CORENET X
Leadership Forum

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Being Future-Ready: Embracing a New Model

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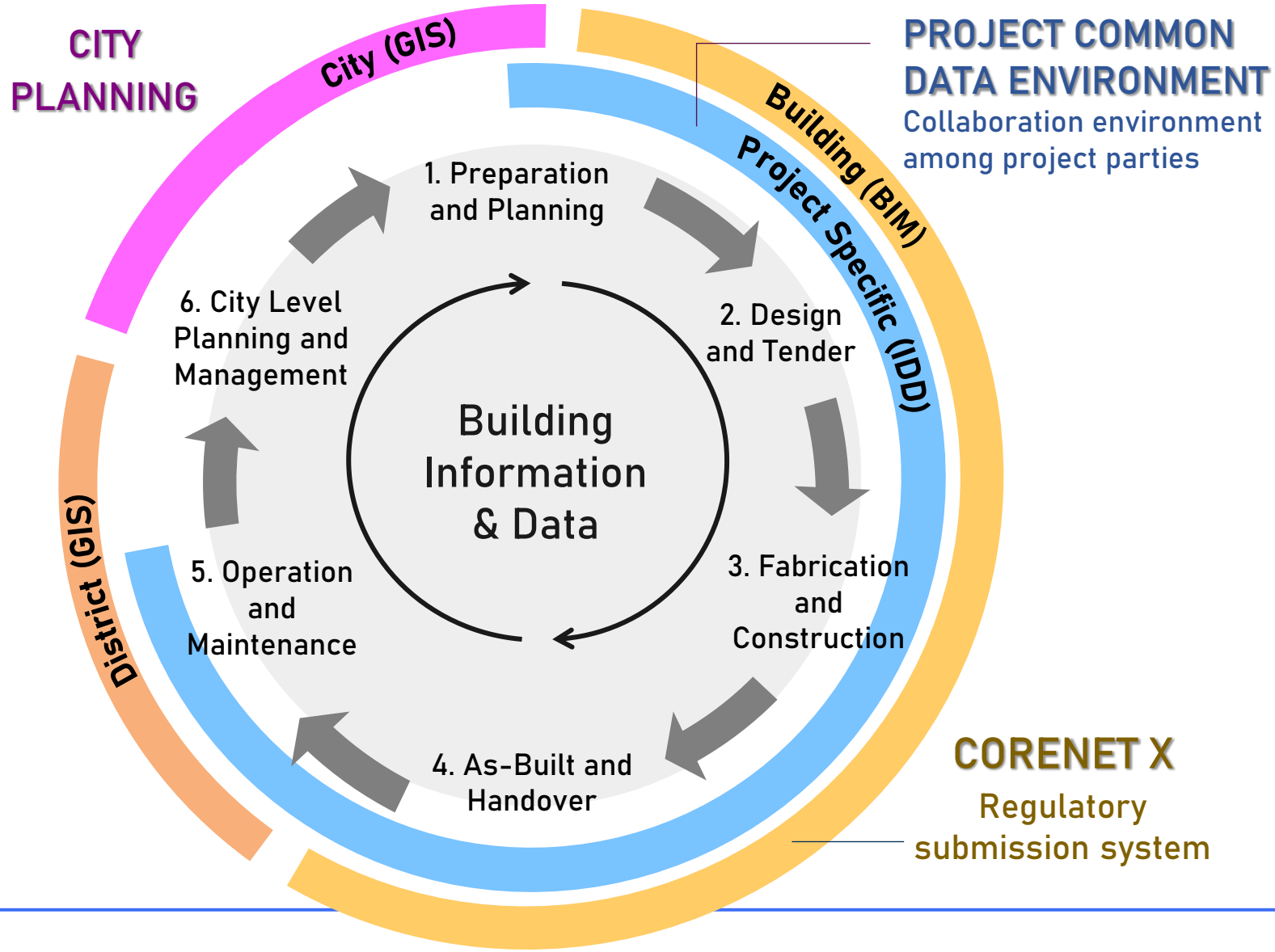
Towards a Data-Driven Project Delivery

- Clearer Definition of Stakeholder Requirements
- More Immersive Coordination & Review of Design
- Easier Monitoring of Trends & Performance

