Advanced
Construction
Information
Development Ltd.

Proposed Residential Development in SHATIN, N.T.

Clash Analysis

Examples of quantities generated by Revit and its precautionary

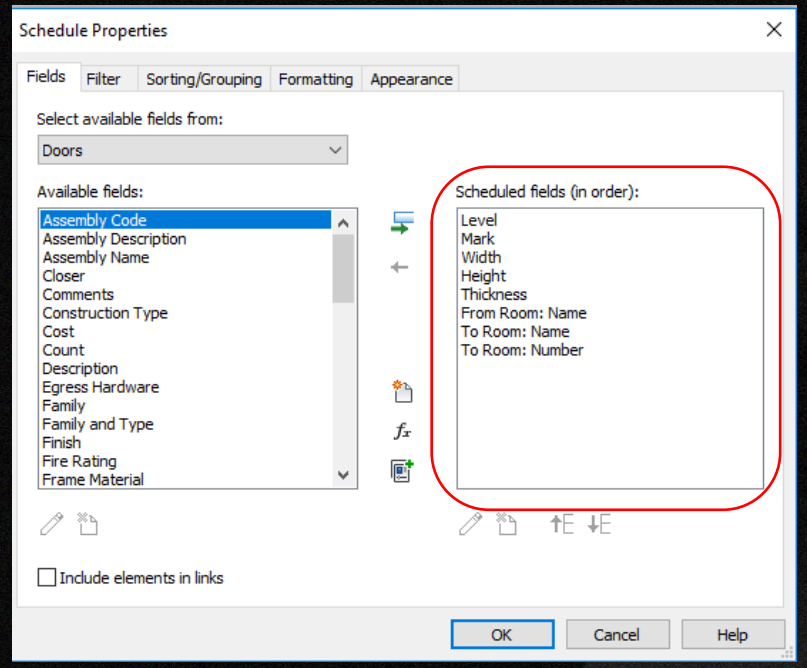
Quantity Take Off -Schedule

- Raw Data e.g. door, window, beam, column, railing, carpark, tree, pipe, etc.
- Information obtained in door schedule:

