

BUILDINGENERGY BOSTON

**A Necessary Evolution:
Three Companies Instigate Change via Offsite Construction**

**Beth Campbell (Unity Homes)
Edie Dillman (B. Public Prefab)
Ilka Cassidy (Holzraum System)**

Curated by Alison Keay and Christopher Nielson

**Northeast Sustainable Energy Association (NESEA)
March 29, 2023**

BUILDINGENERGY BOSTON

A Necessary Evolution: Three Companies Instigate Change via Offsite Construction

UNITY HOMES



Beth Campbell

B.PUBLIC PREFAB



Edie Dillman

HOLZRAUM SYSTEM | Passive House Accelerator



Ilka Cassidy

Northeast Sustainable Energy Association (NESEA)
March 29, 2023



Unity Homes | Beth Campbell

BUILDINGENERGY BOSTON



- Health and Comfort
- High Performance
- Predictability and Expertise
- Cost efficiency via Library of Designs



Unity/Bensonwood
panel production
facility

Fully automated

Keene, NH



20,000 sf solar array
offsets ~75% of
energy use at factory

Keene, NH



Rapid
on-site
assembly

1-2
weeks
typical



“Configured” floor plans

Allow for semi - customization

Add "bumps" or "connectors"

Choose from pre -designed layouts that plug and play into floorplan



Offsite
manufacturing
requires decisions
upfront

and

robust
communication
systems

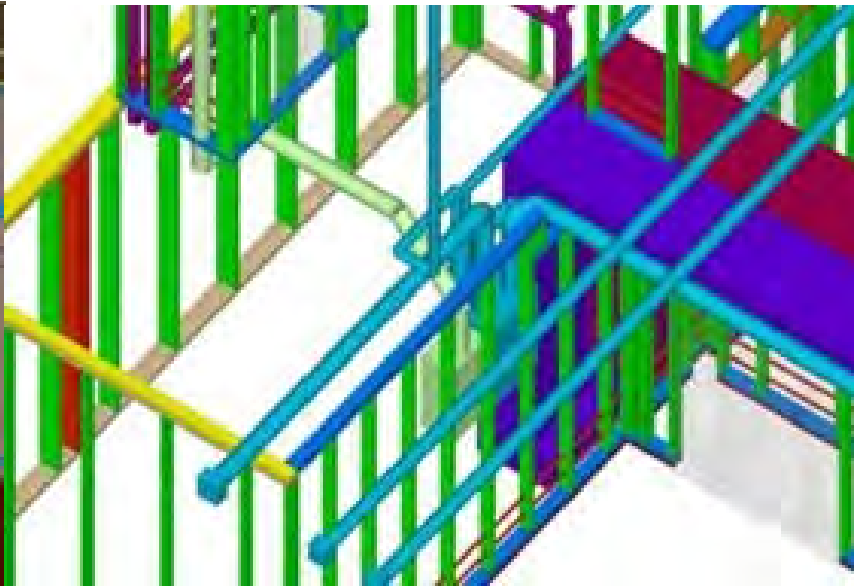
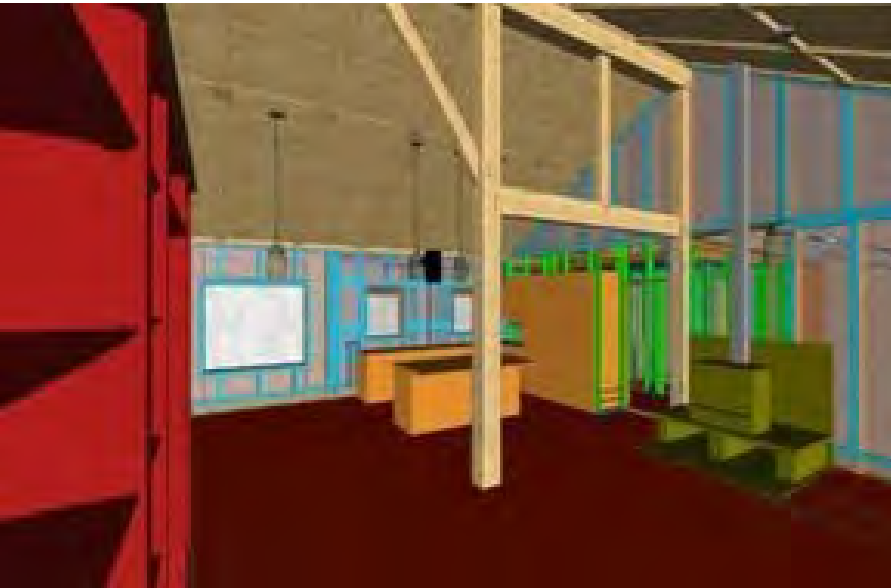


3D model/
virtual fabrication
(VFAB)

Build it virtually
before building it in
real life

--->> QC! <<---

Export files to CNC
machinery





CNC Machinery

**Sheathing/
nailing
station**



Dense pack
cellulose machine

(Pink stuff is panel -
to - panel
connection)



Air & vapor
control layer:

Taped Zip sheathing

(Never rains in
the factory!)



Vapor & air
control layer:

Tapes at interior
sheathing seams

Gaskets between
connections



Pre-formed
exterior
penetrations

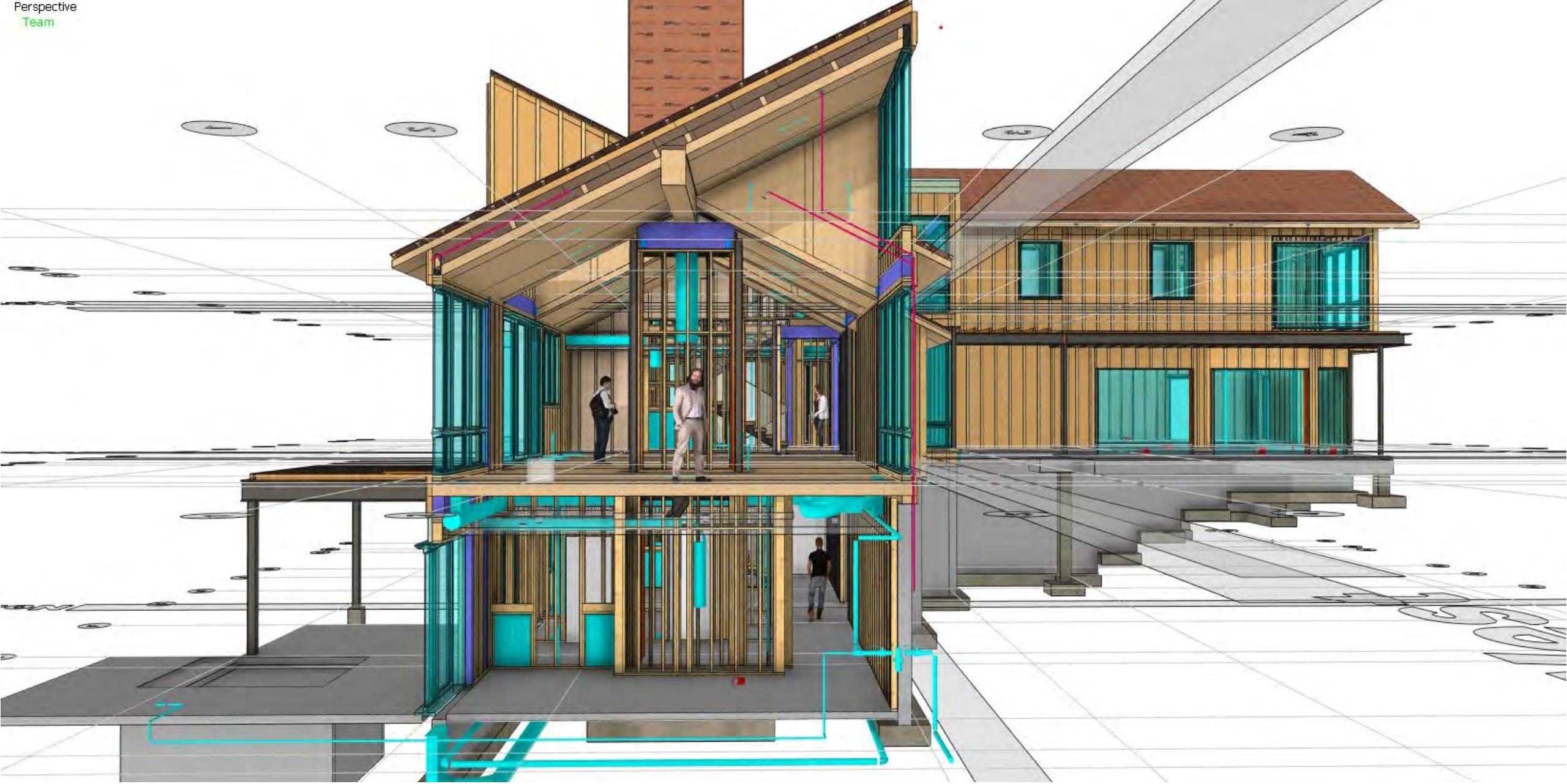
Air sealing made
easy(ier)



