

The left side of the page features several abstract geometric shapes. At the top left is a purple circle. Below it are two vertical blue dashes. To the right is a green triangle. Further right is a purple circle. Below that is a large orange semi-circle. At the bottom left is a green square. In the center-bottom is a large orange circle with four blue dashes around it.

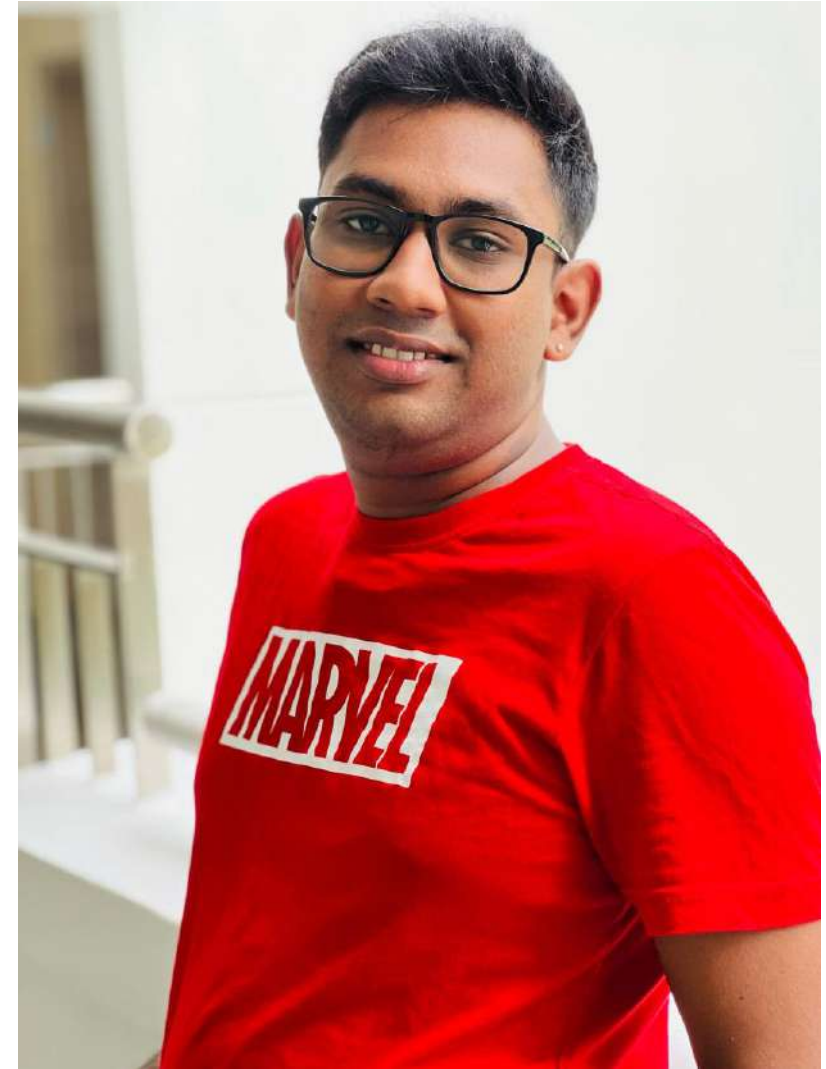
BIM PORTFOLIO

Subram Sivanandam

I am a Civil Engineer with **over 9 years** of hands-on experience in Building Information Modeling (BIM). Currently, I serve as a BIM Manager at Penta-Ocean Construction, Singapore, where I lead the implementation of BIM strategies across complex infrastructure projects. I am an Autodesk Certified Revit User and hold a **DDM Tier 2 Accreditation**, reflecting my commitment to advancing digital delivery and BIM excellence in the construction industry. My expertise includes 3D modeling, parametric family creation, and optimizing workflows across Architecture, Structure, and MEP disciplines. I also have strong experience in **Dynamo scripting** for automation, clash detection for improved coordination, and the use of BIM for accurate quantity take-offs. With a passion for improving construction processes, I am committed to driving innovation in BIM and helping teams achieve higher levels of efficiency, collaboration, and project delivery. My goal is to continue pushing the boundaries of BIM technology to transform how projects are delivered and to make the construction process more integrated, intelligent, and future-ready.

Project Handled

- **CR117 Design and Construction of Bright Hill Interchange Station and Tunnels (MRT)**
- **CR102 Design and construction of tunnels connecting Aviation Park station to Changi East Depot- \$780 Million**
- **Proposed 12-Storey Health and Medical Care Development at Singapore General Hospital**
- **Proposed 3rd Storey Temporary Workers Dormitory (SGA Project)**
- **Jabatan Kerja Raya Road (JKR FT 7) Project.**
- **Terminal 2 (Mechanical and Electrical Services Modeling)**



Educational Background

- **Bachelor of civil Engineering**
Anna University, India
- **Specialist Diploma in Architecture technology**
BCA Academy, Singapore
- **BIM Management**
BCA Academy, Singapore

Professional Certificate

- **Certified ISO 19650 Part 2 &4 / BIM Fundamentals**
BSI, Singapore
- **UAPL Drone Pilot**
Singapore
- **DDM Tier -2 Accreditation**
Buildingsmart, Singapore

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Software Skill

- **2D Drafting & Documentation**
AutoCAD 2026, Microstation V8i
- **3D Modelling, Analysis & Load Calculation**
Revit Architecture, Structure & MEP
ArchiCAD, SketchUp, 3DsMAX, Dynamo,
- **Clash Detection & Coordination**
Navisworks, Solibri,
BIM Collab, Model checker, BIM 360
- **4D Scheduling & Construction Sequencing**
Fuzor VDC, Synchro Pro, Navisworks
- **5D Cost Estimating & Quantity Take-Off**
CubiCost, CostX, Navisworks
- **7D Facility Management (FM)**
COBie,
- **Augmented Reality & Virtual Reality**
Unity, Vuforia : Web based Augmented Reality
- **Planning & Project Management**
Microsoft Project, Primavera P6
- **Cloud Base Collaboration**
BIM 360, ACC

DIGITALIZATION & FACILITY MANAGEMENT

BIM for FM

- Asset Digitization,
- Digital Twin
- Asset Management
- Asset Maintenance



EXPERIENCE IN BIM



BIM/ VDC/ IDD

BIM/VDC for Design Management

- 3D Modelling
- 4D simulation
- 5D Estimation
- 6D AIM

CONSTRUCTION MONITORING FIELD to BIM

- Digital Transformation
- Drone Progress site monitoring



DFMA FOR CONSTRUCTION BIM for Fabrication

- DfMA design and implementation
- Setup for PPVC/PBU
- Rebar Modelling



E-PROJECT MANAGEMENT

BIM to FIELD

- Construction Management Platform through cloud-based web and mobile applications.
- Augmented Reality & Virtual Reality

CR117

DESIGN AND CONSTRUCTION OF BRIGHT HILL INTERCHANGE STATION AND TUNNELS

The CR117 project is part of Singapore's Cross Island Line (CRL) development, aimed at enhancing the nation's public transport network. This specific contract involves the design and construction of underground structures including tunnels, stations, and supporting facilities to improve East-West connectivity and reduce commuter travel time.

Project Cost-\$526 Millions

01

BIM Management, Design & BIM Coordination

Establish BEP, Set Project VDC Standards & Workflows
Chair ICE and VDC Sessions, Establish and manage Project CDE,
Design and BIM Coordination with all involved parties(Consultants, Subcontractors, SWCs)

02

Construction BIM Modelling & Documentation

Modelling of Station, Tunnels,Roads, Adjacent facilities, Surrounding buildings
Production of sheets (CBP, Shop drawings, Setting out drawings, Tiling, RCP etc)

03

CCSM

Develop and Update Prefinal , Final , Updated final CCSM
Coordinate with consultants, Sub Cons, SWC to resolve the issues
regarding the design and coordination, Produce sheets (SEM, CSD)

04

4D Simulation

Produce Baseline 4D Simulation, CIP
Monthly 4D
Planned vs Actual 4D

05

5D Quantity Take-off

Produce Quantity reports,
Monthly Cost analysis, Progress based on site progress
Make necessary adjustments as per the site condition/ progress

06

6D Asset Information Modelling

Representing actual completed building Architecture and Structure
elements. BIM FM Model to LTA Standard, working with SWC for FM
data .

07

Site Progress Monitoring

Using Drones for Aerial Photography, Videography
Monthly/Quarterly/Annual reports of work.

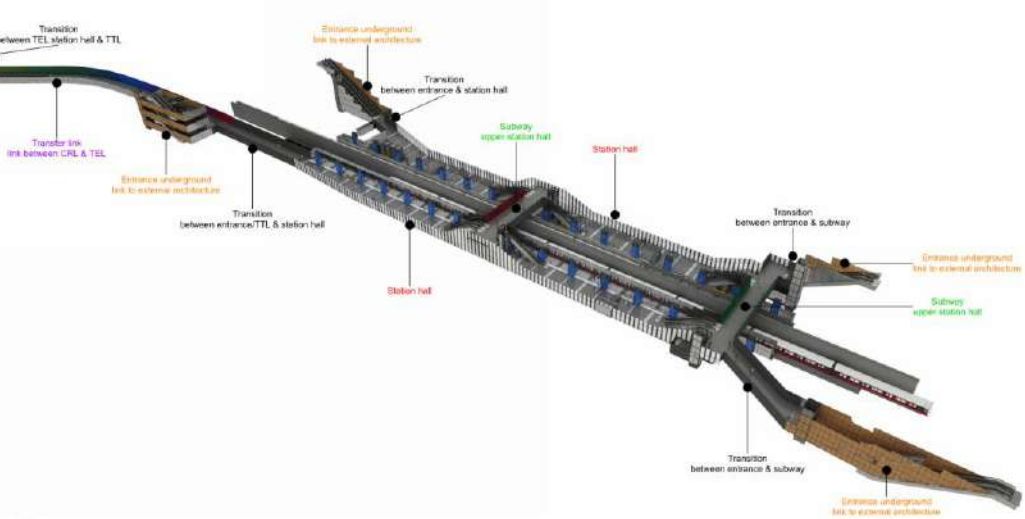
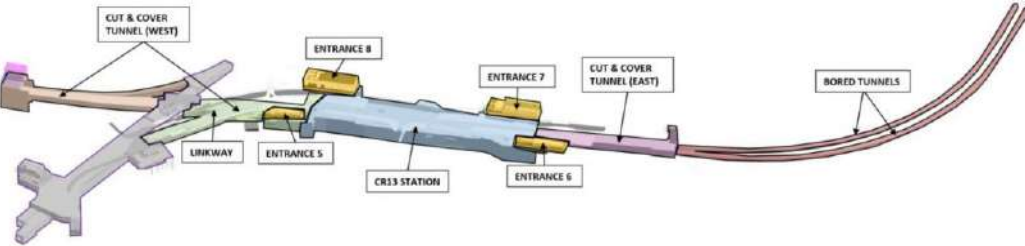
Project Name: CR117 - Cross Island Line Contract

Project Type: Infrastructure (Rail Transit - LTA Project)

