Advanced
Construction
Information
Development Ltd.

BIM – Management Training

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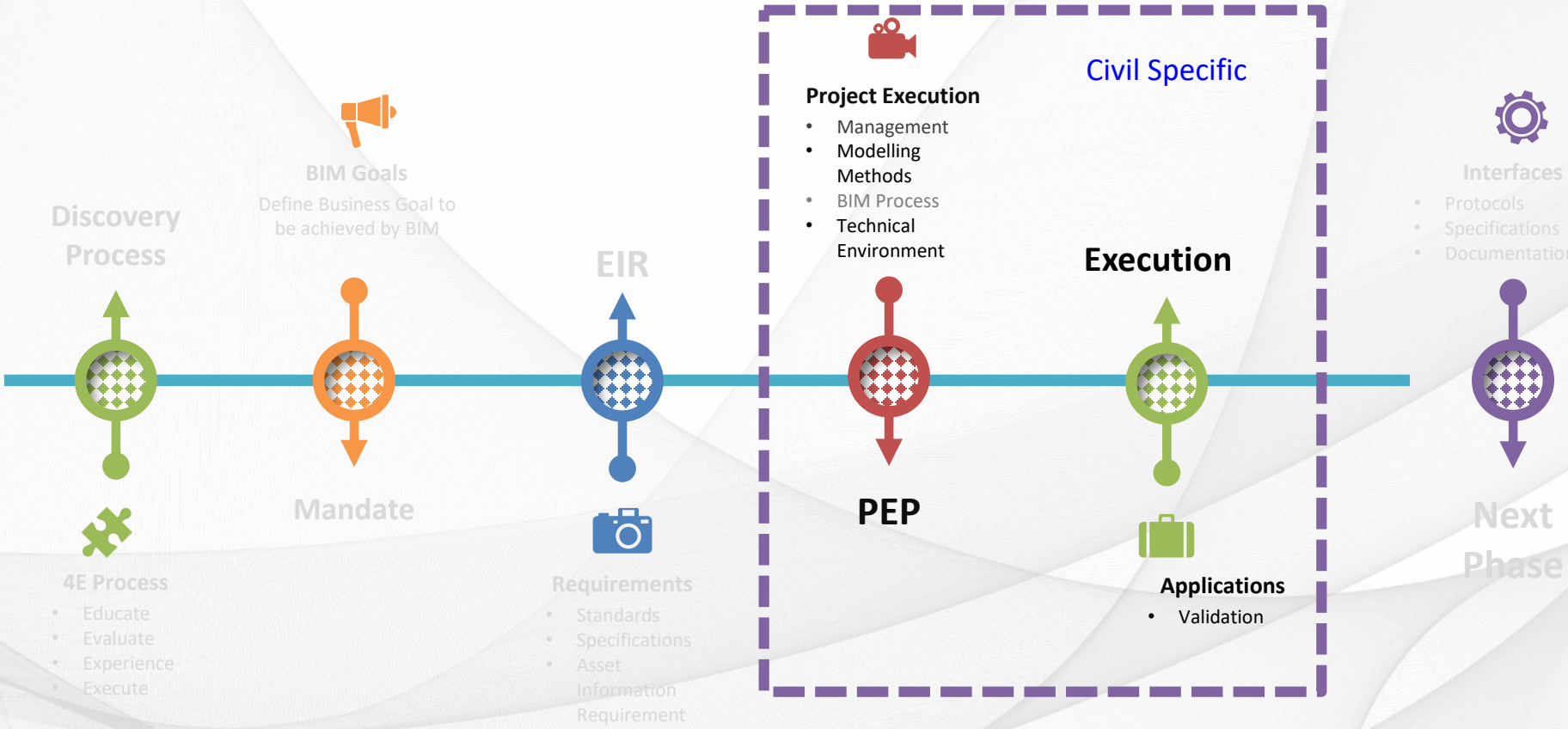
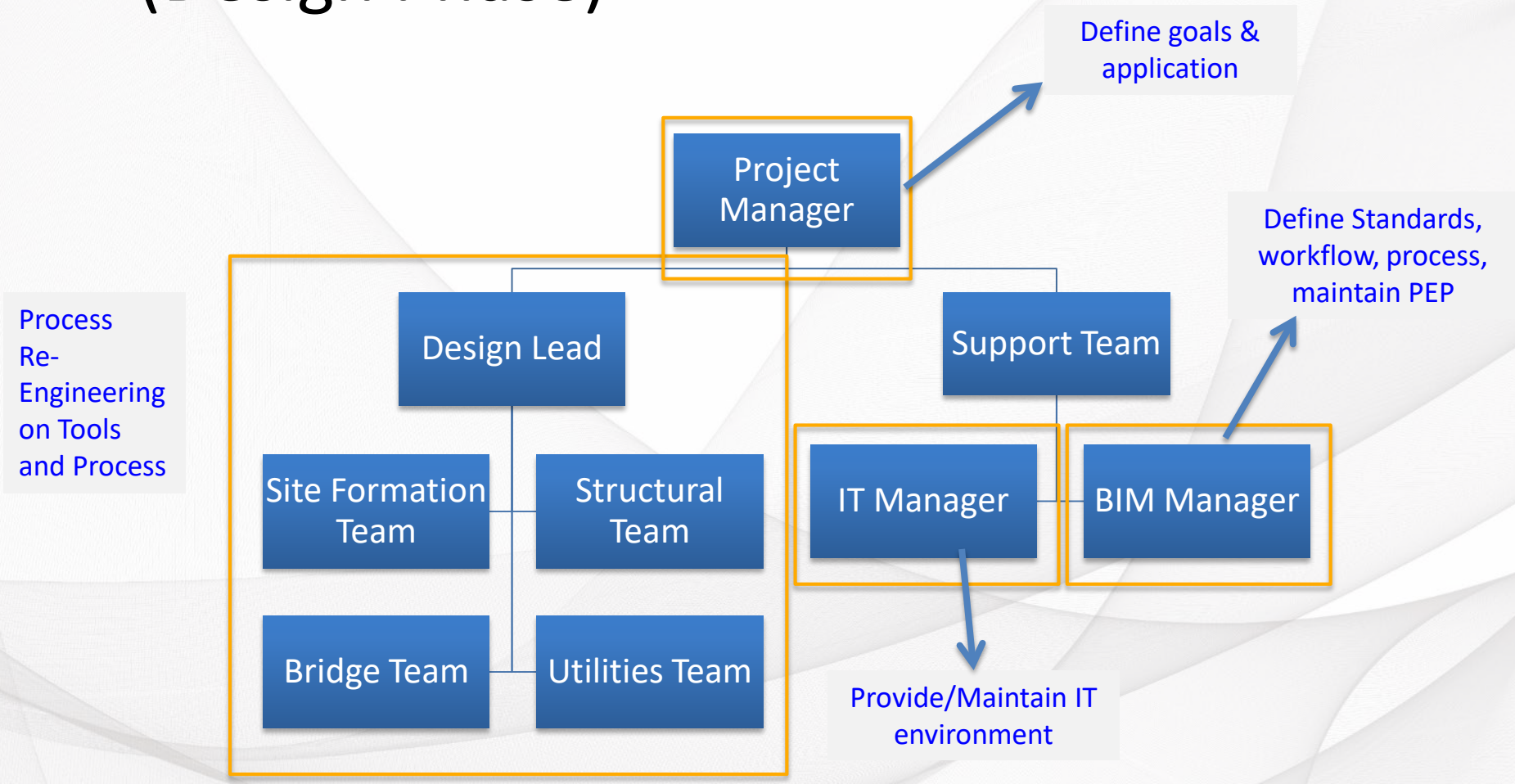
Day 3 - BIM Model as a Project Database (Full Day)

1. Civil Project Execution

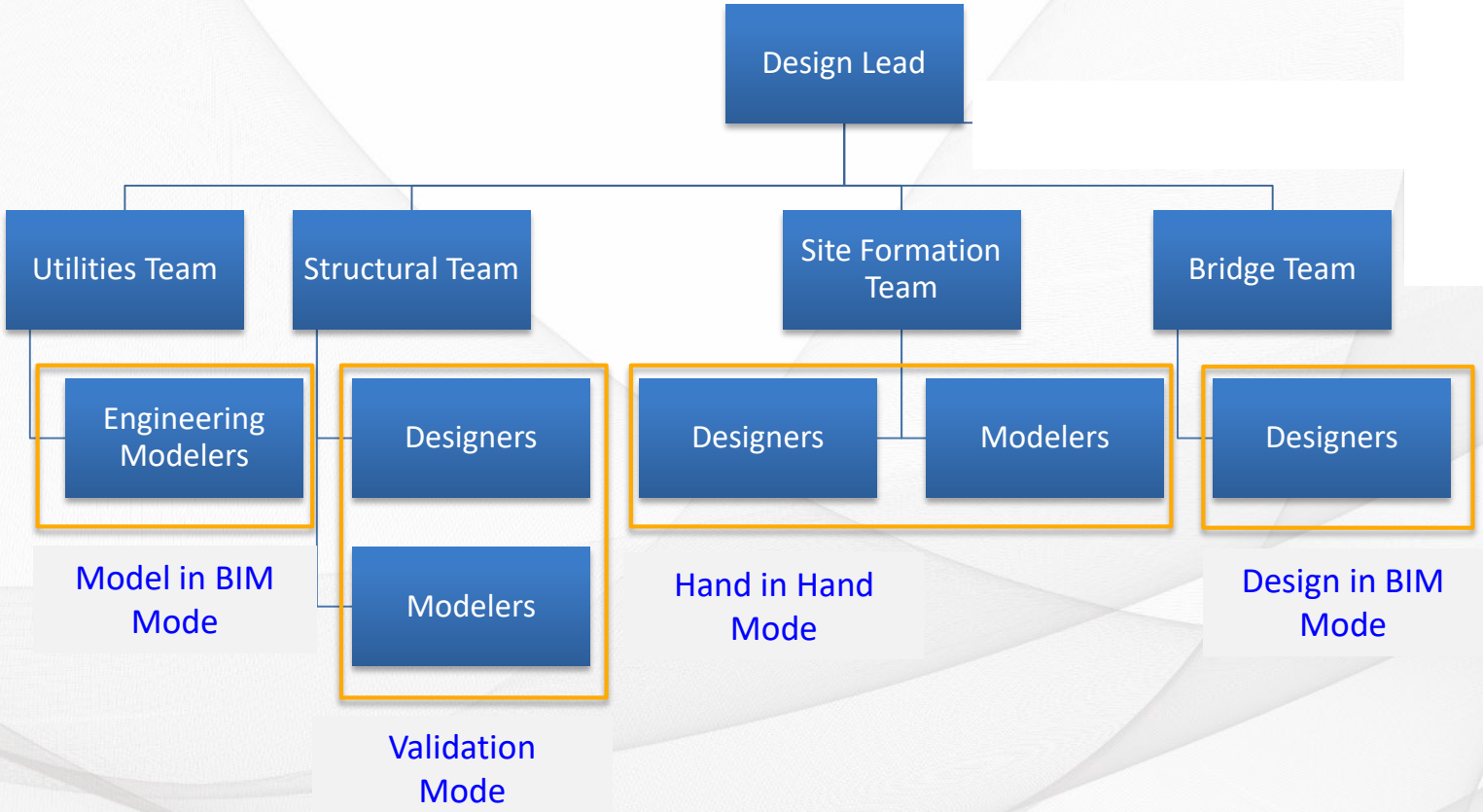


2. O-Chart, Role and Responsibility (Design Phase)



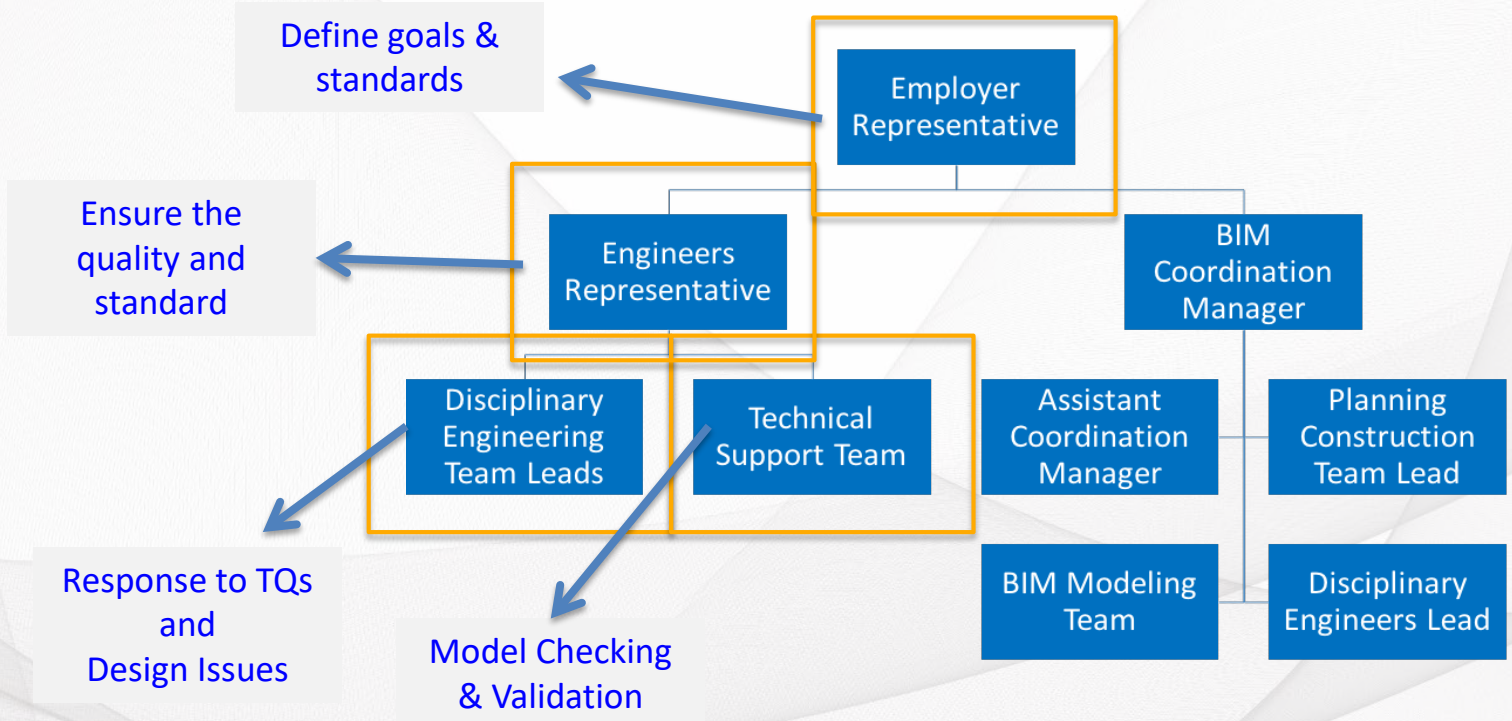
- The Role and Responsibility to be setted up at the beginning
- BIM Manager under Support Team for Project Manager

3. Mode of Process Re-engineering



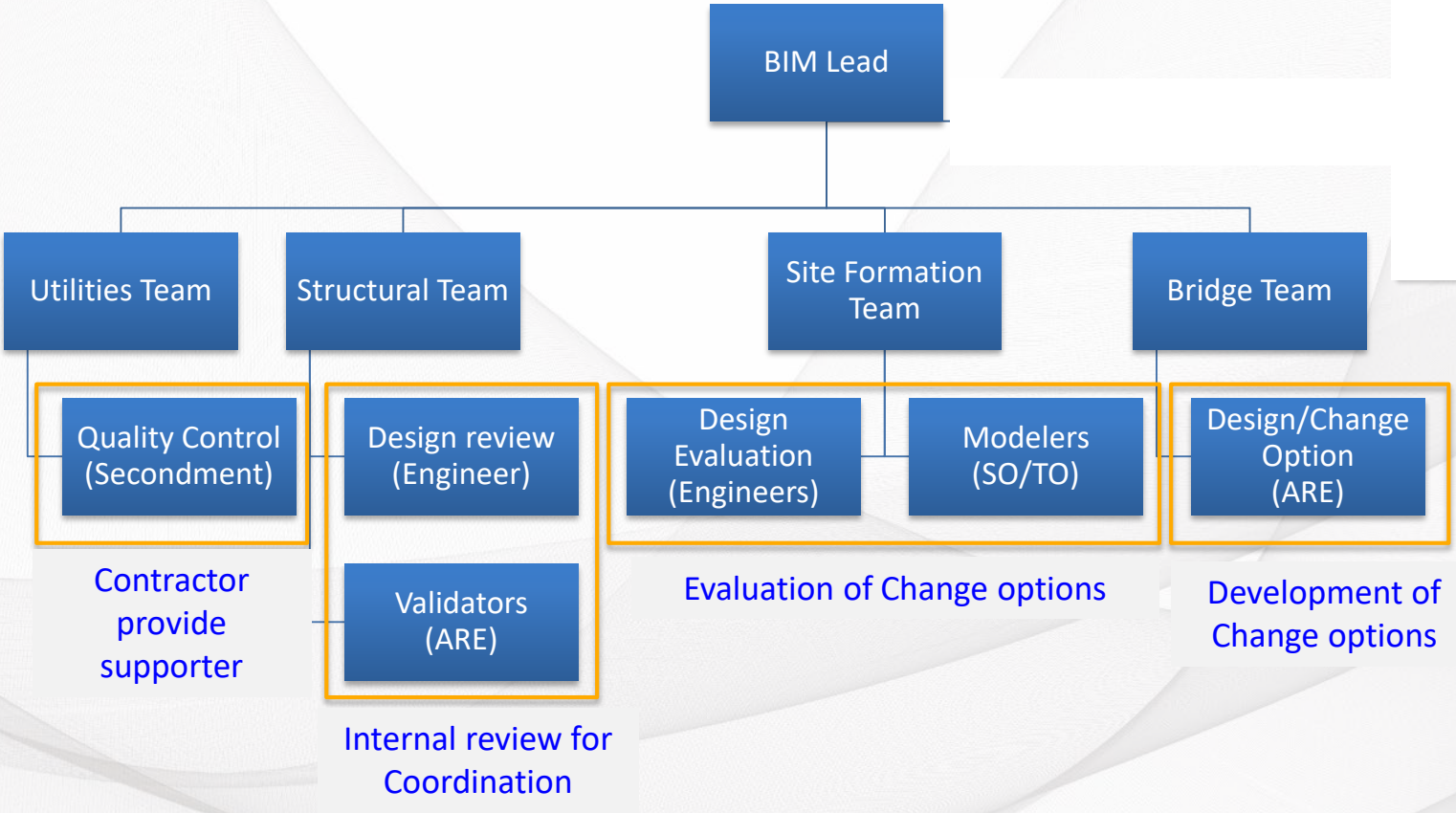
- BIM Model under each discipline

4. O-Chart, Role and Responsibility (Construction Phase)

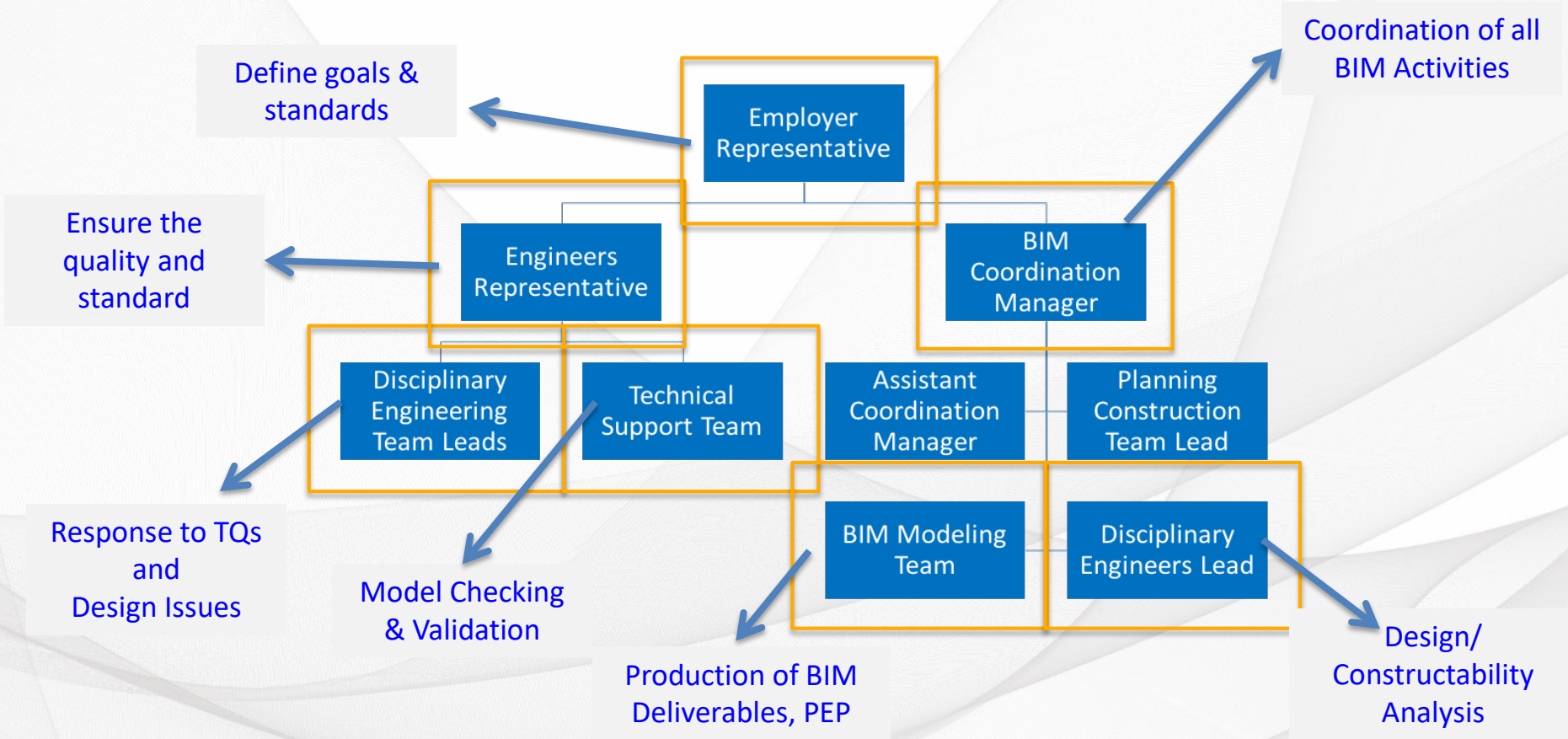


- Respective Representative to define Goals & Standard
- Engineering to response TQ and Model checking by Technical Support Team

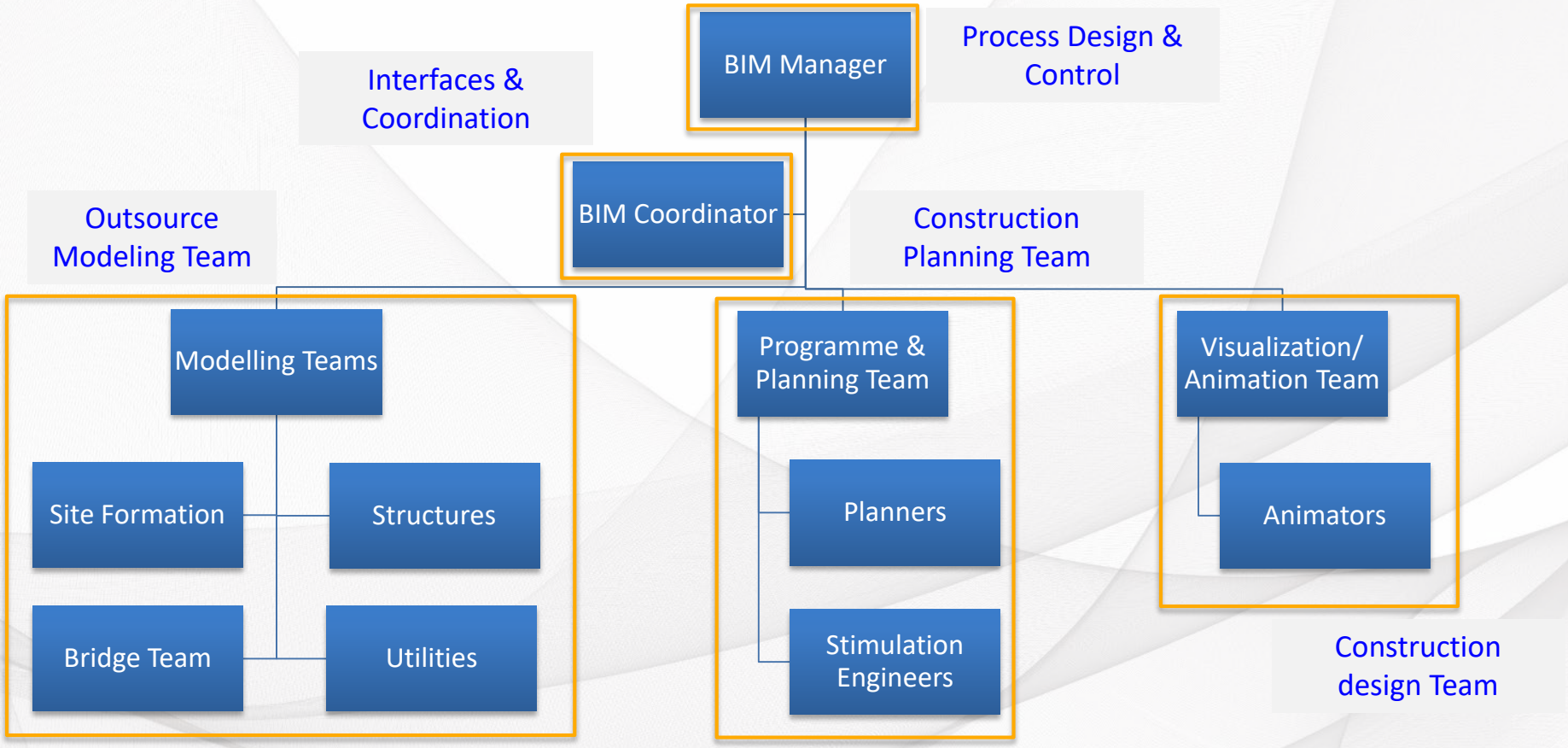
5. Modes of Re-Engineering (RSS)



