



Benefits of IFC in Rail

18th July 2023





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What does buildingSMART do?

BuildingSMART is a neutral, international forum for initiating, developing, creating and promoting adoption of open digital standards for BIM processes. They lead a global community of chapters, members, partners and sponsors.

Throughout industry engagement, buildingSMART International divide their work into 'rooms'. They are currently as follows:



- At buildingSMART UK & Ireland (bSUKI), we help asset owners and the entire supply chain work more efficiently and collaboratively through the entire project and asset lifecycle, through better interoperability.
- We are the UK & Ireland Chapter of buildingSMART International.
- We are responsible for gathering industry requirements and representing the UK & Ireland's needs at international level. This is essential when standards are being developed to ensure we are all catered for.

What is IFC?

- Industry Foundation Classes (IFC) – ISO 16739
- It is a software neutral open data standard
- Managed by buildingSMART International
- It can be used across all information management activities in ISO19650
- It can be accessed for free at:
https://standards.buildingsmart.org/IFC/RELEASE/IFC4/ADD2_TC1/HTML/

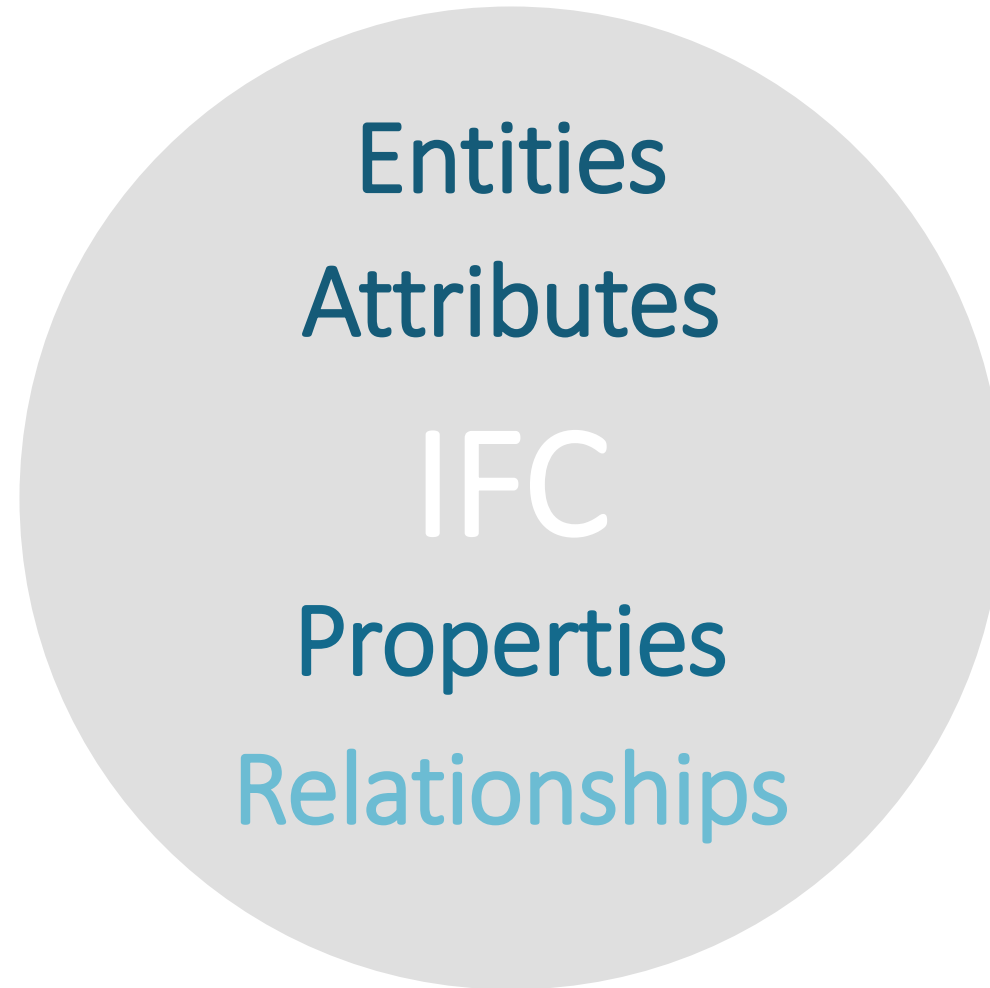
IFC4_ADD2_TC1 - 4.0.2.1 [Official] © 1996-2020 buildingSMART International Ltd.

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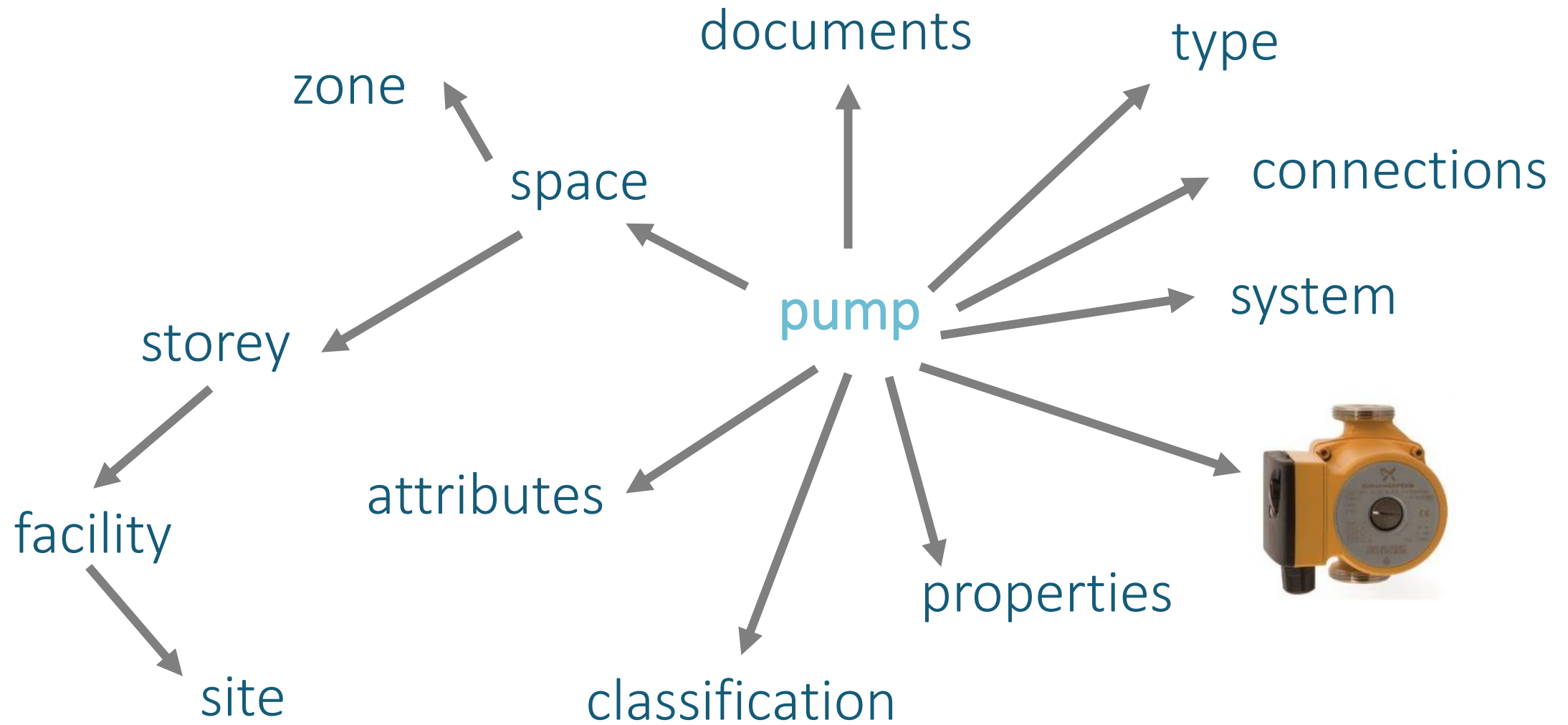