Location: Singapore

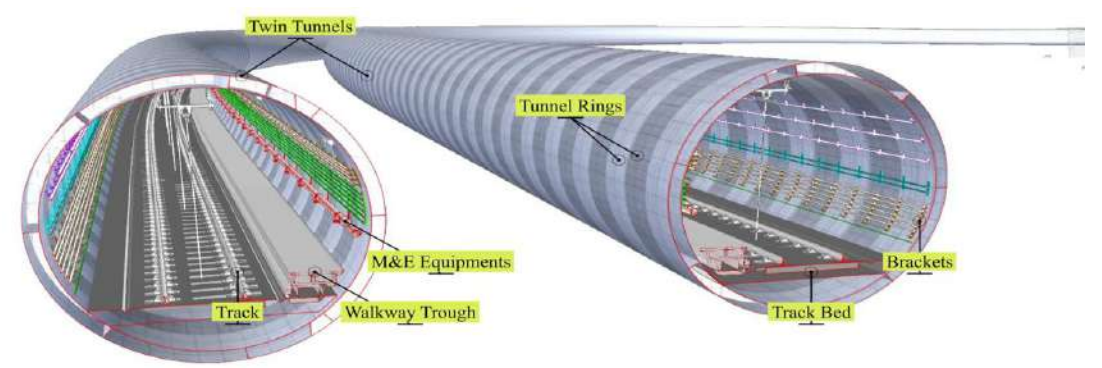
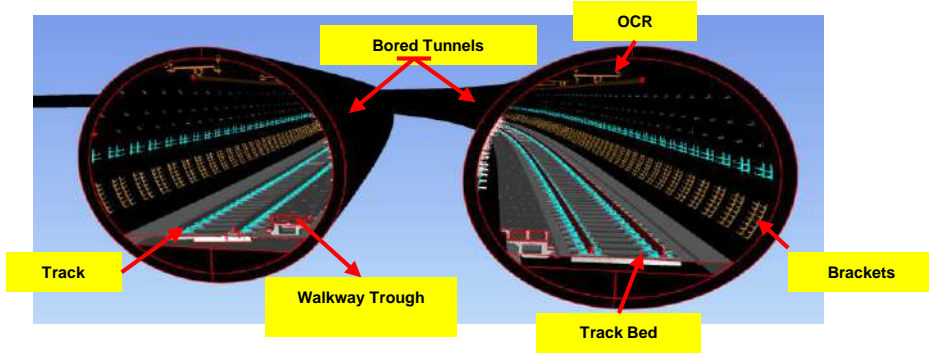
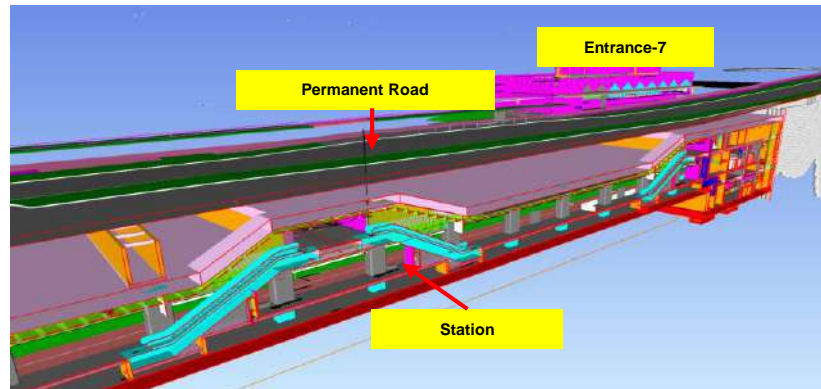
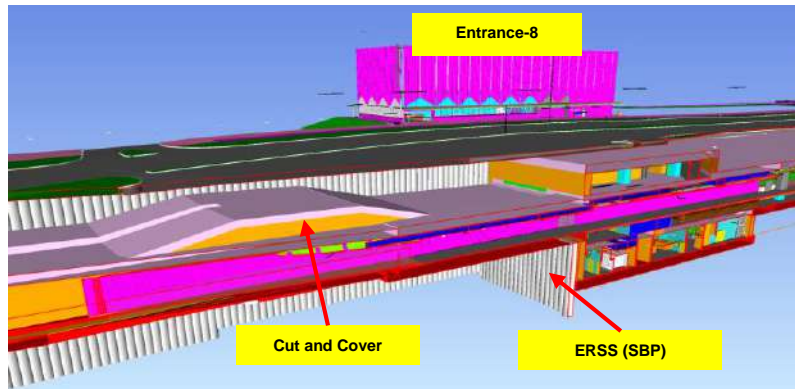
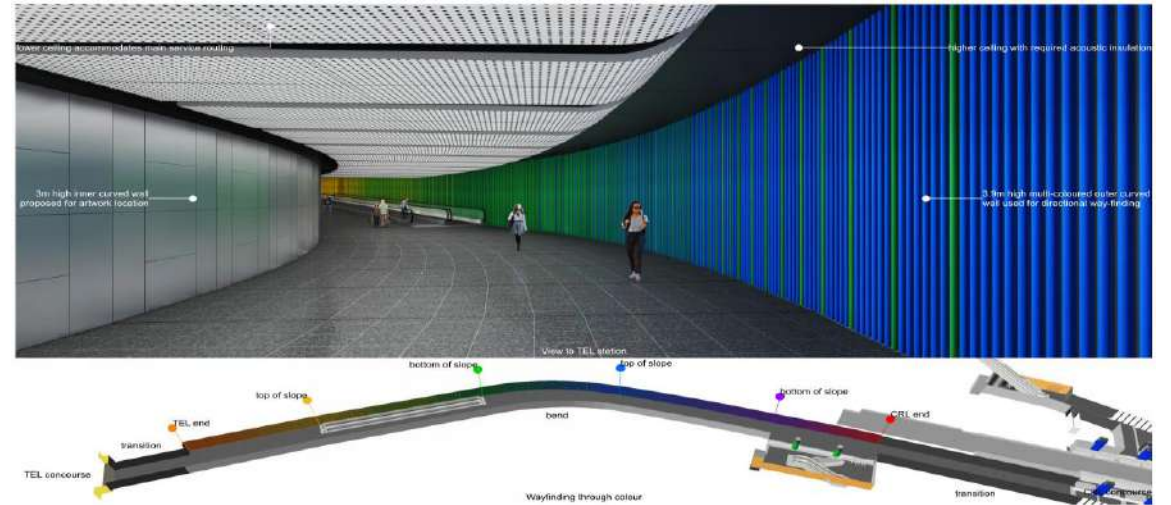
Client: Land Transport Authority (LTA)

Main Contractor: Penta-Ocean Construction Co., Ltd

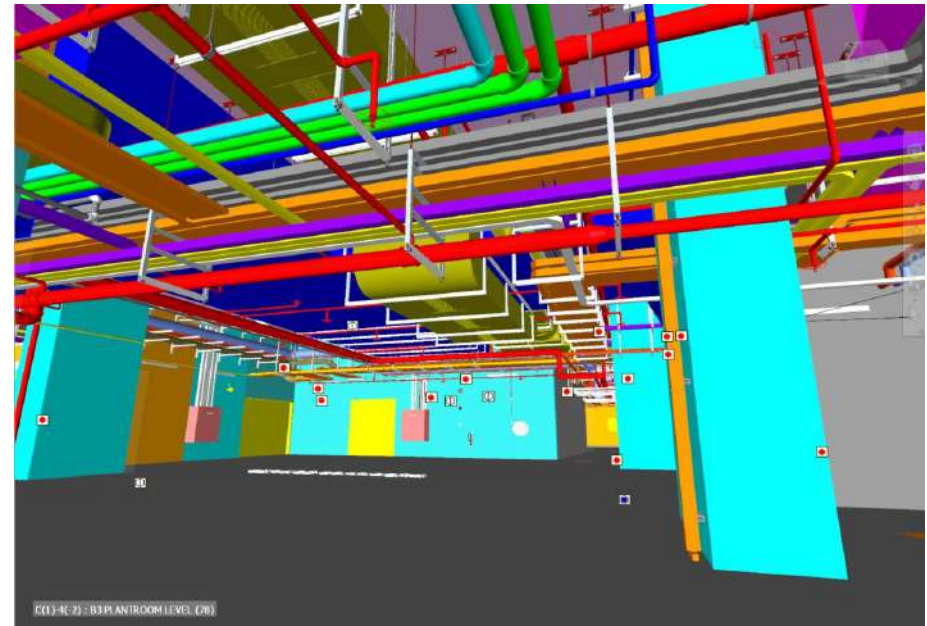


Scope of work in Project: As the BIM Manager and IDD Manager for the CR117 Bright Hill Interchange Station and Tunnels project, I was responsible for overseeing the full BIM lifecycle from design coordination to construction execution. This included managing multi-disciplinary BIM models for the station, tunnels, and associated works, ensuring alignment with LTA standards and progressive updates for authority submissions. I led coordination efforts among consultants, subcontractors, and internal teams to resolve clashes, standardize model deliverables, and facilitate digital drawing production. As IDD Manager, I implemented and monitored workflows on the IDD platform, ensuring seamless integration of BIM with procurement, scheduling (4D), and quantity tracking (5D) systems. In addition, I spearheaded the adoption of AI-driven progress tracking using site-based imagery and drone data to automate as-built comparisons and support data-driven decision-making. My role also included driving digital capability across stakeholders and supporting compliance with LTA's IDD and DfMA strategies

Challenges faced and resolved in Project: One of the major challenges faced in the CR117 Bright Hill Interchange project was managing coordination between multiple stakeholders using differing BIM standards, software platforms, and inconsistent model quality. This often led to clashes, rework, and delays in submissions, particularly during early design integration and tunnel interface works. To address this, I established a standardized BIM execution framework and conducted regular clash review sessions using Navisworks and issue tracking tools, ensuring alignment across all disciplines. Another challenge was achieving reliable AI-based progress tracking, as the site environment presented difficulties in capturing consistent data through drone imagery. I resolved this by working closely with the site team to define optimal drone flight paths and aligning AI detection logic with the BIM model progress zones. Additionally, integrating all project data into the IDD platform required extensive stakeholder