6. O-Chart, Role and Responsibility (Construction Phase)



7. Contractor BIM Team



8. Model Subdivision and LoD

Project Specific Sub-division: O-Chart & File Size

ID	Disciplinary Model	Initial Model	Design Model	Coordinated Model	As-built Model	Sub Models
ES	Existing Site Model	200	200	250	250	4
ER	Road Model	250	300	350	500	7
BR	Bridge Model	250	300	350	500	34
UP	Underpass Model	250	300	350	500	11
BD	Building Model	250	300	350	500	27

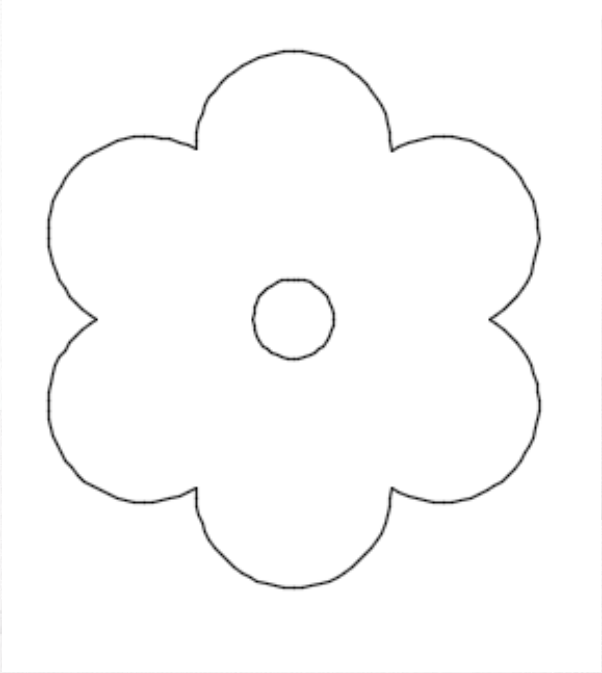
Progressively Developed during project;
May not developed to same LoD

Further sub-division for operation and versioning

- To define LOD in different Stage during the project
- BIM Manager to supervise the LOD and sub-divide models if required

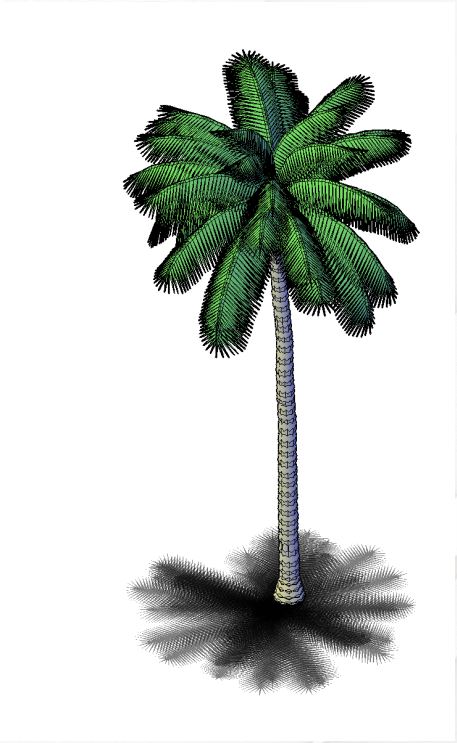
9. LOD 100

LoD	Description
100	Tree as a **symbol**



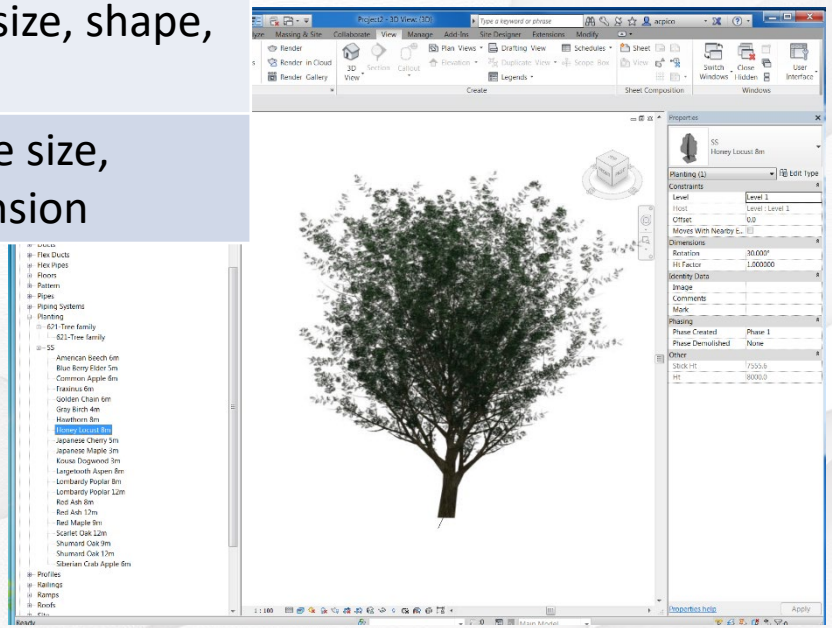
10. LOD 200

LoD	Description
100	Tree as a **symbol**
200	Tree as a **Generic**, with approximated size, shape, location, orientation



11. LOD 299?

LoD	Description
100	Tree as a **symbol**
200	Tree as a **Generic**, with approximated size, shape, location, orientation
300	Tree as a **Specific Object**, with accurate size, shape, location, orientation and dimension



- The LOD need to specify at the beginning of the project
- Example as LOD300 cannot be achieved by designer

12. Level of Development – Example Tree

LoD	Description
100	Tree as a **symbol**
200	Tree as a **Generic**, with approximated size, shape, location, orientation
300	Tree as a **Specific Object**, with accurate size, shape, location, orientation and dimension
400	Tree as a **Specific Object**, with excavation limits/Installation requirements
500	Tree as a **Specific Object**, with name, type, plant date, etc

13. CIC Standard : Pavement

Pavement (Carriageway, Footpath, Cycle Track)

LOD	Description	Data	Example Image
100	Approximate alignment, width and spot levels of the paving surfaces		
200	Element modelling to include approximate 3D alignment, shape and width of pavement		
300	Element modelling to include: • Accurate size and geometry of every layer of paving components (frication course, wearing course, base-course, road-base, sub-base, etc.) that varies continuously along the road alignment • Accurate super-elevation and longitudinal fall of the pavement components Required non-graphic information associated with model elements includes: • Polygon Feature Type * • Surface Material Type * • Paver Type * • Headroom requirement (* to match HyD GIS requirement)		

14. Model Subdivision and Modelling Methodology

Further Sub-division by Type of works

Implication of analytical information availability

ID	Name	Description	Type	Authoring Tools	Category
ER01	FS_Pav	Realigned Ferry Street Pavement	Roadwork	Civil 3D	Corridor
ER02	CPS_CB	Ching Ping Street Cantilever Barrier	Noise Barrier	Revit	Corridor
ER03	FS_Fur	Ferry Street Furniture	Furniture	Civil 3D	Corridor
ER04	FS_STM	Ferry Street Storm water	Drainage	Civil 3D	Pipe Network
ER05	FS_SEW	Ferry Street Sewerage	Sewerage	Civil 3D	Pipe Network
ER06	FS_WTM	Ferry Street Watermain	Water pipe	Civil 3D	Pipe/Pipe Fitting
ER07	FS_CAB	Ferry Street Cable Duct	Cable	Revit	Conduit/Conduit Fitting

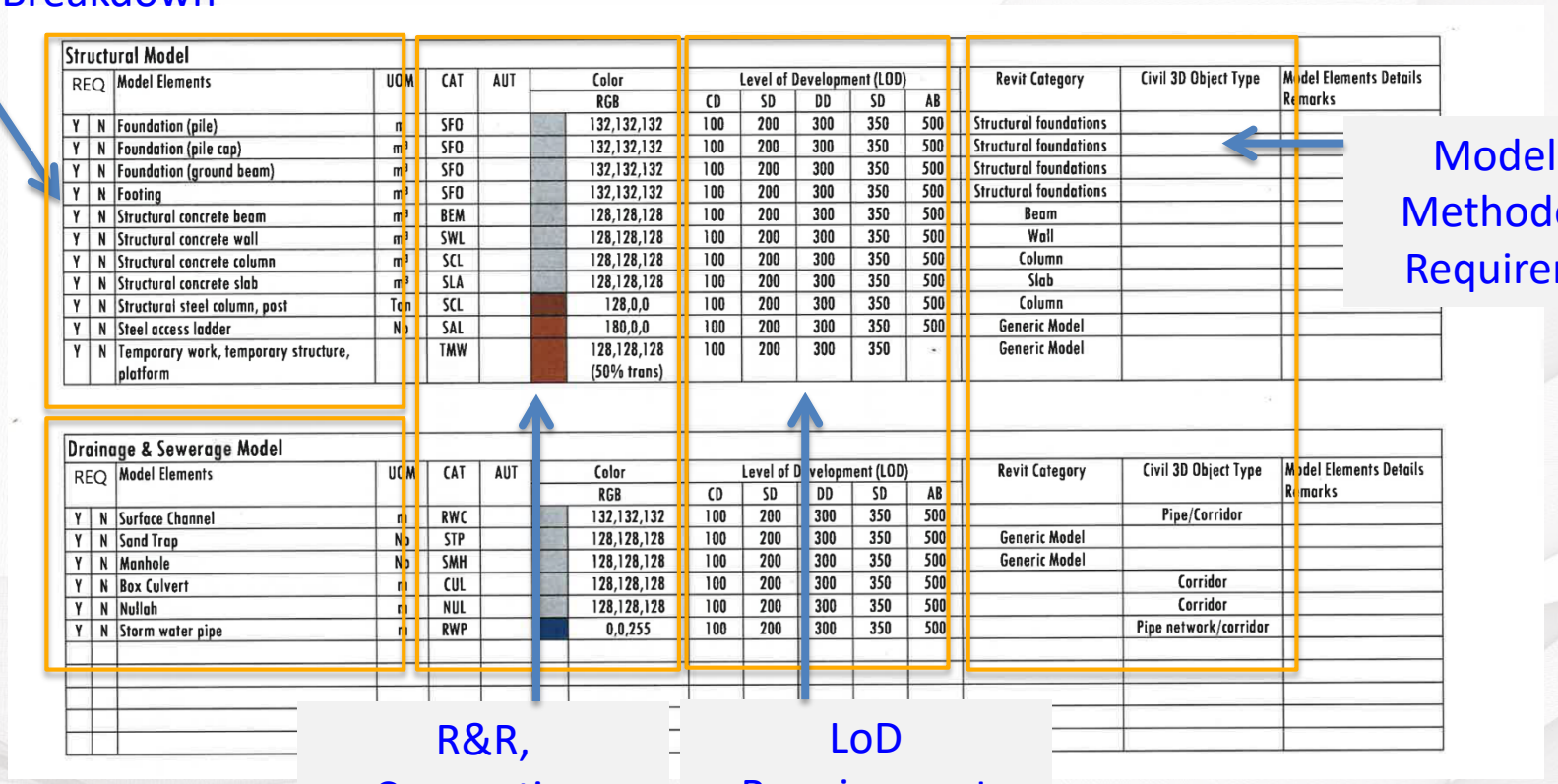
Further sub-division for different modelling tools

15. GEO Disciplinary Model Requirement

- Site Model
  - Existing Ground
  - Nearby 200m building
- Civil Model
  - All nearby by 200m road, tunnel, bridge…
  - Temp Traffic Arrangement
- Geological Model
  - Strata
  - Ground water surface
- Rigid Barrier Model
- Flexible Barrier Model
- Man-made Slope Model
- Rock Slope Model
- Retaining Wall Model
- Soil Nail Model
- Structural Model
- Architectural Model
  - Lands 3Ds Data

16. Sample Model Breakdown Table

Model Breakdown



Structural Model

REQ		Model Elements	UOM	CAT	AUT	Color RGB	Level of Development (LOD) CD	SD	DD	SD	AB	Revit Category	Civil 3D Object Type	Model Elements Details Remarks
Y	N	Foundation (pile)	m	SFO		132,132,132	100	200	300	350	500	Structural foundations		
Y	N	Foundation (pile cap)	m³	SFO		132,132,132	100	200	300	350	500	Structural foundations		
Y	N	Foundation (ground beam)	m³	SFO		132,132,132	100	200	300	350	500	Structural foundations		
Y	N	Footing	m³	SFO		132,132,132	100	200	300	350	500	Structural foundations		
Y	N	Structural concrete beam	m³	BEM		128,128,128	100	200	300	350	500	Beam		
Y	N	Structural concrete wall	m³	SWL		128,128,128	100	200	300	350	500	Wall		
Y	N	Structural concrete column	m³	SCL		128,128,128	100	200	300	350	500	Column		
Y	N	Structural concrete slab	m³	SLA		128,128,128	100	200	300	350	500	Slab		
Y	N	Structural steel column, post	Ton	SCL		128,0,0	100	200	300	350	500	Column		
Y	N	Steel access ladder	No	SAL		180,0,0	100	200	300	350	500	Generic Model		
Y	N	Temporary work, temporary structure, platform		TMW		128,128,128 (50% trans)	100	200	300	350	-	Generic Model		

Drainage & Sewerage Model

REQ		Model Elements	UOM	CAT	AUT	Color RGB	Level of Development (LOD) CD	SD	DD	SD	AB	Revit Category	Civil 3D Object Type	Model Elements Details Remarks
Y	N	Surface Channel	m	RWC		132,132,132	100	200	300	350	500		Pipe/Corridor	
Y	N	Sand Trap	No	STP		128,128,128	100	200	300	350	500	Generic Model		
Y	N	Manhole	No	SMH		128,128,128	100	200	300	350	500	Generic Model		
Y	N	Box Culvert	m	CUL		128,128,128	100	200	300	350	500		Corridor	
Y	N	Nullah	m	NUL		128,128,128	100	200	300	350	500		Corridor	
Y	N	Storm water pipe	m	RWP		0,0,255	100	200	300	350	500		Pipe network/corridor	

Modelling Methodology Requirement

R&R, Convention

LoD Requirement

17. GEO Required File Naming Convention

Field No	1	2	3	4	5	6	7
	Project	-Originator	-Volume/Zone	-Level/Location	-Type	-Role	-Description
	GE19/2011	GEO	XX	XX	M3	GE	ES-200

Field 5: 2 character for Type

AF: Animation File CM: Combined Model DR: Drawing
M2: 2D Model M3: 3D Model VS: Visualization Model

Field 6: 2 character for Role (Refer to CIC BIM standard)

CN: Contractor CV: Civil Engineer EE : Electric Engineer
LS: Land Surveyor LA: Landscape Architect GE: Geotechnical Engineer
PM: Project Manager SC: Sub Contractor ST: Structural Engineer

Field 7: 2 character for description of discipline + 3 Character for usage discipline/LoD + 1 Character for Revision (optional)

Discipline

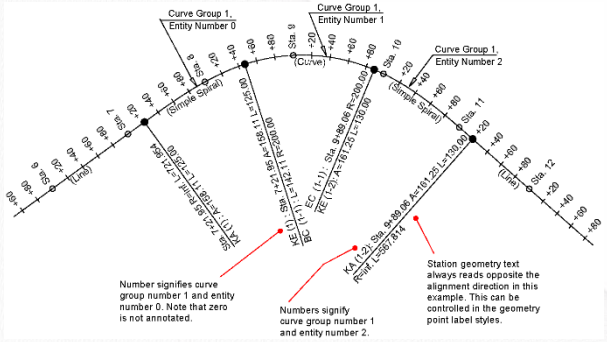
ES : Existing Site Model EG: Existing Ground Model DS: Storm Drainage Model
ST: Structural Model
MP: Multiple

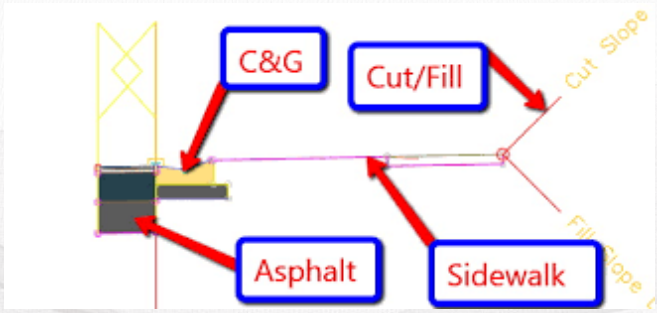
Usage

WIP : Work in Progress COR: Coordination 3DV: 3D Virtual Reality
4DP: 4D programme simulation CON : Construction use DRG: Drawing Production
ASB: As-Built Model CSD : Cost Saving/Alternative Design
CMS : Construction Method Simulation

18. Modelling Methodology : Road Model

Ref. Alignment





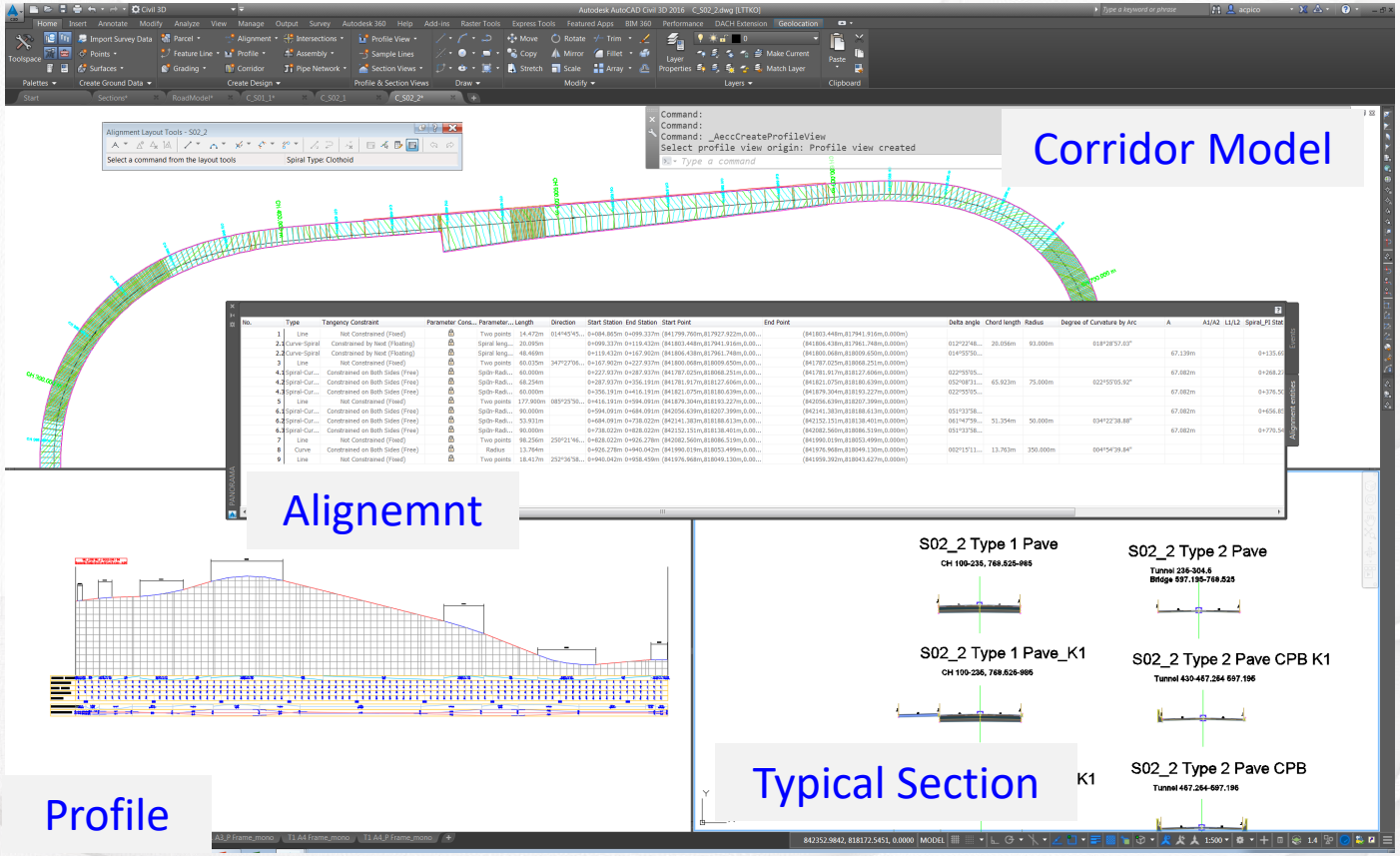
Typical Section

Corridor Model

19. Modelling Methodology : Road Model

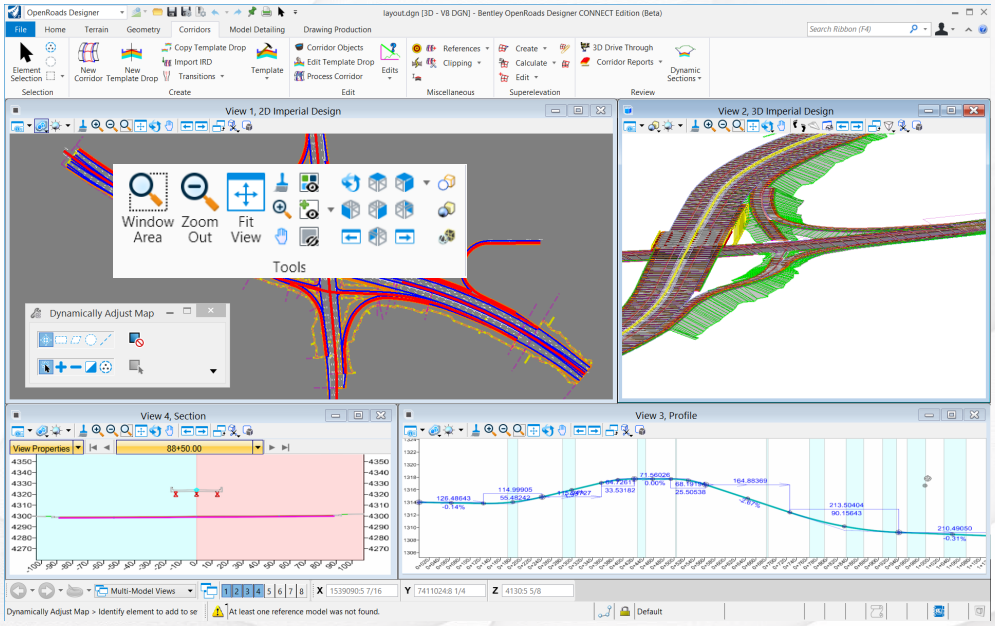
ID	Terminology	Autodesk Civil 3D	Format	Bentley Open Road	Format	Exchange Format
1	Road Model	Corridor	DWG	Corridor	DGN	N/A
2	Centre Alignment	Hz. Alignment	DWG/XML	Hz Geometry	DGN/ALG	XML
3	Vertical Alignment	Profile	DWG/XML	Vr Geometry	DGN/ALG	XML
4	Existing Terrain	Surface	DWG/XML	Surface	DGN/DTM	XML
5	Typical Section	Assembly	DWG	Template	ITL	N/A
6	Road Components	Sub-assembly	PKT	Features	ITL	N/A
7	Create Edit Road Library/Component	Sub-assembly composer	PKT	Components Editor	ITL	N/A
8	Kerb Alignment	Alignment / Feature Line	DWG	Line	DGN	XML/DXF

