



Moving ahead with IFC 4.3

3rd July 2024
Sydney

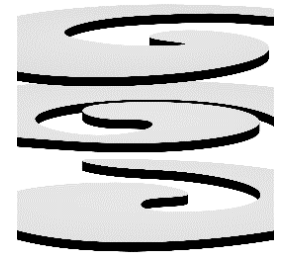


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<https://geometrygym.wordpress.com/>

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Interoperability Tools for BIM and Structural Analysis

Geometry Gym develops utilities and plugins for Rhino3d, Grasshopper, Revit, Tekla, Navisworks and a range of Structural Analysis programs that enable openBIM IFC(Industry Foundation Classes) generation and exchange.

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RhinoIFC

Rhino 6 and Newer

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RevitIFC

Revit 2018 to 2024. Earlier versions available on request.

[ggRevit User v24.01.23](#) (24th Jan 2024)

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NavisIFC

Navisworks Manage 2018 to 2024

[ggNavisIFC v23.11.17](#) (17/11/2023)

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Extra Domains covered by IFC 4.3

- Mapping model objects to IFC Class and PredefinedType
- Property and Quantity Sets
- Resources for IFC

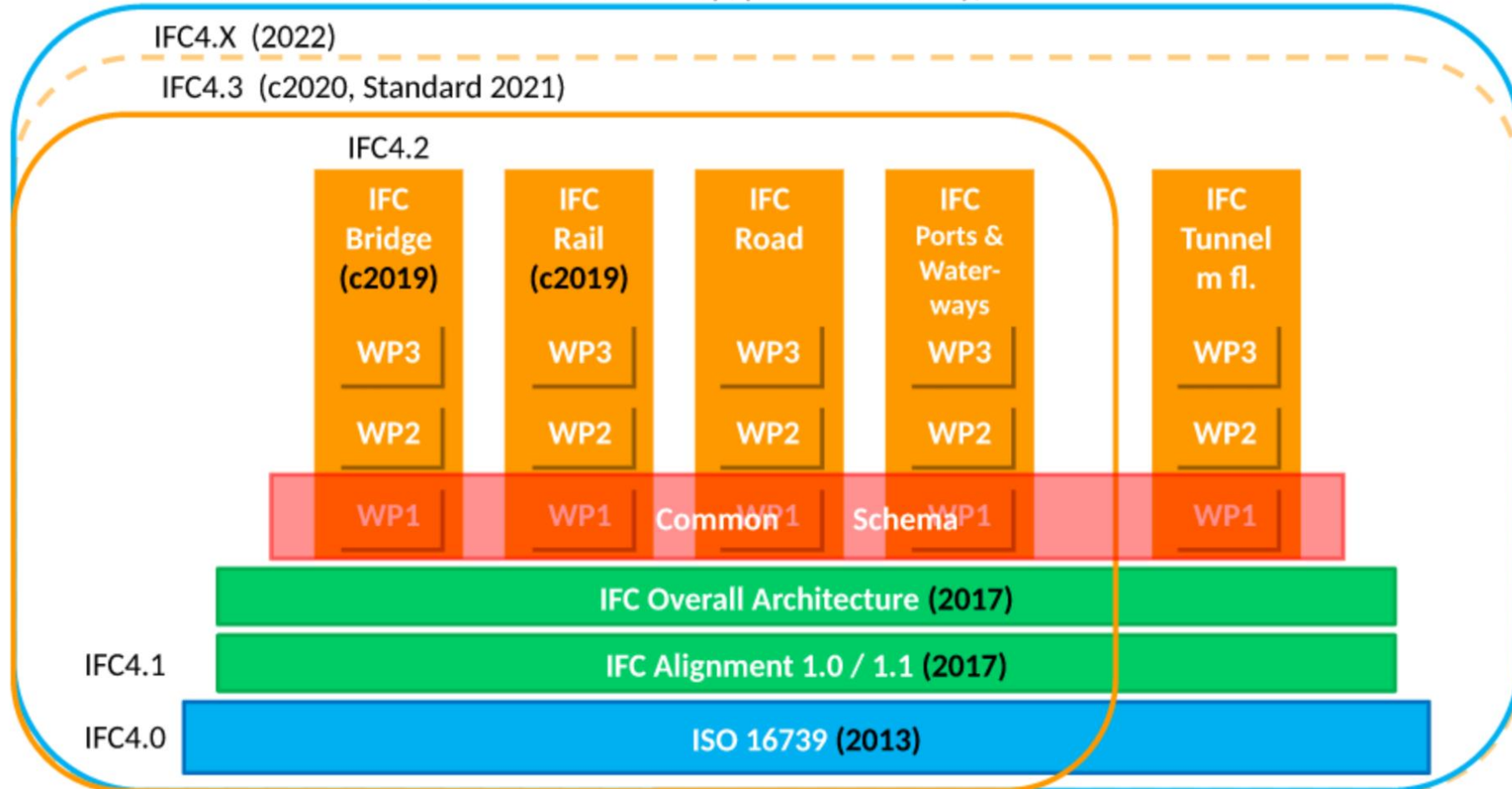
Spatial infrastructure concepts

- Georeferencing
- Alignments
- Spatial breakdown

IFC 4.3 – Infrastructure Extensions



IFC Next Generation (bSI Technical roadmap, published shortly)

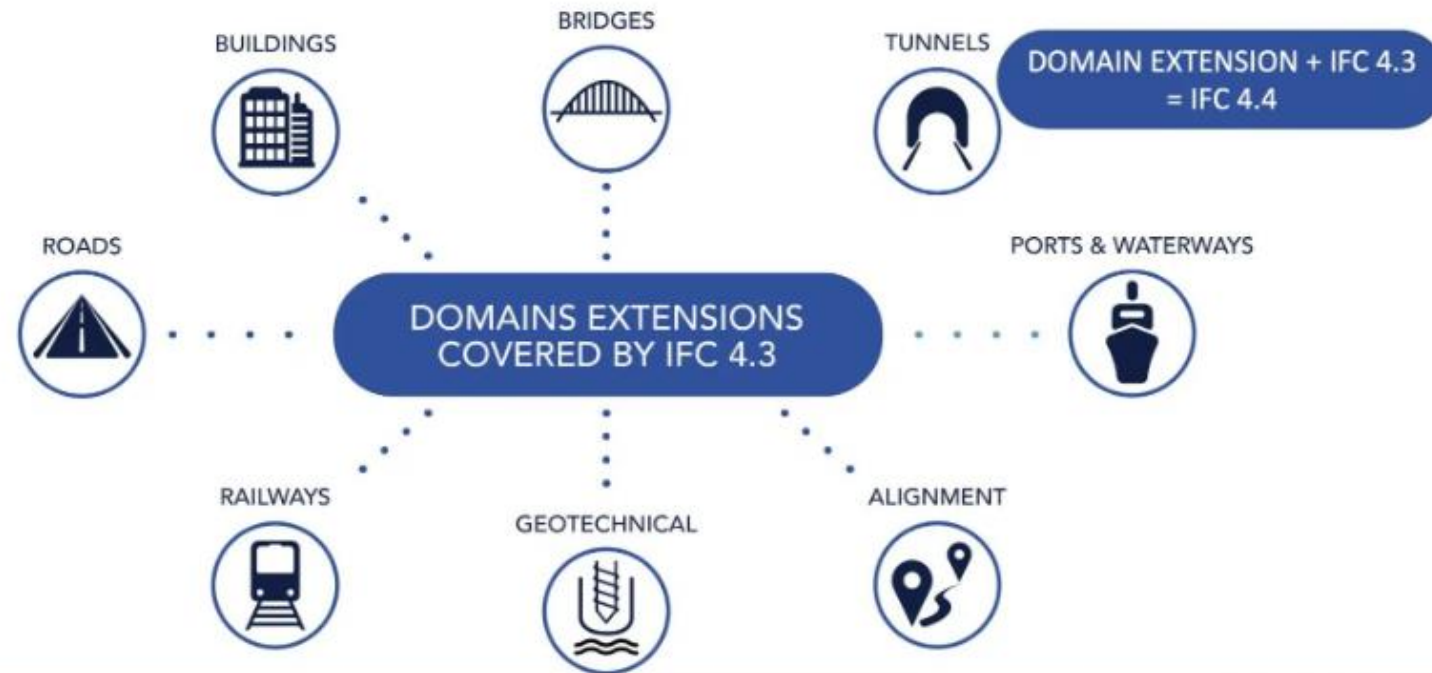




IFC 4.3.2 Documentation (buildingsmart.org)

The status of IFC 4.3 and the benefit of further extensions as IFC 4.4

Domains in the new IFC 4.3 standard



IFC 4.3 – New components

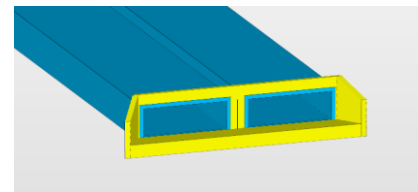
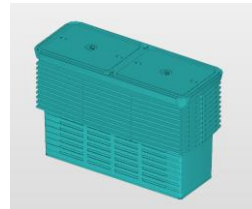
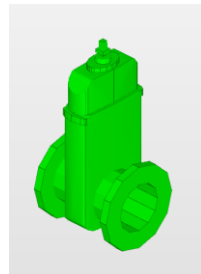
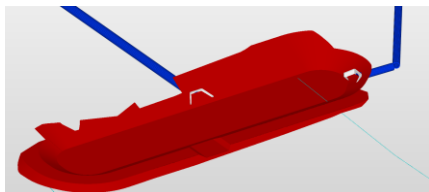
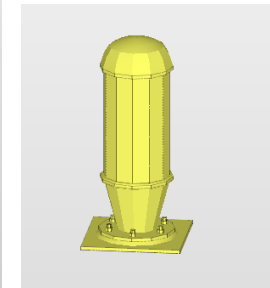
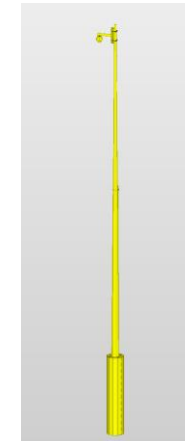
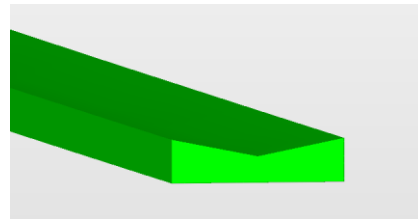
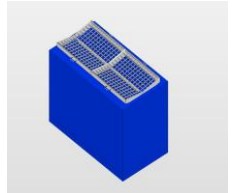
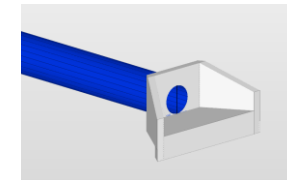
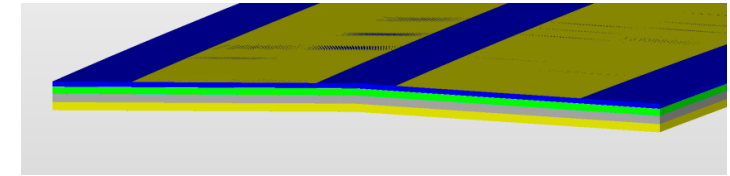
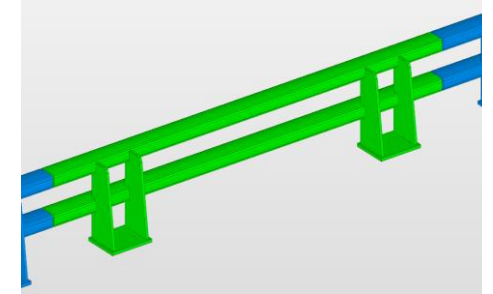
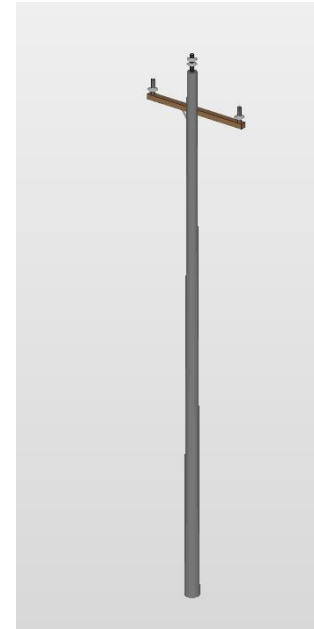
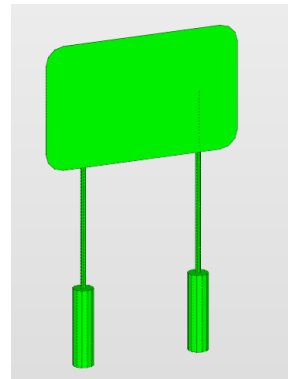
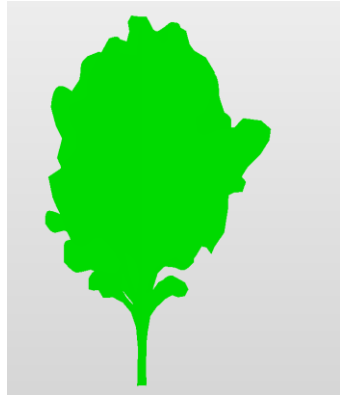
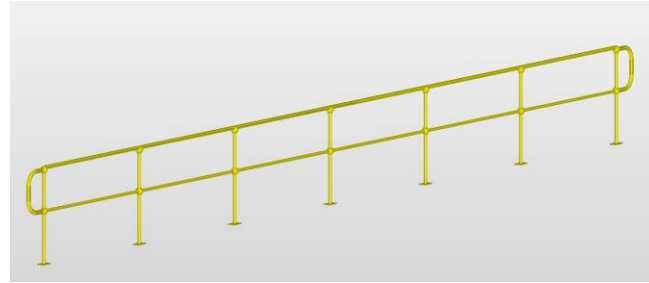


New IFC Classes

- Bridge
- Road
- Rail
- Tunnel

Associated Property Sets

Associated Quantity Sets

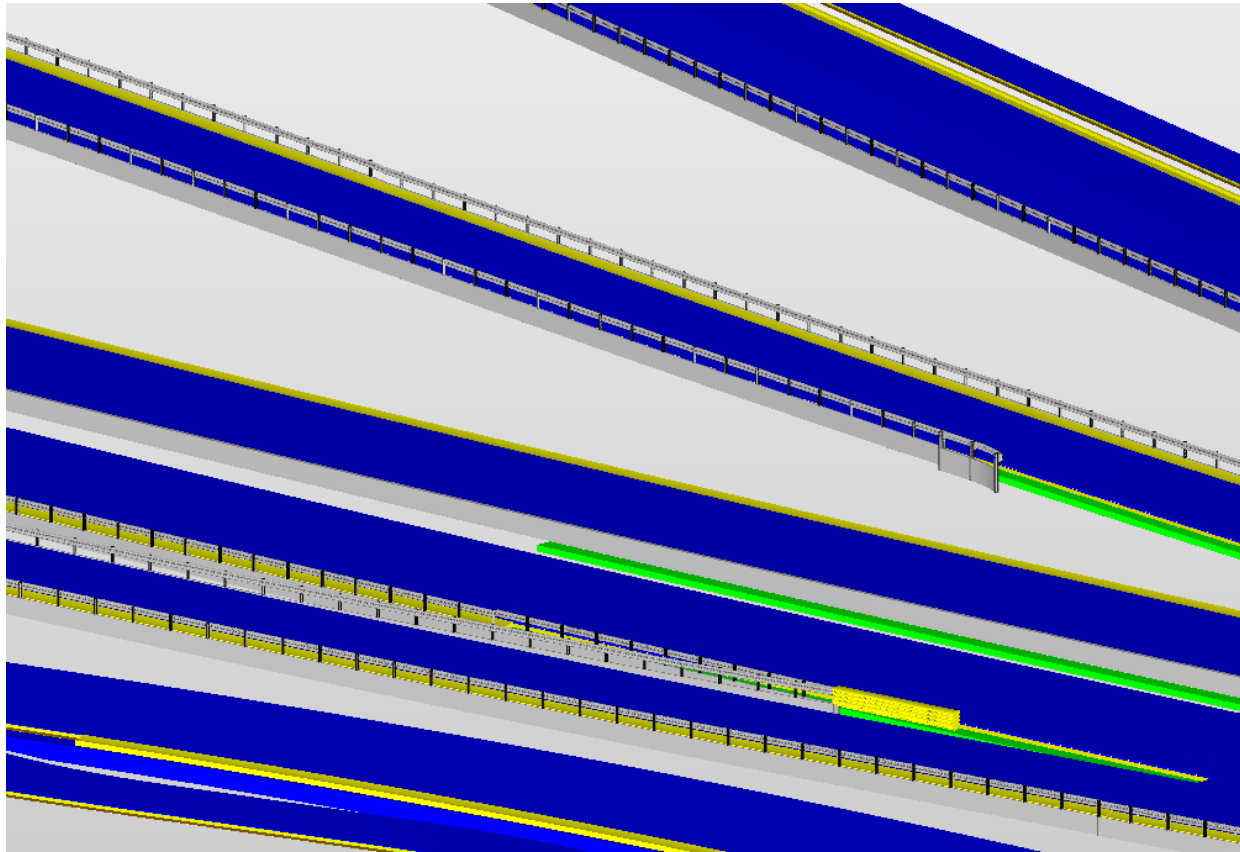




Civil components

Road objects can be generated with alignments and reports chainage dimensions

- Pavements – generated by cross sections
- Signage
- Barriers
- Linemarking
- Street furniture
- Retaining walls
- Rock bolts



Road Objects

IFC 4.3 Class

IfcAudioVisualAppliance.CAMERA

IfcBeam.GIRDER_SEGMENT

IfcColumn.PIERSTEM

IfcCourse.BALLASTBED

IfcCourse.PAVEMENT

IfcDistributionChamberElement.INSPECTIONCHAMBER

IfcEarthworksFill.SLOPEFILL

IfcEarthworksFill.TOPSOIL

IfcFooting

IfcFooting.STRIP

IfcPile.BORED

IfcPipeSegment.RIGIDSEGMENT

IfcRailing.FENCE

IfcRailing.GUARDRAIL

IfcSign.PICTORAL

IfcSlab.APPROACHSLAB

IfcSlab.DECK

IfcSlab.FLOOR

IfcSurfaceFeature.LINEMARKING

IfcWall

IFC 4.3 – Road components filtered by alignment



MODEL TREE
CHBZ02-FGJV-0010-RW-M3D-210020

CLASSIFICATION
Road-Alignment-01
MC2A
MC2B
MC2C
MC2D
MC2E
MC2F
MC2G

SELECTION.. No Selection Sets

INFO
Object.b.2535
BIM Data | Other Properties | Favorites

INFORMATION TAKEOFF
Takeoff Selected | Road-Alignment-Feature_Definition

Corridor Data.Alignment	Corridor Data.Feature_Definition	Bottom Area	Volume	Count
MC2B	D-COMP-BARR-EZY Guard SMART-LHS	38.042 m ²	118.21 m ³	
MC2B	D-COMP-BARR-EZY Guard SMART-RHS	1,228.832 m ²	2,512.01 m ³	
MC2B	D-COMP-BARR-Terminal-TT-LHS	0.445 m ²	798 l	
MC2B	EZY Guard SMART	26.935 m ²	64.22 m ³	
MC2B	Fill	7,310.306 m ²	46,879.76 m ³	
MC2B	GB-Granular Base	1,517.929 m ²	1,807.99 m ³	
MC2B	GS-Granular Subbase	130.243 m ²	97.11 m ³	
MC2B	Gutter-SO	195.397 m ²	549.32 m ³	
MC2B	Kerb Ramp	7.301 m ²	2.20 m ³	
MC2B	Kerb-SA	42.244 m ²	24.48 m ³	
MC2B	LC-Low Cutter Seal	1,975.281 m ²	3,077.13 m ³	