1. Level
2. Mark
3. Width
4. Height
5. Thickness
6. From Room No.
7. To Room No.

Area of wall- one side only

Added Door



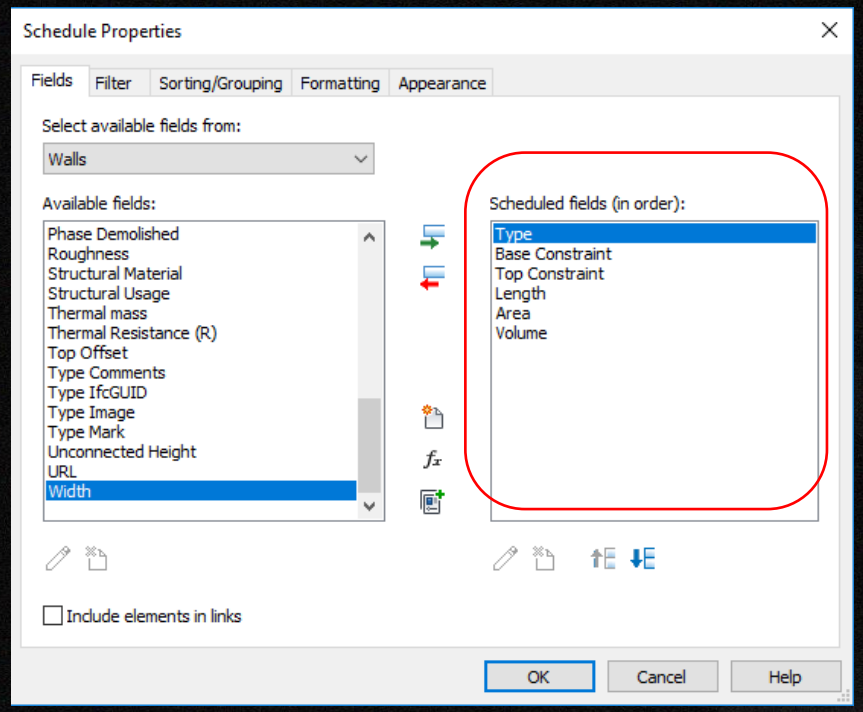
<Door Schedule 2>

A	B	C	D	E	F	G	H
Level	Mark	Width	Height	Thickness	From Room: Name	To Room: Name	To Room: Number
01 - Entry Level	122	915	2134	51	Prep/Dish	Cafeteria	121
01 - Entry Level	124	915	2134	51	Dry Storage	Prep/Dish	122
01 - Entry Level	125	915	2134	51	Corridor	Electrical	125
01 - Entry Level	123	1830	2134	51	Corridor	Conference	123
01 - Entry Level	126	915	2134	51	Corridor	Admin	126
01 - Entry Level	129	915	2134	51	Corridor	Toilet	129
01 - Entry Level	128	915	2134	51	Admin	Storage	128
01 - Entry Level	127	915	2134	51	Office	Admin	126
01 - Entry Level	130	915	2134	51	Stair		
01 - Entry Level	130A	915	2134		Corridor	Stair	130
01 - Entry Level	119A	1730	2134	51	Sprinkler		
01 - Entry Level	119B	1730	2134	51	Electrical	Sprinkler	119
01 - Entry Level	118	1730	2134	51	Lobby	Electrical	118
01 - Entry Level	117	915	2134	51	Lobby	Instruction	117
01 - Entry Level	116	915	2134	51	Lobby	Conference	116
01 - Entry Level	115	1830	2134	51	Lobby	Instruction	115
01 - Entry Level	114	915	2134		Lobby	Stair	114
01 - Entry Level	111	915	2134	51	Lobby	Lounge	111
01 - Entry Level	112	915	2134	51	Lobby	Electrical	112
01 - Entry Level	110	915	2134	51	Corridor	Men	110
01 - Entry Level	109	915	2134	51	Corridor	Women	109
01 - Entry Level	103	915	2134	51	Corridor	Conference	103
01 - Entry Level	104B	915	2134	51	Corridor	Instruction	104
01 - Entry Level	104A	915	2134	51	Corridor	Instruction	104
01 - Entry Level	105B	915	2134	51	Corridor	Instruction	105
01 - Entry Level	105A	915	2134	51	Corridor	Instruction	105
01 - Entry Level	106B	915	2134	51	Corridor	Instruction	106
01 - Entry Level	106A	915	2134	51	Corridor	Instruction	106
01 - Entry Level	108B	915	2134	51	Corridor	Instruction	108
01 - Entry Level	108A	915	2134	51	Corridor	Instruction	108
01 - Entry Level	132A	915	2134		Stair	Corridor	107
01 - Entry Level	132B	915	2134	51	Stair		
02 - Floor	232	915	2134	51	Corridor	Toilet	232
02 - Floor	233	915	2134		Corridor	Stair	233
02 - Floor	217	915	2134		Lobby	Stair	217
02 - Floor	212	915	2134	51	Lobby	Lounge	212
02 - Floor	214	915	2134	51	Lobby	Electrical	214

Schedule- Area or Length

- Information obtained in Wall Schedule

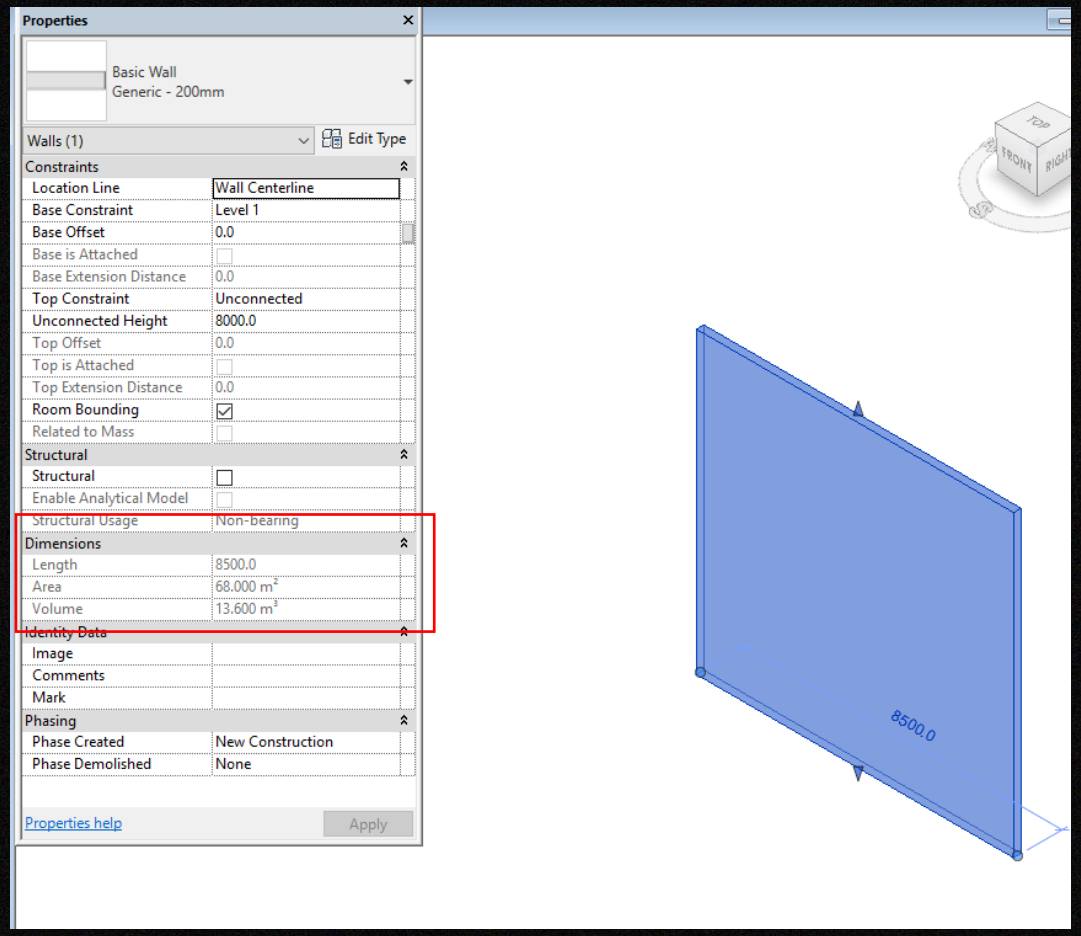
1. Type
2. Base constraint
3. Top constraint
4. Length
5. Area
6. Volume



