Version	Date	Scope	By
0.0	2/9/2017	Adopted Norwegian **Exchange Requirements (ER) for Georeferencing and Creation of Site Local Geometric Representation**, 20091106_ER_Georeferencing.xls	JMi
0.1	2/9/2017	Issued internal draft	JMi
0.2	2/10/2017	Corrected several typos.	JPl, DMa
0.3	6/7/2017	Added definitions to the ifcMapConversion attributes	NBr & DBe
0.4	6/16/2017	Corrected text in column **IFC Model Representation**, rows 48-51; copied definitions to **Definitions and Notes**, rows 89-92; copied defintions to **Definitions and Notes**, rows 57-62; amended text for row 76 **Land Title Number**	YYo & JMi
2.0	Jan-20	Edited and uplifted for bSI publication	JMi & JP

Exchange Requirements (ER) for Model Setup IDM			Mapping to IFC Definitions			

Note: This document is a revised version of the *Norwegian Exchange Requirements (ER) for Georeferencing and Creation of Site Local Geometric Representation*, which provides the foundation of the **Model Setup ER**

Object Type
Attribute Groups

Property	Definitions and notes	Examples and further explanations	Comments	Export	Import	MySuppo	IFC Model Representation	Comments	MVD generic	MVD binding	comments General
											[G] expand to see IFC representation [M] expand to see comments

Exchange Purpose: The purpose of this exchange is to provide correct georeferencing of a site in a project. The data exchanged will map the site's local origin (Multiple IfcSites allowed in on project/IFC file? => IMpl agreements = >TH/TL) correctly to the earths surface and give the deviation of the site's local Y axis from True North. (See IFC 2x4 specification for IfcSite.) The file may optionally contain map or terrain representation of the site. This representation must be in the site's local coordinate system, not in a map coordinate system. (See IFC 2x4 specification for IfcSite.). — There is no limitations by a specific MVD. The ER's mandatory and optional data must be read and interpreted correctly by the receiving applications. Other data can (should?/must?) be ignored by the receiving application but must not cause the application to fail. The minimum IFC version is 2x3. Where 2x3 has shortcomings to 2x4, the workaround for 2x3 is documented.

Process outline: Advanced map and terrain handling is outside the scope of the current IFC Model. In projects these data are provided on other formats defined by the GIS community. Deciding the site's local origin can be done in a GIS system with IFC export capabilities or in a BIM system with GIS capabilities. This application must have a user interface (UI) that allows the user to pick the site's local origin on the map and give the direction of the site's local Y axis relative to True North. Elevation for the site origin must be obtained. How the UI obtains these data is entirely up to the designers of the application as long as the data obtained are inside the scope of the current IFC Model. In projects these data are provided on other formats defined by the GIS community. Deciding the site's local origin can be done in a GIS system with IFC export capabilities or in a BIM system with GIS capabilities. This application wants to export the georeferencing data to a BIM application these Exchange Requirements must be met. Any geometric representation of the site must be transformed to local site coordinate system. See process map: **Model Setup IDM v0.2a_14Sep2016.pdf**

NOTE: Deciding the origin of the site does not lock the position of the building(s). The local origin and orientation of the building can be set later relative to the site coordinate system. Placing the building relative to the site coordinate system does not require a GIS once the site has been properly georeferenced. NOTE2: Applications certified for IFC 2x3 coordination view should by definition be able to read an IFC which follows these ERs? How about the lack of a building?

NOTE: Any BIM application that imports an IFC with georeferencing must store all site related information in this ER. When the site is re-exported the original georeferencing data must be kept without any loss of precision etc.

NOTE: If a BIM application has created a project and a dummy site, then it must be able to update the site information from the imported IFC file with georeferencing data and site geometry.