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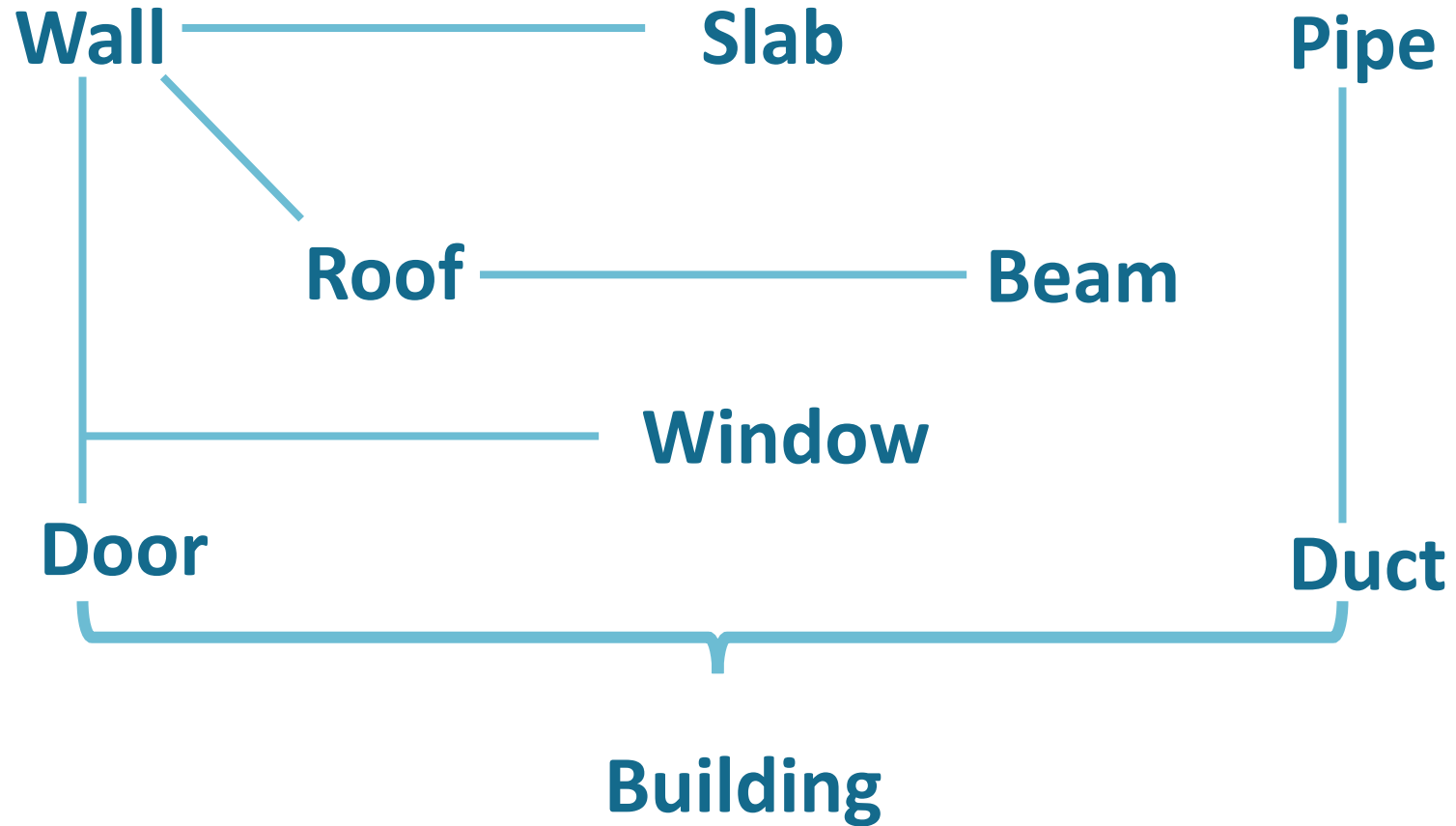
IFC – The basics