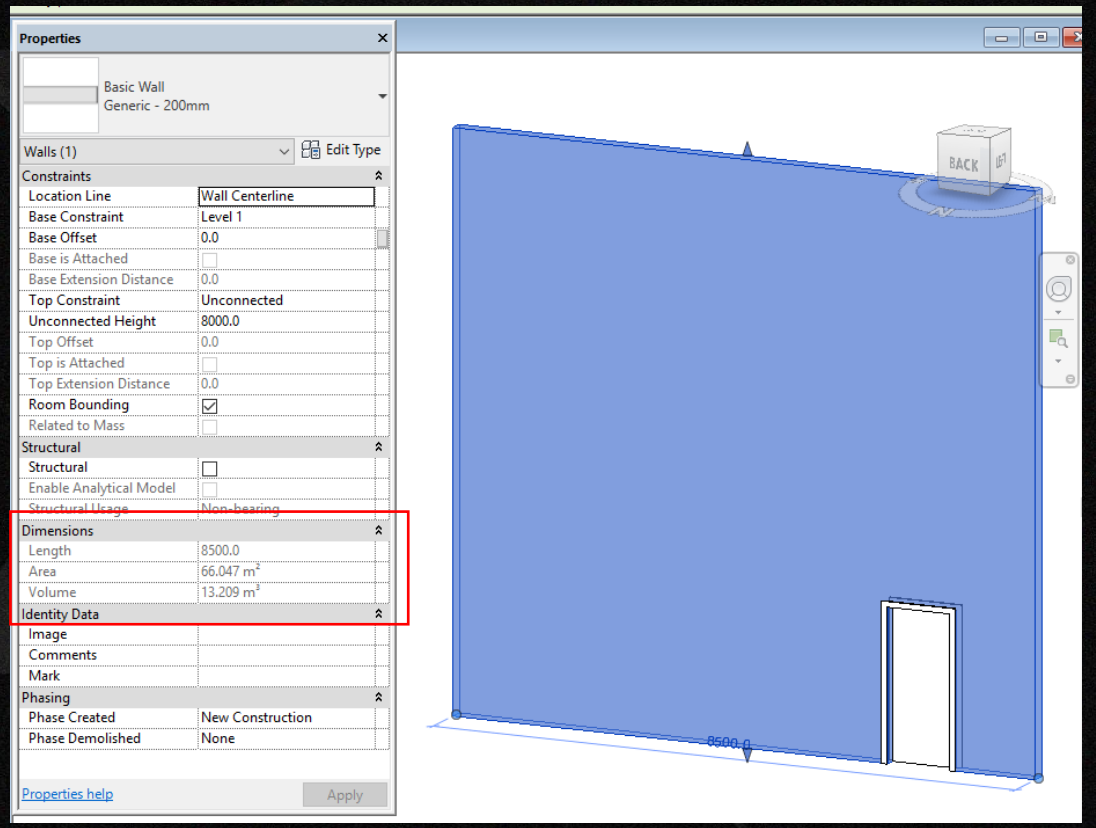
<Wall Schedule>

A	B	C	D	E	F
Type	Base Constraint	Top Constraint	Length	Area	Volume
Exterior - Insulatio	01 - Entry Level	Up to level: Roof	20713	191 m²	57.87 m³
Exterior - Insulatio	01 - Entry Level	Up to level: Roof	20002	174 m²	52.12 m³
Exterior - Insulatio	01 - Entry Level	Up to level: Roof	14133	163 m²	48.92 m³
Exterior - Insulatio	01 - Entry Level	Up to level: Roof	8402	96 m²	28.58 m³
Exterior - Insulatio	01 - Entry Level	Up to level: Roof	8302	91 m²	27.20 m³
Generic - 200mm	01 - Entry Level	Up to level: Roof	8332	98 m²	19.50 m³
Interior - 138mm P	03 - Floor	Up to level: Roof	40983	139 m²	19.32 m³
Generic - 200mm	01 - Entry Level	Up to level: Roof	8385	94 m²	18.83 m³
Generic - 200mm	01 - Entry Level	Up to level: Roof	8402	94 m²	18.81 m³
Generic - 200mm	01 - Entry Level	Up to level: Roof	8332	94 m²	18.81 m³
Interior - 138mm P	03 - Floor	Up to level: Roof	37186	129 m²	17.91 m³
Interior - 138mm P	02 - Floor	Up to level: 03 - Flo	40983	129 m²	17.82 m³
Interior - 138mm P	01 - Entry Level	Up to level: 02 - Flo	40983	127 m²	17.55 m³
Interior - 138mm P	02 - Floor	Up to level: 03 - Flo	32605	105 m²	14.58 m³
Parapet Wall	Roof	Up to level: Parapet	66383	40 m²	11.55 m³
Interior - 138mm P	03 - Floor	Up to level: Roof	25985	83 m²	11.53 m³
Exterior - Insulatio	01 - Entry Level	Up to level: 02 - Flo	8471	32 m²	9.58 m³
Parapet Wall	Roof	Up to level: Parapet	53986	32 m²	9.39 m³
Exterior - Insulatio	01 - Entry Level	Up to level: 02 - Flo	8332	28 m²	8.38 m³
Interior - 138mm P	01 - Entry Level	Up to level: 02 - Flo	17261	53 m²	7.34 m³
Interior - 138mm P	01 - Entry Level	Up to level: 02 - Flo	16246	48 m²	6.68 m³
Parapet Wall	Roof	Up to level: Parapet	37222	22 m²	6.48 m³
Parapet Wall	Roof	Up to level: Parapet	49283	30 m²	5.71 m³
Interior - 138mm P	01 - Entry Level	Up to level: 02 - Flo	8332	31 m²	4.34 m³
Interior - 138mm P	03 - Floor	Up to level: Roof	8332	31 m²	4.34 m³
Interior - 138mm P	03 - Floor	Up to level: Roof	8259	31 m²	4.31 m³