Property	Definitions and notes	Examples and further explanations	Comments	Export	Import	IFC Model Representation	Comments	MVD generic	MVD binding	comments General
Meta data										
Exchange file						HEADER section				
Exchange purpose	Designation of the exchange file to be "**Model Setup**"	No view limitation. Mark the file to comply to ER for Model Setup -- system to assign the standard view definition name		M		file_description(('ViewDefinition [CoordinationView, Model Setup/**MVD**]'), '2;1');	to be done automatically by the application			
Author	Name of the creator of the Georeferencing data	user setting - application need to provide UI		M		file_name with field author	The UI of sending application shall enable the user to fill in the data			
Company	Company name of the Author	user setting - application need to provide UI		M		file_name with field organization	The UI of sending application shall enable the user to fill in the data			
Originating application	Name of the software application that created the data set	system setting the software vendor, shall be specific, i.e. including version information		M		file_name with field originating_system	The version and/or build number should be as specific as possible.			
Date of creation	Time stamp of the creation time	2008-04-12T15:27:46		M		file_name with field time_stamp	to be done automatically by the application			
Project		there has to be exactly one project object in the exchange file				**IfcProject**		GSC-239		
Project Attributes								VBL-296		
Software unique id	Object identifier (formatted as GUID or UUID) to uniquely identify the software object	70ce2f2b-a5f8-4ab7-bc7f-6a838a353f25, has to be maintained by the application (e.g. for re-export)		M		IfcProject.GlobalId	70ce2f2b-a5f8-4ab7-bc7f-6a838a353f25 is exchanged using compression 1mqYvhfVXAixnSOeEADJvb		VBL-170	
Number (or ID)	Client? assigned (short) name or number	delivery contracts may demand a certain naming convention	NOTE: Is this the Project unique ID for exchanges or the project GUID? Or use "seed" empty project distributed to all participants?	M		IfcProject.Name			GSC-241	
Name	User assigned name (full name)	for informational purposes only		M		IfcProject.LongName			GSC-242	
Description	OPTIONAL User assigned optional description	not required for export	[General]: Optional, not checked	O		IfcProject.Description				Optional, not checked
Phase	OPTIONAL Design stage	conceptual design, detailed design, ..., for informational purposes only		O		IfcProject.Phase				
Project units								VBL-359		
Length unit	Default length unit for all length measures in the data set	[m], [mm], [inch], [feet]		M		IfcProject.UnitsInContext (IfcUnitAssignment) with IfcSIUnit.Name = METRE			GSC-246	
Area unit	Default area unit for all length measures in the data set	[m²], [square feet]		M		IfcProject.UnitsInContext (IfcUnitAssignment) with IfcSIUnit.Name = SQUARE_METRE			GSC-245	
Volume unit	Default volume unit for all length measures in the data set	[m³], [cubic feet]		M		IfcProject.UnitsInContext (IfcUnitAssignment) with IfcSIUnit.Name = CUBIC_METRE			GSC-247	
Project decomposition								GSC-240		
Site contained in Project	Link to the top-level node of the spatial structure, being a site		Must be present.	M		IfcRelAggregates			GSC-041	
Building contained in Project	Link to the top-level node of the spatial structure, being a building		Allowed	O		IfcRelAggregates	NOTE in the ArchitecturalHandOver it is restricted to one site object in the IFC file only		GSC-083	has to be given, if there is no site
Site		There must be exactly one site in the project				**IfcSite**			GSC-031	
