

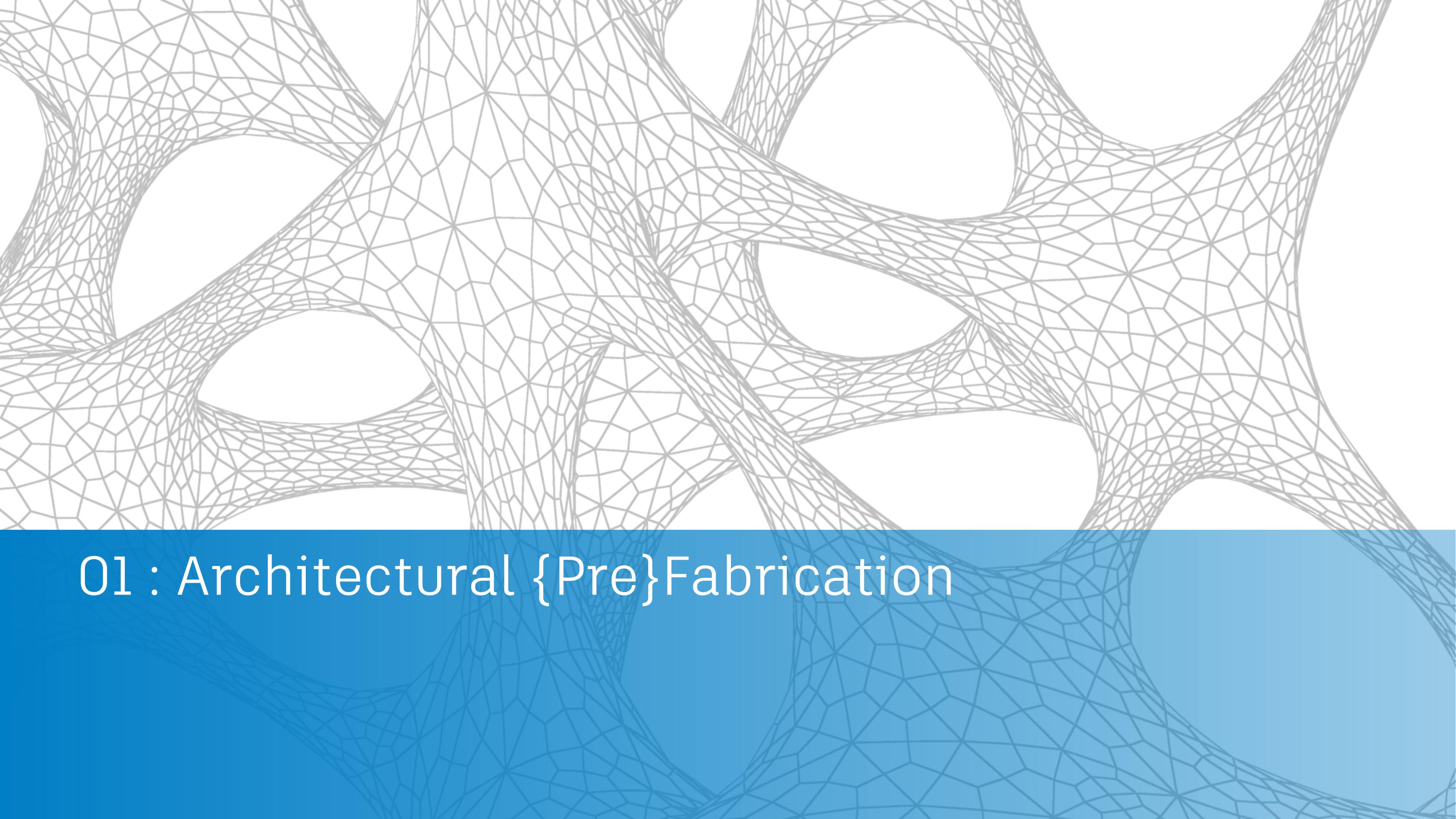
Formulating Fabrication & Design Craft Building Assembly & Component Fabrication

Ian Atkins

Head of BIM, Heatherwick Studio

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The background features a complex, abstract geometric pattern composed of numerous thin, light-grey lines forming a wireframe mesh. This mesh is organized into several large, overlapping spherical structures that intersect and overlap each other. The overall effect is organic and architectural, suggesting a complex system or a futuristic design.

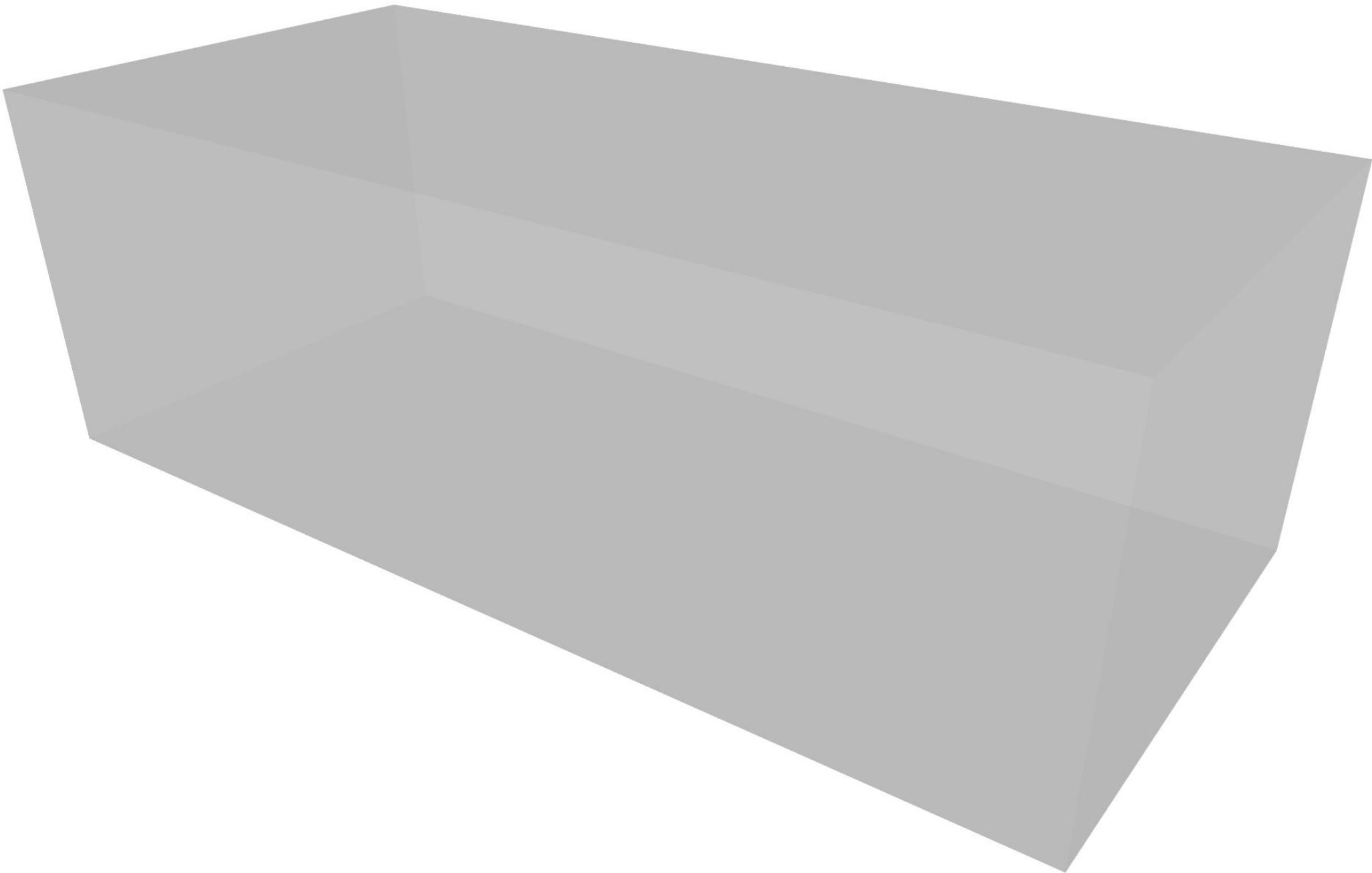
01 : Architectural {Pre}Fabrication

Class Summary

- Dynamic shifts have emerged in the digital realm of building design & the physical methods of offsite fabrication. Buildings are increasingly manufactured/ assembled rather than constructed or crafted. This class will present these digital procedures for designing & modelling buildings in Revit whilst simultaneously assembling & managing your building components through dynamo & into Inventor for fabrication.
- This entails navigating a hierarchy of linked/nested Revit models, Families & formulas; aligning the design BIM with detailed fabrication models in Inventor. Dynamo will be applied as a tool to automate, annotate & design the building layout with the assembled components.
- Orchestrate the Building Model, drawing sets and work instructions in Revit alongside dynamo to layout building components, visualize building data, component relationships and to simultaneously assemble Revit components for building site context, component assembly in factory layout & final modules in transportation.

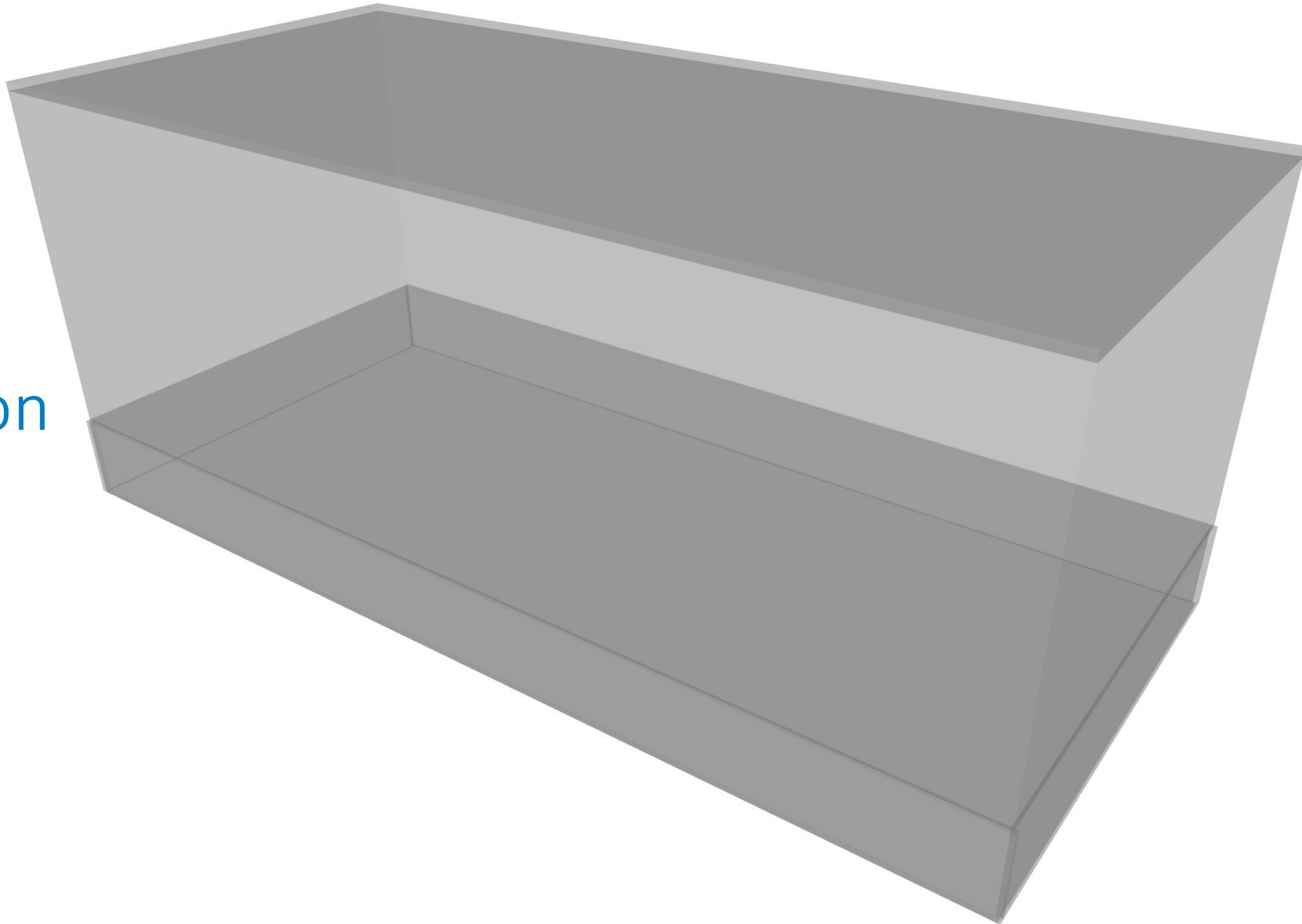
Degrees of Fabrication

- Building
(Typical)



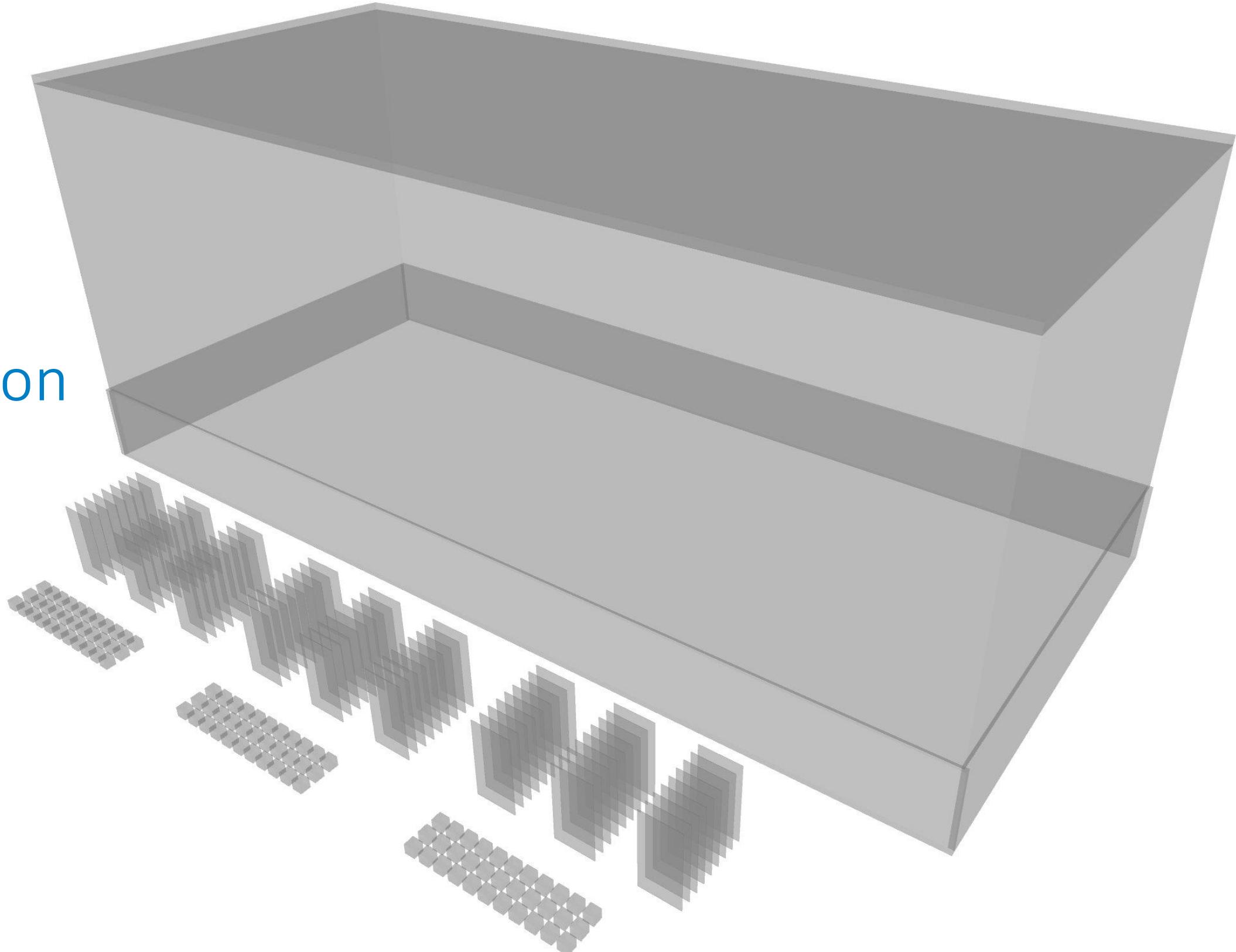
Degrees of Fabrication

- Building
(Typical)
- Roof
- Site Foundation

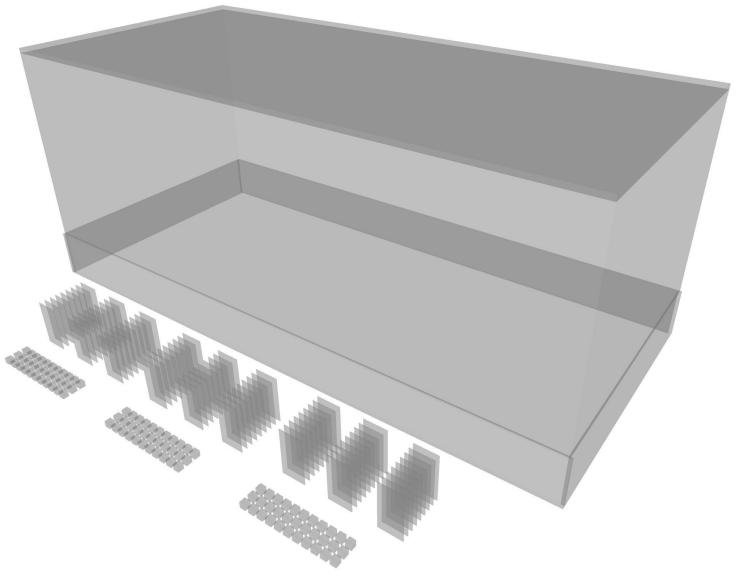


Degrees of Fabrication

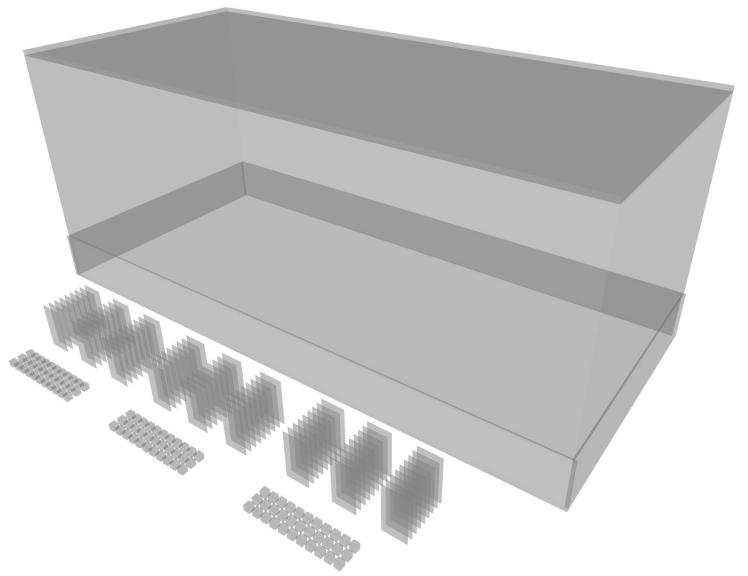
- Building
(Typical)
- Roof
- Site Foundation
- + Assemblies



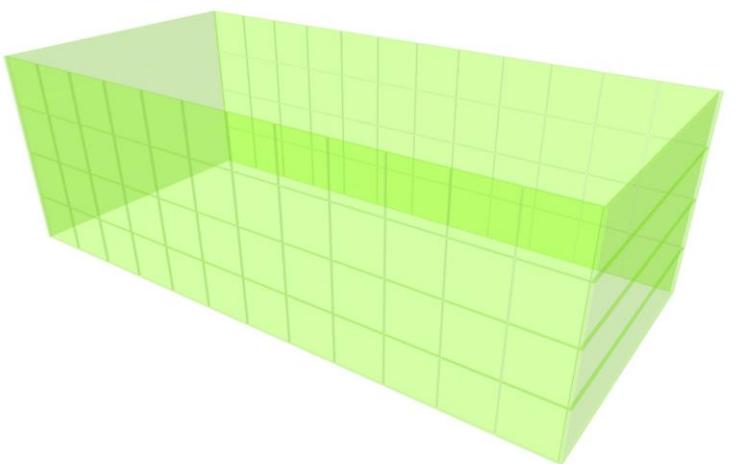
Degrees of Fabrication



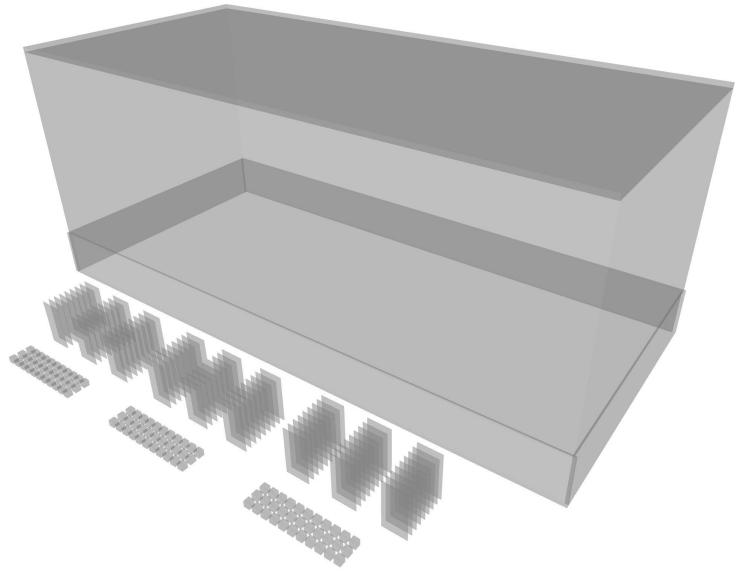
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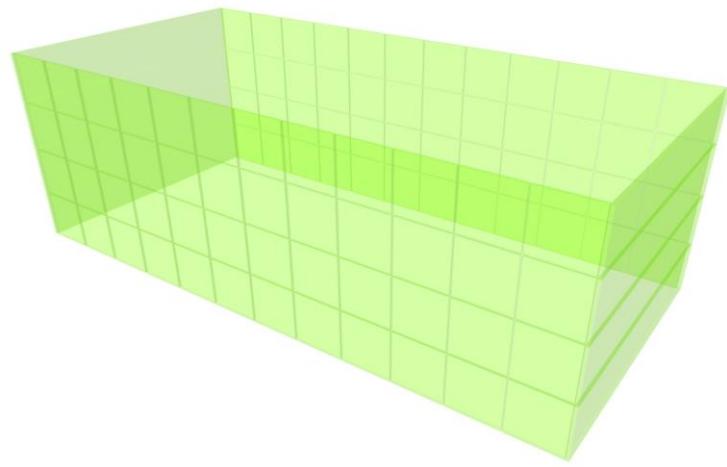
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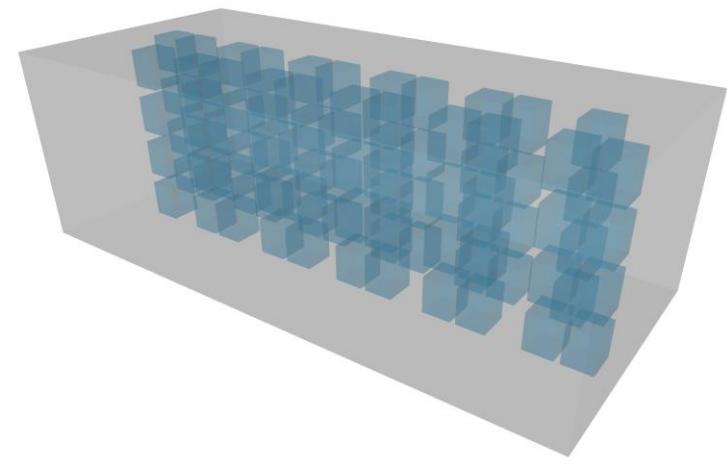
50-Assemblies



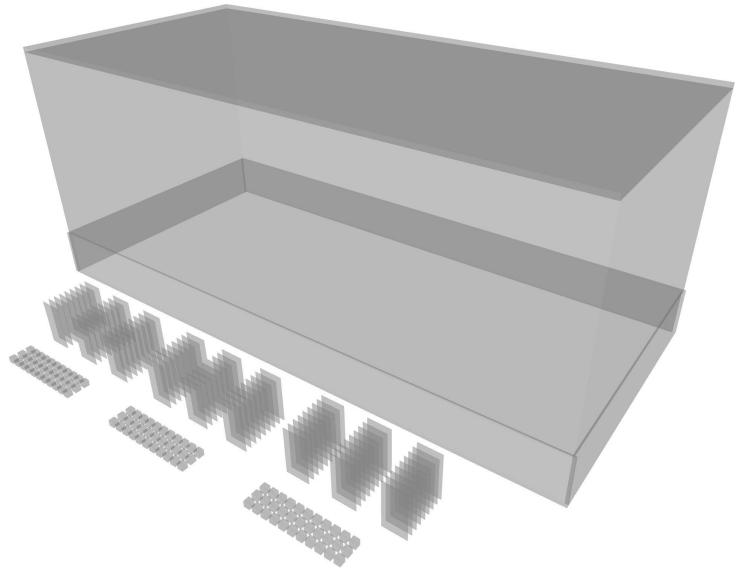
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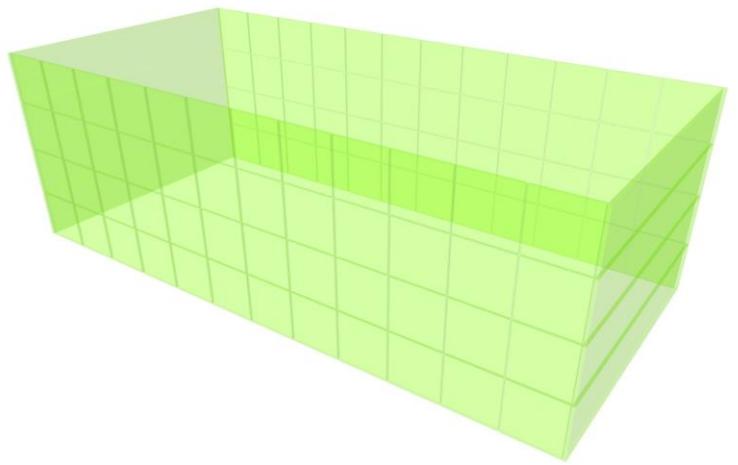
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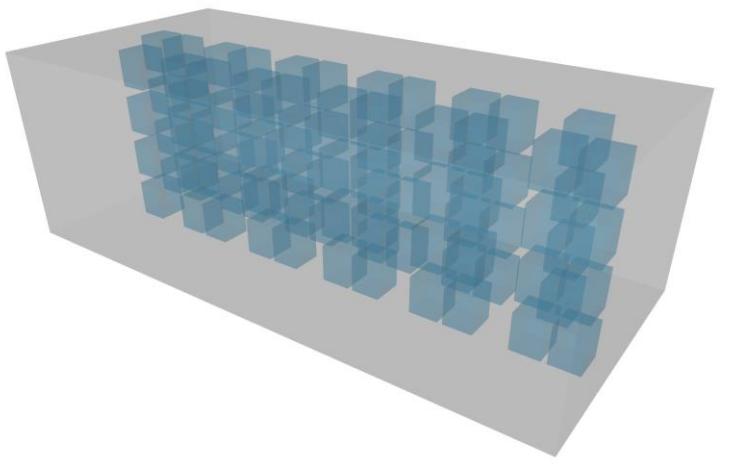
30-Pods



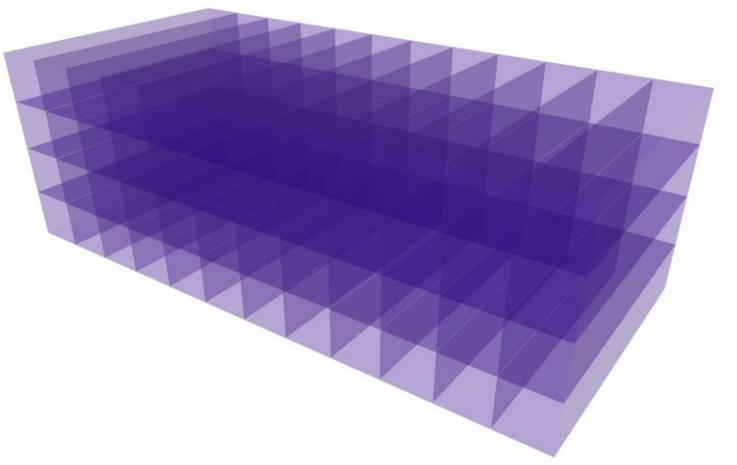
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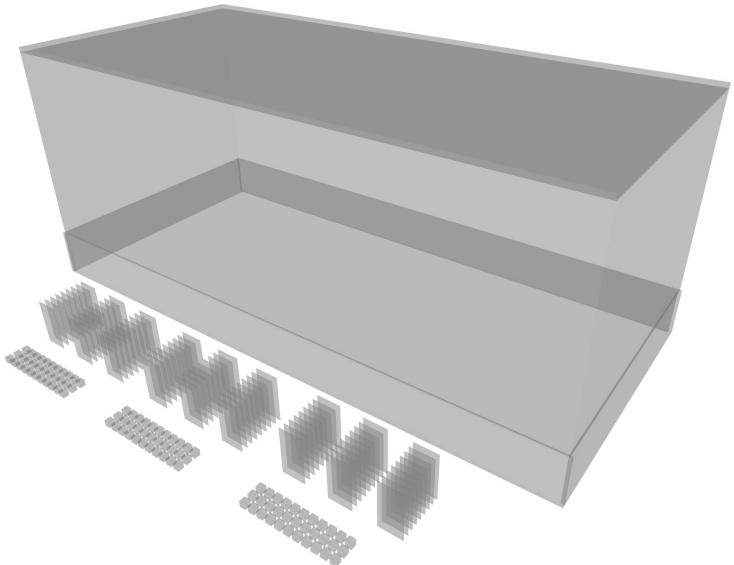
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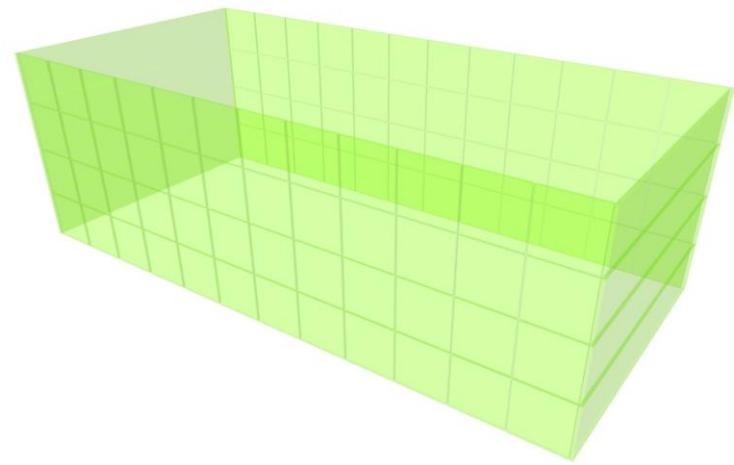
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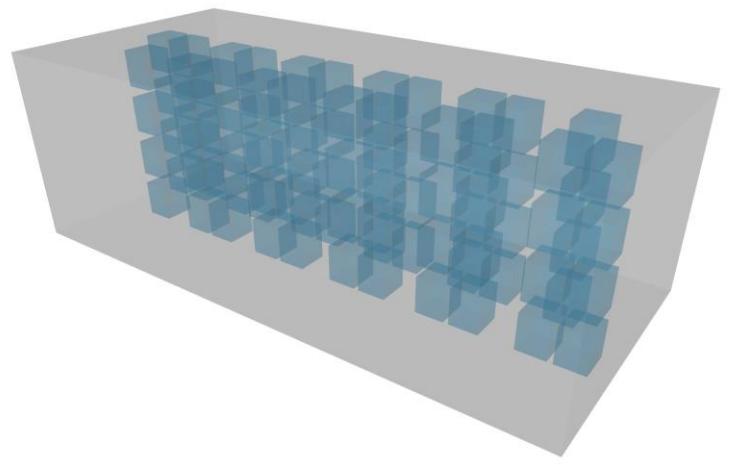
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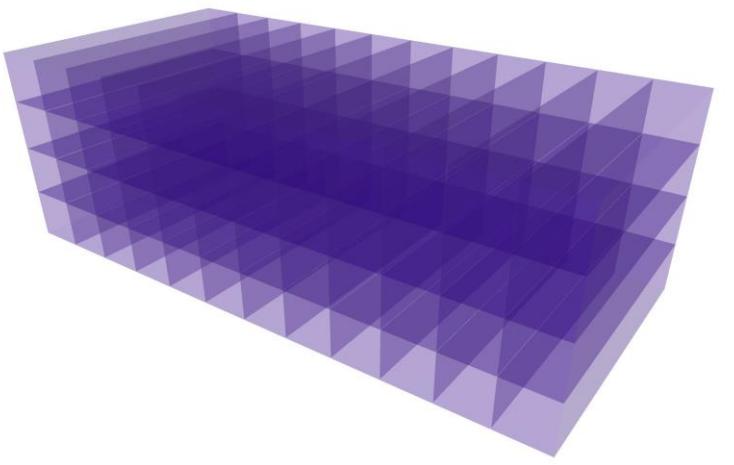
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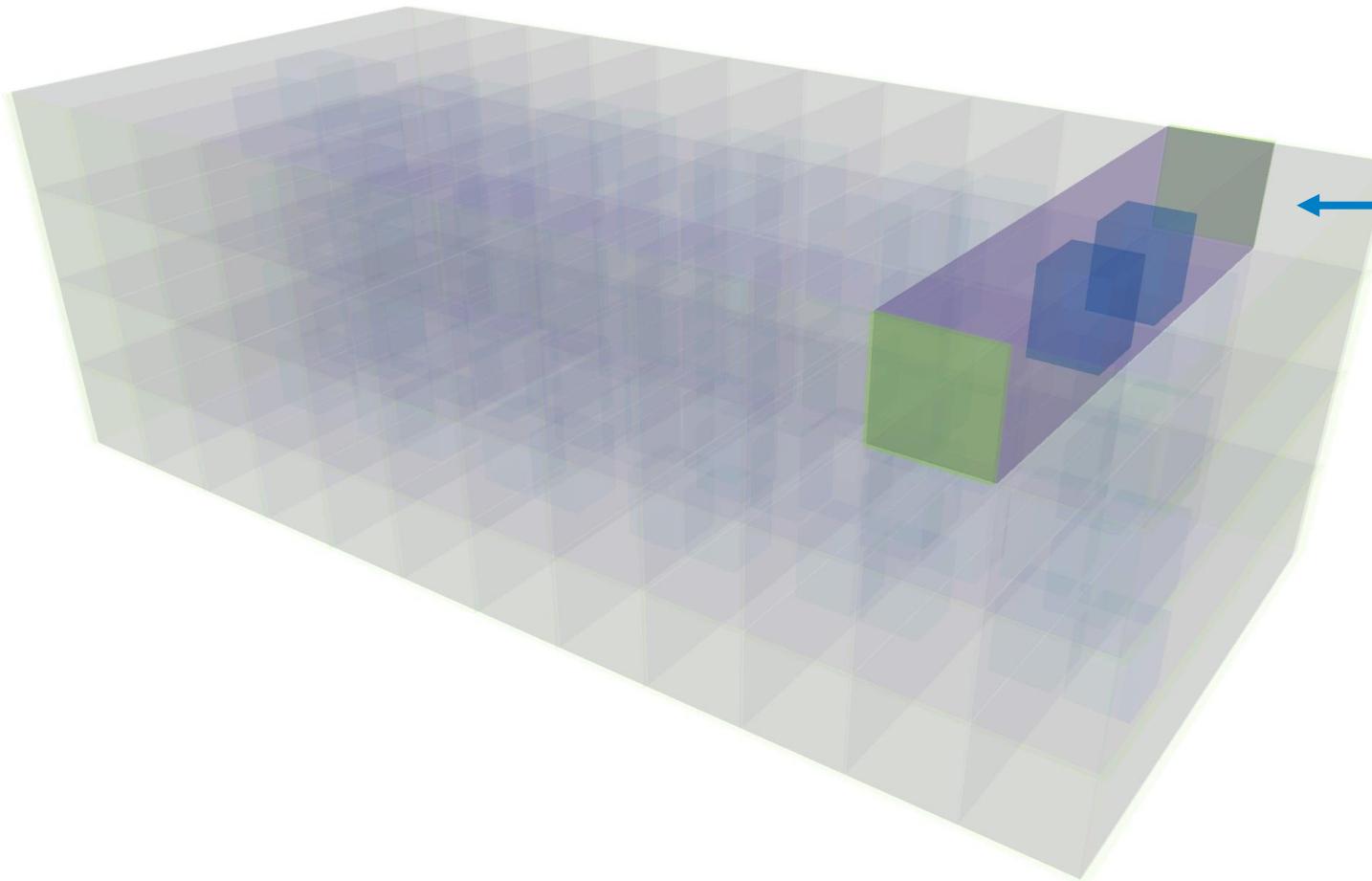
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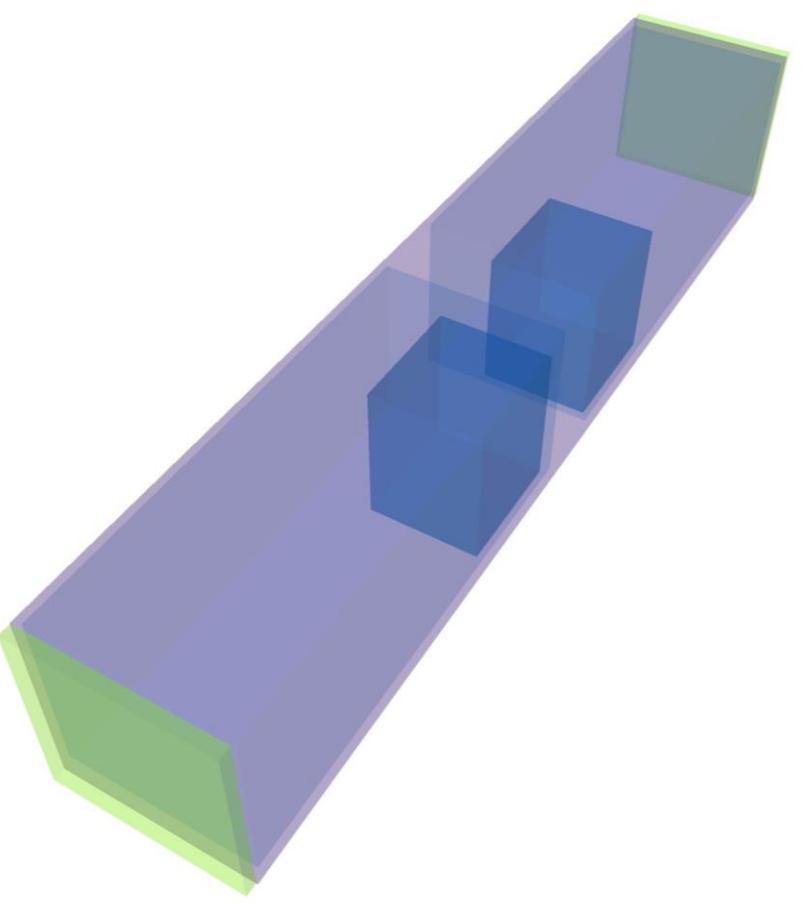
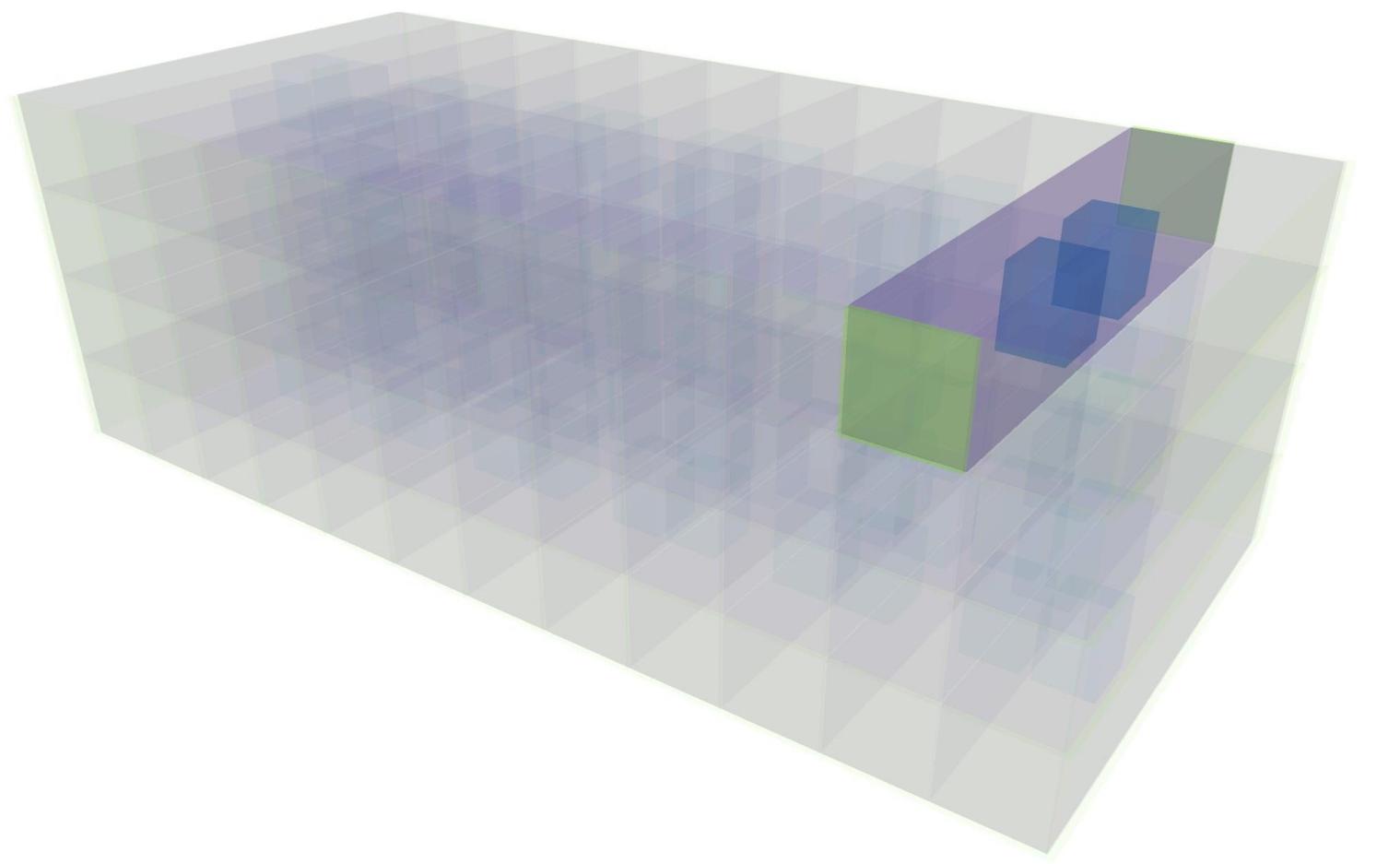


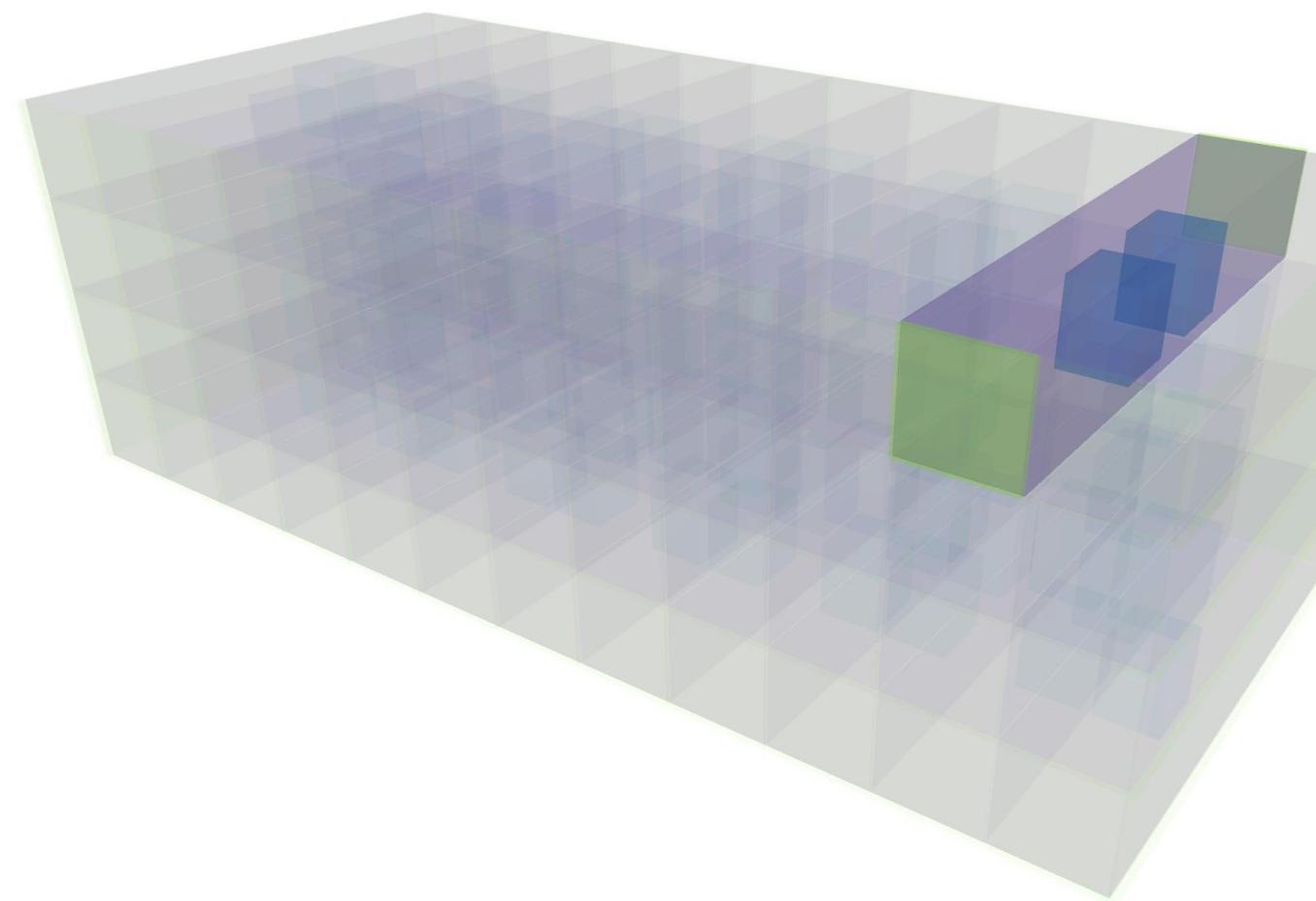
30-Pods



20-Modules







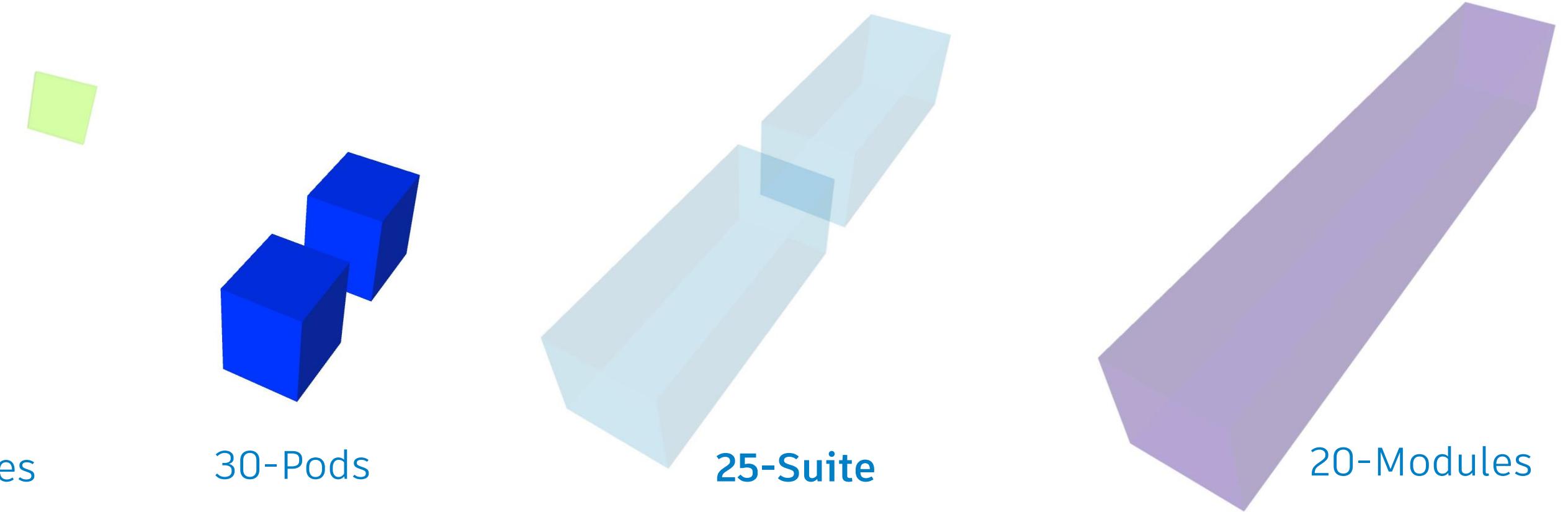
50-Assemblies

30-Pods

25-Suite

20-Modules

15-Level



Further Reference

- Further information on office construction; Digital and Physical Knowledge base

Further Reference

The screenshot shows the homepage of the National Institute of Building Sciences (NIBS). At the top, there's a navigation bar with links for Contact Us, Your Cart, Sign In, and Join. The NIBS logo is on the left, followed by the text "An Authoritative Source of Innovative Solutions for the Built Environment". Below the logo, there's a purple header bar with links for About, Councils & Projects, Membership, Resources, News, Events, and Contact. A banner for the Off-Site Construction Council is prominently displayed, featuring the text "Off-Site Construction Council" and "a council of the National Institute of Building Sciences". To the right of the banner is a search bar labeled "COMMUNITY SEARCH" with the placeholder "Enter search criteria...". Below the search bar is a "LATEST NEWS" section with several news items. On the left side of the main content area, there's a sidebar titled "Resources" with sub-links for About, Board, Webinars, and Resources. The main content area contains a list of resources under various categories: Whole Building Design Guide, Glossary of Off-Site Construction Terms, Off-Site Construction Implementation Resources, Case Studies, Publications, and Off-Site Construction Council Meeting/Discussion Notes.

The Off-Site Construction Council (OSCC) serves as an information resource for all facets of off-site construction. Current resources include:

- Whole Building Design Guide
 - Christ Hospital Joint and Spine Center Case Study
 - Off-Site and Modular Construction Explained
 - Lexington High School Modular Addition
- Glossary of Off-Site Construction Terms
- Off-Site Construction Implementation Resources
 - Lexington High School Modular Addition Case Study
 - The Christ Hospital Joint and Spine Center Case Study
 - Off-Site and Modular Construction Explained
- Case Studies
 - 2040 Market Street, Martin Anderson, AISC
 - Golden Gate Bridge Pavilion, Martin Anderson, AISC
 - Millmont School, Laurie Robert, NRB
 - Pharmaceutical R&D Building, Sue Klawans, Gilbane Building Co.
 - Sprout Space, Allen Post, Perkins + Will
- Publications
 - Saving Time with Bathroom Pods
 - Prefabrication and Modularization: Increasing Productivity in the Construction Industry
 - Improving Construction Efficiency & Productivity with Modular Construction
 - Advancing the Competitiveness and Efficiency of the U.S. Construction Industry
 - Modular Construction Educational Foundation Resources
 - Report of the Results of the 2015 Off-Site Construction Industry Survey of Software Usage
 - Off-Site Studies: Permanent Modular Construction, Process, Practice, Performance
 - Off-Site Studies: Solid Timber Construction, Process, Practice, Performance
 - Off-Site Construction Education: Results of A Survey of Prefabrication in Design and Construction Academics
 - Report of the Results of the 2014 Off-Site Construction Industry Survey
 - Building Offsite: An Introduction
- Off-Site Construction Council Meeting/Discussion Notes

National Institute of Building Science Offsite Construction Council

<http://www.wbdg.org/resources/site-and-modular-construction-explained>

Further Reference



Home About Research Outreach Partners Contact

CURRENT / ONGOING PROJECTS



International KM in Offsite Construction



Interlocking CLT from beetle kill pine



Value Proposition of Panelization



Off-Site Implementation Guide



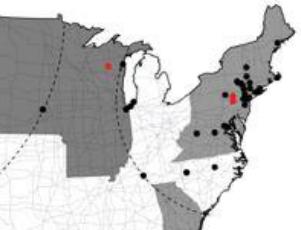
Oldcastle Building Envelope Lab (OBEL)



Built Environment Exchange



H3 Wall



5 in 5 Research Initiative

PAST PROJECTS



The Integrated Technology in Architecture Collaborative

<http://itac.utah.edu/Research.html>



02 : Information Exchange

Design Delivery and BlM Exchange

Project Contract – Plan of Work

Design Delivery and BIM Exchange

Project Contract – Plan of Work

RIBA Plan of Work – Project Stages



Design Delivery and BIM Exchange

Project Contract – Plan of Work

RIBA Plan of Work – Project Stages



Design-Bid-Build

Architect/Engineer



Contractor/Fabricator



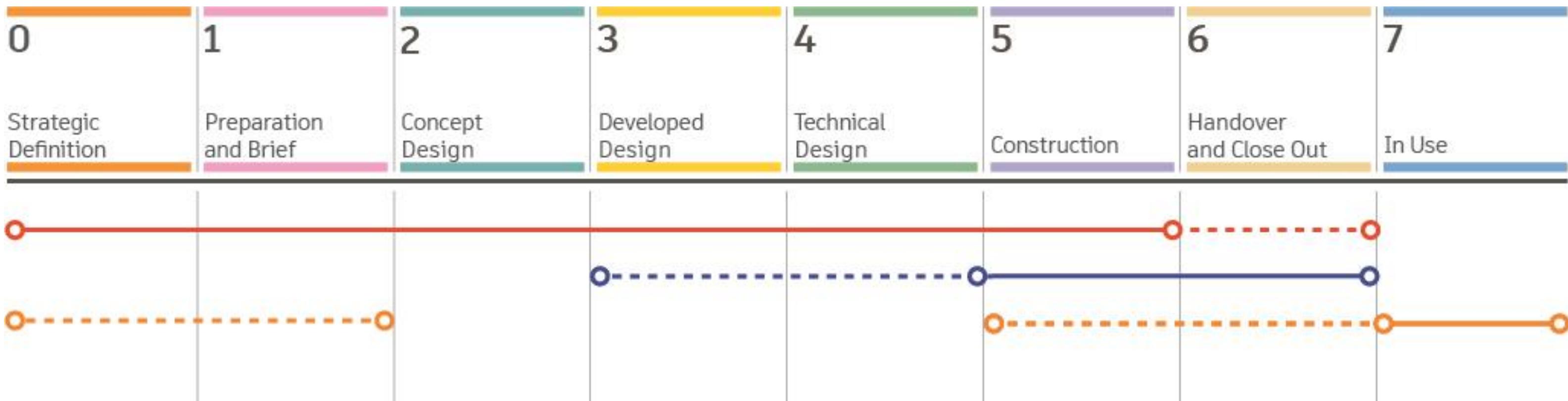
Owner



Design Delivery and BIM Exchange

Project Contract – Plan of Work

RIBA Plan of Work – Project Stages



Design-Bid-Build

+Preconstruction Agreement

Architect/Engineer



Contractor/Fabricator



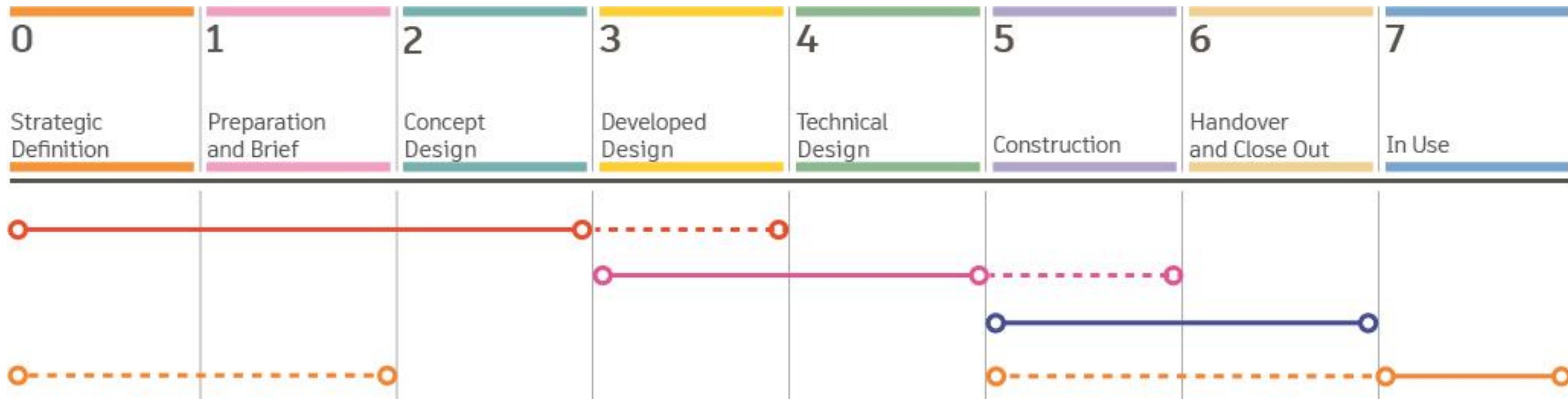
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Design Delivery and BIM Exchange

Project Contract – Plan of Work

RIBA Plan of Work – Project Stages



Design-Bid-Build

+Split Design/Delivery

Design Architect/ Engineer

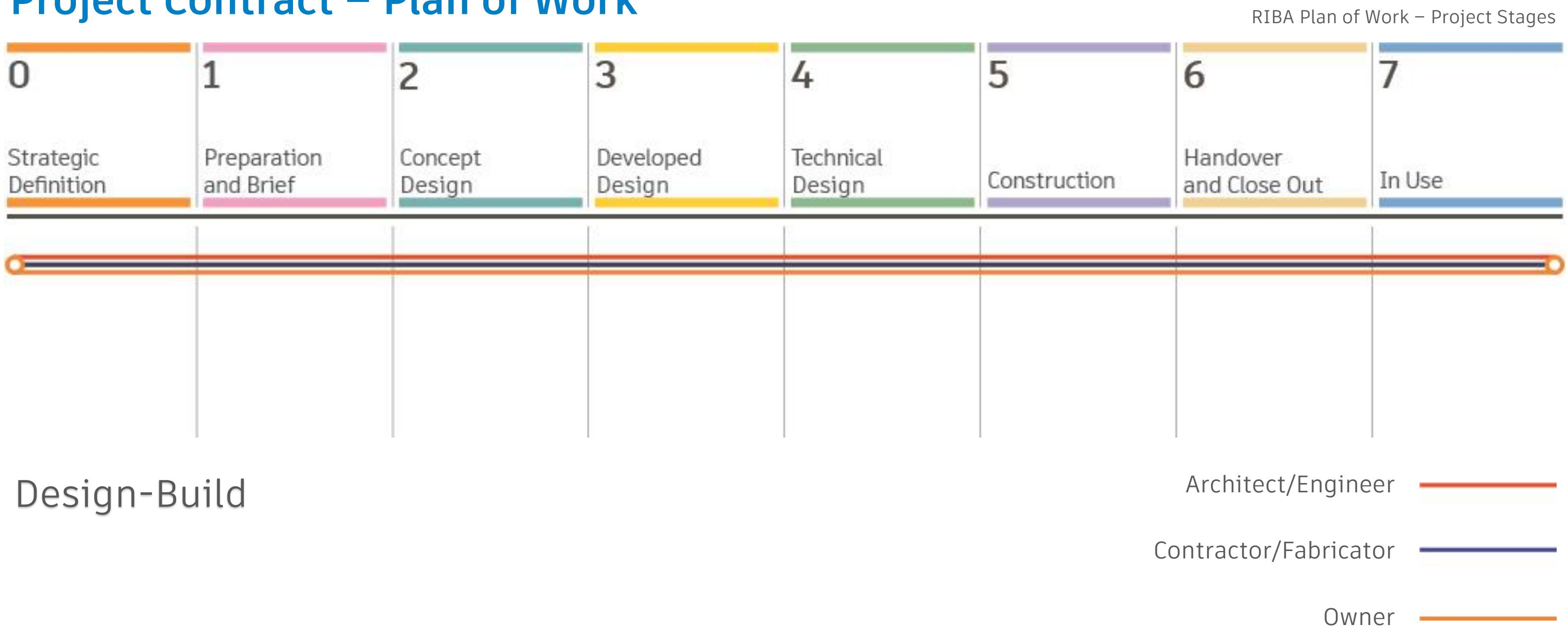
Delivery Architect/Engineer

Contractor/Fabricator

Owner

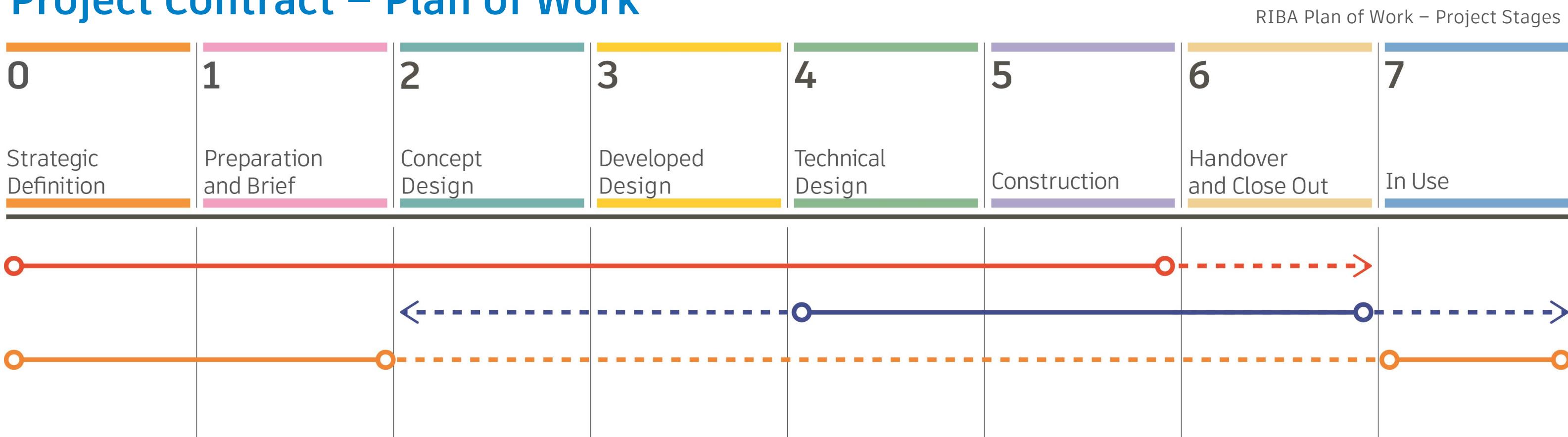
Design Delivery and BIM Exchange

Project Contract – Plan of Work



Design Delivery and BIM Exchange

Project Contract – Plan of Work



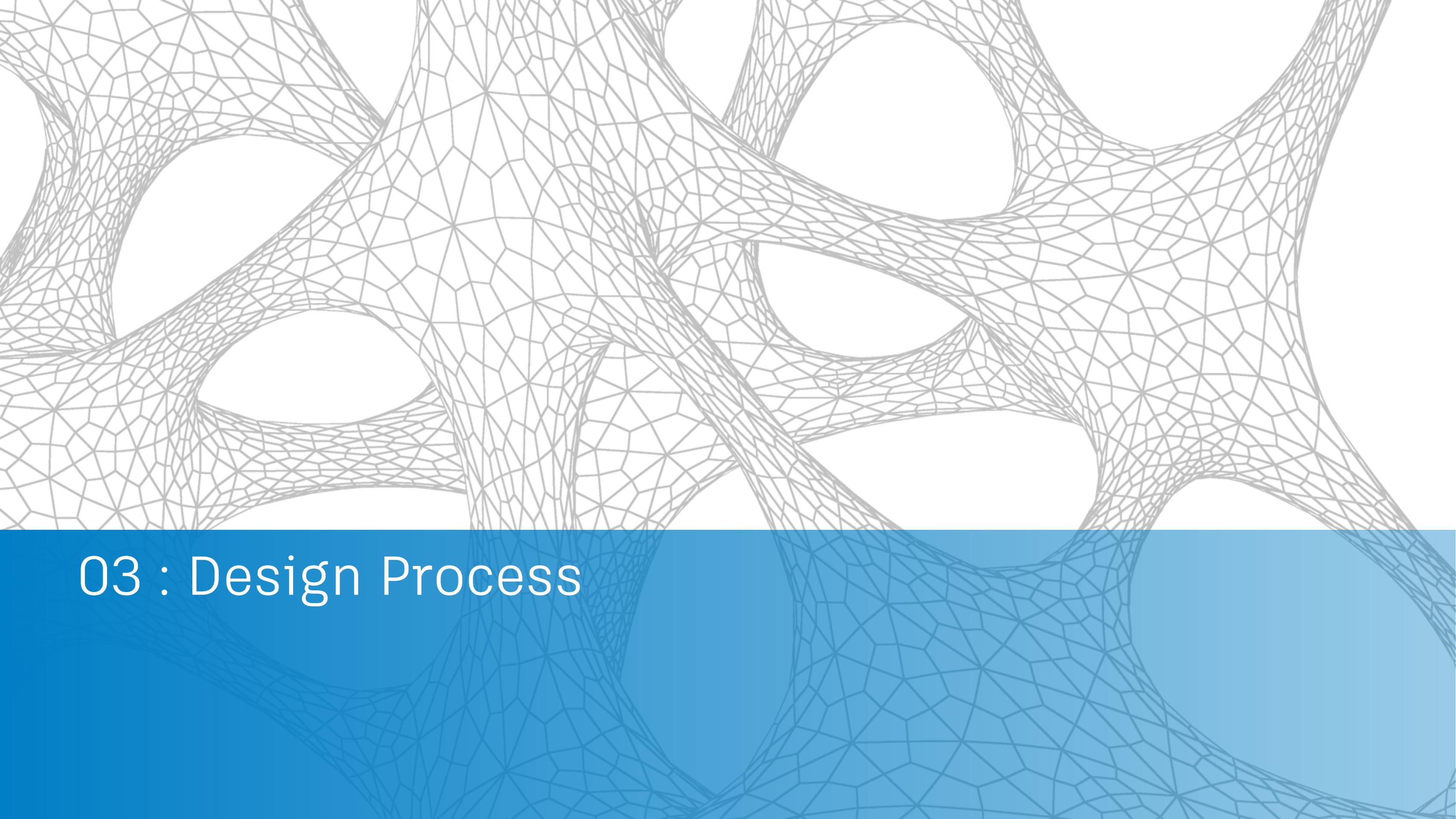
Effective Process for Offsite Design Delivery

Shared Responsibility, Information Exchange Transparent Data Access

Architect/Engineer

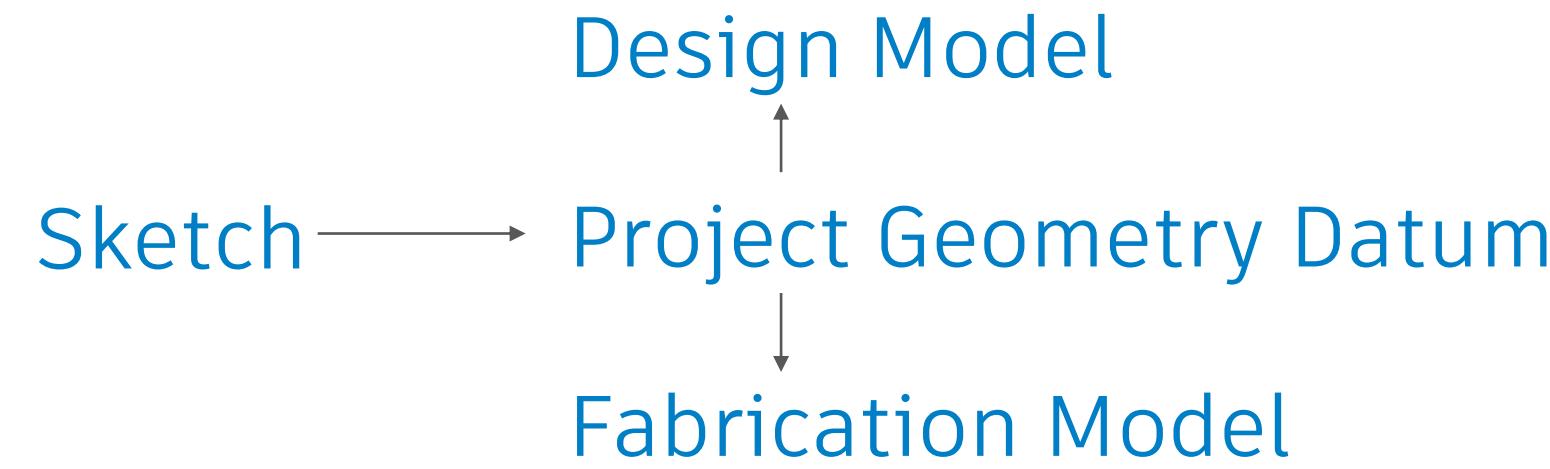
Contractor/Fabricator

Owner

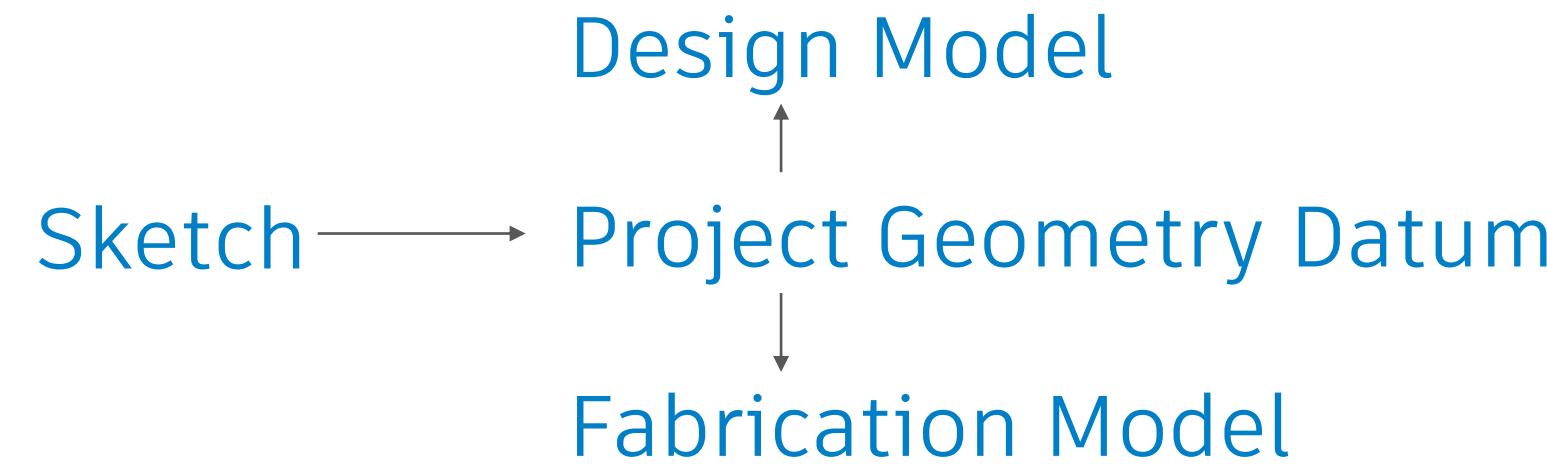


03 : Design Process

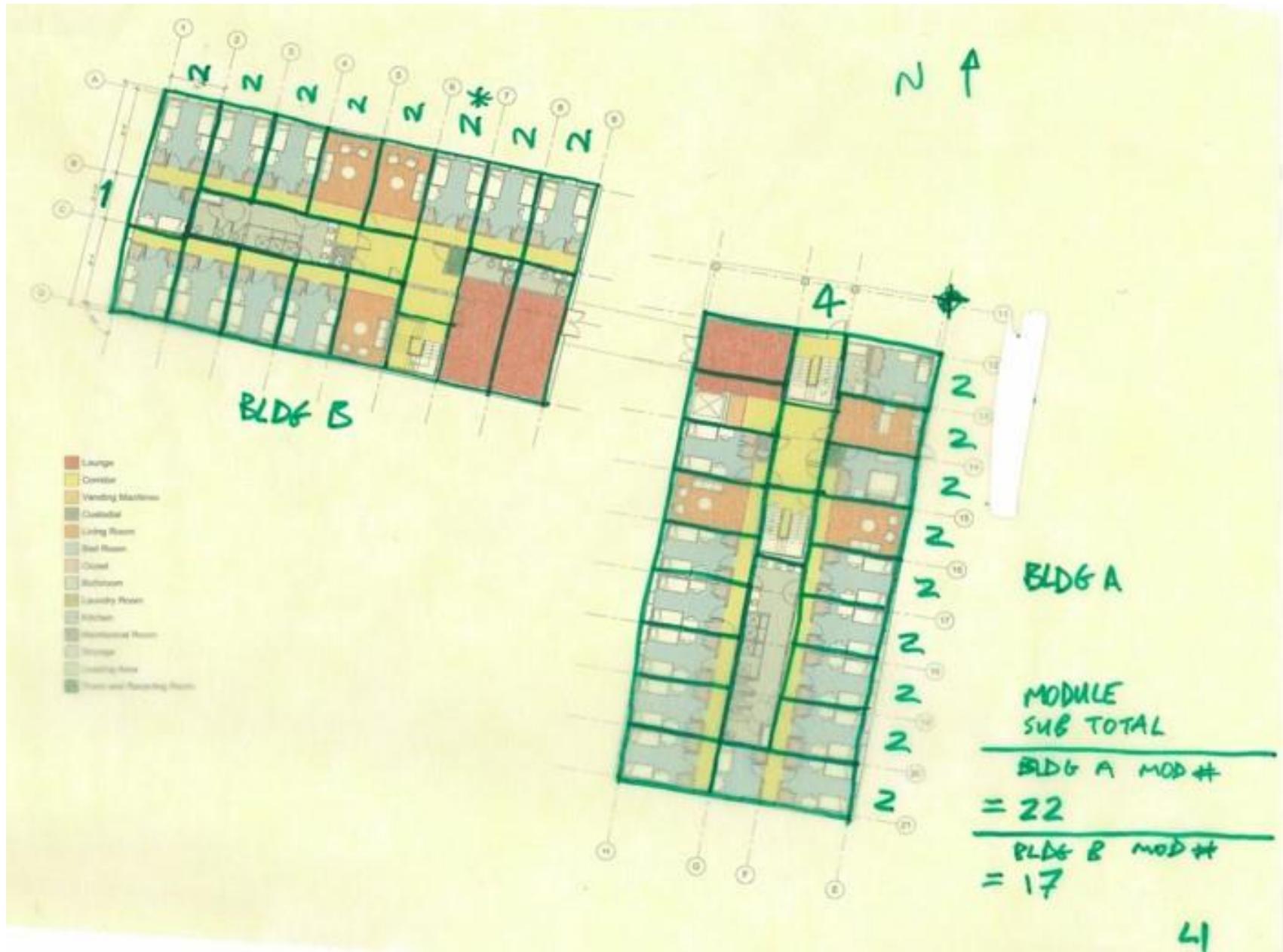
Design Process



Design Process

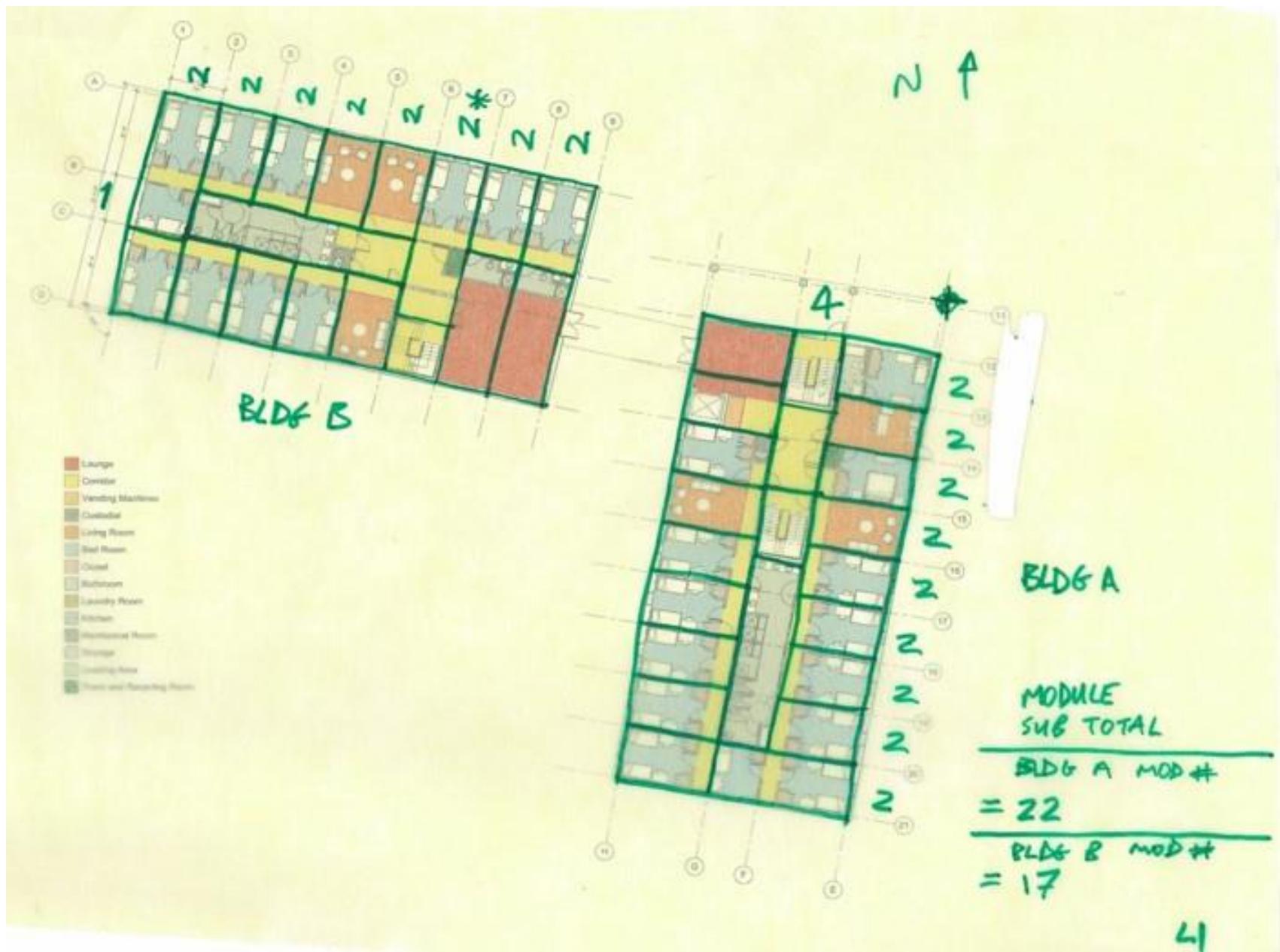


Design Process

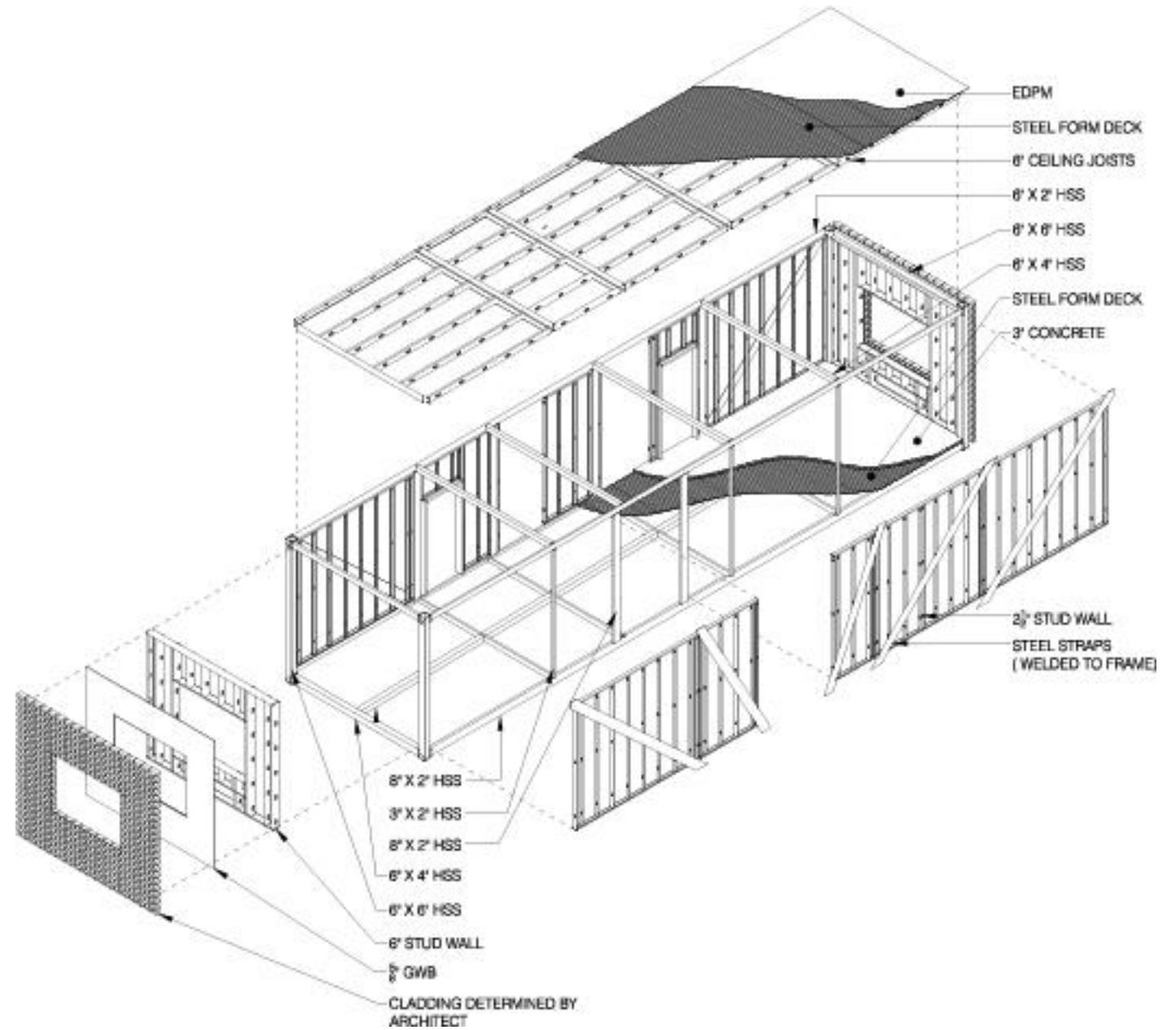


Sketch

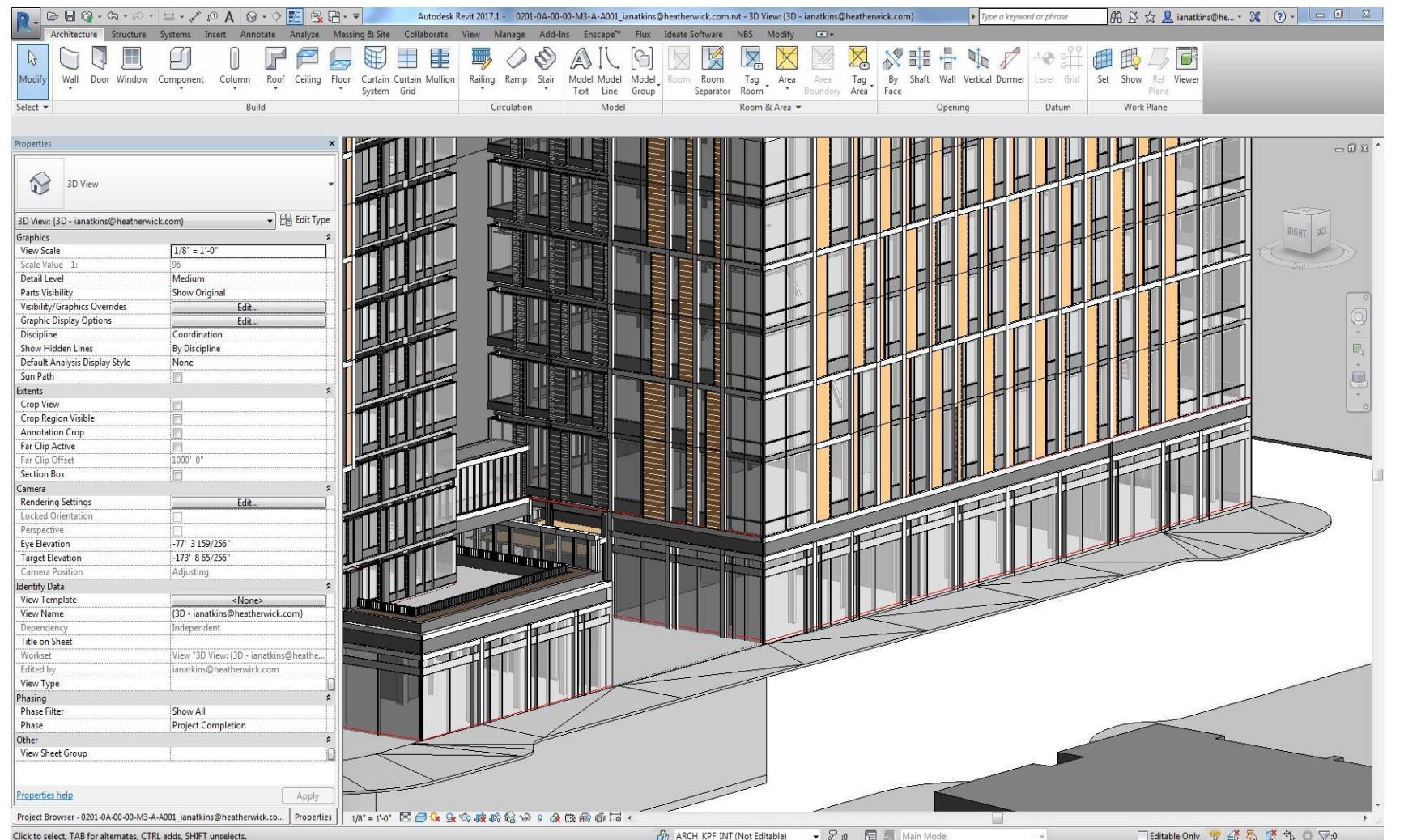
Design Process



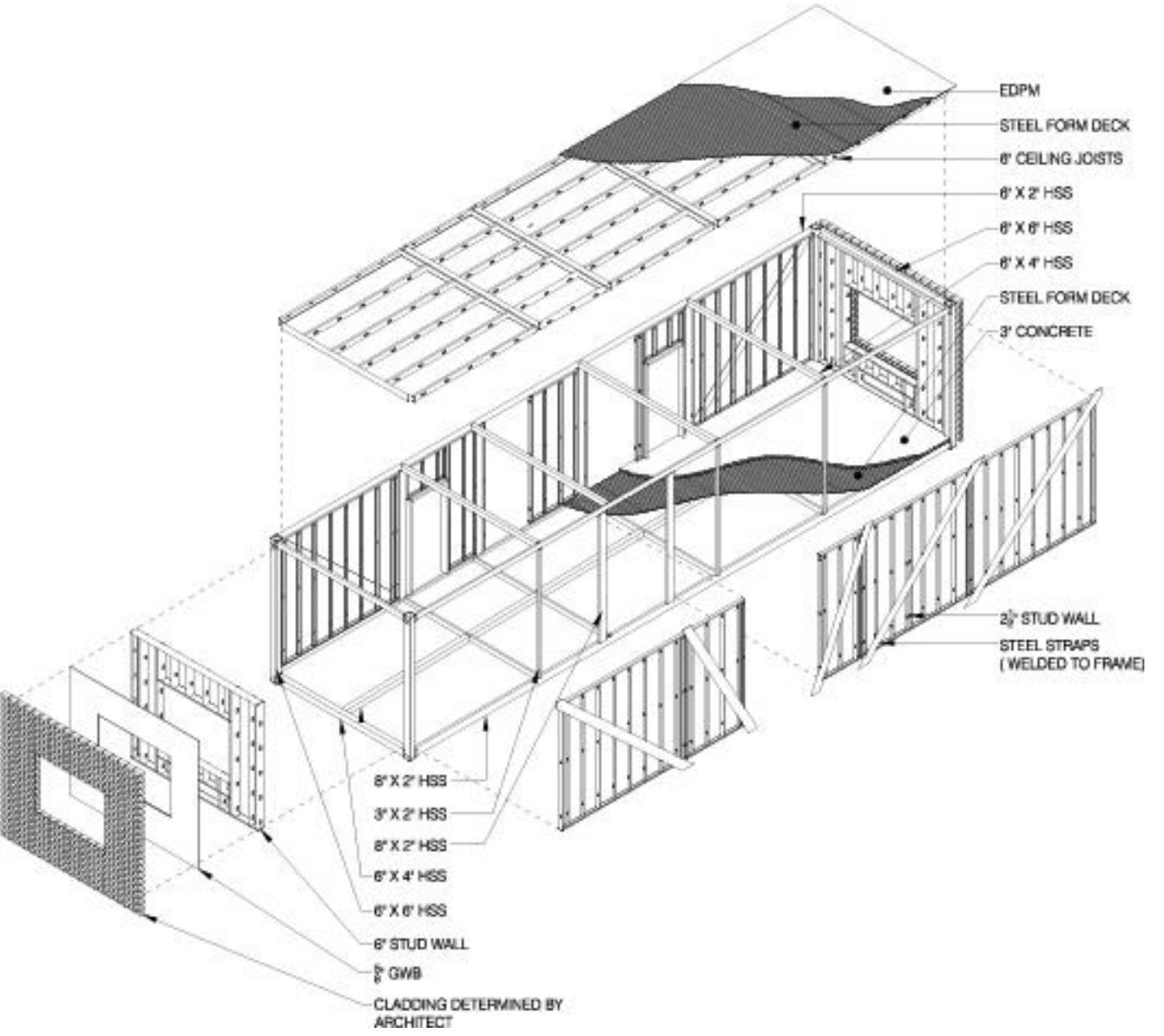
Sketch



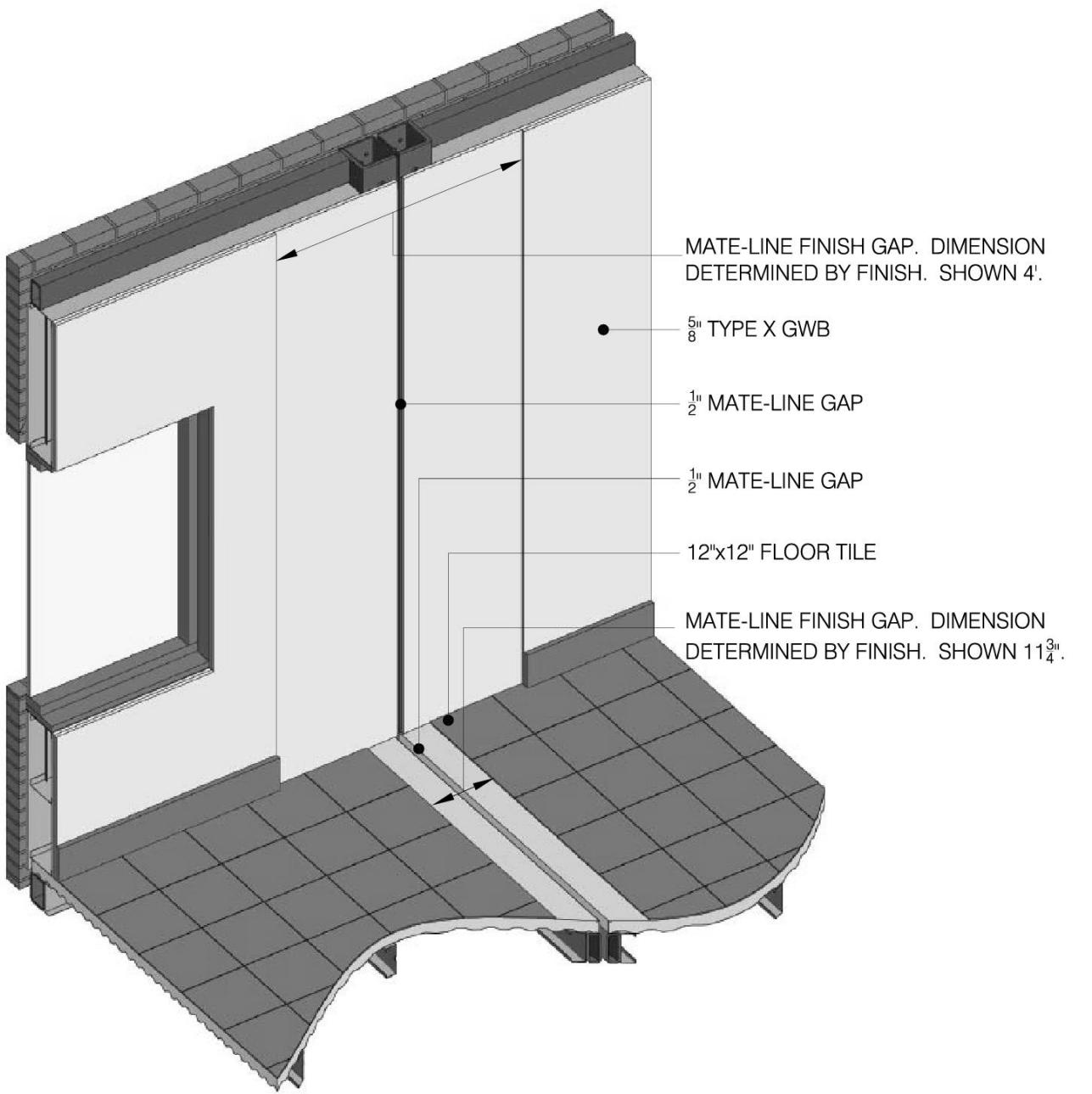
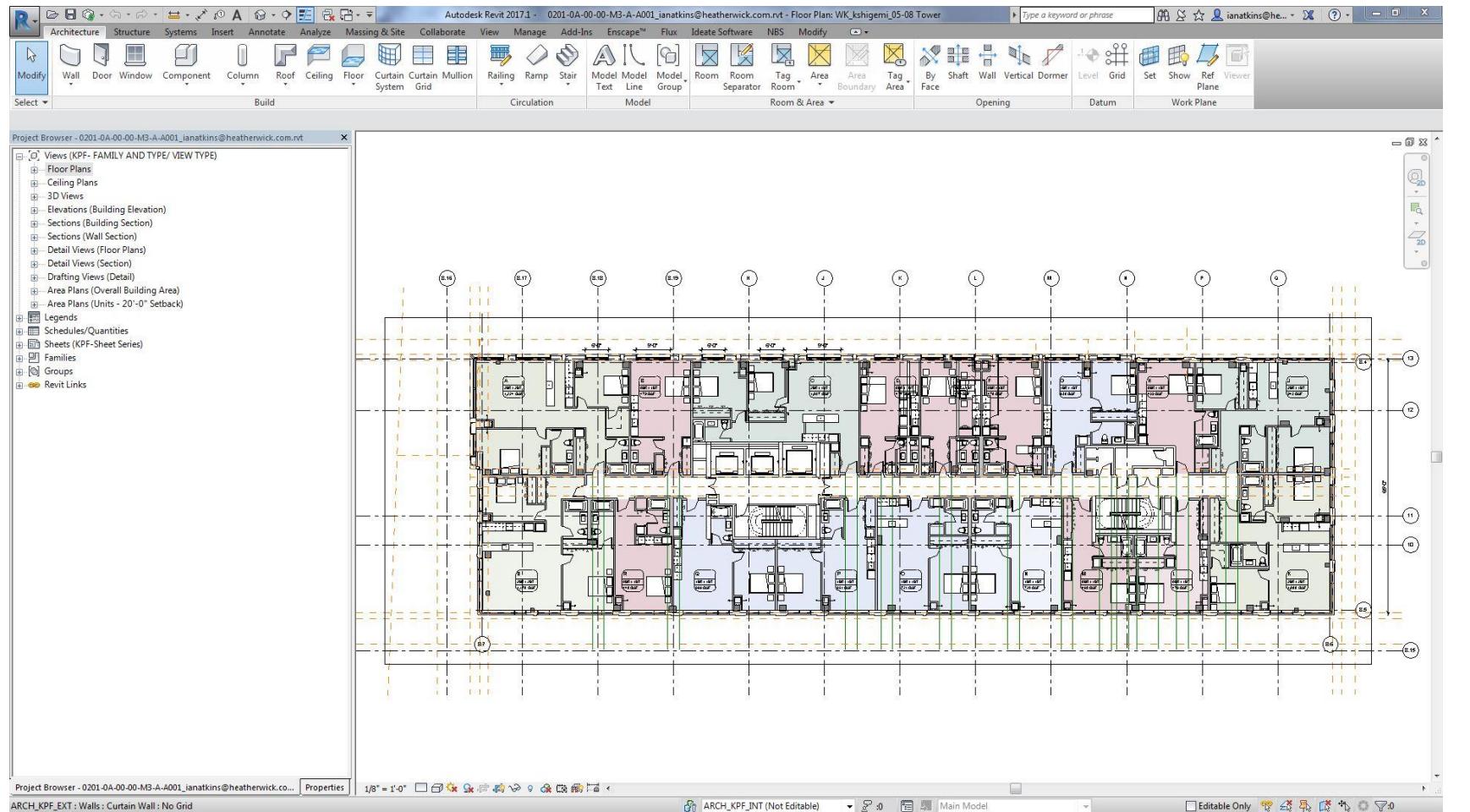
Fabrication Model