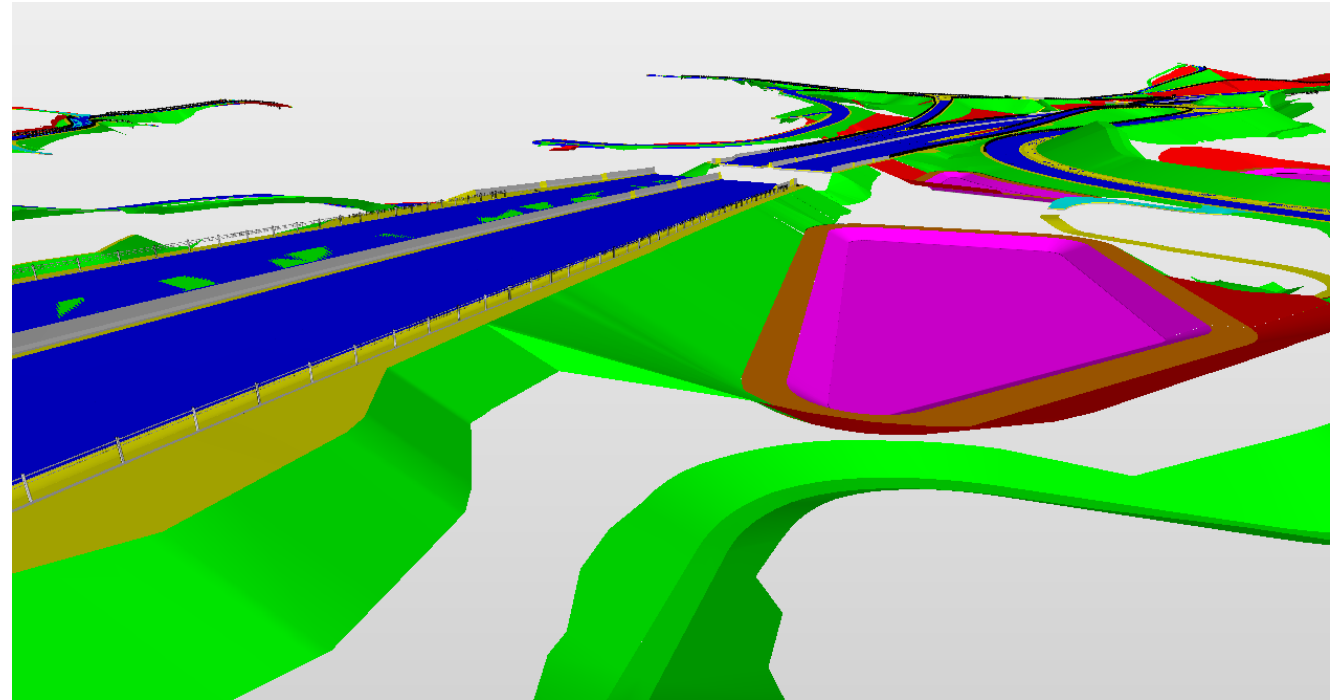


Earthworks

- Probably the hardest components to measure off models
- Spatial locations important
- Mass haulage can be re-programed daily by specialist software
- Most unknown, ill defined component of road projects

Landscaping

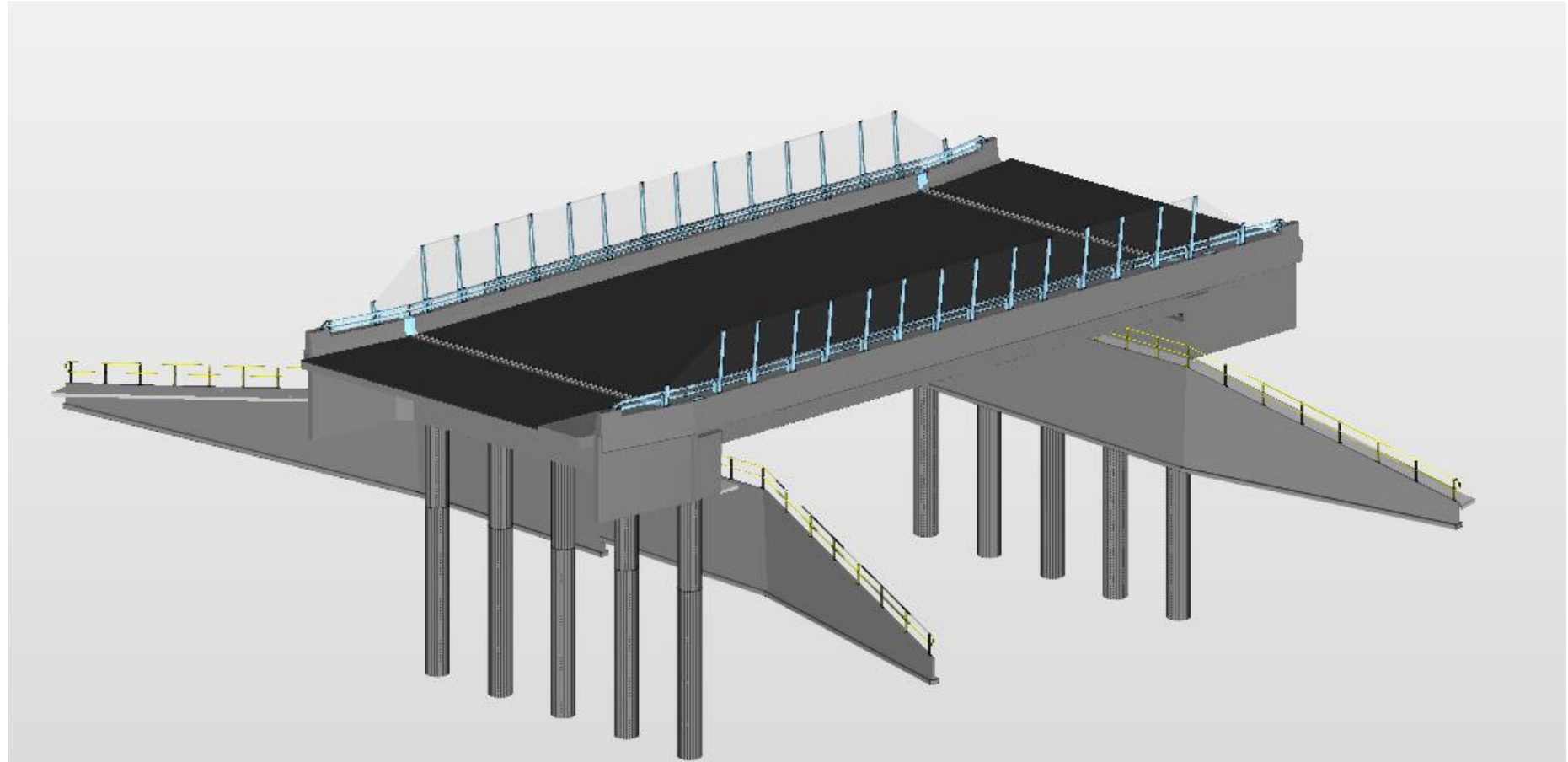
- Vegetation



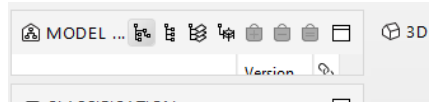


Bridge

- Beam
- Column
- Footing
- Pile
- Slab
- Wall
- Miscellaneous:
 - Bearing
 - Expansion Joint
 - Railing
 - Barrier
- BuildingElementProxy



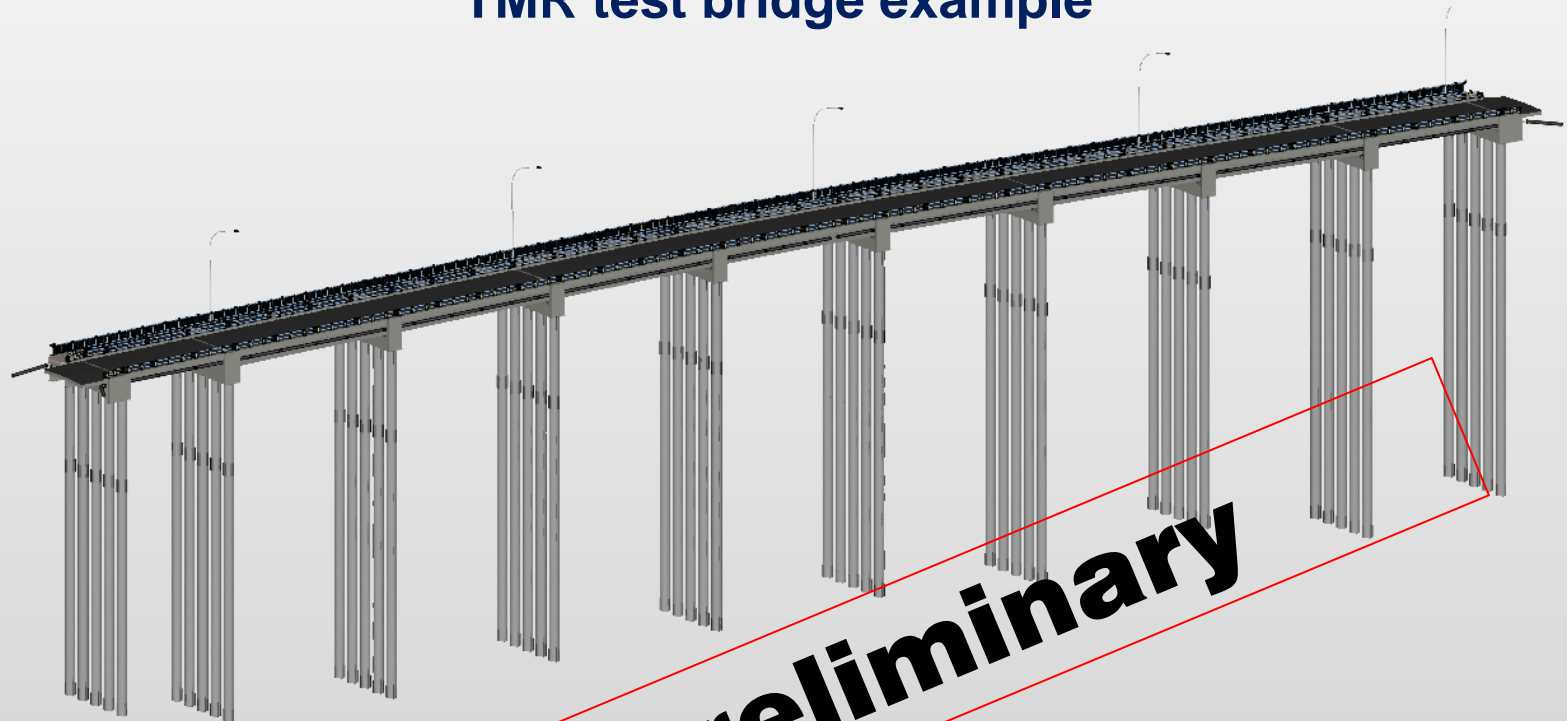
IFC 4.3 – Bridge Components



TMR test bridge example

IFC Elements

- ▶ IfcBeam.DIAPHRAGM
- ▶ IfcBeam.GIRDER_SEGMENT
- ▶ IfcBearing.ELASTOMERIC
- ▶ IfcBearing.PEDESTAL
- ▶ IfcDiscreteAccessory.BRACKET
- ▶ IfcElementAssembly.ABUTMENT
- ▶ IfcElementAssembly.PIER
- ▶ IfcLightFixture.DIRECTIONSOURCE
- ▶ IfcMechanicalFastener.ANCHORBC
- ▶ IfcPavement.FLEXIBLE
- ▶ IfcPile.BORED
- ▶ IfcPipeFitting.BEND
- ▶ IfcPipeFitting.CONNECTOR
- ▶ IfcPipeSegment.RIGIDSEGMENT
- ▶ IfcPlate.COVER_PLATE
- ▶ IfcRailing.BALUSTRADE
- ▶ IfcSlab.APPROACH_SLAB
- ▶ IfcSlab.FLOOR
- ▶ IfcSlab.PAVING



INFORMATION TAKEOFF

Road Elements	Road Elements-TMR-1	IFC Elements	Asset Management Information.Full BIM Object Code	BIS Structure ID	SIM Component Code	SIM Exposure Classification Code	SIM Group Code	SIM Group Nu
Abutment	A-HS-Headstock	IfcElementAssembly.ABUTMENT	00000-AA-A-HS	00000	A	2	A	1
Abutment	A-HS-Headstock	IfcElementAssembly.ABUTMENT	00000-AA-M-PM	00000	A	2	A	1
Abutment	A-HS-Headstock	IfcElementAssembly.ABUTMENT	00000-AB-A-HS	00000	A	2	A	1
Abutment	A-HS-Headstock	IfcElementAssembly.ABUTMENT	00000-AB-M-PM	00000	A	2	A	1
Bearing	B-BE-Bearing Elastomeric	IfcBearing.ELASTOMERIC	00000-AA-B-BE-10-A	00000	B	2	P	1
Bearing	B-BE-Bearing Elastomeric	IfcBearing.ELASTOMERIC	00000-AA-B-BE-11-A	00000	B	2	P	1
Bearing	B-BE-Bearing Elastomeric	IfcBearing.ELASTOMERIC	00000-AA-B-BE-12-A	00000	B	2	P	1
Bearing	B-BE-Bearing Elastomeric	IfcBearing.ELASTOMERIC	00000-AA-B-BE-8-A	00000	B	2	P	1
Bearing	B-BE-Bearing Elastomeric	IfcBearing.ELASTOMERIC	00000-AA-B-BE-9-A	00000	B	2	P	1
Bearing	B-BE-Bearing Elastomeric	IfcBearing.ELASTOMERIC	00000-AA-B-BE-1-A	00000	B	2	P	1
Bearing	B-BE-Bearing Elastomeric	IfcBearing.ELASTOMERIC	00000-AA-B-BE-13-A	00000	B	2	P	1

025	From Cla...	8
030	From Cla...	126

IFC 4.3 – Bridge Components mapping



TMR test bridge example

Common name TMR name IFC Class

Common name	TMR name	IFC Class
Road Elements	Road Elements-TMR-1	IFC Elements
Abutment	A-HS-Headstock	IfcElementAssembly.ABUTMENT
Bearing	B-BE-Bearing Elastomeric	IfcBearing.ELASTOMERIC
Bearing	B-PE-Bearing Pedestal	IfcBearing.PEDESTAL
Bolt	D-HB-Holding down bolts	IfcMechanicalFastener.ANCHORBOLT
Coverplate	M-JT-Joint	IfcPlate.COVER_PLATE
Cross Girder	G-XG-Cross Girder	IfcBeam.DIAPHRAGM
Deck Slab	D-AC-Deck wearing surface	IfcPavement.FLEXIBLE
Deck Slab	D-DK-Cast insitu deck	IfcSlab.FLOOR
Girder	G-CG-Concrete girder	IfcBeam.GIRDER_SEGMENT
Piercap	P-HS-Piercap	IfcElementAssembly.PIER
Pile	F-SP-Driven tubular steel piles	IfcPile.BORED
Pipe	M-DP-Drainage pipes	IfcPipeSegment.RIGIDSEGMENT
Pipe	M-DS-Drainage scuppers	IfcPipeSegment.RIGIDSEGMENT
Pipe Fitting	M-DP-Pipe Fitting	IfcDiscreteAccessory.BRACKET
Pipe Fitting	M-DP-Pipe Fitting	IfcPipeFitting.BEND
Pipe Fitting	M-DP-Pipe Fitting	IfcPipeFitting.CONNECTOR
Railing	T-BA-Pedestrian / shared balustrade	IfcRailing.BALUSTRADE
Railing	T-TR-Steel post and rail	IfcRailing.BALUSTRADE
Relieving Slab	A-RS-Relieving Slab	IfcSlab.APPROACH_SLAB
Restraint Block	B-RB-Restraint Block	IfcBearing.PEDESTAL
Street Light	M-SL-Street Light	IfcLightFixture.DIRECTIONSOURCE
Walkway	D-FW-Walkway	IfcSlab.PAVING

Preliminary

Underground utilities

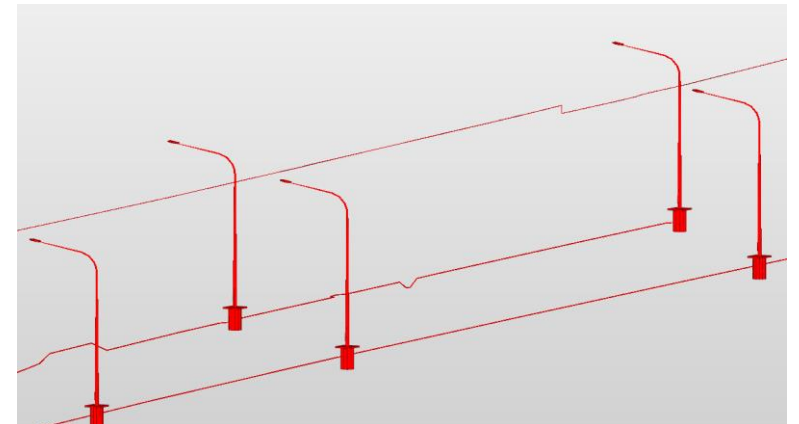
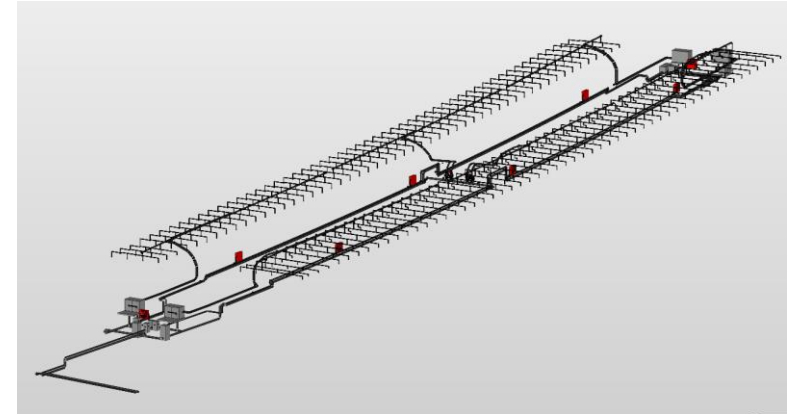
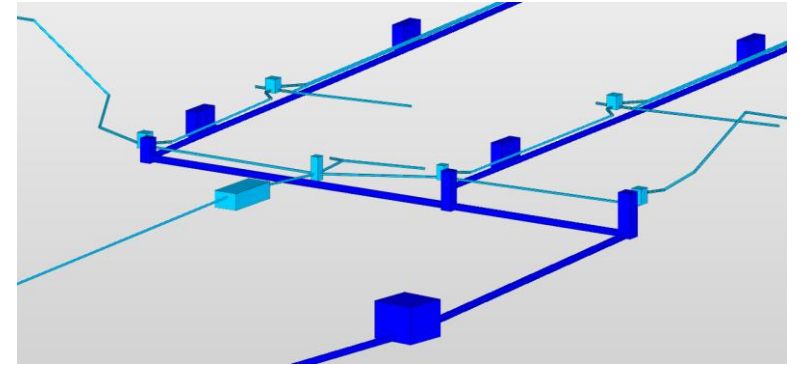
- Stormwater
- Existing utilities potential relocation
- Pipe
- Pit

Above ground utilities

- Tunnel fire services - Pumps and switchboards
- Tunnel ventilation services
- Overhead Wiring
- Power services
- Communications

Electrical Objects

▼ IFC 4.3 Class
▶ ○ IfcAudioVisualAppliance.CAMERA
▶ ○ IfcAudioVisualAppliance.TELEPHONE
▶ ○ IfcCableCarrierFitting.BEND
▶ ○ IfcCableCarrierFitting.CONNECTOR
▶ ○ IfcCableCarrierSegment.CABLETRAYSEGMENT
▶ ○ IfcDistributionChamberElement.INSPECTIONCHAMBER
▶ ○ IfcFooting
▶ ○ IfcFurniture.CABINET
▶ ○ IfcMember.POST
▶ ○ IfcSensor.CONTACTSENSOR
▶ ○ IfcSignal.VISUAL
▶ ○ IfcSlab.FLOOR





New Quantity Sets in IFC 4.3

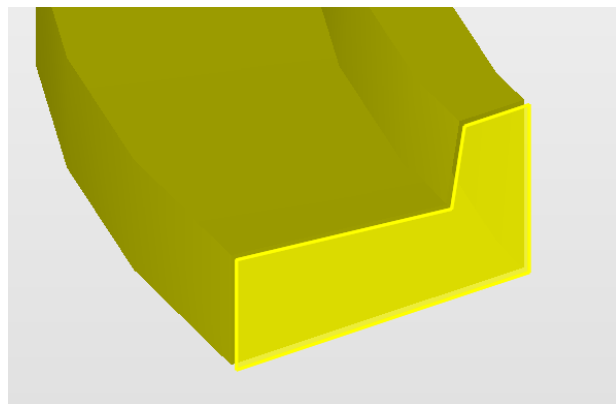
- These need to be implemented by software companies.
- Not all QTO are completely supported
- Export settings need to be activated to generate these in the IFC file.

