Implementation Strategy For CORENET X

JTC Trendspace

KHIN MAW MAW

21st-AUG-2023

Contact

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BIM Manager

- M.Sc (Building Science) NUS, Singapore (2007)
- Specialist Diploma in BIM, BCA Academy, Singapore
- Specialist Diploma in Computational BIM (Building), BCA Academy, Singapore
- DDM Accreditation Tier 2: Lead, buildingSMART Singapore

- 19 Years of Working Experience in Construction industry
- 10 Years of BIM Environment

Implementation Strategy For CORENET X

PROJECT OVERVIEW

JTC TRENDSPACE

PROPOSED ERECTION OF 8-STOREY MULTI-USER GENERAL INDUSTRIAL FACTORY DEVELOPMENT (TOTAL 66 UNITS) WITH ANCILLARY OFFICES, TEMPORARY INDUSTRIAL CANTEEN AT 1ST STOREY AND BASEMENT CARPARK ON LOT 00804 MK11 AT 5 SUNGEI KADUT STREET 2 (SUNGEI KADUT PLANNING AREA)
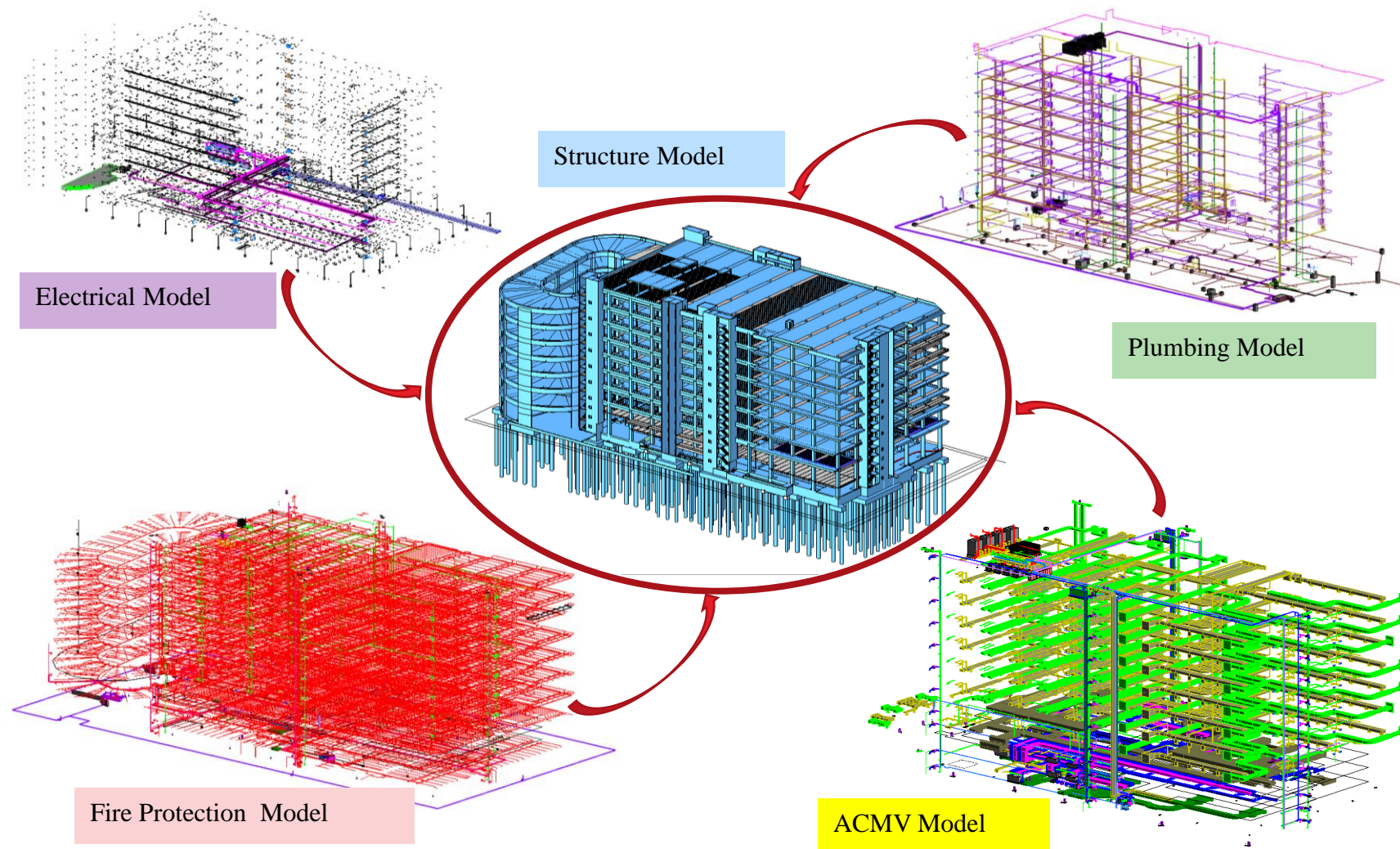

Photo Credit to jtc

Implementation Strategy For CORENET X

JTC Trendspace BIM Models

Electrical Model

Structure Model

Plumbing Model

Fire Protection Model

ACMV Model

Key Facts of CORENET X Successful Implementation

Implementation Strategy For CORENET X

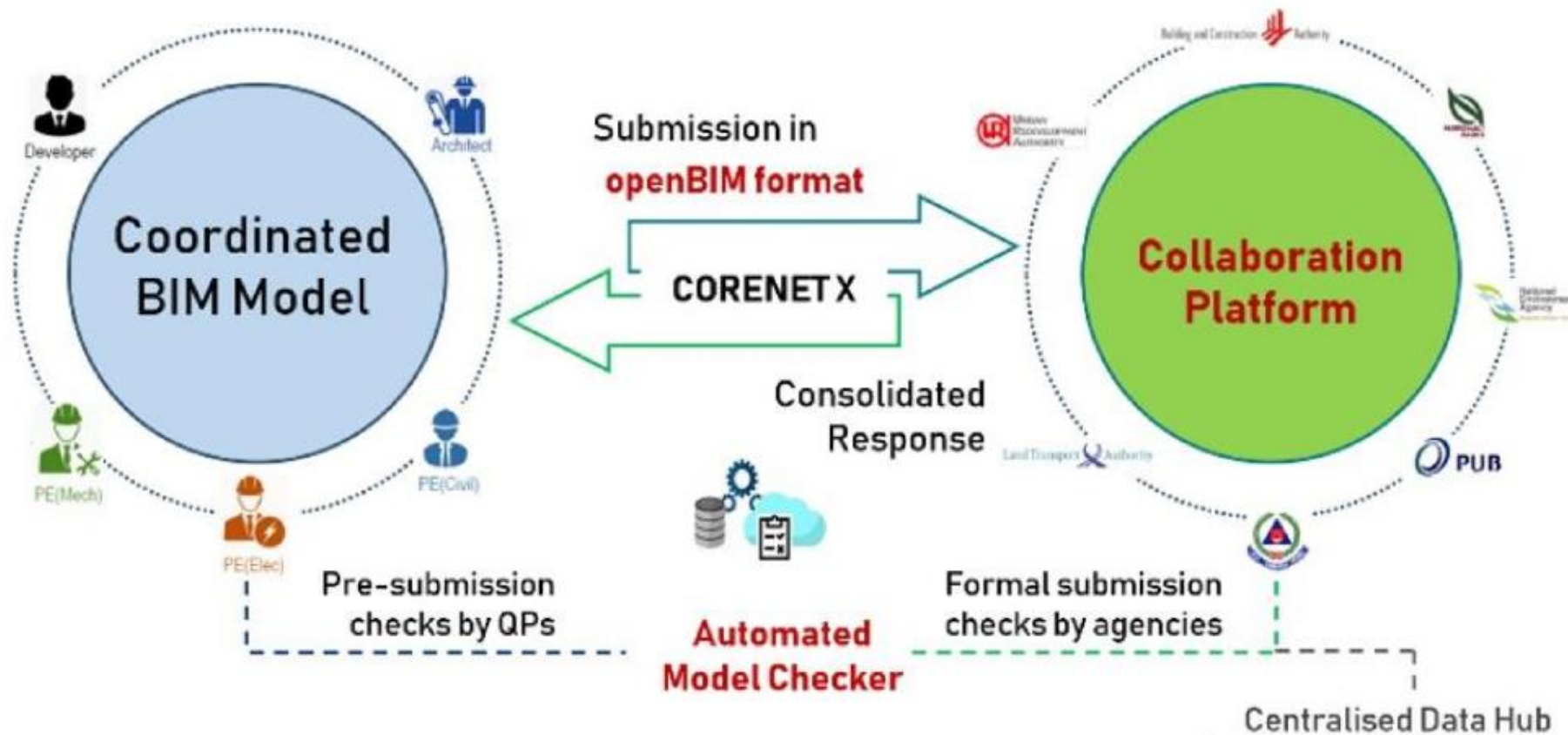**Key Facts of CORENET X Successful Implementation**