Changes of Wall Area

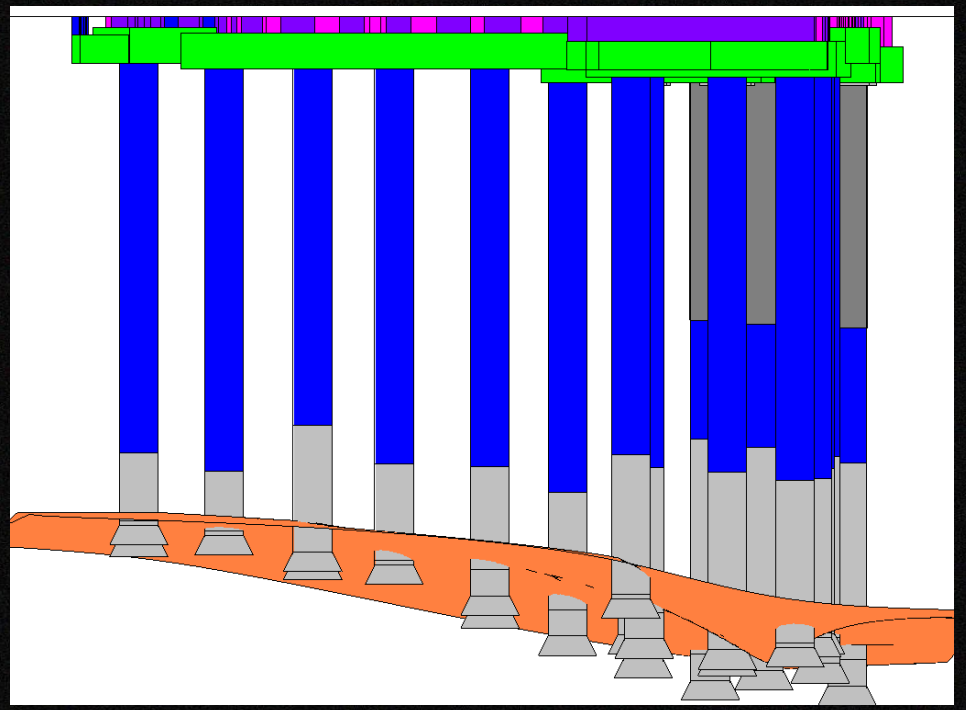


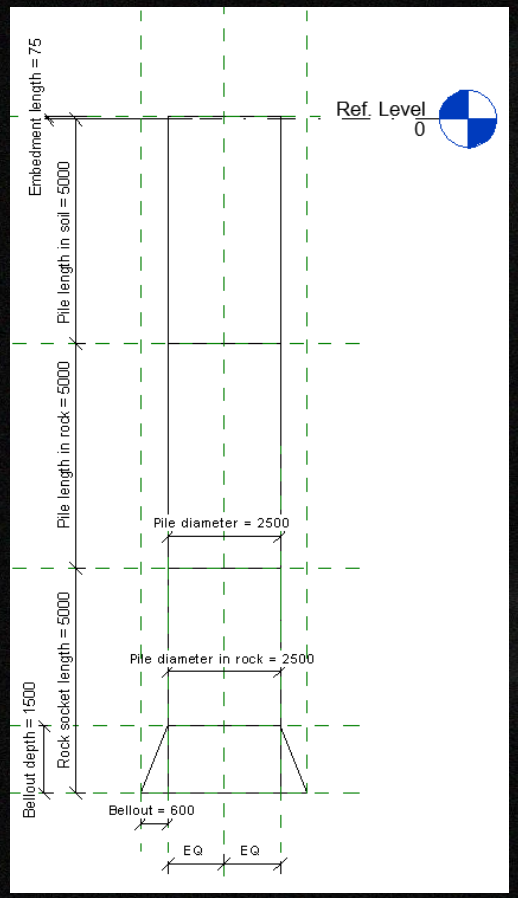
- Area of wall will be changed after door is added.
- One side surface area
- Different cost for different part of wall
- Follow SMM flow to develop QS plugin or dynamo

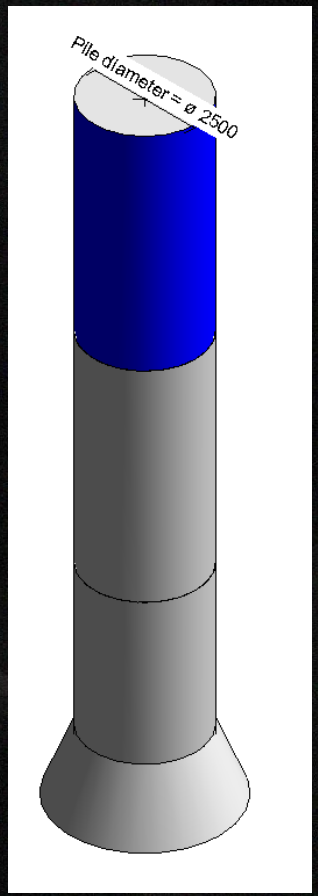


Quantity Take Off - temporary work

- Some of temporary work can not be changed e.g. formwork.
- In design stage, no formwork, need to develop dynamo. (watch video)
- Bore pile model sample