Interoperability and Open Data Standards

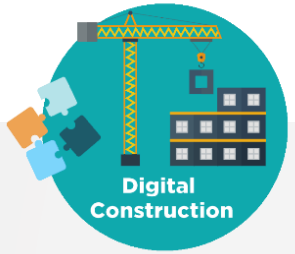
- Data requirements and data footprint throughout the value-chain
- Data flows through the entire value chain, supporting the different applications and use cases



Integrated Digital Delivery and CDE Data Standards

Digital Design

Digital Fabrication



Digital Construction

Digital Asset Delivery & Management

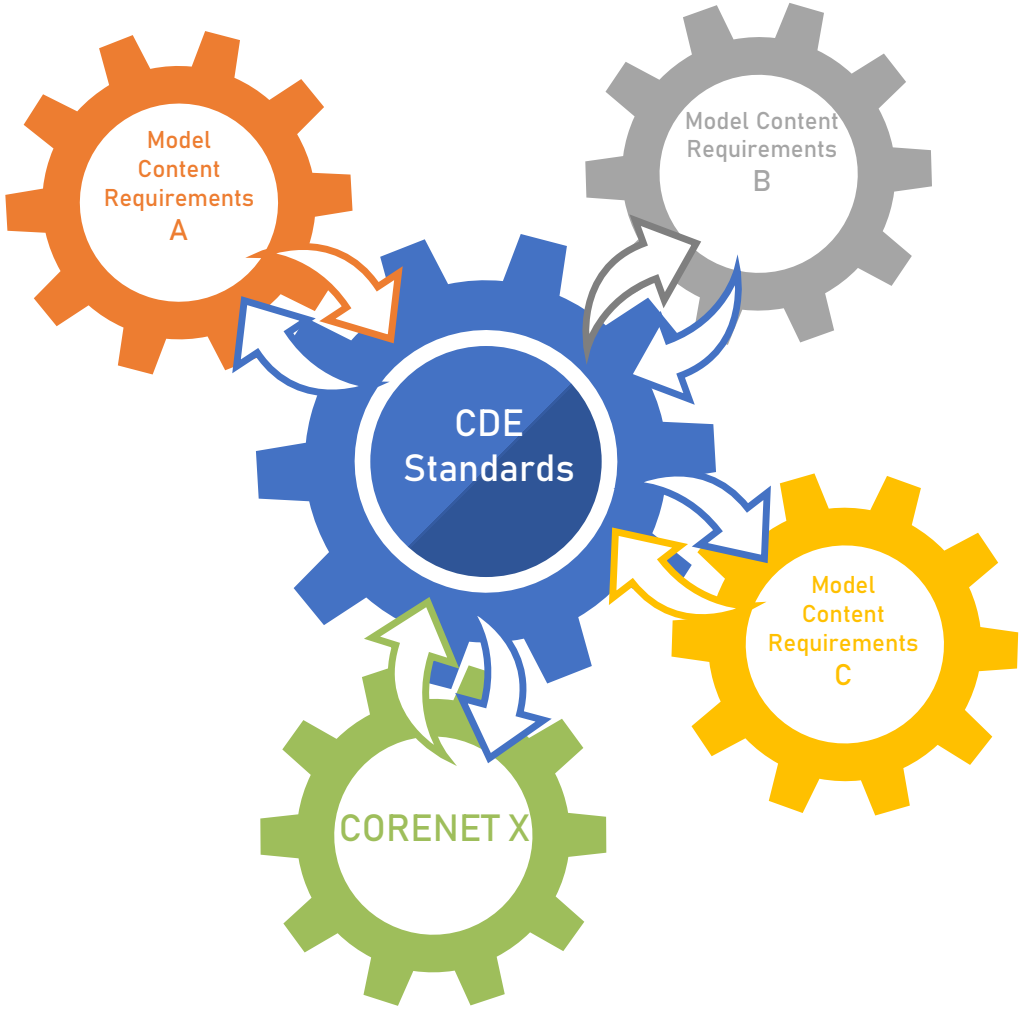
Integrated Design and Regulatory Compliance

Smart Off-site to On-site Construction and Asset Management

CORENET X

CORENET X will strengthen project coordination and facilitate IDD implementation and BIM-based regulatory approvals at the onset of a construction project.

