

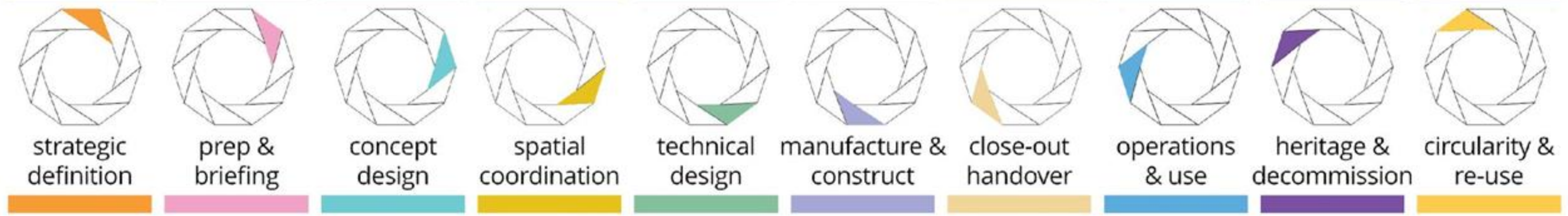


Workflows

BIM in the RIBA Stages

Collective Project Culture through BIM Technologies

Richard Matchett, Zutari



Let's take a look at some of
the players in each of these stages

What they do, what tools they use and
what they contribute to the information model





strategic
definition



prep &
briefing



concept
design



spatial
coordination



technical
design



manufacture &
construct



close-out
handover



operations
& use



heritage &
decommission



circularity &
re-use

Define what
the outcomes
should be

Develop the
plan for
implementation

Collect and share
reference info

Initial concepts,
options, selections
and outlines

Make sure
everything fits

Detailed design,
quantify, specify,
ready to build

Make sure
everything
still fits

Tender for the
work, win

Build it, tweak it,
change it...
manage it and
record it

Handover useful
information to
operator

Use the asset
/ facility for its
intended
purpose

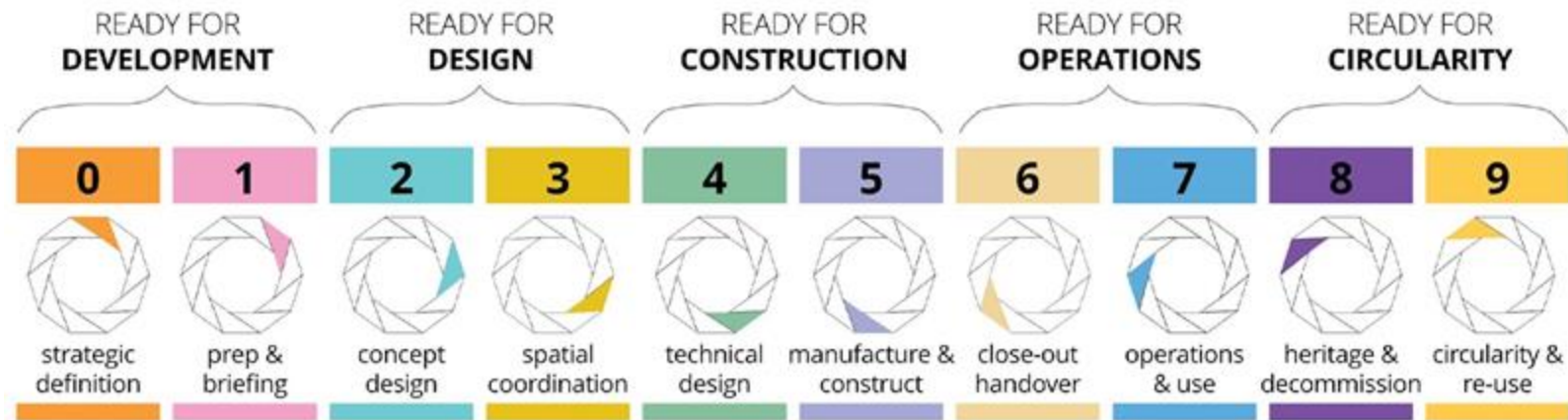
Maintain,
modify,
repurpose...

End of life

Re-use,
recycle,
salvage,
repurpose



BIM Project Work Stages



“Why do we want to BIM together?”

“How do we want to BIM together?”

“What and who are we BIM-ing for?”



You need a Team!!

Project Team

Appointing Party = Client

Lead appointed party = Lead

Appointed party = the other guys



You need a plan!!

BIM Execution Plan (BEP)



You need a ...



... and you need some ...



ARCHICAD





BIM Work Stages

Stage 0

Strategic Definition: Project Works

DEPARTMENT OF ARCHITECTURE, UNIVERSITY OF PRETORIA



BIM Stage 0

Architecture 5.0

Strategic Definition

- 1) Project overview
- 2) Information Requirements
- 3) ISO baseline documents (OIR, AIR, AIM >> EIR)
- 4) Procurement

Architecture 5.0

Owner's Project Requirements

For the Project (The Owner)

- We want a to **upgrade the lifecycle and utility** of the Architecture Building
(the product = the “what for”)
- To better serve **future generations of teachers and students**
(the purpose = the “who”)

For Ourselves (Our Teams)

- We also want to **practice together** new **skills** and improve our design and delivery of buildings in **better ways**
(the purpose = the “what for”)
- We want to make it **easier and better** to do than what we **normally do**
(the process = the “how”)



BIM Stage 0 | Strategic Definition

Architecture 5.0

Owner's Project Requirements

Project Constraints

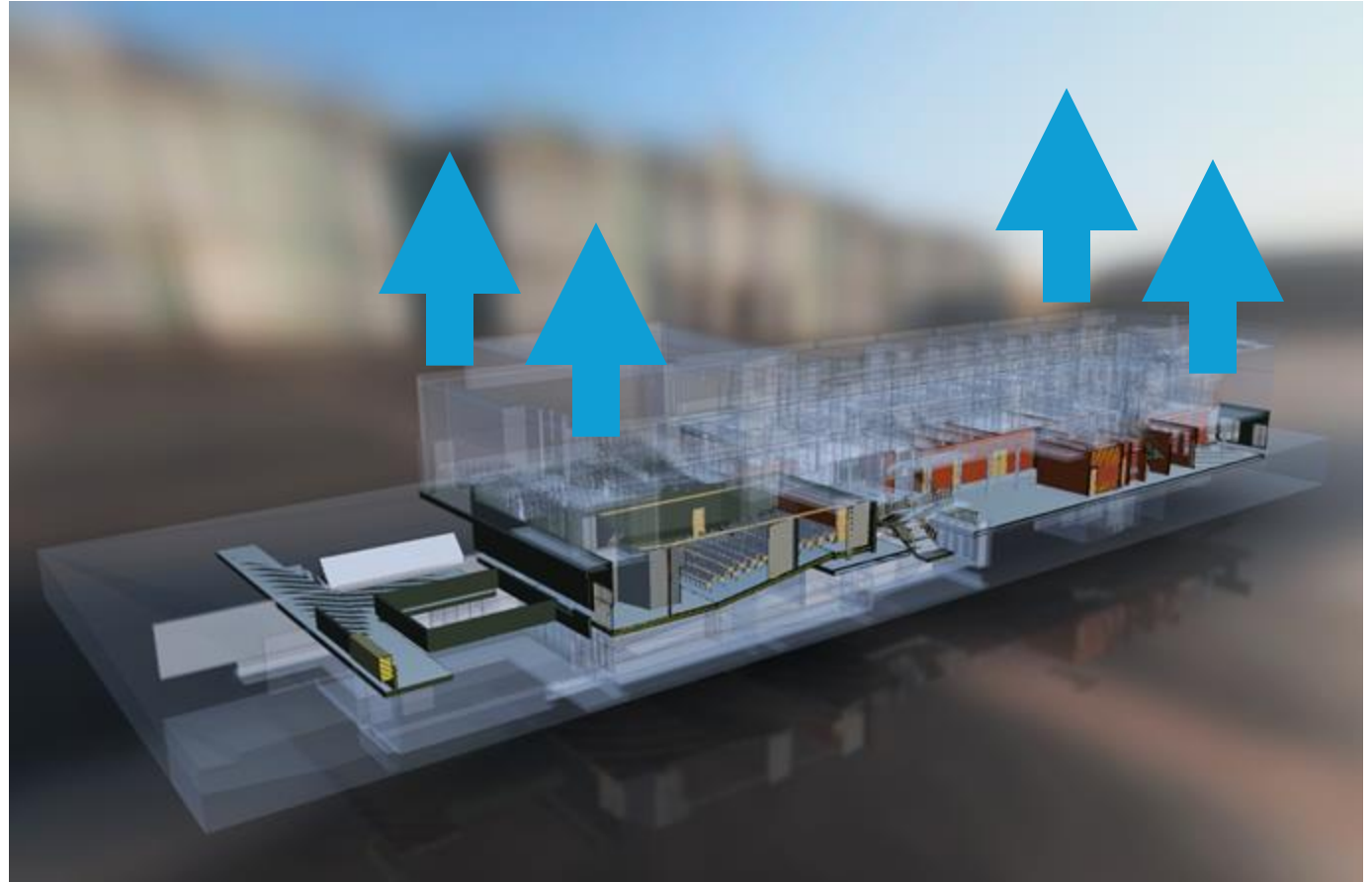
- We have a “limited budget”

Project Principles

- We do not mess up the world, so we will not to make a “new building”
- It must be **awesome** for **students and teachers**, so that good **learning** can take place.
- It must be **way cooler** than the Engineering 4.0 building...hehehe

Project Solution

- Additional two floors on top of existing building



BIM Stage 0 | Strategic Definition

Architecture 5.0

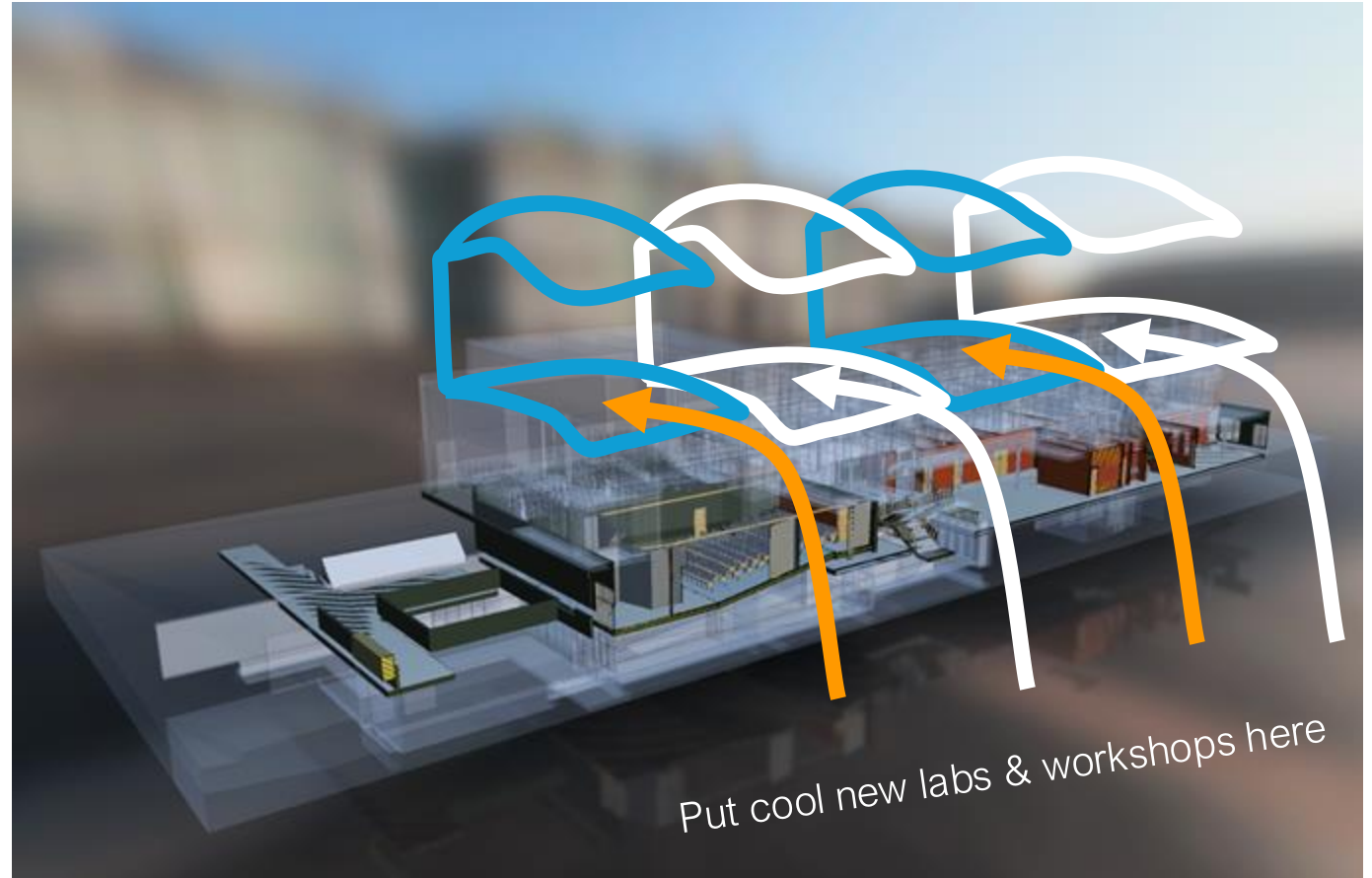
Owner's Project Requirements

Project Program

- Creative workshop areas for learners to work on novel built environment topics

Built Environment Labs for

- York Timber Chair
- Green & Living Walls
- Flexible Facades & Climate Adaption
- Alternative Building Construction Materials
- Future Cities & Urbanism
- Urban Mining & Circularity
- "Digital Learning Zones"
- VR / AR & Community Engagement
- Living Labs & Learning Moments throughout



Architecture 5.0

What information is needed from this project by the building owner(s) in the future?

Project Information Thread following ISO 19650 (BIM Standards)

OIR >> AIR >> PIR >> EIR

Organisational Information Requirements

Asset Information Requirements

Project Information Requirements

Employer's Information Requirements



BIM OIR

Organisational Information Requirements

"What information do we need from this building + design process to ensure effective decisions, reporting and planning happens?"

- Client to-do list for NOW and LATER
- Outline the essential data and digital deliverables support BIM project delivery process effectively for the whole team.

BIM AIR

Asset Information Requirements

"Begin with the end in mind"

- Specific things on the project model formats, content, design systems etc...
- Details on the operational systems, building systems information management etc.



BIM Work | Stage 0

BIM PIR

Project Information Requirements

"Who needs what when, and how would they like to receive their information?"

- Culture of communication, submissions, information content, information milestones etc
- Define the handover information for the end of the project NOW, not later.

BIM Work | Stage 0

BIM EIR

Employer Information Requirements

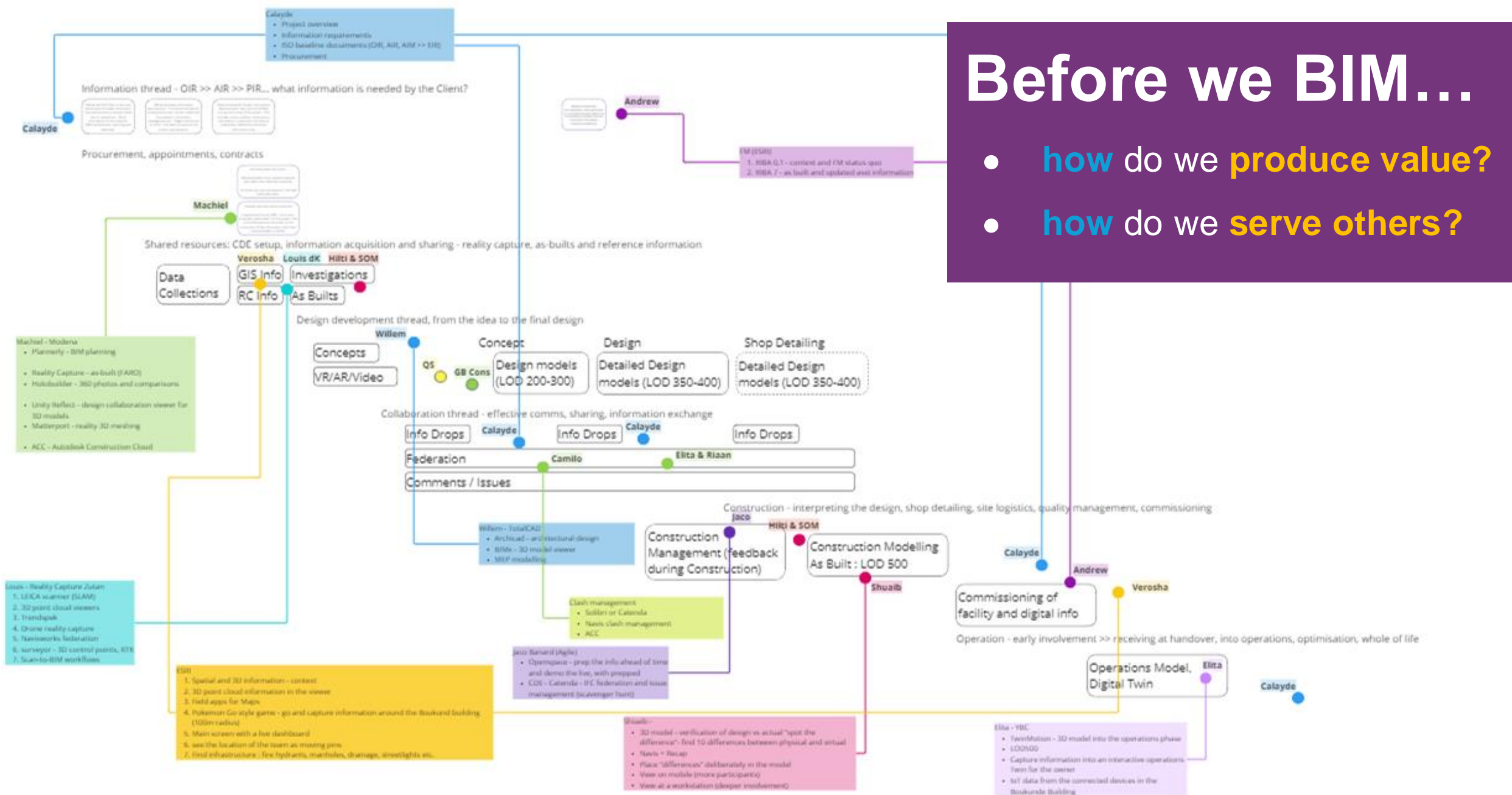
"How will we produce reliable information for proper procurement and contracting?"

- Specific things on the model formats, content, design systems
- Details on the operational systems, building systems information management etc.



Before we BIM...

- how do we produce value?
- how do we serve others?