Pre-formed Penetrations

Just fill with foam once MEPs have run their materials







Collaborative
Design to Manufacturing
Delivery System

Architecture
Energy Modeling
CPHC

Ilka Cassidy
Founder

Heavy/ Mass Timber
Production Design
CPHC

Steve Hessler
Founder

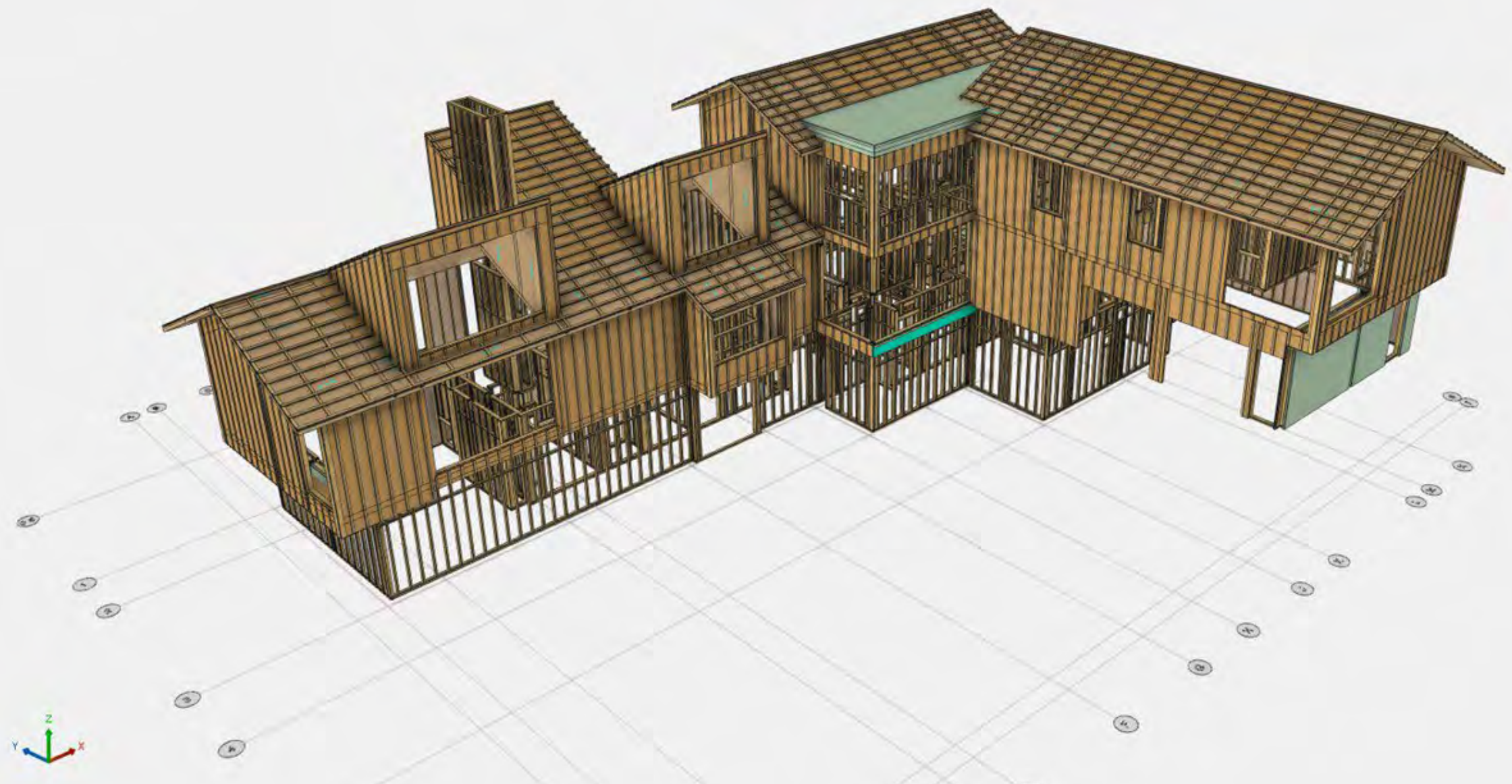
Software
Development

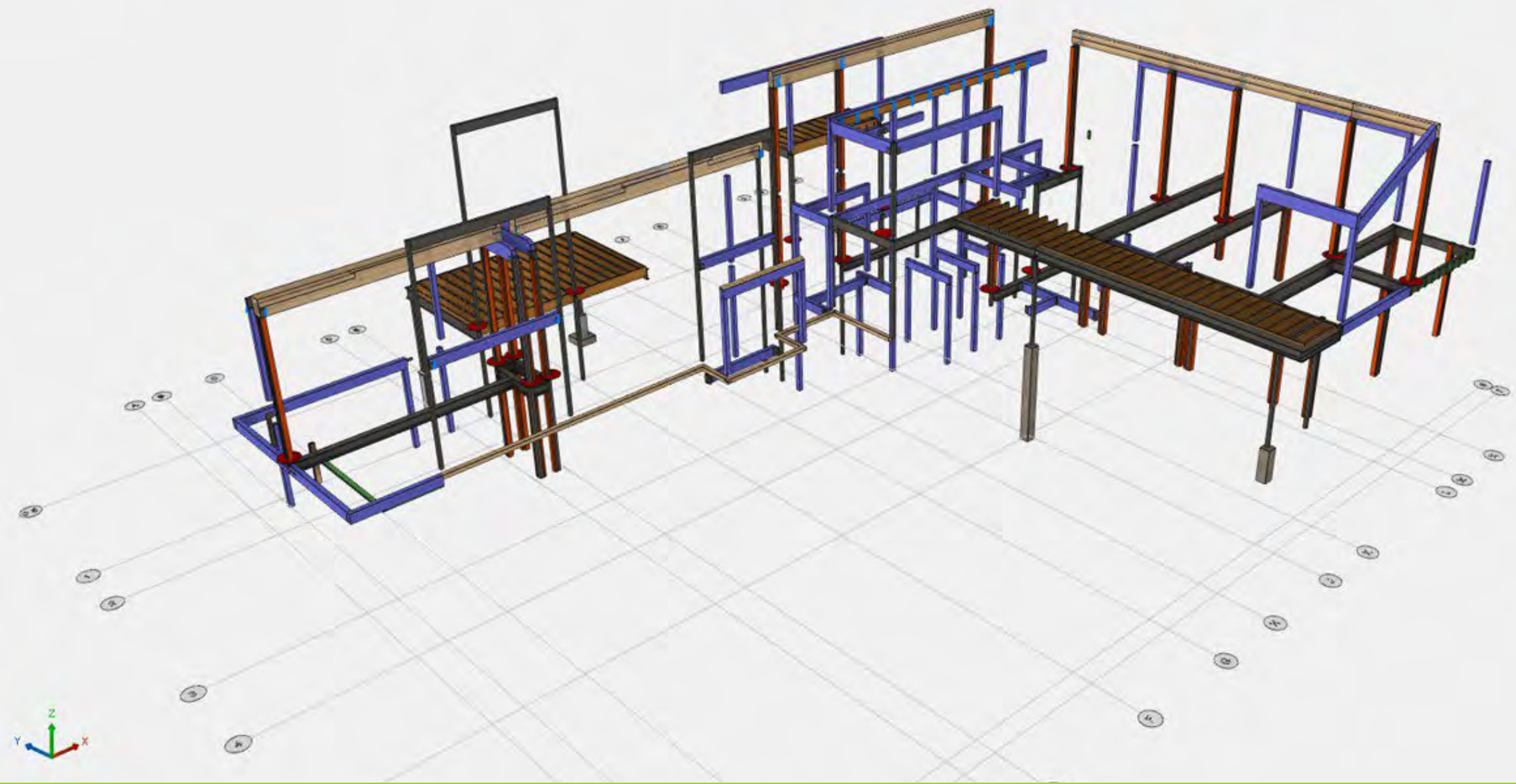
David Hessler
Founder



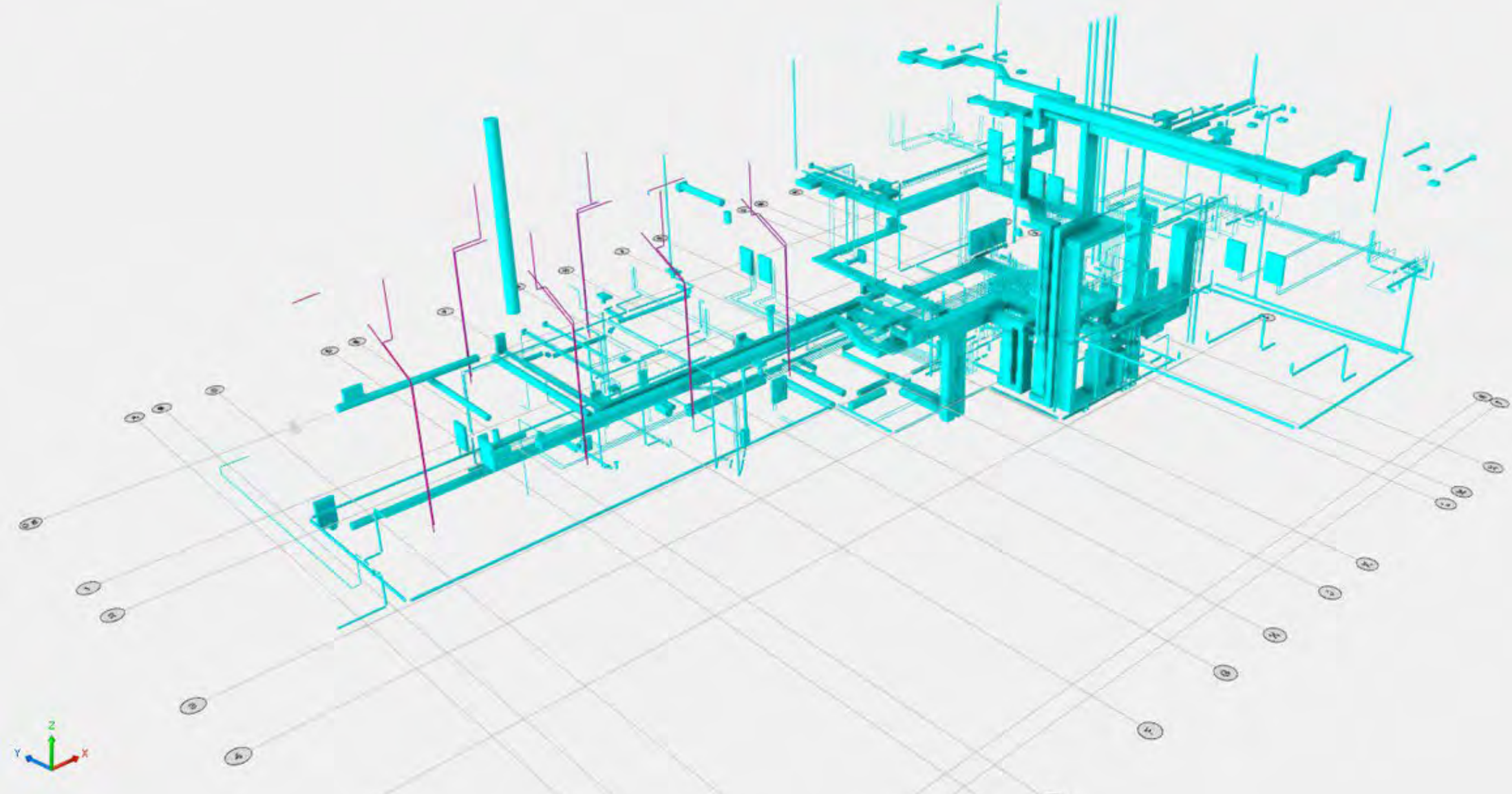


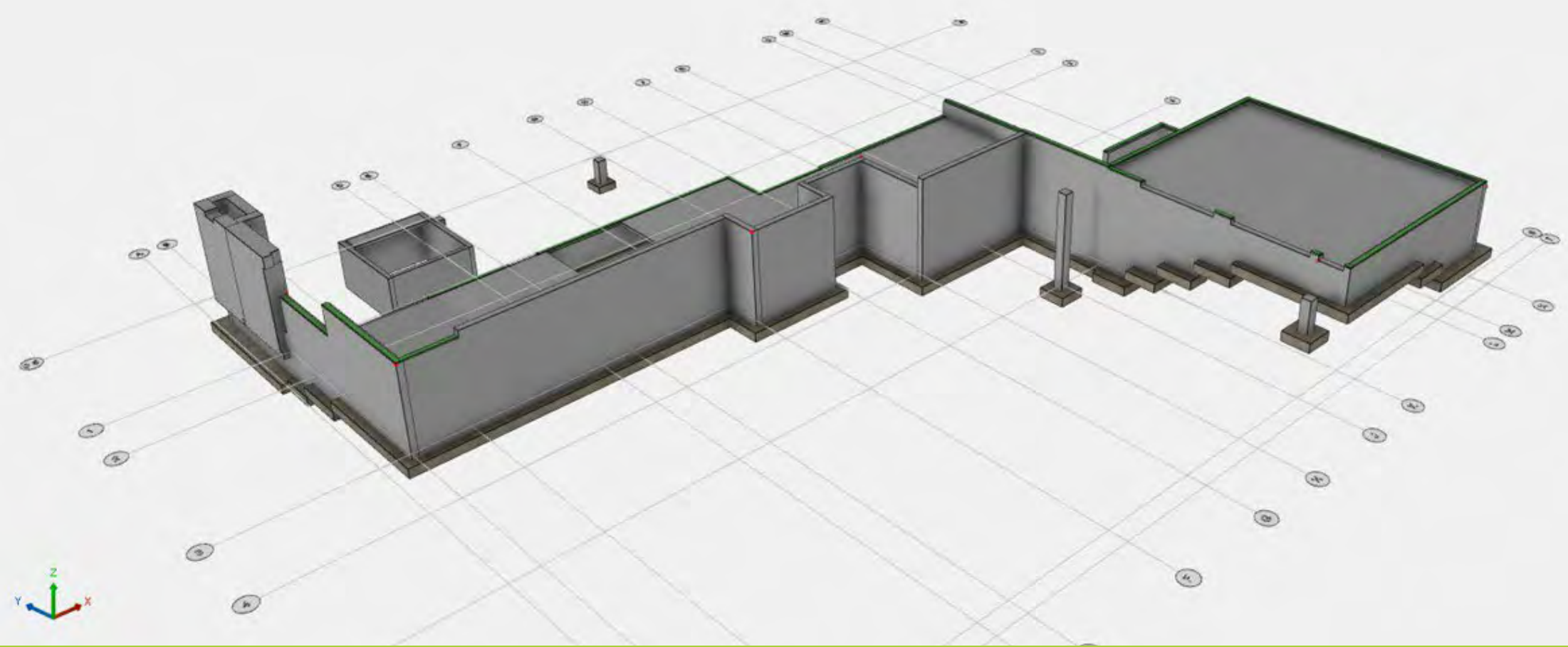
Big Sky Montana Home by Reid Smith Architects