- Understanding of CORENET X

- Preparation of Submission Models

CORENET X

CORENET X SUBMISSION PREPARATION

ARUP

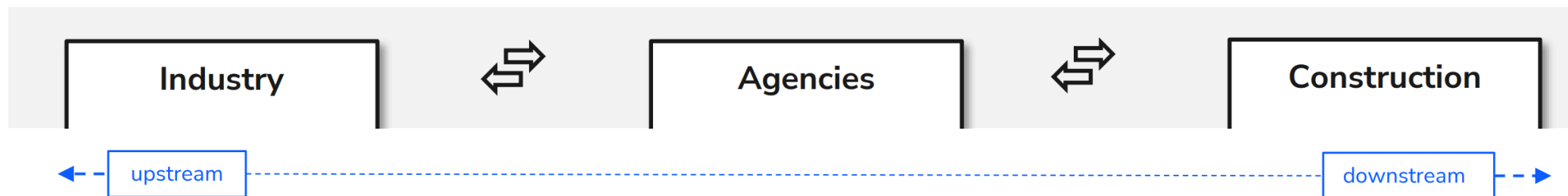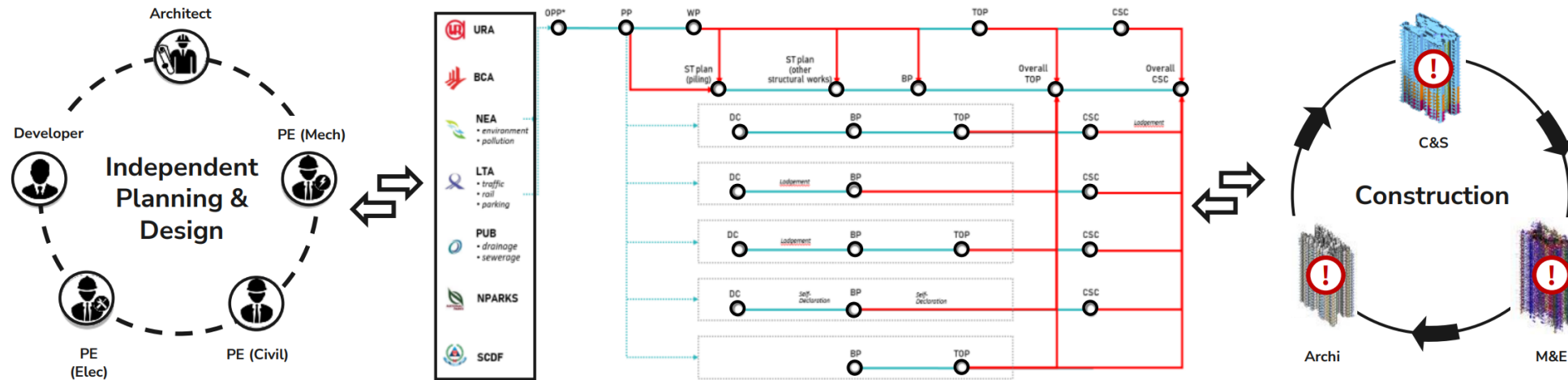**Understanding of CORENET X Model Submission**

Cloud based and Coordinated Model Submission

CORENET X SUBMISSION PREPARATION

Understanding of CORENET X Model Submission

Regulatory Approval Process

Refer for more information of Today and Tomorrow Regulatory Approval Process

Preparation of Submission Models

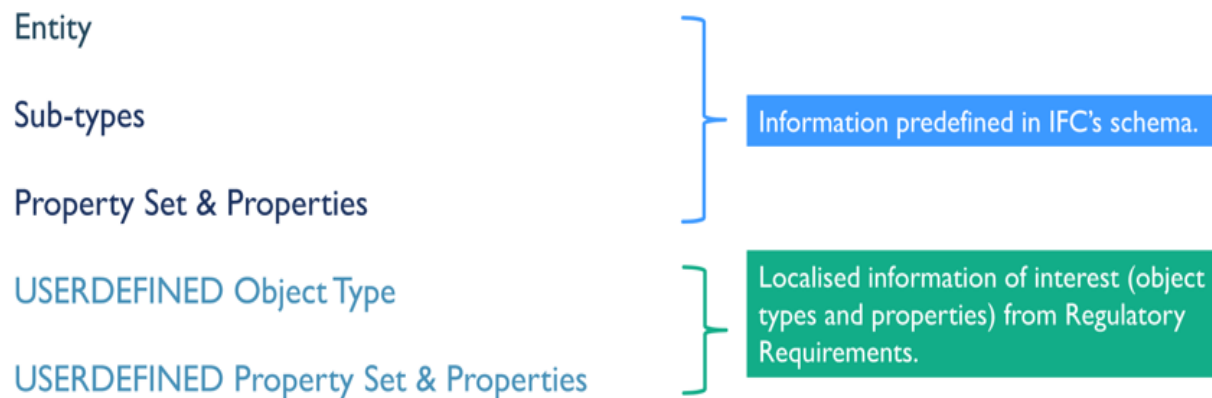# Implementation Strategy For CORENET X

Preparation of Submission Models

- What is IFC 4 and IFC-SG

- Additional Process in Modelling

Implementation Strategy For CORENET X

What is IFC 4 and IFC-SG

KEY DATA STRUCTURES OF IFC–SG

Entity

Sub-types

Property Set & Properties

> Information predefined in IFC's schema.

USERDEFINED Object Type

USERDEFINED Property Set & Properties

> Localised information of interest (object types and properties) from Regulatory Requirements.

IFC 4	IFC-SG
Objects, Types and Properties defined in IFC schema	Localised infomration of interest
Objects (Entity): IfcTank	
SubType (PreDefined)	**SubType (UserDefined)**
STORAGE SECTIONAL VESSEL	BALANCINGTANK POTABLEWATER EJECTORTANK
Properties	**Properties** IsPotable (TRUE/FALSE)
-	TradeEffluent (TRUE/FALSE)

ARUP

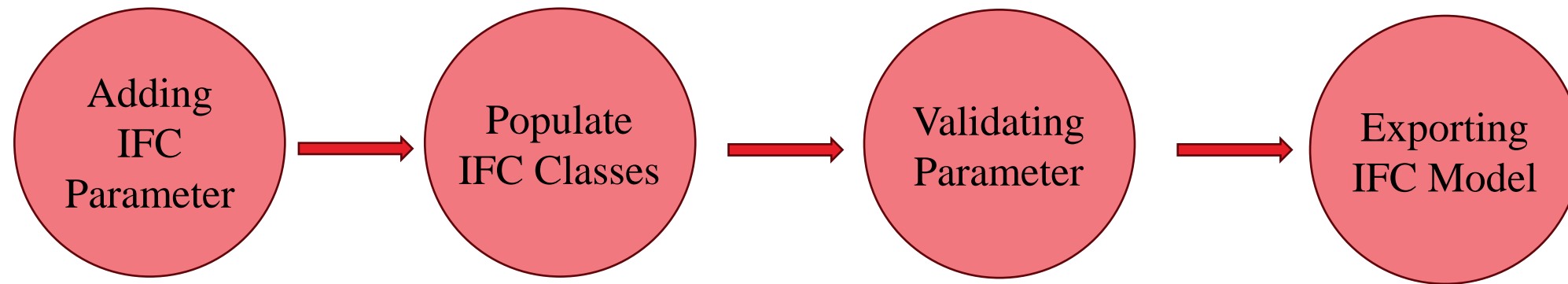# Implementation Strategy For CORENET X

What is IFC 4 and IFC-SG

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Industry-Mapping Table

IFC4 Entities	IFC Sub Types (* = USERDEFINED)	Property Set	Property Name	Property Type	Property Unit	IFC4 Material Set	Sample Value for Reference
IfcTank	STORAGE	N.A	N.A	N.A	N.A	N.A	N.A
IfcTank	STORAGE	N.A	N.A	N.A	N.A	N.A	N.A
IfcTank	*SECTIONAL	N.A	N.A	N.A	N.A	N.A	N.A
IfcTank	VESSEL	N.A	N.A	N.A	N.A	N.A	N.A
IfcTank	*EJECTORTANK	N.A	N.A	N.A	N.A	N.A	N.A
IfcTank	*RECHARGEWELL	N.A	N.A	N.A	N.A	N.A	N.A
IfcTank	*REFUSEHANDLINGEQUIPMENT	Pset_TankTypeCommon	NominalCapacity	Volume	L	N.A	N.A
IfcTank	*DETENTIONTANK	Pset_TankTypeCommon	NominalCapacity	Volume	L	N.A	N.A
IfcTank	STORAGE	Pset_TankTypeCommon	NominalCapacity	Volume	L	N.A	N.A
IfcTank	*POTABLEWATER	Pset_TankTypeCommon	NominalCapacity	Volume	L	N.A	N.A
IfcTank	*DETENTIONTANK	SGPset_Tank	IsPotable	Boolean	N.A	N.A	TRUE/FALSE
IfcTank	STORAGE	SGPset_Tank	IsPotable	Boolean	N.A	N.A	TRUE/FALSE

IFC4 Entities	IFC Sub Types (* = USERDEFINED)	Property Set	Property Name	Property Type	Property Unit	IFC4 Material Set	Sample Value for Reference
IfcColumn	Need not specify	SGPset_Material	MaterialGrade	Label	N.A	N.A	C12/15, C20/25, C30/37, C35/45, C40/50, C50/60, C55/67, C60/75, C70/85, C80/95, S235, S275, S355, S460
IfcColumn	Need not specify	SGPset_SteelConnection	ConnectionDetailsBottom	Label	N.A	N.A	Detail 1
IfcColumn	Need not specify	SGPset_SteelConnection	ConnectionDetailsTop	Label	N.A	N.A	Detail 1
IfcColumn	Need not specify	SGPset_SteelConnection	ConnectionTypeBottom	Label	N.A	N.A	Pinned, Fixed, Free
IfcColumn	Need not specify	SGPset_SteelConnection	ConnectionTypeTop	Label	N.A	N.A	Pinned, Fixed, Free
IfcColumn	Need not specify	SGPset_SteelConnection	SpliceDetail	Label	N.A	N.A	Detail 3