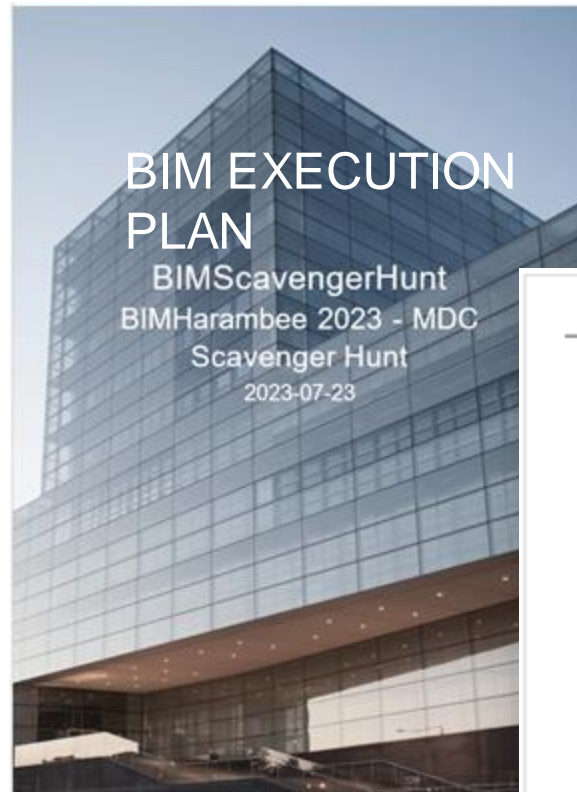
BIM Work Stages

Stage 1

Prep and Briefing

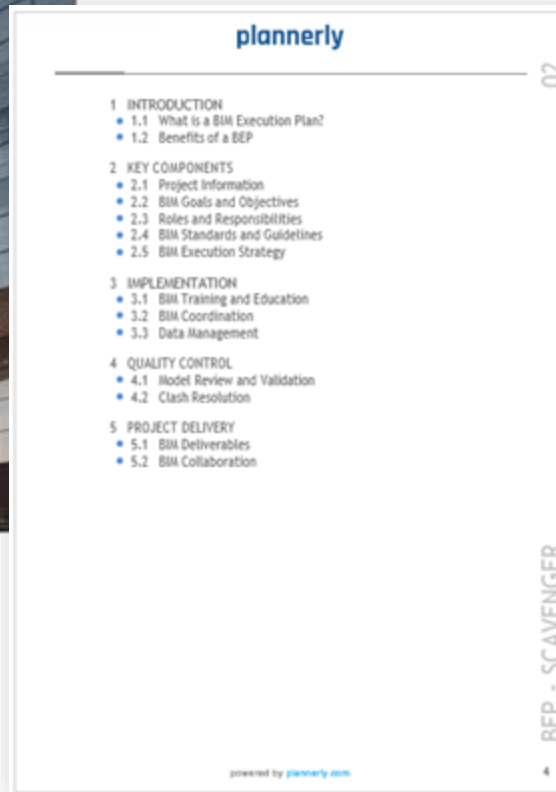
MODENA, SOM, ZUTARI

BIM Execution Plan - BEP



BIM EXECUTION PLAN

BIMScavengerHunt
BIMHarambee 2023 - MDC
Scavenger Hunt
2023-07-23



plannerly

1 INTRODUCTION

- 1.1 What is a BIM Execution Plan?
- 1.2 Benefits of a BEP

2 KEY COMPONENTS

- 2.1 Project Information
- 2.2 BIM Goals and Objectives
- 2.3 Roles and Responsibilities
- 2.4 BIM Standards and Guidelines
- 2.5 BIM Execution Strategy

3 IMPLEMENTATION

- 3.1 BIM Training and Education
- 3.2 BIM Coordination
- 3.3 Data Management

4 QUALITY CONTROL

- 4.1 Model Review and Validation
- 4.2 Clash Resolution

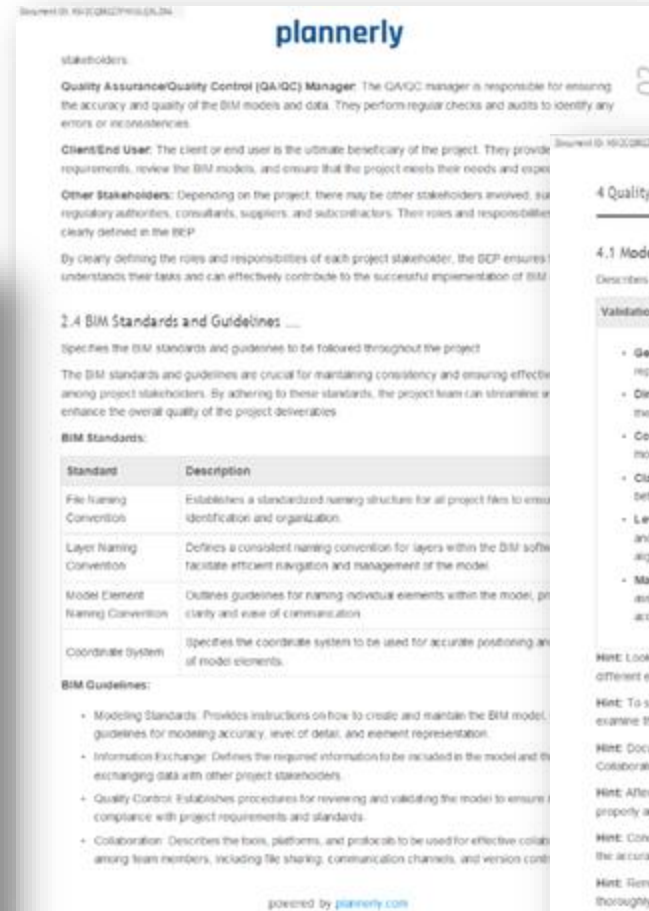
5 PROJECT DELIVERY

- 5.1 BIM Deliverables
- 5.2 BIM Collaboration

powered by plannerly.com

4

BEP - SCAVENGER



plannerly

Stakeholders:

Quality Assurance/Quality Control (QA/QC) Manager: The QA/QC manager is responsible for ensuring the accuracy and quality of the BIM models and data. They perform regular checks and audits to identify any errors or inconsistencies.

Client/End User: The client or end user is the ultimate beneficiary of the project. They provide requirements, review the BIM models, and ensure that the project meets their needs and expectations.

Other Stakeholders: Depending on the project, there may be other stakeholders involved, such as regulatory authorities, consultants, suppliers, and subcontractors. Their roles and responsibilities are clearly defined in the BEP.

By clearly defining the roles and responsibilities of each project stakeholder, the BEP ensures that everyone understands their tasks and can effectively contribute to the successful implementation of BIM.

2.4 BIM Standards and Guidelines

Specifies the BIM standards and guidelines to be followed throughout the project.

The BIM standards and guidelines are crucial for maintaining consistency and ensuring effective communication among project stakeholders. By adhering to these standards, the project team can streamline processes and enhance the overall quality of the project deliverables.

BIM Standards:

Standard	Description
File Naming Convention	Establishes a standardized naming structure for all project files to ensure easy identification and organization.
Layer Naming Convention	Defines a consistent naming convention for layers within the BIM software to facilitate efficient navigation and management of the model.
Model Element Naming Convention	Outlines guidelines for naming individual elements within the model, promoting clarity and ease of communication.
Coordinate System	Specifies the coordinate system to be used for accurate positioning and alignment of model elements.

BIM Guidelines:

- Modeling Standards:** Provides instructions on how to create and maintain the BIM model, including guidelines for modeling accuracy, level of detail, and element representation.
- Information Exchange:** Defines the required information to be included in the model and the protocols for exchanging data with other project stakeholders.
- Quality Control:** Establishes procedures for reviewing and validating the model to ensure compliance with project requirements and standards.
- Collaboration:** Describes the tools, platforms, and protocols to be used for effective collaboration among team members, including file sharing, communication channels, and version control.

powered by plannerly.com



plannerly

4 Quality Control

4.1 Model Review and Validation

Describes the process of reviewing and validating BIM models for accuracy and completeness.

Validation Checklist	Review Process
<ul style="list-style-type: none">Geometry: Check if the model accurately represents the physical elements.Dimensions: Verify that the dimensions in the model match the design specifications.Coordination: Ensure that all discipline models are properly coordinated.Clashes: Identify and resolve clashes between different elements in the model.Levels and Grids: Confirm that the levels and grids are correctly positioned and aligned.Materials: Validate that the materials assigned to the model elements are accurate.	<ol style="list-style-type: none">Preparation: Gather all relevant models and associated documentation.Review: Examine the models to identify any discrepancies or errors.Documentation: Document the issues found and communicate them to the responsible parties.Resolution: Collaborate with the project team to resolve the identified issues.Revalidation: Verify that the resolved issues have been appropriately addressed.Final Review: Conduct a final review to ensure that all models meet the required standards.

Hint: Look for inconsistencies in the model's geometry and dimensions. Pay attention to clashes between different elements. Also, check if the assigned materials match the design specifications.

Hint: To start the review process, gather all relevant models and associated documentation. Then, carefully examine the models for any discrepancies or errors.

Hint: Document any issues found during the review and communicate them to the responsible parties. Collaborate with the project team to resolve these issues.

Hint: After resolving the identified issues, revalidate the models to ensure that the corrections have been properly addressed.

Hint: Conduct a final review to confirm that all models meet the required standards. This includes checking the accuracy of the geometry, dimensions, coordination, and assigned materials.

Hint: Remember to refer to the validation checklist to ensure that all aspects of the BIM models have been thoroughly reviewed and validated.

4.2 Clash Resolution

Provides strategies for resolving clashes and conflicts in BIM models.

Clash resolution is a critical aspect of ensuring the accuracy and integrity of BIM models. It involves

powered by plannerly.com

17

BEP - SCAVENGER



The background image is a dark, atmospheric photograph of a surveying site. In the foreground, a silver surveying tripod stands on a mound of dark soil. A surveying instrument is mounted on top of the tripod. In the background, a line of evergreen trees is visible against a dark sky. A small drone is seen flying in the upper right portion of the sky. The overall scene is dimly lit, suggesting dusk or dawn.

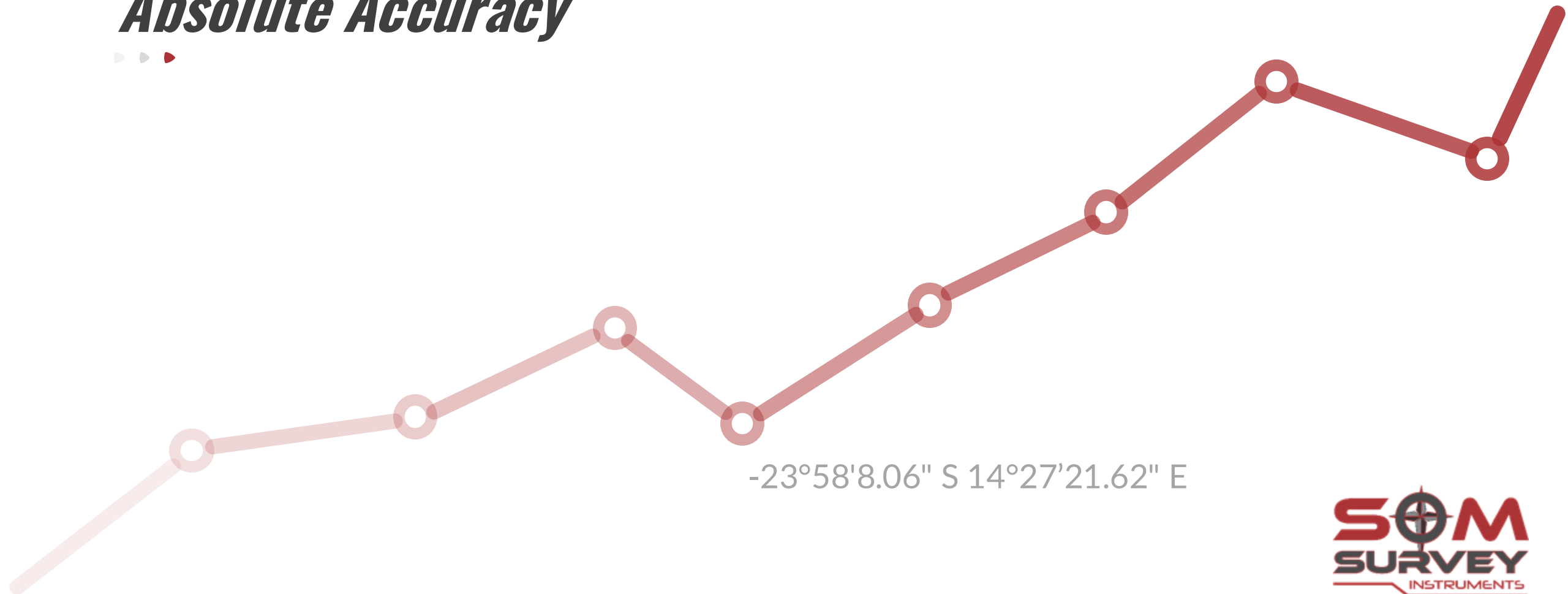
THE IMPORTANCE OF ACCURATE GEOSPATIAL INFORMATION

What is geospatial information and why it's important.

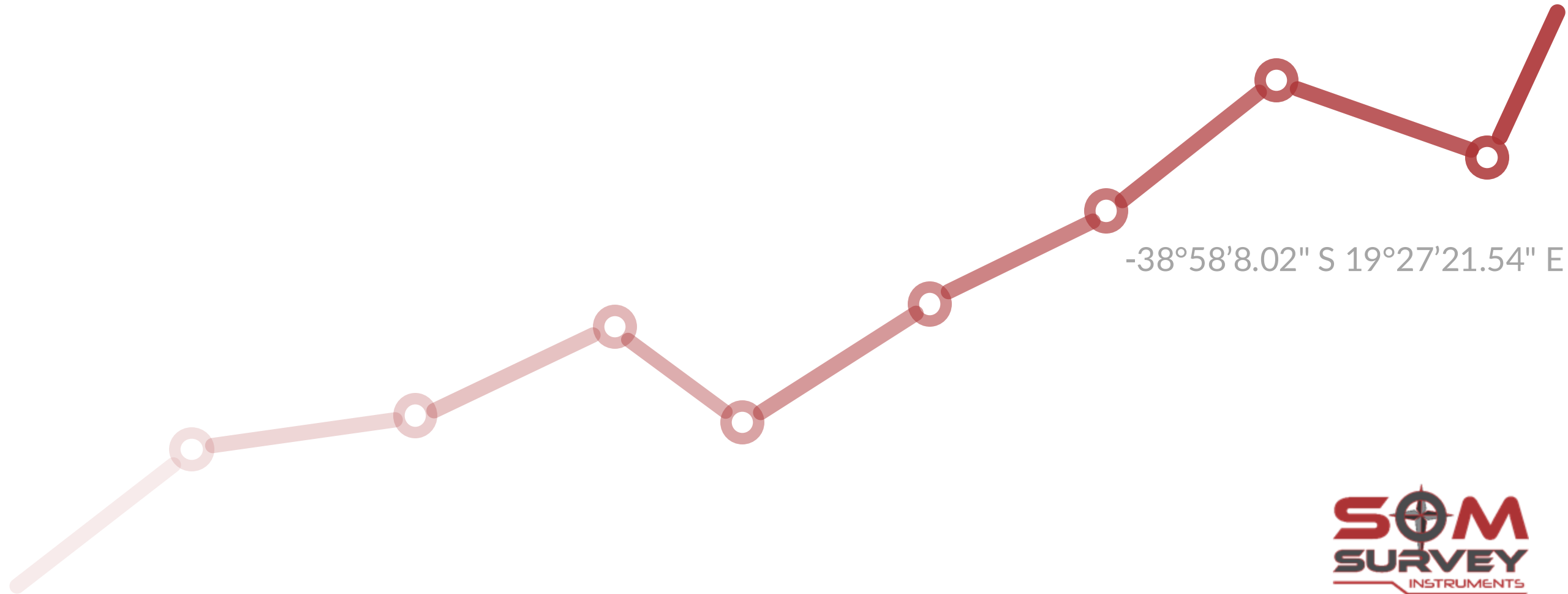


-33°58'8.06" S 18°27'21.82" E

Relative Accuracy VS Absolute Accuracy



The Importance of Establishing Accurate Control on Site



-38°58'8.02" S 19°27'21.54" E



Obtaining Geospatial information - Today



GNSS Receivers

Surveying Drones

LiDAR Scanners



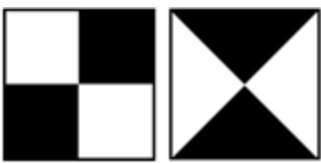
Collect and share reference info

We call this Reality Capture

We digitize real world assets by using technology and software. These Reality Twins becomes the geometric reference information.



What is used in industry



Survey Control

Critical importance to ensure that all data is referenced to the same geographic base information





BIM Work Stages

Stage 2

Concept Design

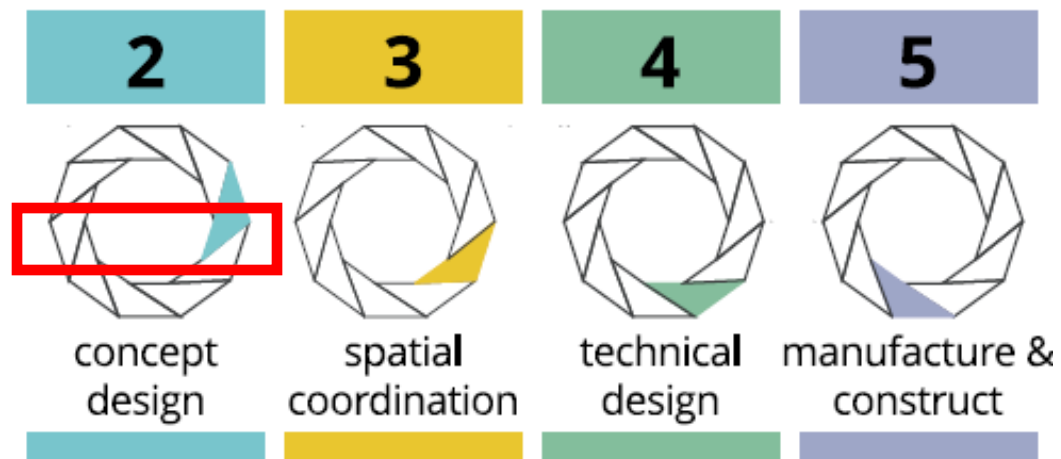
TOTALCAD SOLUTION CENTRE

TotalCAD

SOLUTION CENTRE

 GRAPHISOFT® | DISTRIBUTOR





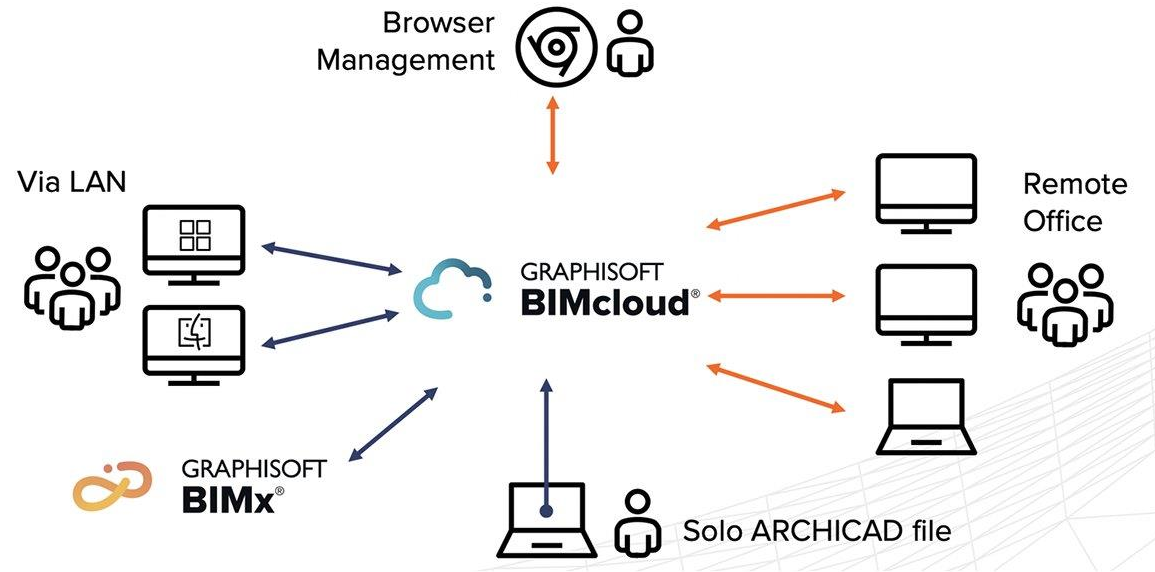


GRAPHISOFT **BIMcloud**[®]

Work Hybrid

Collaborate

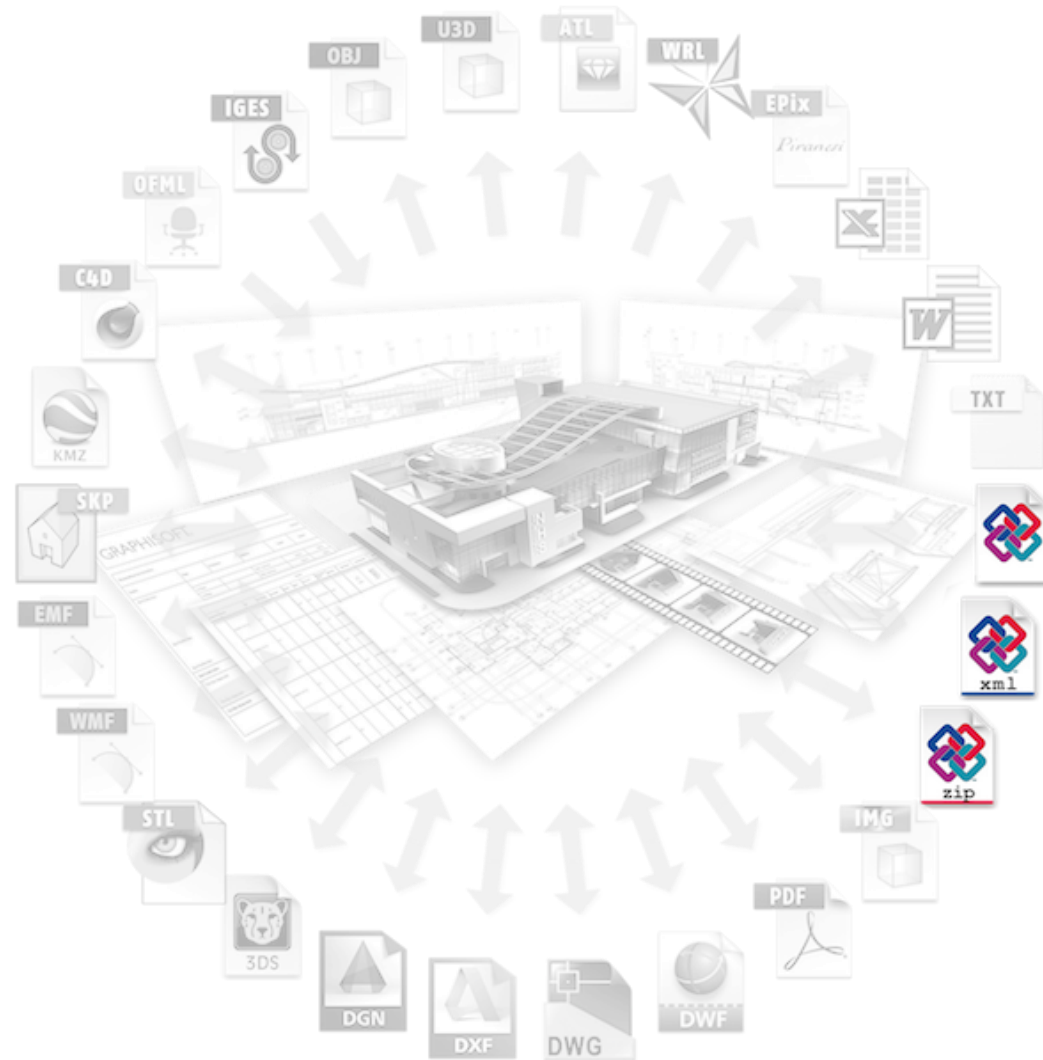
Assurance





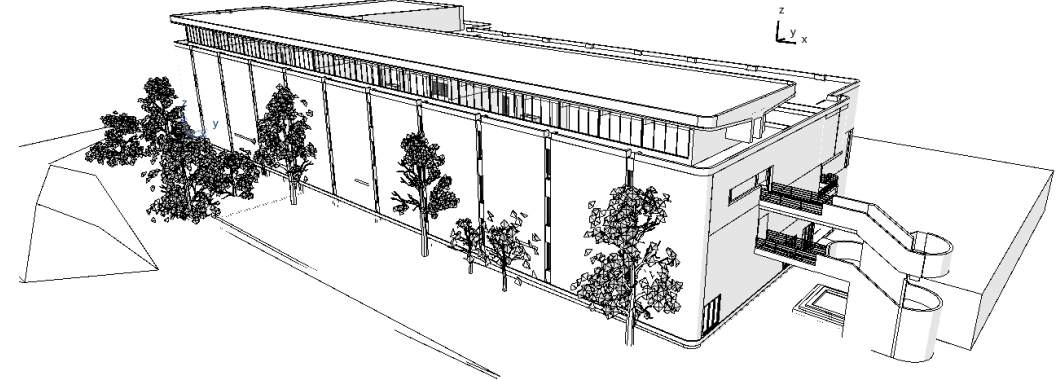
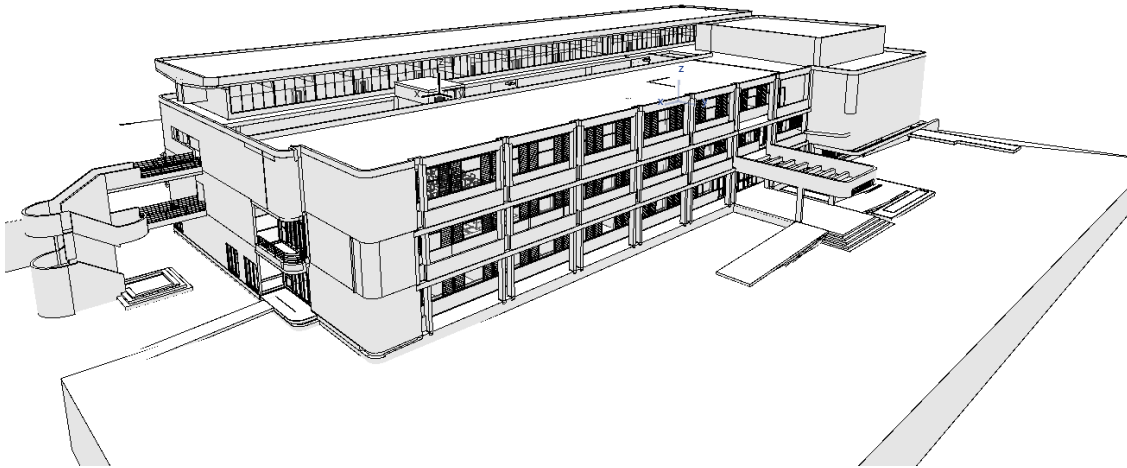
OPEN BIM™