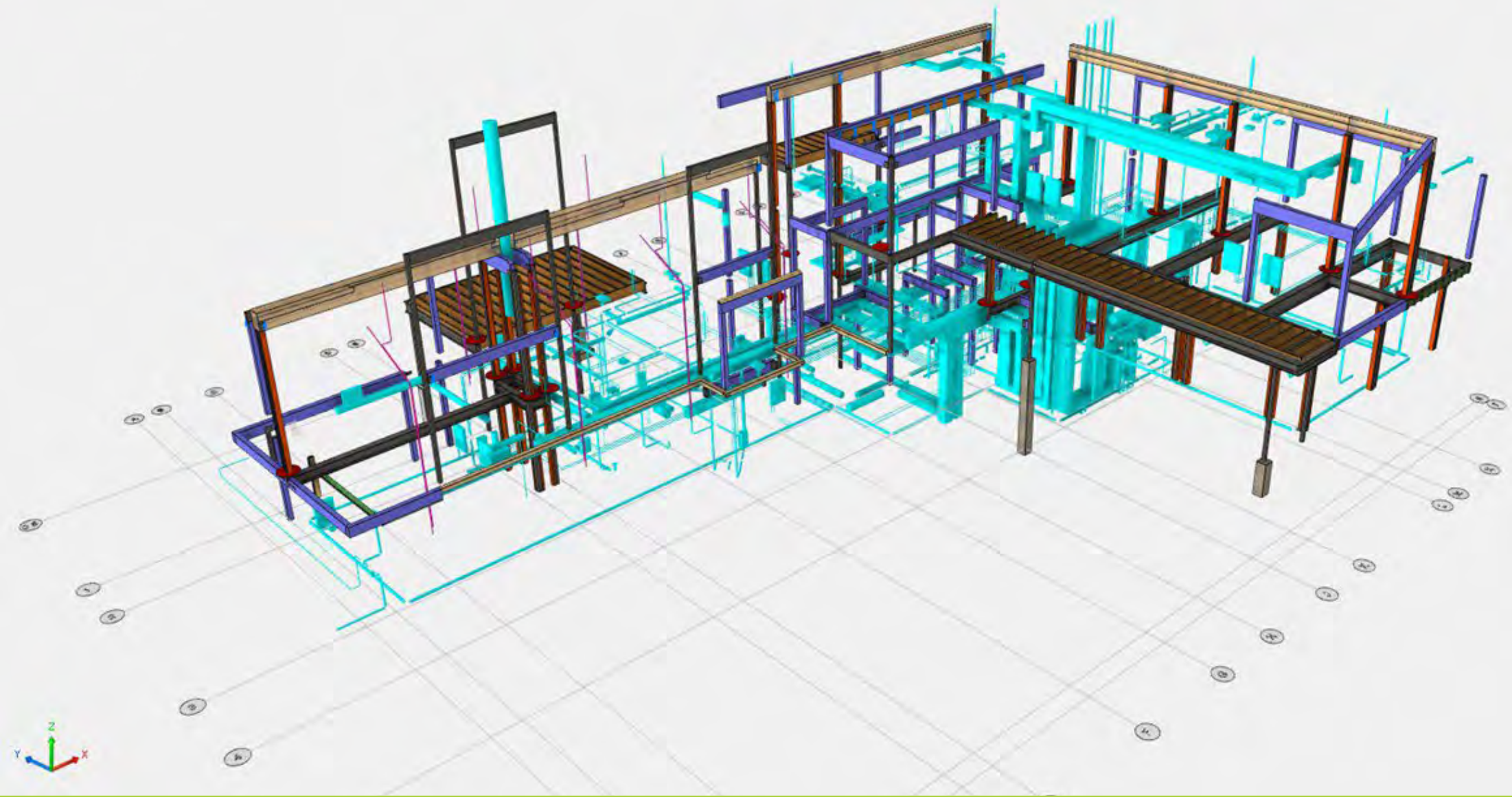


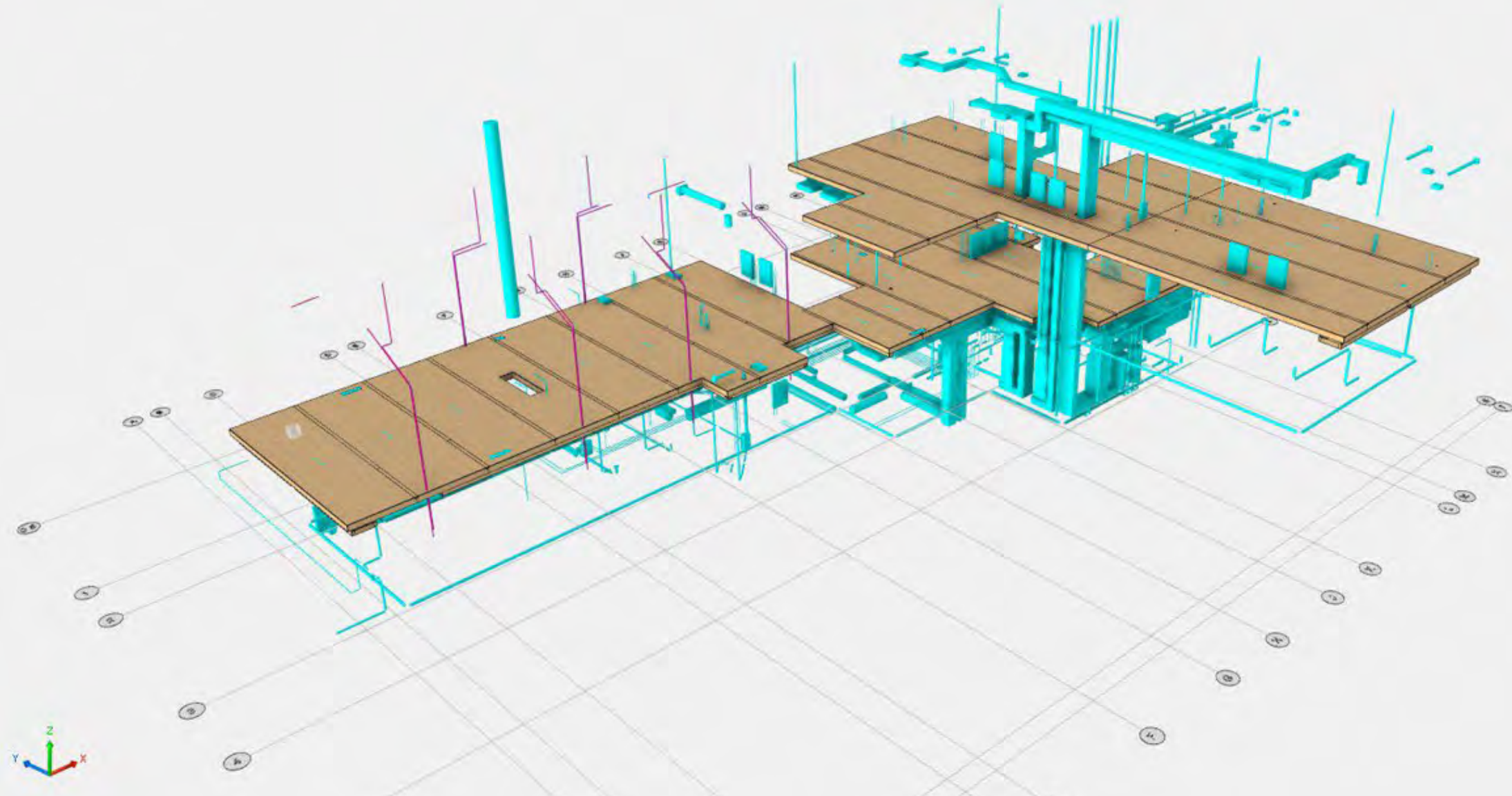


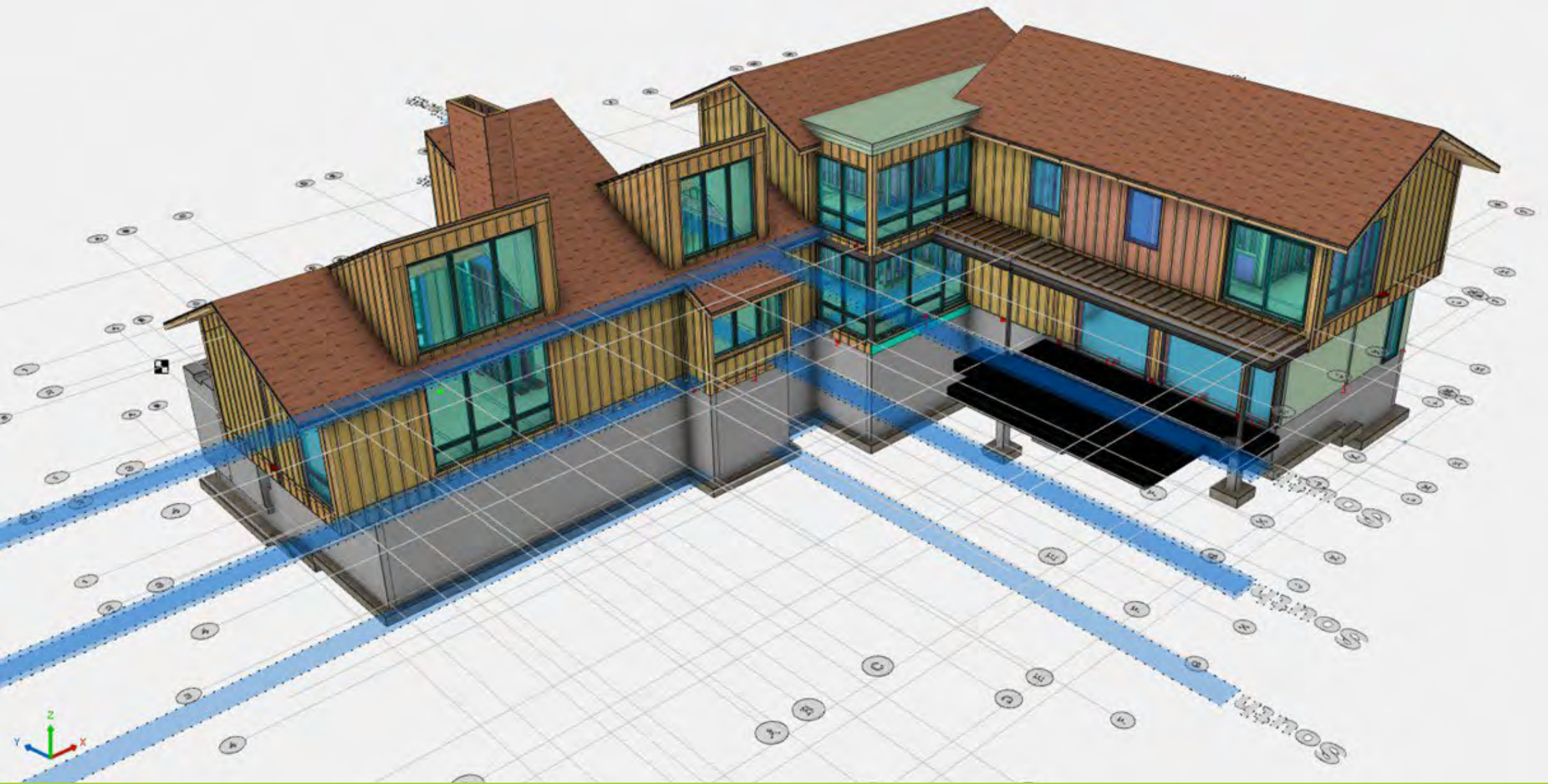
Load Path

