NCID

BIM SCOPE OF WORKS MATRIX

Stage	Submit format and content	Information required	Submission purpose	Example	Services
1	Early Planning stage				
1.1	Topography	Contour and coordinates for project area	For sunshade study, landscape study, excavation and back fill, even sub-structure analysis		

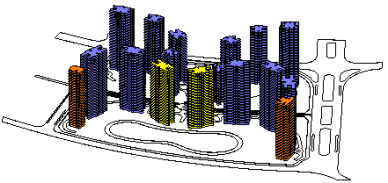| 1.2	Utilities analysis	Existing drainage and sewage system, electricity, gas and telecom system	Preparation for design of underground services	

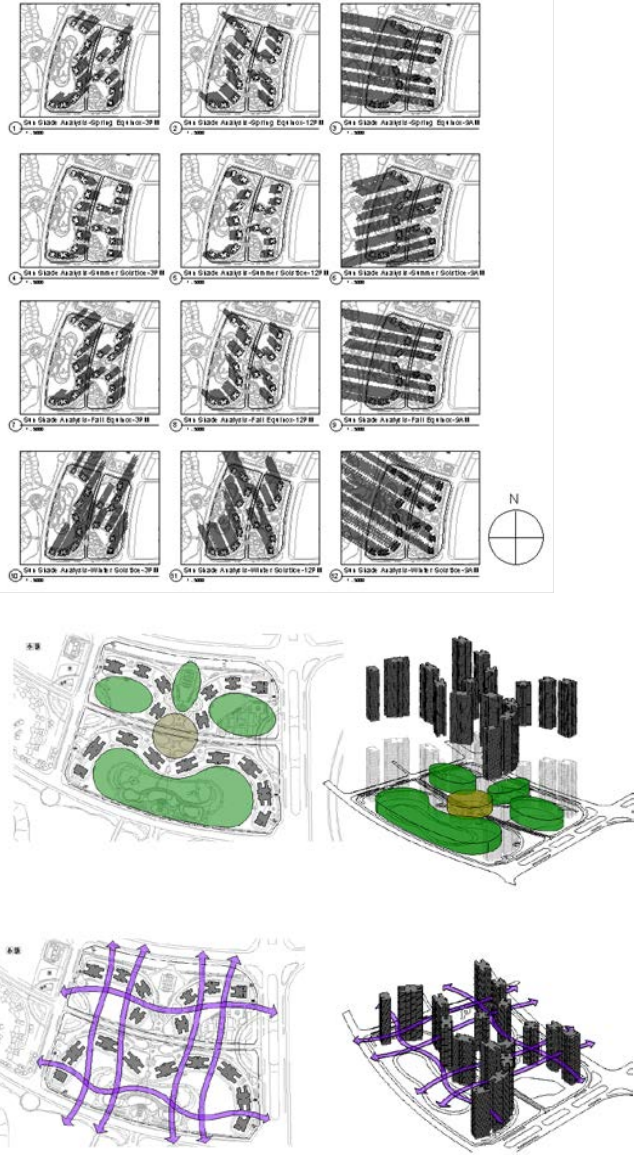| 1.3 | Traffic analysis | Road map | To locate the main and secondary entrance of the building | | |