MODEL COORDINATION & COLLABORATION



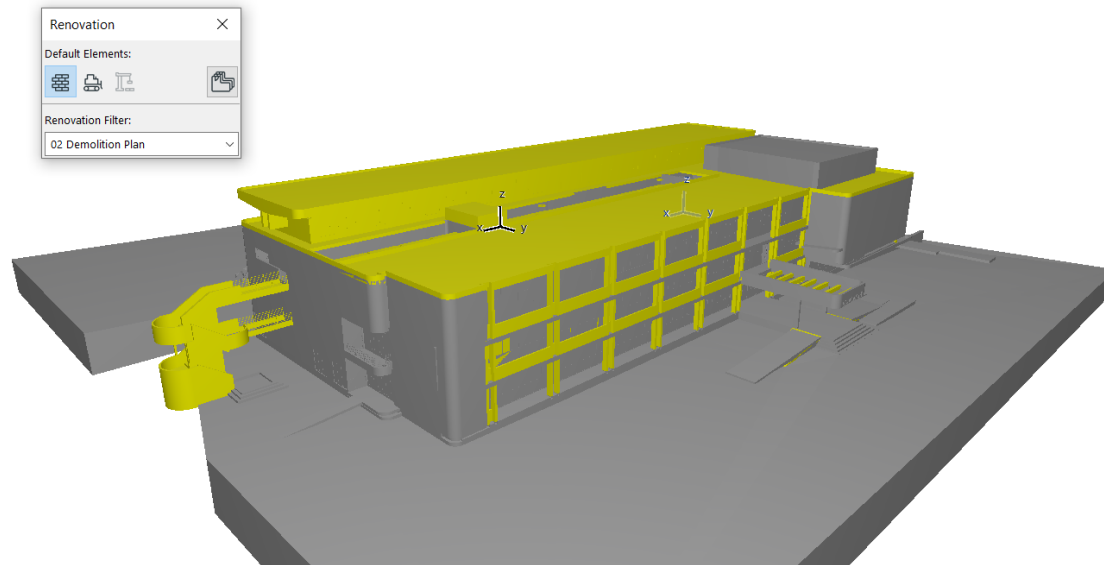
BCF

IMPORT IFC MODEL

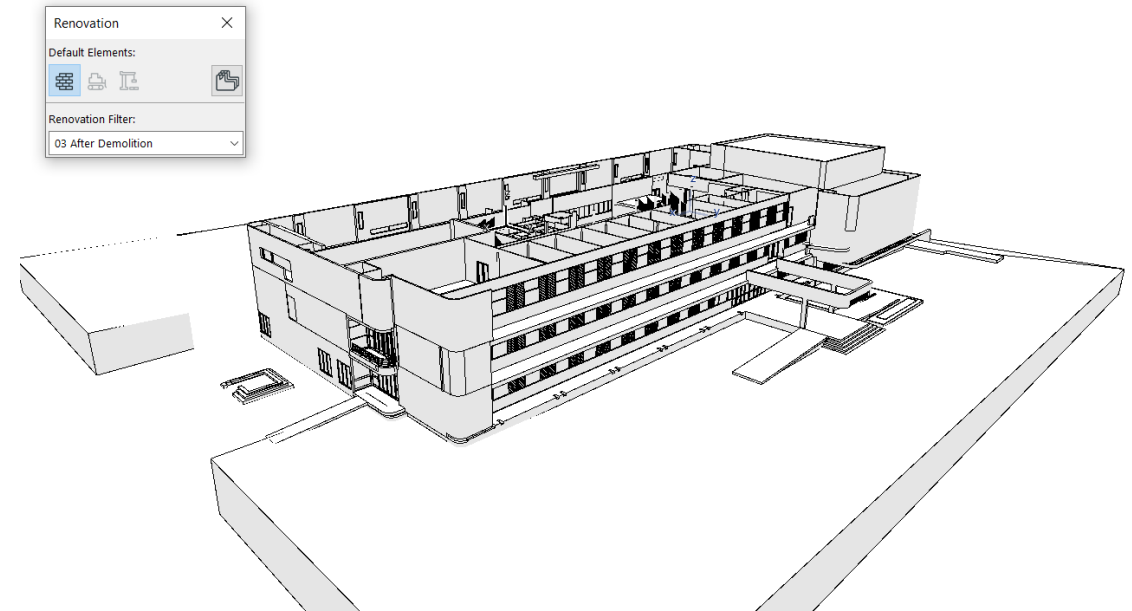


RENOVATION TOOL

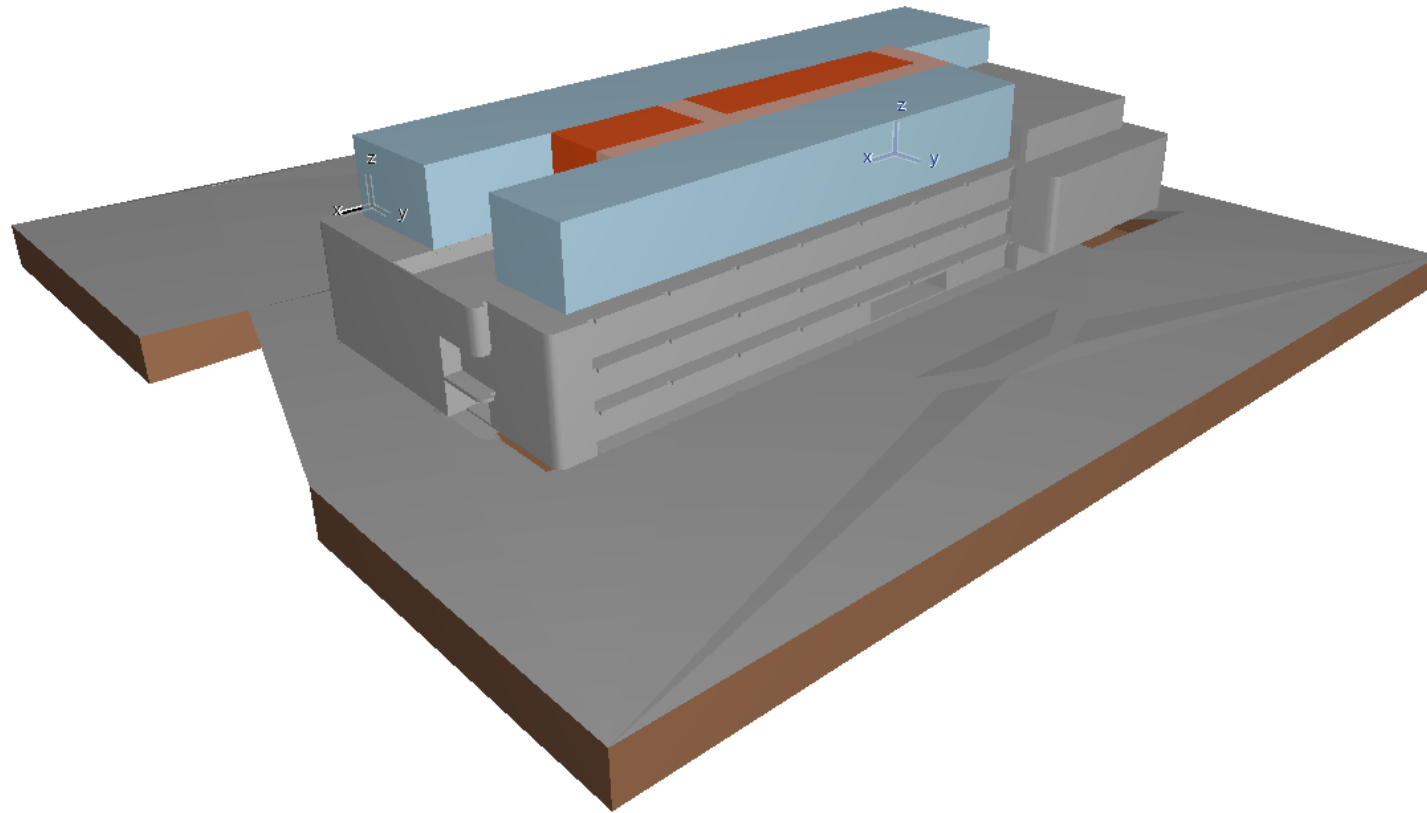
To Be Demolished



After Demolition



PROPOSED ADDITION



AI VISUALIZER

Conceptual Model



Text Prompt

Prompt

>
modern
concrete
residential_

AI Generated Image



New Prompt: Wood

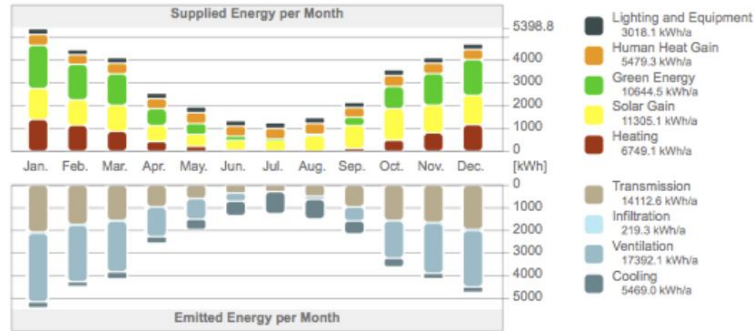


New Prompt: Brick

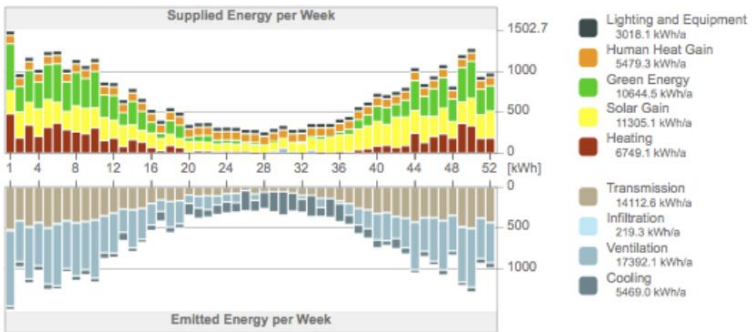


ENERGY ANALYSIS

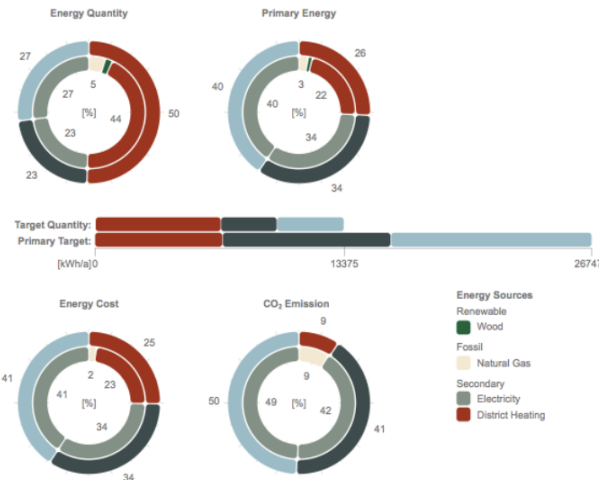
Project Energy Balance



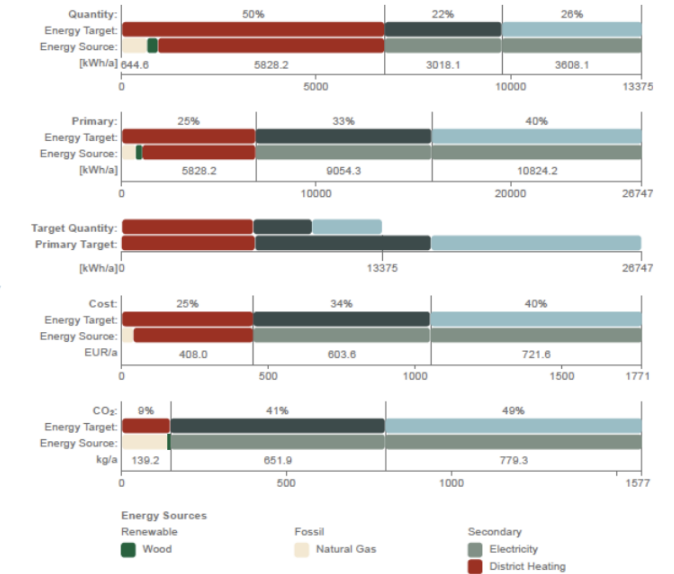
Project Energy Balance



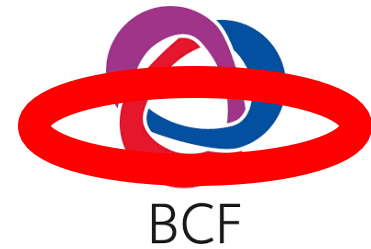
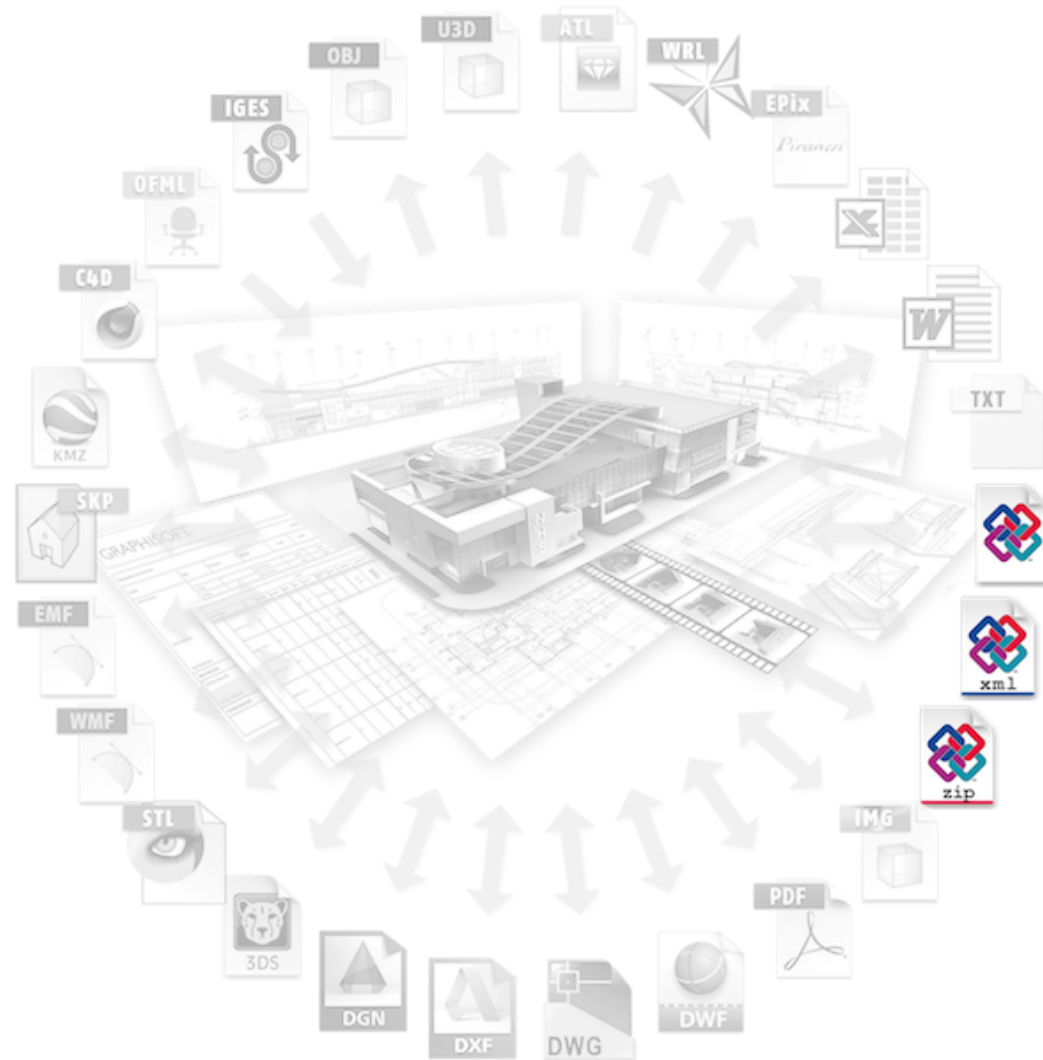
Target Name	Quantity kWh/a	Primary kWh/a	Cost EUR/a	CO ₂ Emission kg/a
Heating	6749	6868	446	146
Cooling	0	0	0	0
Service Hot-Water	0	0	0	0
Ventilation Fans	3608	10824	721	779
Lighting & Appliances	3018	9054	603	651
Total:	13375	26747	1771	1577



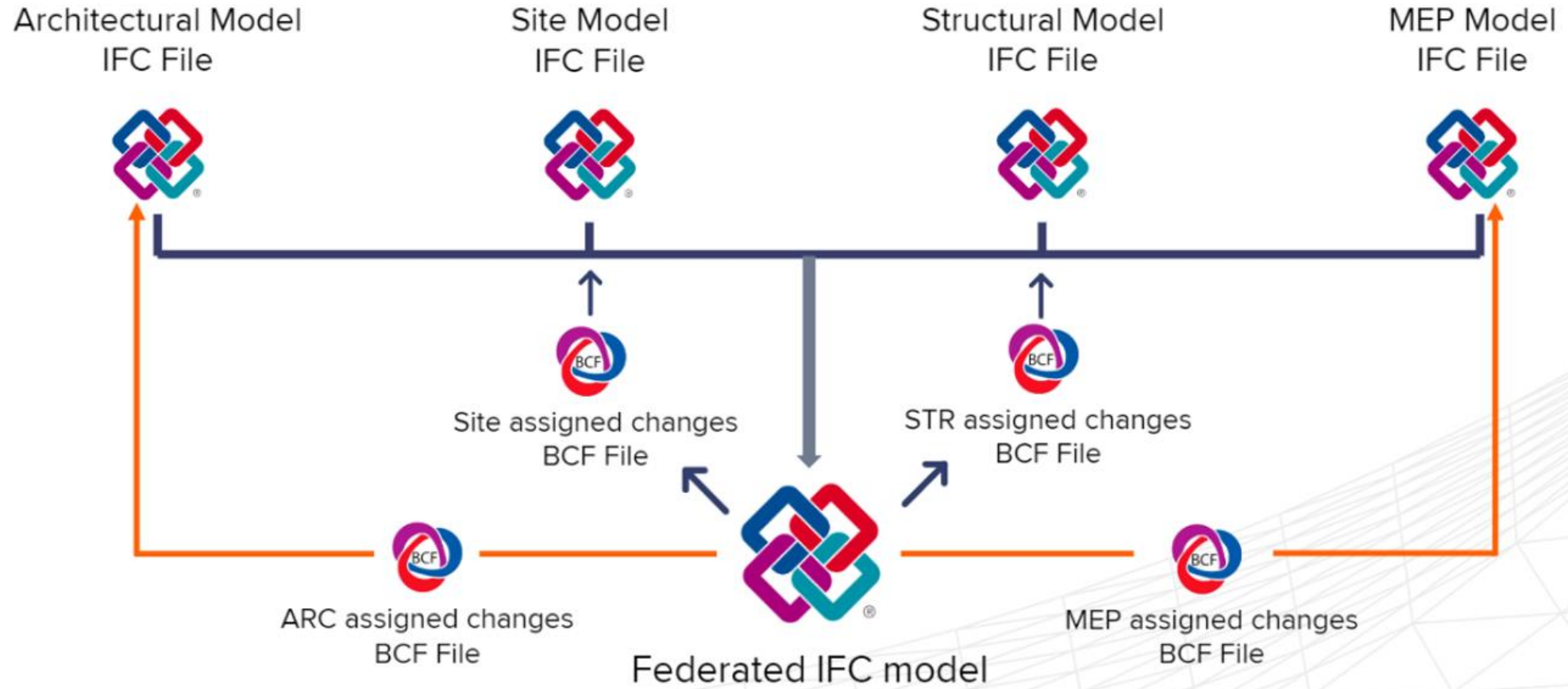
Target Name	Quantity kWh/a	Primary kWh/a	Cost EUR/a	CO ₂ Emission kg/a
Heating	6749	6868	446	146
Cooling	0	0	0	0
Service Hot-Water	0	0	0	0
Ventilation Fans	3608	10824	721	779
Lighting & Appliances	3018	9054	603	651
Total:	13375	26747	1771	1577