Site Attributes									(GSC-033)	
Software unique id	Object identifier (formatted as GUID or UUID) to uniquely identify the software object	70ce2f2b-a5f8-4ab7-bc7f-6a838a353f25, has to be maintained by the application (e.g. for re-export?		M					VBL-170	
Number (or ID)	User assigned unique number or key of the site (short name).		NOTE: Is this the Site unique ID for exchanges or the Site GUID?	M		IfcSite. Name		VBL-025	GSC-034	different to the software key (GUID)
Name	User assigned name (long name)			M		IfcSite.LongName		BSA-S07	BSA-S08	
Description	User assigned optional description	not required for export		O		IfcSite.Description		GSA-008	GSC-035	
Site Georeferencing Attributes									(GSC-033)	
Longitude	Geo location	geographic longitude in geodetic system WGS84, e.g. Chicago Harbor Light -87.35.40 ("-" = W)	Resolution is millionth-second. Redundant in 2x4, but must be given.	M		IfcSite.Longitude	See 2x4 IfcSite documentation		VBL-312	
Latitude	Geo location	geographic latitude in geodetic system WGS84, e.g. Chicago Harbor Light 41.53.30 ("+" = N)	Resolution is millionth-second. Redundant in 2x4, but must be given.	M		IfcSite.Latitude	See 2x4 IfcSite documentation		VBL-313	
Elevation	Site height datum	elevation above the height datum	IFC 2x3: Given according to the height datum used at this location (implicit). IFC 2x4: Defined in IfcCoordinateReferenceSystem.VerticalDatum. Redundant in 2x4, but must still be given.	M		IfcSite.RefElevation	See 2x4 IfcSite and IfcCoordinateReferenceSystem documentation.		VBL-314	
True North	True North	Orientation of site coordinate system relative to True North	2x3: it is given by a 2 dimensional direction within the xy-plane of the project coordinate system. If not resent, it defaults to [0.,1.] - i.e. the positive Y axis of the project coordinate system equals the geographic northing direction. Redundant in 2x4 (XAxisAbscissa/Ordinate), but must	M		IfcProject.RepresentationContexts.IfcGeometricRepresentationContext.TrueNorth	See 2x4 IfcSite and IfcGeometricRepresentationContext			
Geodetic Coordinate Reference System	Identification of datum used		Information needed for transformation from local site coordinates to map coordinates. (NOTE: Not map to geodetic coordinate reference system). Referenced by a Helmert transformation (see report **Model Setup IDM**, Version 0.8, 16 Jan 2017, Section 2.4 The Objective Resolved, pp17-18) - we also need to find the precise Helmert transformation details from OGC or ?? Non-standard PSET in 2x3 - see below?	M						
Name	Name of coordinate reference system	EUREF89-UTM-32, 32632 (EPSG), ...		M		IfcCoordinateReferenceSystem.Name				
Description	Description			M		IfcCoordinateReferenceSystem.Description	Not present in 2x3			
Geodetic Datum	Name by which this datum is identified.	EUREF89, ED50, WSG84, ...		M		IfcCoordinateReferenceSystem.GeodeticDatum	Not present in 2x3			
Vertical Datum	Name by which the vertical datum is identified	NGVD 29, NAVD 88 (North America), NN1954 (Norway), AHD (Australia)...		M		IfcCoordinateReferenceSystem.VerticalDatum	Not present in 2x3			
Map Projection	Identification of Map Projection Used		see Note above for Geodetic Coordinate Reference System							
MapProjection	Name of map projection	UTM, NTM, ...		M		IfcProjectedCRS.MapProjection	Not present in 2x3			
MapZone	Name of zone within map projection	UTM Zone 32 would be: "32"		M		IfcProjectedCRS.MapZone	Not present in 2x3			
MapUnit	Length unit for map coordinates	[m], [mm], [inch], [feet]		M		IfcProjectedCRS.MapUnit	Not present in 2x3			