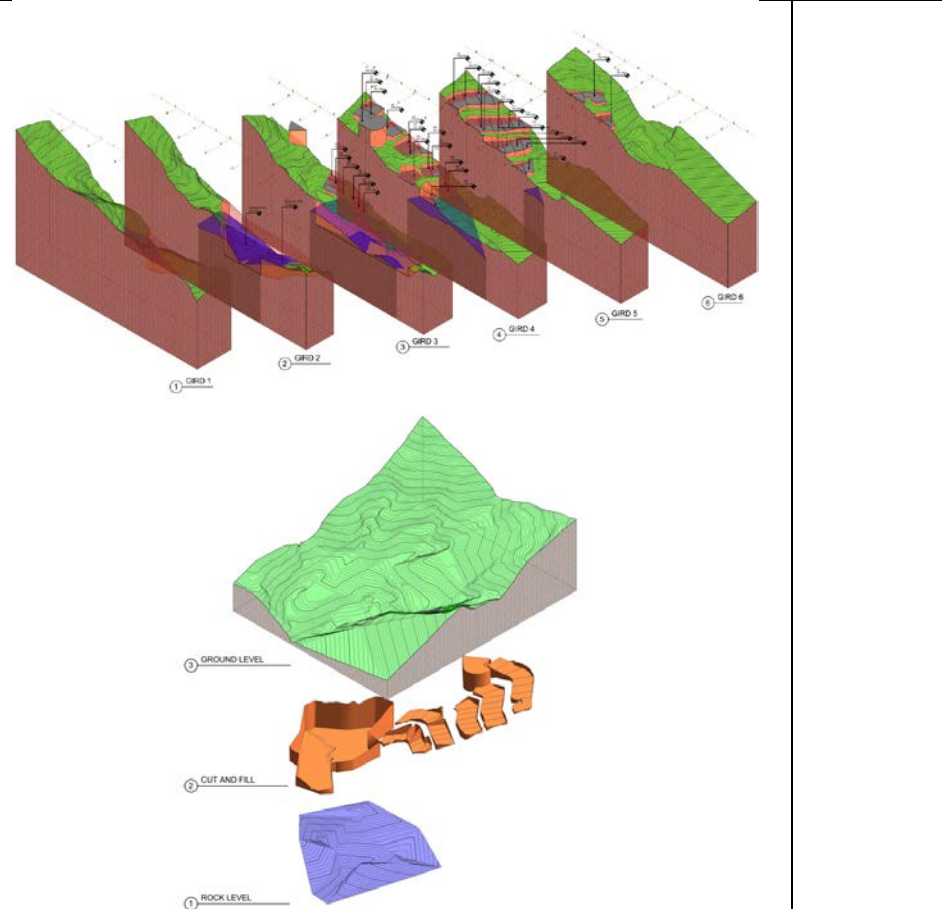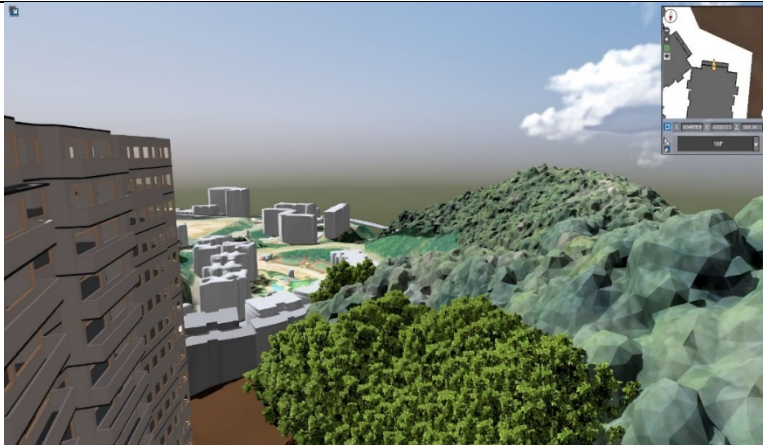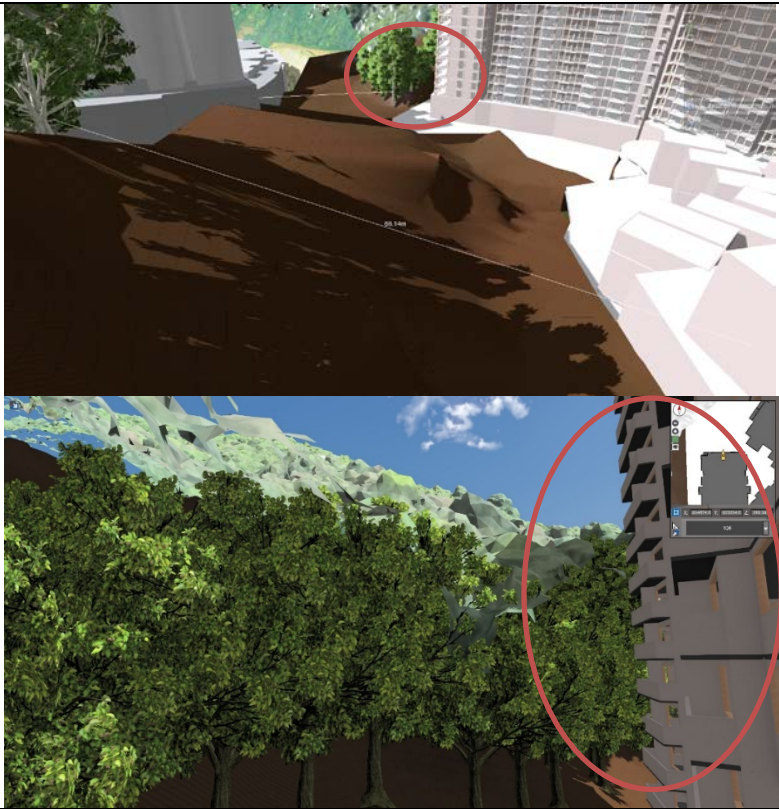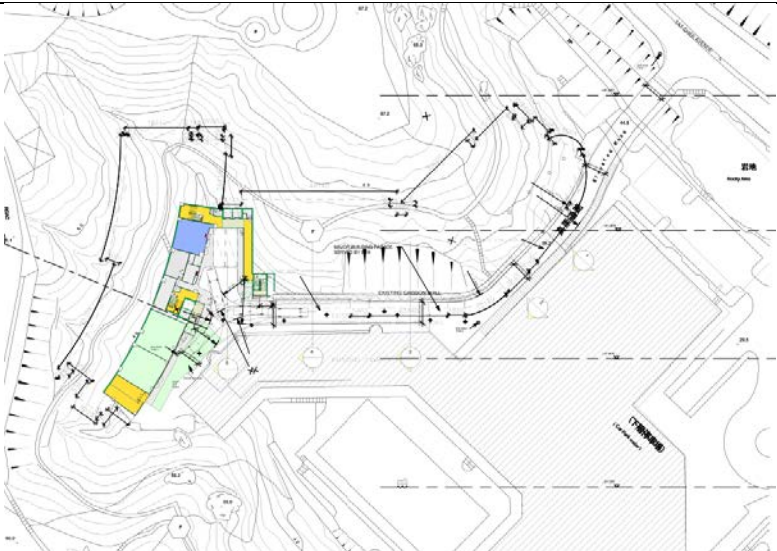| 1.4 | Build mass model to generate the preliminary area schedule | Master plan and floor plans | Preliminary area schedule could be use as early financial analysis | | |