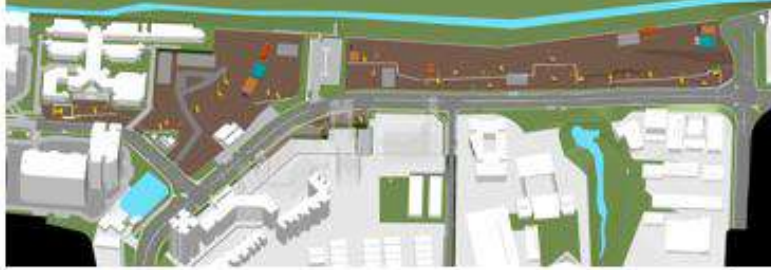


CCSM



4D Simulation for Traffic Diversion

Stage 0 Traffic Diversion



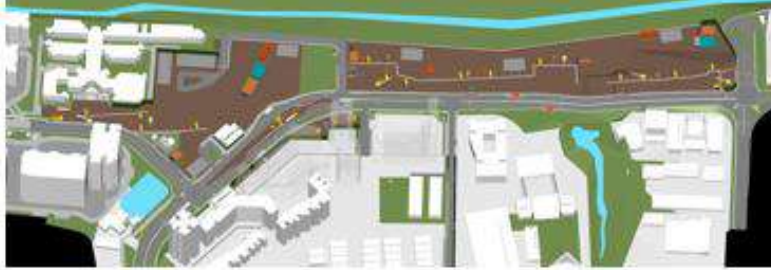
Stage 3 Traffic Diversion



Stage 6 Traffic Diversion



Stage 1 Traffic Diversion



Stage 4 Traffic Diversion



Stage 2 Traffic Diversion

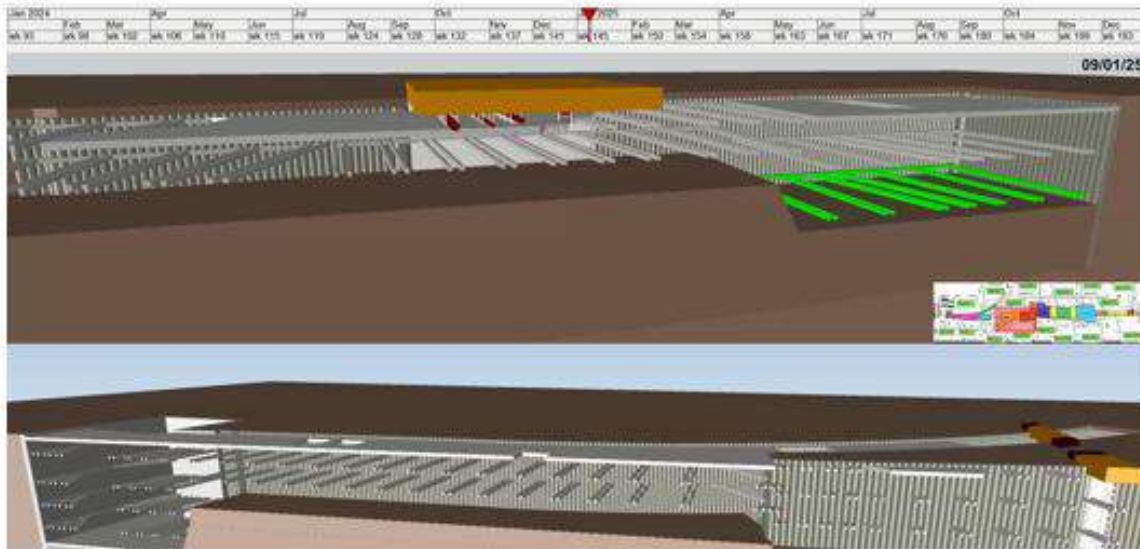
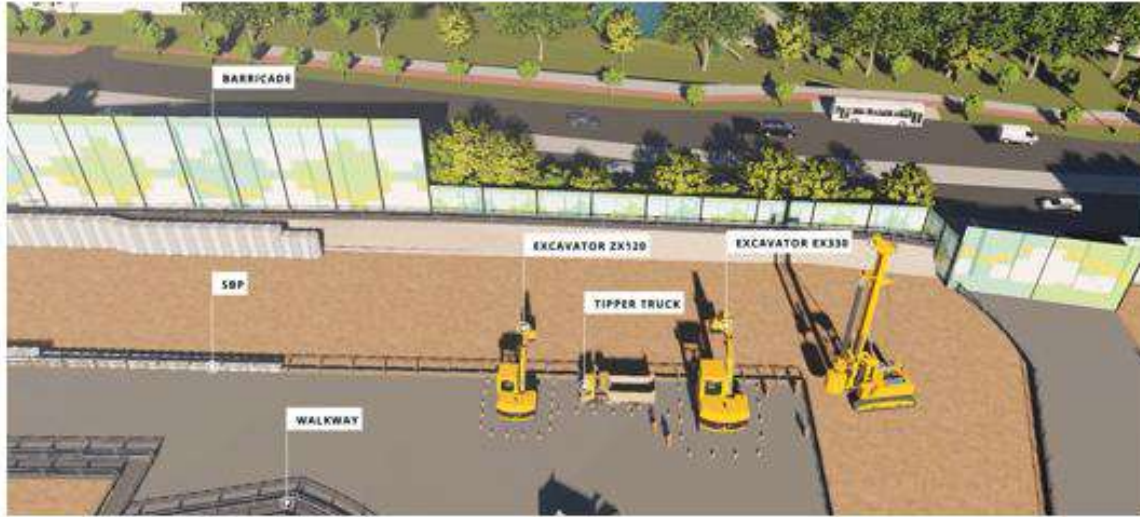


Stage 5 Traffic Diversion



- Helps Temporary Diversion of Roads.
- Helps for Construction planning
- Helps for Safety Planning

Earthwork Safety Video Simulation



- Simulates the excavation process over time linked to the construction schedule.
- Helps visualize excavation stages, sequences, and equipment usage.
- Enhances understanding of spatial constraints and work areas.



Photogrammetry Model (Aerial Survey)

- Help for the Construction team for planning the machinery and equipment.
- Helps the planner for better to plan the sequence of work.
- Generate precise 3D models from drone image.
- Reduce the need for traditional, time-consuming manual survey

CDE Implementation

The screenshot shows the Fulcrum CDE interface. On the left is a navigation menu with options like 'Correspondence', 'BIM', 'Libraries', and 'Support'. The main area displays project details for 'CR159_OCR Stage 3 model ATB relocated with latest LOP'. It includes a 'BIM Submission' header, a 'Completed' status badge, and a table of files. The 'Info' tab is active, showing project metadata and a list of files.

CR159_OCR Stage 3 model ATB relocated with latest LOP

BIM Submission CR117-DC-cr117-siemens159-PWR-00229 (SiemensCR159) Zaw - CR117 - Siemens (CR159) 15 Apr 2025 Due 29 Apr 2025 Completed

Info	Files	Issues
<input type="checkbox"/>	<input checked="" type="checkbox"/> CR159-SMCJV-CR13-ZZ-E-OCR-M3-PIM-0001.ifc	
	CR159-SMCJV-CR13-ZZ-E-OCR-M3-PIM-0001.rvt	
<input checked="" type="checkbox"/>	CR159-SMCJV-TUN15-BF-ZZ-E-OCR-M3-PIM-0001.ifc	
	CR159-SMCJV-TUN15-BF-ZZ-E-OCR-M3-PIM-0001.rvt	
<input checked="" type="checkbox"/>	CR159-SMCJV-TUN15-CC-ZZ-E-OCR-M3-PIM-0001.ifc	
	CR159-SMCJV-TUN15-CC-ZZ-E-OCR-M3-PIM-0001.rvt	



No File Selected
Select a file to begin

FULCRUM CDE

- Reduces manual data handling, minimizing errors and rework.
- Automates routine tasks like document control and approvals
- Facilitates seamless collaboration among all stakeholders.
- Enables real-time access to BIM models and project data

Correspondence

Dashboard

BIM Approval (ICE)

BIM Submission

Design Coordination

Design Coordination (v2)

Design Deliverable

RFA (EXT to POC)













RFA (POC to QP)

RFI

RFI (InSIGHT)

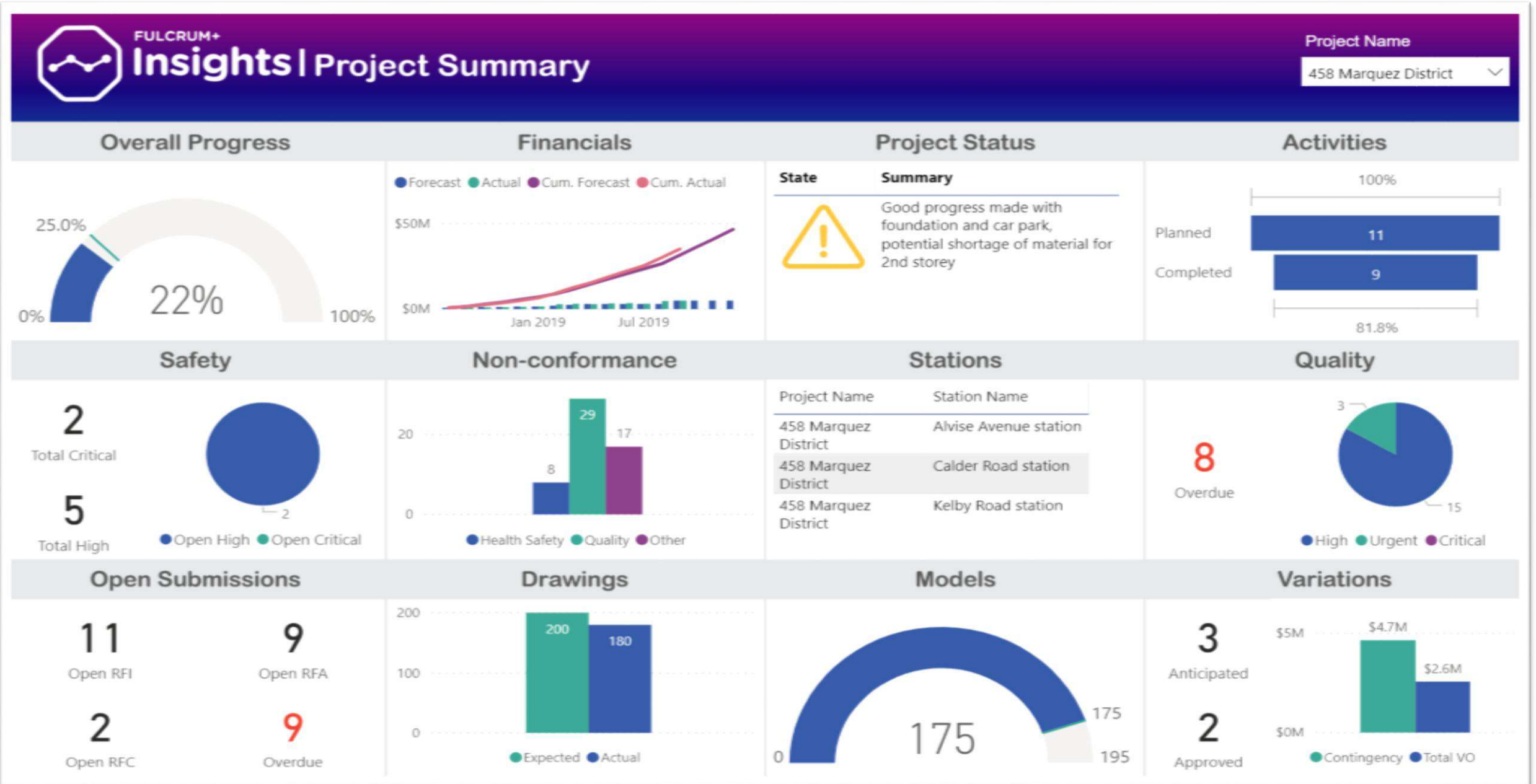
Transmittals

Tracked Correspondences

Info	Files 14	Actions	Issues
<input type="checkbox"/>		  	
<input checked="" type="checkbox"/>	 CR117-POCCL-CR13-ZZ-W-MINE-CO-XXX-0004.ifc		
<input checked="" type="checkbox"/>	 CR117-POCCL-CR13-ZZ-M-MNE-CO-XXX-0007.ifc		
<input checked="" type="checkbox"/>	 CR117-POCCL-CR13-ZZ-P-COM-CO-XXX-0002.ifc		
<input checked="" type="checkbox"/>	 CR117-POCCL-CR13-ZZ-P-COM-CO-XXX-0004.ifc		
<input checked="" type="checkbox"/>	 CR117-POCCL-CR13-ZZ-W-SIG-CO-XXX-0001.ifc		
<input checked="" type="checkbox"/>	 CR117-POCCL-CR13-ZZ-W-SIG-CO-XXX-0003.ifc		
	 CR150-CRFGI-CR13-ZZ-R-TWK-M3-PIM-1025-A01.06-IFC...		
<input checked="" type="checkbox"/>	 CR152-SMMPL-CR13-ZZ-R-SIG-M3-PIM-0001-Signal Stati...		
<input checked="" type="checkbox"/>	 CR152-SMMPL-TUN14-ZZ-R-SIG-M3-PIM-0001-Signal Tu...		