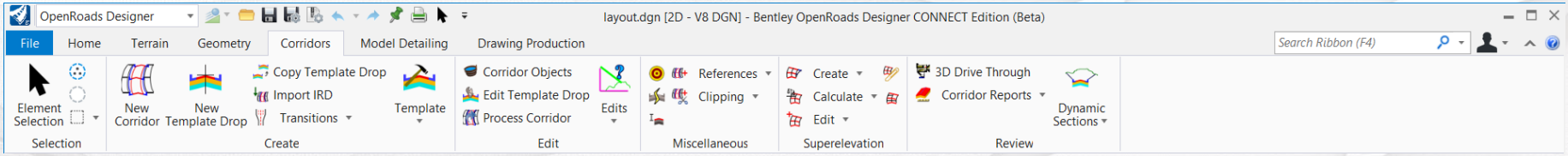
20. C3D Road Modeling



21. OpenRoads Designer

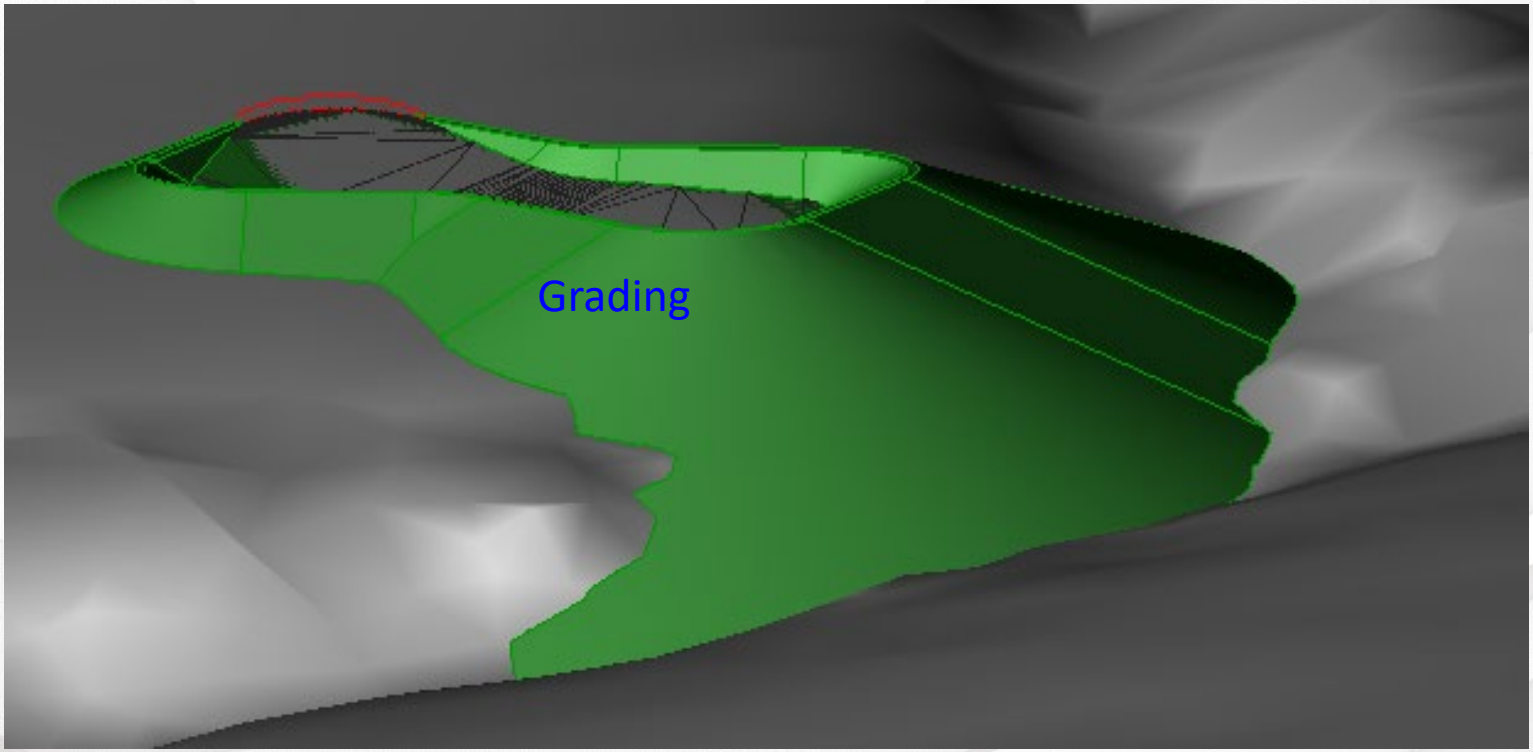
- Survey
- Terrain Modelling
- Geometry (H & V)
- Corridor Modelling
- Dynamic Cross Sections
- Design Intent
- Civil Cells
- Design-Time Visualization



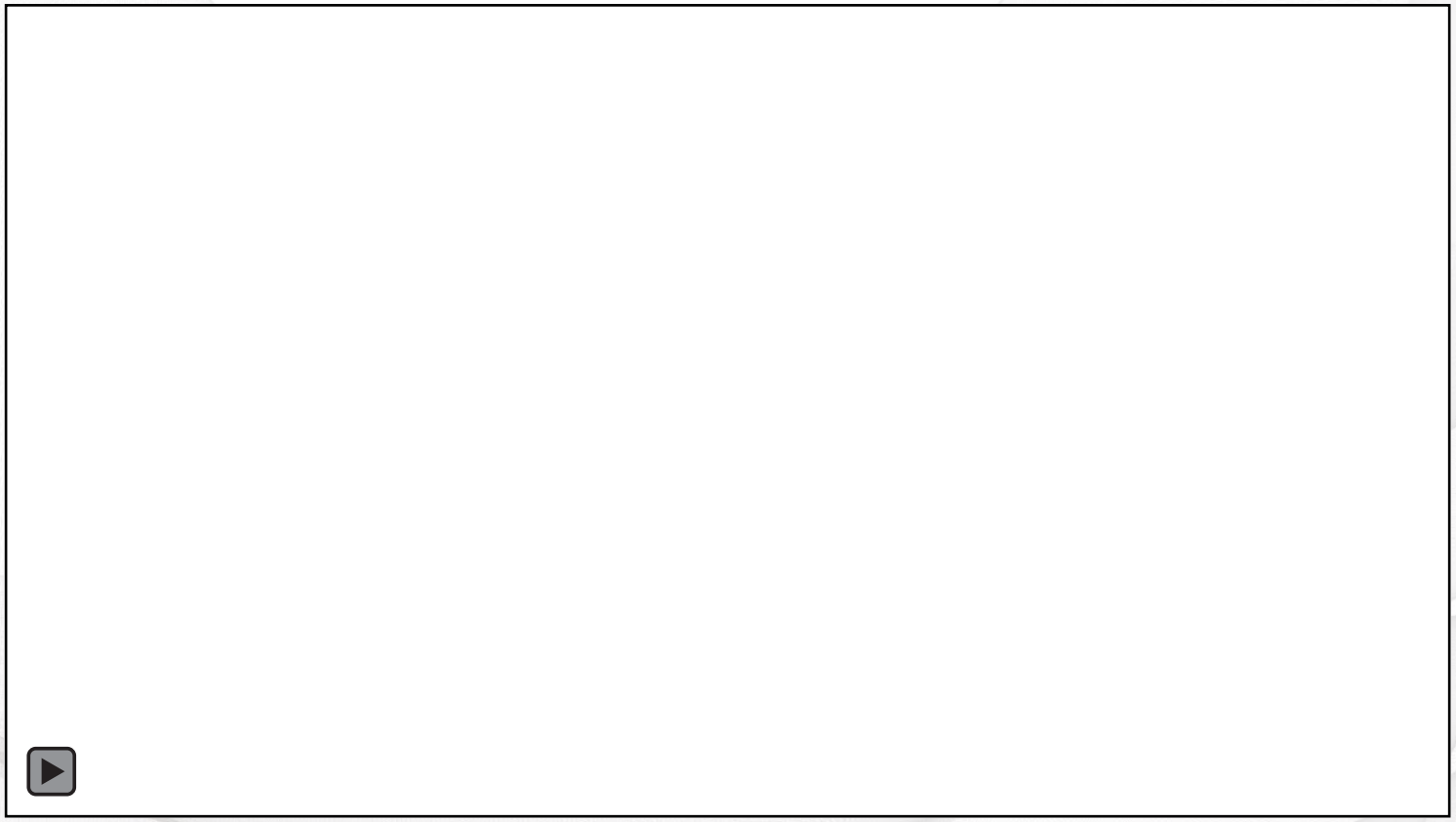


Road Modelling Demo

22. Create Parametric Road Model



23. Modelling Methodology : Site Formation

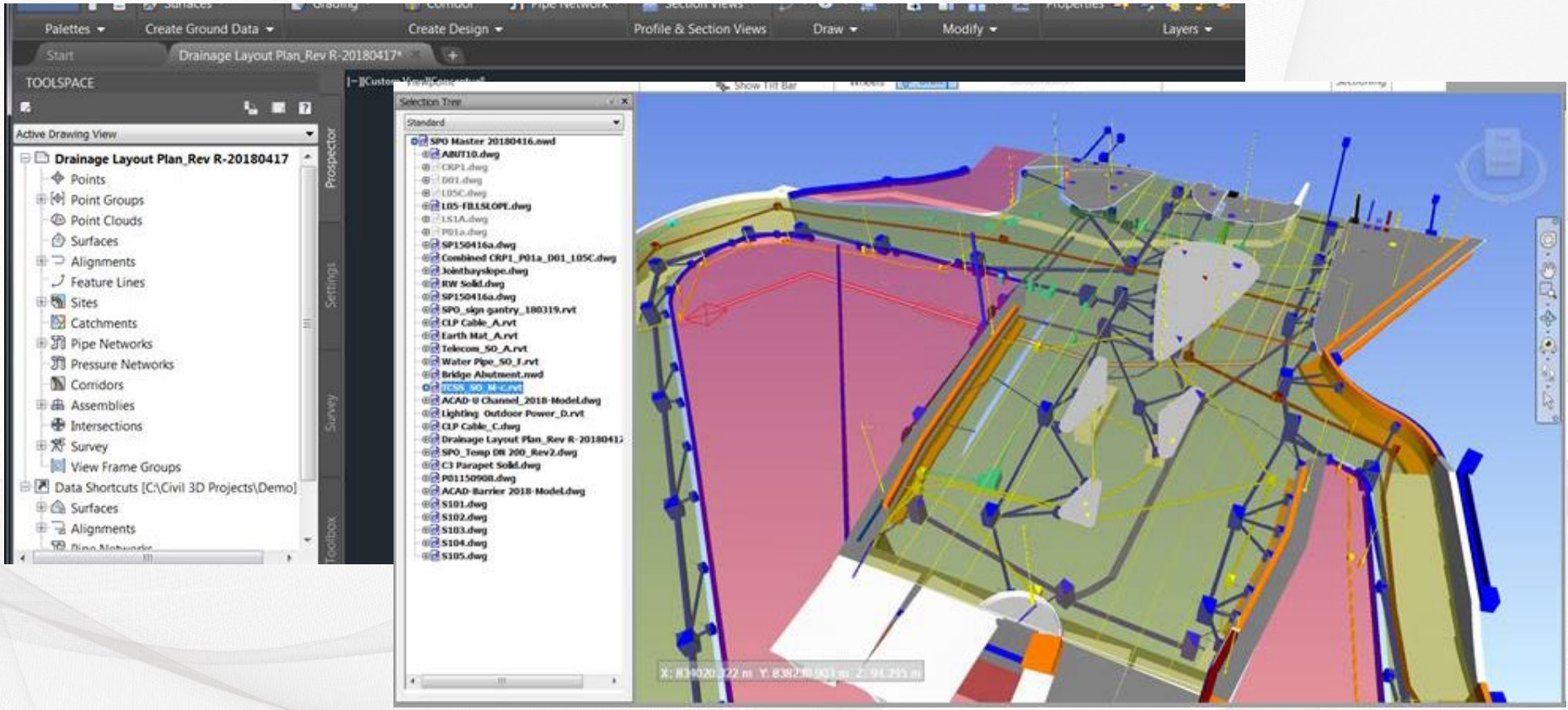


24. Modelling Methodology : Site Model

ID	Terminology	Autodesk Civil 3D	Format	Bentley Open Road	Format	Exchange Format
1	Site formation/Slope	Grading	DWG/XML	3D Slope	DGN/DTM	XML
2	Existing Terrain	Surface	DWG/XML	Terrain	DGN/DTM	XML
3	Building Foot print	Feature Line	DWG	Geometry Tool	DGN	XML
3	Strata/ Sub-surface	Surface	DWG/XML	Terrain	DGN/DTM	XML
4	Bore hole	(Geotechnical Extension)	DWG	(GINT)	DGN	AGS/XML

Site formation Modelling Demo

25. Modelling Methodology : Utilities Model

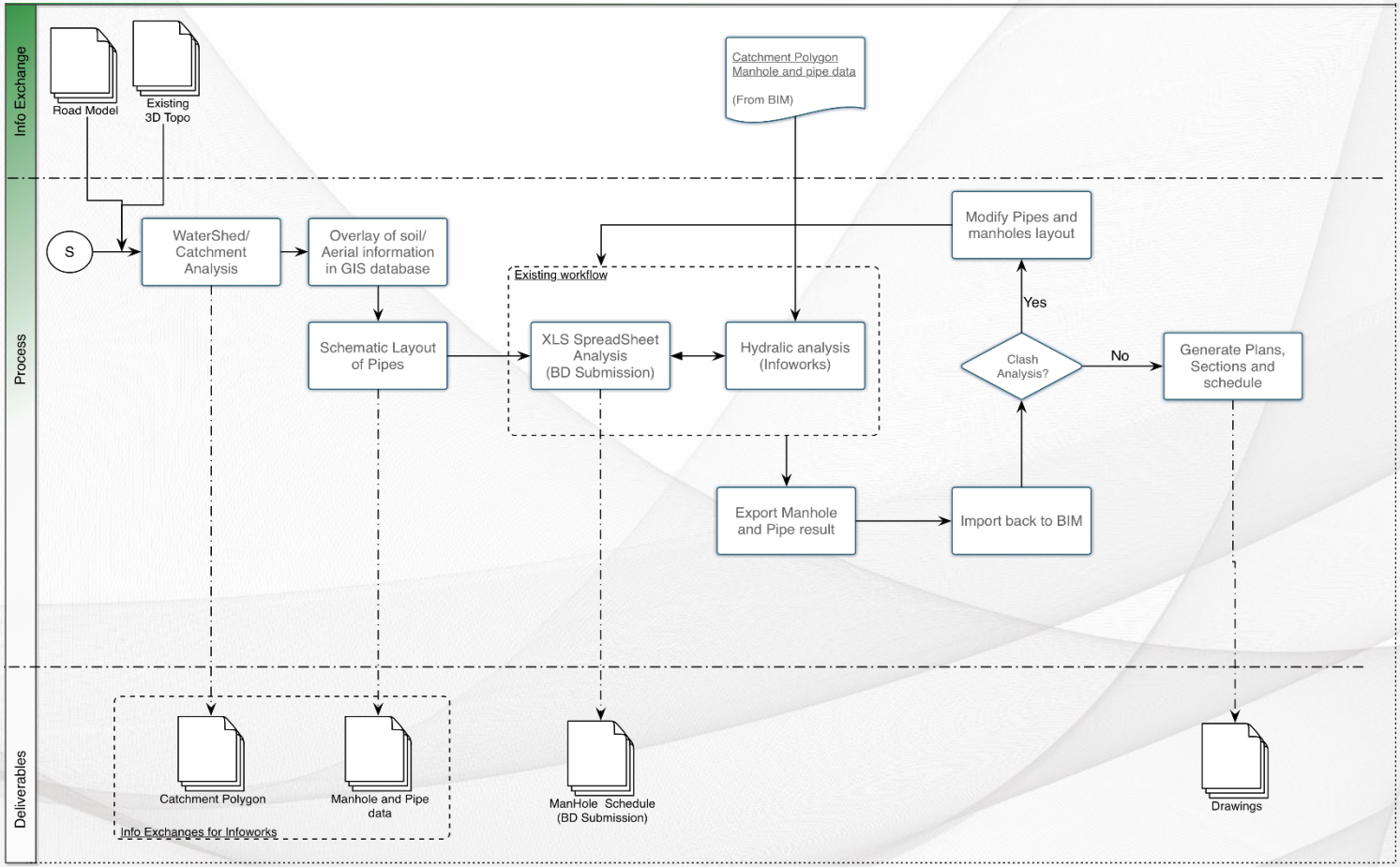


26. Modelling Methodology : Underground Utilities

ID	Terminology	Autodesk	Format	Bentley	Format	Exchange Format
1	Storm Drain/PVC/DI Pipes	C3D: Pipe Network	DWG	SSU: Pipes	DGN	XML
2	Pressure Pipe	C3D: Pressure pipe	DWG	SSU: Pipes	DGN	XML
3	Manholes	C3D: Structures	DWG	SSU: Cells	DGN	N/A
4	Valve, Bend, Fittings	C3D: Fittings	DWG	SSU: Cells	DGN	N/A

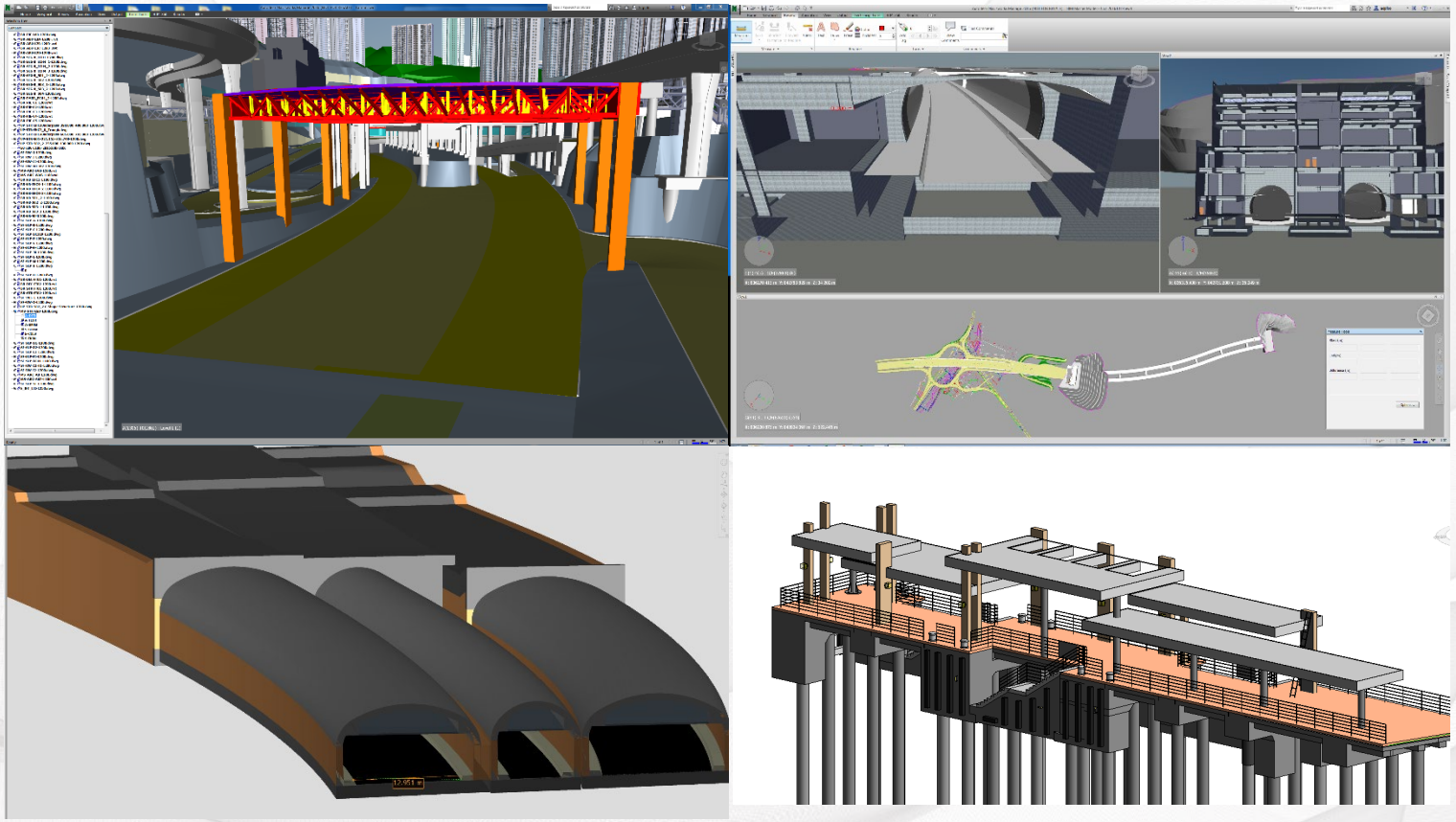
- Utilities could be modelled in C3D/SSU or Revit/AECOSim
- Key Consideration
  - Interfaces with Terrain
  - Storm drainage analysis

27. Strom Drain Analysis



Storm Drain Modelling Demo

28. Modelling Methodology : Structural Model

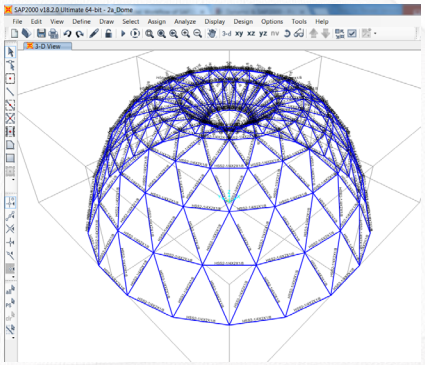


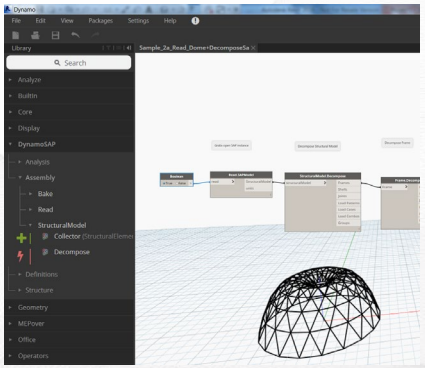
29. Modelling Methodology : Structural Models

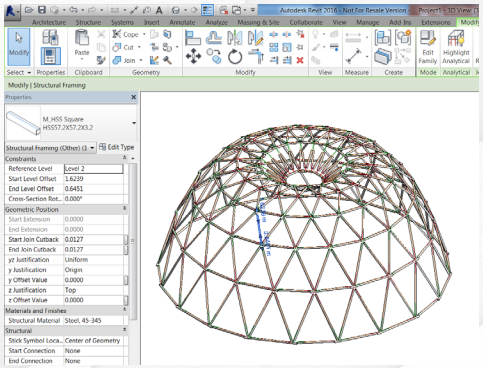
ID	Terminology	Autodesk	Format	Bentley	Format	Exchange Format
1	Beam, Column, Slab…	RVT: Structural Framing	DWG	ABD: Structural Element	DGN	XML
2	Pile, Pile Cap..	RVT: Structural Foundation	DWG	ABD: Structural Element	DGN	XML
3	Bridge Piers	RVT: Generic model	DWG	ABD: Generic model	DGN	N/A
4	Bridge Segments	C3D: Corridor	DWG	OBM : Deck	DGN	N/A
5	Tunnel Lining	C3D: Corridor	DWG	ORD: Corridor	DGN	N/A
6	Retaining Wall	C3D: Corridor	DWG	ORD: Corridor	DGN	N/A