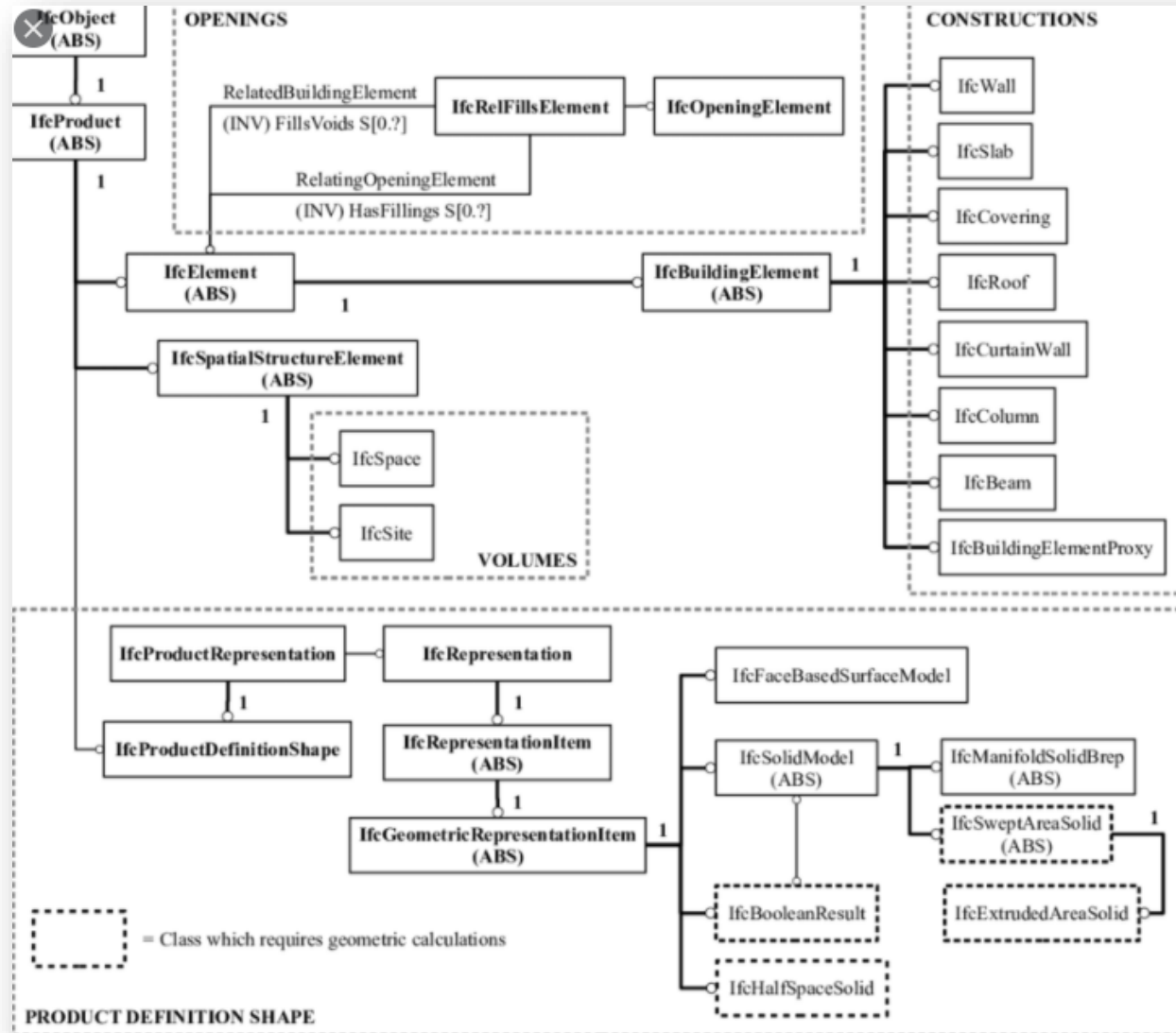
IFC – The relationships



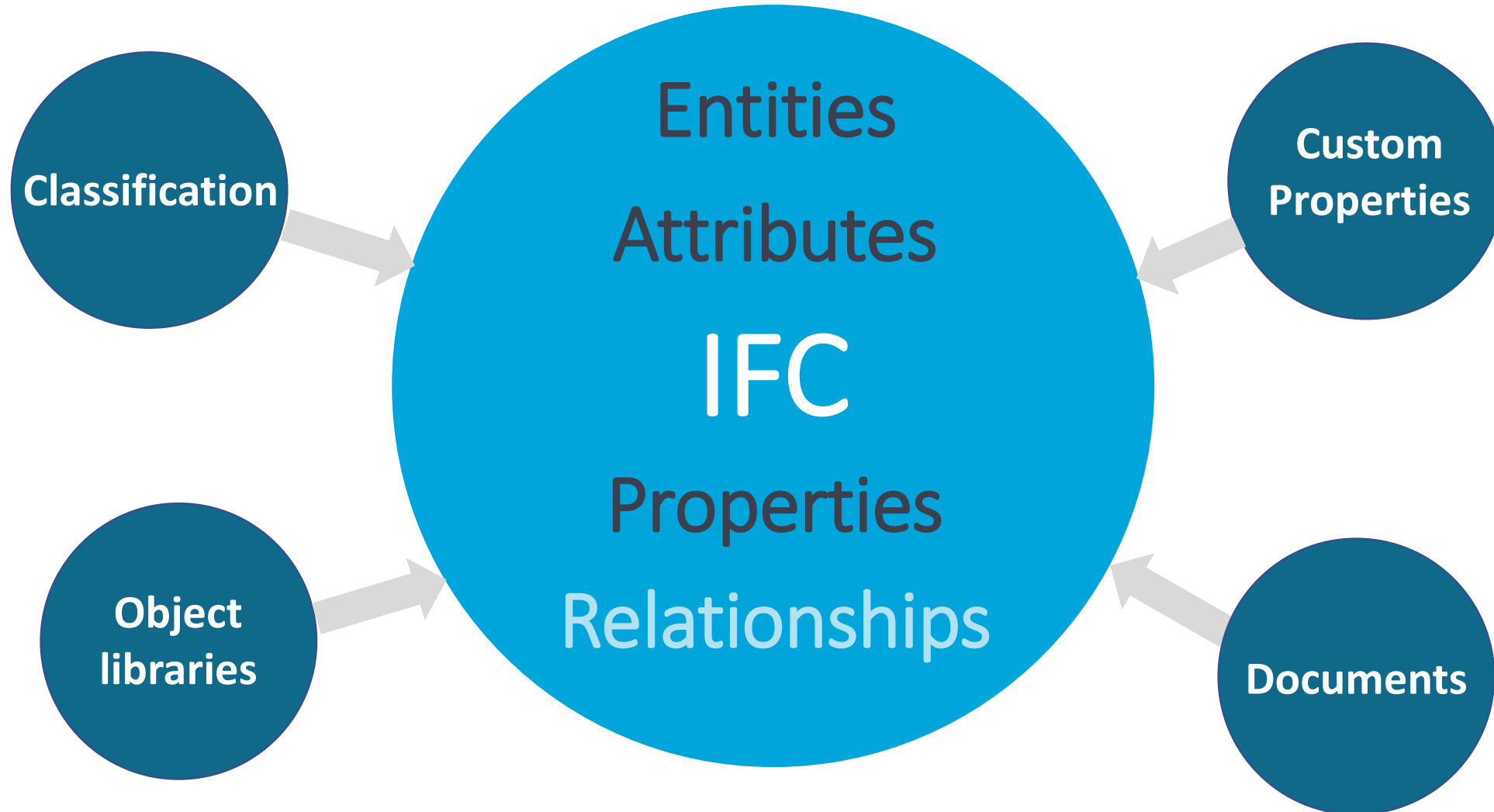
IFC – The schema



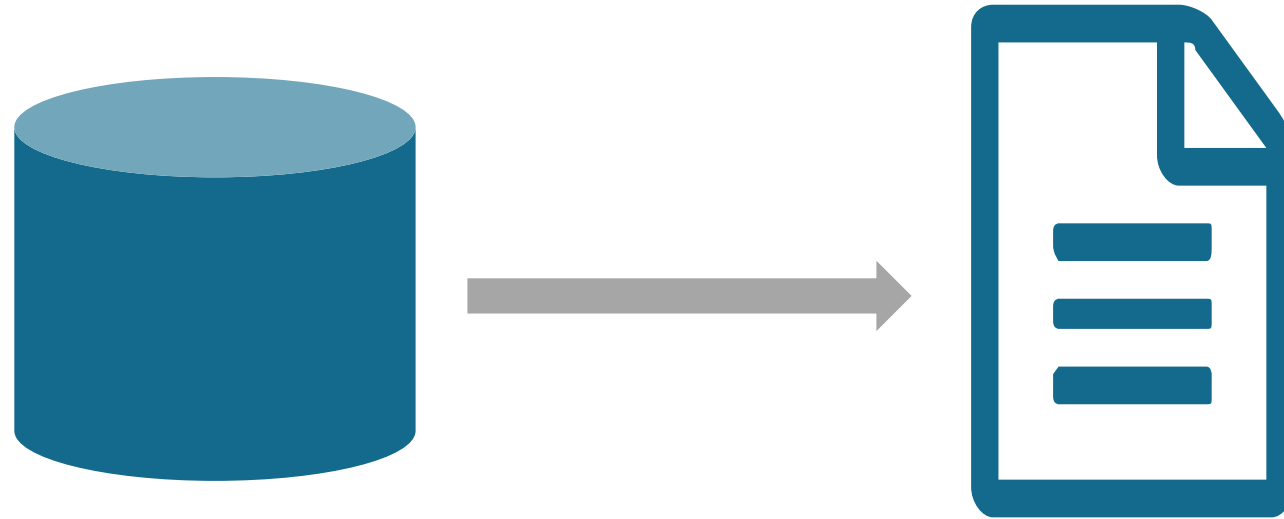
IFC – The express schema



IFC – External connections



IFC – Files



IFC – Formats

SPF_(or .IFC)