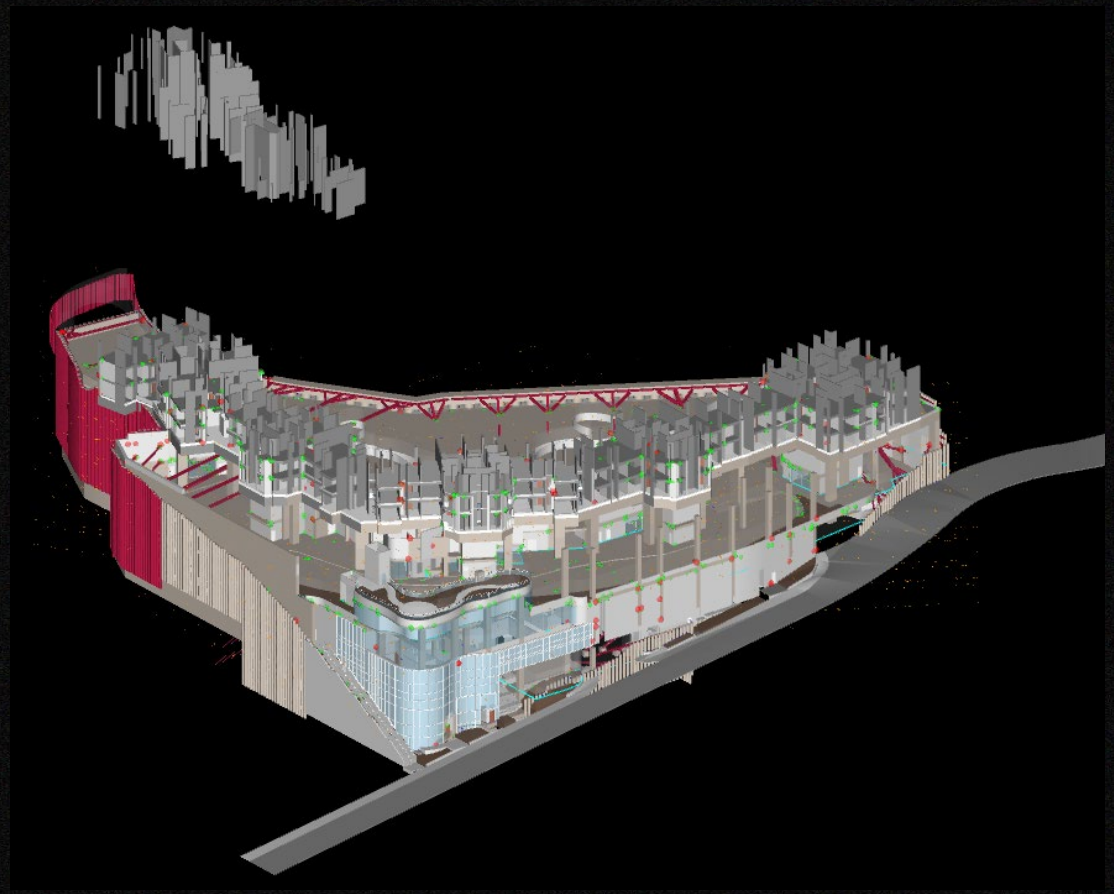






Progress of Clash Plug-in development

Clash Ball in Naviswork

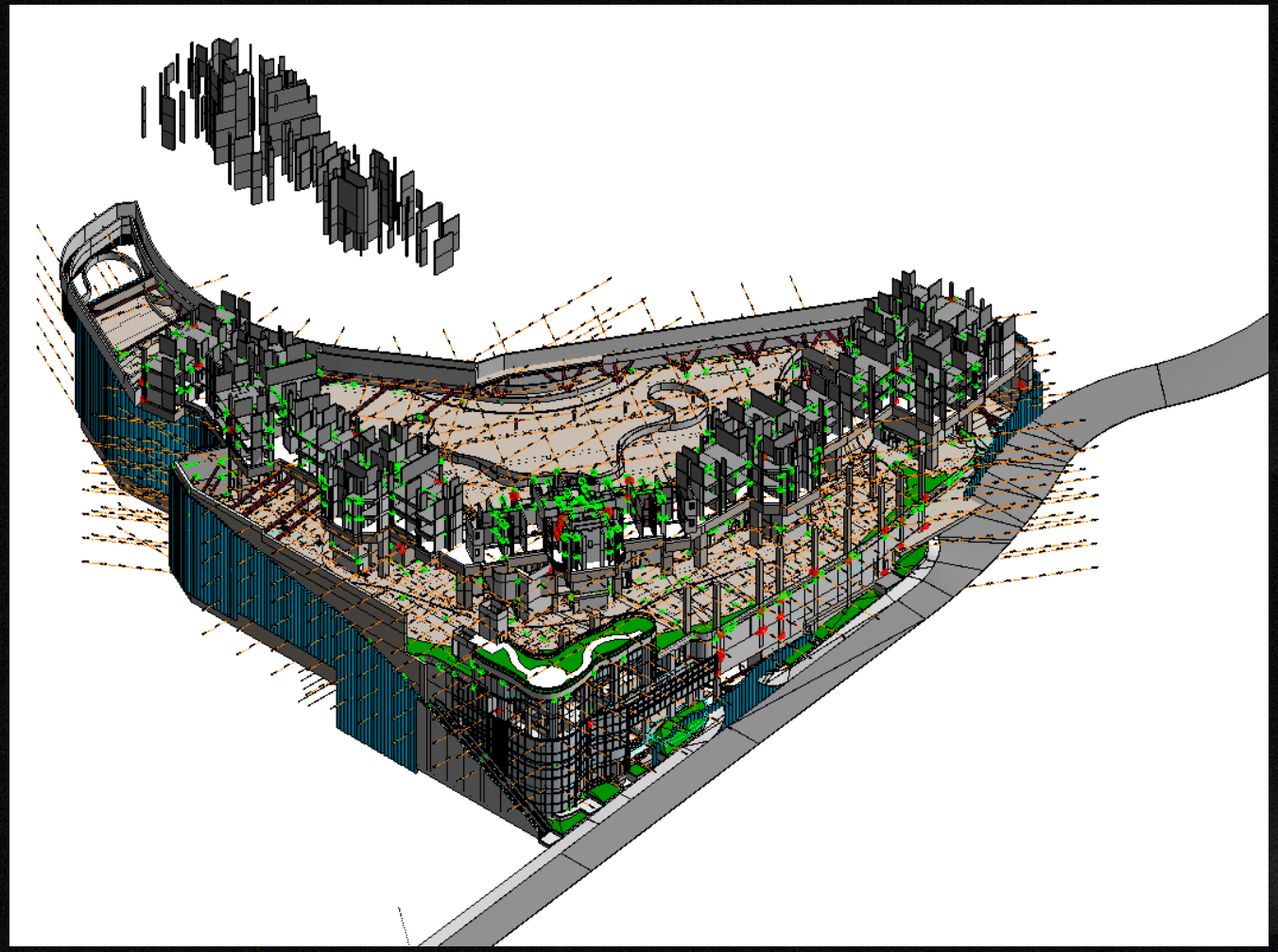


- The development of clash ball in Naviswork is completed.
- Score of Clash Ranking is according to significant of category.

Category	Score
ARC Columns	100
ARC Structural Columns	100
ARC Room	60
ARC Walls	80
ARC Ramps	70
ARC Stairs	70
ARC Ceilings	65
ARC Roofs	60
ARC Floors	60
ARC Curtain Panels	50
ARC Curtain Systems	50
ARC Curtain Wall Mullions	50
ARC Doors	40
ARC Windows	40
ARC Specialty Equipment	30
ARC Generic Models	20
ARC Default	10
STR Columns	100
STR Walls	90
STR Beam Systems	80

Category	Score
STR Framing	70
STR Trusses	80
STR Stairs	70
STR Ramps	70
STR Floors	60
STR Roofs	50
STR Structural Foundations	60
STR Generic Models	20
STR Default	10
MEP Ducts	100
MEP Pipes	90
MEP Cable Trays	80
MEP Mechanical Equipment	60
MEP Electrical Equipment	50
MEP Plumbing Fixtures	40
MEP Electrial Fixtures	30
MEP Generic Models	20
MEP Air Terminals	100
MEP Default	10
Unknown	10