Integrated Digital Delivery and CDE Data Standards



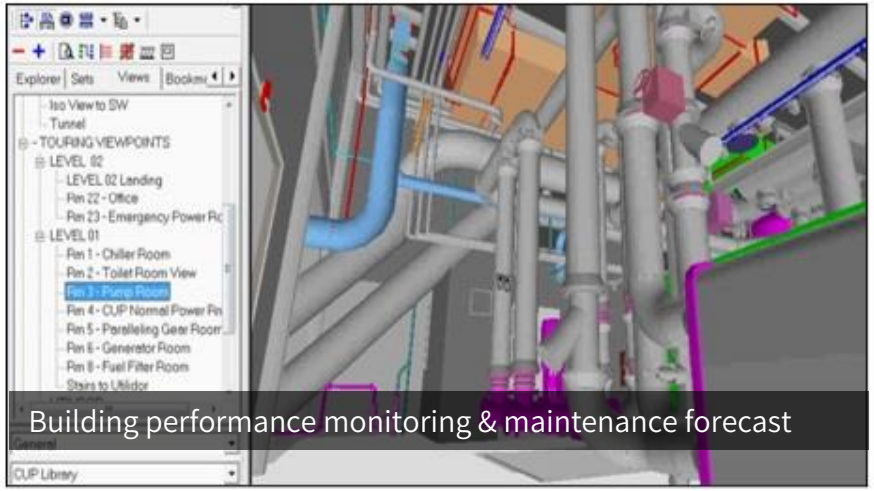
CORENET X data requirements will be aligned to the CDE Data Standard

Synergy of the Built Environment

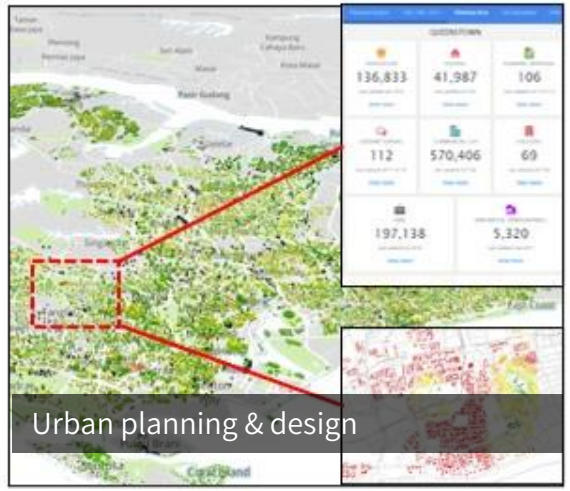
Vision of a Centralised Data Hub (Single Source of Truth)

- Single Source of Truth, enabling evidence-based decision making
- One-stop access to up-to-date datasets extracted from submitted BIM models
- Leverage on geo-spatial + 3D data analytics for building performance monitoring, operations planning, emergency response, policy reviews, etc