Implementation Strategy For CORENET X

Additional Process in Modelling

Adding IFC Parameter → Populate IFC Classes → Validating Parameter → Exporting IFC Model
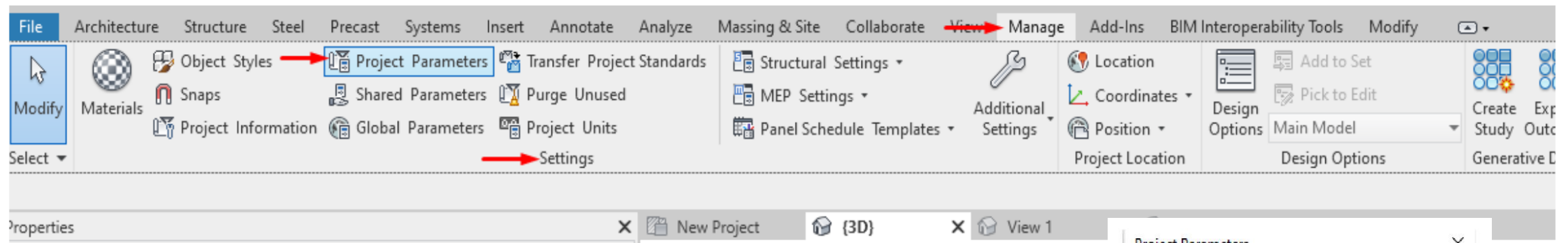
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Implementation Strategy For CORENET X

Adding IFC Parameter

Type 1

- IFC-SG Revit Plugin Tools (no longer available)

Type 2

- Manually Add Parameter

Project Parameter from Manage Tab

Implementation Strategy For CORENET X

Populate IFC Classes and Validation Parameter

IFC Entity and Sub Type

<Fire Alarm Device Schedule>

A	B	C
Family and Type	IfcExportAs	IfcObjectType
Arup_Detector_Smoke_Ceiling Mounted_SG: Smoke Detector	IfcSensorType.USERDEFINED	SMOKEDETECTOR
Arup_Detector_Smoke_Vertically Mounted_SG: Beam Detector	IfcSensorType.USERDEFINED	SMOKESENSOR
Arup_Detector_Smoke_Vertically Mounted_SG: Beam Reflector	IfcSensorType.USERDEFINED	SMOKESENSOR

<Fire Damper>

A	B	C
Family and Type	IfcExportAs	IfcObjectType
ArupSG_Damper: FD	IfcDamperType.FIREDAMPER	

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IFC4 Add 1 and IFC2x3 TC1 Database

Element

IFC Class Mappings 4.1

fire   ✕   Filter Duct Accessories

C2.3.2.5 - IfcDamperType.FIREDAMPER

C2.3.2.6 - IfcDamperType.FIRESMOKEDAMPER

Implementation Strategy For CORENET X

Populate IFC Classes and Validation Parameter

IFC Entity and Sub Type (Structure Element)

Implementation Strategy For CORENET X

Populate IFC Classes and Validation Parameter

IFC Entity and Sub Type (Structure Element)

ARUP

\<Agency\>
Singapore Civil Defence Force (SCDF)

\<Regulatory Guidebook\>
Fire Code

\<Regulatory Requirement\>
b. have the appropriate fire resistance to comply with the requirements of Cl.3.3; and

	\<IFC_Structural Framing Schedule\>			
A	B	C	D	E
Family and Type	IfcExportAs	IfcObjectType	Combustible	IsExternal
Precast - Inverted Tee: 900 x 2400	IfcBeamType		☐	☐
Precast - Inverted Tee: 900 x 2400	IfcBeamType		☐	☑
Precast - Inverted Tee: 800/900 x 2400	IfcBeamType		☐	☐
Precast - Inverted Tee: 800/900 x 2400	IfcBeamType		☐	☑
Precast - Inverted Tee: 800 x 2400	IfcBeamType		☐	☐
Precast - Inverted Tee: 800 x 2400	IfcBeamType		☐	☑

Beam

Summary	Location	Material	Clashes	Pset_BeamC...	Pset_Environ...	SGPset_Beam

Property	Value
Model	JTCFH_STR_Beam
Prefix	
Name	Precast - Inverted Tee:900 x 2400:390769
Phase	For Info
Type	900 x 2400
Type Name	Precast - Inverted Tee:900 x 2400
Description	
Material Name	Concrete - Precast Concrete - 35 MPa
Layer	S-BEAM
Is External	False
Load Bearing	True
Fire Rating	
IFC Element	IfcBeam
Predefined Type	BEAM
Tag	390769
GUID	1ZtoqPuBTB4hEWx16DEBnZ

Beam

Summary	Location	Material	Clashes	Pset_BeamC...	SGPset_Beam

Property	Value
Combustible	False
IsExternal	False

Implementation Strategy For CORENET X

Populate IFC Classes and Validation Parameter

IFC Entity and Sub Type (Structure Element)
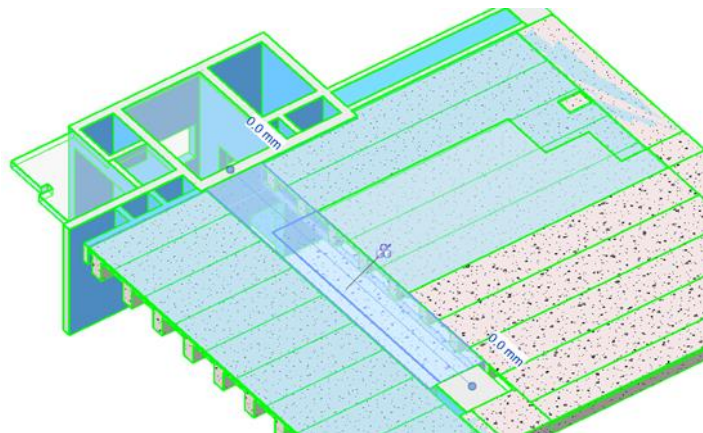

\<Agency\>
Singapore Civil Defence Force (SCDF)

\<Regulatory Guidebook\>
Fire Code

\<Regulatory Requirement\>
b. have the appropriate fire resistance to comply with the requirements of Cl.3.3; and

\<IFC_Structural Framing Schedule\>

A	B	C	D	E
Family and Type	IfcExportAs	IfcObjectType	Combustible	IsExternal
Precast - Inverted Tee: 900 x 2400	IfcBeamType		☐	☐
Precast - Inverted Tee: 900 x 2400	IfcBeamType		☐	☑
Precast - Inverted Tee: 800/900 x 2400	IfcBeamType		☐	☑
Precast - Inverted Tee: 800/900 x 2400	IfcBeamType		☐	☑
Precast - Inverted Tee: 800 x 2400	IfcBeamType		☐	☐
Precast - Inverted Tee: 800 x 2400	IfcBeamType		☐	☑

Beam

Summary	Location	Material	Clashes	Pset_BeamC...	Pset_Environ...	SGPset_Beam

Property	Value
Model	JTCFH_STR_Beam
Prefix	
Name	Precast - Inverted Tee:900 x 2400:390769
Phase	For Info
Type	900 x 2400
Type Name	Precast - Inverted Tee:900 x 2400
Description	
Material Name	Concrete - Precast Concrete - 35 MPa
Layer	S-BEAM
Is External	False
Load Bearing	True
Fire Rating	
IFC Element	IfcBeam
Predefined Type	BEAM
Tag	390769
GUID	1ZtoqPuBTB4hEWx16DEBnZ

Beam

Summary	Location	Material	Clashes	Pset_BeamC...	SGPset_Beam

Property	Value
Combustible	False
IsExternal	False

Implementation Strategy For CORENET X

Populate IFC Classes and Validation Parameter
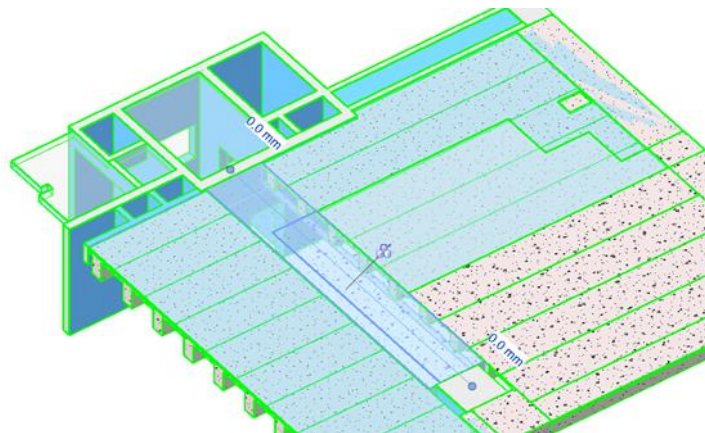
IFC Entity and Sub Type (Structure Element)

\<Agency\>
Building Construction Authority (BCA)

**\<Regulatory Guidebook\>**
Code of Practice on Buildability 2020

\<Regulatory Requirement\>
Floor mesh
Pre-requisites
The use of welded mesh is mandated for all developments where cast in-situ slab has been adopted in the design. The minimum usage of welded mesh must be at least 65% of all cast in-situ slab area.