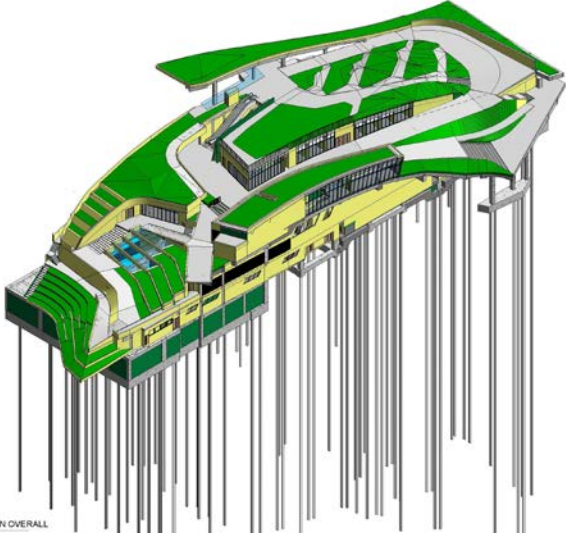| 2	Design stage				
2.1	Sunshade, wind, energy consumption analysis for project	Site contour, existing landscape analysis, includes tree location, species and ages	For design reference, building location and building design checking		

| 2.2 | Excavation analysis | Site topography, master plan and building plans, levels | Excavation analysis could be used as design checking, which could help to revise the design to make sure the excavation keeps at minimum level | | |

2.3	Landscape model, includes trees within project boundary	Site topography, site landscape report and arborist report	Could be used for landscape design, to relocate the purposed tree on the landscape model, and for visual checking		
2.4	Tree crown, roots and growth analysis	Tree species, age; dimension of tree crown and roots	Tree crown analysis for landscape design visual analysis; Tree root analysis for utilities design		

| 2.5 | Clash detection between building and tree crown | Masterplan, building design; tree species, age and dimension of crown and roots | The clash detection will be used for landscape design | | |

| 2.6 | Design options | Masterplan, preliminary architectural and landscape design | Analyze design options to achieve quality design for architecture, master planning and landscape | | |
| 2.7 | Architectural BIM model: room names, function, numbers and area | Masterplan and general arrangement plan, elevations and roof design | For drawing production, material schedule and area schedule | | 2.7 |

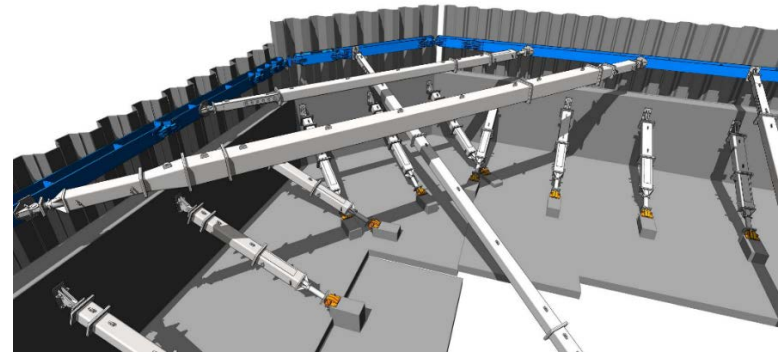| 2.8 | Architectural drawings: Masterplan, general arrangement plans, elevations and sections (up to 1:100) | Masterplan and floor plans, elevations and roof design | For tender drawings and construction drawings | | |
| 2.9 | Area schedule | Masterplan, floor plan and levels | Area schedule from BIM model could provide accurate area instantly, not over or a lot less than the limitation | | |

2.10	Schedule of quantities	Architectural design and materials	Schedule of windows, doors or louvres, help QS to start with preliminary quantity take-off	<table><tr><td colspan="4">WINDOW SCHEDULE</td></tr><tr><td>Type Mark</td><td>Total Width</td><td>Total Height</td><td>Total Area</td></tr></table>	

WINDOW SCHEDULE

Type Mark	Total Width	Total Height	Total Area
A	2250	2250	5.063 m²
			5.063 m²
B	1875	2250	3.769 m²
B	2100	2250	4.725 m²
			8.494 m²
C	2025	2250	4.556 m²
C	2625	2250	5.906 m²
			10.463 m²
D	2700	2250	6.075 m²
D	1850	2250	4.163 m²
			10.238 m²
TOTAL			34.256 m²

2.11	Structural BIM model: piling, pile cap, substructure and superstructure	Structural design for piling, pile cap, ELS, demolition plan, substructure and superstructure	For structural drawing production, export model for structural calculation		

Appendix D

Remark:
- Beam is showed on Green.
- Column is showed on Red.
- Pile Cap is showed on Yellow
- Structural Wall is showed on Blue
- Bearing Wall is showed on Gray
- Footing are showed on White
- Drainage system is showed on Light Blue

Please clarify the followings as marked on Blue Circul

1. Thickness of the Footing is 1.5m.
2. TB083a cannot from the beam detail as to the plan this beam size is 400(w) x 800(h)mm