Material specs of building claddings

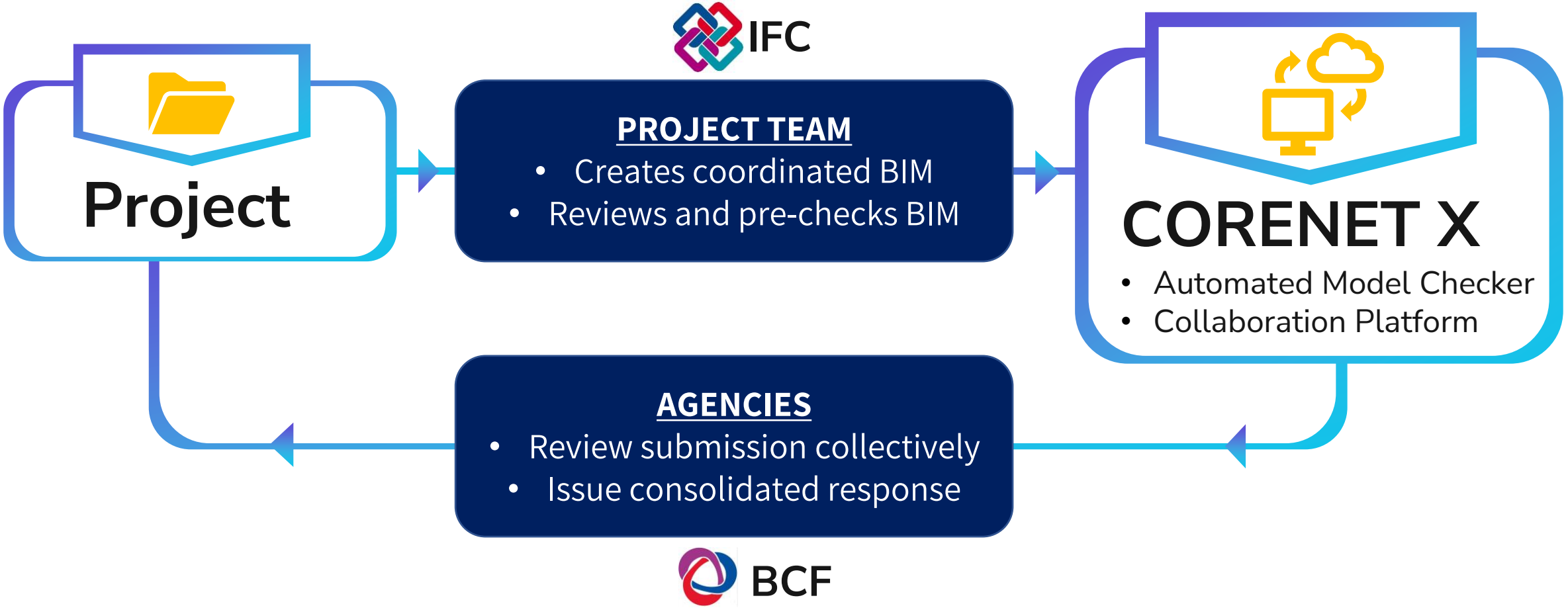


Building performance monitoring & maintenance forecast



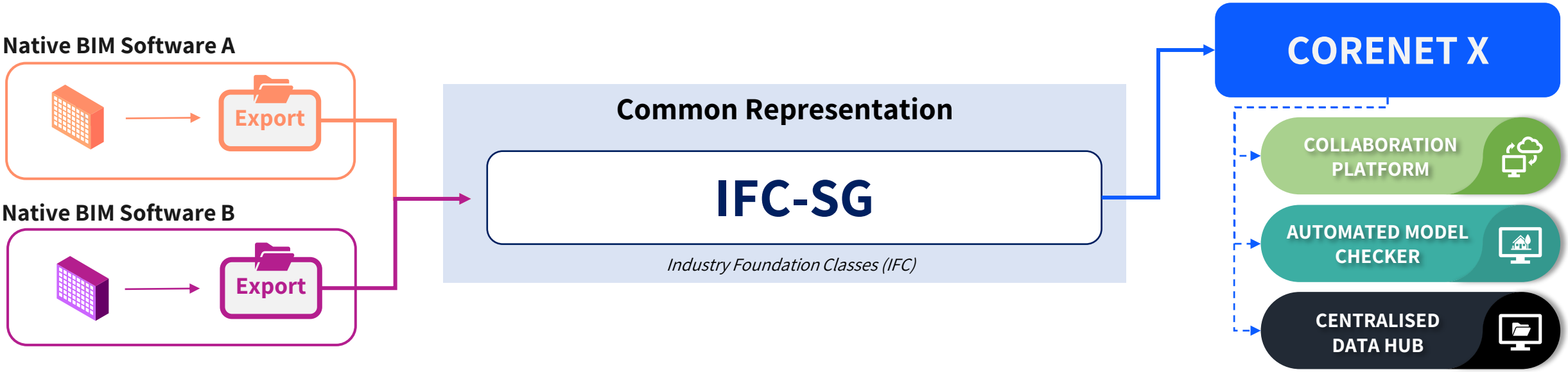
Urban planning & design

Leveraging OpenBIM for CORENET X



IFC for local Regulatory Requirements

An OpenBIM data standard customised for local context



01

Non-Standard Format

- Multiple solutions/ systems needed to process different formats
- Increased costs and maintenance
- Does not fully cater to government regulatory requirements

02

IFC

- ISO standard specifications for digital construction info
- Enables info exchange in a consistent and repeatable way

03

IFC-SG

- Adapting IFC to **cater for local Regulatory Requirements**
- Leverage existing eco-system acceptance and support