Site to Map Conversion	Site to map conversion parameters		see Note above for Geodetic Coordinate Reference System							
Eastings	The shift in X between the two coordinate systems			M		IfcMapConversion.Eastings	Not present in 2x3			
Northings	The shift in Y between the two coordinate systems			M		IfcMapConversion.Northings	Not present in 2x3			
OrthogonalHeight	The shift in Z between the two coordinate systems			M		IfcMapConversion. OrthogonalHeight	Not present in 2x3			
XAxisAbscissa	The X component of the rotation between the two coordinate systems			M		IfcMapConversion.XAxisAbscissa	Not present in 2x3			
XAxisOrdinate	The Y component of the rotation between the two coordinate systems			M		IfcMapConversion.XAxisOrdinate	Not present in 2x3			
Scale	The scale in X, Y between the two coordinate systems			M		IfcMapConversion.Scale	Not present in 2x3			
Coordinate Operation	Relationship between local site coordinate system and map coordinate system (Conversions and Transformations)		see Note above for Geodetic Coordinate Reference System							
SourceCRS	Coordinate system of site			M		IfcCoordinateOperation.SourceCRS='IfcGeometricRepresentationContext'	Not present in 2x3			
TargetCRS	Coordinate system of map projection			M		IfcCoordinateOperation.TargetCRS is a IfcProjectedCRS	Not present in 2x3			
Site Geometry Representation		OPTIONAL					See 2x4 IfcSite documentation		GSC-032	
Foot Print Representation	Geometric Representation	Lines and curves.	Can the **footprint** be a representation of the cadstral boundary?	O		IfcSite.IfcProductDefinitionShape.IfcShapeRepresentation.RepresentationIdentifier = 'FootPrint' IfcSite.IfcProductDefinitionShape.IfcShapeRepresentation.RepresentationType = 'GeometricCurveSet', or 'Annotation2D'	See 2x4 IfcSite documentation			
Survey Point Representation	Geometric Representation	Survey points and breaklines.		O		IfcSite.IfcProductDefinitionShape.IfcShapeRepresentation.RepresentationIdentifier ='SurveyPoints' IfcSite.IfcProductDefinitionShape.IfcShapeRepresentation.RepresentationType = 'GeometricSet'	See 2x4 IfcSite documentation.			
Body Representation	Geometric Representation	Surface or volume representation	Does the extent of the body/surface have to match the cadastral boundary?	M/O		IfcSite.IfcProductDefinitionShape.IfcShapeRepresentation.RepresentationIdentifier = 'FootPrint' IfcSite.IfcProductDefinitionShape.IfcShapeRepresentation.RepresentationType = 'GeometricCurveSet', or 'Annotation2D'	See 2x4 IfcSite documentation			
Site Address		REQUIRED		M					GSC-032	
Address	Address lines	depending on local usage, street number, street name, etc.		M/O		IfcSite.SiteAddress.AddressLines			(incl.)	to be used as default (i.e. if there
City	Town or city name			M/O		IfcSite.SiteAddress.Town			(incl.)	
State	State, Region, or "Länder"	optional in many countries		M/O		IfcSite.SiteAddress.Region			(incl.)	
Zip	Postal code			M/O		IfcSite.SiteAddress.PostalCode			(incl.)	
Land Title Number									GSC-032	
Land Title Number	The land title number (designation of the site within a regional system)			O		IfcSite.LandTitleNumber			(incl.)	to be used as default (i.e. if there
Site Classification						IfcClassificationReference (through relationship IfcRelAssociatesClassification)			GSC-036	
Classification	Site Classification		National Standards - what Classification systems are used for concepts around IfcSite.	O		IfcClassificationReference (through relationship IfcRelAssociatesClassification)			GSC-036	
Classification Item Key	Key of classification item within the classification system			O		IfcClassificationReference.ItemReference			(incl.)	