Foundation plan
1 : 250
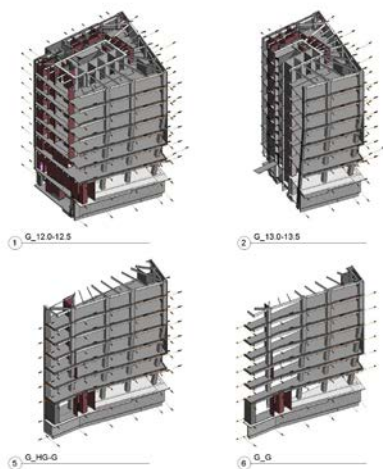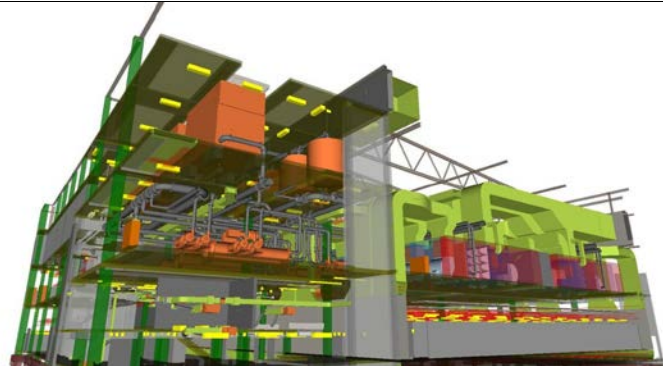
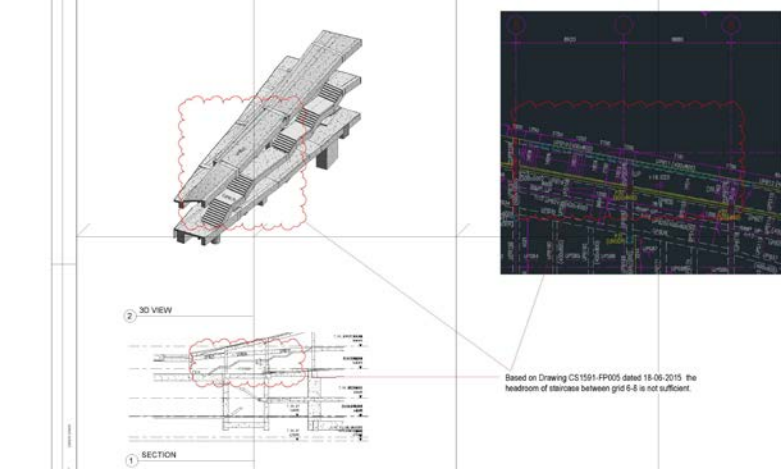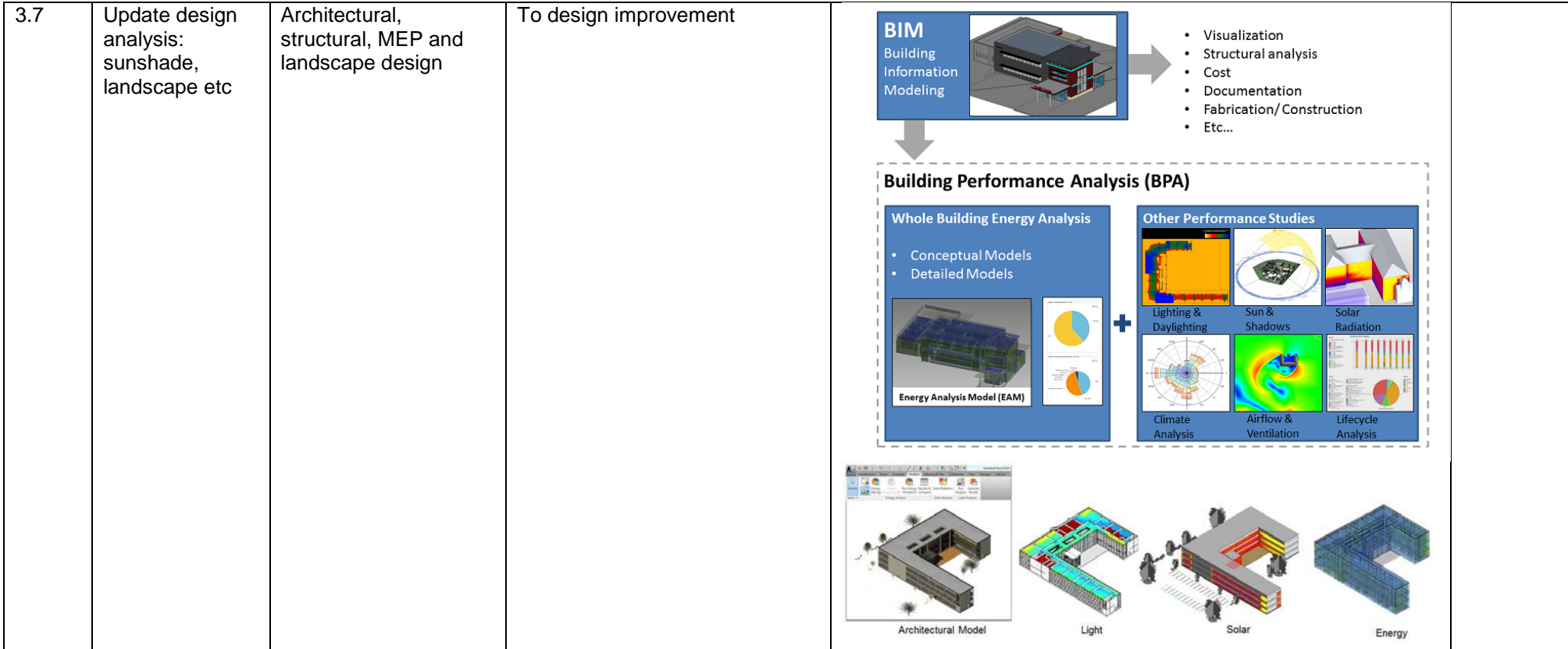| 2.12 | Hoarding design | Hoarding location and height | Commercial ads on hoarding | | |