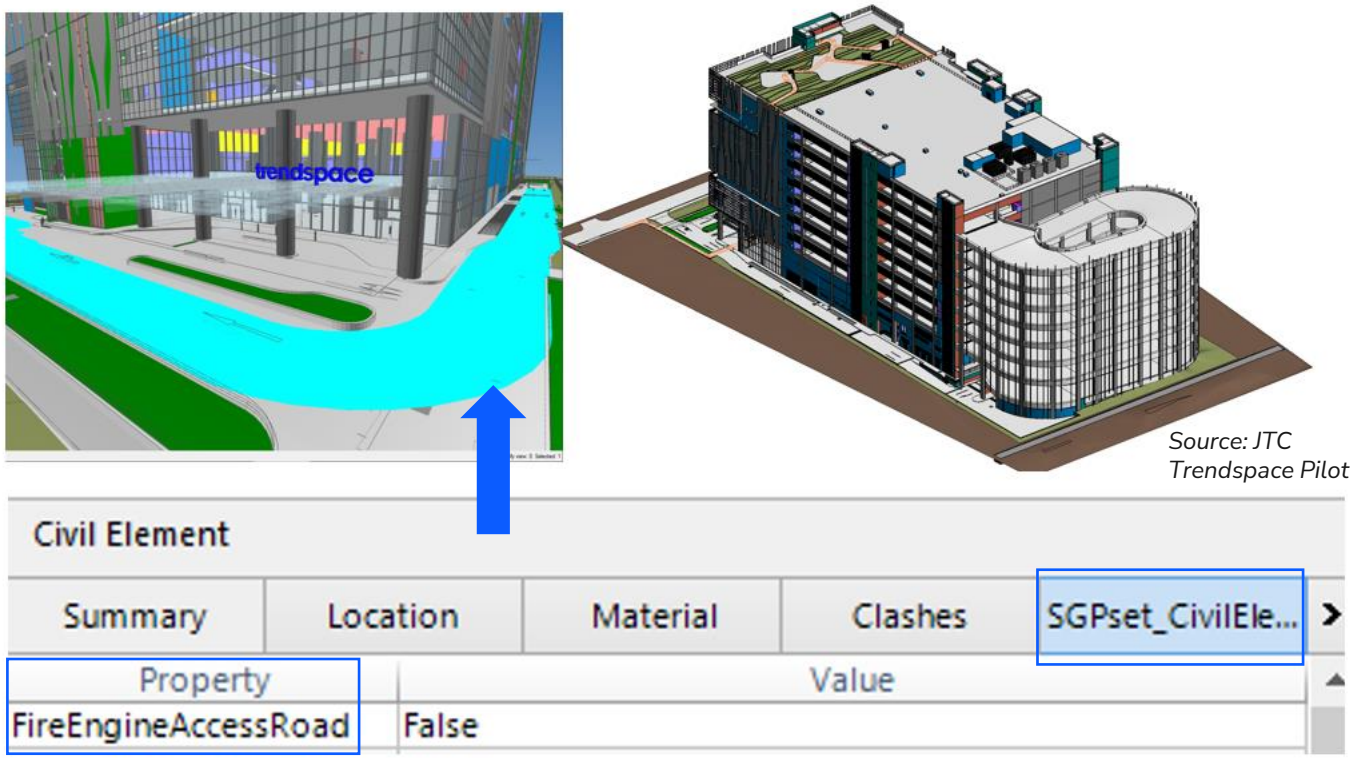
04

IFC-SG in CORENET X

- **Localised information of interest**
- Supports CP and AMC

Example of Regulatory Information (using IFC-SG)