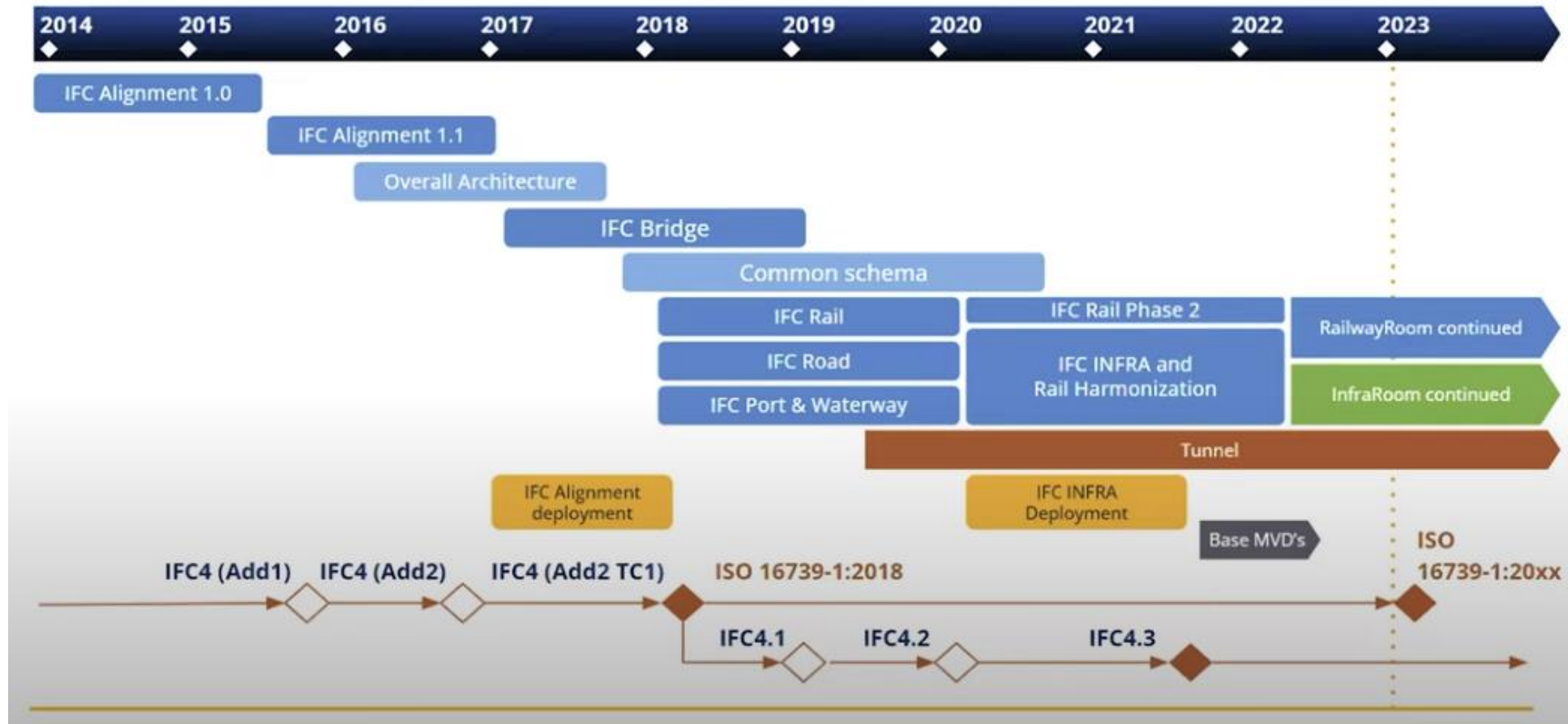
XML

Json

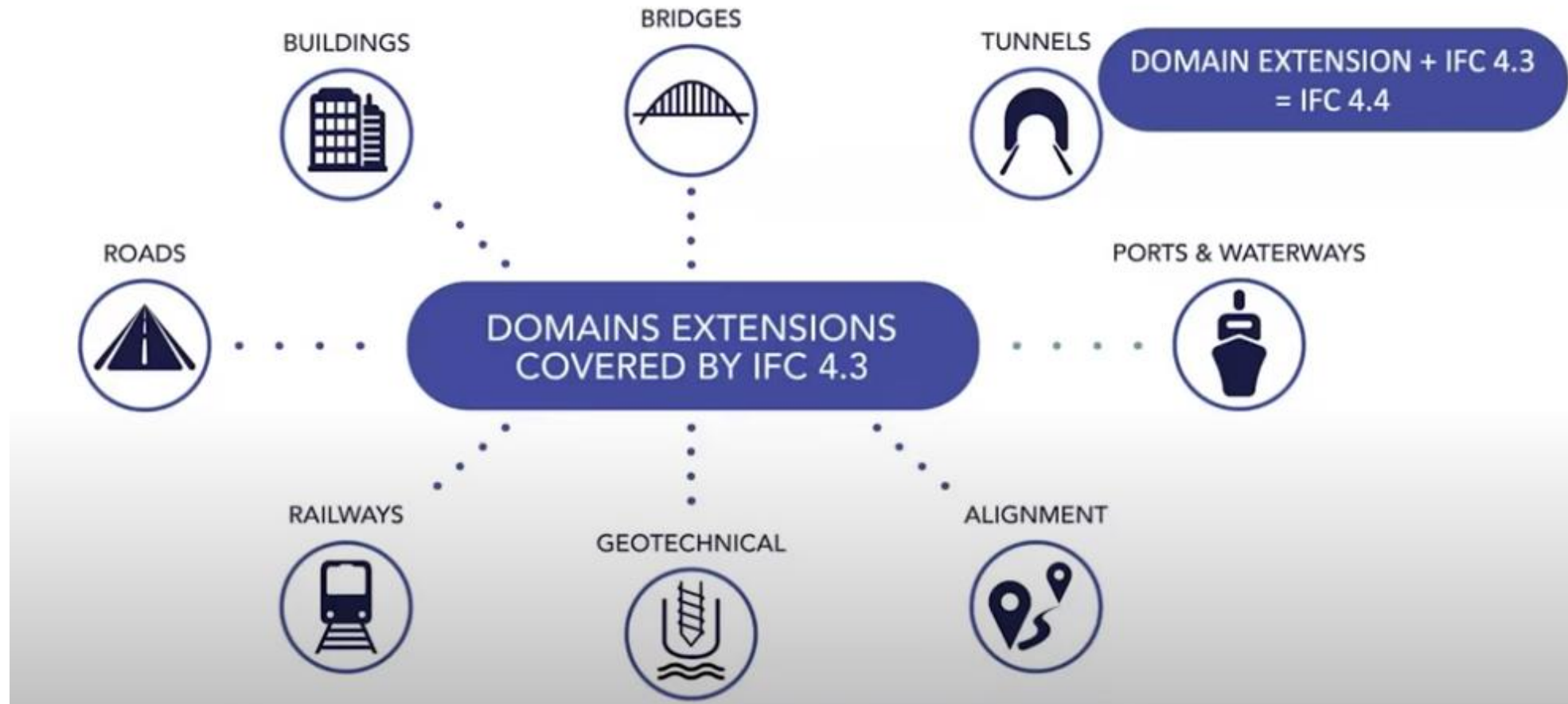
RDF/XML

Turtle

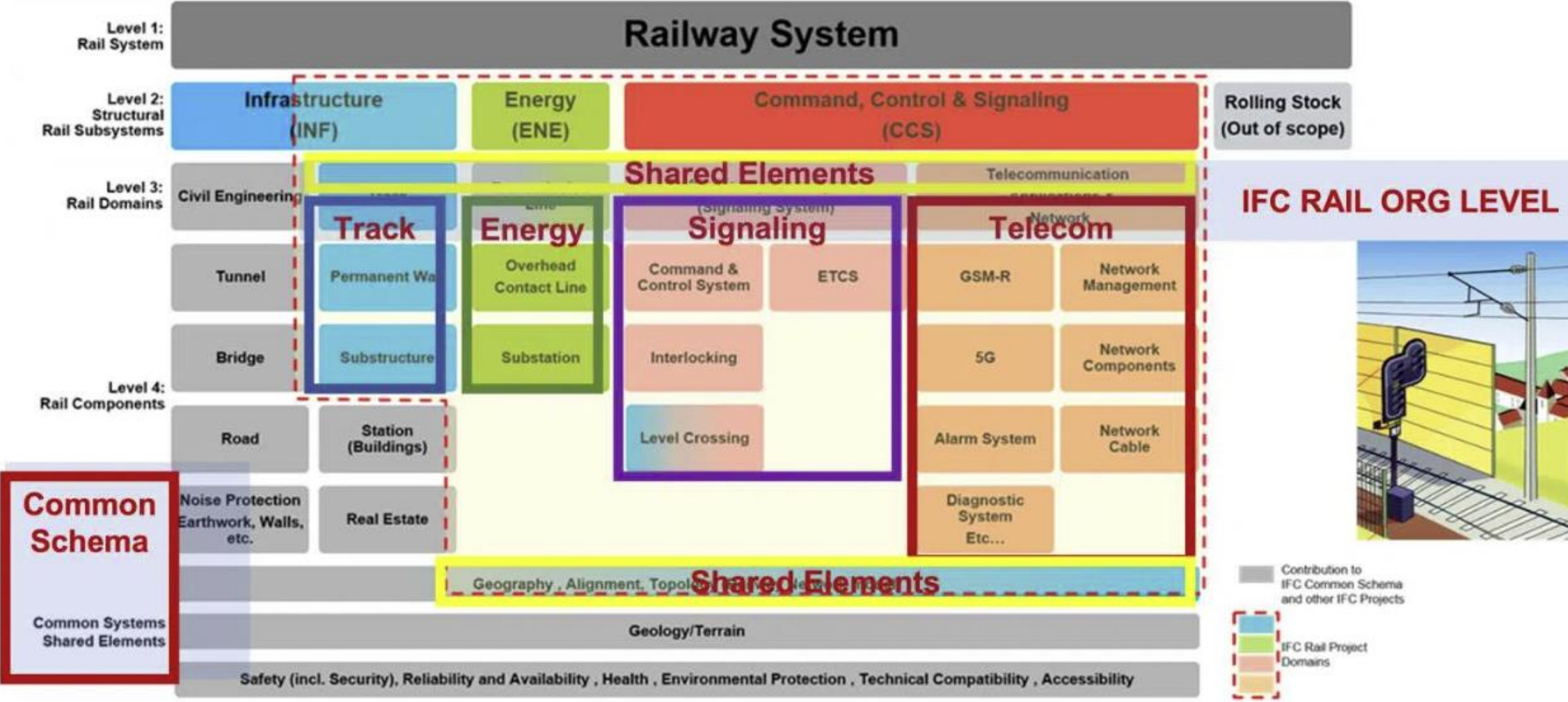