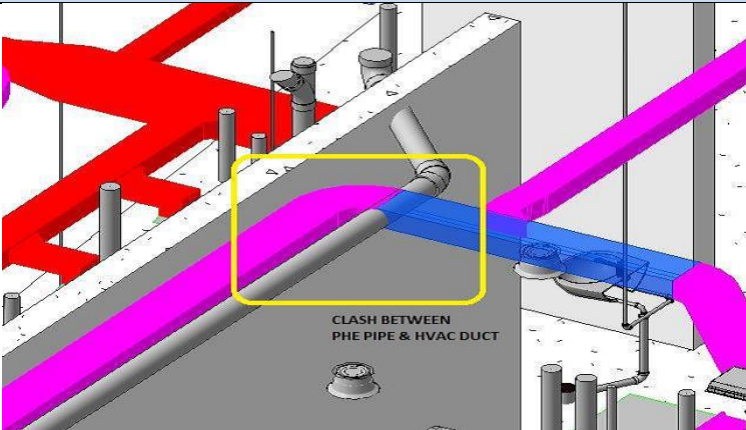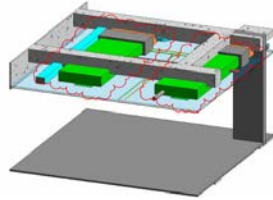| 2.13	Export structural model	Structural design for piling, pile cap, substructure and superstructure	For structural calculation		
2.14	MEP BIM model: MVAC, P&D, FS and electrical design	MEP design for MVAC, P&D, FS and Electrical, dimension and level of ducting and pipework	All MEP elements were model to make sure the design feasibility		
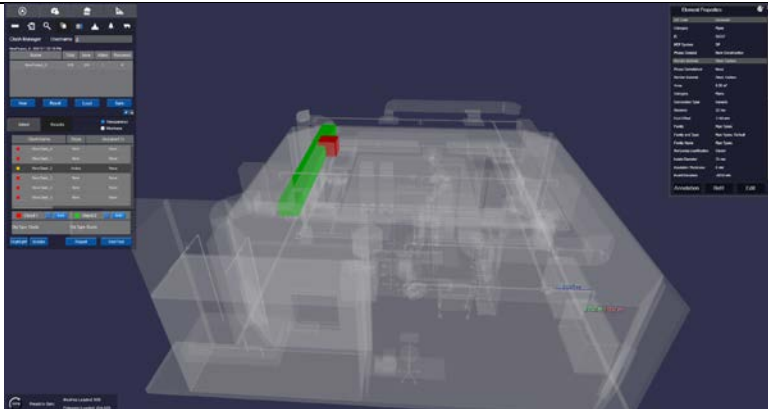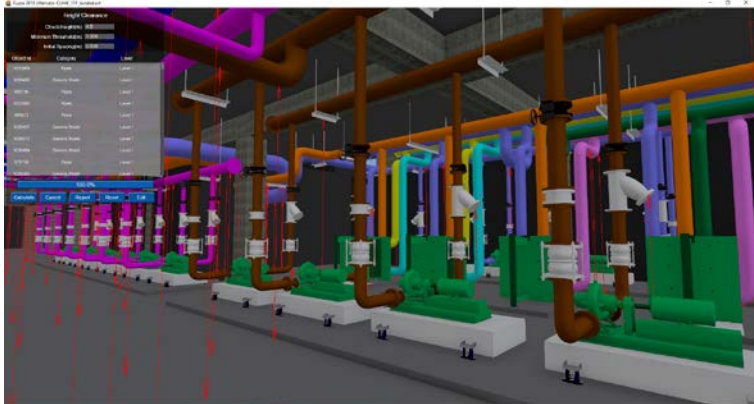
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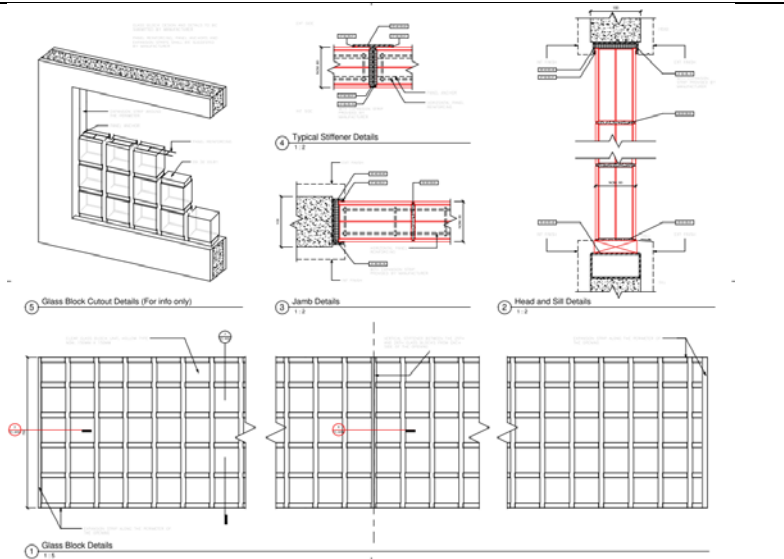
3	Detail design				
3.1	Drawing production for architecture, structure and MEP	Architectural, structural and MEP design	For government submission (GBP)		3.1