\<IFC_Floor Schedule\>

	A	B	C	D	E	F
	Family and Type	IfcExportAs	Structural Material	IfcObjectType	ConstructionMet	WeldedMesh
	Floor: 400	IfcSlabType.FLOOR	Arup_Insitu Concrete		Cast Insitu	☑
	Floor: 325	IfcSlabType.FLOOR	Arup_Insitu Concrete		Cast Insitu	☑
	Floor: 300	IfcSlabType.FLOOR	Arup_Insitu Concrete		Cast Insitu	☑
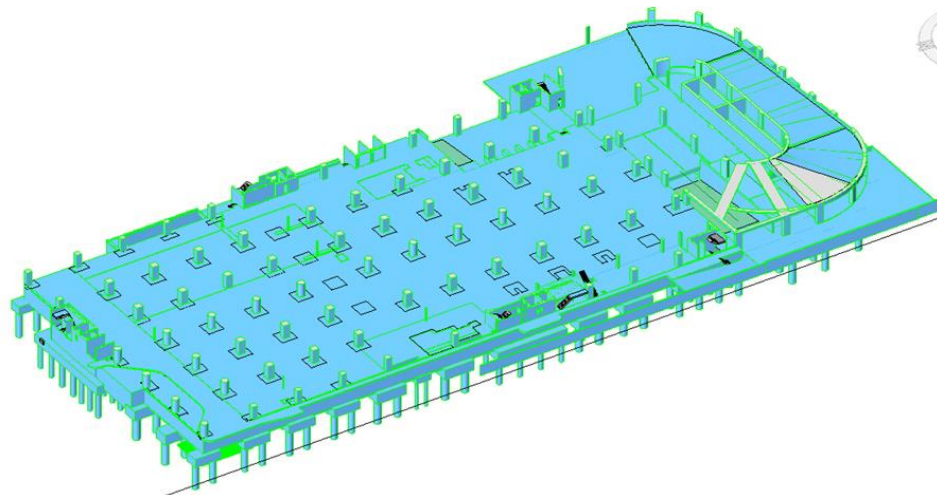
IFC Structure

	Type	Name	Descr
☑	⊞ Slab	Floor:400:949741	
√ ☑	⊟ Slab	Floor:400:949764	
	Material layer	Arup_Insitu Concrete	(Materials)
	⊞ Slab Type	Floor:400	

Properties | Location | Classification | Relations

Name	Value	Unit
⊟ **SGPset_Slab**		
CategoryOfLoadedArea	(blank)	
ConstructionMethod	Cast Insitu	
FlameSpreadClass	(blank)	
ReinforcementSteelGrade	fyk = 500 N/mm2, Class B	
SlabType	One-Way	
WeightGroup	(blank)	
⊟ **SGPset_SlabDimension**		
Length	447 746.348237	mm
Thickness	400	mm
⊟ **SGPset_SlabReinforcement**		
AsRequiredBottomX	324	
AsRequiredBottomY	543	
AsRequiredTopX	432	
AsRequiredTopY	324	
BottomDistribution	H10-200	
BottomMain	H13-200	
Stirrups	1H10-150-300	
StirrupsType	U Type	
TopDistribution	H10-300	
TopMain	H13-200	
WeldedMesh	Yes	
⊟ **SGPset_StructuralLoad**		
ImposedLoad	5kpa	

Implementation Strategy For CORENET X

Populate IFC Classes and Validation Parameter

IFC Entity and Sub Type (Structure Element)

<Agency>
Building Construction Authority (BCA)

<Regulatory Guidebook>
SS EN 1992-1-1:2004 Superstructure

**<Regulatory Requirement>**
1992-1-1
Cl. 9.2
Reinforcement in Beam is adequate: -
Beam Transverse spacing of shear links does not exceed the maximum allowable spacing
Cl. 7.4
Deflection should not exceed maximum allowable deflection

<IFC Structural Framing Schedule PT Rule002_P2>

A	B	C	D	E
Beam Mark	Size (D x W)	NumberOfTendons	IfcExportAs	IfcObjectType
05B109PT	1300 x 2400	4	IfcBeamType.USERDEFINED	PRESTRESSED_BEAM
05B110PT	1300/1400 x 2400	4	IfcBeamType.USERDEFINED	PRESTRESSED_BEAM
05B113APT	1150 x 1400	4	IfcBeamType.USERDEFINED	PRESTRESSED_BEAM
05B113PT	1150 x 2400	4	IfcBeamType.USERDEFINED	PRESTRESSED_BEAM
05B114APT	1150/1250 x 1400	4	IfcBeamType.USERDEFINED	PRESTRESSED_BEAM
05B114PT	1150/1250 x 2400	4	IfcBeamType.USERDEFINED	PRESTRESSED_BEAM
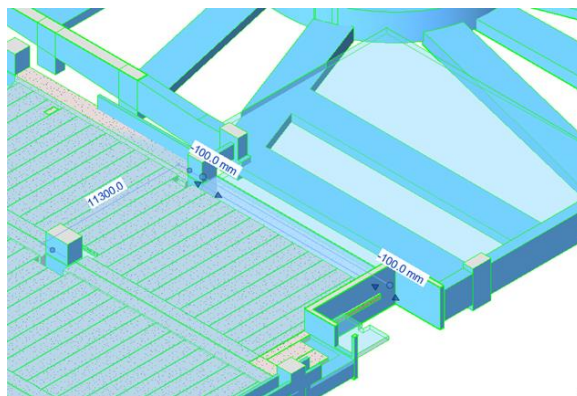
Beam

Summary	Location	Material	Clashes	SGPset_BeamR...

Property	Value
NumberOfTendons	4

Beam

Summary	Location	Material	Clashes	SGPset_BeamR...

Property	Value
NumberOfTendons	4

Beam

Summary	Location	Material	Clashes	Dimensions

Property	Value
Model	R002_P2_PTBeam
Prefix	
Name	Precast - Inverted Tee with Single Nib:1150 x 1400:1...
Phase	For Info
Type	1150 x 1400
Type Name	Precast - Inverted Tee with Single Nib:1150 x 1400
Description	
Material Name	Concrete - Precast Concrete - 35 MPa
Layer	S-BEAM
Is External	True
Load Bearing	True
Fire Rating	
IFC Element	IfcBeam
Predefined Type	USERDEFINED
Tag	1209315
GUID	0XJK0nd59DRRIXY7hQ14Bd
Object Type	PRESTRESSED_BEAM

Implementation Strategy For CORENET X
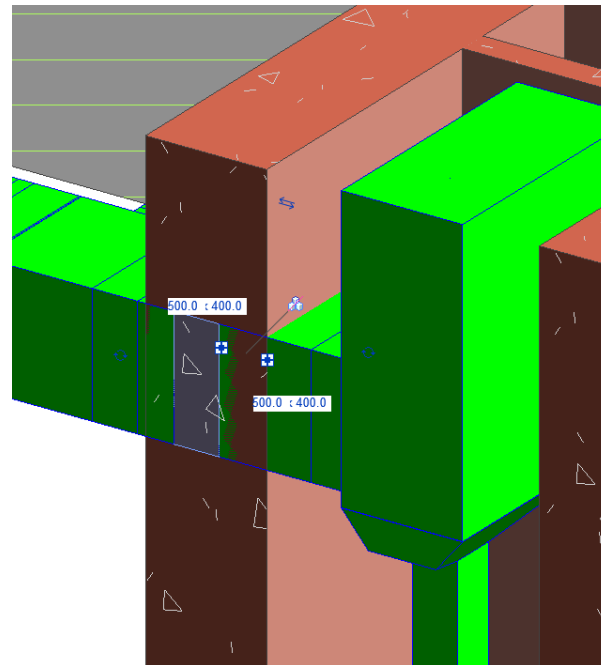
Populate IFC Classes and Validation Parameter

IFC Entity and Sub Type (Mechanical Element)

<Agency>
Singapore Civil Defence Force (SCDF)

<Regulatory Guidebook>
Fire Code

<Regulatory Requirement>
Such openings in the compartment wall or compartment floor shall be protected to comply with the relevant provisions of Cl.3.9.

<Fire Damper>

A	B	C
Family and Type	IfcExportAs	IfcObjectType
ArupSG_Damper: FD	IfcDamperType.FIREDAMPER	

<Duct System Schedule>

A	B	C
Family and Type	IfcExportAs	IfcObjectType
Duct System: EXHAUSTAIR	IfcDistributionSystemType.USERDEFINED	EXHAUSTAIR
Duct System: FRESHAIR	IfcDistributionSystemType.USERDEFINED	FRESHAIR
Duct System: RETURNAIR	IfcDistributionSystemType.USERDEFINED	RETURNAIR
Duct System: SUPPLYAIR	IfcDistributionSystemType.USERDEFINED	SUPPLYAIR

Name	Value	Unit
Element Specific		
Guid	1a$0Jz$O56wf5IM5YoJOS$	
IfcEntity	IfcDuctSegment	
Name	Rectangular Duct:Default:4299238	
ObjectType	Rectangular Duct:Default	
PredefinedType	NOTDEFINED	
Tag	4299238	
Profile		
ProfileName	Default	
Pset_DuctSegmentTypeCommon		
Reference	Default	
Shape	Undefined	
Pset_EnvironmentalImpactIndicators		
Reference	Default	
SGPset_DuctSegment		
FireRating	2 hr	

Implementation Strategy For CORENET X

Populate IFC Classes and Validation Parameter

ARUP

IFC Entity and Sub Type (Electrical Element)

<Agency>
National Parks Board (NParks)

<Regulatory Guidebook>
Guidelines on Greenery Provision and Tree Conservation for Developments

<Regulatory Requirement>
Green buffers and peripheral planting verges should be free from any encroachment, except for allowable minor ancillary structures and landscaping structures as listed in the following table.