Classification Item Name	Clear name of the classification item			O		IfcClassificationReference.Name			(incl.)	
Classification System Name	Name of the classification system			O		IfcClassification.Name (through IfcClassificationReference.ReferencedSource)			(incl.)	
Classification System ID	Identifier of the classification system			O		IfcClassification.Source (through IfcClassificationReference.ReferencedSource)	In IFC2x3 there is an implementer agreement to store the unique id (encoding name, edition, version, etc.) in Source field			
Site Base Quantities						IfcElementQuantity (through relationship IfcRelDefinedByProperties)			(BSA-438)	
Site Perimeter	Total perimeter of the side			O		IfcQuantityLength.Name="GrossPerimeter"			BSA-248	
Site Gross Land Area	Total area of the building site, as projected to the horizontal plane.			O		IfcQuantityArea.Name="GrossArea"			BSA-250	
Site Properties						IfcPropertySet (through relationship IfcRelDefinedByProperties)			GSC-038	
Site Common Properties	Properties that are specified in the standard property definitions (or a relevant subset as) as defined in IFC site common properties			-		IfcPropertySet with Name = 'Pset_SiteCommon'			GSC-039	
Site Coordinate Reference System Propertie	Properties that specify CRS details for GIS location	These two property sets mirror the information provided in IfcMapConversion and IfcCoordinateReferenceSystem in IFC4	Information needed for transformation from local site coordinates to map coordinates. (NOTE: Not map to geodetic coordinate reference system). Information not present in 2x3. A custom PSET in 2x3?	M		IfcPropertySet with Name = "CRS"			GSC-039	
Name	Name of coordinate reference system	MGA56		M		IfcPropertySingleValue.Name="Name"				
Description	Description	Map Grid of Australia Zone 56		M		IfcPropertySingleValue.Name="Description"				
GeodeticDatum	Name by which this datum is identified.	GDA94		M		IfcPropertySingleValue.Name="GeodeticDatum"				
VerticalDatum	Name by which the vertical datum is identified	AHD		M		IfcPropertySingleValue.Name="VerticalDatum"				
Site Map Conversion Properties	Properties that specify the transformation between the local grid coordinate system and a map grid coordinate system.		Information needed for transformation from local site coordinates to map coordinates. (NOTE: Not map to geodetic coordinate reference system). Information not present in 2x3. A custom PSET in 2x3?	M		IfcPropertySet with Name = "MapConversion"			GSC-039	
Eastings	The shift in X between the two coordinate systems	333,780.62		M		IfcPropertySingleValue.Name="Eastings"				
Northings	The shift in Y between the two coordinate systems	6,246,775.89		M		IfcPropertySingleValue.Name="Northings"				
OrthogonalHeight	The shift in Z between the two coordinate systems	97.457		M		IfcPropertySingleValue.Name="OrthogonalHeight"				
XAxisAbscissa	The X component of the rotation between the two coordinate systems	0.99033045		M		IfcPropertySingleValue.Name="XAxisAbscissa"				
XAxisOrdinate	The Y component of the rotation between the two coordinate systems	-0.138731399		M		IfcPropertySingleValue.Name="XAxisOrdinate"				
Scale	The scale in X, Y between the two coordinate systems	0.999998		M		IfcPropertySingleValue.Name="Scale"				
Site Catalogue properties	Property that is specified by an external catalogue.		Names are valid in the local context (e.g. by country, jurisdiction, building owner), only applicable in local context by additional agreements	?		IfcPropertySet with Name = /* to be decided in local context */ and locally defined properties	In IFC2x3 there is an implementer agreement to		GSC-040	