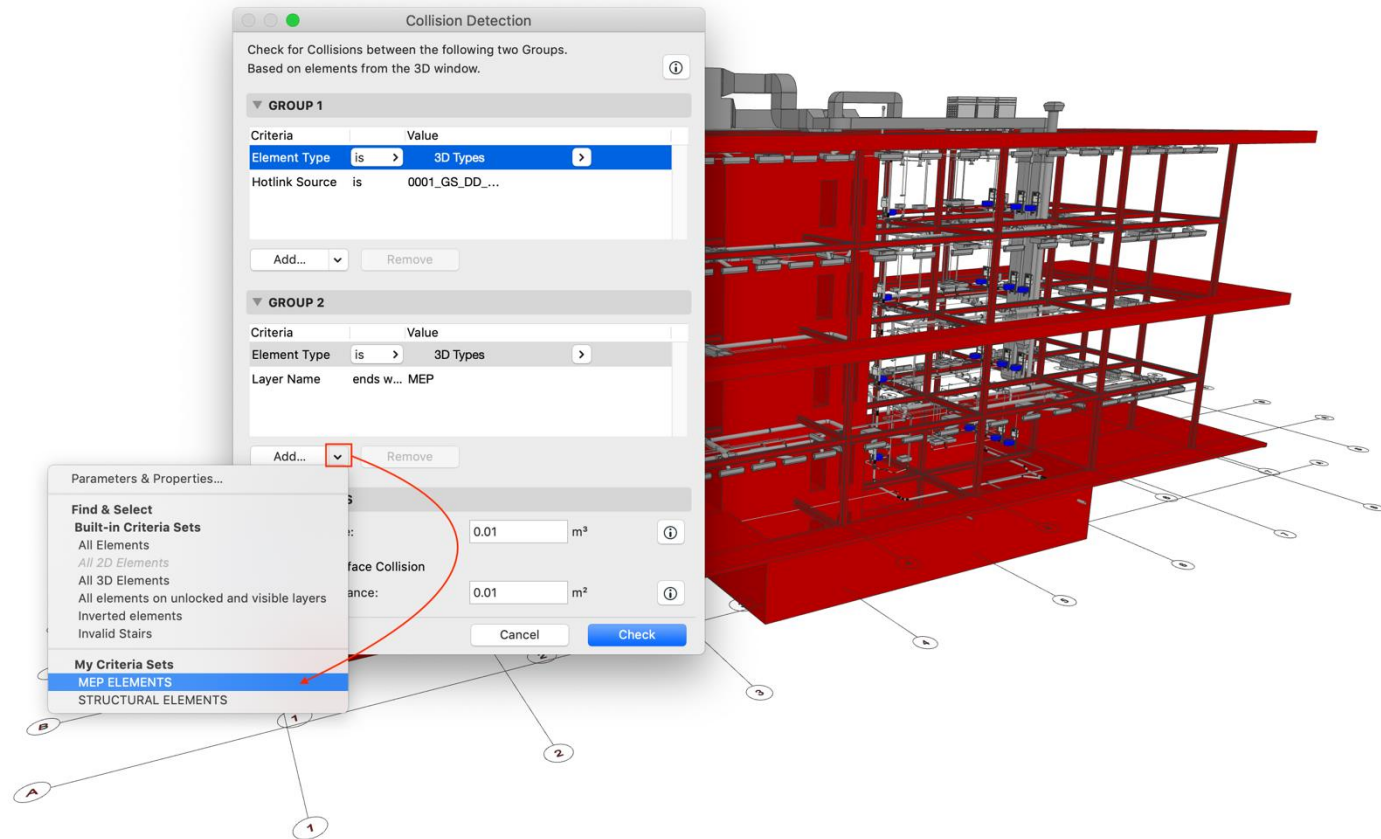
CHANGE COORDINATION IN BCF



CHANGE COORDINATION IN BCF



COLLISION DETECTION

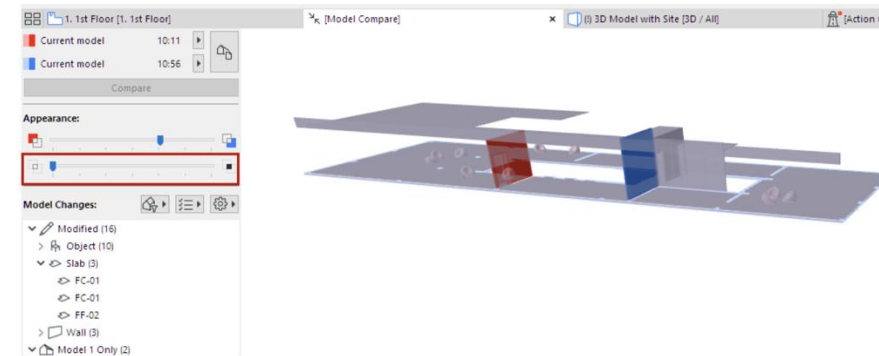
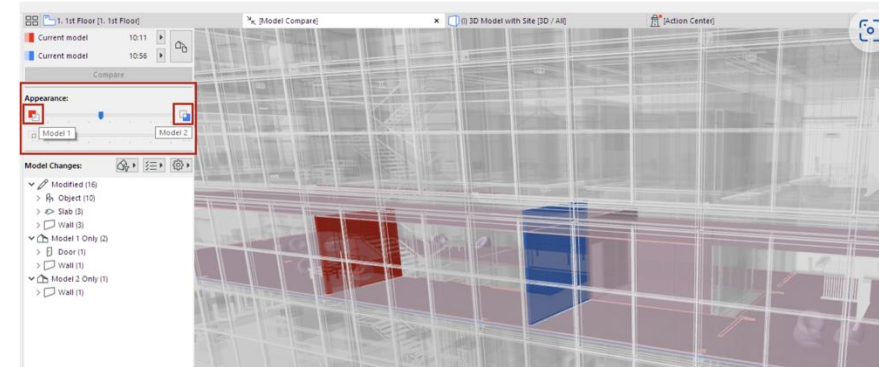
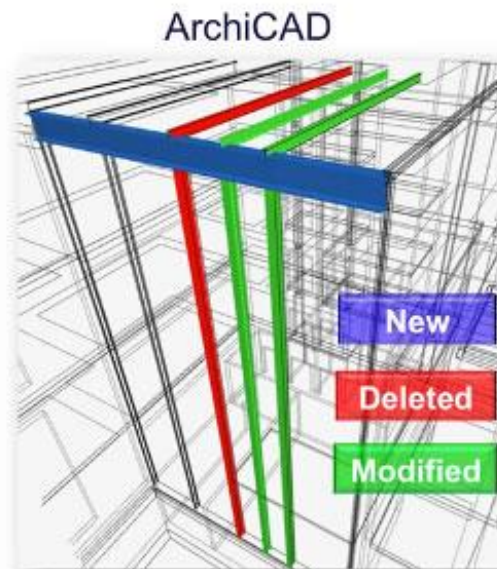


MODEL COMPARISON

IFC Model 1



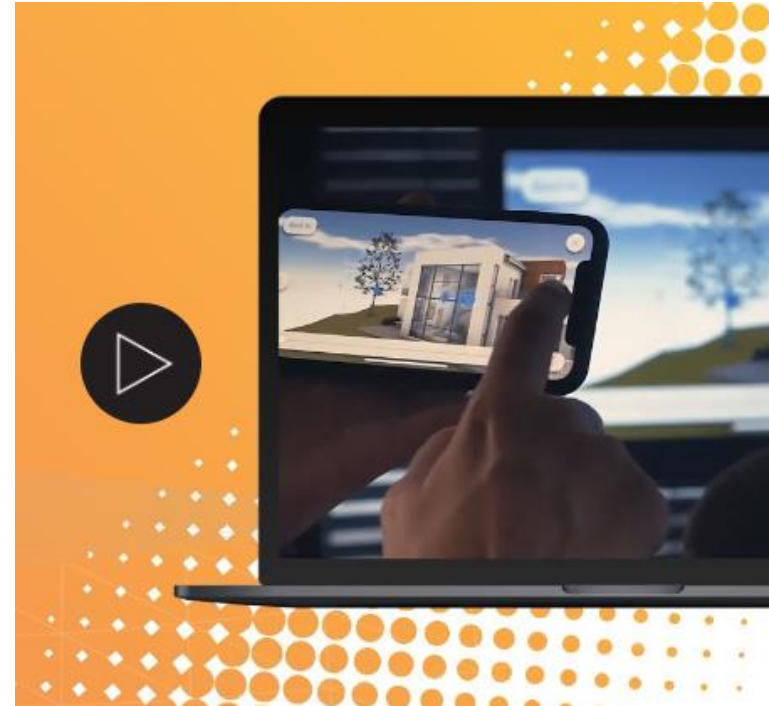
IFC Model 2



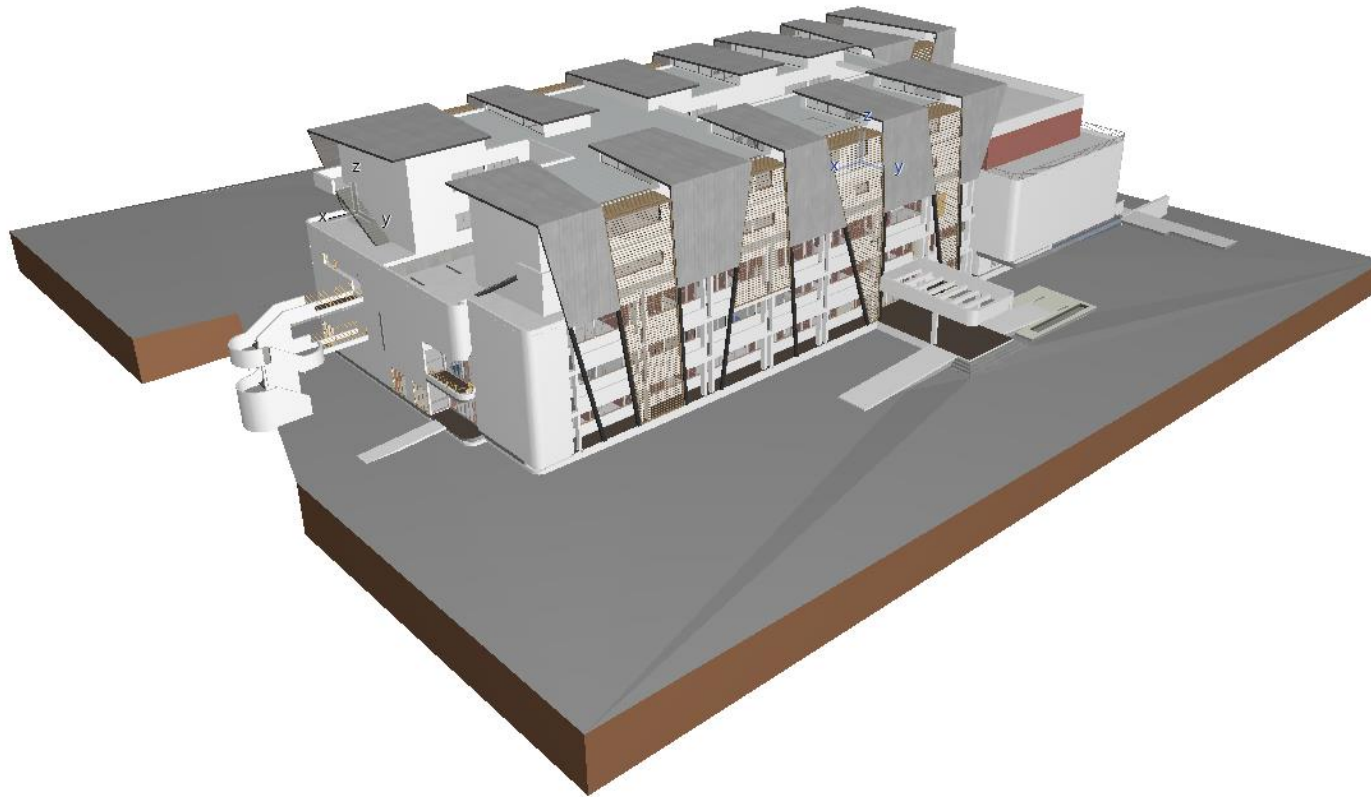
COMMUNICATE CONCEPT WITH CLIENT



GRAPHISOFT
BIMx®

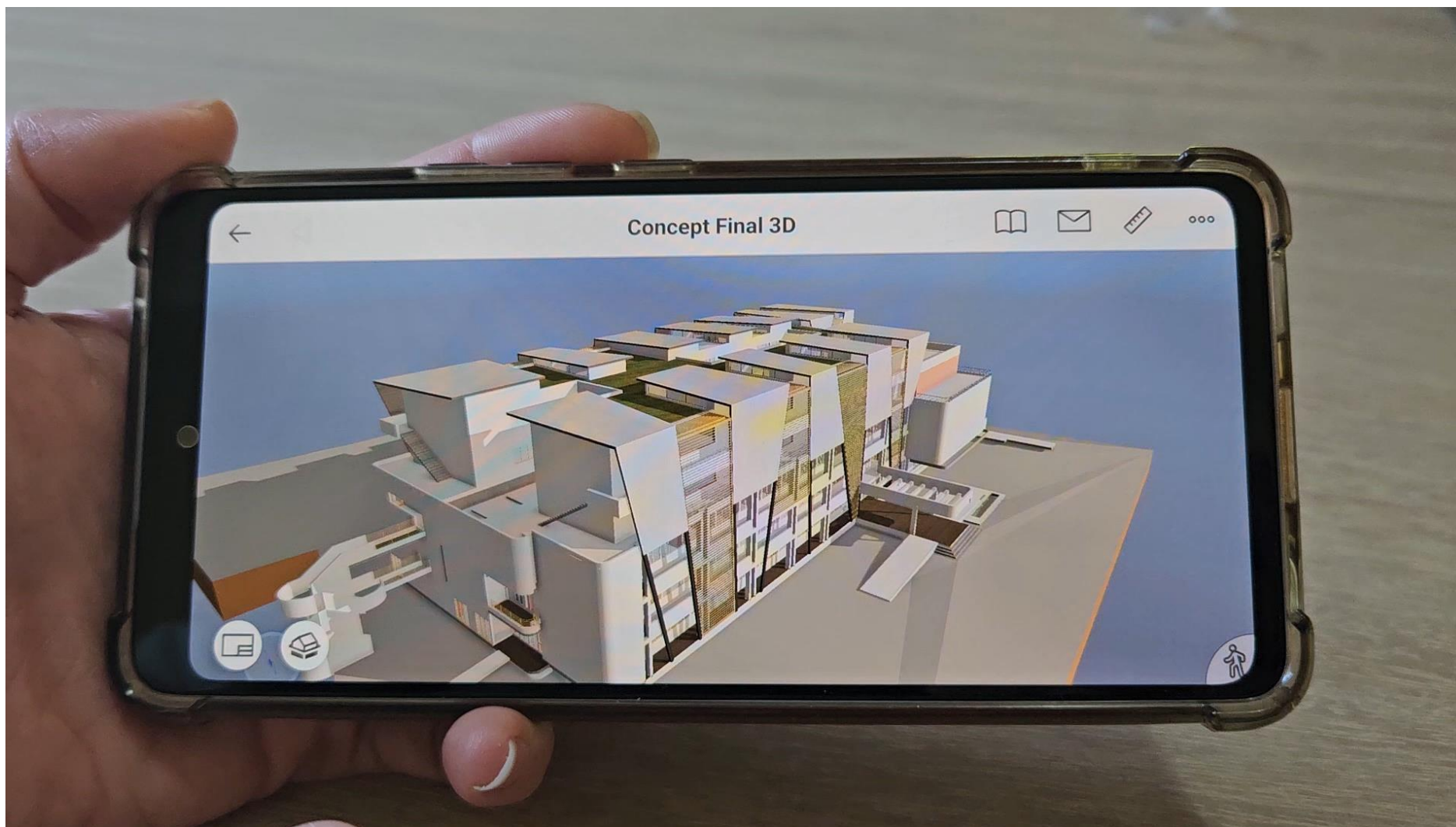


Approved Concept





GRAPHISOFT
BIMx[®]





BIM Work Stages

Stage 3

Spatial Coordination

CATENDA

openBIM Common Data Environment (CDE)

Reinventing communication and collaboration through visual and connected data



Create and resolve issues directly in the model



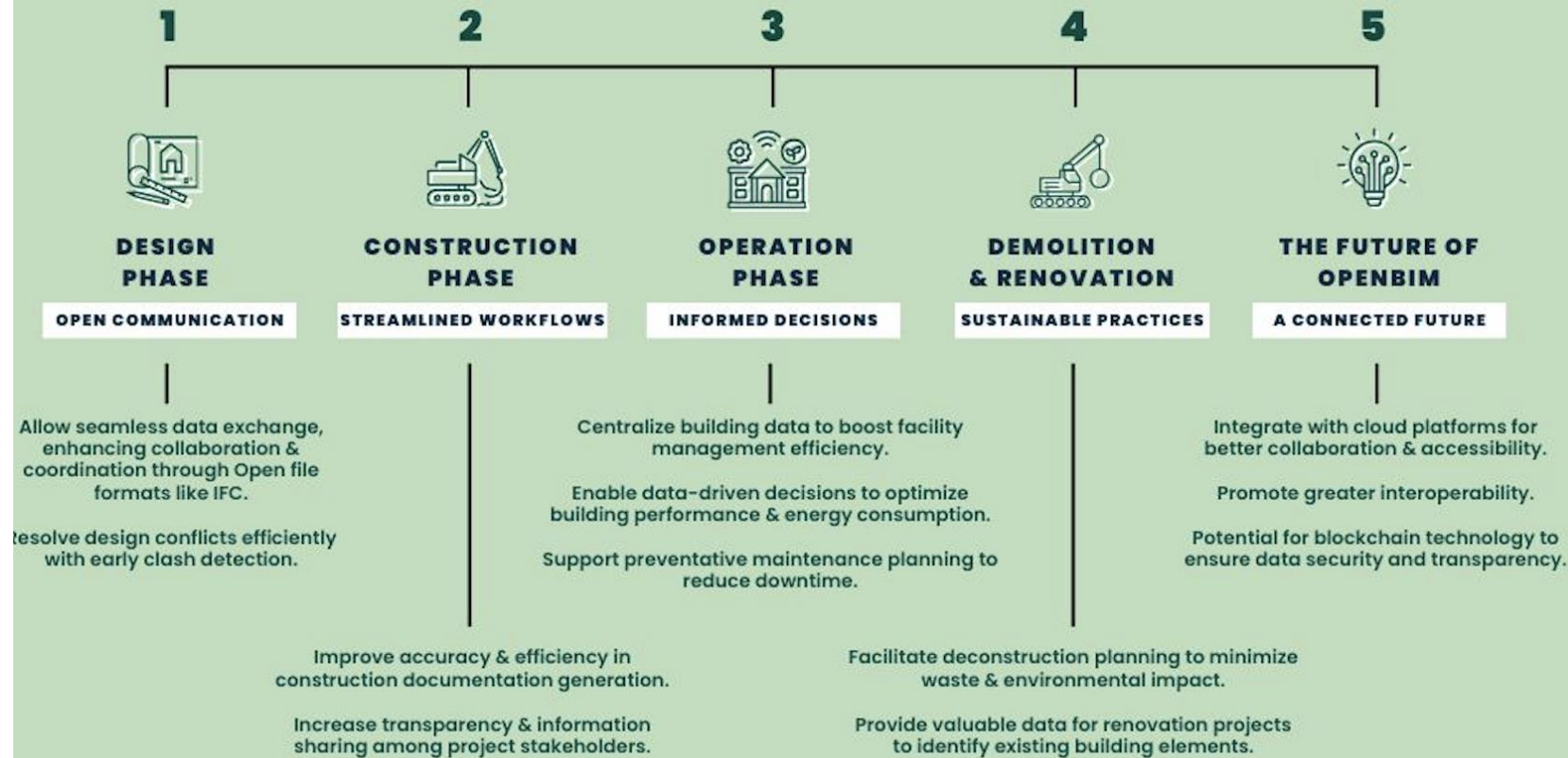
Click on any object to access all stored data



Entire team works in a
CDE (Common Data
Environment)

From Design to Demolition: How openBIM Transforms Projects

openBIM is a collaborative approach to Building Information Modeling (BIM) that utilizes open standards and interoperable software. This approach brings many advantages to building projects throughout the entire lifecycle, such as fostering better communication, improved efficiency, and cost savings.