DIGITAL DESIGN MANAGEMENT



BIM PROGRESS MANAGEMENT

Contents

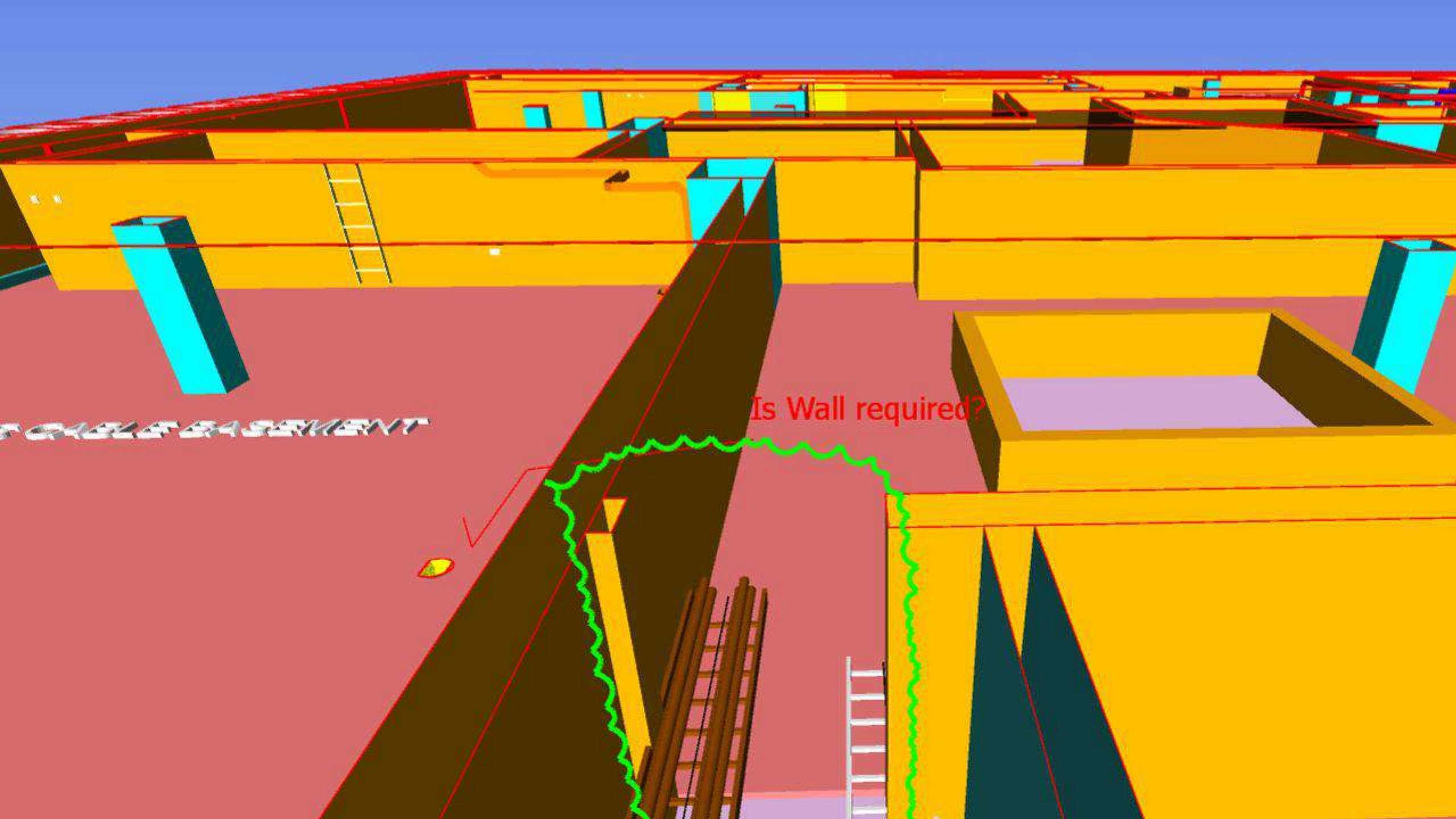
1. Meeting Conduct
2. Model Update Register Status
3. Coordination and Interface
4. BIM Issue Report (Critical Issues)
5. IFC Workflow
6. Dynamo scripting.
7. Workflow (BIM CDE)
8. DFMA
9. AI for safety & Progress Tracking.

Meeting Conduct

ICE Meeting Types	Project Stages	Recommended Frequency	Participants	Objectives
BEP Review	Prelim Design/ Pre-Final Design/ Final Design	Ad-hoc	LTA, POC, ICsg, GreenhilLi, VHA	Agree on BIM deliverables, key processes, information exchange standards
BIM Kick Off Meeting	Prelim Design/ Pre-Final Design/ Final Design	Each time new contractor comes on board	LTA, POC, New Stakeholder	Briefing on BIM Standards to adhere to
Design Coordination	Prelim Design/ Pre-Final Design/ Final Design	Weekly	LTA, POC, ICsg, GreenhilLi, VHA	Resolve conflicting design issues
Interface Coordination	Prelim Design/ Pre-Final Design/ Final Design	Monthly/ Ad-hoc	LTA, POC, ICsg, GreenhilLi, VHA, Interfacing Contract	Resolve interfacing issues
BIM Clash Coordination	Pre-Final Design/ Final Design	Weekly	LTA, POC, ICsg, GreenhilLi, VHA, Interfacing Contract	Resolve CCSM clashes
Utilities/Traffic Coordination	Prelim Design/ Pre-Final Design/ Final Design	Weekly	LTA, POC, ICsg, GreenhilLi, VHA, CPG	Resolve issues related to utilities
ID/Room Coordination	Pre-Final Design/ Final Design	Weekly	LTA, POC, GreenhilLi, VHA	Operation/ maintenance space & M&E requirements coordination
Construction Review	Pre-Final Design/ Final Design/ Construction	Bi-weekly	LTA, POC, ICsg	Resolve construction feasibility related issues using 4D simulation

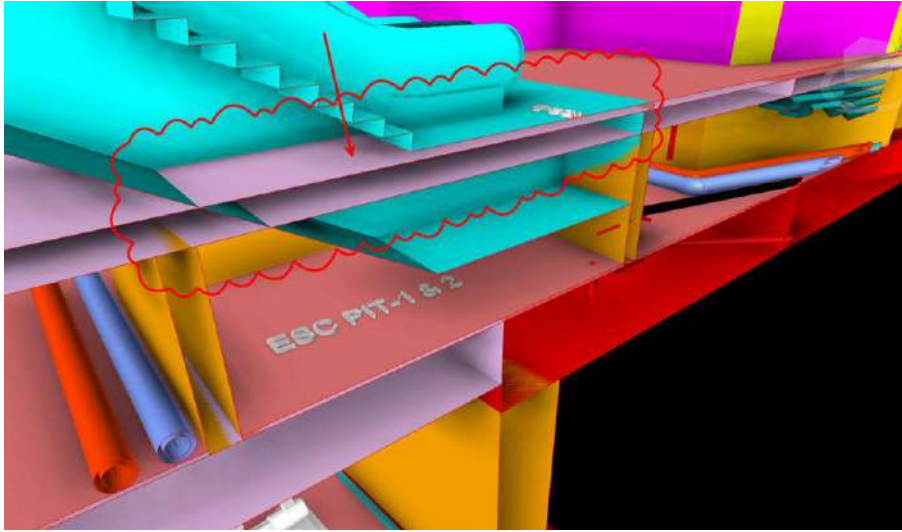
Model Update Register Status

CR117 INDIVIDUAL MODEL REGISTER														
CONTRACT	ORIGINATOR	LOCATION	ZONE/LEVEL	ROLE	DISCIPLINE /SYSTEM	DELIVERY TYPE	BIM MODEL TYPE	MODEL NO.	SOFTWARE VERSION (OPTIONAL)	UNDERSCORE	LATEST EXCHANGE DATE BY ORIGINATOR (YYMMDD)	USER DEFINED (OPTIONAL)	DESCRIPTION	PREVIOUS CODE USED
INDIVIDUAL MODEL														
CR117	GHLPL	CR13	ZZ	A	ARW	M3	PIM	0001	R23	-	230818	Archi with Stru Elements	Architectural Model including Structural Elements. The code under EIR "Archi/ARW" meaning Architectural Work	
CR117	GHLPL	CR13	ZZ	A	ARW	M3	PIM	0002	R23	-	230818	Archi Elemently Only	Architectural Model without Structural Elements. But some Archi items are missing	
02 STRUCTURAL														
CR117	ICSPL	CR13	ZZ	S	CCT	M3	PIM	0001	R23	-	230818	Bored Tunnel & C&C	Structural Model of Cut & Cover Tunnel together with (indicative) Bored Tunnel The code under EIR "Civil & Stru/CCT" meaning Cut and Cover tunnel	
CR117	ICSPL	CR13	ZZ	S	STR	M3	PIM	0001	R23	-	230821	Station Box & Subway Link	Structural Model of Station Box The code under EIR "Civil & Stru/STR" meaning Structural	
CR117	ICSPL	CR13	EB	S	BRT	M3	PIM	0001				TBC	Detail Model of Bored Tunnel for East Bound. Originator to be confirmed by POC	
CR117	ICSPL	CR13	WB	S	BRT	M3	PIM	0001				TBC	Detail Model of Bored Tunnel for West Bound. Originator to be confirmed by POC The code under EIR "Bldg Svcs/SAN" meaning Sanitary Services	
CR117	ICSPL	CR13	ZZ	S	DRN	M3	PIM	0001		-	230619	Permanent Drain	Proposed Permanent Drain Model for Final Reinstatent This model is to be used in preferer than that of by POC if it is the LATEST.	
03 MEP (VHA) designed by VHA, modeled by POC														
CR117	VHAPL	CR13	ZZ	B	PSS	M3	PIM	0001		-	230718	Plumbing	Plumbing System Model The code under EIR "Bldg Svcs/PSS" meaning Plumbing and Sanitary Services	PLU
CR117	VHAPL	CR13	ZZ	B	SAN	M3	PIM	0001		-	230718	Sanitary	Sanitary System Model The code under EIR "Bldg Svcs/SAN" meaning Sanitary Services	
CR117	VHAPL	CR13	ZZ	B	DRN	M3	PIM	0001		-	230718	Station Drainage	Drainage System Model mainly for Station The code under EIR "Common/DRN" meaning Sanitary Services	
CR117	VHAPL	CR13	ZZ	B	DRN	M3	PIM	0002		-	230712	C&C Drainage	Drainage System Model for Tunnel The code under EIR "Common/DRN" meaning Sanitary Services	

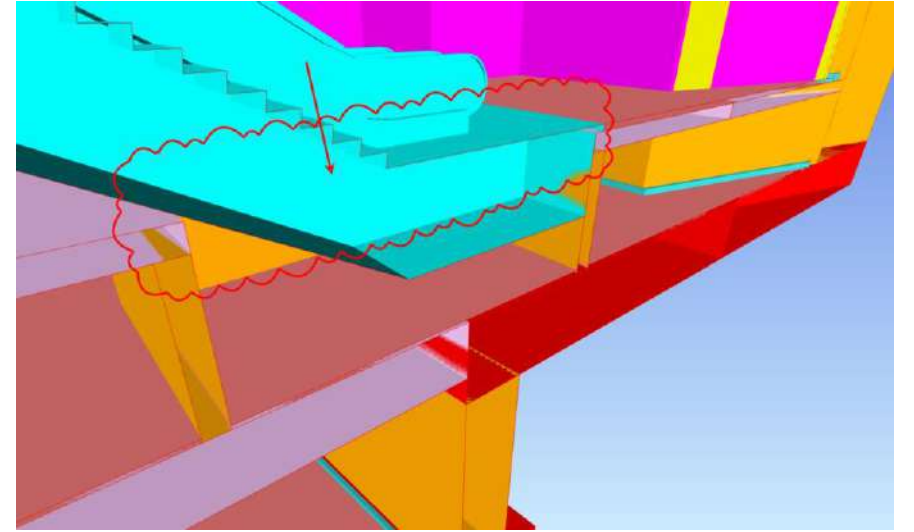


Is Wall required?

CONCRETE SLAB




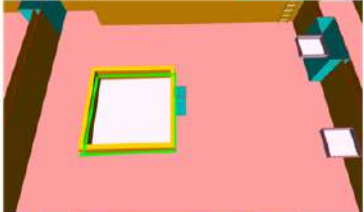


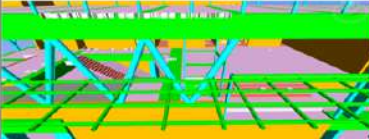


Issue No-75 (Open)



Issue No-75 (Closed)

BIM Issue Report (Critical Issues)