✓ 6.6.5 Quantity Sets [↗](#)

- 6.6.5.1 [Qto_ArealStratumBaseQuantities](#)
- 6.6.5.2 [Qto_CourseBaseQuantities](#)
- 6.6.5.3 [Qto_EarthworksCutBaseQuantities](#)
- 6.6.5.4 [Qto_EarthworksFillBaseQuantities](#)
- 6.6.5.5 [Qto_ImpactProtectionDeviceBaseQuantities](#)
- 6.6.5.6 [Qto_KerbBaseQuantities](#)
- 6.6.5.7 [Qto_LinearStratumBaseQuantities](#)
- 6.6.5.8 [Qto_PavementBaseQuantities](#)
- 6.6.5.9 [Qto_PictorialSignQuantities](#)
- 6.6.5.10 [Qto_ReinforcedSoilBaseQuantities](#)
- 6.6.5.11 [Qto_SignBaseQuantities](#)
- 6.6.5.12 [Qto_SignalBaseQuantities](#)
- 6.6.5.13 [Qto_SurfaceFeatureBaseQuantities](#)
- 6.6.5.14 [Qto_VolumetricStratumBaseQuantities](#)



- Cross sectional area if extruded solid
- Length if generated by along alignment
- Volume quantity used for GHG calculations



6.6.5.6 Qto_KerbBaseQuantities

6.6.5.6.1 Semantic definition [↗](#)

Quantity set for Kerb Base.

6.6.5.6.2 Applicable entities [↗](#)

QTO_TYPEDRIVENOVERRIDE The element quantity defined by this [IfcPropertySetTemplate](#) can be assigned to subtypes of [IfcTypeObject](#) and can be overridden by an element quantity with same name at subtypes of [IfcObject](#).

- IfcKerb
- IfcKerbType

6.6.5.6.3 Properties [↗](#)

Name	Data Type	Description	↗
Length	IfcQuantityLength	The length of the object.	↗
Width	IfcQuantityLength	The width of the object. Only given, if the object has constant thickness (prismatic).	↗
Height	IfcQuantityLength	Characteristic height	↗
Depth	IfcQuantityLength	The depth of the object. Depth (one direction of the non-projected foot print area) of the slab. It shall only be provided, if the slab is rectangular. NOTE Also referred to as width, but not to be confused with the "Width" quantity, that denotes the thickness in the context of the slab.	↗
Volume	IfcQuantityVolume	Volume of the element.	↗
Weight	IfcQuantityWeight	Total weight of object	↗

Table 6.6.5.6.A [↗](#)



- Very limited quantities available
- Perhaps for some components only count is required



6.1.5.2 Qto_BuildingElementProxyQuantities

✓ 6.1.5.2.1 Semantic definition [↗](#)

Quantity set for Building Element Proxies.

✓ 6.1.5.2.2 Applicable entities [↗](#)

QTO_TYPEDRIVENOVERRIDE The element quantity defined by this [IfcPropertySetTemplate](#) can be assigned to subtypes of [IfcTypeObject](#) and can be overridden by an element quantity with same name at subtypes of [IfcObject](#).

- [IfcBuildingElementProxy](#)
- [IfcBuildingElementProxyType](#)

✓ 6.1.5.2.3 Properties [↗](#)

Name	Data Type	Description	
NetSurfaceArea	IfcQuantityArea	Net surface area of the object, normally generated as perimeter * length + 2 * cross section area taking into account possible processing features (cut-out's, etc.) or openings and recesses.	↗
NetVolume	IfcQuantityVolume	Total net volume of the object, taking into account possible processing features (cut-out's, etc.) or openings and recesses.	↗

Table 6.1.5.2.A [↗](#)



- Pavement specific quantities available

6.6.5.8 Qto_PavementBaseQuantities

6.6.5.8.1 Semantic definition [↗](#)

Quantity set for Pavement.

6.6.5.8.2 Applicable entities [↗](#)

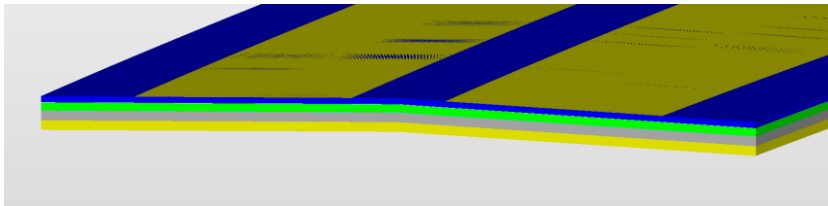
QTO_TYPEDRIVENOVERRIDE The element quantity defined by this [IfcPropertySetTemplate](#) can be assigned to subtypes of [IfcTypeObject](#) and can be overridden by an element quantity with same name at subtypes of [IfcObject](#).

- [IfcPavement](#)
- [IfcPavementType](#)

6.6.5.8.3 Properties [↗](#)

Name	Data Type	Description	
Length	IfcQuantityLength	The length of the object.	↗
Width	IfcQuantityLength	The width of the object. Only given, if the object has constant thickness (prismatic).	↗
Depth	IfcQuantityLength	The depth of the object. Depth (one direction of the non-projected foot print area) of the slab. It shall only be provided, if the slab is rectangular. NOTE Also referred to as width, but not to be confused with the "Width" quantity, that denotes the thickness in the context of the slab.	↗
GrossArea	IfcQuantityArea	Gross Area of the object. Openings, recesses, projections and cut-outs are not taken into account. Indicates the extruded area of the element. Only given, if the element is prismatic.	↗
NetArea	IfcQuantityArea	Total net area of the object. Openings, recesses and cut-outs are taken into account by subtraction, projections by addition. Indicates the extruded area of the object. Only given when prismatic.	↗
GrossVolume	IfcQuantityVolume	Total gross volume of the object. Openings, recesses, enclosed objects and projections are not taken into account.	↗
NetVolume	IfcQuantityVolume	Total net volume of the object, taking into account possible processing features (cut-out's, etc.) or openings and recesses. Total net volume of the slab. Openings and recesses are taken into account by subtraction, projections by addition.	↗

Table 6.6.5.8.3 [↗](#)





Environmental indicators

Table 4. Impact categories included in this assessment

Impact category	Acronym	Unit
Global Warming Potential	GWP	kg CO ₂ equivalents
Ozone Depletion Potential	ODP	kg CFC-11 equivalents
Acidification Potential of soil and water	AP	kg SO ₂ equivalents
Eutrophication Potential	EP	kg PO ₄ ³⁻ equivalents
Photochemical Ozone Creation Potential	POCP	kg C ₂ H ₄ equivalents
Abiotic Depletion Potential for Mineral Elements	ADPE	kg Sb equivalents
Abiotic Depletion Potential for Fossil Fuels	ADPF	MJ

IFC Environmental Indicators properties

AtmosphericAcidificationPerUnit	Pset_EnvironmentalImpactIndicators
ClimateChangePerUnit	Pset_EnvironmentalImpactIndicators
EutrophicationPerUnit	Pset_EnvironmentalImpactIndicators
ExpectedServiceLife	Pset_EnvironmentalImpactIndicators
FunctionalUnitReference	Pset_EnvironmentalImpactIndicators
HazardousWastePerUnit	Pset_EnvironmentalImpactIndicators
InertWastePerUnit	Pset_EnvironmentalImpactIndicators
LifeCyclePhase	Pset_EnvironmentalImpactIndicators
NonHazardousWastePerUnit	Pset_EnvironmentalImpactIndicators
NonRenewableEnergyConsumptionPerUnit	Pset_EnvironmentalImpactIndicators
PhotochemicalOzoneFormationPerUnit	Pset_EnvironmentalImpactIndicators
RadioactiveWastePerUnit	Pset_EnvironmentalImpactIndicators
RenewableEnergyConsumptionPerUnit	Pset_EnvironmentalImpactIndicators
ResourceDepletionPerUnit	Pset_EnvironmentalImpactIndicators
StratosphericOzoneLayerDestructionPerUnit	Pset_EnvironmentalImpactIndicators
TotalPrimaryEnergyConsumptionPerUnit	Pset_EnvironmentalImpactIndicators
Unit	Pset_EnvironmentalImpactIndicators
WaterConsumptionPerUnit	Pset_EnvironmentalImpactIndicators

Some correspondence between EPD and IFC properties: GWP – ClimateChangePerUnit

ClimateChangePerUnit	ifcPropertySingleValue	ifcMassMeasure	Quantity of greenhouse gases emitted calculated in equivalent CO2
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Carbon reporting

Alignment of data: CO2 equivalent

Global warming potential (GWP) = ClimateChangePerUnit property

Quantity x carbon value of material
(Quantity of green house gas emitted calculated in equivalent CO2)

Volume x specific mass = kg

(Solibri has a Carbon Checker tool.
Has currently Finnish and Swedish material databases)

3D

Road Elements-TMR-1	Component	GWP [kg CO2e] - A1:A3	Conversions Unit	Conversions Value	Carbon Checker Material Mapping [en]	Emissions Factor A1:A3 Typical [kg CO2e/Conversions Unit]	Volume [m3]
A-HS-Headstock	Member	28,198 kg/m ³		2400	Ready-mix concrete, C45/55, GWP.70	0.094	124.99 m3
A-HS-Headstock	Object	4,592 kg/m ³		7850	Steel structure, load bearing truss, beam, column, pile, m...	2.5	234 l
A-RS-Relieving Slab	Covering	165 kg/m ³		2400	Ready-mix concrete, C45/55, GWP.70	0.094	731 l
A-RS-Relieving Slab	Member	5,115 kg/m ³		2400	Ready-mix concrete, C25/30, GWP.70	0.067	31.81 m3
A-RS-Relieving Slab	Member	5,681 kg/m ³		2400	Ready-mix concrete, C45/55, GWP.70	0.094	25.18 m3
B-BE-Bearing Elastomeric	Plate	62,211 kg/m ³		7850	Steel structure, load bearing truss, beam, column, pile, m...	2.5	3.17 m3
B-PE-Bearing Pedestal	Plate	4,934 kg/m ³		2400	Ready-mix concrete, C45/55, GWP.70	0.094	21.87 m3
B-RB-Restraint Block	Object	289,273 kg/m ³		7850	Steel structure, load bearing truss, beam, column, pile, m...	2.5	14.74 m3
D-AC-Deck wearing surface	Covering	28,546 kg/m ³		2460	Asphalt concrete for base courses	0.05	232.08 m3
D-DK-Cast insitu deck	Covering	251,979 kg/m ³		2400	Ready-mix concrete, C45/55, GWP.70	0.094	1,116.93 m3
D-FW-Walkway	Covering	31,502 kg/m ³		2460	Asphalt concrete for base courses	0.05	256.11 m3

IFC 4.3 – Uniclass to ICMS3 Mapping

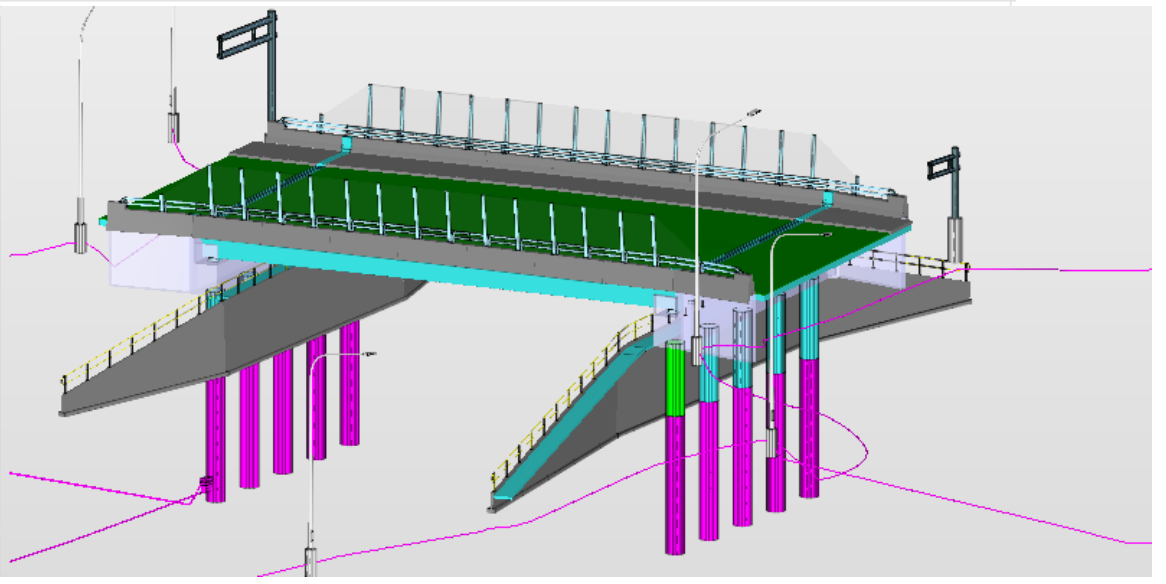


Component	TfNSW_Asset.TfNSW_UniclassAssetCode	Classification Name
Any	Ss_15	2.01.080_Demolition, site preparation and formation_General site formation and slope treatment
Any	Ss_15_10	2.02.020_Substructure_Excavation, disposal and lateral supports (specifically to receive any substructure construction but excluding general site formation and slope treatment)
Any	Ss_15_10_30	2.02.020_Substructure_Excavation, disposal and lateral supports (specifically to receive any substructure construction but excluding general site formation and slope treatment)
Any	Ss_15_10_30_05	2.02.020_Substructure_Excavation, disposal and lateral supports (specifically to receive any substructure construction but excluding general site formation and slope treatment)
Any	Ss_15_10_30_25	2.02.020_Substructure_Excavation, disposal and lateral supports (specifically to receive any substructure construction but excluding general site formation and slope treatment)
Any	Ss_15_10_30_27	2.02.020_Substructure_Excavation, disposal and lateral supports (specifically to receive any substructure construction but excluding general site formation and slope treatment)
Any	Ss_15_10_30_29	2.02.060_Substructure_Structural backfill/ground remediation
Any	Ss_15_10_30_31	2.02.060_Substructure_Structural backfill/ground remediation
Any	Ss_15_10_30_65	2.02.110_Substructure_Bases to supports for tanks, pipes, well heads and the like
Any	Ss_15_10_30_90	2.02.110_Substructure_Bases to supports for tanks, pipes, well heads and the like
Any	Ss_15_10_33	2.01.020_Demolition, site preparation and formation_Environmental treatment
Any	Ss_15_10_33_34	2.01.020_Demolition, site preparation and formation_Environmental treatment
Any	Ss_15_10_35	2.01.020_Demolition, site preparation and formation_Environmental treatment
Any	Ss_15_10_35_07	2.01.020_Demolition, site preparation and formation_Environmental treatment
Any	Ss_15_10_45	
Any	Ss_15_10_76	
Any	Ss_15_10_76_21	
Any	Ss_15_10_78	
Any	Ss_15_10_80	
Any	Ss_15_10_80_33	
Any	Ss_15_10_80_70	
Any	Ss_15_10_80_80	
Any	Ss_15_10_80_85	
Any	Ss_15_30	
Any	Ss_15_30_10	
Any	Ss_15_30_12	
Any	Ss_15_30_15	
Any	Ss_15_30_15_15	
Any	Ss_15_30_15_50	
Any	Ss_15_30_15_65	
Any	Ss_15_30_15_66	
Any	Ss_15_30_17	

CLASSIFICATION

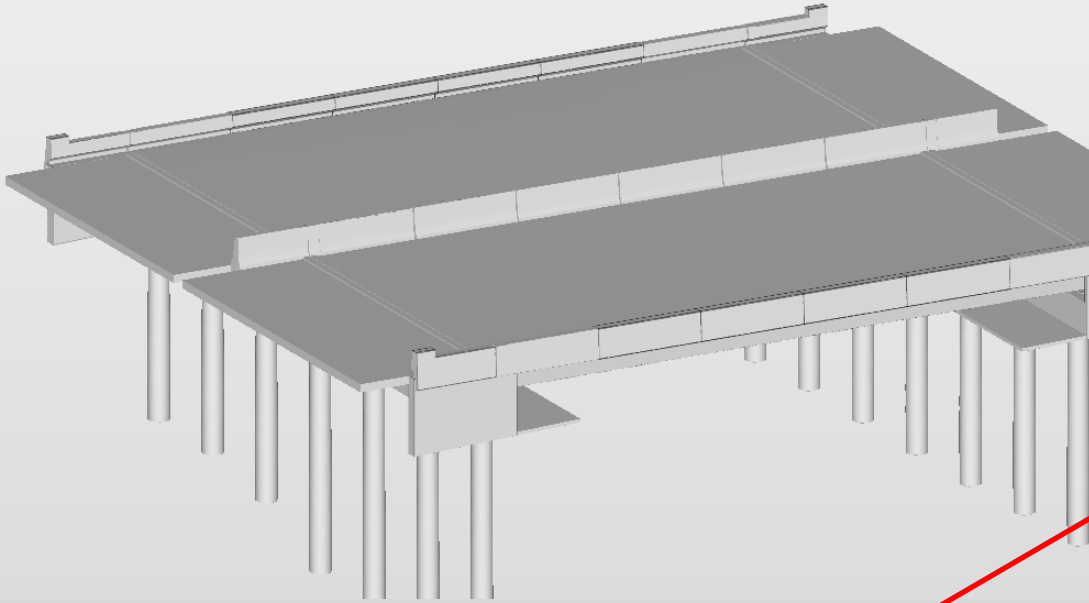
- ICMS_Uniclass_Ss_Civil-v2
 - 2.02.070_Substructure_Earth-retaining structures
 - 2.02.080_Substructure_Abutments/wing walls
 - 2.02.090_Substructure_Pile caps/footings/bases (nearest to the ground level)
 - 2.03.070_Structure_Pavement
 - 2.03.100_Structure_Main structures
 - 2.05.010_Services and equipment_Mechanical systems
 - 2.05.040_Services and equipment_Low-voltage power supply
 - 2.05.080_Services and equipment_Control systems and instrumentation
 - 2.06.030_Surface and underground drainage_Foul and waste water drainage
 - ? Unclassified
- TfNSW_Road_Cost-Codes_04
- TfNSW_SOR_Template

SELECTIO... No Selection Sets



ICMS_Elements-Uniclass_Ss

IFC 4.3 – ICMS3 reporting of GHG values in Solibri



Code	Category and Group with Description of Material or Work Item with Source	<Insert Project Type>			
		Qty	Unit	tCO ₂ e / Unit	tCO ₂ e
	Total Carbon Emissions				
1.	Acquisition Carbon Emissions				
1.01.	Site acquisition (if significant)				
2.	Construction Carbon Emissions				
2.01.	Demolition, site preparation and formation				
2.02.	Substructure e.g. by material or item of work inclusive of component materials (e.g. formwork instead of steel and timber)				
2.03.	Structure				

INFORMATION TAKEOFF

Takeoff All | GWP per Material (Copy) | [Icons]

ICMS Civil Level 3 Groups-Concrete	Material [en]	Volume [m3]	Conversions Unit	Emissions Factor A1:A3 Typical [kg CO ₂ e/Conversions Unit]	GWP [kg CO ₂ e] - A1:A3	Conversions Value
2.02_Substructure	Ready-mix concrete C20/25, GWP.70	4.26 m3	kg/m ³	0.06	613	2400
2.02_Substructure	Ready-mix concrete, C50/60, air-entrained, GWP.70	86.33 m3	kg/m ³	0.12	23,568	2275
2.02_Substructure	Ready-mix concrete, Normal Class-GP-40, GWP.357	169.48 m3	kg/m ³	0.0357	14,521	2400
2.03_Structure	Precast concrete, beam 780 x 480 mm	204.61 m3	kg/m	0.18	0	970
2.03_Structure	Ready-mix concrete C20/25, GWP.70	322.32 m3	kg/m ³	0.06	46,414	2400
2.03_Structure	Ready-mix concrete, C45/55, GWP.70	9.18 m3	kg/m ³	0.094	2,071	2400
2.03_Structure	Unclassified	37.06 m3	Unclassified	Unclassified		Unclassified

bSA IFC 4.3 – Implementation Working Group

Working Group buildingSMART \ TfNSW \ TMR, software companies, consultants, contractors and universities.

a. Clients:

- a. TfNSW
- b. TMR

b. Software:

- a. 12D
- b. Autodesk
- c. Bentley\Seequent (Leapfrog)
- d. Trimble
- e. Allplan
- f. Deswik
- g. Geometry Gym

c. Consultants, contractors and universities:

- a. EIC\CPB
- b. GHD
- c. Mitchell Brandtman
- d. CQR
- e. EXDS
- f. QUT
- g. Geometry Gym

IFC Extent of Proposed Model to be Tested



Transport for New South Wales Digital Engineering Framework -
Fictitious project solely for testing of IFC file format import and export
from model authoring software platforms.
No future infrastructure design or proposal intent.