1. Allowable structures within the tree planting strips:
   - Flag poles
   - Lamp posts
   - Guard house/Sentry post
   - Bin point (Bin Centre is not allowed)
   - OG Boxes
   - Water bulk meter
   - Fire hydrant
   - Entrance gate/post
   - Metering Compartment
   - Development permanent signage
   - Garden furniture
   - Trellis
   - Water features
2. Other object not listed is deemed as encroachment.

<Electrical Equipment Schedule>

	A	B	C
	Family and Type	IfcExportAs	IfcObjectType
	ArupSG_OG: OG - Overground Box	IfcJunctionBoxType.POWER	

Junction Box

Summary	Location	Material	Clashes	Pset_Environm...

Property	Value
Model	JTCFH_ELL
Prefix	
Name	ArupSG_OG:DB-Lx-xx:3784511
Phase	Tender
Type	ArupSG_OG:OG - Overground Box
Type Name	ArupSG_OG:OG - Overground Box
Description	
Material Name	Arup-Electrical Equipment
Layer	E-ELEC-EQPM
IFC Element	IfcJunctionBox
Predefined Type	POWER
Tag	3784511
GUID	2no7hbmZL1XgVRjpnXO7nv
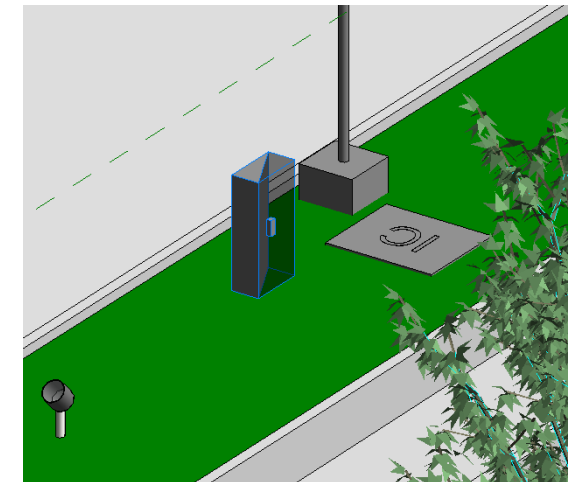
Implementation Strategy For CORENET X

Populate IFC Classes and Validation Parameter

ARUP

IFC Entity and Sub Type (Electrical Element)

<Agency>
Public Utilities Board (PUB)

<Regulatory Guidebook>
Code of Practice on Sewerage and Sanitary Works
2ndEdition –January 2019

<Regulatory Requirement>
(a) WT/Transformer: Sanitary pipes shall not be placed above
potable water storage tank, electrical transformer/switchgear
(c) In all non-residential buildings (e.g. commercial buildings,
shopping malls, hotel, hospital, etc), the sanitary pipes shall
be located such that:
i. no pipes from WC shall be located at the ceiling of a
commercial unit.

<Electrical Equipment Schedule>

	A	B	C
	Family and Type	IfcExportAs	IfcObjectType
ArupSG _DB: DB - Distribution Board	IfcElectricDistributionBoardType.DISTRIBUTIONBOARD	
ArupSG _DP: ArupSG _DP	IfcElectricDistributionBoardType.DISTRIBUTIONBOARD	
DBS_Panel_9000x1000x2100: DBS_Panel_9000x1000x2100	IfcElectricDistributionBoardType.SWITCHBOARD	
MV_Panel_13000x1450x2100: MV_Panel_13000x1450x2100	IfcElectricDistributionBoardType.SWITCHBOARD	
AUS-EE-Transformer.0001: Standard	IfcElectricDistributionBoardType.USERDEFINED	ELECTRICALTRANSFORMER
HT_Panel_4500x1500x2100: HT_Panel_4500x1500x2100	IfcElectricDistributionBoardType.USERDEFINED	SWITCHGEAR
AUS-EE-Transformer.0001: Standard	IfcTransformer	

Name	Value	Unit
Element Specific		
Guid	2XcQ34RLT07P0E8W17crqR	
IfcEntity	IfcElectricDistributionBoard	
Name	DBS_Panel_9000x1000x2100:DBS_Panel_9000x1000x2100:2298190	
ObjectType	DBS_Panel_9000x1000x2100:DBS_Panel_9000x1000x2100	
PredefinedType	SWITCHBOARD	
Tag	2298190	
Pset_ElectricDistributionBoardTypeCommon		
Reference	DBS_Panel_9000x1000x2100	
Pset_EnvironmentalImpactIndicators		
Reference	DBS_Panel_9000x1000x2100	
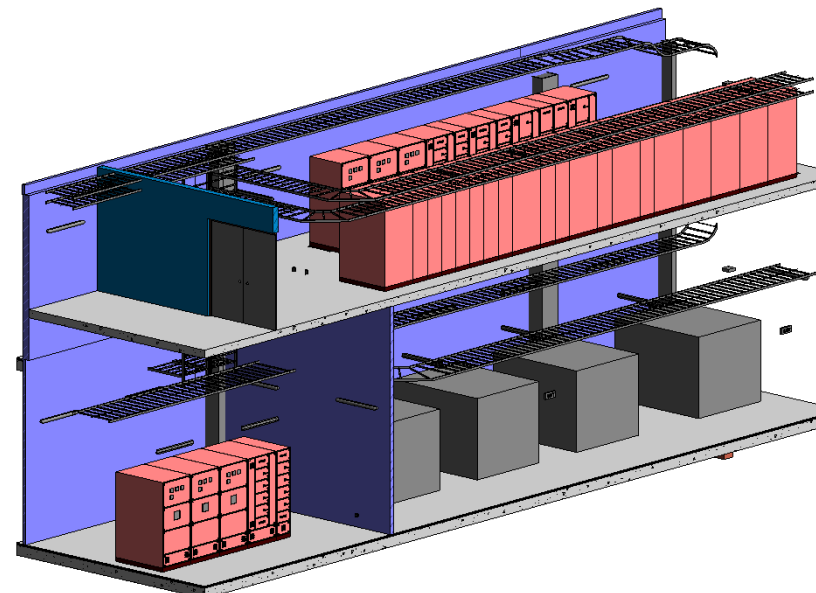
Implementation Strategy For CORENET X

Populate IFC Classes and Validation Parameter

IFC Entity and Sub Type (Fire Protection Element)

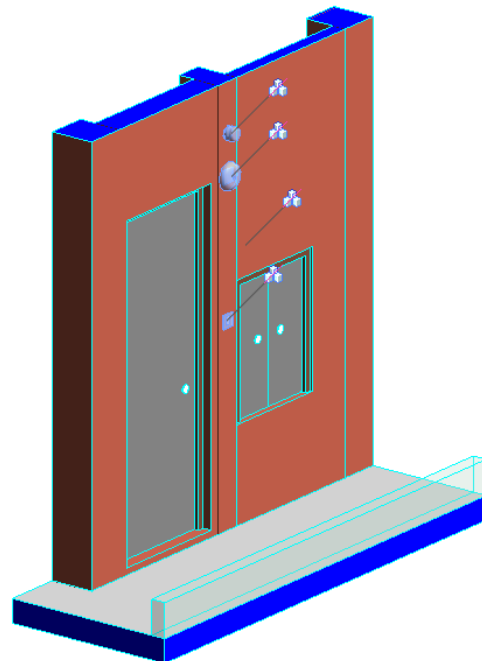

<Agency>
Singapore Civil Defence Force (SCDF)

<Regulatory Guidebook>
Fire Code

<Regulatory Requirement>
Chapter 6: Firefighting systems
Cl. 6.3.3(c) Manual alarm call points

<Fire Alarm Device Schedule>

Family and Type	IfcExportAs	IfcObjectType
	A	B	C
Fire_Alarm_Bell: MANUAL CALL POINT BREAK GLASS (INDOOR)	IfcAlarmType.BELL	
LTA-Call Point: MANUAL CALL POINT BREAK GLASS (INDOOR)	IfcAlarmType.BREAKGLASSBUTTON	

Name	Value	Unit
Element Specific		
Guid	3jYay1grf5YhhIw_ZaDVgz	
IfcEntity	IfcAlarm	
Name	Call Point:MANUAL CALL POINT BREAK GLASS (INDOOR):5321320	
ObjectType	Call Point:MANUAL CALL POINT BREAK GLASS (INDOOR)	
PredefinedType	BREAKGLASSBUTTON	
Tag	5321320	

Name	Value	Unit
Element Specific		
Guid	3jYay1grf5YhhIw_ZaDVhm	
IfcEntity	IfcAlarm	
Name	Fire_Alarm_Bell:MANUAL CALL POINT BREAK GLASS (INDOOR):5321253	
ObjectType	Fire_Alarm_Bell:MANUAL CALL POINT BREAK GLASS (INDOOR)	
PredefinedType	BELL	
Tag	5321253	

Implementation Strategy For CORENET X

Populate IFC Classes and Validation Parameter

IFC Entity and Sub Type (Plumbing Element)

\<Agency\>
Public Utilities Board (PUB)

\<Regulatory Guidebook\>
Code of Practice on Sewerage and Sanitary Works
2ndEdition –January 2019

\<Regulatory Requirement\>
(a) WT/Transformer: Sanitary pipes shall not be placed above potable water storage tank, electrical transformer/switchgear
(c) In all non-residential buildings (e.g. commercial buildings, shopping malls, hotel, hospital, etc), the sanitary pipes shall be located such that:
i. no pipes from WC shall be located at the ceiling of a commercial unit.