Clash Ball in Revit

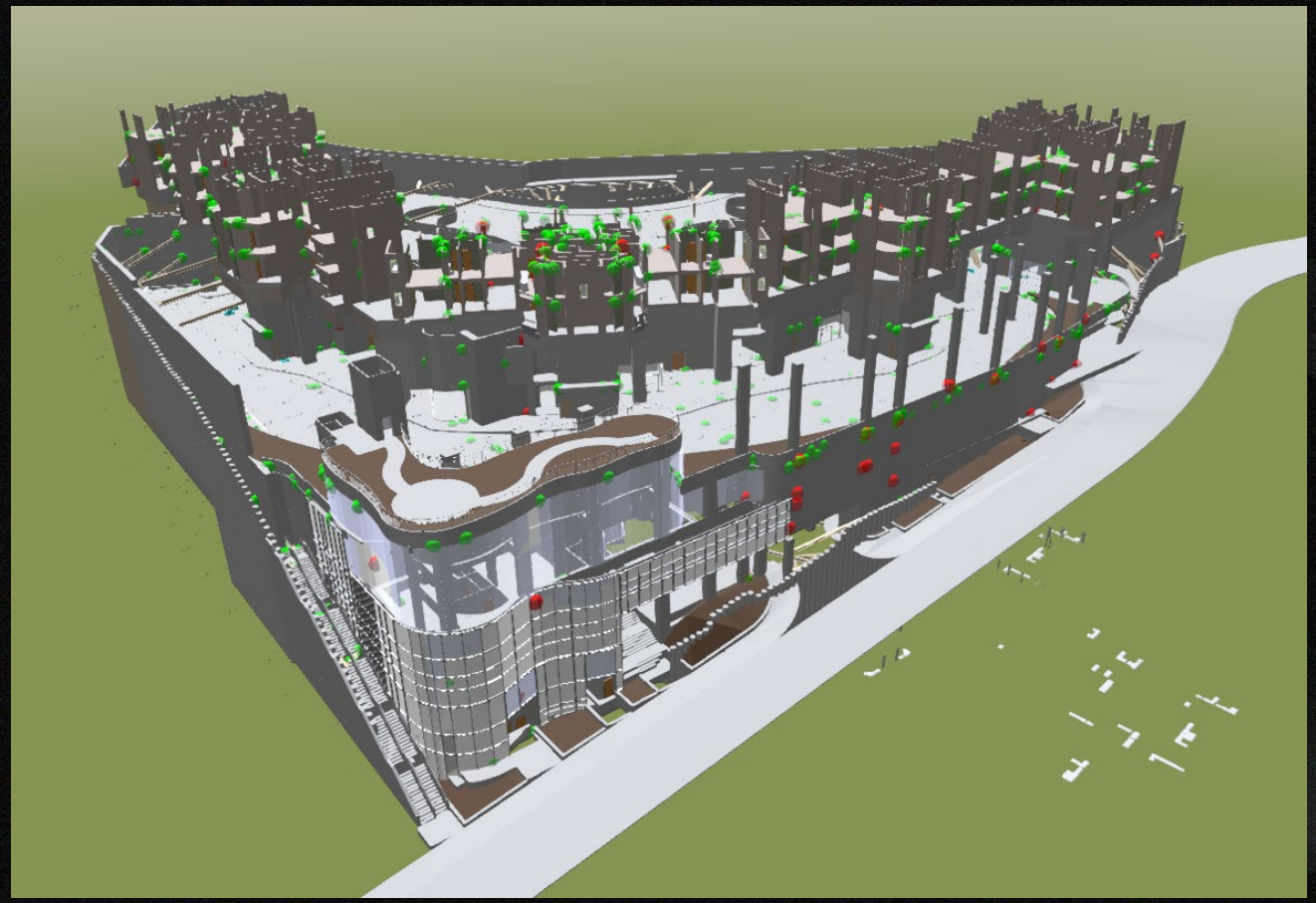


- Clash ball (Generic model) can show in Revit
- 3D gridline to show the location of clash
- Use schedule to define the element ID of clash items and the score of the clash

<Generic Model Schedule>

A
Comments
Clash1|Score=6400|486586:792935|ARC Walls:STR Framing|8/F|T5.D - T5.2|Default|T5-ARC vs STR
Clash2|Score=7200|657228:695479|ARC Walls:MEP Pipes|L00 (+41.000)|PP - PW|Default|L2-ARC vs MEP
Clash3|Score=7200|648810:688890|ARC Walls:MEP Pipes|L00 (+41.000)|P15 - PM|Default|L2-ARC vs MEP
Clash4|Score=7200|648810:689182|ARC Walls:MEP Pipes|L00 (+41.000)|P15 - PM|Default|L2-ARC vs MEP
Clash5|Score=7200|648813:689182|ARC Walls:MEP Pipes|5/F +53.00|T6.E - T6.4|Default|L2-ARC vs MEP
Clash6|Score=7200|657233:726411|ARC Walls:MEP Pipes|L00 (+41.000)|P1 - PJ|Default|L2-ARC vs MEP
Clash7|Score=7200|648812:689182|ARC Walls:MEP Pipes|5/F +53.00|T6.X - T6.4|Default|L2-ARC vs MEP
Clash8|Score=7200|657228:693890|ARC Walls:MEP Pipes|2/F +40.40mPD|P13 - PN|Default|L2-ARC vs MEP
Clash9|Score=7200|657228:692845|ARC Walls:MEP Pipes|2/F +40.40mPD|P13 - PN|Default|L2-ARC vs MEP
Clash4|Score=7200|1831776:681482|STR Framing:MEP Pipes|L00 (+41.000)|P15 - PN|Default|L2-ELS vs MEP
Clash7|Score=7200|1917748:689698|STR Framing:MEP Pipes|L00 (+41.000)|P15 - PL|Default|L2-ELS vs MEP
Clash9|Score=7200|1921927:706466|STR Framing:MEP Pipes|L00 (+41.000)|P12 - PL|Default|L2-ELS vs MEP
Clash10|Score=7200|1990657:724947|STR Framing:MEP Pipes|2/F +41.60|T1.E - T1.3|Default|L2-ELS vs MEP
Clash11|Score=7200|1934743:727157|STR Framing:MEP Pipes|L00 (+41.000)|P1 - PG|Default|L2-ELS vs MEP