3.2	Clash detection	Architectural, structural and MEP design	Design coordination		
3.3	Spatial validation checks for headroom and working space	Architectural, structural and MEP design (all levels shall be clearly mentioned)	For building and services design, building operations and maintenance activities checking		
3.4	Drawing revision	Architectural, structural and MEP design revisions	Make sure all 2D and 3D information update and consistent		

| 3.5 | Schedule revision | Architectural, structural and MEP design revisions | Schedule updated as per design updates will avoid the time gap between design consultant and QS | |

3.6	Animation	Architectural, structural, MEP and landscape design	To visualize the design in virtual reality for design checking	

| 3.7 | Update design analysis: sunshade, landscape etc | Architectural, structural, MEP and landscape design | To design improvement | | |

4	Tender / Construction				
4.1	Clash detection revision	Architectural, structural and MEP design revisions	Constantly clash checking to avoid design fault to minimize unnecessary construction cost		

CLASH BETWEEN
PHE PIPE & HVAC DUCT

MF DUCTS CLASH QUERY

HVAC LAYOUT PLAN - MEZZANINE FLOOR (2 OF 2)
Dated on JUL 2015
GRID 7-8,C

| 4.2 | Drawing production | Architectural, structural and MEP design revisions | Construction drawings | | |
| 4.3 | Schedule revision | Architectural, structural and MEP design revisions, material revisions | For quantity take off | | |

| 4.4 | 4D animation for construction sequence | Architectural, structural and MEP design revisions; construction programme and method statement | Construction sequence checking, clash between trades could be detected before commencement. | | |

| 4.5 | Shop drawing | Shop drawing and method statement | Shop drawing produced from BIM model to ensure the drawing and model are consistent | | |