30. Integrate Structural Analysis

SAP2000 → Dynamo → Revit

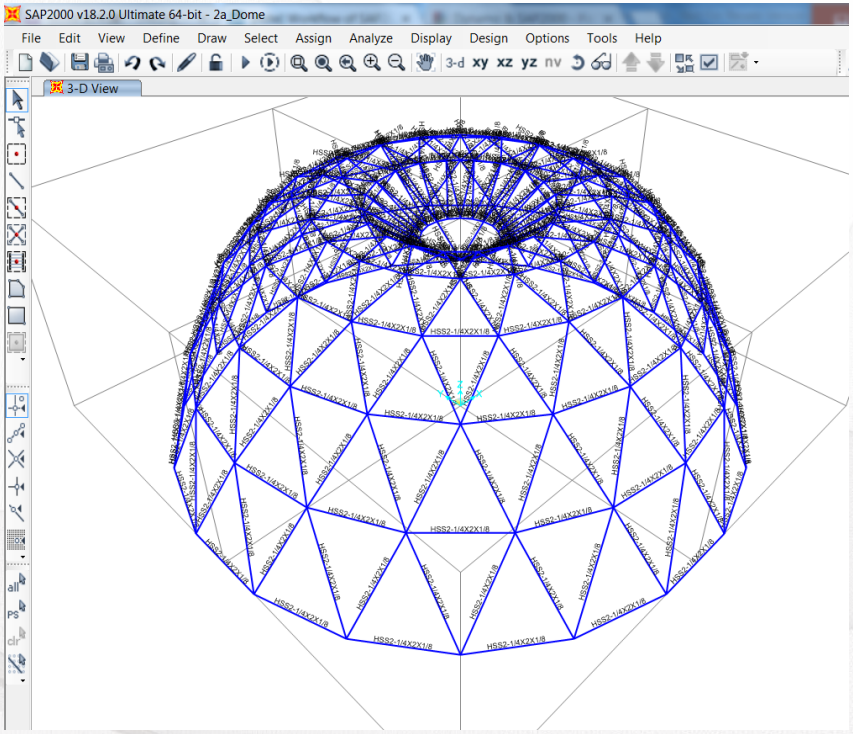




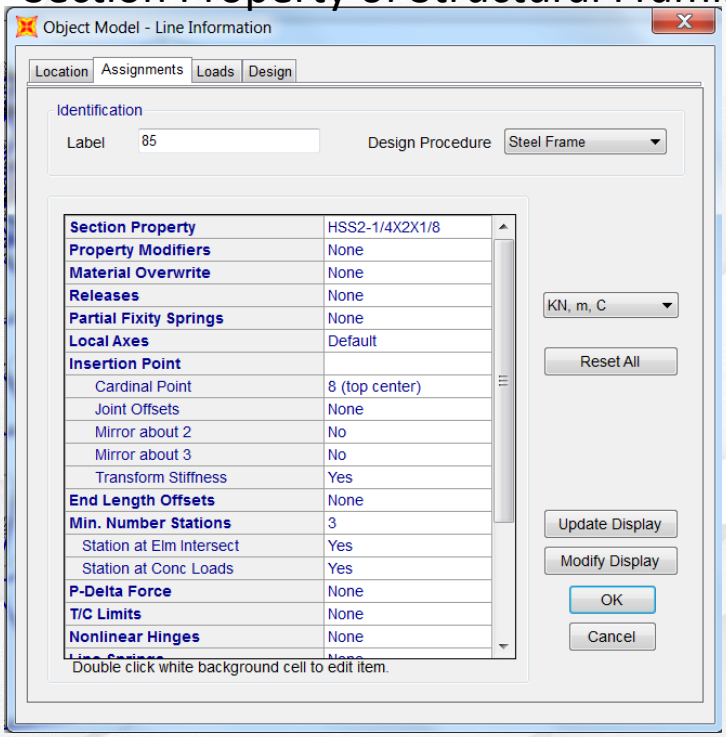


31. SAP2000

Model in SAP2000

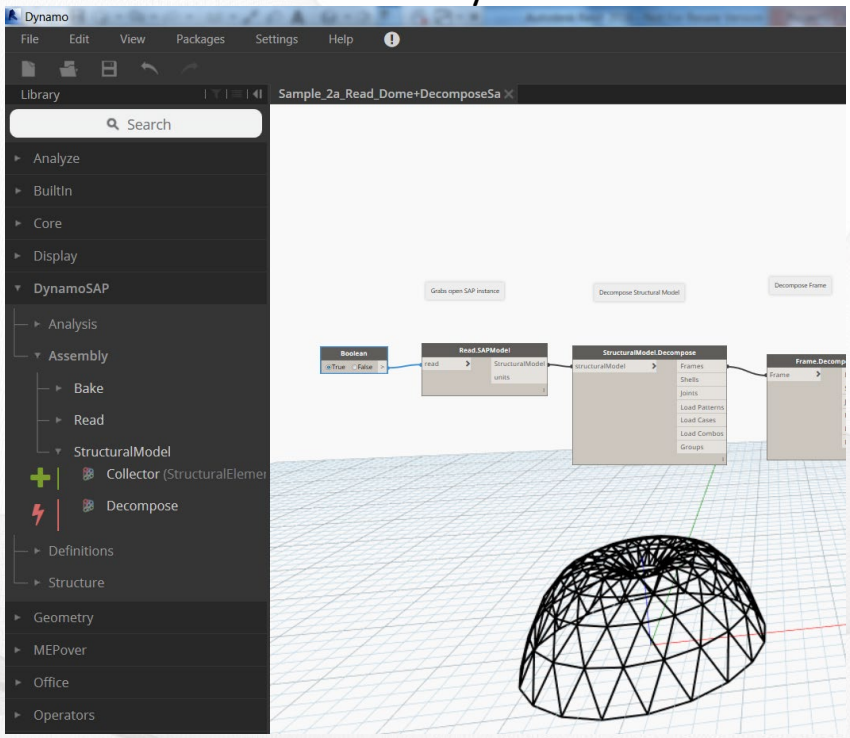


Section Property of Structural Framing

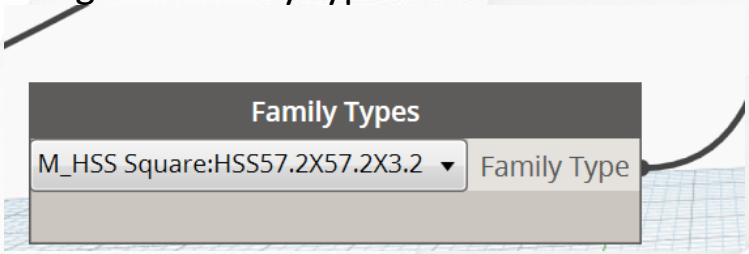


32. Dynamo

Load SAP 2000 Model in Dynamo

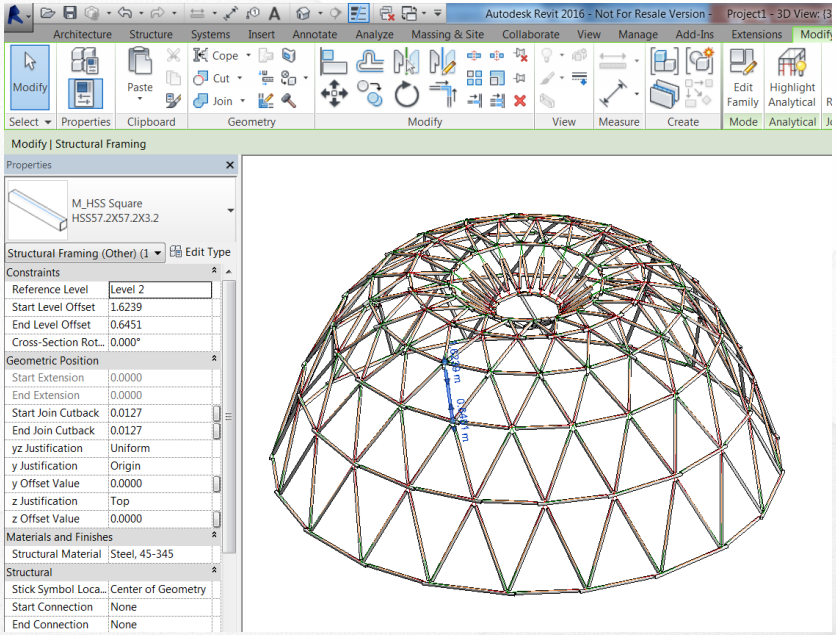


Assign the family type to member

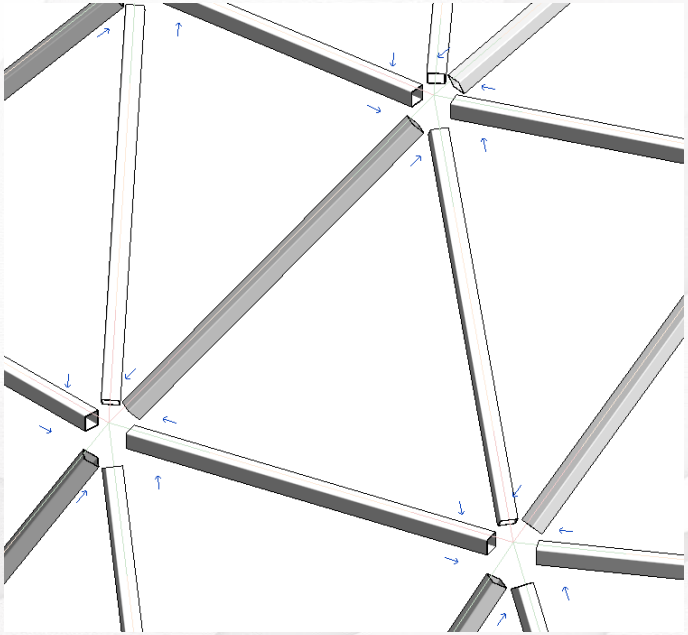


33. Revit

Regenerate Framing Model by Dynamo



Adjust Further Structural Connection Detail



34. Format and Software

	C3D	RVT	ORD	ABD	Open Format	Shared Format	Related Tools
Alignment-based Road Model	Y		Y		IFC	XML	
Topography-related Site formation Model	Y		Y			XML	
Strata Models (Plugins)	GEO		GINT			XML	HolebaseSI
Utilities Model	Y	Y	SSU	Y	IFC	XML	
Bridge Segment Model	Y		OBD		IFC		
Bridge Substructure/Superstructure		G		G	IFC		
Tunnel Model	Y				IFC		Sub Assem composer
Retaining Wall Model	Y	G	Y	G	IFC		
4DMS						MP4	NWD/ Sychro
Drawings/Site Sketches	*	*	*	*	DXF	PDF	
3DVR						EXE	3DS/LRT
Asset Information (COBie)		Y		Y		COBIE	

- IFC 4.0
  - Latest Version support ALG
  - XML-based Text file
- COBie
  - BIM/FM Standard
  - PAS 1192-4
  - XLS file 13 tables
- XML
  - Terrain and alignments
  - XML-base Text files

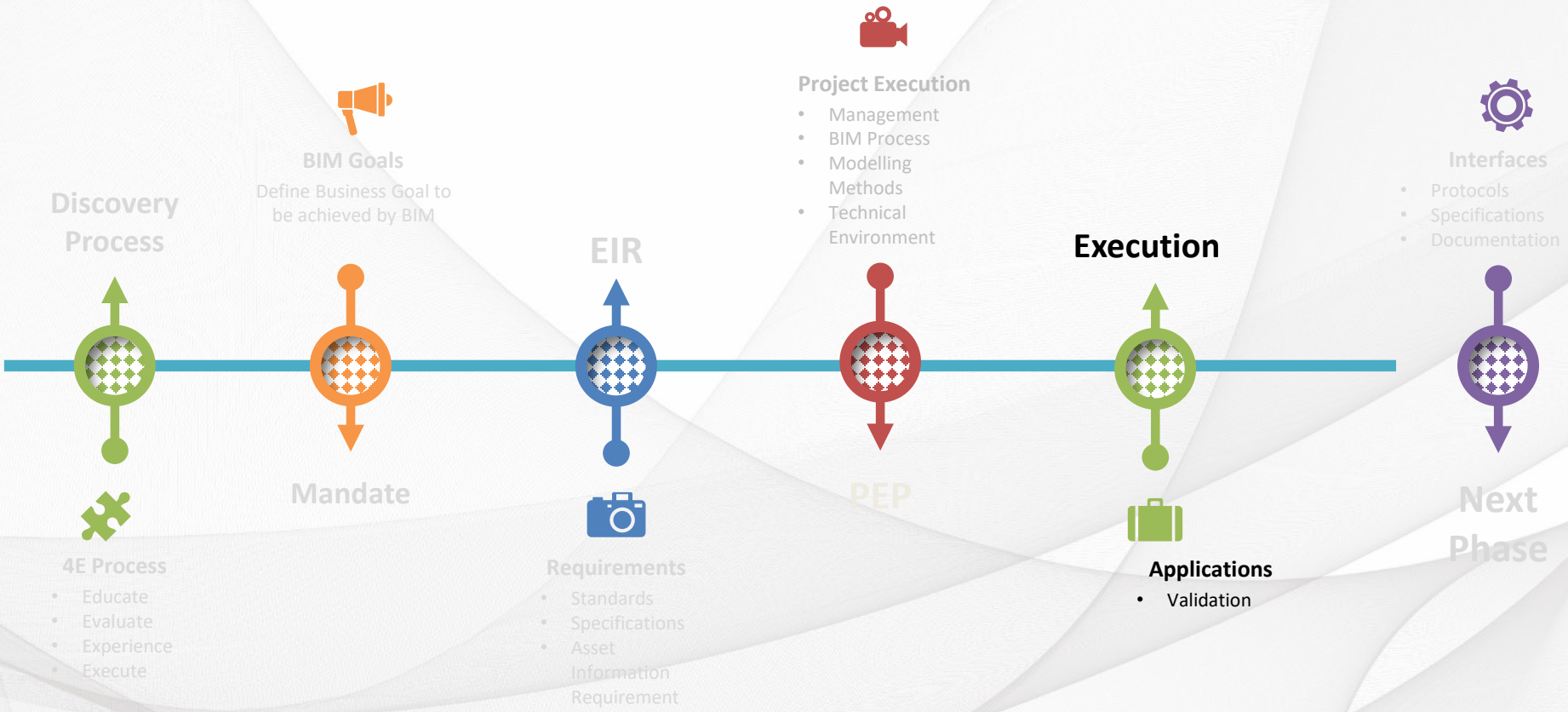
Y - Default Function
G– Generic Solid

GEO – Geotechnical Module
GINT – GINT Module

SSU: SubSurface Utilities
OBD: OpenBridge Designer

3DS: 3Ds Max
LDT: LumenRT

35. Project Execution – Quality Audit



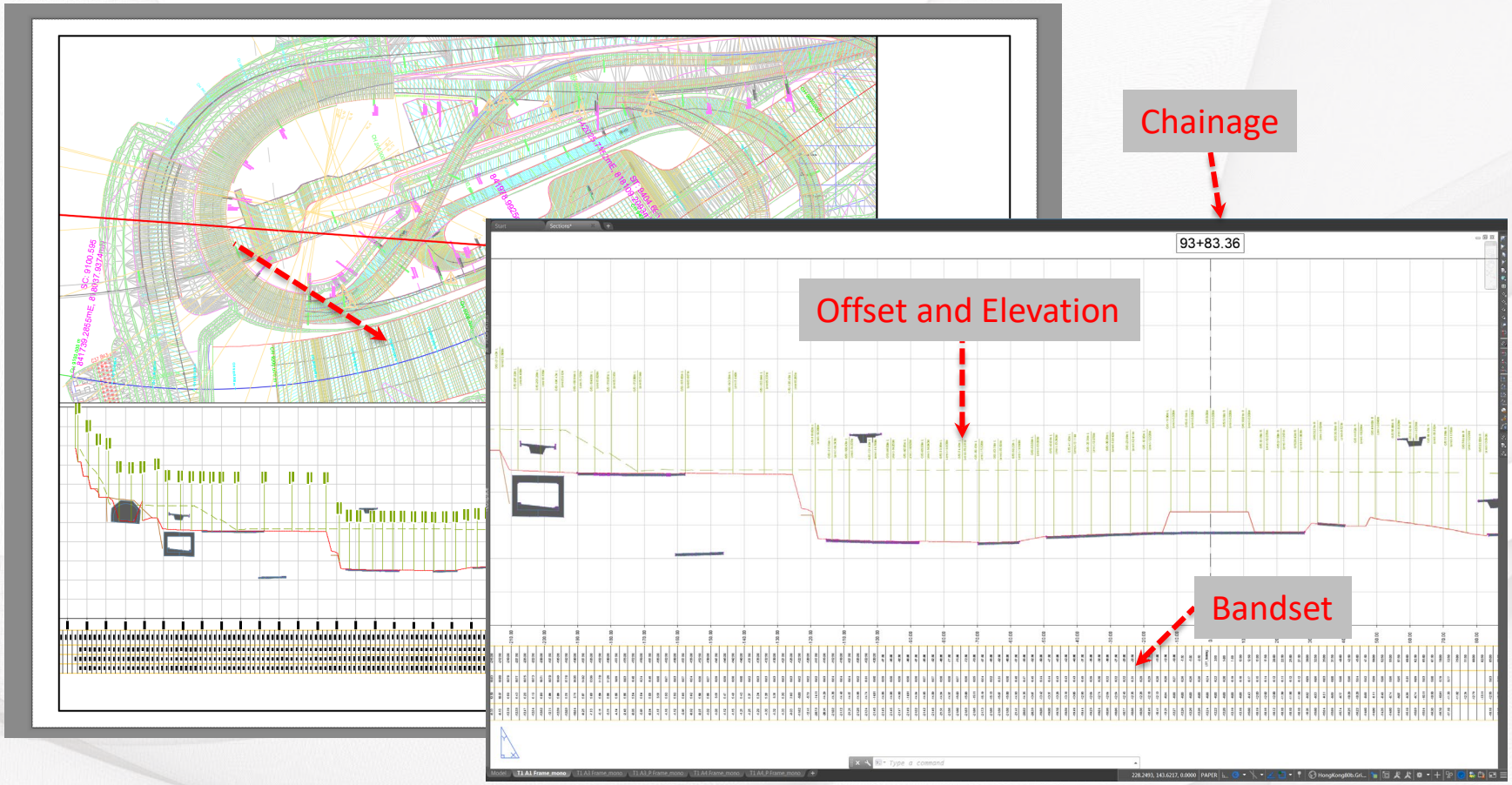
36. QA/QC Process

- Design Standard
  - TPDM
- Modelling Standard
  - Type and Category
- Geometry Accuracy
  - Location, Size, dimension
- Information Completeness

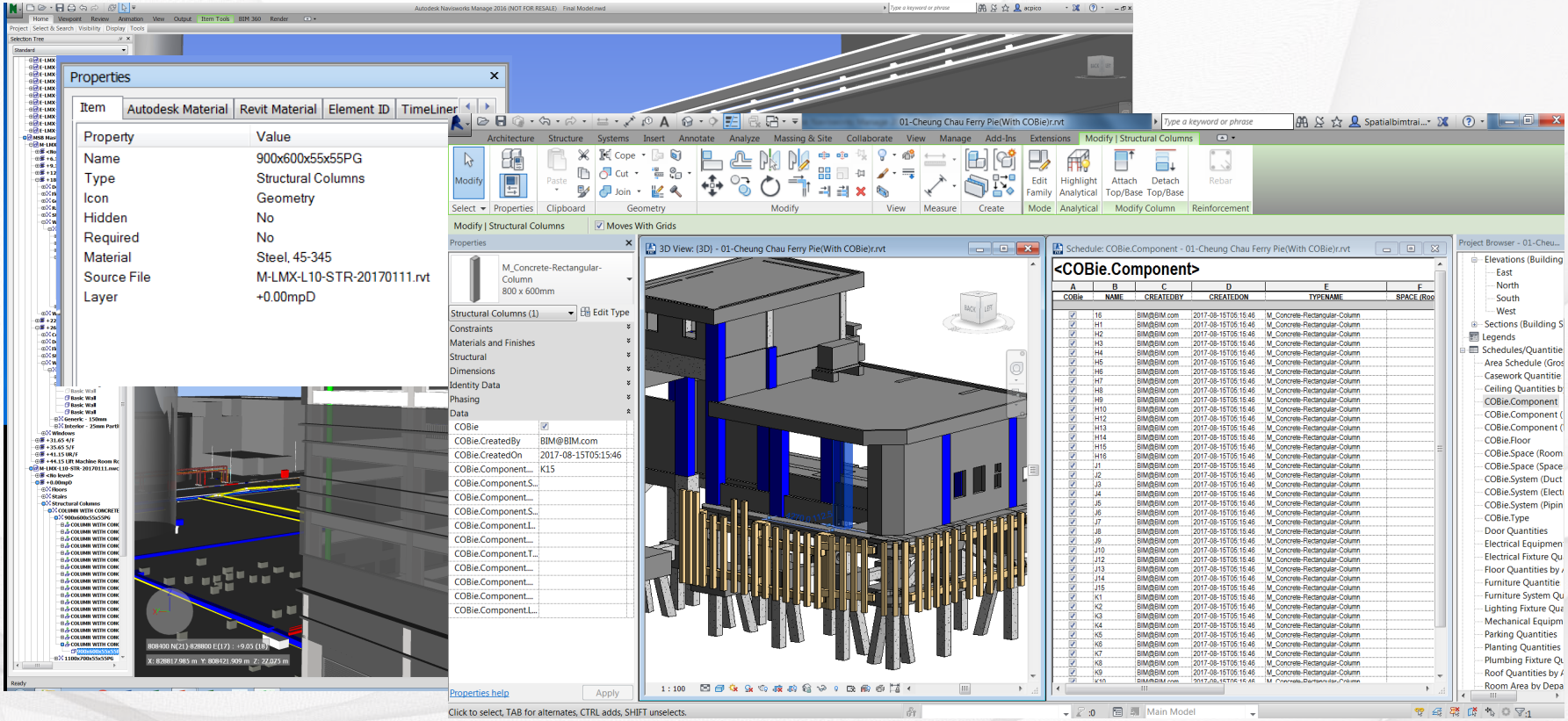
37. BIM Quality check/Quality report

	Visual Inspection	Software Aided	Others
Design Standard	N/A	Design Constraints	Revision Mgt
Modelling Standard	Yes	N/A	Random Checks
CAD Standard	Yes	N/A	Version Mgt
Interference check	Yes	Clash Detection	Revision Mgt
Geometry Accuracy	Overlaid	Sections and Annotation	Point Cloud Overlaid
Information Completeness	Yes	Schedules	Onsite Inspection