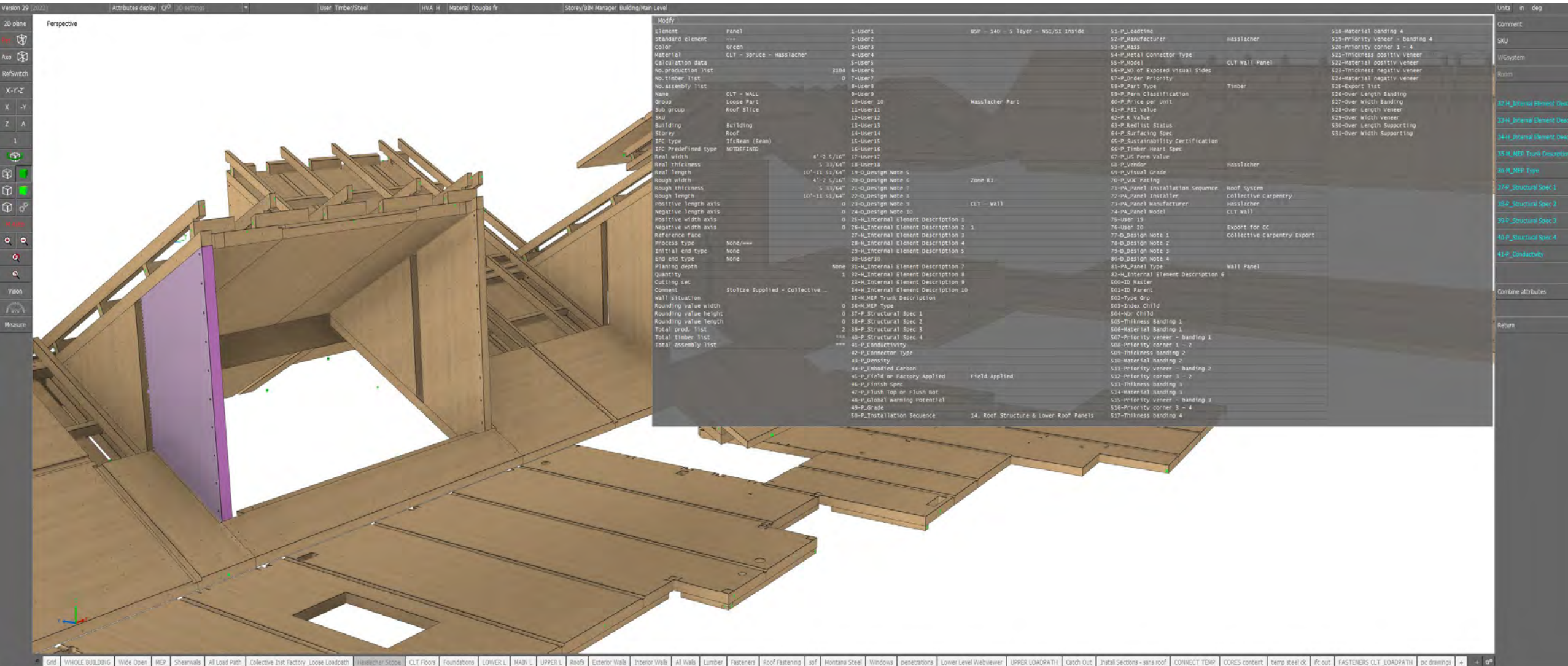


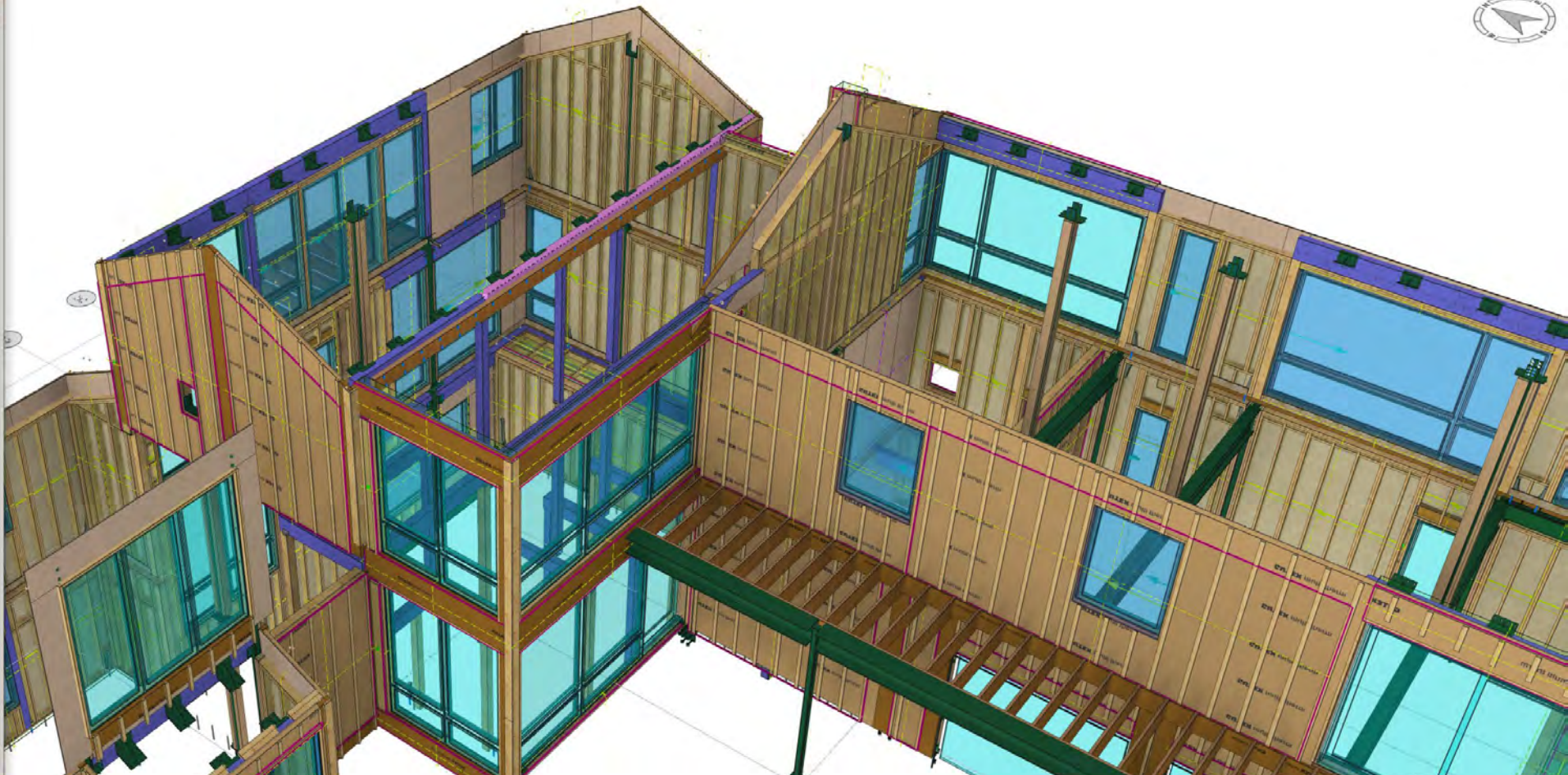


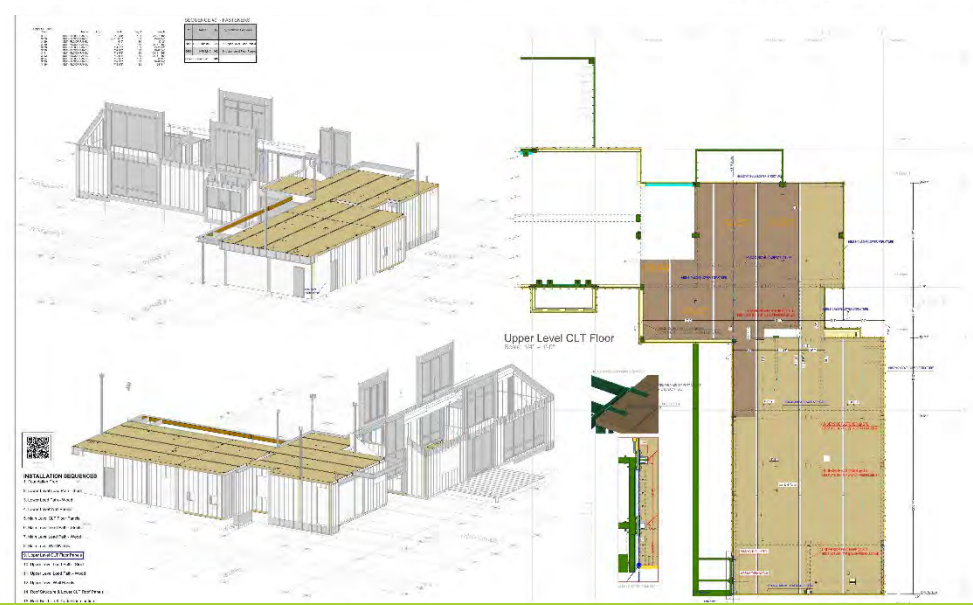