4.6	CSD	Architectural, structural, MEP drawings from contractor	test the feasibility of MEP ductwork / pipework, clash detection between MEP and Architecture / Structure		
4.7	Procurement, cash flow and payment	Contractor's design for architecture, structure and MEP, material and equipment to be used	Procurement, lead time and payment will affect the construction programme		
4.8	Construction safety check	Construction equipment	4D Construction simulation to highlight the construction sequence, while at the same time to visualize the temporary works during construction to ensure the site safety, delivery route, protective measures etc.		
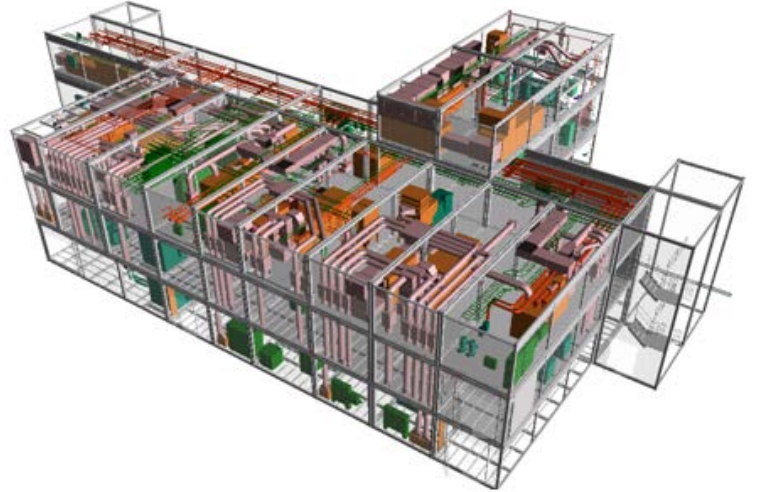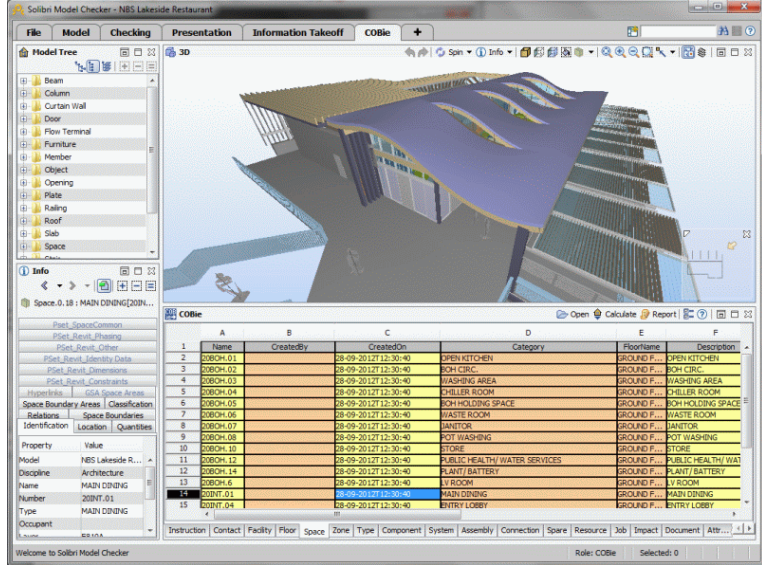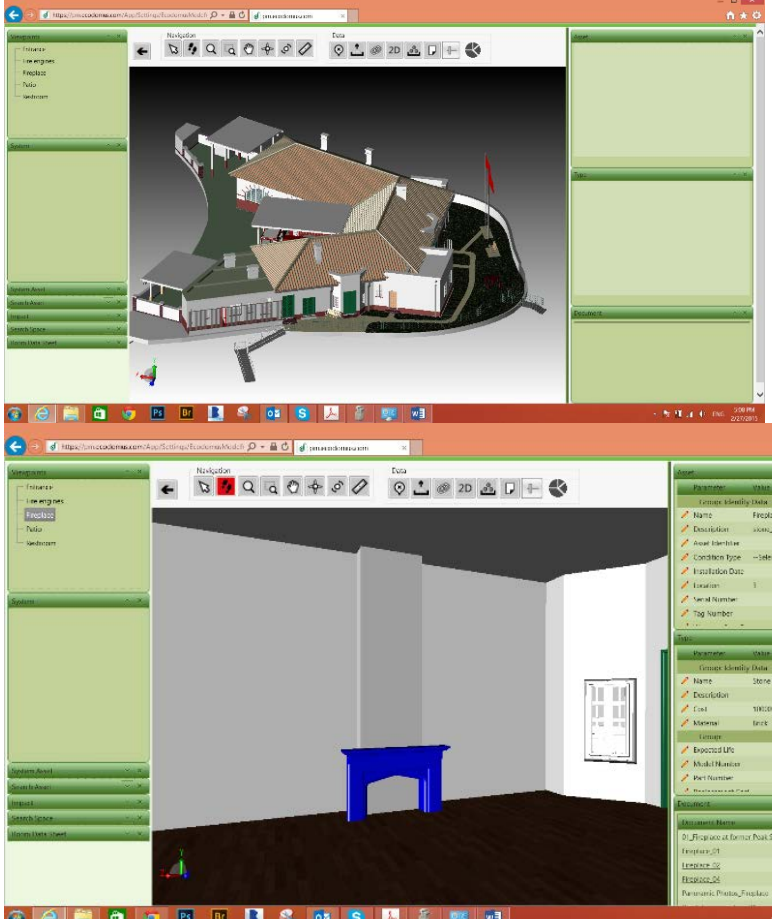
| 4.9 | Site management | Procurement schedule, lead time and site logistic planning, installation detail | To utilize the 4D Construction Simulation techniques facilitate the site planning - material storage, delivery path, hoist management and installation logistics. | | |
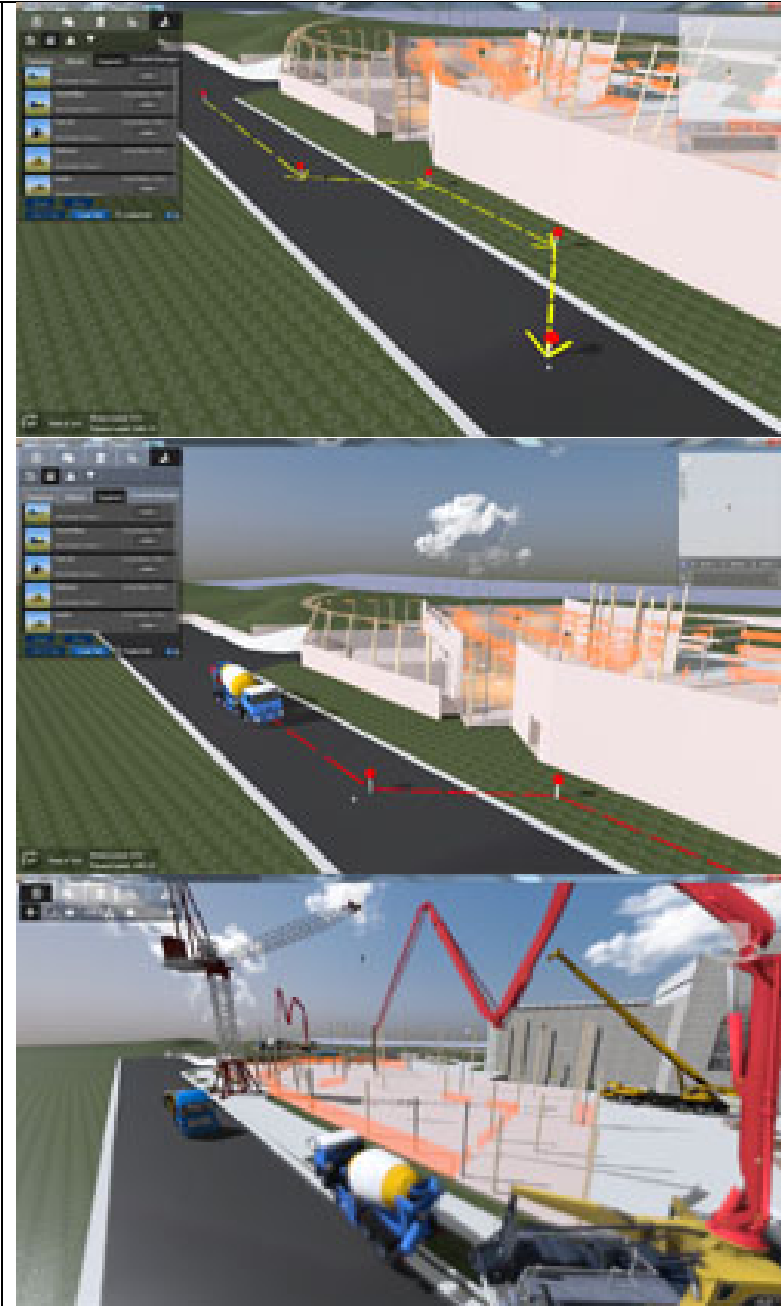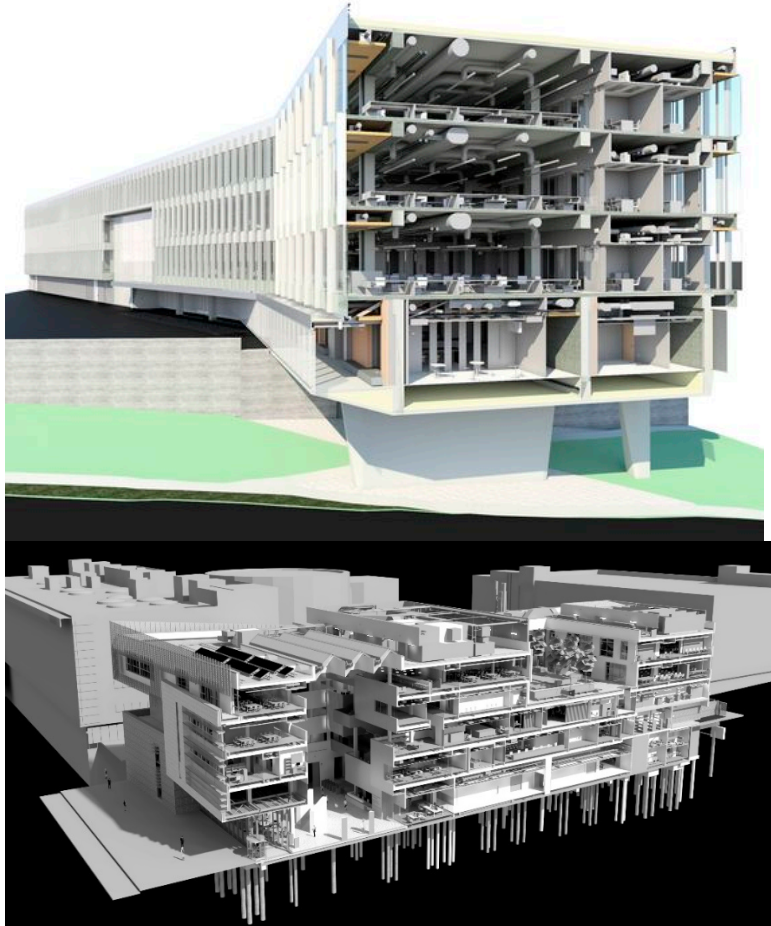
5	Construction completed				
5.1	As-built model	Contractor's architecture, structure, MEP and landscape design, and MEP equipment	Related information to be stored in the model, extra information to future facility management purpose will be added		
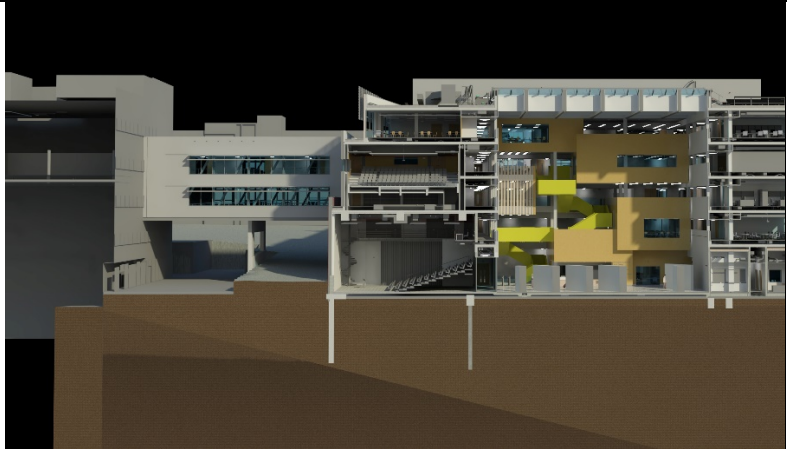
| 5.2 | COBie | Material, O&M manual, warranty and maintenance information | The information will be export and re-store into model in EcoDomus for facility management purpose | | |