38. Geometry : BIM Generate Section and Annotation

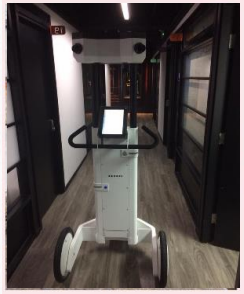


39. Information : Schedule



40. As-Built Verification via Laser scanning

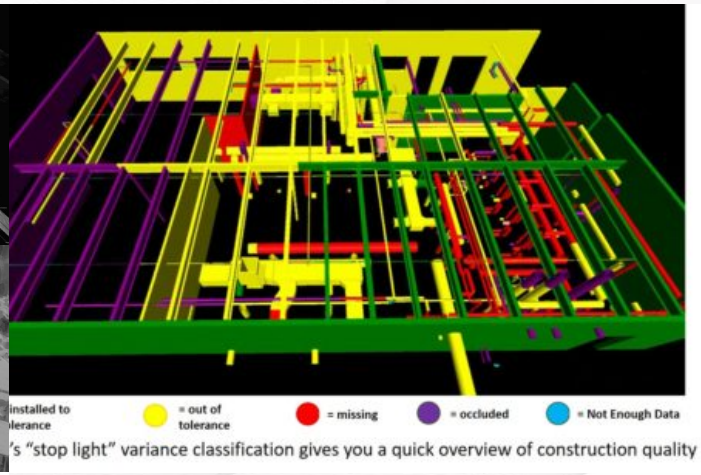
Mobile Scanner



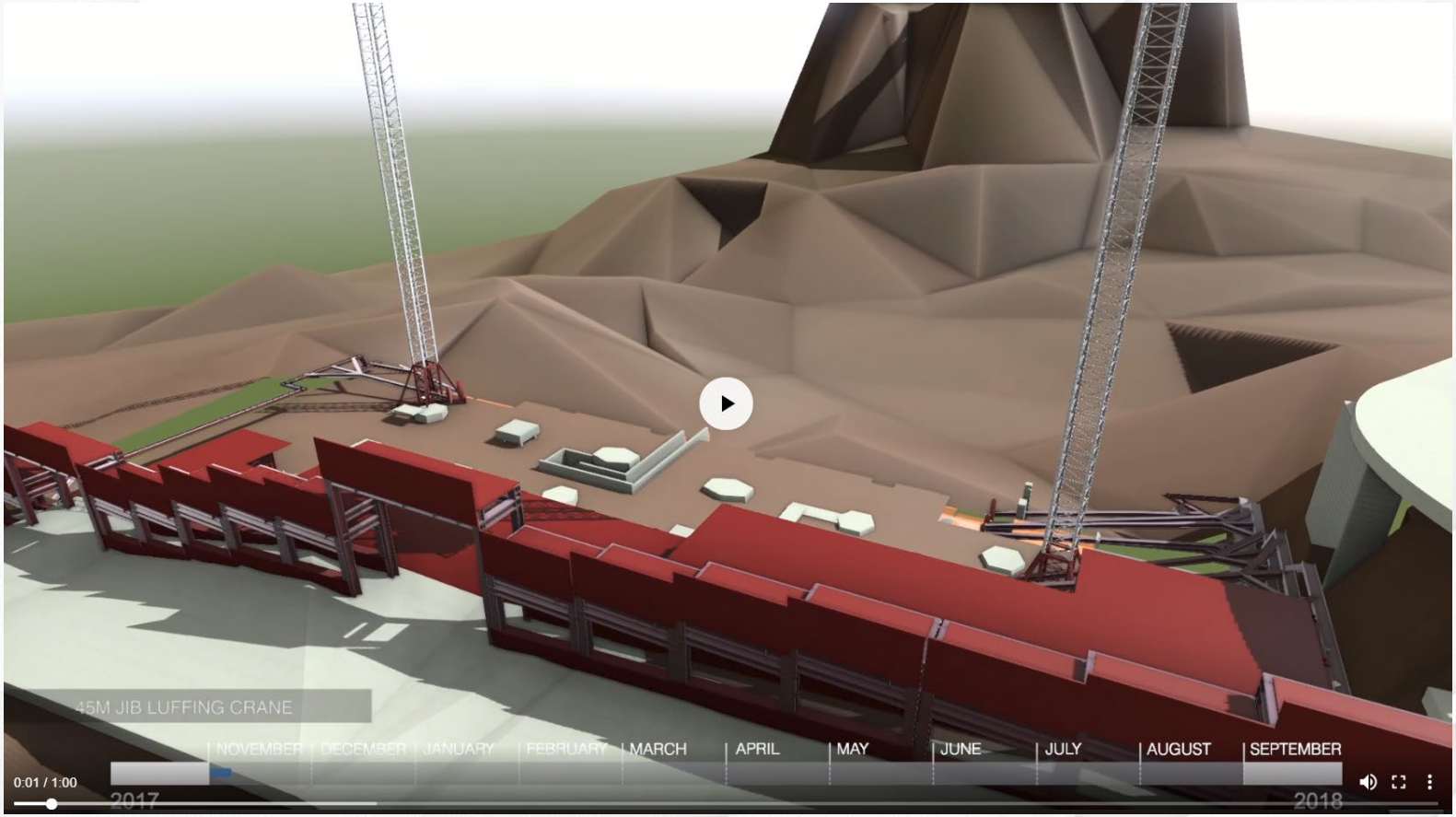
UAV Devices

Point Cloud

Verification

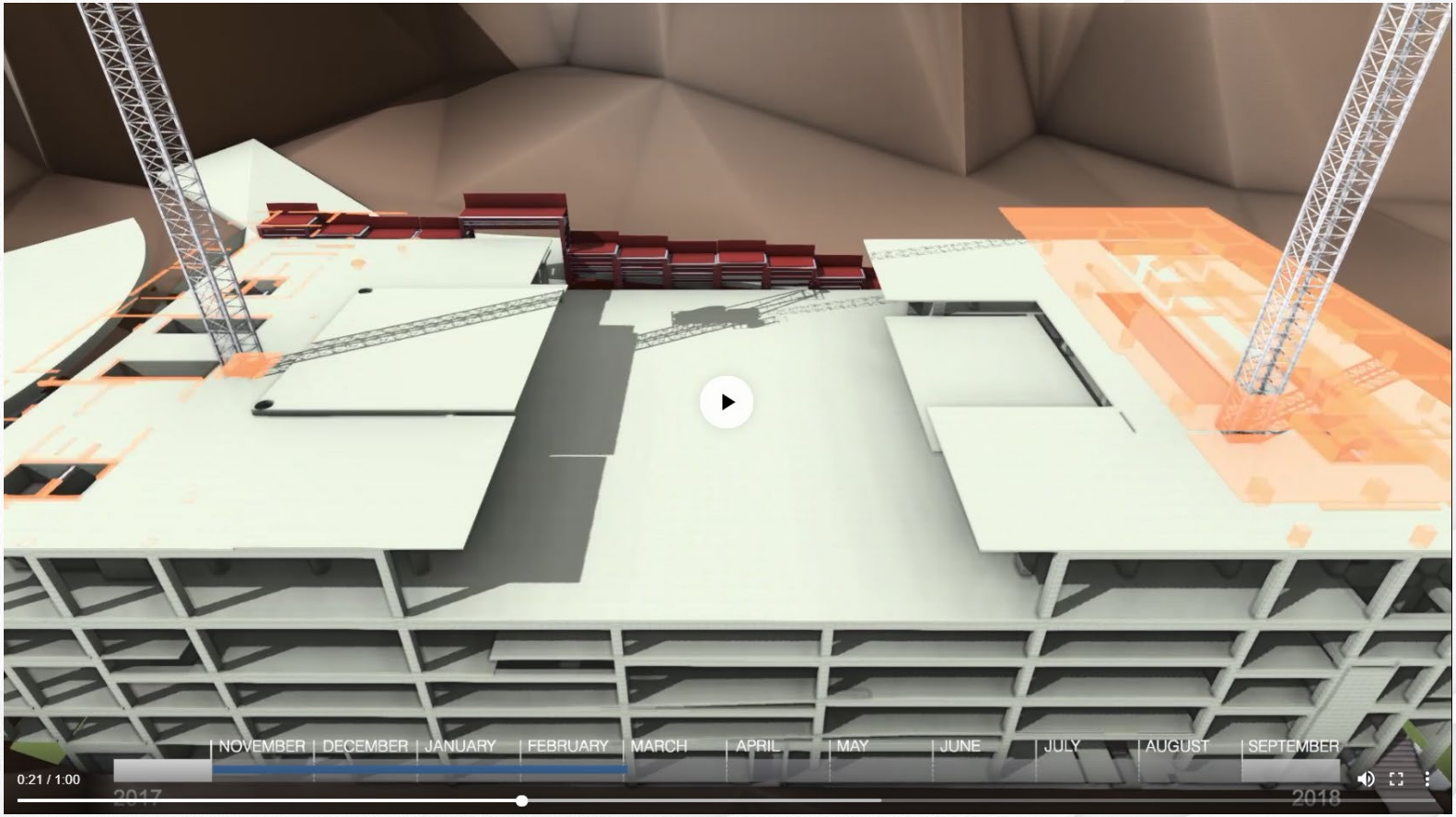


41. Construction 4D



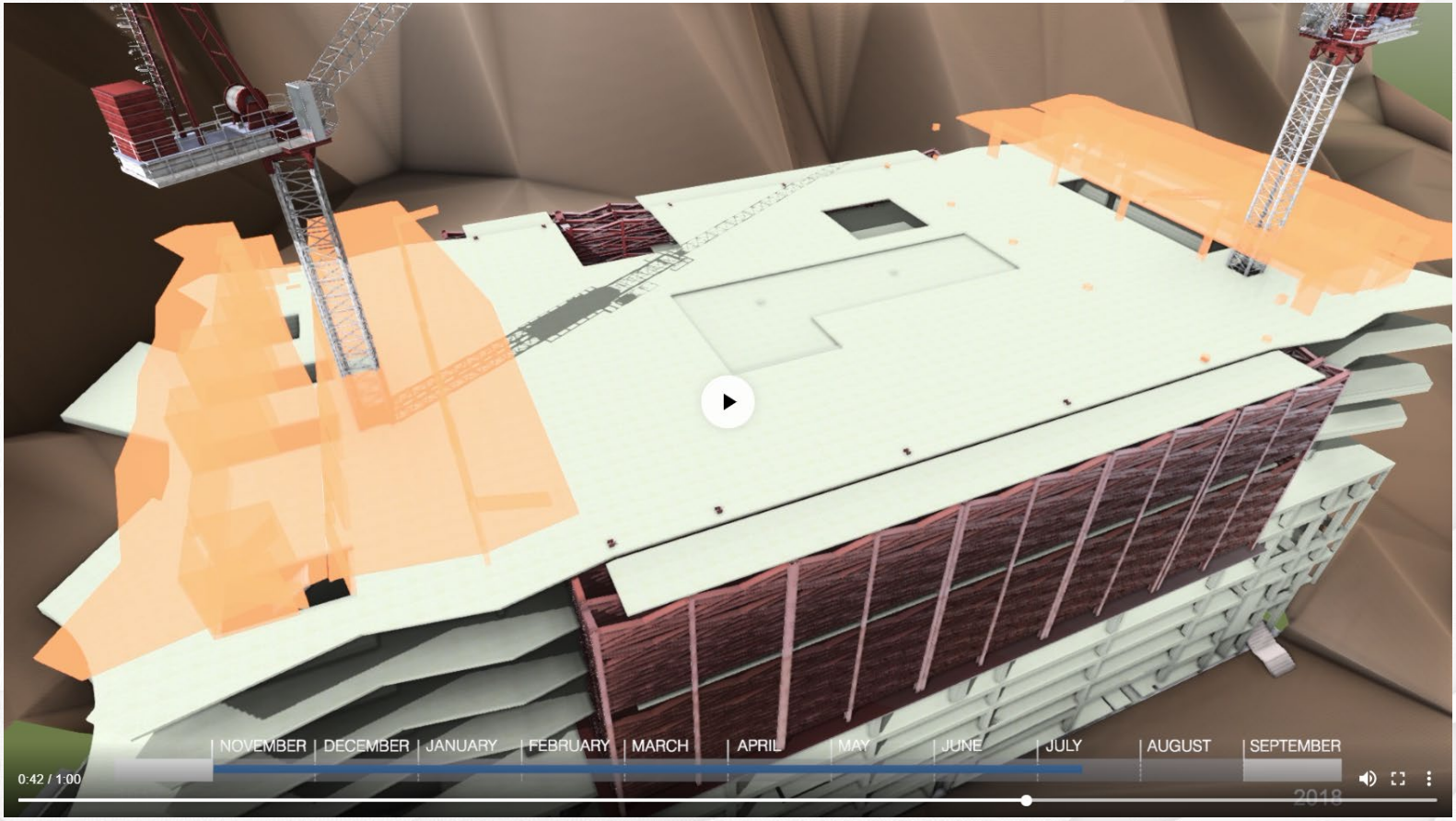
- Simulate the construction sequence with time arrangement
- Construction site transportation can be shown before commencement of site works
- Temporary works can be simulated

42. Construction 4D



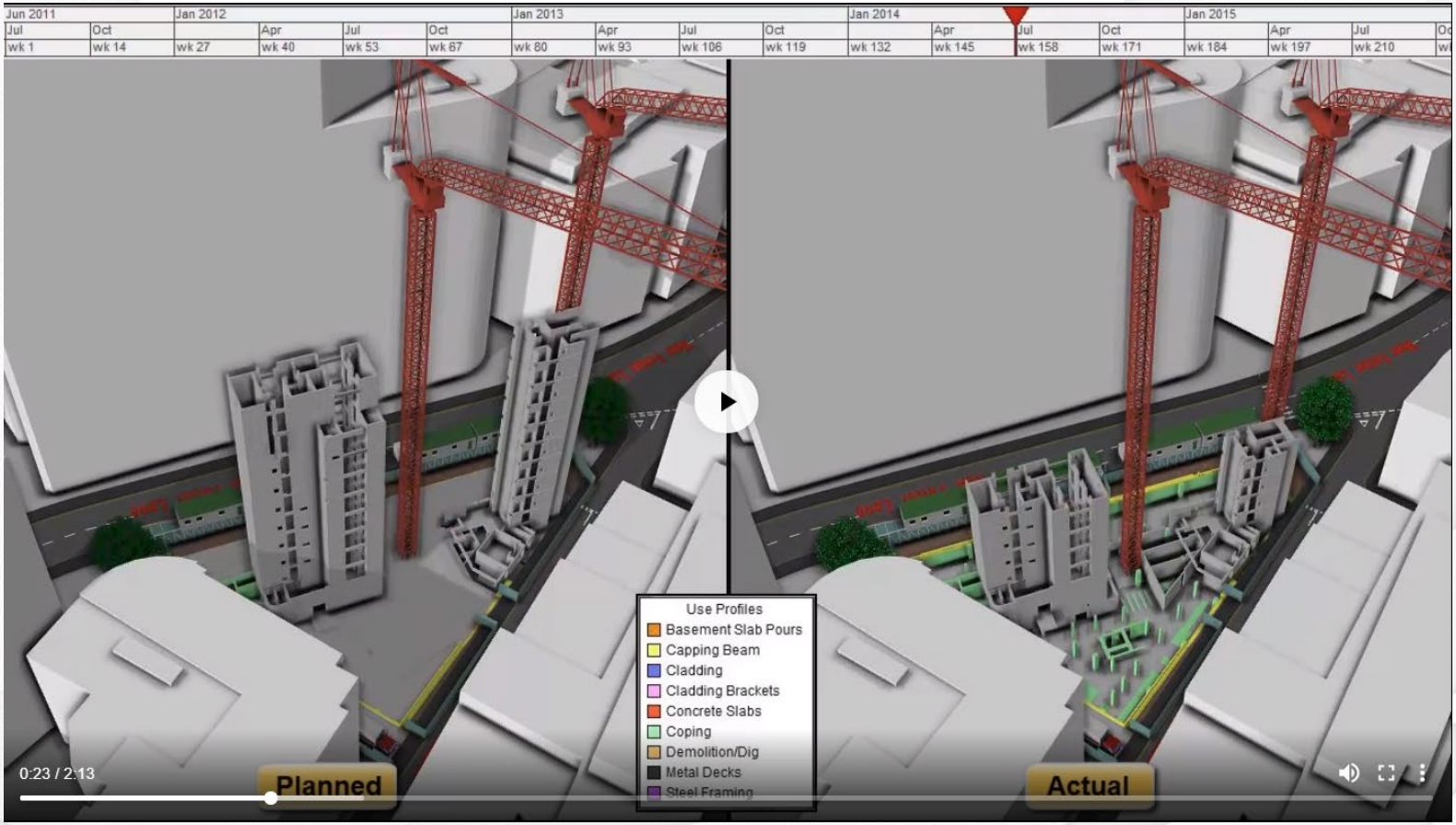
- Simulate the construction sequence with time arrangement
- Construction site transportation can be shown before commencement of site works
- Temporary works can be simulated

43. Construction 4D



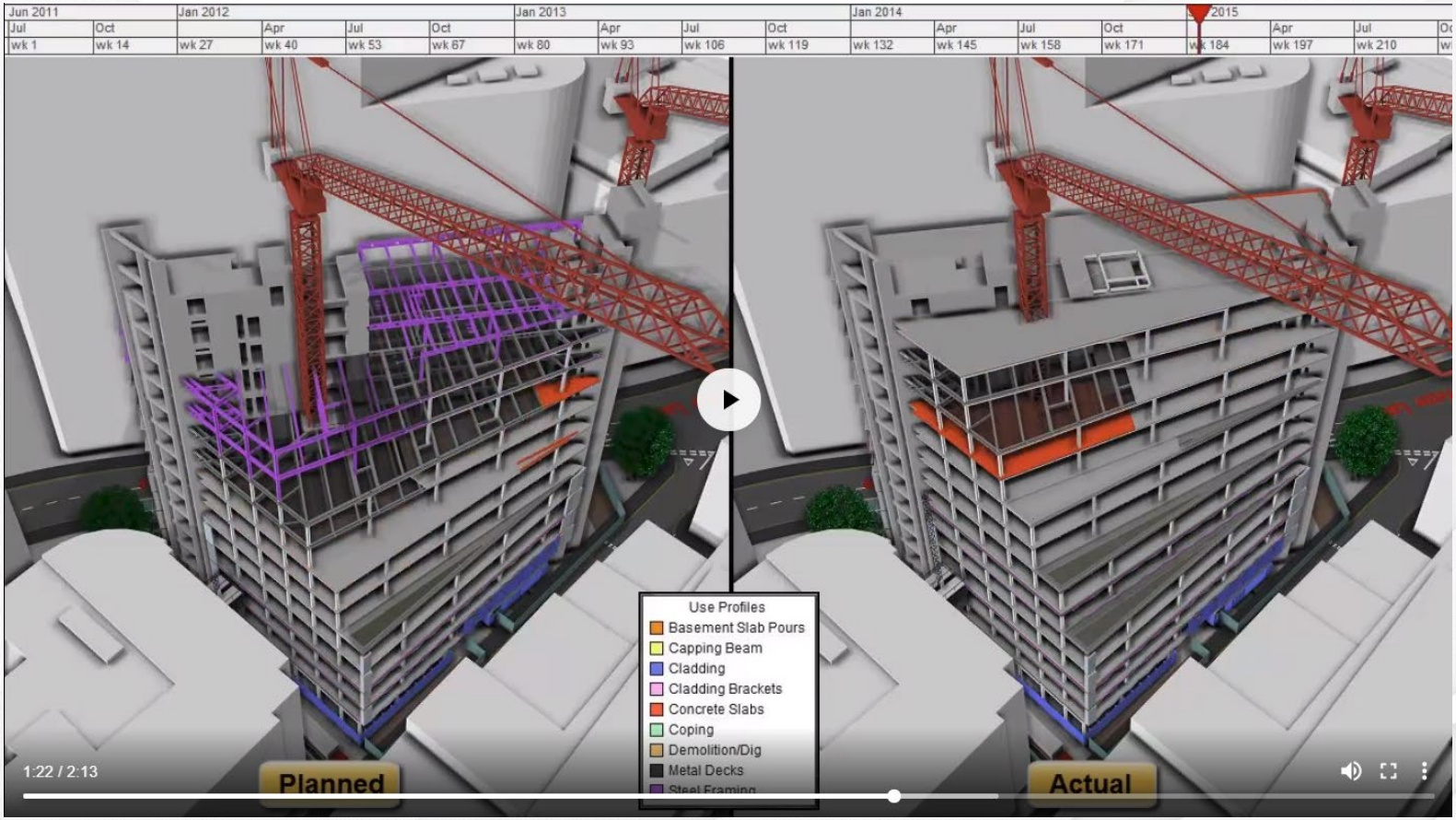
- Simulate the construction sequence with time arrangement
- Construction site transportation can be shown before commencement of site works
- Temporary works can be simulated

44. Construction 4D



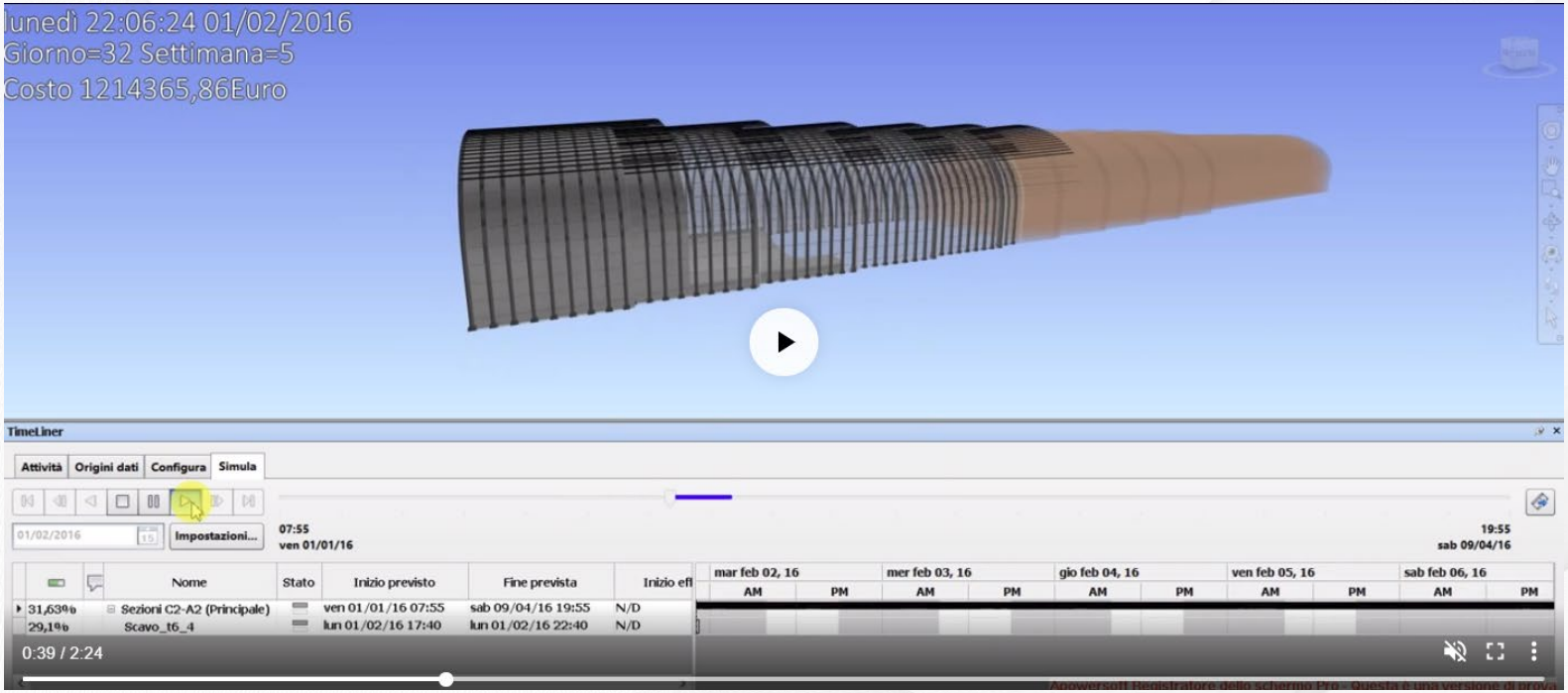
- The Simulation can be used as a supervision tool for supervise the construction progress
- Construction progress on site to be recorded by Clerk of Works day to day

45. Construction 4D



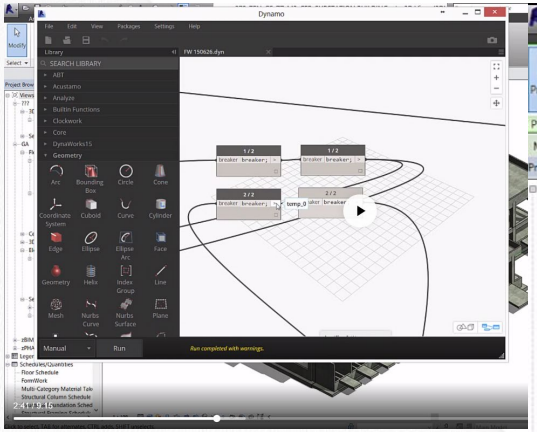
- The Simulation can be used as a supervision tool for supervise the construction progress
- Construction progress on site to be recorded by Clerk of Works day to day

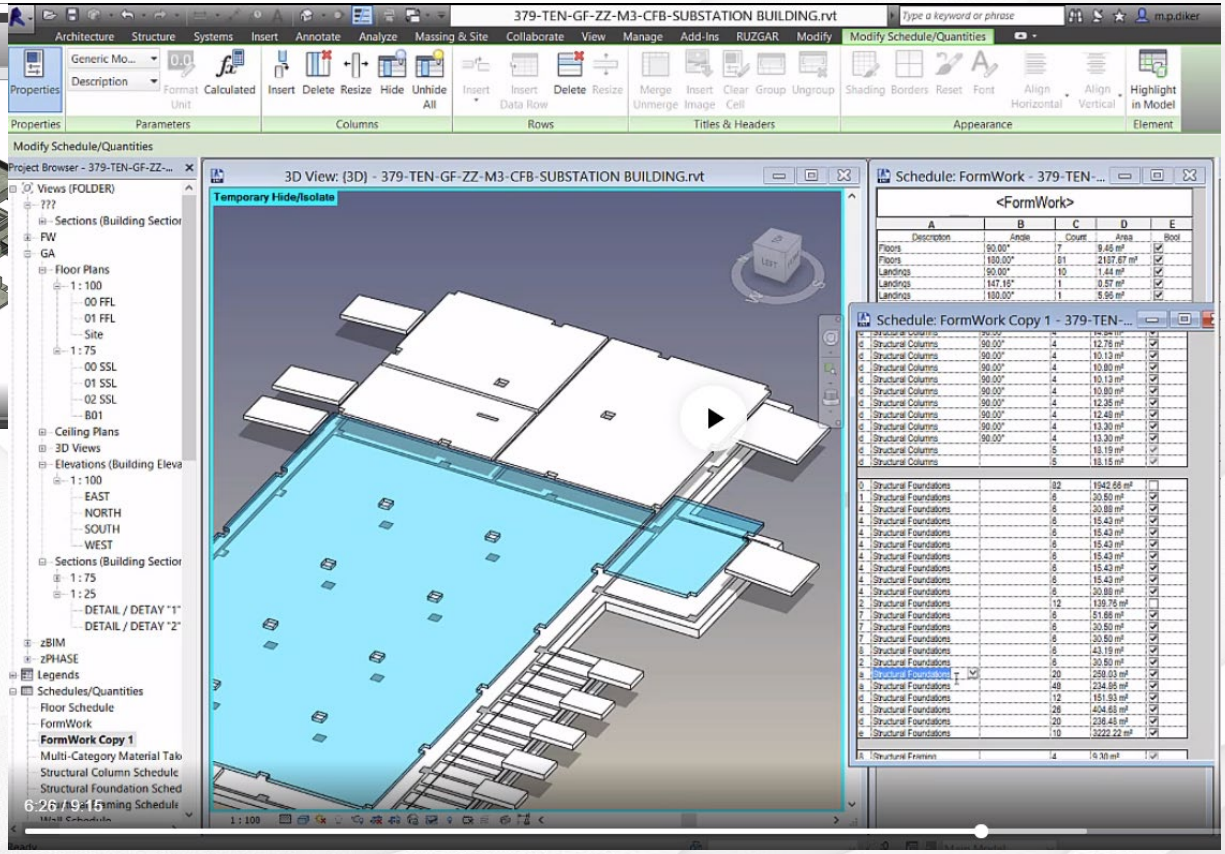
46. Construction 4D / 5D



- The information in BIM can be contributed into 5D in cost control aspect
- Information extract from BIM can only consider as Raw Data only
- Raw data need further edit and analyze by QS

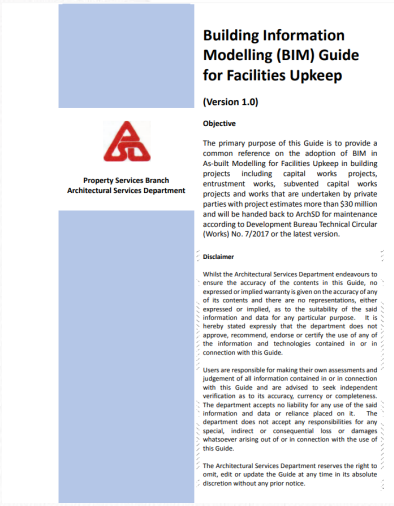
47. Construction 4D / 5D





- E.g. Formwork of RC Works cannot be calculated directly
- Further edit by Dynamo can be used for modelling the formwork
- Information of RC formwork can be quantified for QS

48. Construction 4D and FM



Building Information Modelling (BIM) Guide for Facilities Upkeep

(Version 1.0)

Property Services Branch
Architectural Services Department

Objective

The primary purpose of this Guide is to provide a common reference on the adoption of BIM in As-built Modelling for Facilities Upkeep in building projects including capital works projects, entrustment works, subvented capital works projects and works that are undertaken by private parties with project estimates more than $30 million and will be handed back to ArchSD for maintenance according to Development Bureau Technical Circular (Works) No. 7/2017 or the latest version.

Disclaimer

Whilst the Architectural Services Department endeavours to ensure the accuracy of the contents in this Guide, no expressed or implied warranty is given on the accuracy of any of its contents and there are no representations, either expressed or implied, as to the suitability of the said information and data for any particular purpose. It is hereby stated expressly that the department does not approve, recommend, endorse or certify the use of any of the information and technologies contained in or in connection with this Guide.

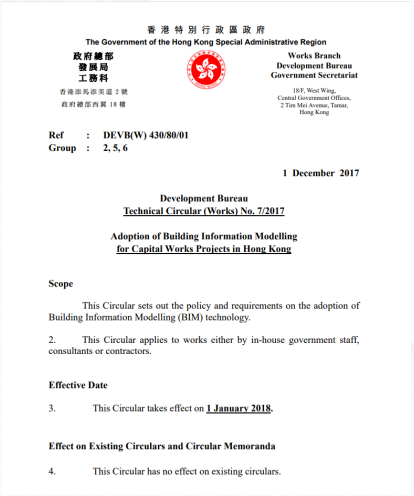
Users are responsible for making their own assessments and judgement of all information contained in or in connection with this Guide and are advised to seek independent verification as to its accuracy, currency or completeness. The department accepts no liability for any use of the said information and data or reliance placed on it. The department does not accept any responsibilities for any special, indirect or consequential loss or damages whatsoever arising out of or in connection with the use of this Guide.

The Architectural Services Department reserves the right to omit, edit or update the Guide at any time in its absolute discretion without any prior notice.

Item	Element	Graphic Model Element *Level of Development (LOD)*	Non-graphic information *Level of Development (LOD)*	3D Animation	BIM Object from original manufacturer	Photo record *(other than 360° photos)*	Other Modelling Requirements	Other Supporting Information
6.3	Acoustic door, panel, fixtures	350	500	✗	✓ (if available)	✓	1) Showing fixing details including all accessories, ironmongeries, etc.	1) Ditto (to Item 6.1). 2) Warranty and certificate. 3) Specification of the acoustic properties.
7.0	**Ironmongery**							
7.1	Elements under this trade	350	500	✗	✓ (if available)	✗		1) Brand name and model information. 2) Technical literature. 3) O&M manual.
8.0	**Steel and Metal Work**							
8.1	Elements under this trade (unless otherwise specified below)	350	500	✗	✓ (if available)	✗		1) Brand name and model information. 2) Technical literature.
8.2	Fall arrest system	350	500	✗	✓ (if available)	✗		1) Ditto (to Item 8.1). 2) Contractor / Specialist Contractor information. 3) O&M manual. 4) Particular specification for examination, testing and operation training.
8.3	Steel sheet / composite aluminium cladding	350	500	✗	✓ (if available)	✓	1) Showing fixing details including joints, supporting frames, insulation layer, etc.	1) Ditto (to Item 8.1). 2) Contractor / Specialist Contractor information. 3) Guarantee and warranty. 4) O&M manual.
8.4	Proprietary shutter, swing and sliding door	350	500	✗	✓ (if available)	✓	1) Showing fixing details including joints, supporting frames, rail / track, etc.	1) Ditto (to Item 8.1). 2) Contractor / Specialist Contractor information. 3) Guarantee and warranty. 4) O&M manual.
8.5	Aluminium windows and doors	350	500	✗	✓ (if available)	✗		1) Ditto (to Item 8.1).
9.0	**Plastering and Finishes**							
9.1	Elements under this trade (unless otherwise specified below)	350	500	✗	✓ (if available)	✗		1) Brand name and model information. 2) Technical literature.

