

Bringing ISO 19650 to Silicon Valley – BIM Challenges on the BART Extension

Peter Starnes

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About the speaker

Peter Starnes

I work for global engineering firm Mott MacDonald and my role involves championing the use of BIM processes and providing leadership and guidance for collaborative working. I act as information manager on BIM projects working towards ISO 19650 and I devise and monitor suitable workflows for BIM processes, tailored to the needs of the project.

I'm responsible for ensuring consistent quality and on-time delivery of technical models, coordinating a multidisciplinary team across multiple locations, organizations and time zones.



About the speaker

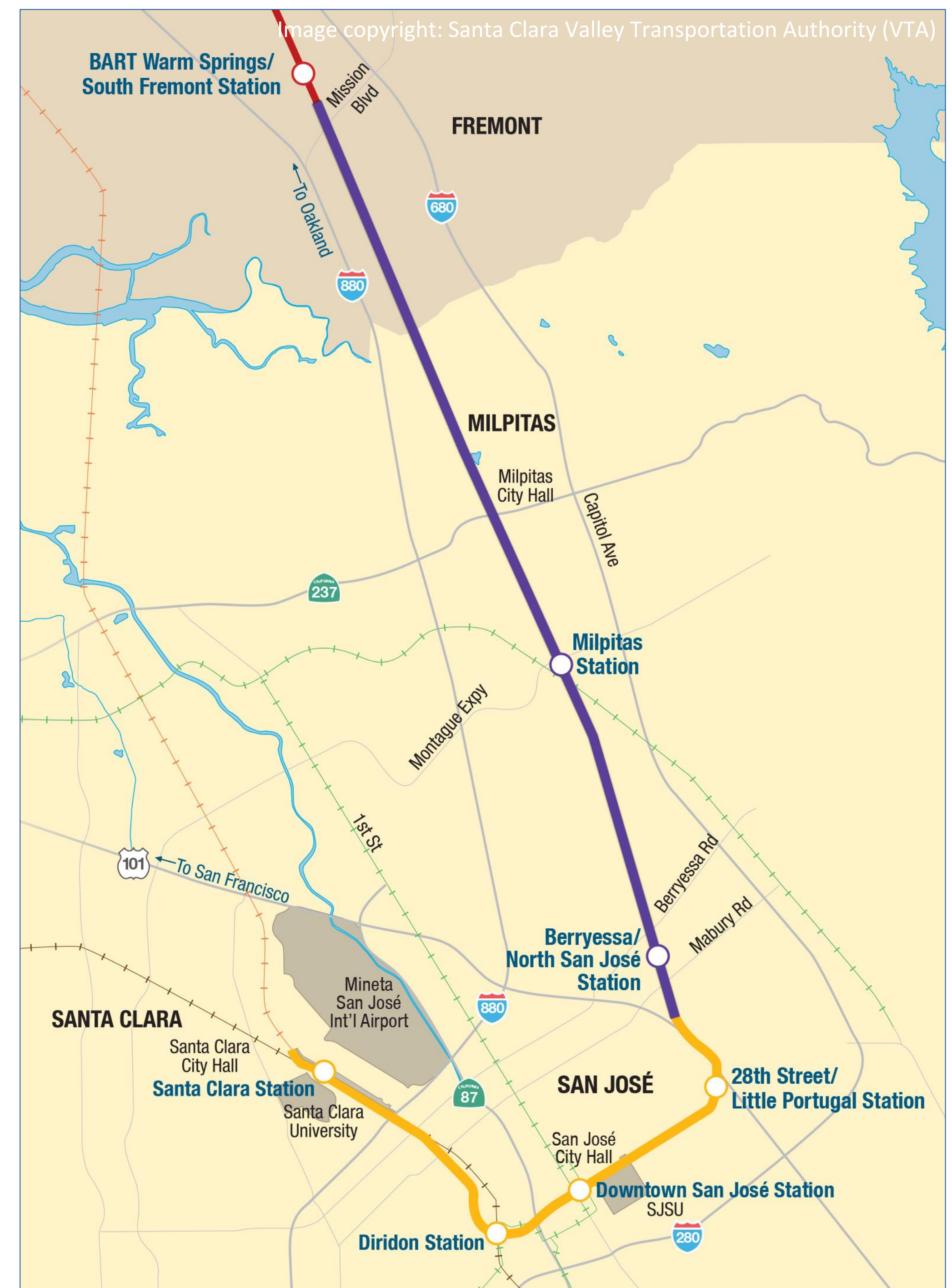
Brindusa Dumitrascu

Senior Digital Delivery Specialist with Mott MacDonald. Learned the ins-and-outs of document management and project delivery by holding a few different roles in the company and by working on some milestone projects.

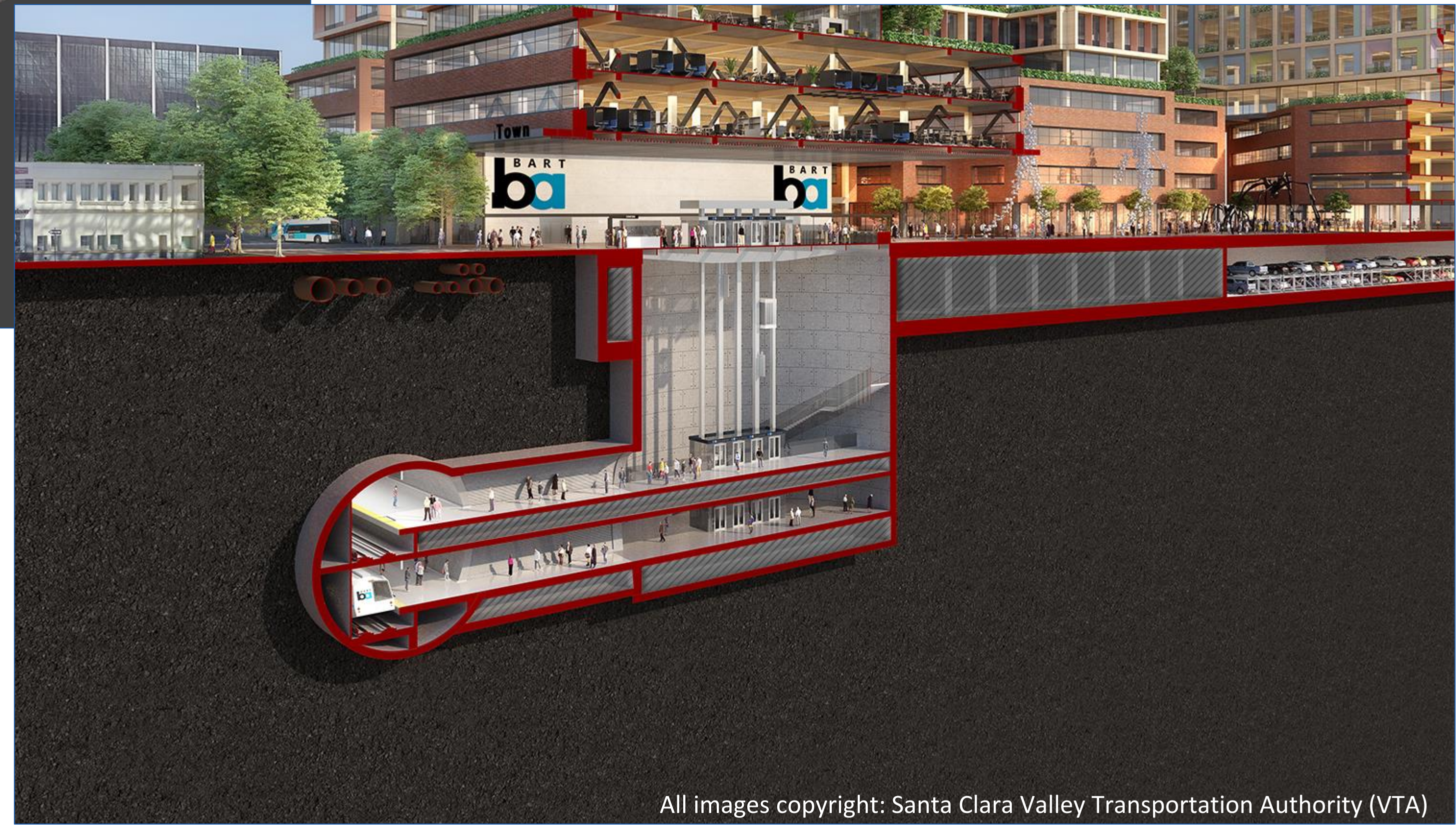
Experienced in Revit, Navisworks, BIM 360, ProjectWise, SharePoint, BIM Track.

Project Overview

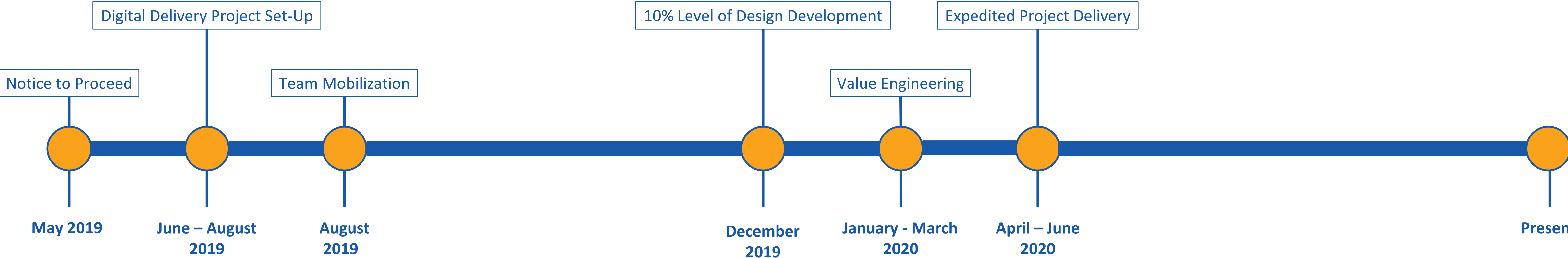
- The BART to Silicon Valley (“BSV”) Program will extend the San Francisco Bay Area Rapid Transit (BART) system from the city of Fremont in Alameda County through the cities of Milpitas, San Jose and Santa Clara, in Santa Clara County.
- The 16-mile BART extension to Santa Clara County is being implemented in multiple phases.
- Phase II of the Program is a 6-mile, 4-station extension from the under-construction Berryessa Station to Santa Clara (BSVII), and it includes:
 - Approximately 5-mile long tunnel through Downtown San Jose
 - Three below-ground stations (28th Street / Little Portugal Station, Downtown San Jose Station, Diridon/Arena Station)
 - One at-grade station (Santa Clara Station)
 - Maintenance yard and associated works.



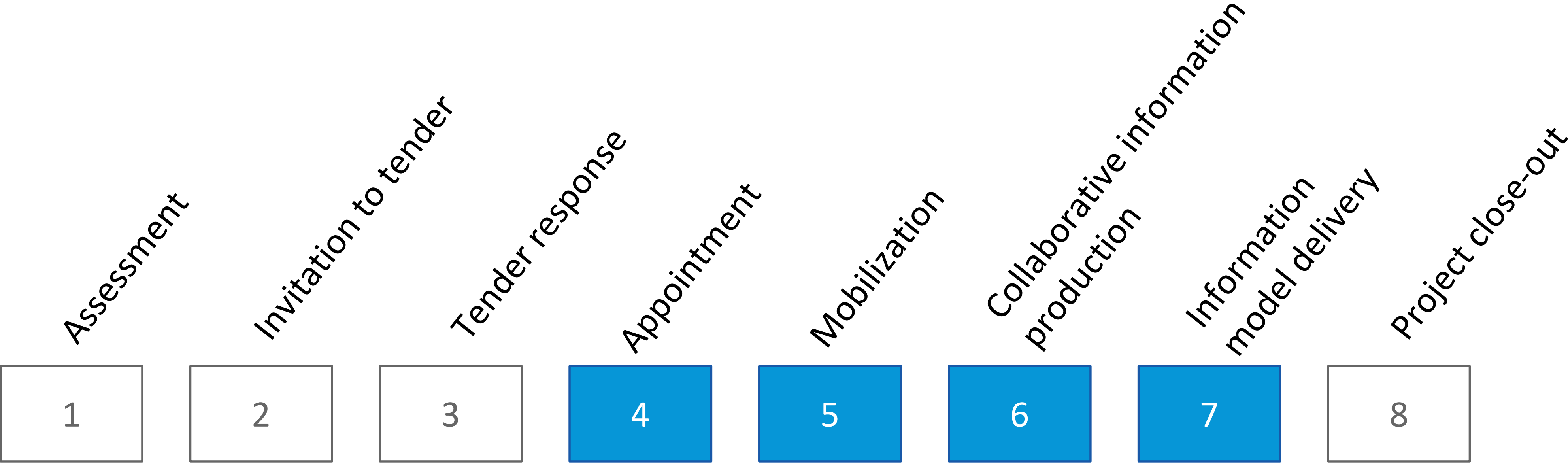
BART to Silicon Valley Phase II



Project Timeline



Delivery Phases



Client BIM Goals for the Project

- Common working environment for **collaboration**
- Mitigate project risk through **connected** data and models
- Use new and **innovative** technologies where appropriate
- Enhance ability to make **informed** and timely decisions
- Increase **confidence** and predictability of cost and schedule
- Simulate construction to identify risks in a **virtual** environment
- Enhance **productivity** and deliver work efficiently

ISO 19650

BSVII project adopts the principles of BIM as set out in ISO 19650:

- Confirm the BIM execution plan
- Establish the digital delivery environment
- Establish the list of deliverables
- Mobilize resources
- Establish the processes for the review, approval, and sharing of information

BS EN ISO 19650-1:2018



BSI Standards Publication

Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) - Information management using building information modelling

Part 1: Concepts and principles

bsi.

BS EN ISO 19650-2:2018



BSI Standards Publication

Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) - Information management using building information modelling

Part 2: Delivery phase of the assets

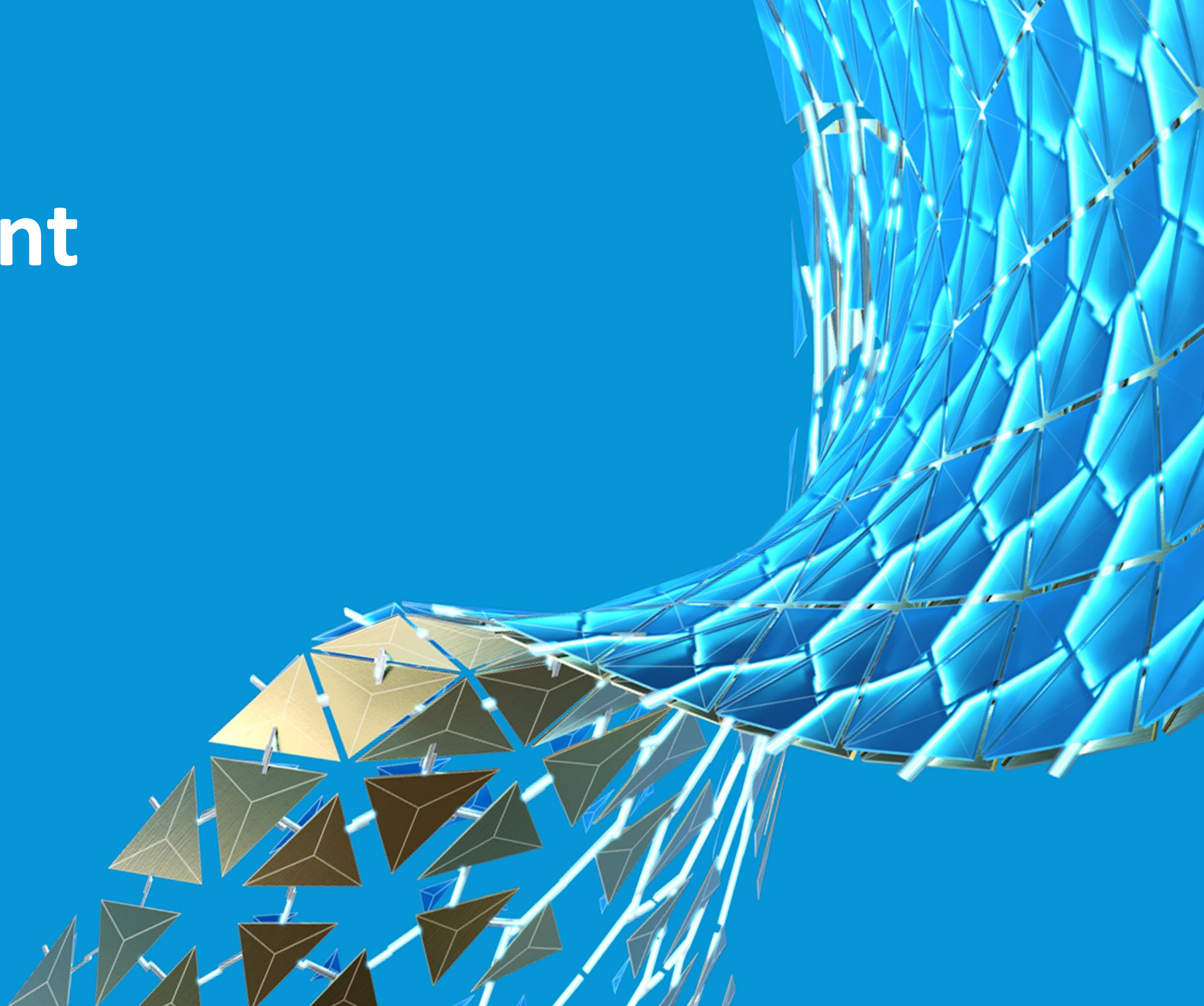
bsi.

Outcome Oriented Targets (Lean Engineering)

“Begin with the end in mind”

- Reduce waiting and searching for information
- Avoid over production of information with no defined use
- Eliminate defects and re-work through better coordination
- Re-use models and look for interchange opportunities
- Build confidence into models
- Reduce time and cost

Appointment



BIM Execution Plan

- Digital delivery
- Building information modeling
- BIM execution plan details
- Key roles and responsibilities
- Project BIM objectives and goals
- File sharing / document management
- Software and training
- BIM / CAD modeling guidelines
- QA / QC and model coordination
- Final deliverables

VTA's BART Silicon Valley Phase II Extension Project

General Engineering Consulting Services



BIM Execution Plan

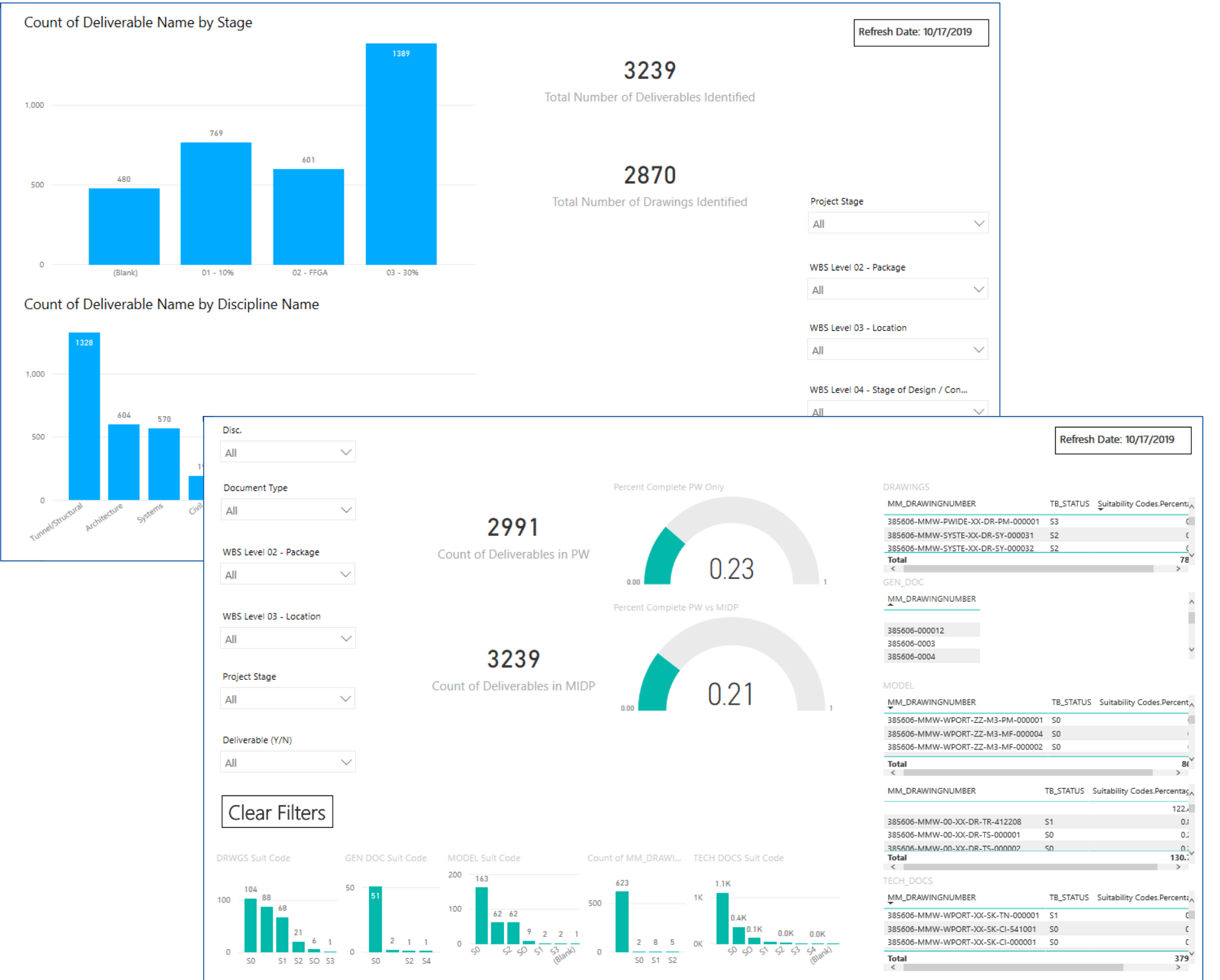
30% Design Phase
Revision P03
June 22, 2020



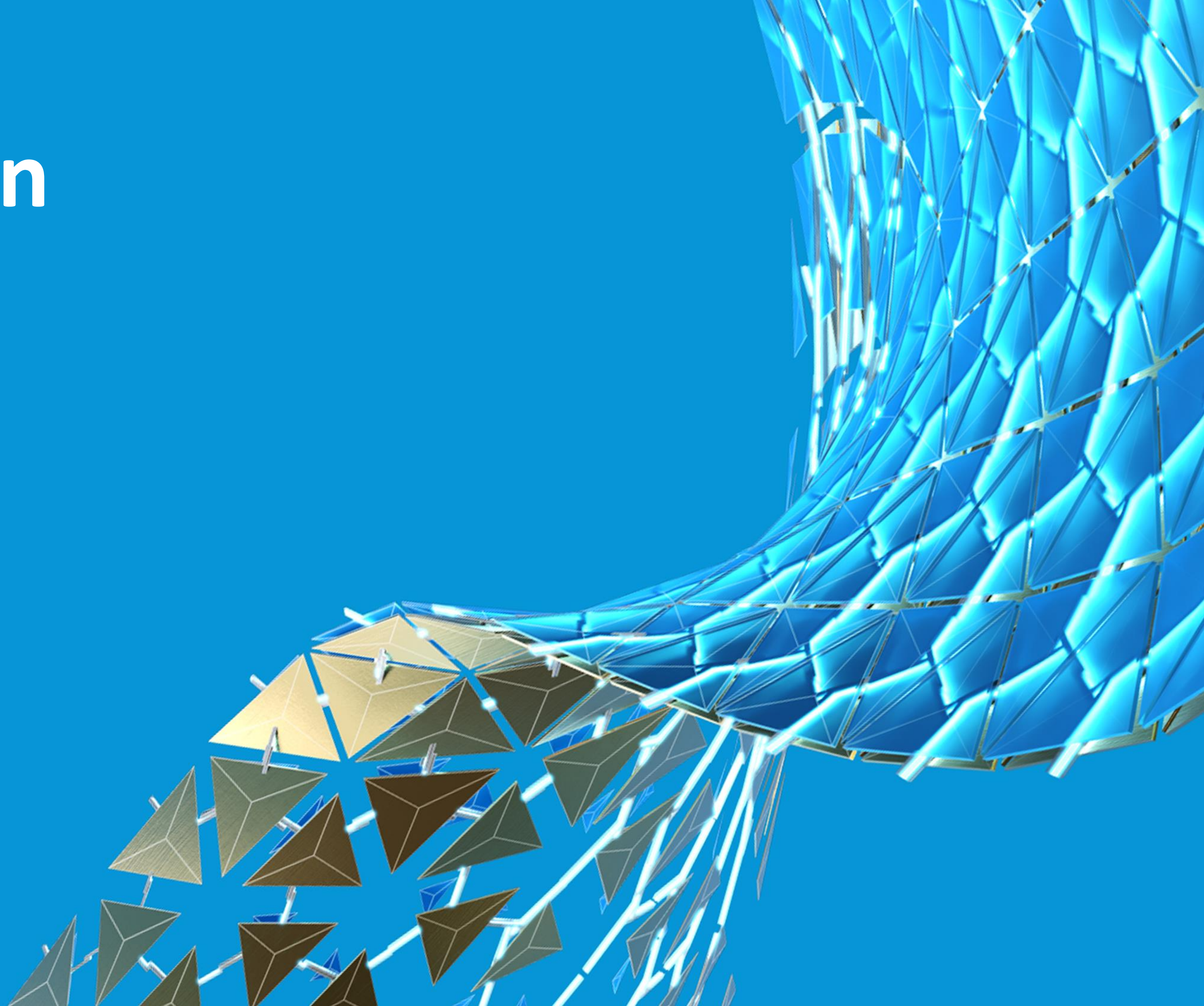
MIDP

- Master Information Delivery Plan
- Master file detailing document names by discipline, asset and contract
- Discipline teams responsible for maintaining drawing lists in the MIDP
- BIM team responsible for maintaining model lists (MPDT – Model Production Delivery Table) in the MIDP
- Tracking the completion of files in Power BI