IFC – Infrastructure Development



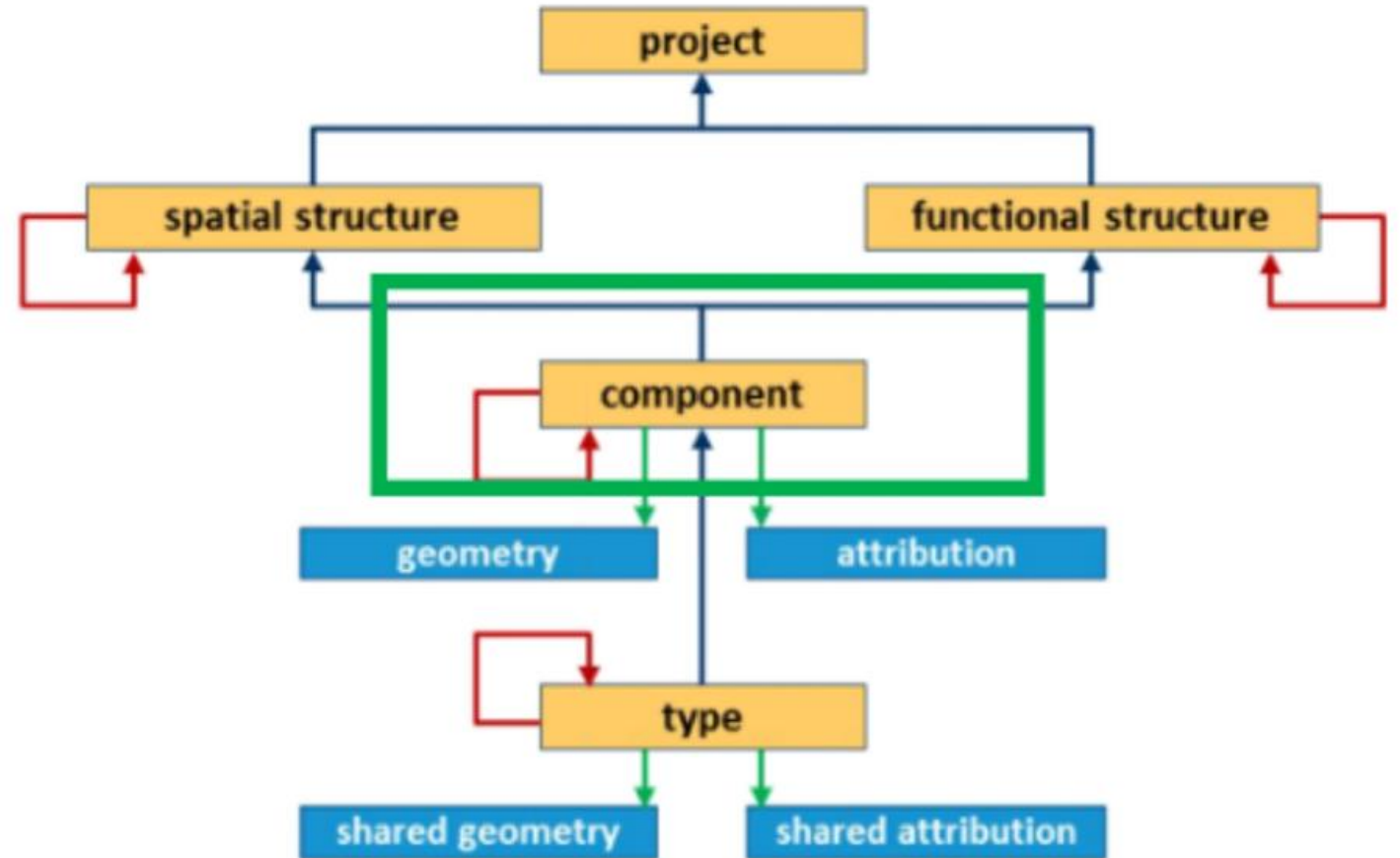
IFC - Domains



IFC Model Federation