... offering reached full circle

With Catenda, the digital twin can now follow the entire lifecycle of a building

Catenda Hub

Catenda's Common Data Environment powerful cloud based, BIM enabled coordination tool



Catenda Site

Catenda Site puts the power of Catenda Hub on the construction site and can provide a segway for using Catenda in the asset management phase



Catenda Duo

A building operating system application enhanced by the power of BIM and visualization.

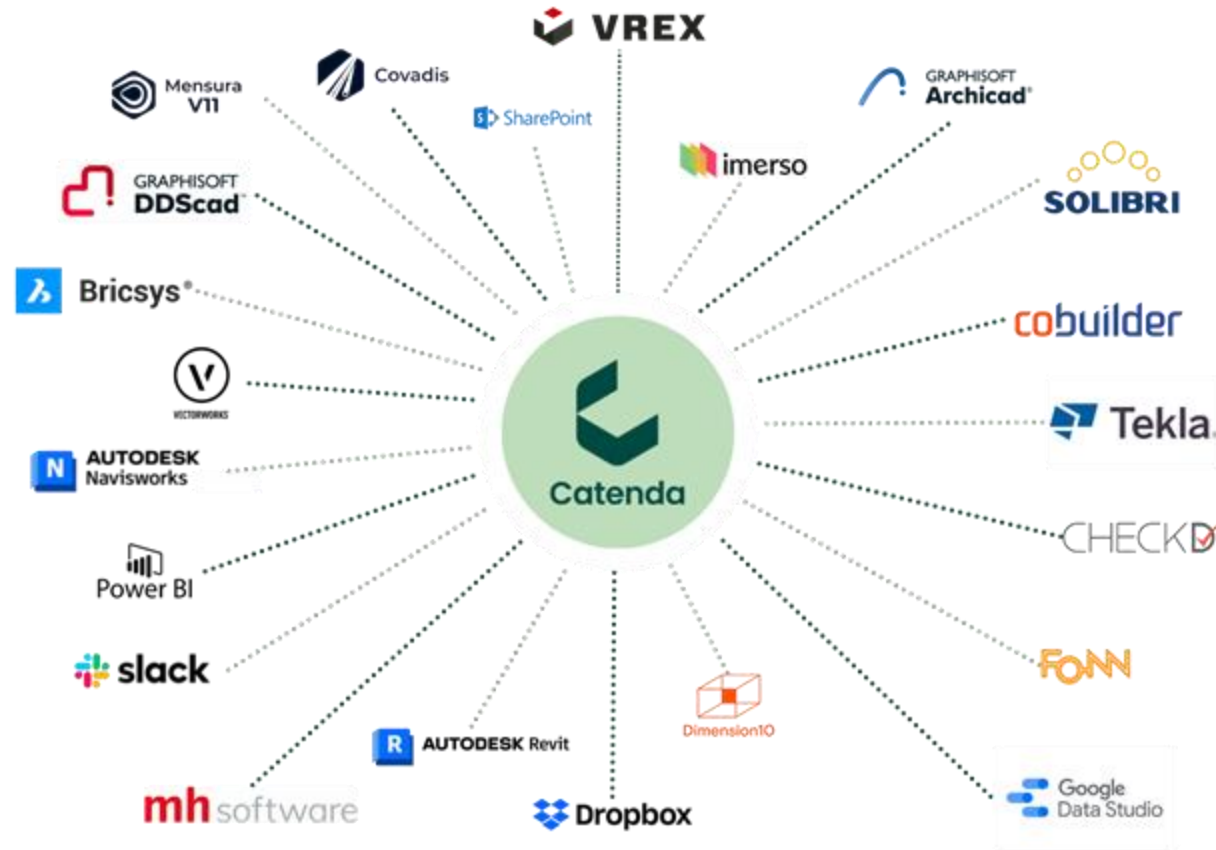


Design

Construction

Operations

Connecting information, keeping everyone on the same (digital) page.



For more information on openBIM, IFC, BCF etc



www.buildingsmart.org

www.agile.co.za

catenda@agile.co.za



Customer Success Story



Location: Mozambique

Project Sponsor: UN and World Bank

Team: Global

Authoring Software: Revit, ArchiCAD

“In Catenda Hub, there’s no way for them to revert to version 2 or 3. This aspect was crucial for me because it helped avoid having an electrical layout in the wrong architectural plan, which is a common issue.”

Camilo Mogni – Project Technical Manager



Efficient BIM Coordination across borders: The role of Catenda Hub on a global project





BIM Work Stages

Stage 4.1

Technical & Detail Design

YORK BROTHERS CONSTRUCTION

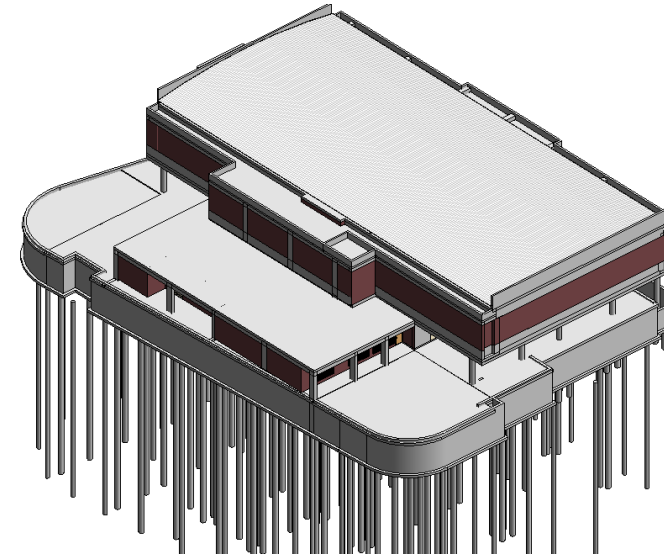
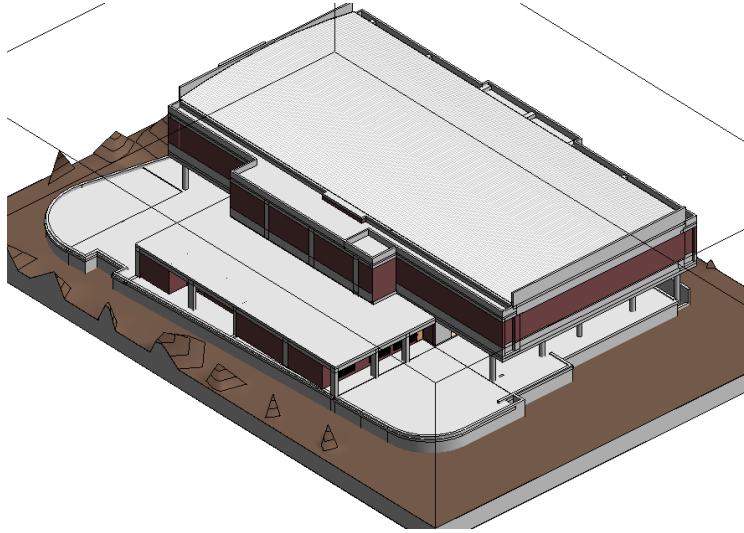
Stage 4 is so important they split it into 2.

First we do the technical stuff

Stage 4: Documentation and procurement

- 4.1 Prepare documentation sufficient for local authority submission:
 - co-ordinate technical documentation with the **consultants** and complete primary co-ordination
 - prepare specifications for the works
 - review the costing and programme with the consultants
 - obtain the client's authority and submit documents for approval
- 4.2 Complete **construction documentation** and proceed to call for tenders:
 - obtain the client's authority to prepare documents to procure offers for the execution of the works
 - obtain offers for the execution of the works
 - evaluate offers and recommend on the award of the building contract
 - prepare the contract documentation (and arrange the signing of the building contract)



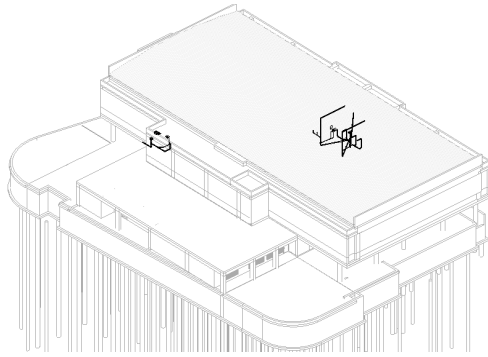


ARCH VS. STRUCTURAL

Stage 4: Documentation and procurement

- 4.1 Prepare documentation sufficient for local authority submission:
 - co-ordinate technical documentation with the **consultants** and complete primary co-ordination
 - prepare specifications for the works
 - review the costing and programme with the consultants
 - obtain the client's authority and submit documents for approval
- 4.2 Complete **construction documentation** and proceed to call for tenders:
 - obtain the client's authority to prepare documents to procure offers for the execution of the works
 - obtain offers for the execution of the works
 - evaluate offers and recommend on the award of the building contract
 - prepare the contract documentation (and arrange the signing of the building contract)

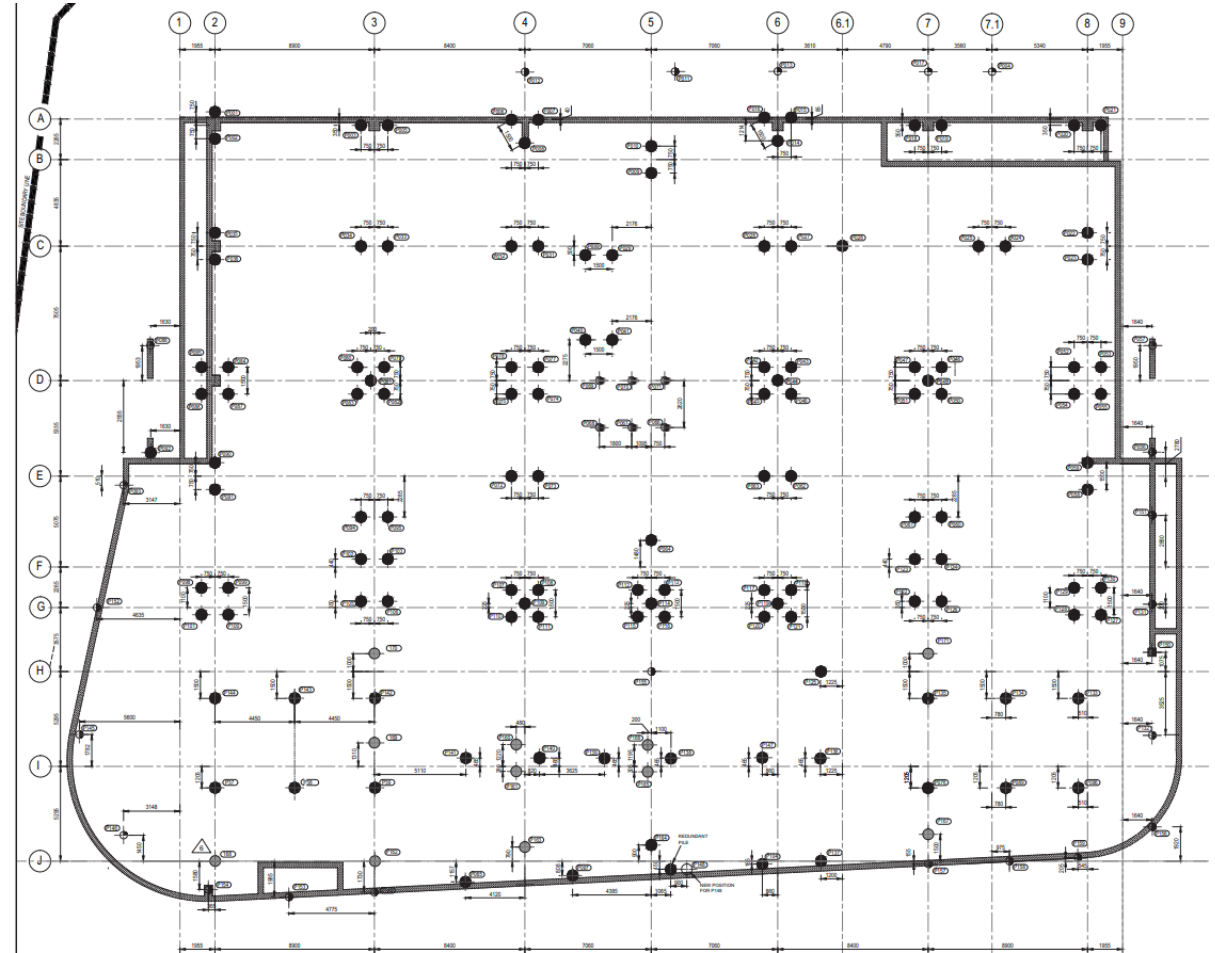


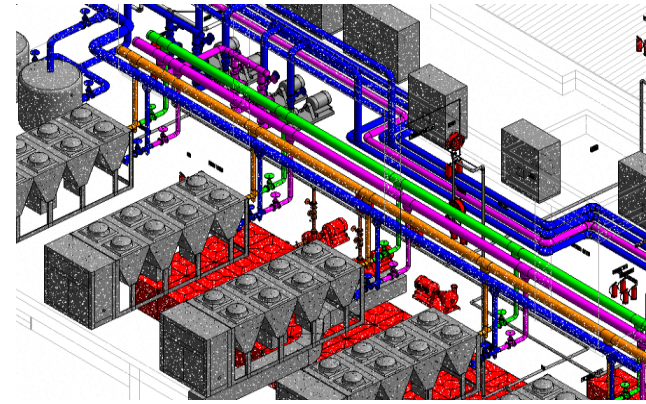
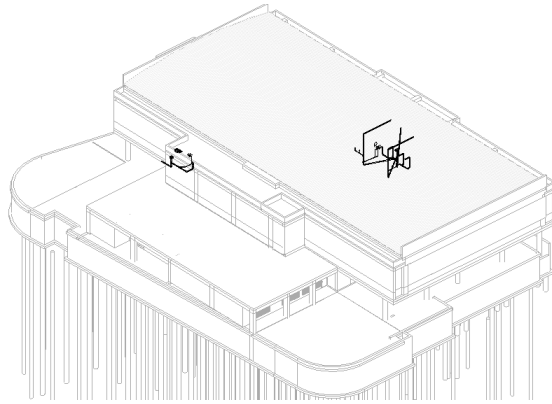


ARCH VS. STRUCTURAL VS. WET SERVICES

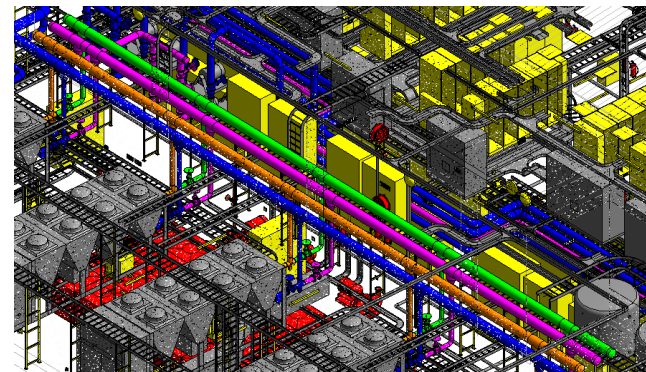
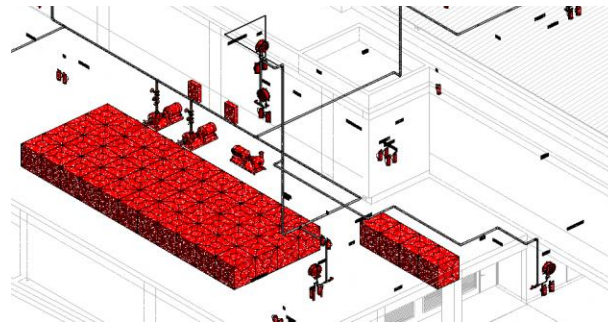
Stage 4: Documentation and procurement

- 4.1 Prepare documentation sufficient for local authority submission:
 - co-ordinate technical documentation with the **consultants** and complete primary co-ordination
 - prepare specifications for the works
 - review the costing and programme with the consultants
 - obtain the client's authority and submit documents for approval
- 4.2 Complete **construction documentation** and proceed to call for tenders:
 - obtain the client's authority to prepare documents to procure offers for the execution of the works
 - obtain offers for the execution of the works
 - evaluate offers and recommend on the award of the building contract
 - prepare the contract documentation (and arrange the signing of the building contract)



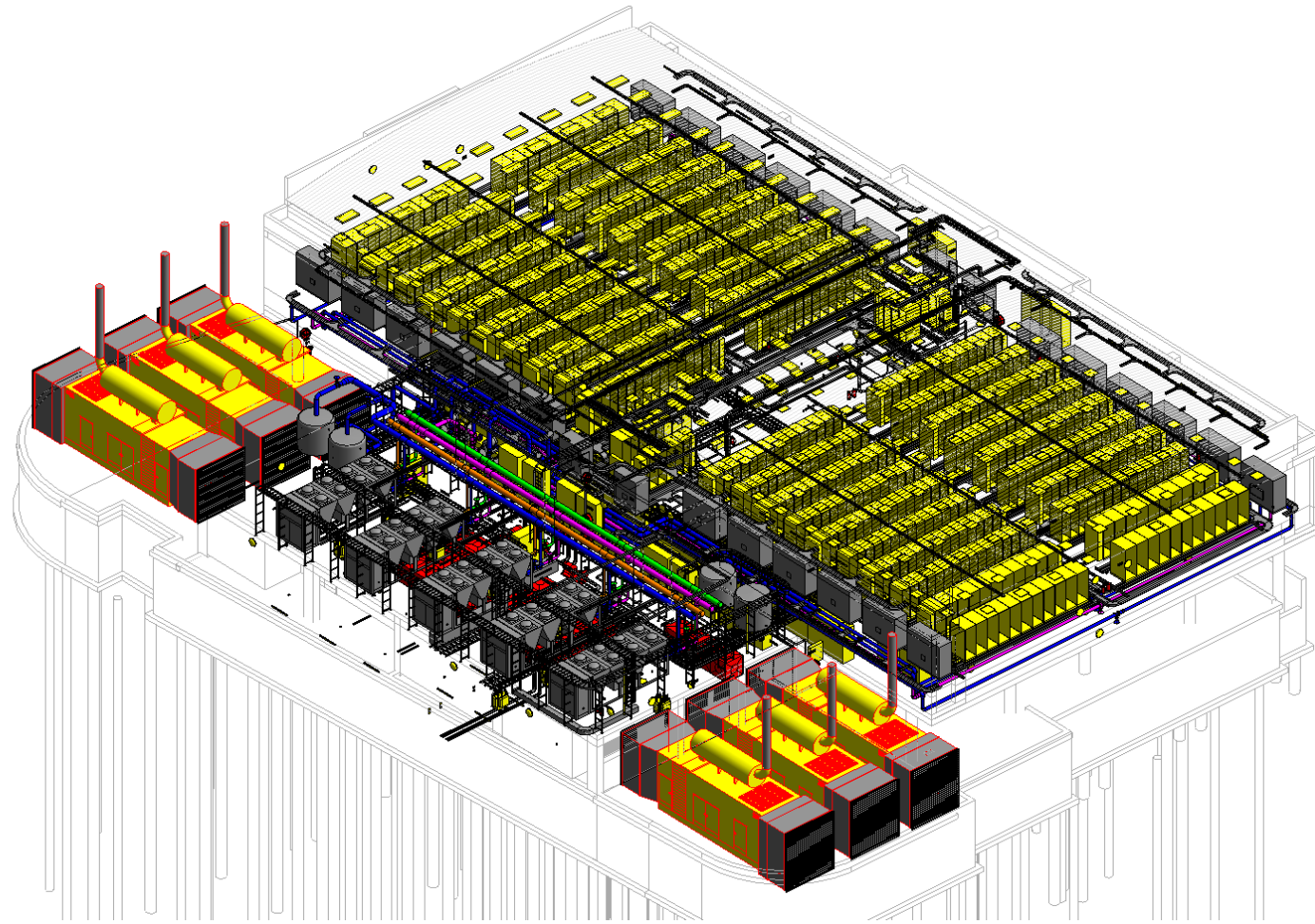


ARCH VS. STRUCTURAL VS. WET SERVICES VS. FIRE VS. MECHANICAL VS. ELECTRICAL



Stage 4: Documentation and procurement

- 4.1 Prepare documentation sufficient for local authority submission:
 - co-ordinate technical documentation with the **consultants** and complete primary co-ordination
 - prepare specifications for the works
 - review the costing and programme with the consultants
 - obtain the client's authority and submit documents for approval
- 4.2 Complete **construction documentation** and proceed to call for tenders:
 - obtain the client's authority to prepare documents to procure offers for the execution of the works
 - obtain offers for the execution of the works
 - evaluate offers and recommend on the award of the building contract
 - prepare the contract documentation (and arrange the signing of the building contract)



SHO SHO SHO! We final got through the toughest part! – Stage 4.1





BIM Work Stages

Stage 4.2

Tender Design

YORK BROTHERS CONSTRUCTION

Stage 4 is so important they split it into 2.