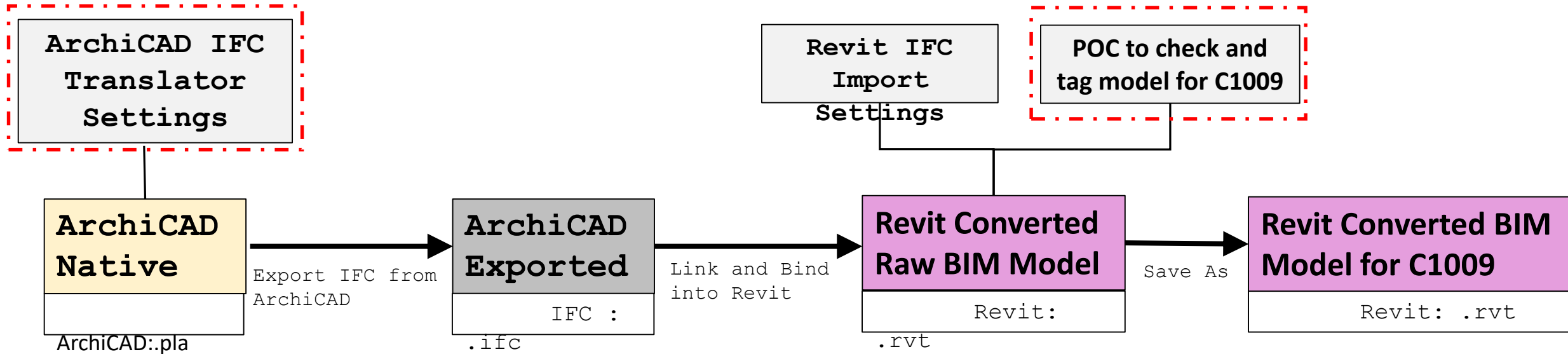
CR117 - ARCHITECTURAL VS STRUCTURAL ISSUE LOG												VER 39. 20/11/2024
NO. OF PENDING ISSUES		1										
NO. OF CLOSED ISSUES		87										
SL. NO.	DATE	LEVEL	LOCATION	RES. PARTY	REFERENCE DRAWINGS	REFERENCE SCREENSHOT (Model)	DESCRIPTION	CONSULTANT'S RESPONSE	RESPONSE DATE	TARGET DATE TO RESOLVE	UPDATED IMAGE BY ARTH	STATUS
81	19 Jun 2024	B3 plant room	Entrance 8	ICSG & GHIL			B3 Plant room Ligt Dp Wall joining between archi & Str Wall					closed
82	19 Jun 2024	U2 Underplatform	Entrance 8	ICSG			Wall for oil pit Traction Tx Room Cable basement-1 U2 Underplatform					closed
83	19 Jun 2024	U2 Underplatform	Entrance 8	ICSG			Wall for oil pit Cable basement-1 U2 Underplatform					closed
84	17 Jul 2024	01 Entrance Level	Entrance 8	ICSG			Entrance-8 secondary steel Beam need shift on main members					closed

Challenges Faced

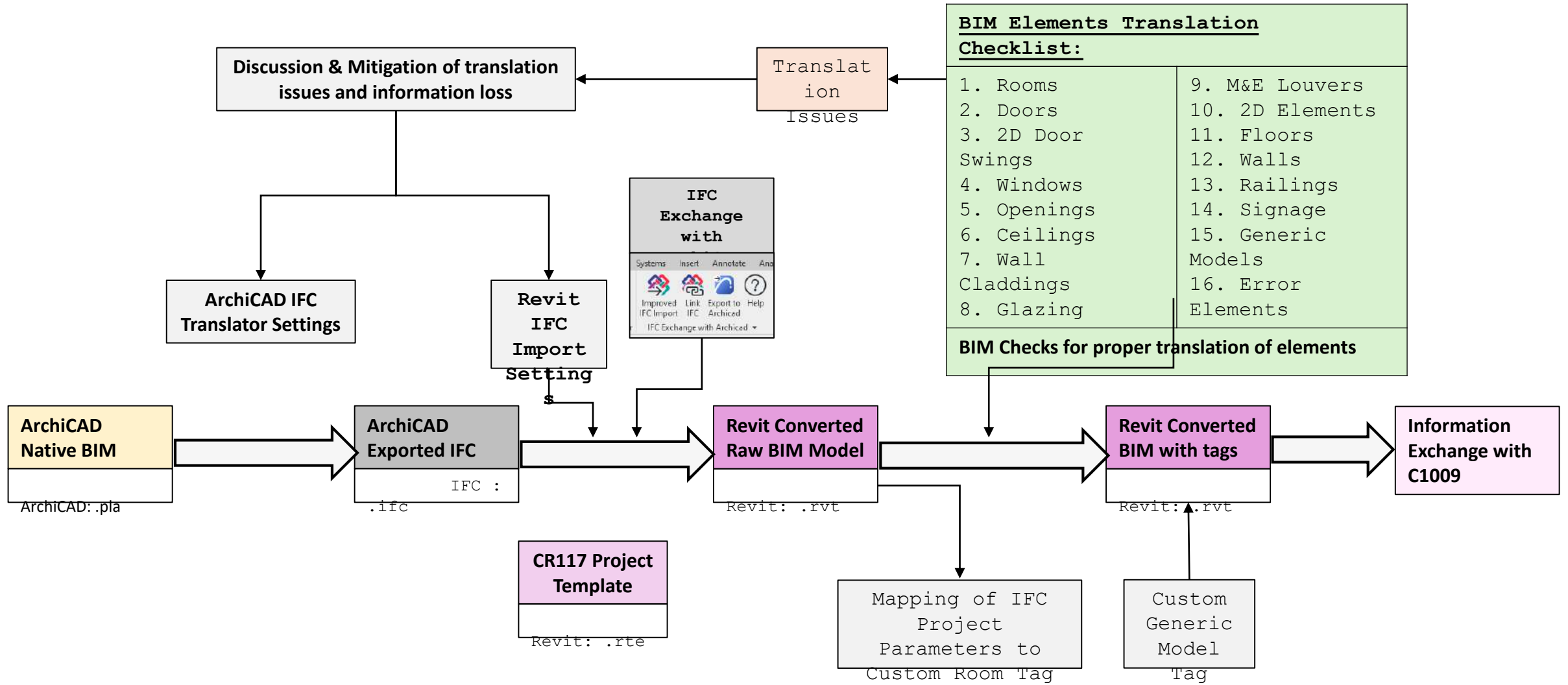
- 1) Conversion issues.
- 2) Loss of Information.
- 3) Dynamo Scripting

ArchiCAD -> IFC -> Revit Conversion Workflow

Workaround Solutions

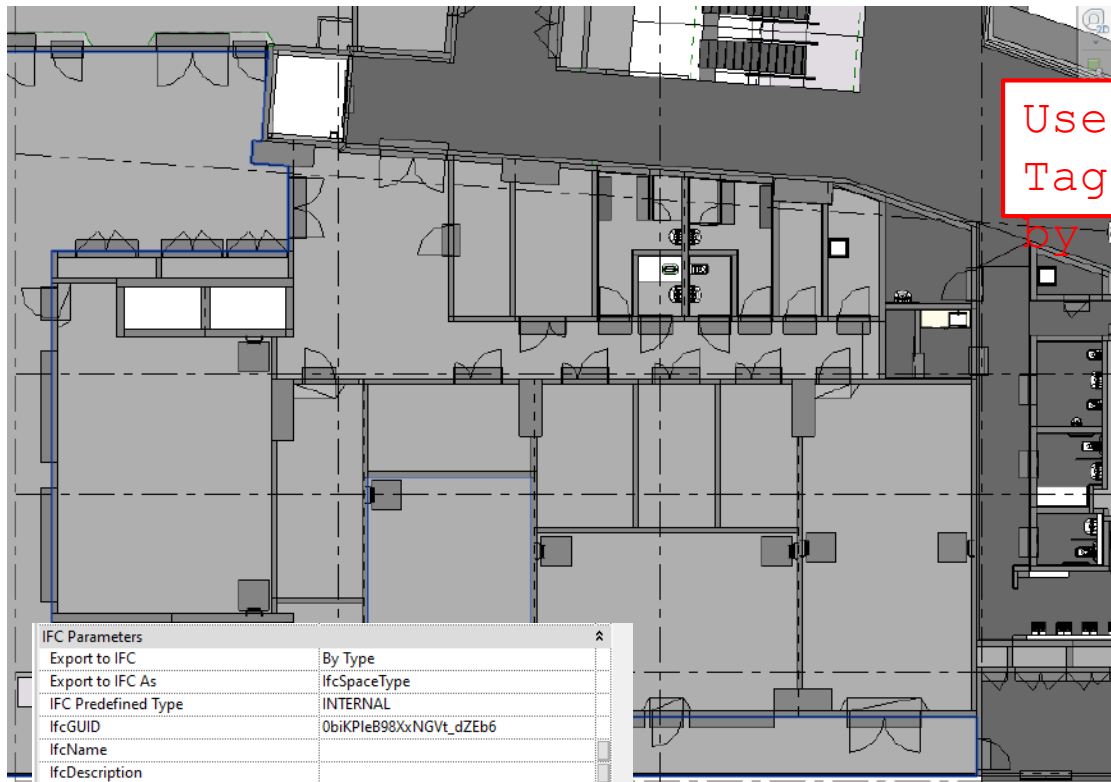


Conversion Workflow (Information Loss Mitigation)



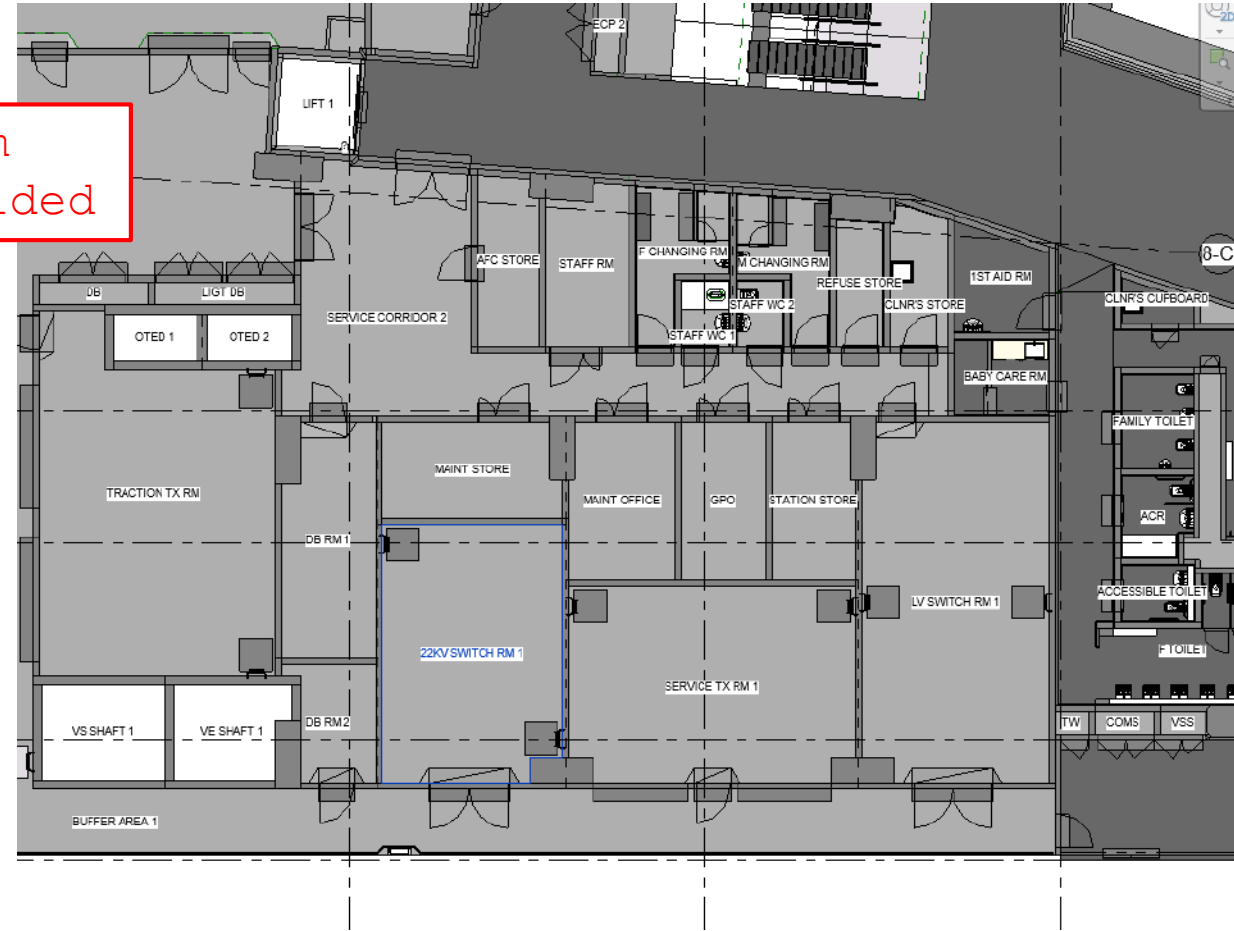
ArchiCAD -> IFC -> Revit Conversion Workflow