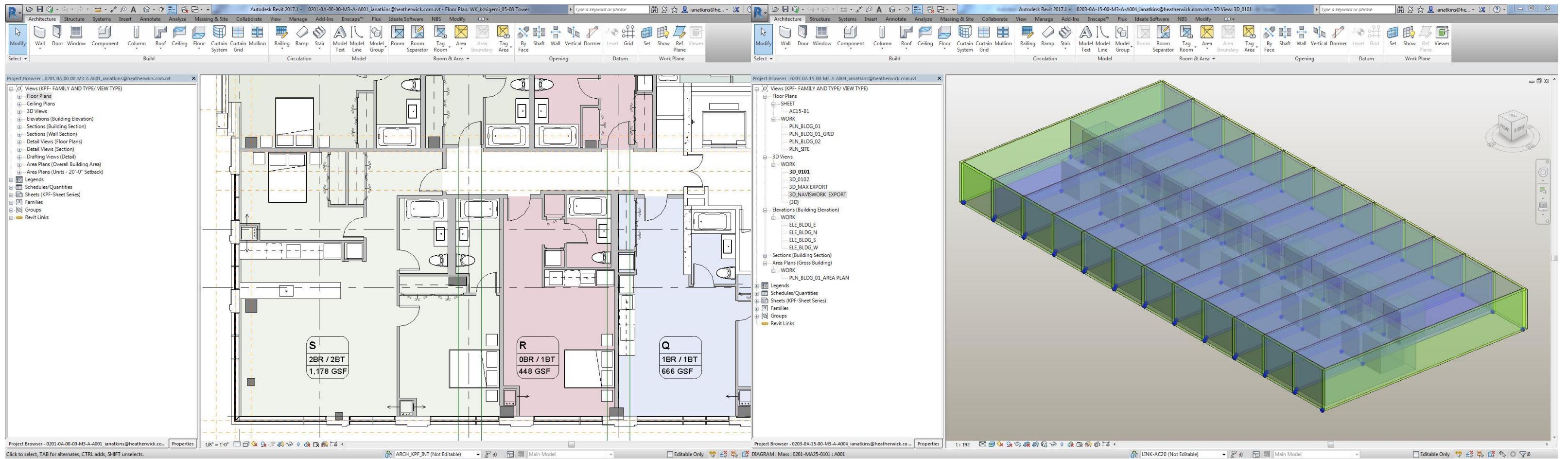


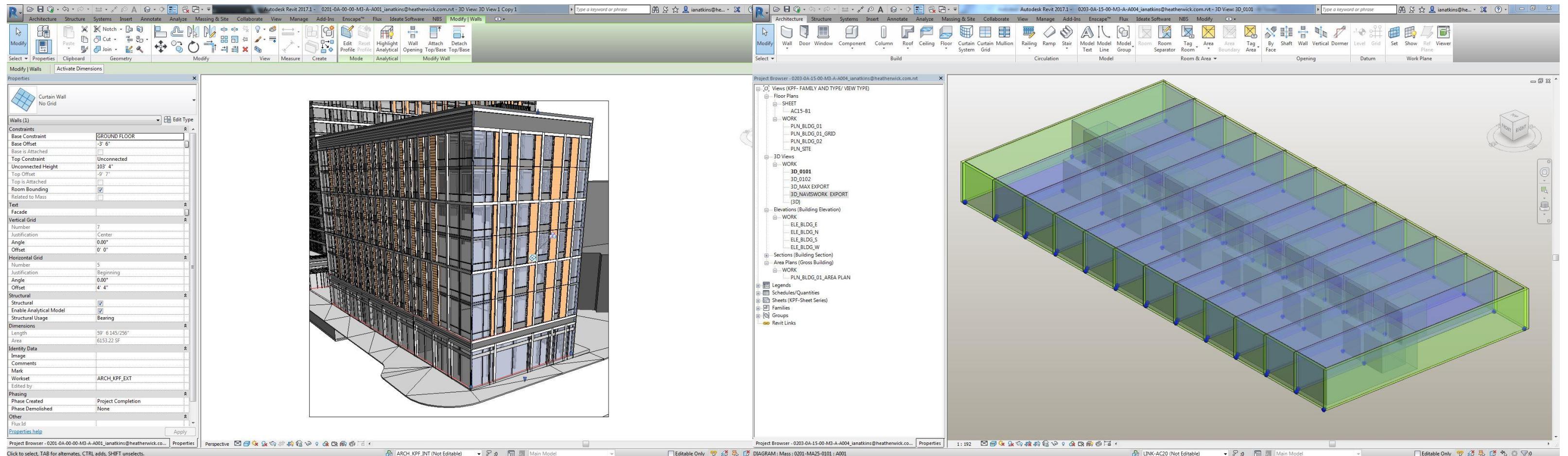
Design Model

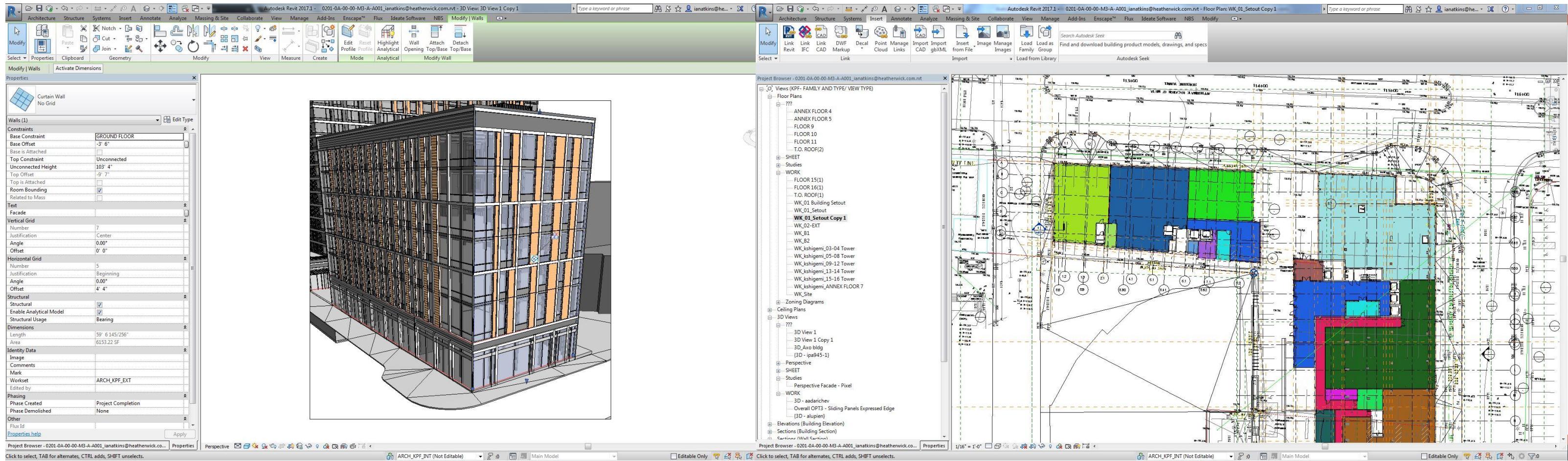


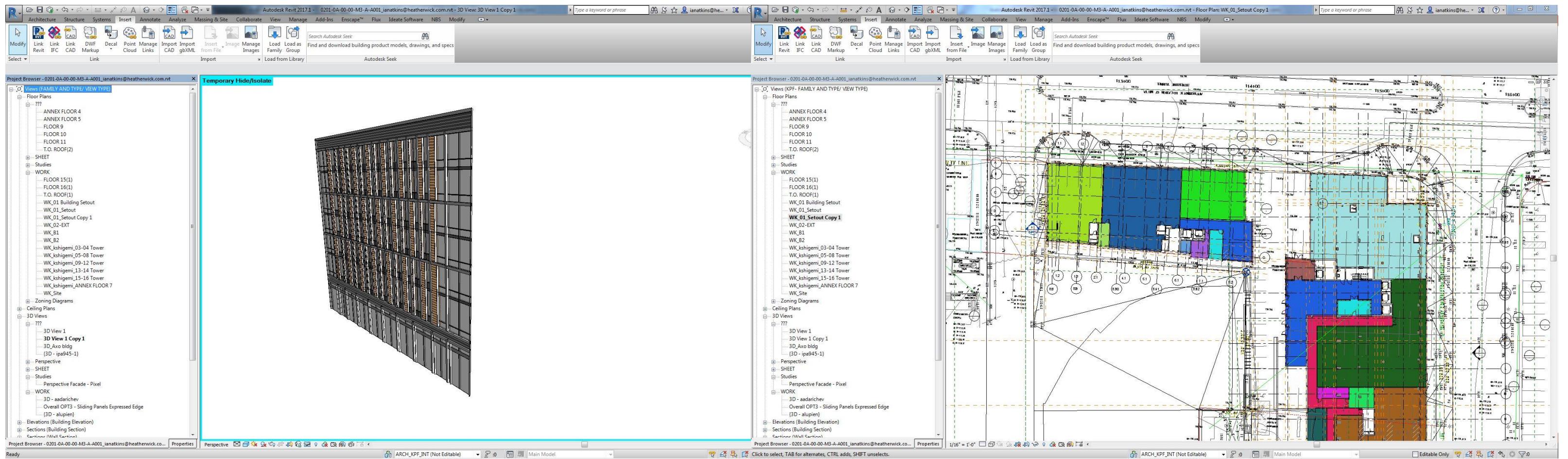
Fabrication Model

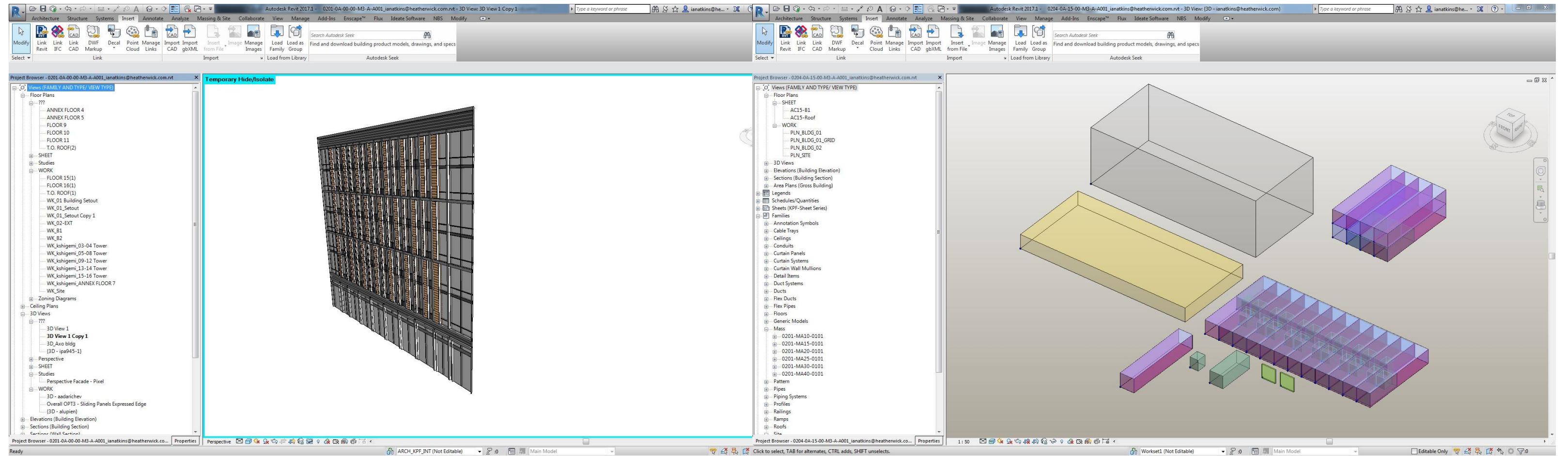












Fabrication Strategy - Module Layout

Design Delivery and BIM Exchange

Project Contract – Plan of Work



Effective Process for Offsite Design Delivery

Shared Responsibility, Information Exchange Transparent Data Access

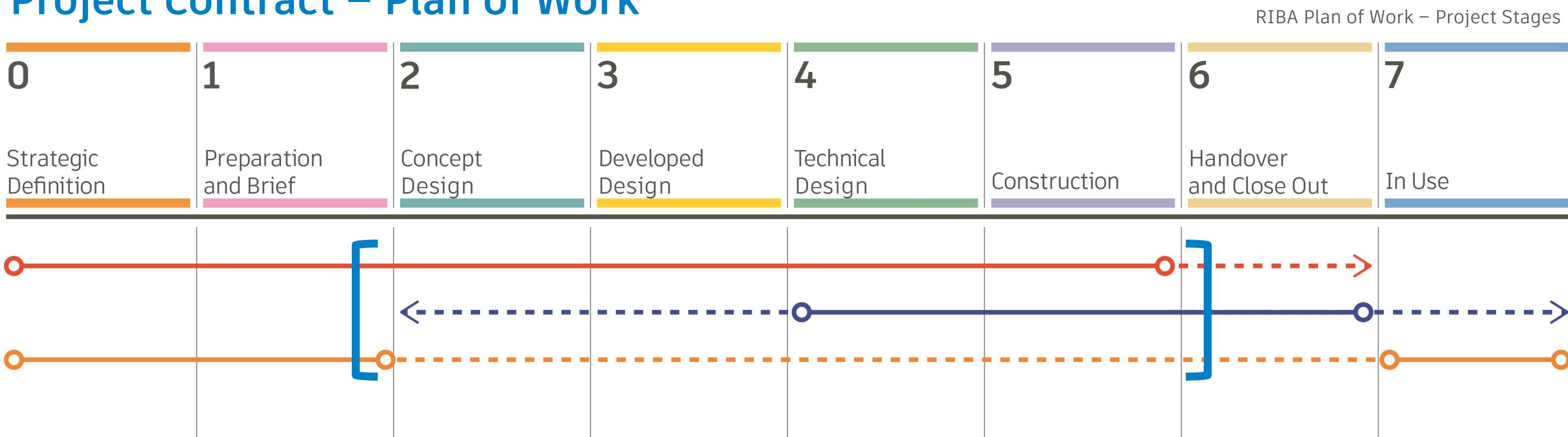
Architect/Engineer

Contractor/Fabricator

Owner

Design Delivery and BIM Exchange

Project Contract – Plan of Work



Effective Process for Offsite Design Delivery

Shared Responsibility, Information Exchange Transparent Data Access

Architect/Engineer



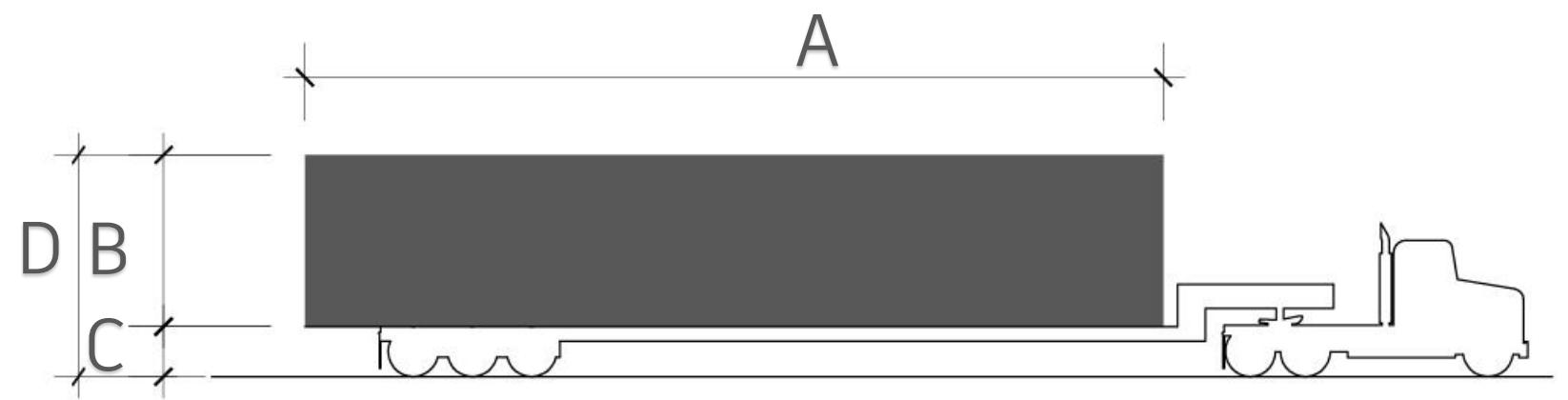
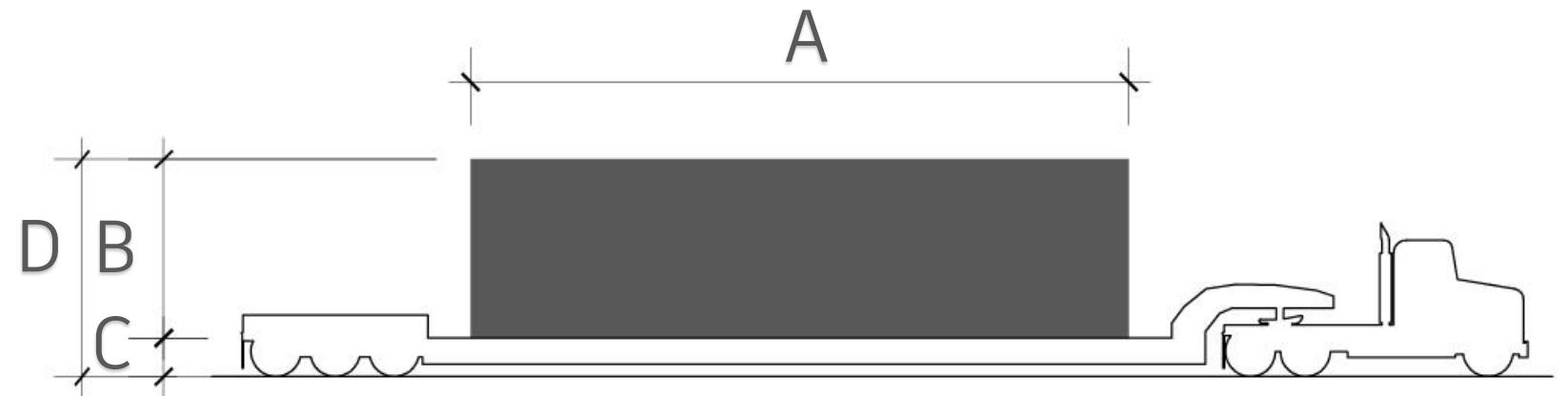
Contractor/Fabricator



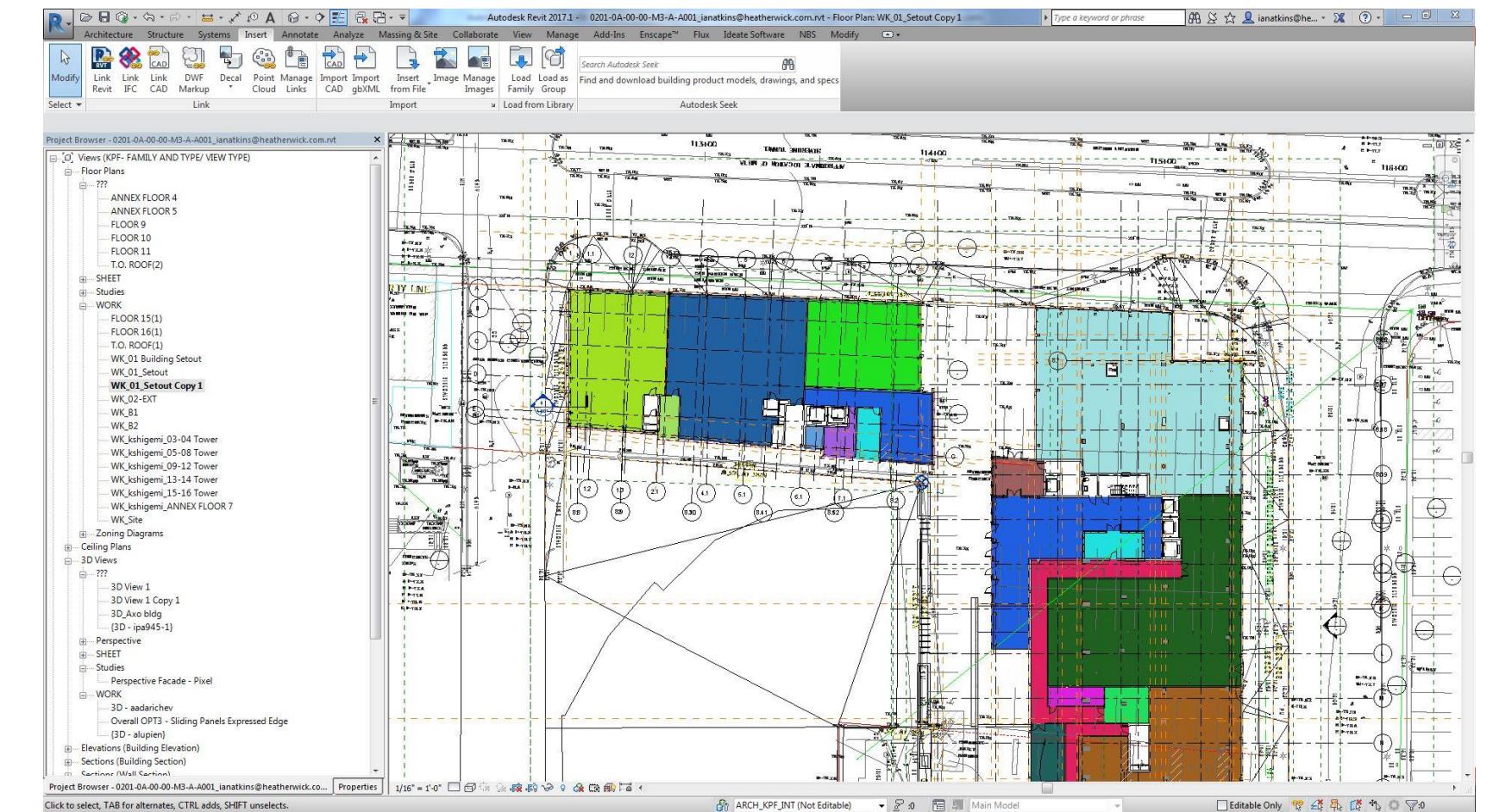
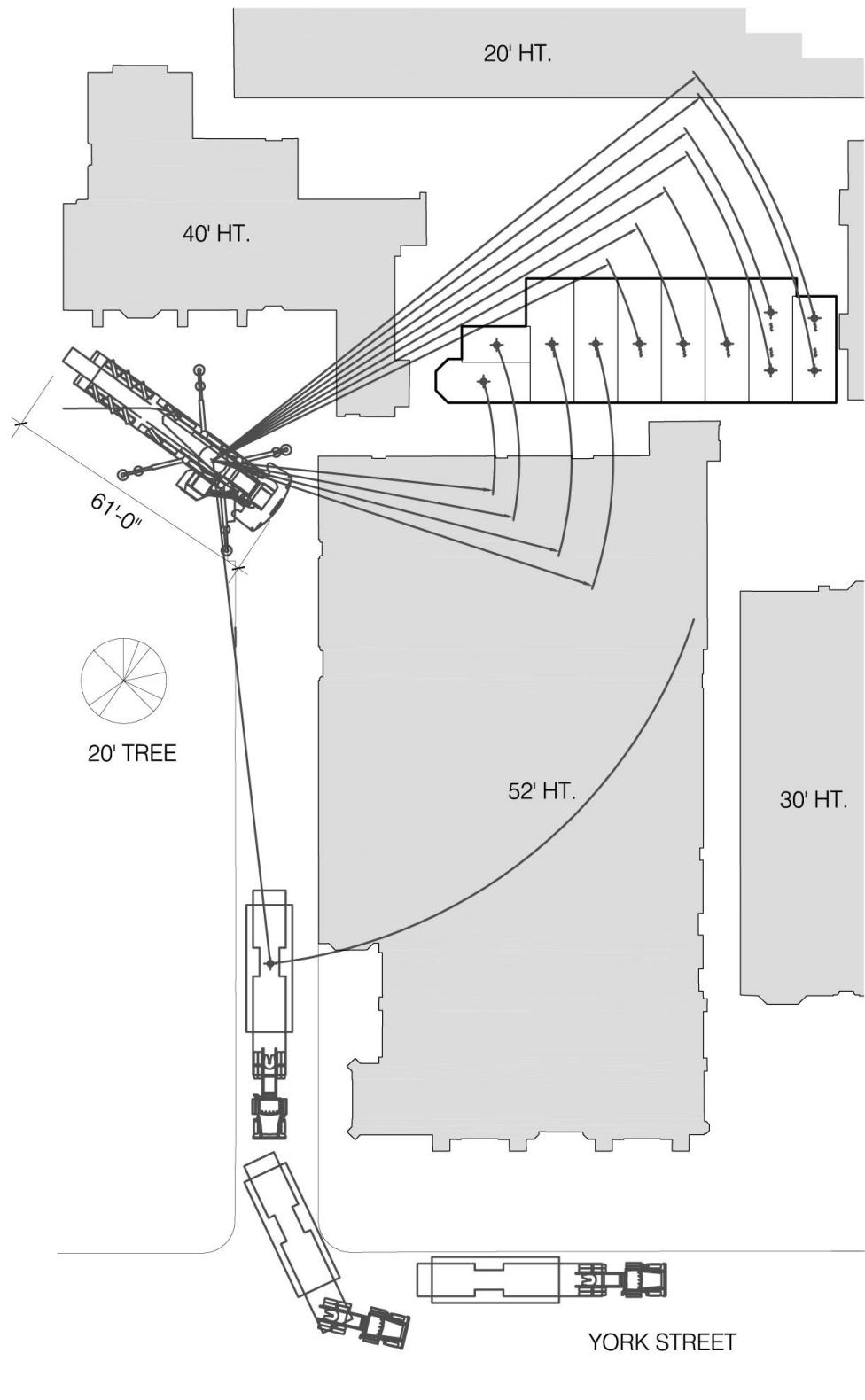
Owner

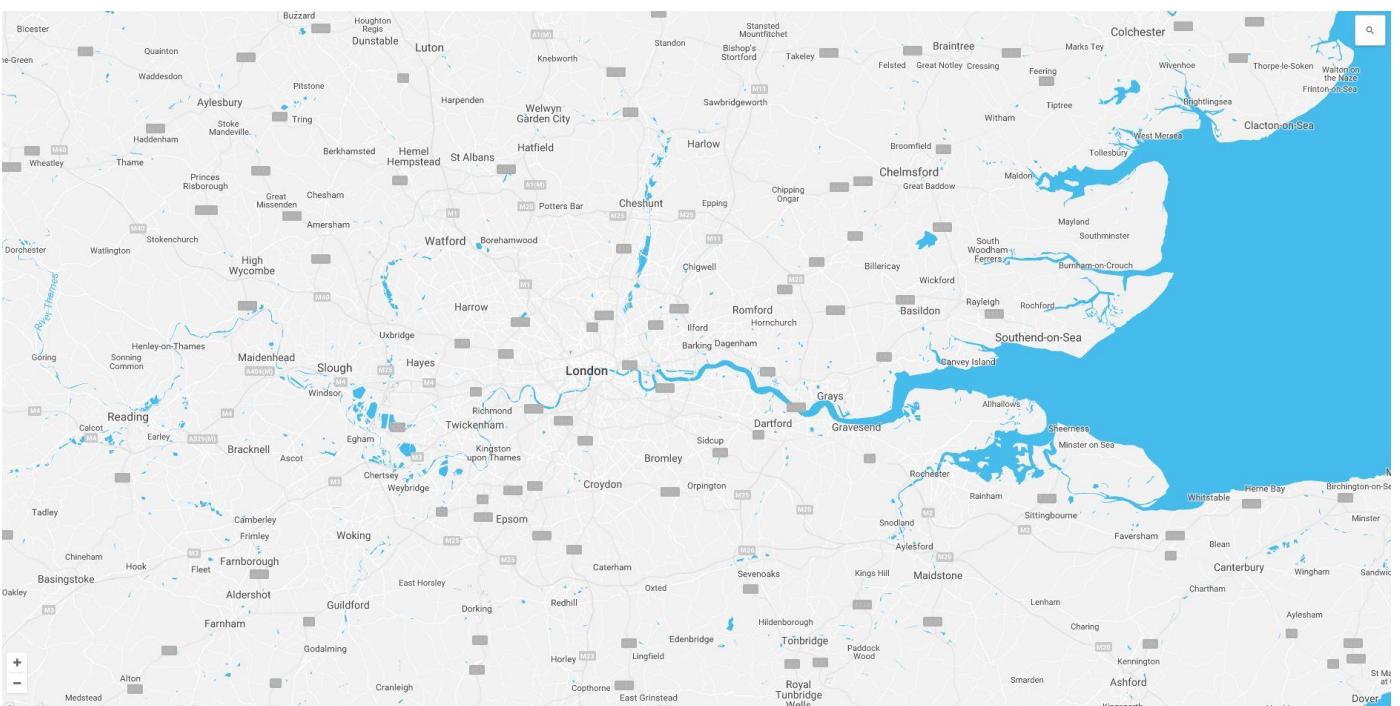


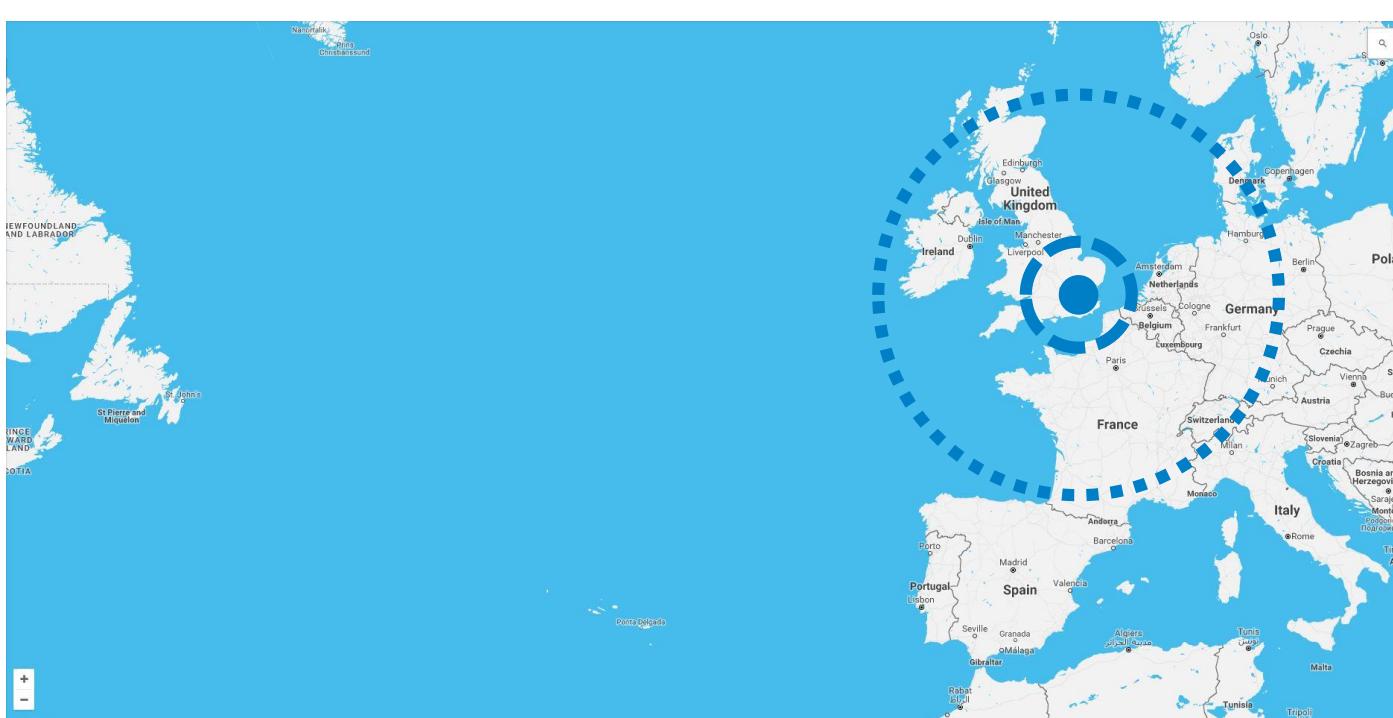
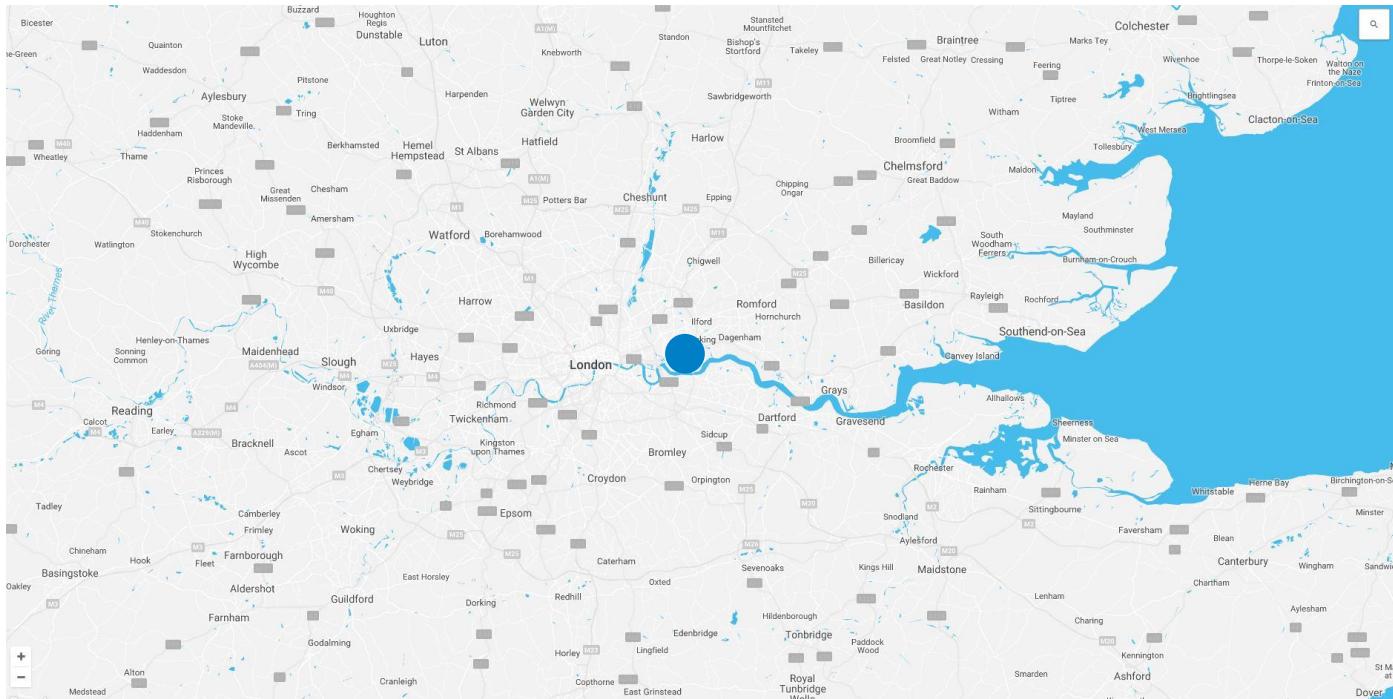
04 : Design Parameters



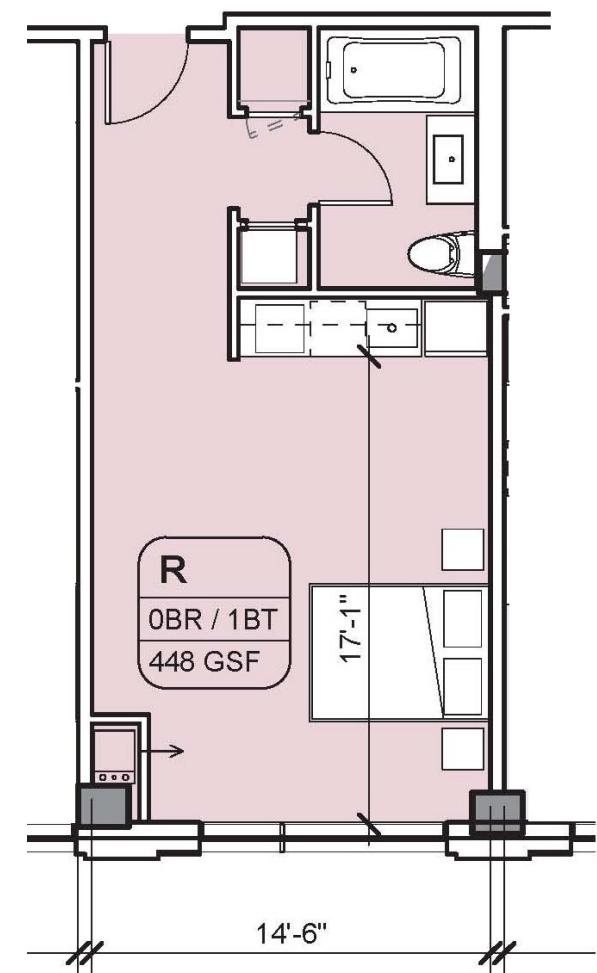
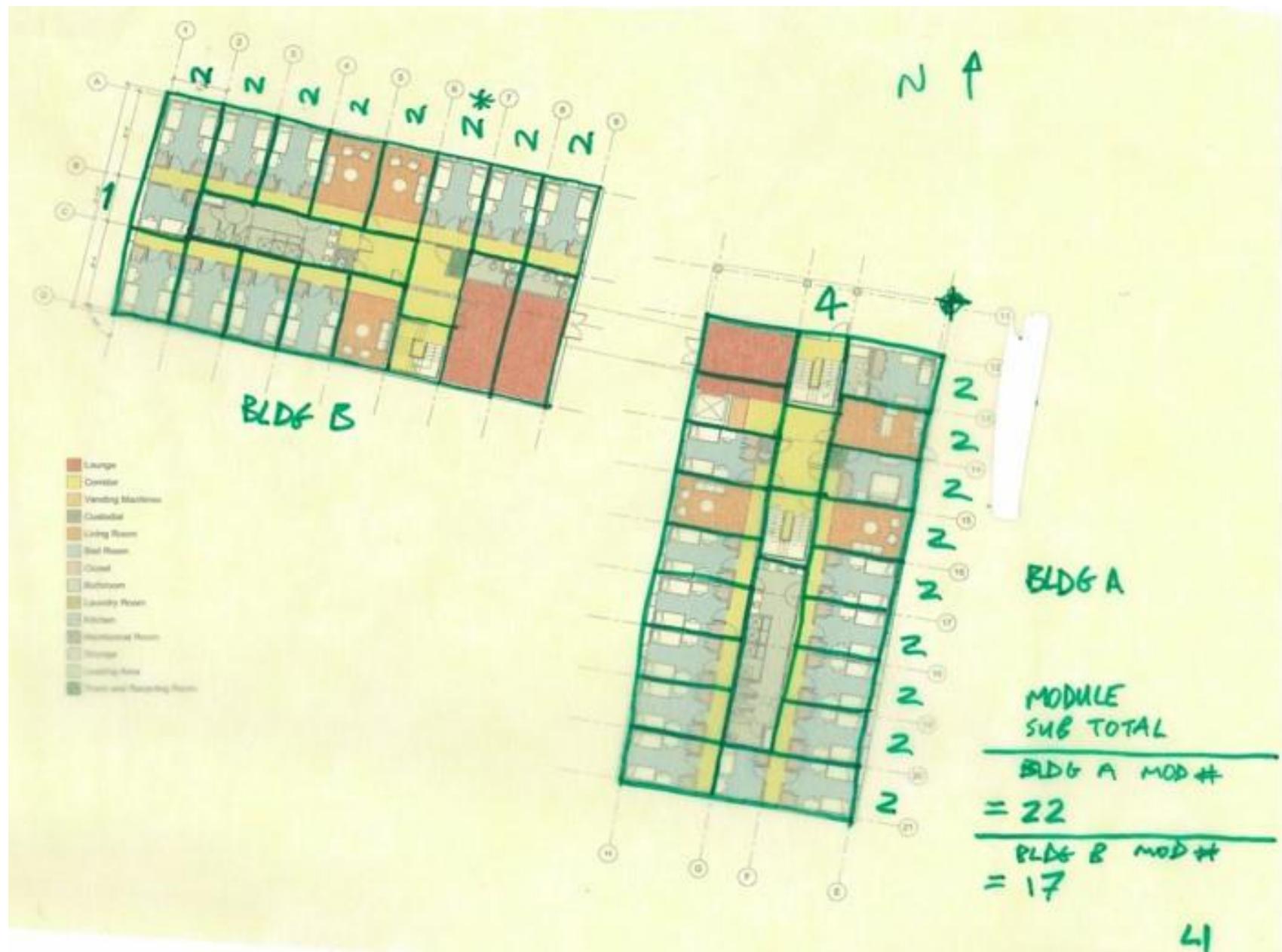
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B	13'-0"	12'-0"
C	2'-0"	3'-2"
D	15'-0"	15'-2"
E	13'-0"	13'0"

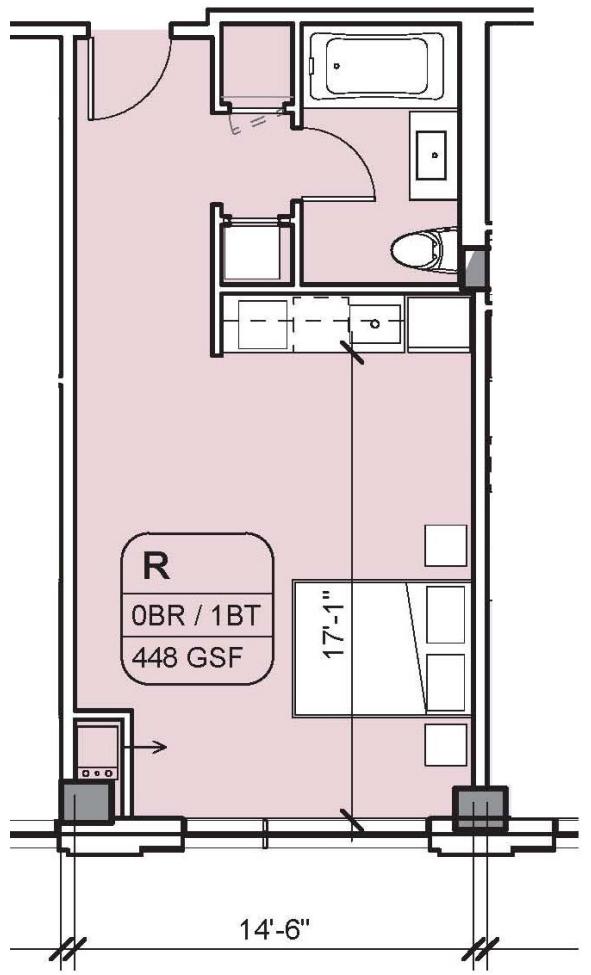
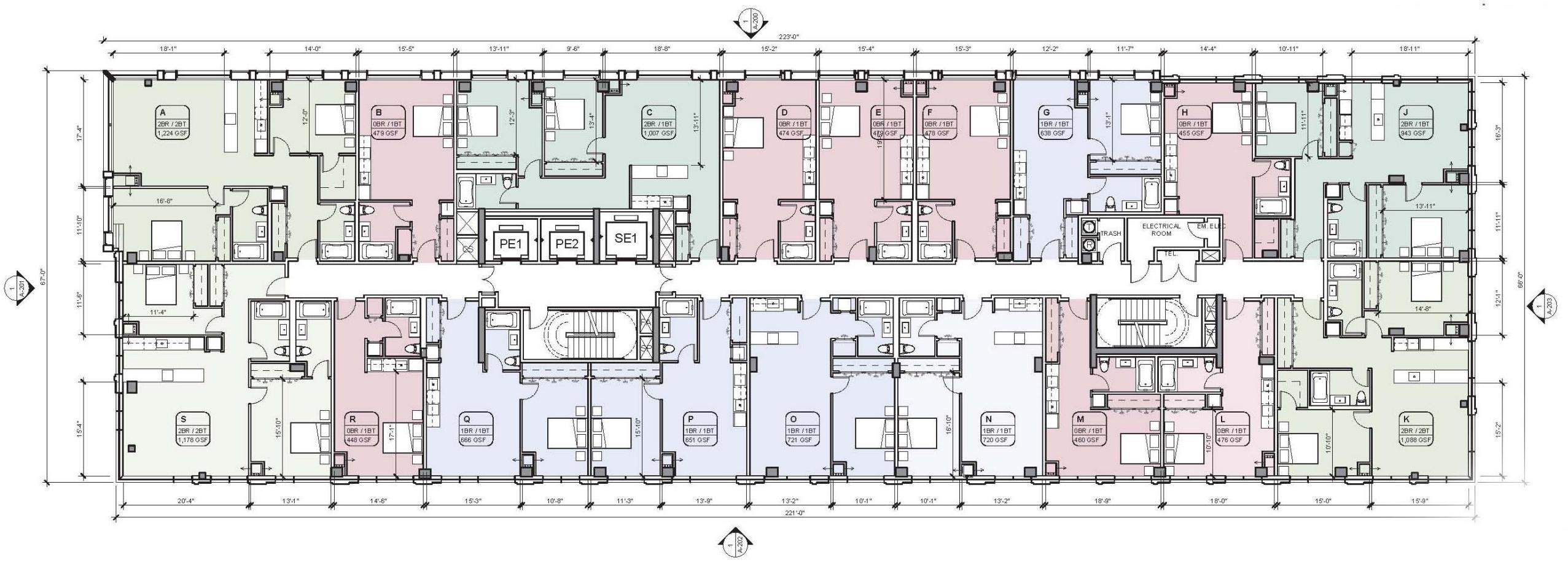


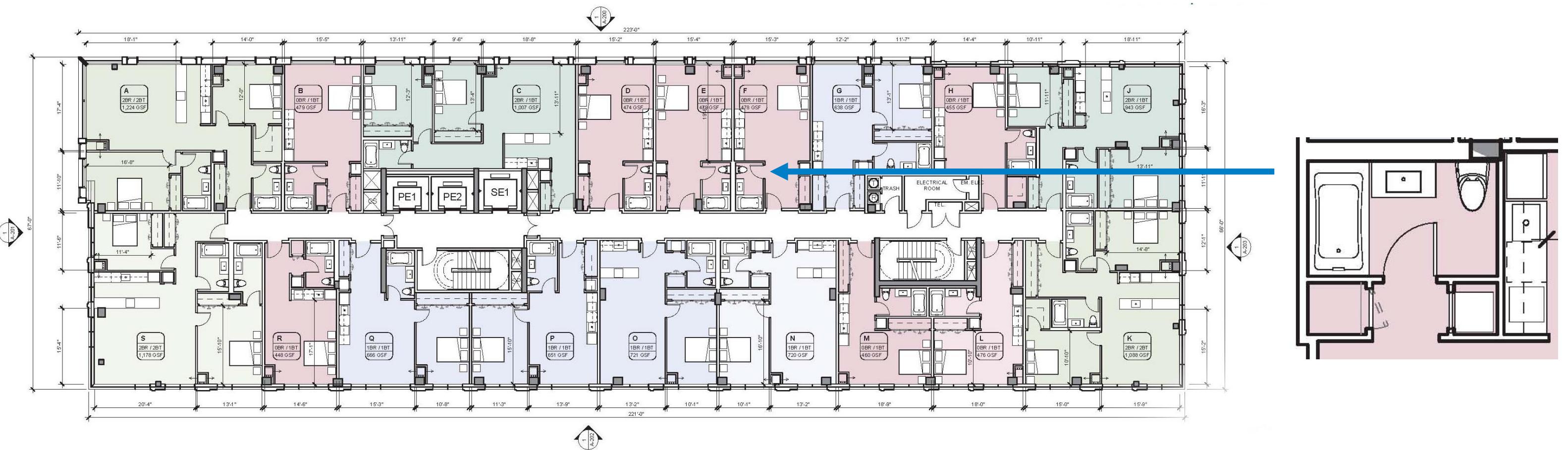


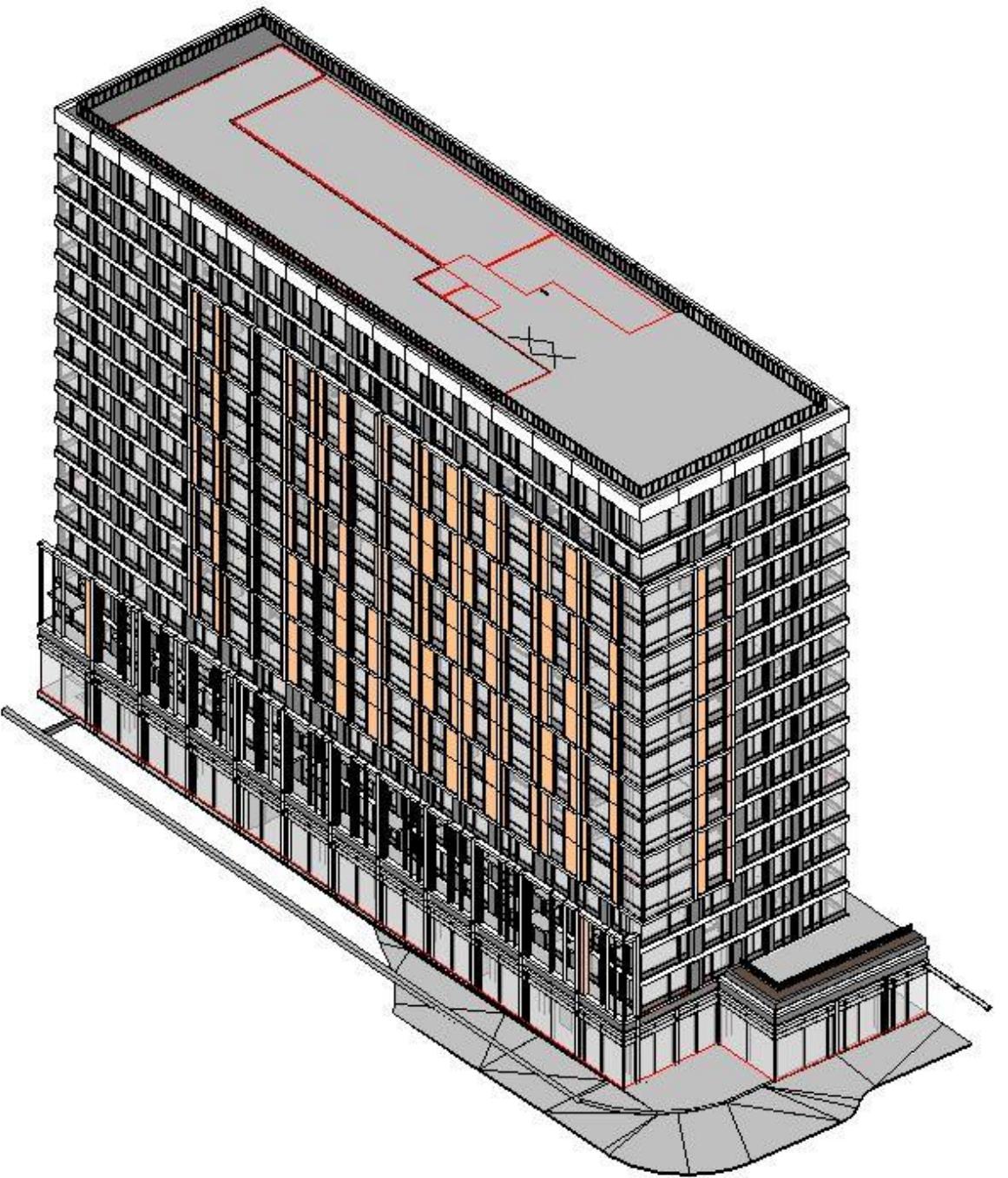
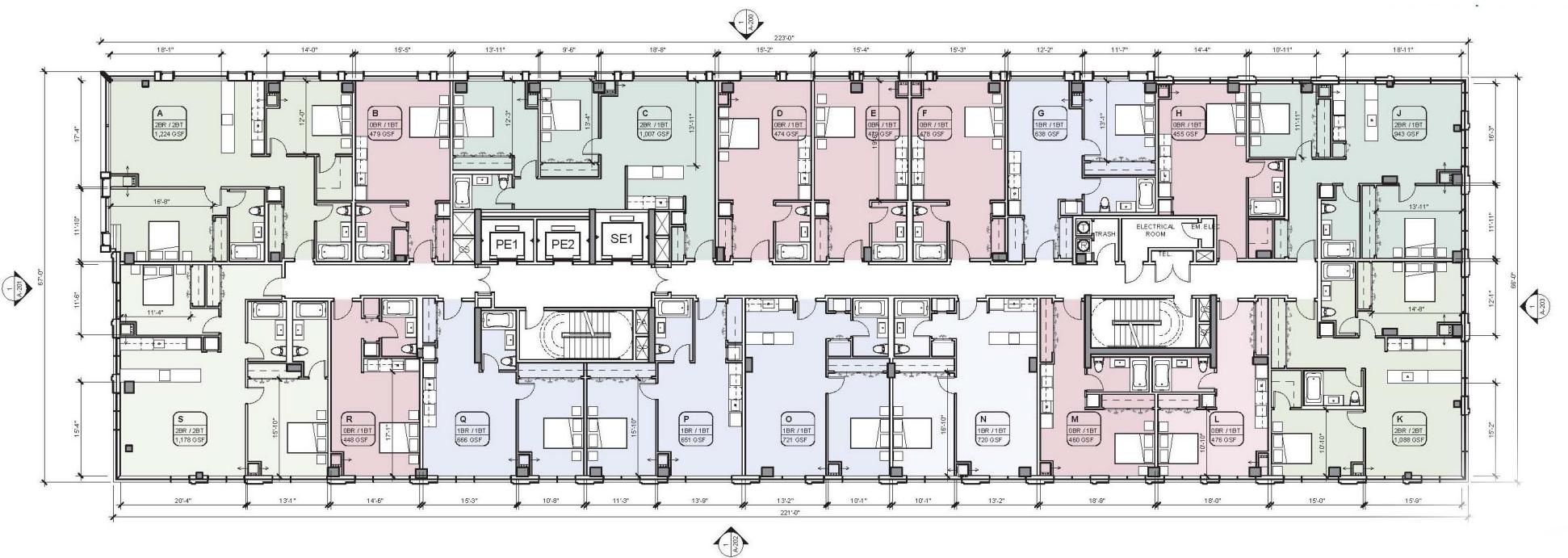


05 : Component Assembly

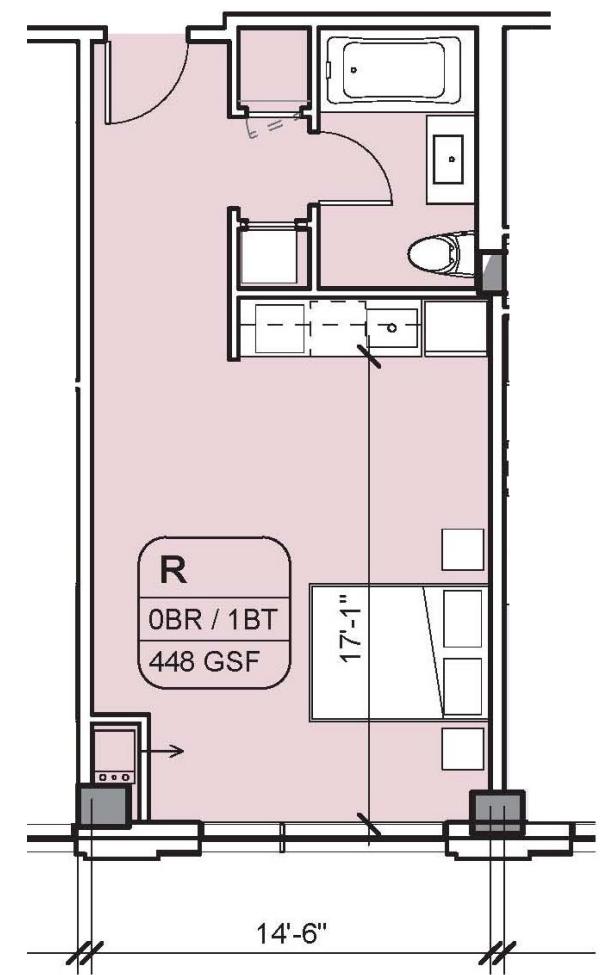
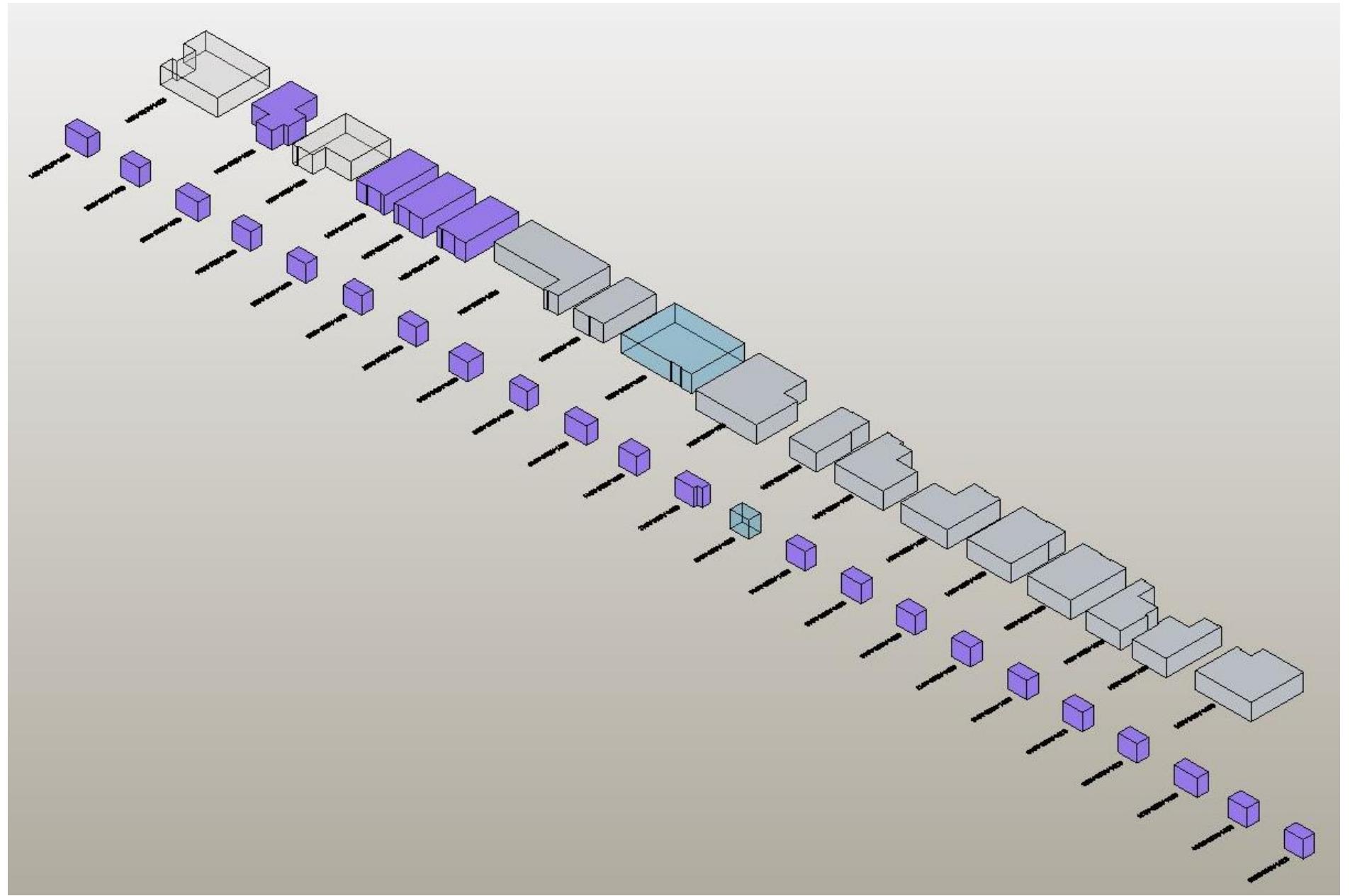


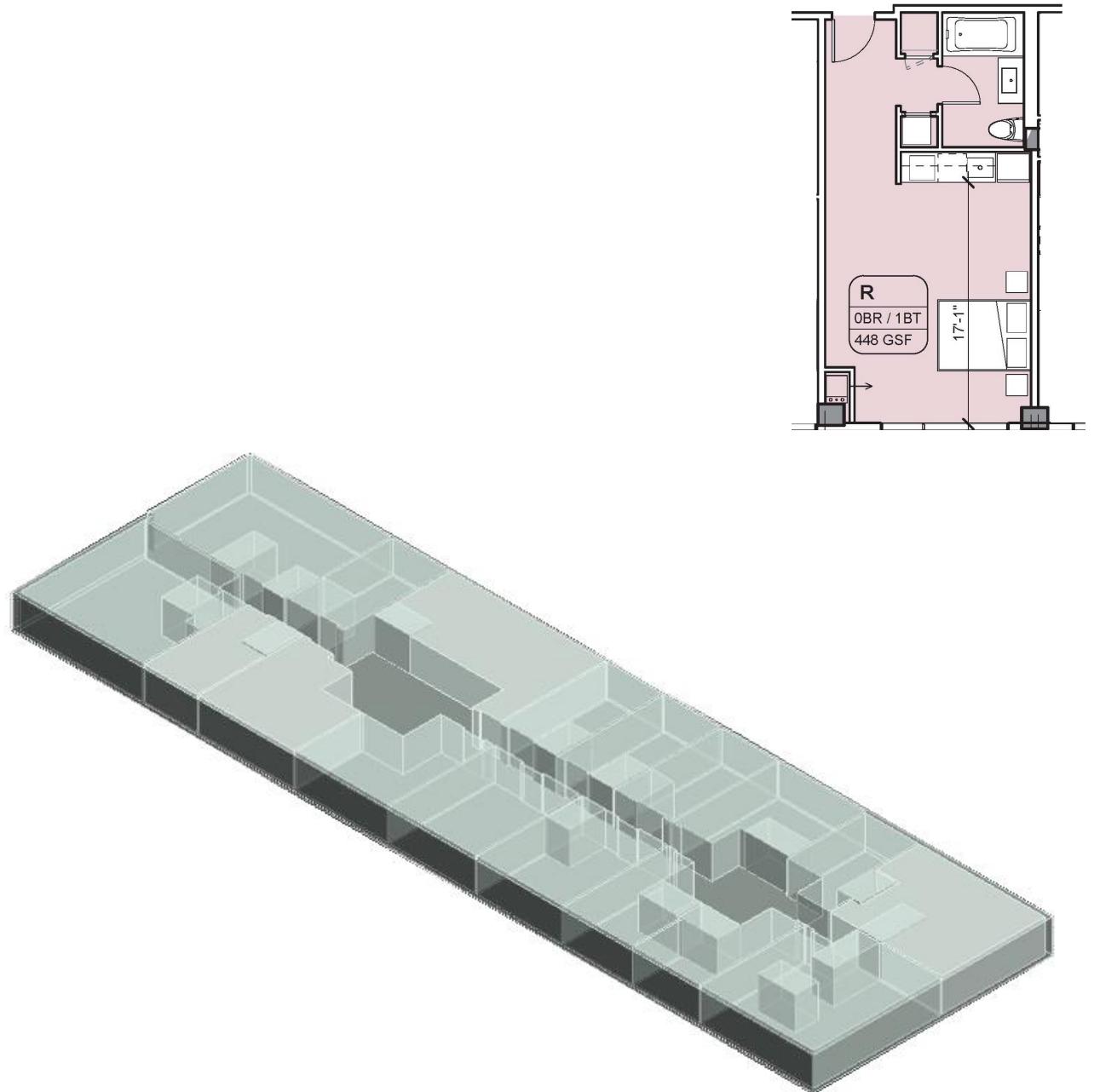
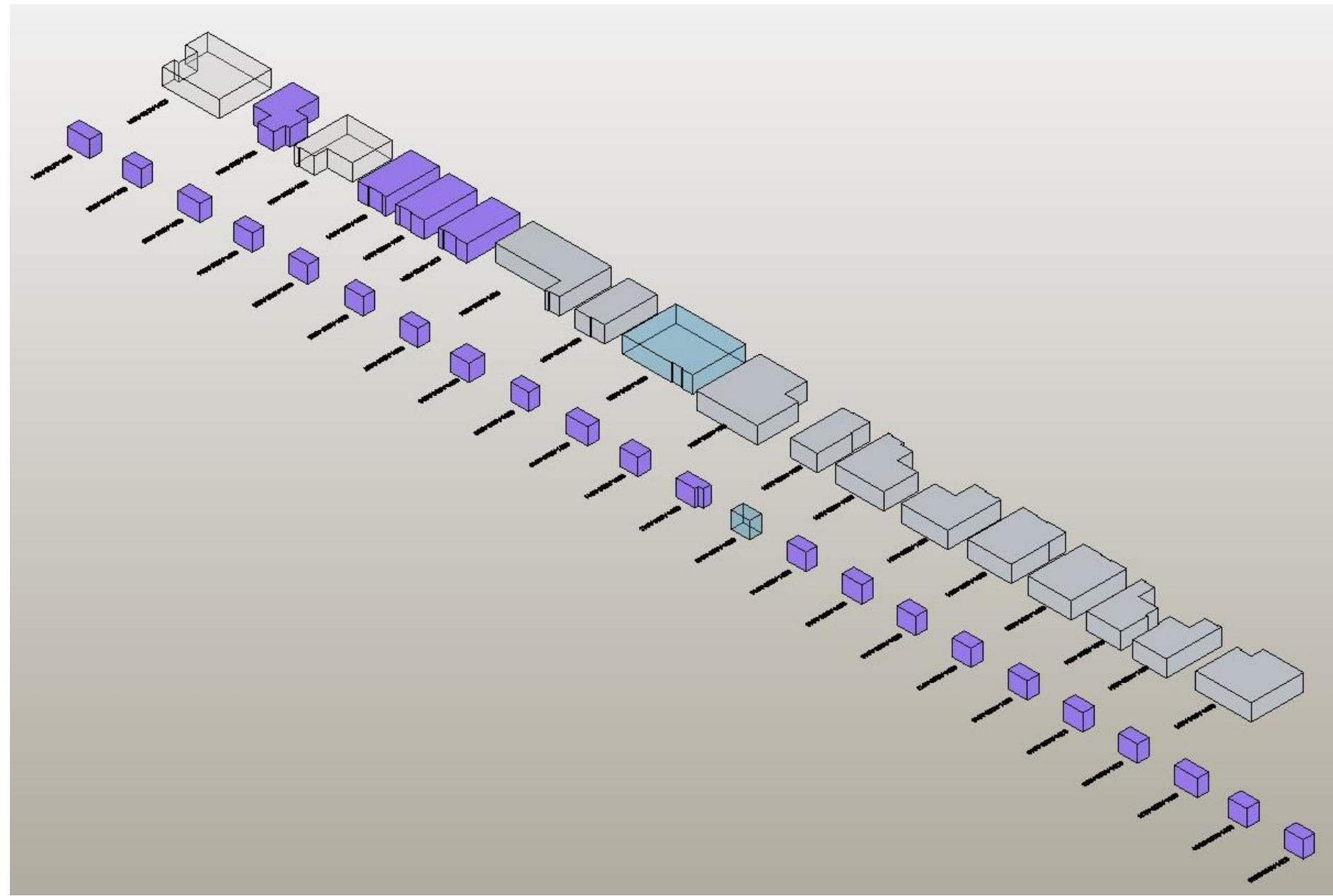


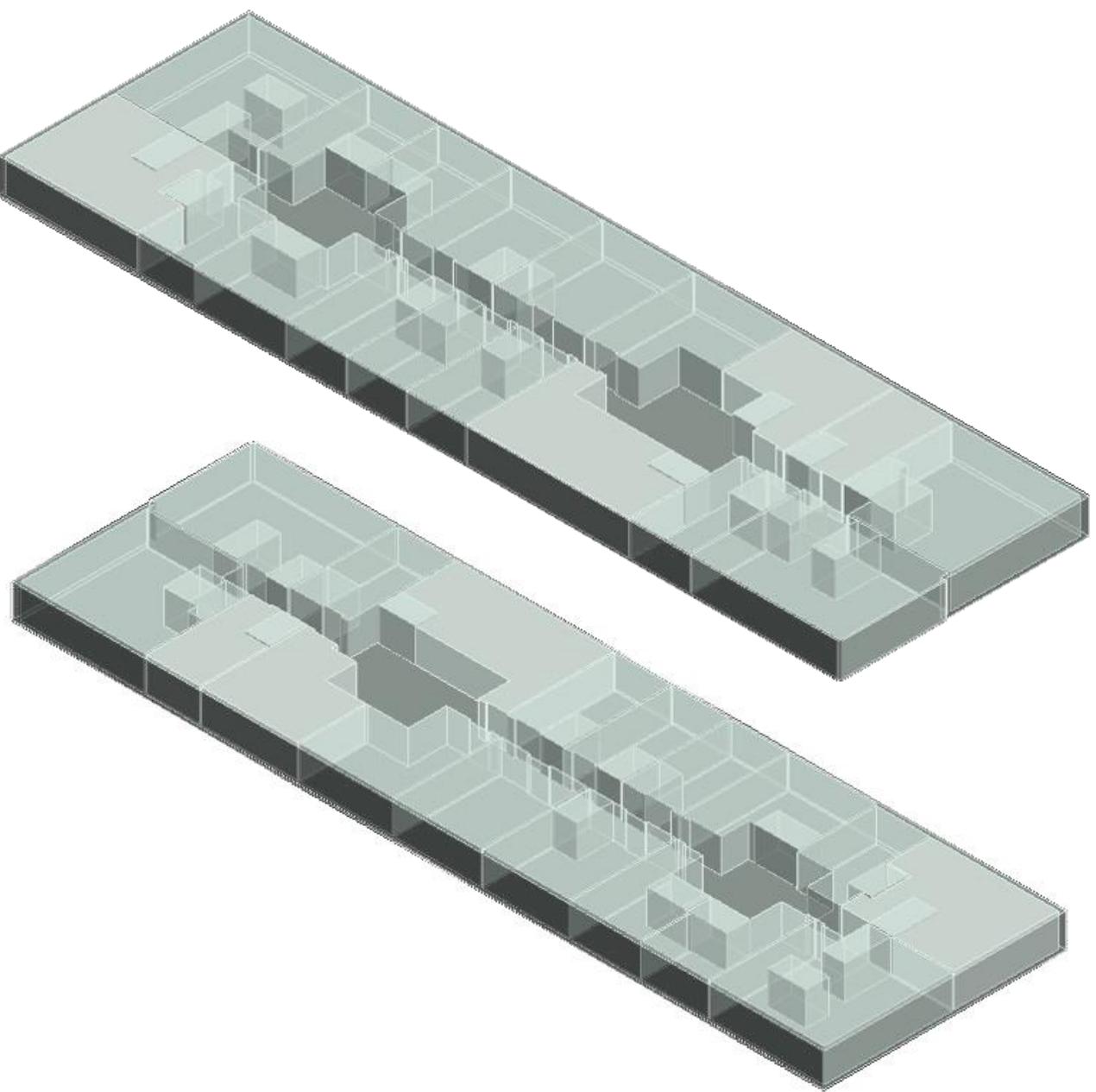
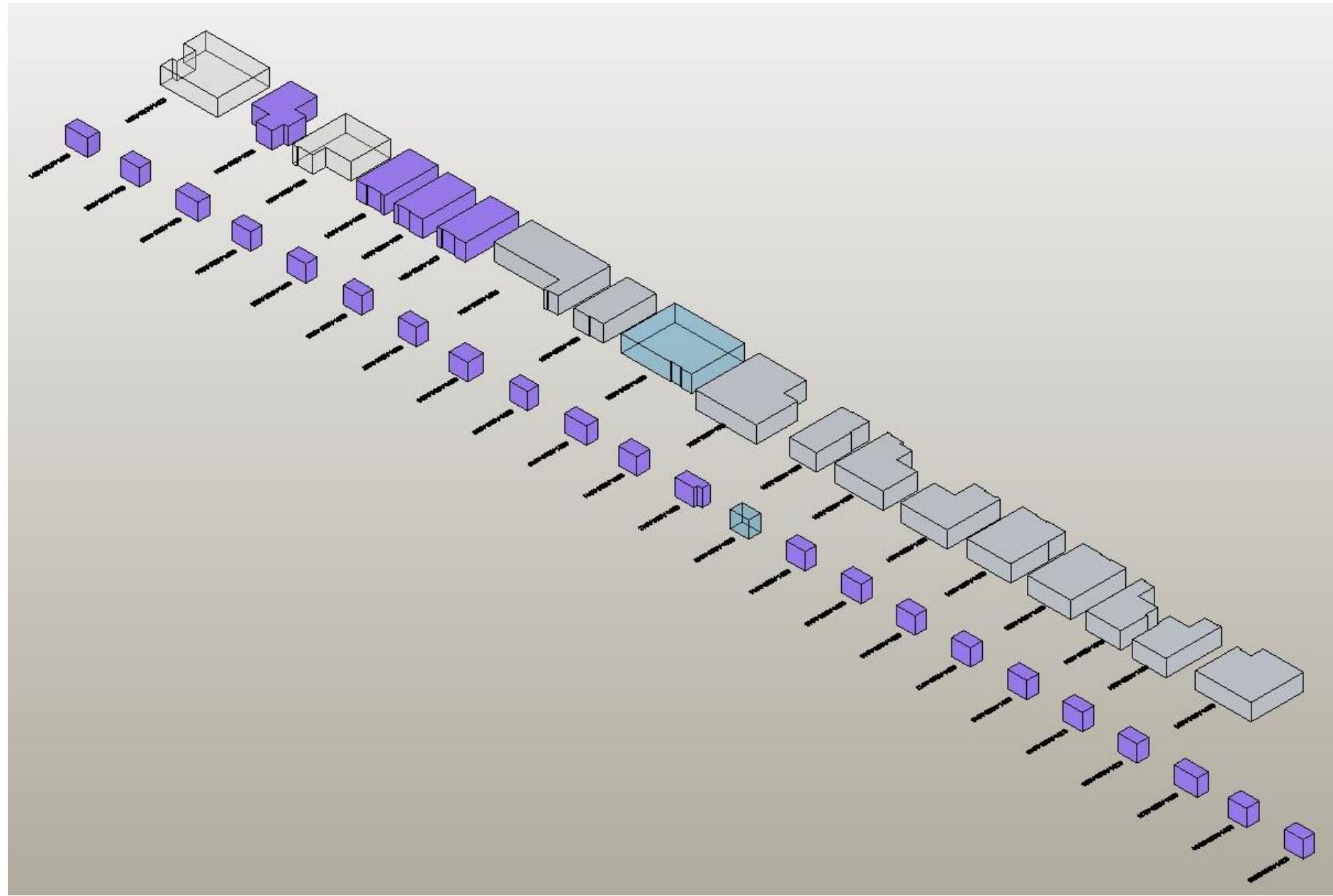