Open for buildingSMART members



Test project dataset

a. Geometry

- Alignments
- Road entities
- Work Zone - IfcSpatialZone

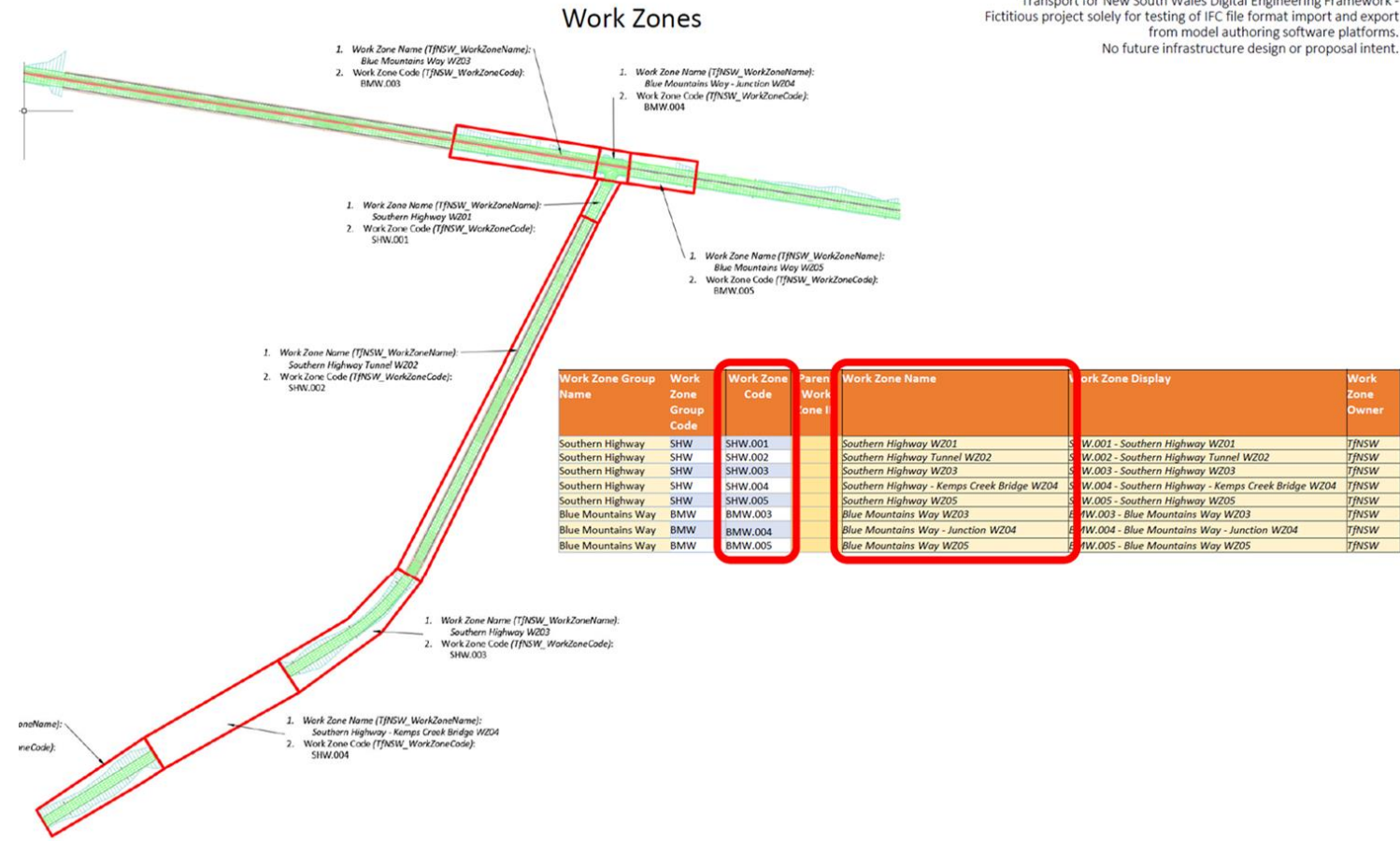
b. Metadata

- Integrate ISO, Australian and Local requirements
 - AS5488 - Classification of subsurface utility information
 - TfNSW \ TMR local schemas
- IFC properties and Property Sets
- bsDD buildingSMART Data Dictionary
- NATSPEC BIM Properties Generator v2.0

c. Uniclass classification tables

- Systems
- Products
- Elements
- Complex
- Entity
- Space\Locations

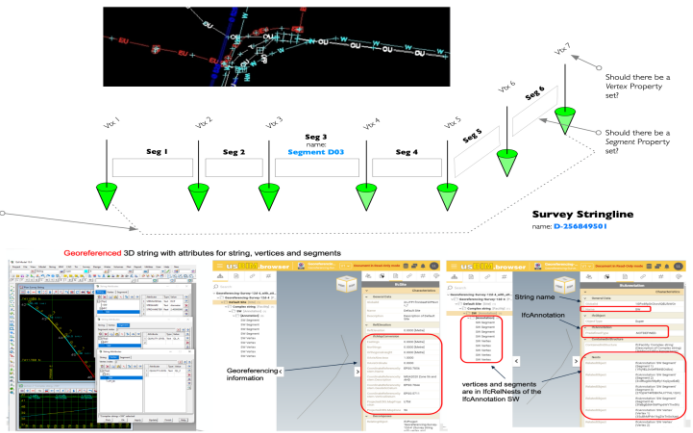
Transport for New South Wales Digital Engineering Framework - Fictitious project solely for testing of IFC file format import and export from model authoring software platforms. No future infrastructure design or proposal intent.





Survey and site conditions

Property Name	IM_43_1588 Subsurface Utility	Example
Unique Identifier	Unique Identifier	D-26849501
Asset Type	Asset Type Code	Drainage
Asset Subtype	Asset Subtype Code	SW
Asset Subtype Description	Asset Subtype Description	N/A
Asset Feature	Asset Feature Code	D
Asset Feature Description	Asset Feature Description	N/A
Asset Owner	Asset Owner	Local Council
Asset Status	Asset Status	In service
Capacity	Capacity	Unknown
Size	Size	0.825
Material	Material Description	N/A
Encasement	Encasement	None
Depth Location	Depth Location	Invert
Depth	Depth	1.70
Quality Level	Quality Level	Quality Level A
Conditions	Conditions	N/A
Utility Small Date	Utility Small Date	Unknown
Source of Information	Source of Information	Locator
Locate Method	Locate Method	Survey
Date Information Observed	Date Information Observed	2022/12/14
Location	Location	Whangaparua
Reports	Publication Report	N/A
	File Report	N/A



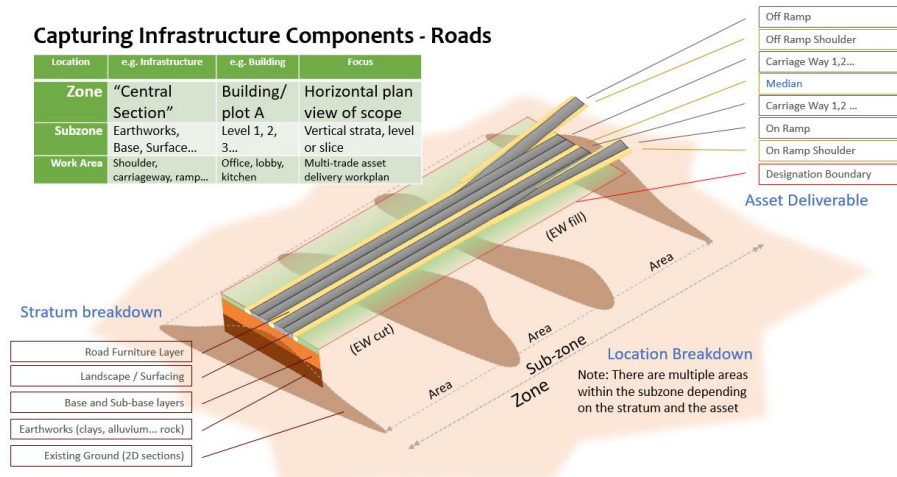
IFC 4.3 Working Group : Survey Stringline Concepts

COR/ym 24 Aug 2022 v1.04

Construction Zones

Capturing Infrastructure Components - Roads

Location	e.g. Infrastructure	e.g. Building	Focus
Zone	"Central Section"	Building/plot A	Horizontal plan view of scope
Subzone	Earthworks, Base, Surface...	Level 1, 2, 3...	Vertical strata, level or slice
Work Area	Shoulder, carriageway, ramp...	Office, lobby, kitchen	Multi-trade asset delivery workplan



Geotech, boreholes and terrain

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT: BH1 AGS Sample Project

LOCATION: Example for multistorey road garage near Furlong CI

POSITION: E 26400.286 N 608080.504 (GCS 2000)

DEPTH: 0.000 m

DATE STARTED: 1/3/20

DATE COMPLETED: 1/3/20

DATE LOGGED: 1/3/20

LOGGED BY: SN

CHECKED BY: MD

DEPTH (m)	DEPTH (ft)	DESCRIPTION	TESTS	STRUCTURE & OTHER OBSERVATIONS
0.00	0.00	CLAY with sand, silty, medium plasticity, organic		SPHINDLE
0.00	0.00	CLAY with sand, silty, medium plasticity, organic, some marl and calciferous material		200 HP Smp = 100 - 200kPa
1.00	3.28	CLAY with sand, silty, medium plasticity, organic, some marl and calciferous material		100 HP Smp = 100 - 200kPa
2.00	6.56	RESIDUAL SOIL		200 HP Smp = 100 - 200kPa
3.00	9.84	RESIDUAL SOIL		
4.00	13.12	RESIDUAL SOIL		
5.00	16.40	RESIDUAL SOIL		
6.00	19.68	RESIDUAL SOIL		
7.00	22.96	RESIDUAL SOIL		
8.00	26.24	RESIDUAL SOIL		
9.00	29.52	RESIDUAL SOIL		
10.00	32.80	RESIDUAL SOIL		
11.00	36.08	RESIDUAL SOIL		
12.00	39.36	RESIDUAL SOIL		
13.00	42.64	RESIDUAL SOIL		
14.00	45.92	RESIDUAL SOIL		
15.00	49.20	RESIDUAL SOIL		
16.00	52.48	RESIDUAL SOIL		
17.00	55.76	RESIDUAL SOIL		
18.00	59.04	RESIDUAL SOIL		
19.00	62.32	RESIDUAL SOIL		
20.00	65.60	RESIDUAL SOIL		
21.00	68.88	RESIDUAL SOIL		
22.00	72.16	RESIDUAL SOIL		
23.00	75.44	RESIDUAL SOIL		
24.00	78.72	RESIDUAL SOIL		
25.00	82.00	RESIDUAL SOIL		
26.00	85.28	RESIDUAL SOIL		
27.00	88.56	RESIDUAL SOIL		
28.00	91.84	RESIDUAL SOIL		
29.00	95.12	RESIDUAL SOIL		
30.00	98.40	RESIDUAL SOIL		
31.00	101.68	RESIDUAL SOIL		
32.00	104.96	RESIDUAL SOIL		
33.00	108.24	RESIDUAL SOIL		
34.00	111.52	RESIDUAL SOIL		
35.00	114.80	RESIDUAL SOIL		
36.00	118.08	RESIDUAL SOIL		
37.00	121.36	RESIDUAL SOIL		
38.00	124.64	RESIDUAL SOIL		
39.00	127.92	RESIDUAL SOIL		
40.00	131.20	RESIDUAL SOIL		
41.00	134.48	RESIDUAL SOIL		
42.00	137.76	RESIDUAL SOIL		
43.00	141.04	RESIDUAL SOIL		
44.00	144.32	RESIDUAL SOIL		
45.00	147.60	RESIDUAL SOIL		
46.00	150.88	RESIDUAL SOIL		
47.00	154.16	RESIDUAL SOIL		
48.00	157.44	RESIDUAL SOIL		
49.00	160.72	RESIDUAL SOIL		
50.00	164.00	RESIDUAL SOIL		
51.00	167.28	RESIDUAL SOIL		
52.00	170.56	RESIDUAL SOIL		
53.00	173.84	RESIDUAL SOIL		
54.00	177.12	RESIDUAL SOIL		
55.00	180.40	RESIDUAL SOIL		
56.00	183.68	RESIDUAL SOIL		
57.00	186.96	RESIDUAL SOIL		
58.00	190.24	RESIDUAL SOIL		
59.00	193.52	RESIDUAL SOIL		
60.00	196.80	RESIDUAL SOIL		
61.00	200.08	RESIDUAL SOIL		
62.00	203.36	RESIDUAL SOIL		
63.00	206.64	RESIDUAL SOIL		
64.00	209.92	RESIDUAL SOIL		
65.00	213.20	RESIDUAL SOIL		
66.00	216.48	RESIDUAL SOIL		
67.00	219.76	RESIDUAL SOIL		
68.00	223.04	RESIDUAL SOIL		
69.00	226.32	RESIDUAL SOIL		
70.00	229.60	RESIDUAL SOIL		
71.00	232.88	RESIDUAL SOIL		
72.00	236.16	RESIDUAL SOIL		
73.00	239.44	RESIDUAL SOIL		
74.00	242.72	RESIDUAL SOIL		
75.00	246.00	RESIDUAL SOIL		
76.00	249.28	RESIDUAL SOIL		
77.00	252.56	RESIDUAL SOIL		
78.00	255.84	RESIDUAL SOIL		
79.00	259.12	RESIDUAL SOIL		
80.00	262.40	RESIDUAL SOIL		
81.00	265.68	RESIDUAL SOIL		
82.00	268.96	RESIDUAL SOIL		
83.00	272.24	RESIDUAL SOIL		
84.00	275.52	RESIDUAL SOIL		
85.00	278.80	RESIDUAL SOIL		
86.00	282.08	RESIDUAL SOIL		
87.00	285.36	RESIDUAL SOIL		
88.00	288.64	RESIDUAL SOIL		
89.00	291.92	RESIDUAL SOIL		
90.00	295.20	RESIDUAL SOIL		
91.00	298.48	RESIDUAL SOIL		
92.00	301.76	RESIDUAL SOIL		
93.00	305.04	RESIDUAL SOIL		
94.00	308.32	RESIDUAL SOIL		
95.00	311.60	RESIDUAL SOIL		
96.00	314.88	RESIDUAL SOIL		
97.00	318.16	RESIDUAL SOIL		
98.00	321.44	RESIDUAL SOIL		
99.00	324.72	RESIDUAL SOIL		
100.00	328.00	RESIDUAL SOIL		

Road, bridge, tunnel design models

Project File Views Models Settings BIM Cad Tim Survey Volumes Design Water Plot Report Utilities User Help

Project: BLUE MOUNTAINS WAY WORK ZONE PC-WZ-04

Section 3 "MA Alignments" - E501

INSPECTIVE DESIGN DESIGN Tunnel en-8

IFC 4.3 – Resources for IFC



buildingSMART Data Dictionary Search (bSDD)

<https://search.bsdd.buildingsmart.org/>

Pr 20 85 08 15 Concrete beams | Uniclass (thenbs.com)

https://uniclass.thenbs.com/taxon/pr_20_85_08_15

Code	Group	Sub group	Section	Object	Title	IFC 4x3Add2 TC1	
3	Pr_20_85_07_84	20	85	07	84	Stainless steel rails	ifcRailingType.GUARDRAIL
4	Pr_20_85_07_85	20	85	07	85	Stainless steel support rails	ifcRailingType.GUARDRAIL
5	Pr_20_85_07_92	20	85	07	92	Unplasticized polyvinyl chloride (PVC-U) support rails	ifcRailingType.GUARDRAIL
6	Pr_20_85_07_97	20	85	07	97	Wall-mounted furniture support rails	ifcRailingType.GUARDRAIL
8	Pr_20_85_08_02	20	85	08	02	Aluminium structural beams	ifcBeamType.BEAM
9	Pr_20_85_08_11	20	85	08	11	Carbon steel beams	ifcBeamType.BEAM
0	Pr_20_85_08_12	20	85	08	12	Castellated carbon steel beams	ifcBeamType.BEAM
1	Pr_20_85_08_15	20	85	08	15	Concrete beams	ifcBeamType.BEAM
2	Pr_20_85_08_16	20	85	08	16	Concrete pier caps	ifcBeamType.PIERCAP
3	Pr_20_85_08_17	20	85	08	17	Cross-laminated timber beams	ifcBeamType.BEAM
4	Pr_20_85_08_33	20	85	08	33	Glued laminated timber beams	ifcBeamType.BEAM
5	Pr_20_85_08_36	20	85	08	36	Hardwood beams	ifcBeamType.BEAM
6	Pr_20_85_08_50	20	85	08	50	Metal web joists	ifcBeamType.JOIST
7	Pr_20_85_08_63	20	85	08	63	Plastics beams	ifcBeamType.BEAM
8	Pr_20_85_08_65	20	85	08	65	Post-tensioned concrete beams	ifcBeamType.BEAM
9	Pr_20_85_08_66	20	85	08	66	Prestressed concrete T-beams	ifcBeamType.T_BEAM
0	Pr_20_85_08_81	20	85	08	81	Softwood beams	ifcBeamType.BEAM
1	Pr_20_85_08_82	20	85	08	82	Steel pier caps	ifcBeamType.PIERCAP
2	Pr_20_85_08_83	20	85	08	83	Stainless steel structural beams	ifcBeamType.BEAM
3	Pr_20_85_08_84	20	85	08	84	Structural wood-composite box beams	ifcBeamType.BEAM
4	Pr_20_85_08_85	20	85	08	85	Structural wood-composite I-beams	ifcBeamType.BEAM
5	Pr_20_85_08_86	20	85	08	86	Structural wood-composite I-joists	ifcBeamType.JOIST
6	Pr_20_85_08_87	20	85	08	87	Structural wood composites	ifcBeamType.BEAM; ifcBeamType.JOIST
7	Pr_20_85_09_01	20	85	09	01	Above-ground drainage pipe brackets	ifcDiscreteAccessoryType.BRACKET
8	Pr_20_85_09_02	20	85	09	02	Aluminium brackets	ifcDiscreteAccessoryType.BRACKET
9	Pr_20_85_09_03	20	85	09	03	Aluminium bronze brackets	ifcDiscreteAccessoryType.BRACKET
0	Pr_20_85_09_05	20	85	09	05	Aluminium downpipe brackets	ifcDiscreteAccessoryType.BRACKET

NATSPEC BIM - NATSPEC BIM Properties Generator

<https://www.bim.natspec.org/tools/properties-generator>



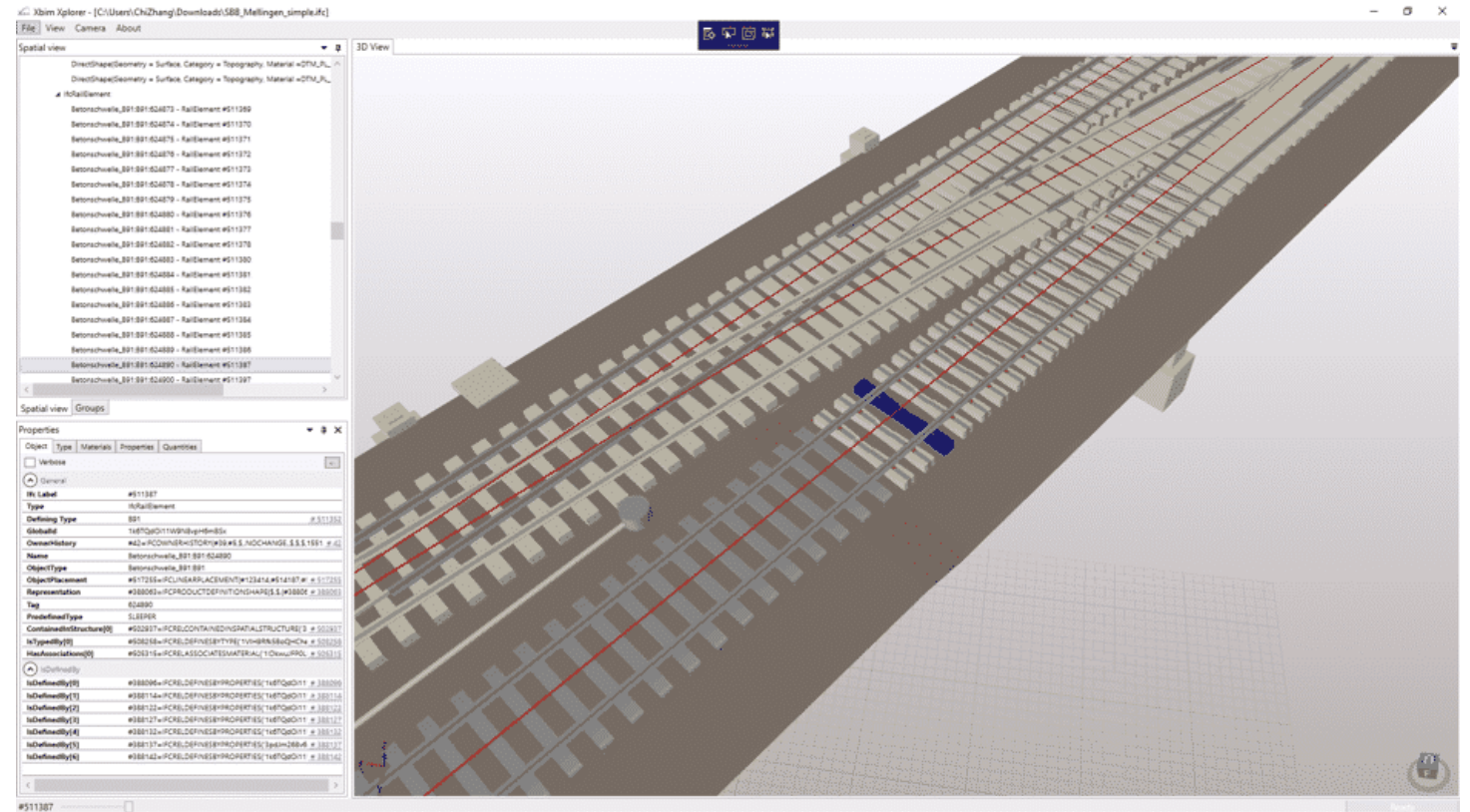
- Geotechnical and Terrain
 - Boreholes
 - Geo models
 - Geo slices
 - Stratums
- Aggregate Course
- Earthworks Structures
 - Cuts
 - Fills
 - Soil Reinforcement
- Alignments