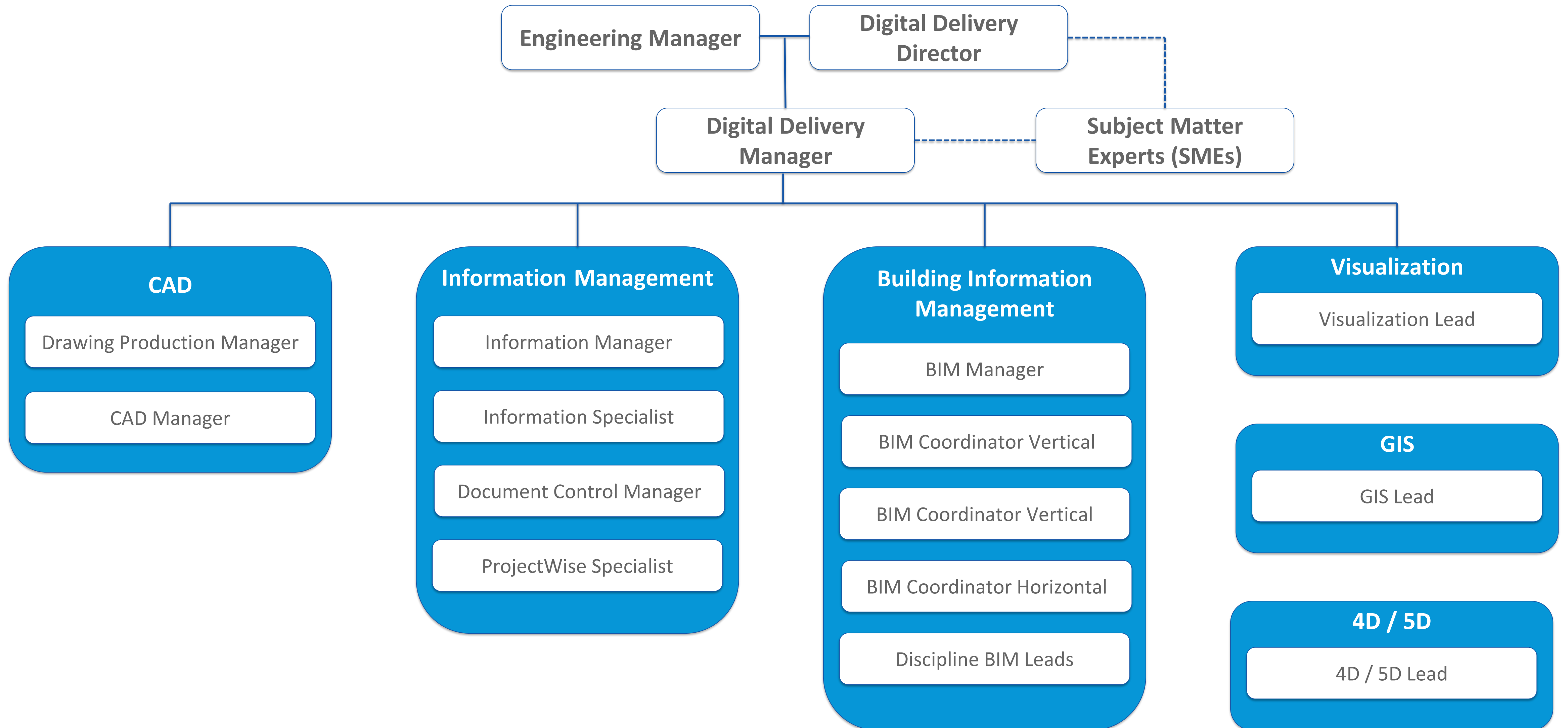
Asset Code	Project Stage	Deliverable	Status	IDR Complete	QC Complete	QA Complete	Drawing Index	Management Review	Coordinator check PW	Approved PW	Final Drawing ready for issuance	Sheet Number	Deliverable Number (ISO 19650 Compliant)	DELIVERABLE COMPONENT	Issued Status	Actual Delivery Date
TRACK	30%	Y		N	<	<						412203	385606-MMW-TRACK-XX-DR-TR-412203	PLAN AND PROFILE1 571+00.00 TO S1 581+00.00	NOT ISSUED	January 1, 1900
TRACK	10%	Y		Y	<	<						412203	385606-MMW-TRACK-XX-DR-TR-412203	PLAN AND PROFILE - S1 571+00.00 TO S1 581+00.00	ISSUED	December 31, 2019
EPD	Y	Management Review		Y	Y	Y						412203	385606-MMW-TRACK-XX-DR-TR-412203	PLAN & PROFILE SHEET 3		
TRACK	30%	Y		N	<	<		Y	Y	Y		412204	385606-MMW-TRACK-XX-DR-TR-412204	PLAN AND PROFILE1 581+00.00 TO S1 590+00.00	NOT ISSUED	January 1, 1900
TRACK	10%	Y		Y	<	<						412204	385606-MMW-TRACK-XX-DR-TR-412204	PLAN AND PROFILE - S1 581+00.00 TO S1 590+00.00	ISSUED	December 31, 2019
EPD	Y	Management Review		Y	Y	Y		Y	Y	Y		412204	385606-MMW-TRACK-XX-DR-TR-412204	PLAN & PROFILE SHEET 4		
TRACK	30%	Y		N	<	<						412205	385606-MMW-TRACK-XX-DR-TR-412205	PLAN AND PROFILE1 590+00.00 TO S1 598+00.00	NOT ISSUED	January 1, 1900
TRACK	10%	Y		Y	<	<						412205	385606-MMW-TRACK-XX-DR-TR-412205	PLAN AND PROFILE - S1 590+00.00 TO S1 598+00.00	ISSUED	December 31, 2019
EPD	Y	Management Review		Y	Y	Y		Y	Y	Y		412205	385606-MMW-TRACK-XX-DR-TR-412205	PLAN & PROFILE SHEET 5		
TRACK	30%	Y		N	<	<						412206	385606-MMW-TRACK-XX-DR-TR-412206	PLAN AND PROFILE1 598+00.00 TO S1 608+00.00	NOT ISSUED	January 1, 1900
TRACK	10%	Y		Y	<	<						412206	385606-MMW-TRACK-XX-DR-TR-412206	PLAN AND PROFILE - S1 598+00.00 TO S1 608+00.00	ISSUED	December 31, 2019
EPD	Y	Management Review		Y	Y	Y		Y	Y	Y		412206	385606-MMW-TRACK-XX-DR-TR-412206	PLAN & PROFILE SHEET 6		
TRACK	30%	Y		N	<	<						412207	385606-MMW-TRACK-XX-DR-TR-412207	PLAN AND PROFILE1 608+00.00 TO S1 617+00.00	NOT ISSUED	January 1, 1900
TRACK	10%	Y		Y	<	<						412207	385606-MMW-TRACK-XX-DR-TR-412207	PLAN AND PROFILE - S1 608+00.00 TO S1 617+00.00	ISSUED	December 31, 2019
EPD	Y	Management Review		Y	Y	Y		Y	Y	Y		412207	385606-MMW-TRACK-XX-DR-TR-412207	PLAN & PROFILE SHEET 7		
EPD	Y	Management Review		Y	Y	Y		Y	Y	Y		412208	385606-MMW-TRACK-XX-DR-TR-412208	PLAN & PROFILE SHEET 8		
TRACK	30%	Y		N	<	<						412209	385606-MMW-TRACK-XX-DR-TR-412209	PLAN AND PROFILE1 624+00.00 TO S1 634+00.00	NOT ISSUED	January 1, 1900
TRACK	10%	Y		Y	<	<						412209	385606-MMW-TRACK-XX-DR-TR-412209	PLAN AND PROFILE - S1 624+00.00 TO S1 634+00.00	ISSUED	December 31, 2019
EPD	Y	Management Review		Y	Y	Y		Y	Y	Y		412209	385606-MMW-TRACK-XX-DR-TR-412209	PLAN & PROFILE SHEET 9		
TRACK	30%	Y		N	<	<						412210	385606-MMW-TRACK-XX-DR-TR-412210	PLAN AND PROFILE1 634+00.00 TO S1 643+00.00	NOT ISSUED	January 1, 1900
TRACK	10%	Y		Y	<	<						412210	385606-MMW-TRACK-XX-DR-TR-412210	PLAN AND PROFILE - S1 634+00.00 TO S1 643+00.00	ISSUED	December 31, 2019
EPD	Y	Management Review		Y	Y	Y		Y	Y	Y		412210	385606-MMW-TRACK-XX-DR-TR-412210	PLAN & PROFILE SHEET 10		
TRACK	30%	Y		N	<	<						412211	385606-MMW-TRACK-XX-DR-TR-412211	PLAN AND PROFILE1 643+00.00 TO S1 652+00.00	NOT ISSUED	January 1, 1900
TRACK	10%	Y		Y	<	<						412211	385606-MMW-TRACK-XX-DR-TR-412211	PLAN AND PROFILE - S1 643+00.00 TO S1 652+00.00	ISSUED	December 31, 2019



Mobilization Resources



Digital Delivery Team



Mobilization of Team

460

MOBILIZED STAFF

49

LOCATIONS

25

FIRMS

10

DISCIPLINES

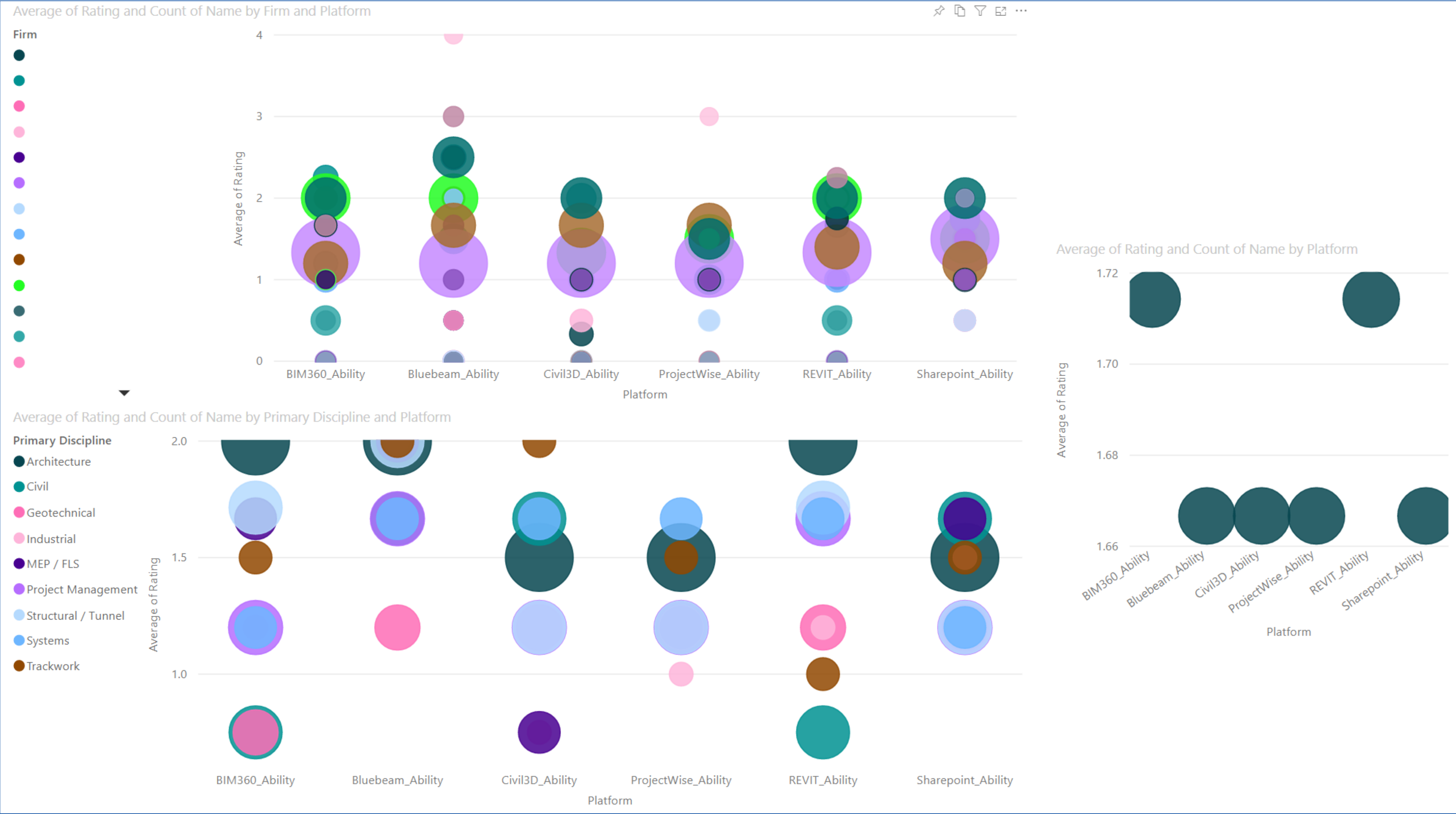
One

Team

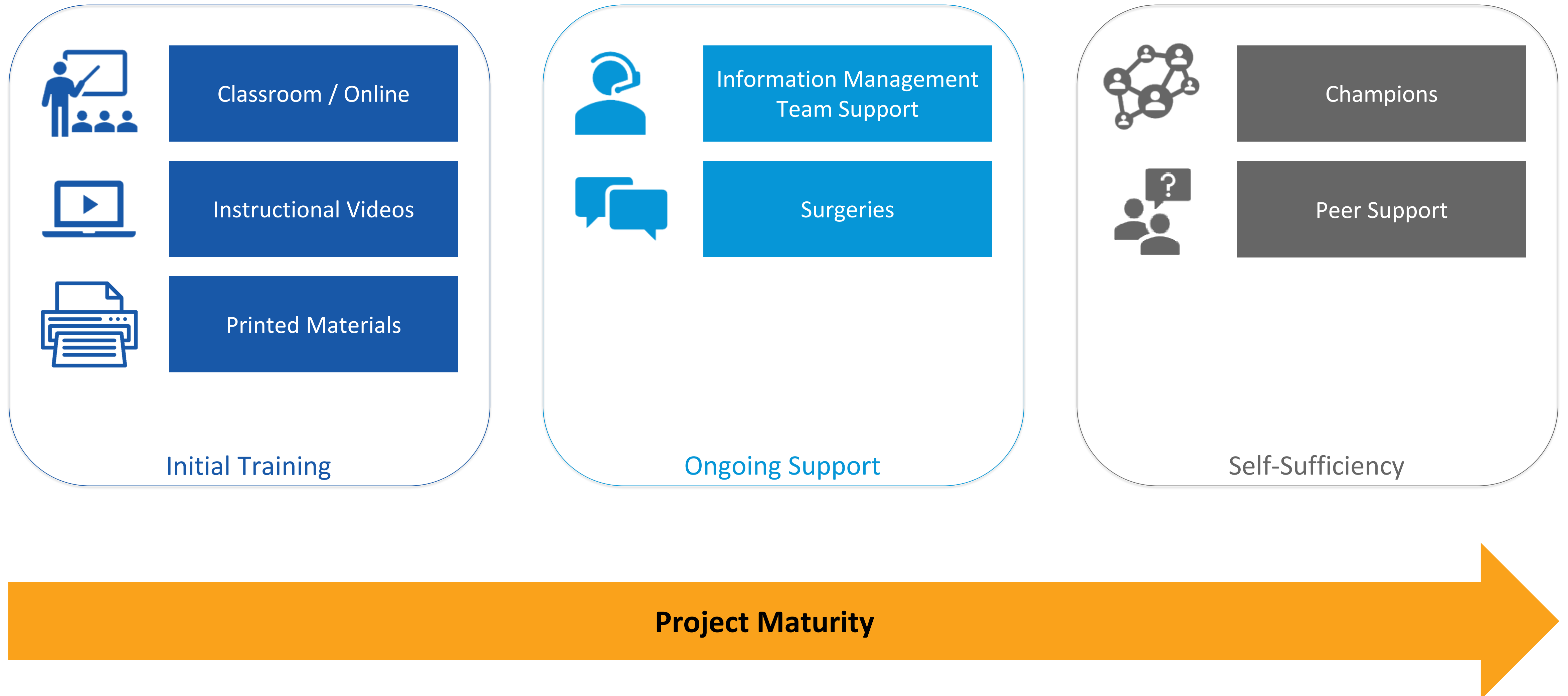
Way of Working

Combined Vision

Skills Survey



Training and Support



Project Wiki

- Step-by-step work instructions
- Training videos
- Training presentations

Home

Welcome to the BSVII project wiki library!

This is an open resource for the BSVII delivery team to learn more about our software packages being used on the project to aid them in their digital delivery journey.

If there is information you'd like to see captured here, please feel free to get in touch with the BSVII Digital Delivery Team (BSVIIinfoman@mottmac.com).

Wiki Links



BIM 360

Welcome to the BIM 360 Wiki!

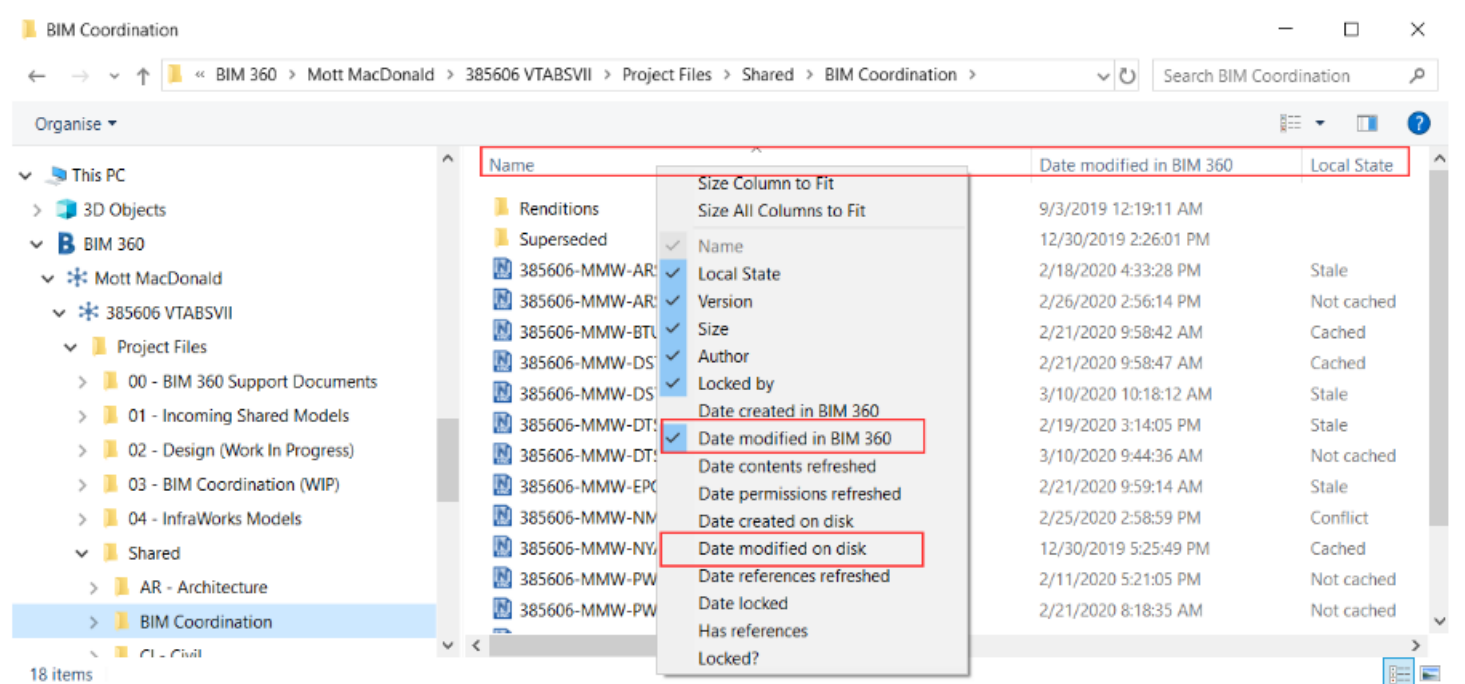
Please follow the links below to additional resources:

- [BIM 360 - Introduction Presentation](#)
- [BIM 360 - Access the Federated Models](#)
- [BIM 360 - Compare Models](#)
- [BIM 360 - Desktop Connector Work Offline](#)
- [BIM 360 - How do I start a New Model](#)
- [BIM 360 - How do I review and share my Model](#)
- [BIM 360 - How do I obtain an Architectural CAD Background](#)
- [BIM 360 - How to Clear the Cache of the BIM 360 Desktop Connector](#)
- [BIM 360 - Show Additional Columns in the Desktop Connector Drive](#)
- [BIM 360 - Where are existing Utilities models](#)

BIM 360 - Show Additional Columns in the Desktop Connector Drive

While in the Desktop Connector Drive, additional columns can be shown or hidden.

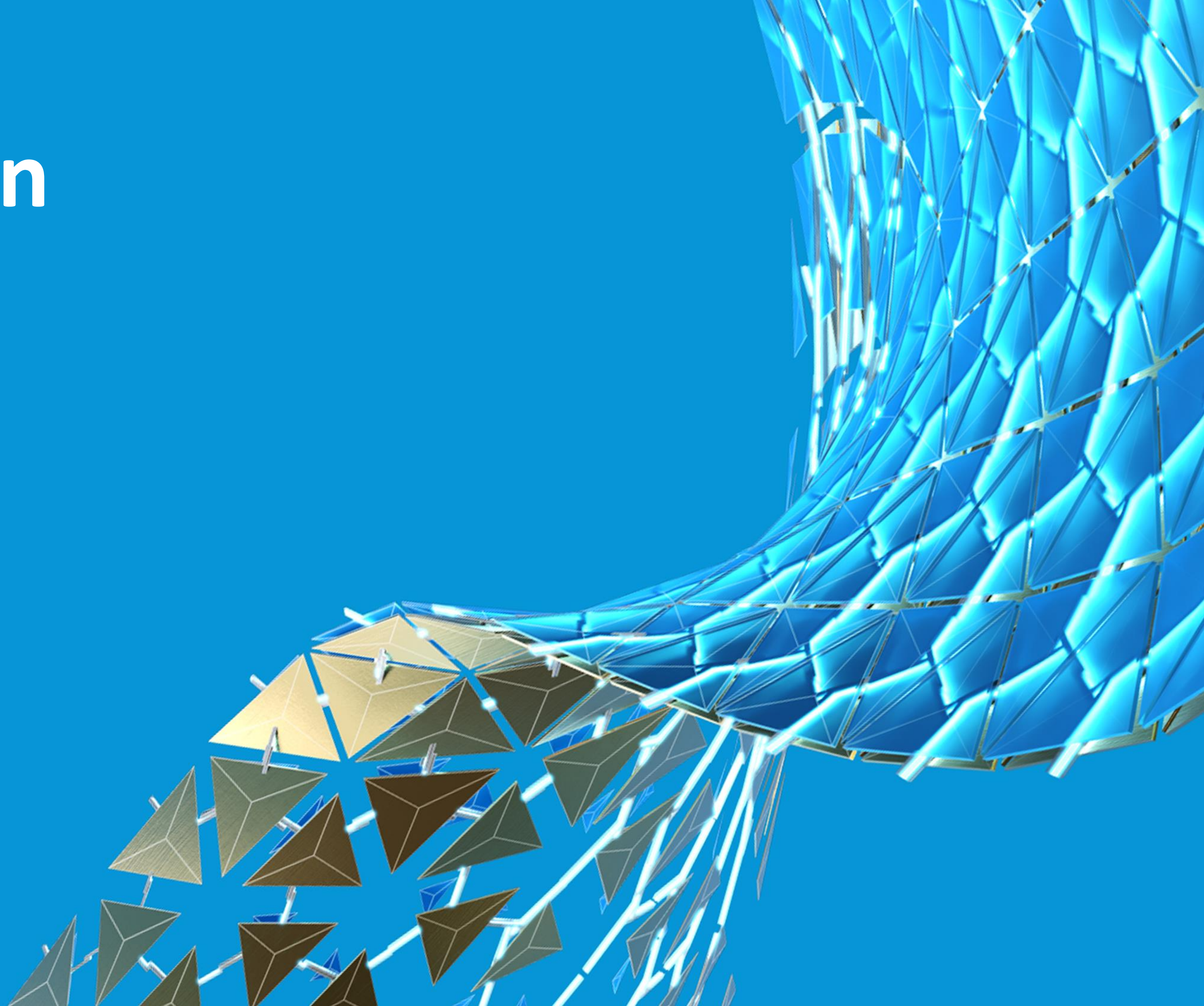
1. Right-click on any of the existing column headers and select the column you wish to show or hide



TRUST

- 1 Create information **once** and store correctly.
- 2 Actively **share** information. Understand ISO 19650 and respect the **workflow**.
- 3 Seek, support and share training **knowledge** with your colleagues.
- 4 Send links instead of attachments – keep the **single source of truth**.
- 5 Be clear and concise – **communication** will be a challenge.
- 6 **Don't be afraid** of the models.
- 7 Only design and model to the required **scope and level of detail**.
- 8 **Sharing is caring** – help others and seek help.