- Guideline for BIM to Facility Management upkeeping
- The Standard of Naming Component to be confirmed by BIM Manager
- Facility Management team can use the information to maintain the continue of upkeeping by the benefit of BIM input

49. Construction 4D and FM



香港特別行政區政府
The Government of the Hong Kong Special Administrative Region

政府總部
發展局
工務科

Works Branch
Development Bureau
Government Secretariat

Ref : DEVB(W) 430/80/01
Group : 2, 5, 6

1 December 2017

Development Bureau
Technical Circular (Works) No. 7/2017

Adoption of Building Information Modelling for Capital Works Projects in Hong Kong

Scope

This Circular sets out the policy and requirements on the adoption of Building Information Modelling (BIM) technology.

2. This Circular applies to works either by in-house government staff, consultants or contractors.

Effective Date

3. This Circular takes effect on 1 January 2018.

Effect on Existing Circulars and Circular Memoranda

4. This Circular has no effect on existing circulars.

10	Space Programming	O	O	
11	Phase Planning (4D Modelling)		O	M
12	Digital Fabrication		O	O
13	Site Utilization Planning			O
14	3D Control and Planning			O
15	As-Built Modelling			M
16	Project Systems Analysis			O
17	Maintenance Scheduling			O
18	Space Management and Tracking			O
19	Asset Management			O
20	Drawing Generation (Drawing Production)		M	M

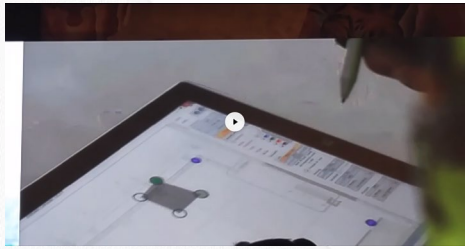
Legend:

M – Mandatory BIM Use for the mentioned stage, including that carried forward from previous stage.

O – Optional BIM Use

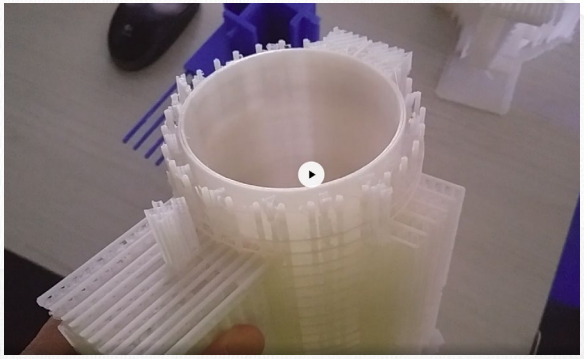
- The 4D Modelling is Mandatory according to Development Bureau circular letter

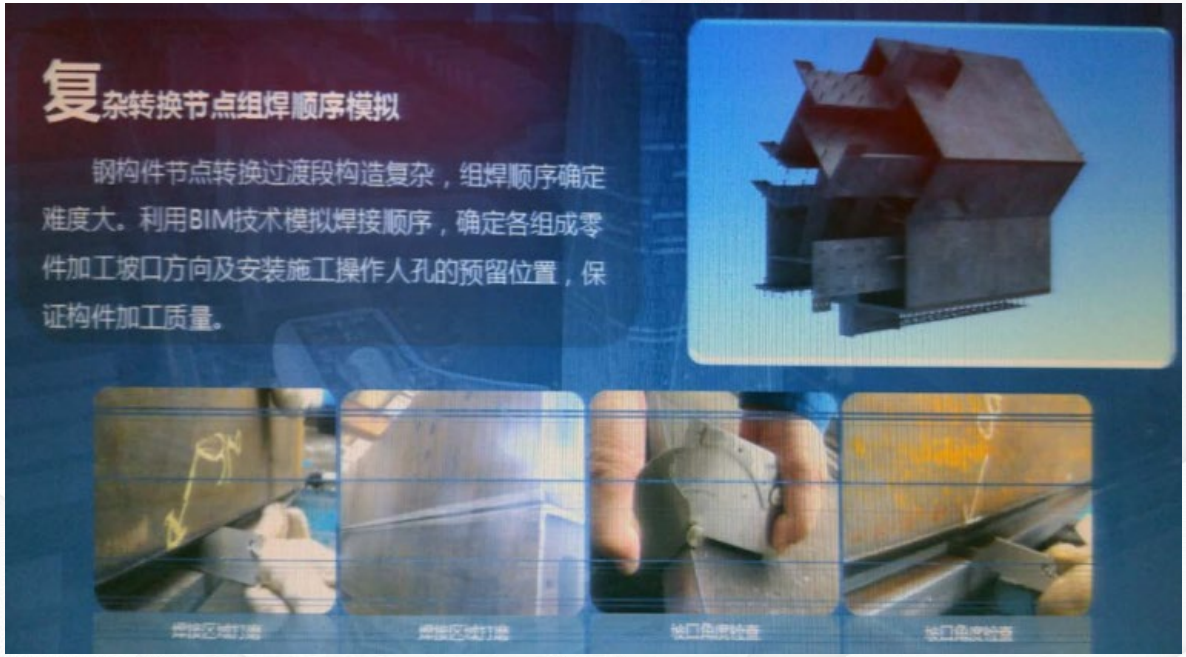
50. BIM for Construction Safety



- Unsafety area can be defined by Site Safety Manager
- Anyone enter unsafety can be detected immediately
- It can contribute the safety control on site during construction

51. BIM for Manufacture Component



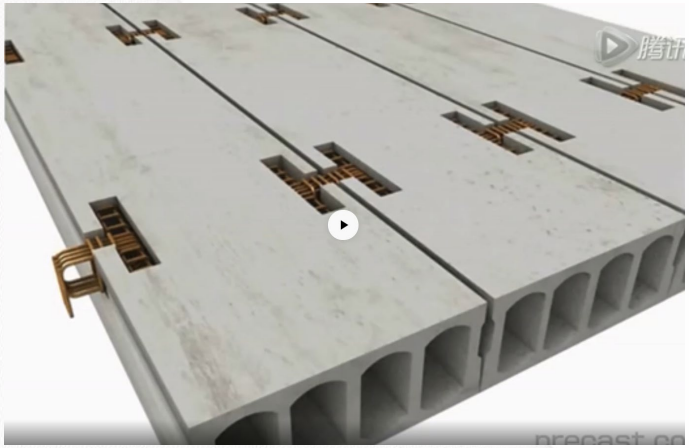


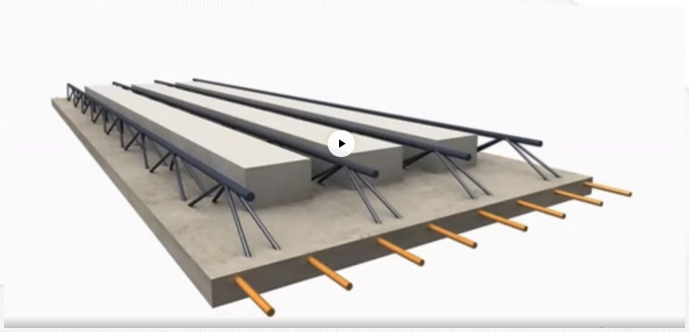
- Complex Structural Joint can be simulated in BIM
- Structural Model in BIM can be 3D printed as a mockup for site coordination
- Manufactured Component can be scanned to compare the tolerance between BIM model and Construction Component

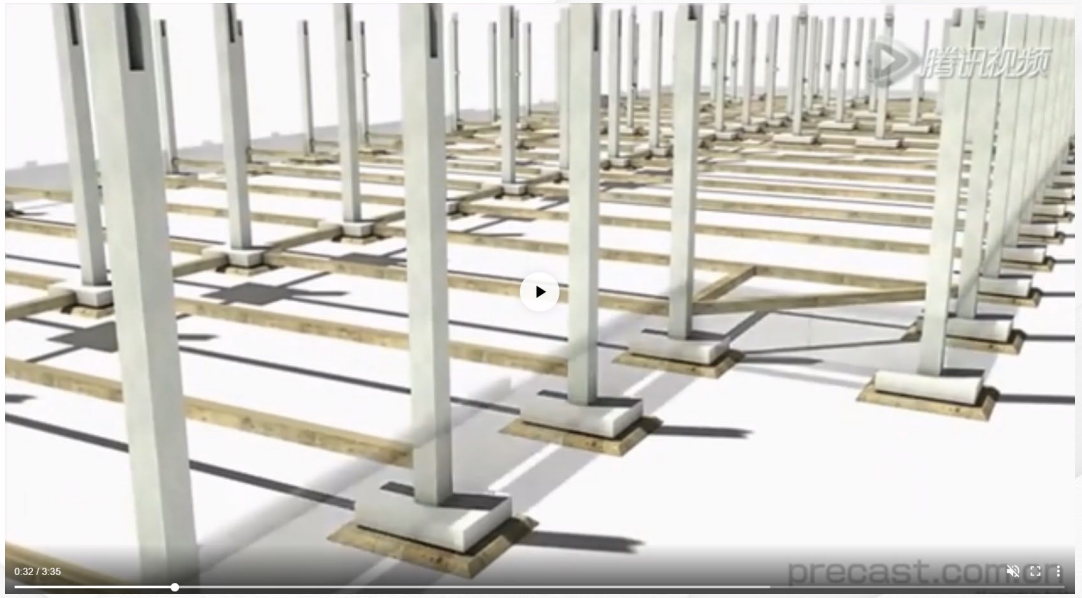
52. BIM in Complex Geometry Construction

- Complex Structural Joint can be simulated in BIM
- Structural Model in BIM can be 3D printed as a mockup for site coordination
- Manufactured Component can be scanned to compare the tolerance between BIM model and Construction Component

53. BIM for Precast Construction

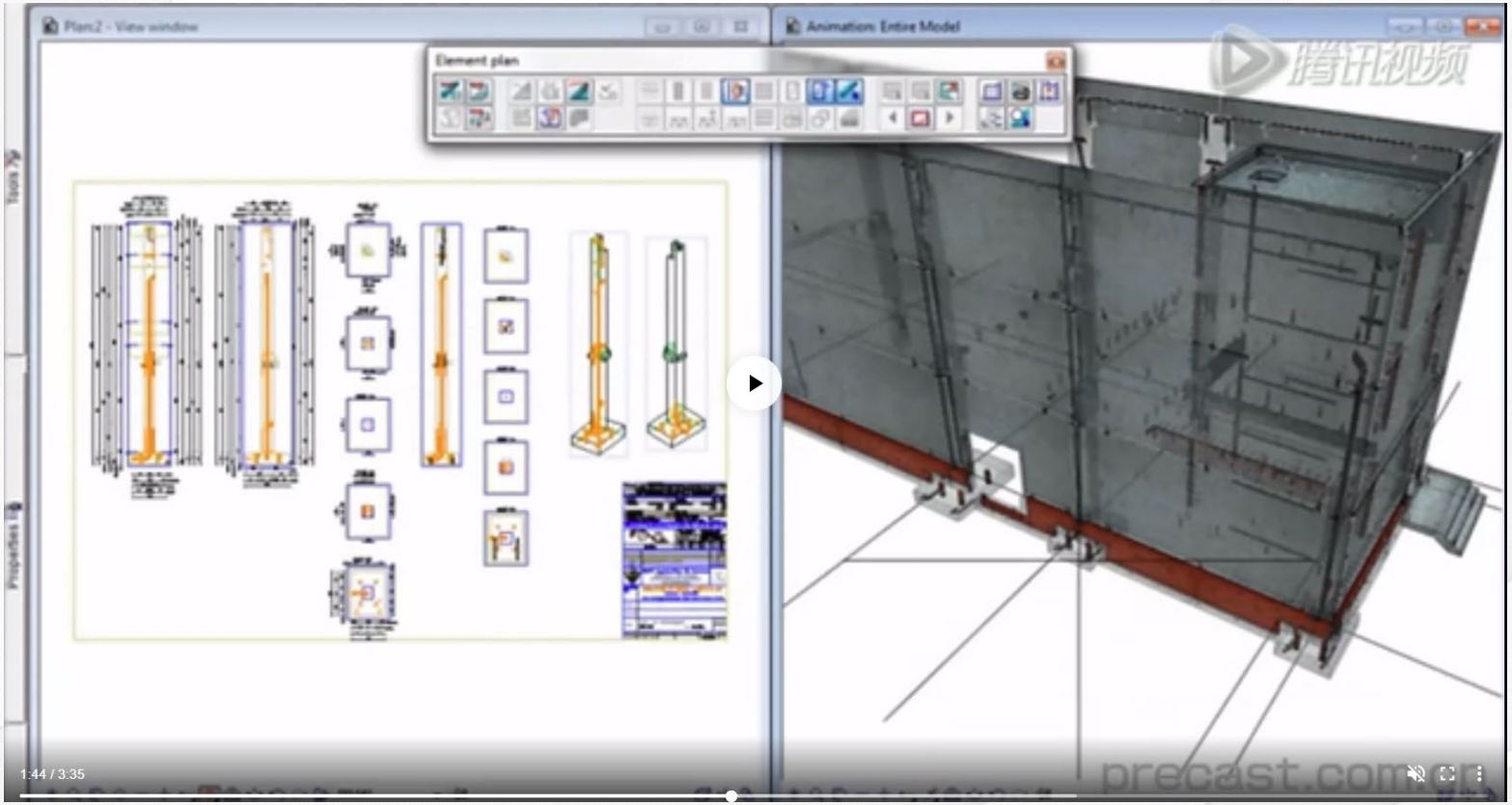






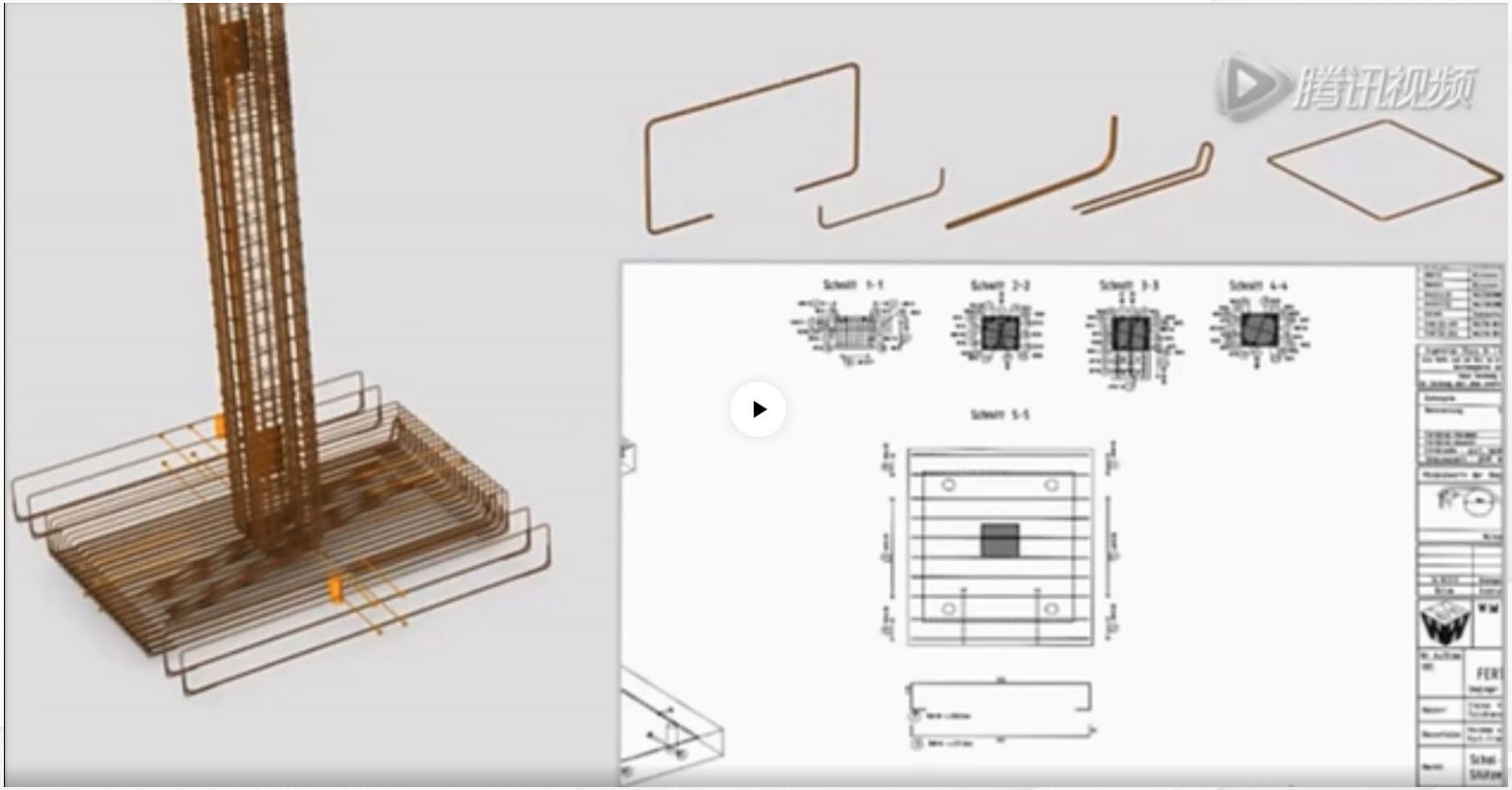
- Component extracted from BIM
- Divided into different components for production
- Connection Joint can be modified before production

54. BIM for Manufacturing



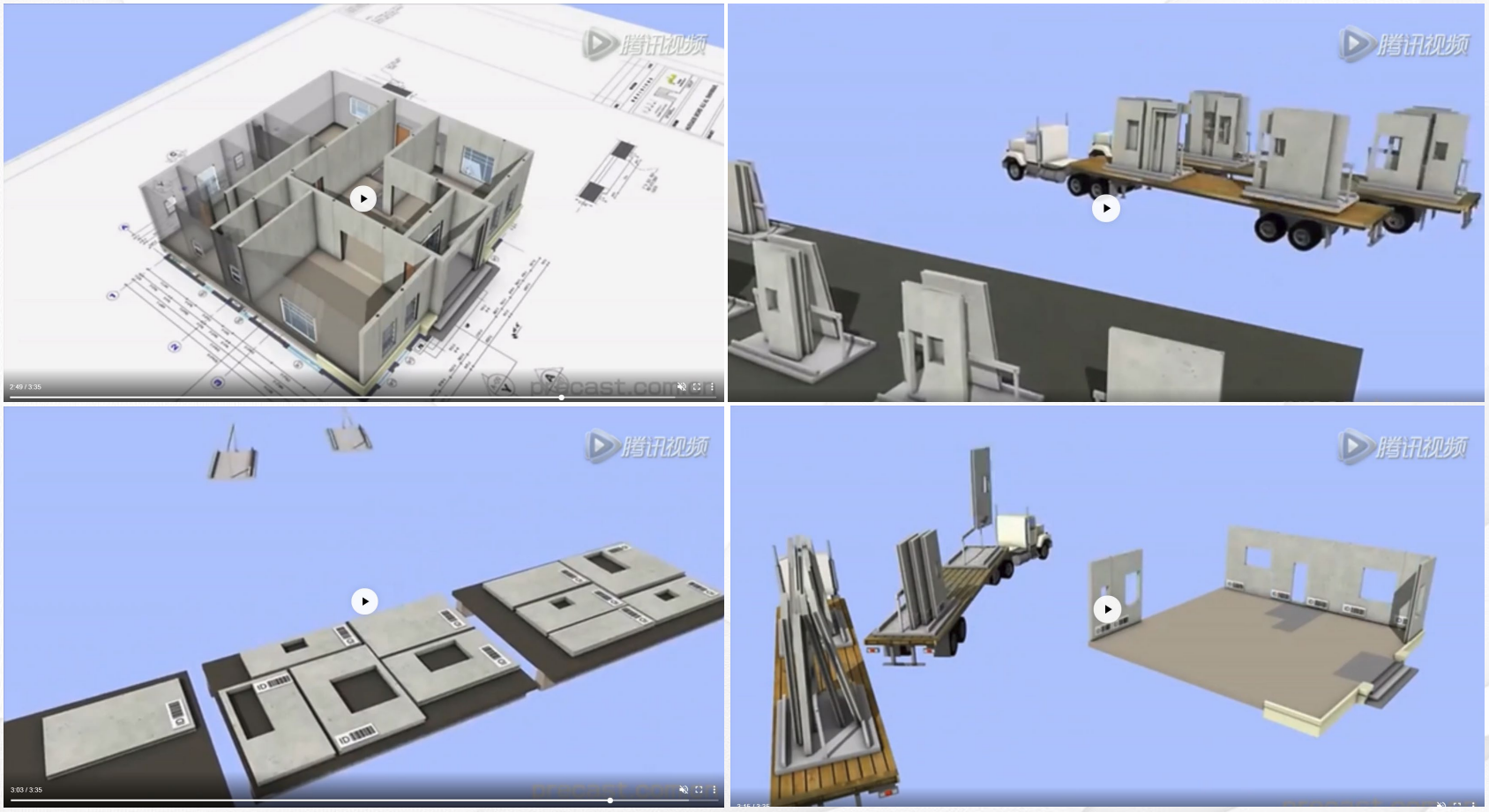
- Division of component can be divided in BIM with details construction joint
- Change of design can be reflected from BIM to drawings consistently
- Construction sequences and transportation can be planned on earlier stage for the project

55. BIM for Manufacturing



- Division of component can be divided in BIM with details construction joint
- Change of design can be reflected from BIM to drawings consistently
- Construction sequences and transportation can be planned on earlier stage for the project

56. BIM for Manufacturing



- Construction and Assembly sequence can be simulated in BIM
- Transportation from manufacturing to site can be simulated in BIM in order to avoid wastage of space
- Assembly on site can be smoothed with label and simulation in BIM

57. BIM for Manufacturing

- Early involved in BIM to the project result in accuracy of construction since the process of simulation is a completed result and potential clash should be resolved before on site construction
- Enough of manpower should be involved

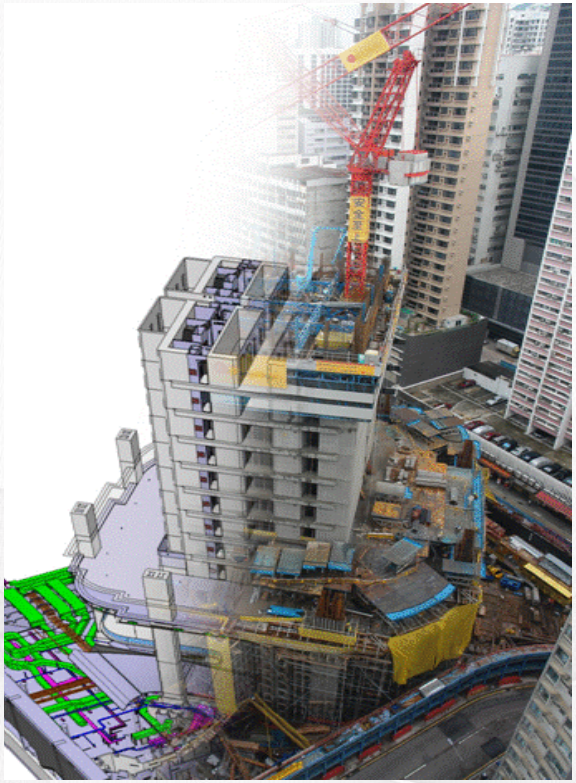
58. BIM for Manufacturing

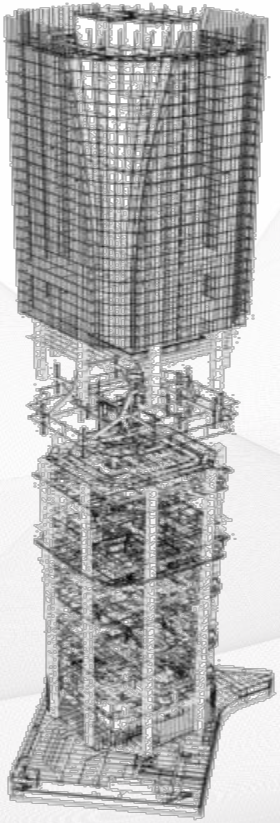
- Early involved in BIM to the project result in accuracy of construction since the process of simulation is a completed result and potential clash should be resolved before on site construction
- Enough of manpower should be involved

59. BIM Adoption – Private Project

HIGH RISE BUILDING PROJECT

Name of Building: One Island East
Client: Swire Properties
Main Contractor: Gammon Construction
Completion: 2008
Description: 1.5 million sq. ft. 70-storey Hong Kong office building.





Andrew Baldwin, David Bordoli (2014). A Handbook for Construction Planning and Scheduling, John Wiley & Sons, Ltd.