Rooms / Spaces – Custom Tag from POC



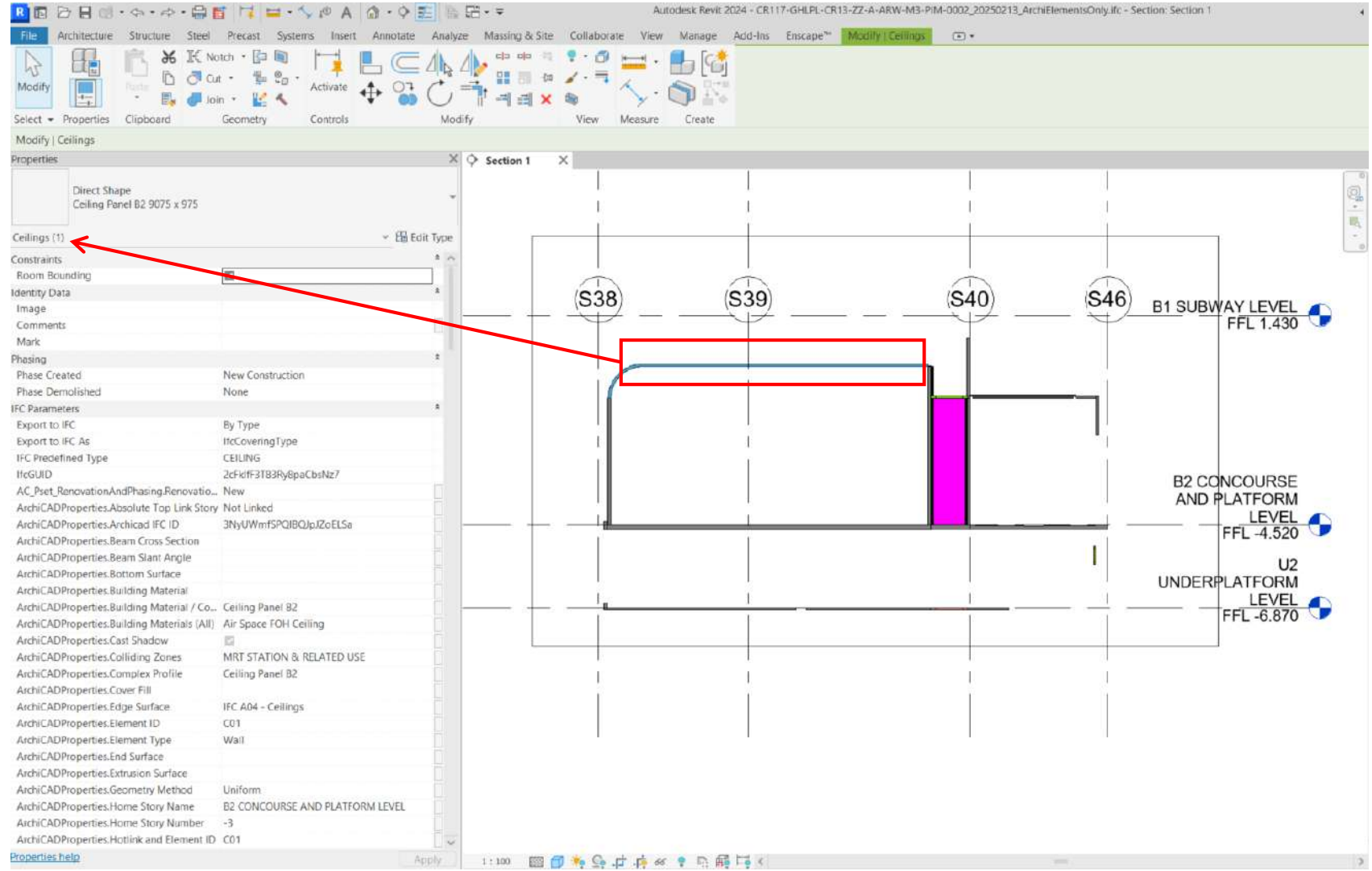
Use Custom Tags provided by POC

IFC Parameters	
Export to IFC	By Type
Export to IFC As	IfcSpaceType
IFC Predefined Type	INTERNAL
IfcGUID	0biKPlE98XxNGVt_dZEb6
IfcName	
IfcDescription	
IfcDecomposes	
IfcDecomposesGUID	
IfcPropertySetList	
Height(ArchiCADQuantities)	5050.0
Width(ArchiCADQuantities)	
IfcName	B2000
IfcDescription	
IfcDecomposes	B2 CONCOURSE AND PLATFORM LEVEL
IfcDecomposesGUID	3jppq2gIaylBM0BqEHMSrc
ClassificationCode	[ARCHICAD Classification]Space
IfcPresentationLayer	A- ANOTROOM
LongNameOverride	22KV SWITCH RM 1
ElevationWithFlooring	0.0

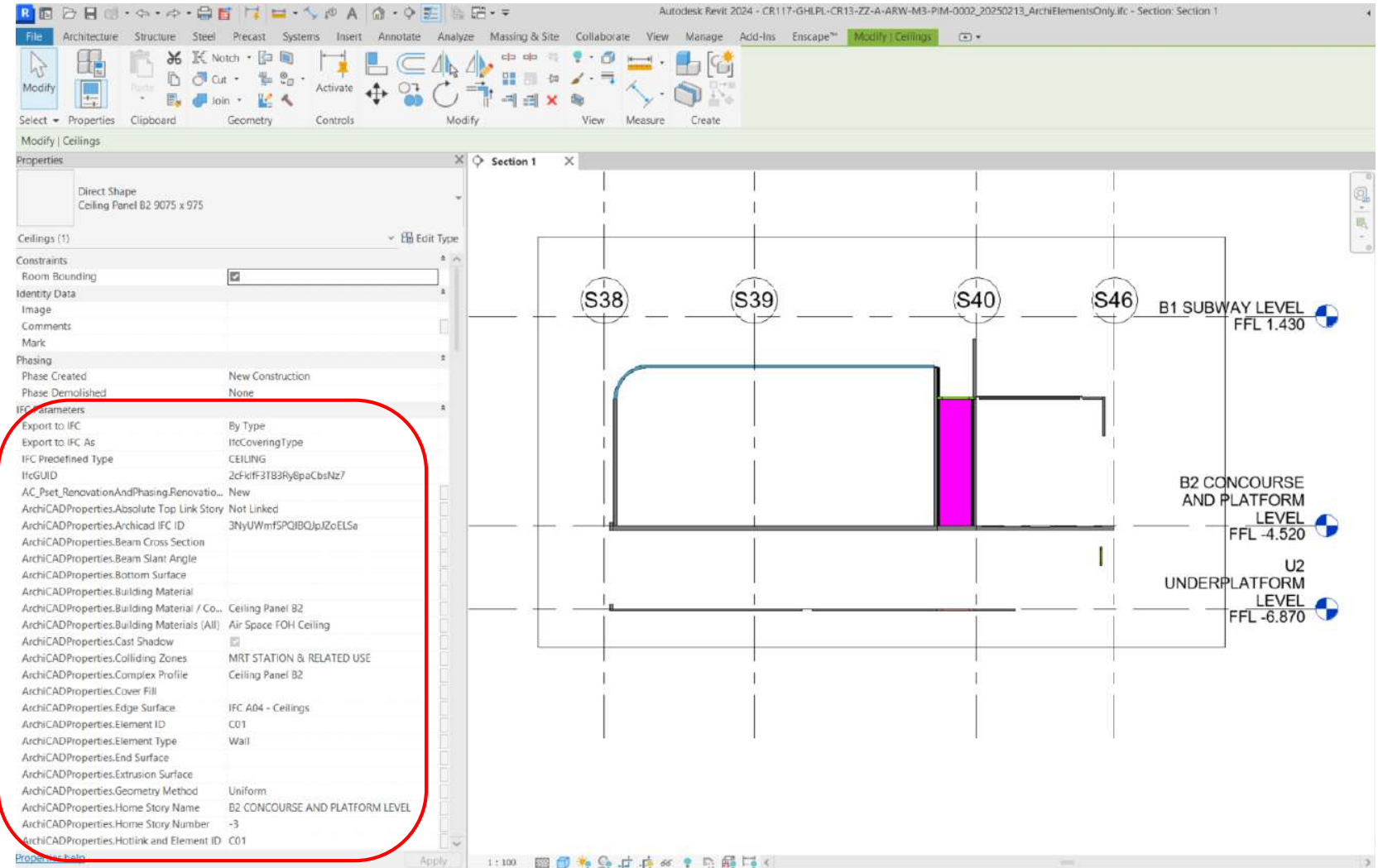


Creating Dynamo scripting for quantity take -off

Need to check the Ceiling category whether they properly modelled



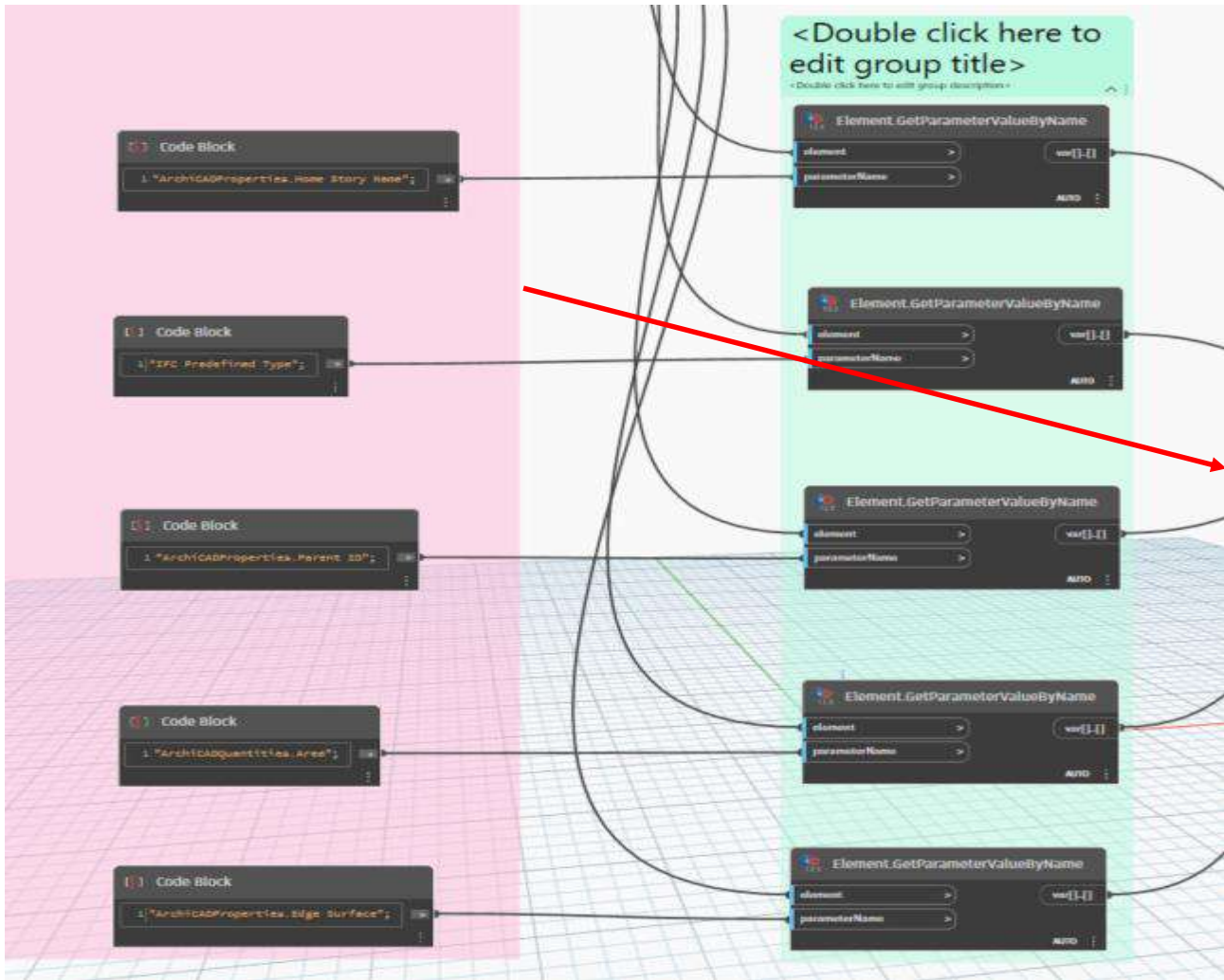
Need to check & study properties where the properties look similar for the ceiling thought the project for extracting quantities



Initial selection of categories for Input

The image is a composite of three parts illustrating the initial selection of categories for input in a Revit-based workflow:

- Left Panel (3D Environment):** Shows a pink grid floor. A workflow diagram is overlaid with a pink background. It includes a 'Categories' panel with 'Ceilings' selected, an 'All Elements of Category' panel with 'Category' and 'Elements' buttons, and a 'List.Flatten' panel with 'list' and 'amount' buttons. A red arrow points from the 'Ceilings' dropdown to the 'Ceilings (1)' entry in the Properties panel.
- Middle Panel (Properties):** A screenshot of the Revit Properties panel for a 'Direct Shape' element. The 'Ceilings (1)' category is highlighted with a red box. The 'IFC Parameters' section is expanded, showing various properties such as 'Export to IFC', 'IFC Predefined Type' (CEILING), and 'ArchiCADProperties'.
- Right Panel (Section View):** A section view diagram labeled 'Section 1' showing three vertical grid lines: S38, S39, and S40. A ceiling element is shown between S38 and S39, and a vertical wall element is shown between S39 and S40.