Mobilization Technology



Robust Digital Framework



BIM 360



Revit



Civil 3D



Navisworks

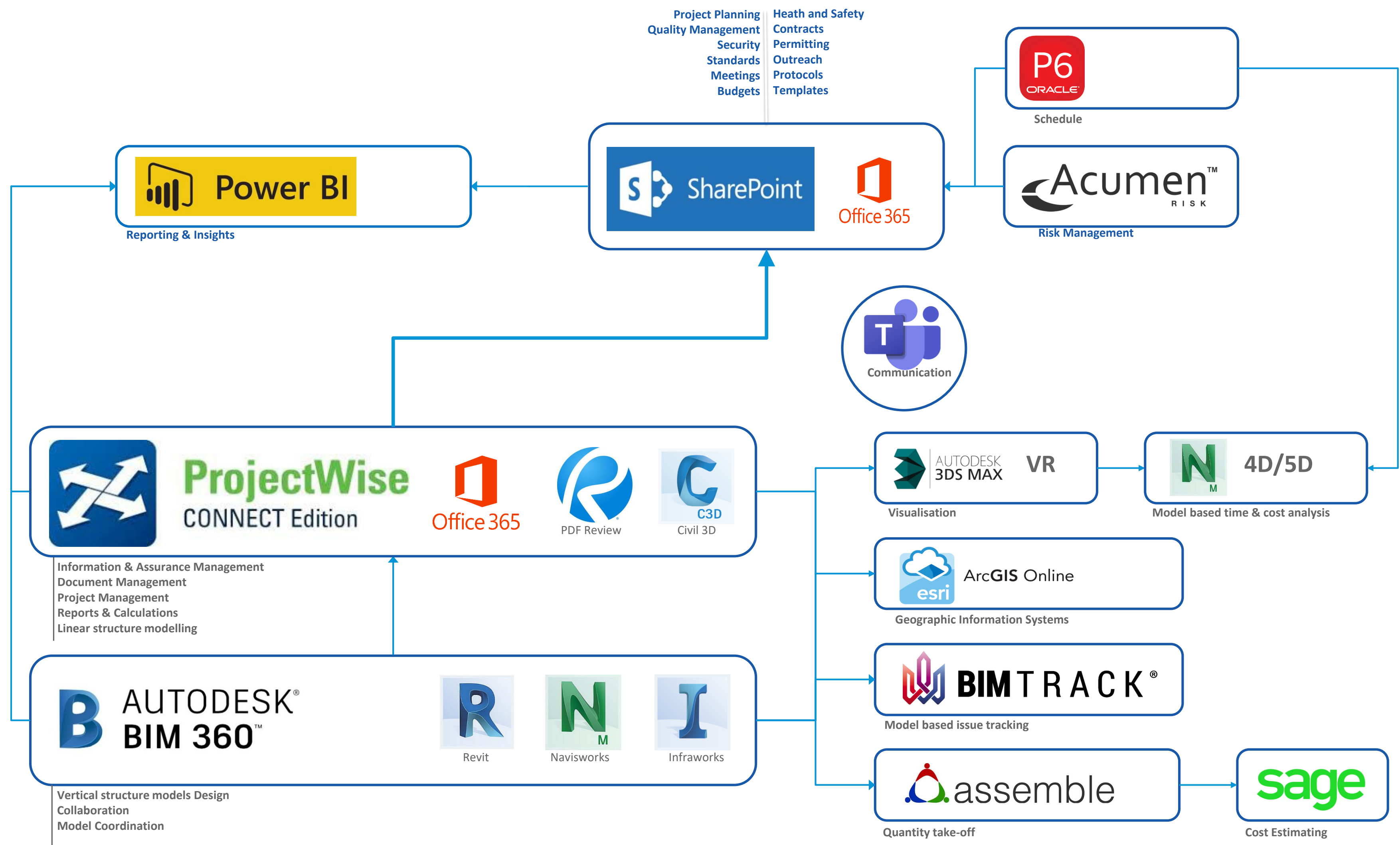


Infraworks

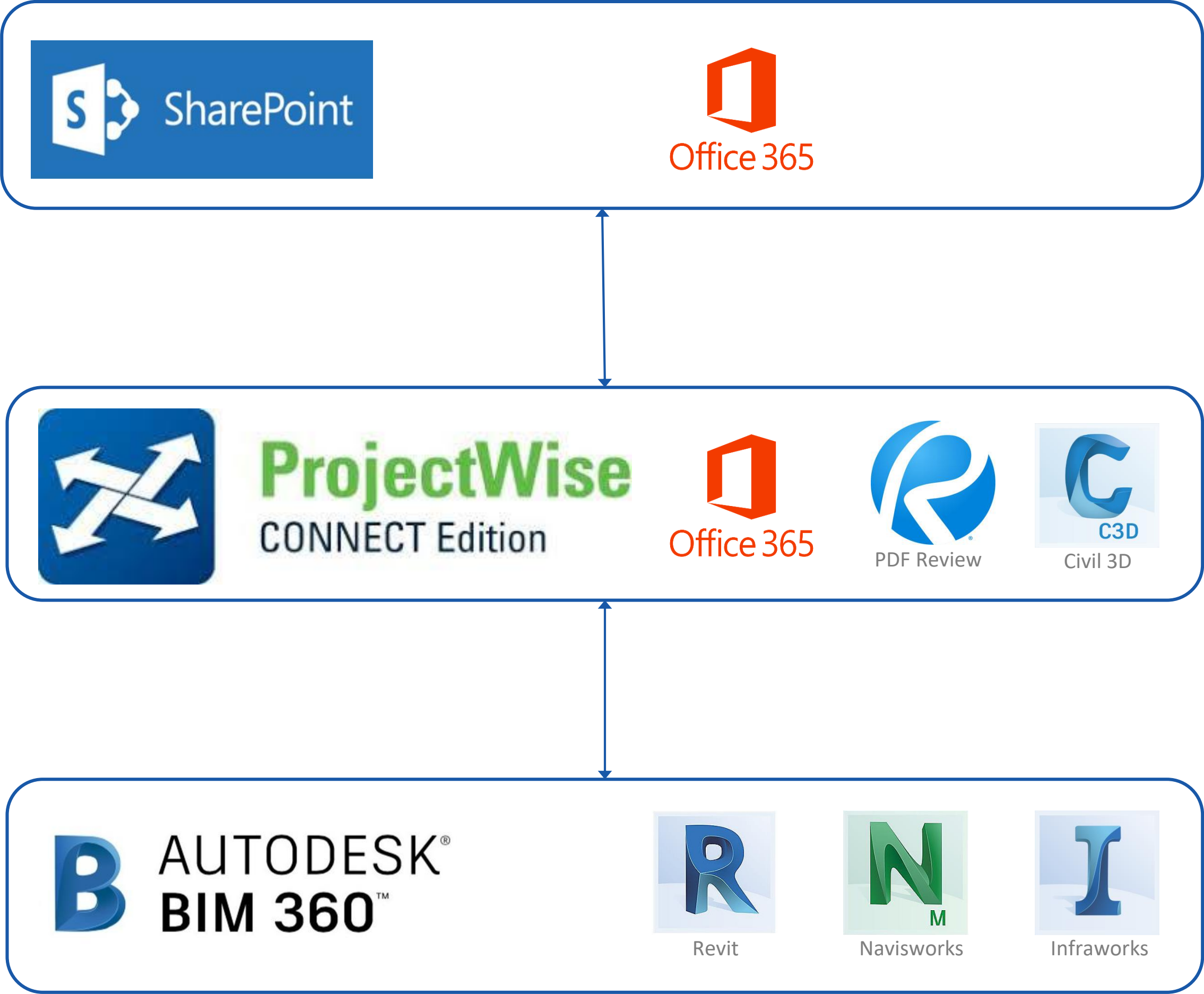


3ds Max

Digital Delivery Environment



Common Data Environment



- Project Planning**
Quality
Management
Security
Standards
Meetings
Budgets
- Heath and Safety**
Contracts
Permitting
Outreach
Protocols
Templates

- Information and Assurance**
Management
Document Management
Project Management
Reports and Calculations
Linear structure modelling

- Vertical structure models**
Design Collaboration
Model Coordination

SharePoint

- Non-delivery information
- GEC project control and management
- Onboarding and training material
- Links, templates and commonly used files

SharePoint

Concept searchProject directoryProject memoryProject site guidance

Home

VTA BSVII General Engineering Contract

Home

Onboarding Material

Project Flythrough

BART Facilities Standards ...

Mobilization

SHARCS

Project OneNote

Financial Overview

Site Mailbox

Digital Delivery

Analyses Working Area

BSVII Wiki

Safety

Newhall Yard & Maintena...

Change Management

Formal Correspondence

Apps

Contact Lists

Subconsultant Invoices &...

Subcontracts and Task Or...

Recycle bin

Edit

+ New

Page details

Platforms

ProjectWise

Teams

BIM 360

Yammer (Retired)

Project App

Calendars

Upcoming Events

Out of Office Calendar

Meetings & Action Tracking

Libraries

10% Submittal

Correspondence

Images and Videos

Management Information

MM Executive

Project Management

RSD Collaboration

Technical

Working Files

EPD Submittal

Cost Estimating

IWP Development Team

Meetings

Office Information

Project Schedule

Safety

Training Materials

Commonly Used Files

Digital Delivery Management

JV Board

Microsoft Teams Library

Project Controls

Quality Management

SVTC Executives

Value Engineering

Subsites

Change Management

Formal Correspondence

Subcontracts and Task Orders

Invoices & Timesheets

Important Dates

Create an event

Month 01

Month 01

Month 01

San Jose, CA

9:53 am

London, London, United Kingdom

5:53 pm

Prague, Czechia

6:53 pm

Budapest, Hungary

6:53 pm

Cape Town, South Africa

6:53 pm

Singapore, Singapore

12:53 am

Sydney, Australia

3:53 am

Most viewed documents

Title	Modified	Modified By
385606-MMW-PWIDE-XX-RP-GE-000021	16 Oct 2020	Lorenzo Allievi

ProjectWise

- Primary CDE for all deliverables
- ISO 19650 structure including file naming, state and suitability codes
- Embedded workflows for file sharing and validation
- Customizable metadata for enhanced analysis
- Title block integration for DWG files
- PDF renditions

ProjectWise Explorer

Datasource Folder Document View Tools Window Help

Address: pw:\mott-use-gw.bentley.com:mott-use-gw\Documents\Project\385606 - VTA BSV Phase II\4. Design\BSV P...

Application Data

Digital Component Catalogue

Projects

385606 - VTA BSV Phase II

0. Executive

1. Project Management

3. Incoming information

4. Design

BSV Phase II-Preliminary Engineering

AR - Architecture

CI - Civil

01 - 2D Models (M2)

02 - 3D Models (M3)

03 - Coordination Models (CR)

04 - Drawings (DR)

05 - Model Renderings (MR)

06 - PDF Renditions

07 - Sketches (SK)

08 - Visualisations (VS)

09 - Bill of Quantities (BQ)

10 - Calculations (CA)

11 - Reports (RP)

12 - Schedules (SC)

13 - Specifications (SP)

14 - Document Sets (DS)

15 - Mark-Ups

GE - Geotech

IN - Industrial

MF - MEP

PM - Project Management

SY - Systems

TR - Trackwork

TS - Tunnel - Structural

UT - Utilities

Document Resources

Drawing Resources

Model Resources

7. Transmittals

8. Training Folder

Transmittal responses

Saved Searches

Deliverables Management

391230 - Central Tunnel

507395501-001 - Antelope Valley Line Environmental & T

Components

Custom Folders

Saved Searches

MM CDE LF (EUNA-UKS)

MM Counters Creek FAS (EUNA-UKS)

List

Spatial

Revision	Gate	Name	Description	State	Suitability*	Suitability	Designed*	Drawn
P01.1		385606-MMW-00-XX-DR-CI-601401	EV - CSA and TWPC Plan - DSTAT - Sheet 1 of 1	Work In Progress	S0	WORK IN PRO...	M.GREEN	---
P02.1		385606-MMW-ARSTA-XX-DR-CI-111000	Abbreviations and Symbols - Sheet 2	Work In Progress			S.JANSSEN	---
P02.1	10	385606-MMW-ARSTA-XX-DR-CI-111003	Roadway & Utility Plan	Work In Progress			S.JANSSEN	---
P02.1	10	385606-MMW-ARSTA-XX-DR-CI-111004	Roadway & Utility Plan	Work In Progress			S.JANSSEN	---
P02.1	10	385606-MMW-ARSTA-XX-DR-CI-111005	Roadway & Utility Plan	Work In Progress			S.JANSSEN	---
P02.1	10	385606-MMW-ARSTA-XX-DR-CI-111006	Typical Road Cross Sections	Work In Progress			S.JANSSEN	---
P02.1		385606-MMW-ARSTA-XX-DR-CI-111007	Abbreviations and Symbols - Sheet 1	Work In Progress			S.JANSSEN	---
P02.1		385606-MMW-ARSTA-XX-DR-CI-601003	Demolition Plan - 100 Scale	Work In Progress			M.ABAY	---
P02.1	10	385606-MMW-ARSTA-XX-DR-CI-601021	TRUCK HAUL ROUTE	Work In Progress			J.WU	---
P02.1		385606-MMW-DSTAT-XX-DR-CI-131000	Abbreviations and Symbols - Sheet 2	Work In Progress			S.JANSSEN	---
P02.1	10	385606-MMW-DSTAT-XX-DR-CI-131002	Site Plan - 100 Scale	Work In Progress			S.JANSSEN	---
P02.1	10	385606-MMW-DSTAT-XX-DR-CI-131003	Roadway & Utility Plan	Work In Progress			S.JANSSEN	---
P02.1	10	385606-MMW-DSTAT-XX-DR-CI-131004	Typical Road Cross Section	Work In Progress			S.JANSSEN	---
P02.1		385606-MMW-DSTAT-XX-DR-CI-131005	Abbreviations and Symbols - Sheet 1	Work In Progress			S.JANSSEN	---
P01.1		385606-MMW-DSTAT-XX-DR-CI-561001	THC - Demolition Plan - DSTAT - Sheet 1 of 1	Work In Progress	S0	Work In Progre...		
P01.1		385606-MMW-DSTAT-XX-DR-CI-591140	THC - Restoration Plan - DSTAT - Sheet 1 of 1	Work In Progress	S0	Work In Progre...		
P02.1	10	385606-MMW-DSTAT-XX-DR-CI-601005	Demolition Plan - 100 Scale	Work In Progress			M.ABAY	---
P02.1	10	385606-MMW-DSTAT-XX-DR-CI-601023	TRUCK HAUL ROUTE	Work In Progress			J.WU	---
P02.1		385606-MMW-DTSJS-XX-DR-CI-121001	Abbreviations and Symbols	Work In Progress			M.VERA CRUZ	---
P02.1		385606-MMW-DTSJS-XX-DR-CI-121003	Abbreviations and Symbols	Work In Progress			M.VERA CRUZ	---
P02.1	10	385606-MMW-DTSJS-XX-DR-CI-121004	Public Roadway Drawing Layout Index	Work In Progress			M.VERA CRUZ	---
P02.1	10	385606-MMW-DTSJS-XX-DR-CI-121006	Roadway & Utility Plan - East Santa Clara St	Work In Progress			M.VERA CRUZ	---
P02.1	10	385606-MMW-DTSJS-XX-DR-CI-121007	Roadway & Utility Plan - East Santa Clara St	Work In Progress			M.VERA CRUZ	---
P02.1	10	385606-MMW-DTSJS-XX-DR-CI-121008	Roadway & Utility Plan - Market St	Work In Progress			M.VERA CRUZ	---
P02.1	10	385606-MMW-DTSJS-XX-DR-CI-121009	Typical Road Cross Section	Work In Progress			M.VERA CRUZ	---
P01.2	10	385606-MMW-DTSJS-XX-DR-CI-121017	Construction Staging	Work In Progress	S3	FOR REVIEW A...	A.HRYNIEWICH	---

385606-MMW-DSTAT-XX-M3-CI-131060

WorkSpace

Components

Spatial

General

Security

More Attributes

File Properties

Audit Trail

Mott MacDonald CDE - Model Attributes

Project

385606

VTA BSV Phase II

Originator

MMW

Mott MacDonald Wong

Asset

DSTAT

BSV Phase II-Preliminary Engineering

Level Code

XX

No Levels Applicable

Document Type

M3

02 - 3D Models (M3)

Discipline

CI

CI - Civil

Project Title

VTA BSV Phase II

Model Description

UT - Proposed Utilities

Revision

Revision Note*

Revision Date

P01.6

10% SUBMITTAL

Suitability Code *

Suitability Description

Gate

Deliverable

Name

Initials

Date

Designed *

S.JANSSE

MC

11/20/19

Tech. Check

Name

Initials

Date

Drawn

Coordinator

Name

Initials

Date

Cont. Check

Approver

Rej/Rev Date

Reject/Revision Reason

Rej/Rev By

M.CRONAN

01/02/20

Returned from Shared

Model Number

385606-MMW-DSTAT-XX-M3-CI-131060

Save

Undo

Close

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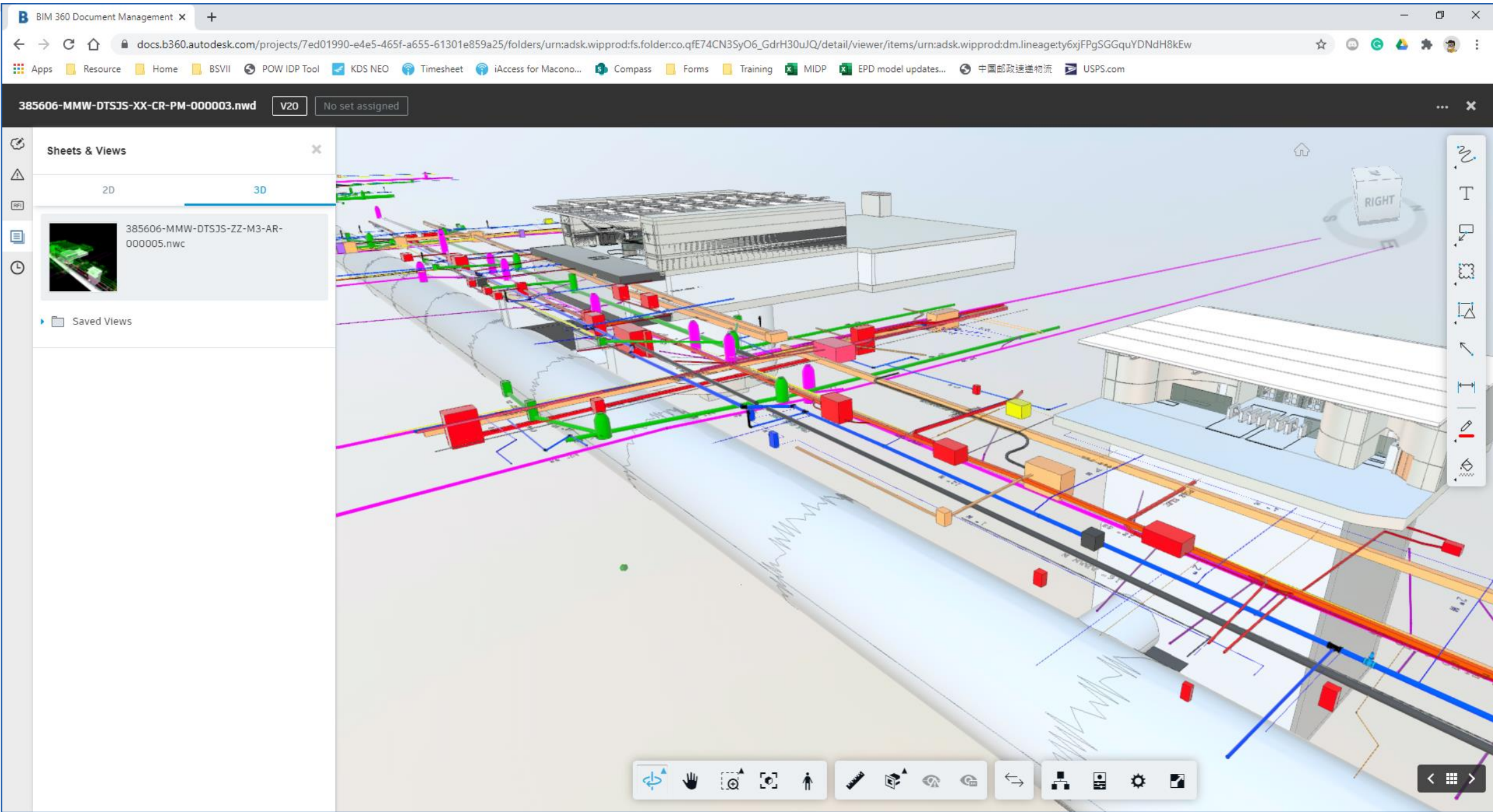
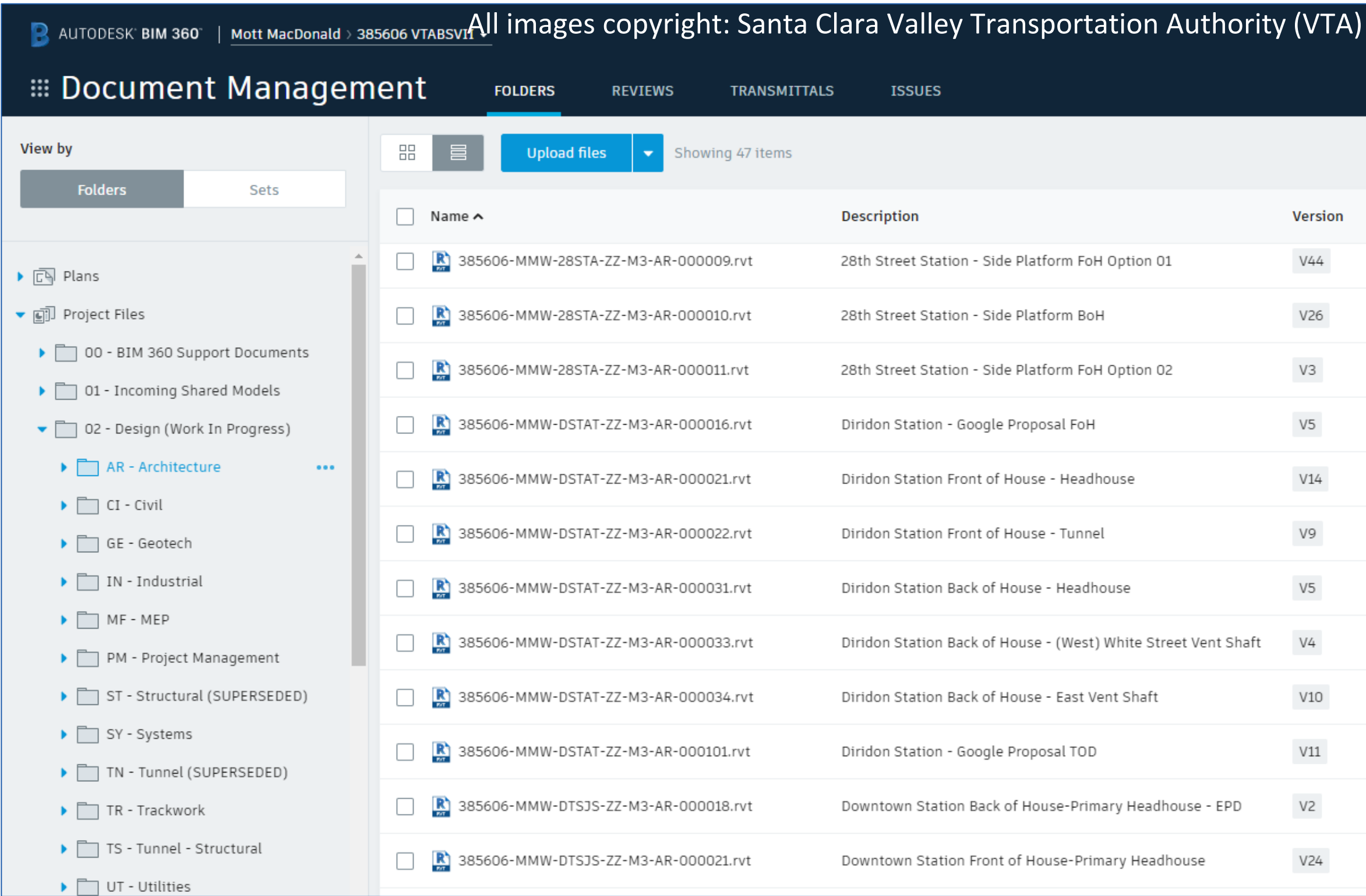
17/86