\<Tank Schedule\>

Family and Type	IfcExportAs	IfcObjectType
	A	B	C
Water Storage Tank: 7 x 2.5 x 3m	IfcTankType.STORAGE	
Water Storage Tank: 3 x 1 x 2m	IfcTankType.STORAGE	
Water Storage Tank: 2 x 3 x 3m	IfcTankType.STORAGE	
Water Storage Tank: 2 x 1.5 x 3m	IfcTankType.STORAGE	
Pressure Tank: 300 litres 2	IfcTankType.STORAGE	

\<Tank Schedule (Potable Water)\>

Family and Type	IfcExportAs	IfcObjectType
	A	B	C
Water Storage Tank: 7 x 4 x 3m	IfcTankType.USERDEFINED	POTABLEWATER
Water Storage Tank: 4 x 2.5 x 2m	IfcTankType.USERDEFINED	POTABLEWATER

\<Pipe Schedule\>
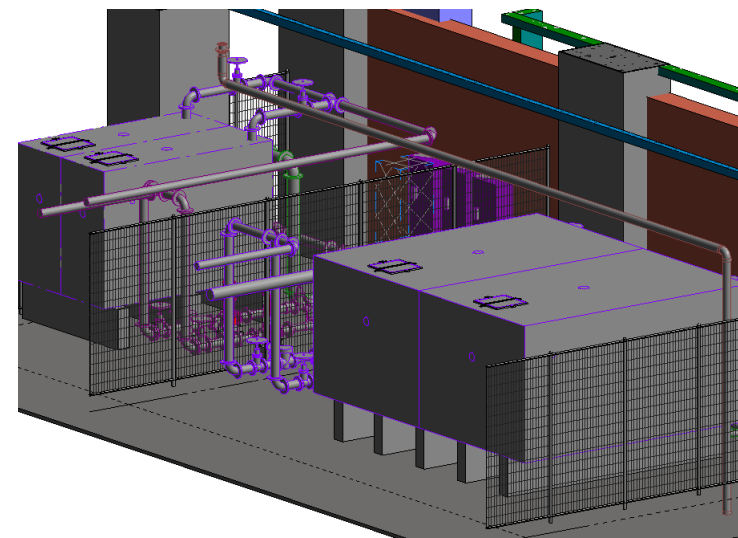
Family and Type	IfcExportAs	IfcObjectType
	A	B	C
Pipe Types: Cast Iron	IfcPipeSegmentType.RIGIDSEMENT	
Pipe Types: Copper	IfcPipeSegmentType.RIGIDSEMENT	
Pipe Types: Ductile Iron	IfcPipeSegmentType.RIGIDSEMENT	
Pipe Types: uPVC	IfcPipeSegmentType.RIGIDSEMENT	
Pipe Types: VCP	IfcPipeSegmentType.RIGIDSEMENT	

Name	Value	Unit
Element Specific		
Guid	3d6W9vXwX3cwbYqj7fzTLa	
IfcEntity	IfcPipeSegment	
Name	Pipe Types:Ductile Iron:3665157	
ObjectType	Pipe Types:Ductile Iron	
PredefinedType	RIGIDSEGMENT	
Tag	3665157	
Profile		
ProfileName	Ductile Iron	
Pset_EnvironmentalImpactIndicators		
Reference	Ductile Iron	
Pset_PipeSegmentOccurrence		
InvertElevation	-1 569.45	mm
Pset_PipeSegmentTypeCommon		
Reference	Ductile Iron	

Implementation Strategy For CORENET X

Populate IFC Classes and Validation Parameter

IFC Entity and Sub Type (Plumbing Element)

<Agency>
Building Construction Authority (BCA)

<Regulatory Guidebook>
Code of Accessibility in the Built Environment (July 2019)

<Regulatory Requirement>
5.6.5.1
Wash basins, as illustrated in Figure 57, must:
(e) have a minimum clear floor space of 750 mm wide by 1200 mm deep of which a maximum of 480 mm in depth may be under the wash basin;

<Wash Basin Schedule>

A	B	C
Family and Type	IfcExportAs	IfcObjectType
Arup_Plumbing Fixture_Connector: Wash Basin - Plumbing	IfcSanitaryTerminalType.WASHHANDBASIN	
Arup_Plumbing Fixture_Connector: Wash Basin - Sanitary	IfcSanitaryTerminalType.WASHHANDBASIN	
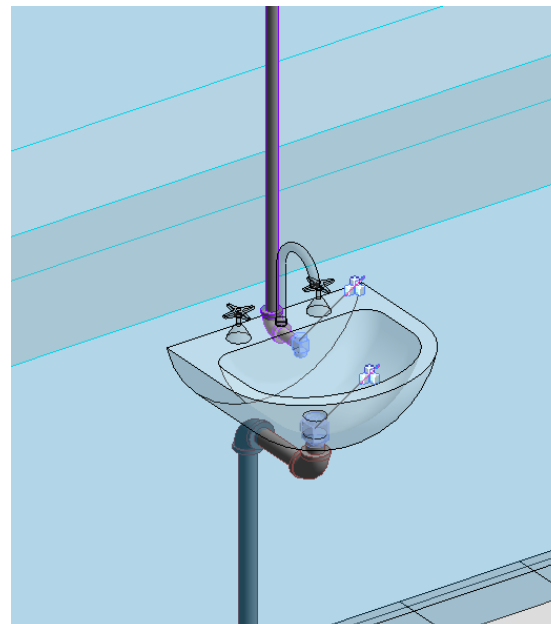
Name	Value	Unit
Element Specific		
Guid	1c2liXwSjFxhZknk7lA6gF	
IfcEntity	IfcSanitaryTerminal	
Name	Arup_Plumbing Fixture_Connector:Wash Basin - Sanitary:4323068	
ObjectType	Arup_Plumbing Fixture_Connector:Wash Basin - Sanitary	
PredefinedType	WASHHANDBASIN	
Tag	4323068	

| Name	Value	Unit
Element Specific		
Guid	1c2liXwSiFxhZknk7lA6e0	
IfcEntity	IfcSanitaryTerminal	
Name	Arup_Plumbing Fixture_Connector:Wash Basin - Plumbing:4322931	
ObjectType	Arup_Plumbing Fixture_Connector:Wash Basin - Plumbing	
PredefinedType	WASHHANDBASIN	
Tag	4322931	

Implementation Strategy For CORENET X

ARUP

Populate IFC Classes and Validation Parameter

IFC Entity and Sub Type (Lightning Protection Element)

<Agency>
Building Construction Authority (BCA)

<Regulatory Guidebook>
Approved Document - Acceptable Solutions (Sept 2019)

<Regulatory Requirement>
<u>LPS Components</u>
1. Tape (Al/Cu)
2. BI-Connector
3. Square Tape Clamp
4. Air-Finial/Metal Covering
5. Air-Finial Base
6. Strike Pad
7. Test Link
8. Insulation Pipe/Sleeve 100KV
9. Earth Pit

LPS Components

No s	LPS System	
1	**Air-Termination System**	
	eg	Metal Roof, Metal Trellis, Metal Lamp Pole, etc
2	**Down Conductor System**	
	eg	Rebars in Concrete Column, Metal Structural Column, Metal Façade, etc
3	**Earth-Termination System**	
	eg	Piles, Raft Foundation, etc

Natural Components

Implementation Strategy For CORENET X

ARUP

Populate IFC Classes and Validation Parameter

IFC Entity and Sub Type (Lightning Protection Element)

<LPS Tape>		
A	**B**	**C**
Family and Type	IfcExportAs	IfcObjectType
Rectangular Duct: LPS_Aluminium Tape	IfcDiscreteAccessoryType.USERDEFINED	LPS_LIGHTNINGTAPE
Rectangular Duct: LPS_Copper Tape	IfcDiscreteAccessoryType.USERDEFINED	LPS_LIGHTNINGTAPE

<LPS Strike Pad>		
A	**B**	**C**
Family and Type	IfcExportAs	IfcObjectType
Arup_LPS_Strike Pad_SG: Generic	IfcDiscreteAccessoryType.USERDEFINED	LPS_STRIKEPAD
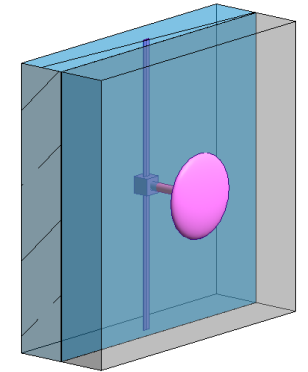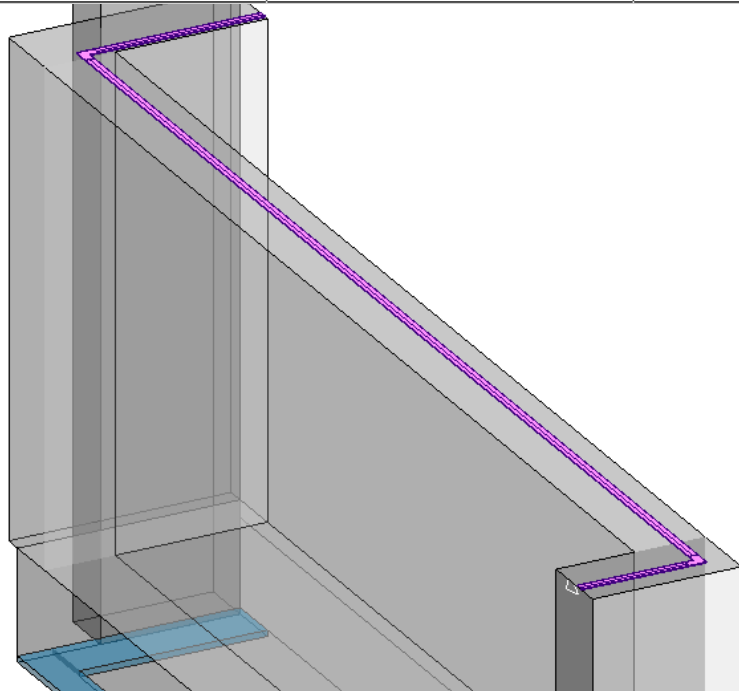
<LPS Air Finial>		
A	**B**	**C**
Family and Type	IfcExportAs	IfcObjectType
ARP_Lightning Rod: Default	IfcDiscreteAccessoryType.USERDEFINED	LPS_AIRFINIAL
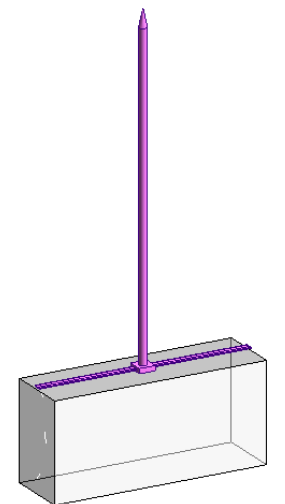
Implementation Strategy For CORENET X