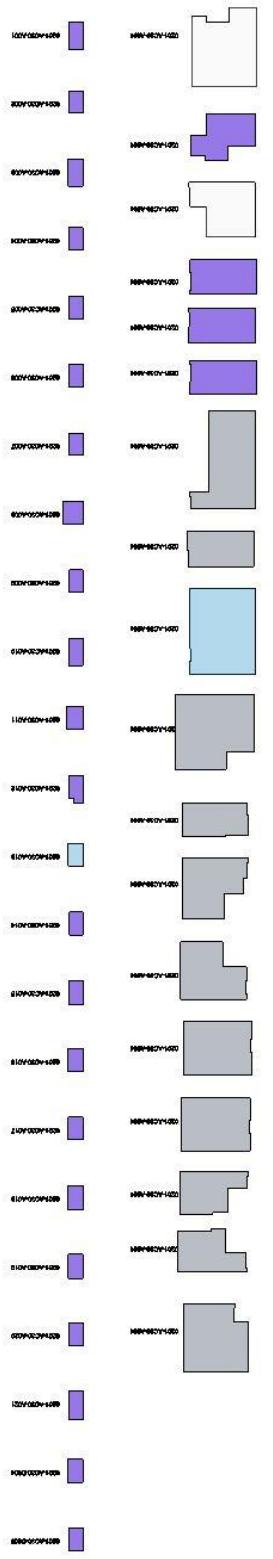
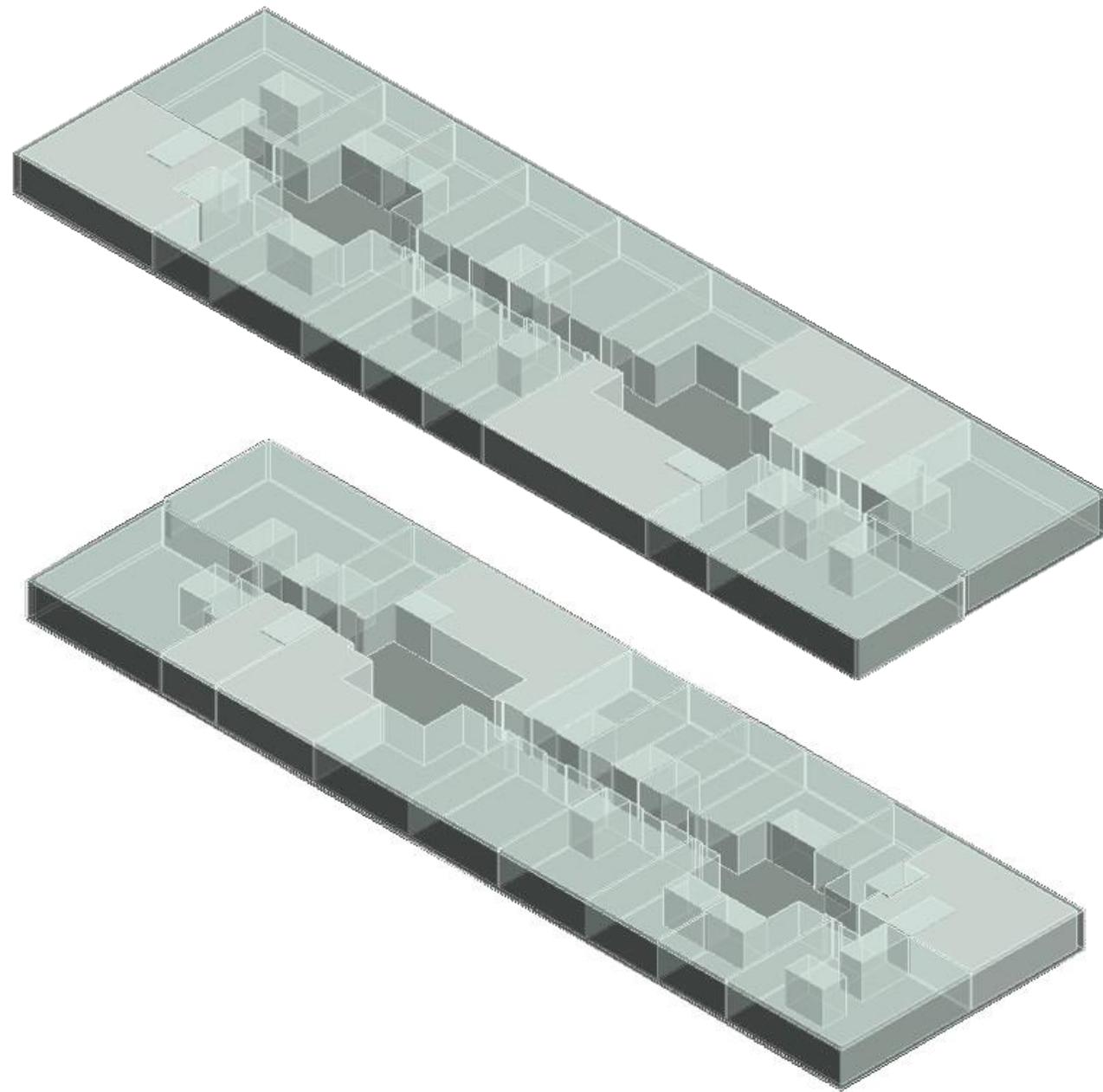
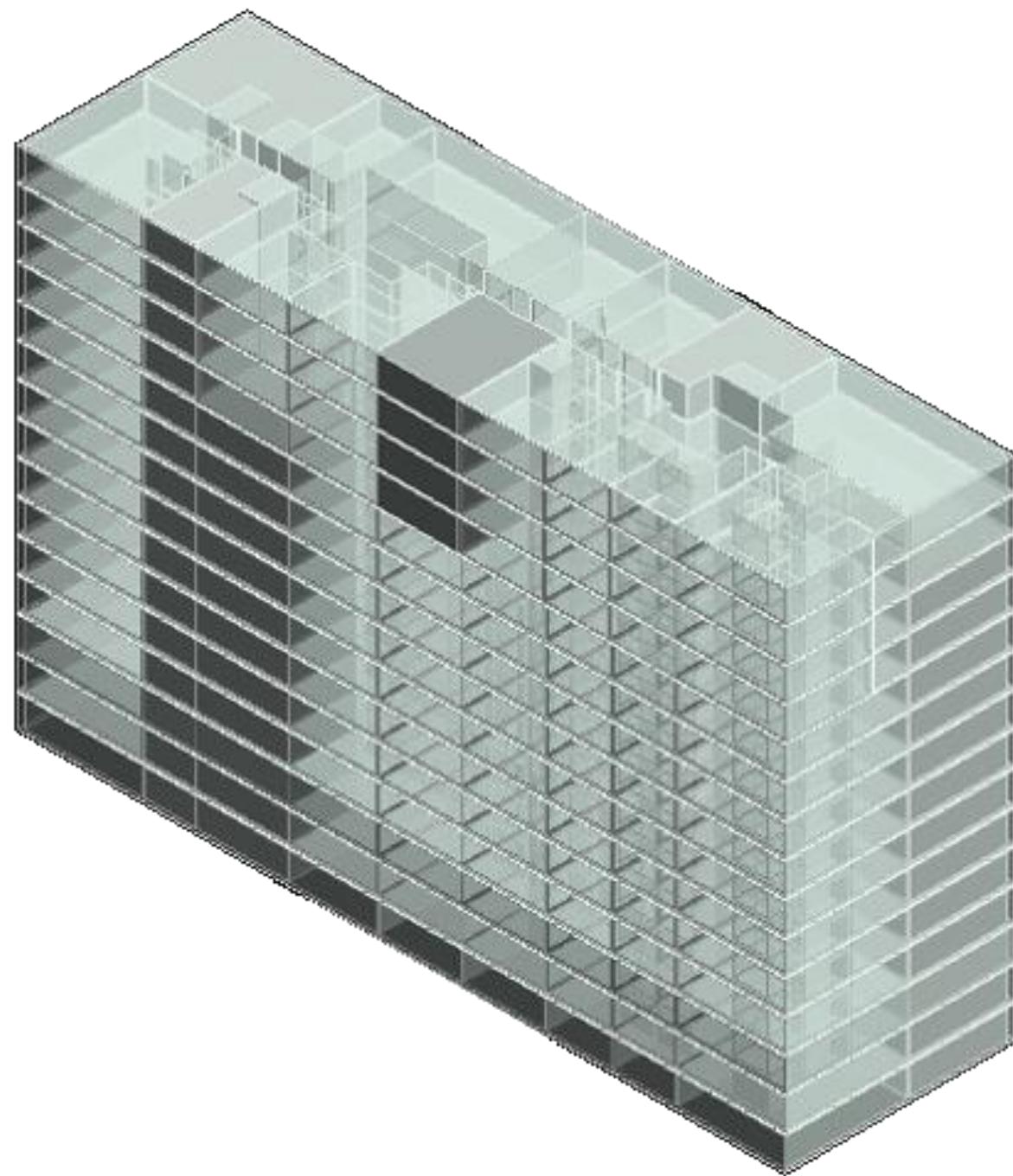


Architecture Model







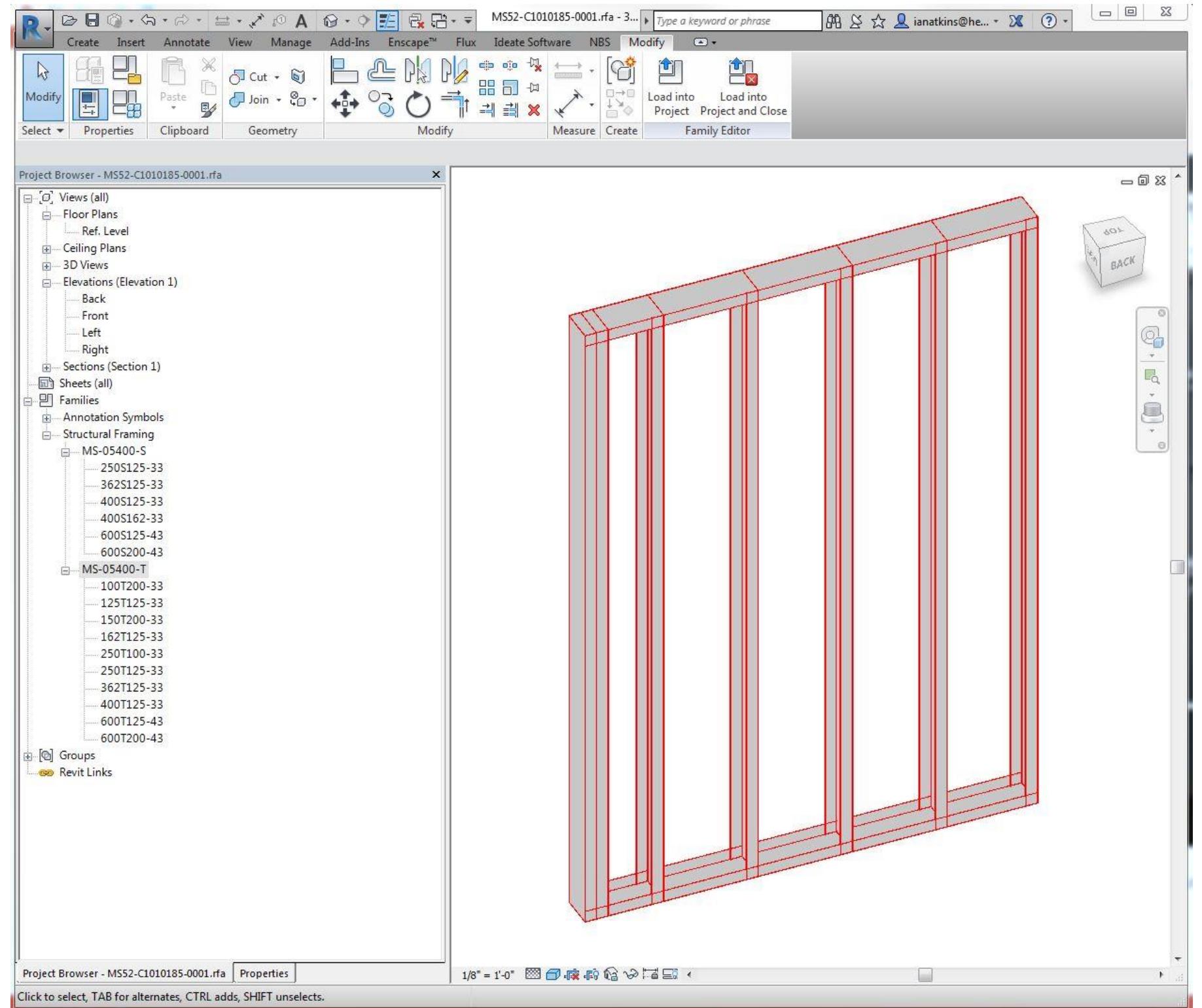


Model Proliferation and Repetition

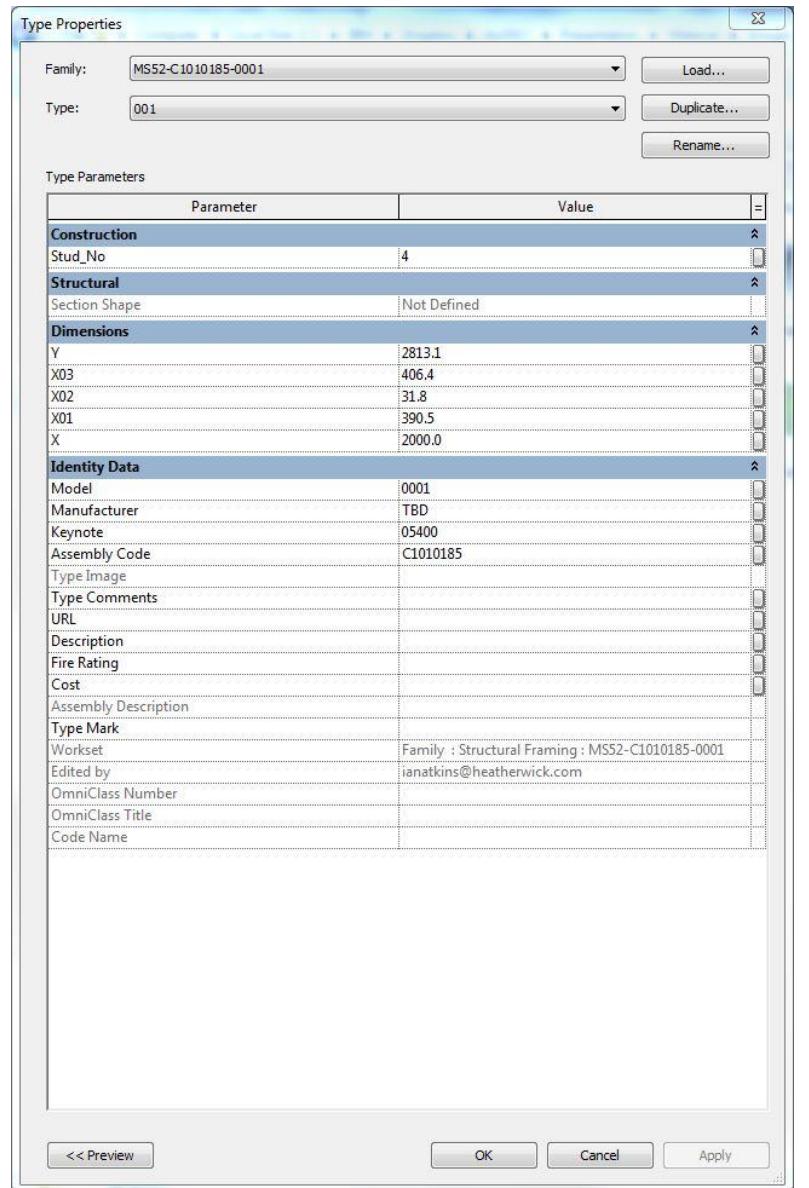
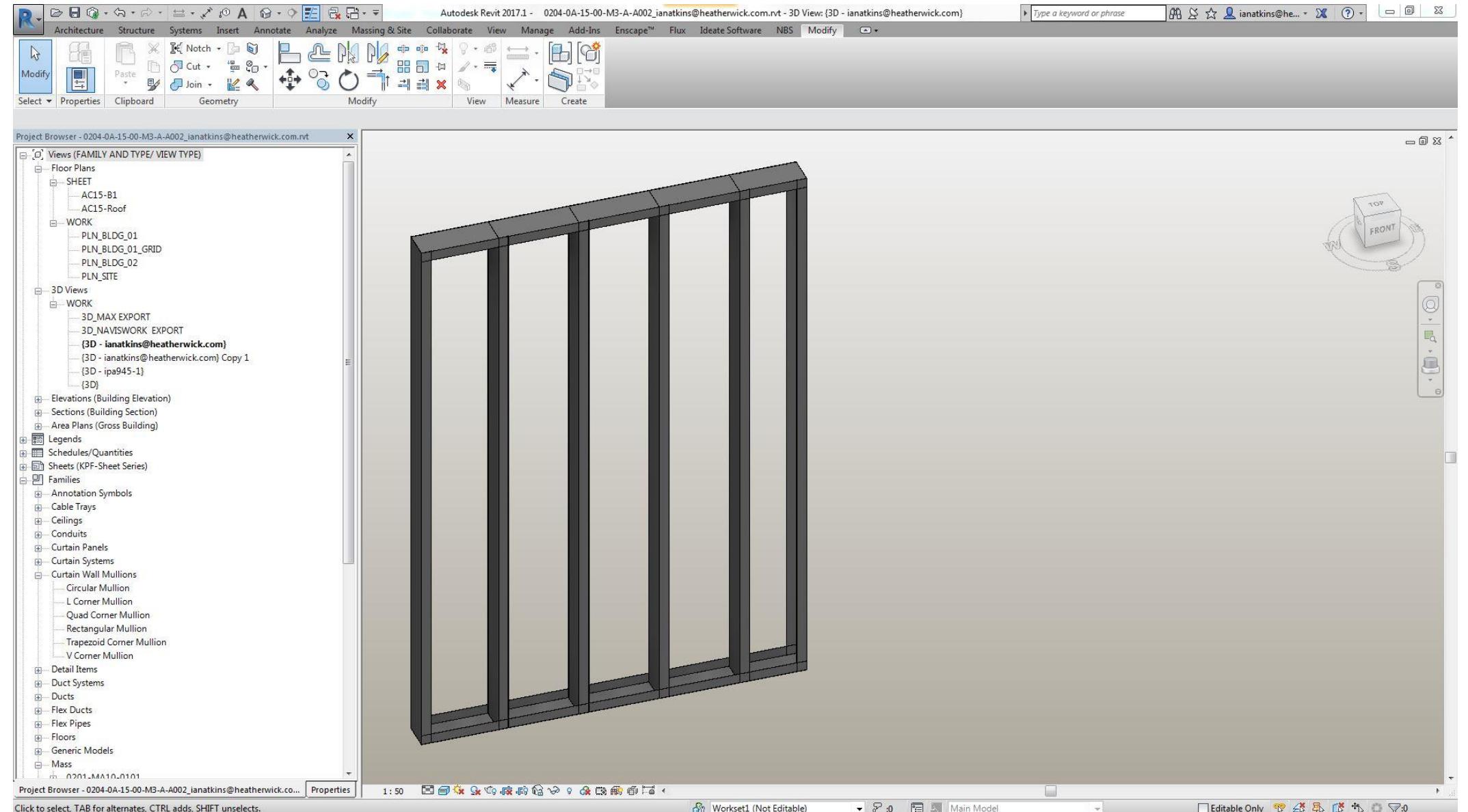
Model Proliferation and Repetition

- Families (+Nested Families)

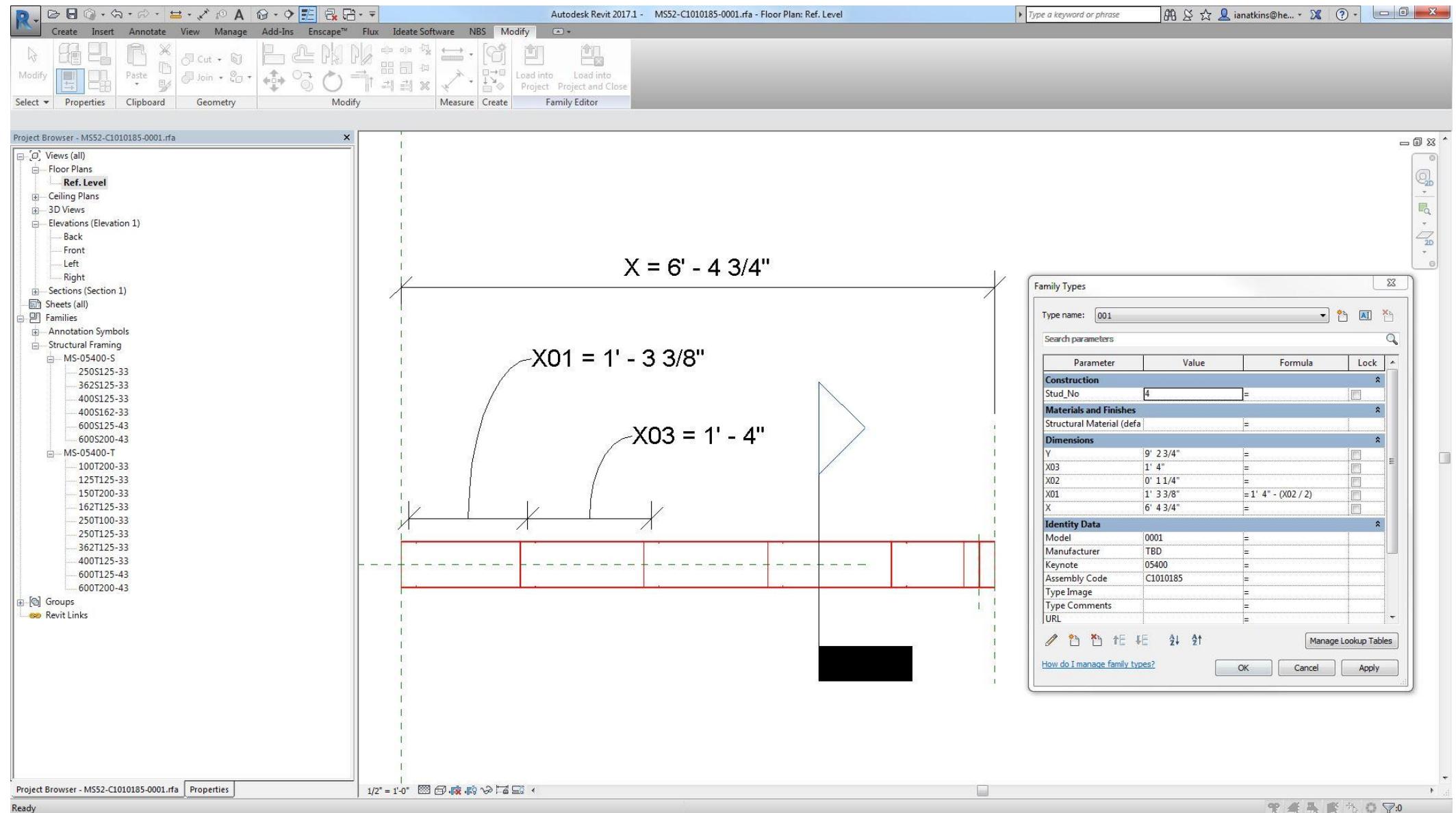
Model Proliferation and Repetition



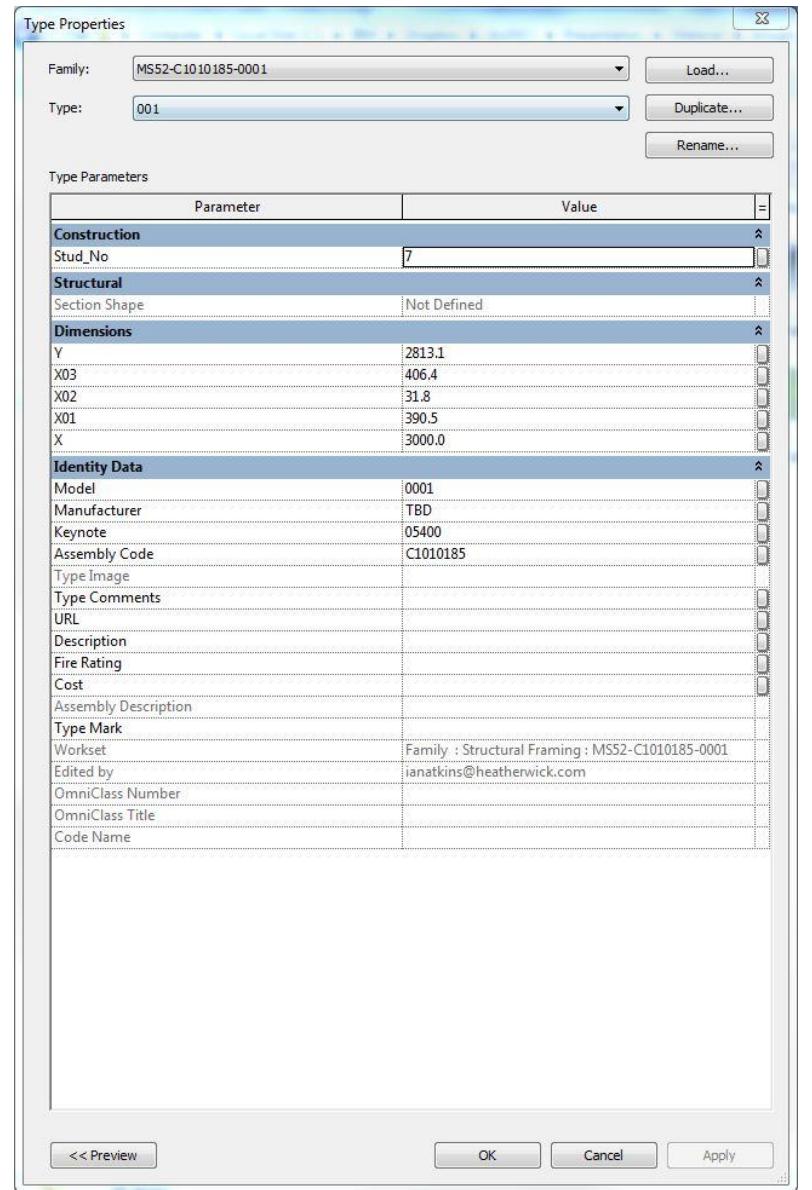
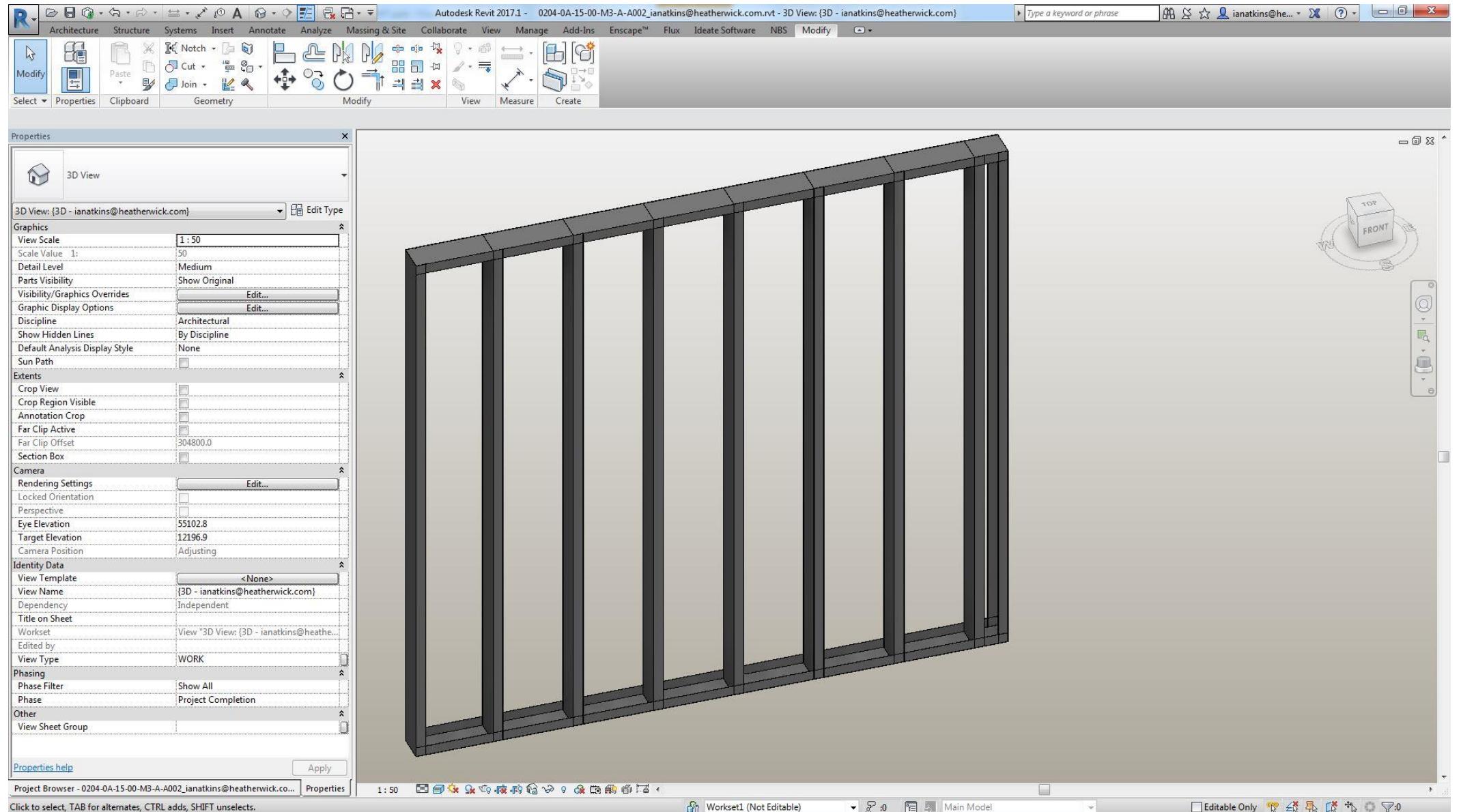
Model Proliferation and Repetition



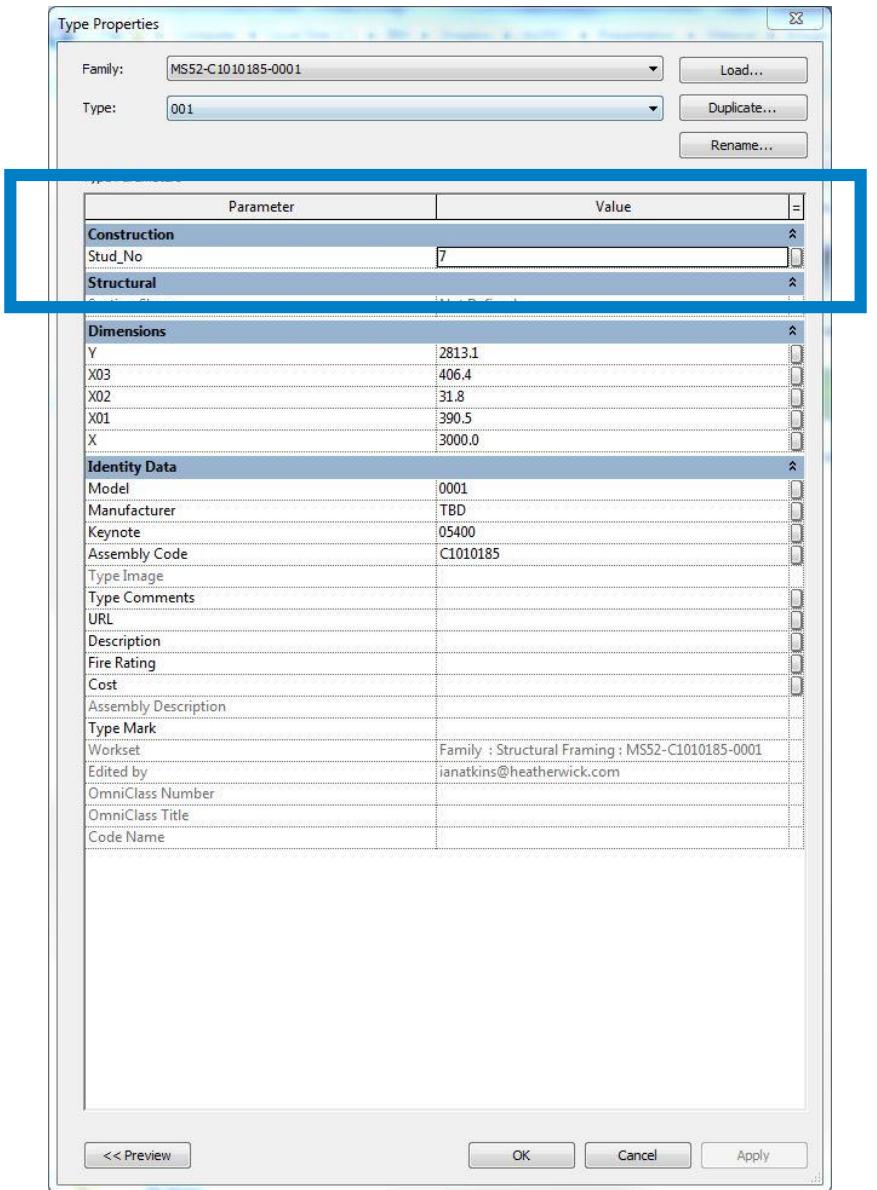
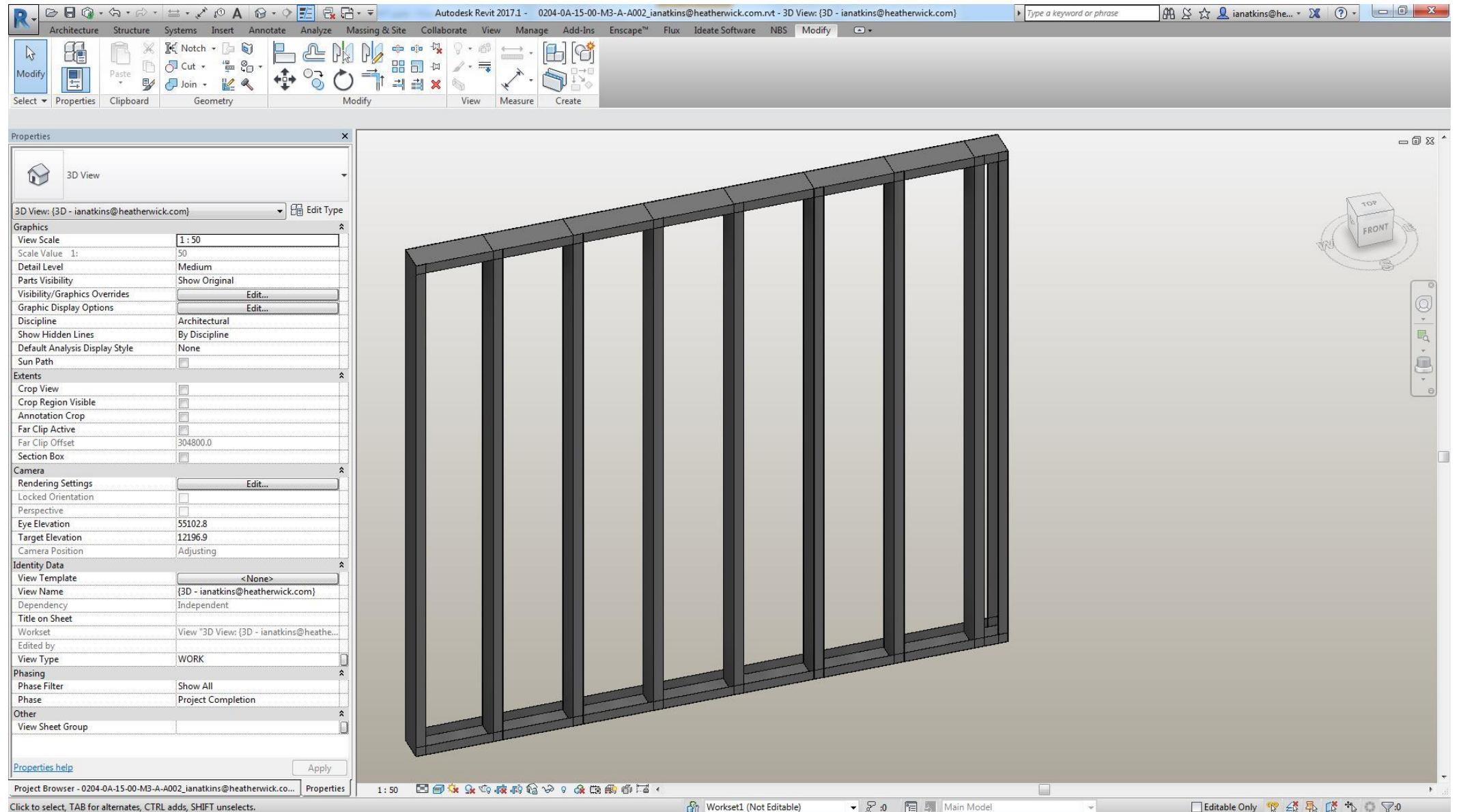
Model Proliferation and Repetition



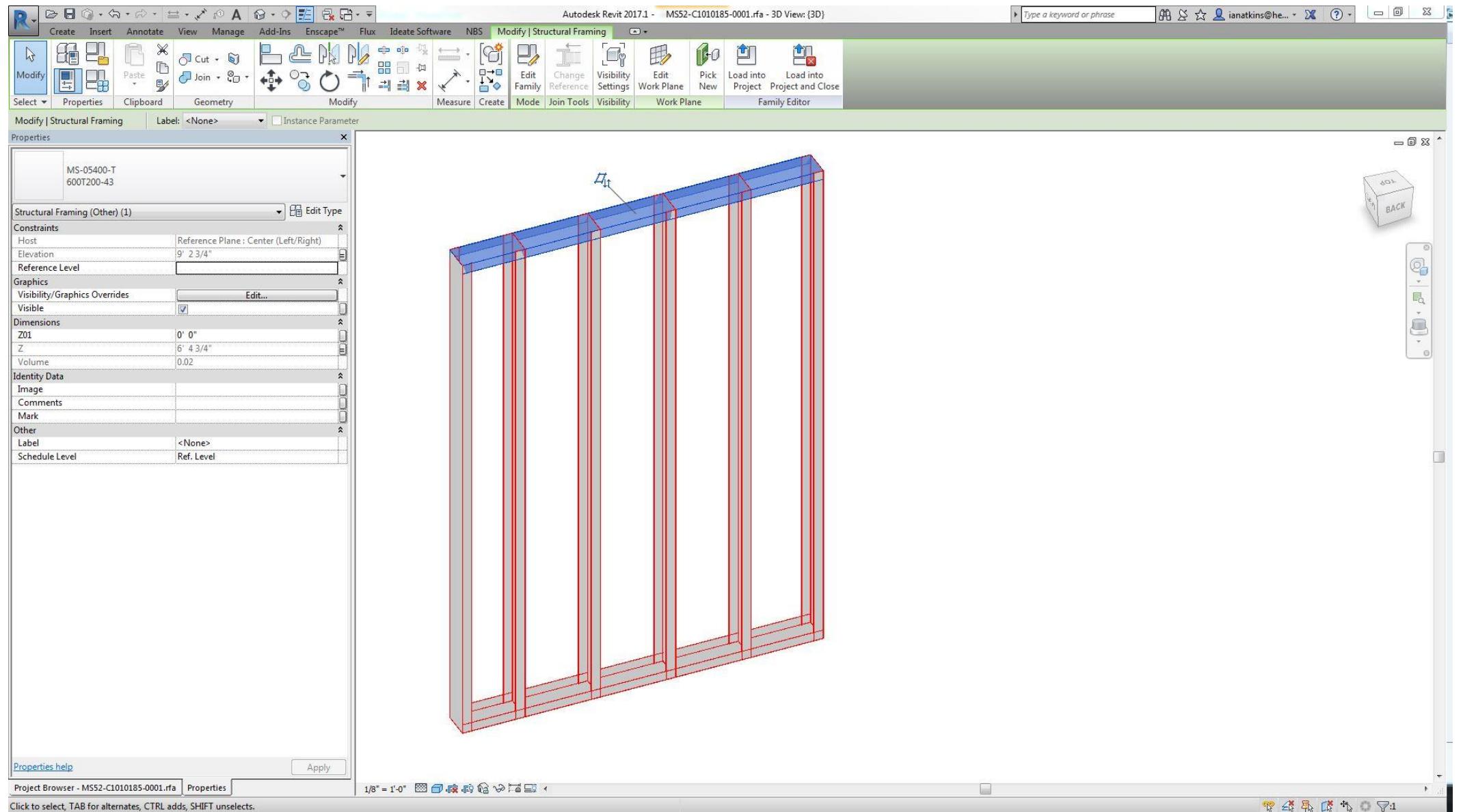
Model Proliferation and Repetition



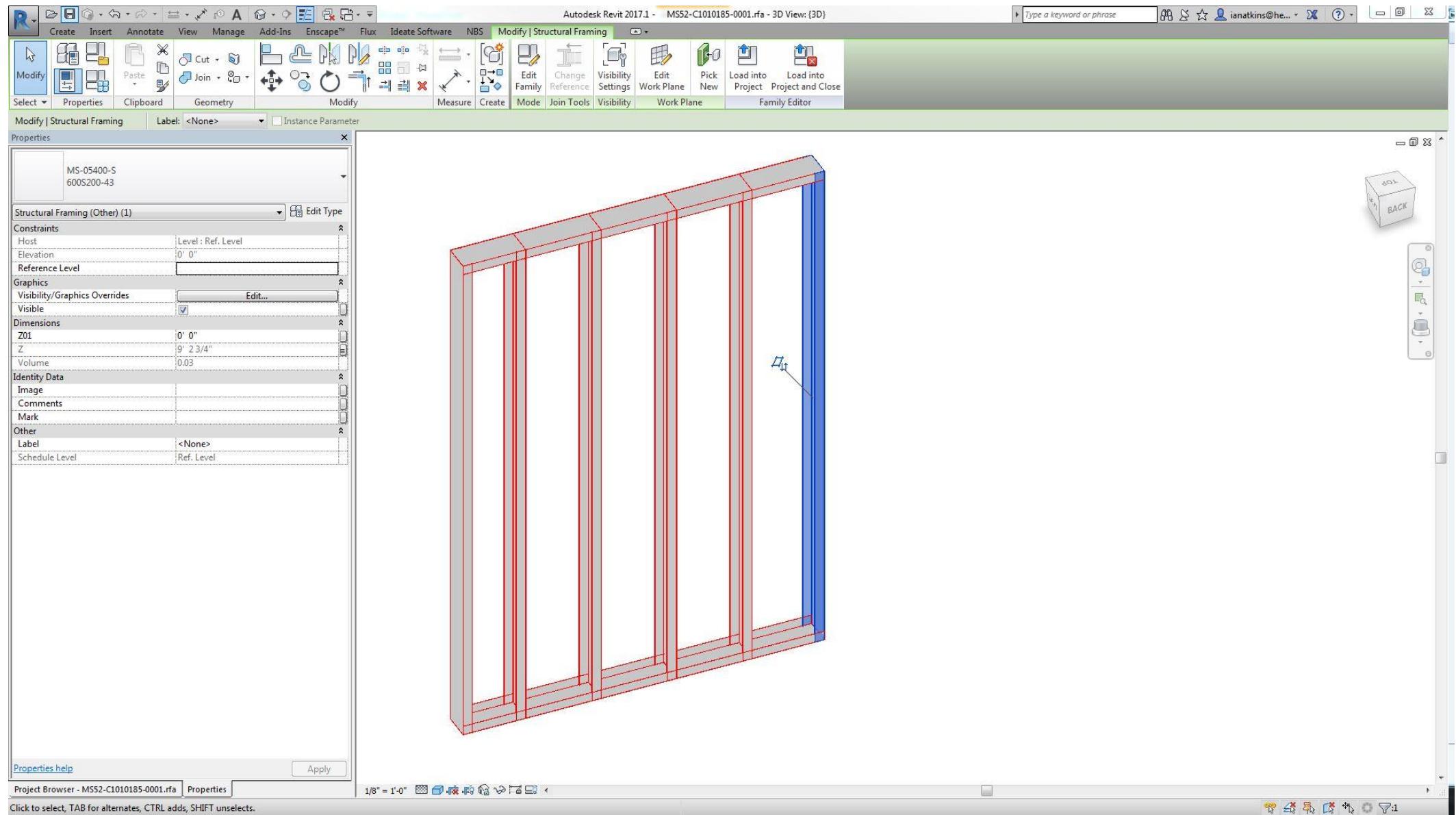
Model Proliferation and Repetition



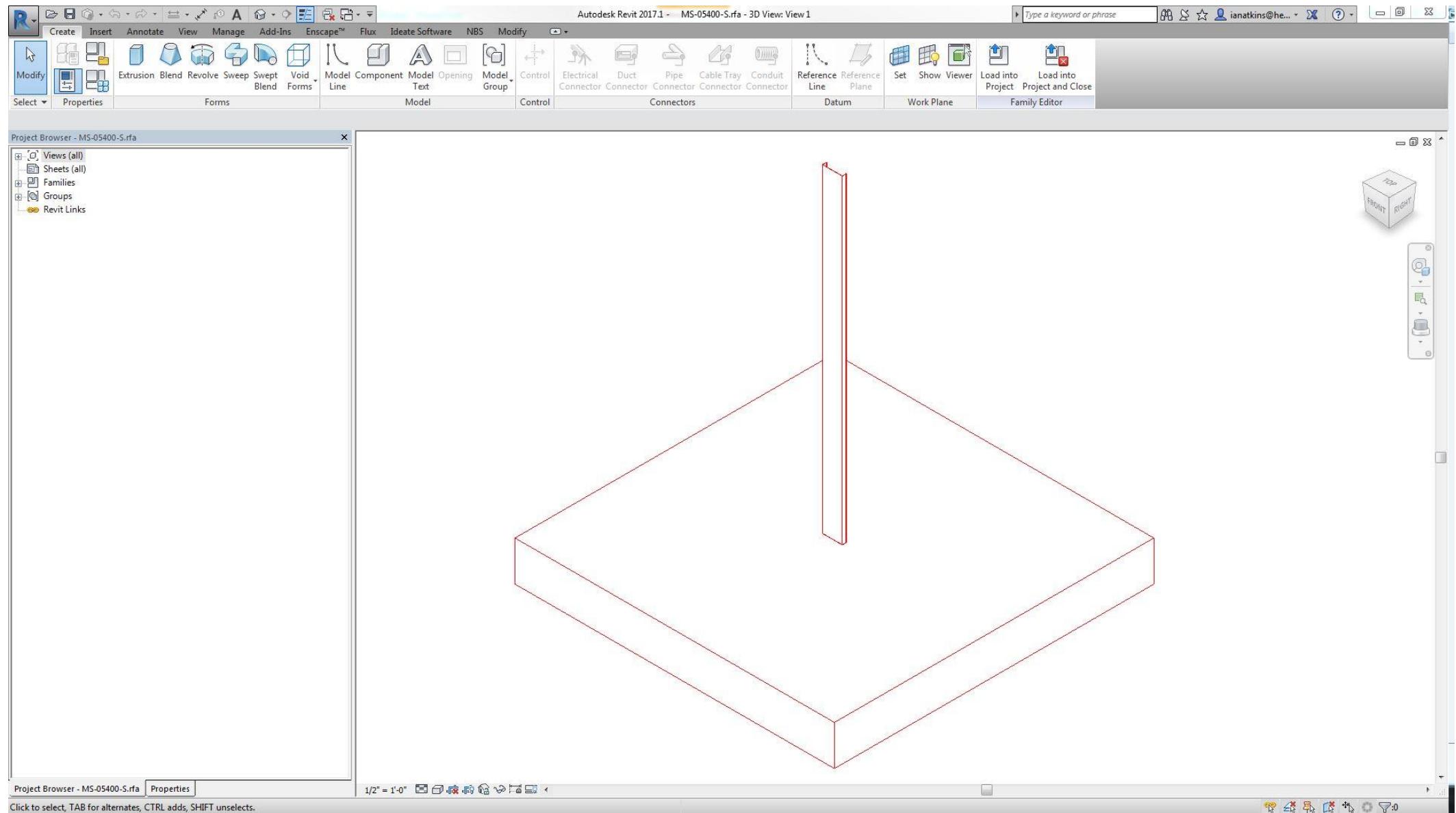
Model Proliferation and Repetition



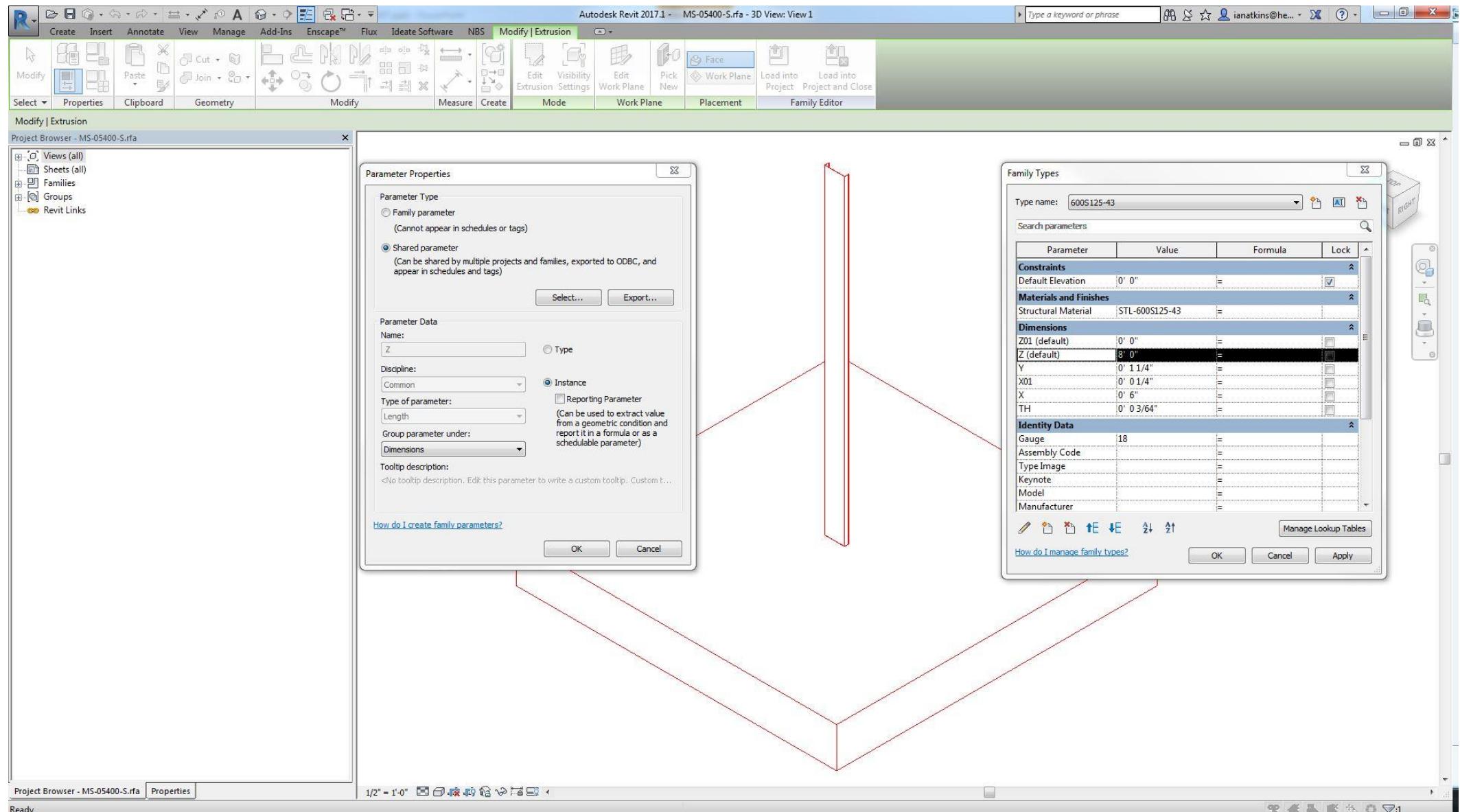
Model Proliferation and Repetition



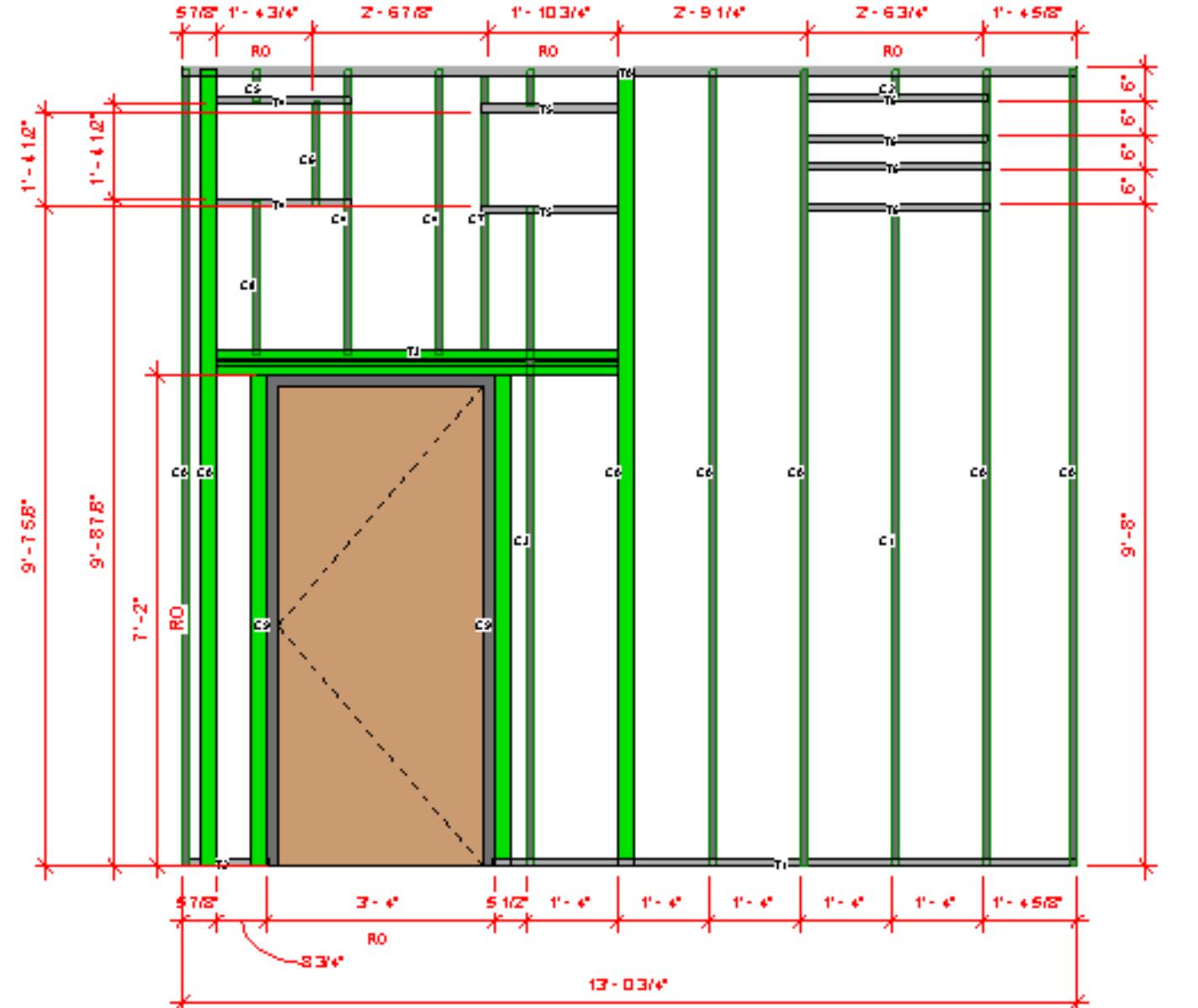
Model Proliferation and Repetition



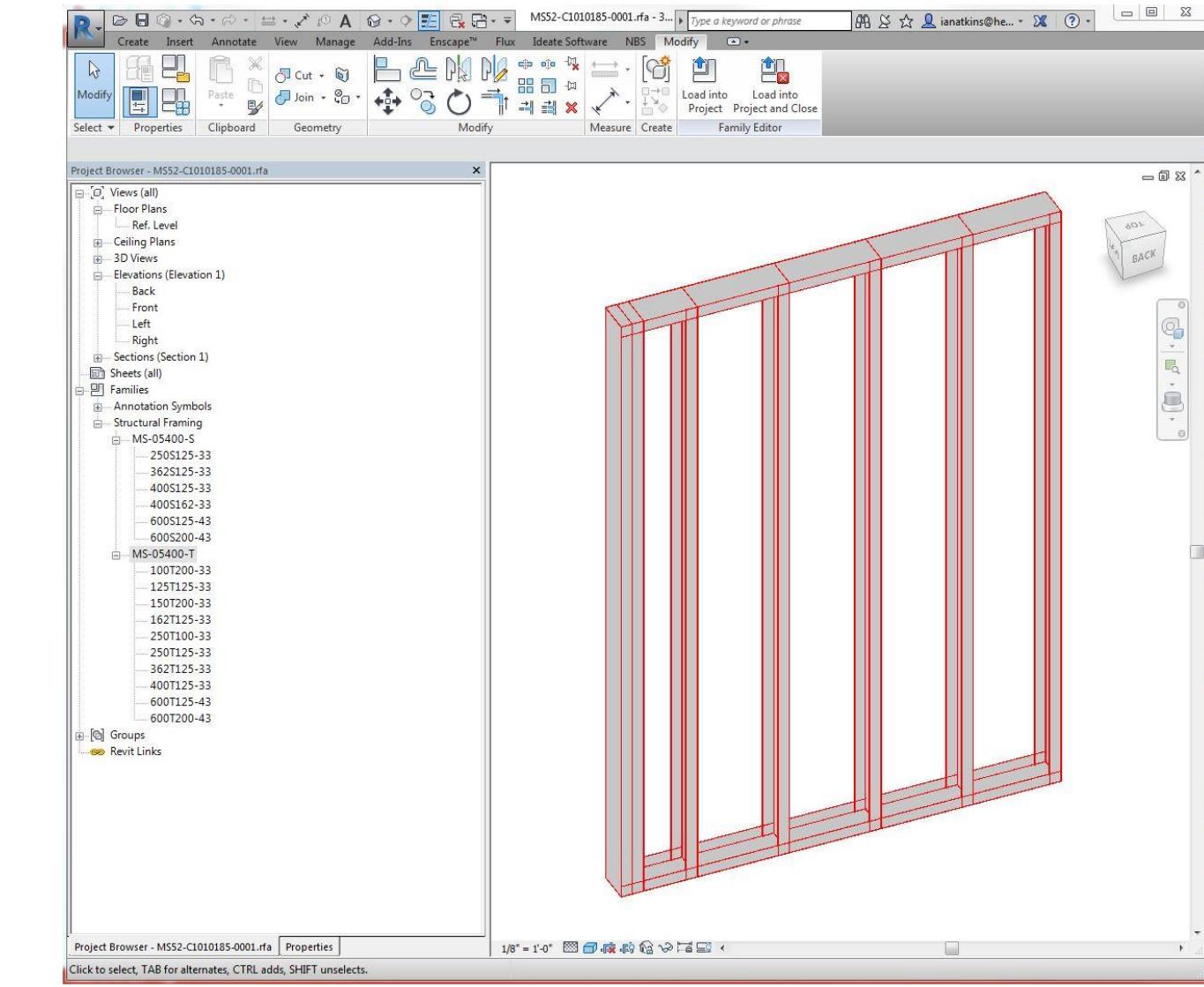
Model Proliferation and Repetition



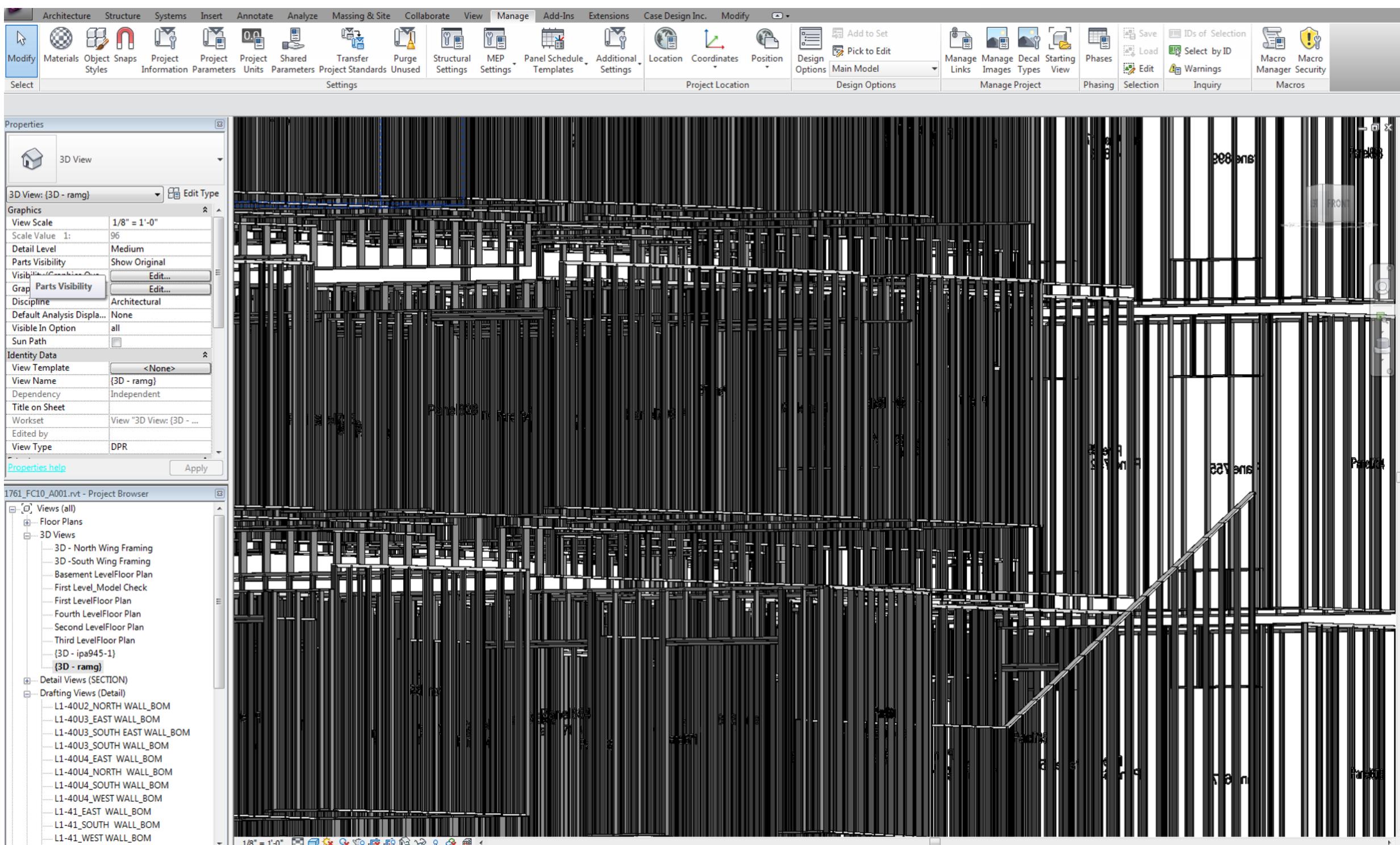
Model Proliferation and Repetition



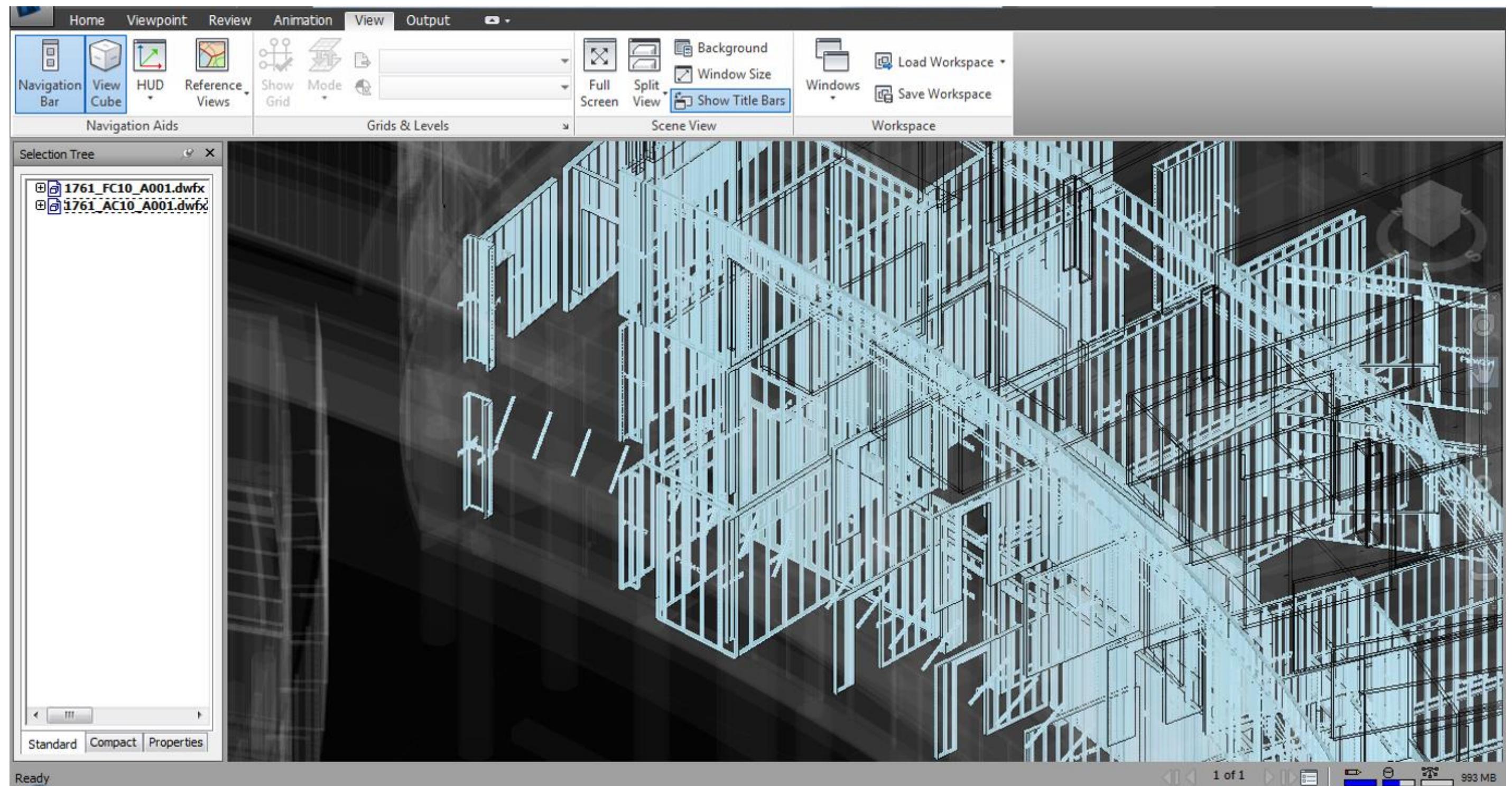
(4) Elevation Framing
SCALE: $1/2'' = 1'-0''$



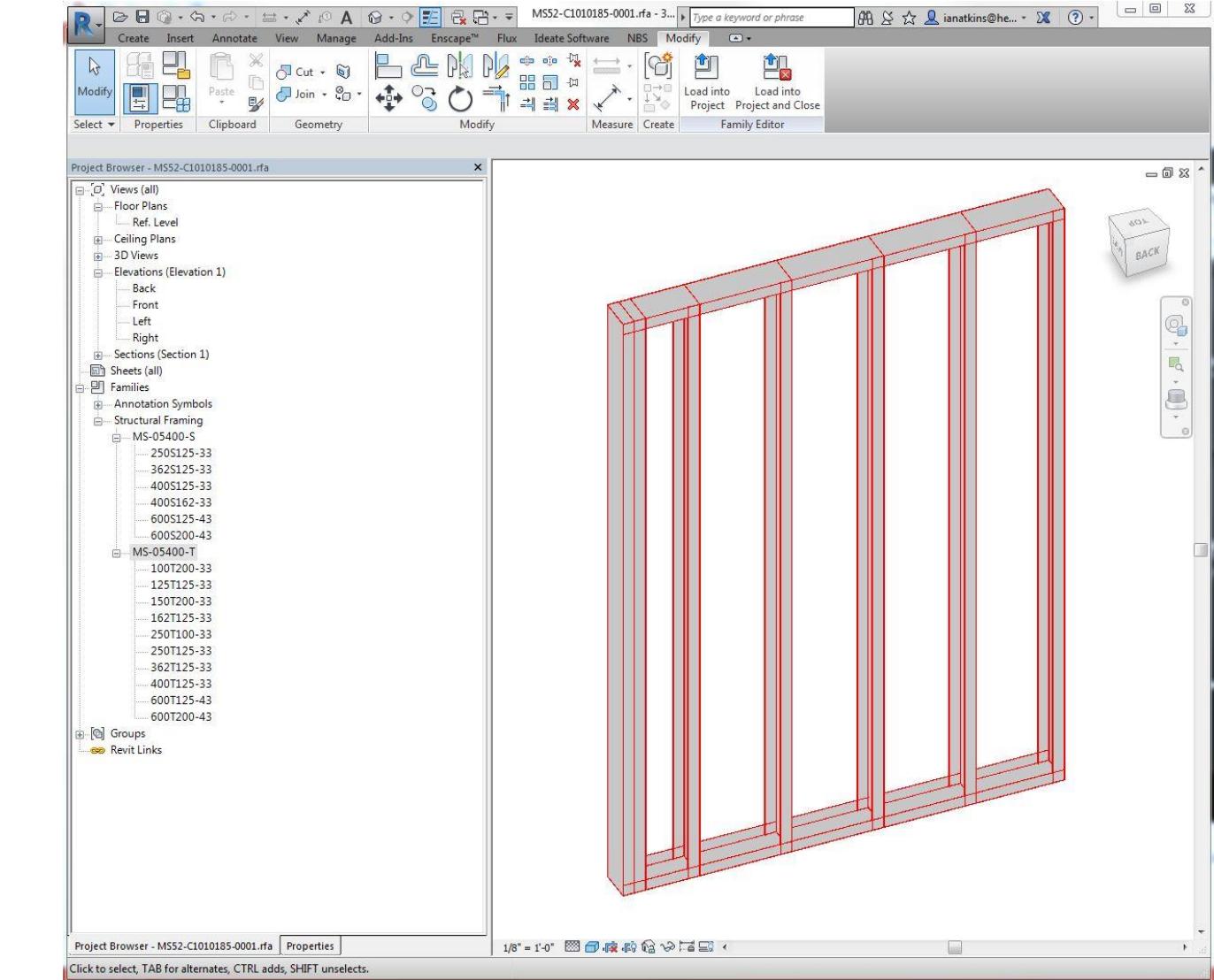
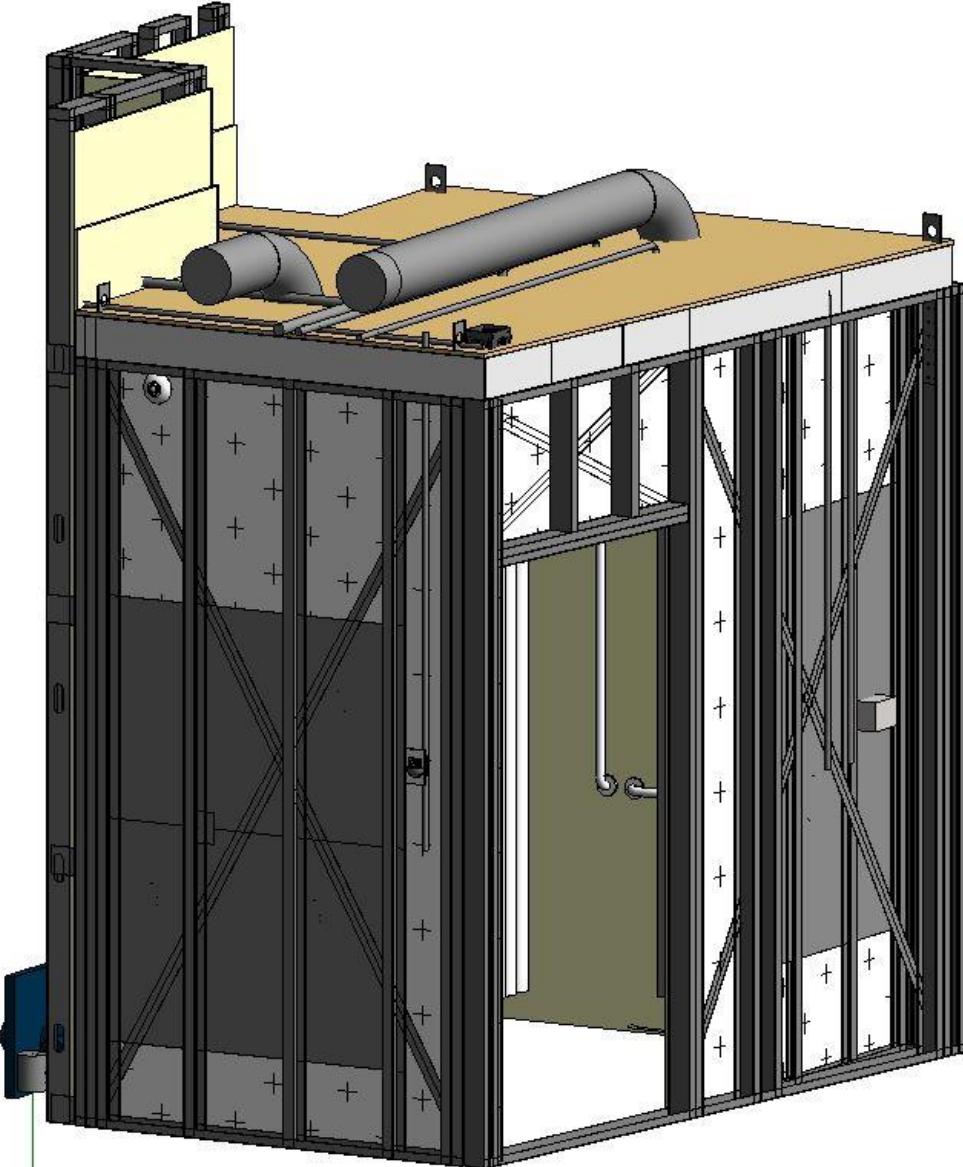
Model Proliferation and Repetition



Model Proliferation and Repetition

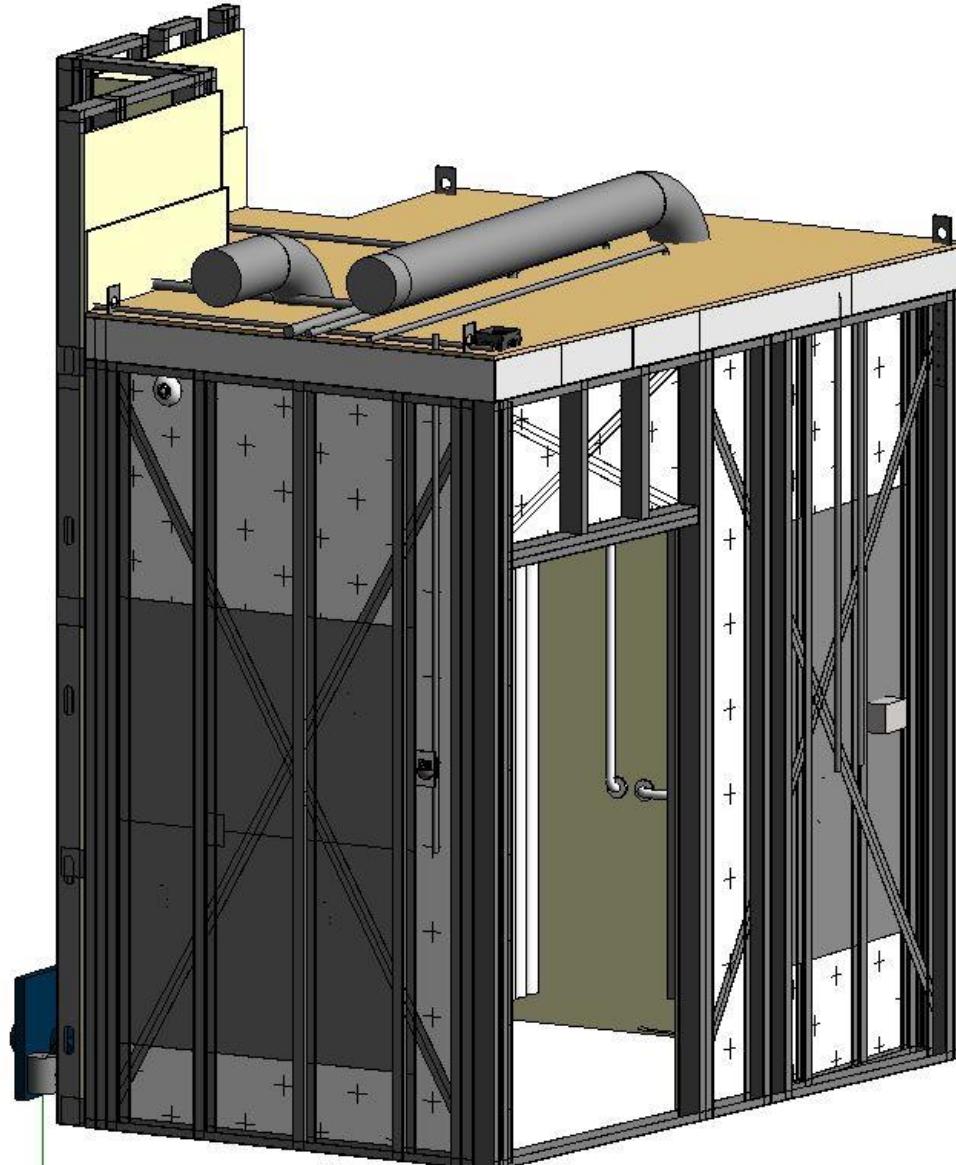


Model Proliferation and Repetition



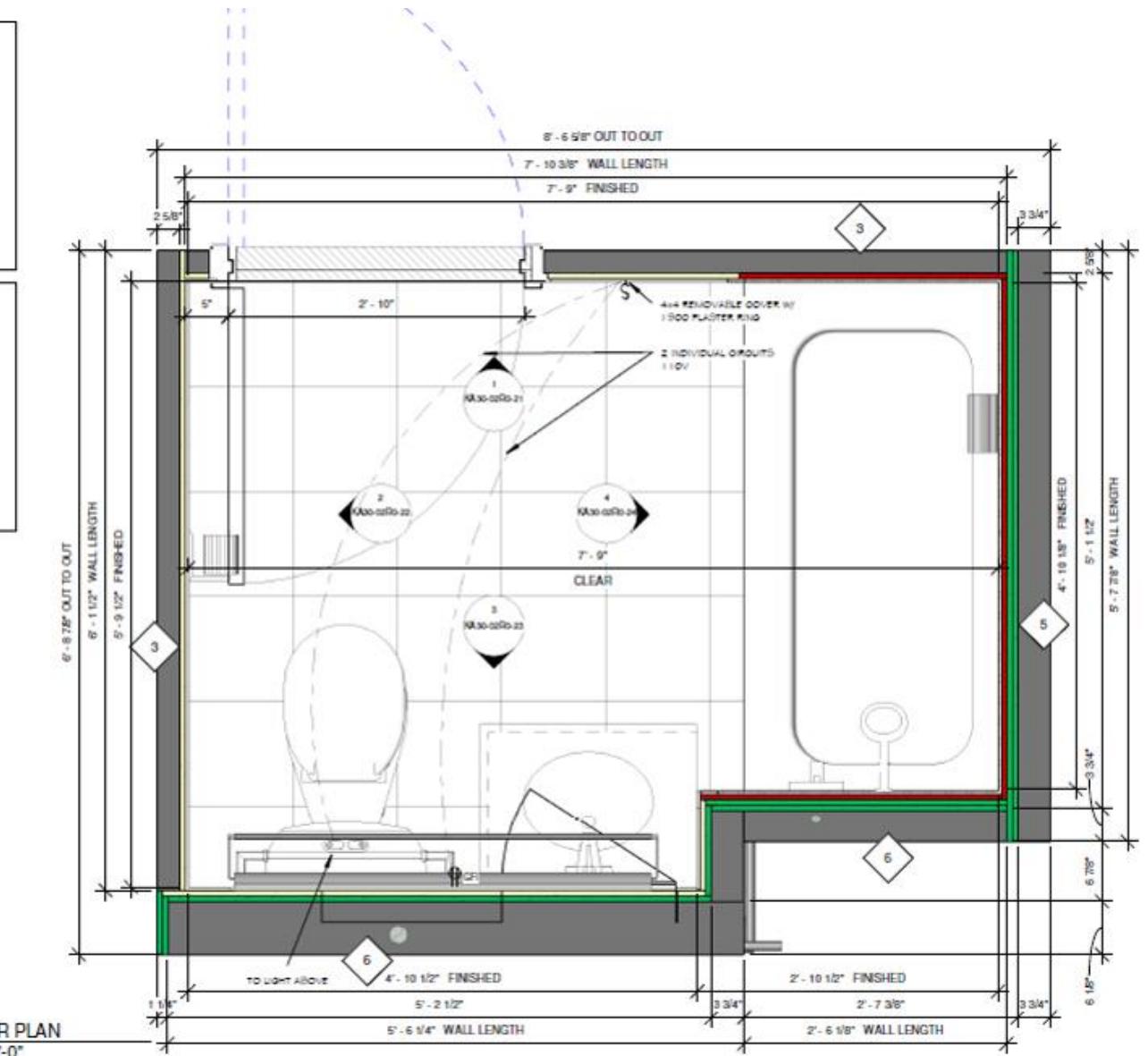
Fabrication Model

Model Proliferation and Repetition



ARCHITECTURAL DRAWING LIST:
A30-100-A - FLOOR PLAN
A30-101-A - HONEYCOMB PLAN
A30-02R0-21 - INTERIOR ELEVATION
A30-02R0-22 - INTERIOR ELEVATION
A30-02R0-22 - INTERIOR ELEVATION
A30-02R0-24 - INTERIOR ELEVATION
A30-0400 - GENERAL DETAILS
M30-01R0-20 - PLUMBING PLAN
M30-01R0-21 - PLUMBING ELEVATION

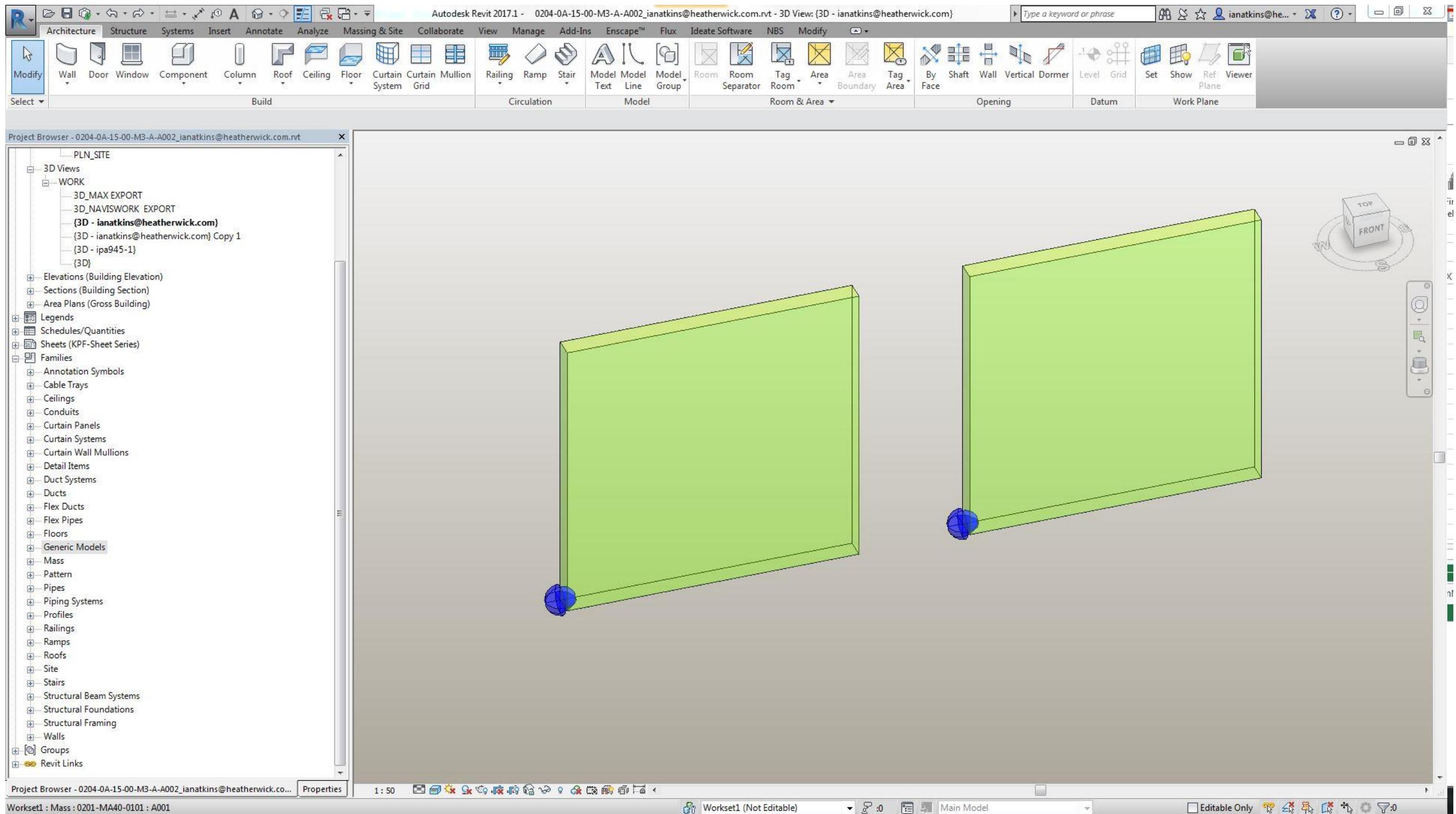
DRYWALL KEY:
■ 5/8" DURAROCK CEMENT BOARD.
■ 5/8" DENS ARMOR PLUS.
■ 5/8" PROROC TYPE X GYPSUM (REFER TO FIRE RATED WALL ASSEMBLY DETAILS)