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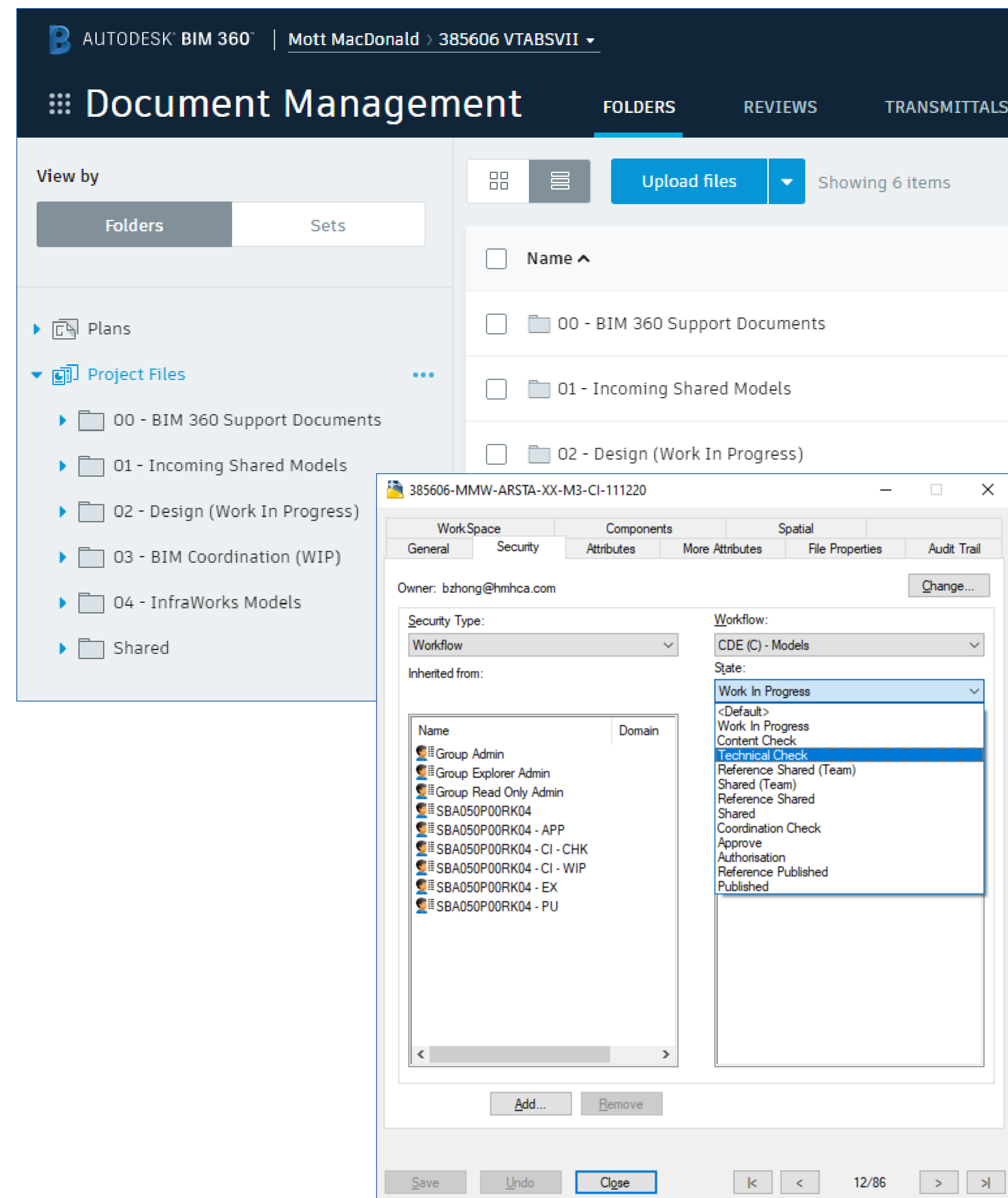
BIM 360

- CDE for all Revit models and federated models
- Applied ISO 19650 environment
- Enhanced model visibility



Information Sharing Workflows

- **BIM 360**
 - Manual set-up of WIP and Shared folders
 - Manual set-up of approval workflows
 - Approved version of the models copied to the Shared folder
 - Custom attributes for suitability code and state
- **ProjectWise**
 - Automated workflows for the review and approval processes
 - Files shared through suitability codes and states



Assemble

- **Typical Quantity Take-Off Process:**
 - Requires high resolution PDFs (higher resolution = higher accuracy)
 - Elements are traced to obtain areas
 - Design intent can be misunderstood
 - Material types
 - Construction methodology
- **Assemble Quantity Take-Off Process:**
 - Models can be directly imported for material take-off
 - Accurate extraction of areas and volumes
 - No tracing or calibration of scales required
 - Eliminates requirement of specific 1ft PDF drawing plots
 - Less opportunity for design intent to be misunderstood
 - Time and cost savings

assemble
AN AUTODESK COMPANY

MMW Diridon Station Quantity Take off

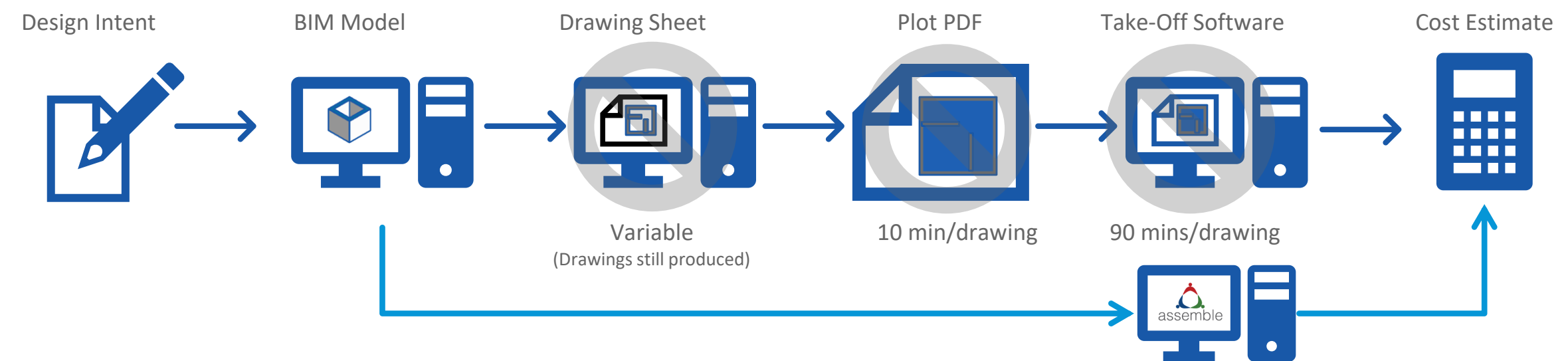
Untitled View Show Changes

Model Tree

- 40%_385606-MMW-DSTAT-XX-M3-TS-0...
- 40%_385606-MMW-DSTAT-ZZ-M3-AR-0...
- 40%_385606-MMW-DSTAT-ZZ-M3-AR-0...
- 40%_385606-MMW-DSTAT-ZZ-M3-TS-0...
- EPD_385606-MMW-DSTAT-ZZ-M3-AR-... (toggle on)
- Casework (2)
 - Casework 5 (1)
 - Casework 6 (1)
- Columns (4)
 - A_Columns_Rectangular (4)
- Doors (33)
 - Door-DoubleFlush-MMW-Pa... (5)
 - Door-Lifts-MMW-Concourse... (8)
 - Door-Passage-Double-Flush (4)
 - Door-Passage-Single-Flush (1)
 - Door-Single-MMW-Panel-xx (15)
- Floors (23)
 - Generic Models (40)
- Landings (12)
- Plumbing Fixtures (10)
- Runs (12)
- Specialty Equipment (124)
- Stairs (2)
- Structural Foundations (225)
- Structural Framing (10)
- Walls (177)

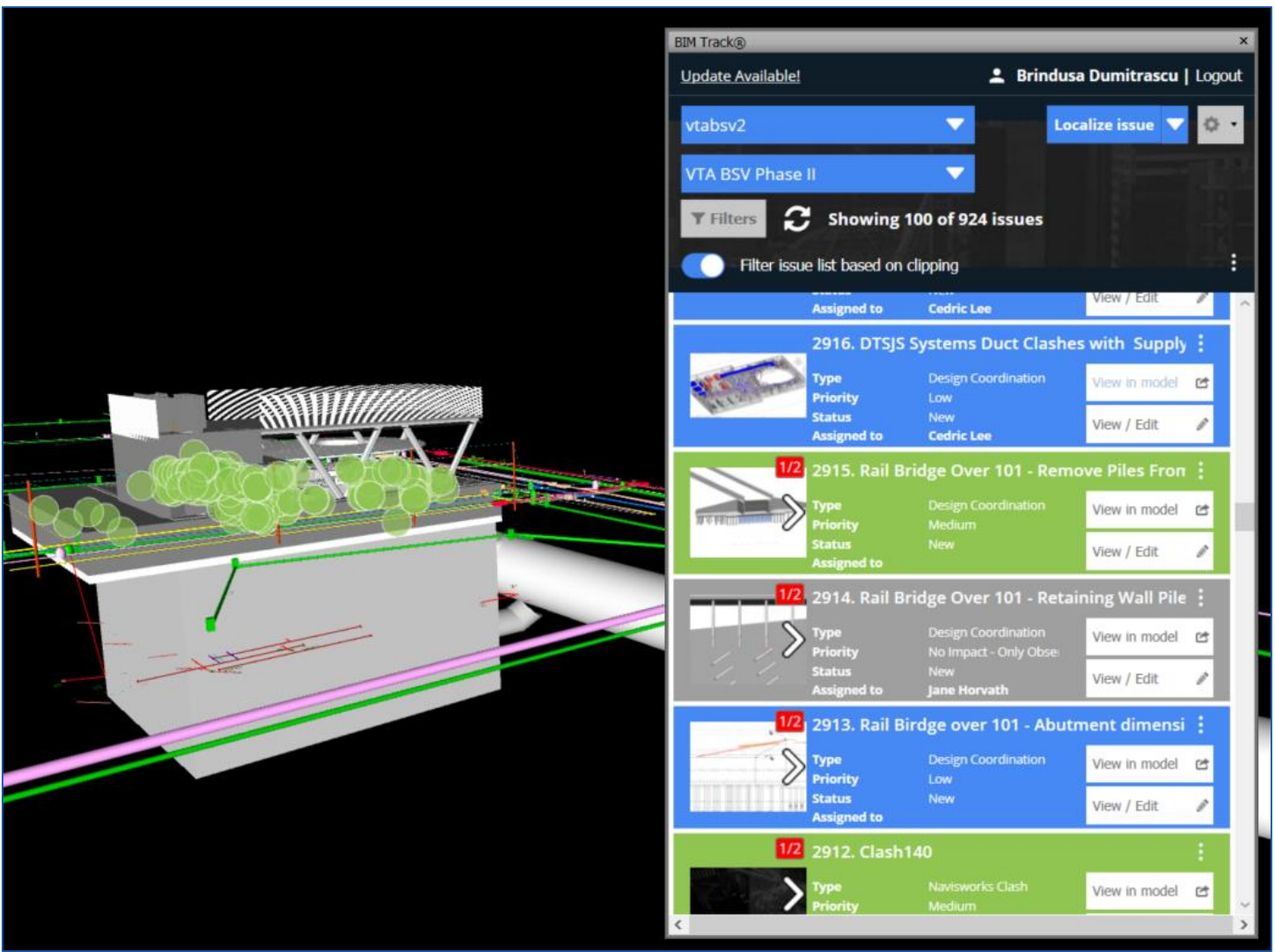
Visibility Settings

Name	Quantity	Unit	Model Name	Count (EA)	Area
Casework	2	EA	EPD_385606...	2	
Casework : Casework 5 : Casework 1	1	EA	EPD_385606...	1	
Casework : Casework 6 : Casework 1	1	EA	EPD_385606...	1	
Columns	4	EA	EPD_385606...	4	
Columns : A_Columns_Rectangular : 400x200mm	4	EA	EPD_385606...	4	
Doors	33	EA	EPD_385606...	33	
Doors : Door-DoubleFlush-MMW-Panel-xx : 68" x 80"	5	EA	EPD_385606...	5	
Doors : Door-Lifts-MMW-ConcourseToPlatform-xx : Door-L...	8	EA	EPD_385606...	8	
Doors : Door-Passage-Double-Flush : Door-Passage-Dou...	4	EA	EPD_385606...	4	
Doors : Door-Passage-Single-Flush : 36" x 84"	1	EA	EPD_385606...	1	
Doors : Door-Single-MMW-Panel-xx : 34" x 80"	10	EA	EPD_385606...	10	
Doors : Door-Single-MMW-Panel-xx : Door-Single-MMW-...	5	EA	EPD_385606...	5	
Floors	142,694.25	SF	EPD_385606...	23	
Floors : Floor : Floor-External-MMW-Generic-5' 0"	1,418.36	SF	EPD_385606...	2	
Floors : Floor : Floor-External-MMW-Terrazzo-0' 6"	12,224.79	SF	EPD_385606...	3	
Floors : Floor : Floor-Internal-MMW-Generic-0' 3"	7,656.95	SF	EPD_385606...	2	
Floors : Floor : Floor-Internal-MMW-Generic-1' 0"	7,184.71	SF	EPD_385606...	5	
Floors : Floor : Floor-Internal-MMW-Generic-3' 9 6/32"	6,603.25	SF	EPD_385606...	2	
Floors : Floor : Floor-Internal-MMW-Generic-5' 0"	51,017.04	SF	EPD_385606...	1	
Floors : Floor : Floor-Internal-MMW-GenericWithMetalPan...	672.11	SF	EPD_385606...	2	
Floors : Floor : Floor-Internal-MMW-Terrazzo-3"	31,334.69	SF	EPD_385606...	2	
Floors : Floor : Generic - 2'	24,582.34	SF	EPD_385606...	4	
Generic Models	40	EA	EPD_385606...	40	



BIM Track

- Issue tracking (not just clashes)
- Integrates with main design software
- Accessible online for non-technical staff
- Record and monitor issues
- Bridge the gap between 2D and 3D teams with hyper-modelling
- All parties access



ISSUES

All images copyright:
Santa Clara Valley Transportation Authority (VTA)

+ Localize issue

542 issues

Filter issue list based on clipping

671. Clash257

Type: Navisworks Clash

Priority: Low

Status: New

Assigned to: Yvonne Liao

View in model

View / Edit

670. Clash240

Type: Navisworks Clash

Priority: Low

Status: New

Assigned to: Yvonne Liao

View in model

View / Edit

669. Clash239

Type: Navisworks Clash

Priority: Low

Status: New

Assigned to: Yvonne Liao

View in model

View / Edit

668. Clash237

Type: Navisworks Clash

Priority: Low

Status: New

Assigned to: Yvonne Liao

View in model

View / Edit

667. Clash236

Type: Navisworks Clash

Priority: Low

Status: New

Assigned to: Yvonne Liao

View in model

View / Edit

GENERAL SETTINGS

Default due date for new issues : 7 days

Default issue color attribute : Priority

Issue mandatory attributes : Asset, Phase, Priority, Status, Type

ATTRIBUTES

Zones

Phases

Status

Types

Disciplines

Priorities

Escalation

Asset

+

PHASES

COLOR

+ Add value

10% Comments

#f90648

10% IDR

#4688F4

30% Design Development

Default

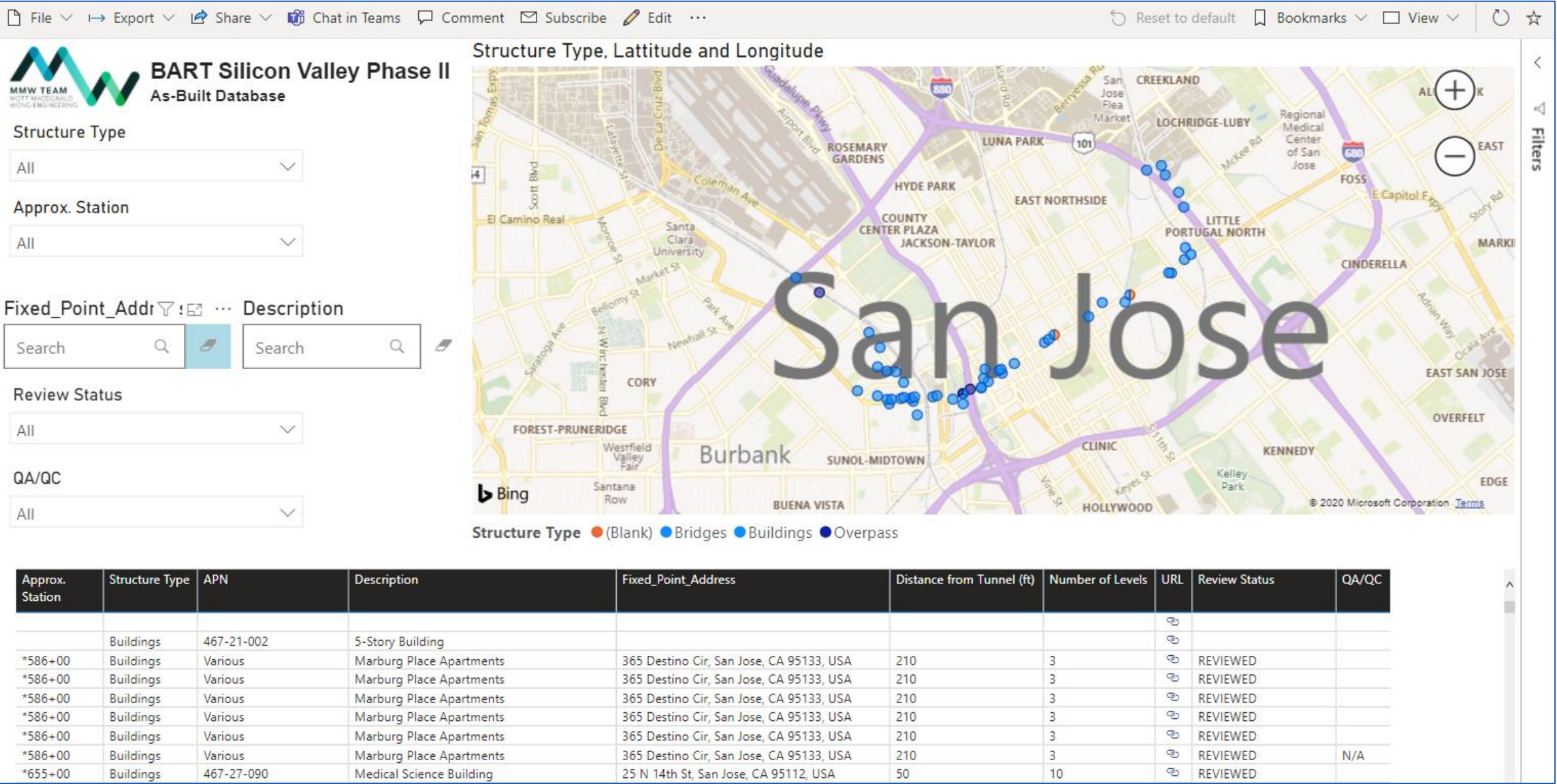
#3dea1f

Value Engineering

#FFC519

Power BI & Power Apps

- Tracking as-built information through to models
- Monitor and report QC of Civil 3D and Revit models
- Visualize data from BIM 360 and ProjectWise
- Geotechnical – GIS dashboard for boreholes and water levels
- Budget reporting
- RFCs and submittals reporting
- Management performance reporting
- Change analysis and earned value reporting
- Project App for automation of common tasks:
 - Mobilization
 - Document control
 - Project directory
 - Key info
 - Etc.
- Staffing Plan



MMW TEAM
YOTT YACONAL
WONG ENGINEERING

BSVII
BART Silicon Valley Phase II Extension

Share this tool:

Name:

Email Address:

Mobilization

New Starter

Document Control

Incoming Information

BIM

Submit Model Review Checklist

Additional Tools

Route Plan

Project Flythrough

Visitor's Log

Action Tracker

Discipline Approver

Outgoing Information

BIM Coordinator Review

Key Documents

Dashboards

Key Communications

Project Approver

Document Register

BIM Manager Review

Join Yammer

Observation Log

Project Directory

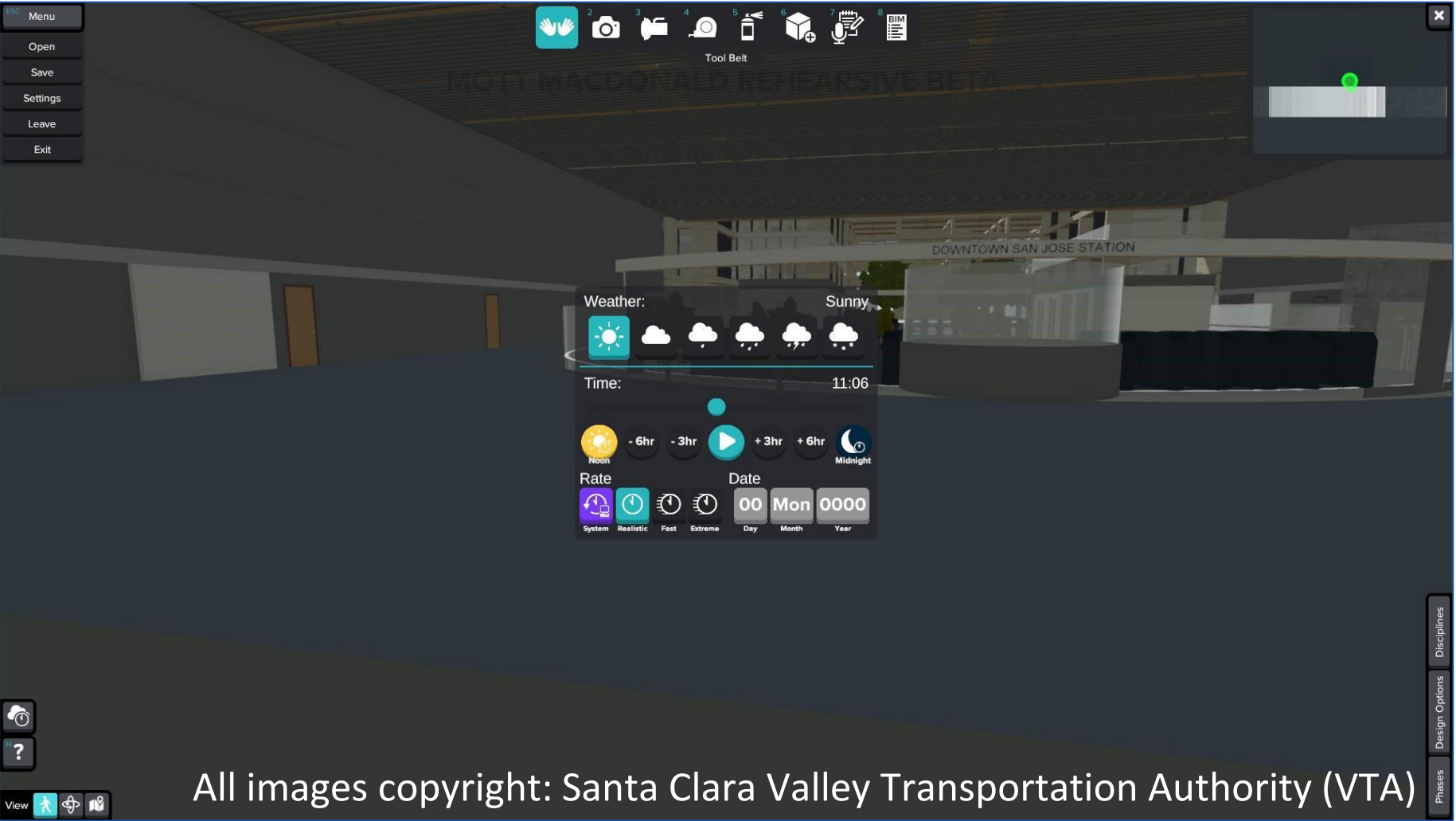
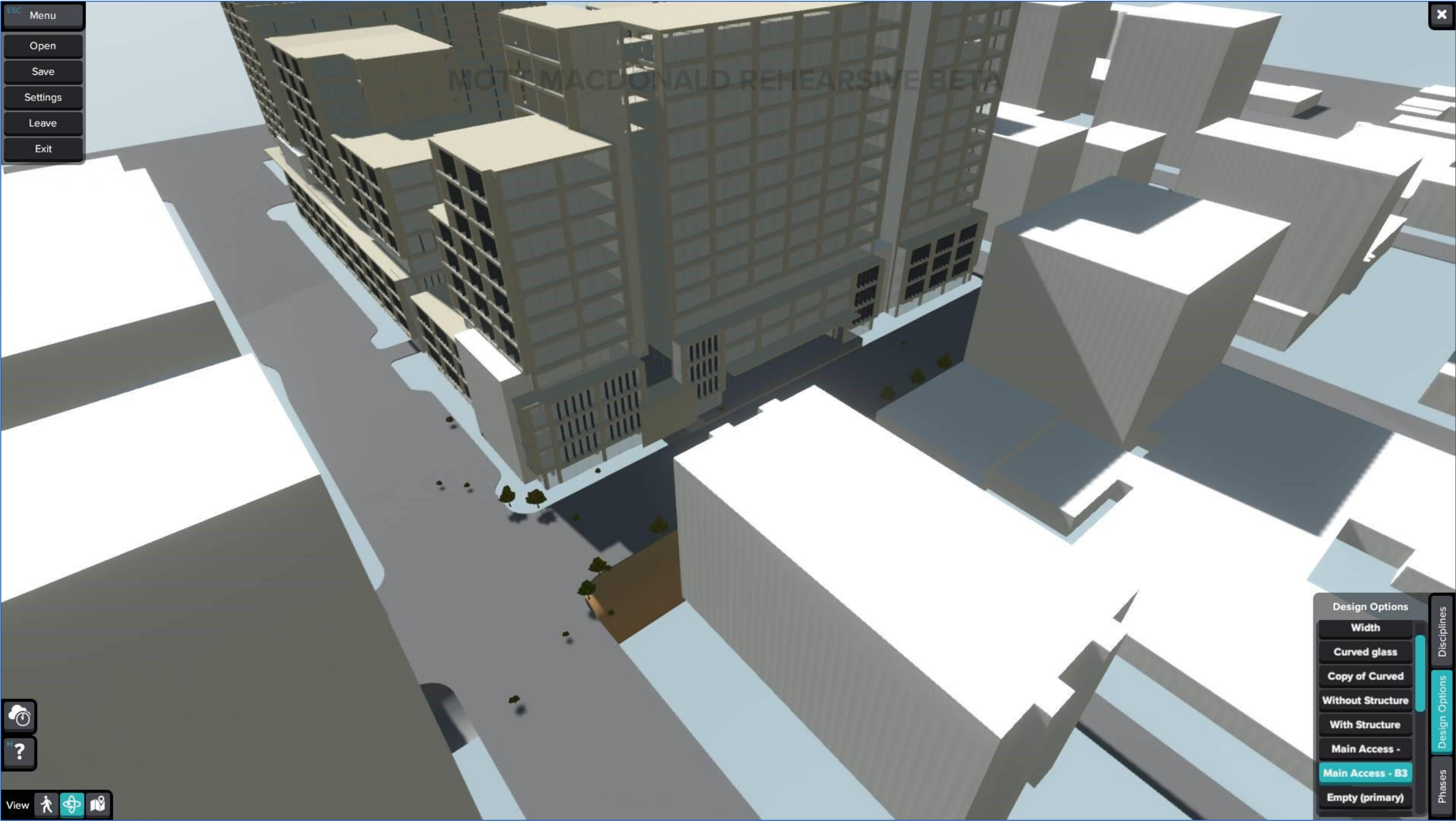
Virtual Reality