Exchange Requirements (ER) for Model Setup IDM | **Mapping to IFC Definitions**

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Object Type / Attribute Groups / Property	Definitions and notes	Examples and further explanations	Comments	Export	Import	MVSuppo	IFC Model Representation	Comments	MVD generic	MVD binding	General	comments
e.g. "totsächliche GRZ"	Ratio between the buildable area and the total area of a site		Similar function as LandTitleNumber for IfcSite	?			IfcPropertySingleValue .Name="tatsächliche GRZ", .Description="D_Merkmalkatalog_BFR || ZL008.11.2.102" .Value=0.65			(incl.)		
Spatial Decomposition										GSC-042		
Site contained in Project	"backlink" to the project as highest node in the project structure		[General]: one project object allowed	M			IfcRelAggregates with RelatingObject = IfcProject			GSC-041	one project object allowed	
Building contained in Site	Reference to all buildings that are situated on this site.			M			IfcRelAggregates with RelatedObject = IfcBuilding			VBL-S04		
Storeys contained in Building	Reference to all storeys that comprise the building.			M			IfcRelAggregates with RelatedObject = IfcStorey	Allowed		GSC-043	used for project structures, where	
IfcPositioningElement	Abstract entity definition for positioning and annotating elements that are used to position other elements relatively.	A *grid* is a positioning element to position building components mainly in vertical structures, an *alignment* is a linear positioning element to position geographic and civil elements mainly in infrastructure works.										
Infrastructure Alignment	Defines an alignment system for linear built assets such as roads, railways, bridges and tunnels for geometric set out.			M/O			IfcAlignment					
Name	Name of the alignment			M								
Description	Additional Descriptive information			M								
ContainedInStructure	Reference to a spatial or linear system in which this alignment is defined	Examples are road, bridge, tunnel or similar		M								
Placement	Definition of the alignment coordinate system.	This should either be omitted, or set to location 0.,0.,0. With no rotation (it shall be identical to the engineering coordinate system of the IfcProject.		M								
Representation	Reference to potentially multiple geometric representations of the alignment.	Two geometric representations are defined: FootPrint	Curve2D – simple 2D line representation of alignment Axis	Curve 3D – 3D line representation of 3D alignment		M								
IsDefinedBy	Reference to the property sets associated to the alignment.	It may include the property "Status", defining the alignment as being new, existing, ...		M								
PredefinedType	Not used			M								
				M								
IfcAlignment2DHorizontal	An IfcAlignment2DHorizontal is a linear reference projected onto the horizontal x/y plane. Points along a horizontal alignment have two coordinate values	The horizontal alignment is defined by segments that are connected end- to-start. The transition at the segment connection is not enforced to be tangential, if the "tangential continuity" flag is set to false, otherwise a tangential continuity shall be preserved. Based on the context of the project, they are geo-referenced and ifcMapConversion		M								
StartDistAlong	Name of the alignment			M								
Segment	Additional Descriptive information			M								
ToAlignment	Reference to a spatial or linear system in wg=which this alignment id =s defined	Examples are road, bridge, tunnel or similar		M								
IfcAlignment2DVertical	An IfcAlignment2DVertical is a height profile along the horizontal alignment. Points along a vertical alignment have two coordinate values.	The first value is the distance along the horizontal alignment, the second value is the height according to the project engineering coordinate system. Based on the context of the project they are geo-referenced and the height value is convertible into orthogonal height above/below the vertical datum		M			IfcAlignment					
Segment	An ordered list of unique vertical alignment segments, each (but the last) are joint end to start			M								
ToAlignment	Link to the IfcAlignment for which it defined the vertical alignment.	Only one IfcAlignment can be linked, a vertical alignment can not be shared by several alignments		M								
IfcAlignment2DSegment	An abstract entity defining common information about horizontal and vertical segments	The start and end tag are defined as annotations, not as referents along the alignment. Only absolute distance expressions are in scope, not distances ahead or behind a referent, such as a station. However such information can be exchanged by tags.		M			IfcAlignment					
StartTag	Tag to annotate the start point of the alignment segment.			M								
EndTag	Tag to annotate the end point of the alignment segment.			M								
TangentialContinuity	Connectivity between the continuous segments is not enforced per se to be tangential	Setting "TangentialContinuity" to True means that the current segment shall continue with tangential continuity to the previous one		M								
IfcAlignment2DHorizontalSegment	A single horizontal alignment segmentIwith an associated curve geometry. The following segment curve types are defined by the CurveGeometry: . line segment . circular arc segment . clothoidal arc segment .	see IFC4 documentation for calculations , checking and validation					IfcAlignment					
CurveGeometry	Geometric representation of the horizontal alignment within the 2D X/Y coordinate space.			M								
ToHorizontal	Link to the IfcAlignment2DHorizontal to which this horizontal segment belongs			M								