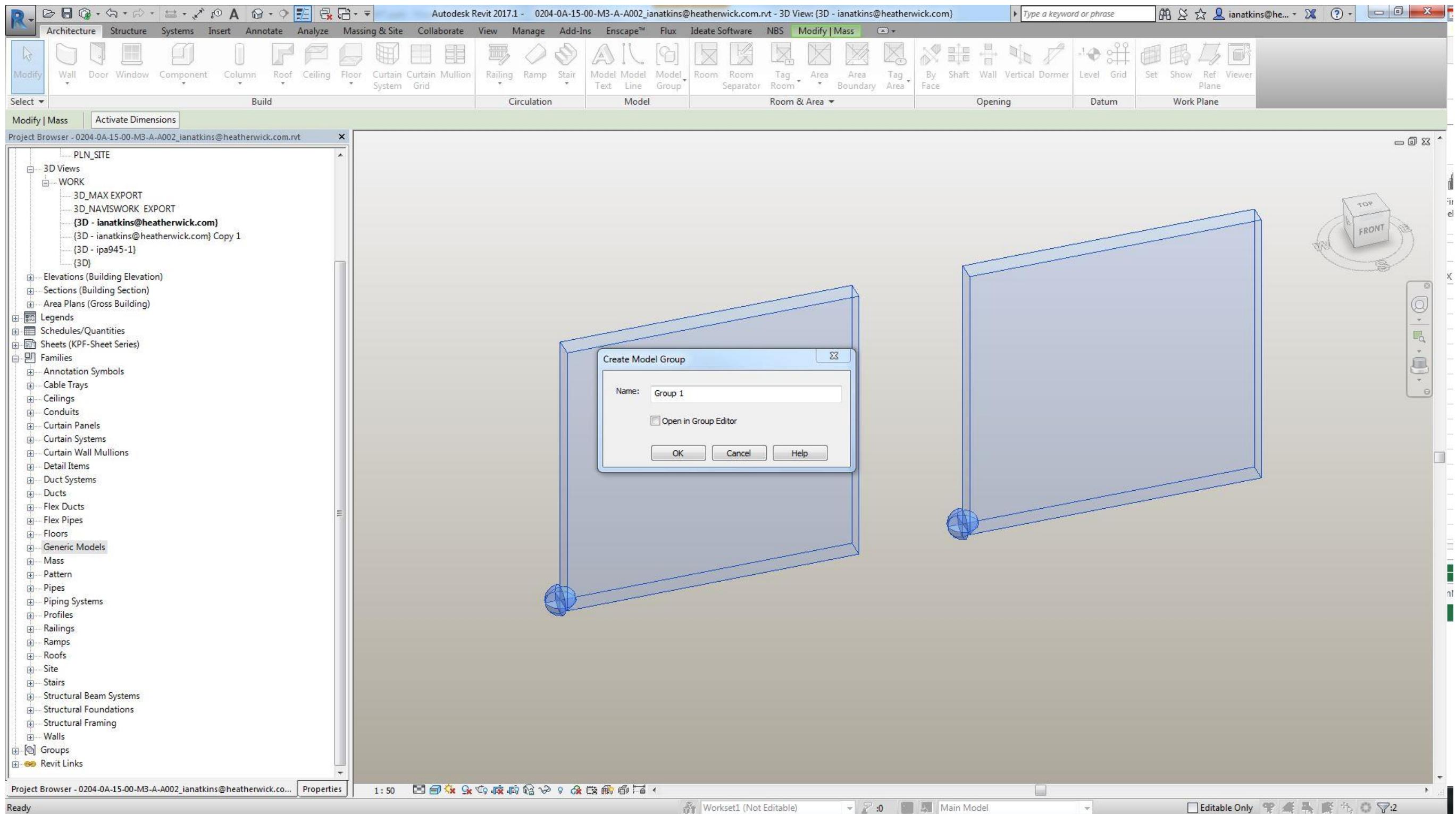


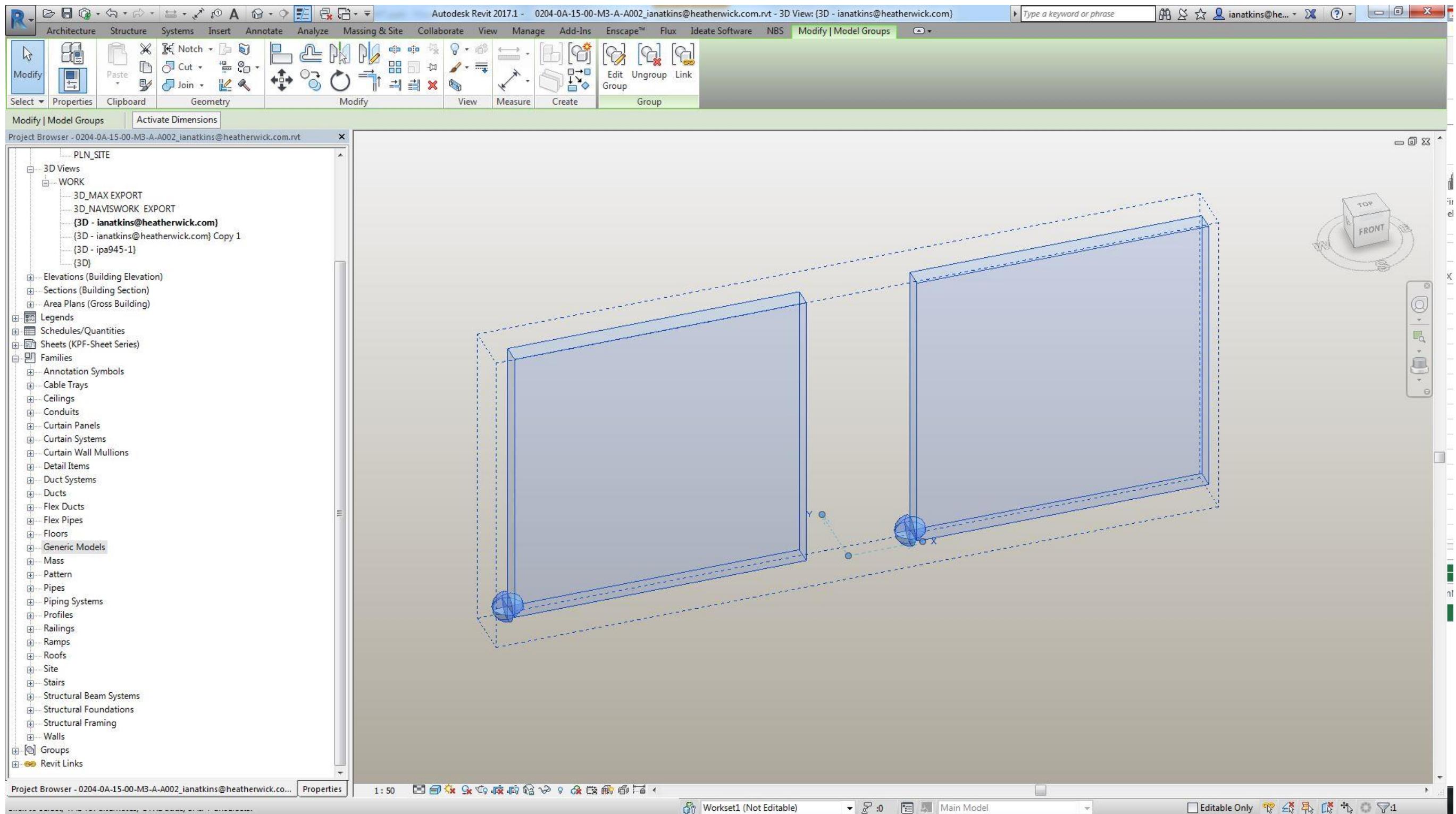
Fabrication Model

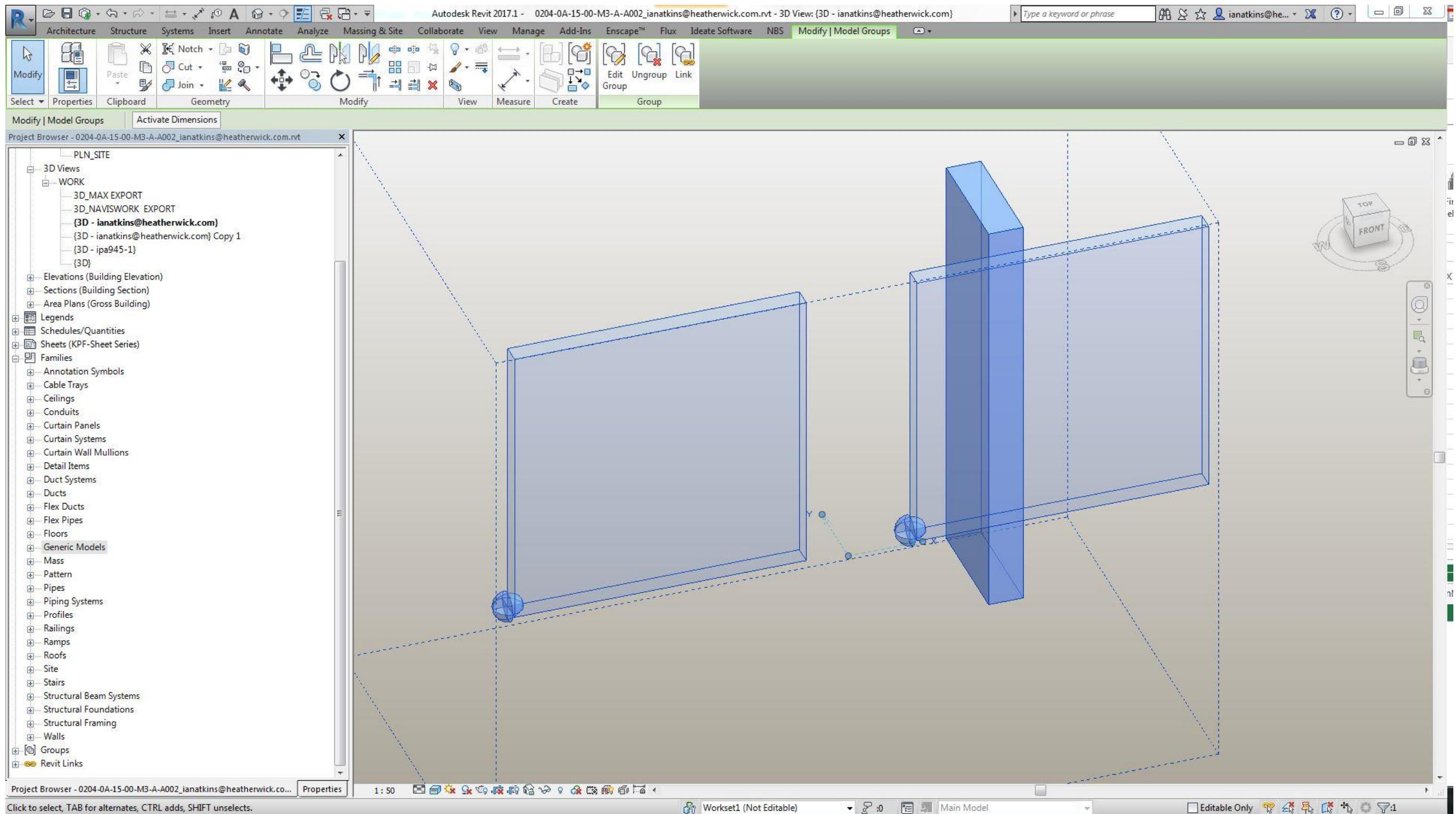
Model Proliferation and Repetition

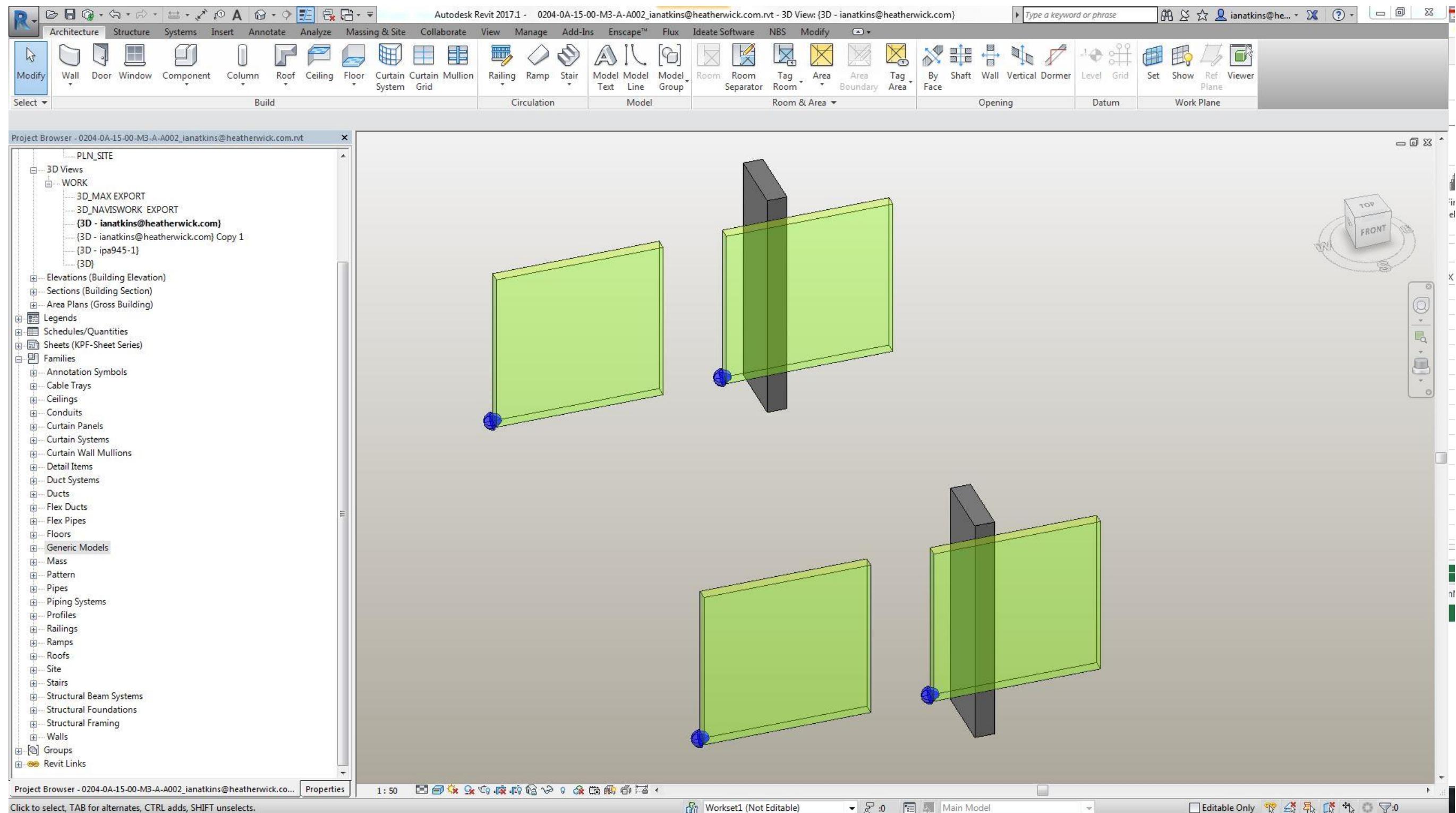
- Families (+Nested Families)
- Groups

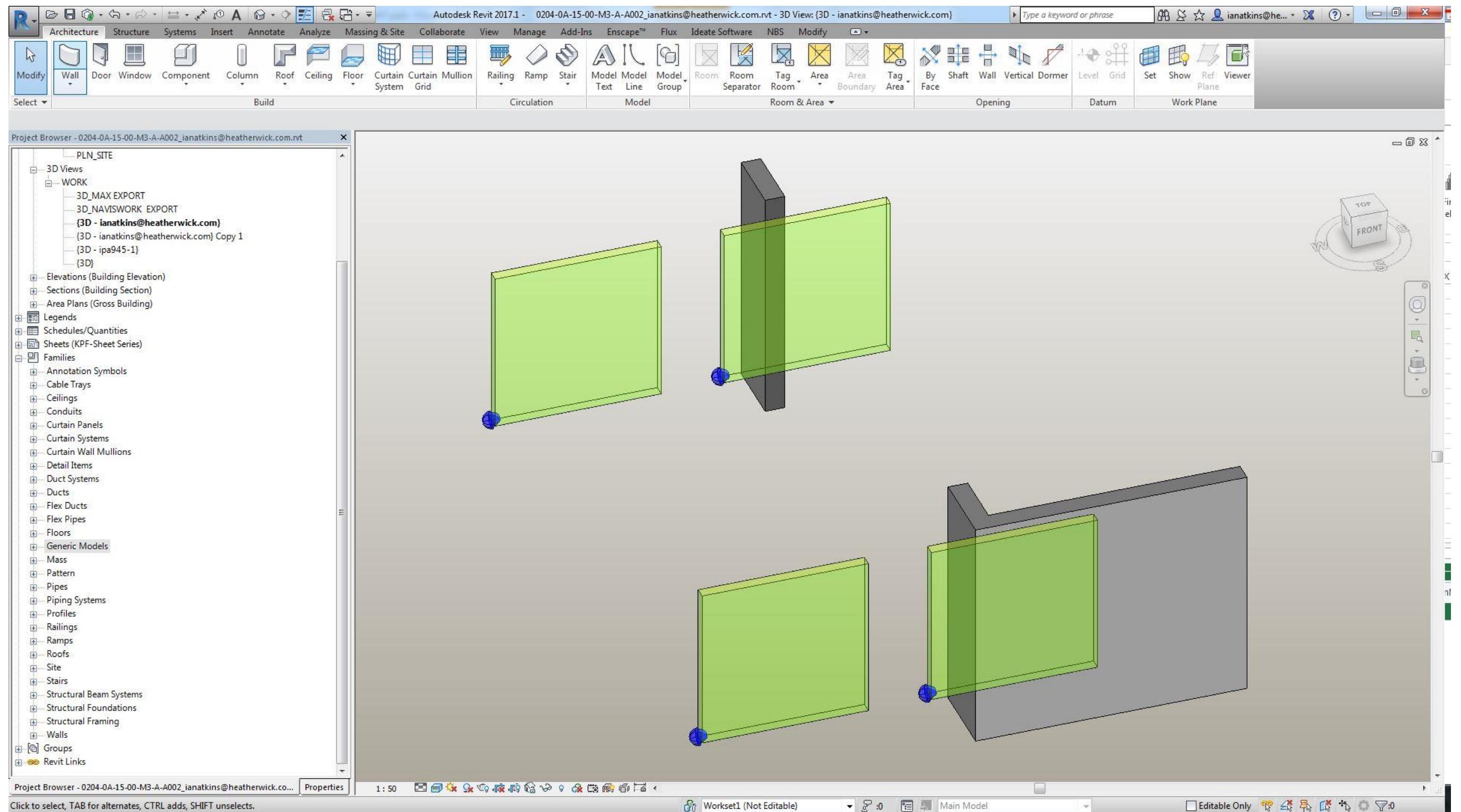


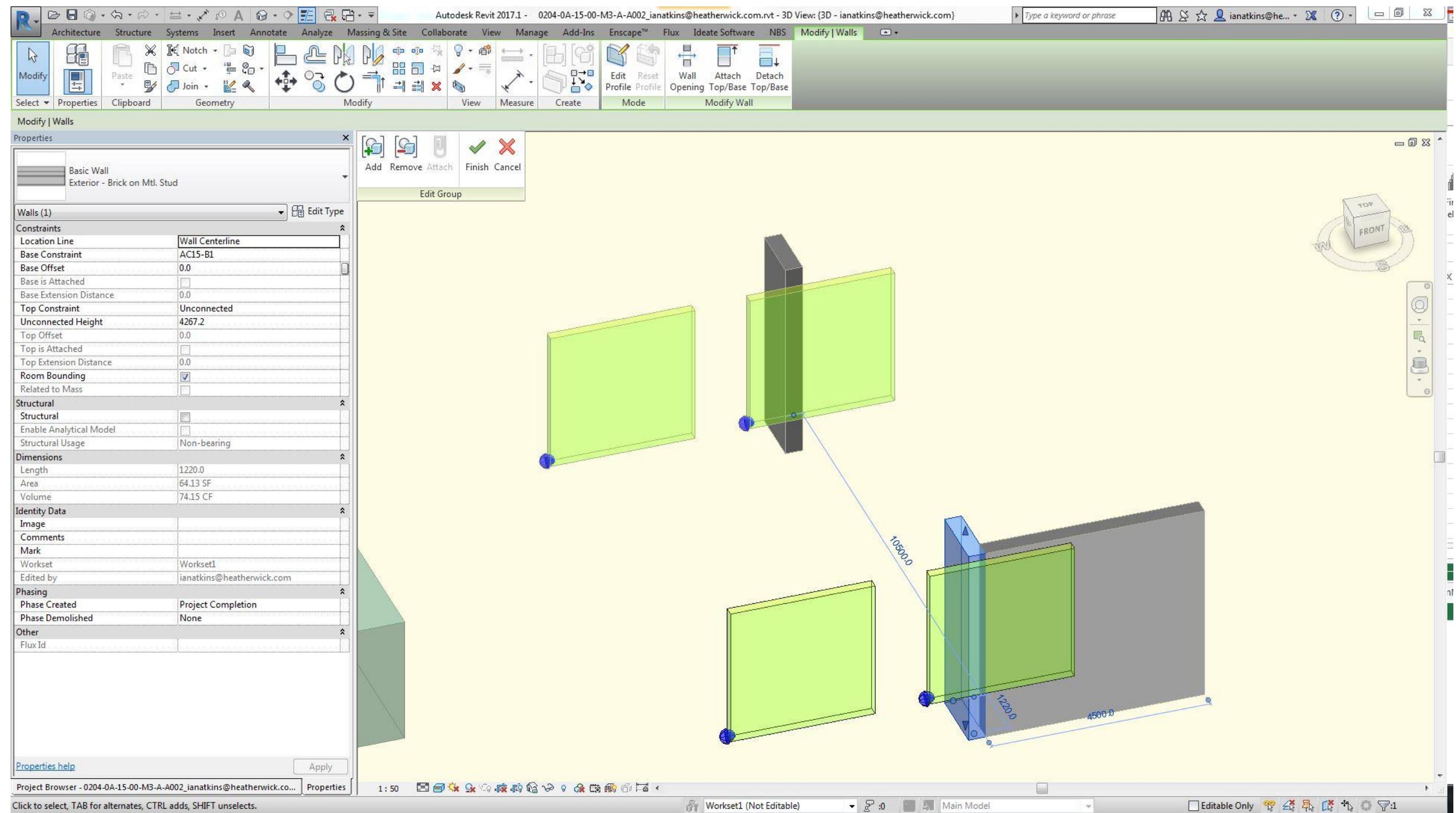


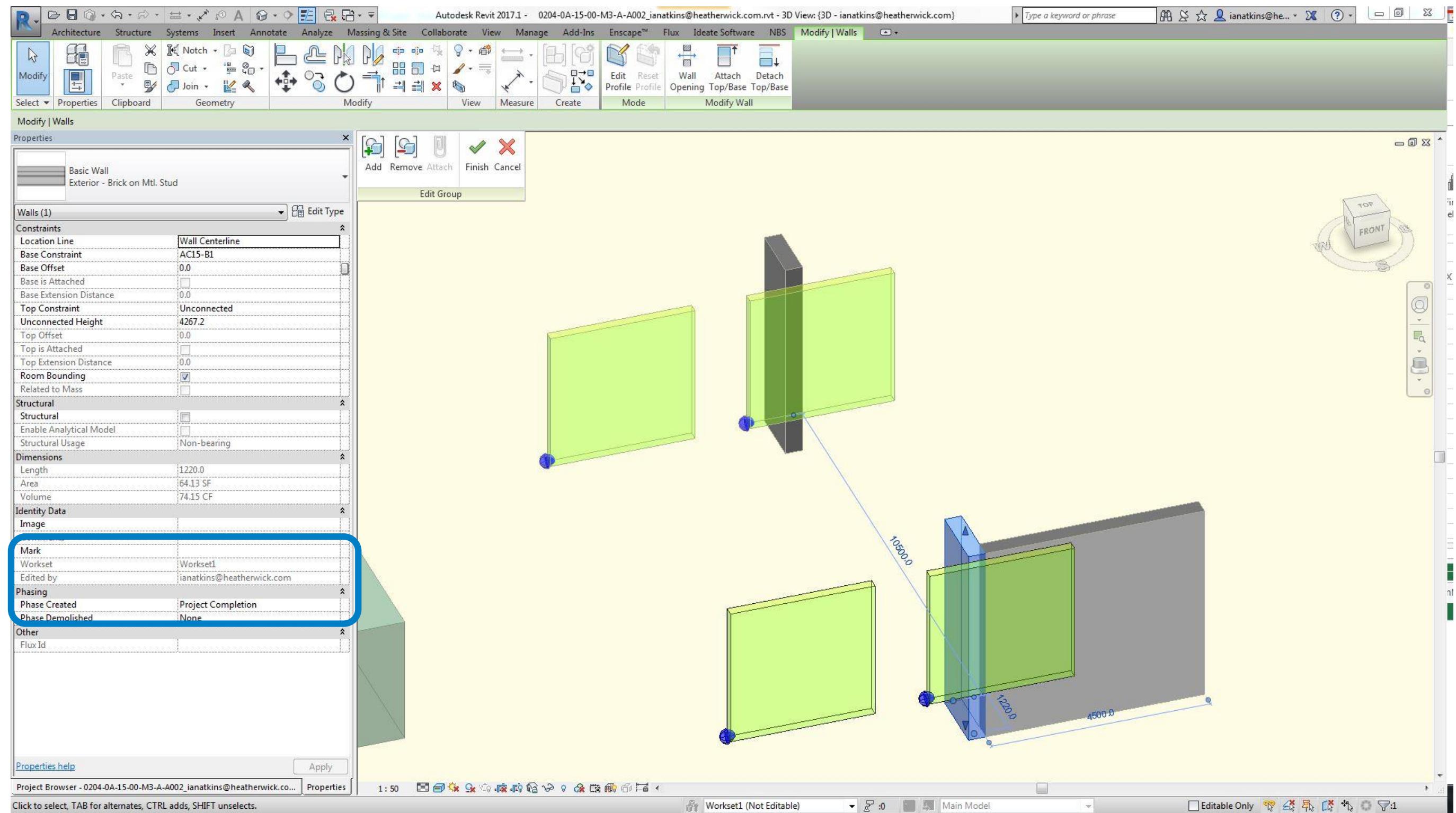


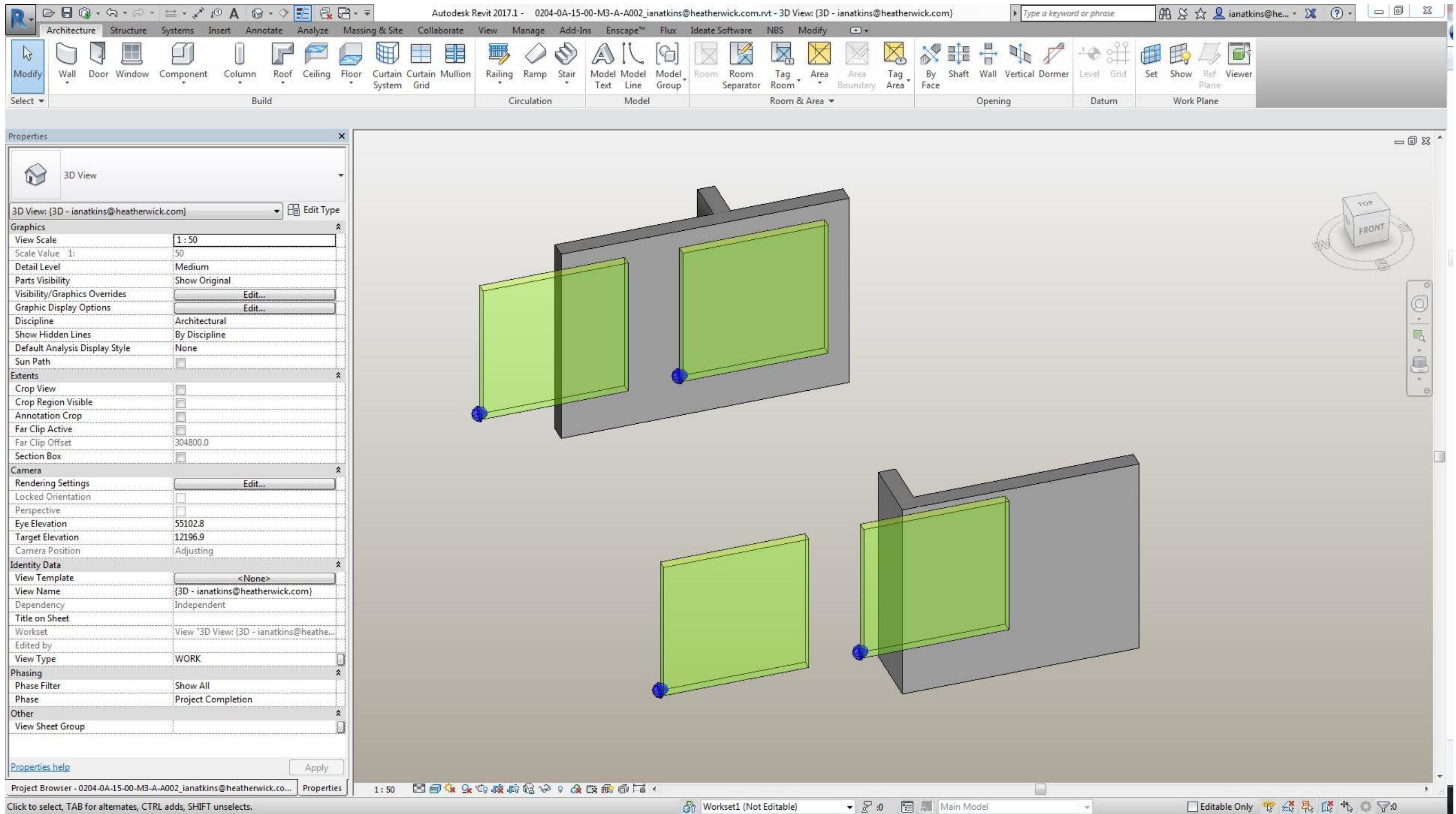


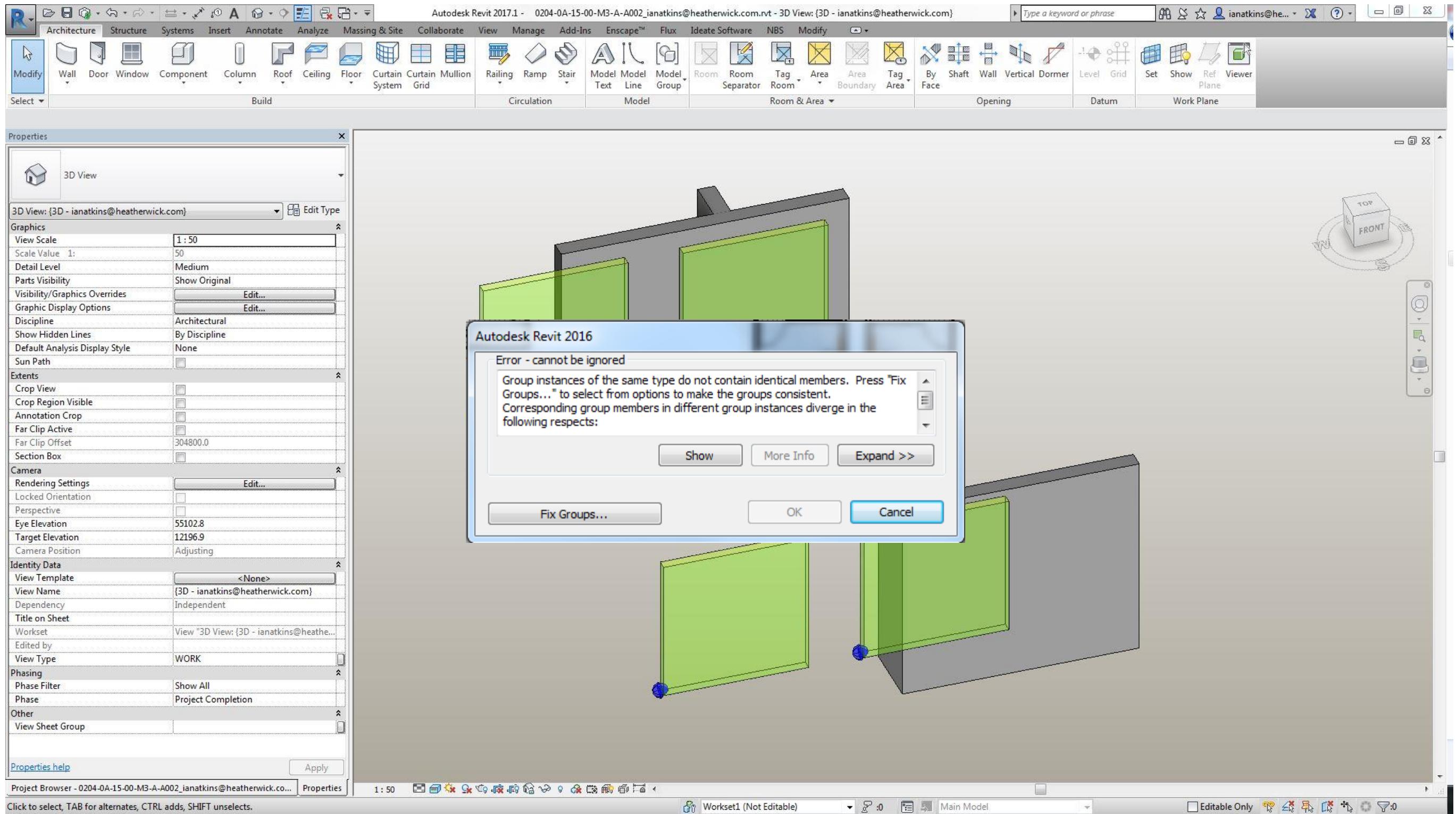


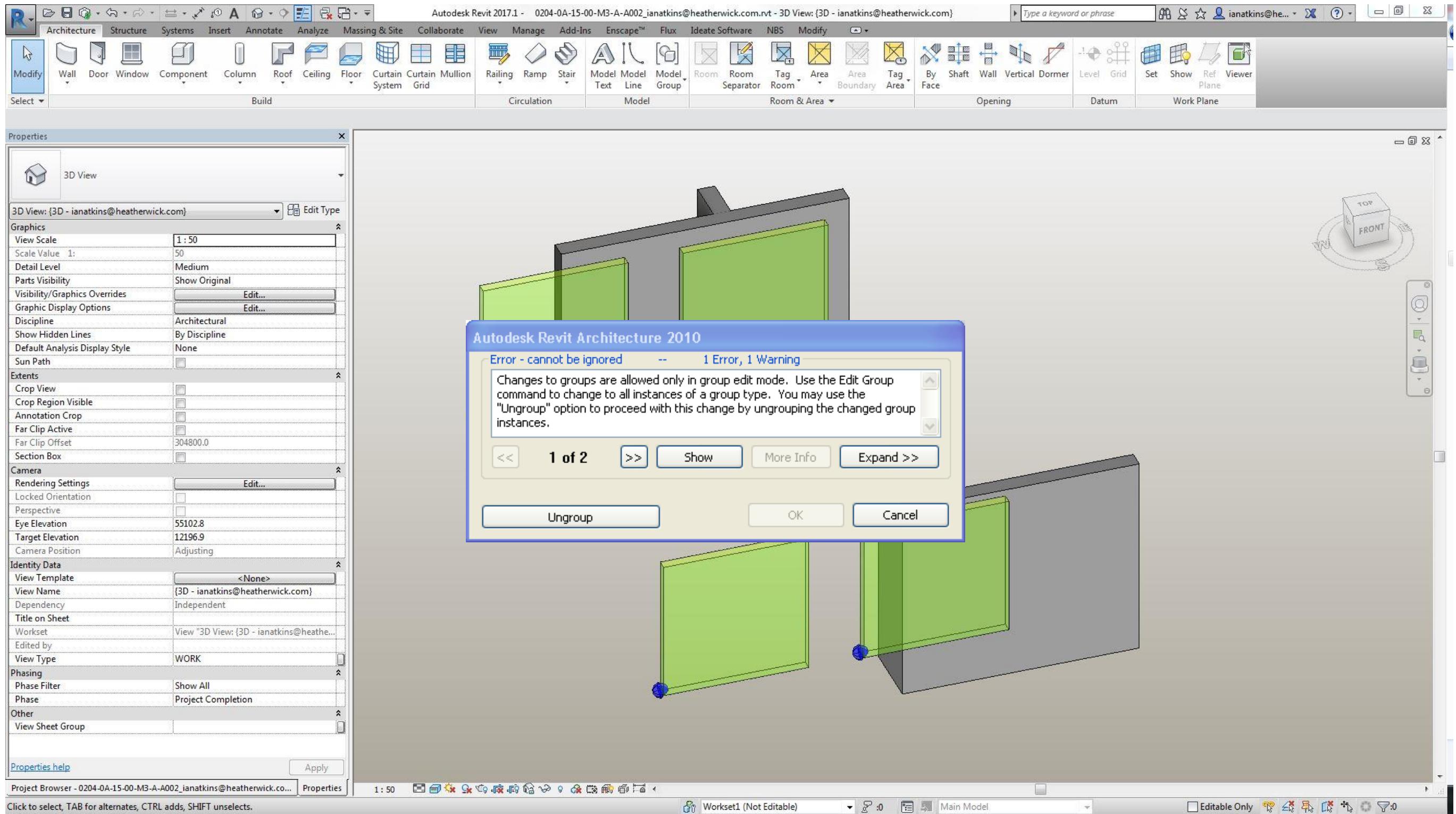


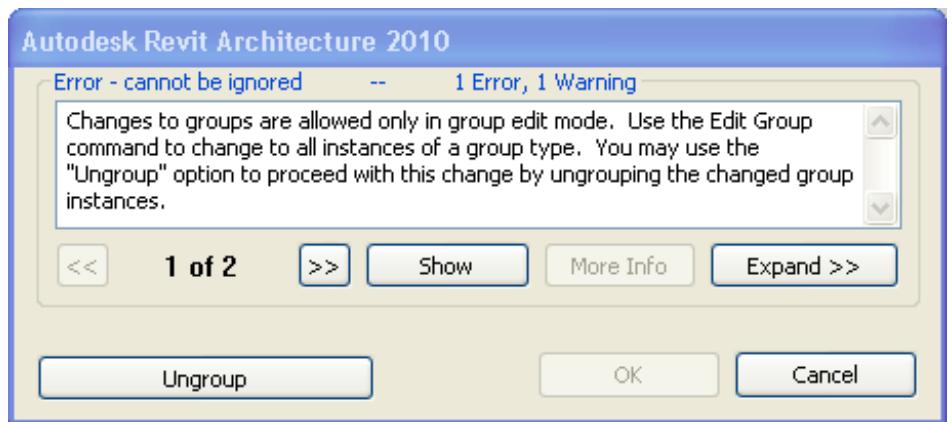




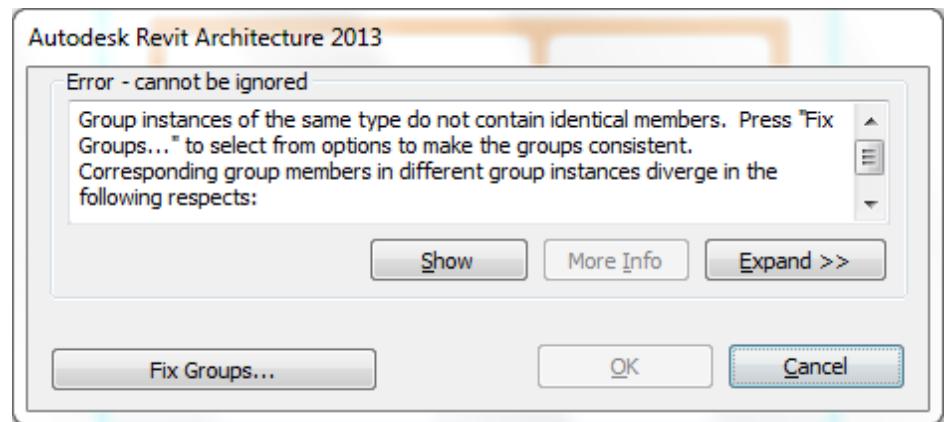


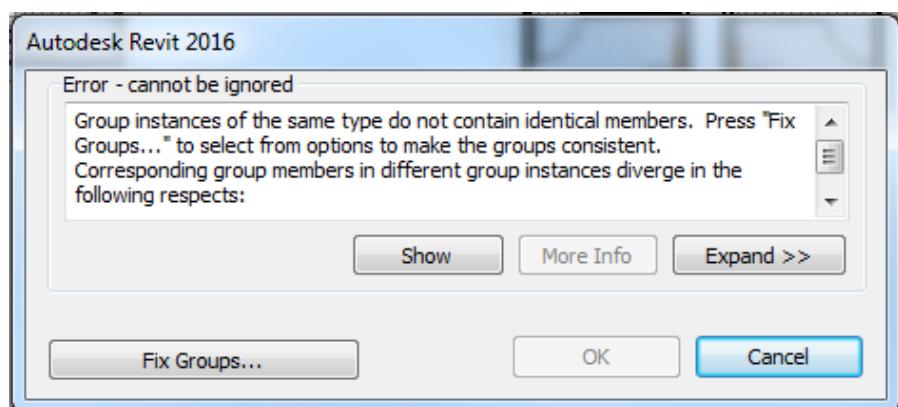






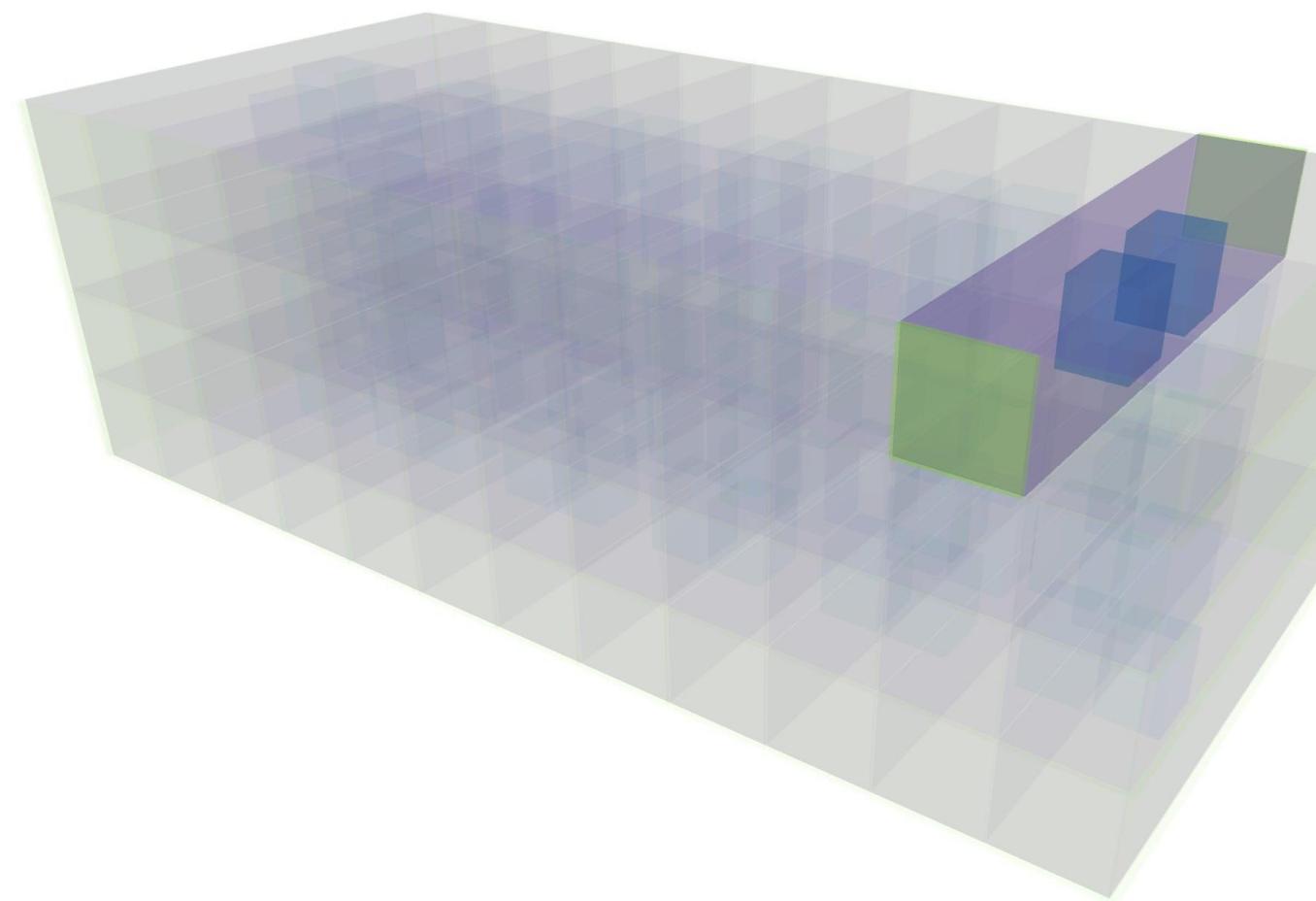






Model Proliferation and Repetition

- Families (+Nested Families)
- Groups (No)
- Linked Files



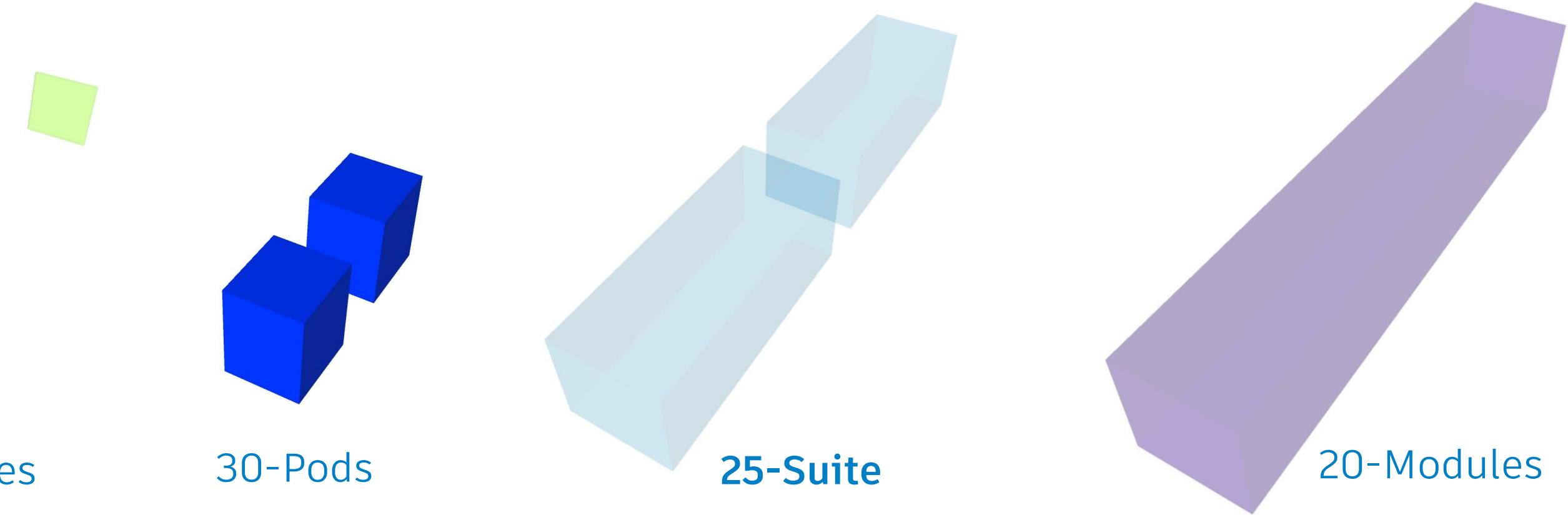
50-Assemblies

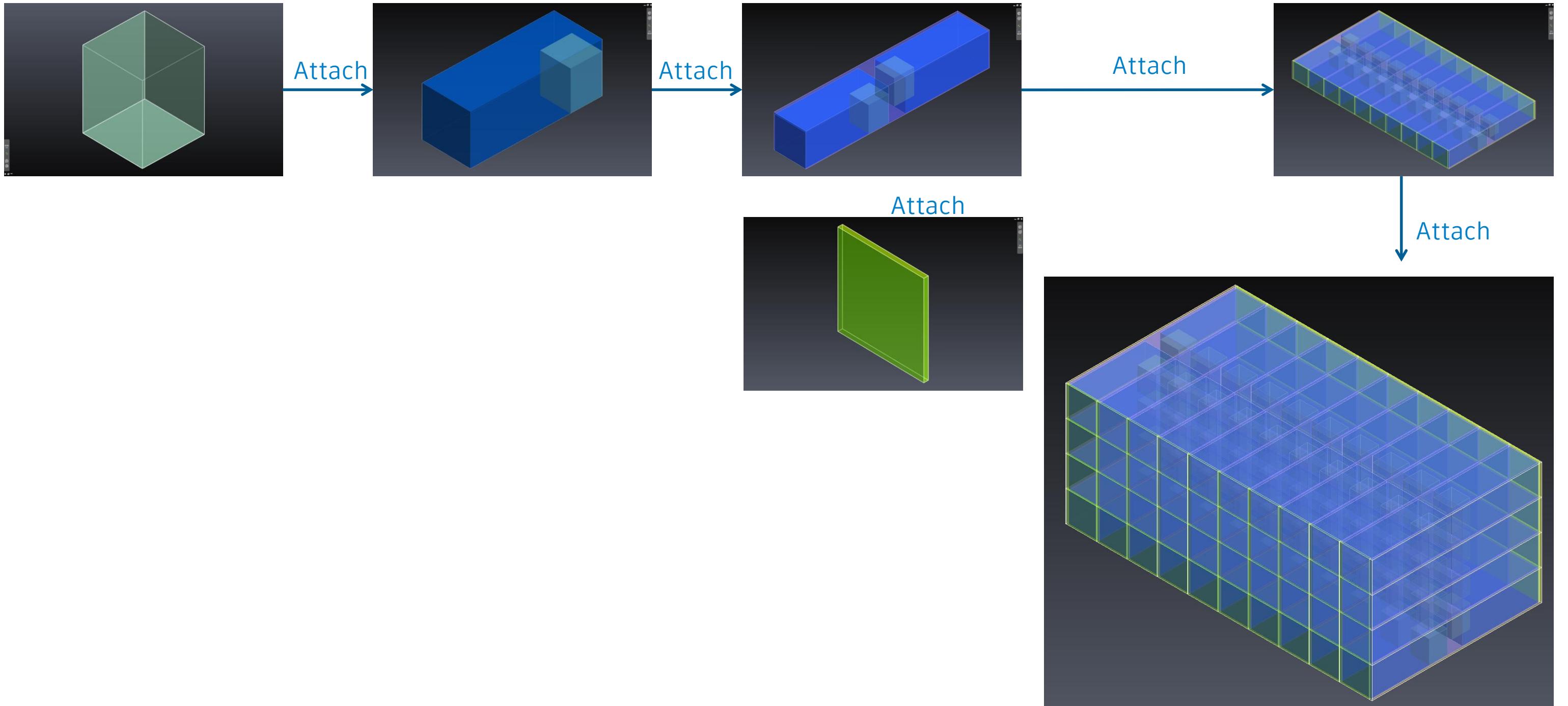
30-Pods

25-Suite

20-Modules

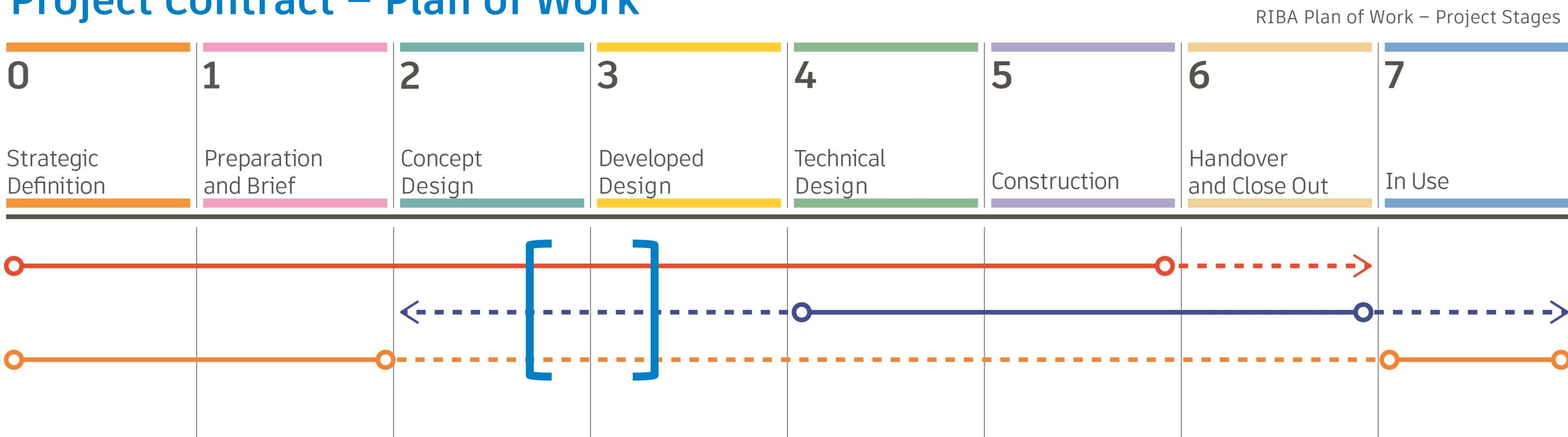
15-Level





Design Delivery and BIM Exchange

Project Contract – Plan of Work



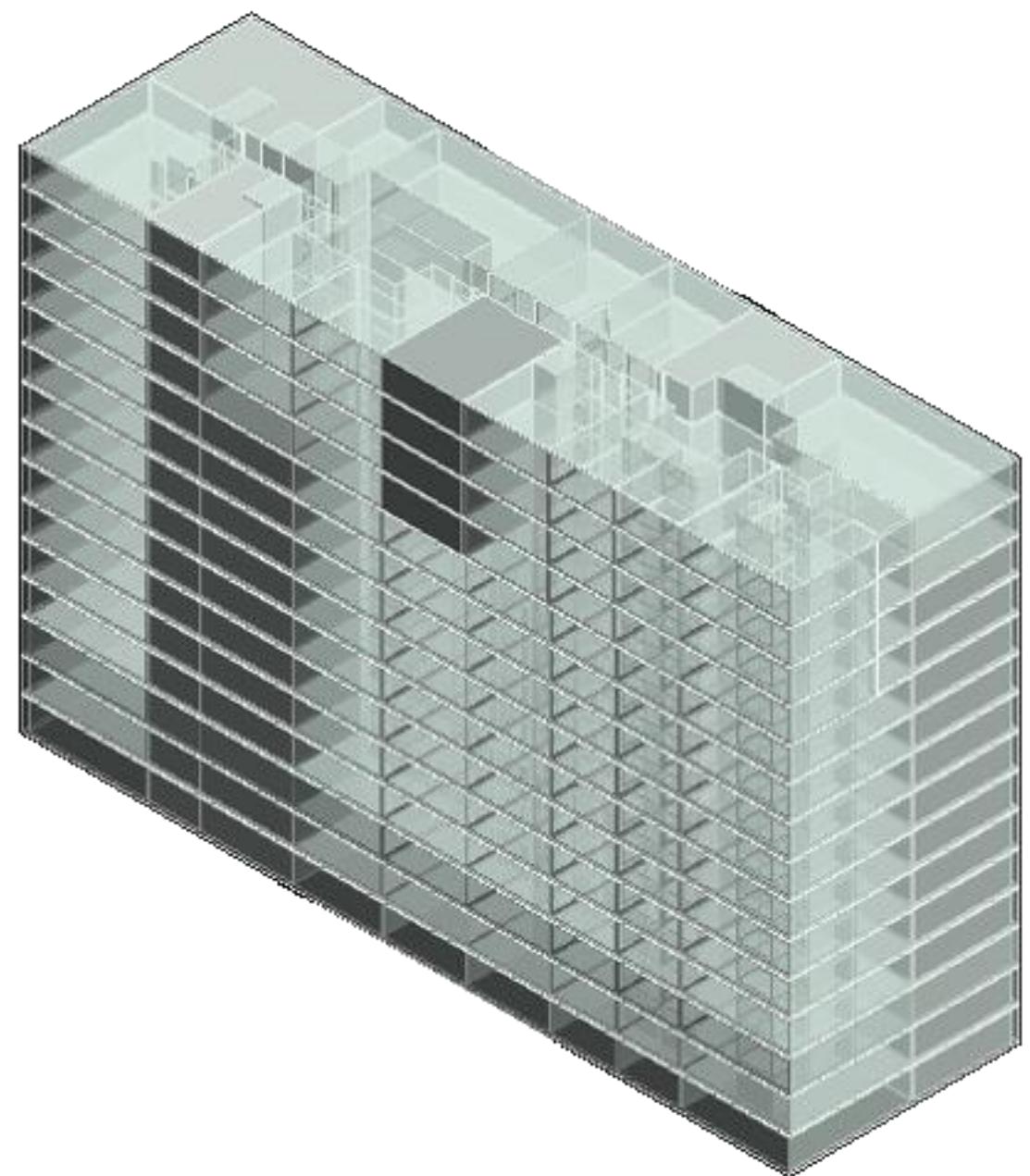
Effective Process for Offsite Design Delivery

Shared Responsibility, Information Exchange Transparent Data Access

Architect/Engineer

Contractor/Fabricator

Owner

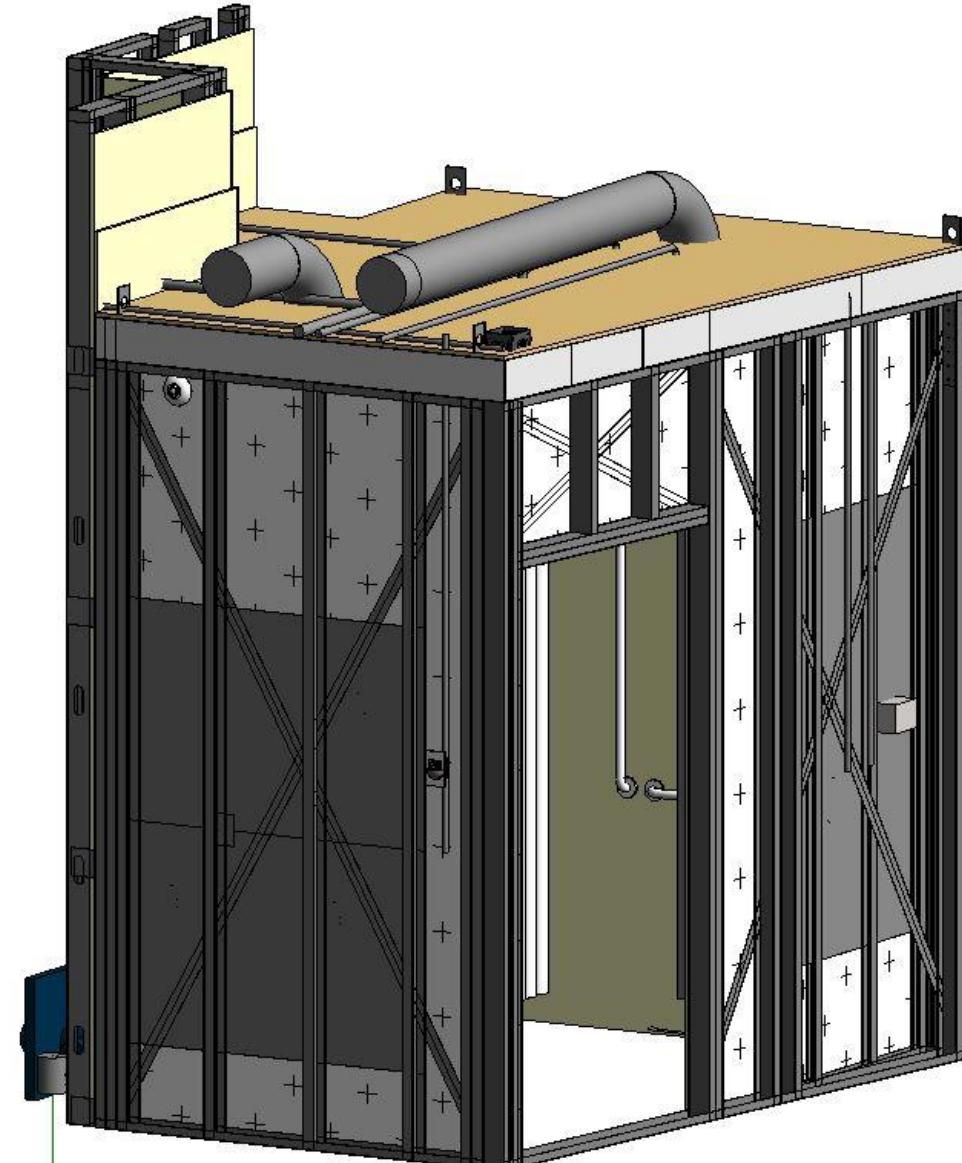


Module Diagram



Architecture Model

06 : Structuring [Building] Data



Fabrication Model

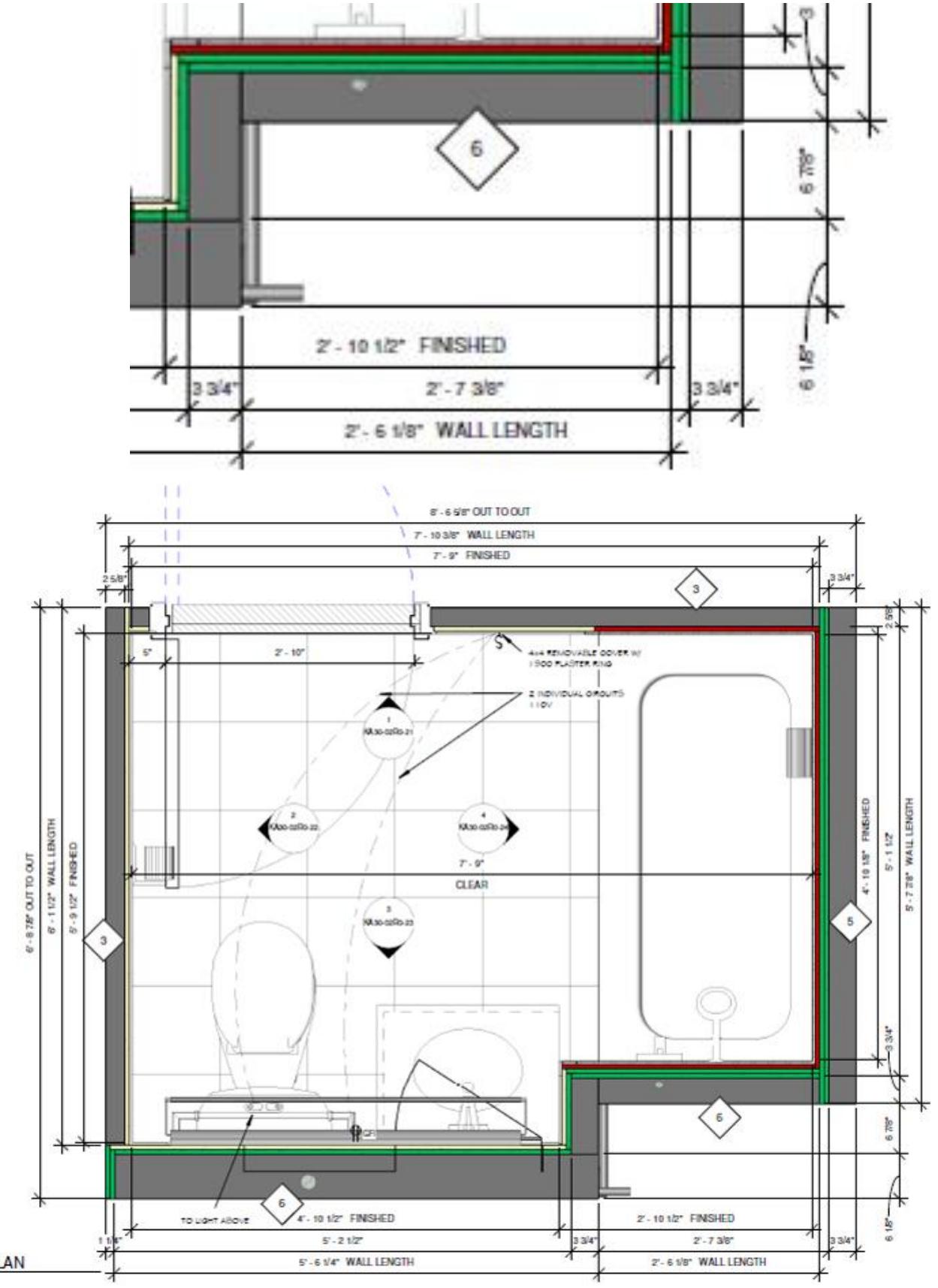
ARCHITECTURAL DRAWING LIST:

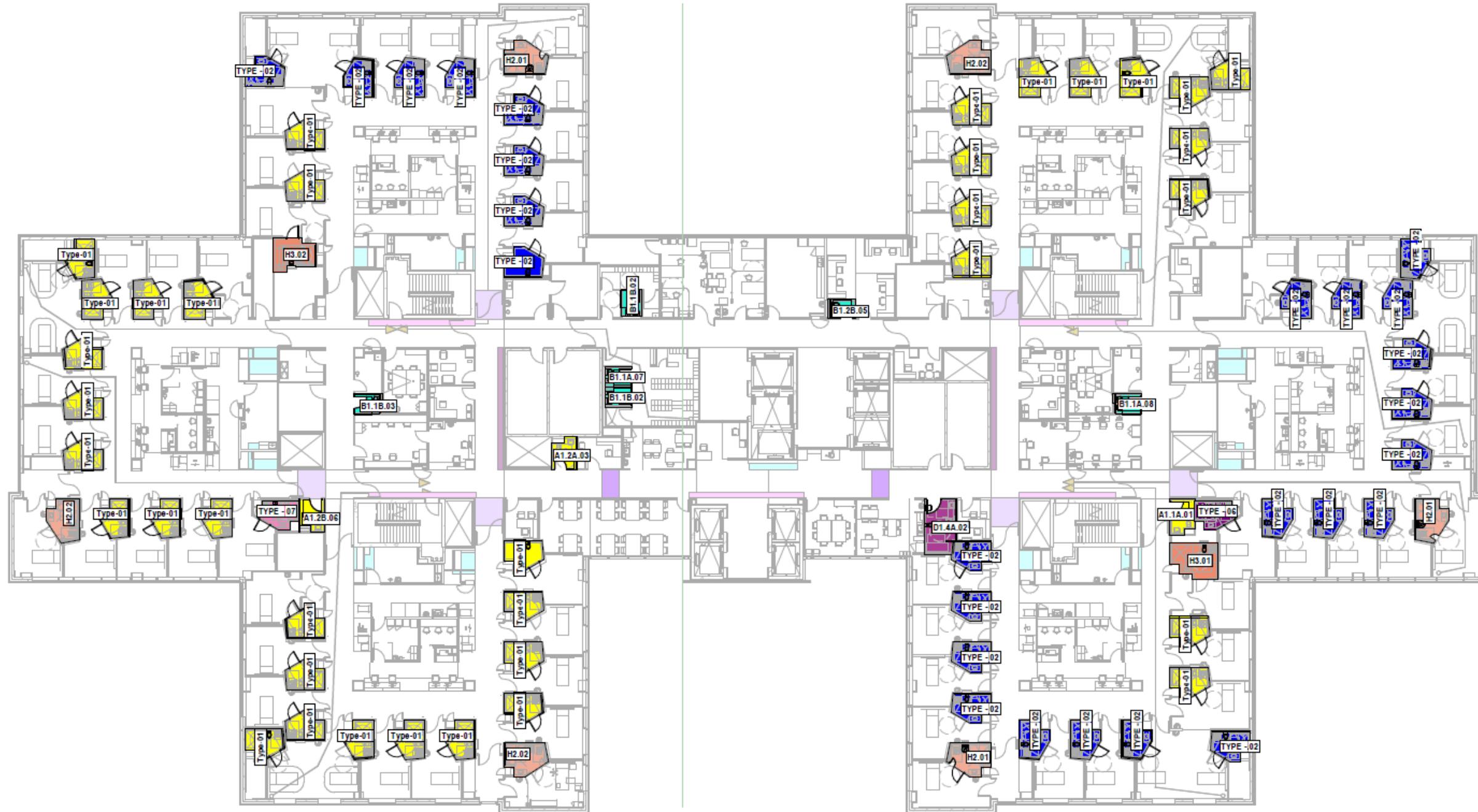
- A30-100-A - FLOOR PLAN
- A30-101-A - HONEYCOMB PLAN
- A30-02R0-21 - INTERIOR ELEVATION
- A30-02R0-22 - INTERIOR ELEVATION
- A30-02R0-23 - INTERIOR ELEVATION
- A30-02R0-24 - INTERIOR ELEVATION
- A30-0400 - GENERAL DETAILS
- M30-01R0-20 - PLUMBING PLAN
- M30-01R0-21 - PLUMBING ELEVATION

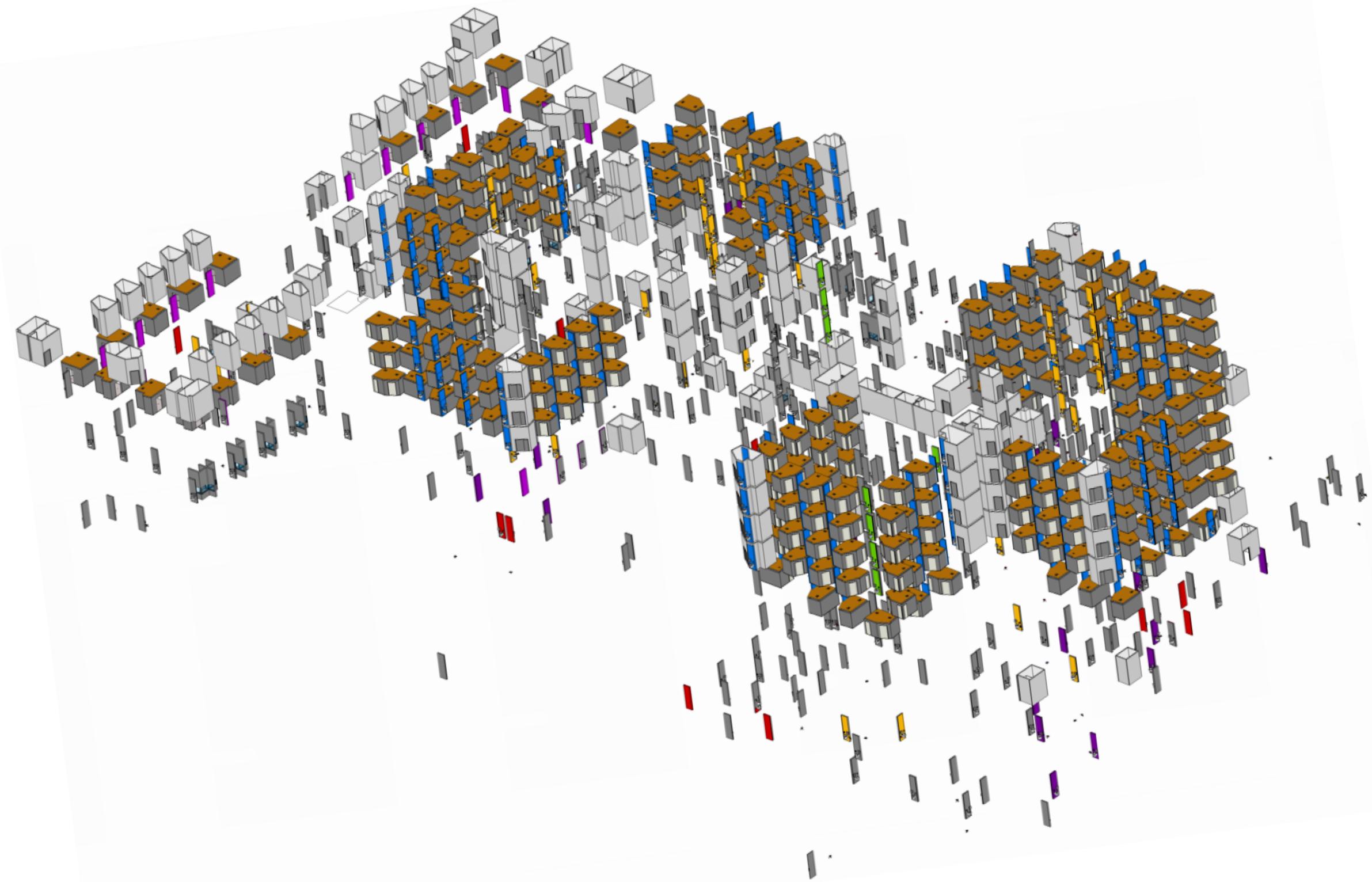
DRYWALL KEY:

- 5/8" DURAROCK CEMENT BOARD.
- 5/8" DENS ARMOR PLUS.
- 5/8" PROROC TYPE X GYPSUM
(REFER TO FIRE RATED WALL ASSEMBLY DETAILS)

① FLOOR PLAN
1" = 1'-0"



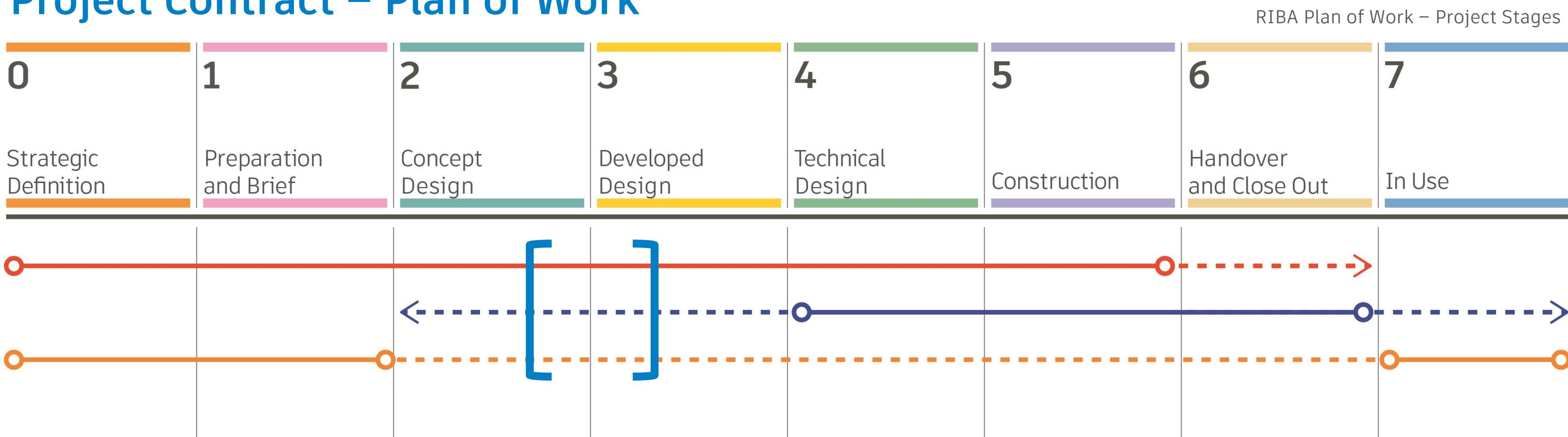




PROPOSED WASHROOM KEY - BUILDING B1											
LOCATION	TYPE A TYPICAL PUBLIC WASHROOM	TYPE B.1 TYPICAL PUBLIC WASHROOM	TYPE B.2 TYPICAL PUBLIC WASHROOM	TYPE C.1 TYPICAL PUBLIC WASHROOM	TYPE C.2 TYPICAL PUBLIC WASHROOM	TYPE D TYPICAL PUBLIC WASHROOM	TYPE E TYPICAL PUBLIC WASHROOM	TYPE F TYPICAL PUBLIC WASHROOM	TYPE G.1 TYPICAL PUBLIC WASHROOM	TYPE G.2 TYPICAL PUBLIC WASHROOM	TOTAL
LEVEL 1	-	1	-	-	-	-	-	1	-	1	3
LEVEL 2	-	2	-	1	-	-	1	1	1	1	7
LEVEL 3	4	-	1	-	-	-	-	-	1	1	7
LEVEL 4	1	-	-	2	1	-	-	-	-	-	4
LEVEL 5	2	4	1	-	1	-	1	-	-	-	9
LEVEL 6	2	-	1	1	2	-	-	1	1	1	9
LEVEL 7	2	-	2	-	-	-	-	1	-	-	4
LEVEL 8	2	-	2	-	-	-	-	1	-	-	5
TOTAL	13	7	7	4	4	-	2	5	3	4	49

Design Delivery and BIM Exchange

Project Contract – Plan of Work



Effective Process for Offsite Design Delivery

Shared Responsibility, Information Exchange Transparent Data Access

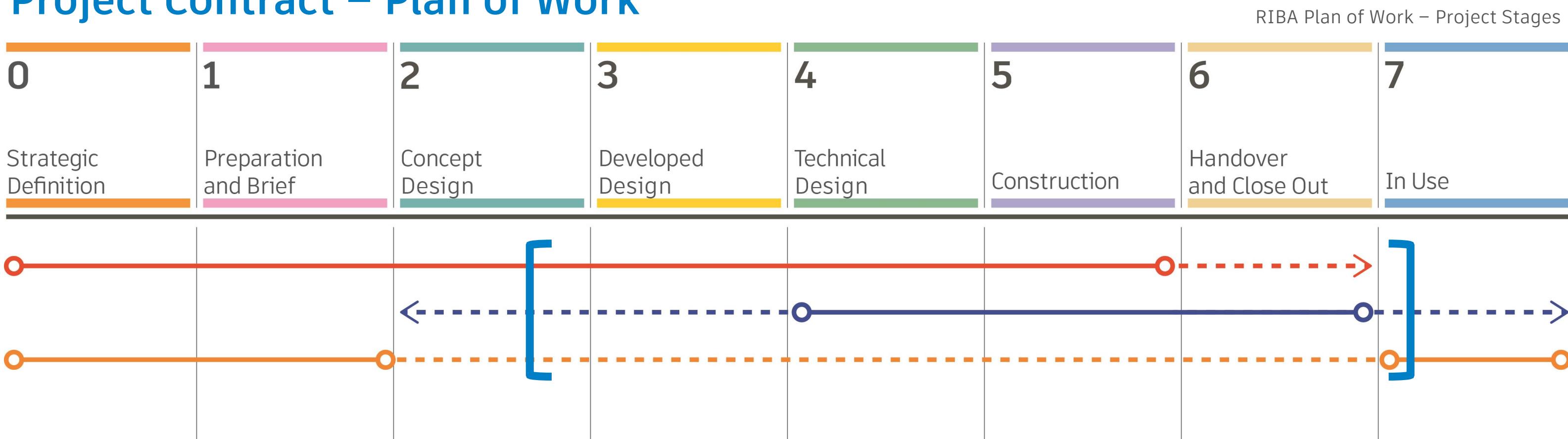
Architect/Engineer

Contractor/Fabricator

Owner

Design Delivery and BIM Exchange

Project Contract – Plan of Work



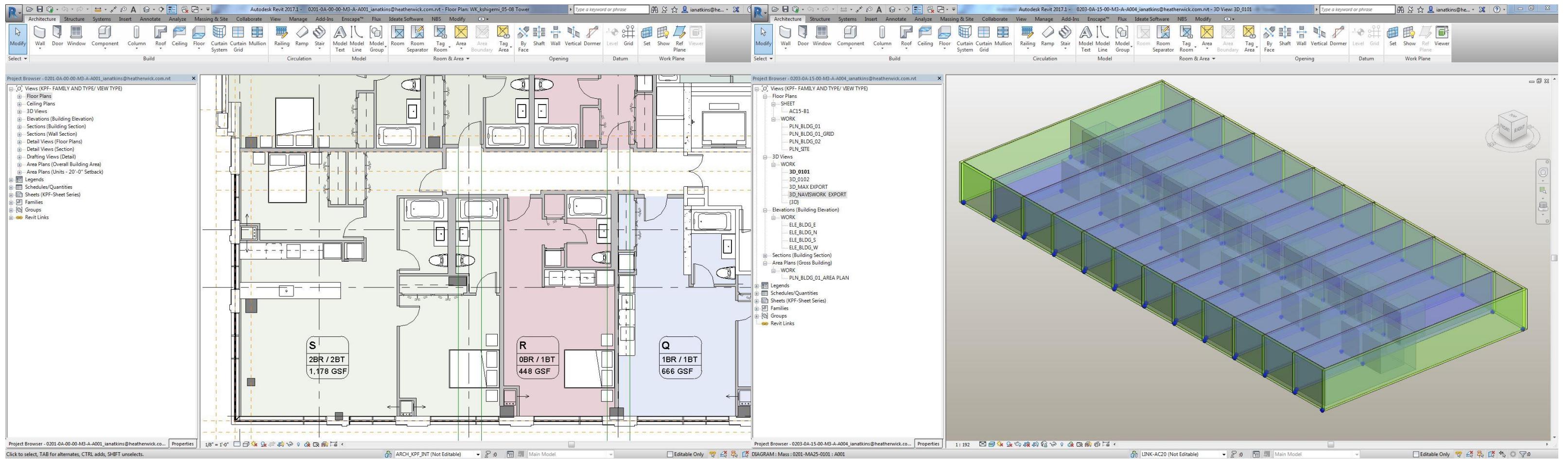
Effective Process for Offsite Design Delivery

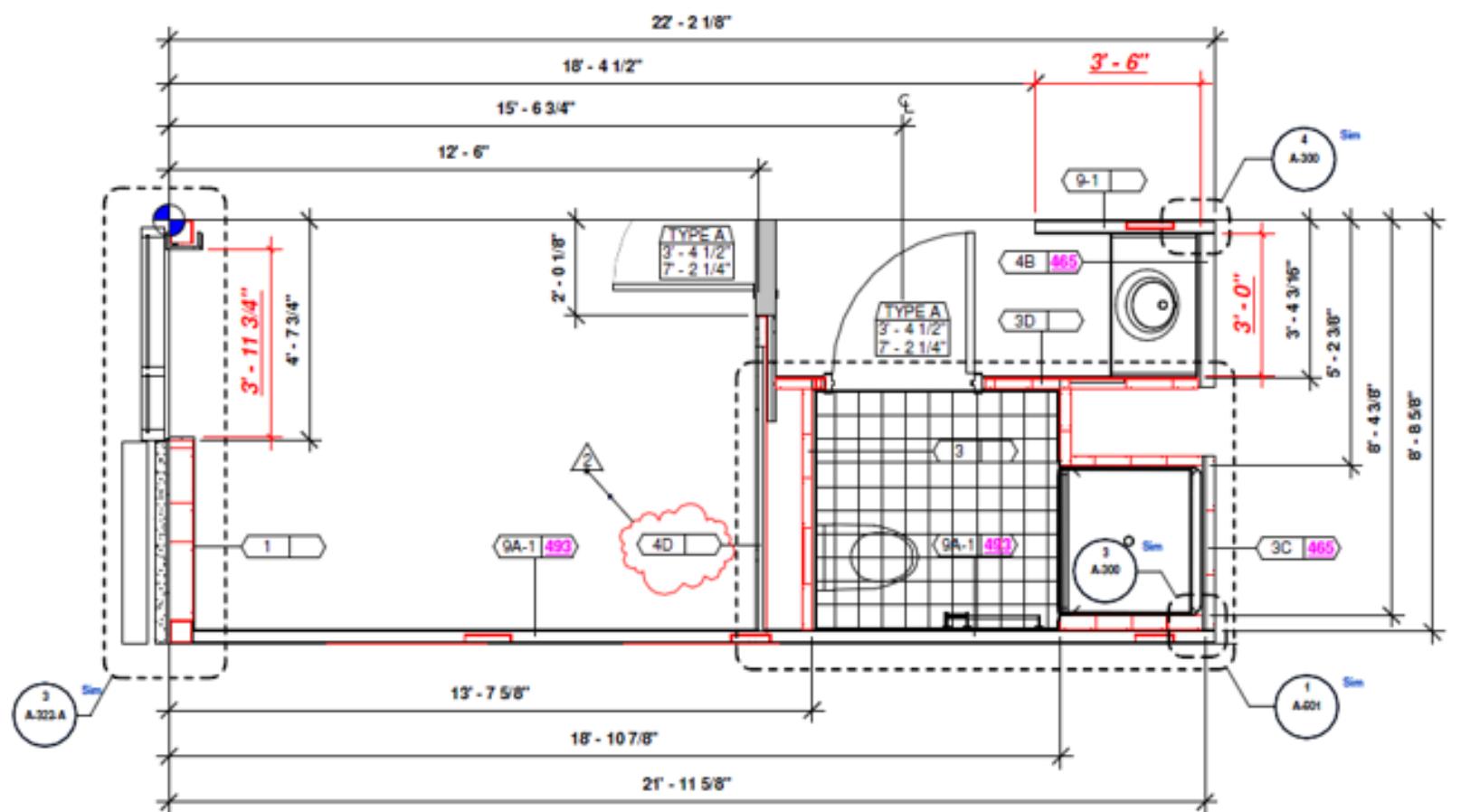
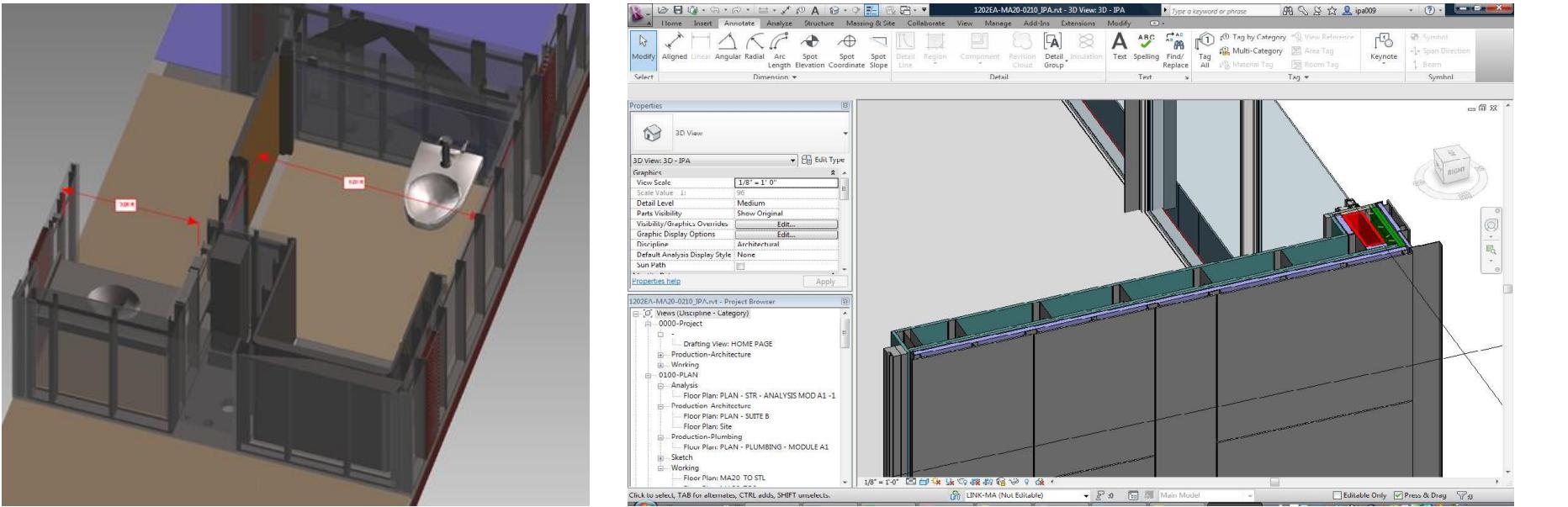
Shared Responsibility, Information Exchange Transparent Data Access