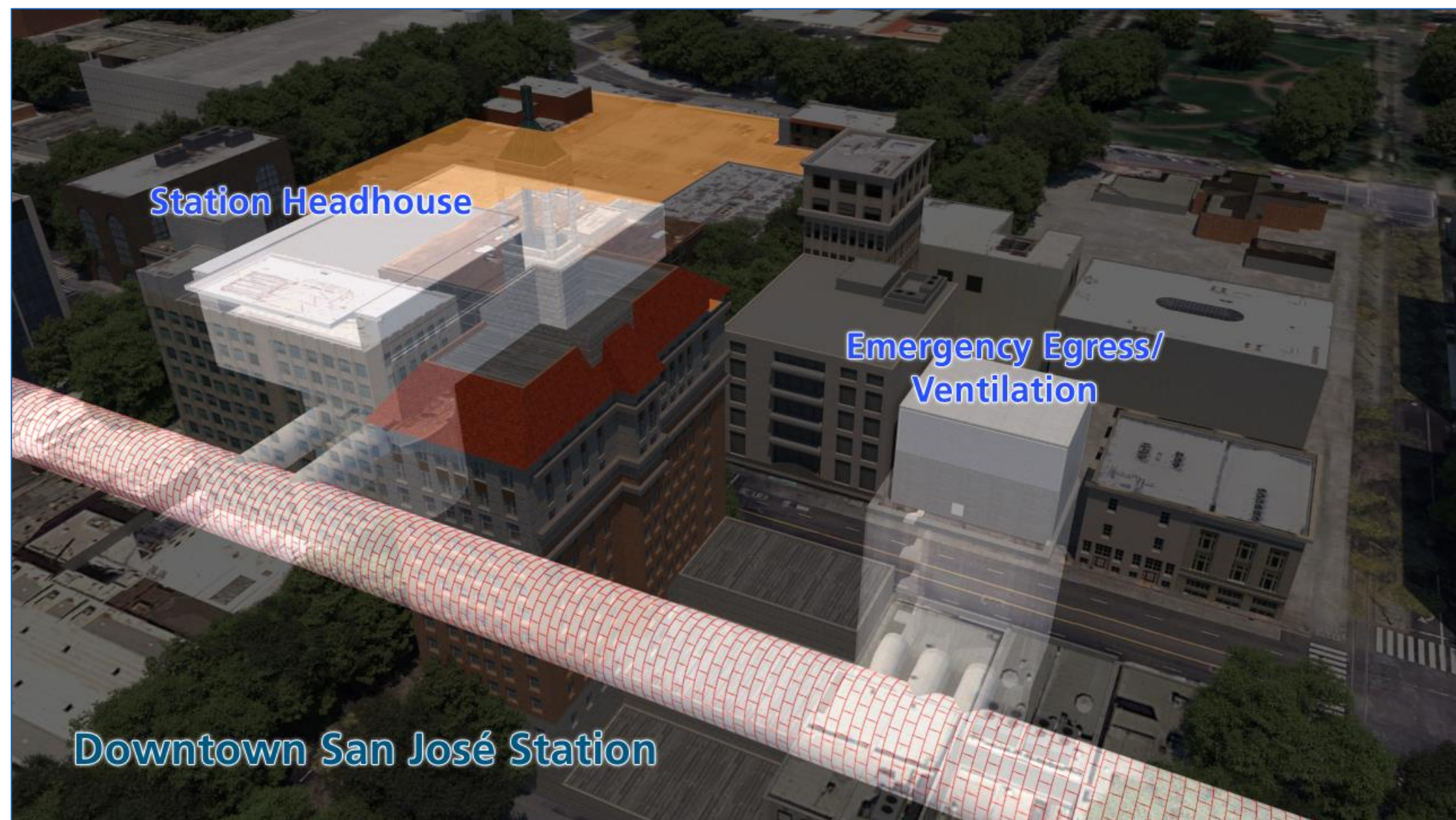
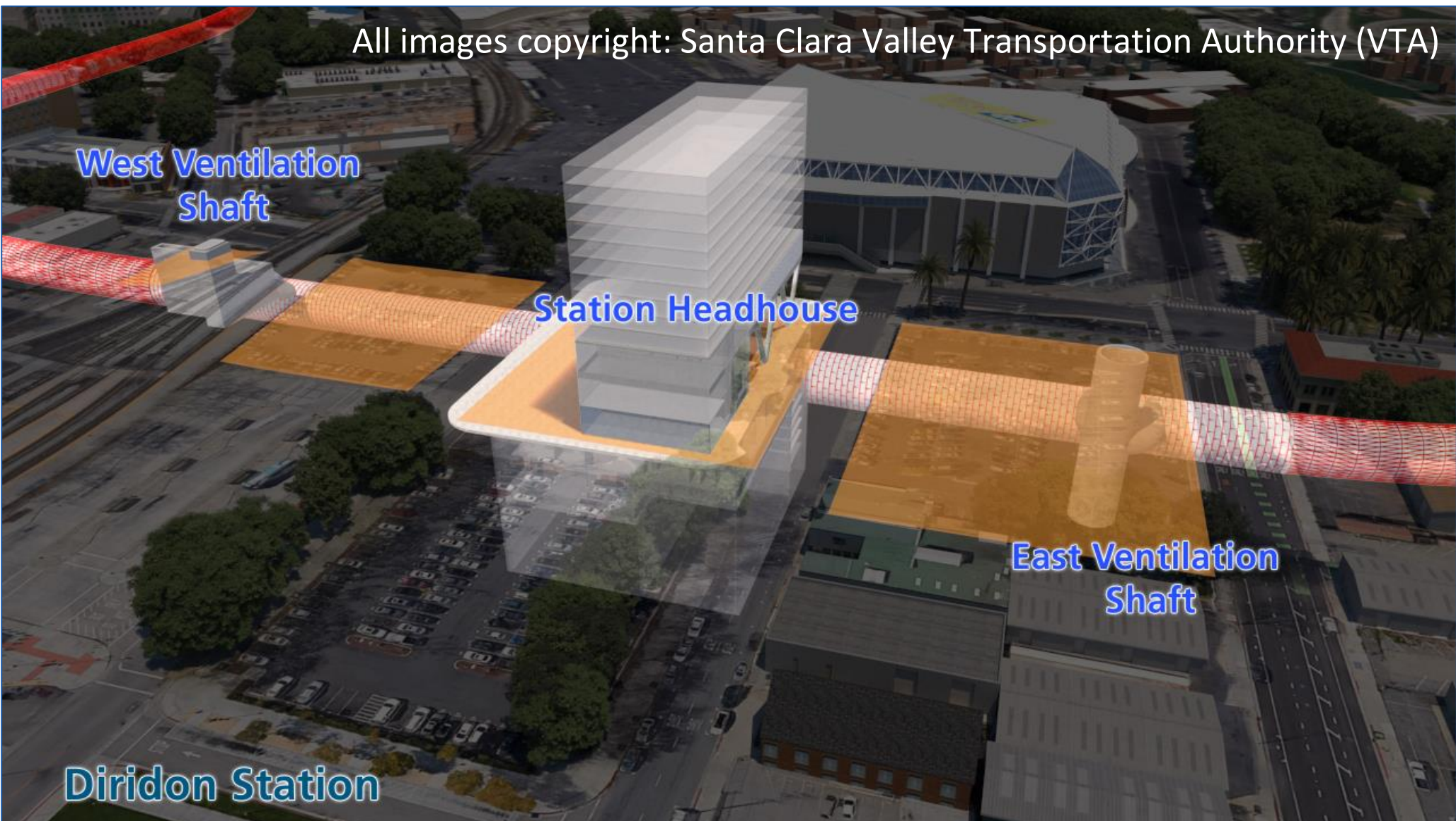
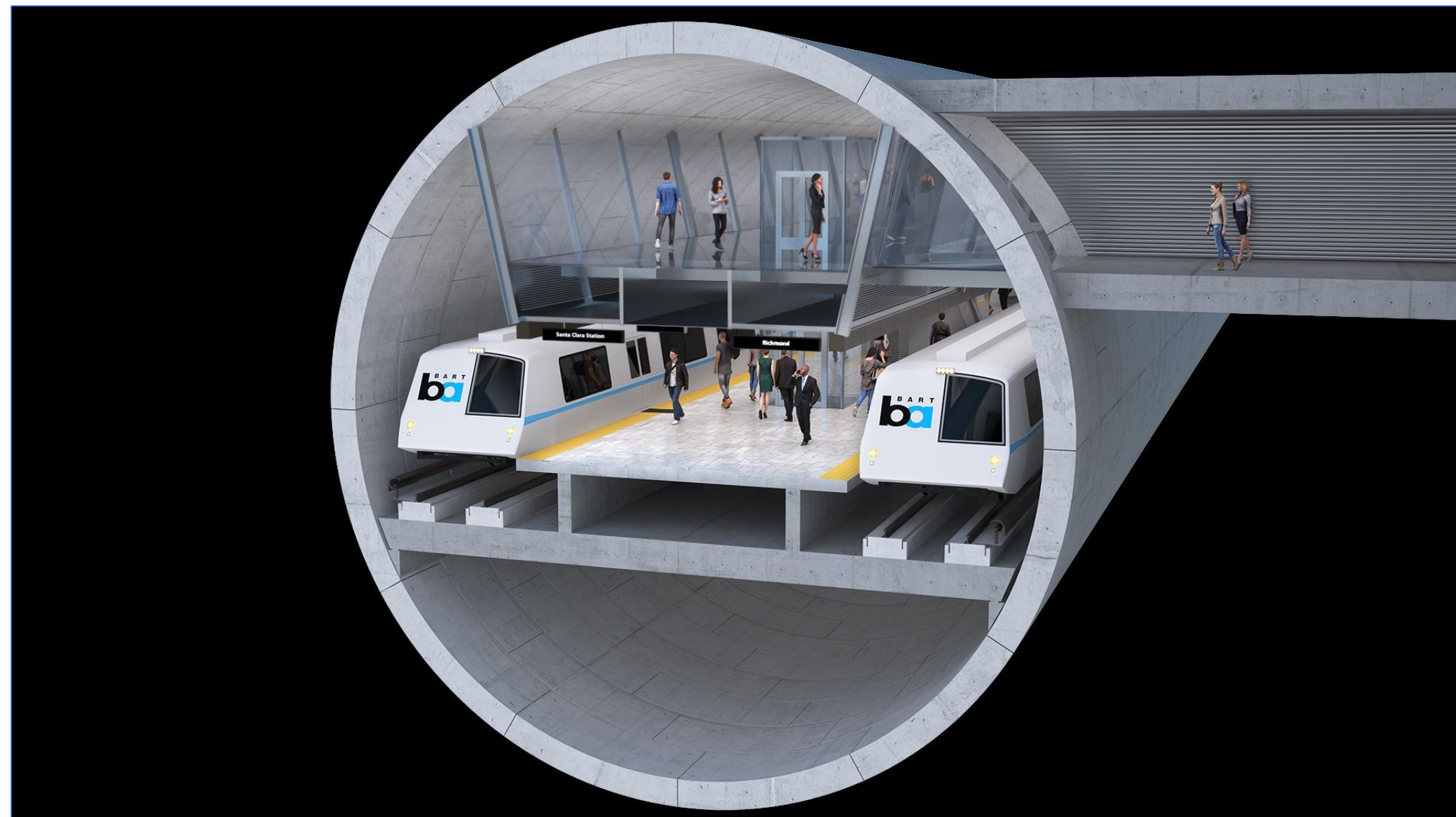
AUTODESK®
REVIT®



www.Rehearsive.io

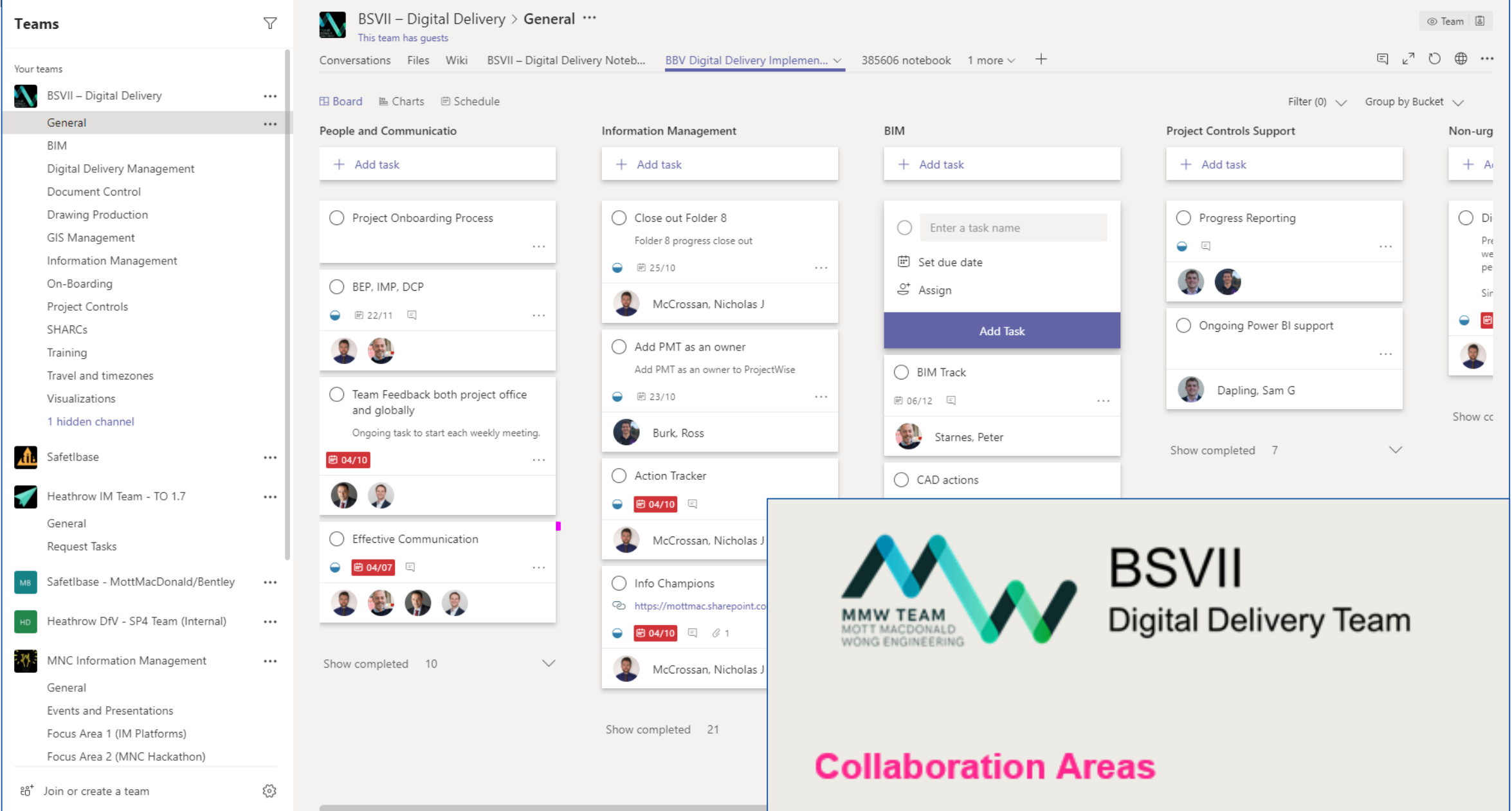



Visualization



Communication

- Teams
 - Instant messaging
 - Screen sharing
 - Meetings
 - File sharing
 - OneNote
 - Planner
- Yammer
 - Open communication
 - Reduced email communication
 - Increased collaboration
 - Team engagement
- Newsletters
 - Various information management topics
- Project BIM Meetings
 - Standard updates
 - Tips and tricks
 - Round Robin





BSVII

Digital Delivery Team

Collaboration Areas

All,

The purpose of this newsletter is to outline some options for document collaboration.

SharePoint:

The [Working Files](#) library on SharePoint is continually being used by the team to collaborate on documents. Multiple people can be in the same document at once.

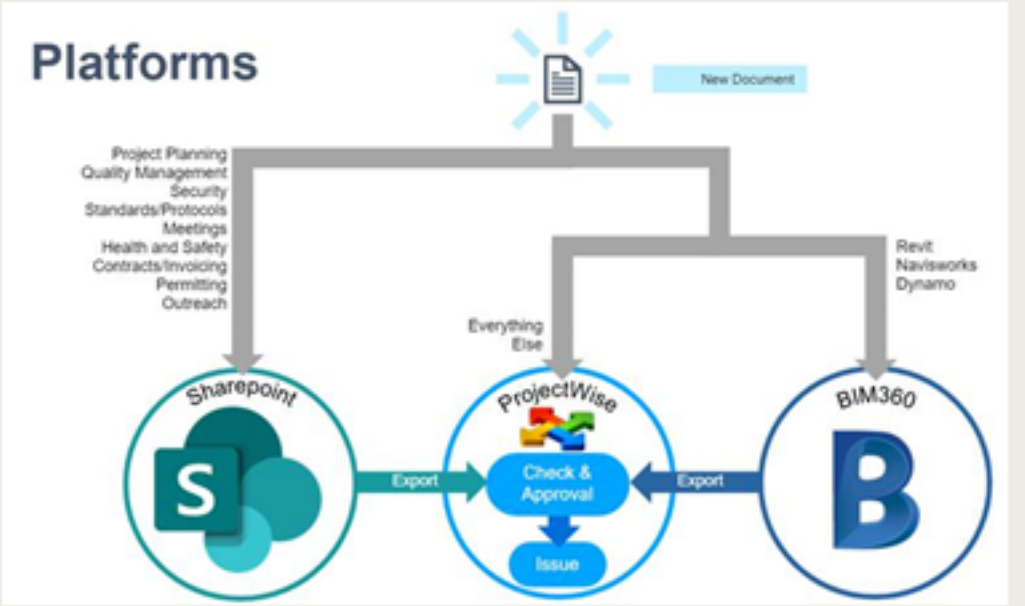
Teams:

Additionally, we have a project [Teams](#) site for collaboration purposes broken down by asset. This is a great way to communicate to different team members and store files for collaboration purposes. Similar to the Working Files library in SharePoint, multiple people can be in a document at once.

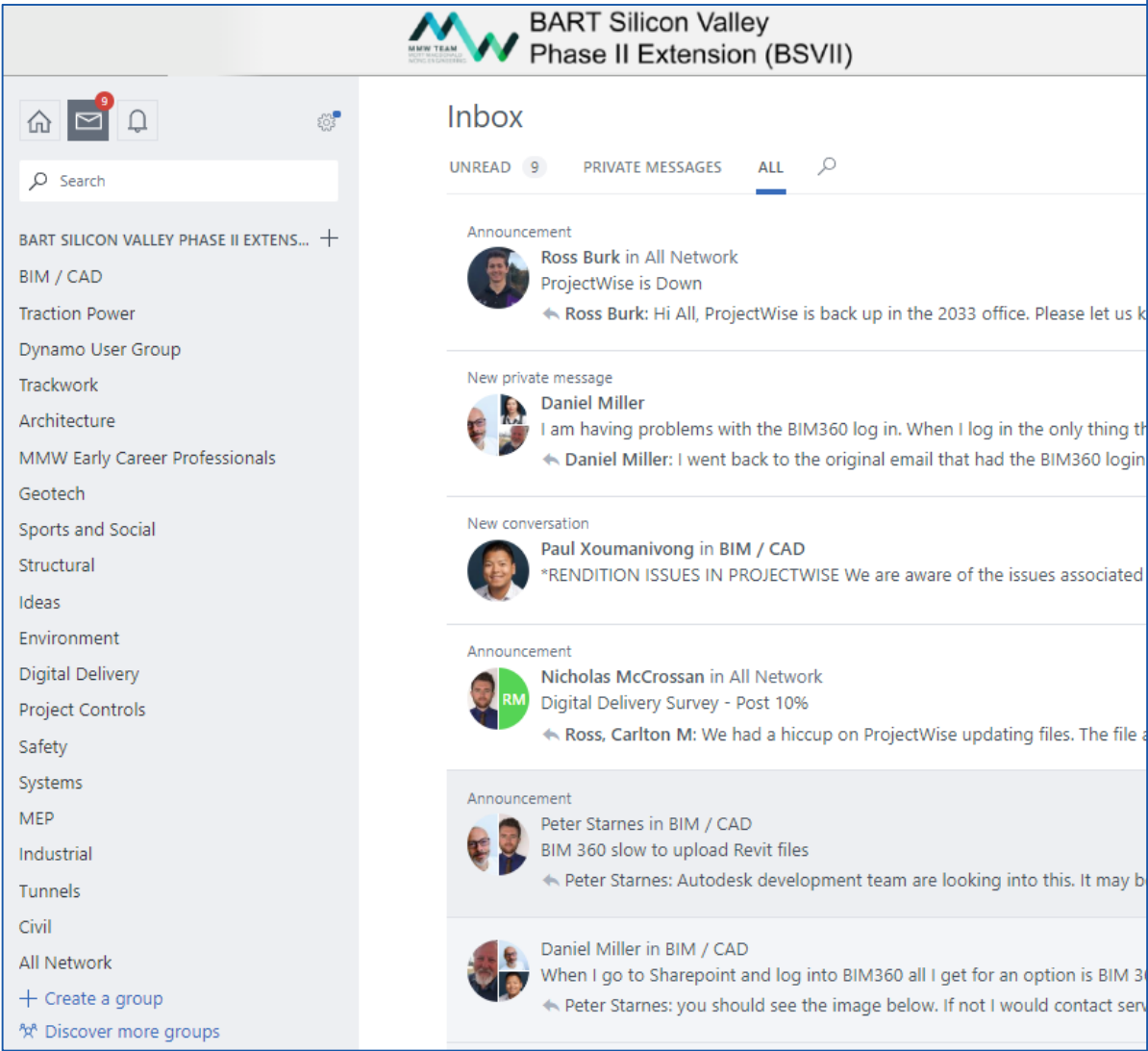
Note: when files are placed onto the Teams site, the files are being stored in the GEC SharePoint site in the background.