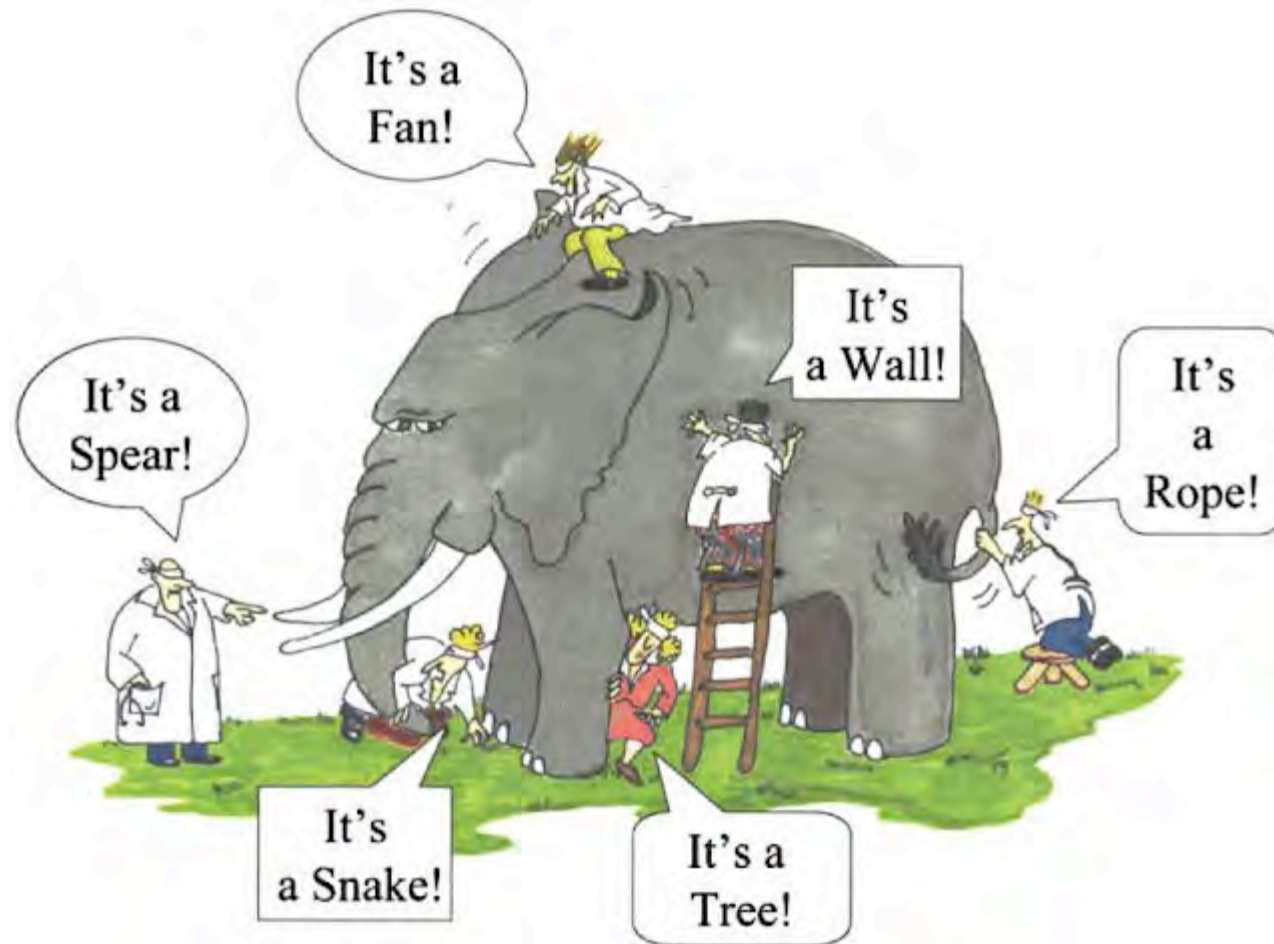










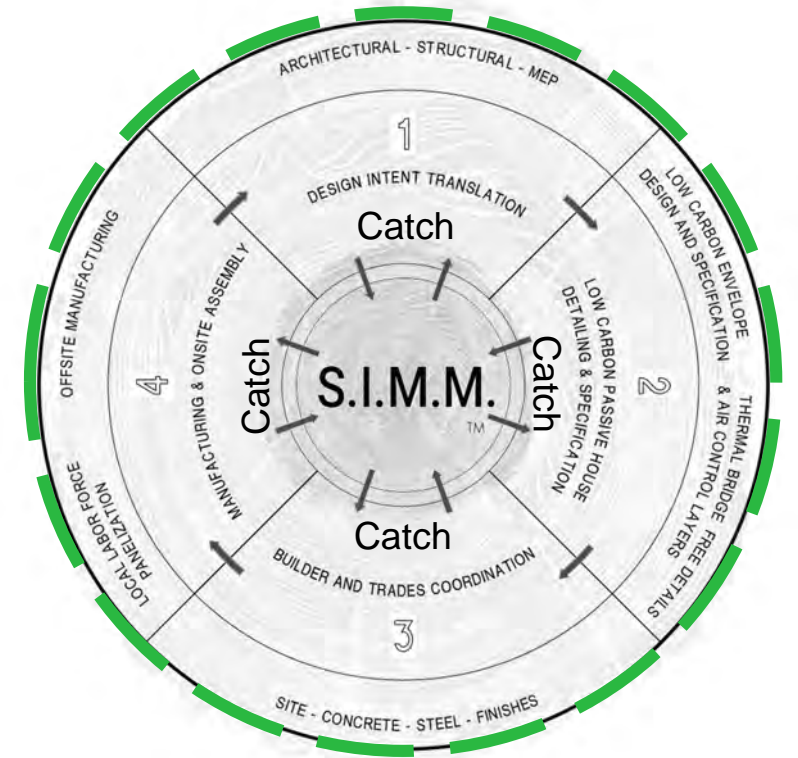
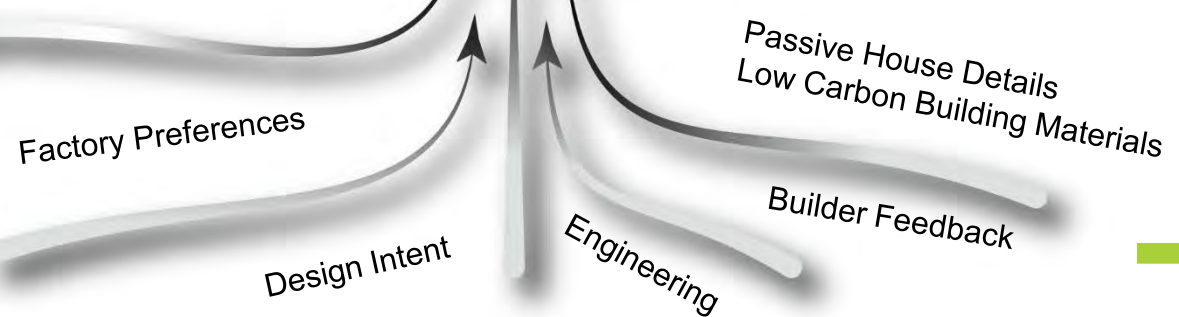