Architect/Engineer

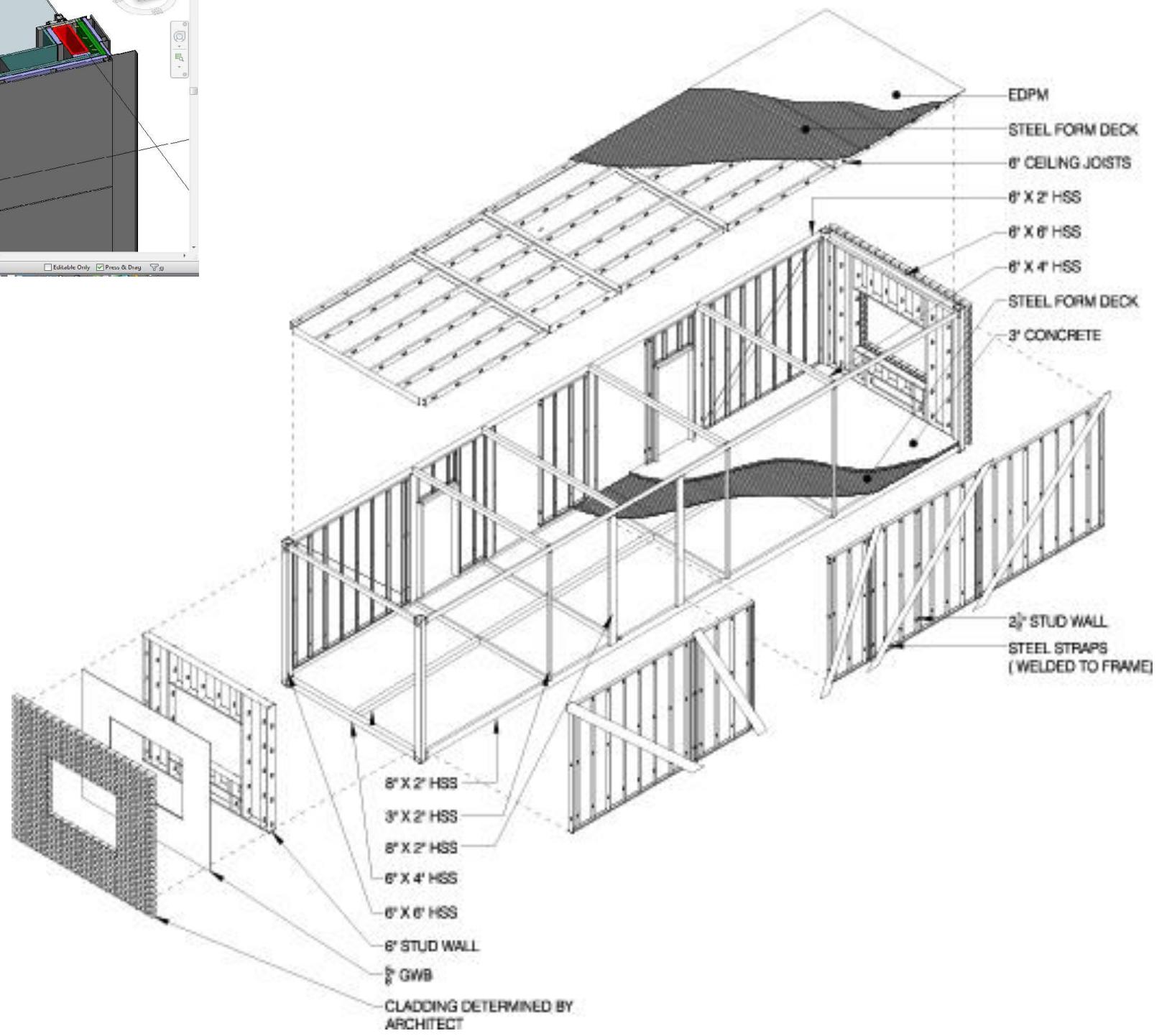
Contractor/Fabricator

Owner



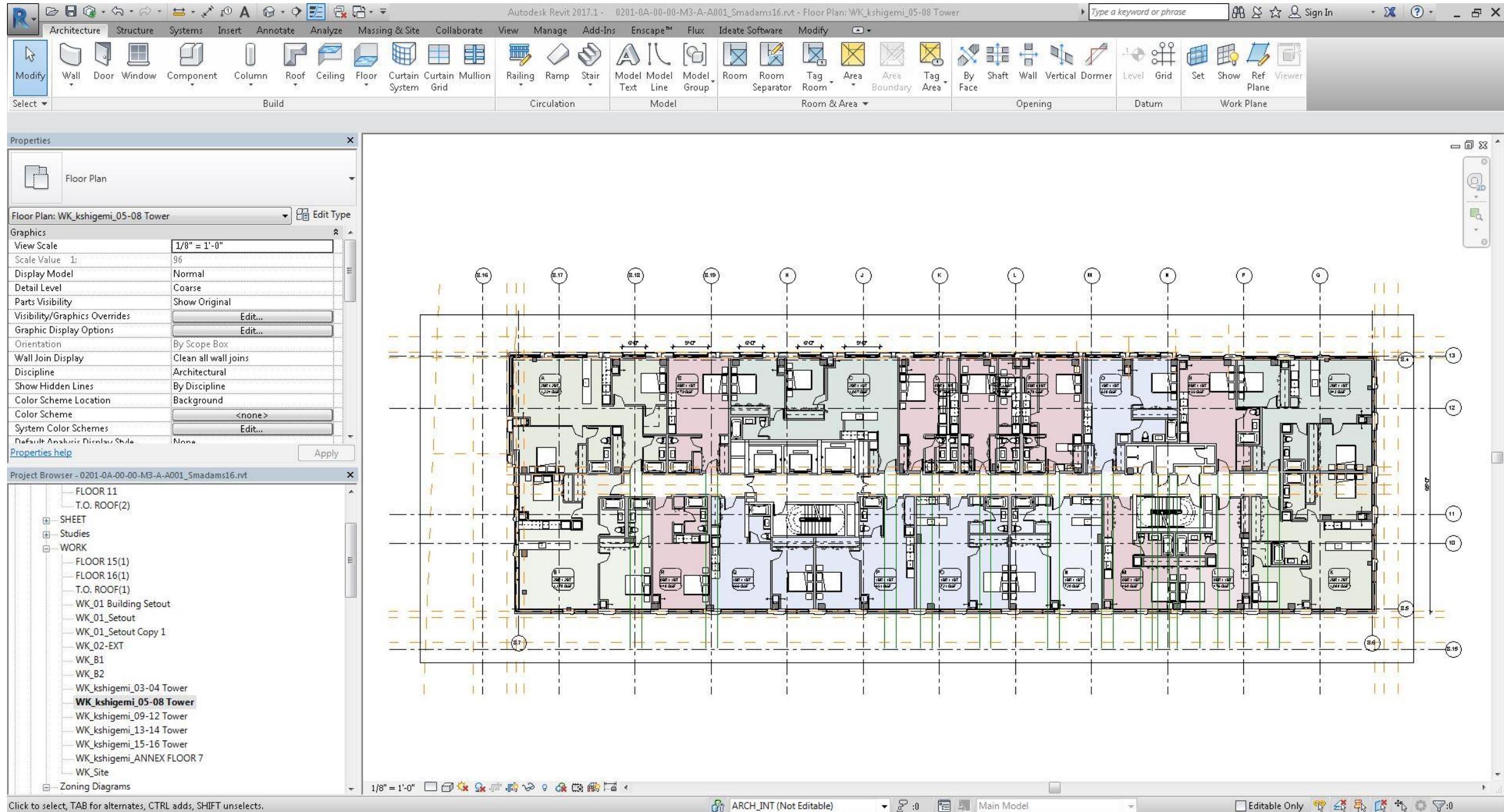


Fabrication Model



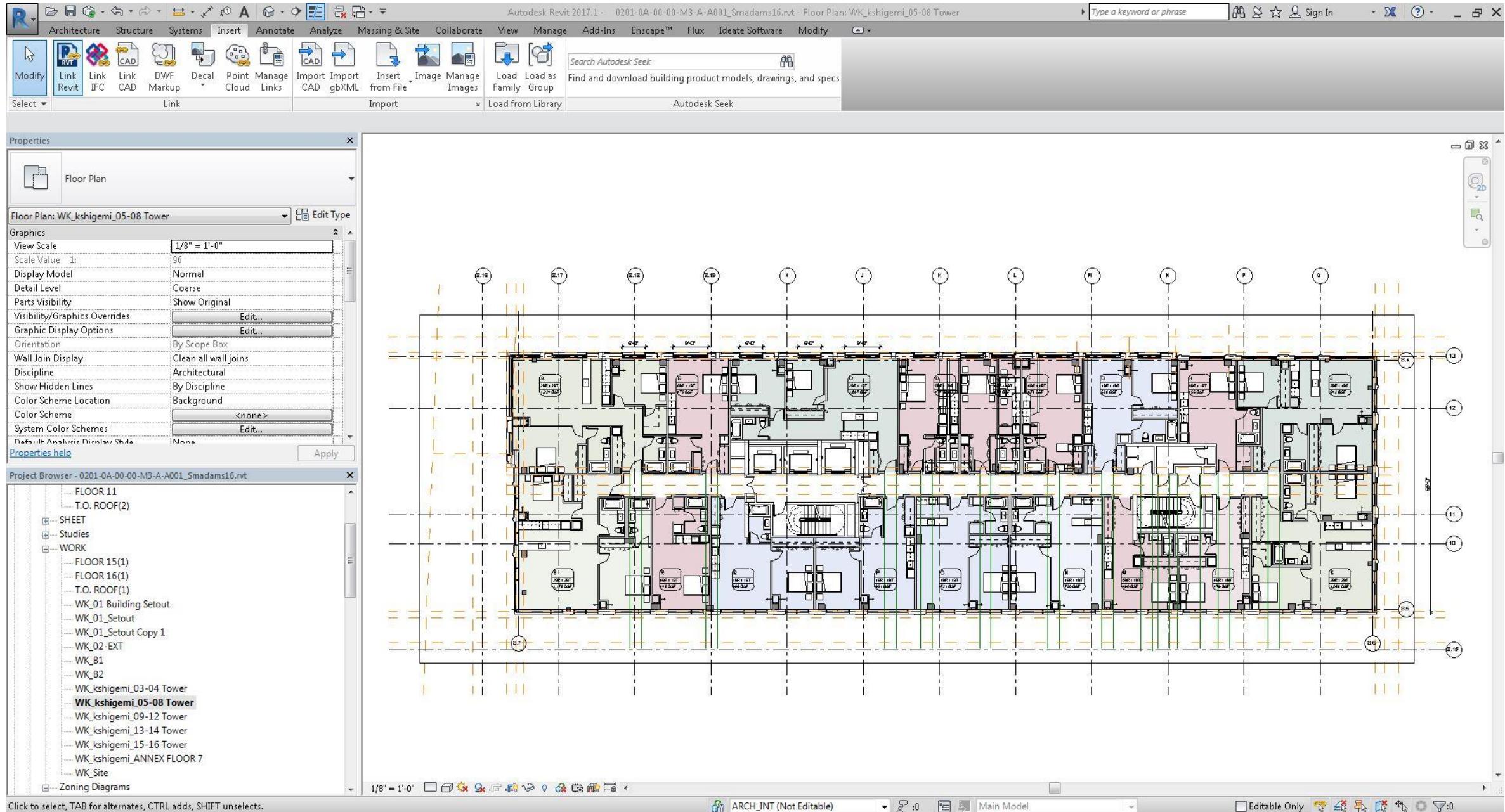
File Structure - Data Preparation

Grids



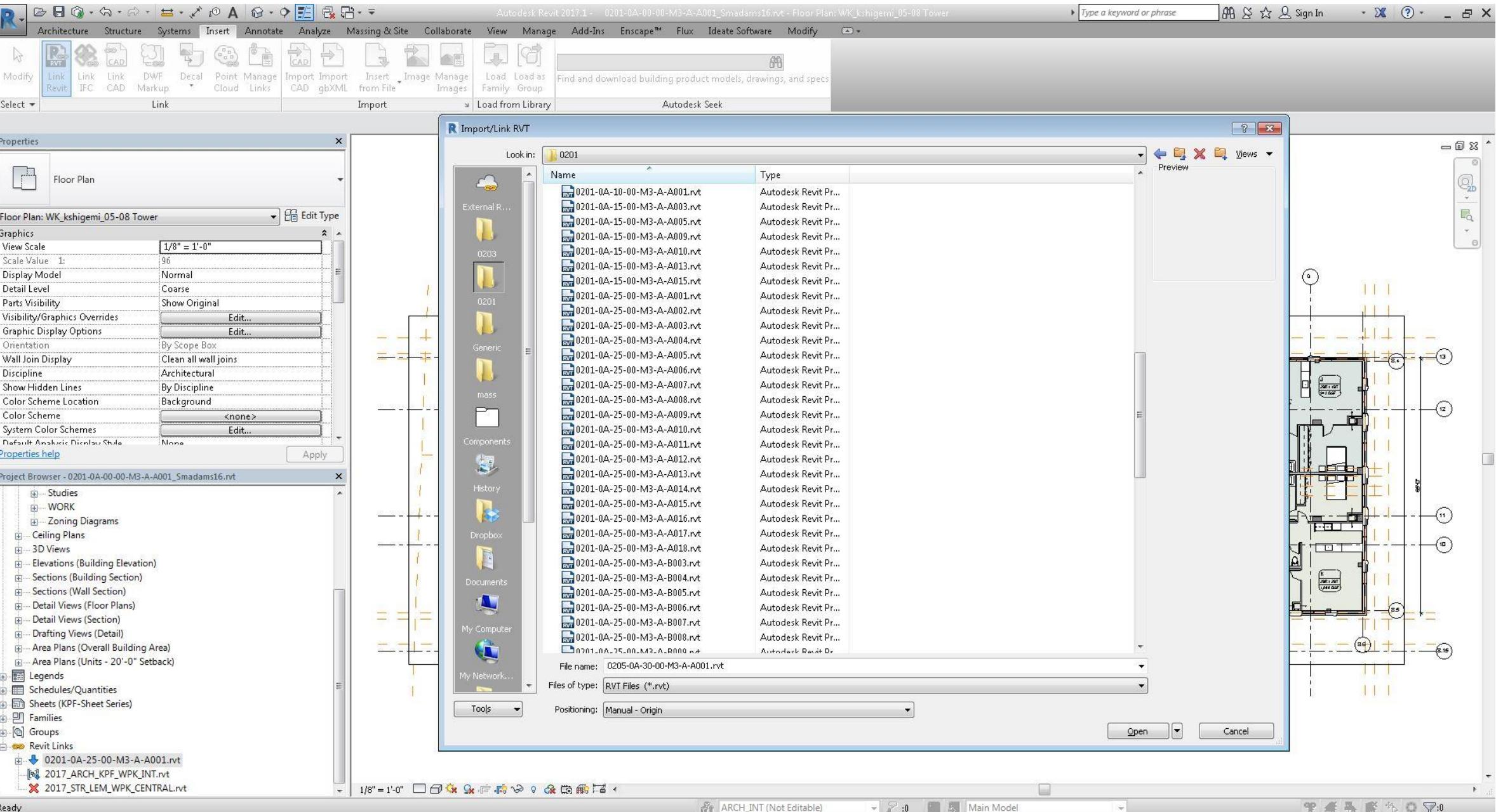
File Structure - Data Preparation

Grids



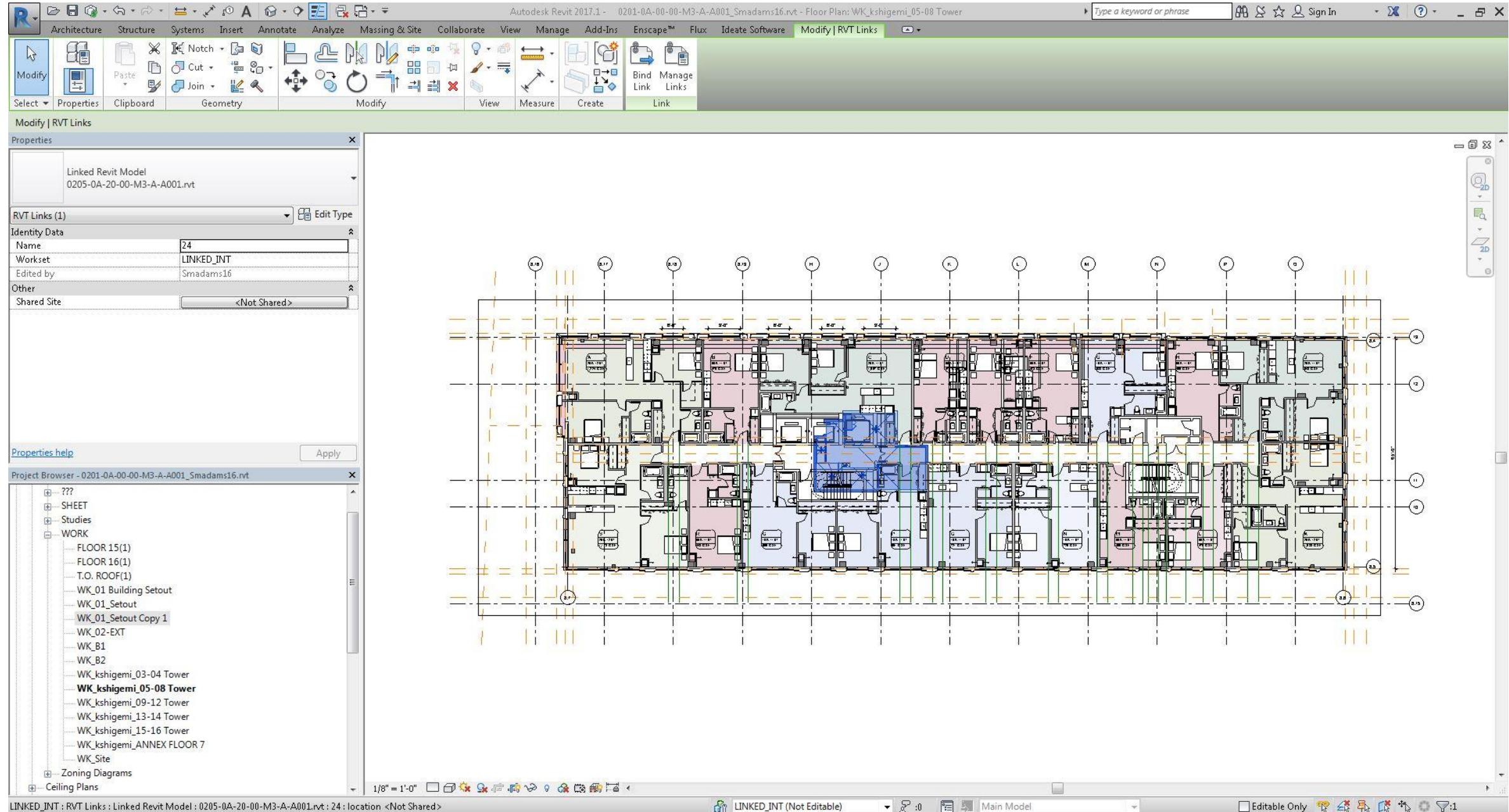
File Structure - Data Preparation

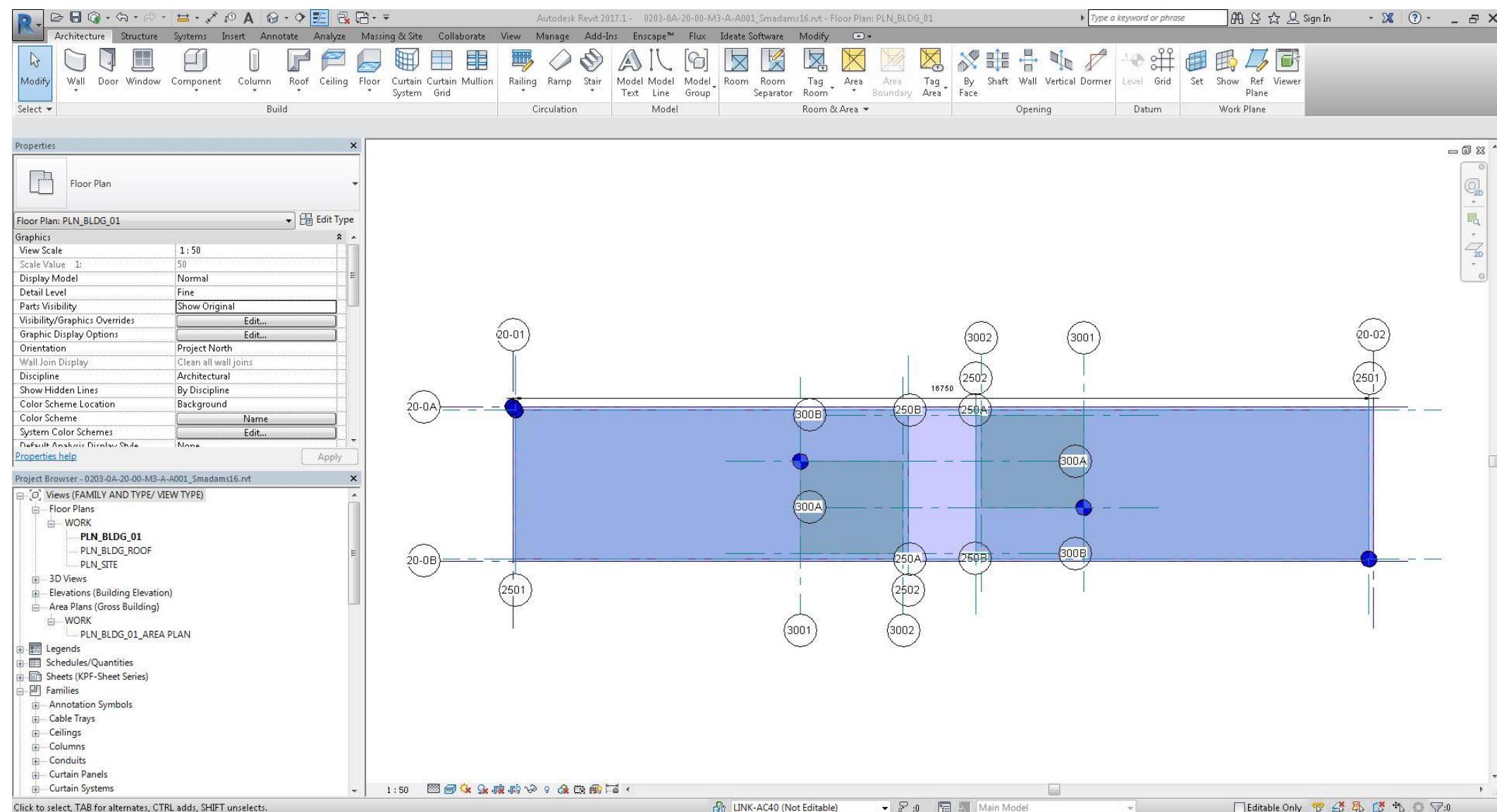
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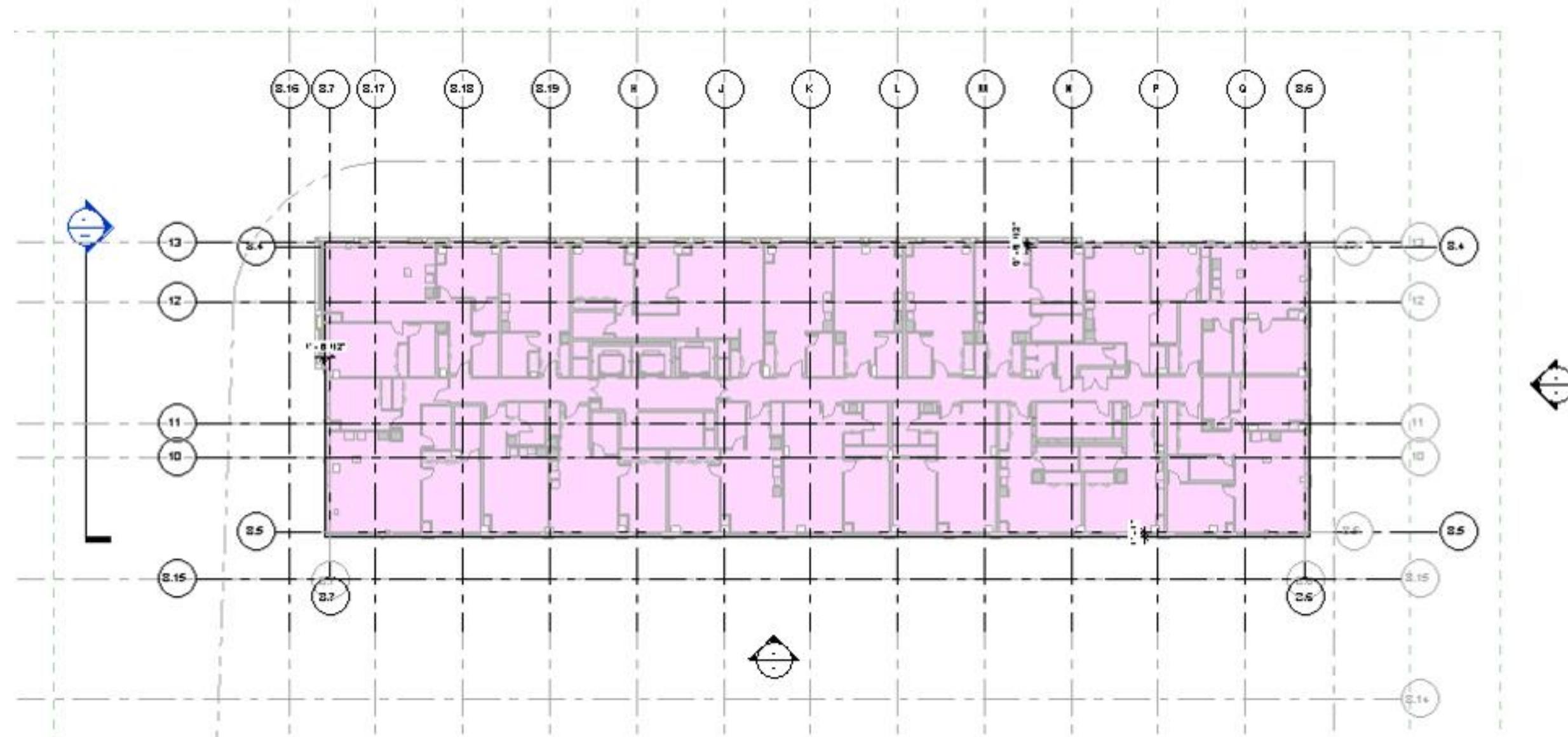


File Structure - Data Preparation

Grids

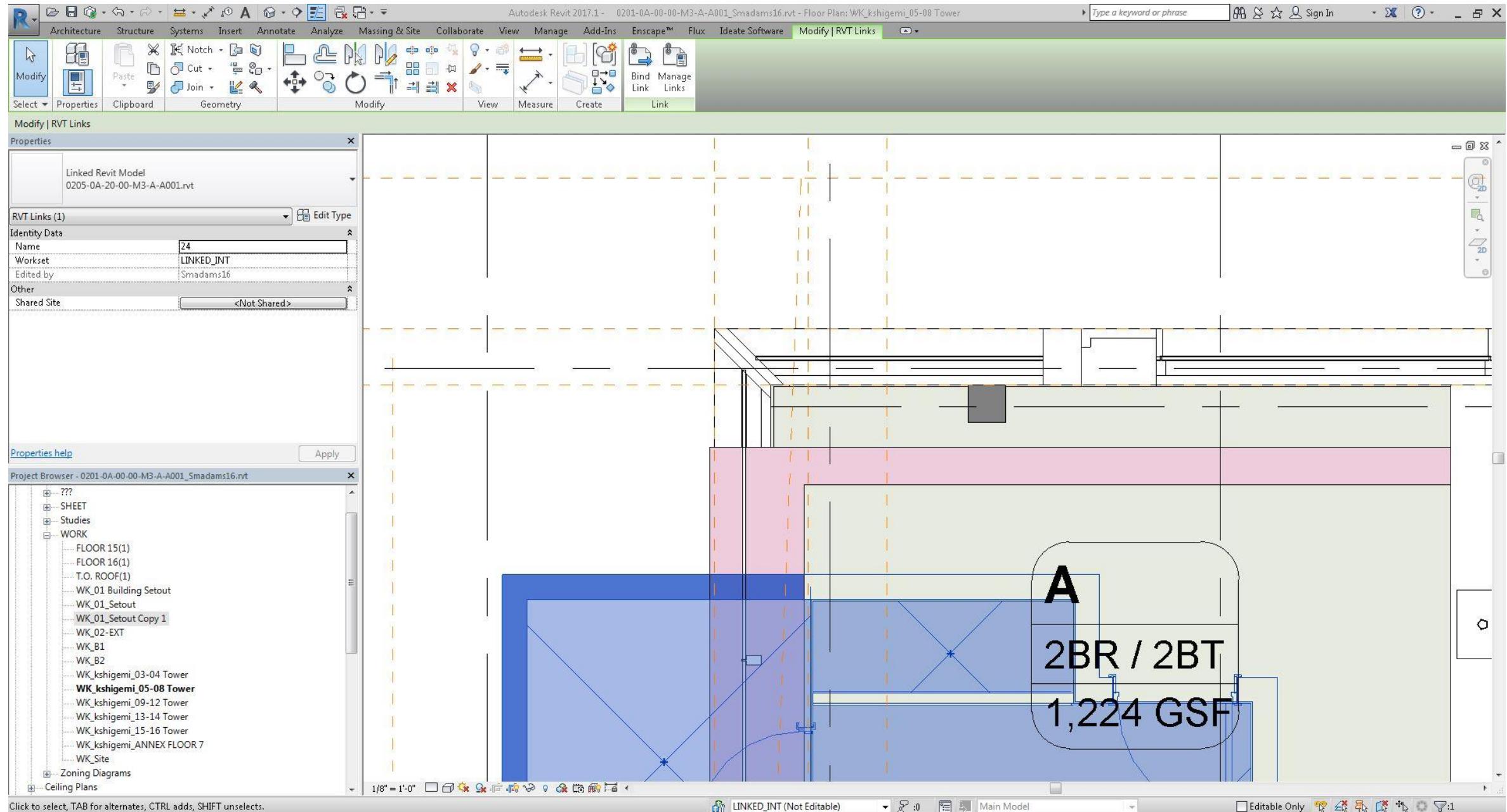






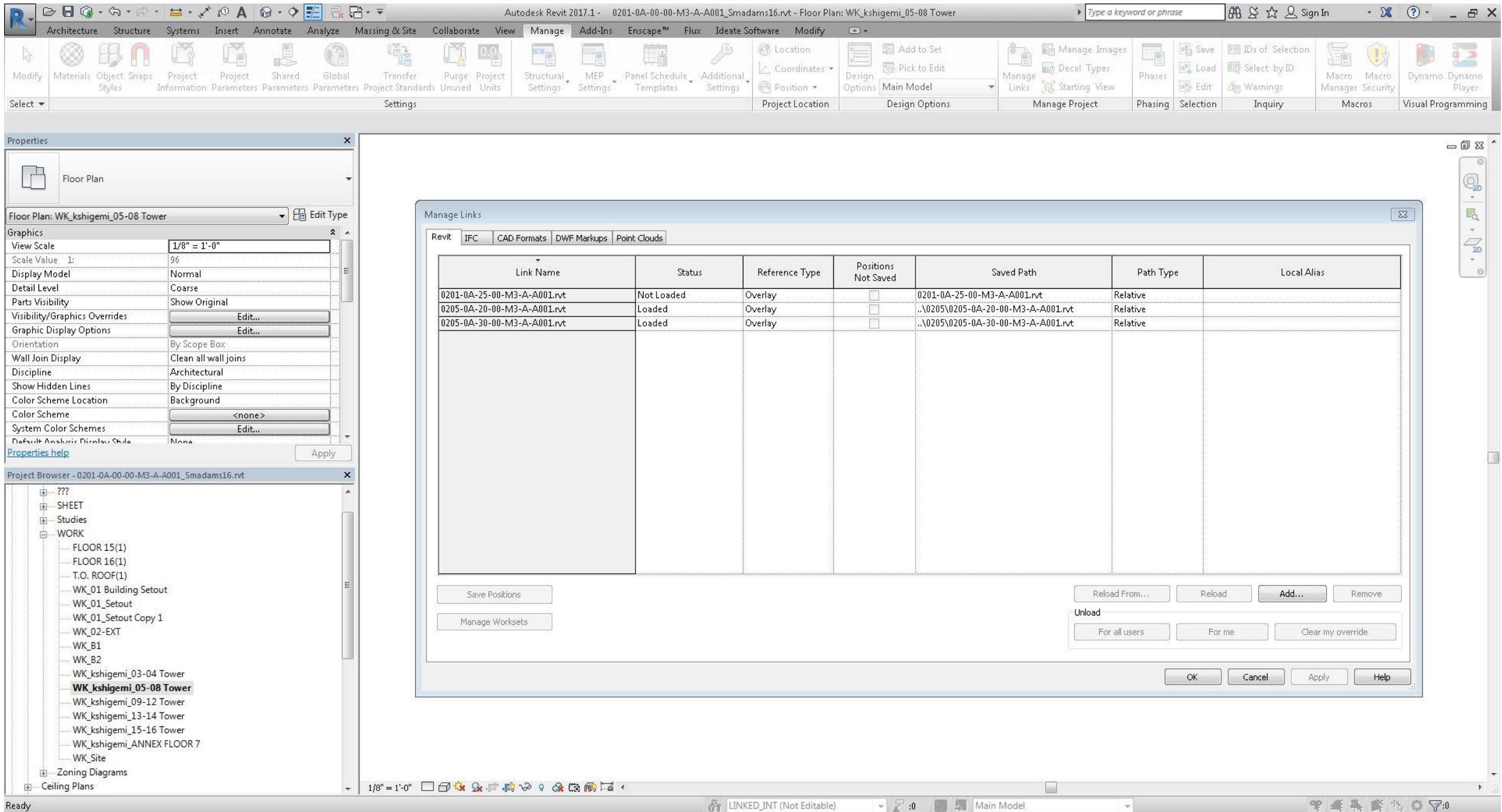
File Structure – Data Preparation

Grids



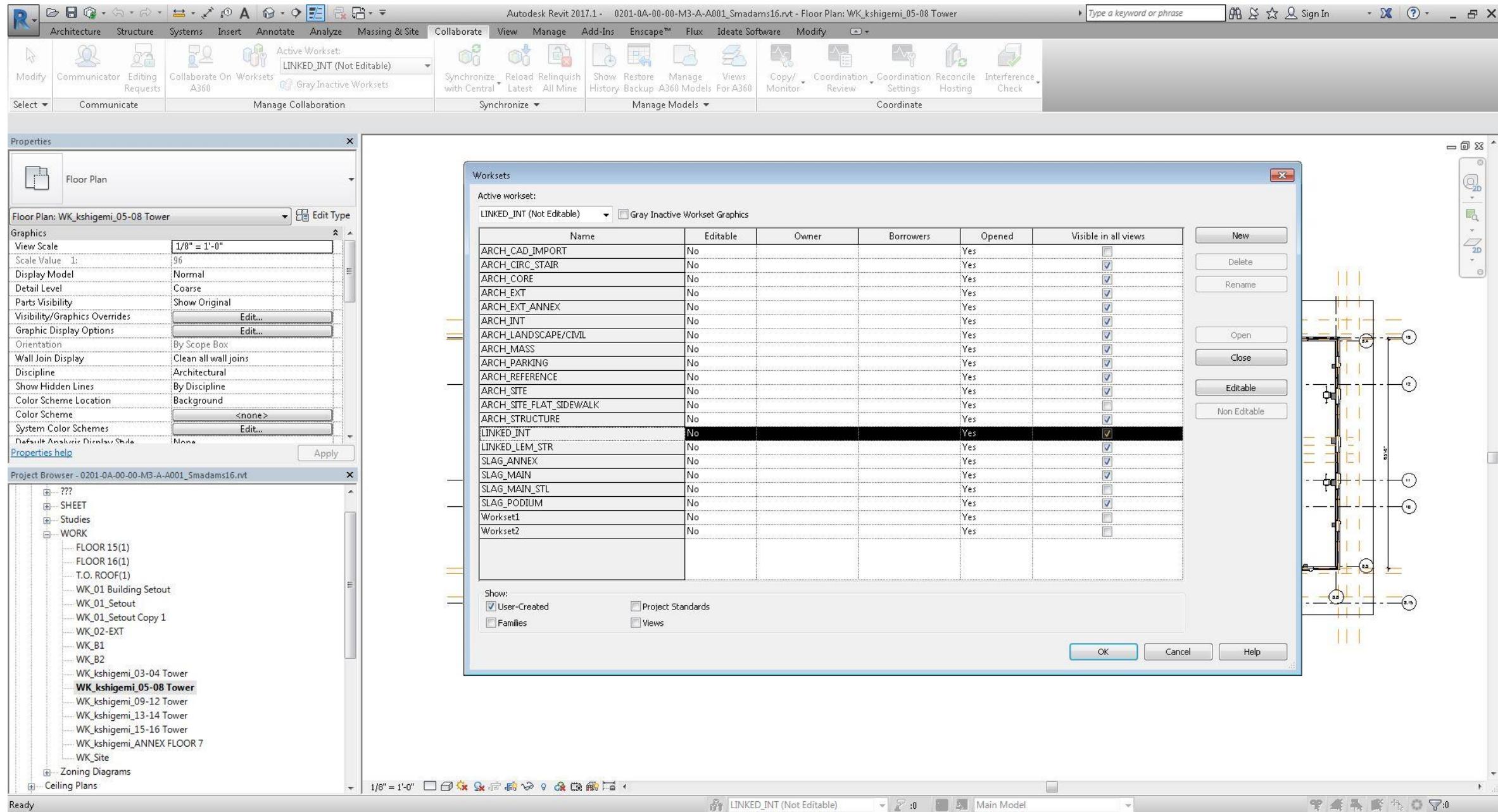
File Structure – Data Preparation

Links



File Structure – Data Preparation

Links/Worksets



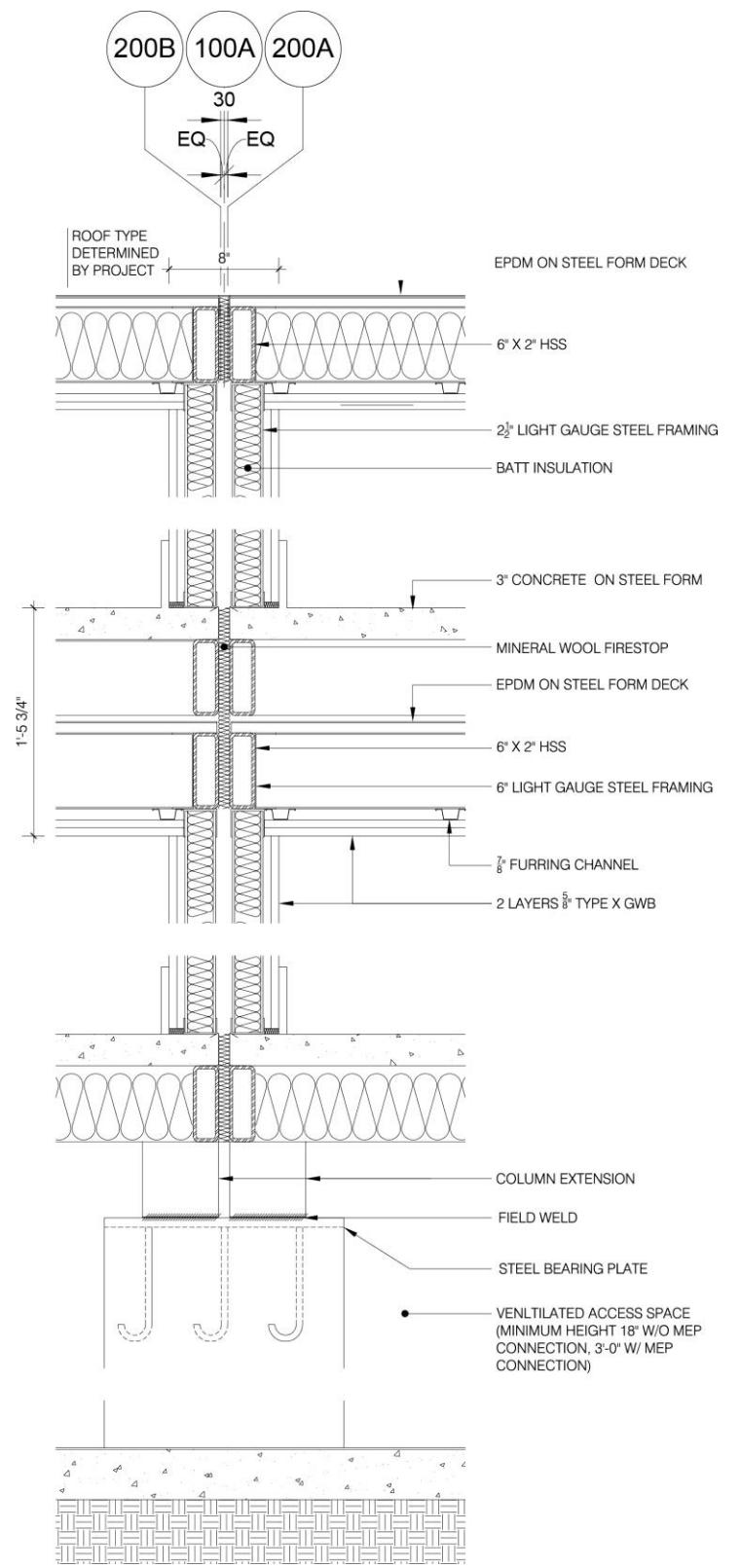
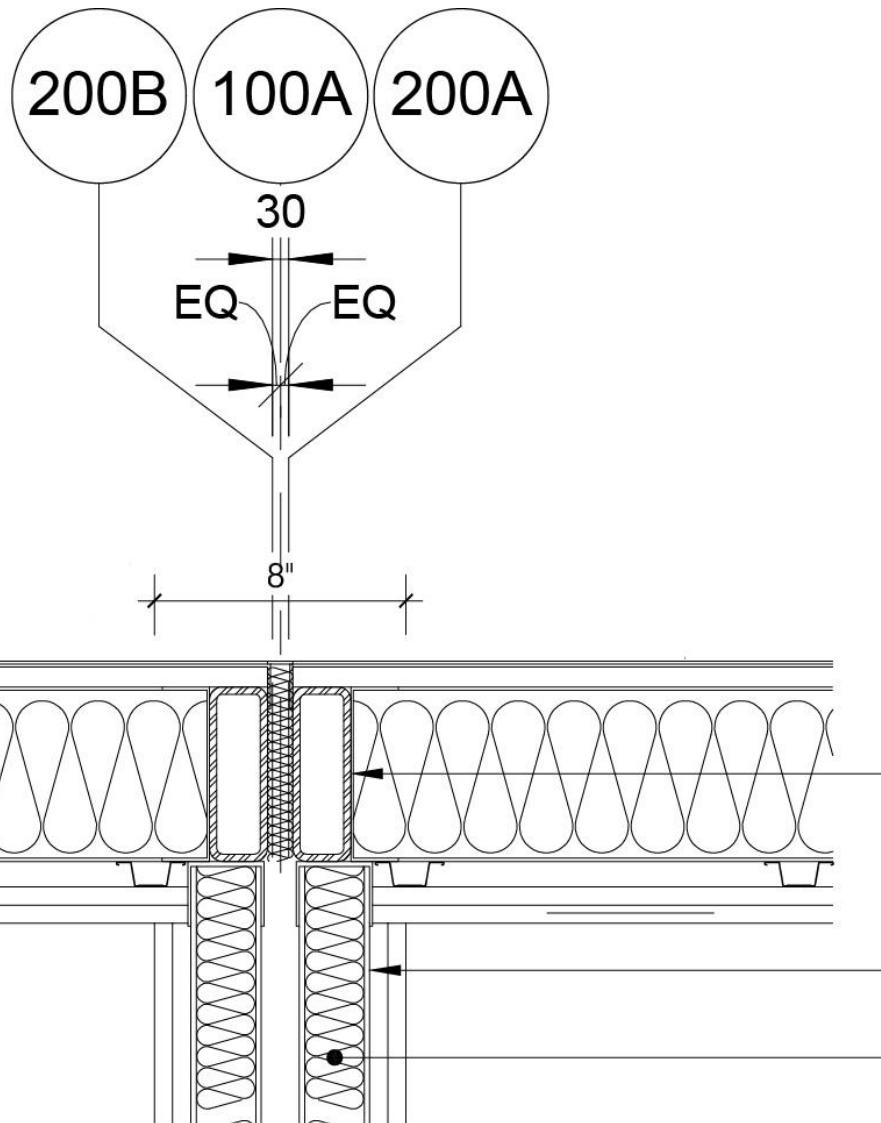
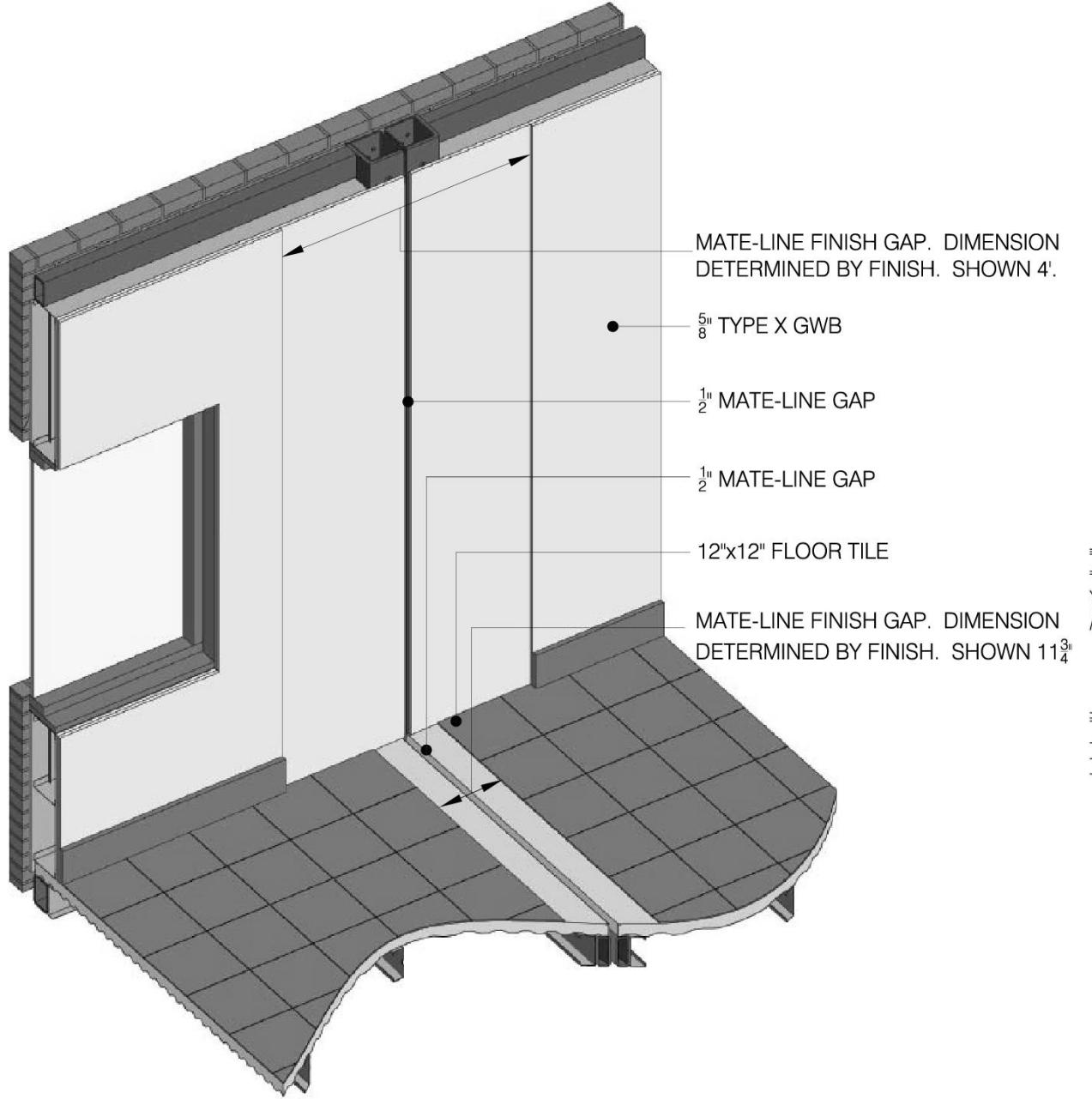
File Structure – Data Preparation

Worksets

ARCH_CAD_IMPORT
ARCH_CIRC_STAIR
ARCH_CORE
ARCH_EXT
ARCH_EXT_ANNEX
ARCH_INT
ARCH_LANDSCAPE/CIVIL
ARCH_MASS
ARCH_PARKING
ARCH_REFERENCE
ARCH_SITE
ARCH_SITE_FLAT_SIDEWALK
ARCH_STRUCTURE
LINKED_INT
LINKED_LEM_STR
SLAG_ANNEX
SLAG_MAIN
SLAG_MAIN_STL
SLAG_PODIUM
Workset1
Workset2

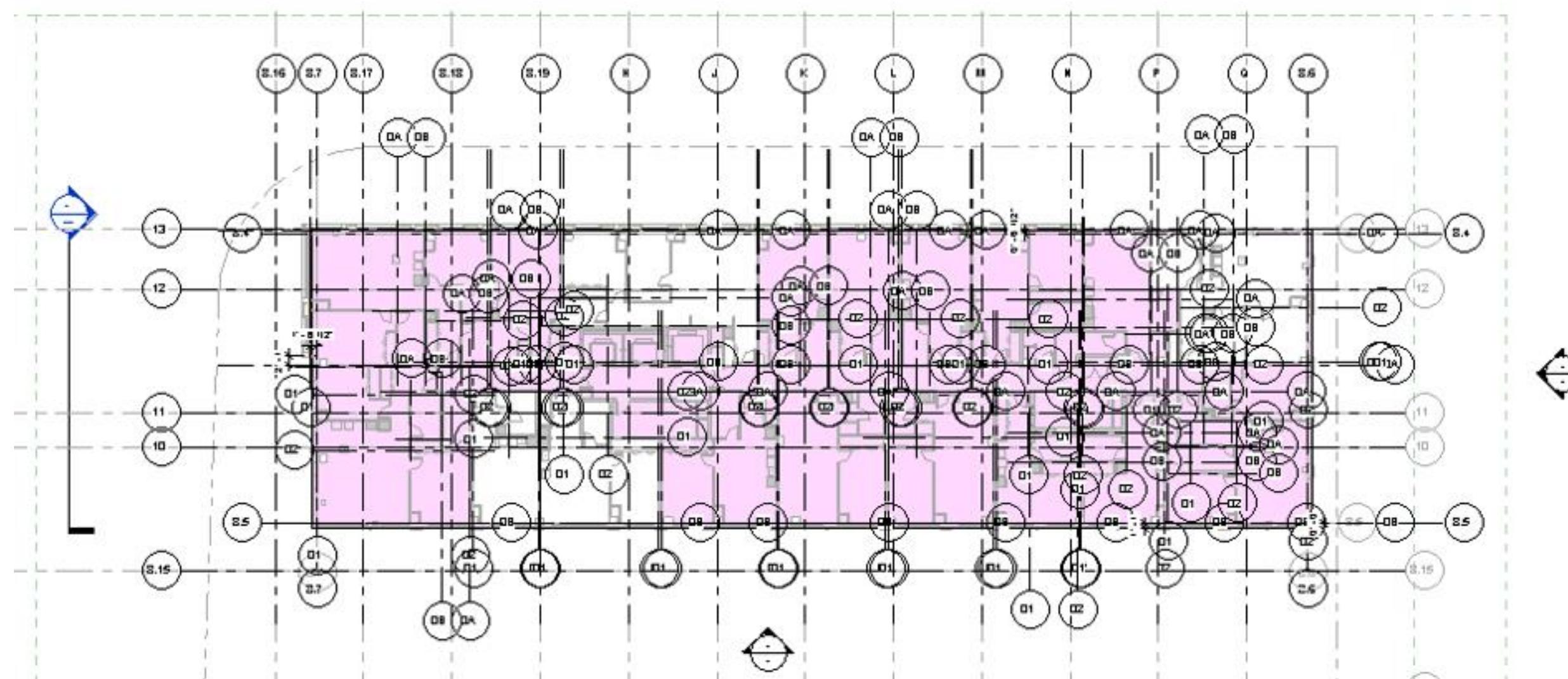
File Structure – Data Preparation

Grids



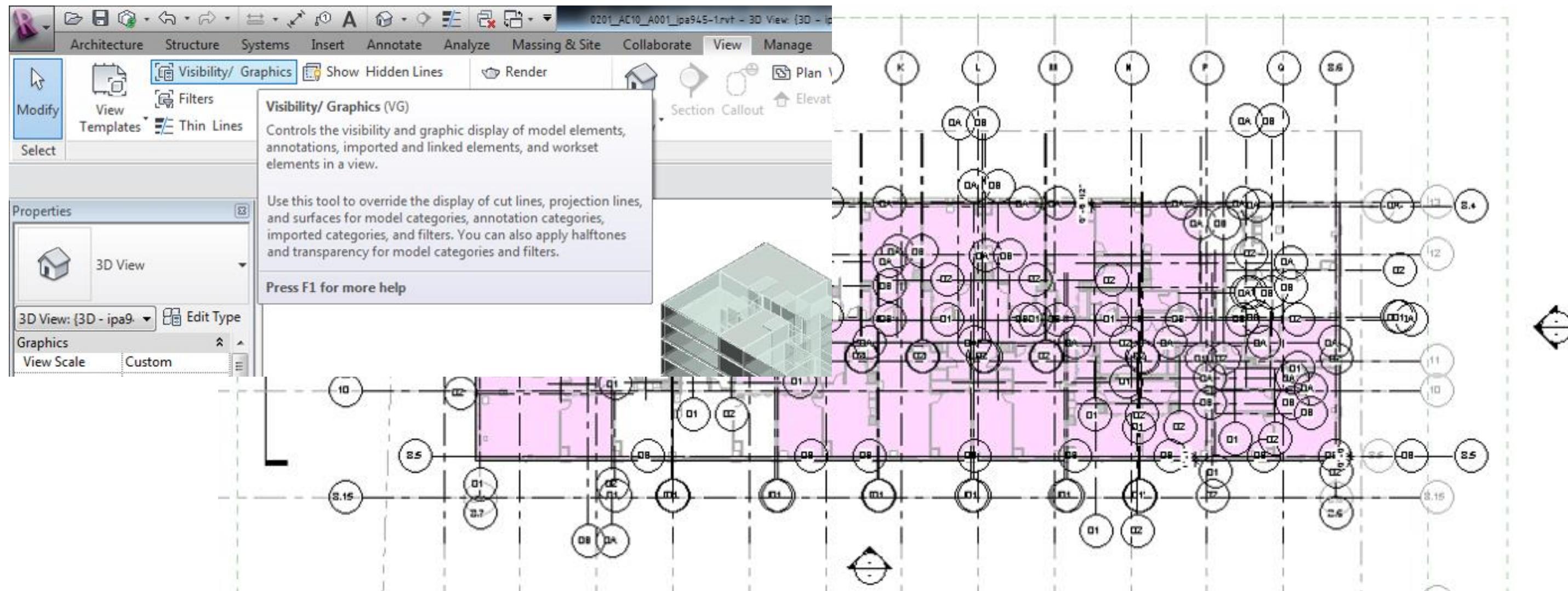
File Structure – Data Preparation

Grids



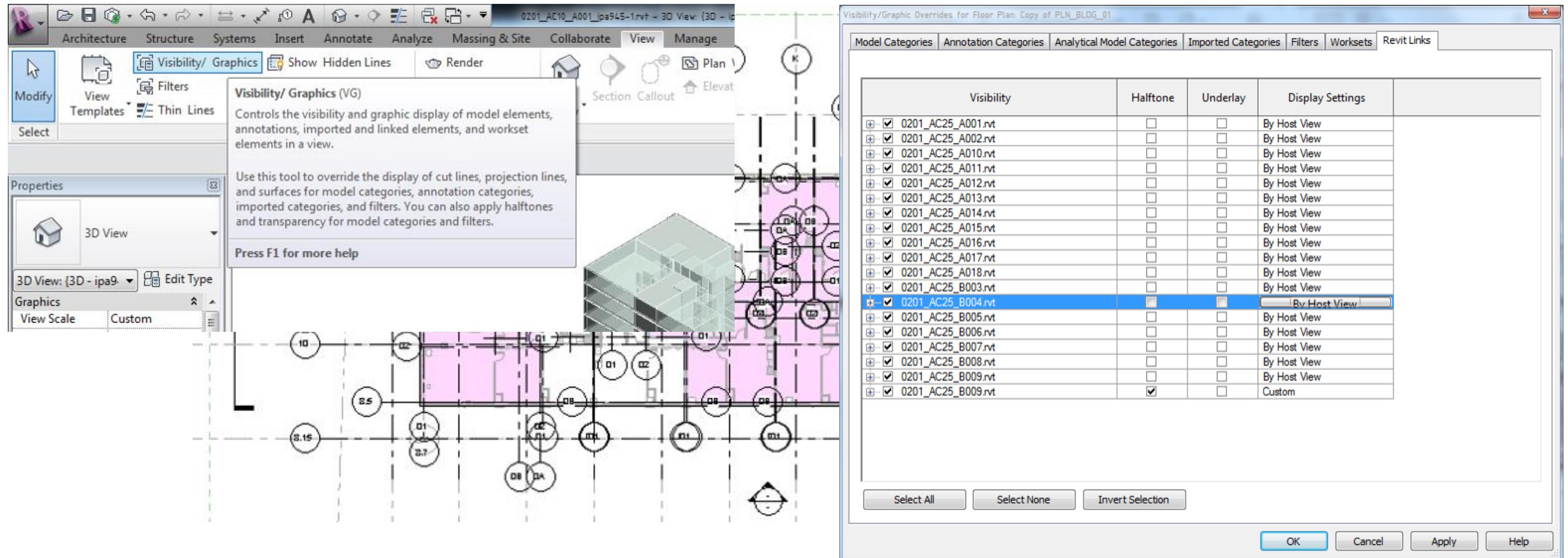
File Structure - Data Preparation

Grids



File Structure – Data Preparation

Grids



File Structure – Data Preparation

Grids

The screenshot displays two Revit dialog boxes and a floor plan view.

Left Dialog: RVT Link Display Settings

- Annotation categories:** <Custom>
- Show annotation categories in this view:**
- Filter list:** <show all>
- Visibility Grid:** A table where rows represent categories and columns represent display types (Lines, Patterns, Transparency, Cut, Halftone). The "Grids" row is selected (highlighted in blue) and has its "Halftone" checkbox checked.
- Buttons:** All, None, Invert, Expand All, OK, Cancel, Apply, Help.

Middle View: Floor Plan View

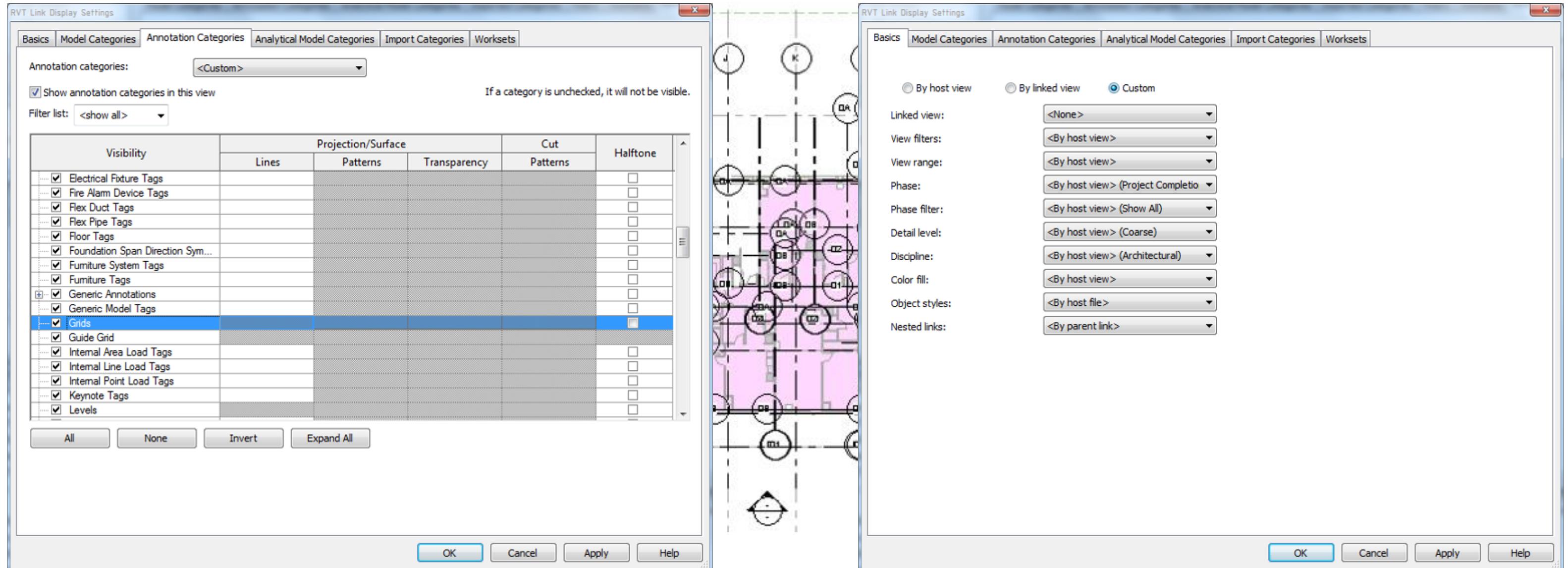
A floor plan view showing multiple vertical and horizontal grid lines. Some grid lines are highlighted in pink, corresponding to the selected "Grids" category in the visibility settings.

Right Dialog: Visibility/Graphic Overrides for Floor Plan: Copy of PLN_BLDG_01

- Model Categories:** Annotation Categories, Analytical Model Categories, Imported Categories, Filters, Worksets, Revit Links.
- Table:** A grid of visibility overrides for various model categories. The "0201_AC25_B004.rvt" row is selected (highlighted in blue) and has its "Underlay" checkbox checked.
- Buttons:** Select All, Select None, Invert Selection, OK, Cancel, Apply, Help.

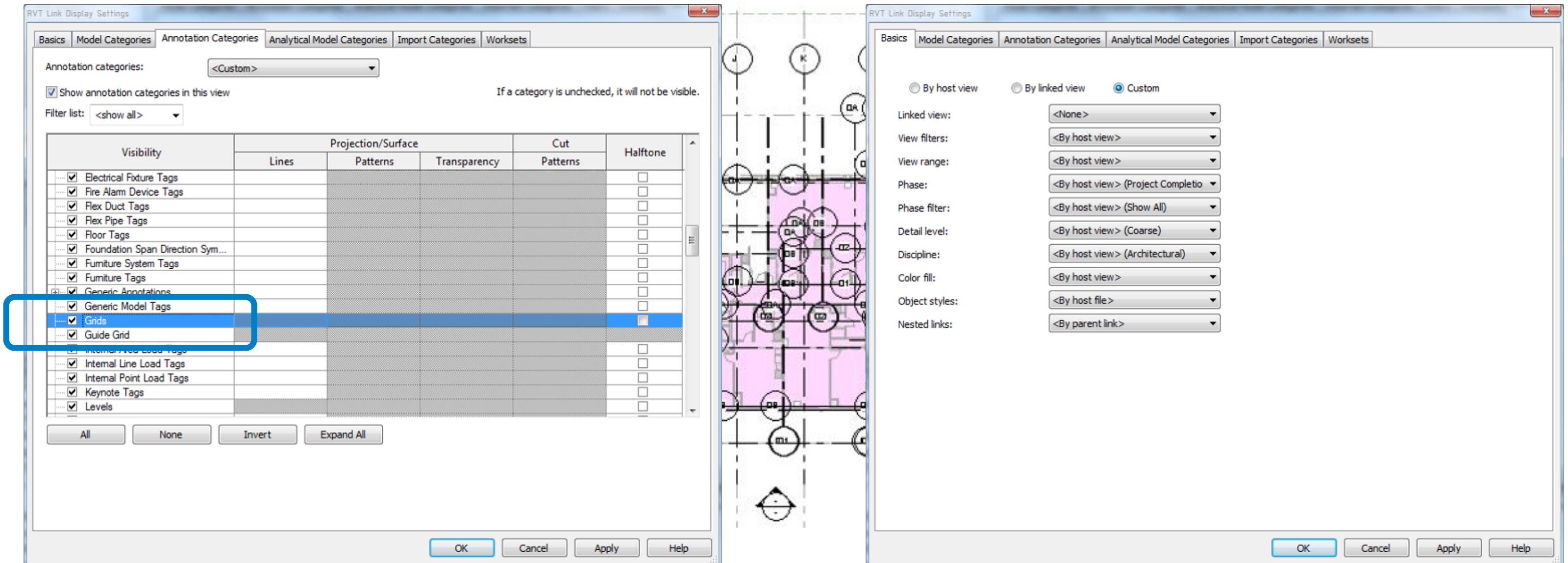
File Structure – Data Preparation

Grids



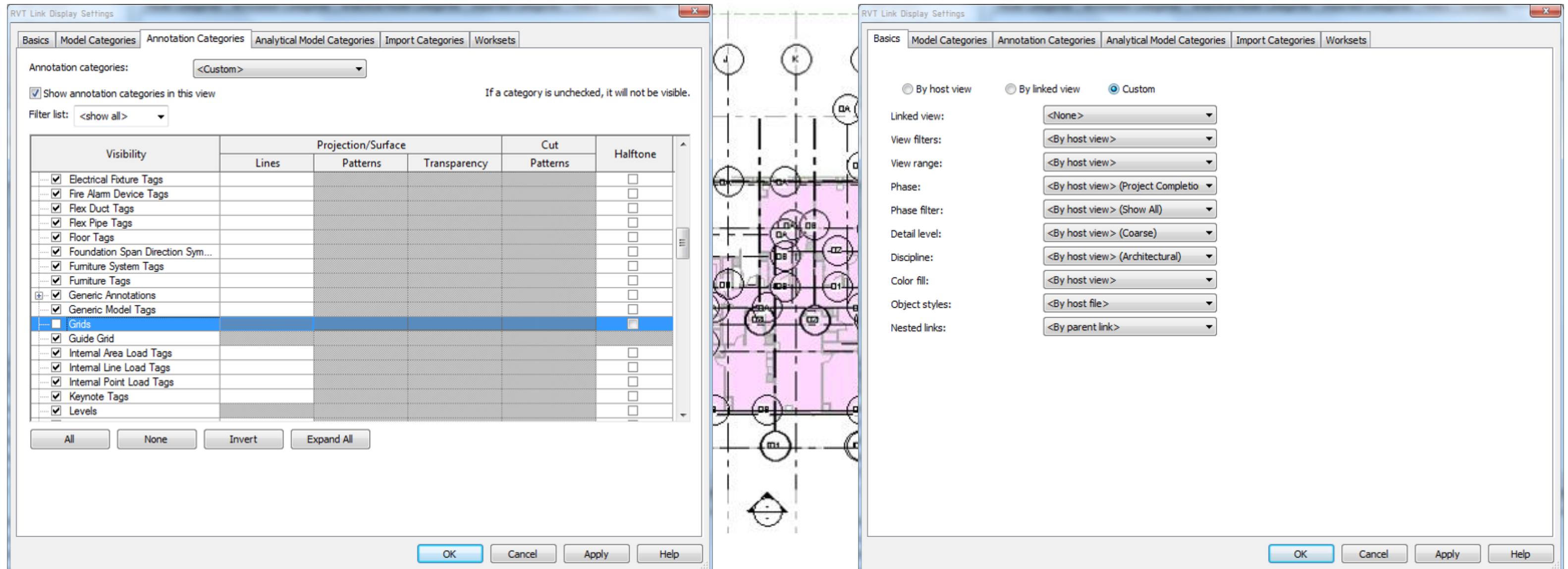
File Structure – Data Preparation

Grids



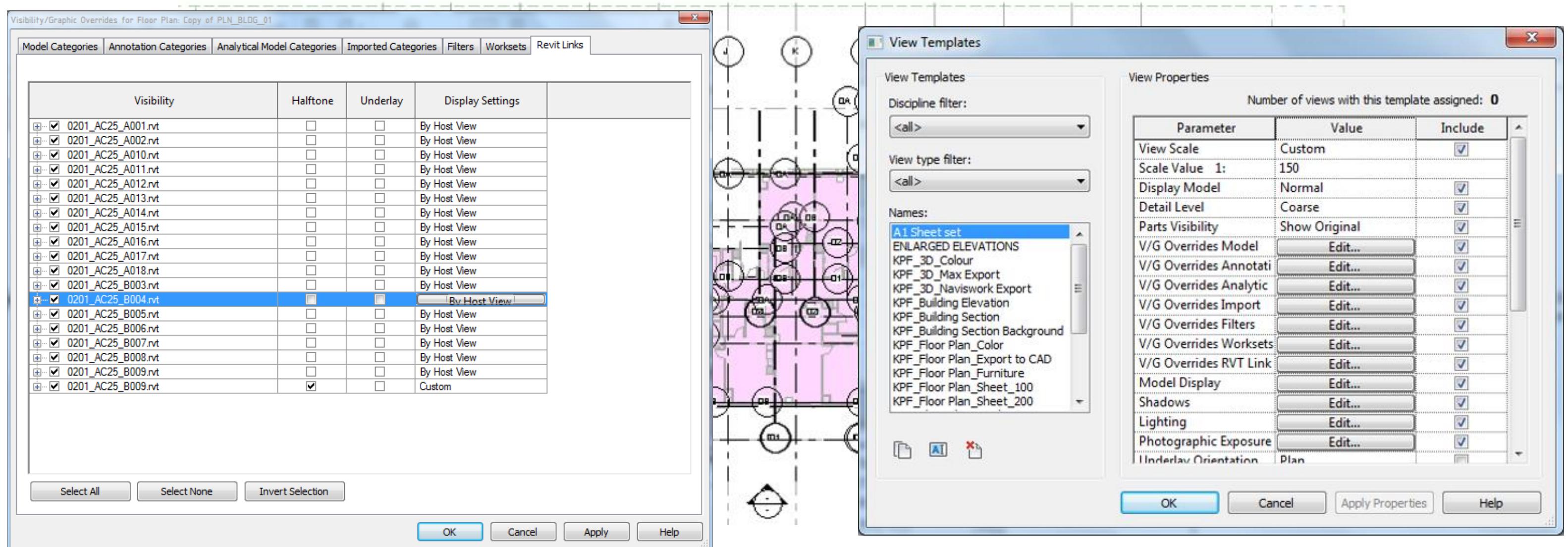
File Structure – Data Preparation

Grids



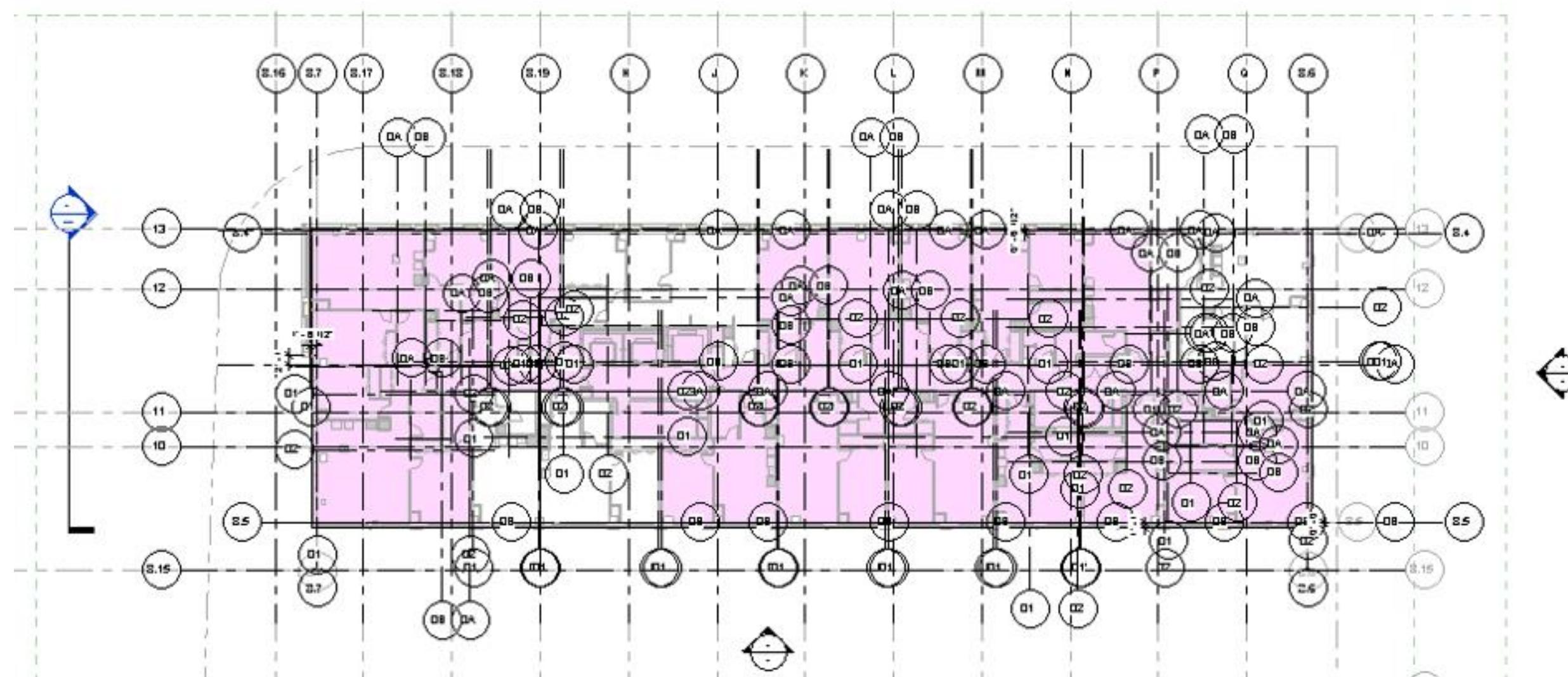
File Structure – Data Preparation

Grids



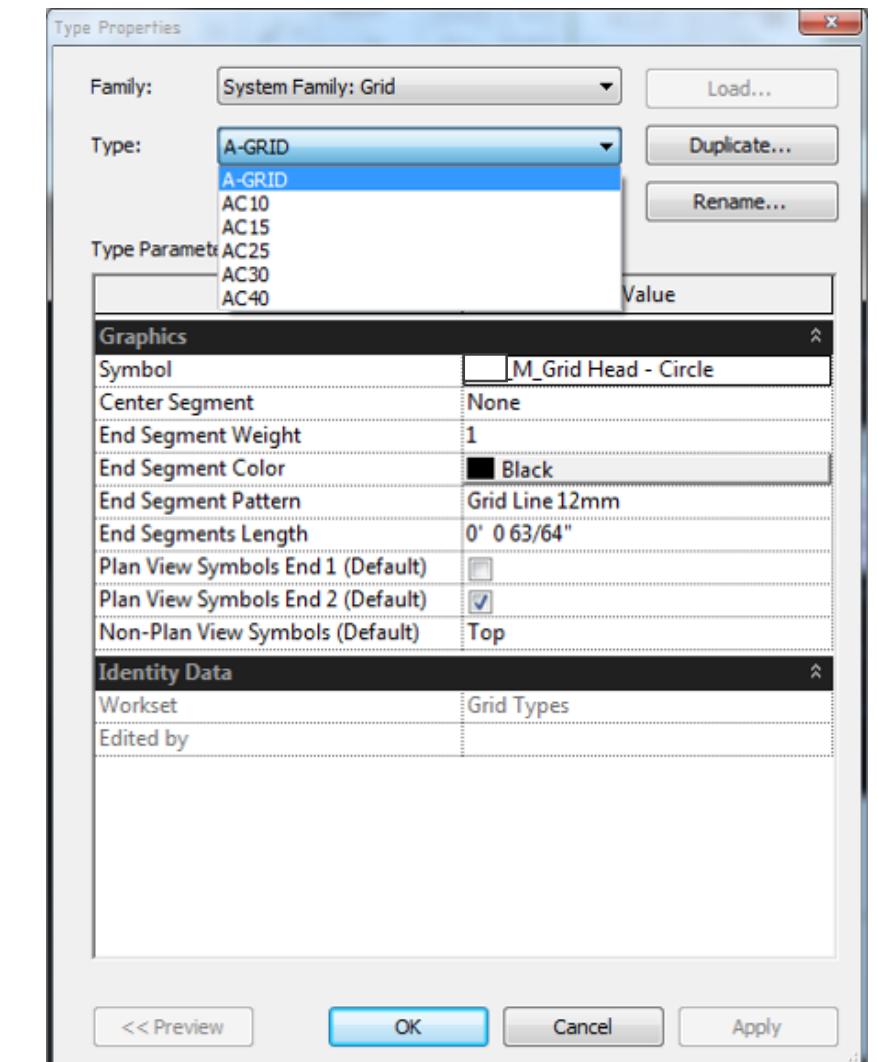
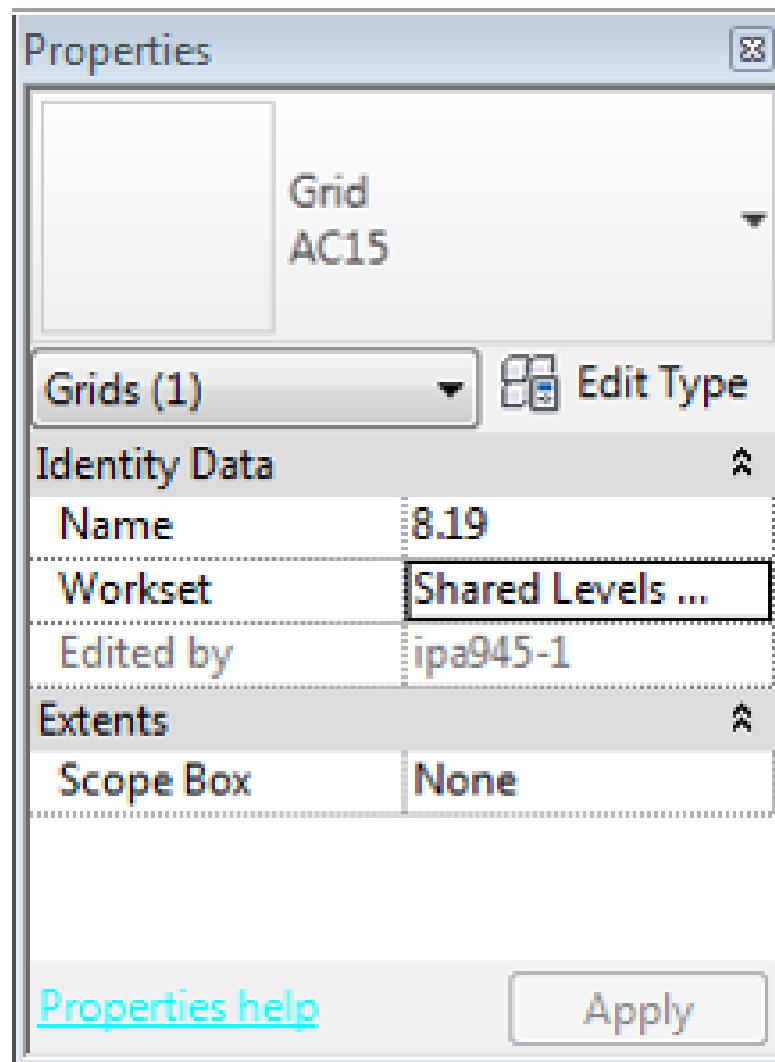
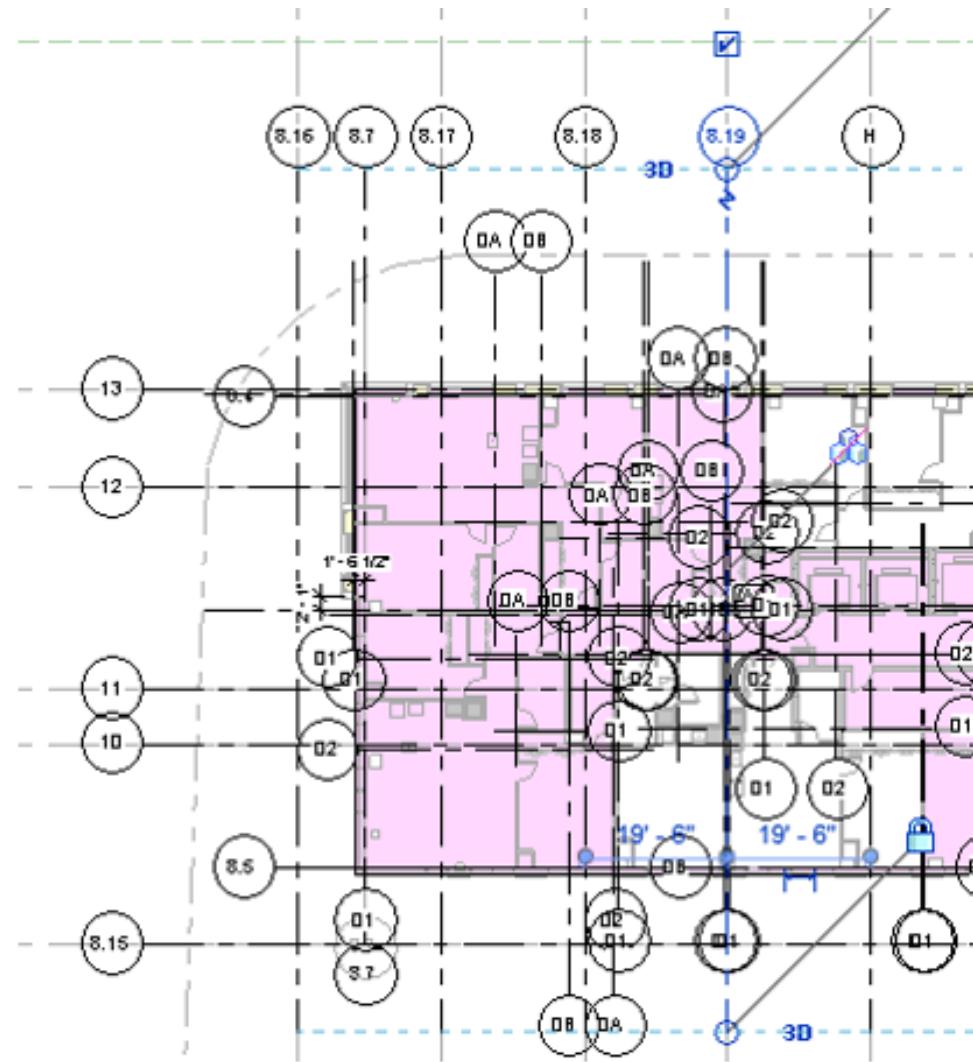
File Structure – Data Preparation

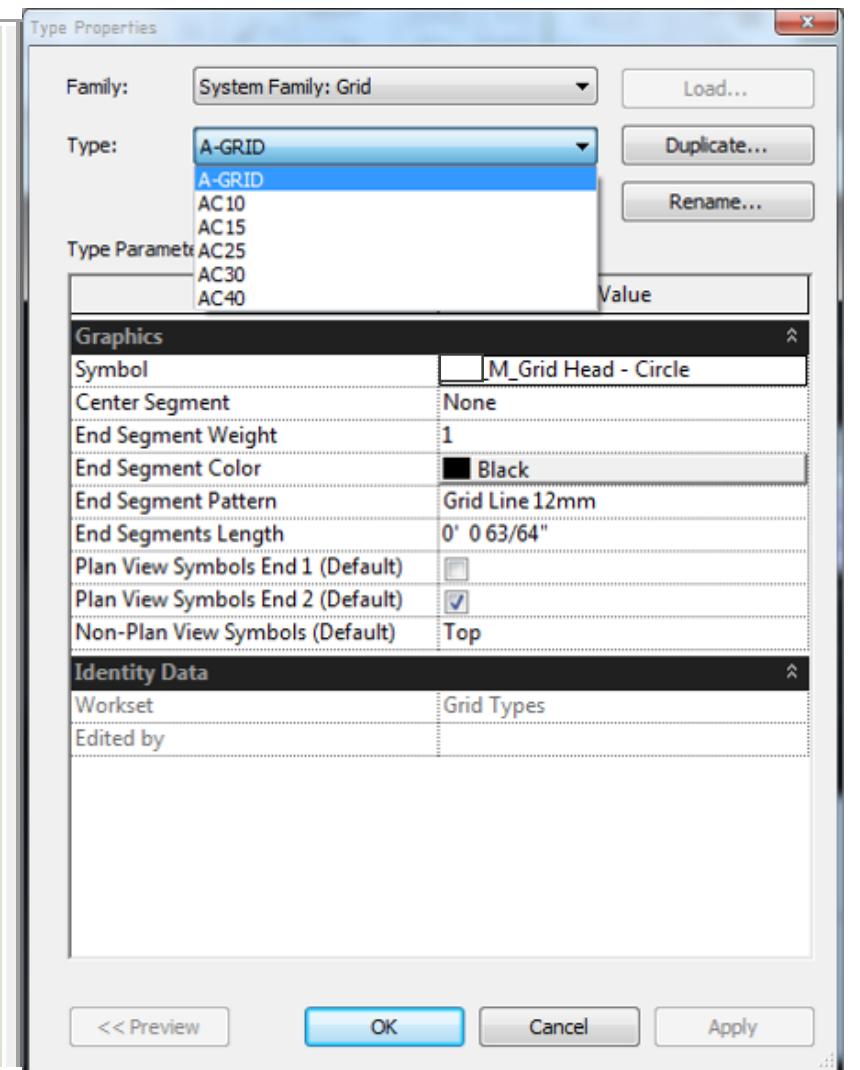
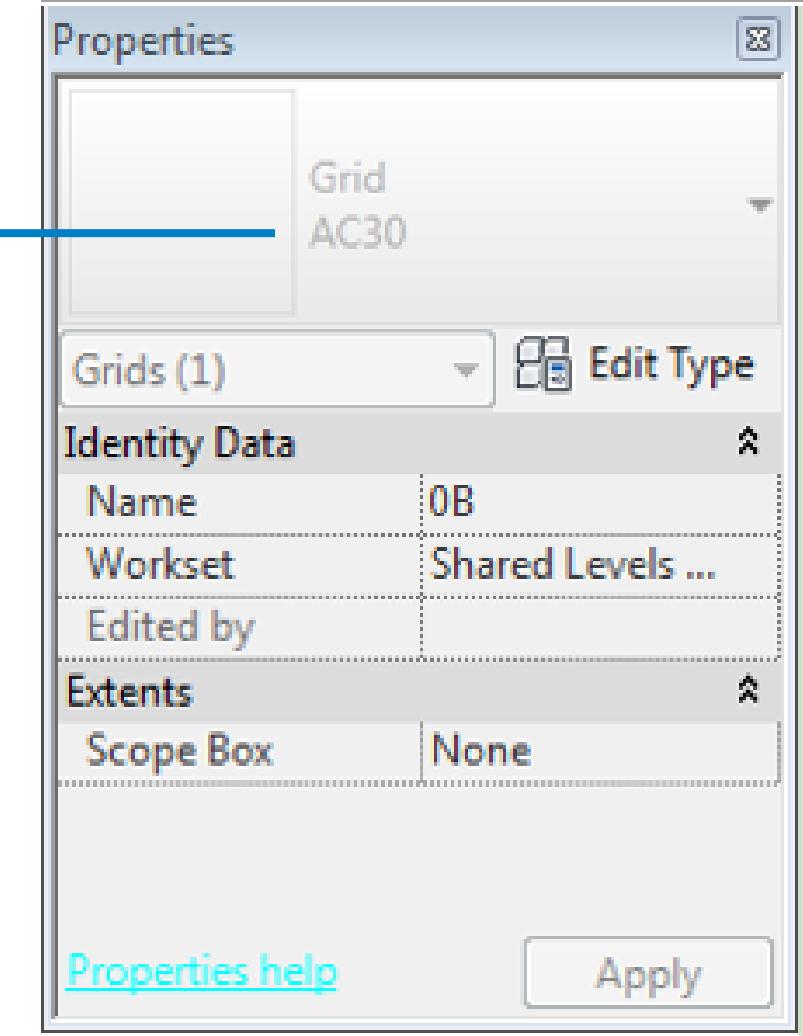
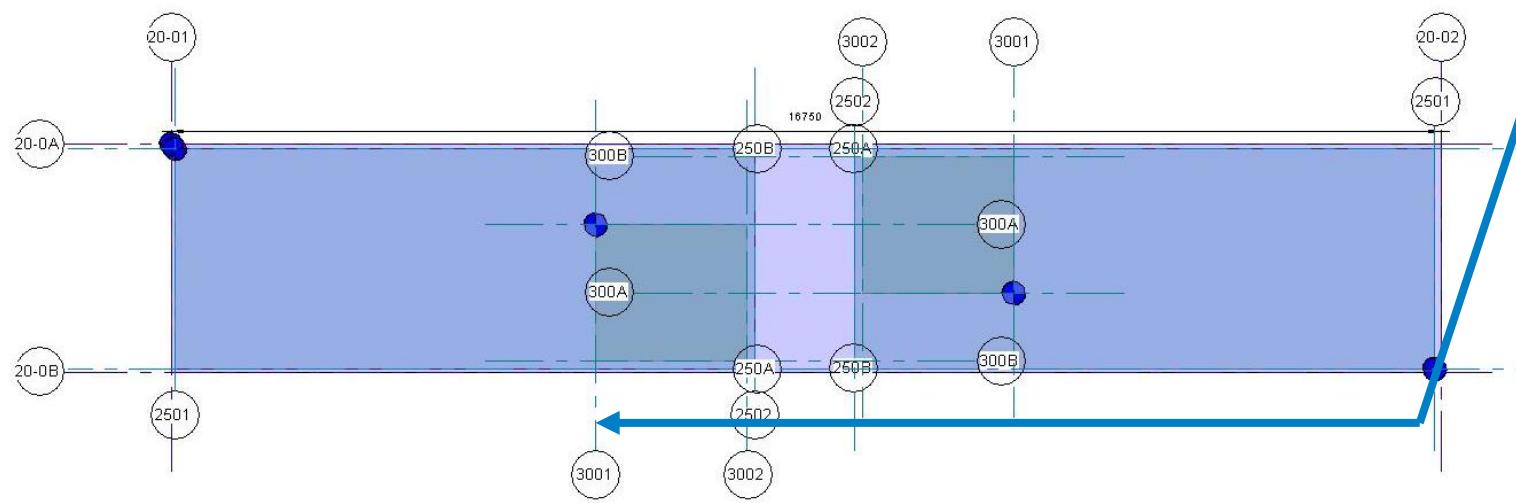
Grids