The collaboration areas listed above aren't meant to be the final storage place for documents. Below is a simple graphic on where to officially store documents once collaboration has finished.

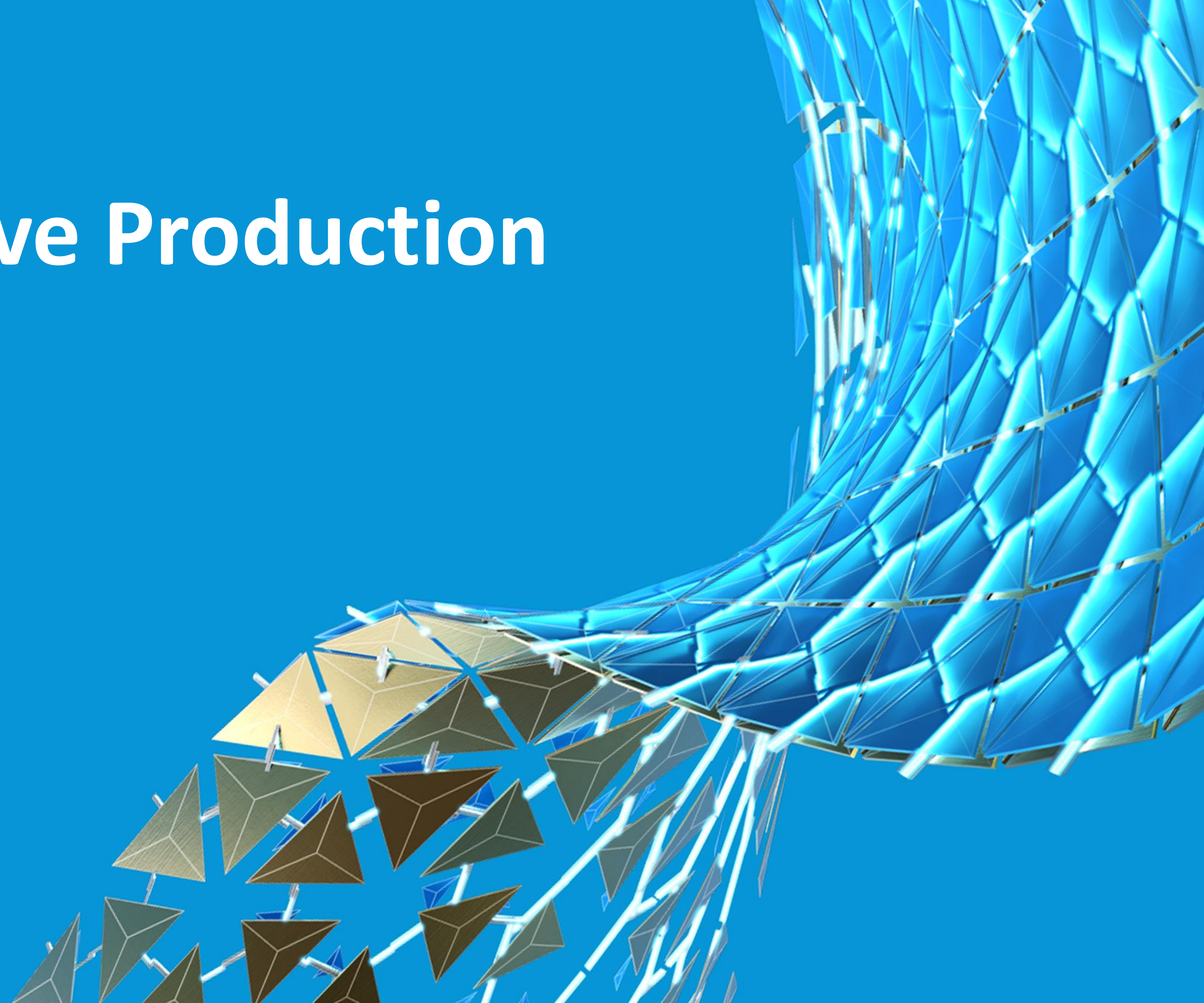
Platforms



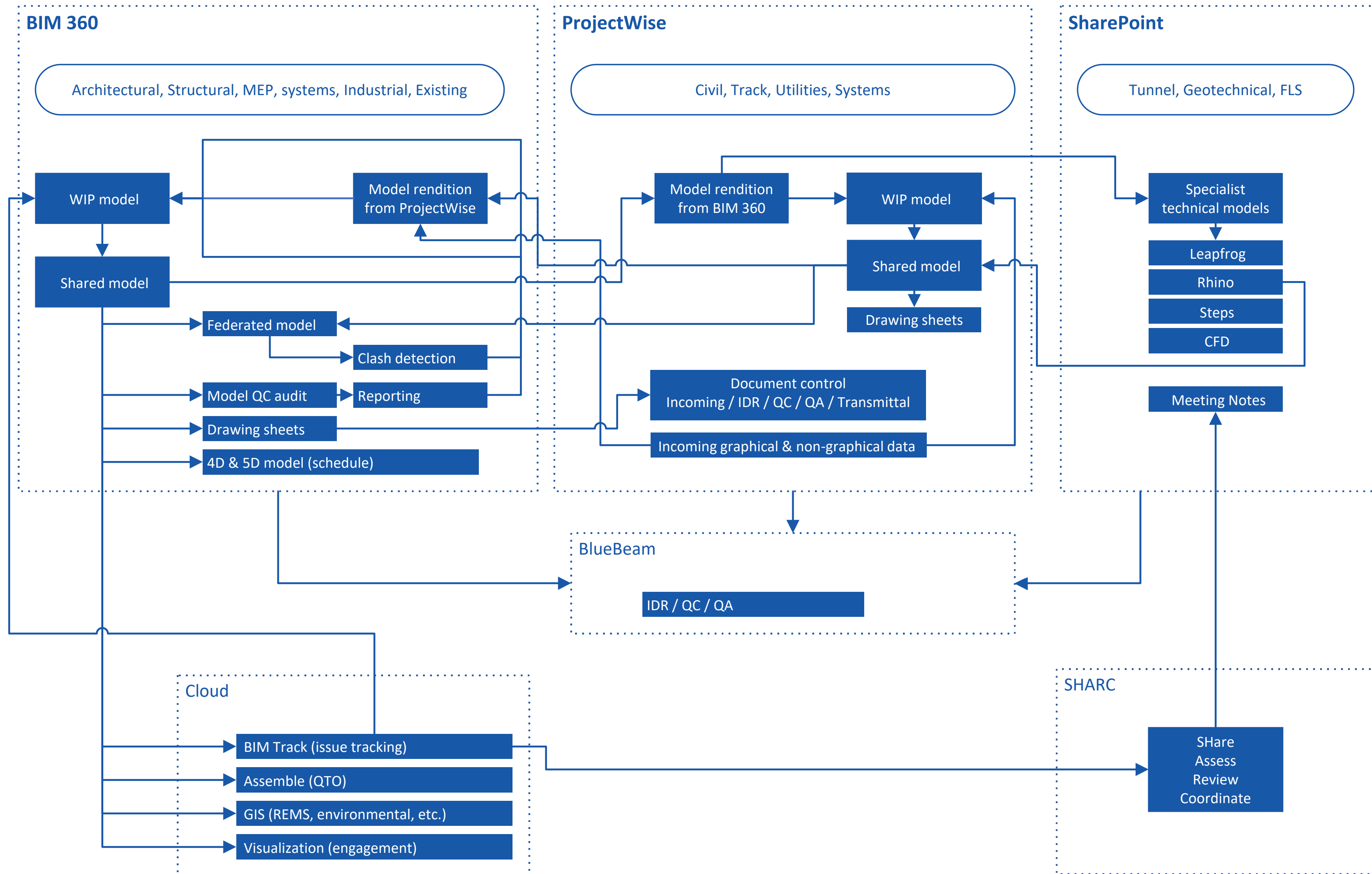
```
graph TD; ND[New Document] --> S((Sharepoint)); S -- Export --> PW((ProjectWise)); PW -- Check & Approval --> B((BIM360)); B -- Export --> PW; PW -- Issue --> B; S --- S_L[Project Planning, Quality Management, Security, Standards/Protocols, Meetings, Health and Safety, Contracts/Invoicing, Permitting, Outreach]; PW --- PW_L[Everything Else]; B --- B_L[Revit, Navisworks, Dynamo];
```



Collaborative Production



Data Connections



Renditions

- **Link two graphical CDEs (BIM 360 and ProjectWise)**
- **Manually created**
- **Monitored through version control and reporting**
- **BIM 360 -> ProjectWise**
 - Notification from BIM 360 when a model is shared
 - Spreadsheet to keep track of the renditions
 - Date of shared model
 - Date of rendition
- **ProjectWise -> BIM 360**
 - Email notification when a ProjectWise model is shared
 - Custom attribute in BIM 360 for the corresponding ProjectWise shared version
 - Power BI:
 - Manual export weekly from ProjectWise with the state and date of files
 - Comparison against the renditions in BIM 360

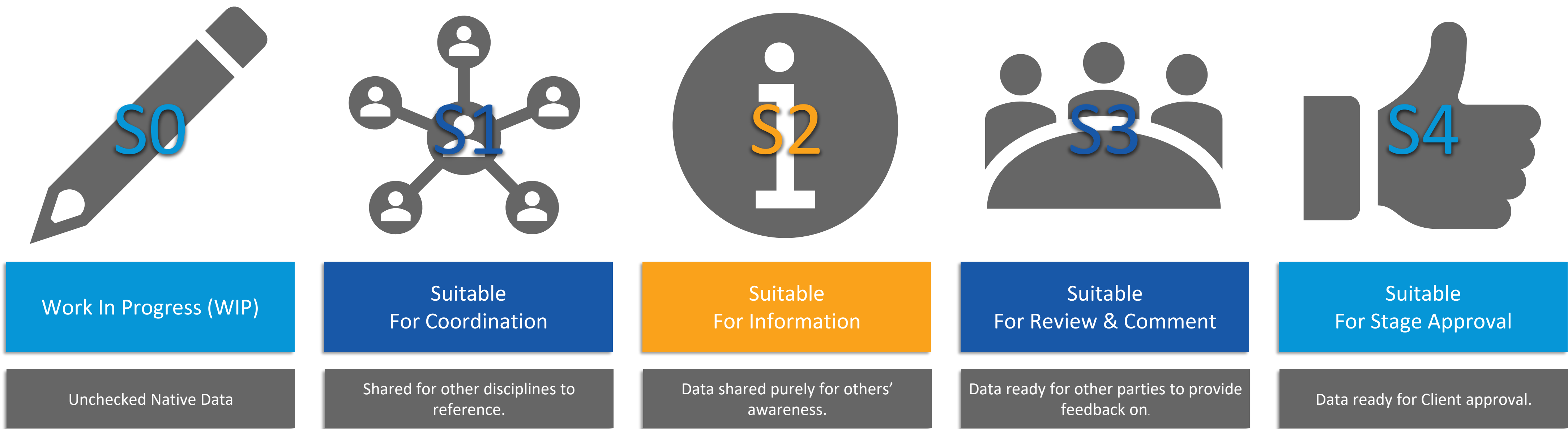
View by			Upload files	Showing 48 items
Folders				
02 - Design (Work In Progress)				
03 - BIM Coordination (WIP)				
04 - InfraWorks Models				
Shared				
AR - Architecture				
CI - Civil				
Renditions				
Superseded				
GE - Geotech				
IN - Industrial				
MF - MEP				
PM - Project Management				
SY - Systems				
TR - Trackwork				

<input type="checkbox"/>	Name ^	Description	Version
<input type="checkbox"/>	385606-MMW-ARSTA-XX-M3-CI-111050.dxf	Proposed Site Improvements	V17
<input type="checkbox"/>	385606-MMW-ARSTA-XX-M3-CI-111050.nwc	Proposed Site Improvements	V2
<input type="checkbox"/>	385606-MMW-ARSTA-XX-M3-CI-111060.dxf	Proposed Utilities	V7
<input type="checkbox"/>	385606-MMW-ARSTA-XX-M3-CI-111060.nwc	Proposed Utilities	V5
<input type="checkbox"/>	385606-MMW-ARSTA-XX-M3-CI-111220.shared.dwg	Ex TIN - ARSTA (Alum Rock Station)	V4
<input type="checkbox"/>	385606-MMW-DSTAT-XX-M3-CI-131050.dxf	Proposed Site Improvements	V3
<input type="checkbox"/>	385606-MMW-DSTAT-XX-M3-CI-131050.nwc	Proposed Site Improvements	V1
<input type="checkbox"/>	385606-MMW-DSTAT-XX-M3-CI-131060.dxf	Proposed Utilities	V3
<input type="checkbox"/>	385606-MMW-DSTAT-XX-M3-CI-131060.nwc	Proposed Utilities	V7
<input type="checkbox"/>	385606-MMW-DSTAT-XX-M3-CI-131220.shared.dwg	Ex TIN - DSTAT (Diridon Station)	V1

ProjectWise Explorer		
Datasource	Folder	Document
pw:\mott-use-pw.bentley.com:mott-use-pw\Documents\Projects\385606 - VTA BSV Phase II\4. Design\BSV Pt		
385606 - VTA BSV Phase II		
0. Executive		
1. Project Management		
3. Incoming information		
4. Design		
BSV Phase II-Preliminary Engineering		
AR - Architecture		
CI - Civil		
GE - Geotech		
IN - Industrial		
MF - MEP		
PM - Project Management		
00 - Model renditions		
Superseded		
01 - 2D Models (M2)		
02 - 3D Models (M3)		
03 - Coordination Models (CR)		
04 - Drawings (DR)		
05 - Model Renderings (MR)		
06 - PDF Renditions		
07 - Sketches (SK)		
08 - Visualisations (VS)		
09 - Bill of Quantities (BQ)		
10 - Calculations (CA)		

Version	Name
Superseded	Superseded
A	_Model rendition README.txt
C	385606-MMW-ARSTA-XX-M3-PM-000002 - 3D Station box .dwg
R	385606-MMW-ARSTA-XX-M3-PM-000002 - 3D Station box.dwg
A	385606-MMW-ARSTA-XX-M3-PM-000002 - Site Plan
U	385606-MMW-ARSTA-XX-M3-PM-000002 - Street Level.dwg
I	385606-MMW-ARSTA-XX-M3-PM-000003 - Longitudinal Section.dwg
B	385606-MMW-ARSTA-ZZ-M3-AR-000009 - Headhouse Profile.dwg
V4	385606-MMW-ARSTA-ZZ-M3-AR-000009 - SECTION BB'.dwg
X	385606-MMW-DSTAT-XX-M3-PM-000003 - 3D Station Box.dwg
Z1	385606-MMW-DSTAT-XX-M3-PM-000003 - Concourse with Adits.dwg
I	385606-MMW-DSTAT-XX-M3-PM-000003 - Longitudinal Section.dwg
AB	385606-MMW-DSTAT-XX-M3-PM-000003 - Street Level.dwg
A	385606-MMW-DSTAT-ZZ-M3-AR-000006 - Headhouse profile.dwg
V6	385606-MMW-DSTAT-ZZ-M3-AR-000006 - LONGITUDINAL SECTION A.dwg
R	385606-MMW-DTSJS-XX-M3-PM-000002 - 3D Station Box.dwg
R	385606-MMW-DTSJS-XX-M3-PM-000002 - Concourse with Adits.dwg
T	385606-MMW-DTSJS-XX-M3-PM-000002 - Street Level.dwg
J	385606-MMW-DTSJS-XX-M3-PM-000003 - Longitudinal Section.dwg
B	385606-MMW-DTSJS-ZZ-M3-AR-000007 - Headhouse Profile.dwg

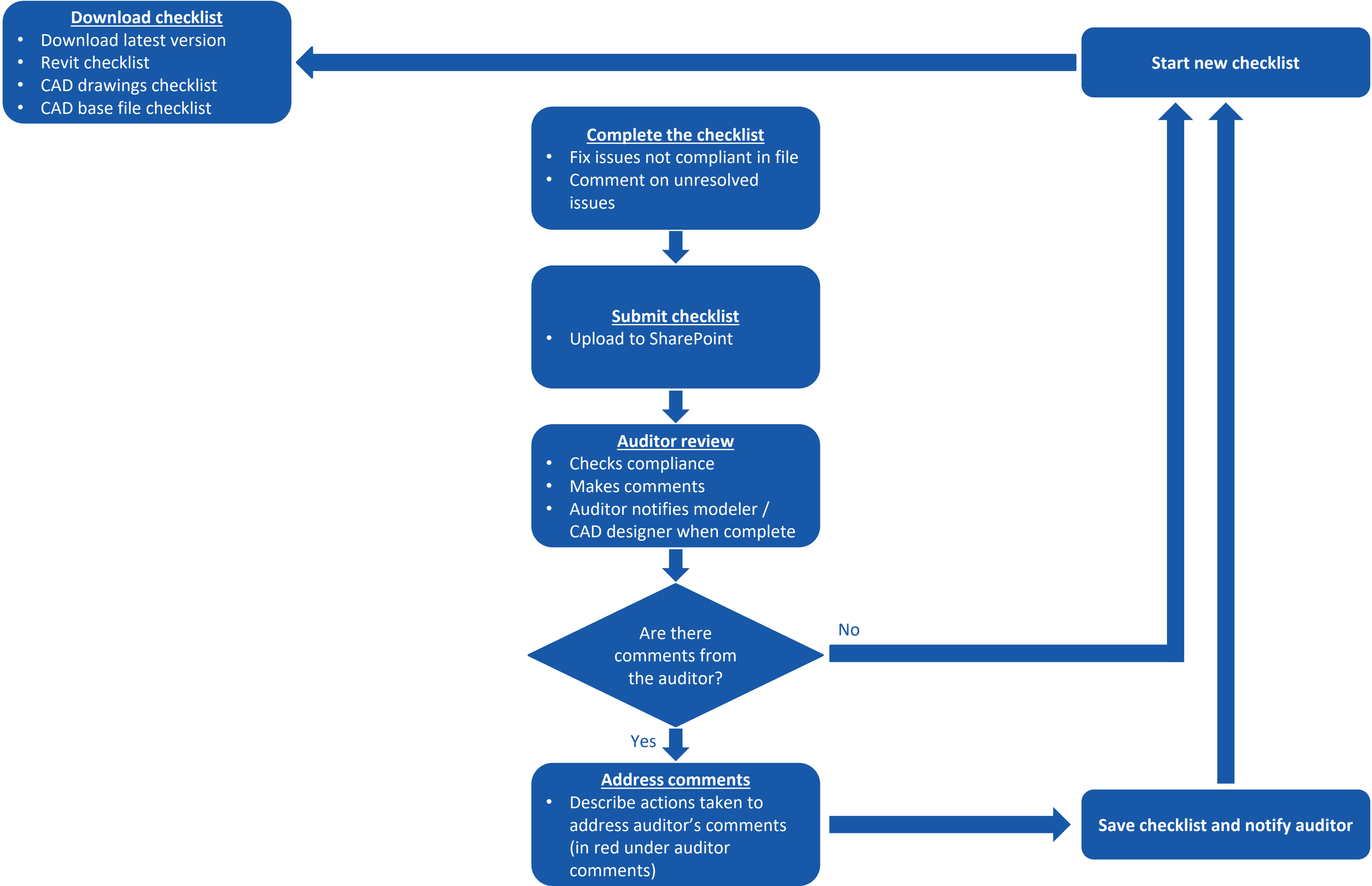
Suitability Codes



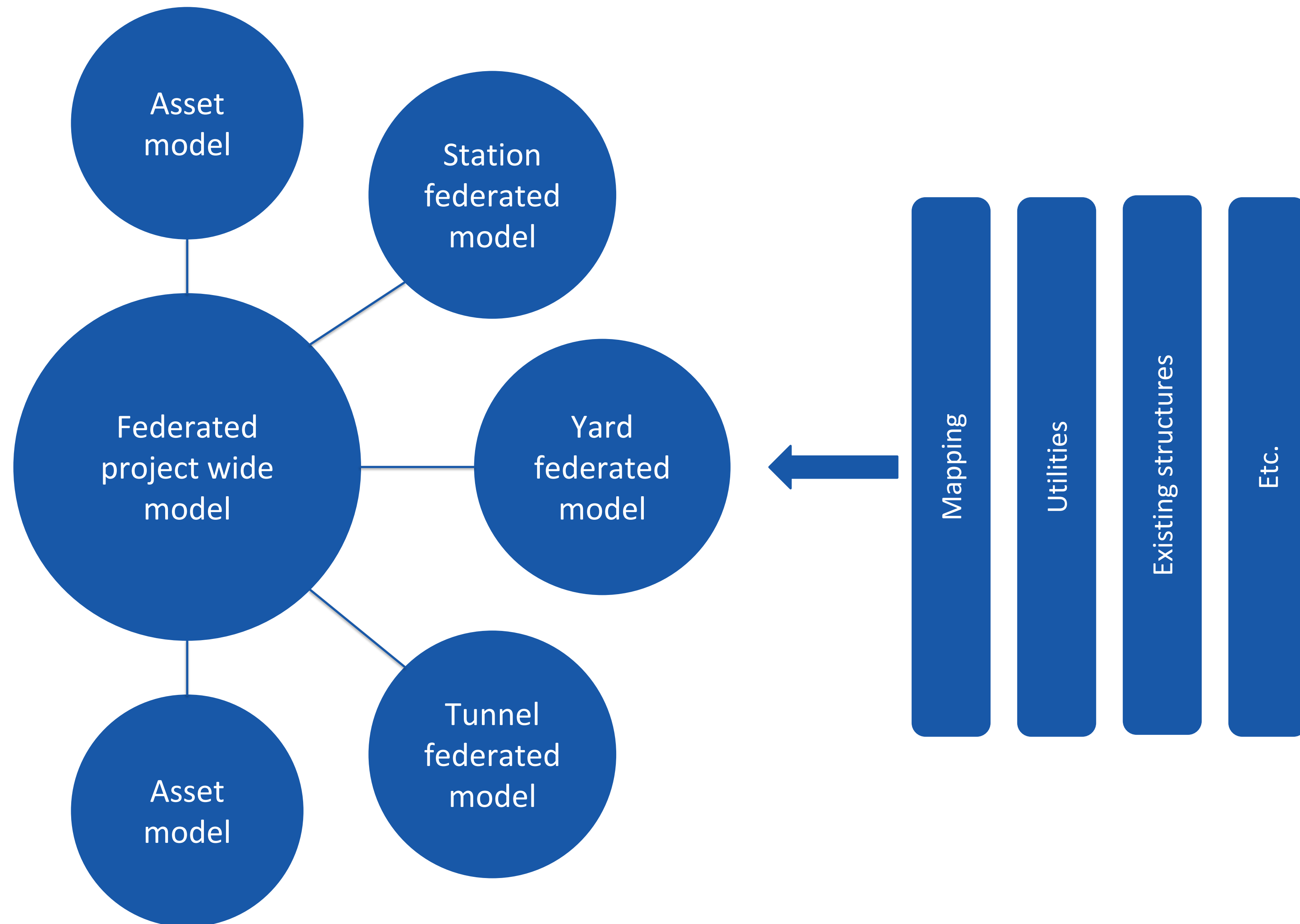
States

ISO 19650 State	ISO 19650 Description	ProjectWise Workflow State	Visible To
Work In Progress	Information in development by the Discipline Team. Not visible by any other discipline.	Work In Progress	<div>Discipline</div> <div>MMW Team</div> <div>Design Stakeholders</div> <div>PMT / VTA</div>
Check / Review / Approve Transition	Discipline Data compared against agreed standards, methods and procedures by the Discipline Team.	Content Check	
		Technical Check	
Shared	Constructive and collaborative development of the data through inter-disciplinary coordination. Non-editable and visible to other disciplines.	Shared (Team)	
		Shared	
Review / Authorize	All data compared against information requirements for coordination, completeness and accuracy. This separates data that can be relied on for the next stage of delivery from that which is subject to change.	Coordination Check	
		Approve	
		Authorization	
Published	Data that is authorized for use.	Published	