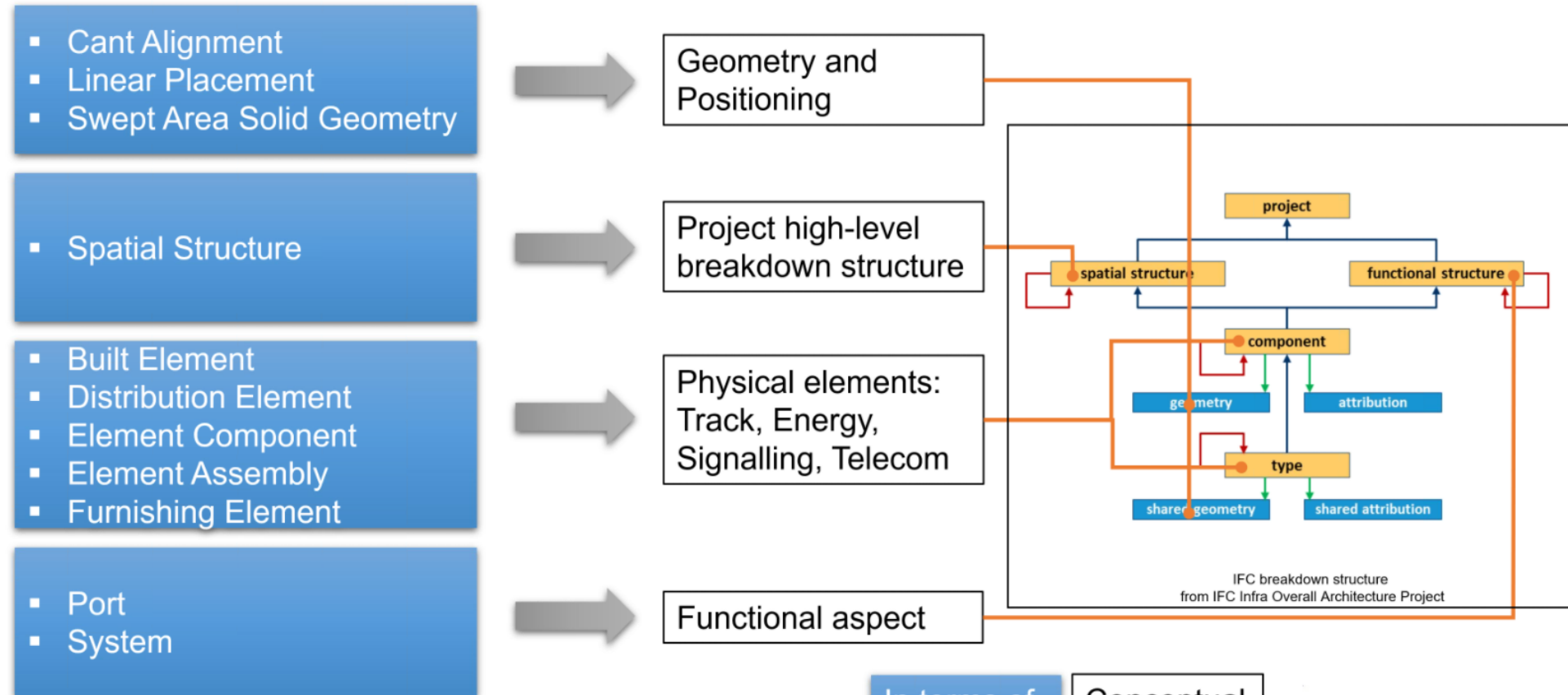


IFC Rail Structure



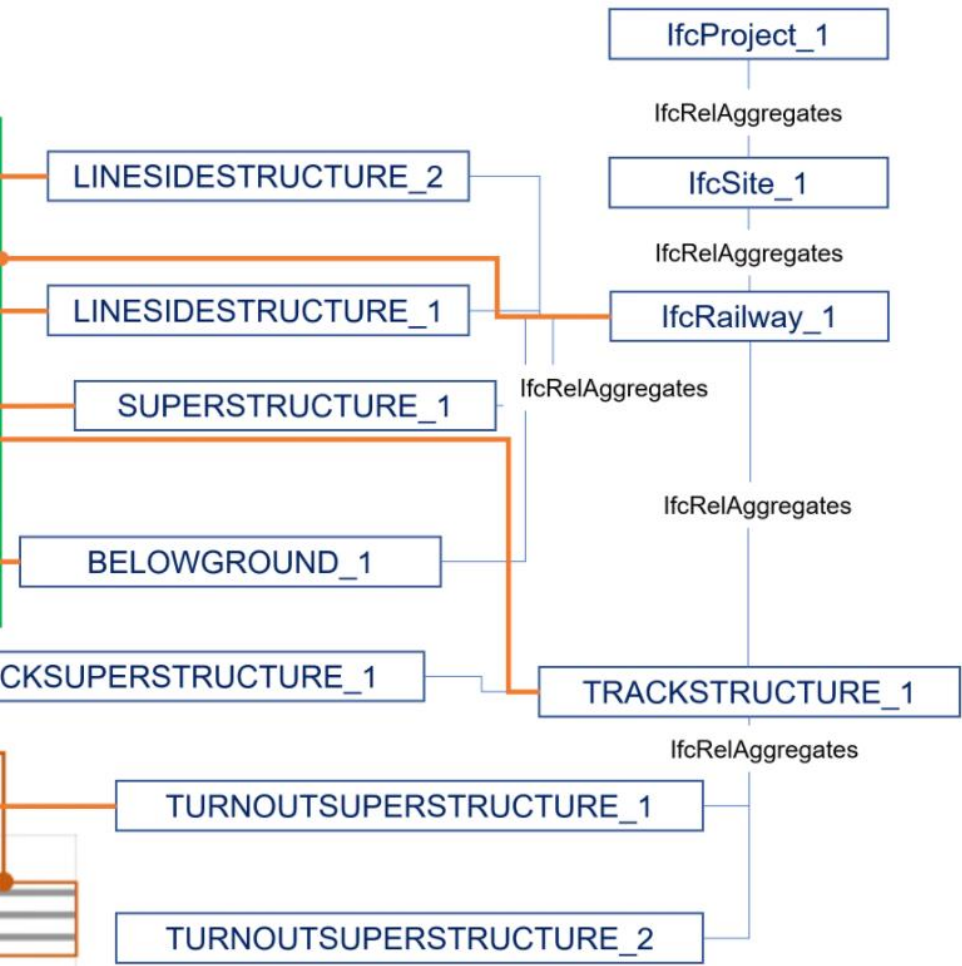
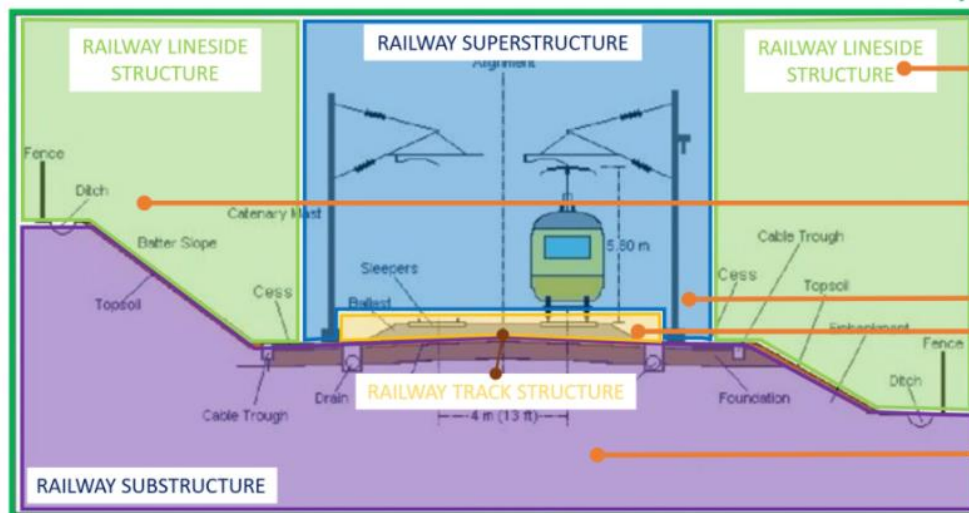
IFC Rail Project