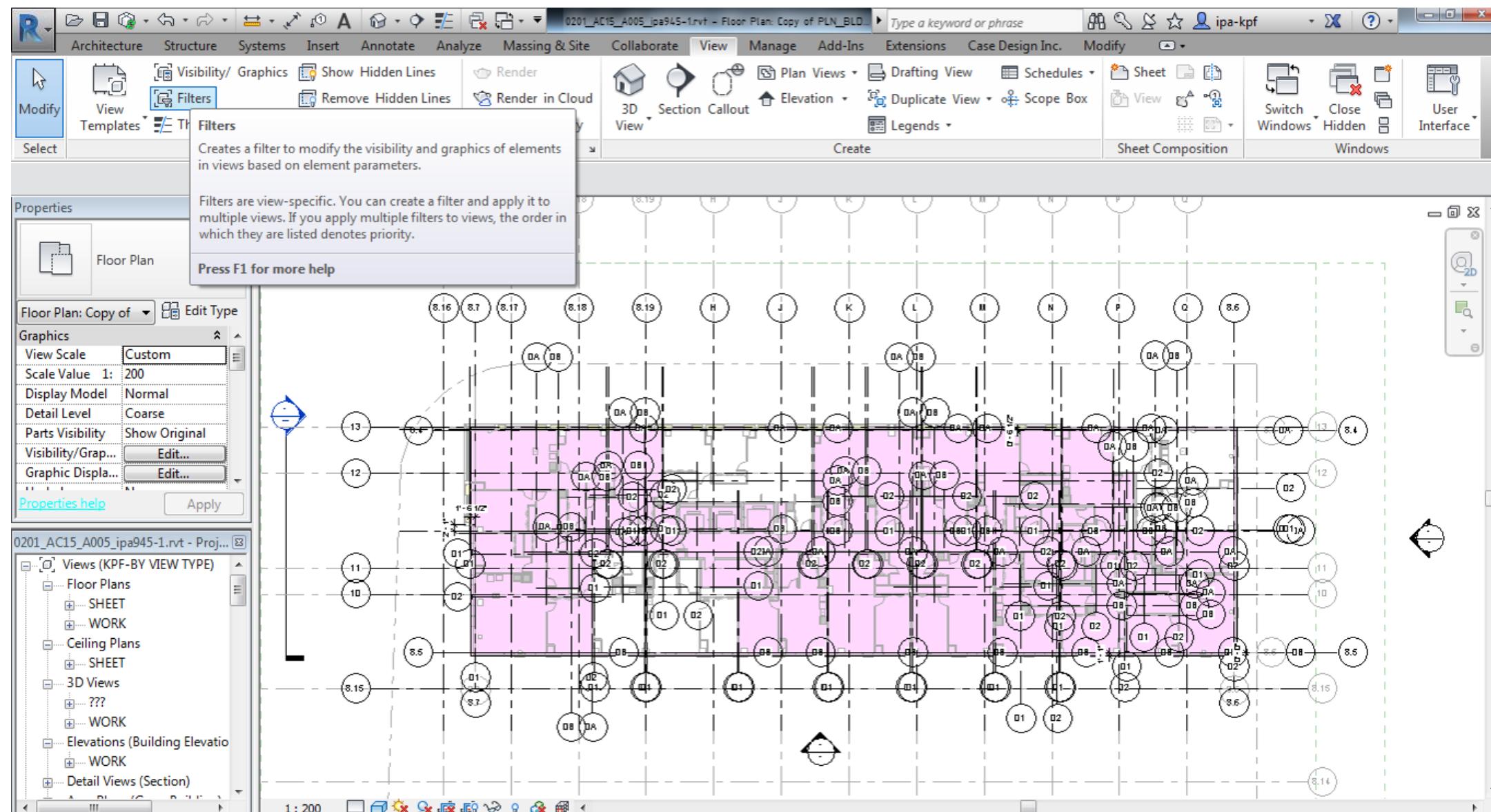


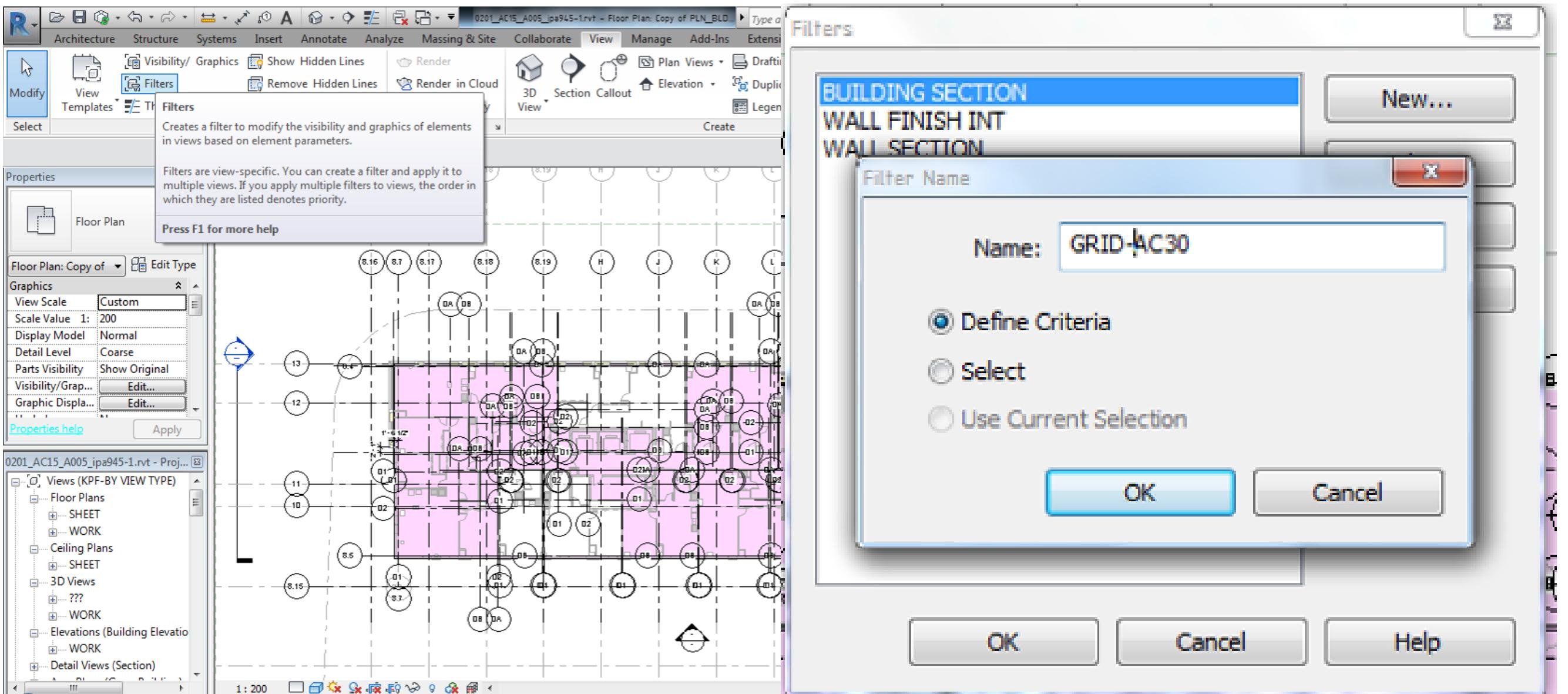
File Structure – Data Preparation

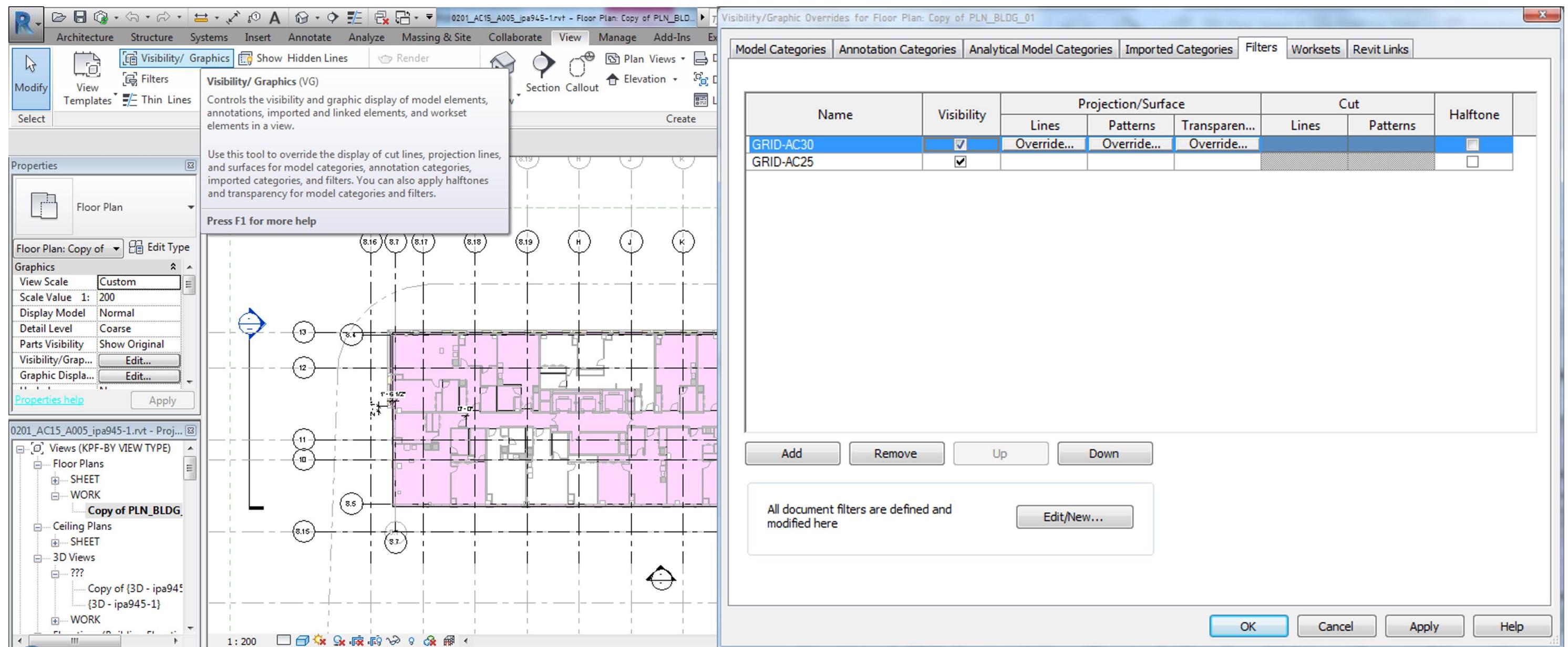
Grids - Filters

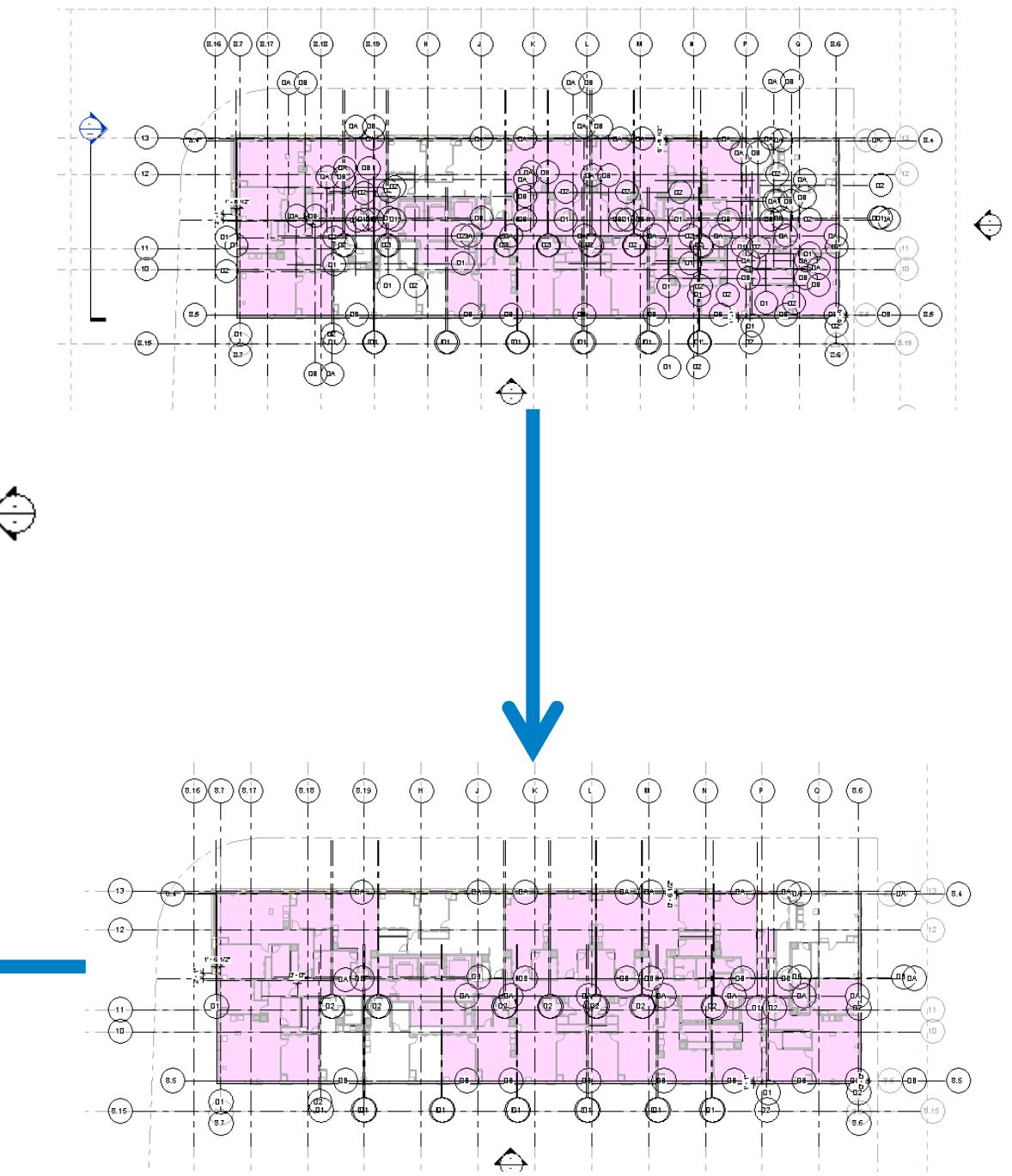
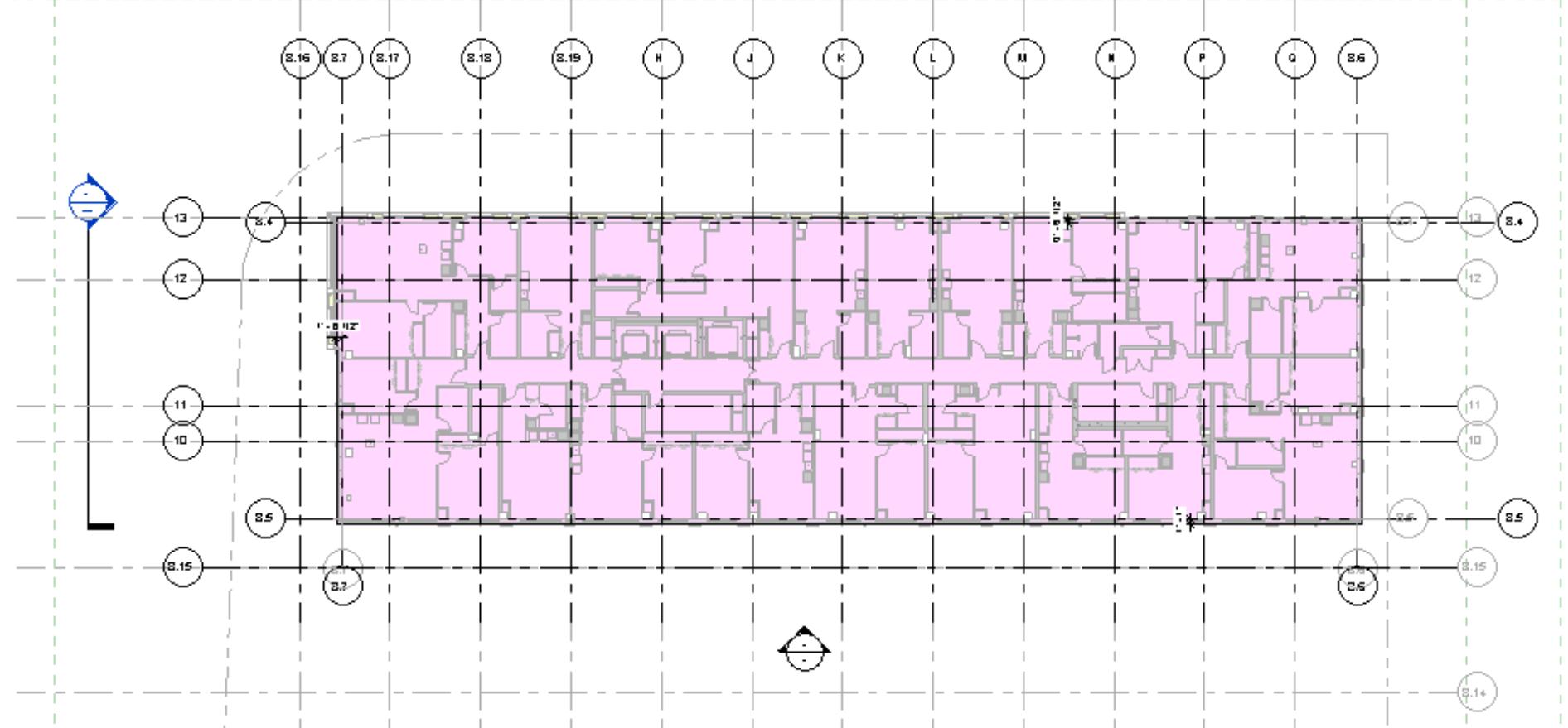






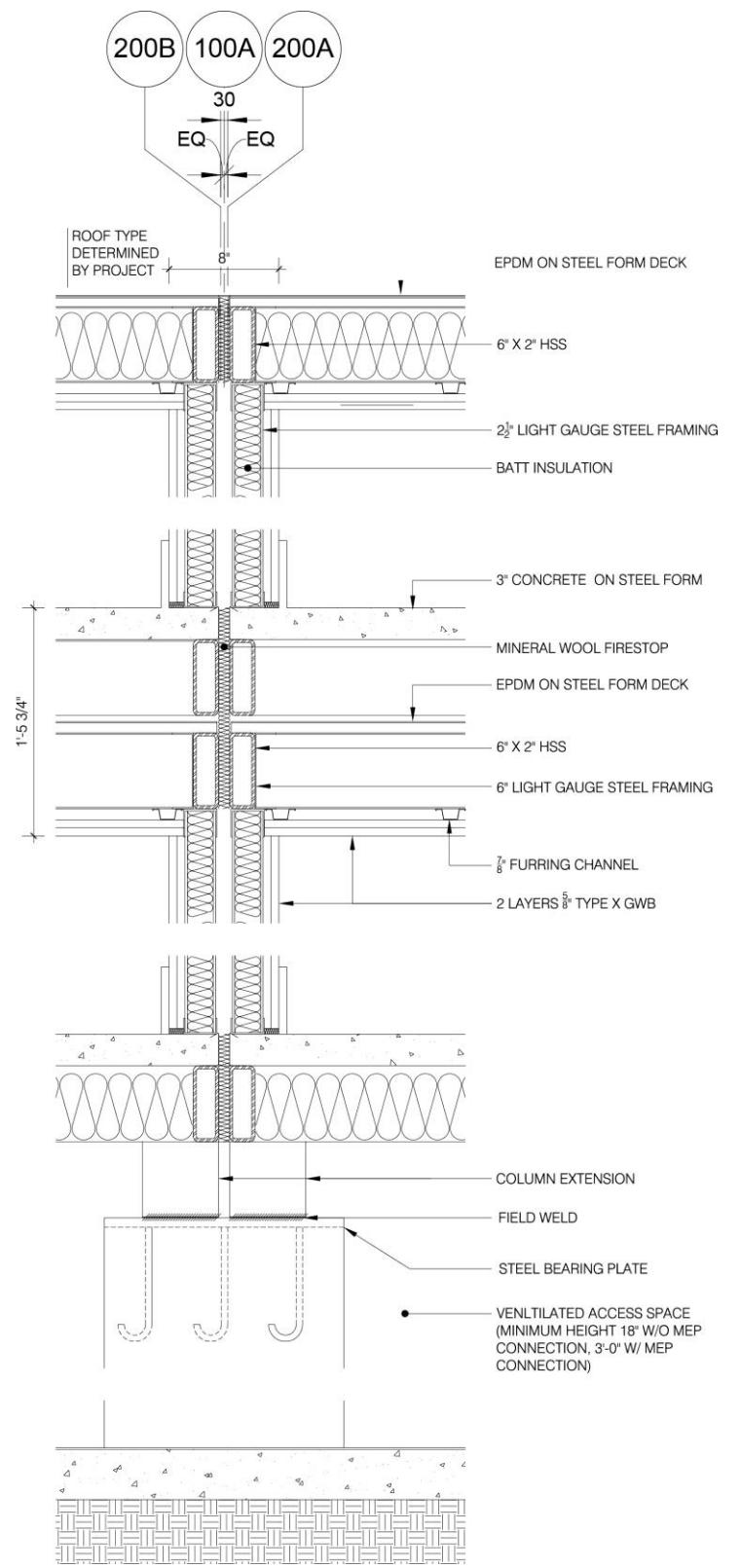
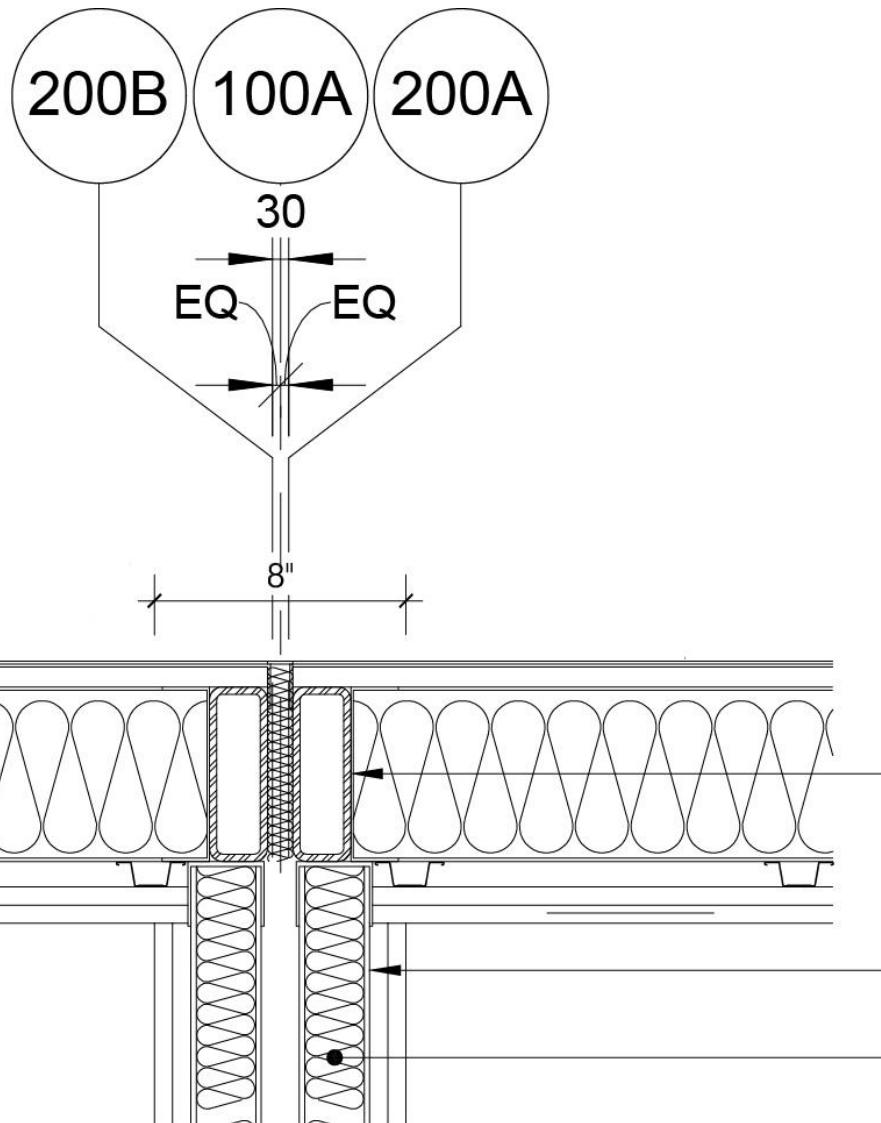
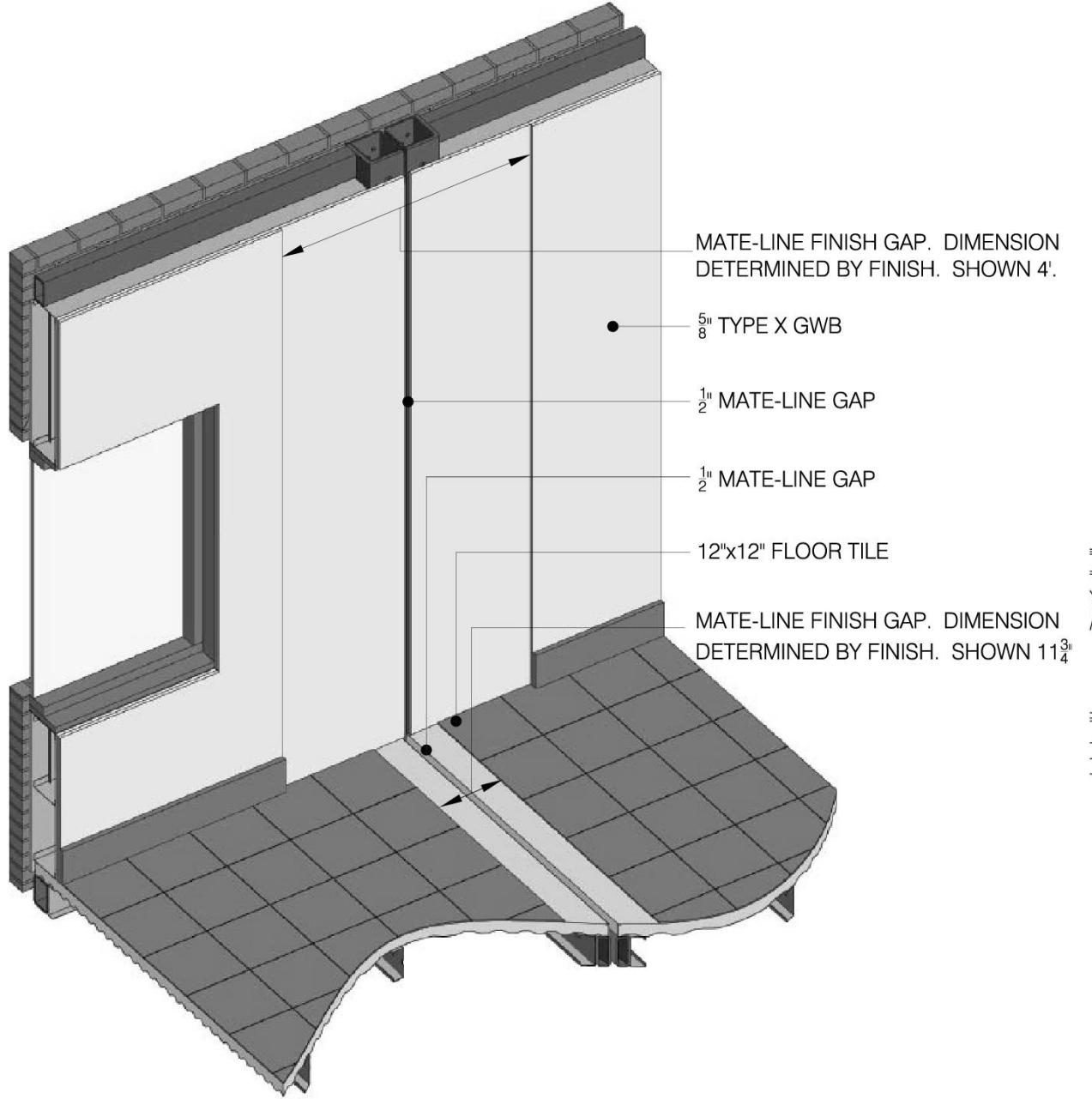






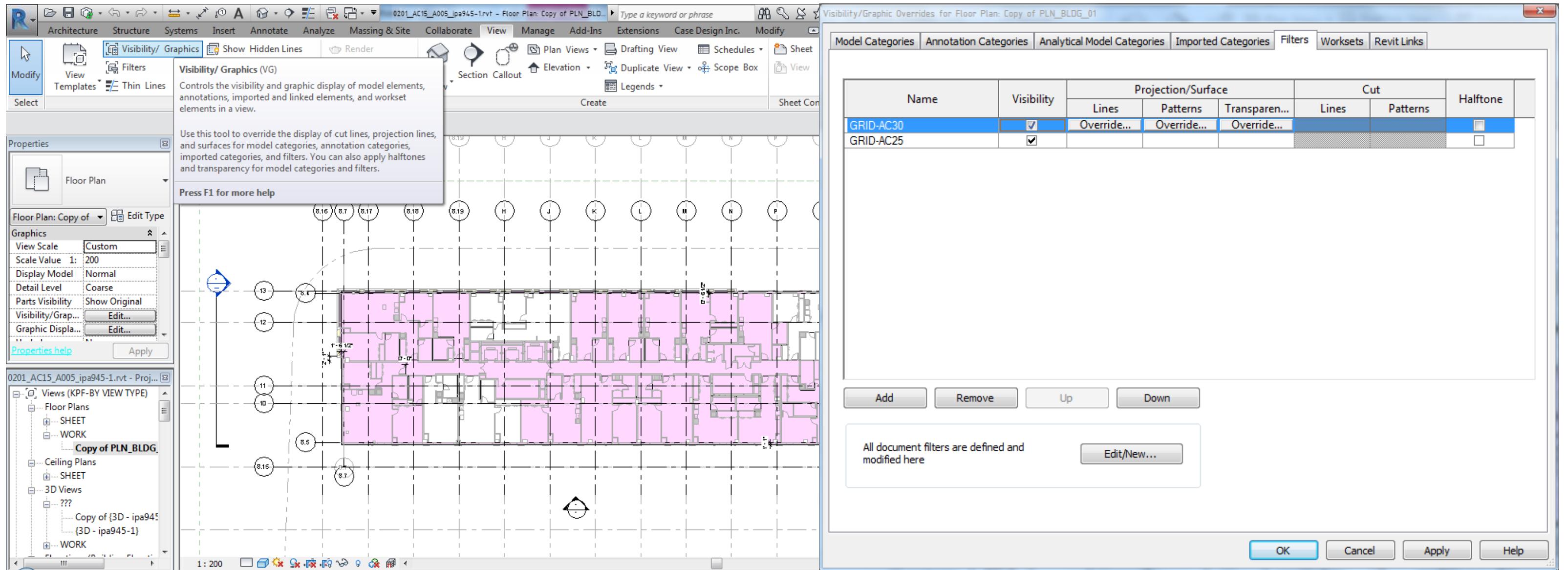
File Structure – Data Preparation

Grids



File Structure – Data Preparation

Grids

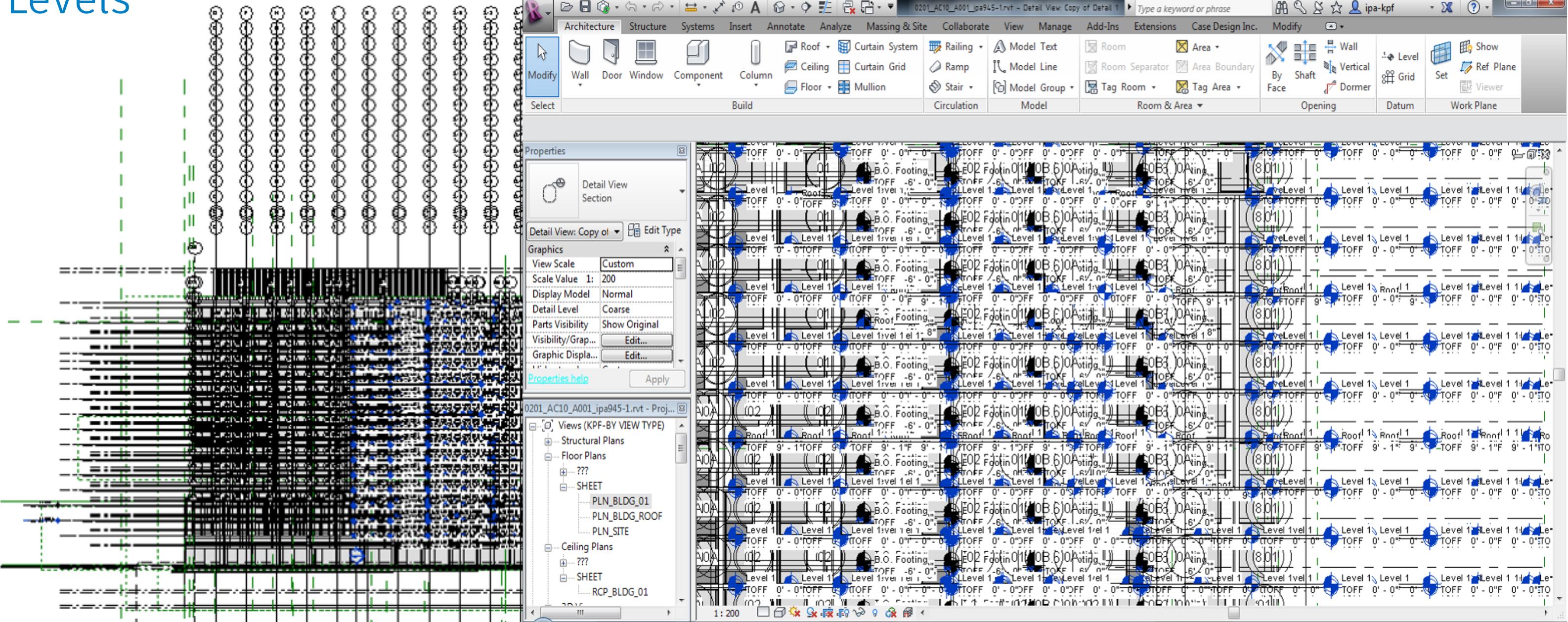


File Structure – Data Preparation

Levels

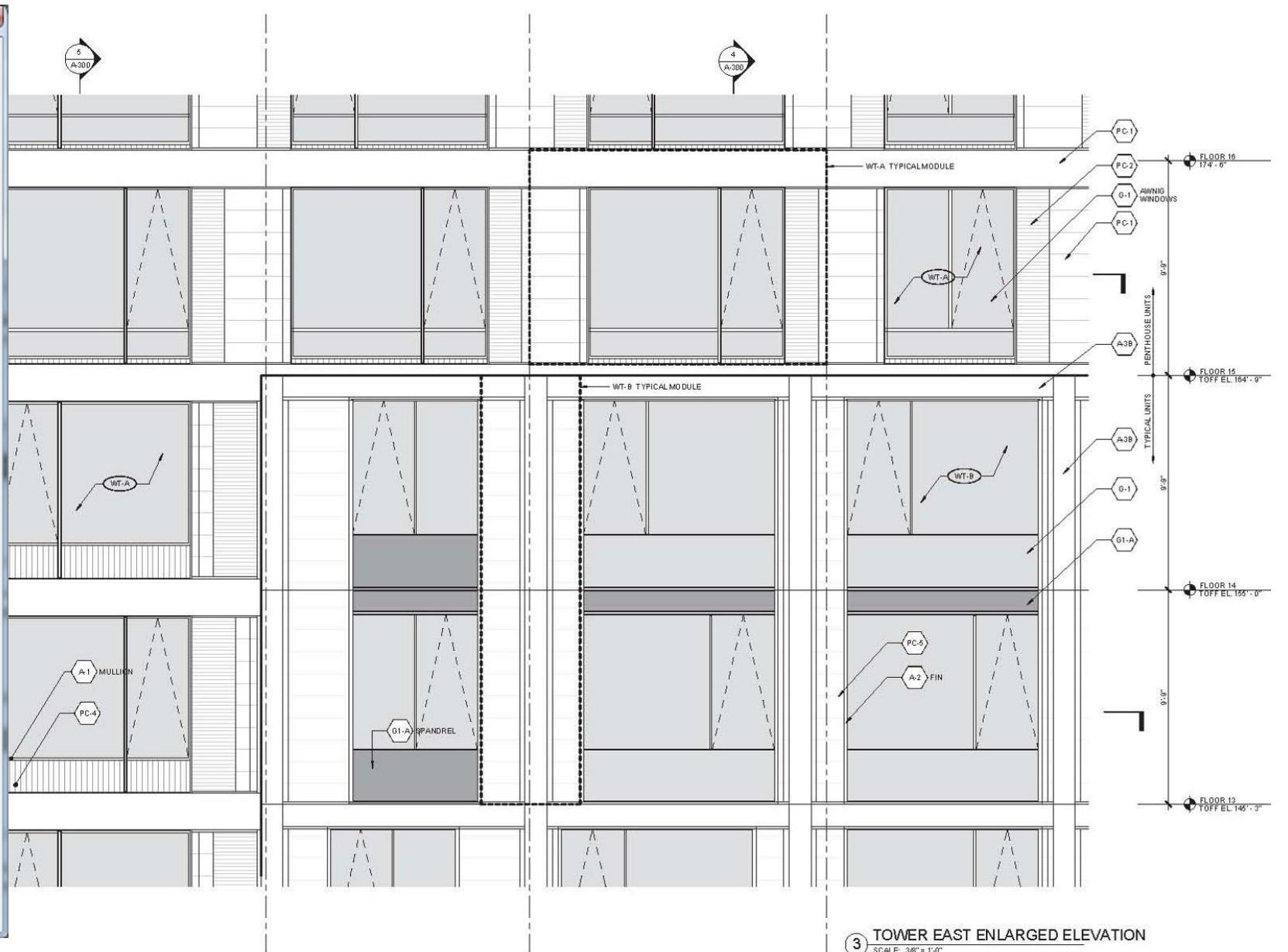
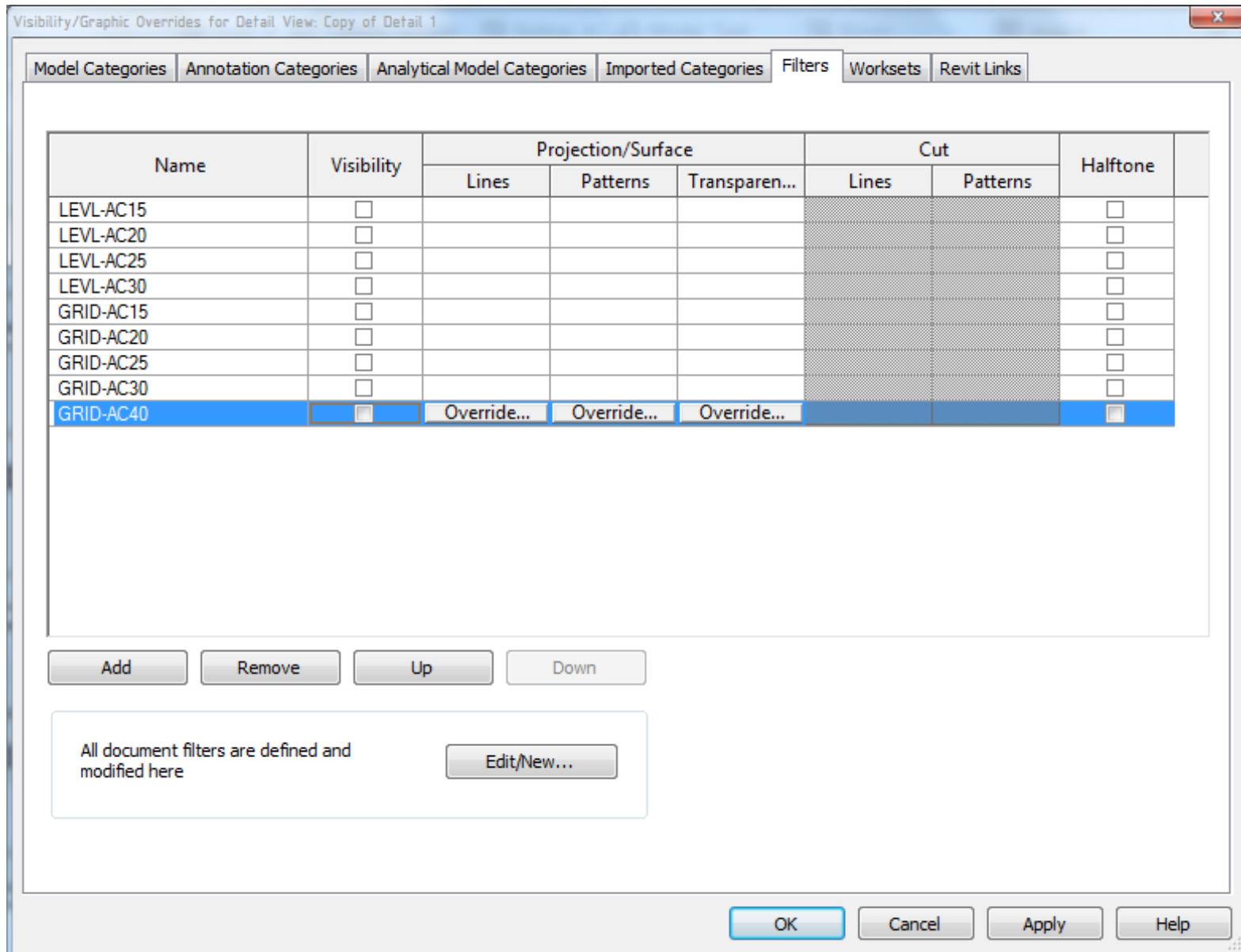
File Structure – Data Preparation

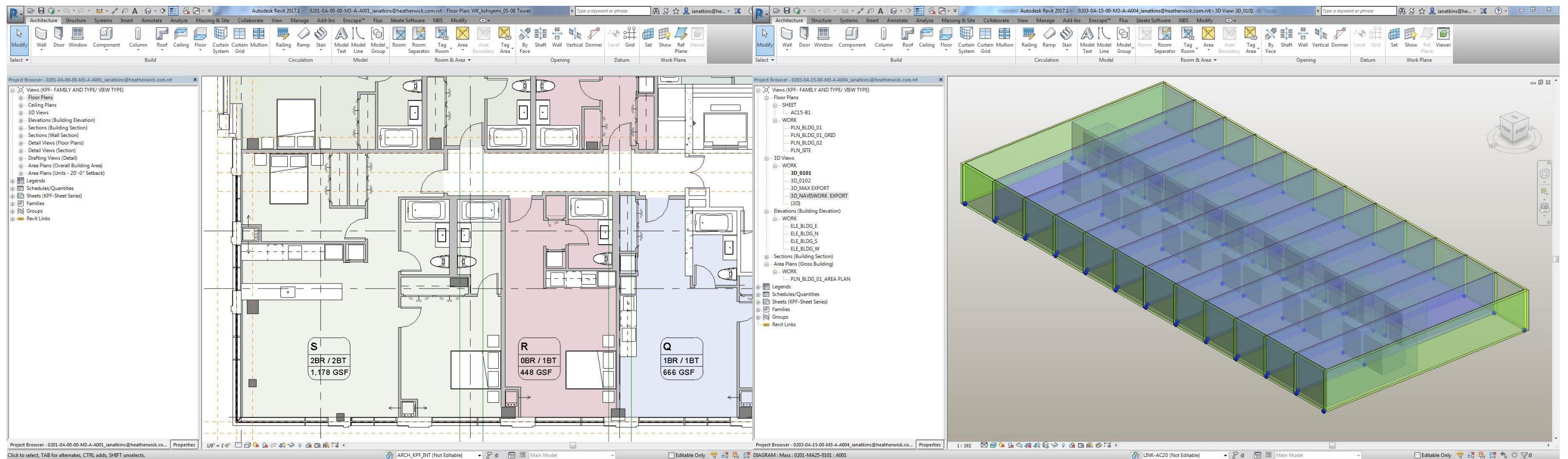
Levels



File Structure – Data Preparation

Levels

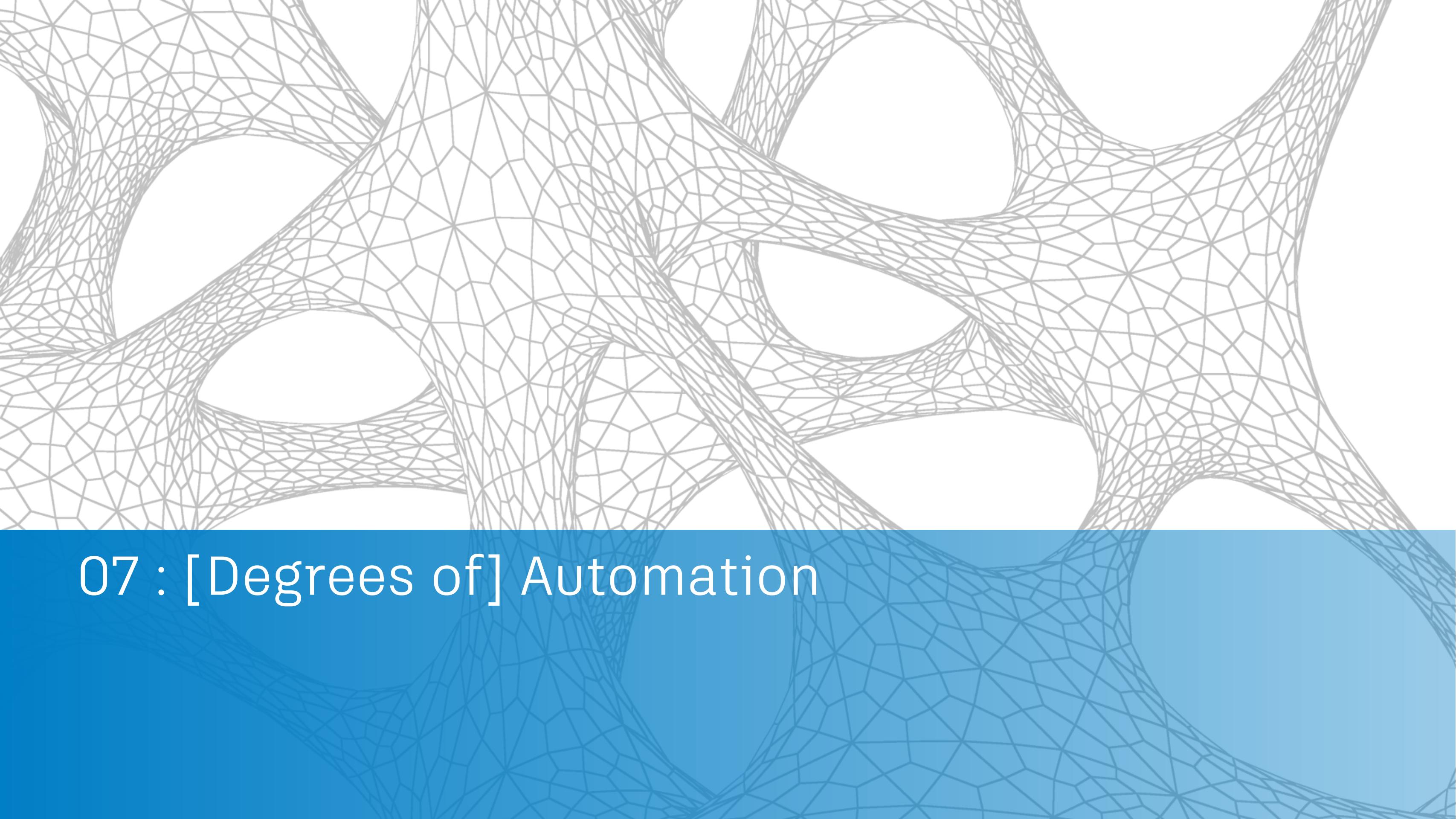




File Structure – Data Preparation

Worksets

ARCH_CAD_IMPORT
ARCH_CIRC_STAIR
ARCH_CORE
ARCH_EXT
ARCH_EXT_ANNEX
ARCH_INT
ARCH_LANDSCAPE/CIVIL
ARCH_MASS
ARCH_PARKING
ARCH_REFERENCE
ARCH_SITE
ARCH_SITE_FLAT_SIDEWALK
ARCH_STRUCTURE
LINKED_INT
LINKED_LEM_STR
SLAG_ANNEX
SLAG_MAIN
SLAG_MAIN_STL
SLAG_PODIUM
Workset1
Workset2

The background features a complex, abstract geometric pattern composed of numerous thin, light-grey lines forming a wireframe mesh. This mesh is organized into several large, overlapping spherical shapes that appear to be in motion, creating a sense of depth and perspective. The overall effect is reminiscent of a molecular structure or a microscopic view of a complex system.

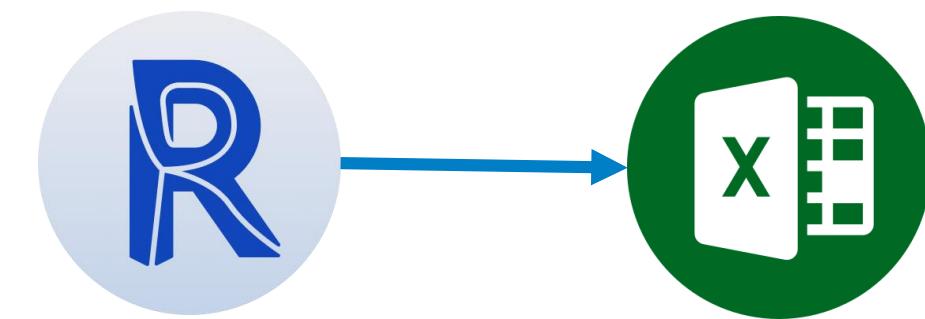
07 : [Degrees of] Automation

File Structure – Data Preparation

Strategy and Datum (Degrees of Automation)

File Structure – Data Preparation

Strategy and Datum



00000-MA00-DigitalProduction.xlsx - Excel

FILE HOME PAGE LAYOUT FORMULAS DATA REVIEW VIEW DEVELOPER FLUX Ablebits Data Ablebits Utilities Ablebits Quick Tools BLUEBEAM ACROBAT Ian Atkins

Cut Copy Paste Format Painter Arial 10 A A Wrap Text General Normal Bad Good Neutral Conditional Format as Calculation Check Cell Explanatory... Input Insert Delete Format AutoSum A Z Sort & Find & Filter Clear Create PDF Change Settings Batch PDF

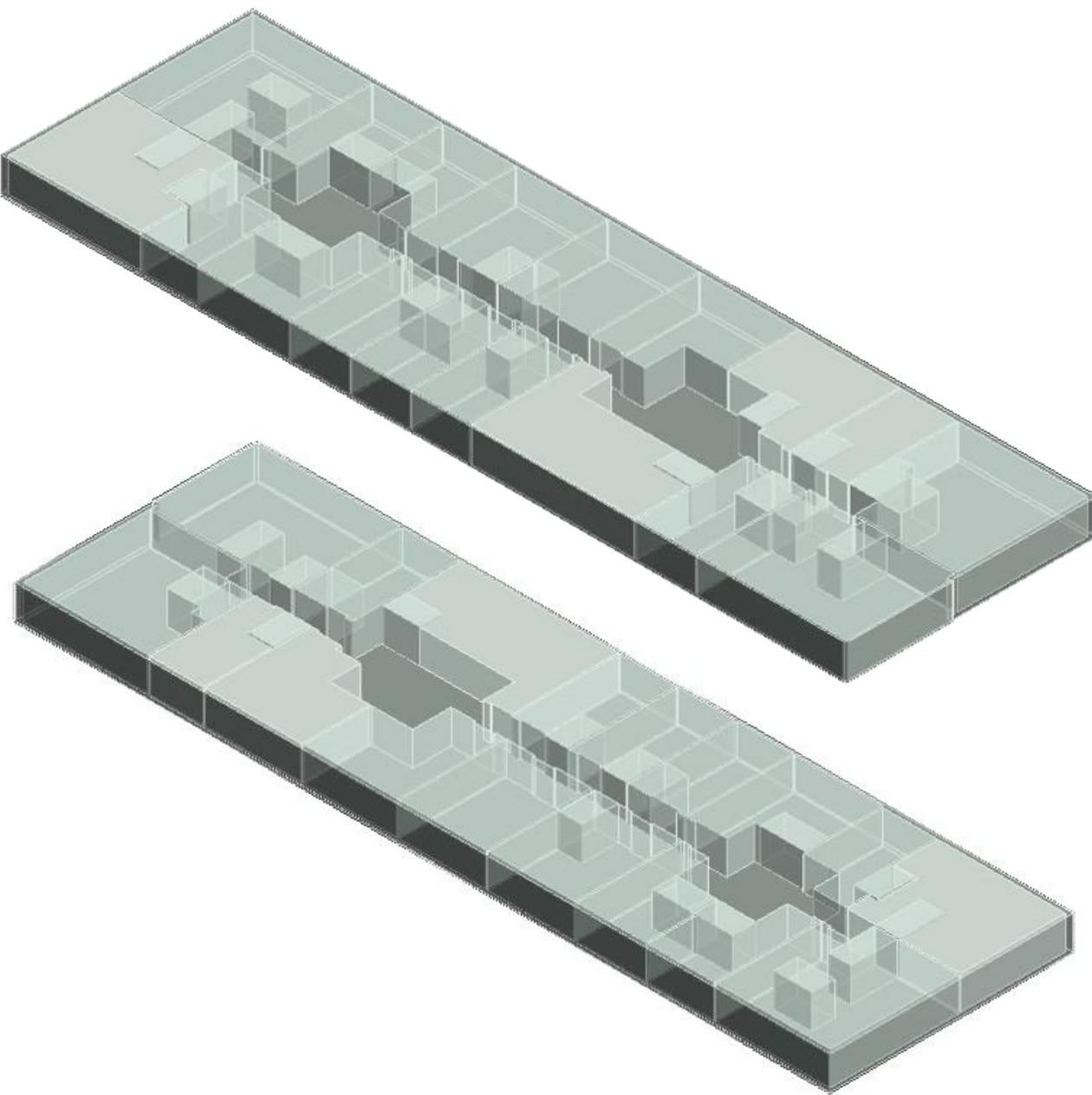
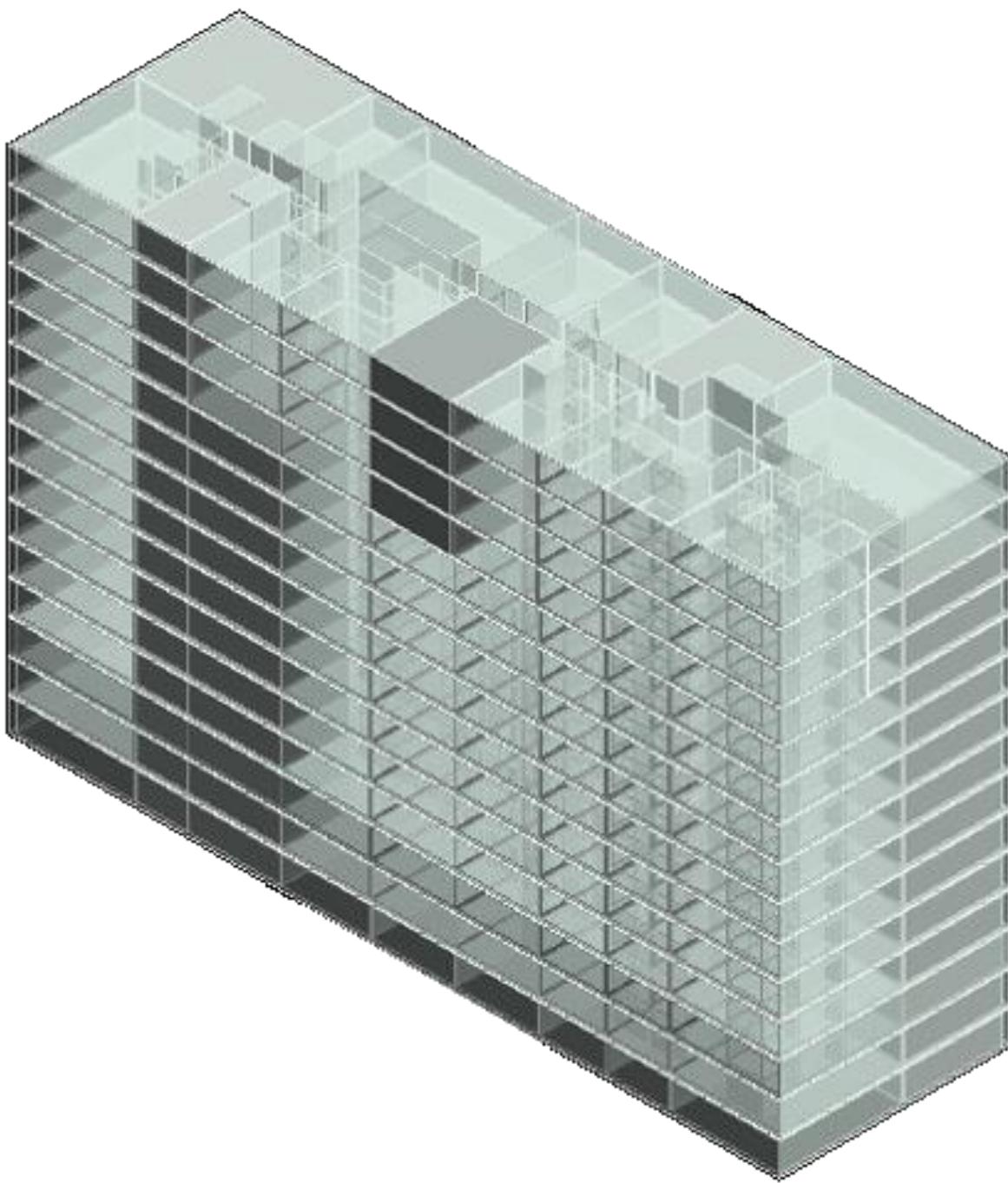
Clipboard Font Alignment Number Styles Cells Editing Bluebeam

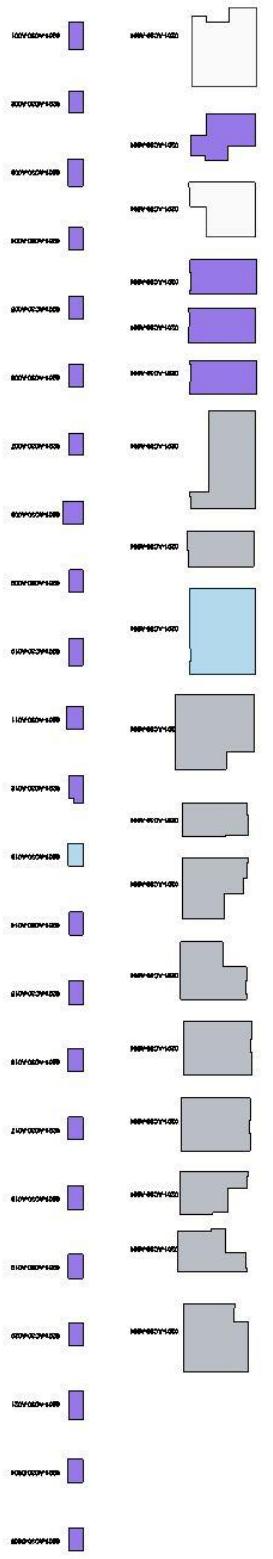
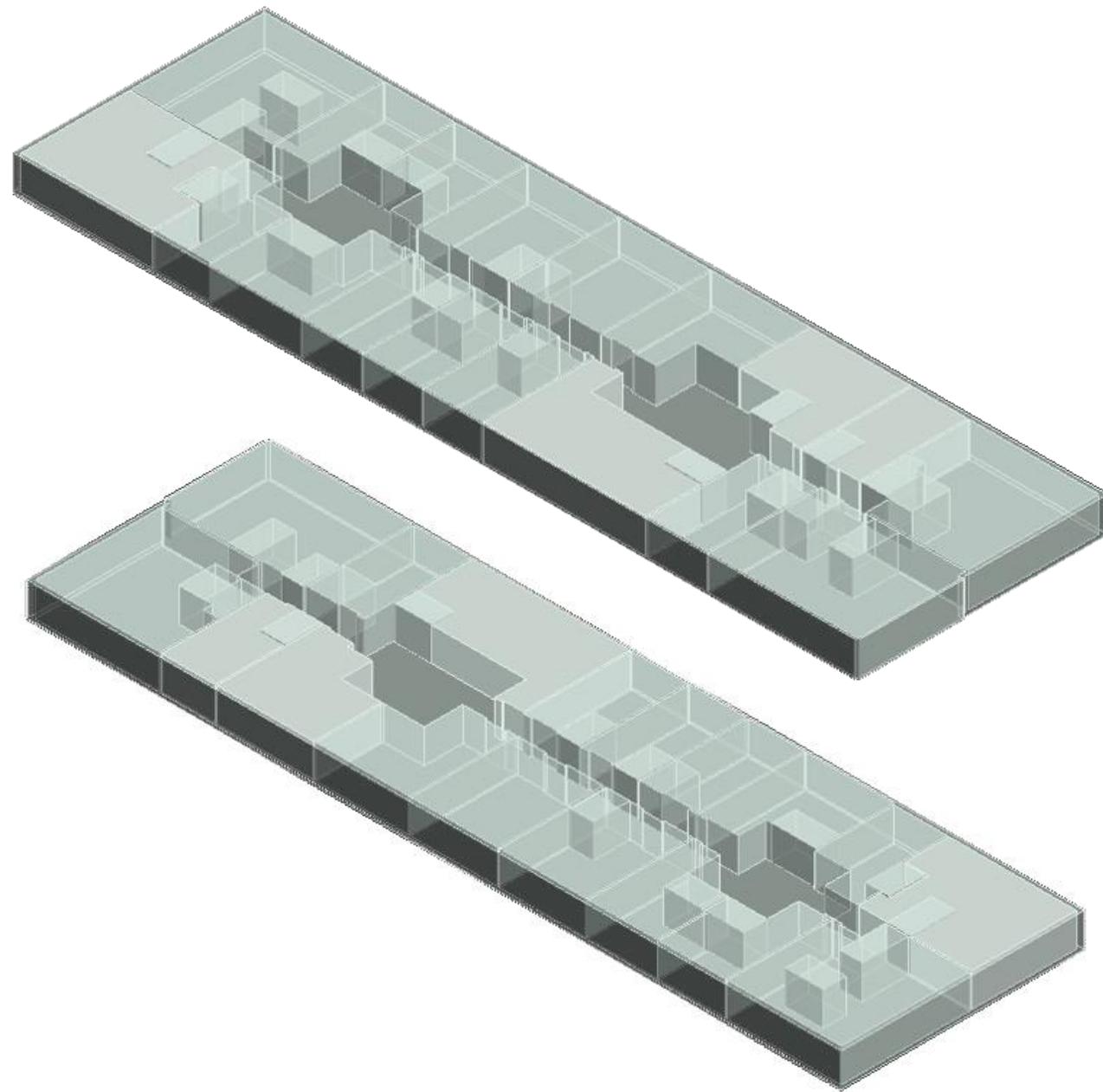
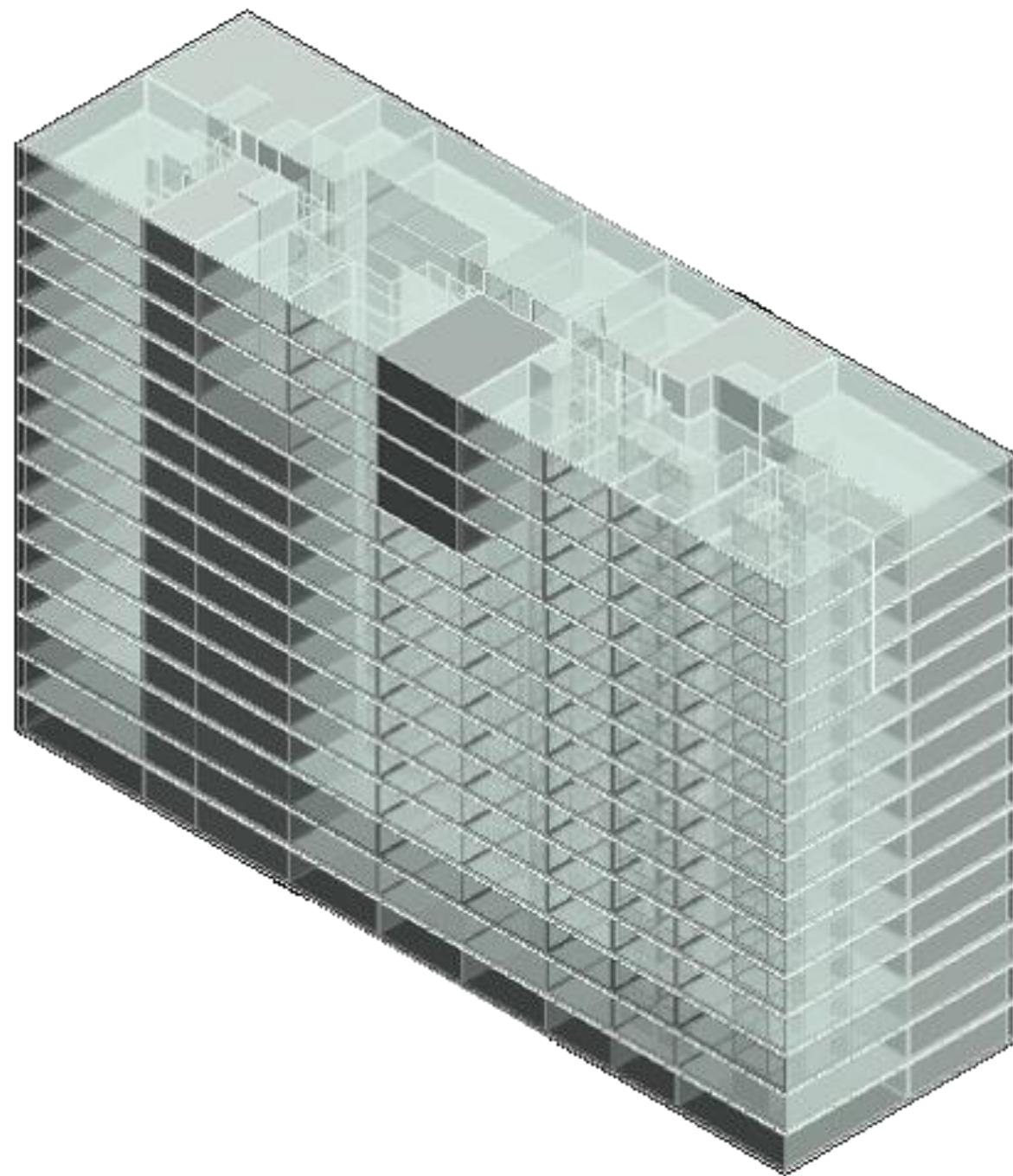
Q13 : fx Adjust Grid

MA20

Type Contains Issues

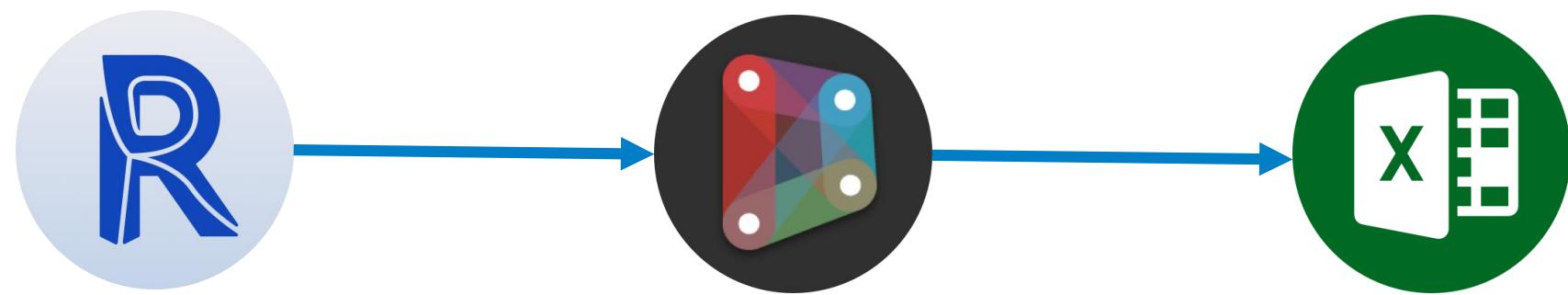
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4 A	102	1	1	IPA	1						NA						
5 A	103	1	1	IPA	1						NA						
6 A	104	1	1	IPA	1						NA						
7 A	105	1	1	IPA	1						NA						
8 A	106	1	2	IPA	1						NA						
9 A	107	1	1	IPA	1						NA						
10 A	108	1	1	IPA	1						NA						
11 A	109	1	1	IPA	1						NA						
12 A	201	4	1	IPA	1		0A001-MA20-A201	C	G	B	0A001-MS10-A000	0A001-MA25-E360	0A001-MA25-E370	0A001-MA40-0436	0A001-MA40-0437	Rotate Mod for Datum	
13 A	202	3	1	IPA	2		0A001-MA20-A202	C	A	B	0A001-MS10-A000	0A001-MA25-E202	0A001-MA25-E302	0A001-MA40-0409	0A001-MA40-0403	Adjust Grid	
14 A	203	4	1	IPA	2		0A001-MA20-A203	C	A	B	0A001-MS10-A000	0A001-MA25-E120	0A001-MA25-E120	0A001-MA40-0409	0A001-MA40-0403		
15 A	204	4	2	IPA	2		0A001-MA20-A204	E	A	B	0A001-MS10-A000						
16 A	205	4	2	IPA	2		0A001-MA20-A205	E	A	B	0A001-MS10-A000						
17 A	206	4	2	IPA	2		0A001-MA20-A206	D	F	B	0A001-MS10-A000						
18 A	207	2	2	IPA	2		0A001-MA20-A207	D	A	B	0A001-MS10-A000						
19 A	208	3	2	IPA	2		0A001-MA20-A208	D	A	B	0A001-MS10-A000						Column A.4 is 3" too far east of where the CAD documents show
20 A	209	3	2	IPA	2		0A001-MA20-A209	D	A	B	0A001-MS10-A000						
21 A	301	1	1	IPA	1		0A001-MA20-A301	C	A	B	0A001-MS10-A000						
22 A	302	1	1	IPA	1		0A001-MA20-A302	B	A	B	0A001-MS10-A000						
23 A	303	1	1	IPA	1		0A001-MA20-A303	B	A	B	0A001-MS10-A000						
24 A	304	1	1	IPA	1		0A001-MA20-A304	B	A	B	0A001-MS10-A000						
25 A	305	1	1	IPA	1		0A001-MA20-A305	B	A	B	0A001-MS10-A000						
26 A	306	1	1	IPA	1		0A001-MA20-A306	B	F	B	0A001-MS10-A000						
27 A	307	1	1	IPA	1		0A001-MA20-A307	B	A	B	0A001-MS10-A000						
28 A	308	1	1	IPA	1		0A001-MA20-A308	A	A	B	0A001-MS10-A000						
29 A	309	1	1	IPA	1		0A001-MA20-A309	C	A	B	0A001-MS10-A000						
30 B	102	4	4	IPA	1	LWV	0A001-MA20-B102	A	C	A	0A001-MS10-B000	0A001-MA25-E302	0A001-MA25-E320	to include all sides	0A001-MA40-0430		
31 B	103	4	4	IPA	1		0A001-MA20-B103	A	A	B	0A001-MS10-B000	0A001-MA25-E209	0A001-MA40-0401	0A001-MA40-0401			
32 B	104	4	4	IPA	4		0A001-MA20-B104	A	A	A	0A001-MS10-B000	0A001-MA25-E109	0A001-MA40-0401	0A001-MA40-0401			
33 B	105	4	4	IPA	4		0A001-MA20-B105	A	A	A	0A001-MS10-B000	0A001-MA25-C509	0A001-MA25-D109	0A001-MA40-0401	0A001-MA40-0401		
34 B	106	4	4	IPA	4		0A001-MA20-B106	A	A	A	0A001-MS10-B000	0A001-MA25-D409	0A001-MA25-D209	0A001-MA40-0401	0A001-MA40-0401		
35 B	107	4	4	IPA	1		0A001-MA20-B107	A	B	A	0A001-MS10-B000	0A001-MA25-D309	0A001-MA25-D309	0A001-MA40-0405	0A001-MA40-0405		
36 B	108	4	4	IPA			0A001-MA20-B108	A	A	A	0A001-MS10-B000						
37 B	109	4	4	IPA			0A001-MA20-B109	A	A	A	0A001-MS10-B000						
38 B	110	4	4	IPA			0A001-MA20-B110	A	A	A	0A001-MS10-B000						
39 B	111	4	4	IPA			0A001-MA20-B111	A	A	A	0A001-MS10-B000						
40 B	112	4	4	IPA	3		0A001-MA20-B112	A	E	A	0A001-MS10-B000						
41 B	113	4	4	IPA			0A001-MA20-B113	A	A	A	0A001-MS10-B000						
42 B	114	4	4	IPA			0A001-MA20-B114	A	A	A	0A001-MS10-B000						
43 B	115	4	4	IPA	4		0A001-MA20-B115	A	A	A	0A001-MS10-B000						
44 B	116	4	4	IPA			0A001-MA20-B116	A	A	A	0A001-MS10-B000						
45 B	117	4	4	IPA			0A001-MA20-B117	A	A	A	0A001-MS10-B000						
46 B	118	4	4	IPA			0A001-MA20-B118	A	B	A	0A001-MS10-B000						
47 B	119	4	4	IPA			0A001-MA20-B119	A	A	A	0A001-MS10-B000						
48 B	120	4	4	IPA			0A001-MA20-B120	A	A	A	0A001-MS10-B000						
49 B	121	4	4	IPA			0A001-MA20-B121	A	A	A	0A001-MS10-B000	0A001-MA25-B121-1	0A001-MA25-B121-2	0A001-MA40-0401	0A001-MA40-0401		
50 B	122	4	4	IPA			0A001-MA20-B122	A	A	A	0A001-MS10-B000	0A001-MA25-B122-1	0A001-MA25-B122-2	0A001-MA40-0401	0A001-MA40-0401		
51 B	123	4	4	IPA			0A001-MA20-B123	A	D	A	0A001-MS10-B000	0A001-MA25-B123-1	0A001-MA25-B123-2	to include all sides	0A001-MA40-0431		
52 B	202	4	4	IPA	2		0A001-MA20-B202	A	C	B	0A001-MS10-B000	0A001-MA25-E301	0A001-MA25-E321	to include all sides	0A001-MA40-0432		





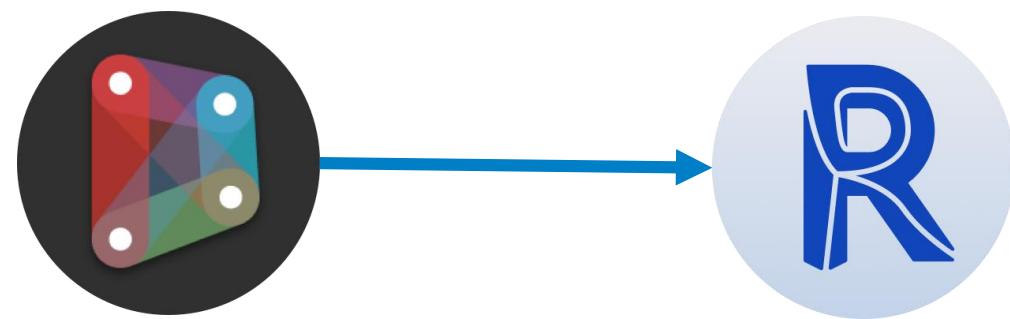
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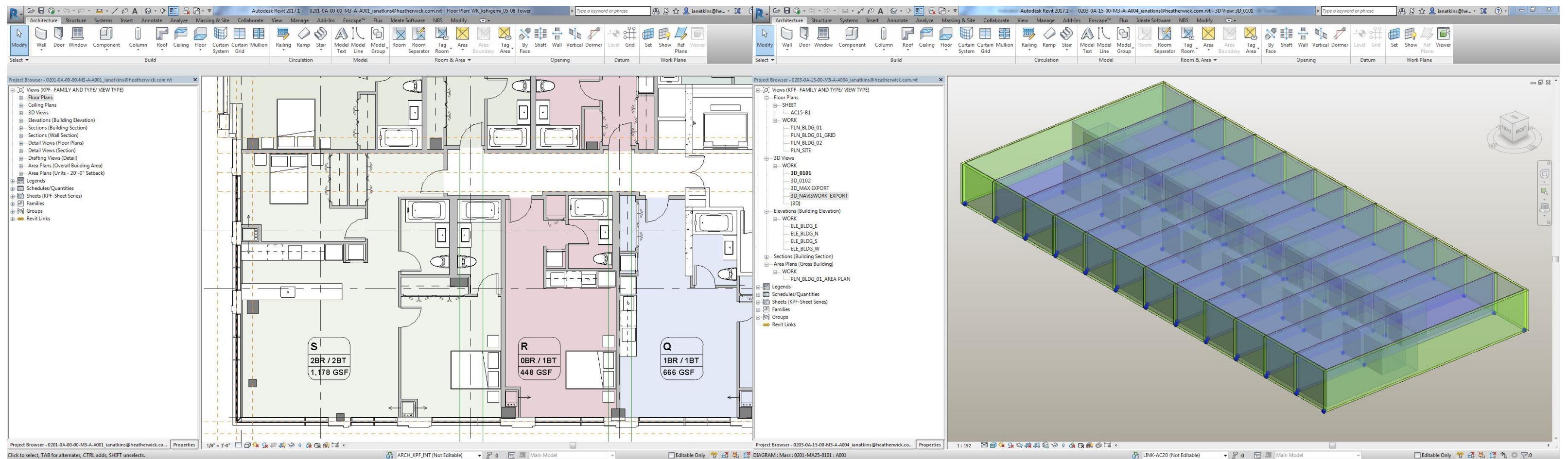
Strategies and Datums