Fire Engine Access Road

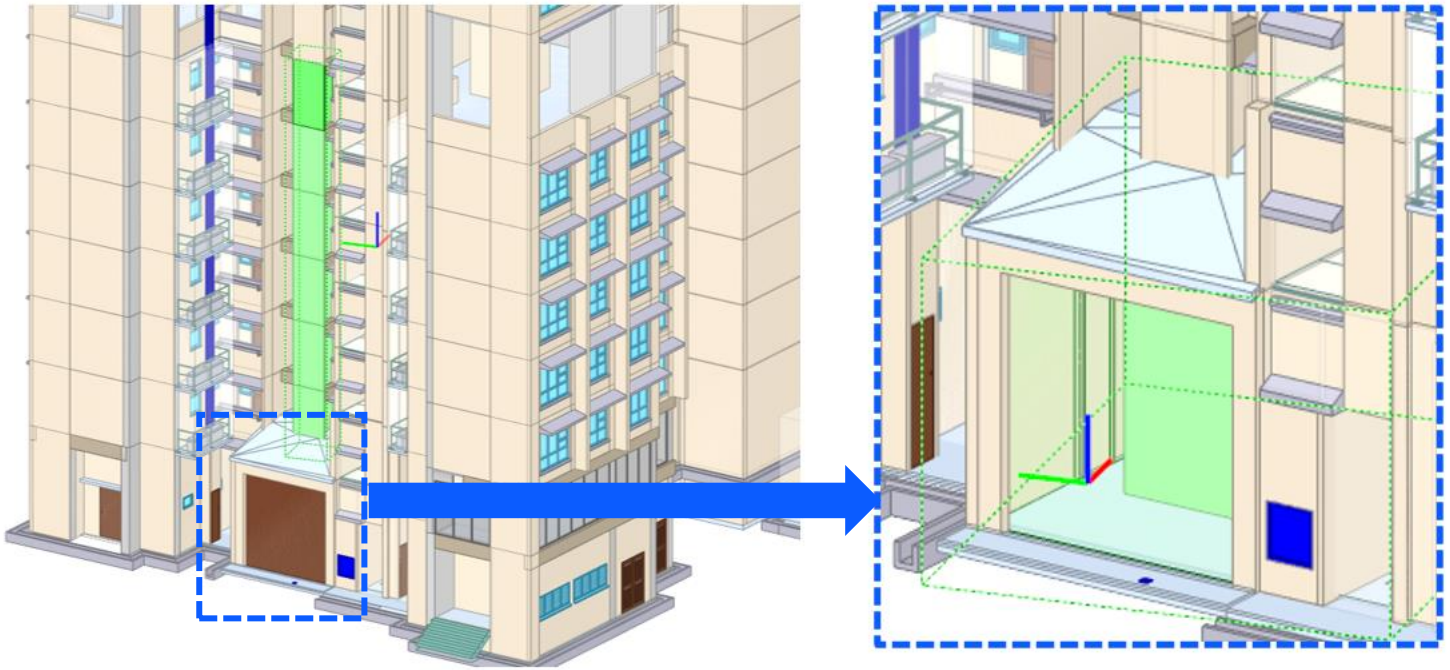


Source: JTC Trendspace Pilot

Defining a customized **“FireEngineAccessRoad"** type under the IfcCivilElement entity, to indicate the fire engine access road in a project development.

Example of Regulatory Information (using IFC-SG)

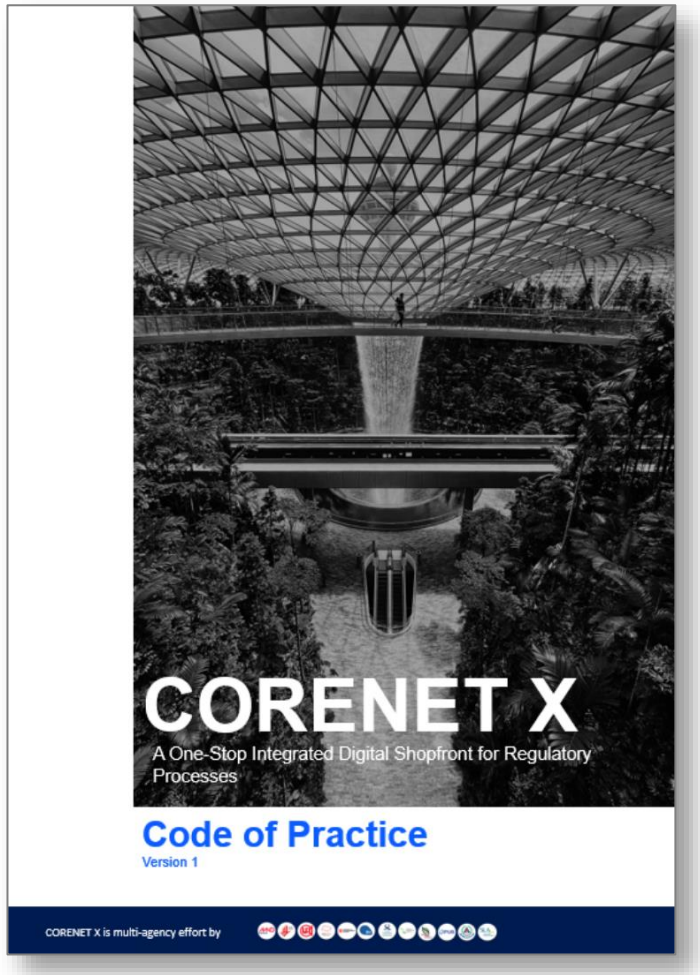
Precast Refuse Chute



Defining a customized **“PrecastRefuseChute"** type to meet the regulatory requirements for:

- Environmental Health
- Buildability and Productivity

CORENET X Code of Practice



- ✓ Team-level preparations for submission planning and inter-disciplinary collaboration
- ✓ Details on timing and content of IFC-SG and supplementary data required at each Gateway

2 **Construction Gateway**

Continued from previous page

Fire Compartmentation

	Agency	Requirement Category	Common Components
	SCDF	Compartmentation • Separation of transit and non-transit occupancies • Separation of public and ancillary areas • Separation of commercial spaces • Separation between viaduct and M&E plantrooms / commercial spaces • Fire rating of compartment • Compartmentation by height • Vertical fire spread	• Door • Space • Wall

Fire Fighting, Equipment

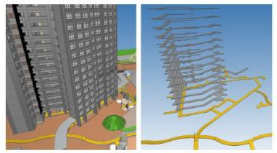
	Agency	Requirement Category	Common Components
	SCDF	Fire hydrant system • Location of fire hydrant(s) • Hydrant coverage not more than 50m from fire engine access road / accessway	• Fire Hydrant • Road
		Sprinklers & system • Provision of sprinklers for basement • Provision of sprinklers for buildings having habitable height more than 24m (mixed-use residential buildings)	• Space
		Rising mains & system • The type of rising main provided (dry or wet) • Location of landing valve(s) • Rising main coverage • Standby hose provision • Breeching inlet location	• Breeching Inlet • Hose Reel • Landing Valve • System
		Hose reel & system • Location of hose reel • Hose reel coverage	• Hose Reel
		Emergency voice communication system • One way and two way EVC	-

Accessible Route

A virtual representation of the Accessible Route.

A **Construction Gateway**

Gateway Key Words	Agency	Requirement Category
Access to site	BCA	Passenger alighting and boarding point
Access within building	BCA	Accessible route and maneouvring space (within the development)
Connectivity	BCA	Accessible route (to the ingress / egress development entrance)
Vehicular Parking	BCA	Accessible vehicle parking



Accessible Route within BIM model (left) and with rest of BIM model hidden (right)

IFC Entity: IfcBuildingElementProxy

IFC USER-DEFINED SubType: ACCESSIBLEROUTE

S/N	IFC-SG Property	IFC-SG PropertySet	Property Type	Input Limitation	Examples
1	BarrierFreeAccessibility	SGPset_BuildingElementProxy	Boolean	Yes	TRUE/ FALSE
2	Width	SGPset_BuildingElementProxyDimension	Measurement auto-generated from BIM*	No	1200

Other notes

- Width is in mm
- This component can be modelled with Generic Models (Revit), Model Element (Archicad), or Object (OpenBuildings) functions in respective native BIM software
- Other components that could be viewed with Accessible Route may include Lift, Ramp, Slab, Space, Vehicular Parking, if they contain a positive BarrierFreeAccessibility property

Beam

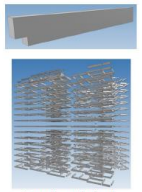
Includes beams from various material and construction method, as well as trellis

Piling Gateway

Gateway Key Words	Agency	Requirement Category
Structural	BCA	Structural design (piling and foundation works)

Construction Gateway

Gateway Key Words	Agency	Requirement Category
Buildability	BCA	Buildability design (scoring)
Structural	BCA	Structural design (main structural elements of building excluding piling)



Beam closeup (top) and view of all beams in a project (above)

Definition of IFC-SG structural parameters

1. Text format of TopLeft, TopMiddle, TopRight, BottomLeft, BottomMiddle & BottomRight:
   - Use '+' for more than 1 layer of reinforcement: BottomMiddle = 5H32+2H20
2. Text format of StirrupsLeft, StirrupsMiddle & StirrupsRight:
   - Use '+' for more than 1 layer of reinforcement: StirrupsLeft = H10-100+H8-100