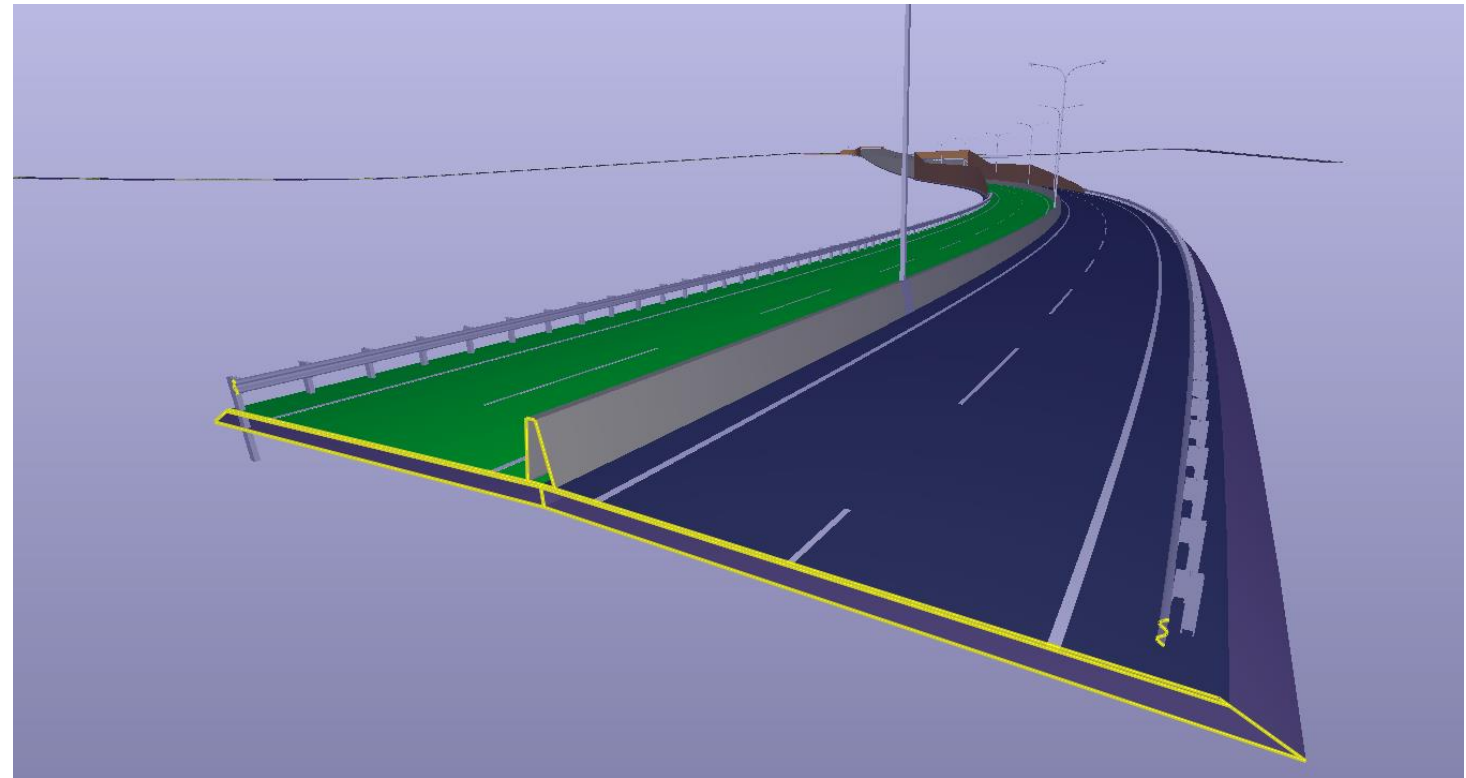
- Track Domain
- Telecommunications Domain
- Signalling Domain
- Energy Domain

- Systems
- Spatial





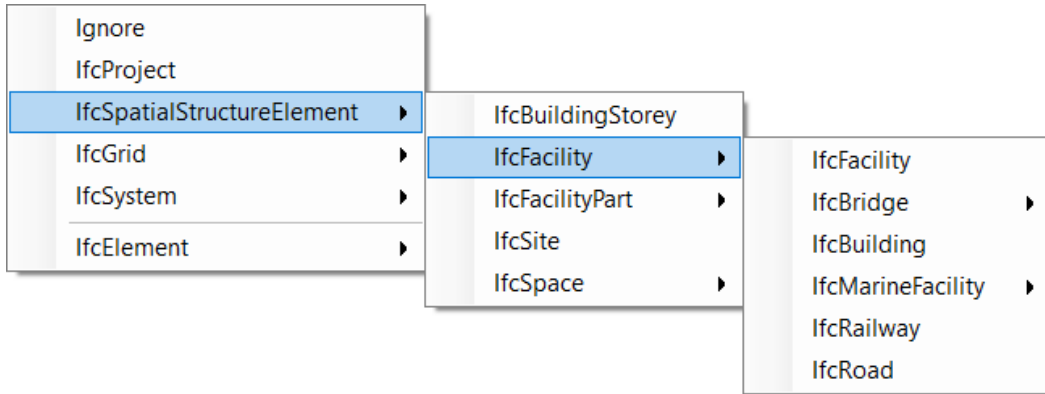
- Controlled Access Highways, Dual carriageway, Single carriageway, Street, Bicycle Path, Footpath
- Interchanges
- Intersections
- Road Structure
- Road Guard Elements
- Road Sign Elements
- Road Paving Components
- Utilities
- Paved Surfaces





- Complexes : Cargo Ports, Passenger Terminals, Marinas, Ship Building Yards, Marine and Water Maintenance, Canals, Channels, Ship Locks
- Facilities : Breakwaters, Revetments, Sluices, Ship Lifts, Hydraulic lift docks, Slipways, Dry Docks, Floating Docks, Wharfs/Quays, Ship Locks, Anchorages, Navigational Channels, Storage/Working Areas, Intermodal yards
- Products : Cargo and Vehicles, Cranes, Marine Doors/Lock Gates, Aids to Navigation, Fenders and Bollards, Mooring Systems, Rock Armour Systems

IFC 4.3 – Infrastructure Extension Facility Classification



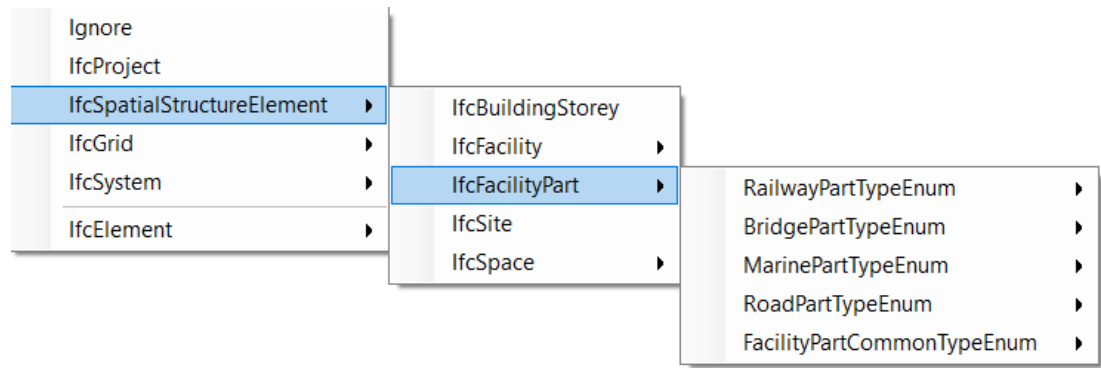
Bridge

- NOTDEFINED
- USERDEFINED
- ARCHED
- CABLE_STAYED
- CANTILEVER
- CULVERT
- FRAMEWORK
- GIRDER
- SUSPENSION
- TRUSS

Marine Facility

- NOTDEFINED
- USERDEFINED
- CANAL
- WATERWAYSHIPLIFT
- EMBANKMENT
- LAUNCHRECOVERY
- MARINEDEFENCE
- HYDROLIFT
- SHIPYARD
- SHIPLIFT
- PORT
- QUAY
- FLOATINGDOCK
- NAVIGATIONALCHANNEL
- BREAKWATER
- DRYDOCK
- JETTY
- SHIPLOCK
- BARRIERBEACH
- SLIPWAY
- WATERWAY

IFC 4.3 – Infrastructure Extension Facility Part Classification



Railway

- NOTDEFINED
- USERDEFINED
- TRACKSTRUCTURE
- TRACKSTRUCTUREPART
- LINESIDESTRUCTUREPART
- DILATATIONSUPERSTRUCTURE
- PLAINTRACKSUPESTRUCTURE
- LINESIDESTRUCTURE
- SUPERSTRUCTURE
- TURNOUTSUPERSTRUCTURE

Road

- ROADSIDEPART
- BUS_STOP
- HARDSHOULDER
- INTERSECTION
- PASSINGBAY
- ROADWAYPLATEAU
- ROADSIDE
- REFUGEISLAND
- TOLLPLAZA
- CENTRALRESERVE
- SIDEWALK
- PARKINGBAY
- RAILWAYCROSSING
- PEDESTRIAN_CROSSING
- SOFTSHOULDER
- BICYCLECROSSING
- CENTRALISLAND
- SHOULDER
- TRAFFICLANE
- ROADSEGMENT
- ROUNABOUT
- LAYBY
- CARRIAGEWAY
- TRAFFICISLAND

Marine

- CREST
- MANUFACTURING
- LOWWATERLINE
- CORE
- WATERFIELD
- CILL_LEVEL
- BERTHINGSTRUCTURE
- COPELEVEL
- CHAMBER
- STORAGE
- APPROACHCHANNEL
- VEHICLESERVICING
- SHIPTRANSFER
- GATEHEAD
- GUDINGSTRUCTURE
- BELOWWATERLINE
- WEATHERSIDE
- LANDFIELD
- PROTECTION
- LEEWARDSIDE
- ABOVEWATERLINE
- ANCHORAGE
- NAVIGATIONALAREA
- HIGHWATERLINE

Common

- NOTDEFINED
- USERDEFINED
- SEGMENT
- ABOVEGROUND
- JUNCTION
- LEVELCROSSING
- BELOWGROUND
- SUBSTRUCTURE
- TERMINAL
- SUPERSTRUCTURE

Bridge

- NOTDEFINED
- USERDEFINED
- ABUTMENT
- DECK
- DECK_SEGMENT
- FOUNDATION
- PIER
- PIER_SEGMENT
- PYLON
- SUBSTRUCTURE
- SUPERSTRUCTURE
- SURFACESTRUCTURE

IFC 4.3 – Georeferencing (Model Setout)



Coordinate System – Assign

Currently Assigned

Code: MGA/20C-54
Description: Map Grid of Australia Zone 54, GDA2020 Conformal Grid
How

Status: Up to date | Code type: Autodesk | Category: No filter selected | Unit: No filter selected

Search

Status	Code	Description	Definition type	Referenced to	Categories	EPSG code	Unit
✓	MGA/20-46	Map Grid of Australia Zone 46, G...	P	GDA2020-7F	Australia	7846	Meter
✓	MGA/20-47	Map Grid of Australia Zone 47, G...	P	GDA2020-7F	Australia	7847	Meter
✓	MGA/20-48	Map Grid of Australia Zone 48, G...	P	GDA2020-7F	Australia	7848	Meter
✓	MGA/20-49	Map Grid of Australia Zone 49, G...	P	GDA2020-7F	Australia	7849	Meter
✓	MGA/20-50	Map Grid of Australia Zone 50, G...	P	GDA2020-7F	Australia	7850	Meter
✓	MGA/20-51	Map Grid of Australia Zone 51, G...	P	GDA2020-7F	Australia	7851	Meter
✓	MGA/20-52	Map Grid of Australia Zone 52, G...	P	GDA2020-7F	Australia	7852	Meter
✓	MGA/20-53	Map Grid of Australia Zone 53, G...	P	GDA2020-7F	Australia	7853	Meter
✓	MGA/20-54	Map Grid of Australia Zone 54, G...	P	GDA2020-7F	Australia	7854	Meter
✓	MGA/20-55	Map Grid of Australia Zone 55, G...	P	GDA2020-7F	Australia	7855	Meter
✓	MGA/20-56	Map Grid of Australia Zone 56, G...	P	GDA2020-7F	Australia	7856	Meter
✓	MGA/20-57	Map Grid of Australia Zone 57, G...	P	GDA2020-7F	Australia	7857	Meter
✓	MGA/20-58	Map Grid of Australia Zone 58, G...	P	GDA2020-7F	Australia	7858	Meter
✓	MGA/20-59	Map Grid of Australia Zone 59, G...	P	GDA2020-7F	Australia	7859	Meter
✓	MGA/20C-46	Map Grid of Australia Zone 46, G...	P	GDA2020-C	Australia	7846	Meter

Assign View Close Help

Draw Modify Layers Clipboard

Object Selection Settings

Selected: 1

Survey Point

PREVIEW AND POSITIONING

SURVEY POINT SETTINGS

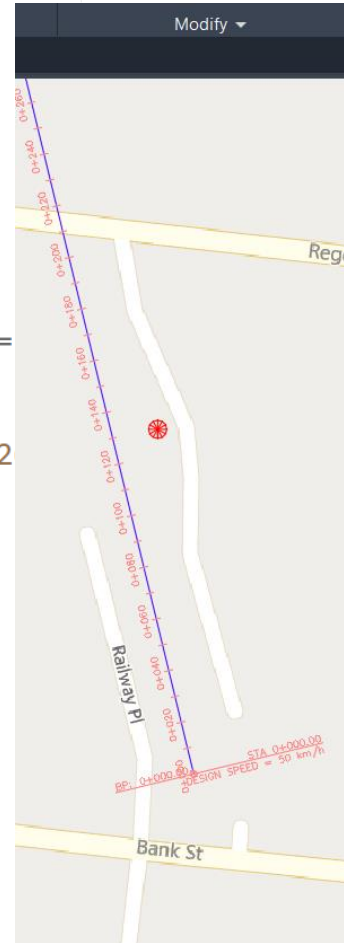
Geo Referencing Map...

Name:	EPSG:28356
Description:	BILT Developments Setout
Geodetic Datum:	GDA94
Vertical Datum:	AHD
Map Projection:	EPSG:28356
Map Zone:	56
Eastings:	333780622
Northings:	6246775891
Orthogonal Height:	97457
X Axis Abscissa:	0.99
X Axis Ordinate:	-0.14
Scale:	1.00

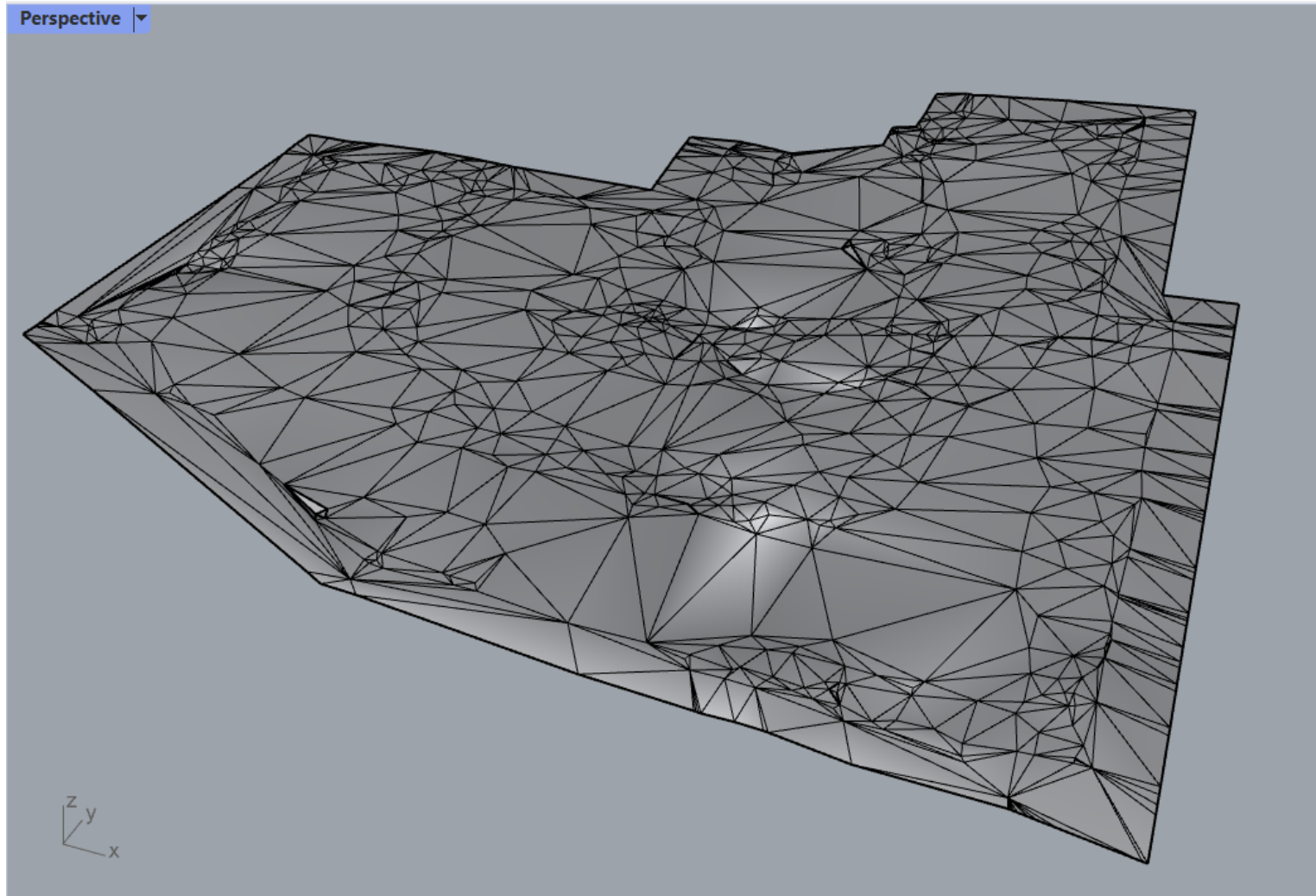
IFC 4.3 – Georeferencing (Model Setout)



```
1 <?xml version="1.0" encoding="UTF-8" standalone="yes"?>
2 <ifcXML xsi:schemaLocation="http://standards.buildingsmart.org/IFC/RELEASE/IFC4_1/FINAL/XML/IFC4x1.xsd" xmlns:xsi="
http://www.w3.org/2001/XMLSchema-instance" xmlns="http://www.buildingsmart-tech.org/ifc/IFC4x1/final">
3   <IfcProject GlobalId="15001TNHr8b8KzpLKxFkct" Name="Port Fairy Rail Trail">
4     <RepresentationContexts>
5       <IfcGeometricRepresentationContext ContextType="Model" CoordinateSpaceDimension="3" Precision="0.0001">
6         <WorldCoordinateSystem xsi:type="IfcAxis2Placement3D">
7           <Location xsi:type="IfcCartesianPoint" Coordinates="0 0 0" />
8         </WorldCoordinateSystem>
9         <TrueNorth xsi:type="IfcDirection" DirectionRatios="0 1" />
10        <HasSubContexts>
11          <IfcGeometricRepresentationSubContext id="i65" ContextIdentifier="Axis" ContextType="Model" TargetView=
graph_view" />
12        </HasSubContexts>
13        <HasCoordinateOperation xsi:type="IfcMapConversion" Eastings="500000.714333918" Northings="6833561.505302
OrthogonalHeight="0">
14          <TargetCRS xsi:type="IfcProjectedCRS" Name="EPSG:7854" GeodeticDatum="" />
15        </HasCoordinateOperation>
16      </IfcGeometricRepresentationContext>
17    </RepresentationContexts>
18    <UnitsInContext xsi:type="IfcUnitAssignment">
19      <Units>
20        <IfcSIUnit UnitType="lengthunit" Name="metre" />
21        <IfcSIUnit UnitType="areaunit" Name="square_metre" />
22        <IfcSIUnit UnitType="volumeunit" Name="cubic_metre" />
23        <IfcSIUnit UnitType="pressureunit" Prefix="mega" Name="pascal" />
24        <IfcSIUnit UnitType="planeangleunit" Name="radian" />
25      </Units>
26    </UnitsInContext>
27  </IfcProject>
```