60. BIM Adoption – Public Project

HONG KONG HOUSING AUTHORITY PROJECT

Autodesk Far East Ltd. (2010), Autodesk BIM Award 2010, Hong Kong, Macau and Taiwan

61. BIM Adoption – Public Project

HONG KONG HOUSING AUTHORITY PROJECT

Autodesk Far East Ltd. (2010), Autodesk BIM Award 2010, Hong Kong, Macau and Taiwan

62. BIM Adoption – Public Project

HONG KONG HOUSING AUTHORITY PROJECT

Autodesk Far East Ltd. (2010), Autodesk BIM Award 2010, Hong Kong, Macau and Taiwan

63. BIM Adoption – Public Project

HONG KONG HOUSING AUTHORITY PROJECT

Autodesk Far East Ltd. (2010), Autodesk BIM Award 2010, Hong Kong, Macau and Taiwan

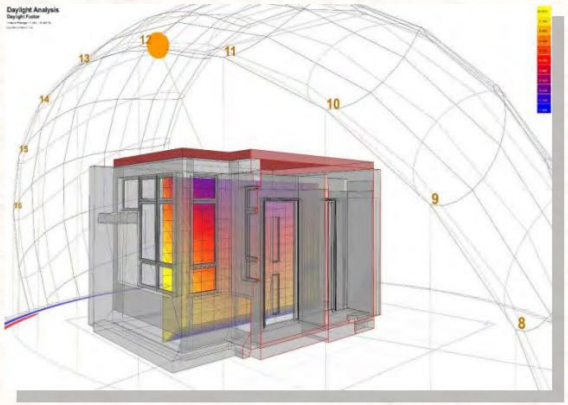
64. BIM Adoption – Public Project

HONG KONG HOUSING AUTHORITY PROJECT

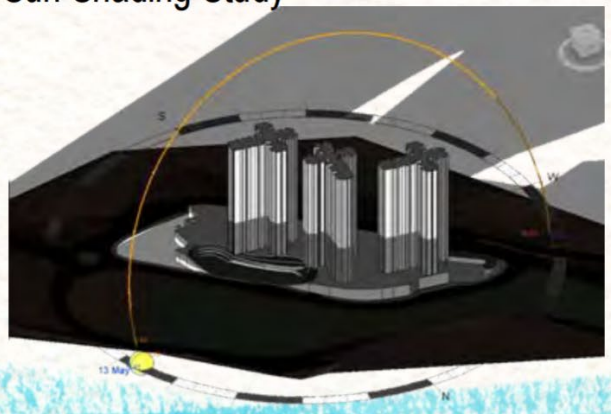
BIM Technology in HA – Current Applications

Visual Assessment

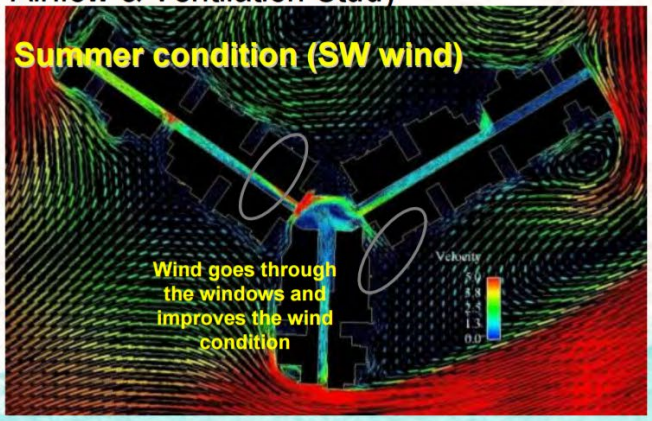
Daylight Analysis



Sun Shading Study



Airflow & Ventilation Study



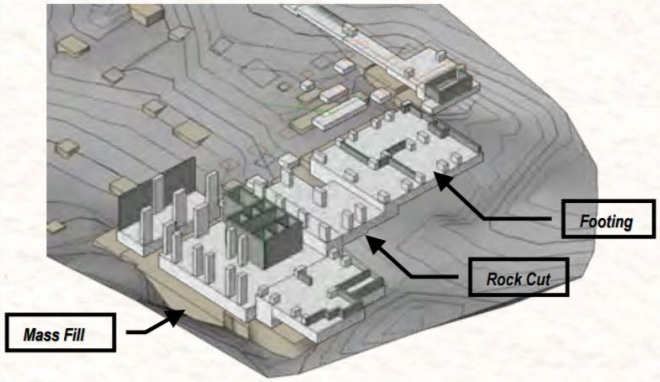
Ada Fung (2013). Application of BIM and RFID Application of BIM and RFID in Public Housing Projects in Public Housing Projects, CICID 10th Anniversary Conference

65. BIM Adoption – Public Project

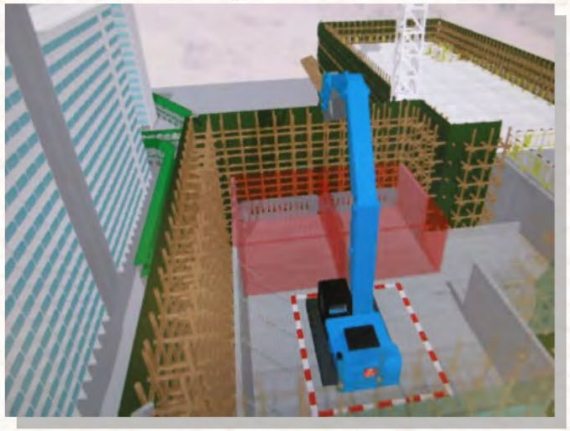
HONG KONG HOUSING AUTHORITY PROJECT

BIM Technology in HA – Current Applications

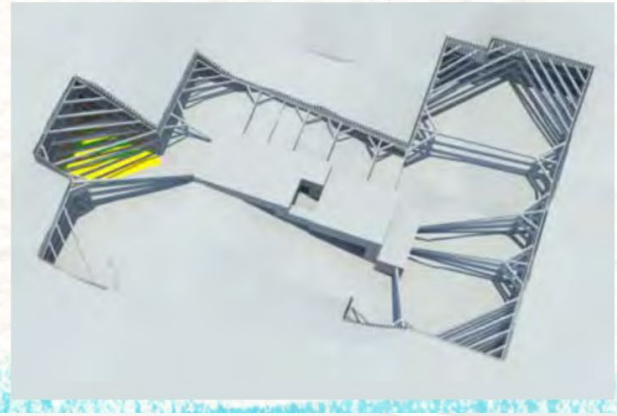
Optimization of Foundation Design



Site Safety Planning for Construction, Demoliti



Excavation and Lateral Support Simulation



Demolition Simulation

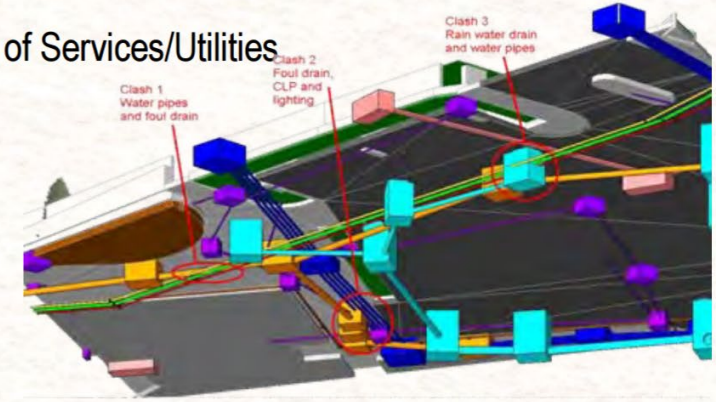
Ada Fung (2013). Application of BIM and RFID Application of BIM and RFID in Public Housing Projects in Public Housing Projects, CICID 10th Anniversary Conference

66. BIM Adoption – Public Project

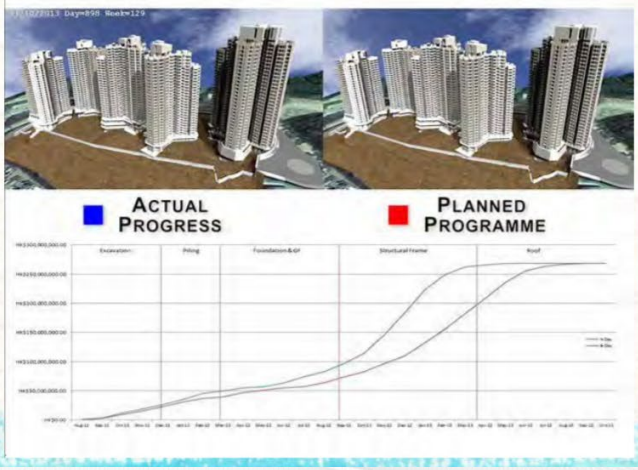
HONG KONG HOUSING AUTHORITY PROJECT

BIM Technology in HA – Current Applications

Co-ordinations of Services/Utilities Design



5D Model to Study Cash Flow



6-Day Typical Floor Construction Cycle

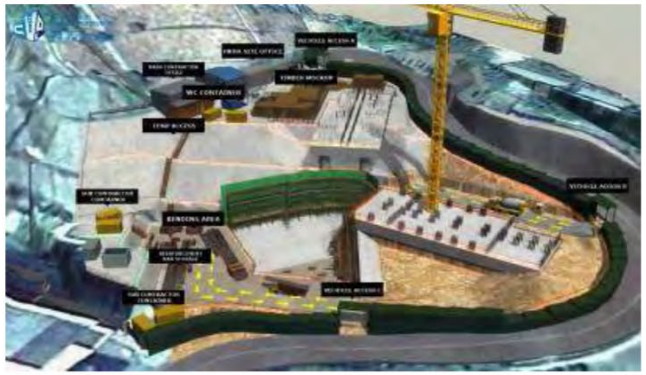
Ada Fung (2013). Application of BIM and RFID Application of BIM and RFID in Public Housing Projects in Public Housing Projects, CICID 10th Anniversary Conference

67. BIM Adoption – Public Project

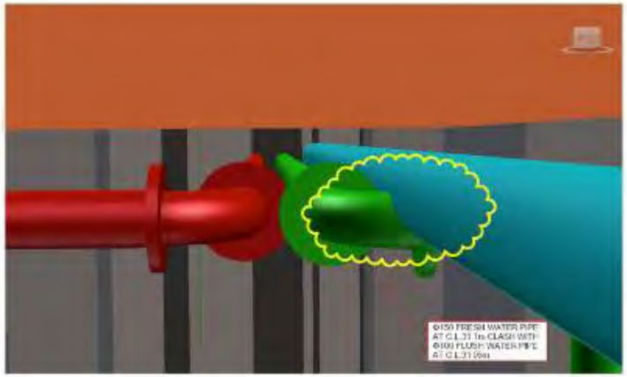
HONG KONG HOUSING AUTHORITY PROJECT

Contractor's Applications

Site Layout Planning

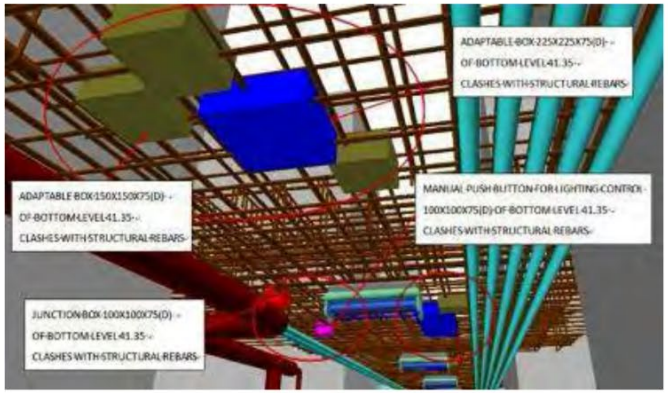


Clashes Study



Virtual Rehearsal : Six-day Cycle for Typical Floor

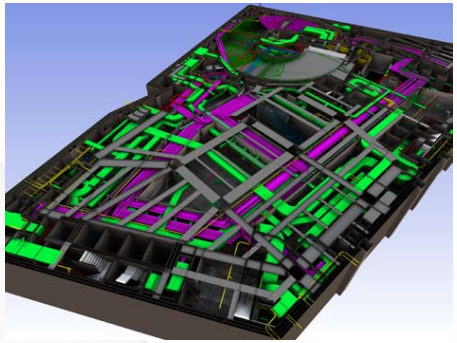
Rebars Fixing & Services Installation Collaboration



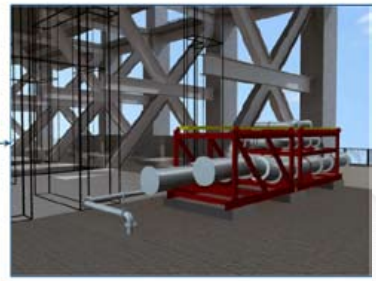
Ada Fung (2013). Application of BIM and RFID Application of BIM and RFID in Public Housing Projects in Public Housing Projects, CICID 10th Anniversary Conference

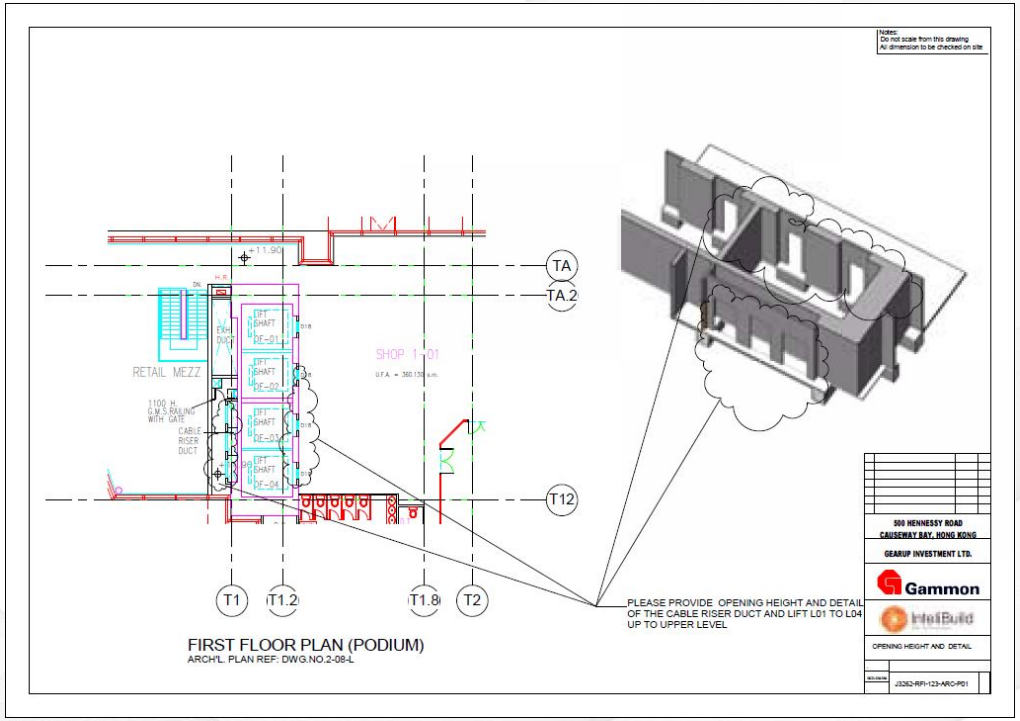
68. BIM Adoption – Commercial Office

Redevelopment of Hennessy Centre

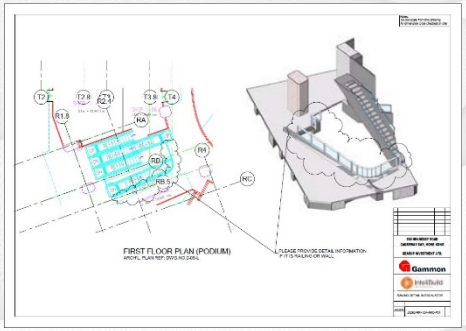


Pipe Module Installation





Pipe Rack Units

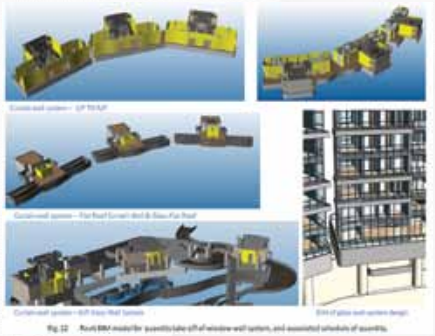


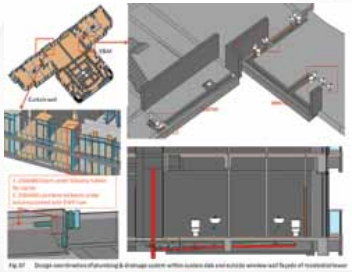
Company: Gammon Construction Limited
Project: Redevelopment of Hennessy Centre
Location: Causeway Bay, Hong Kong
Type: Commercial
Scheduled Time of Completion: 2012

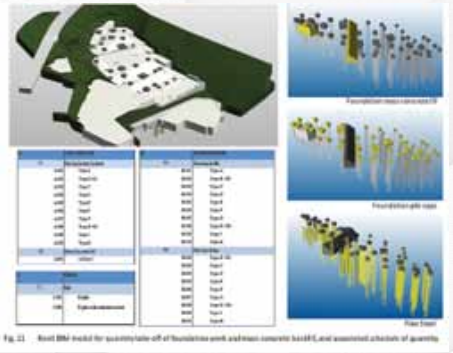
Autodesk Far East Ltd. (200), Autodesk BIM Award 2010, Hong Kong, Macau and Taiwan

69. BIM Adoption – Private Residential Project

The University Heights Redevelopment







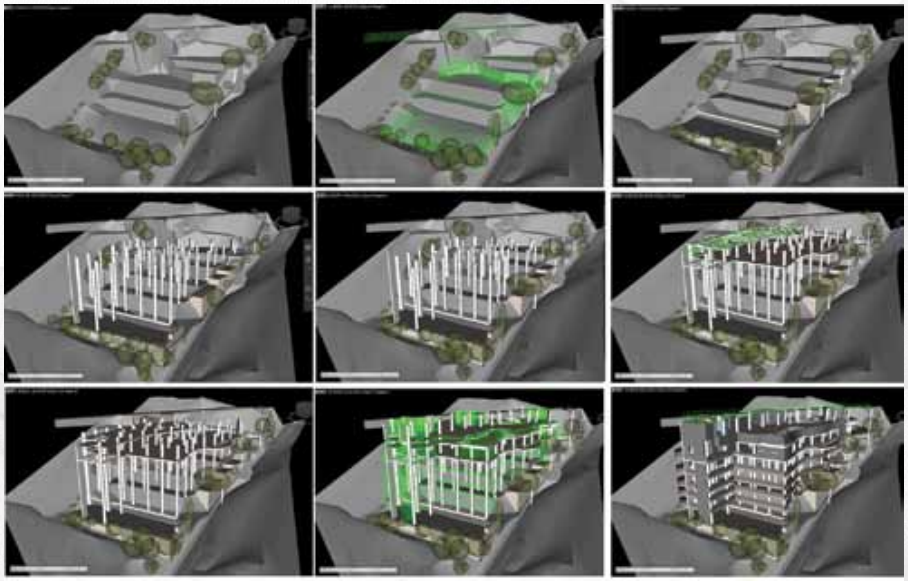


Fig. 05 Captured views of Navisworks 4D simulation to visualize the construction process of site formation work and basement structure.

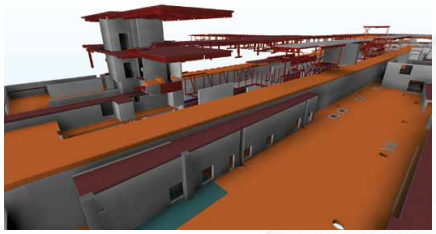
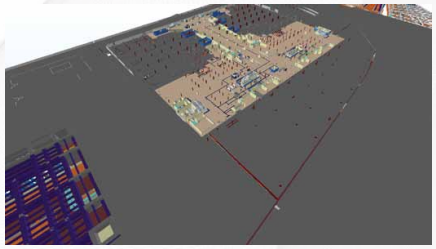
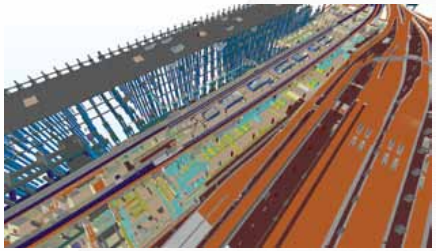
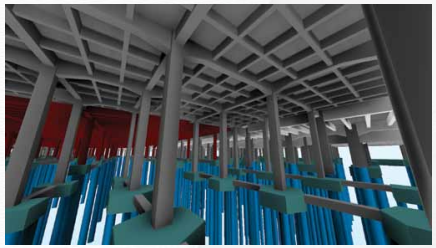
Company: Chinachem Group
Project: The University Heights Redevelopment
Location: No.42-44, Kotewall Road, Mid-levels West, Hong Kong
Type: Luxury High-end Residential Development
Scheduled Time of Completion: 2017

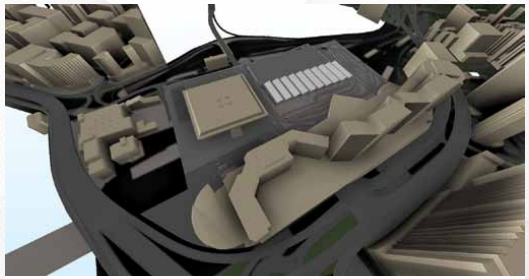
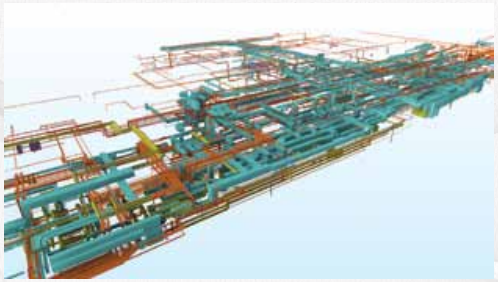
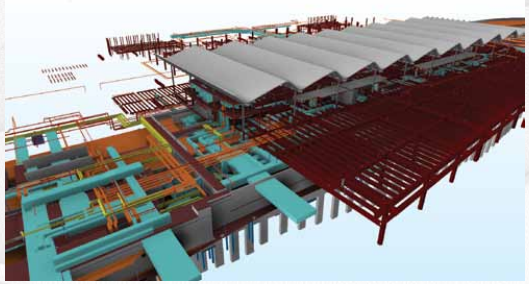
BIM Partners:
• Andrew Lee King Fun & Associates Architects Limited
• Far East Consulting Engineers Limited • CM Wong & Associates Limited • Rider Levett Bucknall Limited • Atkins China Limited
• Vircon Limited

Autodesk Far East Ltd. (2013), Autodesk BIM Award 2013, Hong Kong, Macau and Taiwan

70. BIM Adoption – Metro Station

Hung Hom Station & Approach Tunnels

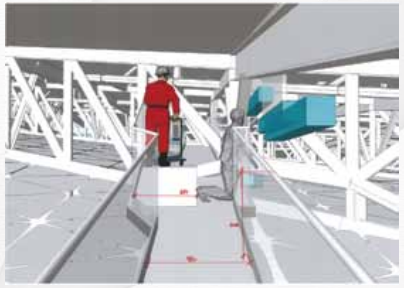
Company: MTR Corporation Limited
Project: Hung Hom Station & Approach Tunnels
Location: Hung Hom, Hong Kong
Type: Civil Infrastructure
Scheduled Time of Completion: 2018

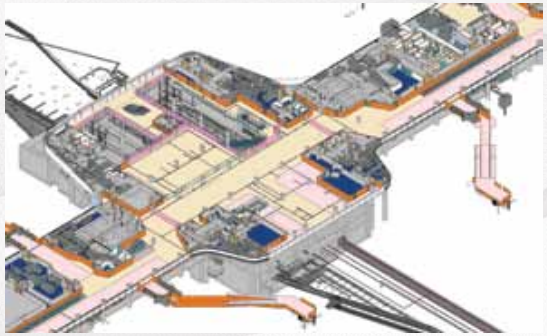
BIM Partners:
- Aedas Limited • Parsons Brinckerhoff
- Atkins • Sweett Limited • InteliBuild
- Leighton Contractor (Asia) Limited
- Gammon Kaden Joint Venture

Autodesk Far East Ltd. (2013), Autodesk BIM Award 2013, Hong Kong, Macau and Taiwan

71. BIM Adoption – Airport

Hung Hom Station & Approach Tunnels





Company: Mott MacDonald and Arup
Project: Midfield Development Design Consultancy Services
Location: Hong Kong International Airport
Type: Infrastructure
Scheduled Time of Completion: Q3, 2015

BIM Partners:
• Airport Authority Hong Kong • Aedas Limited • OTC Limited • Atkins China Limited • Bo Steiber Lighting Design

Autodesk Far East Ltd. (2009), Autodesk BIM Award 2009, Hong Kong, Macau and Taiwan

72. BIM Adoption – Design and Build

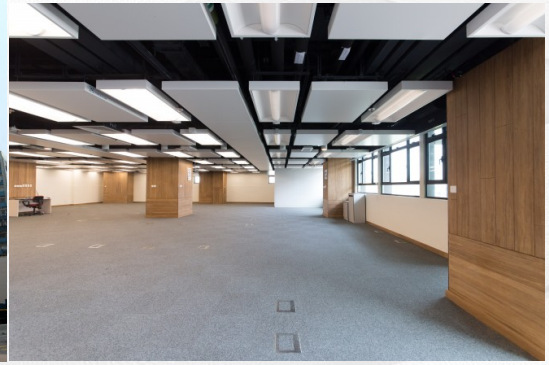
Renovation of 1/F Main Block APB Centre Architectural Services Department

- Use of BIM for renovation project

PLATINUM
鉑金級 BI 室內建築 V1.0 2015
HKGBC
BEAM Plus
綠建環評

Total Score: 89.0

BEAM Plus
Interiors V1.0
Platinum



Completion Year: 2015
IFA: 794sqm

Owner: Architectural Services Department
Architect: Llewelyn-Davies HK Ltd.
M&E: Wong & Ouyang (BS) Ltd.
Sustainable Design: Ove Arup
BIM Consultant: Vircon Ltd.

From Hong Kong Green Building Council (2016)

73. BIM Adoption – Full BIM

Xiqu Centre

Image courtesy of BTA & RLP Company Ltd.