BEAM SEQUENCING & SPAN DEFINITION

Online Self Help Resources

IFC-SG RESOURCE KIT https://go.gov.sg/ifcsg

✓ **Agencies' IFC-SG Mapping Requirements**

✓ **IFC-SG How-To Guides, Videos, Exercises**

✓ **IFC-SG Templates**

AUTODESK

GRAPHISOFT Archicad®

Tekla

OpenBuildings™ Designer CONNECT Edition

FOC Apps to Facilitate IFC-SG Model Preparation

BIMLife

IFC-SG Validator

IfcOpenShell

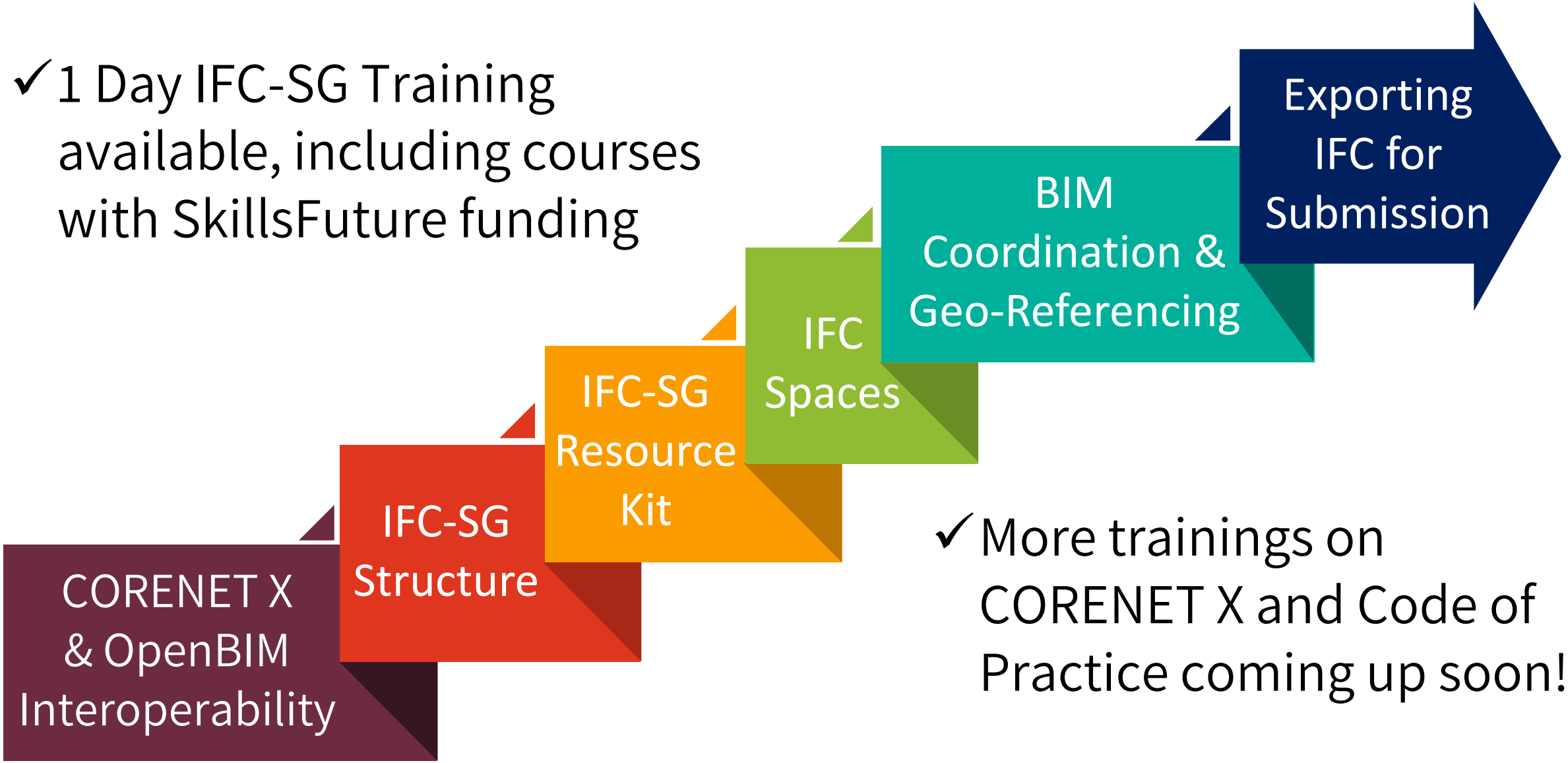
DiRoots.

BlenderBIM

Singapore Polytechnic

Building Capability

✓1 Day IFC-SG Training available, including courses with SkillsFuture funding



✓More trainings on CORENET X and Code of Practice coming up soon!

Thank you

Latest updates on CORENET X can be found at
https://go.gov.sg/cx