Secondly, we get to do it all again, but with finesse this time.

Stage 4: Documentation and procurement

- 4.1 Prepare documentation sufficient for local authority submission:
 - co-ordinate technical documentation with the **consultants** and complete primary co-ordination
 - prepare specifications for the works
 - review the costing and programme with the consultants
 - obtain the client's authority and submit documents for approval
- 4.2 Complete **construction documentation** and proceed to call for tenders:
 - obtain the client's authority to prepare documents to procure offers for the execution of the works
 - obtain offers for the execution of the works
 - evaluate offers and recommend on the award of the building contract
 - prepare the contract documentation (and arrange the signing of the building contract)

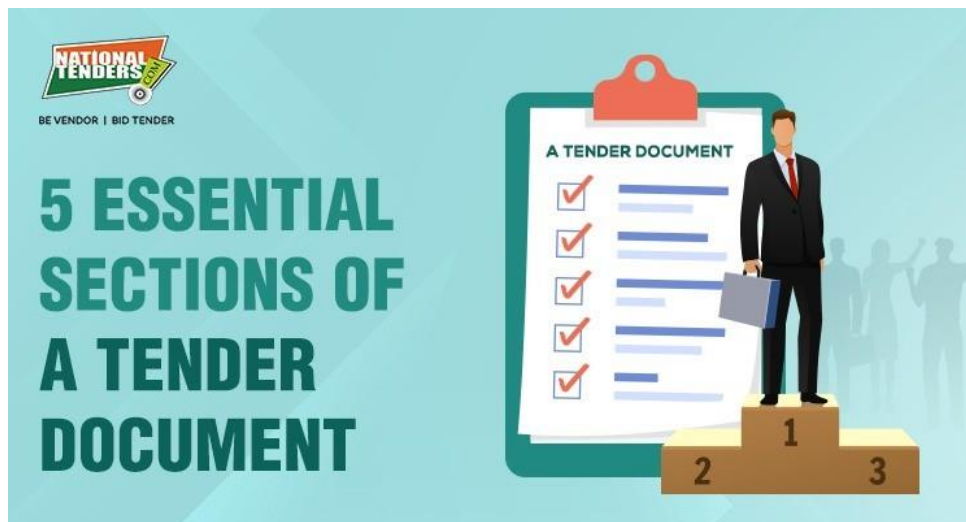




Stage 4: Documentation and procurement

- 4.1 Prepare documentation sufficient for local authority submission:
 - co-ordinate technical documentation with the **consultants** and complete primary co-ordination
 - prepare specifications for the works
 - review the costing and programme with the consultants
 - obtain the client's authority and submit documents for approval
- 4.2 Complete **construction documentation** and proceed to call for tenders:
 - obtain the client's authority to prepare documents to procure offers for the execution of the works
 - obtain offers for the execution of the works
 - evaluate offers and recommend on the award of the building contract
 - prepare the contract documentation (and arrange the signing of the building contract)





TENDERS RECEIVED		
Contractor A	Contractor B	Contractor C
R 100 000 000,00	R 105 000 000,00	R 95 000 000,00

Stage 4: Documentation and procurement

- 4.1 Prepare documentation sufficient for local authority submission:
 - co-ordinate technical documentation with the **consultants** and complete primary co-ordination
 - prepare specifications for the works
 - review the costing and programme with the consultants
 - obtain the client's authority and submit documents for approval
- 4.2 Complete **construction documentation** and proceed to call for tenders:
 - obtain the client's authority to prepare documents to procure offers for the execution of the works
 - obtain offers for the execution of the works
 - evaluate offers and recommend on the award of the building contract
 - prepare the contract documentation (and arrange the signing of the building contract)











Stage 4: Documentation and procurement

- 4.1 Prepare documentation sufficient for local authority submission:
 - co-ordinate technical documentation with the **consultants** and complete primary co-ordination
 - prepare specifications for the works
 - review the costing and programme with the consultants
 - obtain the client's authority and submit documents for approval
- 4.2 Complete **construction documentation** and proceed to call for tenders:
 - obtain the client's authority to prepare documents to procure offers for the execution of the works
 - obtain offers for the execution of the works
 - evaluate offers and recommend on the award of the building contract
 - prepare the contract documentation (and arrange the signing of the building contract)

TENDERS RECEIVED		
Contractor A	Contractor B	Contractor C
R 100 000 000,00	R 105 000 000,00	R 95 000 000,00

TENDERS RECEIVED		
Contractor A	Contractor B	Contractor C
R 99 000 000,00	R 100 000 000,00	R 100 000 000,00
		
		



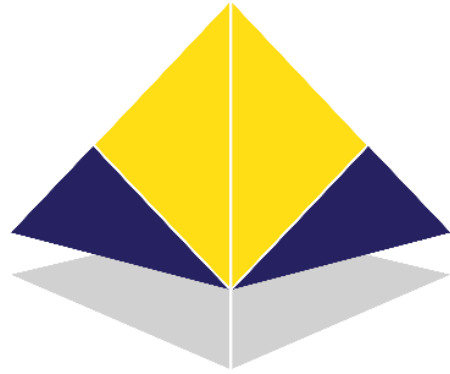


Stage 4: Documentation and procurement

- 4.1 Prepare documentation sufficient for local authority submission:
 - co-ordinate technical documentation with the **consultants** and complete primary co-ordination
 - prepare specifications for the works
 - review the costing and programme with the consultants
 - obtain the client's authority and submit documents for approval
- 4.2 Complete **construction documentation** and proceed to call for tenders:
 - obtain the client's authority to prepare documents to procure offers for the execution of the works
 - obtain offers for the execution of the works
 - evaluate offers and recommend on the award of the building contract
 - prepare the contract documentation (and arrange the signing of the building contract)



THANK YOU!



YORK BROS
CONSTRUCTION
EXCELLENCE ANYONE CAN TRUST

CONTACT US

EMAIL: NATHAN@YORKBROS.CO.ZA

TEL: 076 0523 065



BIM Work Stages

Stage 5

Manufacture & Construction

OPENSOURCE, BAKER BAYNES



360° Jobsite Capture & Artificial Intelligence

Jaco Barnard,
Managing Director, Agile Business Technology

OpenSpace Automates 360 Documentation & Analytics

HOW IT WORKS



A wearable 360 camera and mobile app (iOS and Android supported).

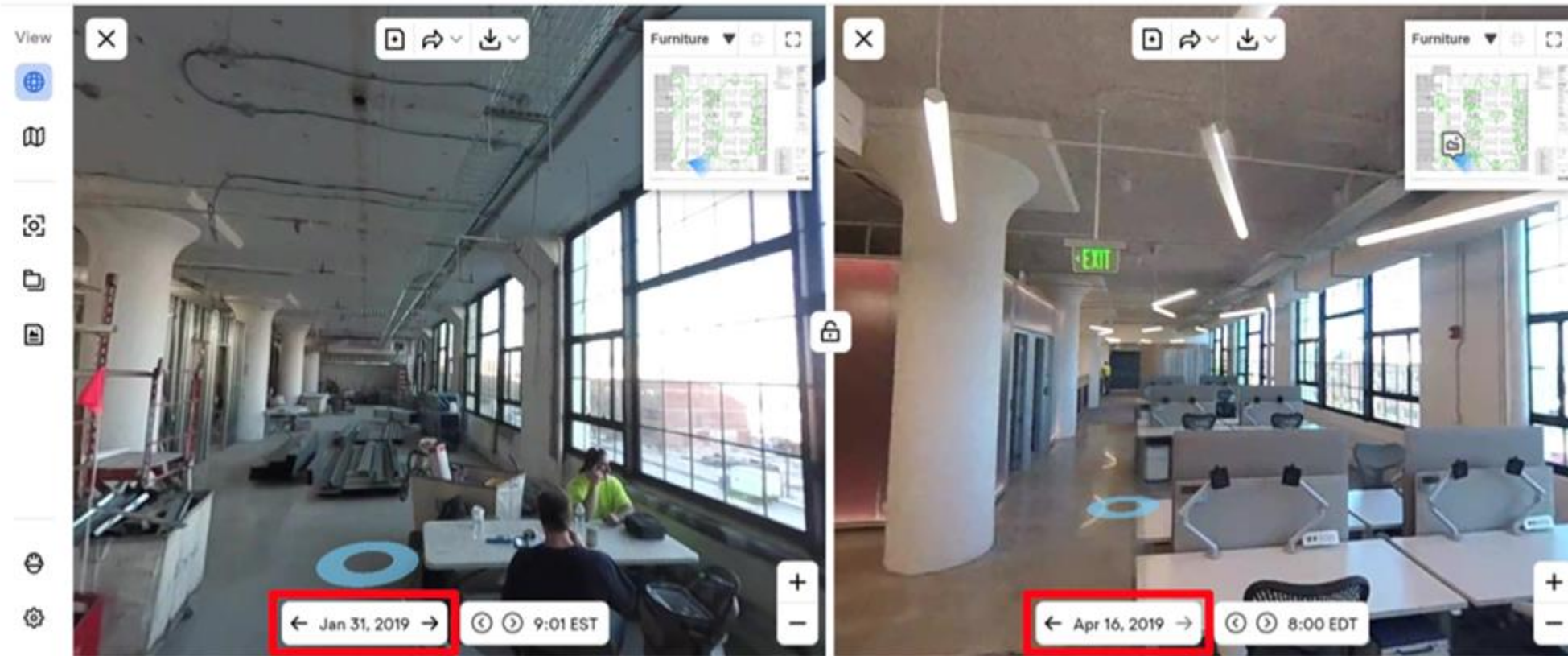


OpenSpace Vision Engine processes, organizes, and securely stores the data



Browser-based virtual jobsite viewer. Integrated with project management software.

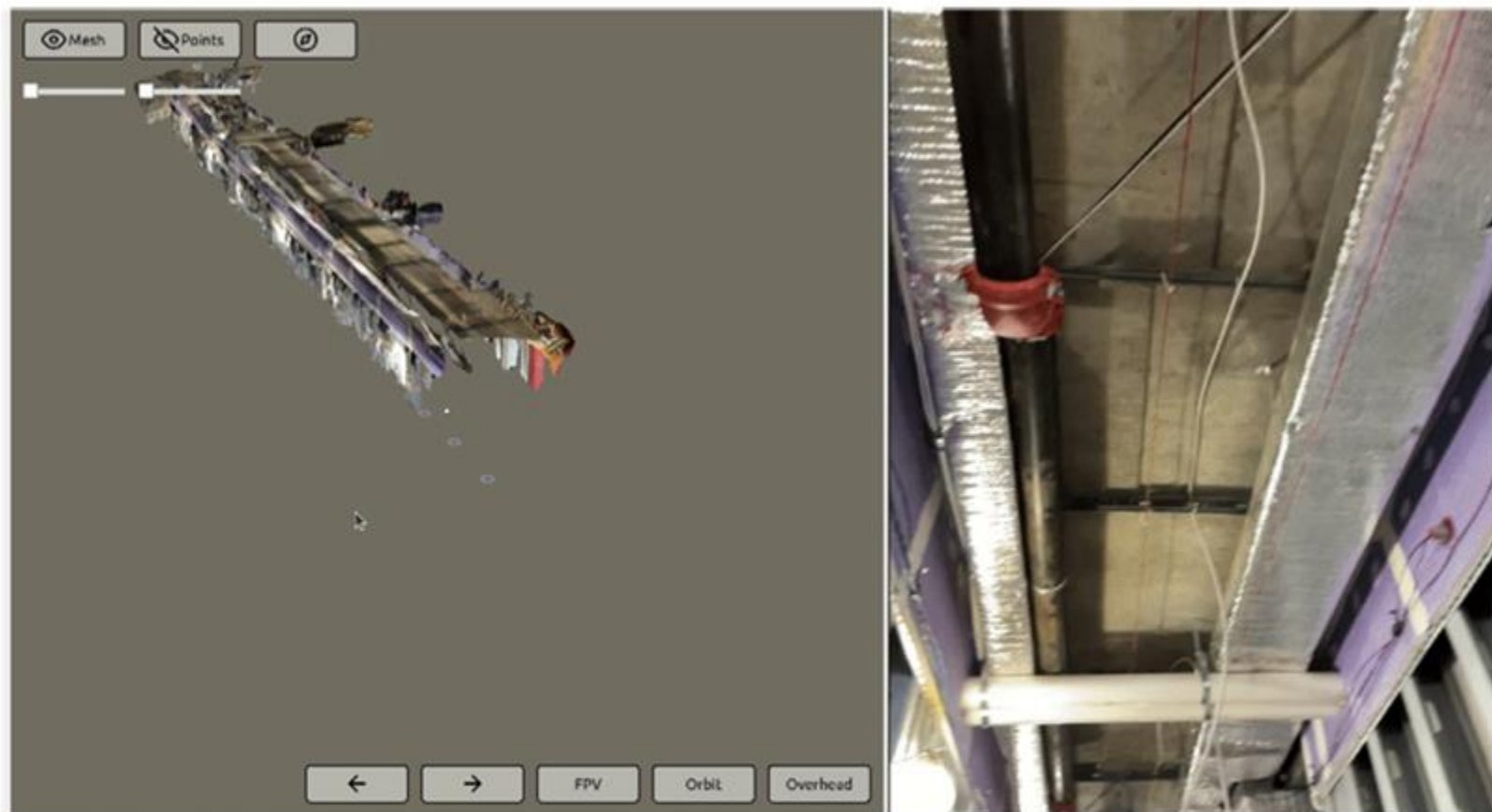
See What Was There Today, Yesterday, a Week Ago, or Even Five Years Ago



Compare Actual Site Conditions to Your 3D Model

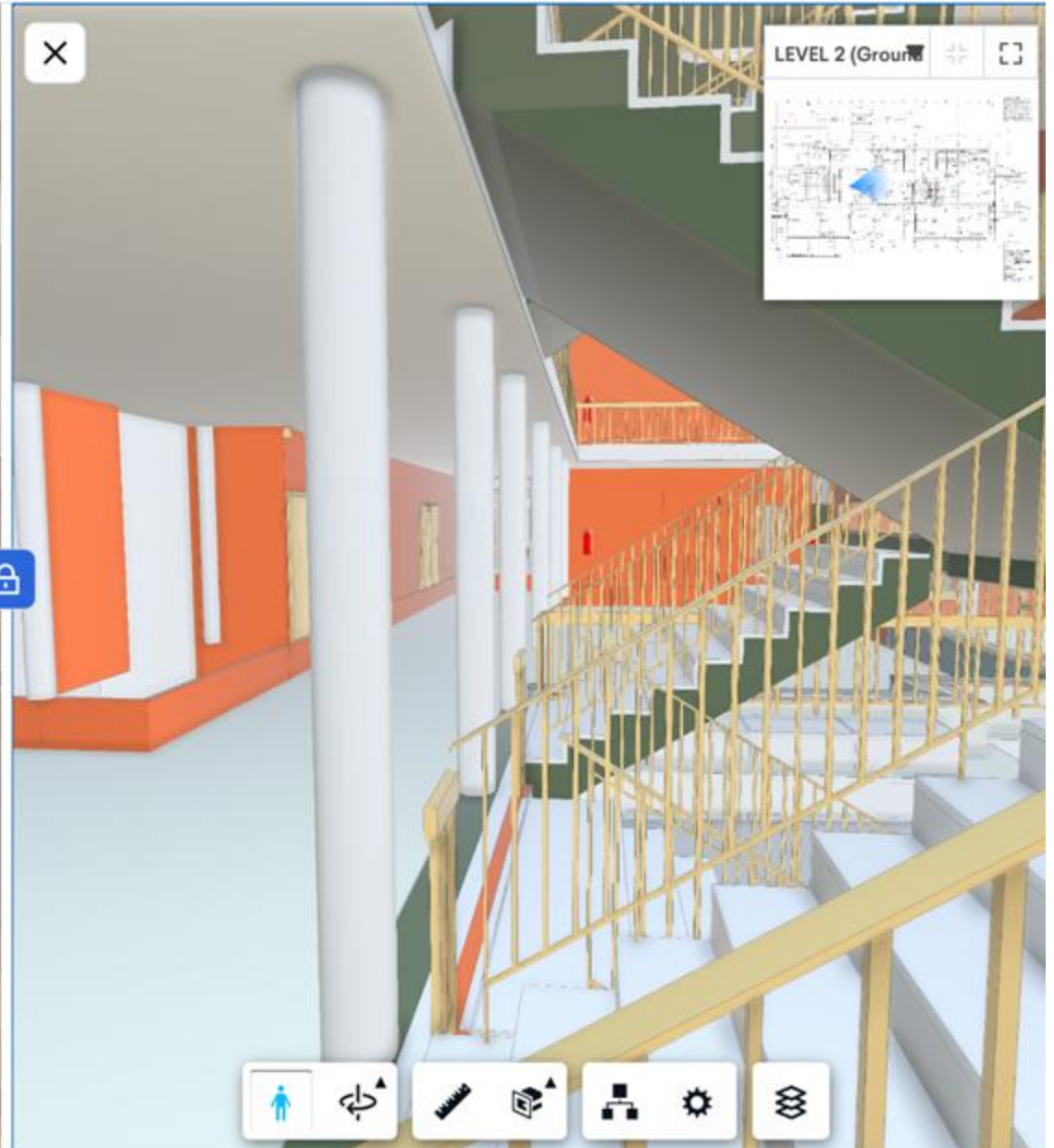
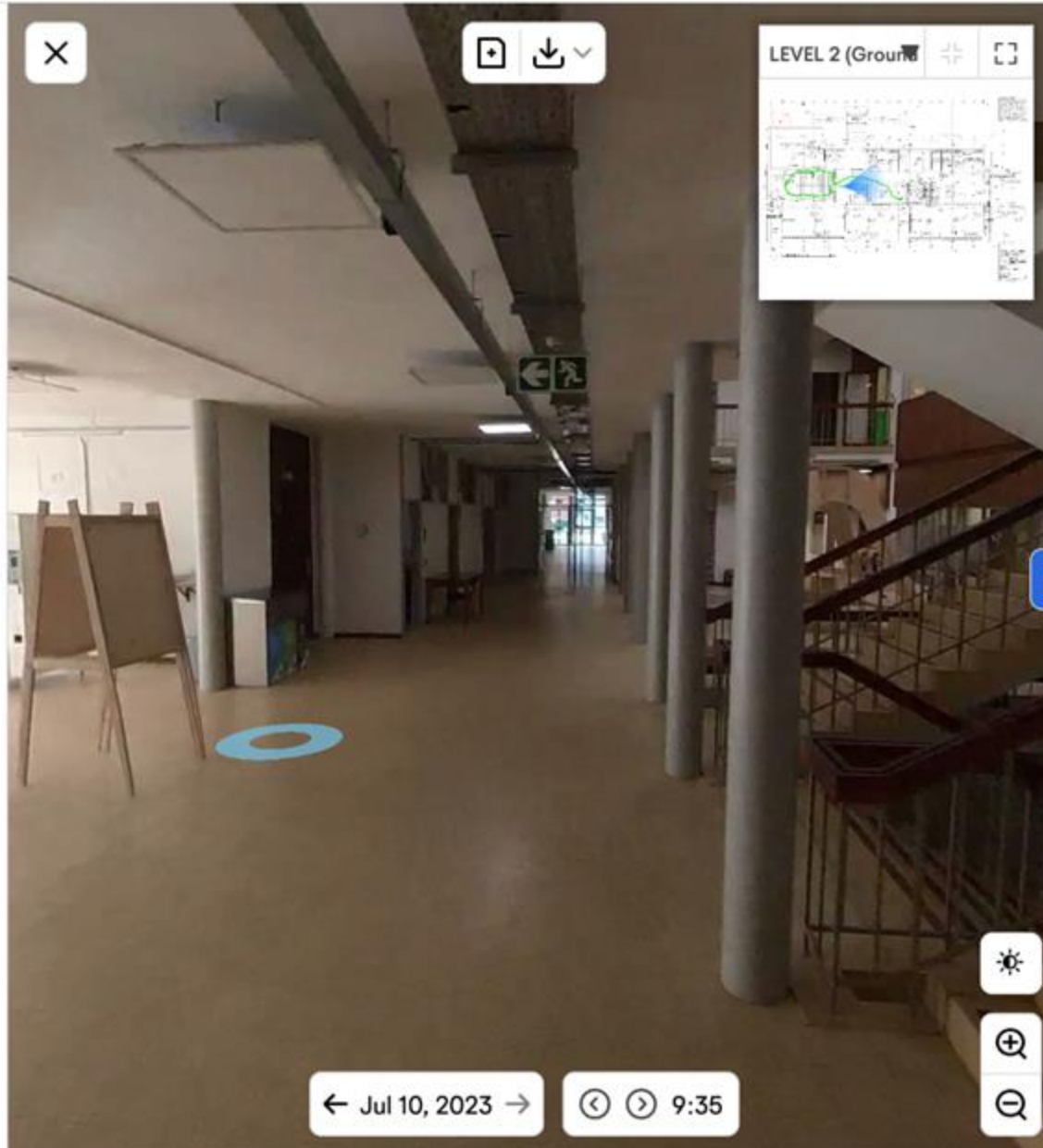


3D Scanning with Smart Phones





BOUKUNDE MODEL 2.ifc
May 20, 2023 5:20 PM • jaco@agile.co.za



Three Pillars of 360 Jobsite Capture



Simple

Tap Start
Walk like Normal
Tap Stop



Fast

30 minutes or less from
upload to view



Powerful

If you can use Google
Street View you can use
OpenSpace



Tell Kevin we need to redo this wall!