Clash13|Score=7200|1934673:726720|STR Framing:MEP Pipes|L00 (+41.000)|P1 - PH|Default|L2-ELS vs MEP
Clash13|Score=9000|2645280:689182|STR Columns:MEP Pipes|5/F +53.00|T6.X - T6.4|Default|L2-STR vs MEP
Clash8|Score=6000|681421:2572473|ARC Floors:STR Columns|1/F|P20 - PW|Default|Podium-ARC vs STR
Clash25|Score=6400|648718:2693343|ARC Walls:STR Framing|L03(+44.600)|P24 - PW|Default|Podium-ARC vs STR
Clash38|Score=7200|655548:2575228|ARC Walls:STR Walls|5/F +53.00|T3.B - T3.7|Default|Podium-ARC vs STR
Clash41|Score=6400|648902:2668730|ARC Walls:STR Framing|L03(+44.600)|P20 - PV|Default|Podium-ARC vs STR
Clash45|Score=8000|688596:2643475|ARC Walls:STR Columns|1/F +34.40|P22 - PV|Default|Podium-ARC vs STR
Clash48|Score=8000|649399:2643475|ARC Walls:STR Columns|L03(+45.120)|P22 - PV|Default|Podium-ARC vs STR
Clash49|Score=6400|648756:2655453|ARC Walls:STR Framing|L03(+44.600)|P9 - PQ|Default|Podium-ARC vs STR
Clash50|Score=6000|681421:2572404|ARC Floors:STR Columns|1/F|P20 - PW|Default|Podium-ARC vs STR
Clash57|Score=6400|648707:2693343|ARC Walls:STR Framing|L03(+44.600)|P24 - PW|Default|Podium-ARC vs STR
Clash61|Score=6000|584355:2643475|ARC Floors:STR Columns|5/F +53.00|T3.B - T3.7|Default|Podium-ARC vs STR
Clash68|Score=8000|655548:2643475|ARC Walls:STR Columns|5/F +53.20|T3.B - T3.7|Default|Podium-ARC vs STR
Clash70|Score=6400|648721:2693343|ARC Walls:STR Framing|L03(+44.600)|P24 - PW|Default|Podium-ARC vs STR
Clash100|Score=6400|417746:2601818|ARC Walls:STR Framing|5/F +53.00|T6.X - T6.4|Default|Podium-ARC vs STR
Clash102|Score=6400|648725:2693343|ARC Walls:STR Framing|L03(+45.120)|PQ - PV|Default|Podium-ARC vs STR