IFC 4.3 – Surfaces



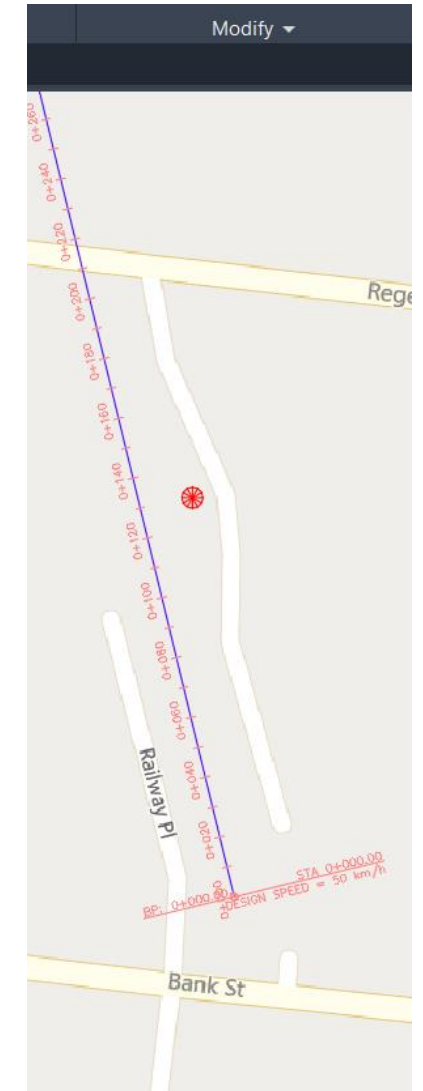


- Refactored from IFC4.1 Semantic Description
- Horizontal
 - Predefined type now Generic Cubic which covers TfNSW Cubic Transitions
- Vertical Projection
- Cant Definition

IFC 4.3 – Alignment Horizontal



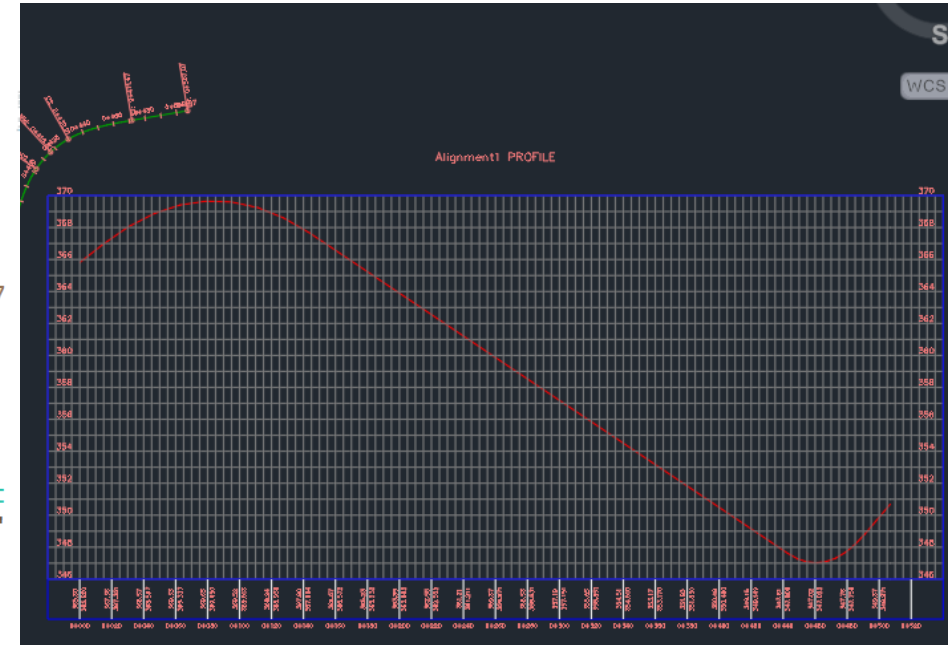
```
<IfcAlignment GlobalId="2L5kbusAn19gfk79PpuElq" Name="Alignment - (4)">
  <IsNestedBy>
    <IfcRelNests GlobalId="1pIvAF6MlX_qFGcTyEz029">
      <RelatedObjects>
        <IfcAlignmentHorizontal GlobalId="2mUQXC1YEBnQ2qu_qktr$W" Name="Alignment - (4)">
          <IsNestedBy>
            <IfcRelNests GlobalId="3xL8qfJaM35Xb_gm1K_gyd">
              <RelatedObjects>
                <IfcAlignmentSegment GlobalId="0WkIkesvQhks8SmiBjbIwq">
                  <ObjectPlacement xsi:nil="true" href="i24" />
                  <Representation xsi:type="IfcProductDefinitionShape"> ...
                </Representation>
                <GeometricParameters xsi:type="IfcAlignmentHorizontalSegment" StartDirection="
-4.49997359081849" StartRadiusOfCurvature="0" EndRadiusOfCurvature="0"
SegmentLength="1767.97072" PredefinedType="line">
                  <StartPoint id="i30" xsi:type="IfcCartesianPoint" Coordinates="108183.25509
-1082640.93264" />
                </GeometricParameters>
              </IfcAlignmentSegment>
            <IfcAlignmentSegment GlobalId="02L7PKY0pwcncrTShOvmlI">
              <ObjectPlacement xsi:nil="true" href="i24" />
              <Representation xsi:type="IfcProductDefinitionShape"> ...
            </Representation>
            <GeometricParameters xsi:type="IfcAlignmentHorizontalSegment" StartDirection="
-4.49997359081798" StartRadiusOfCurvature="-800" EndRadiusOfCurvature="-800"
SegmentLength="446.19216" PredefinedType="circulararc">
              <StartPoint xsi:nil="true" href="i34" />
            </GeometricParameters>
          </IfcAlignmentSegment>
        </IfcRelNests>
      </RelatedObjects>
    </IfcAlignmentHorizontal>
  </IsNestedBy>
</IfcAlignmentHorizontal>
</IfcRelNests>
</IsNestedBy>
</IfcRelNests>
</IsNestedBy>
</IfcAlignment>
```



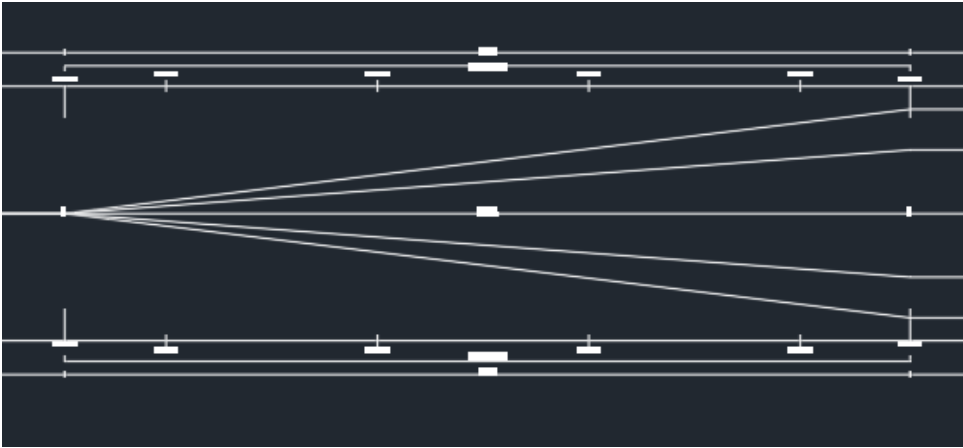
IFC 4.3 – Alignment Vertical



```
<IfcAlignment GlobalId="0jf_kMZ$nCZvfW8BjN2_gf" Name="Alignment1">
  <IsNestedBy>
    <IfcRelNests GlobalId="0EnDoLEyj8c9WsNDJc2NsV">
      <RelatedObjects>
        <IfcAlignmentHorizontal GlobalId="0IfcjsZ$nE2v5xfcXk_T0i" Name="Alignment1"
          StartDistAlong="0"> ...
        </IfcAlignmentHorizontal>
        <IfcAlignmentVertical GlobalId="1dLHMk8gz8b88CSzeLhuS2" Name="Alignment1 vertical">
          <IsNestedBy>
            <IfcRelNests GlobalId="1SaEdMn7TF990v1oFOmsAh">
              <RelatedObjects>
                <IfcAlignmentSegment GlobalId="0kFYhAnN98GvwALuoJw_OD">
                  <ObjectPlacement xsi:nil="true" href="i24" />
                  <GeometricParameters xsi:type="IfcAlignmentVerticalSegment" StartDistAlong="0"
                    HorizontalLength="14.256" StartHeight="365.8" StartGradient="0.0784810126582277"
                    EndGradient="0.0784810126582277" PredefinedType="constantgradient" />
                </IfcAlignmentSegment>
                <IfcAlignmentSegment GlobalId="0qwrT$JvPF40nGHKAy6q3a">
                  <ObjectPlacement xsi:nil="true" href="i24" />
                  <GeometricParameters xsi:type="IfcAlignmentVerticalSegment" StartDistAlong="
                    14.256" HorizontalLength="129.488" StartHeight="366.918825316456" StartGradient
                    ="0.0784810126582277" EndGradient="-0.0670103092783505" RadiusOfCurvature="890"
                    PredefinedType="parabolicarc" />
                </IfcAlignmentSegment>
                <IfcAlignmentSegment GlobalId="0nZpXxRiD0TgJCFY_XGbTu">
                  <ObjectPlacement xsi:nil="true" href="i24" />
                  <GeometricParameters xsi:type="IfcAlignmentVerticalSegment" StartDistAlong="
                    143.744" HorizontalLength="299.295" StartHeight="367.661484536082"
                    StartGradient="-0.0670103092783505" EndGradient="-0.0670103092783505"
                    PredefinedType="constantgradient" />
                </IfcAlignmentSegment>
            </IfcRelNests>
          </IsNestedBy>
        </IfcAlignmentVertical>
      </RelatedObjects>
    </IfcRelNests>
  </IsNestedBy>
</IfcAlignment>
```



IFC 4.3 – Alignment Cant



```
<IsNestedBy>
  <IfcRelNests GlobalId="32XuW$S$LJrXURNLrZpN$T">
    <RelatedObjects>
      <IfcAlignmentHorizontal GlobalId="3rECx1BJdS3ytVuRN6wNsB" Name="Alignment - (11)">
      </IfcAlignmentHorizontal>
      <IfcAlignmentCant GlobalId="1k3zvH9_8xUEv2mnQgJBS_" RailHeadDistance="1.5">
        <IsNestedBy>
          <IfcRelNests GlobalId="2ck7K921T8igVZxXXXUMs8">
            <RelatedObjects>
              <IfcAlignmentSegment GlobalId="27dF17gFEe_zgqBZZWdgod">
                <ObjectPlacement xsi:nil="true" href="i24" />
                <GeometricParameters xsi:type="IfcAlignmentCantSegment" StartDistAlong="0"
                  HorizontalLength="1452.00854111782" StartCantLeft="0" StartCantRight="0"
                  PredefinedType="constantcant" />
              </IfcAlignmentSegment>
              <IfcAlignmentSegment GlobalId="2dNpuQexJjin8r2gAHFF4I">
                <ObjectPlacement xsi:nil="true" href="i24" />
                <GeometricParameters xsi:type="IfcAlignmentCantSegment" StartDistAlong="
                  1452.00854111782" HorizontalLength="400" StartCantLeft="0" EndCantLeft="0.03"
                  StartCantRight="0" EndCantRight="-0.03" PredefinedType="lineartransition" />
              </IfcAlignmentSegment>
              <IfcAlignmentSegment GlobalId="0yUbTVL1hINE0wpJmKXY3">
                <ObjectPlacement xsi:nil="true" href="i24" />
                <GeometricParameters xsi:type="IfcAlignmentCantSegment" StartDistAlong="
                  1852.00854111782" HorizontalLength="269.335182037214" StartCantLeft="0.03"
                  StartCantRight="-0.03" PredefinedType="constantcant" />
              </IfcAlignmentSegment>
              <IfcAlignmentSegment GlobalId="2o66VgkRV814ro654AR0It">
                <ObjectPlacement xsi:nil="true" href="i24" />
                <GeometricParameters xsi:type="IfcAlignmentCantSegment" StartDistAlong="
                  2121.34372315504" HorizontalLength="400" StartCantLeft="0.03" EndCantLeft="0"

```

IFC 4.3 – Alignment Stationing and Referents



```
<RelatedElements>
  <IfcAlignment GlobalId="1m1938VK59oun8s3hoIT69" Name="Alignment - (11)" ObjectType="Rail">
    <IsNestedBy>
      <IfcRelNests GlobalId="3m434I_SPOoEMgSeAjevZBe">
        <RelatedObjects>
          <IfcReferent GlobalId="113UgFGvz9ZA6rOjAQogkf" Name="30+000.00">
            <IsDefinedBy>
              <IfcRelDefinesByProperties GlobalId="3KVd05gdf0Ph2vZQglzGyI">
                <RelatingPropertyDefinition xsi:type="IfcPropertySet" GlobalId="
                1XEUmtZXD3HQonzXR7TpQ2" Name="Pset_Stationing">
                  <HasProperties>
                    <IfcPropertySingleValue Name="Station">
```

Equation	Raw Station Back	Station Back	Station Ahead	Increase/Decrease	Comment
1	30+980.00m	30+980.00m	31+000.00m	Increasing	

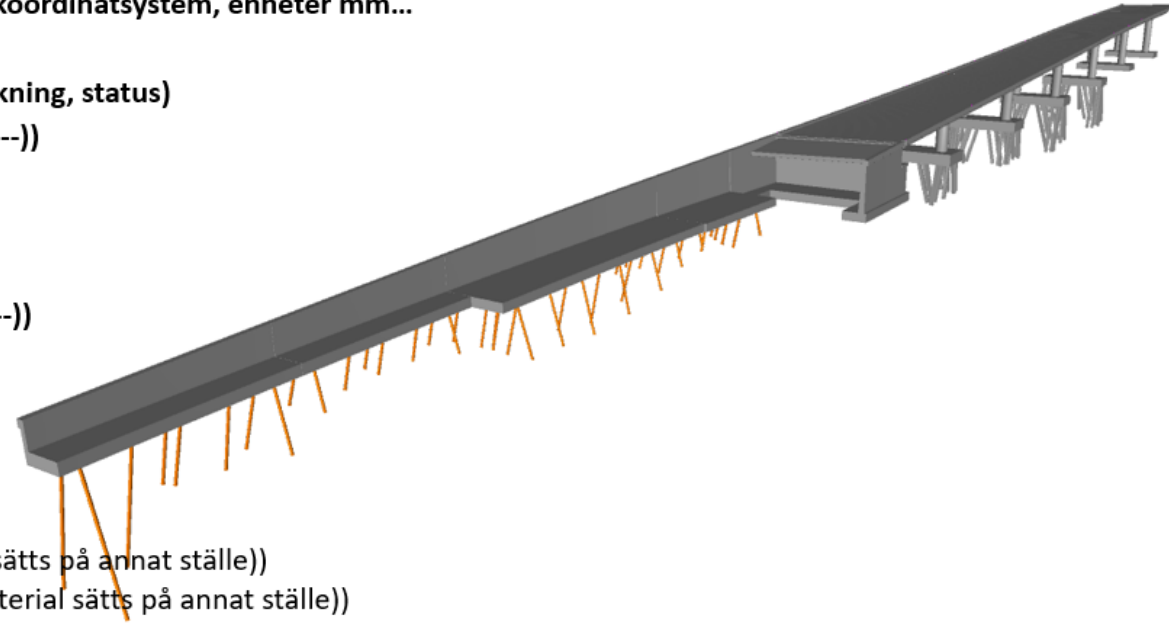
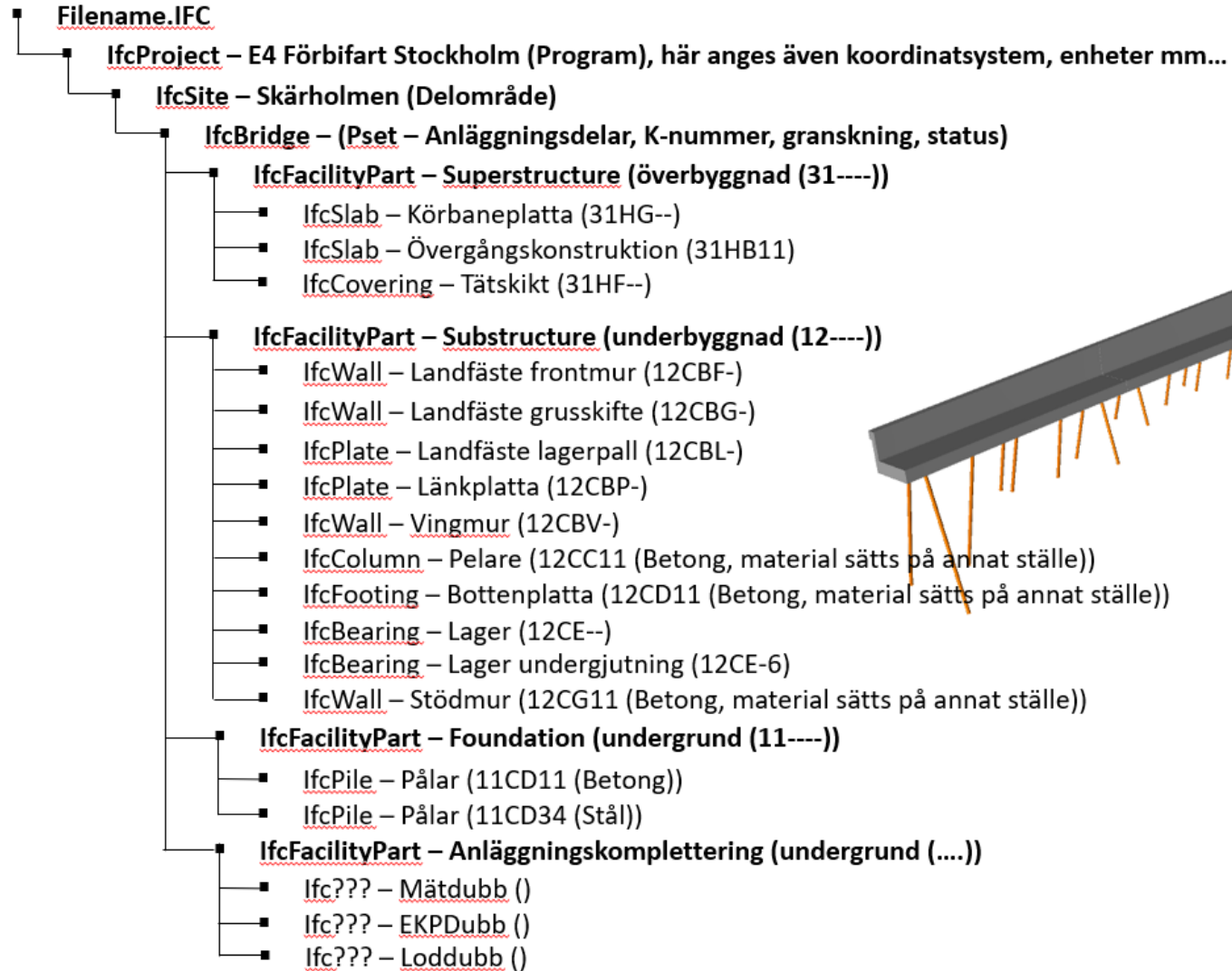
STA AHEAD = 31+000.00
STA BACK = 30+980.00

```
    </IfcPropertySingleValue>
  </IfcReferent>
</IsDefinedBy>
</IfcRelDefinesByProperties>
</IfcRelNests>
</IsNestedBy>
</IfcAlignment>
</RelatedElements>
</IfcCompositeCurve>
```



```
<PlacementRelTo xsi:type="IfcLinearPlacement">
  <PlacementRelTo xsi:nil="true" href="i33" />
  <RelativePlacement xsi:type="IfcAxis2PlacementLinear">
    <Location xsi:type="IfcPointByDistanceExpression">
      <DistanceAlong>
        <IfcNonNegativeLengthMeasure-wrapper>0</IfcNonNegativeLengthMeasure-wrapper>
      </DistanceAlong>
      <BasisCurve xsi:nil="true" href="i387" />
    </Location>
    <Axis id="i3336" xsi:type="IfcDirection" DirectionRatios="0 0 1" />
  </RelativePlacement>
  <CartesianPosition xsi:type="IfcAxis2Placement3D">
    <Location xsi:type="IfcCartesianPoint" Coordinates="701086.40144 5181294.59966 679.276"
    />
    <Axis id="i3929" xsi:type="IfcDirection" DirectionRatios="0 0 1" />
    <RefDirection xsi:type="IfcDirection" DirectionRatios="0.1539566 0.98807761 0" />
  </CartesianPosition>
</PlacementRelTo>
```