- Material recall, okie dokey.



- Redesign the hall?



We need to install-



- We have to demo it all!



- Fire in the wrecking ball!

LEAVE NO ROOM FOR INTERPRETATION

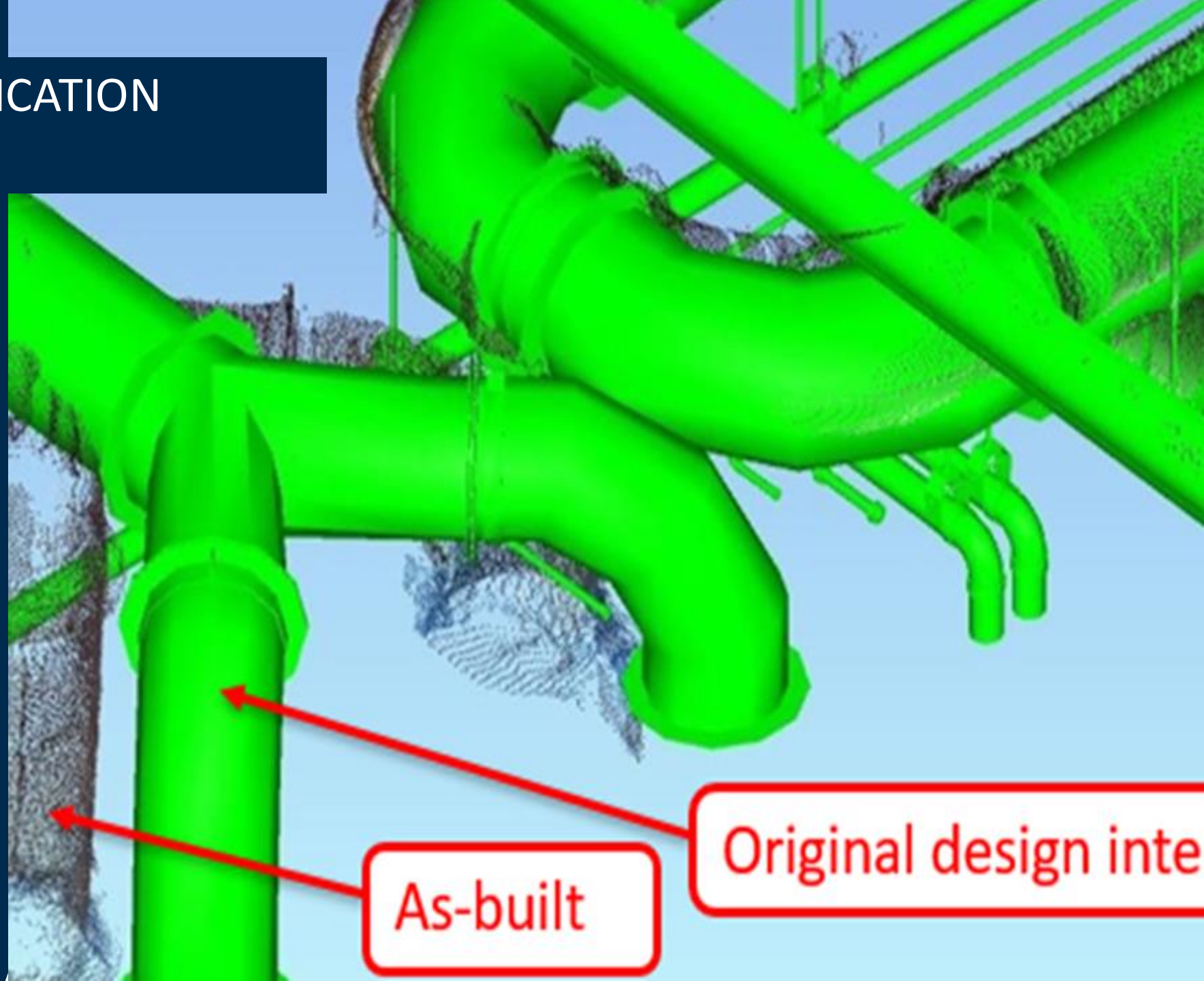
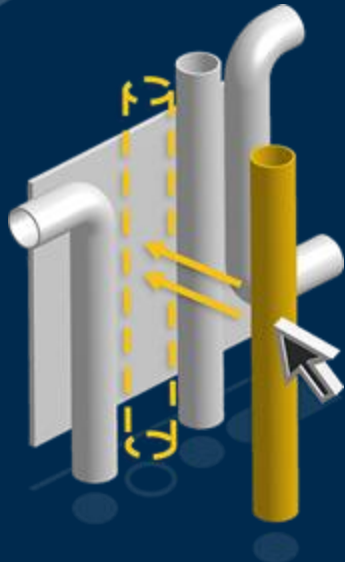
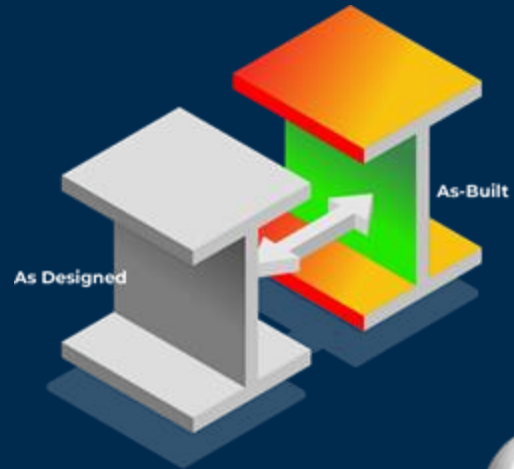


REALITY CAPTURE Construction Monitoring



CONSTRUCTION VERIFICATION

Quality Control



QUALITY INSPECTIONS

CONSTRUCTION MANAGEMENT

MANAGE AND TRACK CONSTRUCTION ISSUES & CHANGES

3 0-1 - Concrete Pre Pour Checklist

1. Pre Pour Information

1.1 Location of pour

1. Forms and Accessories

2.1 Verify location, dimensions and grades are as required.

☐ Pass ☐ Fail ☐ NA

2.2 Verify formwork materials are as specified.

☐ Pass ☐ Fail ☐ NA

RFIs

Create RFI

RFI #6

In Review

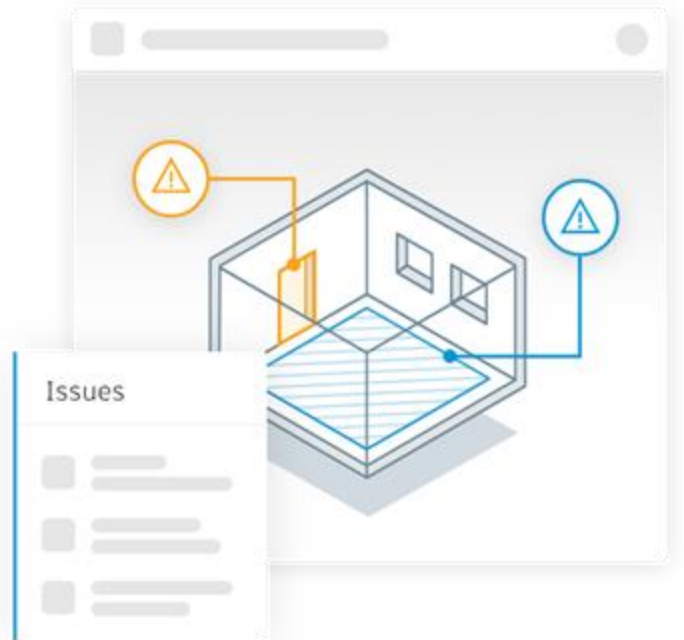
Submit

Details

Attachments

Activity

Issues





BIM Work Stages

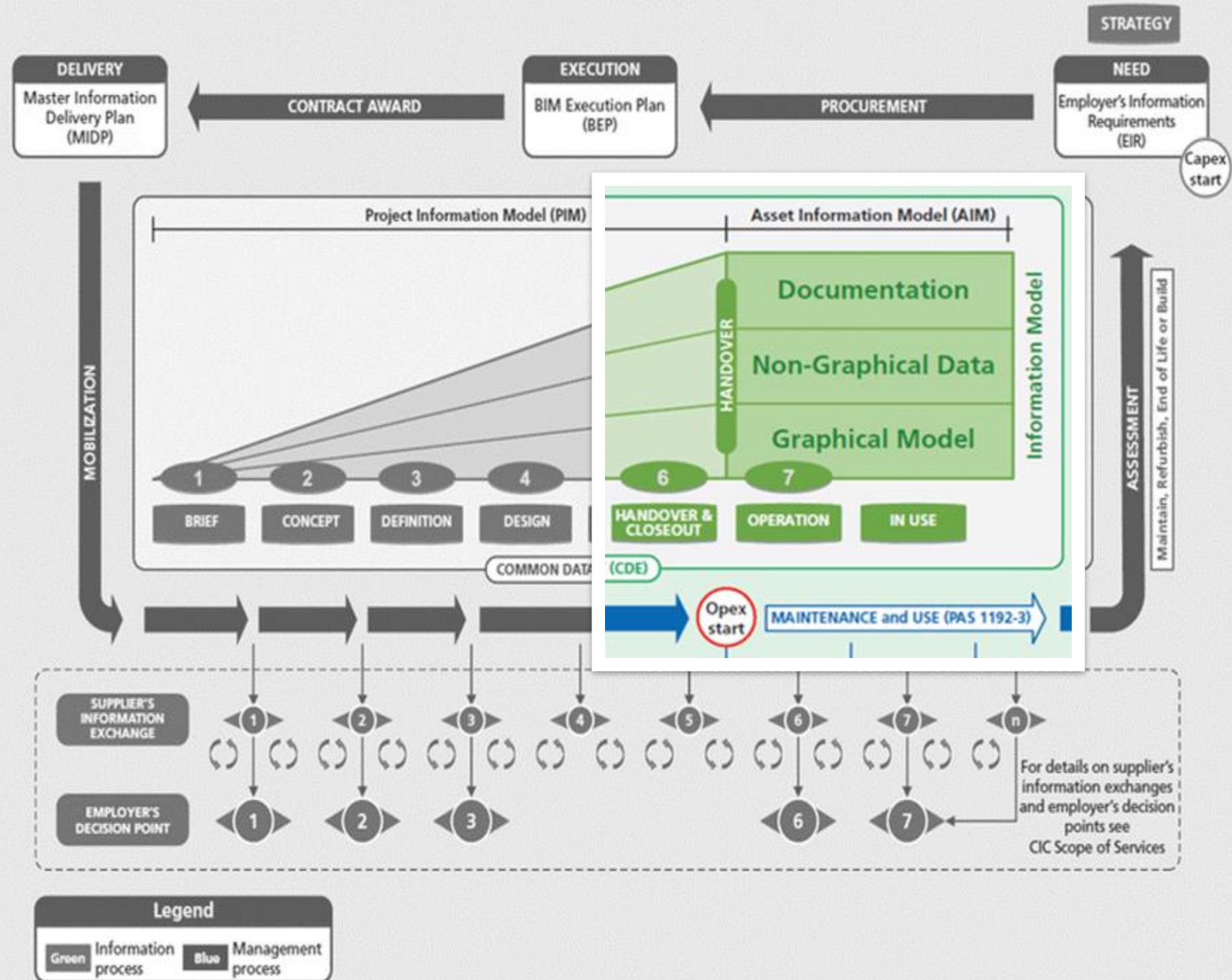
Stage 6

Close-out & Handover

BAKER BAYNES

BIM

From PIM - AIM



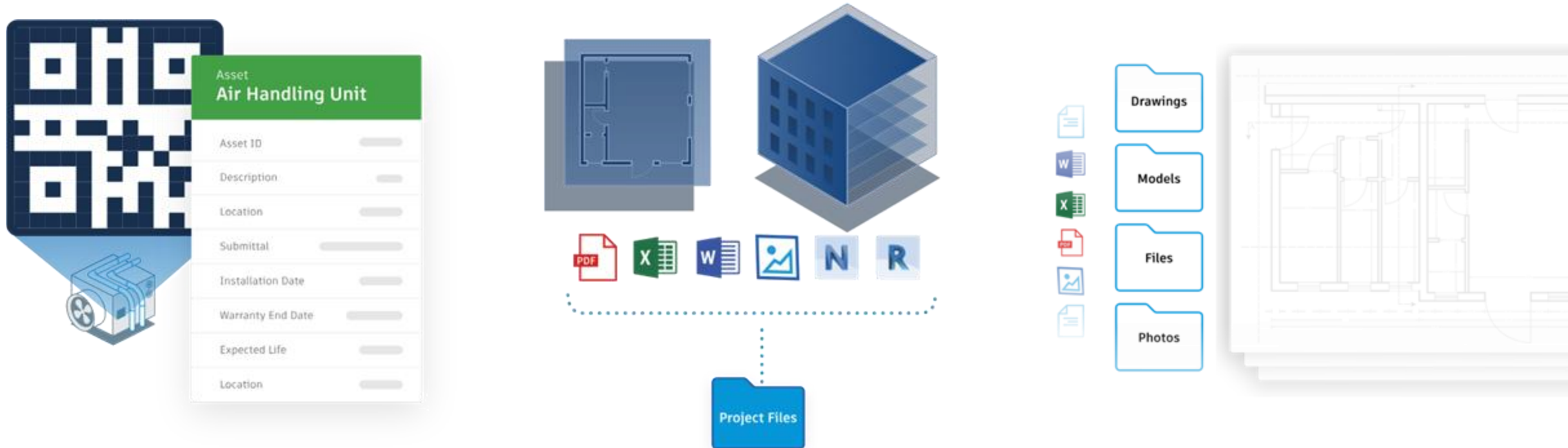
COMMISSIONING

- Access asset data and resolve defects

GENERATE TURNOVER DOCUMENTATION

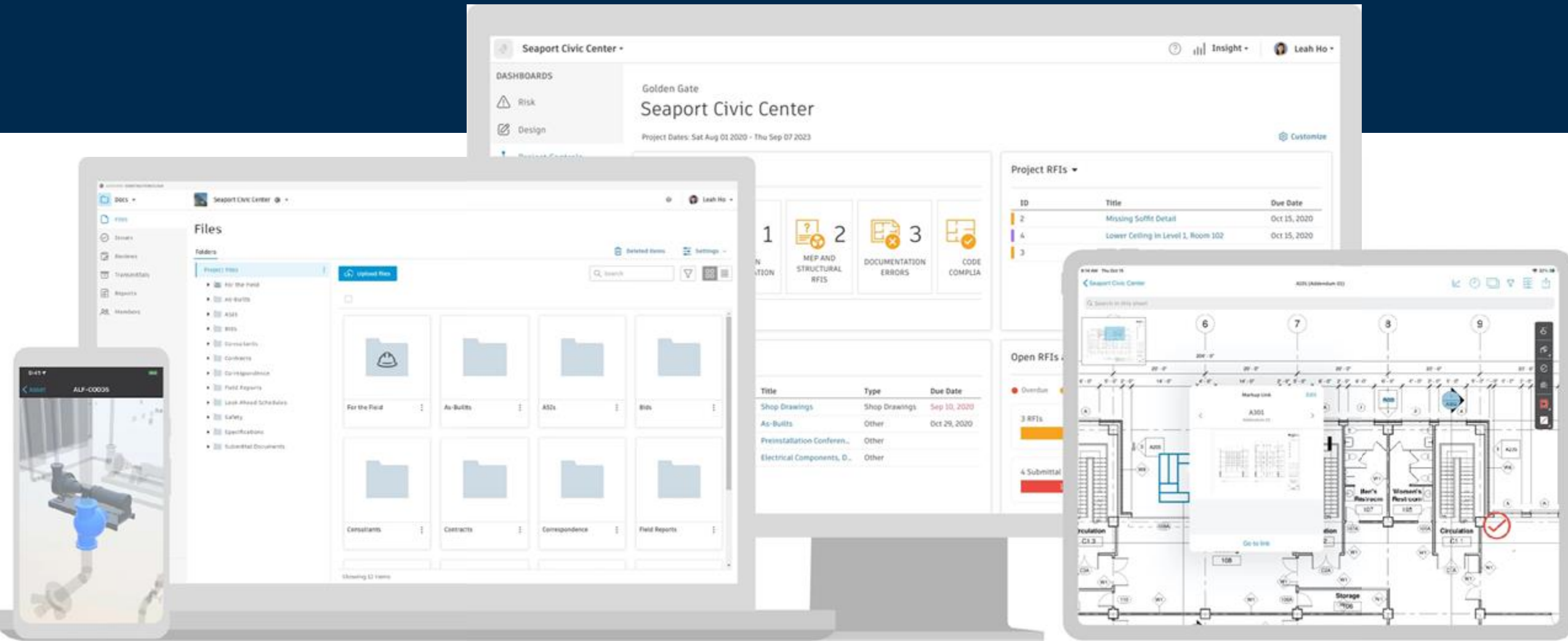
- That meets Information Requirements

DELIVER ACCURATE AS-BUILTS



COMMON DATA ENVIRONMENT

- Structured information, that someone can find (and use) 10 years down the line





BIM Work Stages

Stage 7

Operations & Use

ESRI

BIM

Supplies detailed information about *built* assets.



GIS

Provides information about assets in the context of the *built* and *natural* environment.