Populate IFC Classes and Validation Parameter

IFC Entity and Sub Type (Lightning Protection Element)

<LPS Test Link>

A	B	C
Family and Type	IfcExportAs	IfcObjectType
Arup_LPS_Test Link_SG: Generic	IfcDiscreteAccessoryType.USERDEFINED	LPS_TESTLINKBOX

<LPS Metal Capping>

A	B	C
Family and Type	IfcExportAs	IfcObjectType
Metal Capping: Default	IfcDiscreteAccessoryType.USERDEFINED	LPS_METALCAPPING

<LPS Earth Pit>
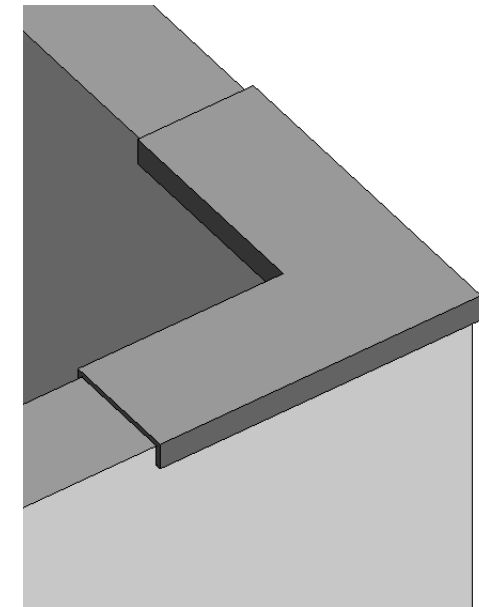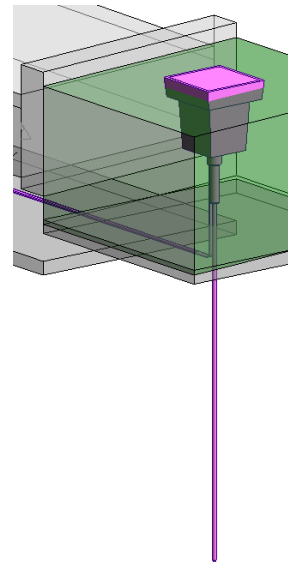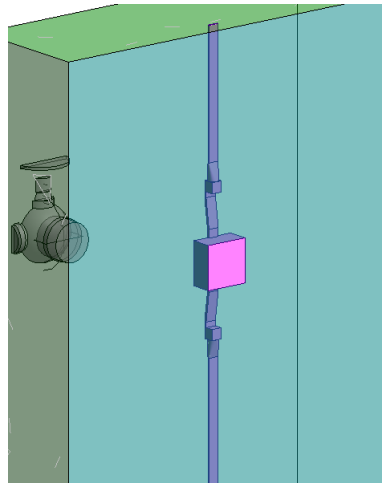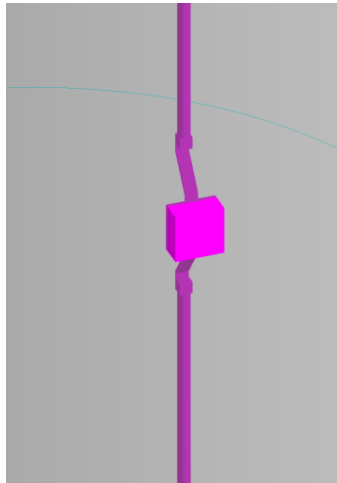
A	B	C
Family and Type	IfcExportAs	IfcObjectType
Arup_LPS_Earth Pit_SG: Generic	IfcDistributionChamberElementType.USERDEFINED	LPS_EARTHPIT

Implementation Strategy For CORENET X

Populate IFC Classes and Validation Parameter

IFC Entity and Sub Type (Lightning Protection Element)

<LPS Square Tape Clamp>		
A	B	C
Family and Type	IfcExportAs	IfcObjectType
Arup_LPS_Square Clamp_Vertical_SG: Generic	IfcDiscreteAccessoryType.USERDEFINED	LPS_SQUARETAPECLAMP
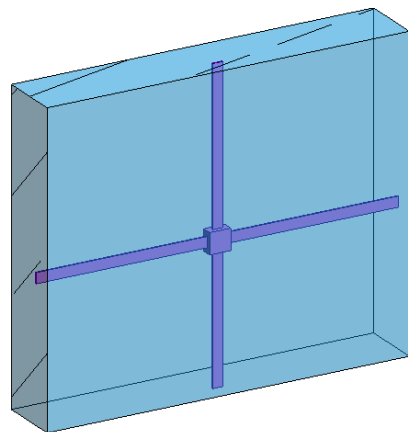
<LPS Bi-Metallic Connector>		
A	B	C
Family and Type	IfcExportAs	IfcObjectType
Arup_LPS_Square Clamp_Vertical_SG: Generic	IfcDiscreteAccessoryType.USERDEFINED	LPS_BIMETALLICCONNECTOR
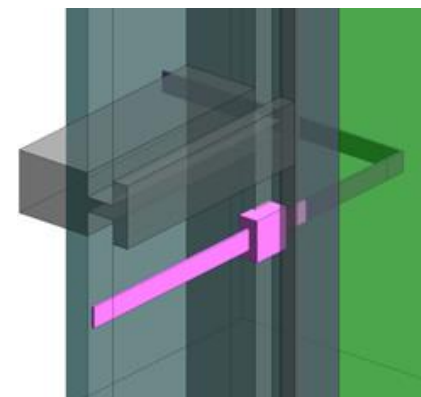
Implementation Strategy For CORENET X

Populate IFC Classes and Validation Parameter

IFC Entity and Sub Type (Lightning Protection Element)

<LPS Down Conductor>
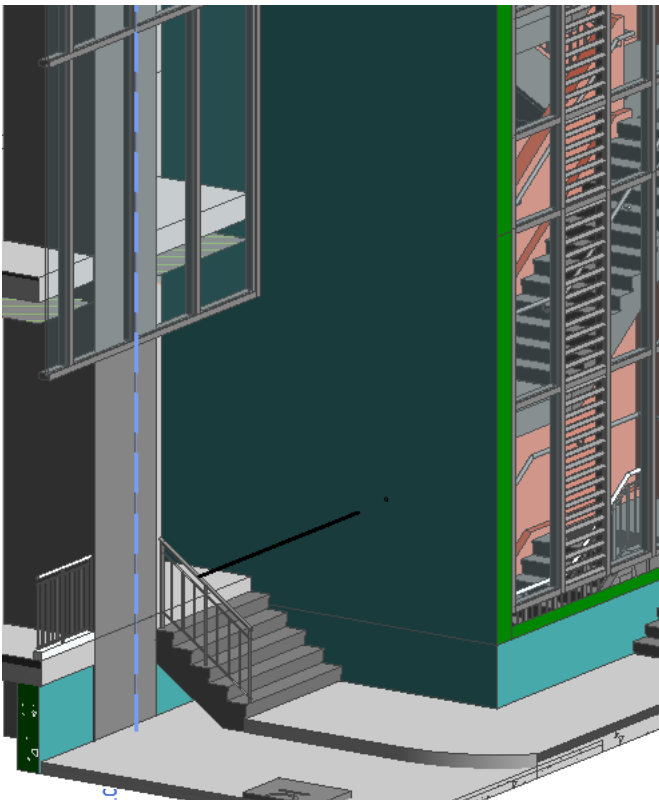
A	B	C
Family and Type	IfcExportAs	IfcObjectType
Round Duct: LPS_Down Conductor	IfcCableSegmentType.USERDEFINED	LPS_NATURALDOWNCONDUCTOR

<Lightning Protection System>

A	B	C
Family and Type	IfcExportAs	IfcObjectType
Duct System: Lightning Protection System	IfcDistributionSystemType.USERDEFINED	LIGHTNINGPROTECTION

Implementation Strategy For CORENET X

Populate IFC Classes and Validation Parameter

IFC Entity and Sub Type (Lightning Protection Element)

<LPS Bonding>		
A	**B**	**C**
Family and Type	IfcExportAs	IfcObjectType
Arup_LPS_Bond_Vertical_SG: Generic	IfcDiscreteAccessory	

If LPS components such as tapes are connected to LPS Natural component such as façade, railing and, we need to model "Bond" element and assign the connection of natural component Pset info. In IFC mapping table, "Bond" element mapping is not required to map so no IFC mapping info of "Bond" elements. Therefore, we have provided and proposed "Bond" element IFC info is as "IfcDiscreteAccessory".