Outputs



Design to Fabrication Process

Inputs





Properties Issue Storyboard Structure

search for text...

<input type="checkbox"/>	IFC Name	Sheathing - Roof
<input type="checkbox"/>	IFC Type	IFCBEAM
<input type="checkbox"/>	Material	5/8" Red ZIP Sheathing

Cadwork3dProperties

<input type="checkbox"/>	D_Design Note 1	Collective Carpentry Export
<input type="checkbox"/>	D_Design Note 6	Zone R1
<input type="checkbox"/>	Group	Loose Part
<input type="checkbox"/>	H_Internal Element Description 2	1
<input type="checkbox"/>	PA_Panel Installation Sequence	Roof System
<input type="checkbox"/>	PA_Panel Installer	Collective Carpentry
<input type="checkbox"/>	PA_Panel Manufacturer	Huber
<input type="checkbox"/>	P_Field or Factory Applied	Field Applied
<input type="checkbox"/>	P_Installation Sequence	16. Static Roof Panels & Upper Layers
<input type="checkbox"/>	P_Manufacturer	Huber
<input type="checkbox"/>	P_Model	5/8" Red ZIP
<input type="checkbox"/>	P_Part Type	Lumber
<input type="checkbox"/>	Prod_Nb	2289

Search (0)

Hooper - All - 10.17.22.ifc
Hooper Residence



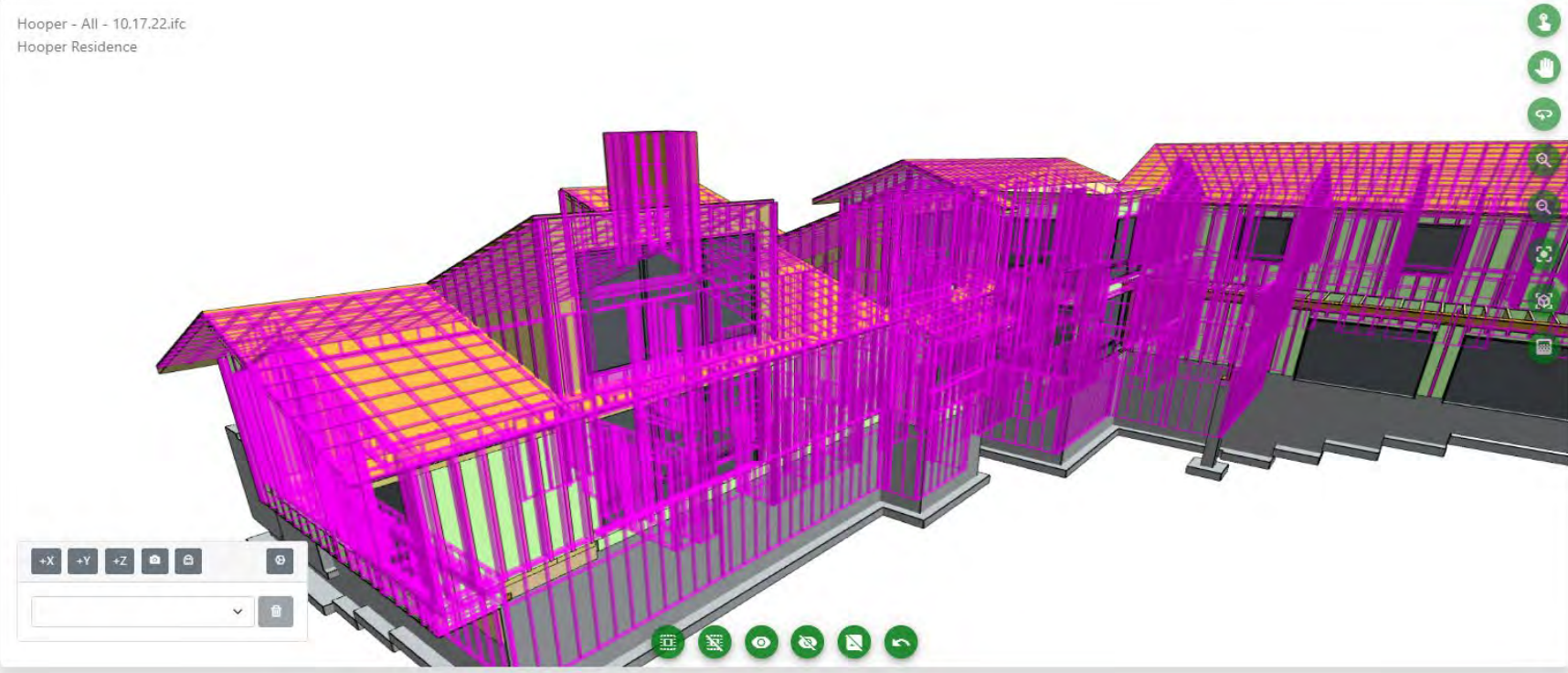
	Sub Group	Name	IFC Type	Material	Group	
<input checked="" type="checkbox"/>		Exterior Wall Slice	Sheathing - Wall	IFCBEAM	CDX Plywood	MN1
<input checked="" type="checkbox"/>		Exterior Wall Slice	Sheathing - Wall	IFCBEAM	CDX Plywood	MN5
<input checked="" type="checkbox"/>		Exterior Wall Slice	Sheathing - Wall	IFCBEAM	CDX Plywood	MN8
<input checked="" type="checkbox"/>		Exterior Wall Slice	A35	IFCBEAM	Galvanized Steel_1	LE2
<input checked="" type="checkbox"/>		Exterior Wall Slice	A35	IFCBEAM	Galvanized Steel_1	LE2
<input checked="" type="checkbox"/>		Exterior Wall Slice	A35	IFCBEAM	Galvanized Steel_1	LN6

Properties Issue Storyboard Structure

search for text...

Select a single element to view its properties. You have [6545] elements selected.

Search (0)



+X +Y +Z

Navigation and manipulation controls including a search input and a trash icon.

Sub Group	Name	IFC Type	Material	Group	
<input checked="" type="checkbox"/>	Exterior Wall Slice	Sheathing - Wall	IFCBEAM	CDX Plywood	MN1
<input checked="" type="checkbox"/>	Exterior Wall Slice	Sheathing - Wall	IFCBEAM	CDX Plywood	MN5
<input checked="" type="checkbox"/>	Exterior Wall Slice	Sheathing - Wall	IFCBEAM	CDX Plywood	MN6
<input checked="" type="checkbox"/>	Exterior Wall Slice	A35	IFCBEAM	Galvanized Steel_1	LE2
<input checked="" type="checkbox"/>	Exterior Wall Slice	A35	IFCBEAM	Galvanized Steel_1	LE2
<input checked="" type="checkbox"/>	Exterior Wall Slice	A35	IFCBEAM	Galvanized Steel_1	LN6

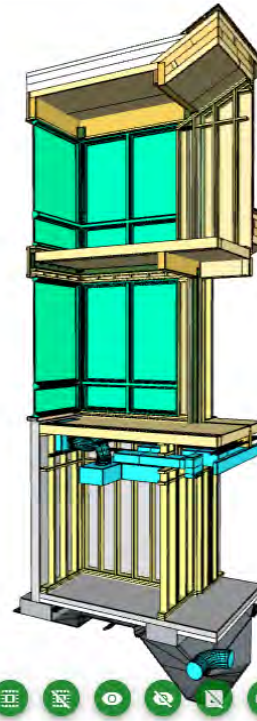


Properties Issue Storyboard Structure

search for text...