File Structure – Data Preparation

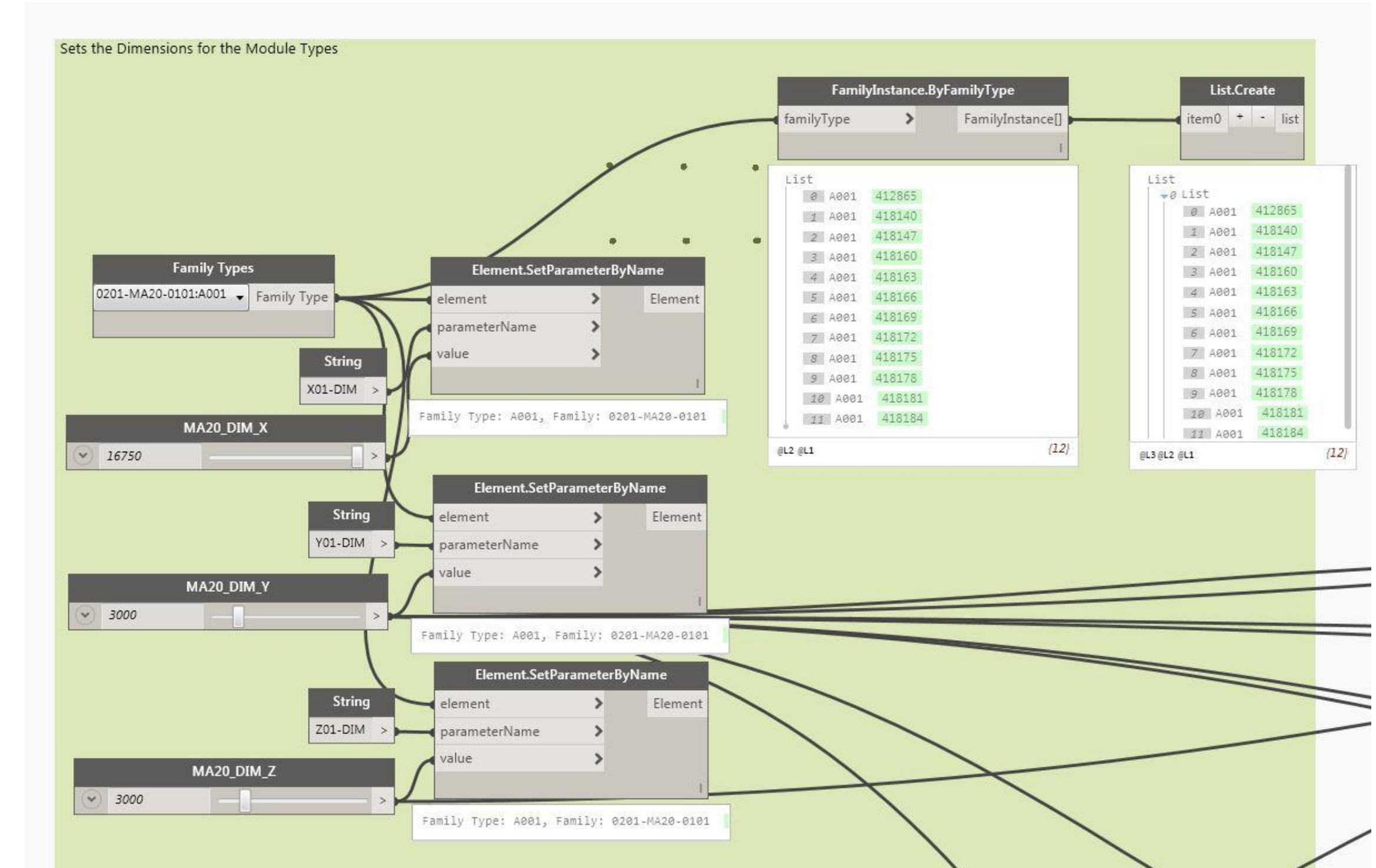
Strategies and Datums



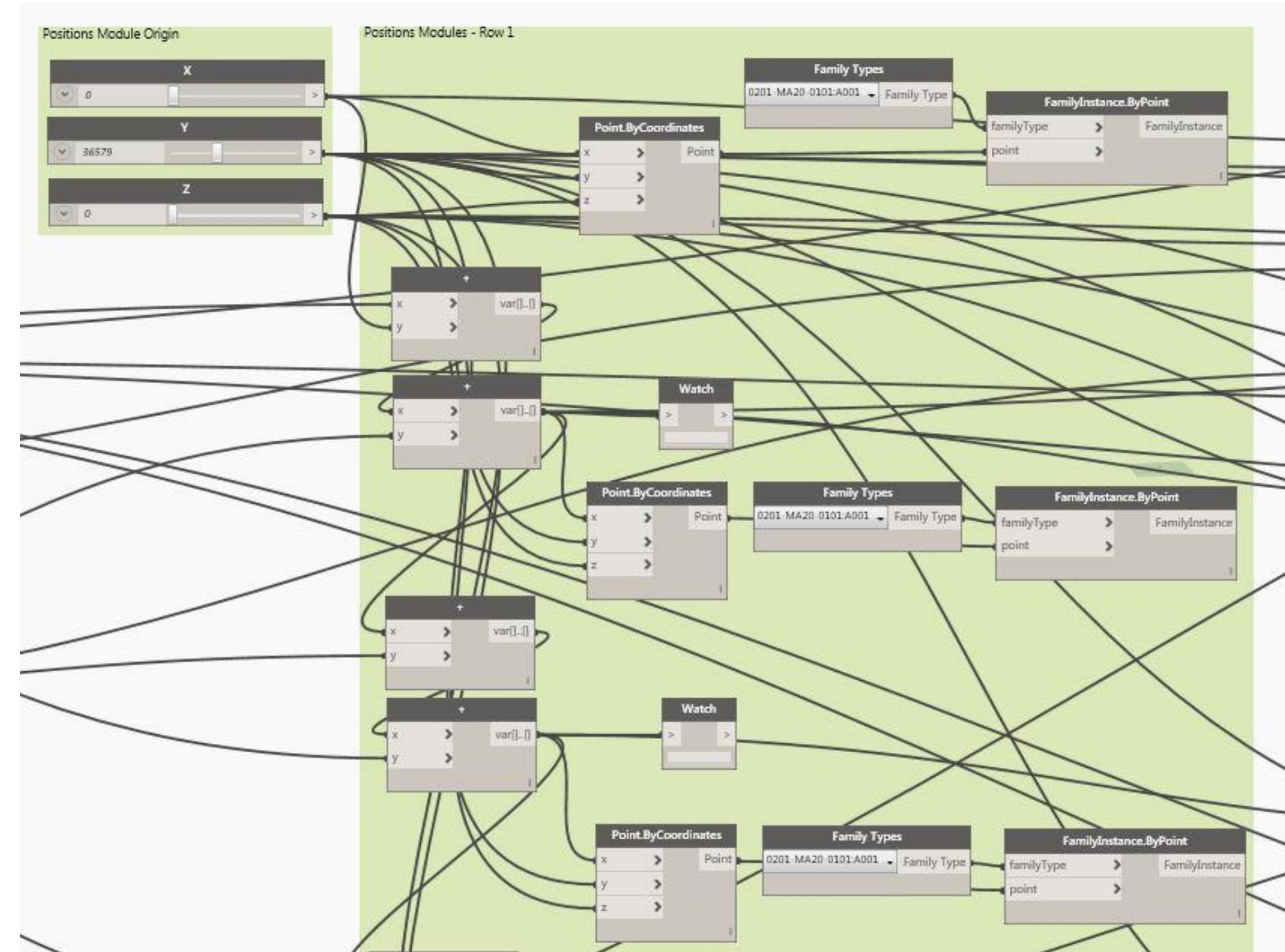


File Structure – Data Preparation

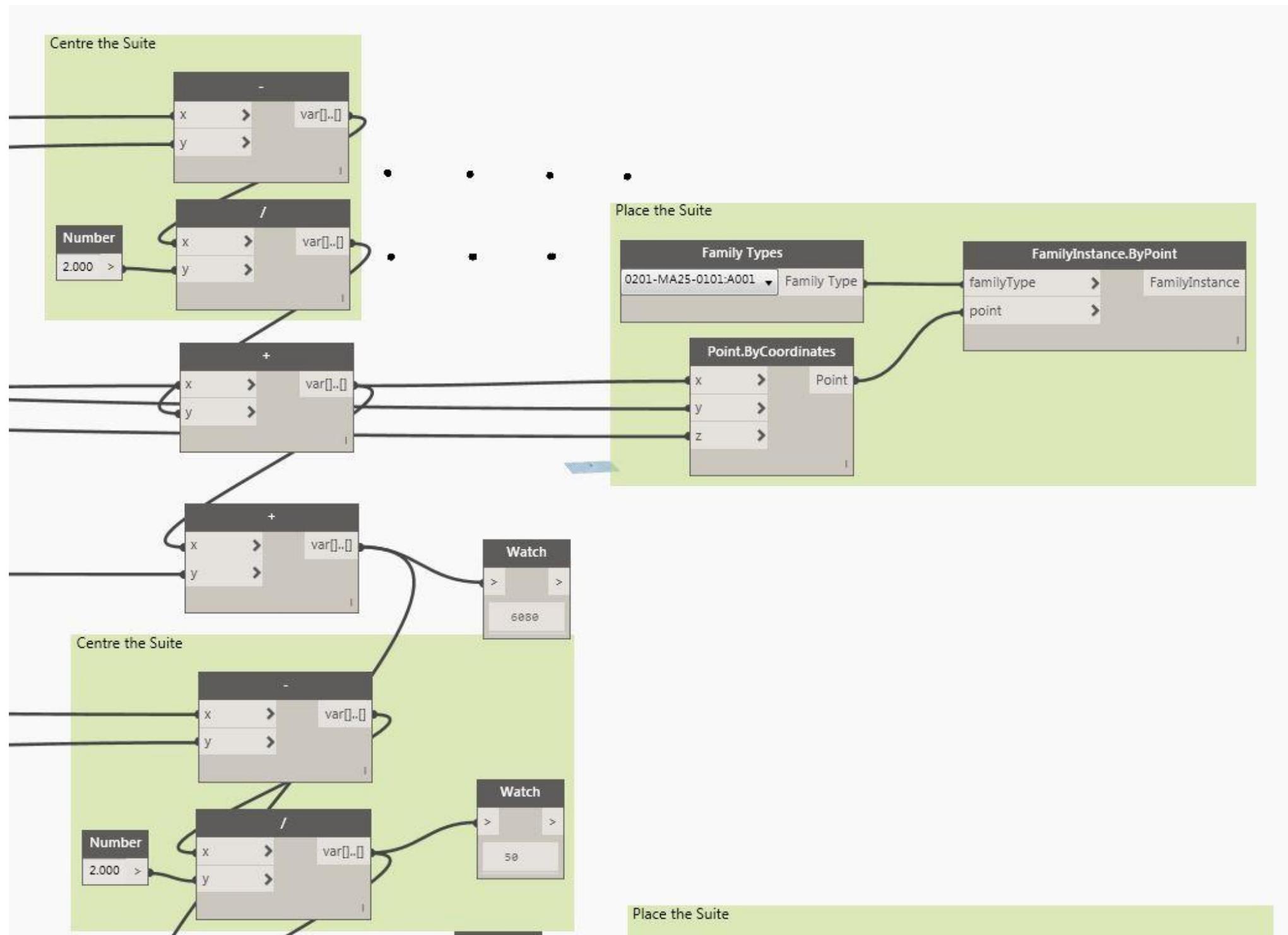
Setting the
Modular
Dimension



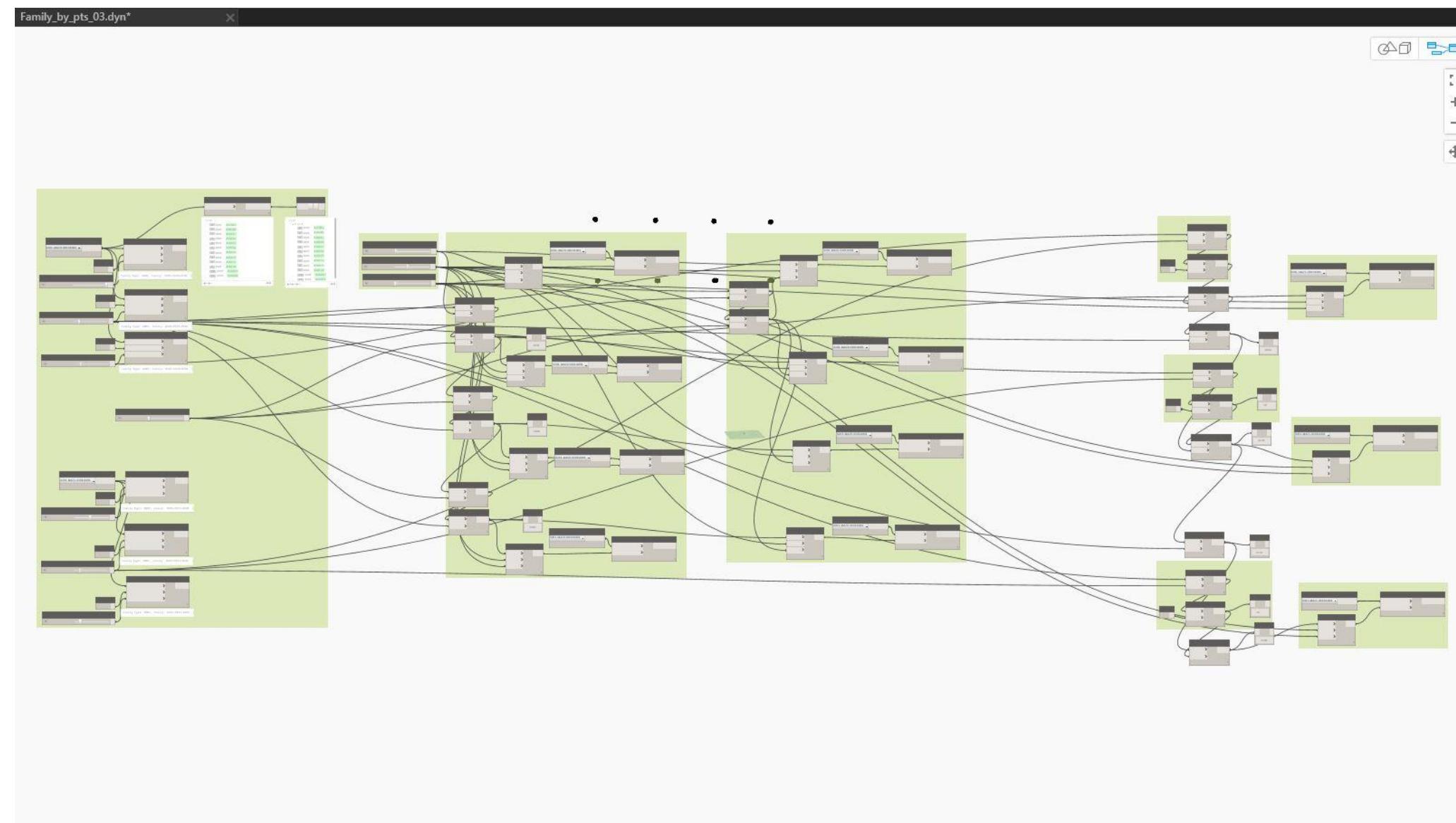
File Structure – Data Preparation



File Structure – Data Preparation

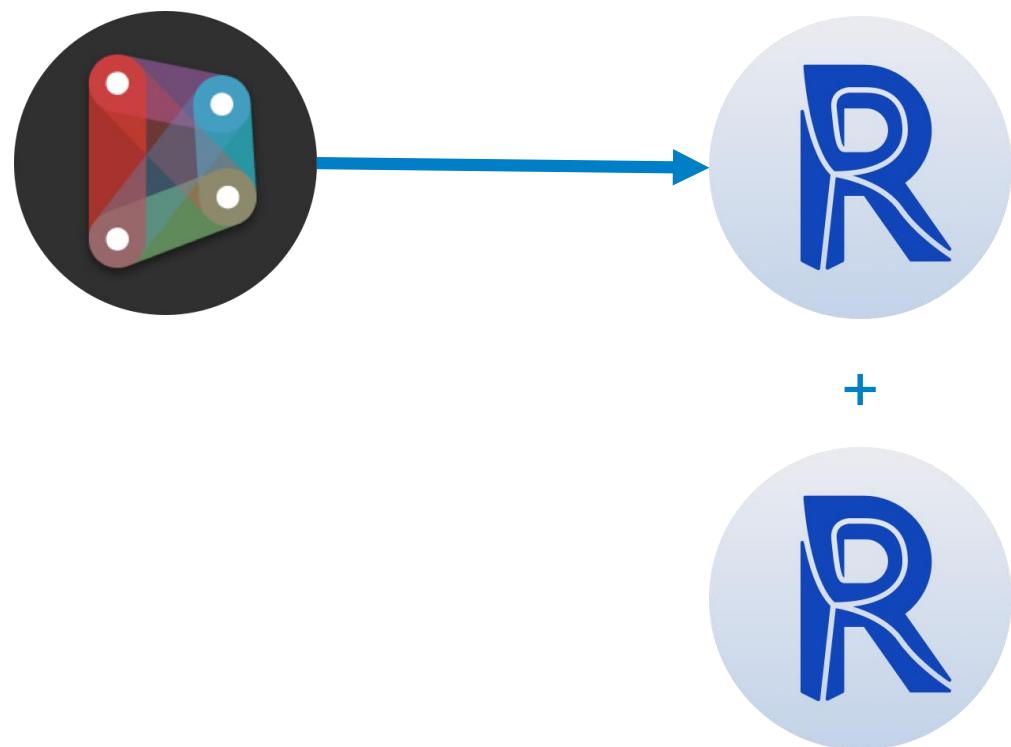


File Structure – Data Preparation

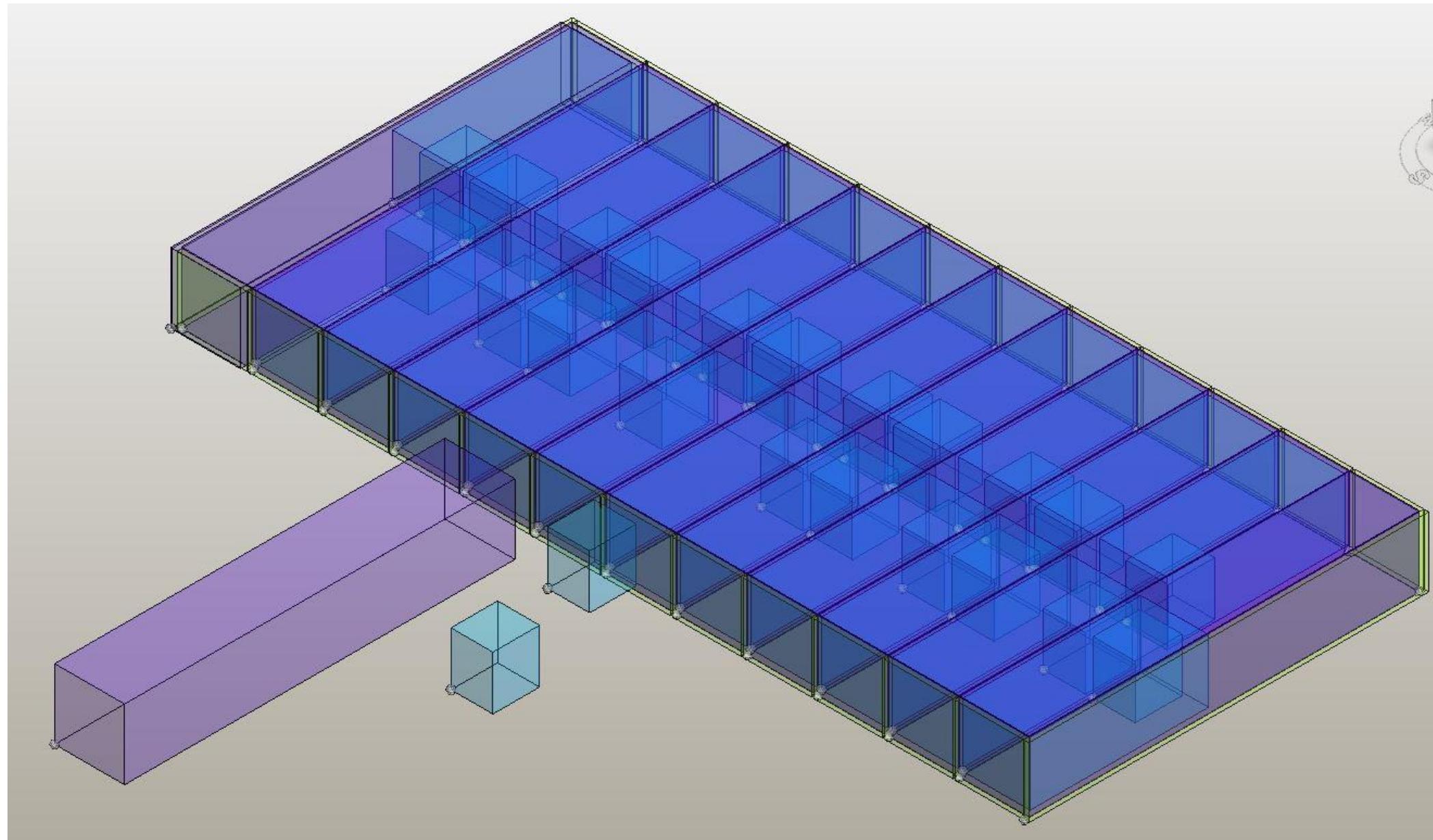


File Structure – Data Preparation

- Setting Module Dimension
- Setting Module Locations/ Positions

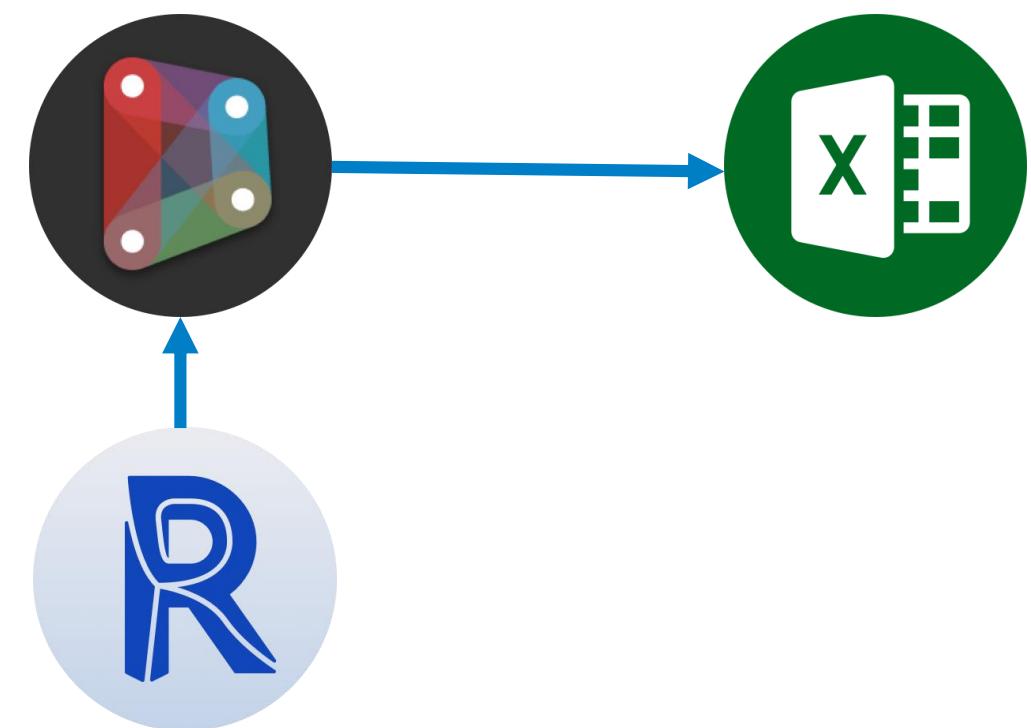


File Structure – Data Preparation

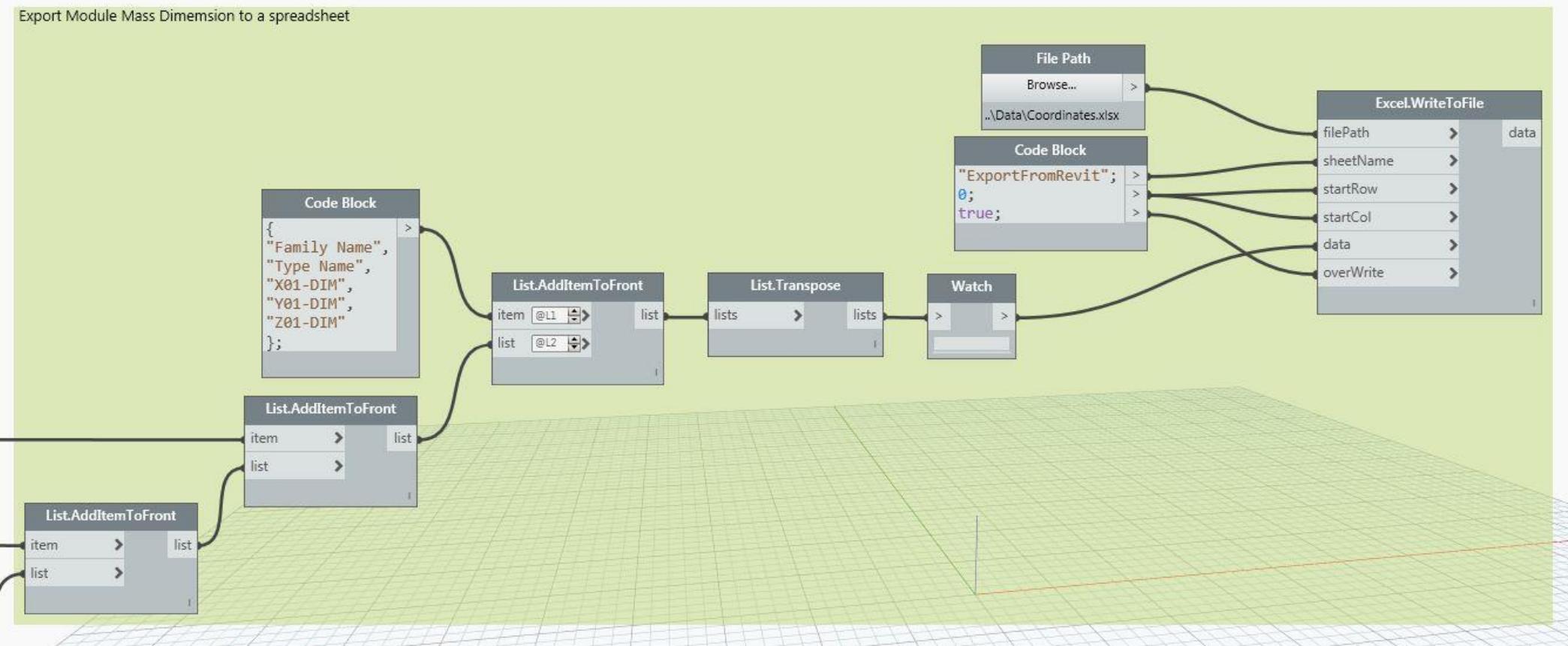
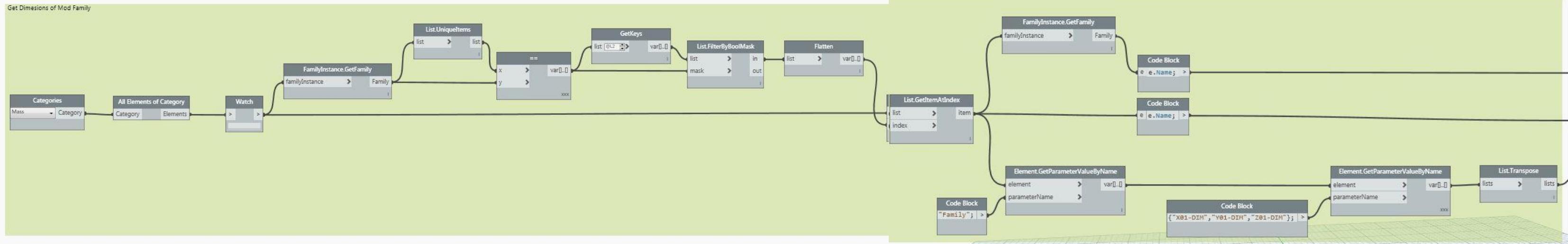


File Structure – Data Control

Strategy and Datum

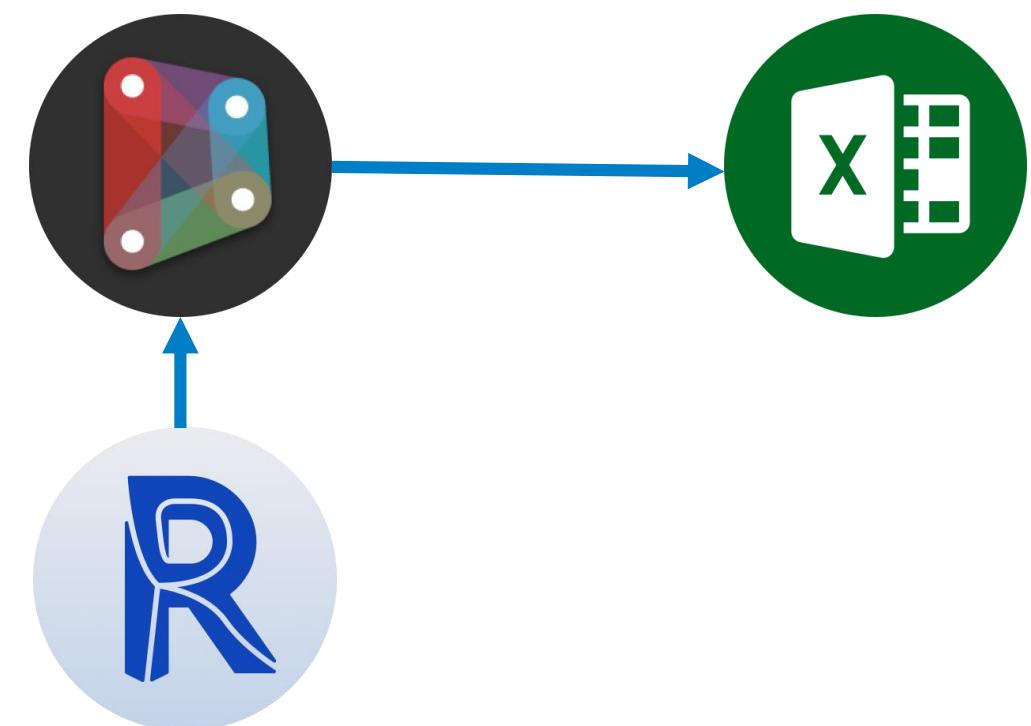


File Structure – Data Preparation

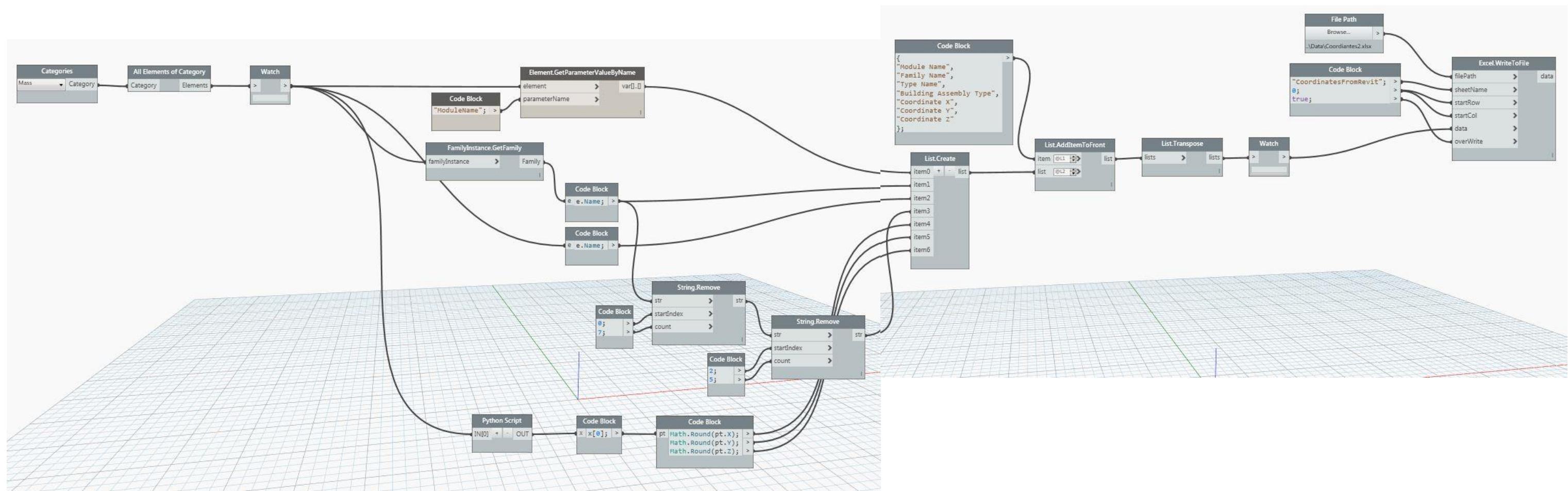


File Structure – Data Control

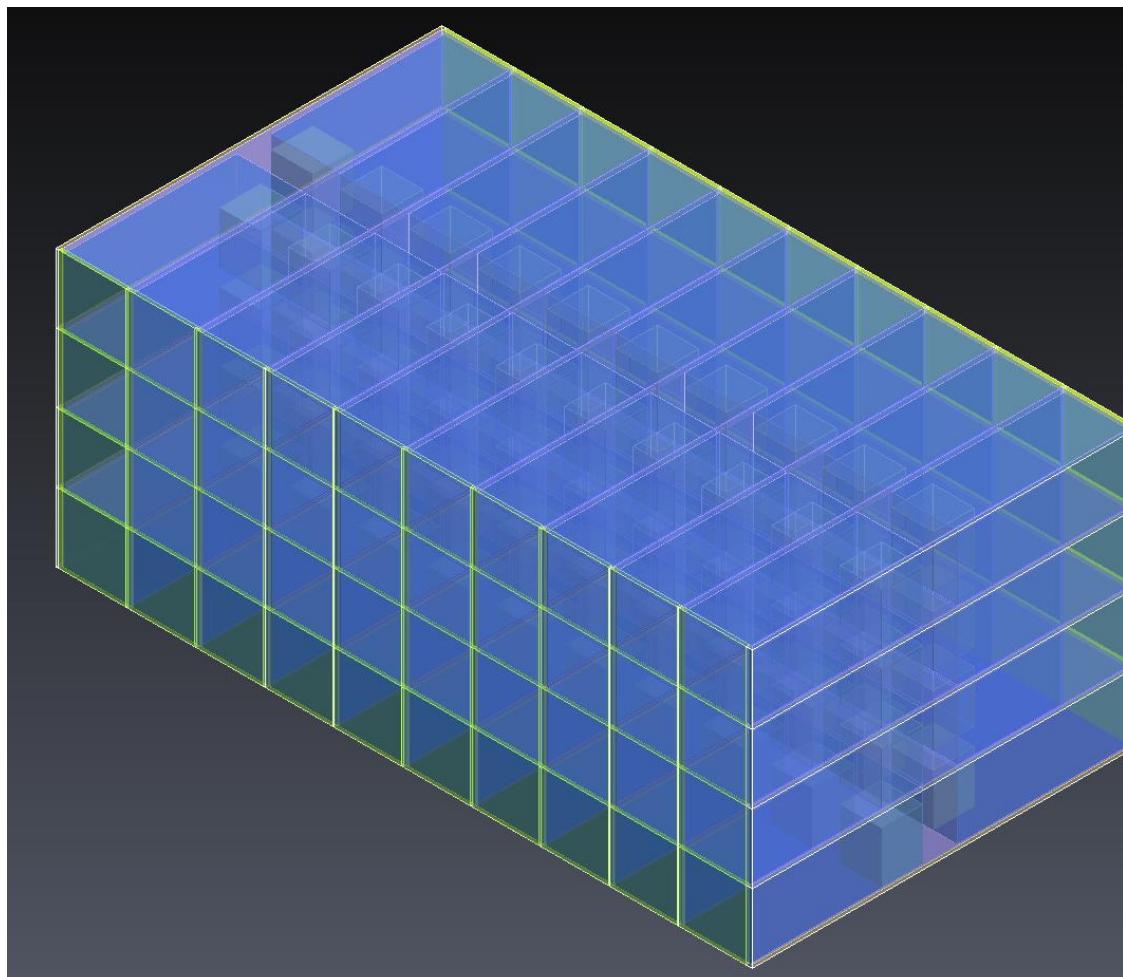
Strategy and Datum



File Structure – Data Preparation



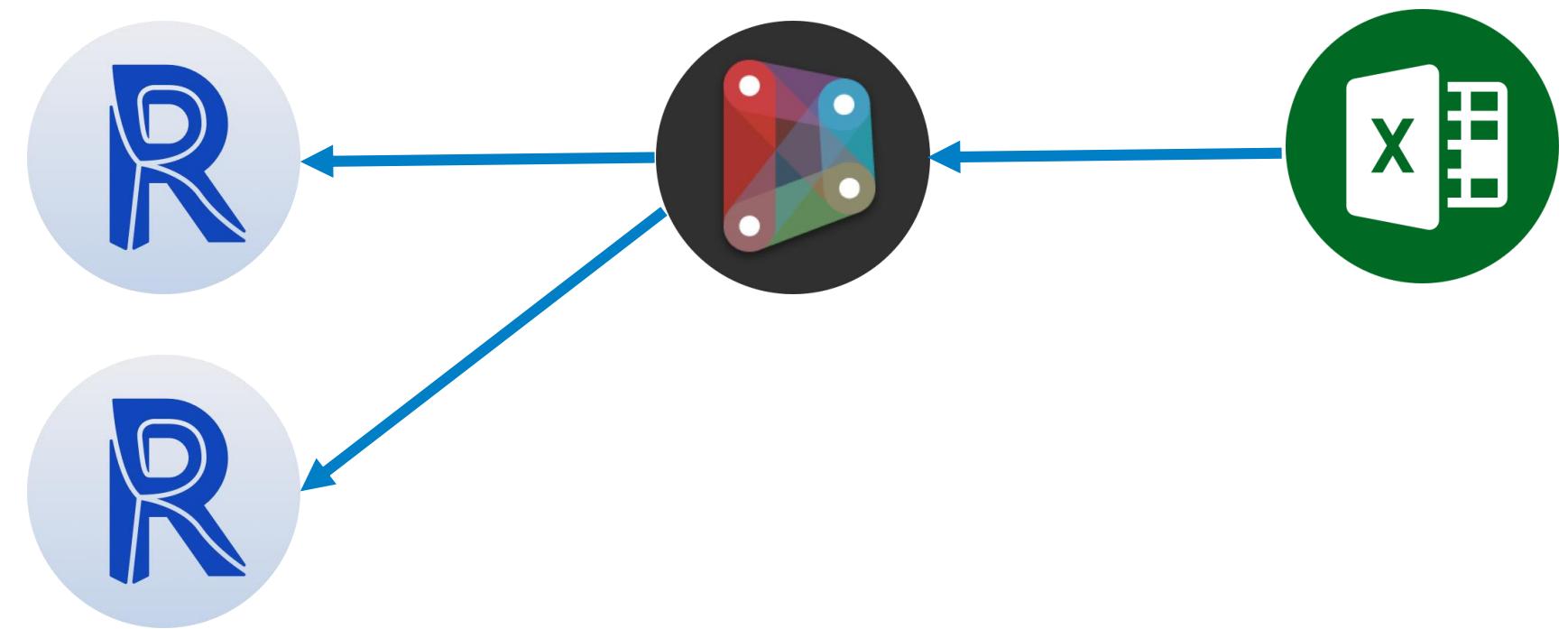
File Structure – Data Preparation



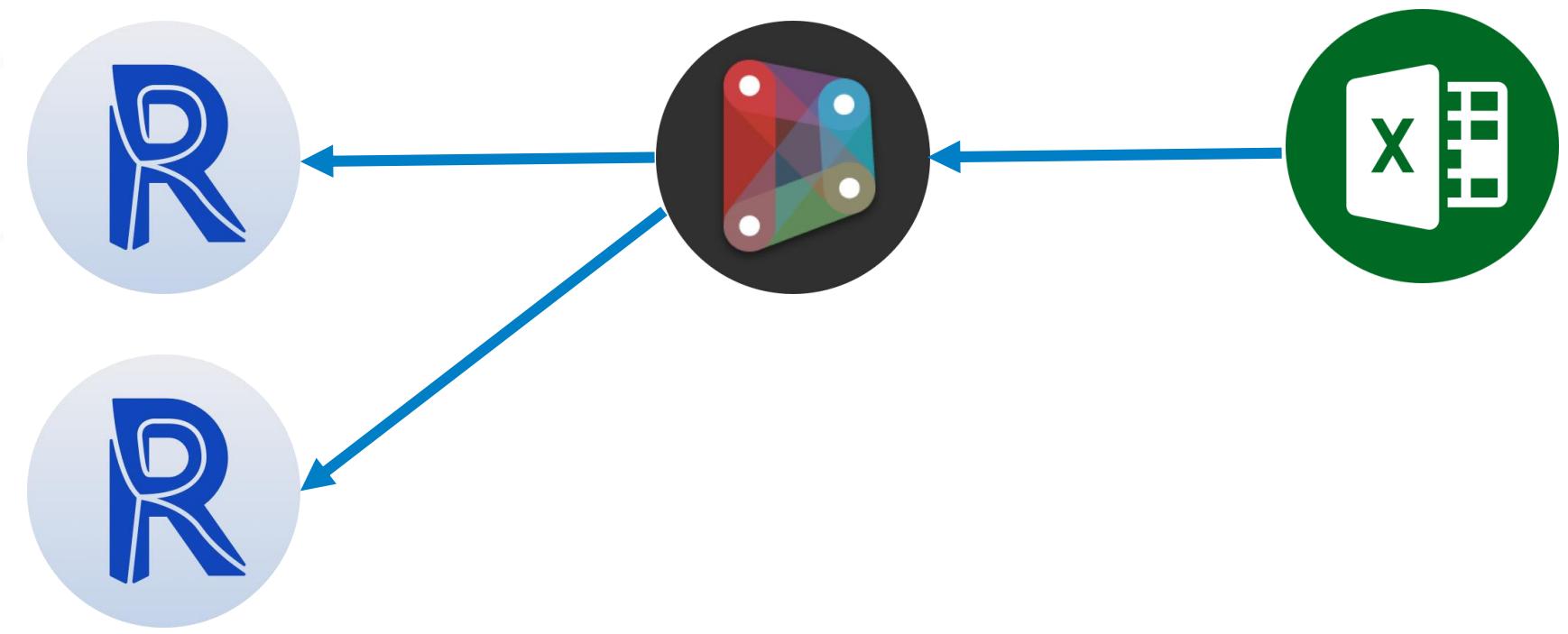
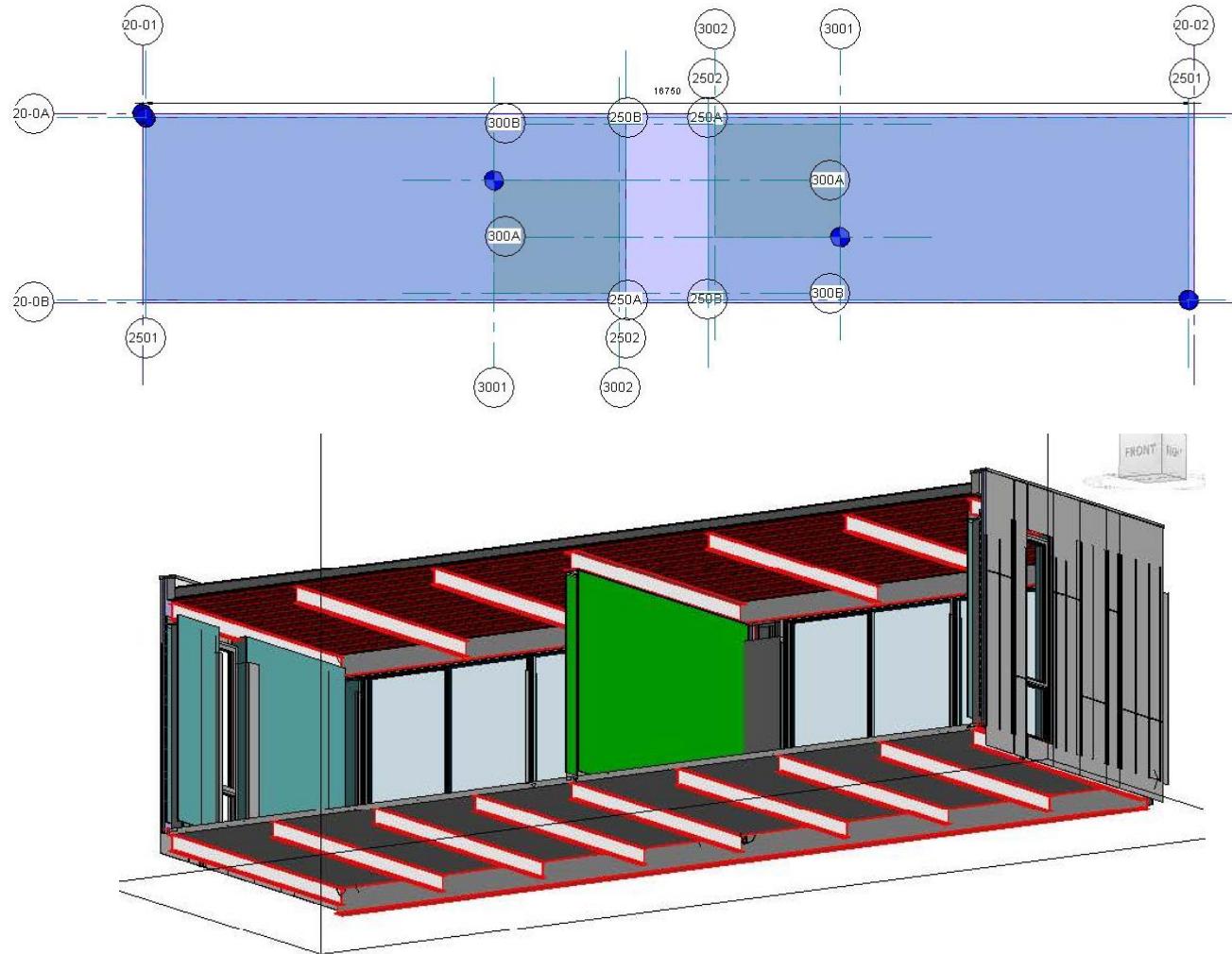
00000-MA00-DigitalProduction.xlsx - Excel																		Ian Atkins	
FILE	HOME	INSERT	PAGE LAYOUT	FORMULAS	DATA	REVIEW	VIEW	DEVELOPER	FLUX	Ablebits Data	Ablebits Utilities	Ablebits Quick Tools	BLUEBEAM	ACROBAT					
Clipboard	Cut	Copy	Format Painter	Font	Font	Font	Font	Font	Font	Font	Font	Font	Font	Font	Font	Font	Font		
	Font	Font	Font																
Q13	...	X	✓	fx	Adjust Grid														
MA20	Type	Contains																Issues	
Building	Mod Name	Template Status	Linked into	Who	Modeling Status	Who	Mod File Name	Length	Width	Height	Structure	Suite - East Side	Suite - West Side	Facade - West Side	Facade - East Side	I	Z		
3	A	101	1	1	PA	2						04001-MS10-A000						make this a mod	
4	A	102	1	1	PA	1						04001-MS10-A000							
5	A	103	1	1	PA	1						04001-MS10-A000							
6	A	104	1	1	PA	1						04001-MS10-A000							
7	A	105	1	1	PA	1						04001-MS10-A000							
8	A	106	2	PA	1	1						04001-MS10-A000	04001-MA15-0001						
9	A	107	1	1	PA	1						04001-MS10-A000							
10	A	108	1	1	PA	1						04001-MS10-A000							
11	A	109	1	1	PA	1						04001-MS10-A000							
12	A	201	4	1	PA	1						04001-MA20-A201	C G B	04001-MS10-A000	04001-MA25-E360	04001-MA25-E370	04001-MA40-0436	04001-MA40-0437	rotate mod for datum
13	A	202	3	1	PA	2						04001-MA20-A202	C A B	04001-MS10-A000	04001-MA25-E360	04001-MA25-E302	04001-MA40-0409	04001-MA40-0403	adjust grid
14	A	203	4	1	PA	3						04001-MA20-A203	C A B	04001-MS10-A000	04001-MA25-E120	04001-MA25-E120	04001-MA40-0409	04001-MA40-0403	
15	A	204	4	2	PA	2						04001-MA20-A204	E A B	04001-MS10-A000					site
16	A	205	4	3	PA	2						04001-MA20-A205	E A B	04001-MS10-A000					
17	A	206	4	2	PA	2						04001-MA20-A206	D F B	04001-MS10-A000					
18	A	207	2	2	PA	2						04001-MA20-A207	D A B	04001-MS10-A000					
19	A	208	3	2	PA	2						04001-MA20-A208	D A B	04001-MS10-A000					column A 4 is 3" too far east of where the CAD documents show
20	A	209	3	2	PA	2						04001-MA20-A209	D A B	04001-MS10-A000					
21	A	301	1	1	PA	1						04001-MA20-A301	C A B	04001-MS10-A000					
22	A	302	1	1	PA	1						04001-MA20-A302	B A B	04001-MS10-A000					
23	A	303	1	1	PA	1						04001-MA20-A303	B A B	04001-MS10-A000					
24	A	304	1	1	PA	1						04001-MA20-A304	B A B	04001-MS10-A000					
25	A	305	1	1	PA	1						04001-MA20-A305	B A B	04001-MS10-A000					
26	A	306	1	1	PA	1						04001-MA20-A306	B F B	04001-MS10-A000					
27	A	307	1	1	PA	1						04001-MA20-A307	B A B	04001-MS10-A000					
28	A	308	1	1	PA	1						04001-MA20-A308	A A B	04001-MS10-A000					
29	A	309	1	1	PA	1						04001-MA20-A309	C A B	04001-MS10-A000					
30	B	102	4	4	PA	1						04001-MA20-B102	A C A	04001-MS10-B000	04001-MA25-E302	04001-MA25-E320	to include all sides	04001-MA40-0430	
31	B	103	4	4	PA	1						04001-MA20-B103	A A A	04001-MS10-B000		04001-MA25-E209	04001-MA40-0401	04001-MA40-0401	
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33	B	105	4	4	PA	4						04001-MA20-B105	A A A	04001-MS10-B000	04001-MA25-C509	04001-MA25-D109	04001-MA40-0401	04001-MA40-0401	
34	B	106	4	4	PA	4						04001-MA20-B106	A A A	04001-MS10-B000	04001-MA25-D409	04001-MA25-D209	04001-MA40-0401	04001-MA40-0401	
35	B	107	4	4	PA	1						04001-MA20-B107	A B A	04001-MS10-B000	04001-MA25-D309	04001-MA25-D309	04001-MA40-0405	04001-MA40-0405	
36	B	108	4	4	PA							04001-MA20-B108	A A A	04001-MS10-B000			04001-MA40-0401	04001-MA40-0401	
37	B	109	4	4	PA							04001-MA20-B109	A A A	04001-MS10-B000			04001-MA40-0401	04001-MA40-0401	
38	B	110	4	4	PA							04001-MA20-B110	A A A	04001-MS10-B000			04001-MA40-0401	04001-MA40-0401	
39	B	111	4	4	PA							04001-MA20-B111	A A A	04001-MS10-B000			04001-MA40-0401	04001-MA40-0401	
40	B	112	4	4	PA	3						04001-MA20-B112	A E A	04001-MS10-B000			04001-MA40-0405	04001-MA40-0405	
41	B	113	4	4	PA							04001-MA20-B113	A A A	04001-MS10-B000			04001-MA40-0401	04001-MA40-0401	
42	B	114	4	4	PA							04001-MA20-B114	A A A	04001-MS10-B000			04001-MA40-0401	04001-MA40-0401	
43	B	115	4	4	PA	4						04001-MA20-B115	A A A	04001-MS10-B000			04001-MA40-0401	04001-MA40-0401	
44	B	116	4	4	PA							04001-MA20-B116	A A A	04001-MS10-B000			04001-MA40-0401	04001-MA40-0401	
45	B	117	4	4	PA							04001-MA20-B117	A A A	04001-MS10-B000			04001-MA40-0401	04001-MA40-0401	
46	B	118	4	4	PA							04001-MA20-B118	A B A	04001-MS10-B000			04001-MA40-0405	04001-MA40-0405	
47	B	119	4	4	PA							04001-MA20-B119	A A A	04001-MS10-B000			04001-MA40-0401	04001-MA40-0401	
48	B	120	4	4	PA							04001-MA20-B120	A A A	04001-MS10-B000			04001-MA40-0401	04001-MA40-0401	
49	B	121	4	4	PA							04001-MA20-B121	A A A	04001-MS10-B000	04001-MA25-B121-1	04001-MA25-B121-2	04001-MA40-0401	04001-MA40-0401	
50	B	122	4	4	PA							04001-MA20-B122	A A A	04001-MS10-B000	04001-MA25-B122-1	04001-MA25-B122-2	04001-MA40-0401	04001-MA40-0401	
51	B	123	4	4	PA							04001-MA20-B123	A D A	04001-MS10-B000	04001-MA25-B123-1	04001-MA25-B123-2	to include all sides	04001-MA40-0431	
52	B	202	4	4	PA	2						04001-MA20-B202	A C B	04001-MS10-B000	04001-MA25-E301	04001-MA25-E321	to include all sides	04001-MA40-0432	

File Structure – Data Control

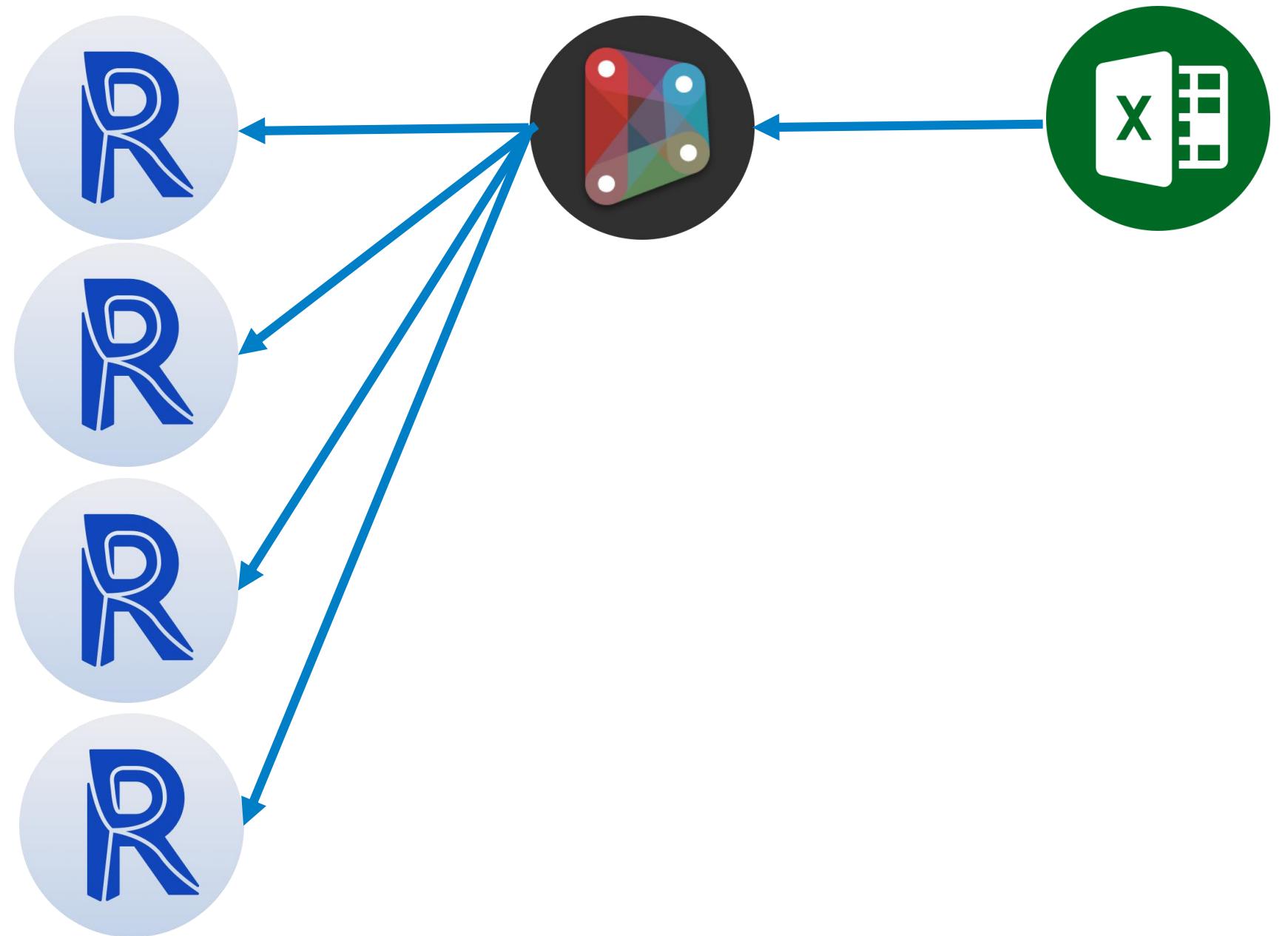
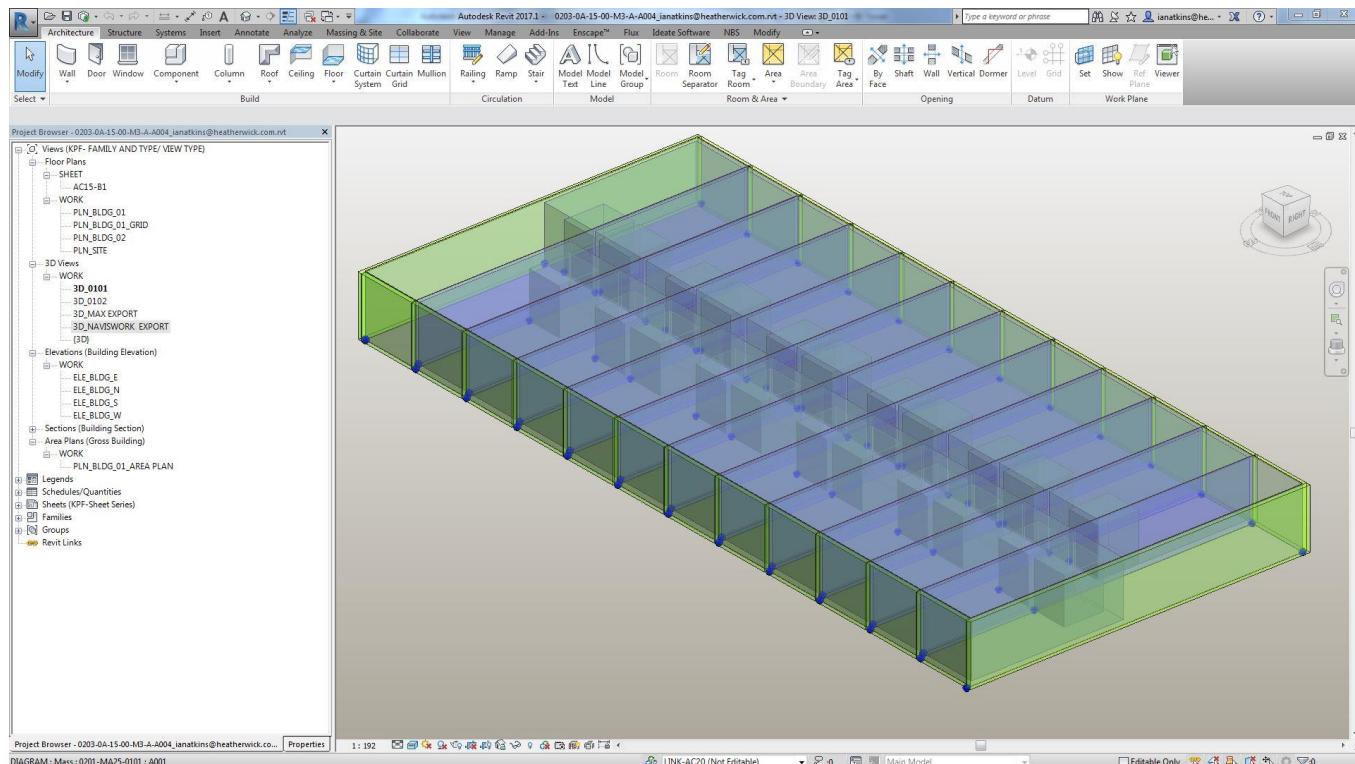
Strategy and Datum



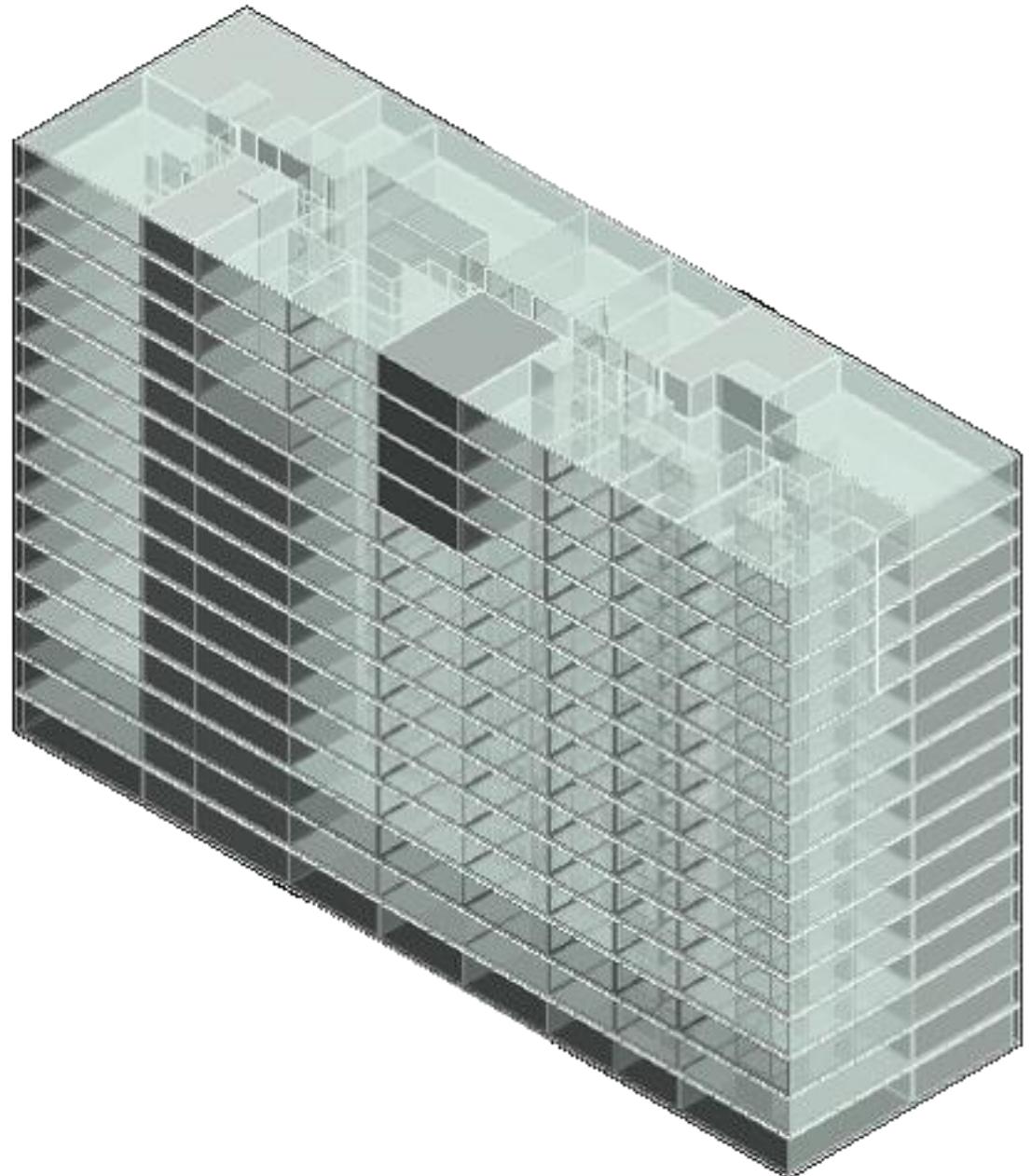
File Structure – Data Preparation



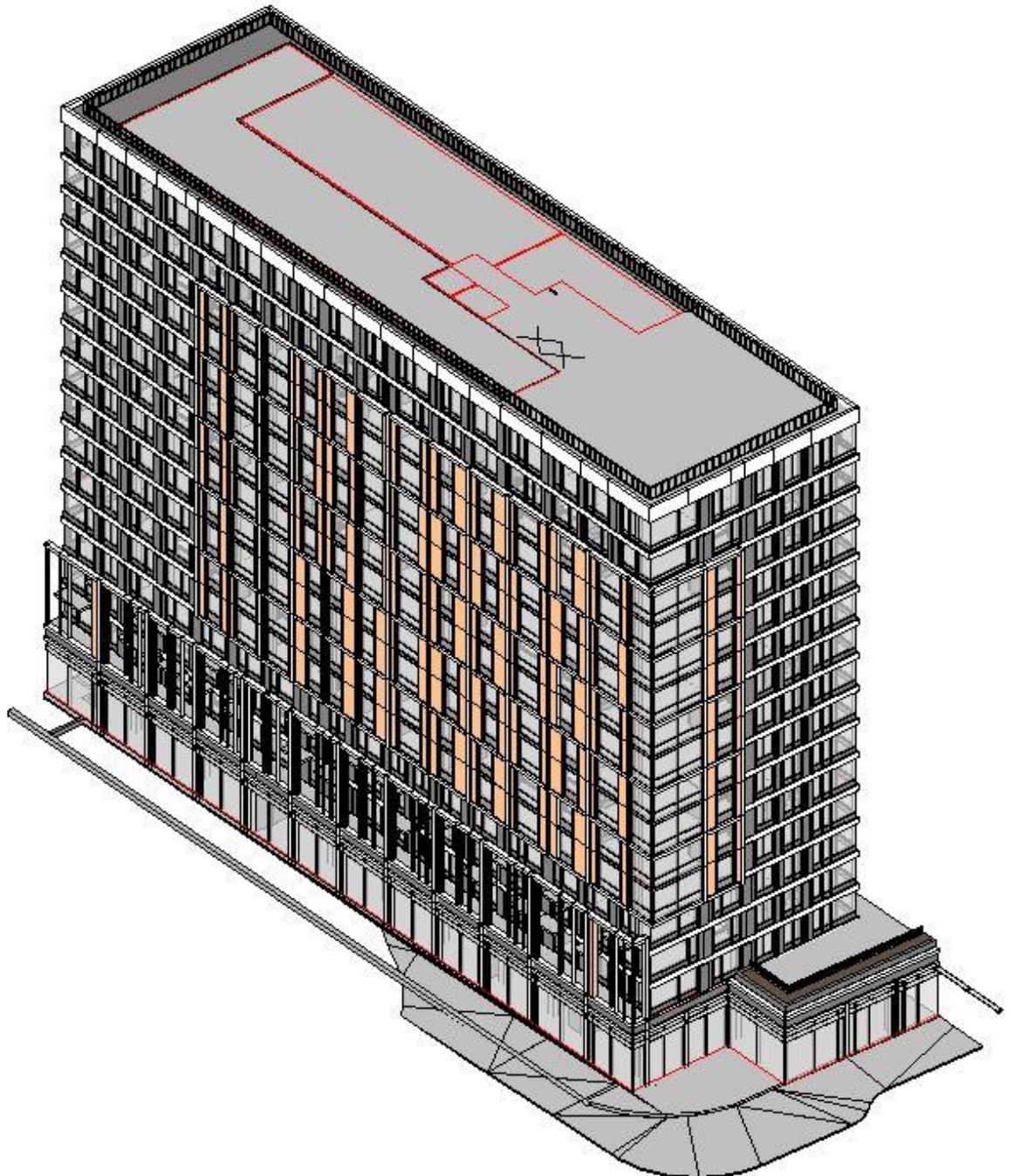
File Structure – Data Preparation



File Structure – Data Preparation

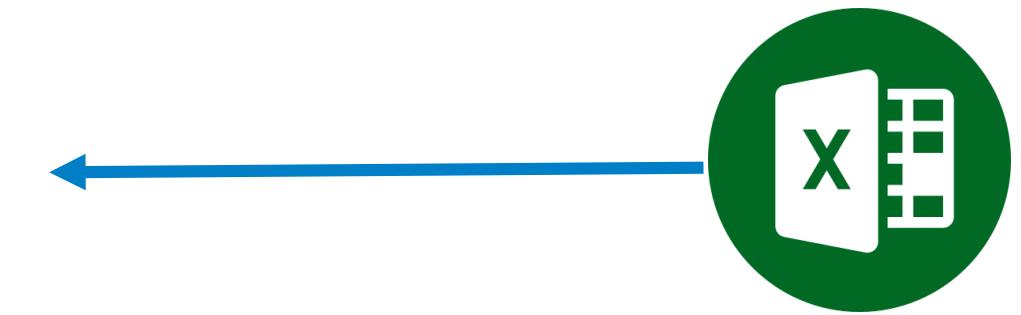
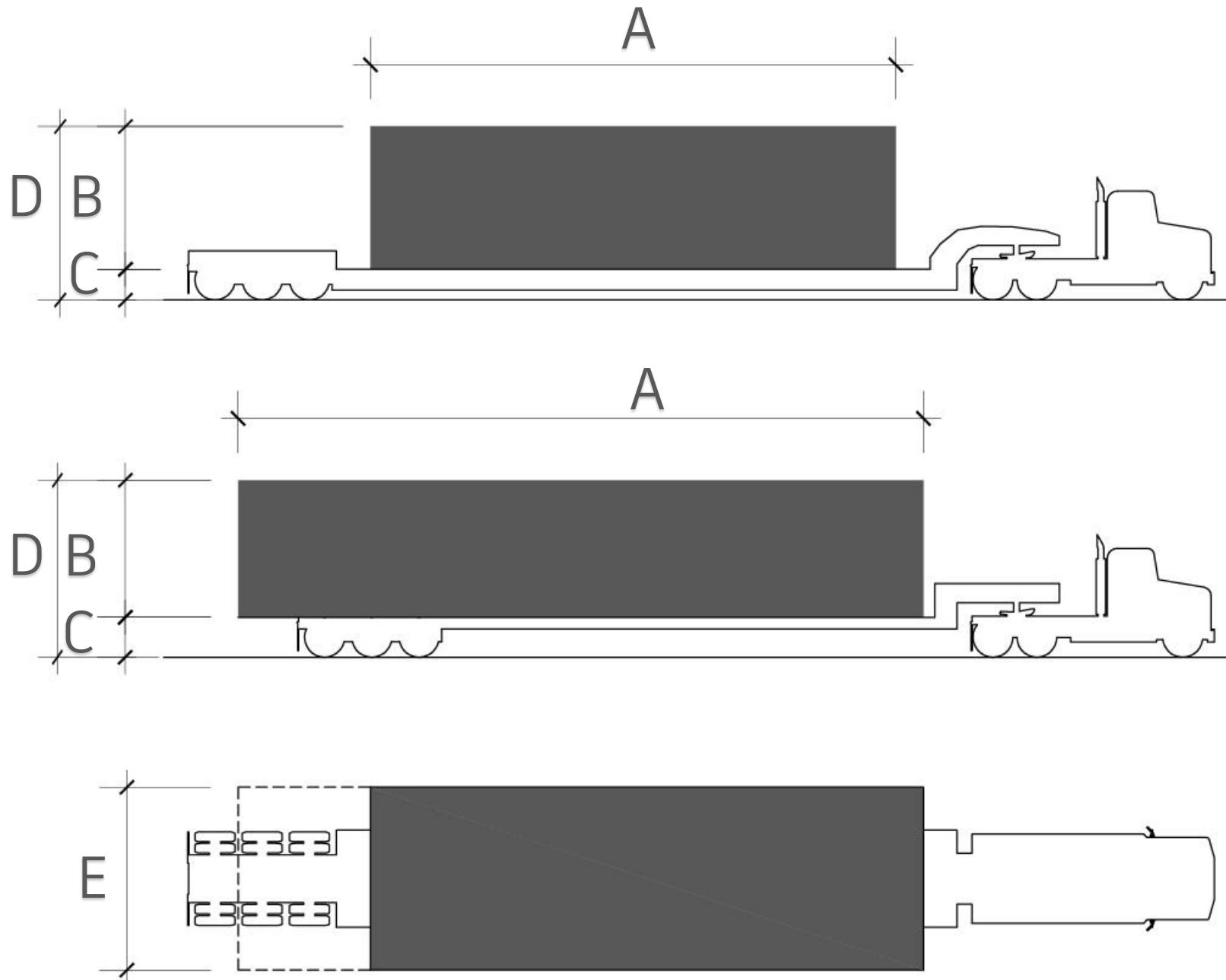


Module Diagram



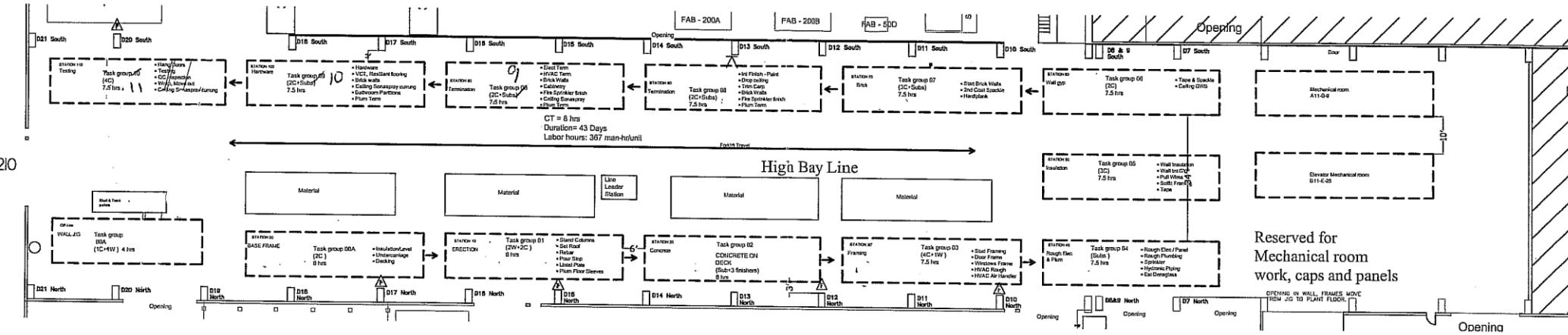
Architecture Model

File Structure – Data Preparation



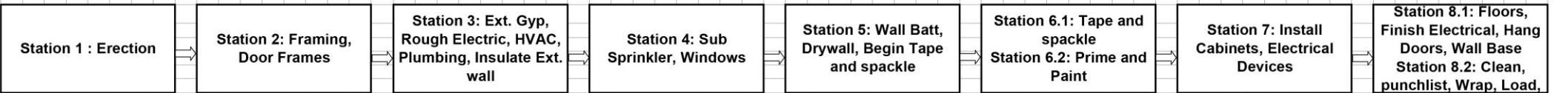
Dimension	Double Drop	Single Drop
A	40'-0"	50'-0"
B	13'-0"	12'-0"
C	2'-0"	3'-2"
D	15'-0"	15'-2"
E	13'-0"	13'0"

File Structure - Data Preparation

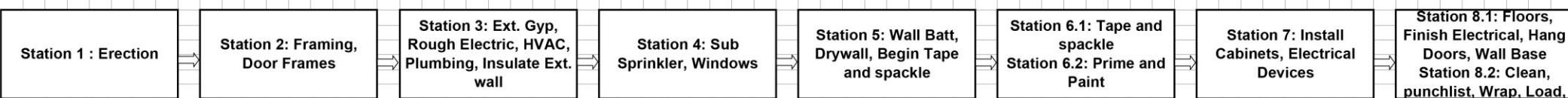


Tasks	Erection	Framing	Door Frames	CT	Tasks	Ext gyp	Ext Insulation	Rough Elec	Plumbing	Sprinkler	CT	Tasks	Windows	Wall Batt	Tape and spackle	Drywall	Tasks	Tape and spackle	Prime and Paint	Cabinets	Electrical Devices	Wrap, Load Move
C	C	C			W	W	W			E		PI	PI	PI			C	W		C		
W	W	W			E	E	E			PI		Pa	Pa	Pa			W	E		W		
E	E	E			PI	PI	PI			Pa						PI	PI		PI			
PI	PI	PI			Pa	Pa	Pa									Pa	Pa		Pa			
Pa	Pa	Pa																				
Workforce	0 0	Workforce	0 0		Workforce	0 0	Workforce	0 0		Workforce	0 0	Workforce	0 0	Workforce	0 0	Workforce	0 0	Workforce	0 0	Workforce	0 0	

Production Line 1



Production Line 2

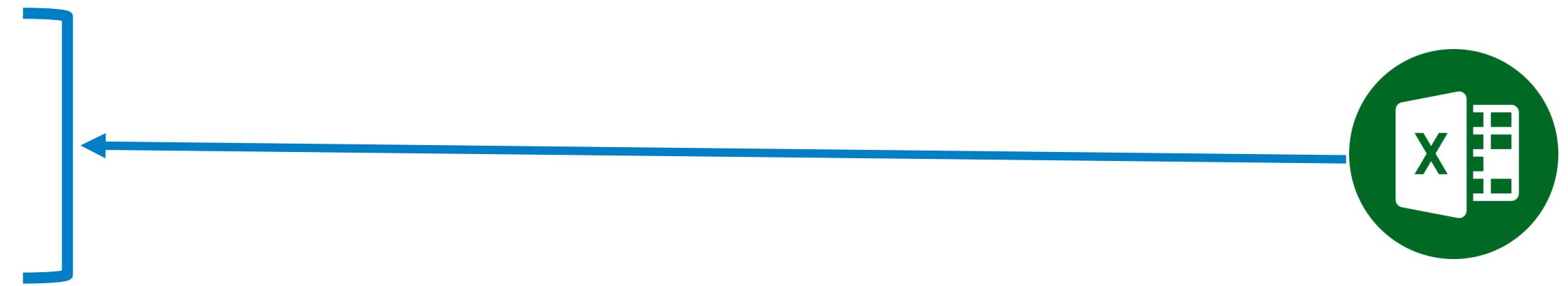




File Structure – Data Preparation

Data Exchange and Data Extraction

Dimension
Position
Quantity
Workset Name

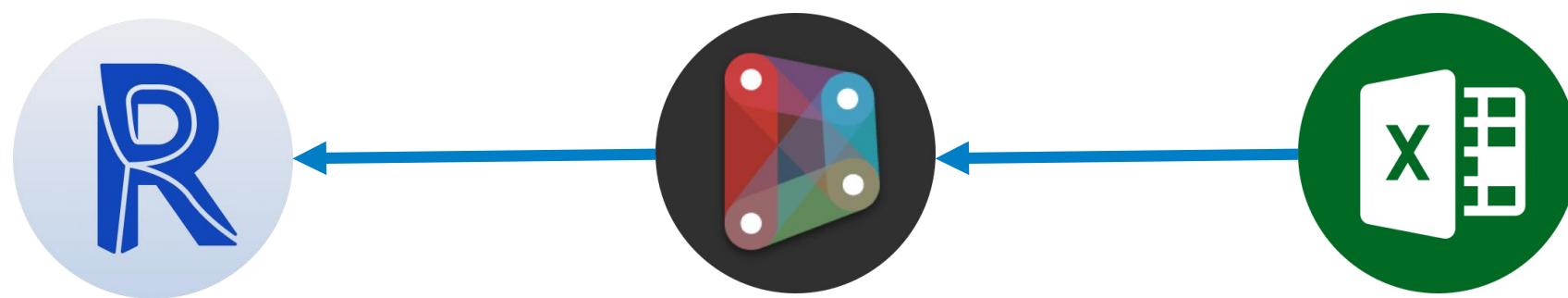


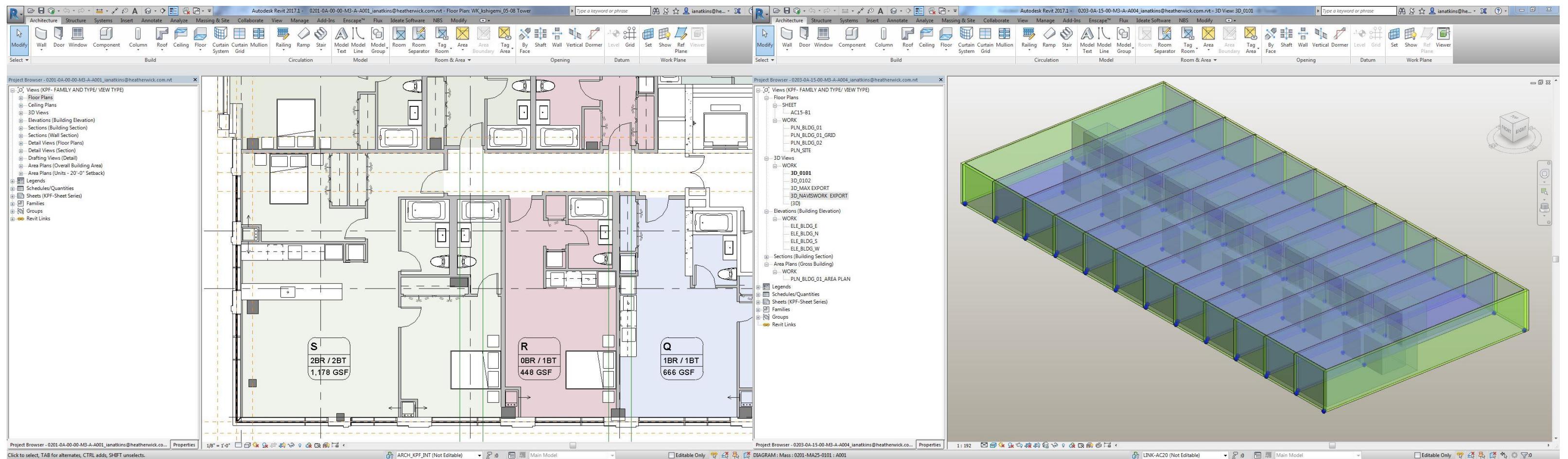
File Structure – Data Preparation

Worksets

File Structure – Data Control

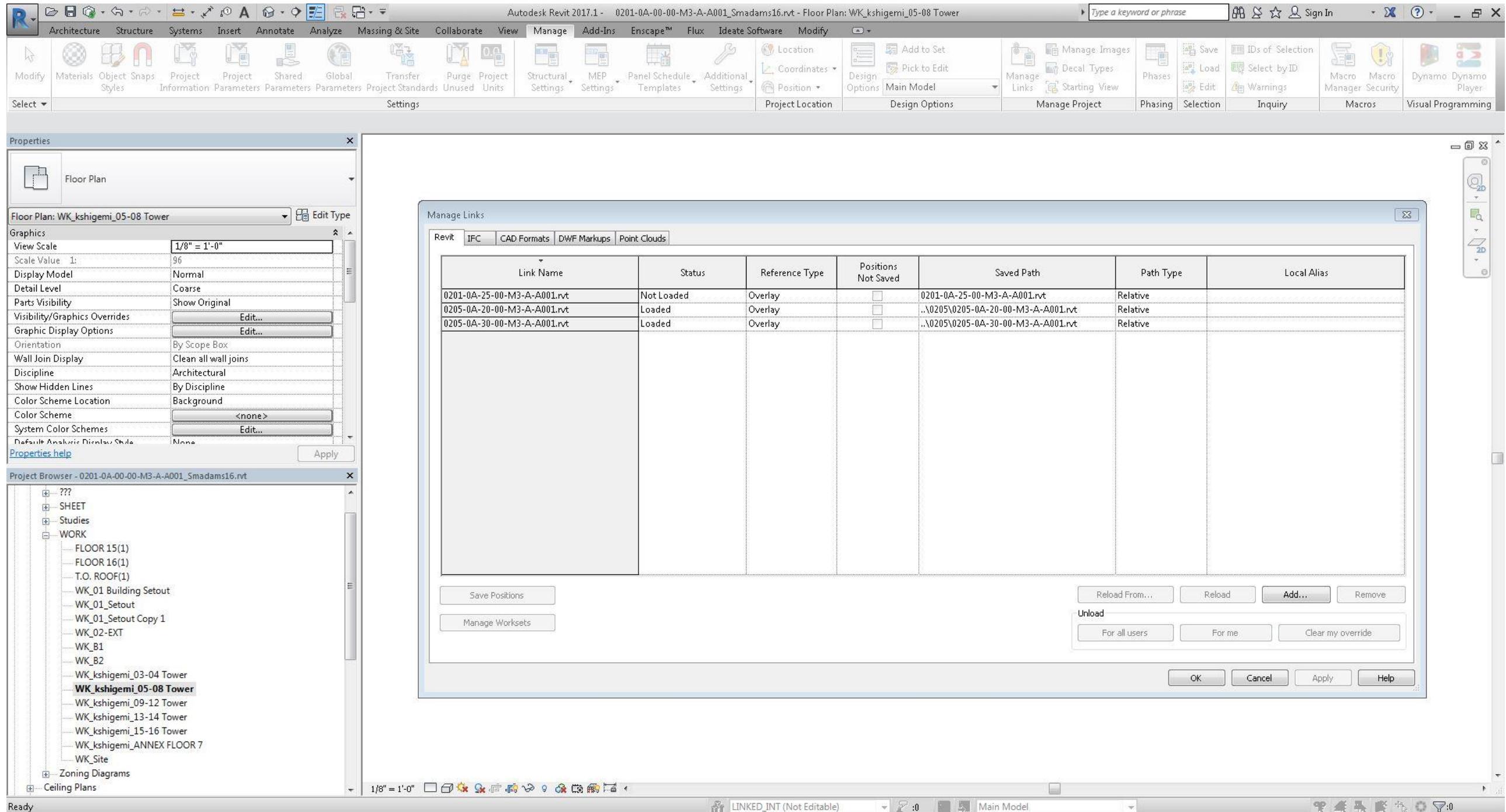
Worksets





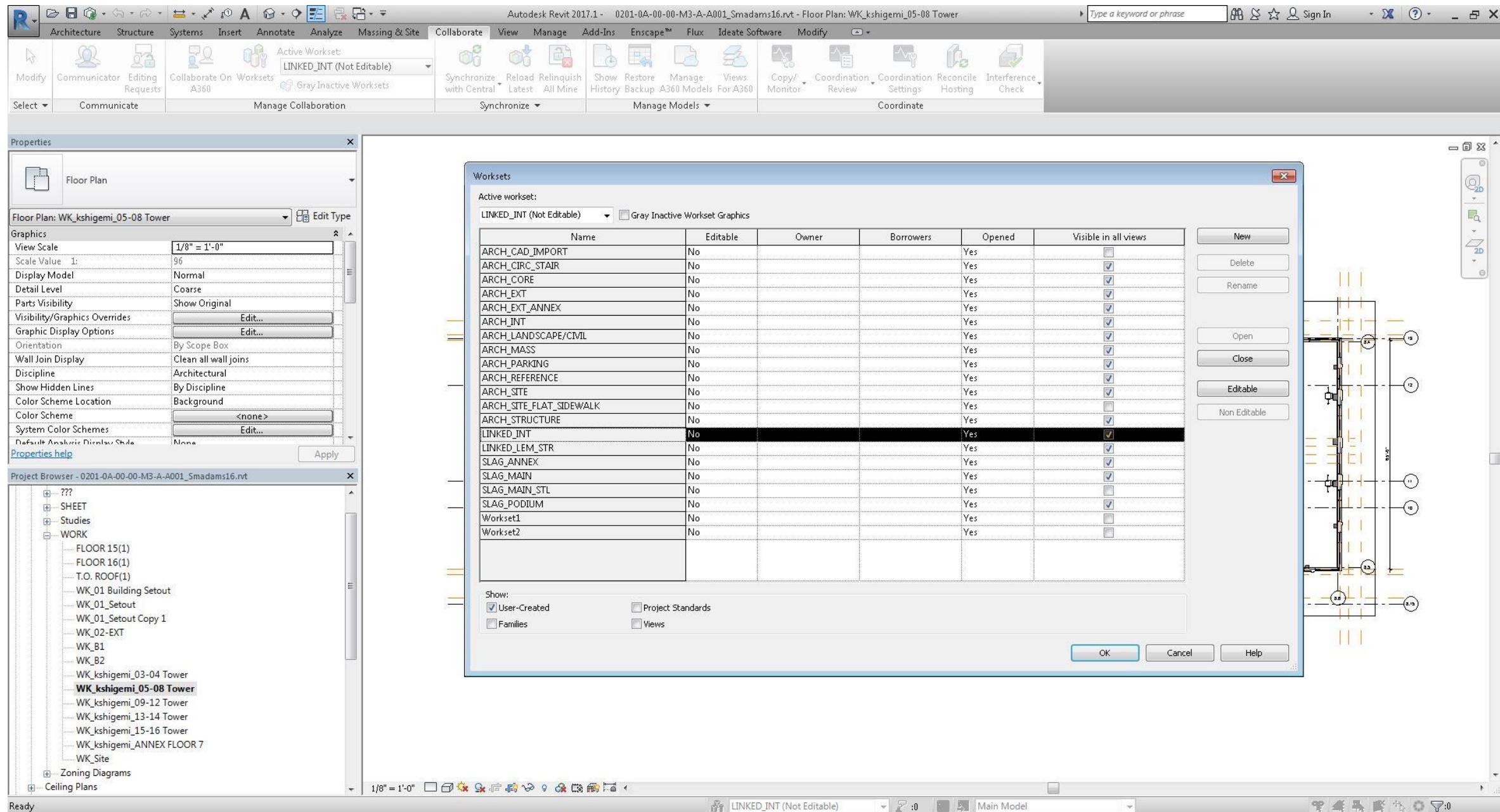
Data Structure – File Preparation

Links



Data Structure – File Preparation

Workset



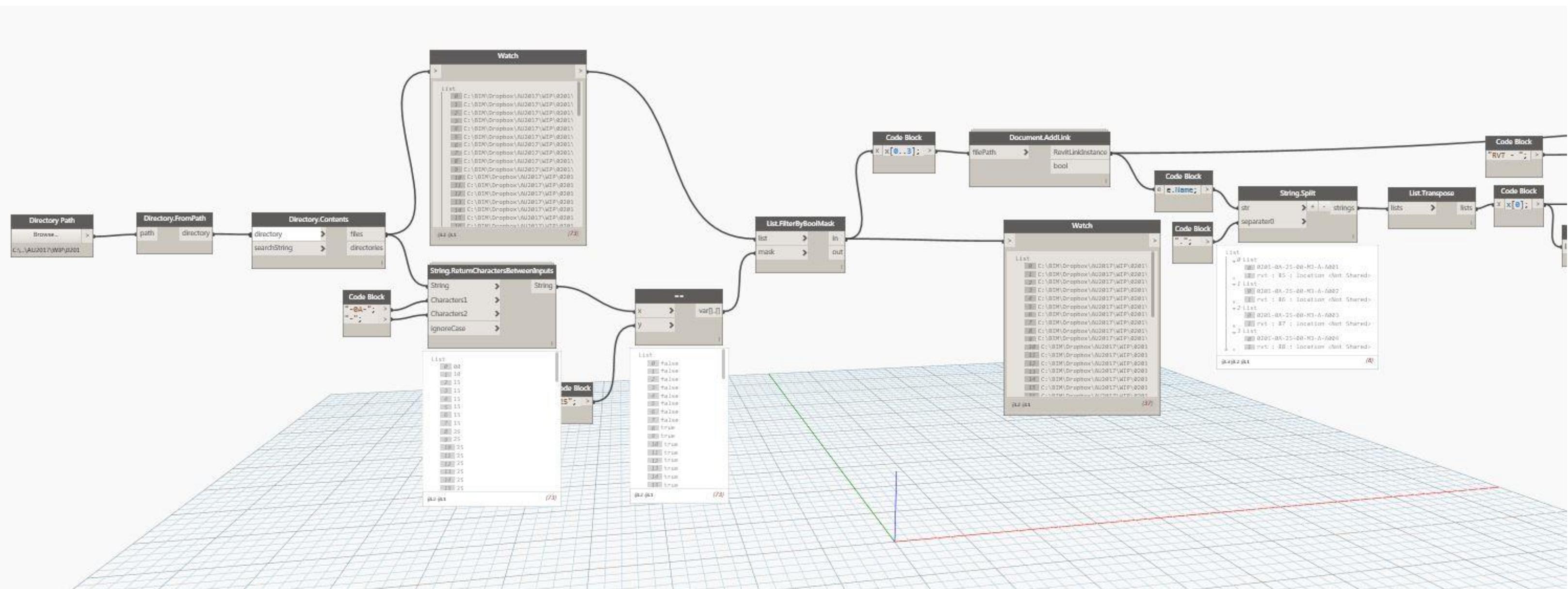
Data Structure – File Preparation

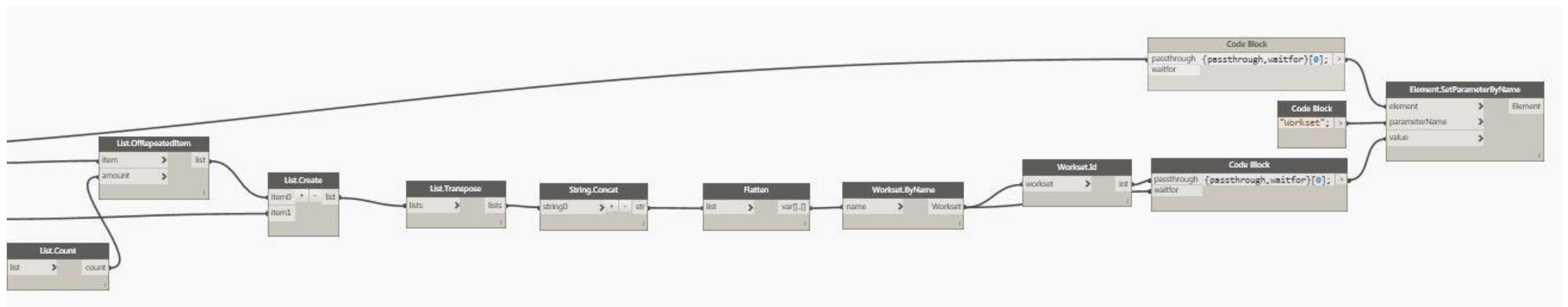
Worksets

ARCH_CAD_IMPORT
ARCH_CIRC_STAIR
ARCH_CORE
ARCH_EXT
ARCH_EXT_ANNEX
ARCH_INT
ARCH_LANDSCAPE/CIVIL
ARCH_MASS
ARCH_PARKING
ARCH_REFERENCE
ARCH_SITE
ARCH_SITE_FLAT_SIDEWALK
ARCH_STRUCTURE
LINKED_INT
LINKED_LEM_STR
SLAG_ANNEX
SLAG_MAIN
SLAG_MAIN_STL
SLAG_PODIUM
Workset1
Workset2

Data Structure – File Preparation

Worksets





The background features a complex, organic wireframe mesh composed of numerous thin, light-grey lines forming a series of interconnected triangles and quadrilaterals. The mesh is highly detailed and spans the entire frame, creating a sense of depth and structure.