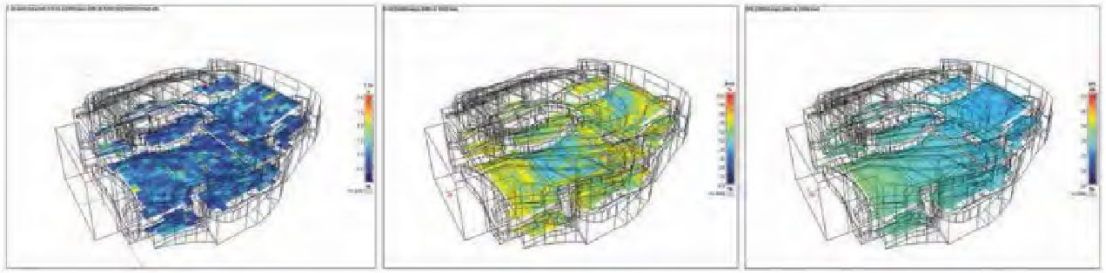
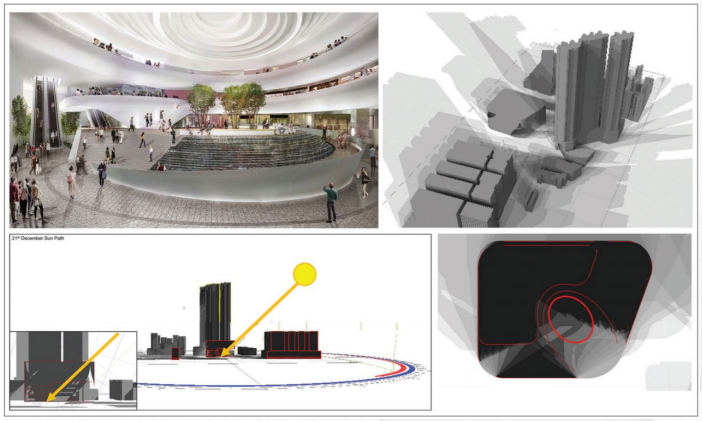


Image courtesy of BTA & RLP Company Ltd.



Company: BTA & RLP Company Limited
Project: Xiqu Centre
Location: West Kowloon Cultural District, Hong Kong
Type: Theatre and Retail
Scheduled Time of Completion: 2017

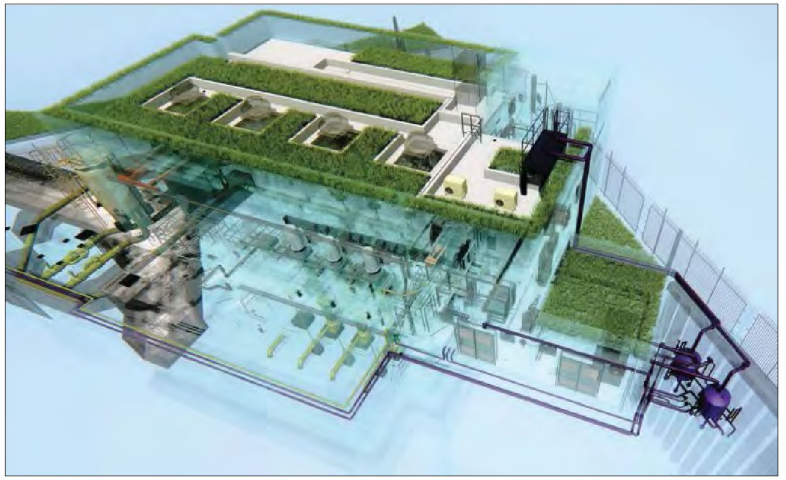
BIM Partners:

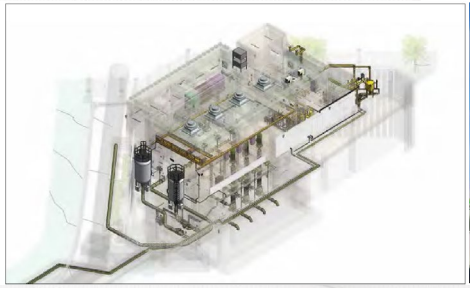
- West Kowloon Cultural District Authority
- Buro Happold International
- Rider Levett Bucknall
- Atkins China Ltd.
- Front Inc.
- Hip Hing Construction Co. Ltd.
- Kingsfield Engineering Ltd.

Autodesk Far East Ltd. (2015), Autodesk BIM Award 2015, Hong Kong, Macau and Taiwan

74. BIM Adoption – Asset Management

Study on the Trial Use of Building Information Modelling (BIM) for Asset Management





Company: Water Supplies Department, HKSAR Government
Project: Study on the Trial Use of Building Information Modelling (BIM) for Asset Management
Location: Tai Po and Telegraph Bay Salt Water Pumping Stations
Type: Waterworks
Scheduled Time of Completion: 2015

BIM Partners:

- Summit Technology (HK) Ltd • Sino-iTech Holdings Co Ltd.

Autodesk Far East Ltd. (2015), Autodesk BIM Award 2015, Hong Kong, Macau and Taiwan

75. BIM Adoption – Revitalization Project

Revitalization of Shophouses at 600-626 Shanghai Street, Mong Kok

Enabling a more efficient building life cycle through the use of Building Information Modelling
Image courtesy of Urban Renewal Authority

To adopt the use of BIM in the building life cycle: Design, Build and Operate
Image courtesy of Urban Renewal Authority

Enhanced Design Communication, Closer Collaboration and quality of the buildings

3D digital representation of building data
Image courtesy of Urban Renewal Authority

Interface of the entrance, covered cloister, finishes of old and new façade can be evaluated easily
Image courtesy of Urban Renewal Authority

Company: Urban Renewal Authority
Project: Revitalization of Shophouses at 600-626 Shanghai Street, Mong Kok
Location: Mong Kok, Hong Kong
Type: Revitalization and Preservation
Scheduled Time of Completion: 2018/2019

BIM Partners:

- Chau Lam Architects & Associates Architects & Engineers (HK) Limited
- Ben Tse & Associates Limited • Far East Consulting Engineers Limited
- China Point Consultants Limited • Beria Consultants Limited
- Team 73 HK Limited • Wan Chung Construction Company Limited
- Vircon Limited

Autodesk Far East Ltd. (2017), Autodesk BIM Award 2015, Hong Kong, Macau and Taiwan

76. BIM Adoption – Landscape

The Use of BIM for Landscape Design – Landscape Information Modelling

Image courtesy of Architectural Services Department, HKSAR Government

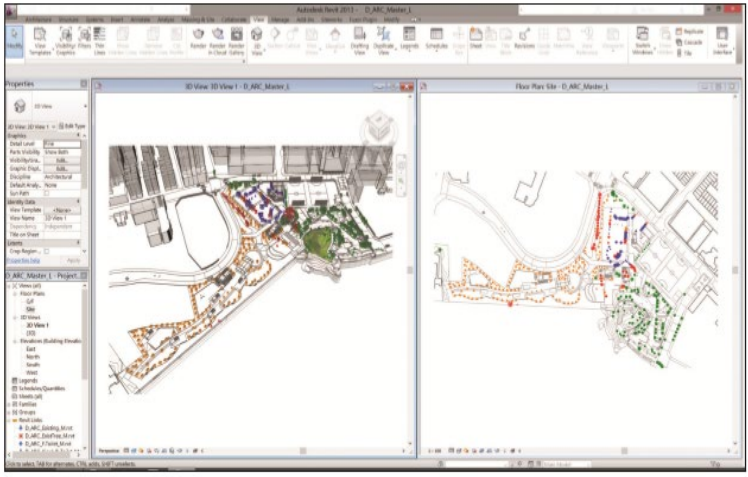
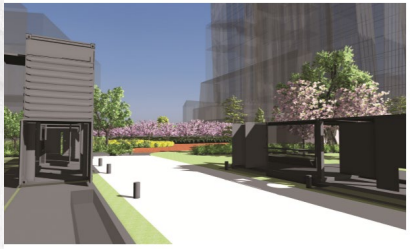


Image courtesy of Architectural Services Department, HKSAR Government



Company: Architectural Services Department, HKSAR Government
Project: The Use of BIM for Landscape Design – Landscape Information Modelling
Location: Victoria Park, Causeway Bay; Parks in To Kwa Wan & Kwun Tong
Type: Landscape Design and Construction
Scheduled Time of Completion: 2015-2018

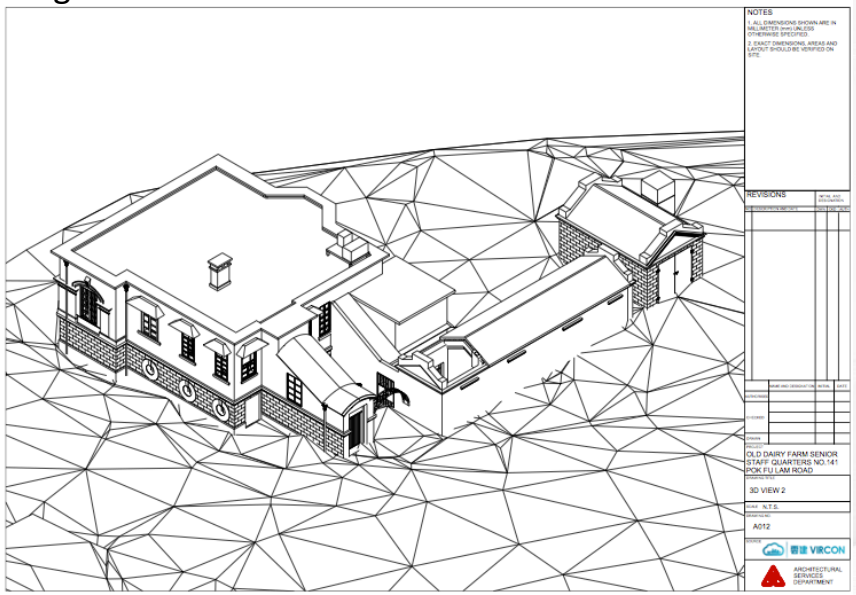
BIM Partners:
• Vircon Ltd. • Kalloc Studios Asia Ltd.

Autodesk Far East Ltd. (2015), Autodesk BIM Award 2015, Hong Kong, Macau and Taiwan

77. BIM Adoption – Heritage

HERITAGE

- Use of BIM for Heritage Record and Further Design



Year Built: 1887
Grading: Grade 1
Selected Applicant: Caritas-Hong Kong
Project Title: The Pokfulam Farm Project
Content: The project will present the history of the Old Dairy Farm and introduce the culture of Pokfulam village and the surrounding area through exhibitions, guided tours and workshops

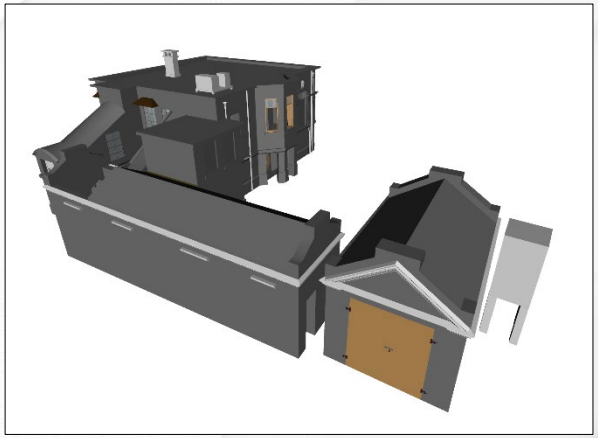
Conserve and Revitalise Hong Kong Heritage Department (2013), Revitalising Historic Buildings Through Partnership Scheme, Resource Kit

78. BIM Adoption – Heritage

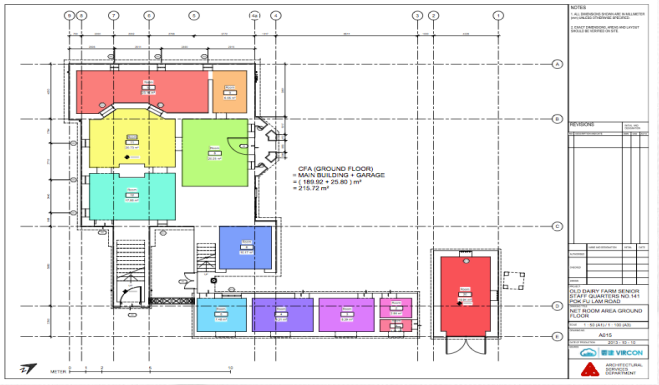
TERRESTRIAL LASER SCANNING AND BIM

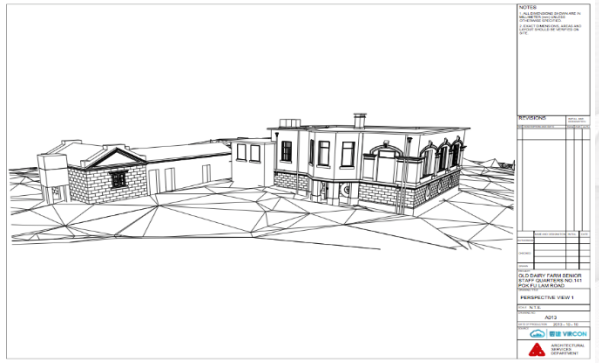
3D Scanning

Point Cloud Data



BIM Model

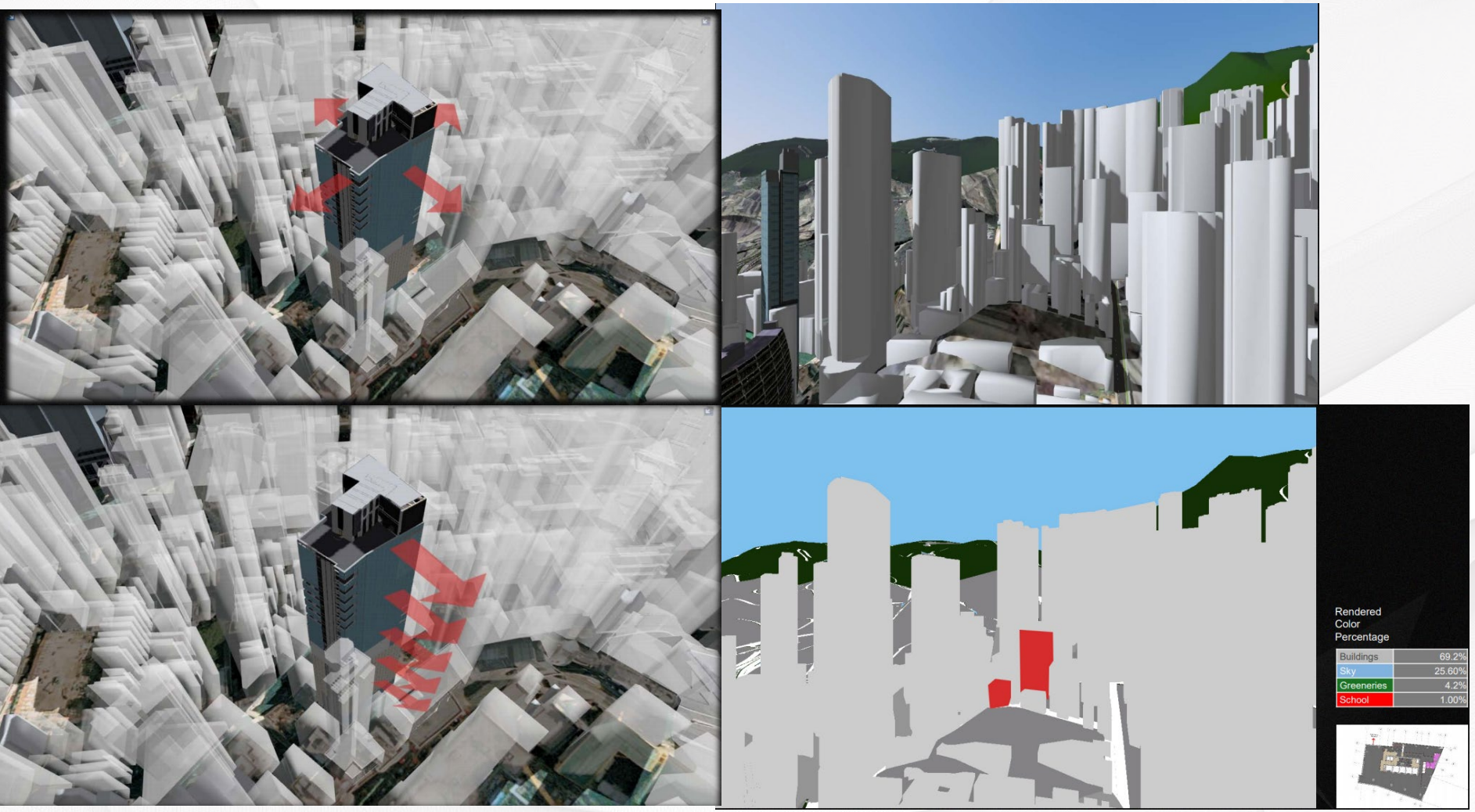




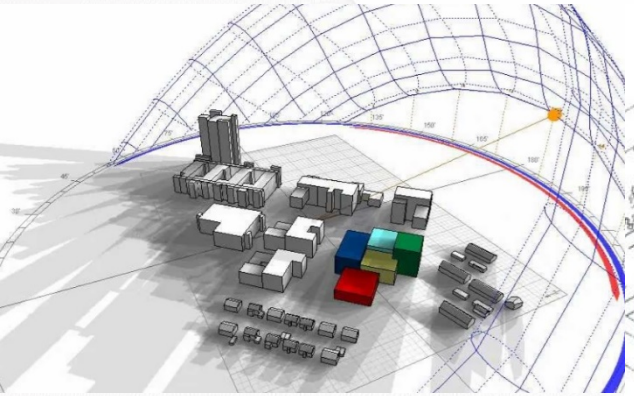
Drawing Production and Quantity Take-off

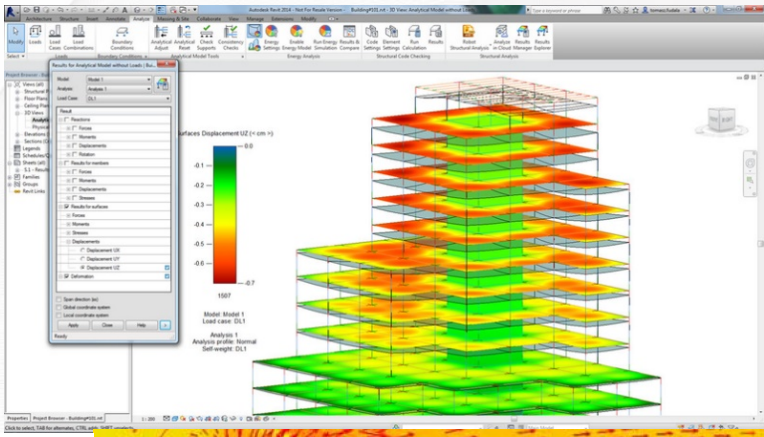
Room Schedule	
Name	Area
Room 01	10.37 m²
Room 02	6.65 m²
Room 03	24.67 m²
Room 04	24.61 m²
Room 05	4.53 m²
Room 06	21.89 m²
Room 07	24.25 m²
Room 08	23.20 m²
Room 09	10.55 m²
Room 10	7.48 m²
Room 11	25.21 m²
Room 12	24.35 m²
Room 13	21.31 m²
Room 14	9.55 m²
Room 15	4.30 m²
Room 16	9.73 m²
Room 17	7.48 m²
Room 18	1.84 m²

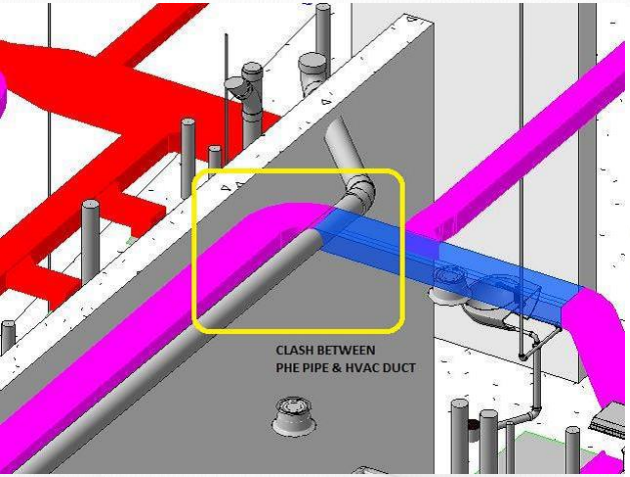
79. Constraints of conceptual analytical tools and decisions made on their basis

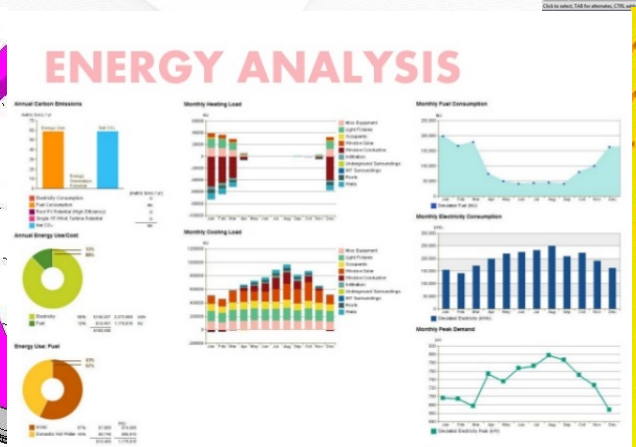


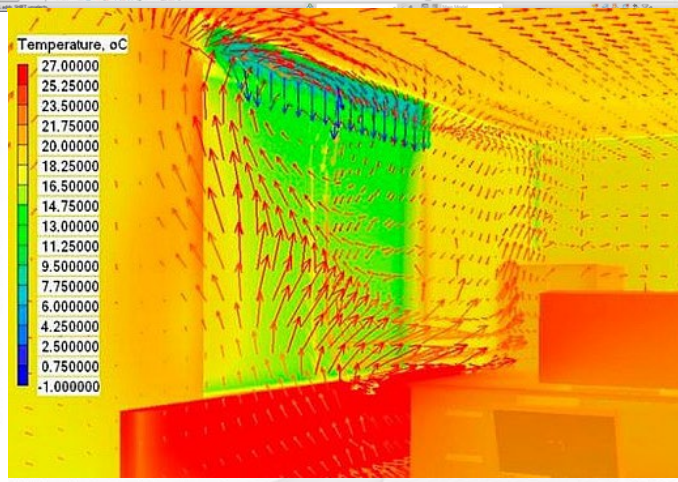
80. Applying selected analytical tools to a validated model











81. Understanding the results of analyses and drawing conclusions for the project

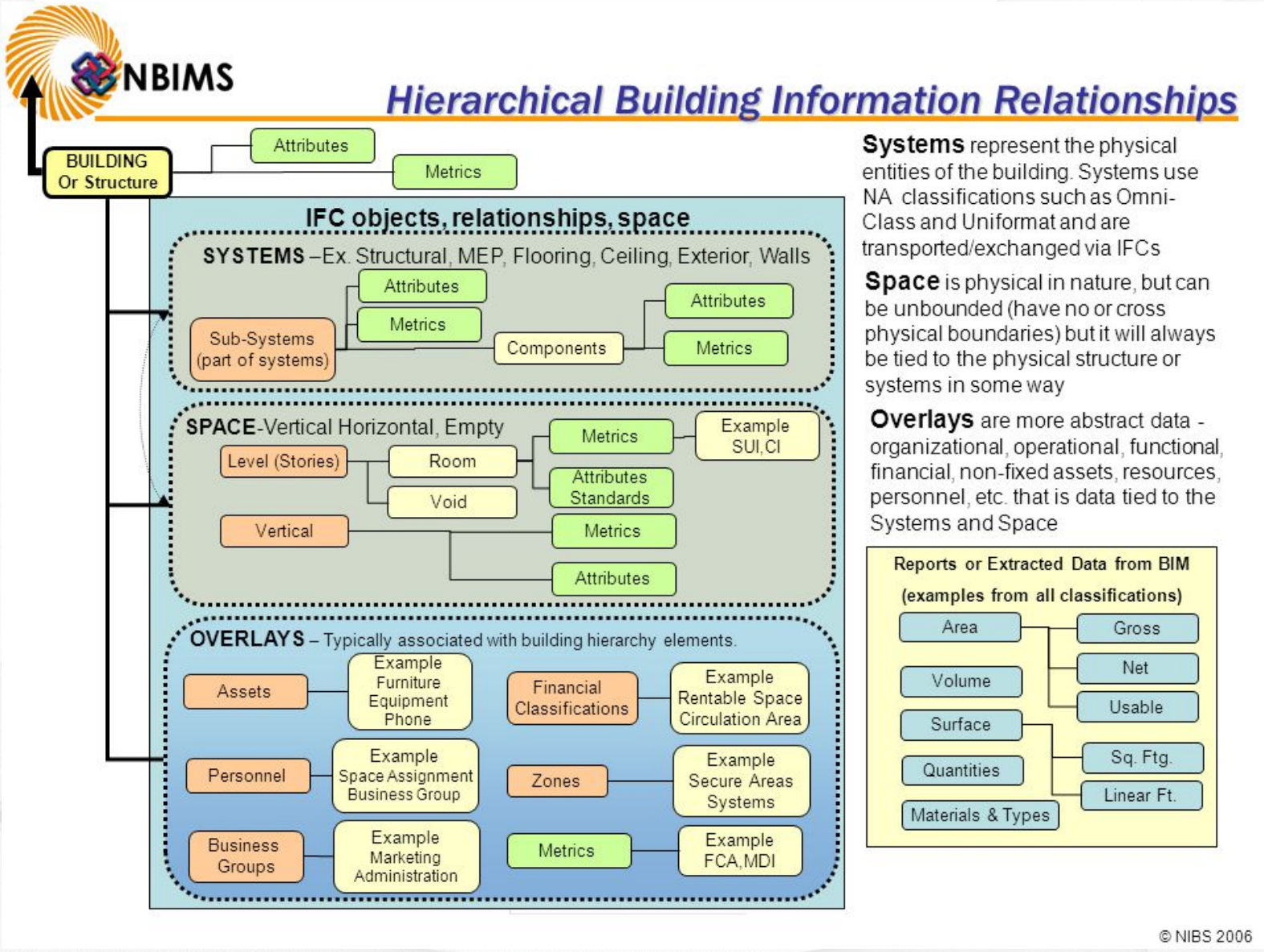
82. Basic application of BIM model as a/an database/ objective database

- 3D - 三維資訊模型 – 3D Model
- 4D - 建設規劃 – Scheduling
- 5D - 工料測量 – Quantity Surveying
- 6D - 可持續性分析 - Sustainability
- 7D - 設施管理應用 – Facility Management

……

Addition of Information in BIM!

83. Hierarchy and organization of a project database



THANK YOU