Overview of Defined Concepts from IFC Rail

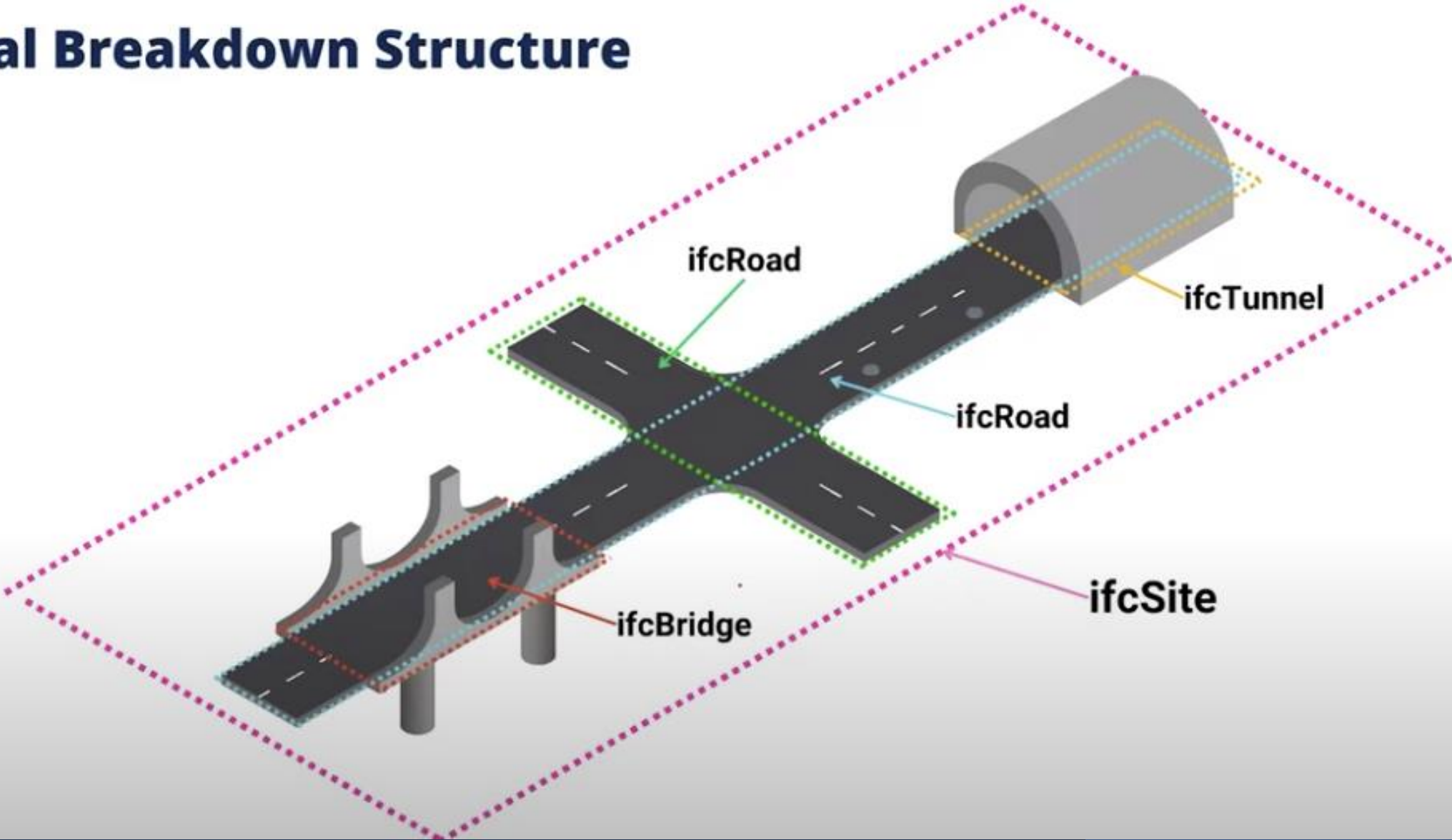


IFC Rail Project

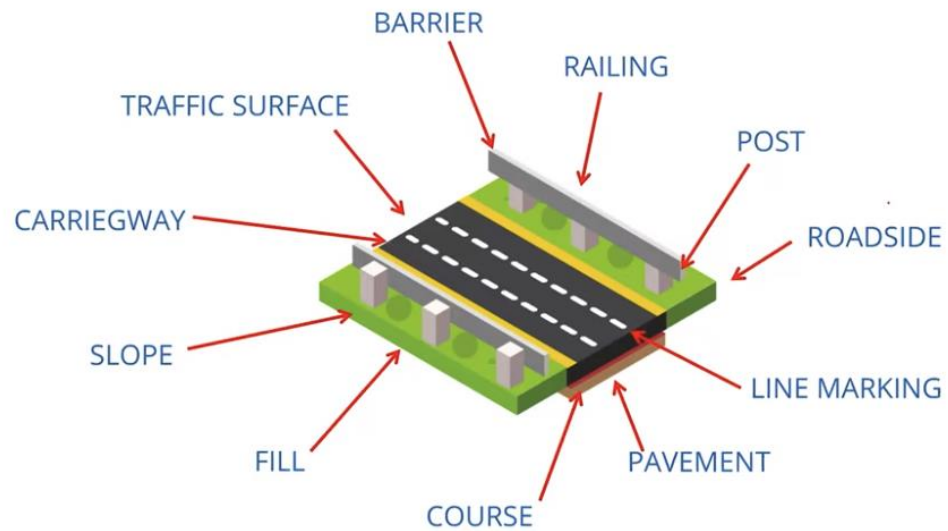
Spatial Structure example



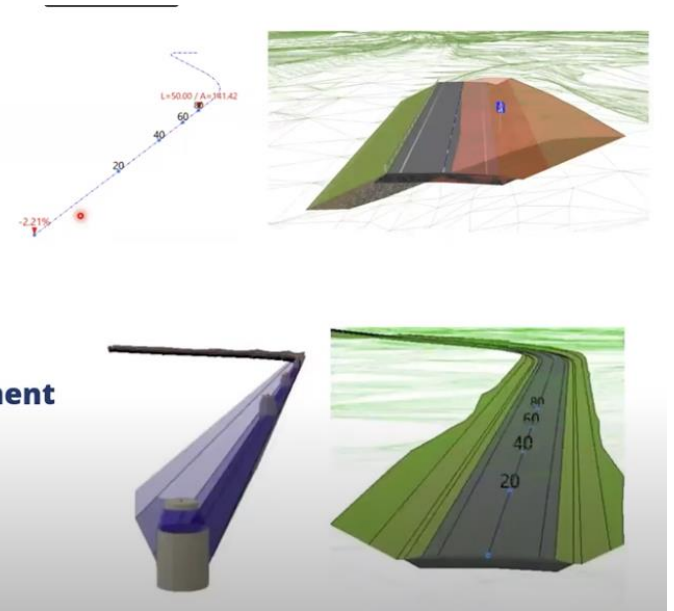
Spatial Breakdown Structure



Taxonomy, Ontologies, Semantics, Classes, Types



ifcRoad
ifcRoadPart
ifcAlignment
ifcGeomodel
ifcGeotechnicalStratum
ifcCourse
ifcKerb
ifcEarthworksFill
ifcEarthworksCut
ifcDistributionChamberElement
ifcAnnotation
ifcElementAssembly
ifcMember
ifcBuiltElement
ifcPipeSegment



ID/Name

General Data	
Globalid	1GY50UxwX58woWsuYEqHW
Name	Sign

Type

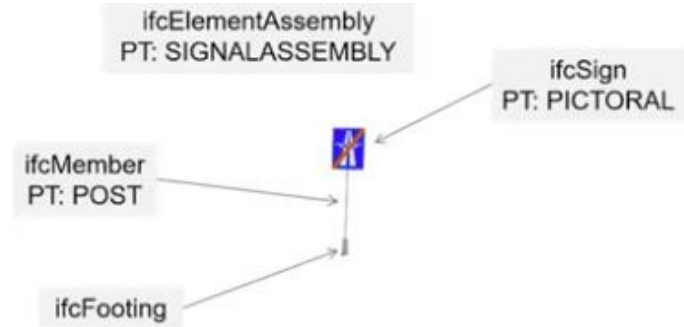
IfcElementAssembly	
PredefinedType	SIGNALASSEMBLY