IFC 4.3 – Spatial Breakdown



IFC Bridge

IFC 4.3 – Spatial Breakdown



Browser Toolbar

- test Project
 - test site
 - IfcSolidStratum [1]
 - IfcWaterStratum [1]
 - IfcMarineFacility [1]
 - Test Shipyard
 - Water Field
 - Low Water Level
 - Pier 2
 - Berth 3
 - RHD_GM_Vessel:RHD_GM_Vessel:339925
 - Berth 4
 - RHD_GM_Vessel:RHD_GM_Vessel:339926
 - RHD_GM_Pier:RHD_GM_Pier:338216
 - Floating Dry Dock 2
 - RHD_GM_FloatingDock:RHD_GM_Floating...
 - Floating Dry Dock 1
 - RHD_GM_FloatingDock:RHD_GM_Floating...
 - Pier 3
 - Berth 5
 - RHD_GM_Vessel:RHD_GM_Vessel:339927
 - RHD_GM_Pier:RHD_GM_Pier:338217
 - Pier 1
 - Berth 1
 - RHD_GM_Vessel:RHD_GM_Vessel:339923
 - RHD_GM_Pier:RHD_GM_Pier:338215
 - Land Field
 - Floor:Landside Area Slab:338232
 - Quay 1
 - Berth 2
 - RHD_GM_Vessel:RHD_GM_Vessel:339924
 - RHD_GM_QuayWall:RHD_GM_QuayWall:3...
 - Quay 2
 - Berth 6
 - RHD_GM_Vessel:RHD_GM_Vessel:339928
 - RHD_GM_QuayWall:RHD_GM_QuayWall:3...
 - Dry Dock 1
 - RHD_GM_DryDock:RHD_GM_DryDock:338...
 - Dry Dock 2
 - RHD_GM_DryDock:RHD_GM_DryDock:338...

SpatialStructure-6-3.ifc - IFC4X3_RC2, ViewDefinition [Ifc4X3NotAssigned]

3D View

A 3D isometric view of a marine facility structure. The structure is composed of several long, narrow rectangular volumes, some of which are cyan and others red. These volumes are arranged in a complex, interconnected layout, representing different parts of the facility such as piers, berths, and dry docks. The structure is set against a black background, and a 3D coordinate system is visible in the bottom left corner of the view area.

IFC 4.3 – Spatial Breakdown



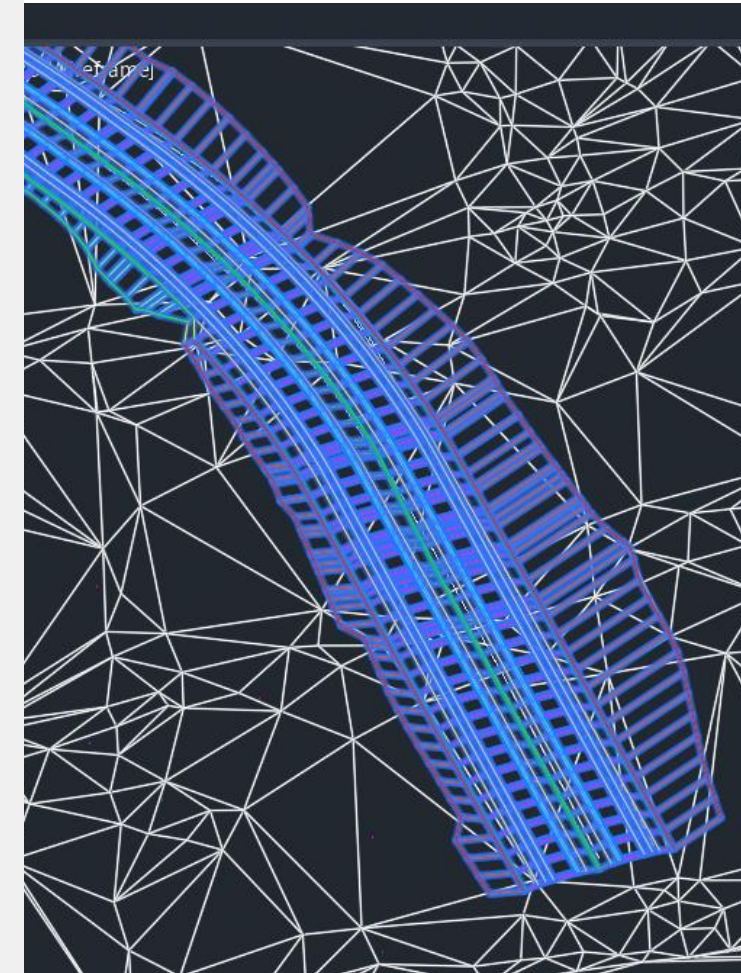
Extract Corridor Solids

Codes to Extract
[Property Data](#)
[Output Options](#)

Corridor
 Corridor - (1)

Add Regions

| Name | Code Type | Side | Start Station | End Station | Color | Layer Name Template |
|-------------------------------------|-----------|-------|---------------|-------------|---------|--------------------------|
| [-] Baseline (1) | | | | | ByLa... | <[Subassembly Name(CP)]> |
| [-] Region: 0+00.00' - 17+29.04' | | | 0+00.00' | 17+29.04' | | |
| [-] Assembly - (1) | | | 0+00.00' | 17+29.04' | | |
| [-] MedianDepressedShoulderExt | | No | | | | |
| [-] Shape - 0Base | Shape | | | | 147 | <[Subassembly Name(CP)]> |
| [-] Shape - 1Pave1 | Shape | | | | 161 | <[Subassembly Name(CP)]> |
| [-] Shape - 2Pave2 | Shape | | | | 41 | <[Subassembly Name(CP)]> |
| [-] Shape - 3SubBase | Shape | | | | 61 | <[Subassembly Name(CP)]> |
| [-] Link - 0 | Link | | | | ByLa... | <[Subassembly Name(CP)]> |
| [-] Link - 1Base | Link | | | | 35 | <[Subassembly Name(CP)]> |
| [-] Link - 2Datum_SubBase | Link | | | | mag... | <[Subassembly Name(CP)]> |
| [-] Link - 3Pave1 | Link | | | | 37 | <[Subassembly Name(CP)]> |
| [-] Link - 4Pave2 | Link | | | | 25 | <[Subassembly Name(CP)]> |
| [-] Link - 5Top_Datum_Ditch | Link | | | | 161 | <[Subassembly Name(CP)]> |
| [-] Link - 6Top_Datum_Median | Link | | | | 161 | <[Subassembly Name(CP)]> |
| [-] Link - 7Top_Gravel | Link | | | | 161 | <[Subassembly Name(CP)]> |
| [-] Link - 8Top_Pave | Link | | | | 161 | <[Subassembly Name(CP)]> |
| [-] LaneSuperelevationAOR - (Right) | | Right | | | | |
| [-] Shape - 0Base | Shape | | | | 147 | <[Subassembly Name(CP)]> |
| [-] Shape - 1Pave1 | Shape | | | | 161 | <[Subassembly Name(CP)]> |
| [-] Shape - 2Pave2 | Shape | | | | 41 | <[Subassembly Name(CP)]> |
| [-] Shape - 3SubBase | Shape | | | | 61 | <[Subassembly Name(CP)]> |
| [-] ShoulderExtendSubbase - (Right) | | Right | | | | |
| [-] Shape - 0Base | Shape | | | | 147 | <[Subassembly Name(CP)]> |
| [-] Shape - 1Pave1 | Shape | | | | 161 | <[Subassembly Name(CP)]> |
| [-] Shape - 2Pave2 | Shape | | | | 41 | <[Subassembly Name(CP)]> |
| [-] Shape - 3SubBase | Shape | | | | 61 | <[Subassembly Name(CP)]> |
| [-] DaylightStandard - (Right) | | Right | | | | |



IFC 4.3 – Spatial Breakdown

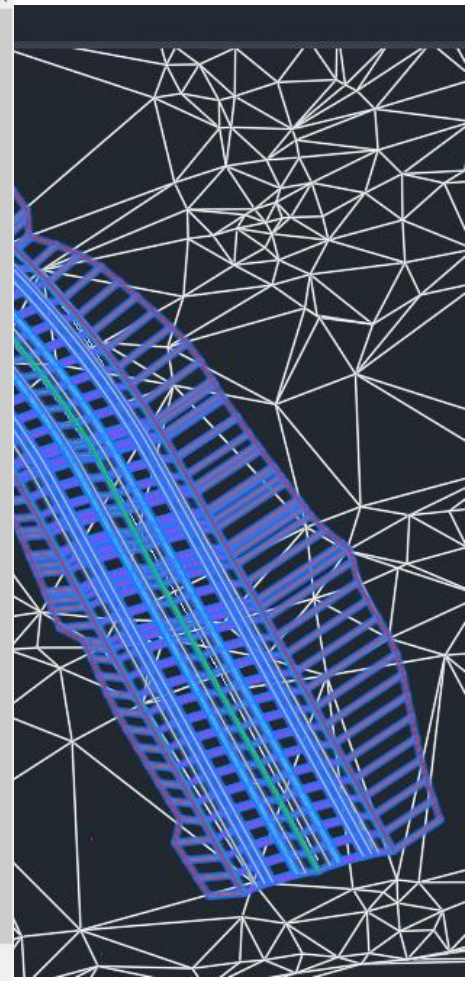


GeometryGym IFC Tree Browser <http://www.geometrygym.com>

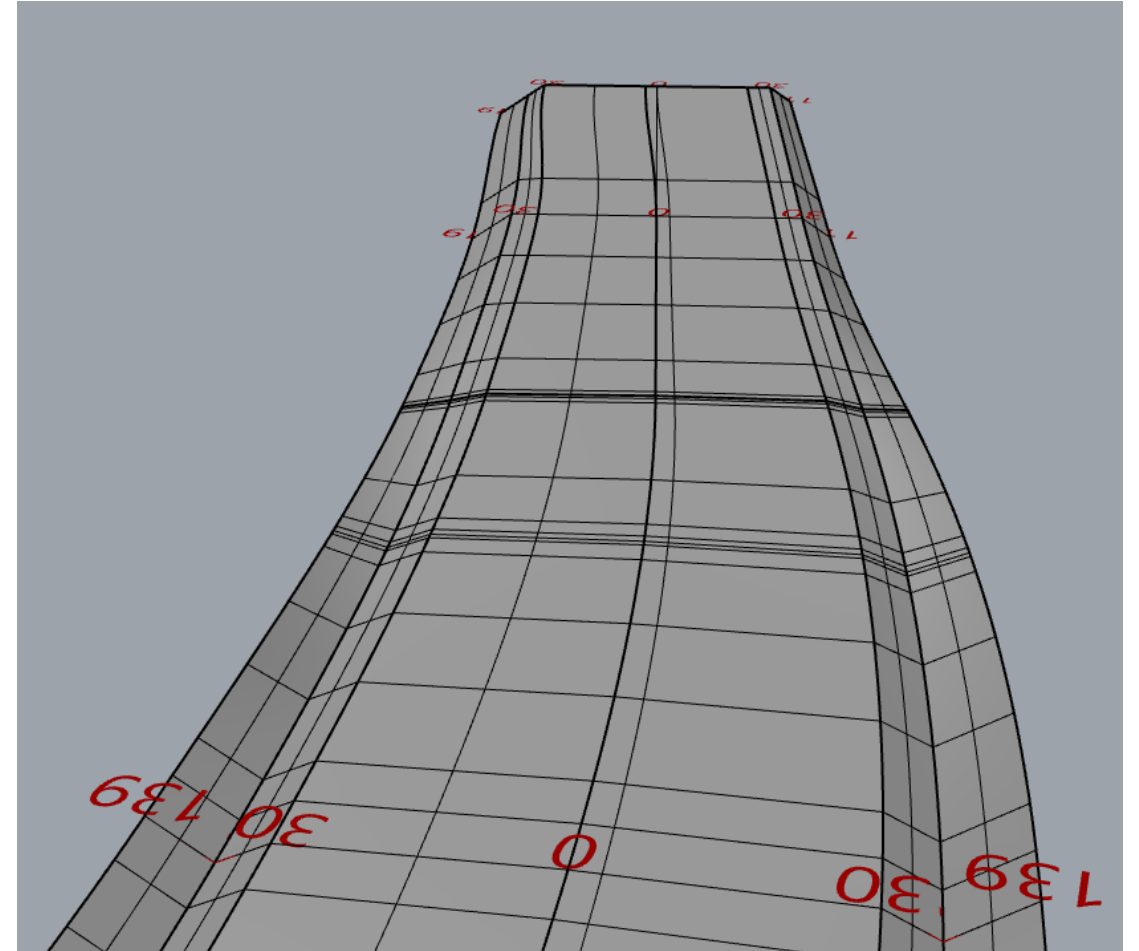
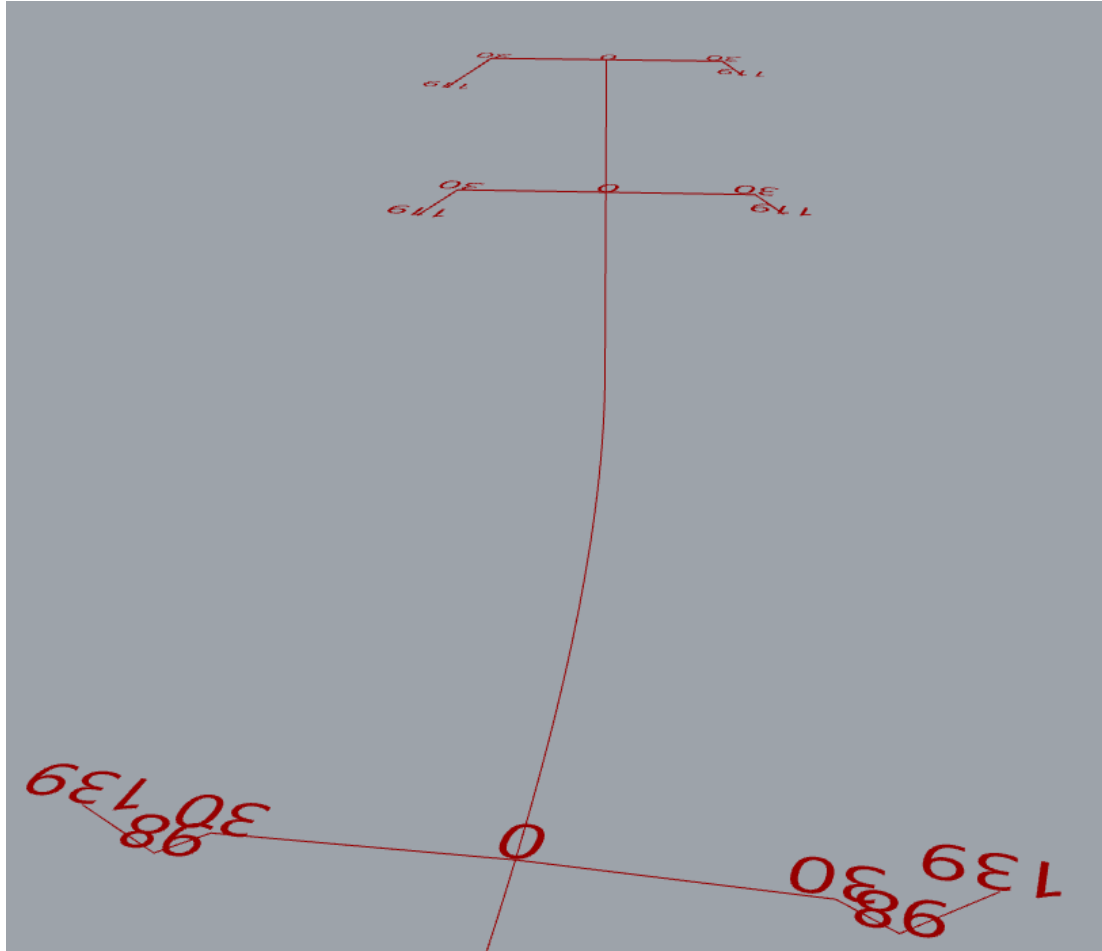
Search Id