Properties: Direct Shape
Ceiling Panel B2 9075 x 975

Ceilings (1) Edit Type

Constraints: Room Bounding

Identity Data: Image, Comments, Mark

Phasing: Phase Created: New Construction, Phase Demolished: None

IFC Parameters (circled in red):

Export to IFC	By Type
Export to IFC As	IfcCoveringType
IFC Predefined Type	CEILING
IfcGUID	2cF8fF3T83Ry0paCbsNz7
AC_Pset_RenovationAndPhasing.Renovatio...	New
ArchicADProperties.Absolute Top Link Story	Not Linked
ArchicADProperties.Archicad IFC ID	3NyUWmISQjBQjZoSLSa
ArchicADProperties.Beam Cross Section	
ArchicADProperties.Beam Slant Angle	
ArchicADProperties.Bottom Surface	
ArchicADProperties.Building Material	
ArchicADProperties.Building Material / Co...	Ceiling Panel B2
ArchicADProperties.Building Materials (All)	Air Space FOH Ceiling
ArchicADProperties.Cast Shadow	<input checked="" type="checkbox"/>
ArchicADProperties.Colliding Zones	MRT STATION & RELATED USE
ArchicADProperties.Complex Profile	Ceiling Panel B2
ArchicADProperties.Cover Fill	
ArchicADProperties.Edge Surface	IFC A04 - Ceilings
ArchicADProperties.Element ID	C01
ArchicADProperties.Element Type	Wall
ArchicADProperties.End Surface	
ArchicADProperties.Extrusion Surface	
ArchicADProperties.Geometry Method	Uniform
ArchicADProperties.Home Story Name	B2 CONCOURSE AND PLATFORM LEVEL
ArchicADProperties.Home Story Number	-3
ArchicADProperties.Hotlink and Element ID	C01

Section 1: S38, S39, S40

<Double click here to edit group title>
<Double click here to edit group description>

Element.GetParameterValueByName

element

parameterName

var[]

AUTO

Element.GetParameterValueByName

element

parameterName

var[]

AUTO

Element.GetParameterValueByName

element

parameterName

var[]

AUTO

Element.GetParameterValueByName

element

parameterName

var[]

AUTO

Element.GetParameterValueByName

element

parameterName

var[]

AUTO

<Double click here to edit group title>
<Double click here to edit group description>

List Create

Item0

Item1

Item2

Item3

Item4

List

List Transpose

data

lists

AUTO

<Double click here to edit group title>
<Double click here to edit group description>

File Path

Browse...

C:_Desktop\Dynamo Trail\New Microsoft Excel Worksheet.xlsx

Code Block

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Code Block

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Data.ExportToExcel

FilePath

sheetName

startRow

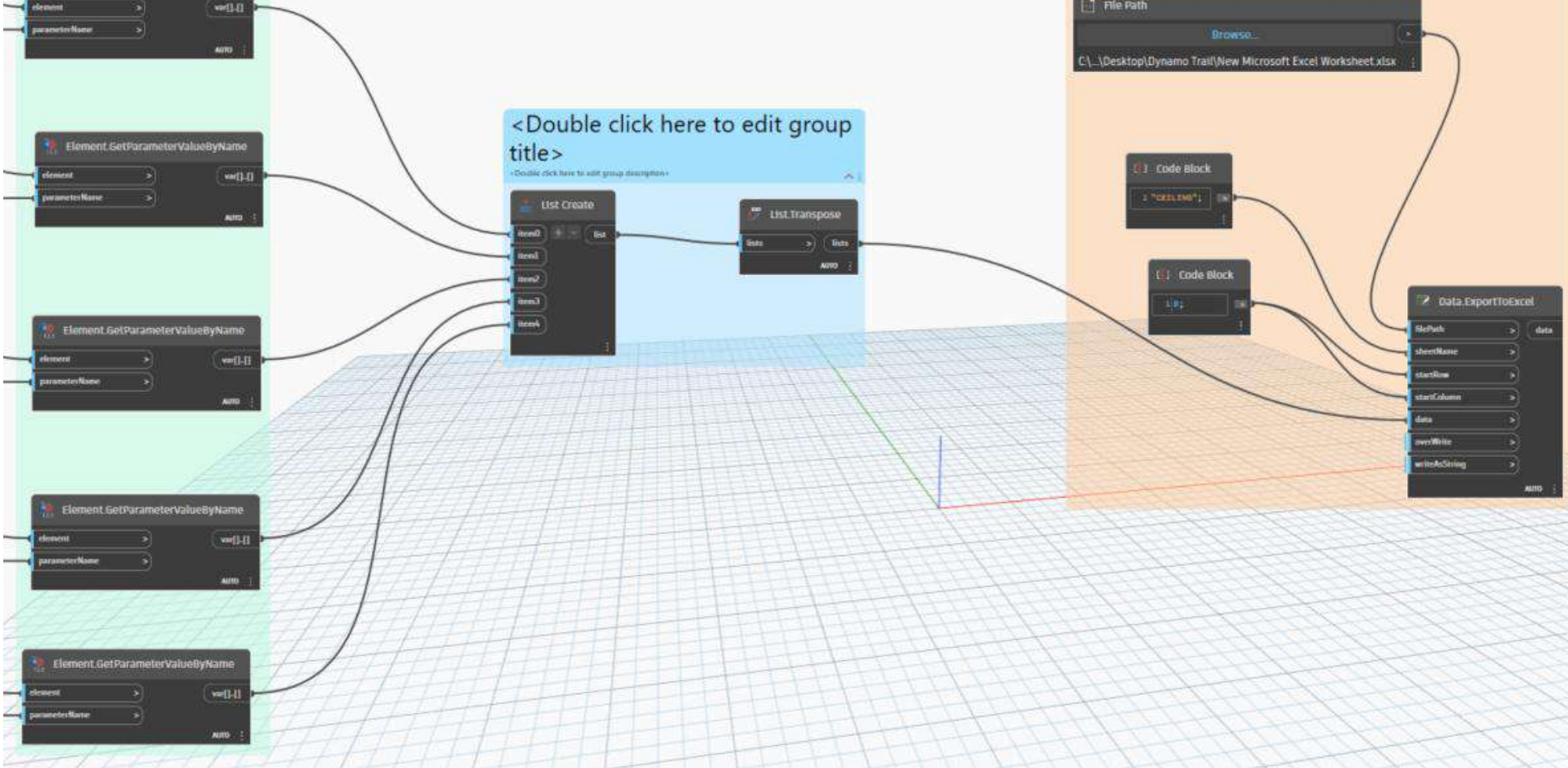
startColumn

data

overwrite

writeAsString

AUTO



BIM MANAGEMENT WORKFLOW

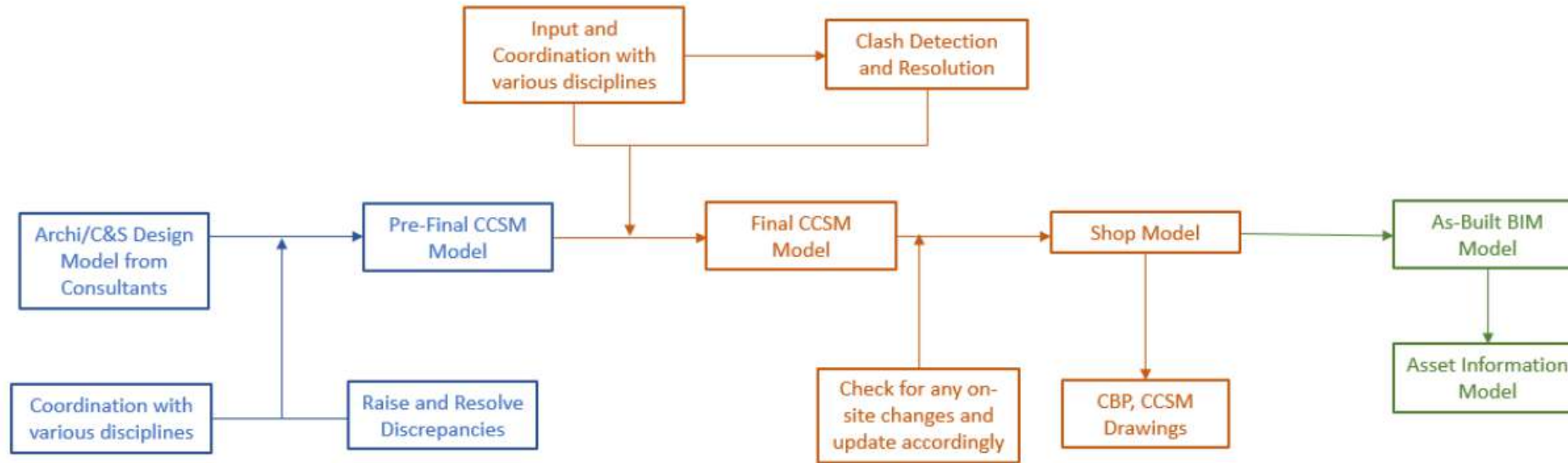
BIM WORK-FLOW

CDE WORK-FLOW

BIM EXECUTION

PLAN

BIM WORK FLOW



Design Development

- Preliminary Design from Consultant
- Design validation and planning using Pre-Final and Final Models by Consultant
- Design Submission Models and Drawings