6	Facility management			
6.1	Model and COBie information re-combine in EcoDomus for facility management	Model: contractor's design for architecture, structure, MEP and related equipment, landscape design Information: information that facility management required, e.g. material, O&M manual and warranty	Extra time and human resource required for facility management because of the insufficient information, massive information could be centralize and accessible when BIM technology introduced into facility management	

7	Marketing purpose				
7.1	Perspective	Architectural, structural, MEP and landscape design, material, color selection and tree information	Generated directly from BIM model, which is tally with the construction model, minimize the possibility of argument since the inconsistency of market drawing and actual built area		

| 7.2 | 3D printing | Architectural, structural, MEP and landscape design, material, color selection and tree information | Generated directly from BIM model, which is tally with the construction model, minimize the possibility of argument since the inconsistency of market drawing and actual built area | |

| 7.3 | Animation for interior and exterior | Architectural, structural, MEP and landscape design, material, color selection and tree information | Generated directly from BIM model, which is tally with the construction model, minimize the possibility of argument since the inconsistency of market drawing and actual built area | | |

| 7.4 | Color plan or isometric perspective | General arrangement plan, interior design including furniture, material and color selection | Generated directly from BIM model, which is tally with the construction model, minimize the possibility of argument since the inconsistency of market drawing and actual built area | | |

| 7.5 | Sales brochure | Leasable area and material selection | Generated directly from BIM model, which is tally with the construction model, minimize the possibility of argument since the inconsistency of market drawing and actual built area | |

| 7.6 | Area schedule and unit price | Architectural design and unit price | Generated directly from BIM model, which is tally with the construction model, minimize the possibility of argument since the inconsistency of market drawing and actual built area | |

| 7.7 | Facility | Architectural, structural, MEP and landscape design | Generated directly from BIM model, which is tally with the construction model, minimize the possibility of argument since the inconsistency of market drawing and actual built area | |