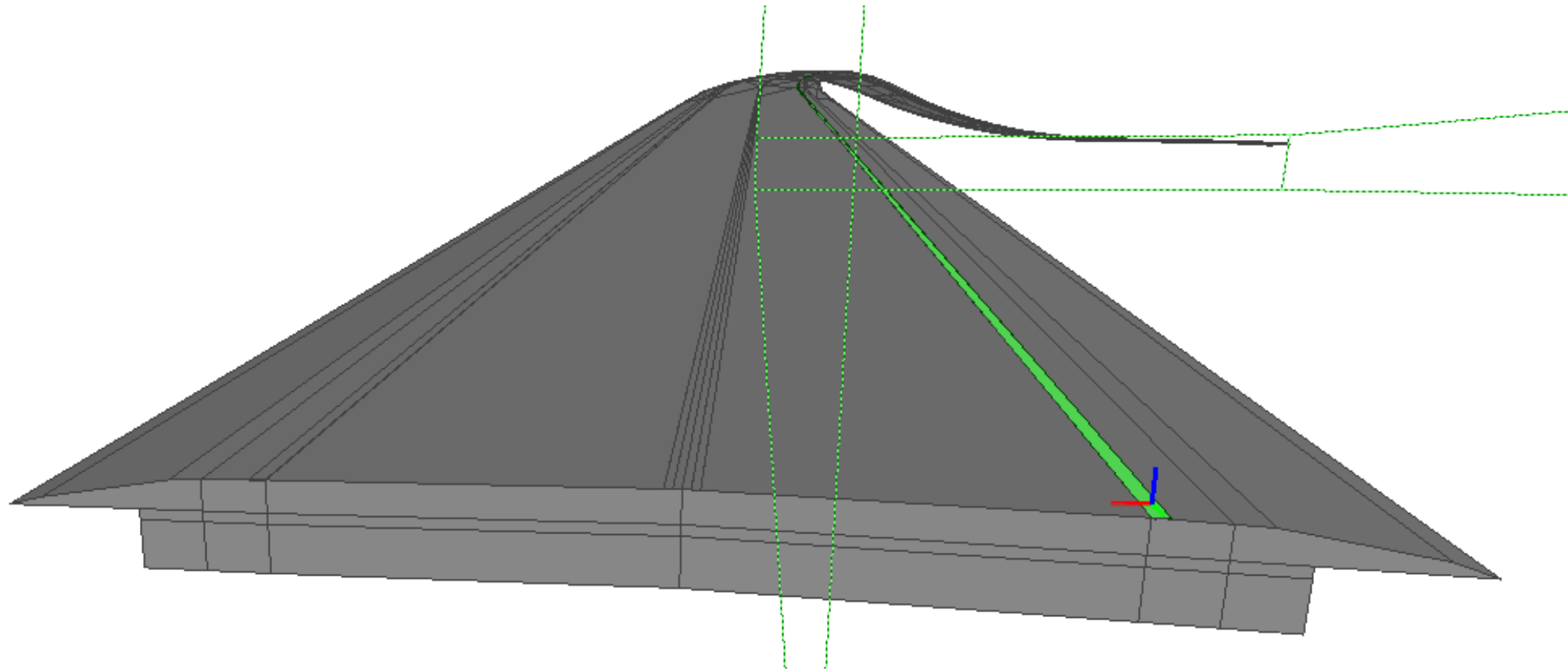
Include Entity Size

```
IFC
├─ #13= IFCPROJECT('288DNyNjvChBh2nD$soGunM',$, 'Unknown', $, $, $, $, (#39), #12);
│   └─ IsDecomposedBy : #6= IFCROAD('1_0Rza9xv0YRdL2wAIYS6j', $, 'UnknownName', $, $, #5, $, $, $, $);
│       └─ Placement : #5= IFCLOCALPLACEMENT($, #4);
│           └─ IsDecomposedBy(2)
│               └─ #18= IFCSITE('2rzL2vqnv4BBa22ZODPi0S', $, $, $, $, #17, $, $, $, $, $, $);
│                   └─ #1995= IFCFACILITYPART('28ZA1vwB1CCe$8nnEpkvZf', $, 'Corridor - (1)', $, 'Corridor', #1994, $, $, $, IFCROADPARTTYPEENUM(.ROADSEGMENT.), ..LONGITUDINAL.);
│                       └─ Placement : #1994= IFCLOCALPLACEMENT(#5, #1993);
│                           └─ IsDecomposedBy : #1999= IFCFACILITYPART('2HOgB1Ps1kvlorm7vvgN_P', $, 'Baseline (1)', $, 'Baseline', #1998, $, $, $, IFCROADPARTTYPEENUM(.ROADSEGMENT.), ..LONGITUDINAL.);
│                               └─ Placement : #1998= IFCLOCALPLACEMENT(#1994, #1997);
│                                   └─ IsDecomposedBy : #2454= IFCFACILITYPART('0tPJwAmT91hRIZxsBB7i4', $, 'Corridor Region (1)', $, 'BaselineRegion', #2453, $, $, $, IFCROADPARTTYPEENUM(.ROADSEGMENT.), ..LONGITUDINAL.);
│                                       └─ Placement : #2453= IFCLOCALPLACEMENT(#1998, #2452);
│                                           └─ IsDecomposedBy(7)
│                                               └─ #2645= IFCFACILITYPART('0RIKRJAht4shdgzGUglReO', $, 'MedianDepressedShoulderExt', $, 'MedianDepressedShoulderExt', #2644, $, $, $, IFCROADPARTTYPEENUM(.USE...);
│                                                   └─ Placement : #2644= IFCLOCALPLACEMENT(#2453, #2643);
│                                                       └─ ContainsElements(13)
│                                                           └─ #2927= IFCCOURSE('0MYZZmwoX9D8$NZx6ZP9K0', $, 'Pave1', $, 'CorridorShape', #2924, #2926, $, $);
│                                                               └─ #3231= IFCCOURSE('0d8LaU8IX3$QjJjwaPjaUr', $, 'Pave2', $, 'CorridorShape', #3228, #3230, $, $);
│                                                                   └─ #3529= IFCCOURSE('1PKS5DSYjFXhYRoLqHV58p', $, 'Base', $, 'CorridorShape', #3526, #3528, $, $);
│                                                                       └─ #3827= IFCCOURSE('1XZpkFSaDEnP5Hre81spqD', $, 'SubBase', $, 'CorridorShape', #3824, #3826, $, $);
│                                                                           └─ #4125= IFCCOURSE('1RI5NF5AXFjxlOztcvzm_h', $, 'Pave1', $, 'CorridorShape', #4122, #4124, $, $);
│                                                                               └─ #4423= IFCCOURSE('0E9MrgGi9E8eNBBrHx8BhrH', $, 'Pave2', $, 'CorridorShape', #4420, #4422, $, $);
│                                                                                   └─ #4721= IFCCOURSE('1xs3A2ITD2xvZ2wq1kP0Fg', $, 'Base', $, 'CorridorShape', #4718, #4720, $, $);
│                                                                                       └─ #5019= IFCCOURSE('3k4TmuL45F6e$PbvK5y5SW', $, 'SubBase', $, 'CorridorShape', #5016, #5018, $, $);
│                                                                                           └─ #10121= IFCCOURSE('1HdNDE$QH6fuaY2PzhSVhO', $, 'Top, Gravel', $, 'CorridorSurface', #10118, #10120, $, ..USERDEFINED.);
│                                                                                               └─ #10419= IFCCOURSE('2_lbHw6gTCRelPWeH6IAyz', $, 'Top, Datum, Median', $, 'CorridorSurface', #10416, #10418, $, ..USERDEFINED.);
│                                                                                                   └─ #10717= IFCCOURSE('32ams1NLn06hF$YcE$EMAA', $, 'Top, Datum, Ditch', $, 'CorridorSurface', #10714, #10716, $, ..USERDEFINED.);
│                                                                                                       └─ #11015= IFCCOURSE('0VwZMZuoDDmQ3LeRiR9ulv', $, 'Top, Datum, Median', $, 'CorridorSurface', #11012, #11014, $, ..USERDEFINED.);
│                                                                                                           └─ #11313= IFCCOURSE('3H646k8T10mPk2kZbASJGw', $, 'Top, Gravel', $, 'CorridorSurface', #11310, #11312, $, ..USERDEFINED.);
│                                                                                                               └─ #5040= IFCFACILITYPART('3ZyQha50r1jPGS95OMKrpm', $, 'LaneSuperelevationAOR - (Right)', $, 'LaneSuperelevationAOR - (Right)', #5039, $, $, $, IFCROADPARTTYPEENUM(.USERDEFINED.), ..LONGITUDINAL.);
│                                                                                                                   └─ #6241= IFCFACILITYPART('2E9Tq_i9D04ebBy0wQGGfp', $, 'ShoulderExtendSubbase - (Right)', $, 'ShoulderExtendSubbase - (Right)', #6240, $, $, $, IFCROADPARTTYPEENUM(.USERDEFINED.), ..LONGITUDINAL.);
│                                                                                                                       └─ #7442= IFCFACILITYPART('3UJLBPq6H2ZOzhHxq73x3O', $, 'LaneSuperelevationAOR - (Left)', $, 'LaneSuperelevationAOR - (Left)', #7441, $, $, $, IFCROADPARTTYPEENUM(.USERDEFINED.), ..LONGITUDINAL.);
│                                                                                                                           └─ #8643= IFCFACILITYPART('2NFCyK5gLEDB8rpi0sqZi6', $, 'ShoulderExtendSubbase - (Left)', $, 'ShoulderExtendSubbase - (Left)', #8642, $, $, $, IFCROADPARTTYPEENUM(.USERDEFINED.), ..LONGITUDINAL.);
│                                                                                                                               └─ #11334= IFCFACILITYPART('2_Yt6bilv2bONgAhtK43X2', $, 'DaylightStandard - (Right)', $, 'DaylightStandard - (Right)', #11333, $, $, $, IFCROADPARTTYPEENUM(.USERDEFINED.), ..LONGITUDINAL.);
│                                                                                                                                   └─ #12237= IFCFACILITYPART('0fYr0dSwn5xQ4DTomWz91v', $, 'DaylightStandard - (Left)', $, 'DaylightStandard - (Left)', #12236, $, $, $, IFCROADPARTTYPEENUM(.USERDEFINED.), ..LONGITUDINAL.);
│                                                                                                                                       └─ ContainsElements : #2001= IFCELEMENTASSEMBLY('1LheU9$_v9JQuKn2v94u3q', $, 'StringLineCollectionMap', $, $, #2003, $, $, $);
```



IFC 4.3 – Sectioned Shapes (Solids and surfaces)







Implementers meetings have been held online for several years now. All Major vendors have been attending to discuss their implementations:

- **12D**
- **Autodesk (Civil 3D and Revit)**
- **Bentley**
- **ESRI**
- **Trimble**

- **ACCA (usBIM)**
- **BlenderBIM**
- **Nemetchek (ARCHICAD, Vectorworks, Allplan)**
- **Geometry Gym plugin for Rhino3D and Grasshopper.**

There are others not noted on this slide.



Viewers that have been used by Scott and Jon for IFC4.3

- **ACCA usBIM**
- **Autodesk (Navisworks and ACC)**
- **BIM Collab Zoom** - Free version
- **BIMvision** - Free Version
- **Open IFC Viewer (Open Design Alliance)** - Free Version
- **Solibri** - Free Version

There are others not noted on this slide. Many authoring applications also support Import.

ACCA usBIM IFC4.3



usBIM.browser v.2.5.1_3 - Work - Microsoft Edge
https://browser.usbim.com/doc/c4c61a11b7084d6f885e891678caacfe

usBIM.browser IFC_Demo_Port_Fairy_Rail_Trail IFC_Demo_Port_Fairy_Rail_Trail.ifc V3 Document in Read-Only mode

Search

- IFC_Demo_Port_Fairy_Rail_Trail
 - Site (2)
 - Project (1)
 - Road (1)
 - RoadPart (12)
 - Elements (11)
 - GeographicElement (2)
 - Alignment (2)
 - Rail Trail Alignment Section 1 t...
 - AlignmentSegment (77)
 - Referent (210)
 - Surface1 - Surface (3) [Align...
 - IfcRailing [Railing]
 - Annotation (17)
 - Sign (2)
 - Borehole [Borehole]**
 - BuiltElement (32)

FRONT RIGHT

IfcBorehole

Characteristics

- General Data
 - GlobalId: 2dqLGqwsX36Ou9TxI7vS7G
 - Description: Borehole
- ObjectType
 - ObjectType: CogoPoint
- Tag
 - Tag: 89F6
- ContainedInStructure
 - RelatingStructure: IfcSite Port Fa...
- IfcObjectPlacement
 - PlacementRelTo: IfcSite Port Fa...
 - Location: [0.0000; 0.0000; 0.0000]
 - Axis: [0.0000; 0.0000; 1.0000]
 - RefDirection: [1.0000; 0.0000; 0.0000]
- Geometric Representation
 - Body: Point
- Classification
 - IfcClassificationReference
 - Name: Drill Hole
 - Description: Style for drill hole.

Elements

Autodesk Navisworks (ACC) IFC4.3



The screenshot displays the Autodesk Navisworks Manage 2025 interface. The main window shows a 3D perspective view of a rail trail model. The left-hand pane contains the Selection Tree, which is expanded to show the hierarchy of the model. The right-hand pane shows the Properties window for the selected element, 'BasicCurbAndGutter'.

Selection Tree:

- Standard
- IFC_Demo_Port_Fairy_Rail_Trail.ifc
 - Unknown
 - Rail Trail Alignment Section 1 to 4
 - Site 1
 - Port Fairy Rail Trail
 - Port Fairy to Warrnambool Rail Trail
 - Section 3
 - FootPath
 - BasicCurbAndGutter** (Selected)
 - BasicSidewalk
 - BasicCurbAndGutter
 - BasicSidewalk
 - Section 2
 - IfcGeographicElement
 - IfcSign
 - Terrain
 - IfcSign
 - IfcRailing

Properties Window:

| Property | | Value |
|-------------|--|--------------------------------|
| Name | | BasicCurbAndGutter |
| Type | | IfcRoadPart |
| Icon | | Insert Group |
| Hidden | | No |
| Required | | No |
| Material | | |
| Source File | | IFC_Demo_Port_Fairy_Rail_Trail |

BIMvision IFC4.3



BIMcollab Zoom (free version): IFC_Demo_Port_Fairy_Rail_Trail

File View Navigate My view Validate Sectioning Extra Help

Navigation Smart views Conflicts Lists Issues

Offline

- IFC_Demo_Port_Fairy_Rail_Trail
 - Group
 - Port Fairy Rail Trail
 - Geographic Element
 - Terrain**
 - Road
 - Port Fairy to Warrnambool Rail Trail - Section 2 & 3
 - Section 2
 - Section 3
 - FootPath
 - Alignment
 - Rail Trail Alignment Section 1 to 4
 - Alignment
 - Alignment Horizontal

Geographic Element

| Summary | Location | PartOf | Clashes | 3D Visualizati... | General |
|-----------------|--------------------------------|--------|---------|-------------------|---------|
| Property | | Value | | | |
| Model | IFC_Demo_Port_Fairy_Rail_Trail | | | | |
| Prefix | | | | | |
| Name | Terrain | | | | |
| Phase | | | | | |
| Type | | | | | |
| Description | Terrain Description | | | | |
| Material Name | | | | | |
| Layer | | | | | |
| IFC Element | IfcGeographicElement | | | | |
| Predefined Type | TERRAIN | | | | |
| Tag | 7125 | | | | |
| GUID | 2BnanTma1CP9D3_diHm6Wi | | | | |
| Vertex Count | 60 | | | | |

Free mode Buy now

My view: 0 Selected: 1

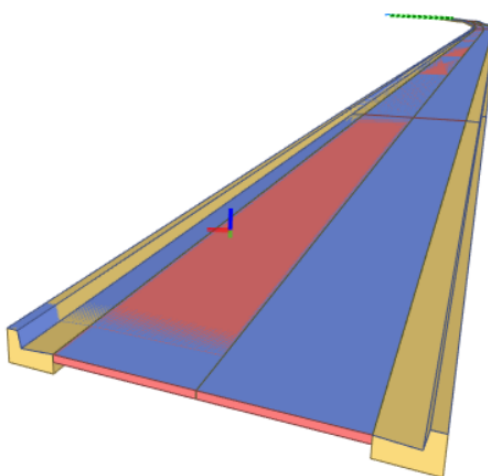
BIMvision IFC4.3



BIMvision 2.28.0 - F:\Civil3D\IFC_Demo_Port_Fairy_Rail_Trail.ifc

FILE VIEW OBJECTS SECTIONS MEASUREMENT CHANGES PLUGINS

3D Projections in space 2D view Reset zoom Enclose Fly mode Camera Default Top Front Back Rotate left Rotate right Options Object color Minimap X Y Z Storey slide Clear selected Clear all X axis Y axis Z axis Notifications (1) DEMO of PLUGINS See also



IFC structure

| Active | Type | Name | Description |
|-------------------------------------|-------------|--|-------------|
| <input checked="" type="checkbox"/> | IfcSign | | Sign |
| <input checked="" type="checkbox"/> | IfcRoad | Port Fairy to Warrnambool Rail Trail - Section 2 & 3 | |
| <input checked="" type="checkbox"/> | IfcRoadPart | Section 2 | |
| <input checked="" type="checkbox"/> | IfcRoadPart | FootPath | |
| <input checked="" type="checkbox"/> | IfcRoadPart | BasicSidewalk | |
| <input checked="" type="checkbox"/> | IfcRoadPart | BasicSidewalk | |
| <input checked="" type="checkbox"/> | IfcRoadPart | BasicCurbAndGutter | |
| <input checked="" type="checkbox"/> | IfcRoadPart | BasicCurbAndGutter | |
| <input checked="" type="checkbox"/> | IfcRoadPart | Section 3 | |
| <input checked="" type="checkbox"/> | IfcRoadPart | FootPath | |

Properties Location Classification Relations

| Name | Value | Unit |
|-----------------------------------|-------------------------------------|------|
| Element Specific | | |
| Guid | 0GBewc9k91sFVLSFvcr0u | |
| IfcEntity | IfcRoadPart | |
| Name | Section 2 | |
| ObjectType | Baseline | |
| PredefinedType | ROADSEGMENT | |
| UsageType | LONGITUDINAL | |
| Corridor Identity | | |
| BaselineGuid | 102e8ea6-d2e2-41da-97d5-fcf66d40d78 | |
| CorridorHandle | 7164 | |
| EndStation | 294+610.16 | |
| HorizontalBaselineHandle | 7868 | |
| HorizontalBaselineIfcGlobalId | 05dnwgbK0i9BQ3X6yTGj_ | |
| StartStation | 298+486.00 | |
| VerticalBaselineHandle | 7871 | |
| VerticalBaselineIfcGlobalId | 3Ygm_U4bHr3KqK26117di | |
| Corridor Model Information | | |

Open IFC Viewer (Open Design Alliance) IFC4.3



Open IFC Viewer 25.5

FILE VIEW TOOLS APPEARANCE PLUGINS

Pan Orbit Free Orbit Rotation Rotation settings Fly mode Fly mode settings Zoom Extents Zoom Window Parallel Make snapshot Regen Orthographic views Isometric views Viewport Configuration Shaded

Navigation Camera Regen View Render mode

Object explorer

- IFC_Demo_Port_Fairy_Rail_Trail.ifc
 - IfcProject (57)
 - IfcSites (56)
 - IfcAlignments (1)
 - Rail Trail Alignment Section 1 to 4 (1)
 - Rail Trail Alignment Section 1 to 4 - Surface1 - Surface (3)
 - Group_1
 - Group_2

Properties

| | |
|----------------------------|------------------------------|
| IsObjectIdsInFlux | F |
| IsPersistent | T |
| IsReadEnabled | T |
| IsReallyClosing | F |
| IsTransactionResident | T |
| IsUndoing | F |
| IsWriteEnabled | T |
| AutoDelete | F |
| IsDisposed | F |
| Description | |
| CloneMeForDragging | T |
| CriteriaFileName | |
| DesignCheckSetName | Basic |
| EndingStation | 302362 |
| EndingStationWithEquations | 294610 |
| HasRoundabout | F |
| IsConnectedAlignment | F |
| IsOffsetAlignment | F |
| IsSiteless | T |
| Length | 3876 |
| ReferencePointStation | 298486 |
| SiteName | |
| StartingStation | 298486 |
| StationIndexIncrement | 100 |
| UseDesignCheckSet | F |
| UseDesignCriteriaFile | F |
| UseDesignSpeed | F |
| DisplayName | Alignment |
| FingerPrint | -2147483648 |
| Name | Rail Trail Alignment Section |
| StyleName | Proposed |
| Bounds | ((607782.111386588,575092 |
| SDAI | |
| original_type_name | IfcAlignment |

Solibri IFC4.3



Solibri Anywhere - IFC_Demo_Port_Fairy_Rail_Trail

FILE MODEL CHECKING COMMUNICATION INFORMATION TAKEOFF BCF LIVE CONNECTOR SCORE VIEWS ?

Spin Info

MODEL TREE

- IFC_Demo_Port_Fairy_Rail_Trail
 - Unknown
 - Port Fairy Rail Trail
 - Road.b.1
 - Geographic Element
 - Geographic Element.b.1**
 - Site 1
 - Object

3D

INFO

Geographic Element.b.1

BIM Data Other Properties Favorites

Identification Location Quantities Relations Classification

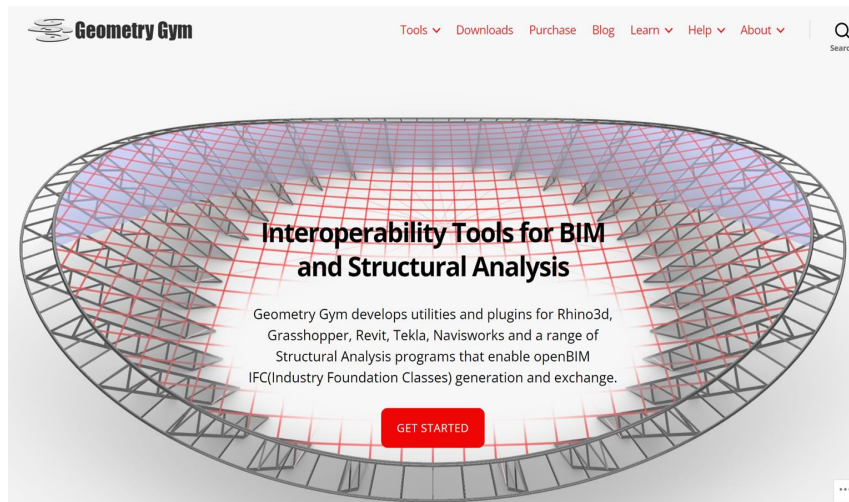
| Property | Value |
|------------------------|------------------------|
| Description | Terrain Description |
| Material | |
| GUID | 2BnanTma1CP9D3_diHm6Wi |
| BATID | 7125 |
| Ifc Information | |
| Predefined Type | TERRAIN |
| IFC Entity | IfcGeographicElement |
| IFC Type | |
| IFC Schema | IFC4X3_ADD2 |
| Hierarchy | |

Selected: 0



Moving ahead with IFC 4.3 – Building & Civil Infrastructure

3rd July 2024



Thankyou

Any questions

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