Relations

DecomposedBy	
RelatedObject	IfcFooting 'Foundation' (1NdTUXJlX9ZeZMfV6u05gA)
RelatedObject	IfcMember 'Sign post' (2Y7ZGFYFP2v8CXJe5GPTcd)
RelatedObject	IfcSign 'Sign' (26xPL9HC1AFRkNUGwKPHEX)
ContainedInStructure	
ContainedInStructure	IfcRoadPart 'Roadside' (2yDH3csA5Da8bf1ImuWKLb)

Properties

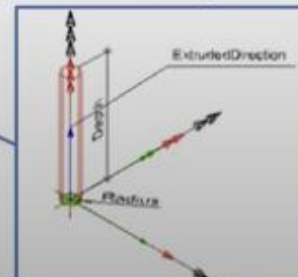
Properties	
Segnaletica_Caratteristiche prestazionali	
Classe pellicola retroriflettente	2.0000
Altezza carattere	12.5000 [Metre]
Descrizione	Rettangolare medio
Segnaletica_Caratteristiche qualitative	
Tipo supporto	Monopalo



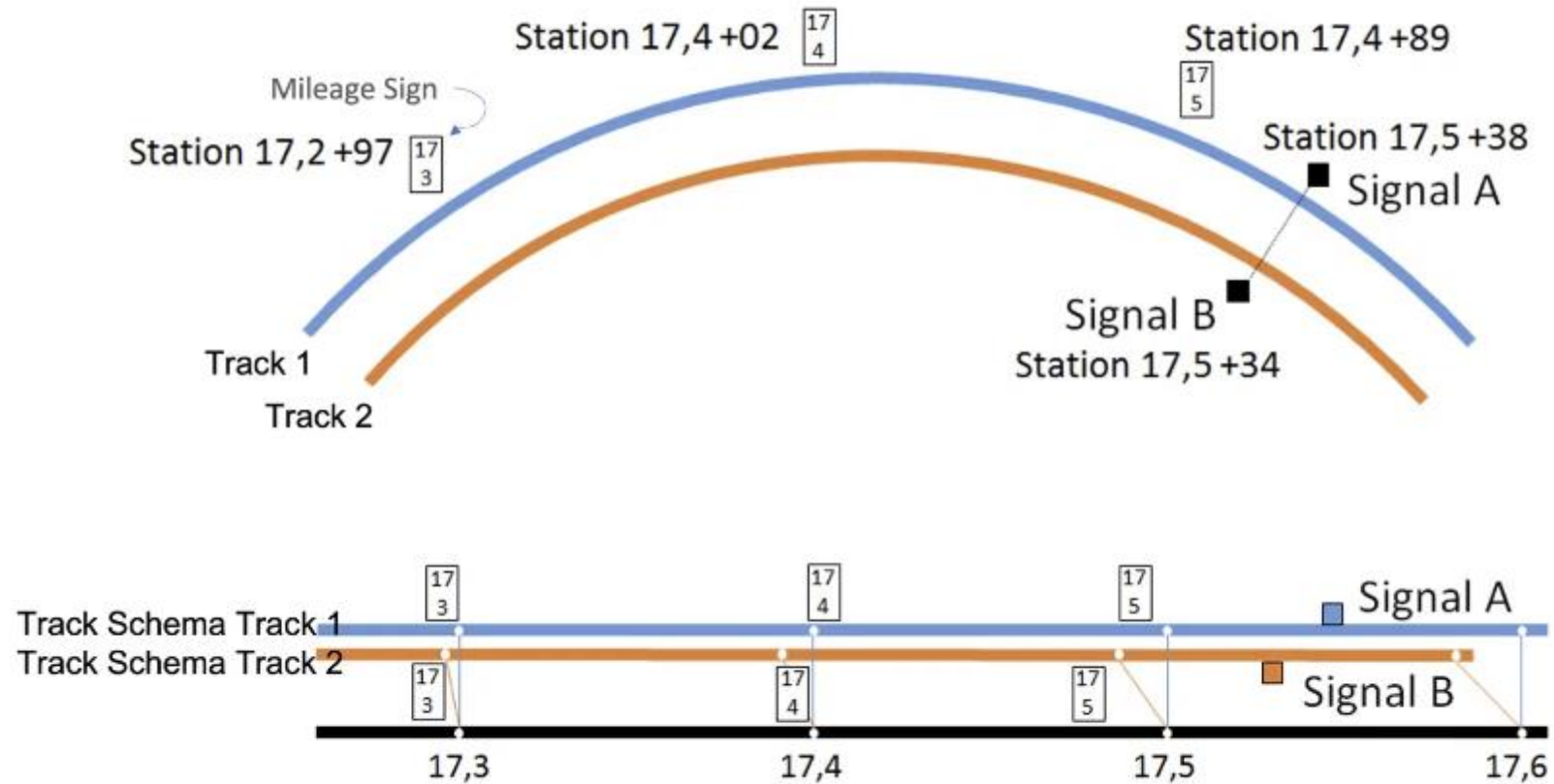
Location

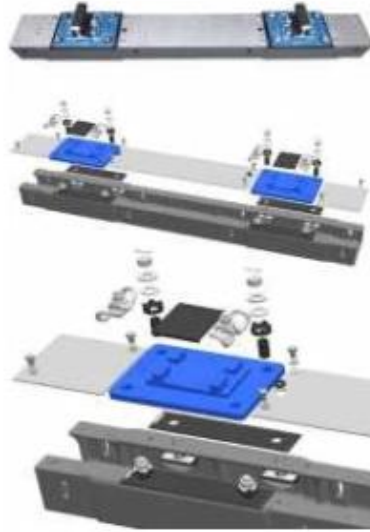
IfcObjectPlacement	
PlacementRelTo	i18n.ifc.IfcObjectPlacementAbsolutePos
Location	[0.0000; 0.0000; 0.0000] [i18n.ifc.IfcMeters]
Axis	[0.0000; 0.0000; 1.0000]
RefDirection	[1.0000; 0.0000; 0.0000]

Geometry



IFC Stationing on Alignment





Property		
Name	Description	Data type
Panel	Referenced track panel or turnout panel or dilatation panel	Identifier
Track-Panel-Sequence	Sequence of sleepers within the track panel <OR> to Position	Integer
Track-Panel-Position	<OR> to Sequence / [m]	Real
Condition	Indication of whether the hollow sleeper was new/used when it was installed	Label
Sleeper type	Type of sleeper. This is determined by its material and structural properties/geometry.	Enum_SleeperType
Undersleeperpad	Indication of whether the sleeper has an undersleeperpad and, if so, what type.	Enum_Undersleeperpad
Coating	Indication of whether and by what means the sleeper has been waterproofed (esp. wooden sleepers) à contamination, for special disposal	Enum_Coating
Turnout-Panel-Position	Reference of corresponding installation plan of the turnout	Identifier
Dilatation-Panel-Position	Reference of corresponding installation plan of the dilatation	Identifier
Manufacturer	How and by whom was the hollow sleeper manufactured?	Label
Installation date	Date on which the hollow sleeper was (or will be) installed.	Date
Disassembly date	Date on which the hollow sleeper was (or will be) removed.	Date
Manufacturing date	Date on which the hollow sleeper was (or will be) manufactured.	Date
Putting into operation date	Date on which the hollow sleeper was (or will be) put into operation.	Date
Sleeper dimension	Length, width, height / [m] / t.b.d. ask CRBIM@Dusseldorf	Real

HS2

IFC Specification

Document no: HS2-HS2-IM-SPE-000-000014

Revision	Author	Reviewed by	Approved by	Date approved	Reason for revision
P01	Alexander Hulston	Jonathan Rhind, Clive Paulse, Davies Mukonoweshuro	Sonia Zahiroddiny	11/04/2022	Initial issue

Handling Instructions: Uncontrolled when printed

Any Questions