Clash Ball in Fuzor



- Revit model sync to Fuzor
- Changing the size of object in Revit and move the location of the object in Fuzor
- Use “Peer to peer” function in Fuzor for collaboration

Next step

- Change the shape of clash ball in Fuzor.
- When click clash ball, clash item will be highlighted

Sequence of tackling the clash

- ARC & STR parties to solve the clash in T3 this time
- T3 (For Collaboration) – Solved before next BIM Meeting
- T6 (Construction)
- T1
- T2
- T5

T3_Clash Pivot Table	11_ELS-STR FOUNDATION (100)	12_ELS-GENERIC MODEL (80)	13_ELS-STR FRAMING (70)	14_ELS-STR STIFFENER (20)	15_STR COLUMN (100)	16_STR WALL (90)	17_STR FRAMING (80)	18_STR FLOOR (60)	19_STR FOUNDATION (60)	20_STR GENERIC MODEL (20)	21_PIPE (90)	22_MECHANICAL EQUIPMENT (60)	23_PLUMBING FIXTURE (40)	24_MEP GENERIC MODEL (20)	Grand Total
01_ARC COLUMN (100)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02_ARC WALL (80)	0	0	0	0	18	34	95	71	0	0	0	0	0	0	218
03_ARC STAIR (70)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04_ROOM (60)	0	0	0	0	10	38	87	5	0	0	0	0	0	0	140
05_ARC FLOOR (60)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06_CURTAIN PANEL (50)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07_CURTAIN WALL (50)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08_DOOR (40)	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4
09_WINDOW(40)	0	0	0	0	0	0	2	1	0	0	0	0	0	0	3
10_ARC GENERIC MODEL (20)	0	0	0	0	4	0	2	4	0	0	0	0	0	0	10
11_RAILING (10)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12_ELS-STR FOUNDATION (100)					0	0	0	0	0	0	0	0	0	0	0
13_ELS-GENERIC MODEL (80)					0	0	0	0	0	0	0	0	0	0	0
14_ELS-STR FRAMING (70)					0	0	0	0	0	0	0	0	0	0	0
15_ELS-STR STIFFENER (20)					0	0	0	0	0	0	0	0	0	0	0
16_STR COLUMN (100)											0	0	0	0	0
17_STR WALL (90)											0	0	0	0	0
18_STR FRAMING (70)											0	0	0	0	0
19_STR FLOOR (60)											0	0	0	0	0
20_STR FOUNDATION (60)											0	0	0	0	0

Main Clash	
ARC VS ELS	0
ARC VS STR	52
ARC VS MEP	0
ELS VS STR	0
ELS VS MEP	0
STR VS MEP	0
TOTAL	52

Sequence of tackling the clash

- ARC & STR & MEP parties to solve the clash podium
- L2 (For Collaboration) – Solved before next BIM Meeting

Clash Matrix	11_ELS-STR FOUNDATION (100)	12_ELS-GENERIC MODEL (80)	13_ELS-STR FRAMING (70)	14_ELS-STR STIFFENER (20)	15_STR COLUMN (100)	16_STR WALL (90)	17_STR FRAMING (80)	18_STR FLOOR (60)	19_STR FOUNDATION (60)	20_STR GENERIC MODEL (20)	21_PIPE (90)	22_MECHANICAL EQUIPMENT (60)	23_PLUMBING FIXTURE (40)	24_MEP GENERIC MODEL (20)	Grand Total
01_ARC COLUMN (100)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02_ARC WALL (80)	137	0	825	10	80	128	1018	527	51	0	9	0	0	0	2785
03_ARC STAIR (70)	48	0	24	0	3	0	2	2	0	0	0	0	0	0	79
04_ROOM (60)	257	0	80	11	107	45	774	137	11	0	0	0	0	0	1422
05_ARC FLOOR (60)	87	0	7	0	25	2	51	2	5	0	0	0	0	0	179
06_CURTAIN PANEL (50)	0	0	0	0	1	1	13	12	3	0	0	0	0	0	30
07_CURTAIN WALL (50)	0	0	0	0	0	0	7	16	10	0	0	0	0	0	33
08_DOOR (40)	1	0	7	1	2	6	0	3	5	0	0	0	0	0	25
09_WINDOW(40)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10_ARC GENERIC MODEL (20)	0	0	1	2	0	0	0	0	0	0	0	0	0	0	3
11_RAILING (10)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12_ELS-STR FOUNDATION (100)					16	7	52	119	0	0	1	1	1	0	197
13_ELS-GENERIC MODEL (80)					0	0	0	0	0	0	0	0	0	0	0
14_ELS-STR FRAMING (70)					24	332	97	103	4	0	4	0	0	3	567
15_ELS-STR STIFFENER (20)					20	4	5	0	0	0	0	0	0	0	29
16_STR COLUMN (100)											1	0	0	11	12
17_STR WALL (90)											0	0	0	1	1
18_STR FRAMING (70)											0	0	0	0	0
19_STR FLOOR (60)											0	0	0	0	0
20_STR FOUNDATION (60)											0	0	0	0	0

Main Clash	
ARC VS ELS	185
ARC VS STR	211
ARC VS MEP	9
ELS VS STR	92
ELS VS MEP	7
STR VS MEP	1
TOTAL	505

VR

- Review clash analysis
- Site safety management review
- Assembly Sequence
- Virtual Mock Up
- Special unit owner engagement design process

THANK YOU !