IfcAlignment2DVerticalSegment	Individual segment along the IfcAlignment2DVertical, being defined in the distance-along/z coordinate space. The vertical alignment is defined by segments that connects end-to-start. The vertical alignment curve geometry is defined in a plane with x = distance along horizontal, the y = height (or	see iFC4 documentation for calculations , checking and validation					IfcAlignment					
StartDistAlong	Distance along the horizontal alignment, measured along the IfcAlignment2DHorizontal given in the length unit of the global			M								
StartHeight	Elevation in Z of the start point relative to the IfcAlignment coordinate system. NOTE it is strongly advised to not offset the IfcAlignment coordinate system from the project engineering coordinate system			M								
StartGradient	Gradient of the tangent of the vertical segment at the start point. It is provided as a ratio measure. The ratio is percentage/100 (0.1 is equal to 10%).			M								
HorizontalLength	Length measured as distance along the horizontal alignment of the segment.			M								
Grids	IfcTree ia a planar design grid defined in 3D space used as an aid in locating structural and design elements.	The position of the grid (ObjectPlacement) is defined by a 3D coordinate system (and thereby the design grid can be used in plan, section or in any position relative to the world		M			IfcGrid					
UAxes	List of grid axes defining the first row of grid lines.			M								
VAxes	List of grid axes defining the second row of grid lines.			M								
WAxes	List of grid axes defining the third row of grid lines. It may be given in the case of a triangular grid.											
PredefinedType	Predefined types to define the particular type of the grid.											
Building		There must be exactly one building in the project					**IfcBuilding**			GSC-031 (GSC-033)		
Building Attributes												
Software unique id	Object identifier (formatted as GUID or UUID) to uniquely identify the software object	70ce2f2b-a5f8-4ab7-bc7f-6a838a353f25, has to be maintained by the application (e.g. for re-export)		M			IfcBuilding.GlobalId			VBL-170		
Number (or ID)	User assigned unique number or key of the site (short name).			M			IfcBuilding. Name		VBL-025	GSC-034	different to the software key (GUID)	
Name	User assigned name (long name)			O			IfcBuilding.LongName		BSA-S07	BSA-S08		
Elevation	User assigned optional description			M			IfcBuilding.Elevation		GSA-008	GSC-035		
Building Storey		There must be one or more storeys in the building					**IfcBuildingStorey**			GSC-031 (GSC-033)		
BuildingStorey Attributes												
Software unique id	Object identifier (formatted as GUID or UUID) to uniquely identify the software object	70ce2f2b-a5f8-4ab7-bc7f-6a838a353f25, has to be maintained by the application (e.g. for re-export)		M			IfcBuildingStorey.GlobalId			VBL-170		
Number (or ID)	User assigned unique number or key of the storey (short name).			M			IfcBuildingStorey. Name		VBL-025	GSC-034	different to the software key (GUID)	
Name	User assigned name (long name)			O			IfcBuildingStorey.LongName		BSA-S07	BSA-S08		
Elevation	User assigned elevation relative to the Project height Datum			M			IfcBuildingStorey.Elevation		GSA-008	GSC-035		
Building Element		There can be none to many building elements in the spatial entity					**IfcBuildingElement**			GSC-031 (GSC-033)		
Building Element Attributes												
Software unique id	Object identifier (formatted as GUID or UUID) to uniquely identify the software object.	70ce2f2b-a5f8-4ab7-bc7f-6a838a353f25, has to be maintained by the application (e.g. for re-export)		M			IfcBuildingElement.GlobalId			VBL-170		
Number (or ID)	User assigned unique number or key of the site (short name).			M			IfcBuildingElement. Name		VBL-025	GSC-034	different to the software key (GUID)	
Name	User assigned name (long name)			O			IfcBuildingElement.?		BSA-S07	BSA-S08		
Elevation	User assigned optional description			M			IfcBuildingElement.Tag		GSA-008	GSC-035		
Building Element Proxy		There can be none to many building elements in the spatial entity					**IfcBuildingElementProxy**			GSC-031 (GSC-033)		
Building Element Attributes												
Software unique id	Object identifier (formatted as GUID or UUID) to uniquely identify the software object.	70ce2f2b-a5f8-4ab7-bc7f-6a838a353f25, has to be maintained by the application (e.g. for re-export)		M			IfcBuildingElementProxy.GlobalId			VBL-170		
Number (or ID)	User assigned unique number or key of the site (short name).			M			IfcBuildingElementProxy. Name		VBL-025	GSC-034	different to the software key (GUID)	
Name	User assigned name (long name)			O			IfcBuildingElementProxy.?		BSA-S07	BSA-S08		
Elevation	User assigned optional description			M			IfcBuildingElementProxy.Tag		GSA-008	GSC-035		
Spatial Containment										GSC-240		
Element contained in Spatial Structure	Link to a node of the spatial structure, being a site, building or storey		Allowed	M			IfcRelContainedInSpatialStructure	NOTE in the ArchitecturalHandOver it is		GSC-083	has to be given, if there is no site	
Geographic Element	Geographic objects from the GIS system that are relevant to show on the site in a BIM system.	Objects representing trees, roads, pipes, infrastructure, etc.	Note; the position, scaling and orientation of these objects must be converted to fit the local site coordinate system.	O			Ifc2x4: IfcGeographicElement and IfcGeographicElementType Ifc2x3: IfcProxy and IfcProxy.Name (for element type) and IfcProxy.Tag (for element ID/position-number/instance identification). See Ifc2x4 documentation.	Owned by IfcSite through IfcSite.ContainsElements		GSC-031		

Key

not checked **VBL-025**

modified or new with respect to Norwegian orginal **UAxes**