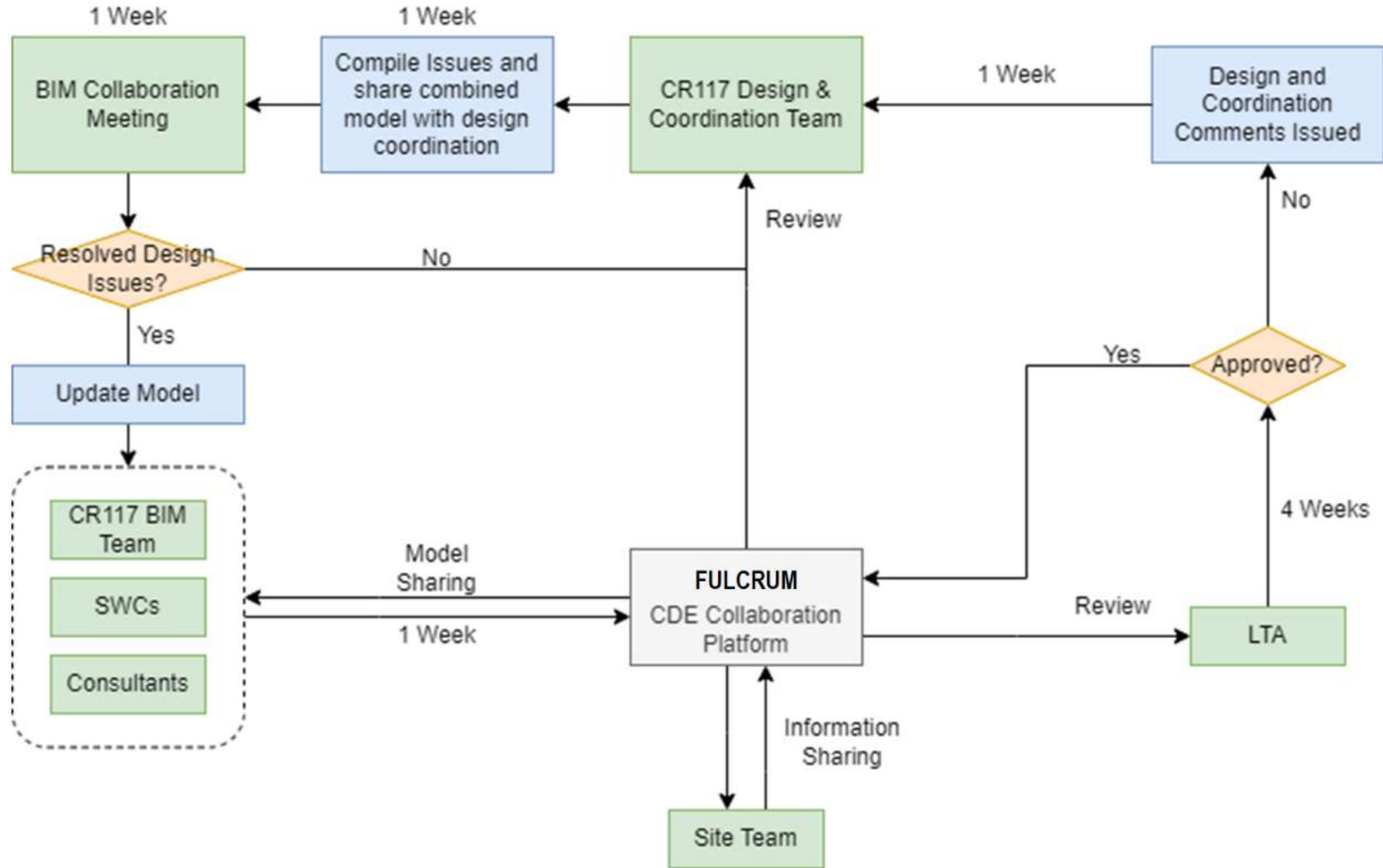
Coordination / Construction Documentation

- Coordinate with SWC's
- Coordinate with other services
- CCSM documentation
- CBP, CSD, RCP Drawings

ABAIM/ Handover

- As Built model validation
- Asset Information validation
- Model check before handover

CDE WORK FLOW





BIM EXECUTION

CR117 BIM EXECUTION PLAN

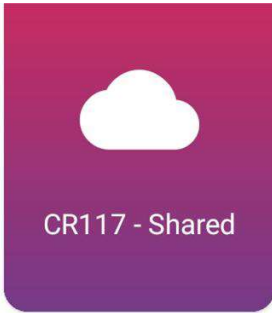
CR117 – DESIGN AND CONSTRUCTION OF BRIGHTHILL
INTERCHANGE STATION AND TUNNEL
PENTA-OCEAN CONSTRUCTION CO., LTD

REVISION G: 30-MAY-2023
DOC REF: CR117-POCCL-CR13-XX-W-PJM-PL-BEP-0001

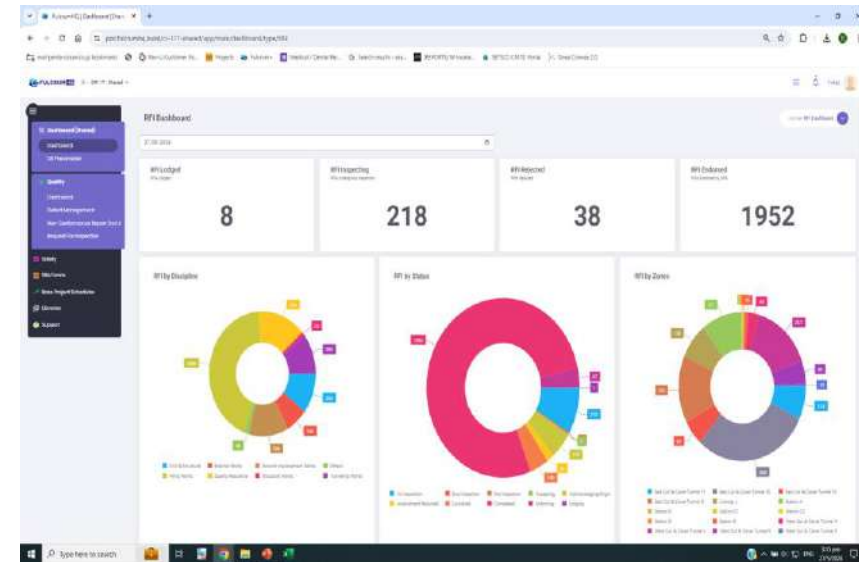
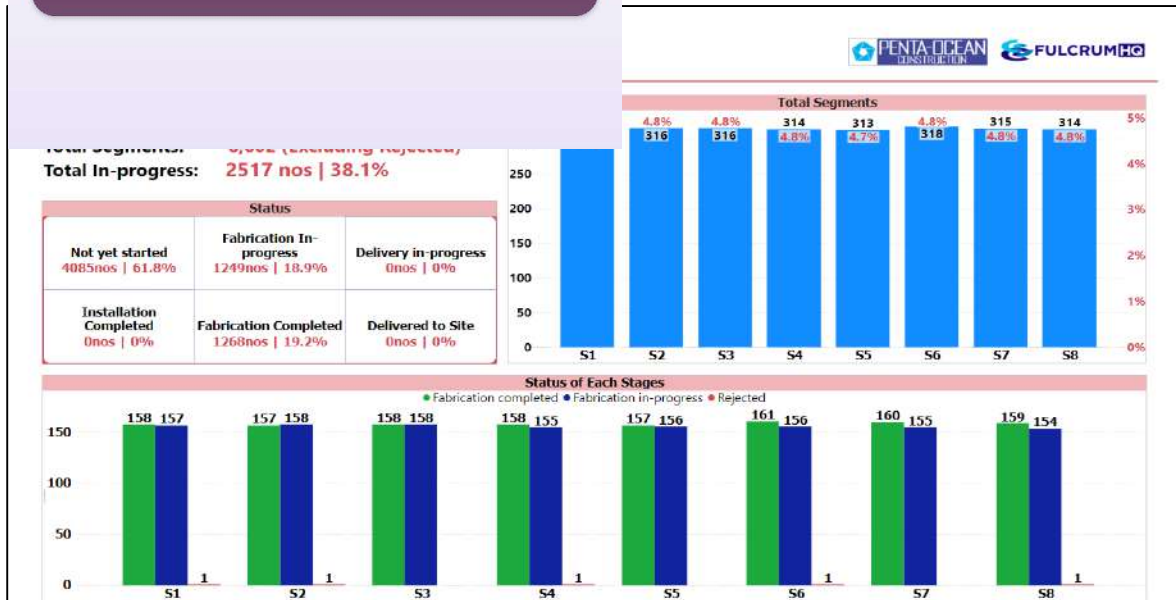
Contract Number	CR117
Contract Title	Design and Construction of Bright Hill Interchange Station and Tunnels
Contract Type	Design and Build
Project Reference Number	A1916 – 01171 - 2022
Document Title	CR117 BIM Execution Plan
Document Reference	CR117-POCCL-CR13-XX-W-PJM-PL-BEP-0001
Date	30-May-2023

30 Aug 2023	H	Final Design submission and General updates	 Subram sivanandam	 Leonard Ching	 Shinji Koketsu
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DFMA



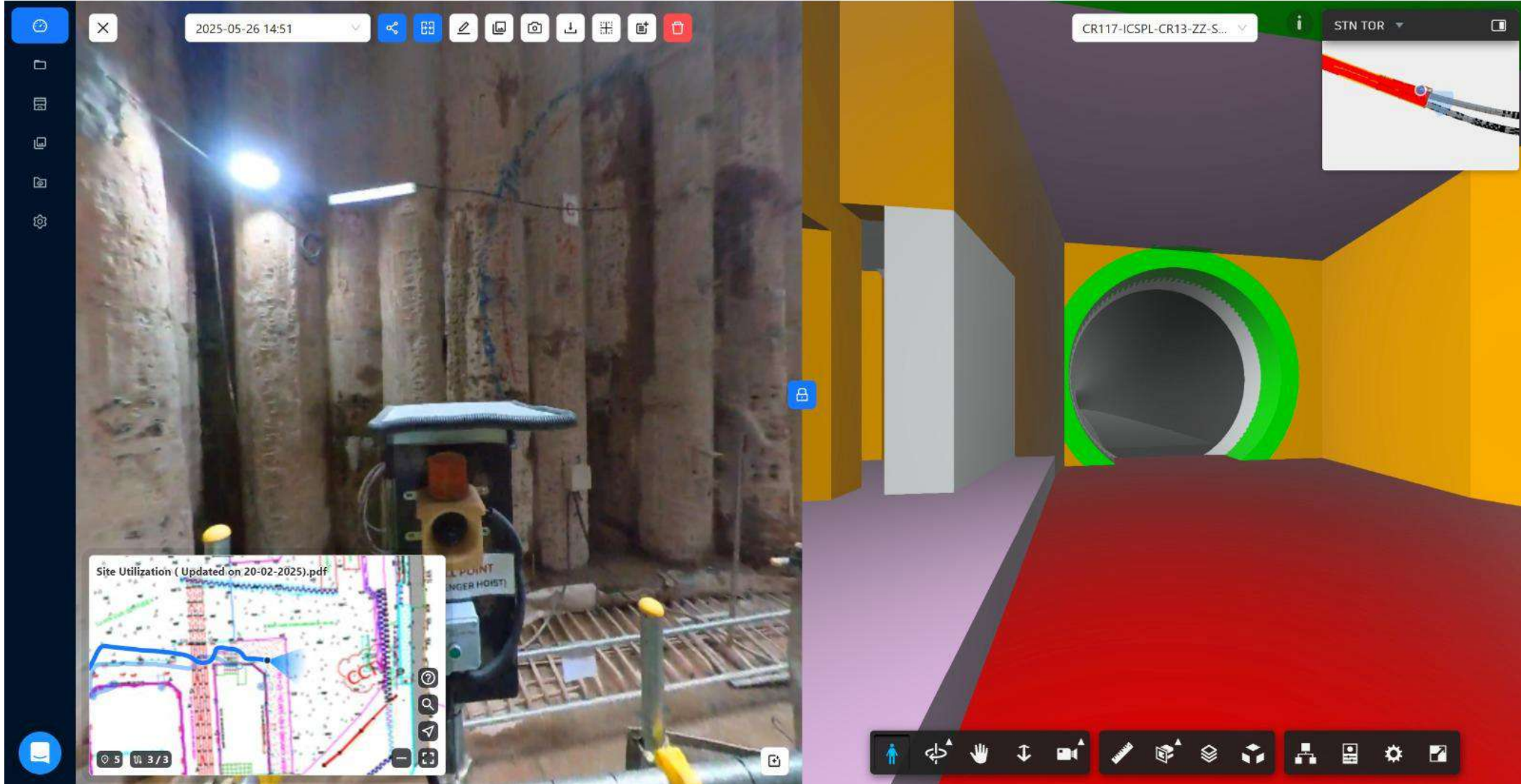
**UNIQUE QR CODE /
SEGMENT ID**



Video Analytics Using AI



BIM VS 360



Drone Pilot License

Unmanned Aircraft Pilot Licence



CAAS

U2408395

Name of Pilot:
Sivanandam Subram

Date of Birth:
29 May 1995

Date of Issue:
26 Mar 2024

Issuing Authority:
Civil Aviation Authority of Singapore

THIS PILOT IS ENTITLED TO EXERCISE THE PRIVILEGES IN CONJUNCTION WITH THE CLASS, CATEGORY AND RATING SHOWN BELOW:

Class A (Rotorcraft)

Limitations:
Restricted to operate Multi-rotor UA up to 7kg only

Valid Till:
15 Mar 2028