzWsj71PpgLNk2bFjs',#114,'StWGridPlacement_', 'StWGridPlacement_', $, #16, $, $, .ELEMENT, 0, 0, $);
```

```

#16=IFCLOCALPLACEMENT(#9,#6);
#18=IFCRELAGGREGATES('1$113Cr7H34ekJnEVzD2qx',#114,'BuildingContainedinSite',$,#13,(#15));
#19=IFCGRID('377y2whmj83waAdwq0y8Ug',#114,'Grid-1-
FF0','Default','STWPC_ENTITY_GENERIC_GRID',#22,$,(#28,#32,#36),(#38,#40,#42,#44),$);
#20=IFCCARTESIANPOINT((0,-0.0254,0.));
#21=IFCAXIS2PLACEMENT3D(#20,#4,#5);
#22=IFCLOCALPLACEMENT(#16,#21);
#24=IFCRELCONTAINEDINSPATIALSTRUCTURE('0Cd6loZNDDdQ4KDSRT_ZPL',#114,$,$,(#19,#45,#57,#69)
,#15);
#25=IFCCARTESIANPOINT((0.,0.));
#26=IFCCARTESIANPOINT((9.144,0.));
#27=IFCPOLYLINE((#25,#26));
#28=IFCGRIDAXIS('A-1',#27,.T.);
#29=IFCCARTESIANPOINT((0.,9.144));
#30=IFCCARTESIANPOINT((9.144,9.144));
#31=IFCPOLYLINE((#29,#30));
#32=IFCGRIDAXIS('A-2',#31,.T.);
#33=IFCCARTESIANPOINT((0.,18.288));
#34=IFCCARTESIANPOINT((9.144,18.288));
#35=IFCPOLYLINE((#33,#34));
#36=IFCGRIDAXIS('A-3',#35,.T.);
#37=IFCPOLYLINE((#25,#29));
#38=IFCGRIDAXIS('A-1',#37,.T.);
#39=IFCPOLYLINE((#29,#33));
#40=IFCGRIDAXIS('A-2',#39,.T.);
#41=IFCPOLYLINE((#26,#30));
#42=IFCGRIDAXIS('B-1',#41,.T.);
#43=IFCPOLYLINE((#30,#34));
#44=IFCGRIDAXIS('B-2',#43,.T.);

```

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