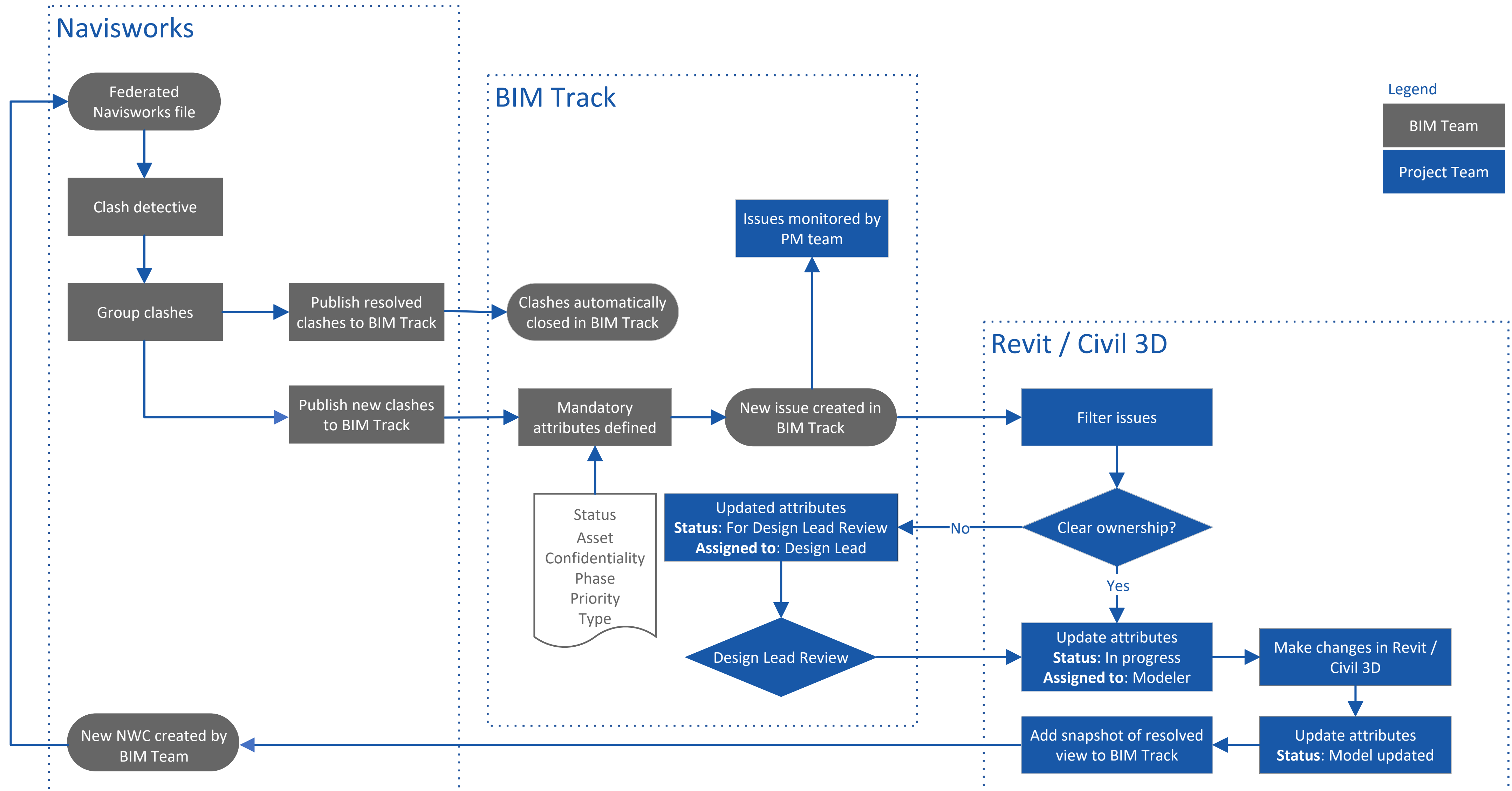
CAD / Revit QA / QC



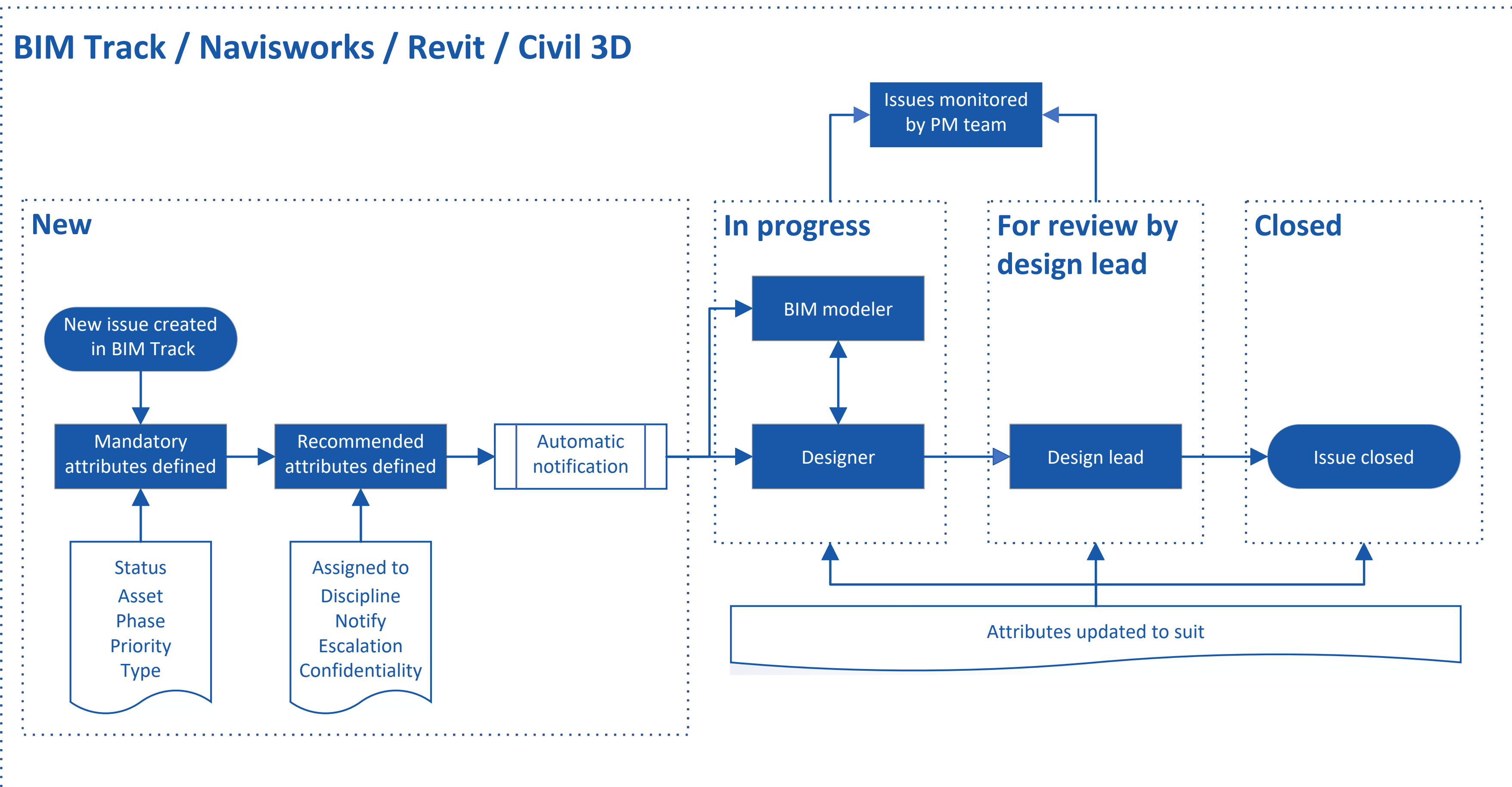
Model Federation



Clash Resolution Process

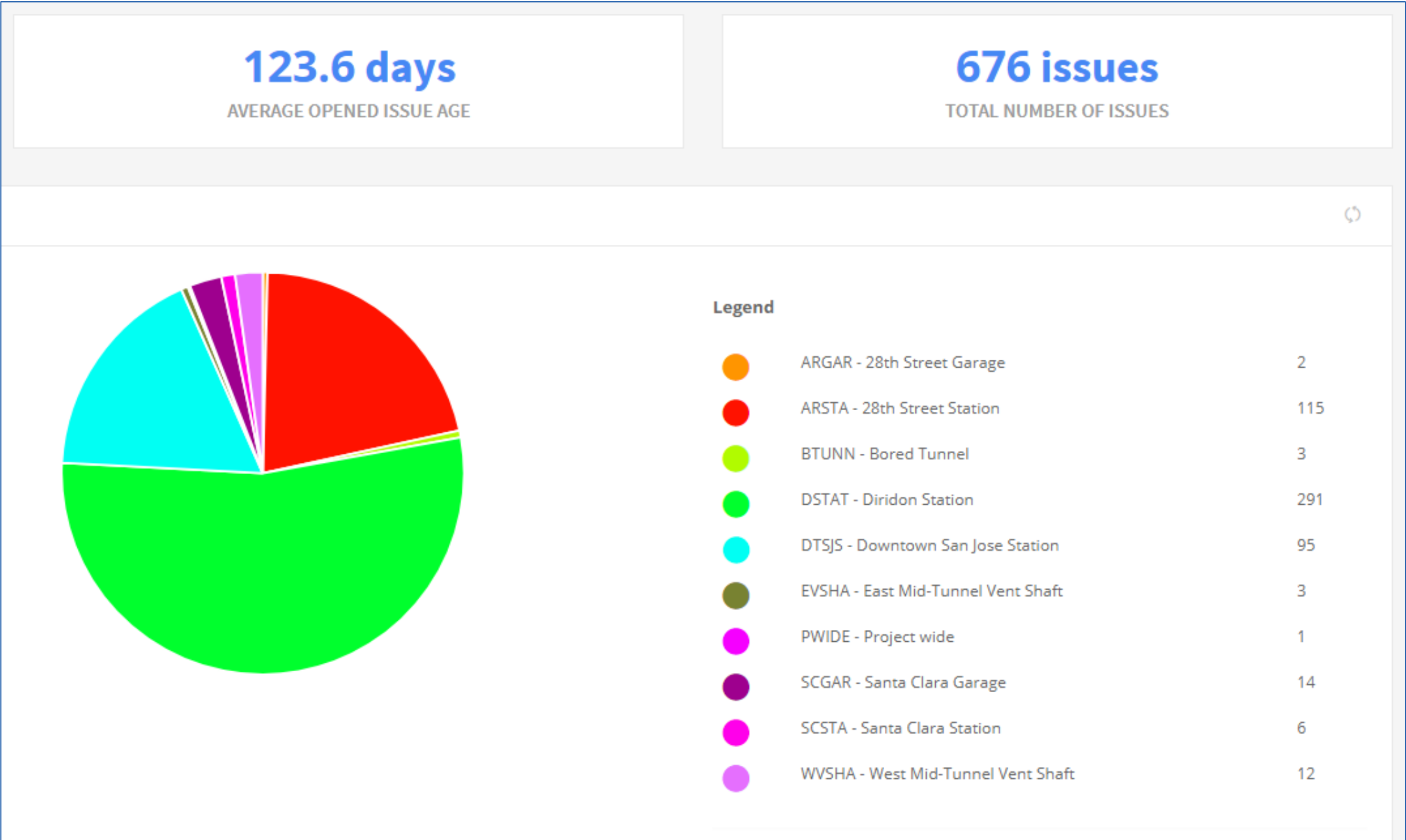


Issue Tracking Process



Issue Reporting

- Interactive project metrics: instant overview of project coordination performance
- Report templates:
 - Personal
 - Shared
- Scheduled reports:
 - Daily basis
 - Every week
 - Every month
- Customizable report metrics



ISSUES PROPERTIES

All

Description

Priority

Phase

Confidentiality

Last changed by

Notification list

Assigned to

Status

Disciplines

Author

Last changed

Escalation

Type

Zone

Issue group

Created

Due date

Asset

METRICS

All

Average time to close an issue

Issues By Priorities

Issues By Status

Issues By Disciplines

Issues By Escalation

Average opened issue age

Issues By Phases

Issues By Type

Issues By Groups

Issues By Asset

Issues By Assigned To

Issues By Zones

Issues By Confidentiality

Issues By Author

Total vs Closed Issues

Periodicity

Start date

End date

Weekly

4/30/2020

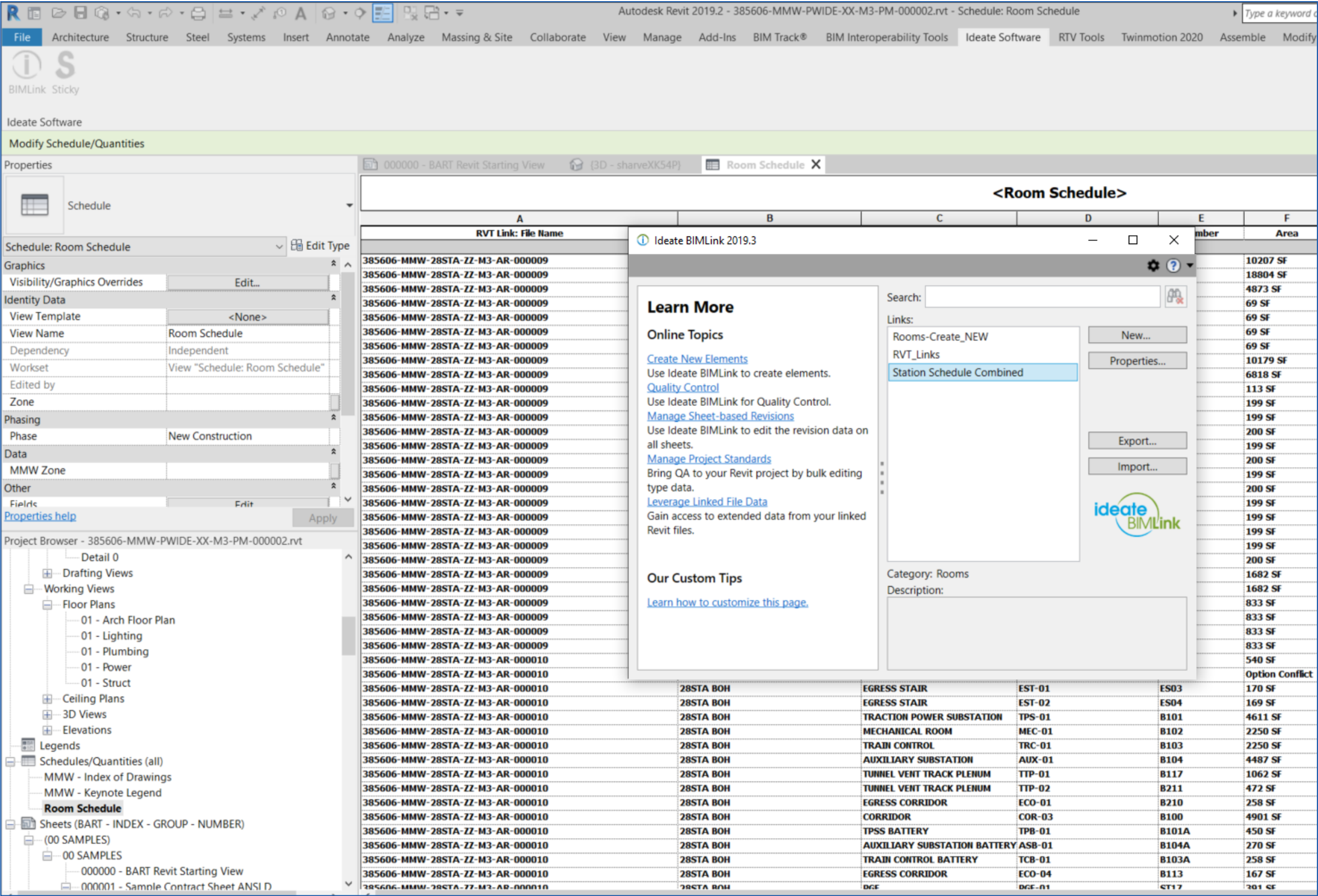
10/16/2020

Include archived issues

* Date range are not saved into a report template.

Room Criteria

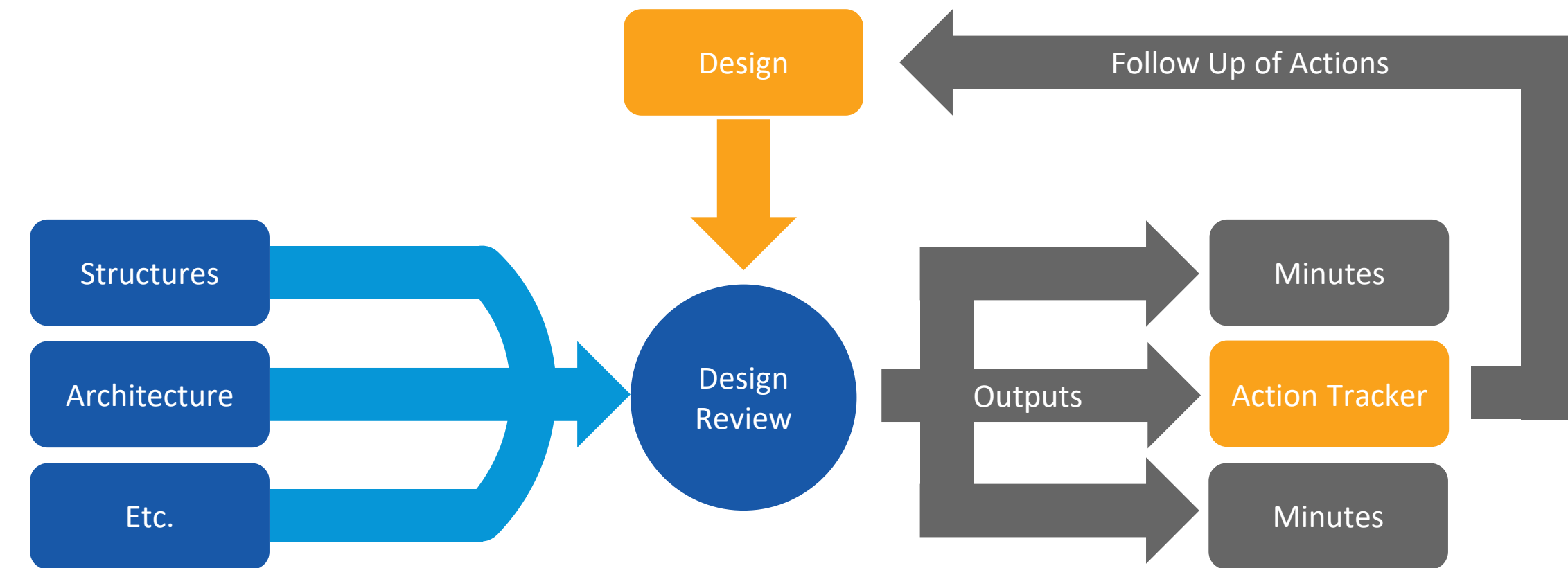
- Discrepancies on room numbers and names across the different stations
- Standard room types not complying with the BART facility standard requirements
- Using Ideate BIMLink:
 - Publish room data from federated model to Excel
 - Comparison table of existing room data against the BFS template



COMBINED STATION NAME	COMBINED ROOM NAME	COMBINED ROOM ID	COMBINED ROOM #	COMBINED ROOM AREA (SF.)	COMBINED ROOM LENGTH	COMBINED ROOM WIDTH	CEILING HEIGHT	BIM MODEL OWNERSHIP	REFERENCE STATION
28STA BOH	EGRESS STAIR	0	ES13	262.79	19' 0"	13' 10"	9' 0"		
28STA BOH	EQUIPMENT ACCESS HATCH	0	ST21	120.01	11' 12"	10' 0"	14' 0"		
DTJSJS BOH-MEXICO BAKERY	ANCILLARY ROOM	0	AS54	156.00	13' 0"	11' 12"	20' 8 3/7"		
IMID TUNNEL EAST VENT SHAFT	MID TUNNEL GAP BREAKER STATION	0	162	1123.60	61' 7 1/3"	18' 2 5/6"	16' 9 3/4"		
IMID TUNNEL EAST VENT SHAFT	BATTERY ROOM	0	167	96.00	11' 12"	7' 12"	7' 12"		
IMID TUNNEL EAST VENT SHAFT	SERVICE STAIR	0	181	0.00	#DIV/0!	0' 0"	#DIV/0!		
IMID TUNNEL WEST VENT SHAFT	BATTERY ROOM	0	185	106.44	15' 5"	6' 10 5/6"	8' 0"		
IMID TUNNEL WEST VENT SHAFT	MID-TUNNEL GAP BREAKER	0	186	465.97	41' 9 4/5"	11' 1 5/7"	17' 7"		
IMID TUNNEL WEST VENT SHAFT	MID TUNNEL GAP BREAKER STATION	0	190	465.97	41' 9 4/5"	11' 1 5/7"	17' 5 7/9"		
IMID TUNNEL WEST VENT SHAFT	BATTERY ROOM	0	200	106.44	15' 5"	6' 10 5/6"	8' 0"		
0 - TEMPLATE	JANITOR'S ROOM	JAN-00	(by floor)	240.00	20'	12'	8' ?	Local Architect	Milpitas Station
28STA BOH	JANITOR'S ROOM	JAN-01	B107	85.50	9' 0"	9' 0"	14' 0"		
IDSTAT BOH-HEADHOUSE	JANITOR'S ROOM	JAN-01	B122	147.00	13' 12"	10' 6"	26' 2"		
DTJSJS BOH-HEADHOUSE	JANITOR'S ROOM	JAN-01	AS43	28.42	5' 8 1/5"	4' 12"	33' 0"		
DTJSJS BOH-JOHNHY V	JANITOR'S ROOM	JAN-01	AS44	64.00	17' 1 3/5"	3' 8 5/6"	8' 0"		
DTJSJS BOH-MEXICO BAKERY	JANITOR'S ROOM	JAN-01	UPL	0.00	#DIV/0!	0' 0"	#DIV/0!		
28STA BOH	JANITOR'S ROOM	JAN-02	B205	101.14	11' 0"	9' 2 1/3"	10' 0"		
DTJSJS BOH-MEXICO BAKERY	JANITOR'S ROOM	JAN-02	LPL	114.11	11' 3 4/7"	10' 1 1/5"	8' 0"		
IDSTAT BOH-EAST VENT SHAFT	JANITOR'S ROOM	JAN-03	PL25	110.00	11' 0"	10' 0"	10' 0"		
IDSTAT BOH-WHITE STREET VENT SHAFT	JANITOR'S ROOM	JAN-04	PL35	132.06	12' 6"	10' 6 7/9"	11' 5 7/8"		
DTJSJS BOH-HEADHOUSE	BROCHURE STORAGE ROOM		AS48	214.95	17' 8 1/3"	12' 1 7/9"	8' 0"		
DTJSJS BOH-HEADHOUSE	TUNNEL VENT PLENUM		B127	1336.68	110' 7 3/7"	12' 1"	7' 12"		
DTJSJS BOH-HEADHOUSE	TUNNEL VENT PLENUM		B129	681.12	42' 8"	15' 11 1/2"	8' 0"		
0 - TEMPLATE	AC SWITCHGEAR ROOM	ACS-00	(by floor)	600.00	30'	20'	8' ?	Local Architect	Size to be Confirmed by Systems
IDSTAT BOH-HEADHOUSE	AC SWITCHGEAR ROOM	ACS-01	ST36	605.00	30' 3"	20' 0"	9' 12"		
0 - TEMPLATE	AREA OF REFUGE	AOR-00	(by floor)	(Varies)	NA	NA	NA	Local Architect	CBC 1009.6
0 - TEMPLATE	ARMORY	ARM-00	(by floor)	1 per 200 calculated occupant load	6'-8"	5'-6"	8' ?	Local Architect	Part of Police Zone Facility (where occurs) / Warm
0 - TEMPLATE	AUXILIARY SUBSTATION BATTERY ROOM	ASB-00	(by floor)	430.00	TBD	TBD	8' ?	Local Architect	Size to be Confirmed by Systems
28STA BOH	AUXILIARY SUBSTATION BATTERY ROOM	ASB-01	B104A	270.21	22' 6 1/5"	11' 12"	25' 0"		
IDSTAT BOH-HEADHOUSE	AUXILIARY SUBSTATION BATTERY ROOM	ASB-01	B135	502.25	24' 6"	20' 6"	26' 2"		
DTJSJS BOH-HEADHOUSE	AUXILIARY SUBSTATION BATTERY ROOM	ASB-01	B119	283.12	21' 0"	13' 5 3/4"	8' 0"		
IMID TUNNEL EAST VENT SHAFT	AUXILIARY SUBSTATION BATTERY ROOM	ASB-01	160	120.00	15' 0"	7' 12"	7' 12"		
IMID TUNNEL WEST VENT SHAFT	AUXILIARY SUBSTATION BATTERY ROOM	ASB-01	180	120.00	11' 12"	10' 0"	7' 12"		
DTJSJS BOH-HEADHOUSE	AUXILIARY SUBSTATION BATTERY ROOM	ASB-02	B121	283.14	21' 0"	13' 5 3/4"	7' 12"		
0 - TEMPLATE	AUXILIARY SUBSTATION	AUX-00	(by floor)	80	TBD	TBD	18'-0" Clear	Local Architect	Size TBD by Systems per each station design
28STA BOH	AUXILIARY SUBSTATION	AUX-01	B104	4486.77	99' 8 1/2"	44' 12"	23' 3 1/2"		
IDSTAT BOH-HEADHOUSE	AUXILIARY SUBSTATION	AUX-01	B132	5509.33	113' 4 4/5"	48' 7"	26' 2"		
DTJSJS BOH-HEADHOUSE	AUXILIARY SUBSTATION ROOM	AUX-01	B115	6258.42	128' 11 2/3"	48' 6 2/7"	8' 0"		
28STA BOH	EMERGENCY LIGHTING BATTERY ROOM	BAT-01	B110	226.63	10' 0"	11' 4"	14' 0"		
0 - TEMPLATE	BIKE PARKING	BIP-00	(by floor)	Furnish per projected ridership	10'-9"	9'	8' ?	Local Architect(AIA) or F&P	Furnish per projected ridership demand per station
IDSTAT FOH-HEADHOUSE	BIKE PARKING	BIP-01	ST53	3529.84	71' 3"	49' 6 3/7"	8' 0"		