Name	Value	Unit
Element Specific		
Guid	0PYq76Z1r3_gR3gNM_M26s	
IfcEntity	IfcDiscreteAccessory	
Name	Arup_LPS_Bond_Vertical_SG:Generic:4022256	
ObjectType	Arup_LPS_Bond_Vertical_SG:Generic	
PredefinedType	NOTDEFINED	
Tag	4022256	
Profile		
ProfileName	Generic	
Pset_ElementComponentCommon		
Reference	Generic	
Pset_EnvironmentalImpactIndicators		
Reference	Generic	
SGPset_DiscreteAccessory		
LS_NaturalComponentElement	Yes	
IfcDiscreteAccessory	Arup_LPS_Bond_Verti...	
Material layer	Metallic	(Materials)
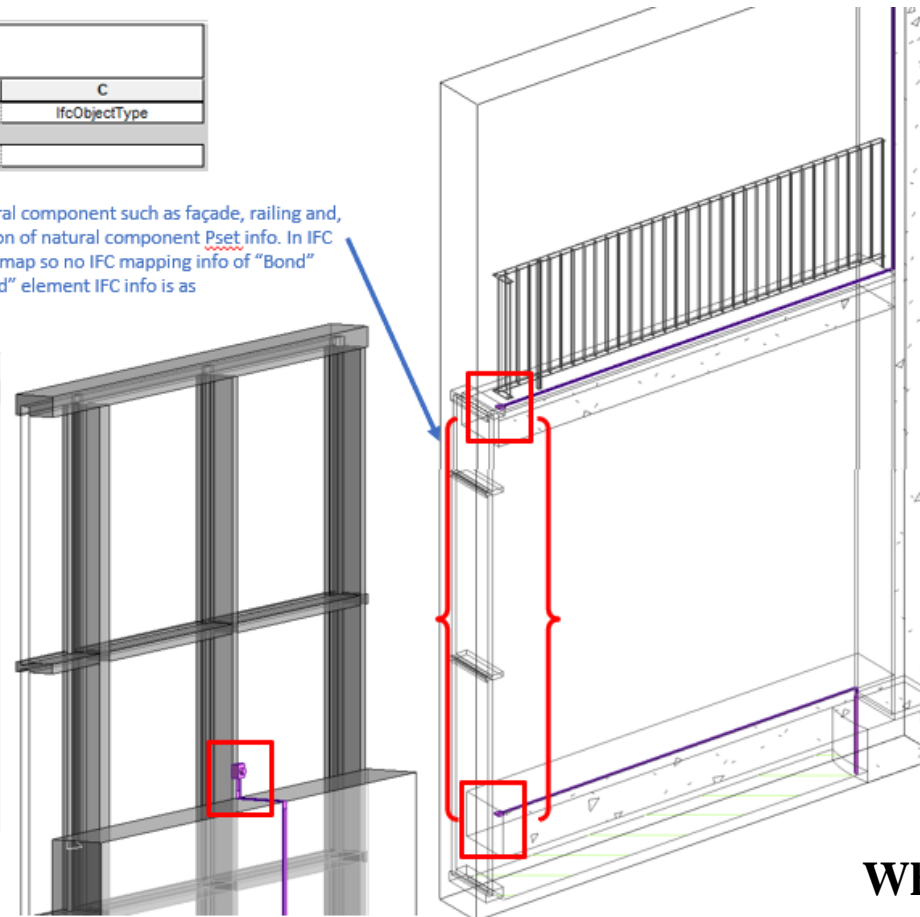
What is the conclusion of LPS System?

Implementation Strategy For CORENET X

Exporting IFC Model

Standard Process

Implementation Strategy For CORENET X
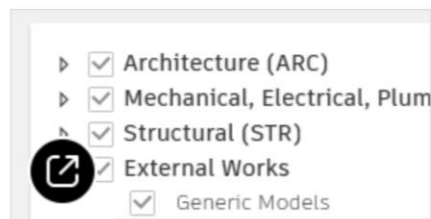
ARUP

Additional Process in Modelling

Current Practice

IFC-SG Resources
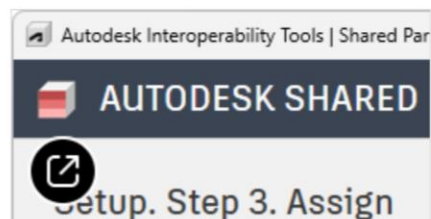
Shared Parameters Tool Configuration File

Download a configuration XML file for the Autodesk Shared Parameter Tool for Revit tool quickly add the IFC-SG schema parameters to your models.
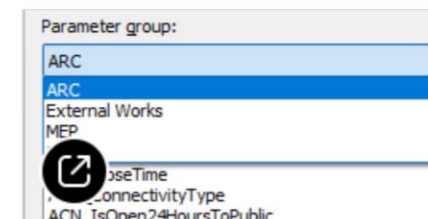
Model Checker Checkset

Download a checkset XML file for the Autodesk Model Checker for Revit tool with checks to validate the IFC-SG schema parameters are in your model and attached to the correct family categories.
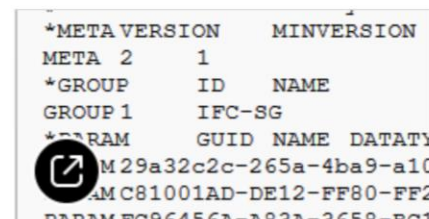
Shared Parameters File

Download a Revit shared parameters TXT file for the IFC-SG schema.

Shared Parameters File By Discipline

Download a Revit shared parameters TXT file for the IFC-SG schema, organized by discipline.

Adding Share parameter to either Project or Family

Implementation Strategy For CORENET X

Exporting IFC Model

FLOW OF INFORMATION FROM NATIVE BIM TO IFC

Information in IFC comes from information modelled in the Native BIM Model

Export to IFC

Components and parameters of interest to be modelled in BIM

Configure components and parameters in BIM authoring software to map to the desired IFC representation

Eventual IFC model with components and parameters captured

6
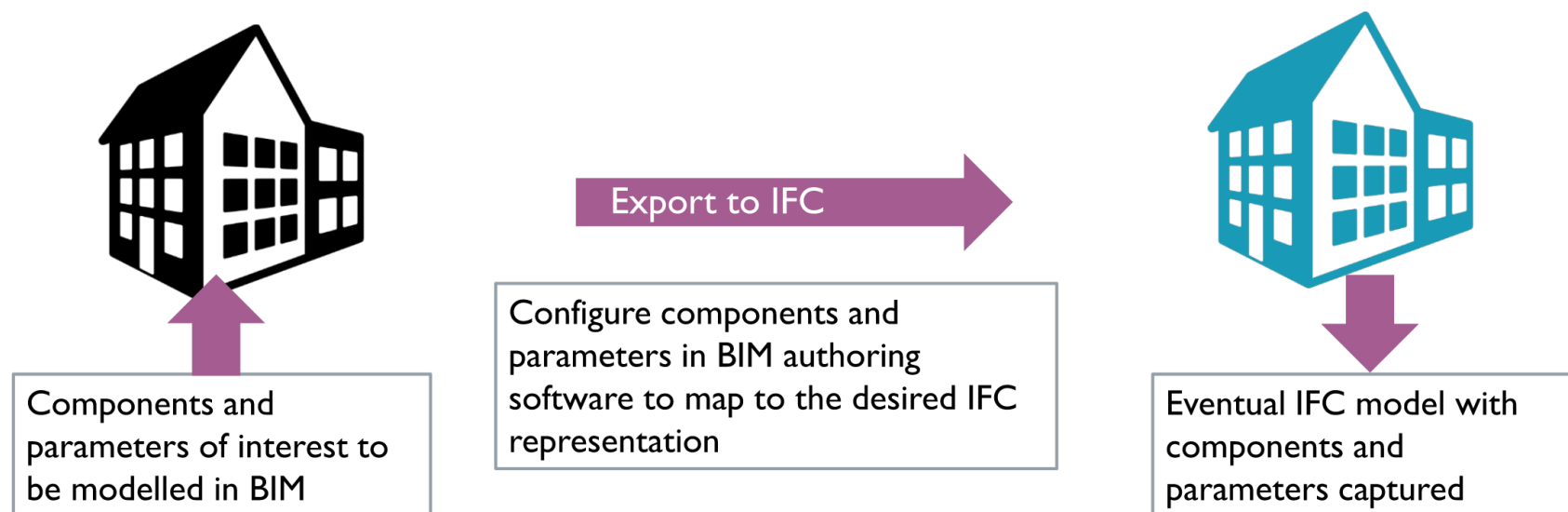
Usable Company Standard Parameter as IFC-SG properties?

Implementation Strategy For CORENET X

IFC Exporting with Customise Config file

Company parameter can be mapped with IFC-SG parameter name

IFC-SG resource toolkit   Revit IFC Exporter JSON Files Revit 2021 to 2023

Implementation Strategy For CORENET X

Take away

- Understanding of IFC 4 and IFC-SG and Industry Mapping Table

- Understanding of Additional Process in Modelling

- Available Latest Technology from Software Vendor

Thank you

Q?