Geography and Design

An Integrated and Holistic Approach

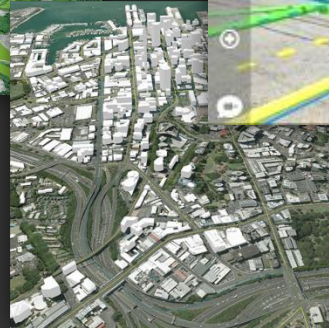
CONTEXT



Landscape
Information Models

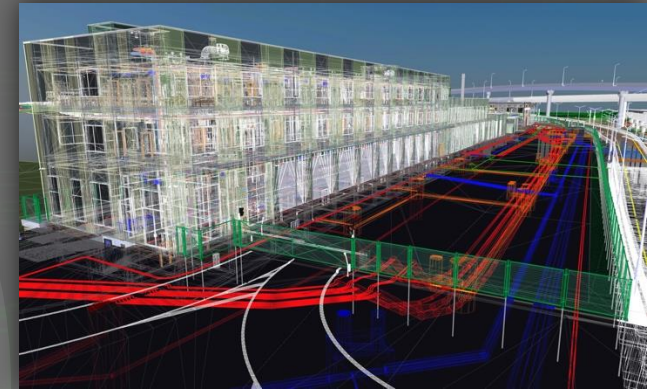


Network Information
Models



City Information Models

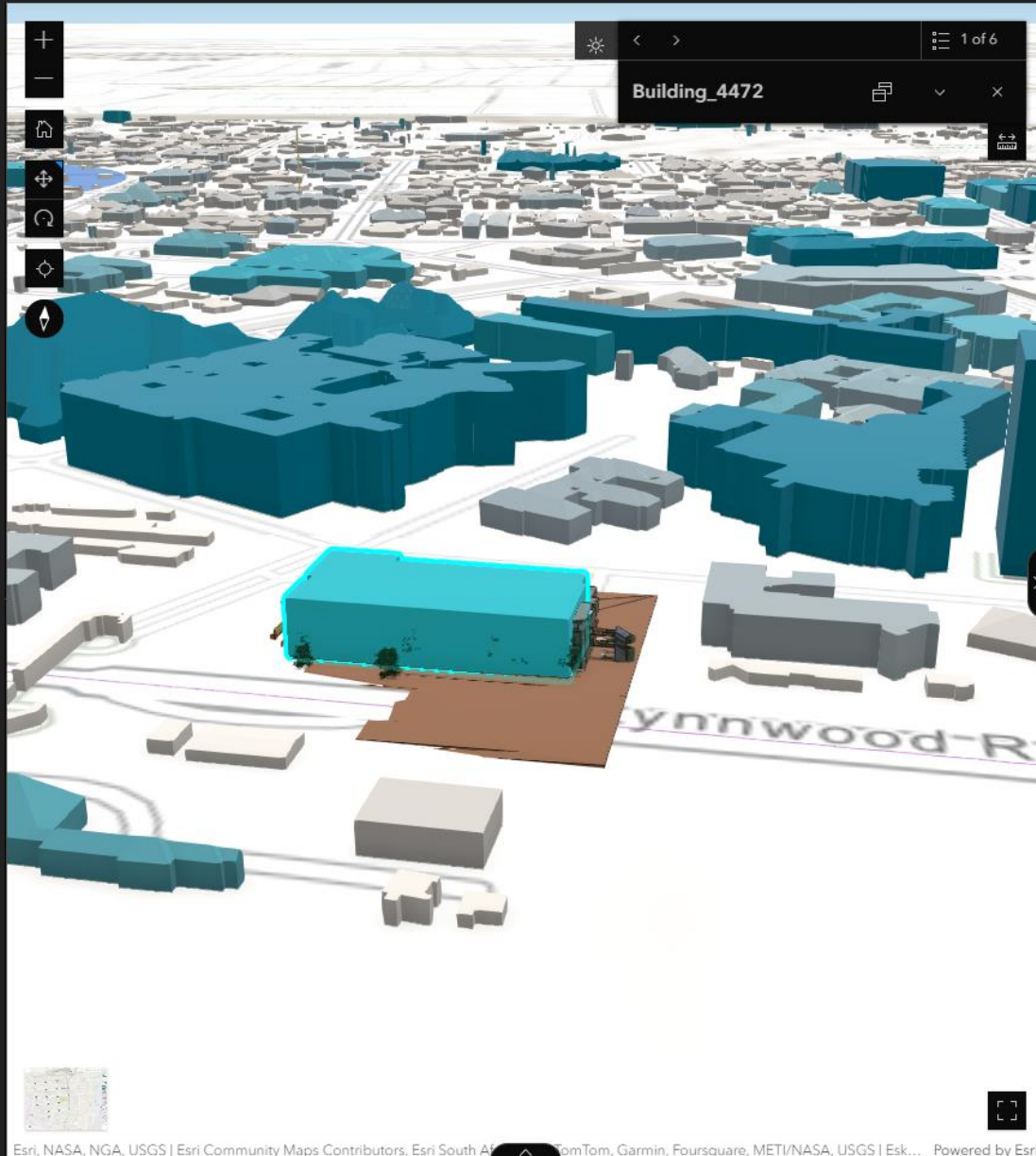
CONTENT



Building Information Models

*Geography Provides the
Common Language for Collaborating*

ArcGIS GeoBIM



Document: A1-11 FLOOR PLAN_ LEVEL 1 REV 04.pdf



Safety Planning

Fire Decision System Based on BIM & GIS 🔥

Rescue Stimulation



search for items inside the building



00 00 21



Level1  Level2

Your location | Fire location

Point2

1
2
All

/ Quick Navigation /

West entrance

East entrance

North entrance

location one

location two

location three



Mobile Worker Maintenance Form

Work Order ID
US-013

Location
Verify that the location is turned on in your device
33°56'S 18°52'E

Name & Surname
Odwa Dandala

Staff email
odandala@esri-southafrica.com

Worker ID *
OD

Completion Date
Thursday, 13 October 2022
13:59

Mobile Worker Maintenance Form

Completion Date
Thursday, 13 October 2022
17:08

Status *
☐ In Progress
☐ Declined
☒ Completed
☐ On Hold

Priority
Medium

Assignment Type *
Condition-Based Maintenance

Assignment Description
Assess condition of fibre

On Site Notes
Please provide any additional notes
Everything is good

4982

Mobile Worker Maintenance Form

Condition *
☐ Bad
☐ Good
☒ Very Good

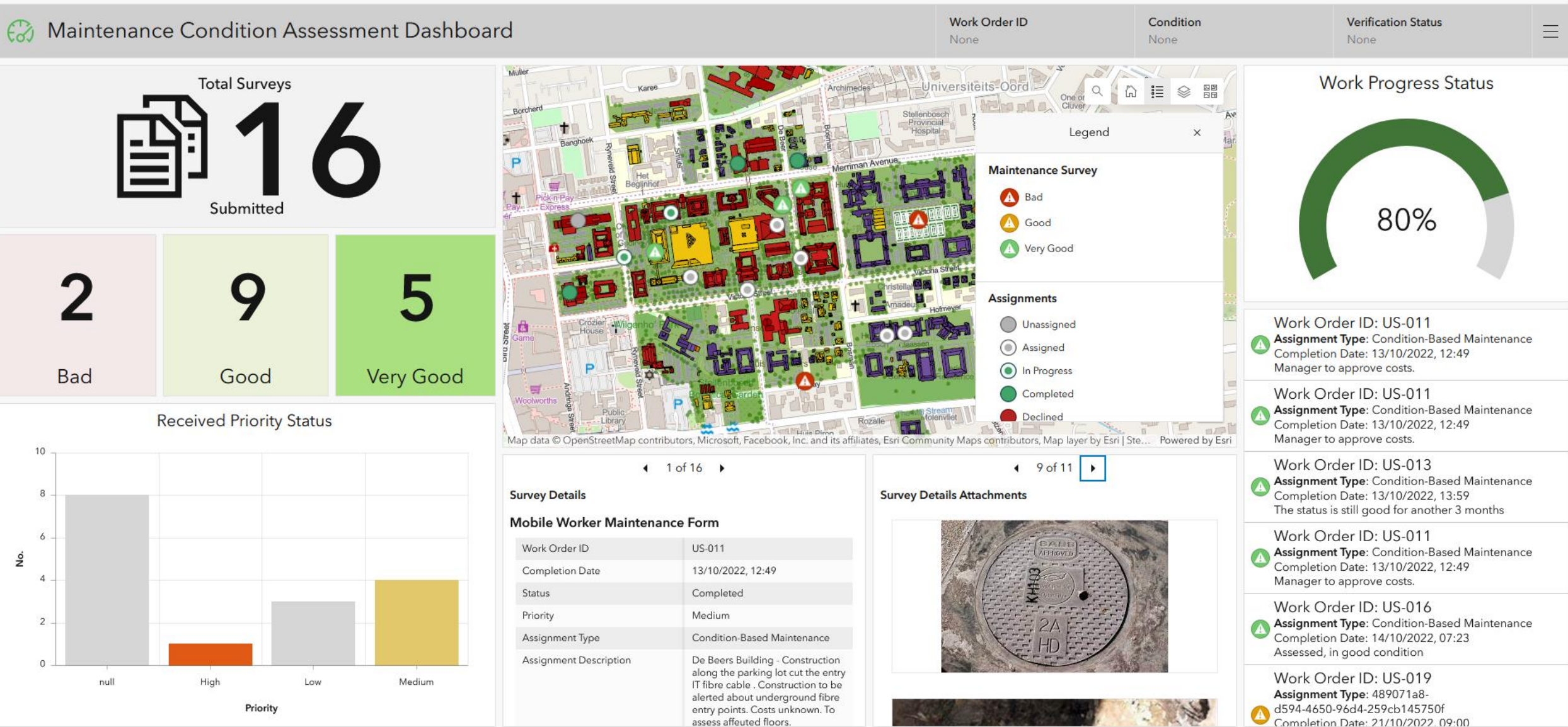
Pictorial Evidence

Signature *

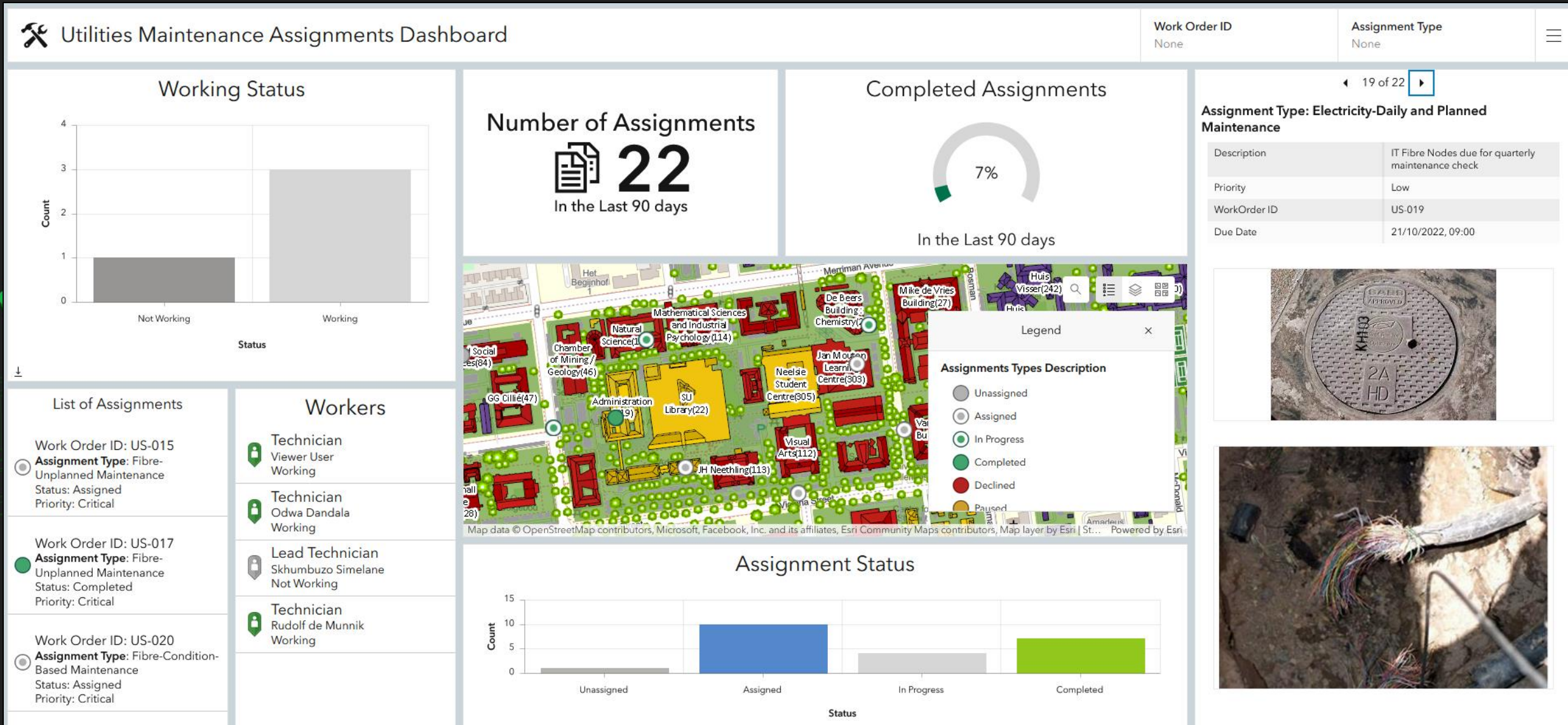
Compliance*
☒ I agree that the assignment is completed



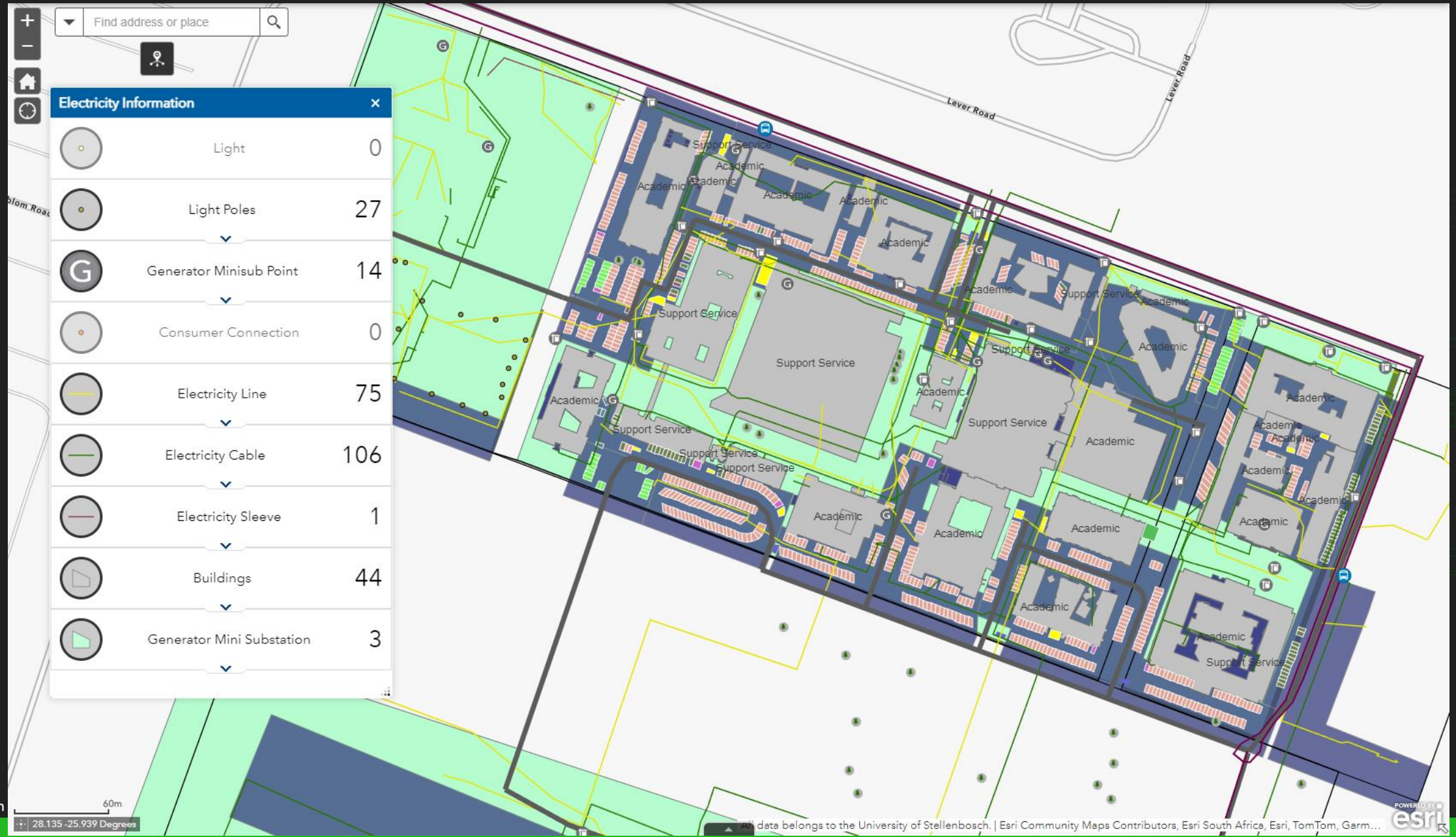
Campus Operational Management



Campus Utility Maintenance Management



Campus Utility Inventory





BIM Work Stages

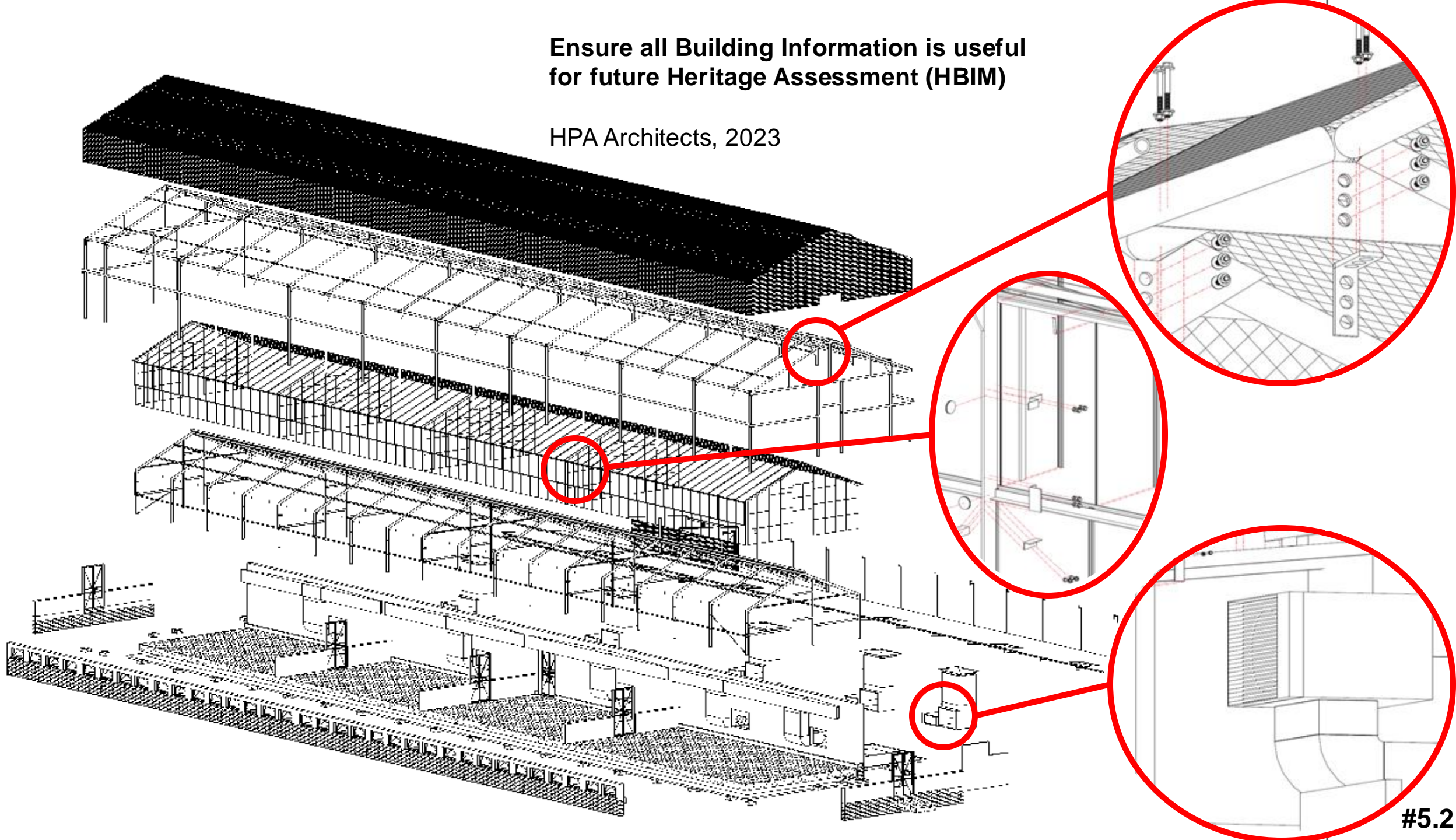
Stage 8

Heritage or Decommissioning

UNIVERSITY OF PRETORIA

**Ensure all Building Information is useful
for future Heritage Assessment (HBIM)**

HPA Architects, 2023



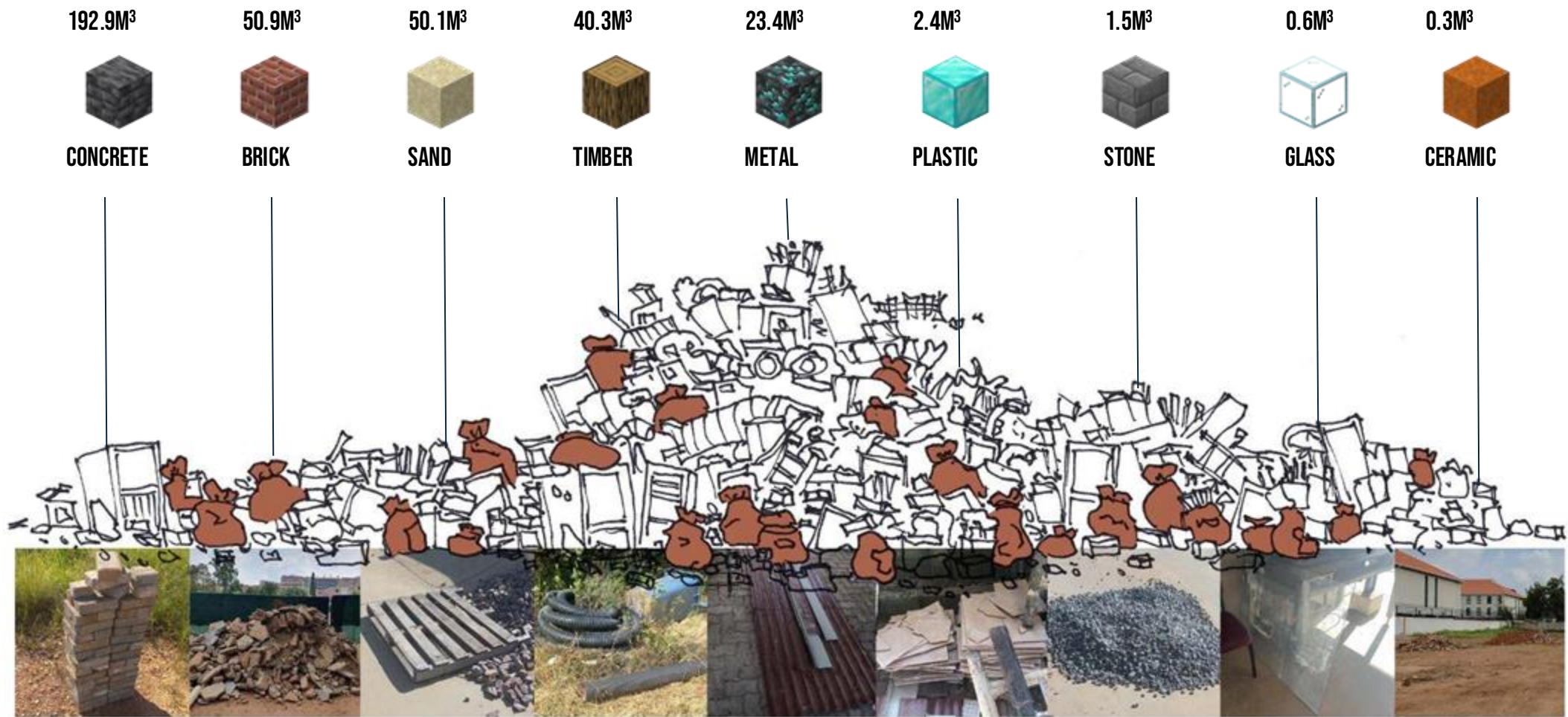


BIM Work Stages

Stage 9


Circularity & Re-Use

UNIVERSITY OF PRETORIA



GOVENDER & TAYLOR, 2023
FUTURE CITIES STUDIO, DEPARTMENT OF ARCHITECTURE, 2023

Ensure that Built Environment Information contributes to Circularity in the future

The background is an aerial view of a city, possibly a simulation or a stylized map. It features various buildings, roads, and green spaces. A large, dark, semi-transparent rectangular overlay is centered on the image. Inside this overlay, there is a large white circular arrow pointing clockwise. The text is positioned within this dark area.

Wait a minute,
Better Information Management (BIM)
is the only path to achieve a

Circular Built Environment