SHARC Meetings

- SHARC: **SH**are, **A**ppraise, **R**evue and **C**ooordinate
- Discuss and resolve issues that arise during design development
- Present and discuss complete or partially complete elements of the design
- Led by package managers and design unit leads
- Held on a regular basis, usually weekly
 - General overview
 - Specific workgroups
- **Model based** suitable
- Organized through the Design Integration Manager

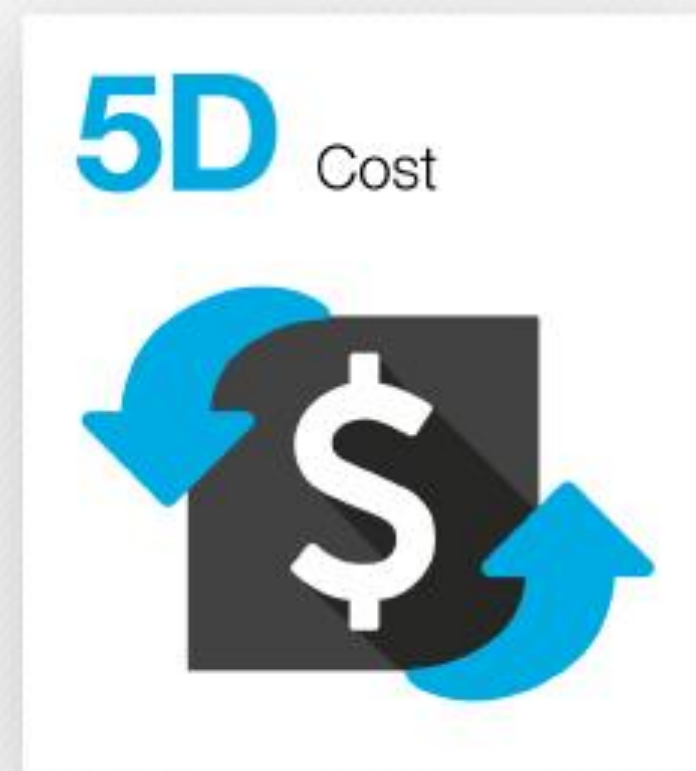
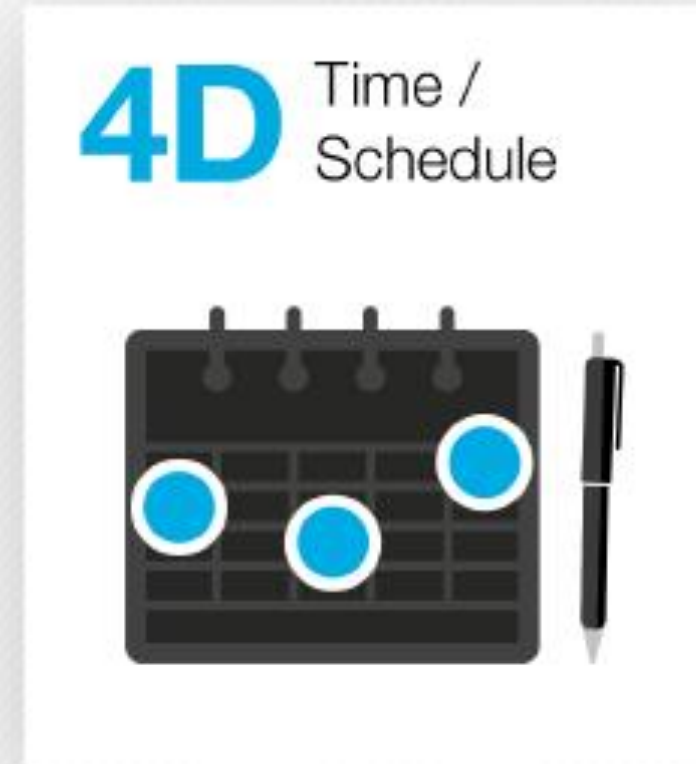


Next Steps



4D and 5D

- Requirements defined in the BIM Execution Plan
- 4D federated Navisworks model with all elements linked to the client's P6 construction WBS activities in timeline
- 5D federated Navisworks model with all elements linked to their respective project WBS items in the Navisworks quantification catalogue



Level of Development

- **Requirements defined in the BIM Execution Plan**
- **Each stage of the project requires a specific level of development (LOD)**
- **LOD 300 for 30% deliverable**
- **Discipline leads to record the appropriate LOD in the Model Production Delivery Table (MPDT)**

Level of Development	Description
LOD 100	The model element may be graphically represented in the model with a symbol or other generic representation but does not satisfy the requirements for LOD 200. Information related to the model element (e.g., cost per square foot, tonnage of HVAC) can be derived from other model elements.
LOD 200	The model element is graphically represented within the model as a generic system, object, or assembly with approximate quantities, size, shape, location, and orientation. Non-graphic information may also be attached to the model element.
LOD 300	The model element is graphically represented within the model as a specific system, object or assembly in terms of quantity, size, shape, location, and orientation. Non-graphic information may also be attached to the model element.
LOD 350	The model element is graphically represented within the model as a specific system, object or assembly terms of quantity, size, shape, location, and orientation, and interfaces with other building systems. Non-graphic information may also be attached to the model element.
LOD 400	The model element is graphically represented within the model as a specific system, object or assembly in terms of size, shape, location, quantity, and orientation with detailing, fabrication, assembly, and installation information. Non-graphic information may also be attached to the model element.
LOD 500 (as-builts)	The model element is a field verified representation in terms of size, shape, location, quantity, and orientation. Non-graphic information may also be attached to the model elements.

Asset Information

- Requirements defined in the BIM Execution Plan
- Non-graphical information attached to the model elements
- CSI 2010 Uniformat II classification system

Type Properties

Family: SpecialtyEquipment-Escalator-MMW-KoneusTravelMaster 110-DSTAT Load...

Type: SpecialtyEquipment-Escalator-MMW-KoneusTravelMaster 110-DSTAT 4 Duplicate... Rename...

Type Parameters

Parameter	Value
Constraints	
Landing Step Offset	2' 3 71/256"
Incline Steps Visible	56
Incline Steps Offset	0' 7 231/256"
Landing Steps	2
Landing Step Visible	3
Incline Steps	55
Fall Protection Barrier	<input checked="" type="checkbox"/>
Construction	
Pit Wall Depth	0' 4"
Mounting Depth	0' 7 7/8"
Materials and Finishes	
Step Finish	Stainless Steel-KONEUS-Step-Stainless Steel
Pit House	Concrete
Machine House	Metal Side
Handrail	Plastic-KONEUS-Handrail-Black
Finish_x	Metal Side
Fall Protection Barrier Finish	Glass-KONEUS-Balustrade-Clear Glass
Default	Metal Side
Balustrade Panel	Glass-KONEUS-Balustrade-Clear Glass
Dimensions	
Height	36' 2 75/128"
Width of Truss	4' 11 57/128"
Width of Pit	5' 8"
Width of Escalator	5' 8"
Upper Truss	4' 3 23/128"
Total Span	86' 11 17/256"
Top Landing Offset	3' 7 59/256"
Top Landing Floor Opening	13' 5 11/128"
Top Landing	11' 10 3/64"
Step Width	3' 4"
Span	62' 8 191/256"
Safety Barrier Height	3' 7 79/256"
Reinforced Truss	43' 5 137/256"
Pit Length	18' 8 167/256"
Pit Depth	4' 9 23/256"

[What do these properties do?](#)

<< Preview OK Cancel Apply

Choose Assembly Code - [C:\ProgramData\Autodesk\RVT 2019\Libraries\US Imperial\Unifor...

Show classifications for: Walls

Uniformat Classification	Revit Category
No classification	
A - Substructure	
B - Shell	
B10 - Superstructure	
B20 - Exterior Enclosure	
B2010 - Exterior Walls	
B2010100 - Exterior Wall Construction	Walls
B2010110 - Ext. Wall - CIP	Walls
B2010120 - Ext. Wall - Precast	Walls
B2010125 - Ext. Wall - Precast Lintels & Specialties	Walls
B2010130 - Ext. Wall - Tilt-up	Walls
B2010140 - Ext. Wall - CMU	Walls
B2010142 - Ext. Wall - CMU Cavity	Walls
B2010144 - Ext. Wall - CMU Composite	Walls
B2010146 - Ext. Wall - CMU Lintels & Specialties	Walls
B2010148 - Ext. Wall - Glass Block	Walls
B2010150 - Ext. Wall - Brick (Single Wythe)	Walls
B2010152 - Ext. Wall - Brick (Double Wythe)	Walls
B2010154 - Ext. Wall - Brick Cavity	Walls
B2010156 - Ext. Wall - Brick Composite	Walls
B2010158 - Ext. Wall - Brick Veneer w/ Stud	Walls
B2010160 - Ext. Wall - Stone Veneer w/ Stud	Walls
B2010170 - Ext. Wall - Metal Siding Supports	Walls
B2010175 - Ext. Wall - Metal Siding Panels	Walls
B2010180 - Ext. Wall - Wood Stud w/ Siding & Shingles	Walls
B2010185 - Ext. Wall - Wood Stud w/ Stucco	Walls

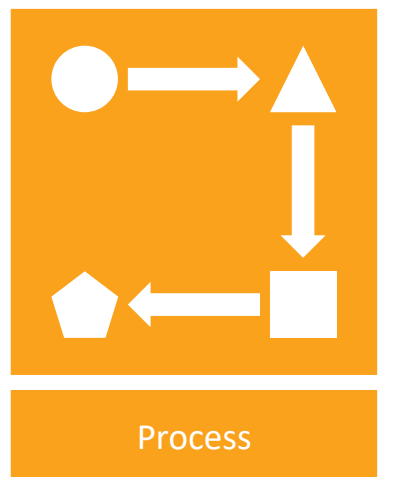
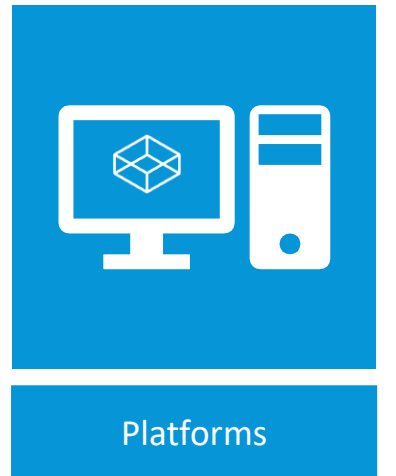
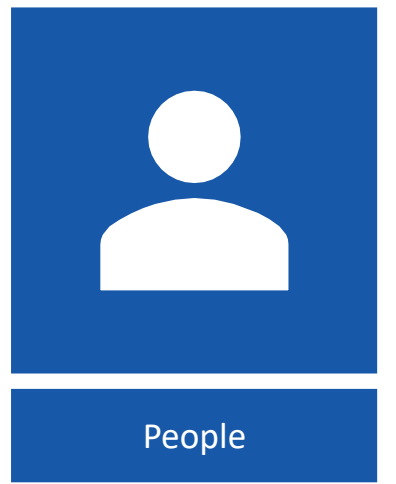
OK Cancel Help

Outcome



Challenges

- **ISO 19650:**
 - Awareness of ISO standard
 - ISO workflow different between ProjectWise, BIM 360, SharePoint in order to achieve same aim
- **Inertia to change**
- **Drip feed mobilization of teams**
- **Technology platforms**
- **Processes**
- **Tools**
- **Feedback**



Successful Delivery of First Phase of Project

920

FILES SUBMITTED

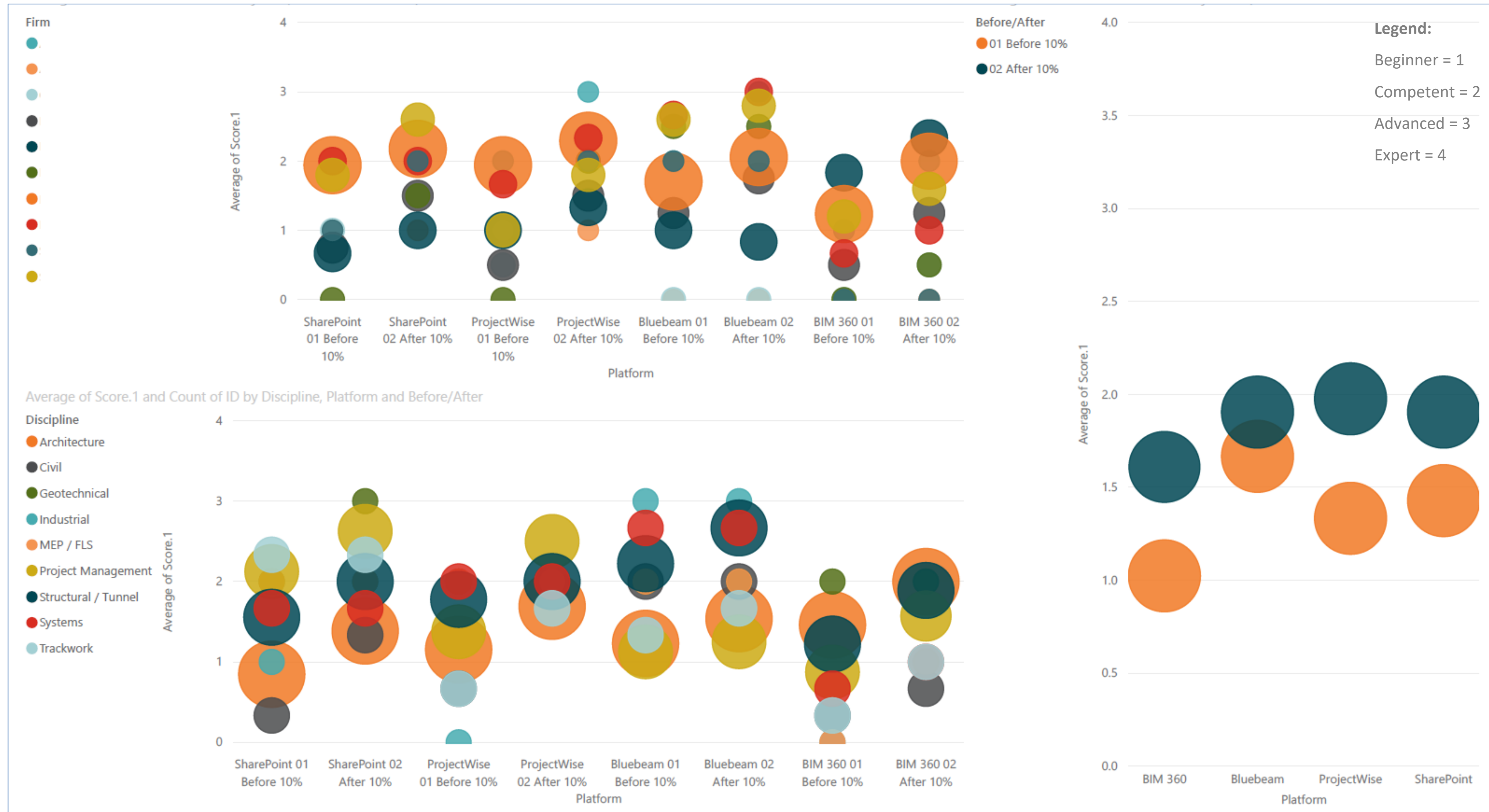
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3D MODELS

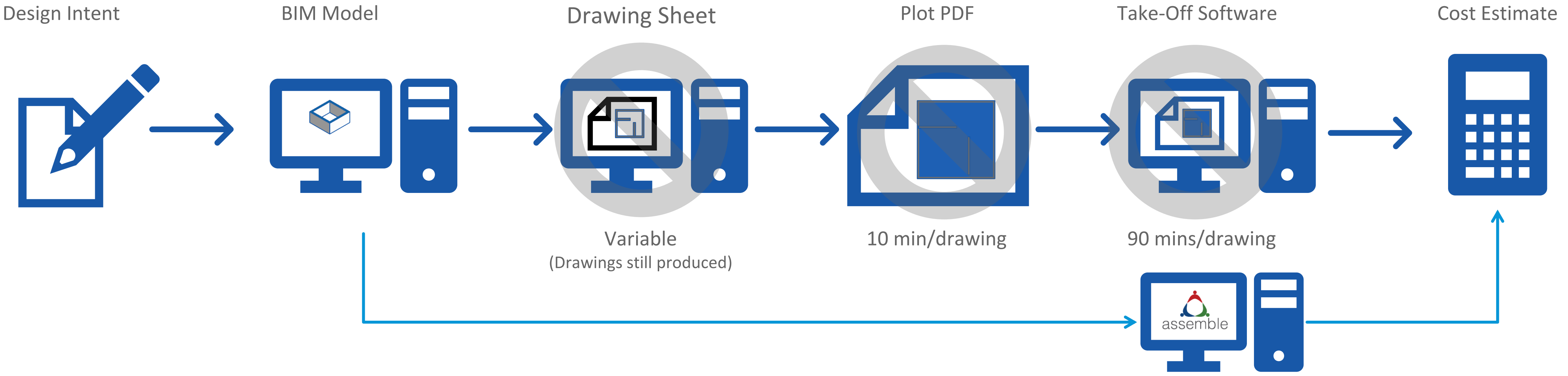
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INCOMING FILES

Upskilling of Whole Team

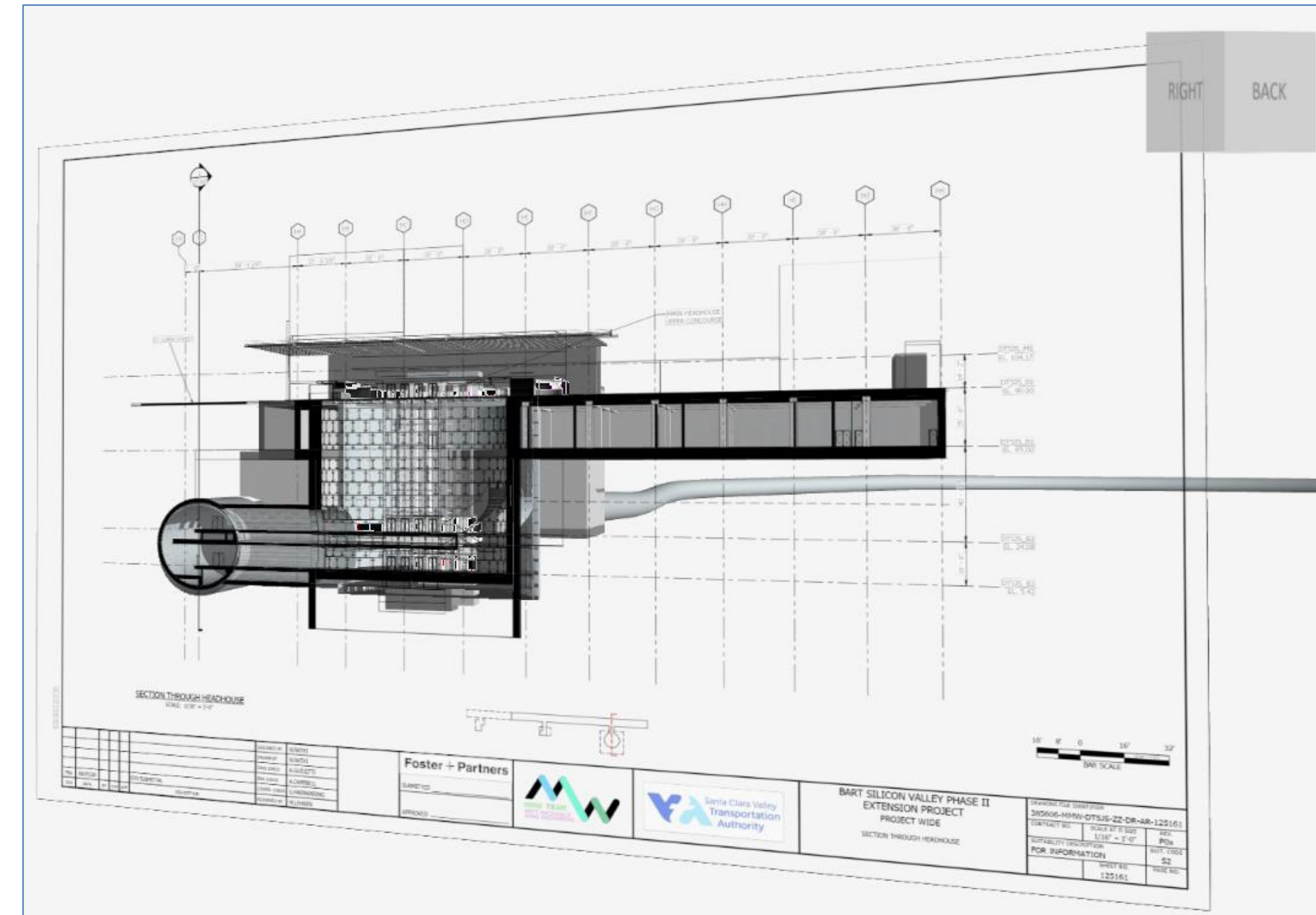
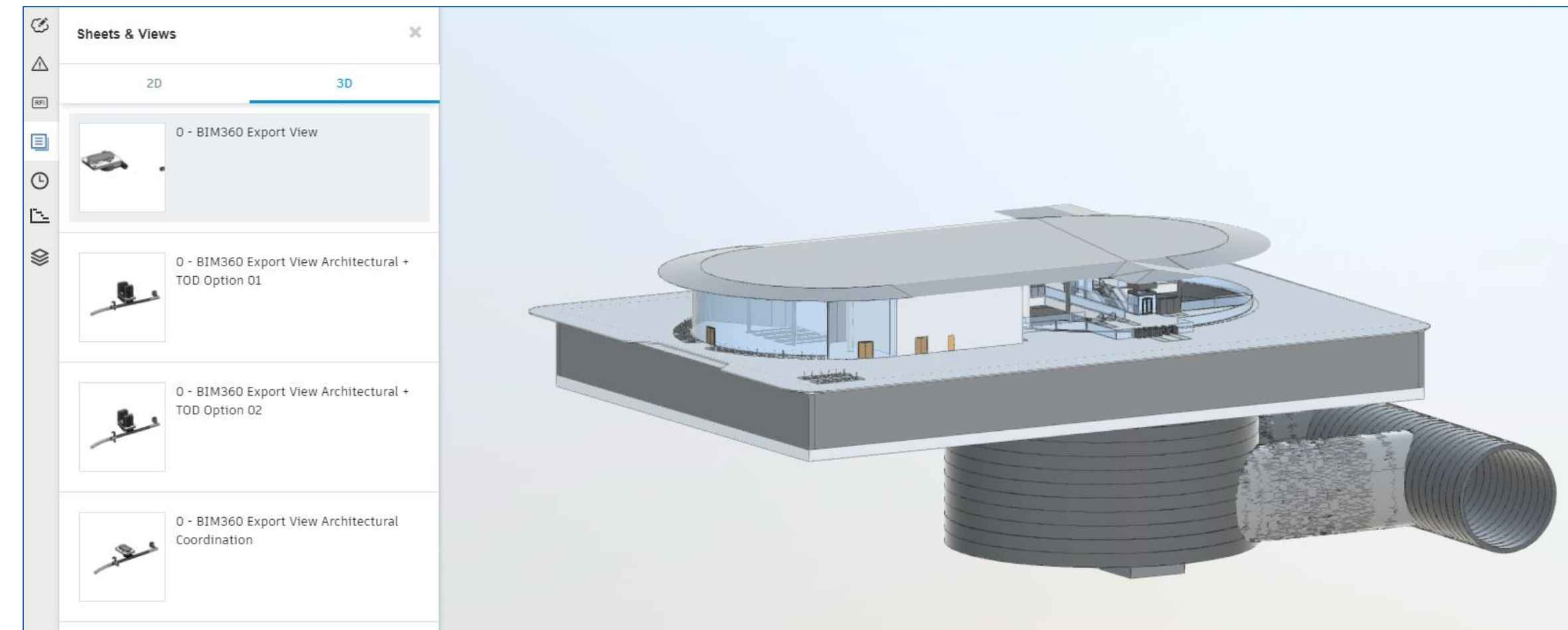


Assemble



Models Visibility

- **BIM 360 Viewer**
 - Individual models shared on a regular basis
 - Navisworks federated models for the individual assets and Projectwide
 - Used in the asset coordination meetings
 - Visible to all design team members
- **BIM Track**
 - Models published to BIM Track on a regular basis
 - Sheets hyper-modeled
 - Used for issue tracking
 - Visible to all team (including client)



Did We Establish ISO 19650?



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