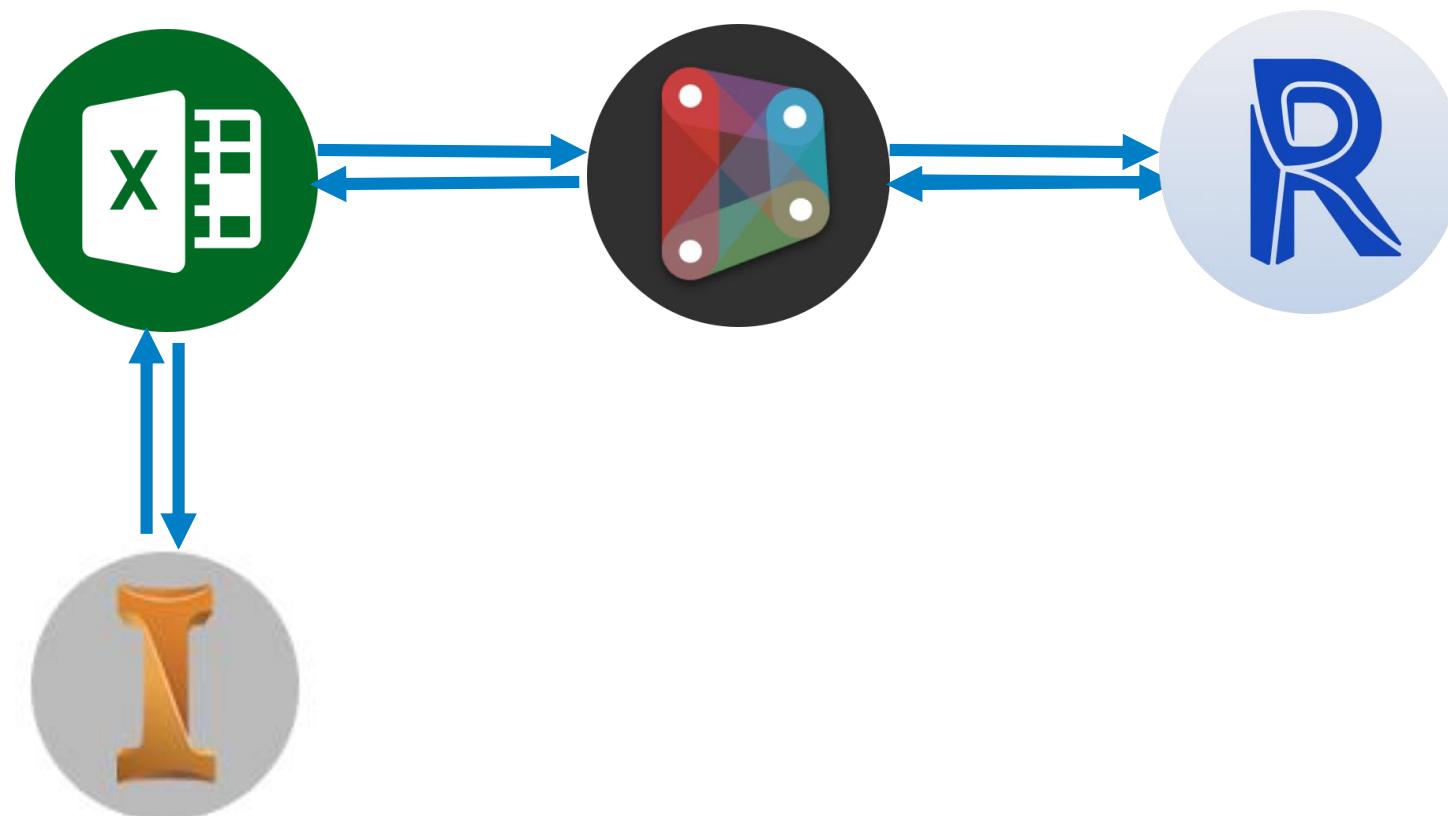
07 : Model Data + Building Fabrication

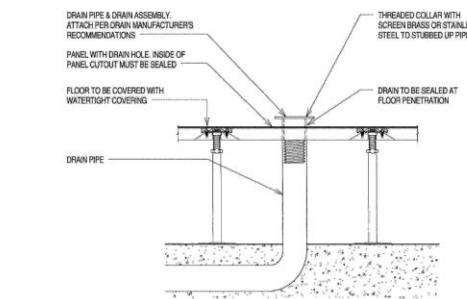
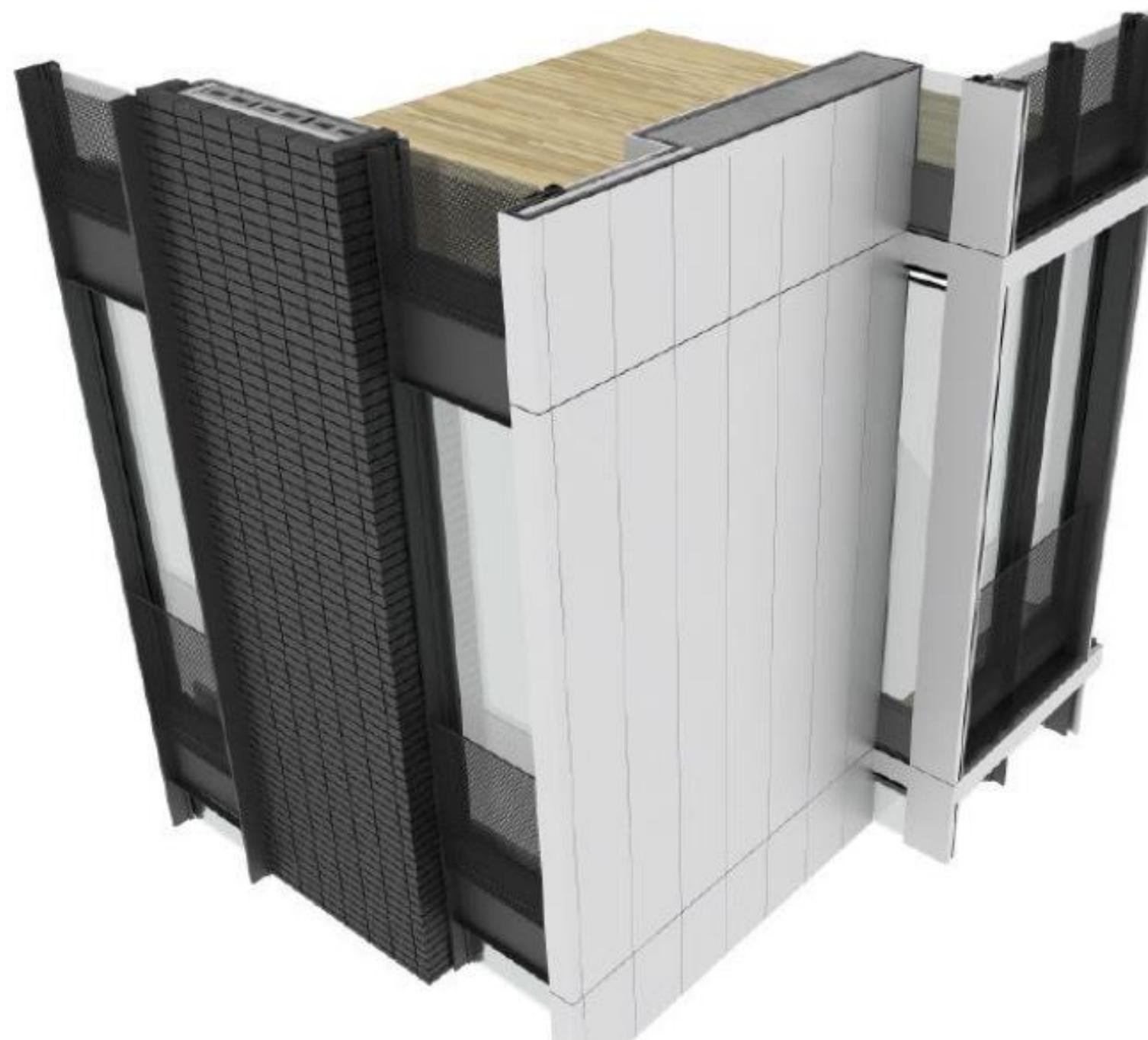
Data Structure – File Preparation

Hyper-Detail

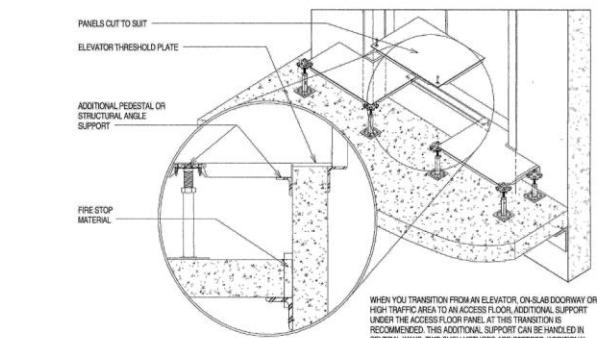
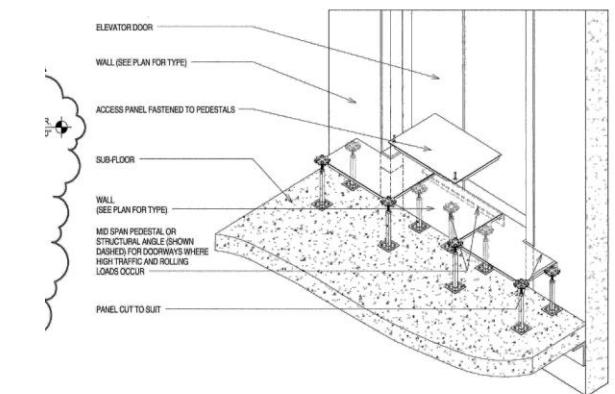
Data Structure – File Preparation

Hyper-Detail

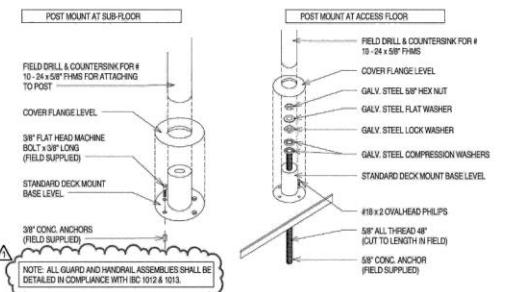
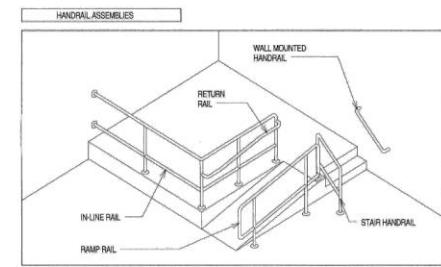




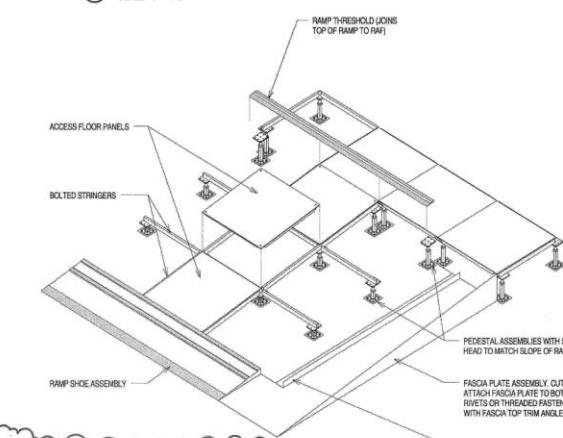
⑤ RAISED FLOOR DETAIL @ DRAIN PIPE
SCALE: 1/8" = 1'-0"



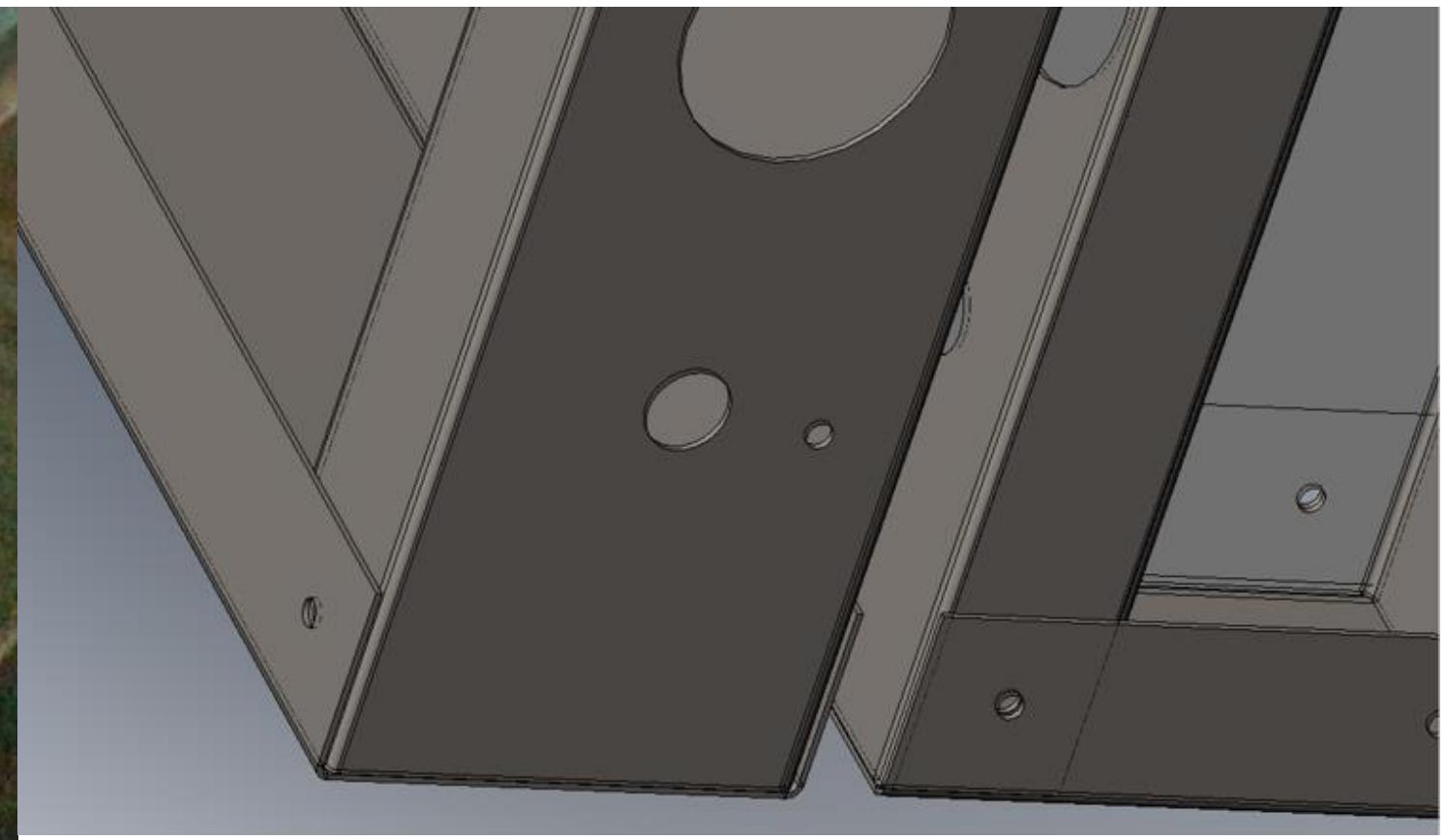
ELEVATOR TRANSITION @ RAISED ACCESS FLOOR
SCALE: 3" = 1'-0"

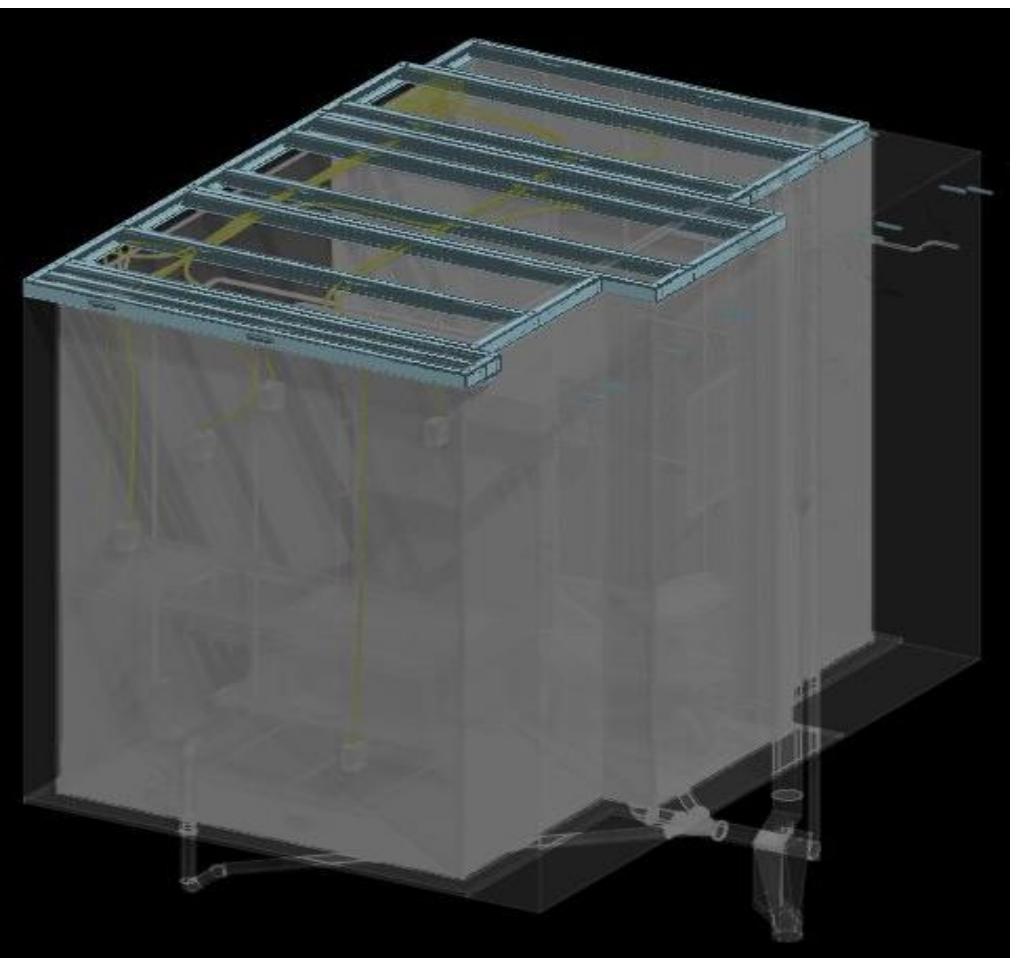
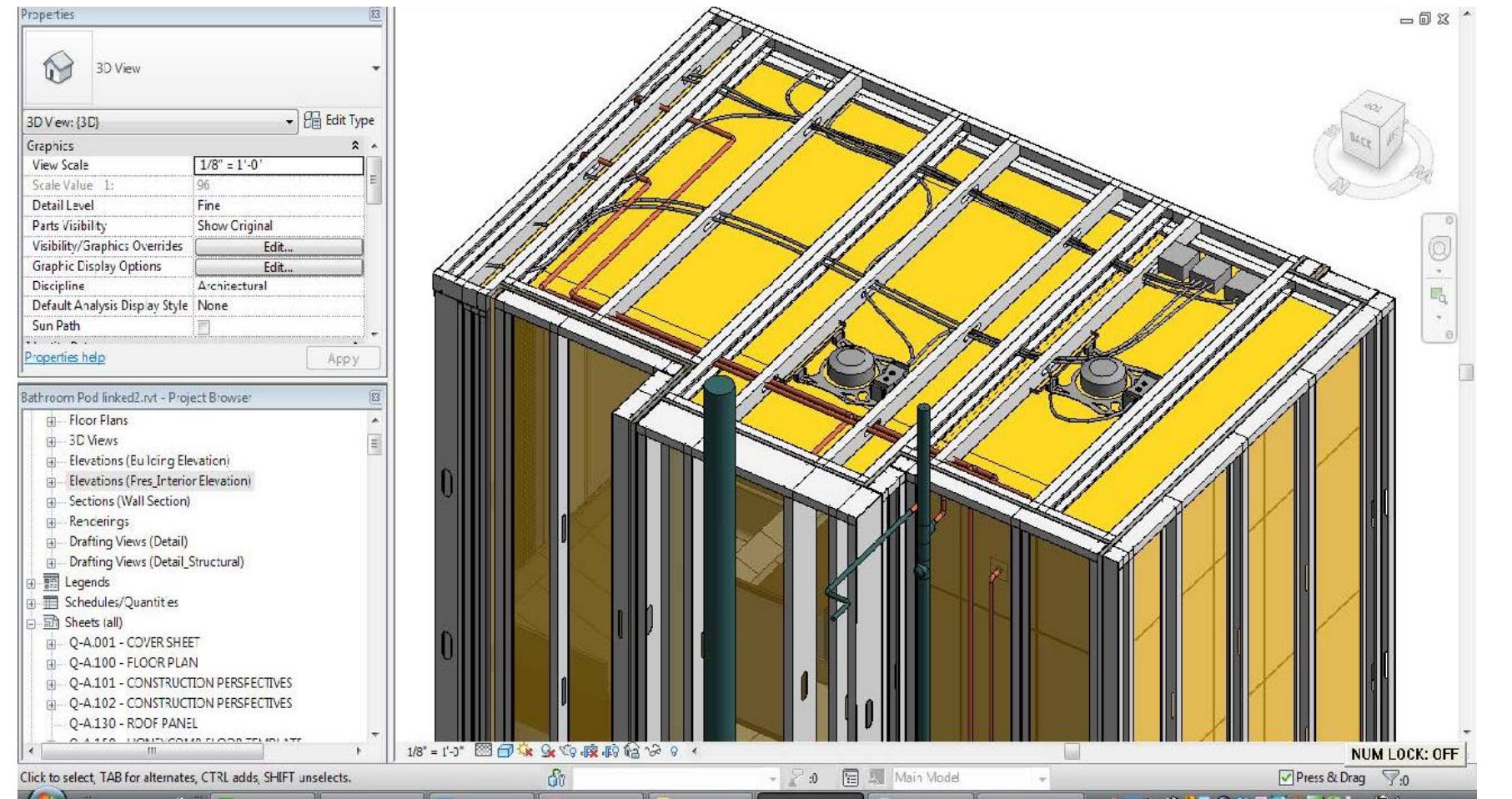


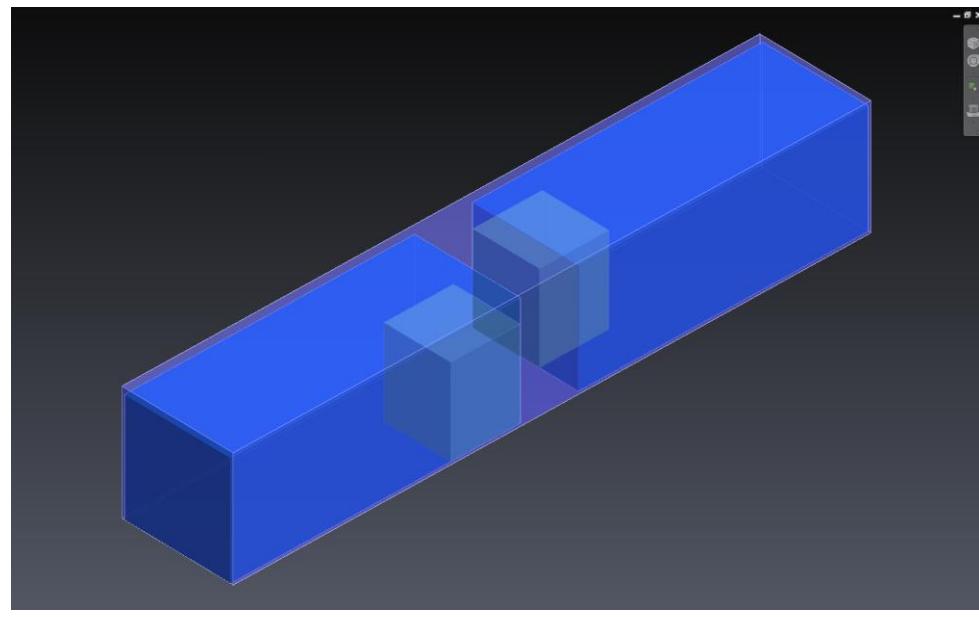
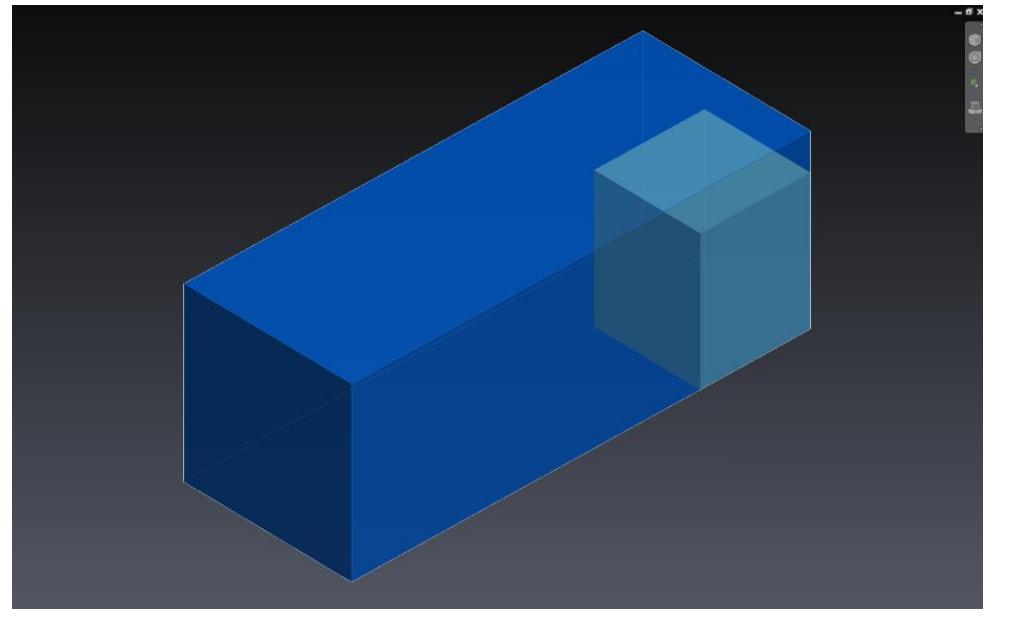
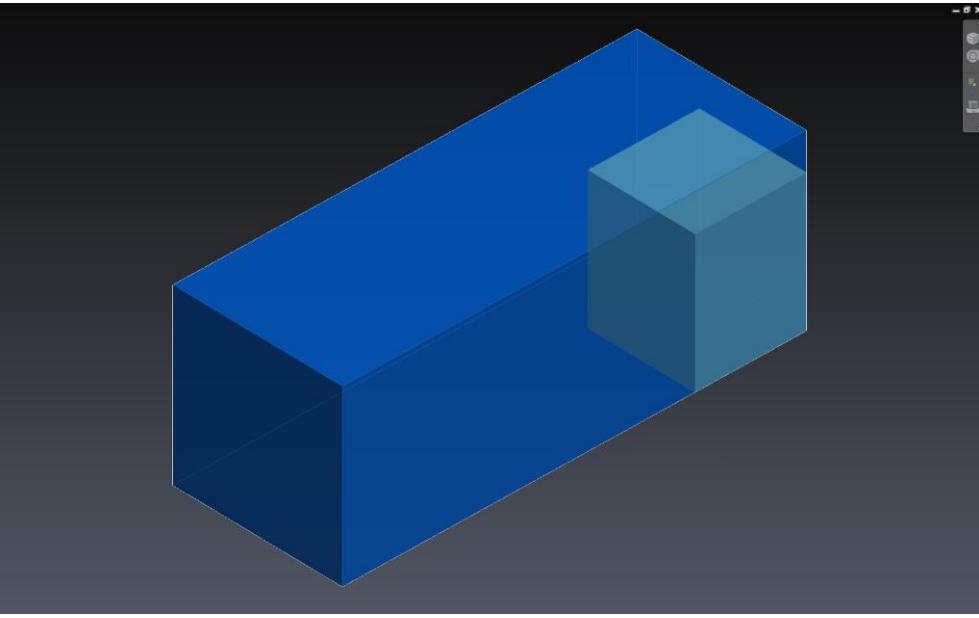
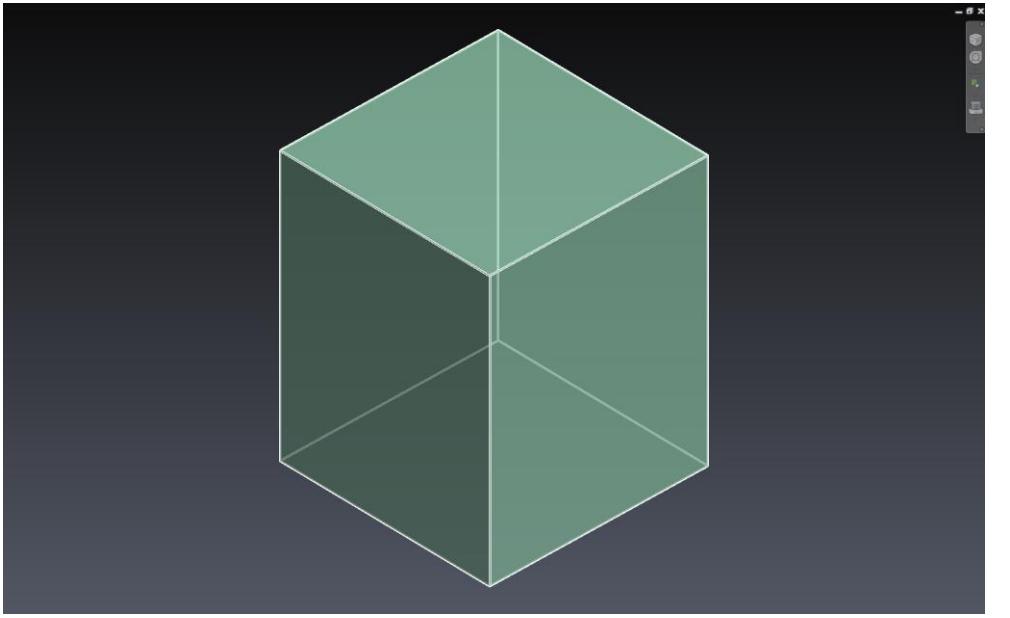
② RAISED ACCESS FLOOR HANDBRAL / GUARDRAL APPLICATIONS
SCALE: 8" = 1'-0"

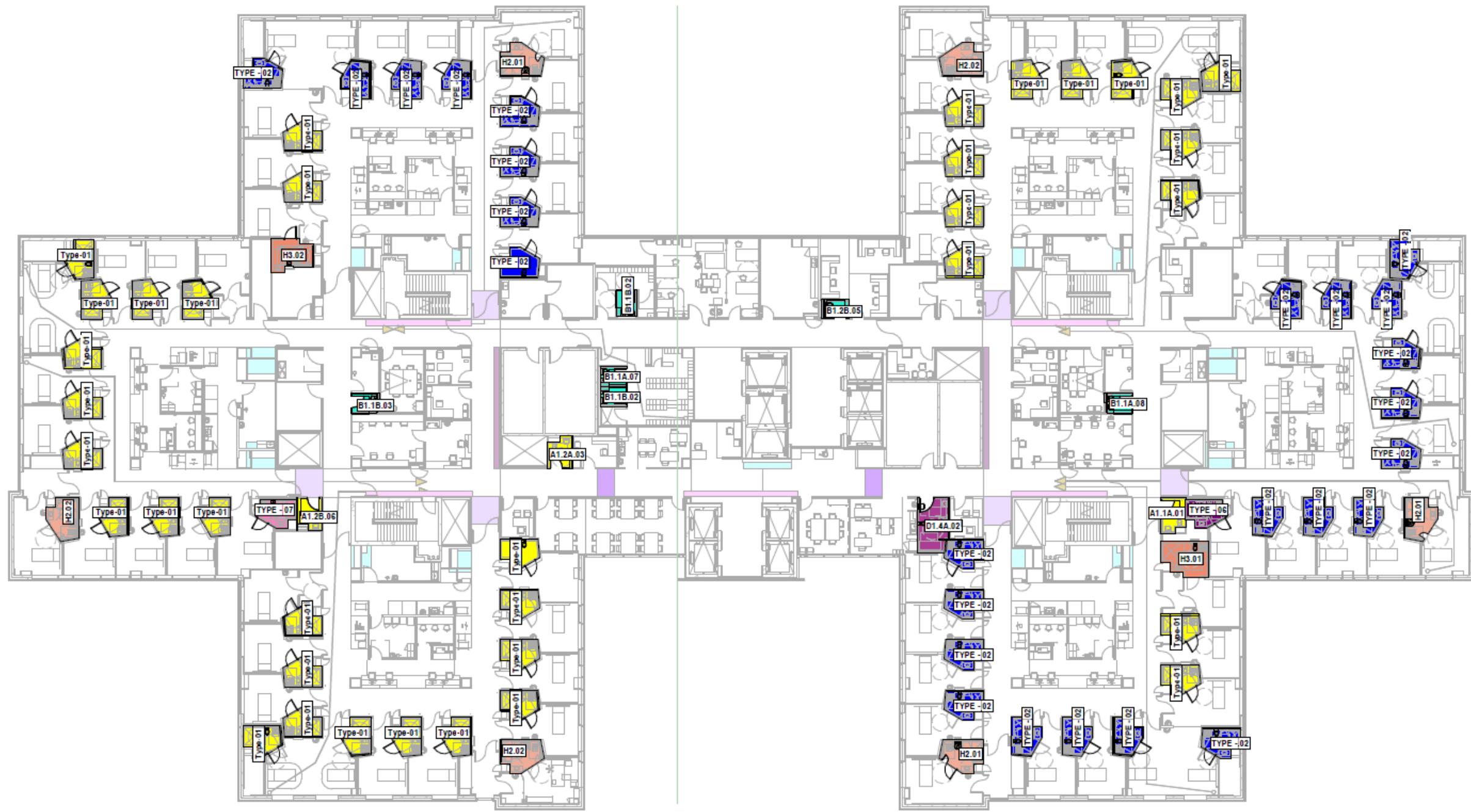


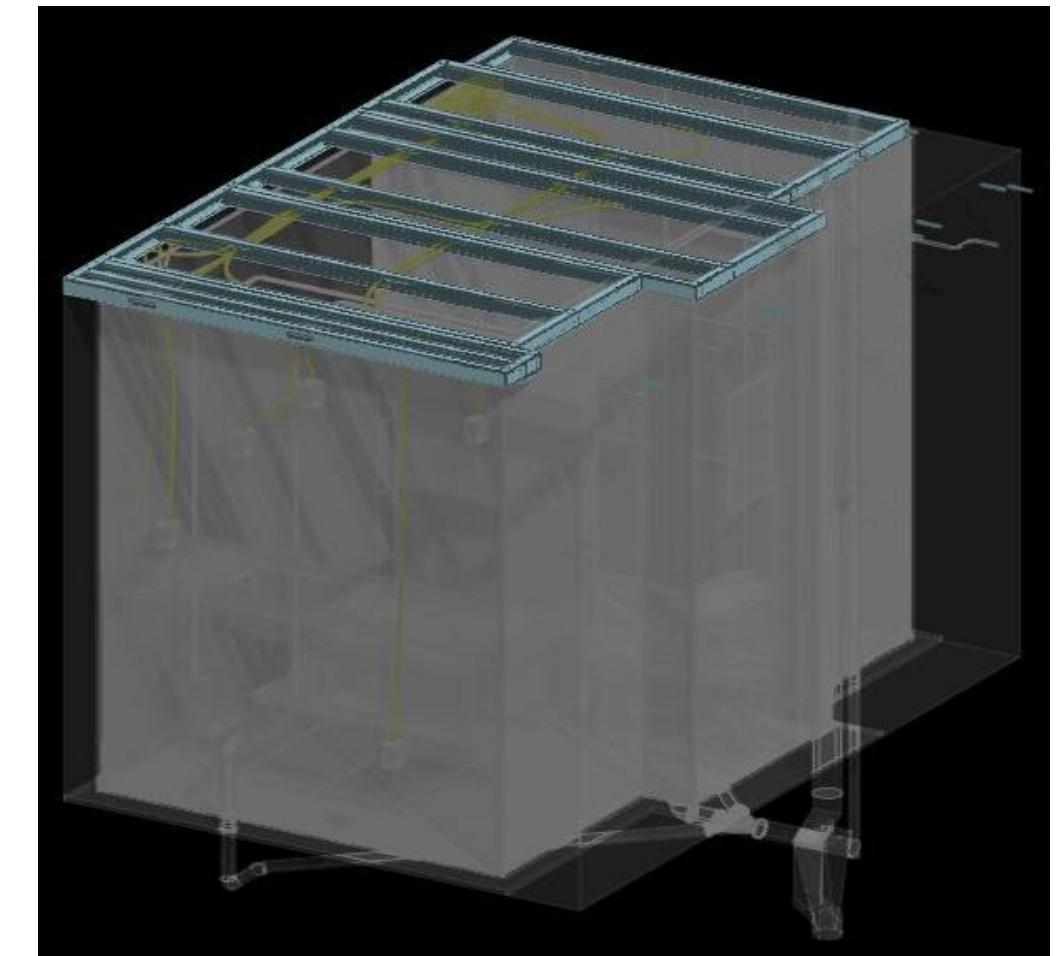
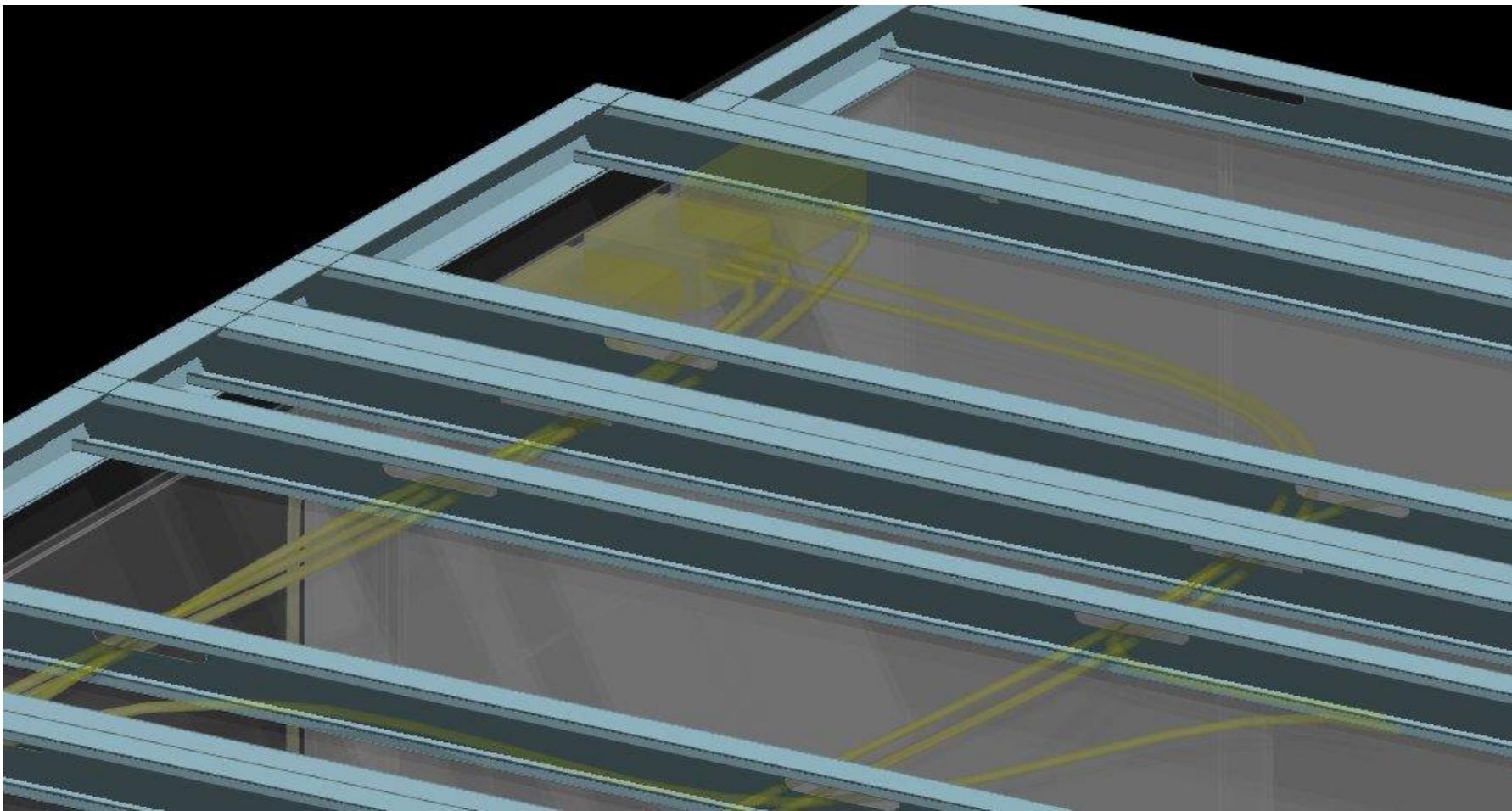
① RAISED FLOOR RAMP ASSEMBLY
SCALE: 3" = 1'-0"

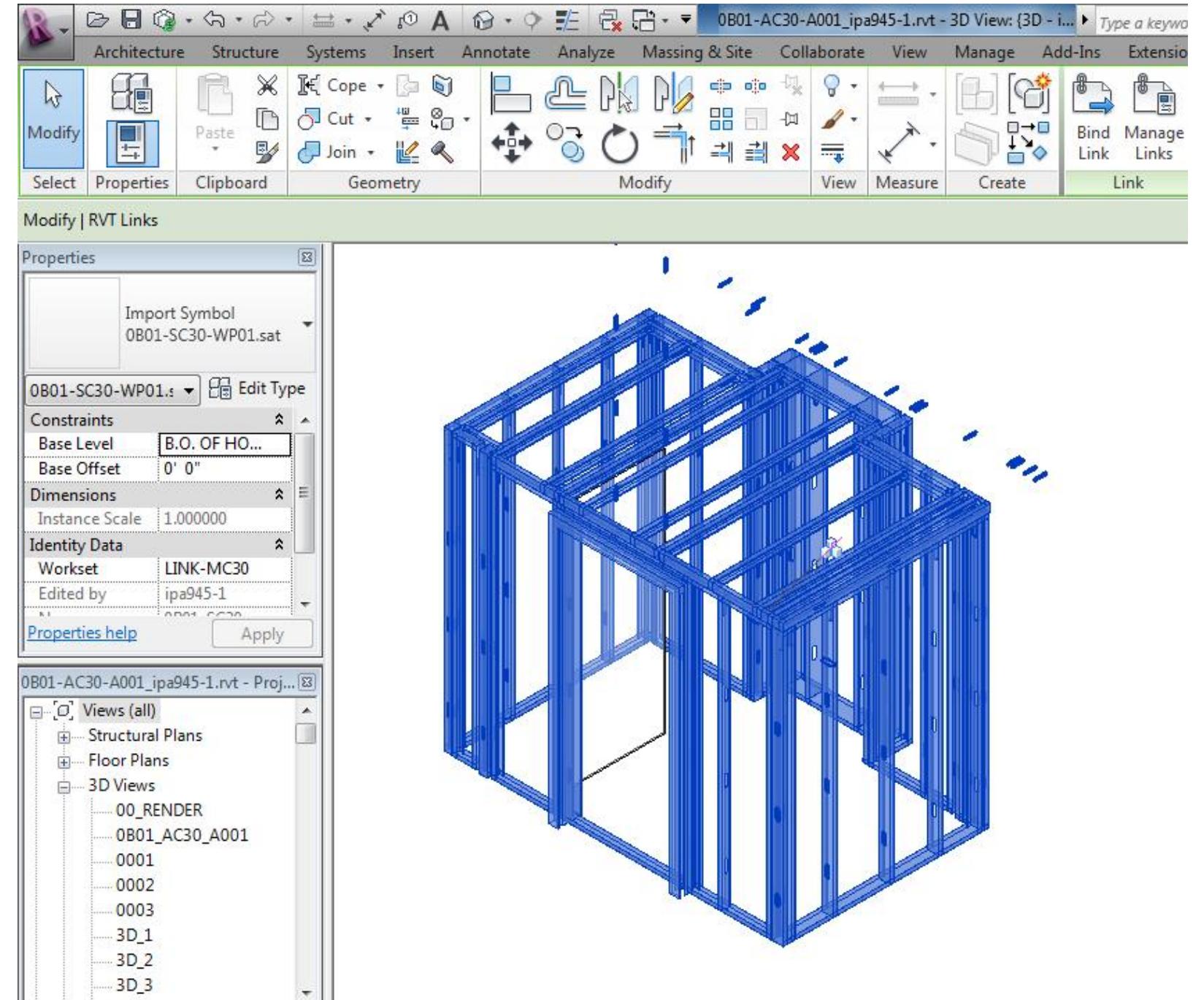
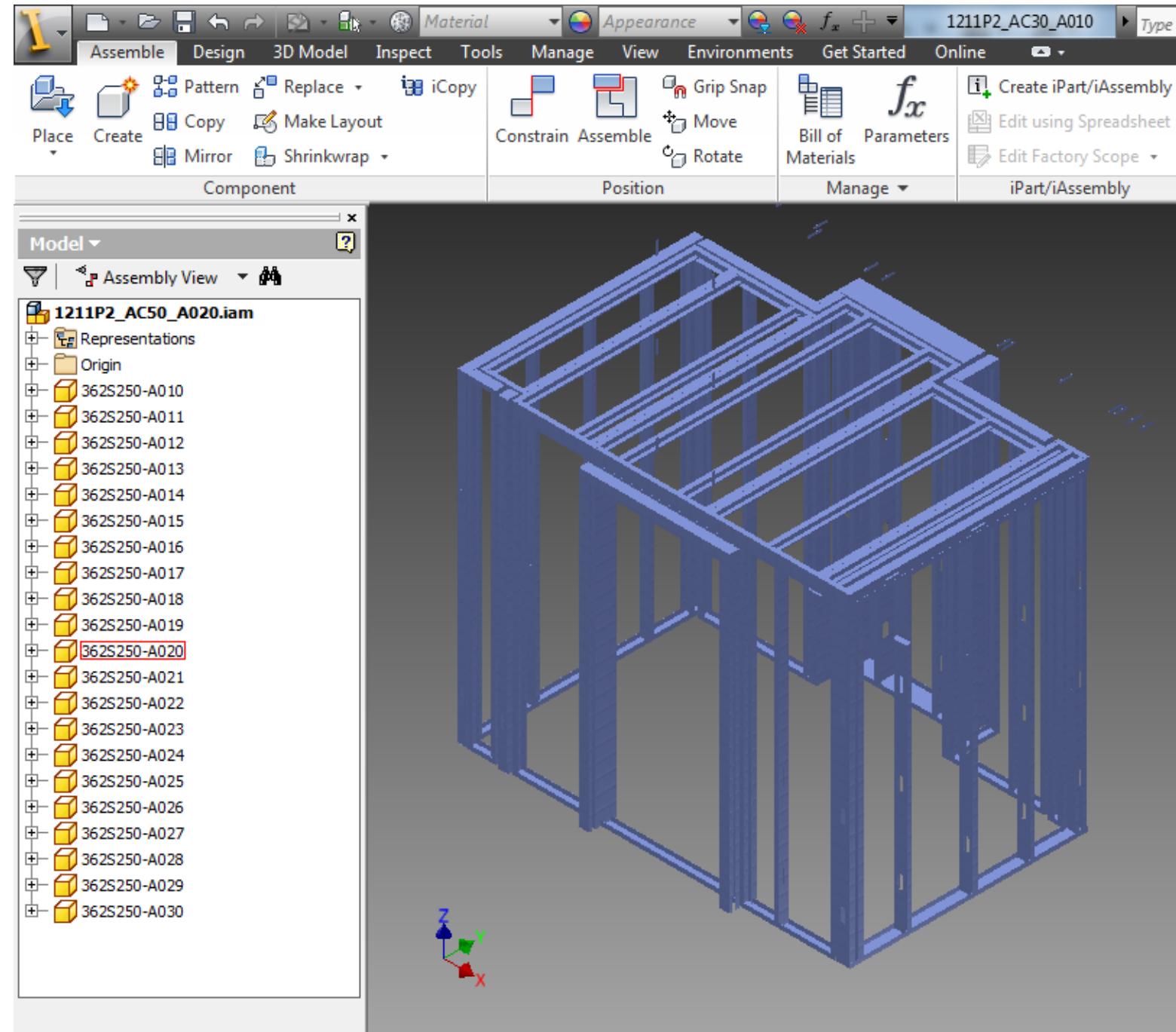


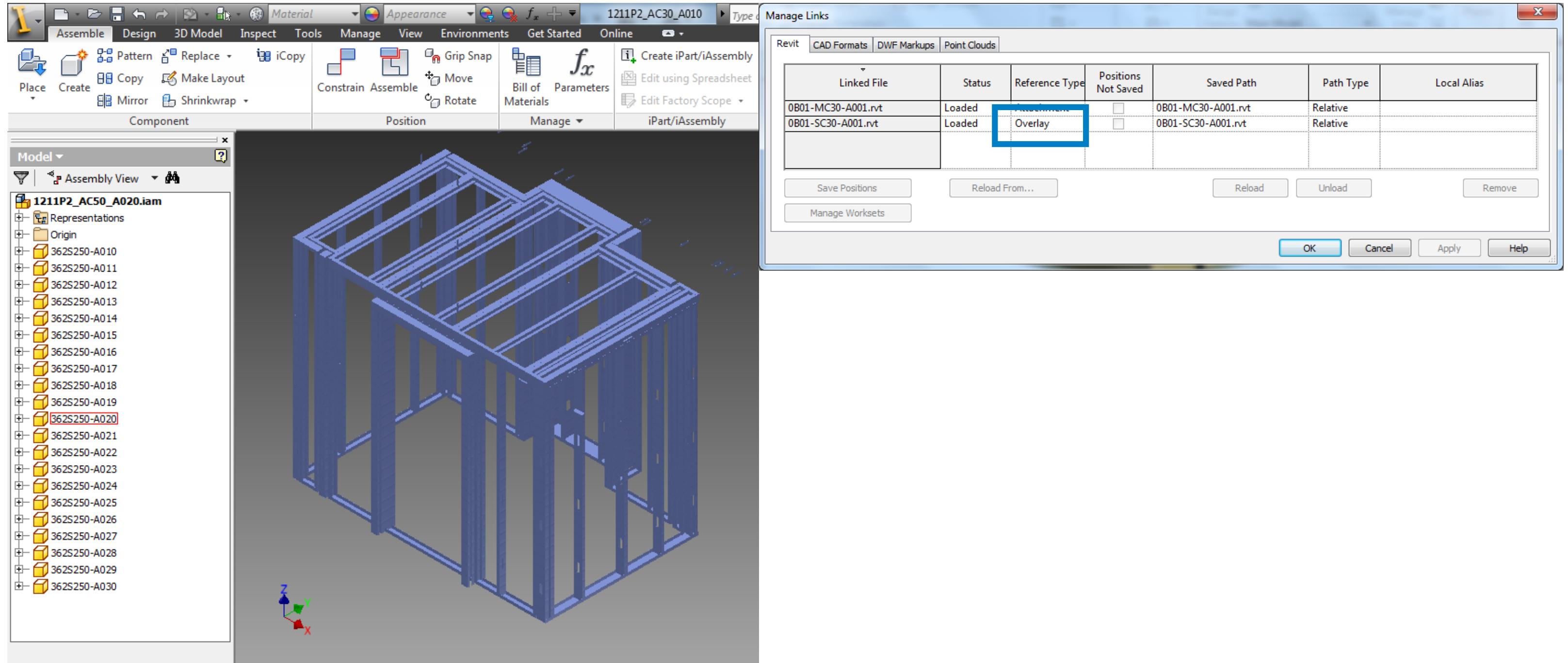


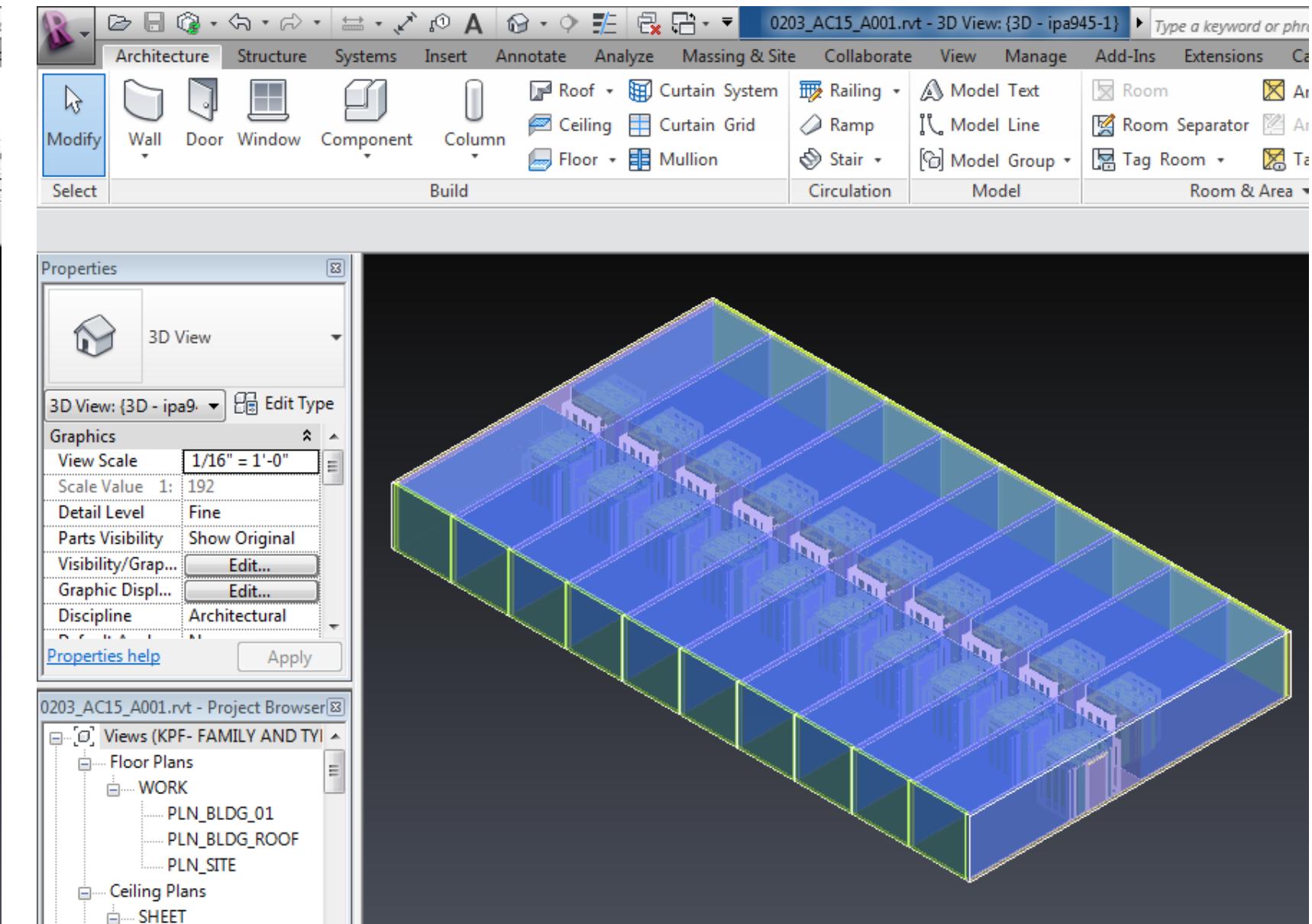
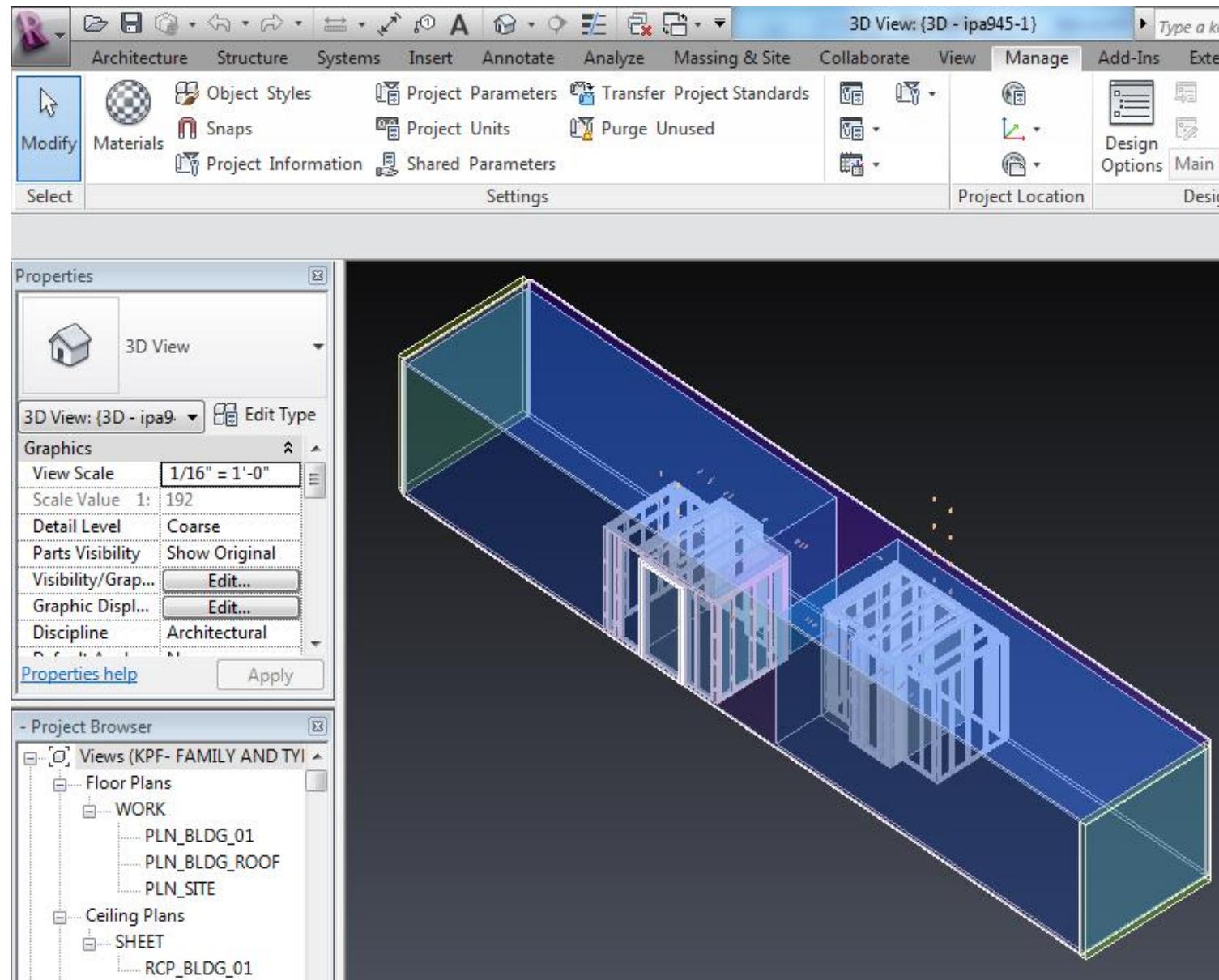


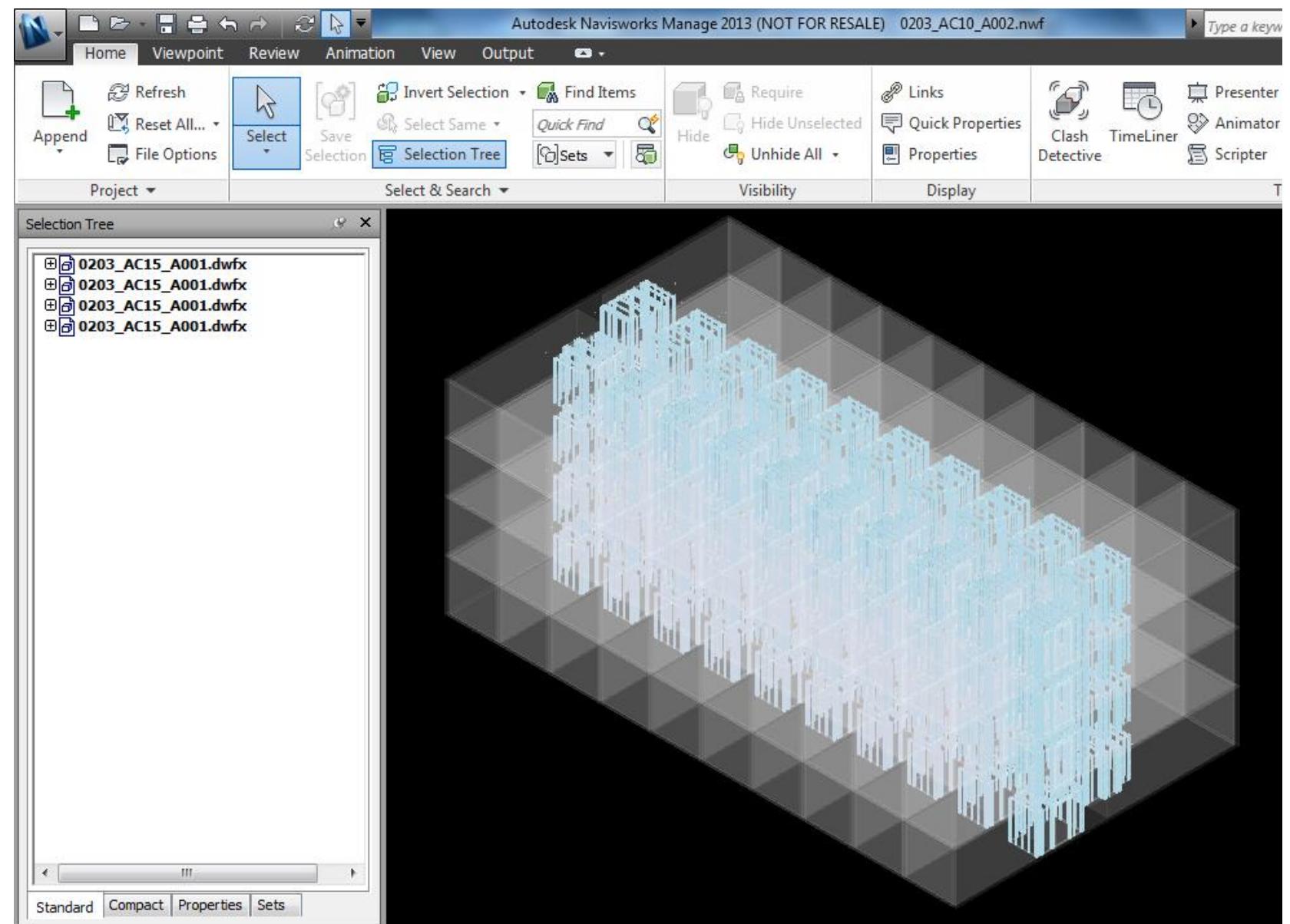
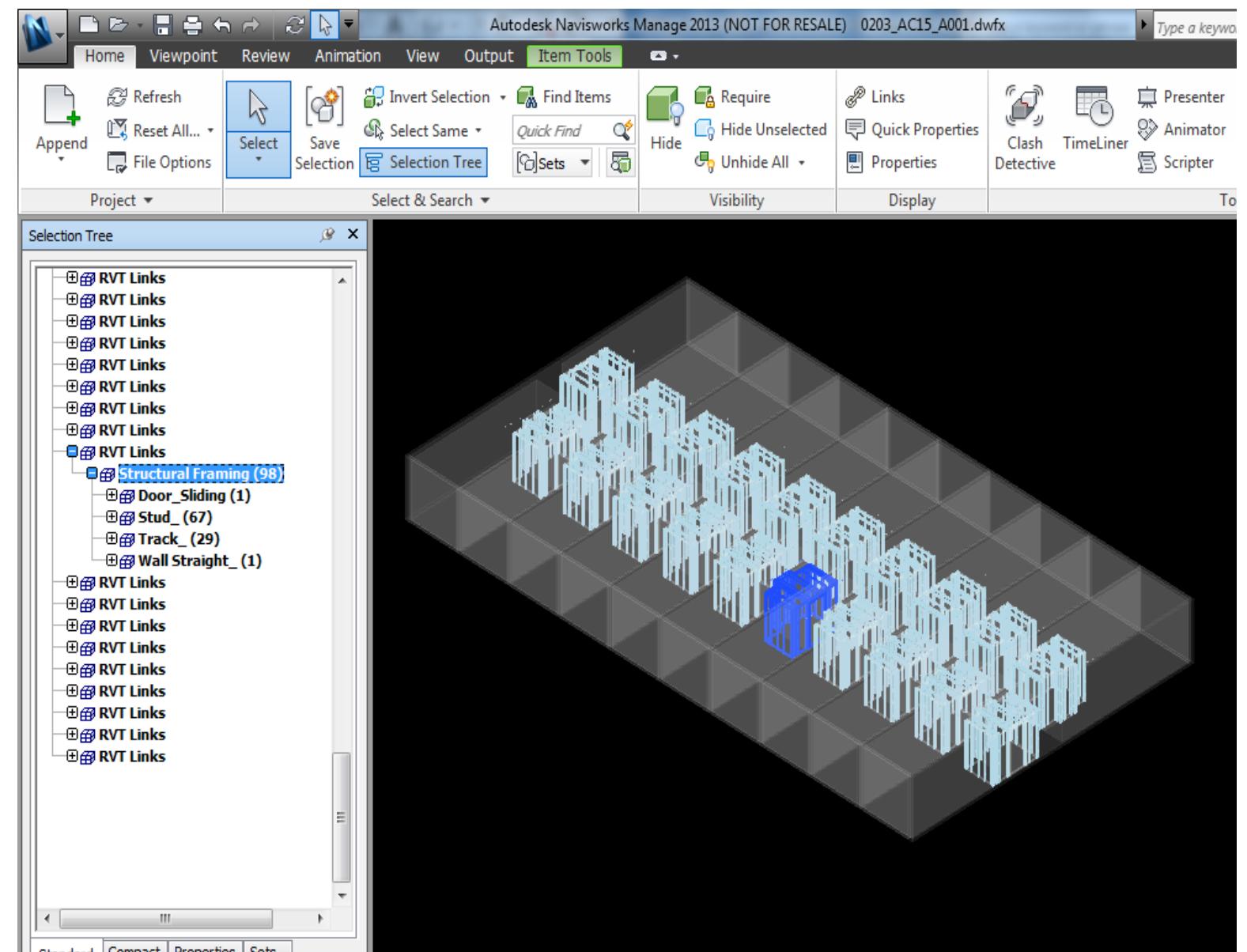


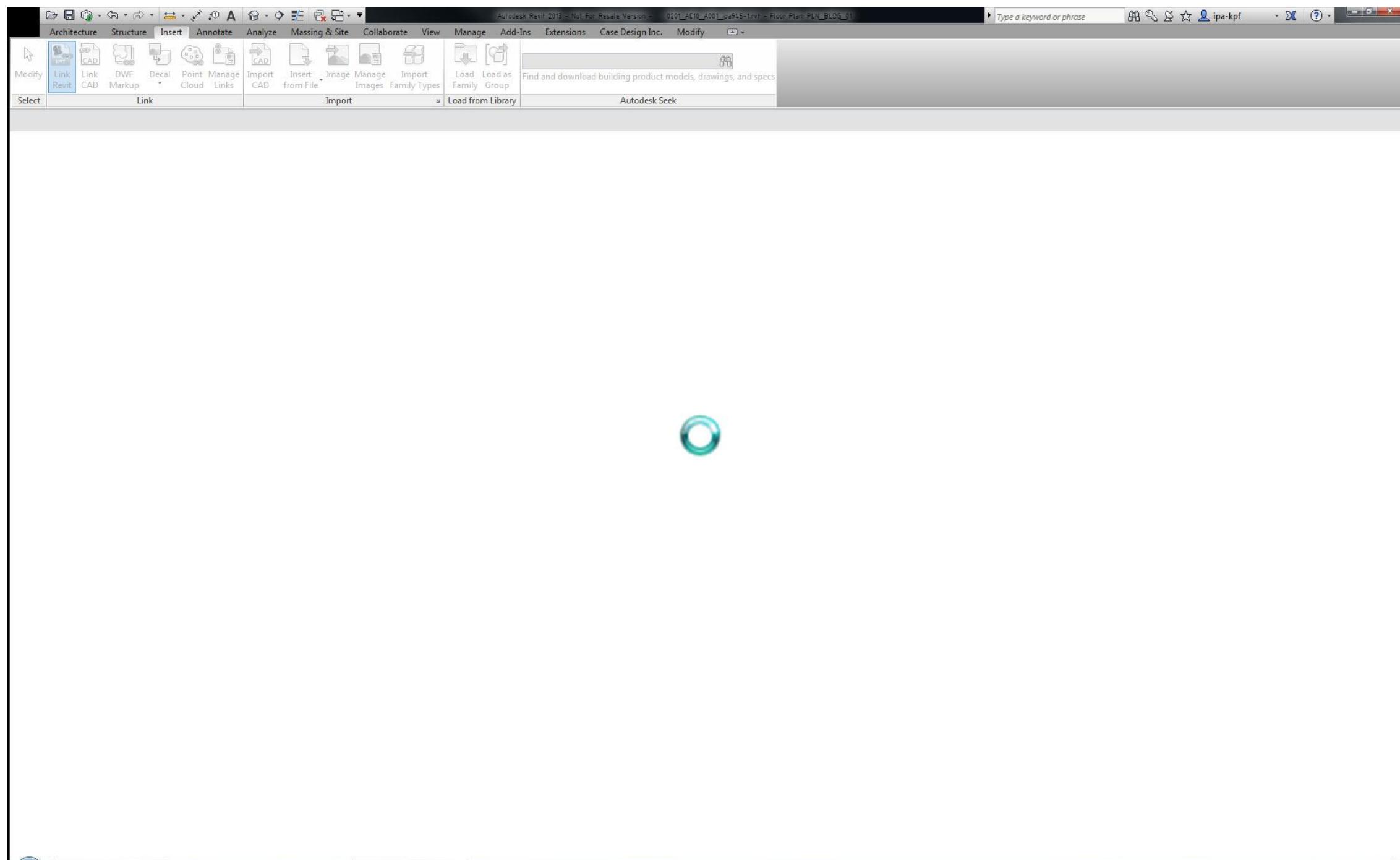


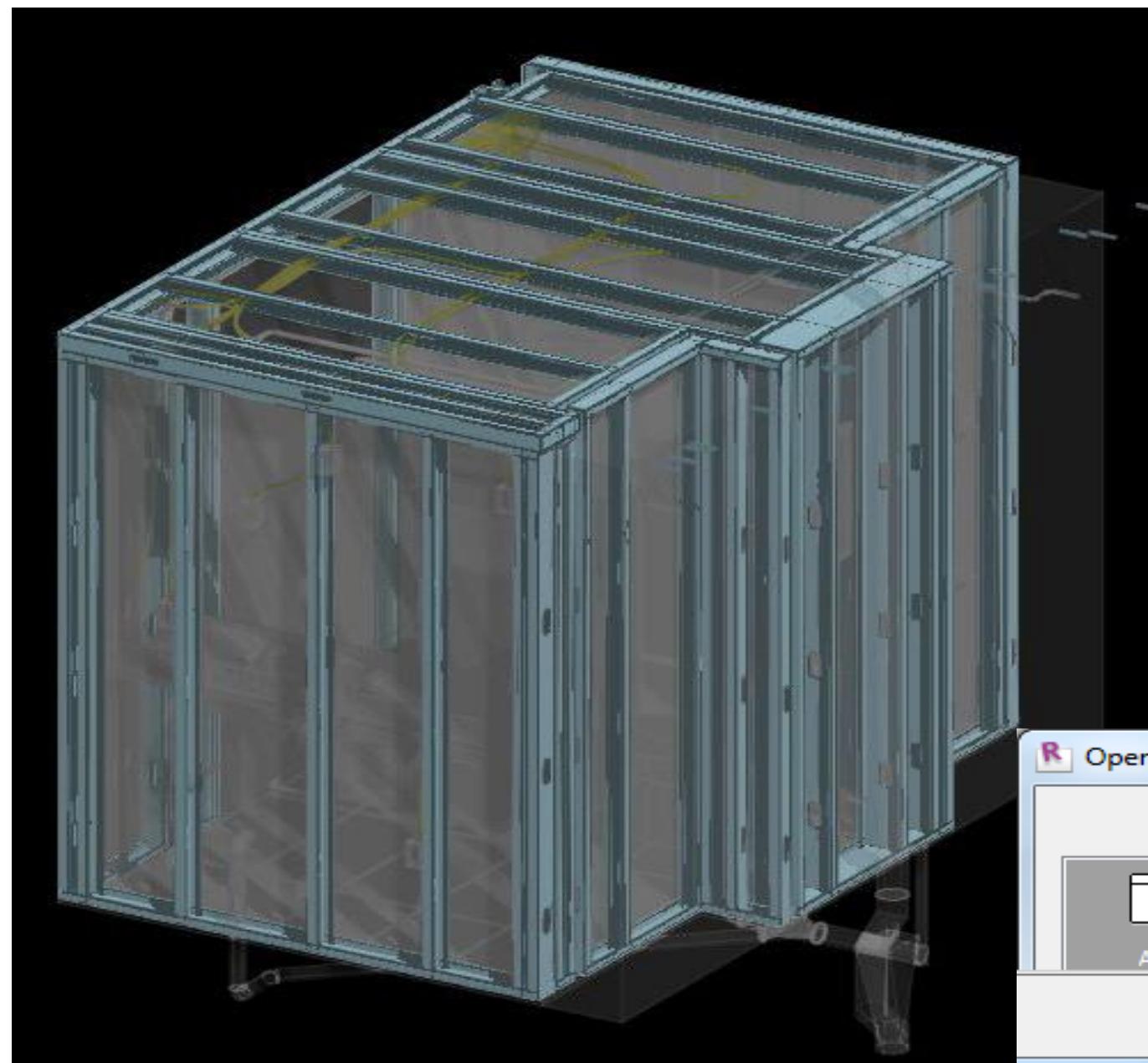












Worksets

Active workset: LINK-MC30 (Not Editable) Gray Inactive Workset Graphics

Name	Editable	Owner	Borrowers	Opened	Visible in all views
AC30	No			Yes	<input checked="" type="checkbox"/>
INTR	Yes	ipa945-1		Yes	<input checked="" type="checkbox"/>
LINK-MC30	No			Yes	<input checked="" type="checkbox"/>
LINK-SC30	No			Yes	<input checked="" type="checkbox"/>
Shared Levels and Grids	No			Yes	<input checked="" type="checkbox"/>
Workset1	No			Yes	<input checked="" type="checkbox"/>

New Delete Rename

Show: User-Created Families Project Standards Views

Properties

Linked Revit Model
OB01-SC30-A001.rvt

RVT Links (1) Edit Type

Identity Data

Name	SC30-A001
Workset	LINK-SC30
Edited by	ipa945-1
Other	Shared Site <Not Shared>

Open

Look in: AC30

Workset:
All
Editable
Last Viewed
Specify...

Name
OB01-AI
OB01-M

Open Cancel

Properties help

Apply

SolidWorks interface showing an assembly named **1211P2_AC50_A020.iam**.

The left pane displays the **Model View** showing a blue wireframe assembly. The tree view lists components: **1211P2_AC50_A020.iam**, **Representations**, **Origin**, and numerous sub-components starting with **362S250-A010** through **A030**.

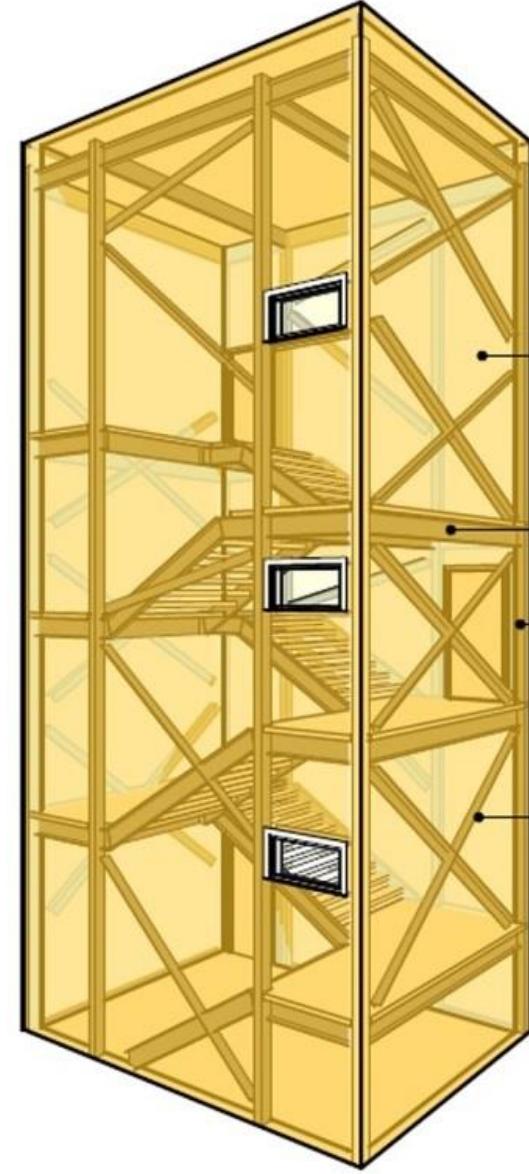
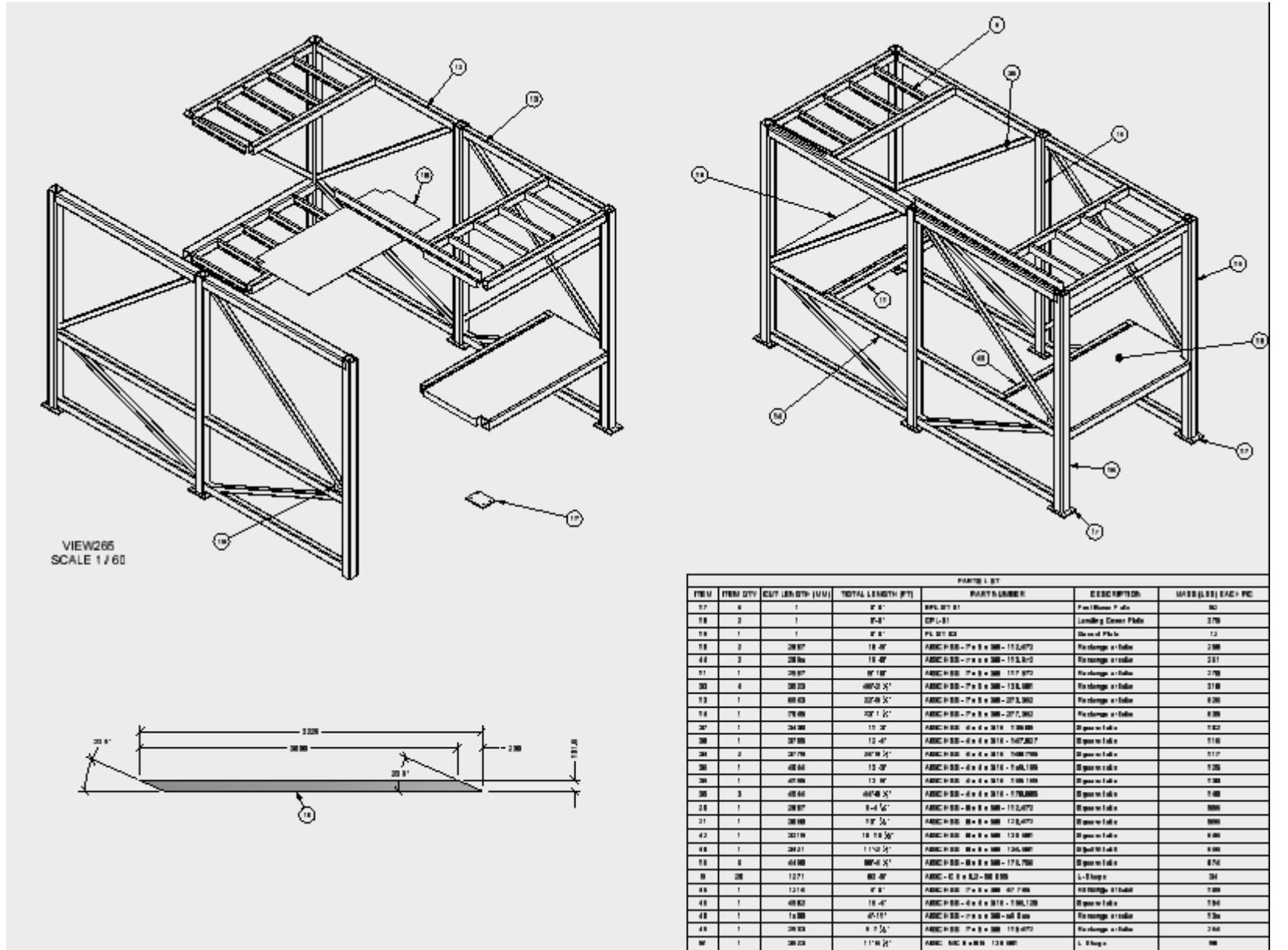
The top menu bar includes: Assemble, Design, 3D Model, Inspect, Tools, Manage, View, Environments, Get Started, Online.

The toolbar includes: Place, Create, Pattern, Replace, iCopy, Constrain Assemble, Grip Snap, Move, Rotate, Bill of Materials, Parameters, Materials, Manage, iPart/iAssembly.

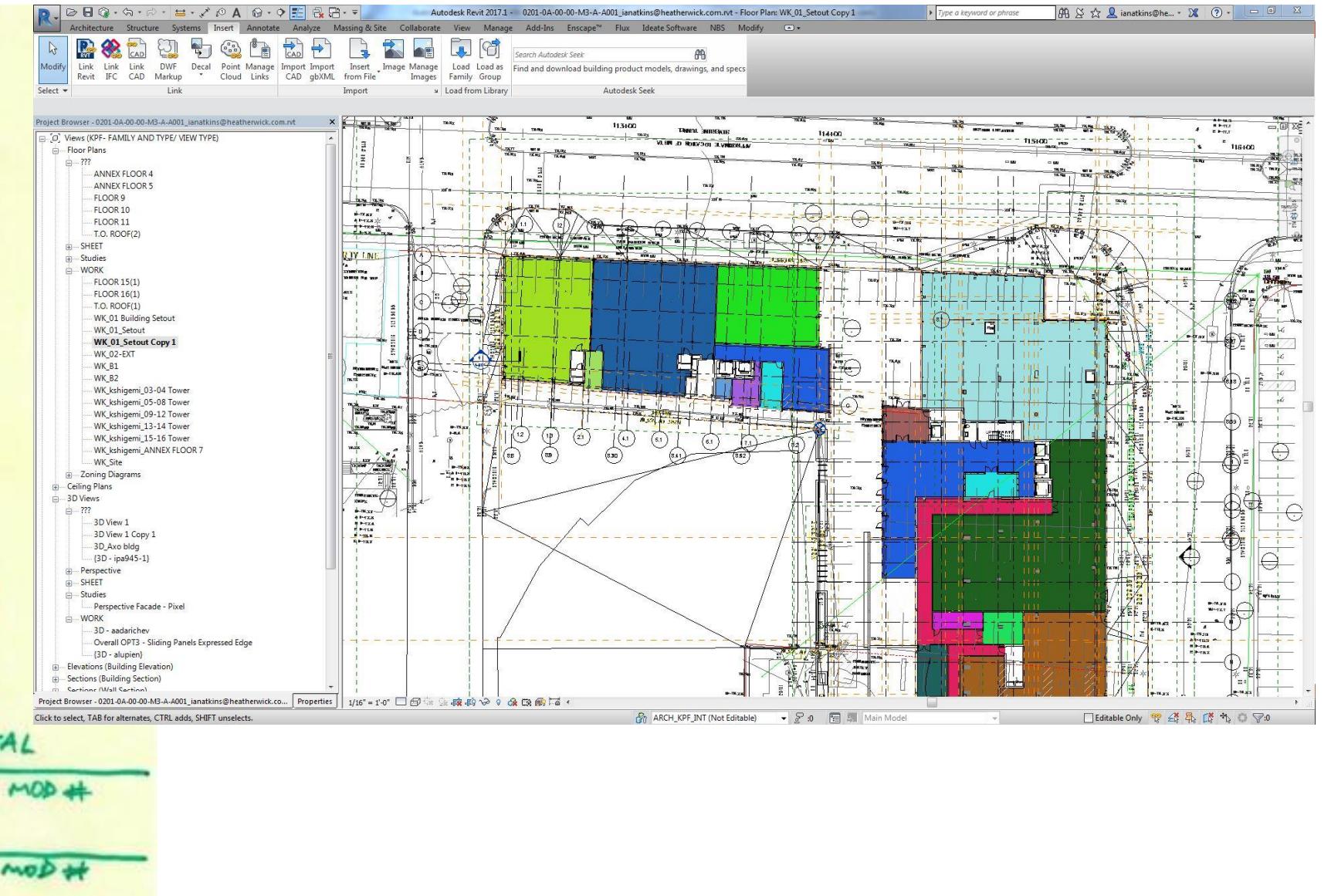
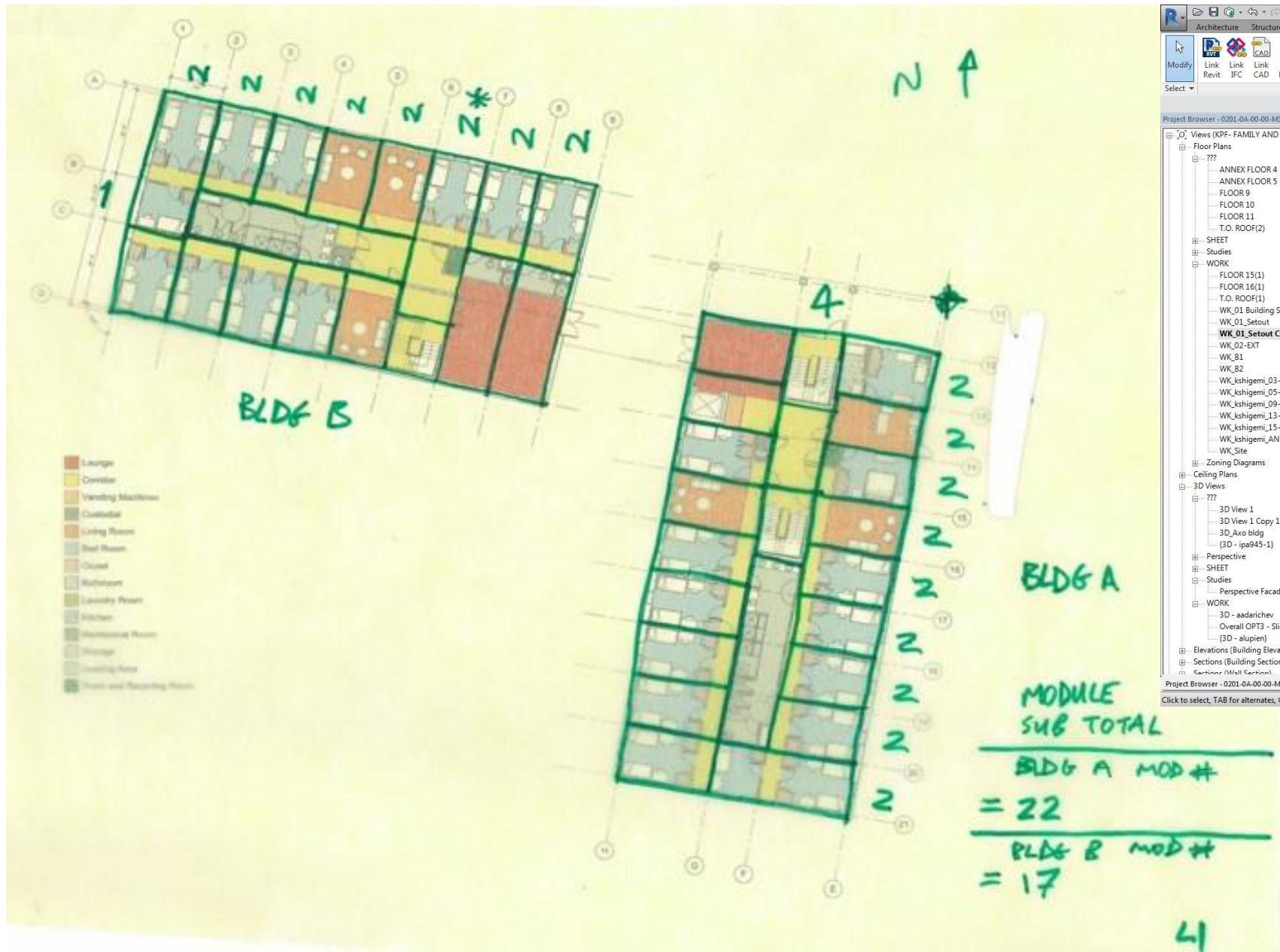
The **Bill of Materials [1211P2_AC50_A010.iam]** dialog shows the following data:

Part Number	Thumbnail	BOM Structure	Unit QTY	QTY	Stock Number	Description
250S125-0101		Normal	Each	1	250S125-0101	
250S125-0102		Normal	Each	1		
250S125-0103		Normal	Each	1		
250S125-0104		Normal	Each	1		
250S125-0105		Normal	Each	1		
250S125-0106		Normal	Each	1		

The **Model View** on the right shows a tree structure of parts under the assembly **1211P2_AC50_A020.iam**. The part **362S250-A020** is highlighted with a red border.

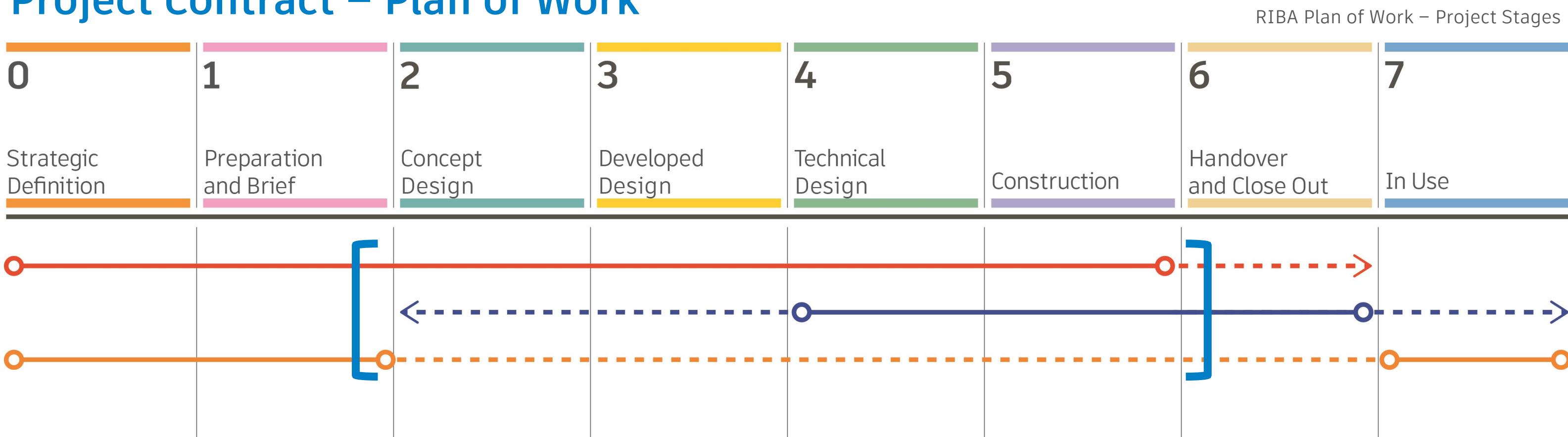






Design Delivery and BIM Exchange

Project Contract – Plan of Work



Effective Process for Offsite Design Delivery

Shared Responsibility, Information Exchange Transparent Data Access

Architect/Engineer

Contractor/Fabricator

Owner



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