Select an element to list its properties

Clean Core 9-21-22.ifc
HZCatchIFC_1



+X +Y +Z [Icons] [Reset]

[Dropdown] [Trash]



Visibility	Selection	Name	IFC Type	Material	D_Design Note 1	D_Design Note 6	D_Design Note 9	Group	H_Internal Element D...	H_Internal Element D...	PA_Panel Installation ...	PA_Panel Installer	PA_Panel Manufacturer	PA_Panel Type
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Beam	IFCBEAM	GLULAM - Doug Fir - US	Collective Carpentry Exp...			Loose Part	copy cut_set	1	Roof System	Collective Carpentry		
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Beam	IFCBEAM	GLULAM - Doug Fir - US	Collective Carpentry Exp...			Loose Part	copy	1	Roof System	Collective Carpentry		
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Beam	IFCBEAM	GLULAM - Doug Fir - US	Collective Carpentry Exp...			Loose Part	copy cut_set	1				
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Beam	IFCBEAM	GLULAM - Doug Fir - US	Collective Carpentry Exp...			Loose Part	copy cut_set	1	Roof System	Collective Carpentry		

export (50).csv

Show all

HOLZRAUM CAT... AutoSave Off export (50) Steve Hessler SH

File Home Insert Draw Page Layout Formulas Data Review View Help BLUEBEAM

Calibri 11 General Conditional Formatting Format as Table Cell Styles

Undo Clipboard Font Alignment Number Styles

POSSIBLE DATA LOSS Some features might be lost if you save this workbook in the comma-delimited (.csv) format. To preserve these features, save it in an Excel file format.

A1 Visible

1	Visible	Selected	Name	IFC Type	Material	D_Design	D_Design	D_Design	Group	H_Interna	H_Interna	PA_Panel	PA_Panel	PA_Panel	PA_Panel	P_Field	Oi_P_Insta
2	TRUE	FALSE	Beam	IFCBEAM	GLULAM	-	Collective Carpentry	Export	Loose Part	copy cut	1	Roof Syst	Collective Carpentry			Field Appl	14. Roo
3	TRUE	FALSE	Beam	IFCBEAM	GLULAM	-	Collective Carpentry	Export	Loose Part	copy	1	Roof Syst	Collective Carpentry			Field Appl	14. Roo
4	TRUE	FALSE	Beam	IFCBEAM	GLULAM	-	Collective Carpentry	Export	Loose Part	copy cut	1					Field Appl	3. Lowe
5	TRUE	FALSE	Beam	IFCBEAM	GLULAM	-	Collective Carpentry	Export	Loose Part	copy cut	1	Roof Syst	Collective Carpentry			Field Appl	14. Roo
6	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	UW3	copy cut	1					Factory Af	12. Upp
7	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	L31	copy	1					Factory Af	4. Lowe
8	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	L31	copy	1					Factory Af	4. Lowe
9	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	M28	copy cut	1					Factory Af	8. Main
10	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	L8	copy	1					Factory Af	4. Lowe
11	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	L8	copy	1					Factory Af	4. Lowe
12	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	L9	copy	1					Factory Af	4. Lowe
13	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	L7	copy	1					Factory Af	4. Lowe
14	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	L8	copy	1					Factory Af	4. Lowe
15	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	L8	copy	1					Factory Af	4. Lowe
16	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	L7	copy	1					Factory Af	4. Lowe
17	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	L8	copy	1					Factory Af	4. Lowe
18	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	L7	copy	1					Factory Af	4. Lowe
19	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	L8	copy	1					Factory Af	4. Lowe
20	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	L8	copy	1					Factory Af	4. Lowe
21	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	L9	copy	1					Factory Af	4. Lowe
22	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	U37	copy cut	1					Factory Af	12. Upp
23	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	L9	copy	1					Factory Af	4. Lowe
24	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	L7	copy	1					Factory Af	4. Lowe
25	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	U37	copy	1					Factory Af	12. Upp
26	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	U37	copy	1					Factory Af	12. Upp
27	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	L9	copy	1					Factory Af	4. Lowe
28	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	L31	copy cut	1					Factory Af	4. Lowe
29	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	L31	copy	1					Factory Af	4. Lowe
30	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	L9	copy cut	1					Factory Af	4. Lowe
31	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	U37	copy	1					Factory Af	12. Upp
32	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	UW9	copy cut	1					Factory Af	12. Upp
33	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	Loose Part	copy	1					Field Appl	8. Main
34	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	Loose Part	copy	1					Field Appl	12. Upp
35	TRUE	FALSE	Blocking	IFCBEAM	SPF	-	Collective Carpentry	Export	UN9	copy	1					Factory Af	12. Upp

export (50)

Ready Accessibility: Unavailable

search for text...

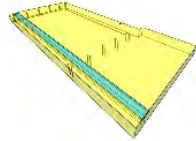
Internal Element D... H_Internal Element D... PA_Panel Installation ... PA_Panel Installer PA_Panel Manufacturer PA_Panel Type

Internal Element D...	H_Internal Element D...	PA_Panel Installation ...	PA_Panel Installer	PA_Panel Manufacturer	PA_Panel Type
py cut_set	1	Roof System	Collective Carpentry		
py cut_set	1	Roof System	Collective Carpentry		
py cut_set	1	Roof System	Collective Carpentry		
py cut_set	1	Roof System	Collective Carpentry		
py cut_set	1				

Project: Hooper Residence

Group By: **None** Issue Storyboard File

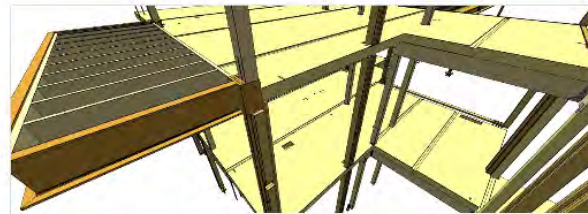
Hooper Residence



clt question 1

[HZ#959](#)

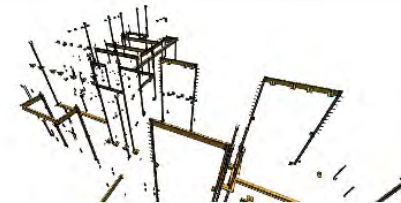
2/28/23, 12:01 PM



Have we resolved this?

[HZ#686](#)

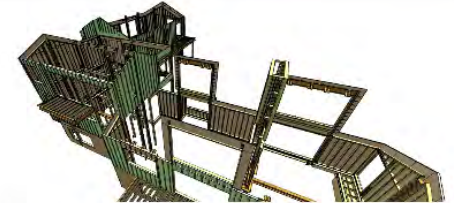
1/26/23, 3:26 PM



steel

[HZ#82](#)

1/26/23, 9:51 AM



ext walls + loadpath

[HZ#82](#)

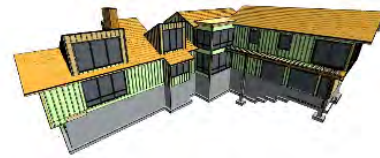
1/26/23, 9:50 AM



Exterior Walls Only

[HZ#82](#)

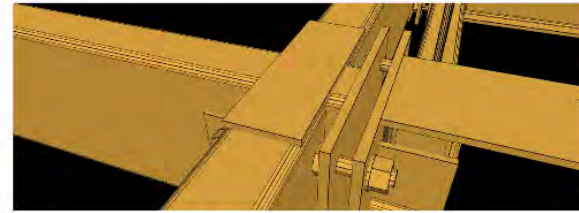
1/26/23, 9:49 AM



full building

[HZ#82](#)

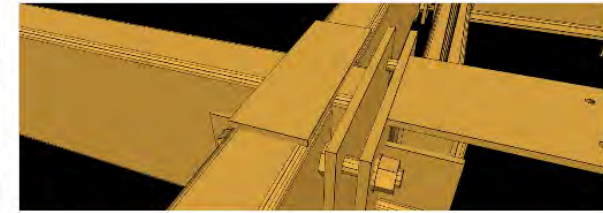
1/26/23, 9:47 AM



Yep. that should work Matt. thanks

[HZ#74](#)

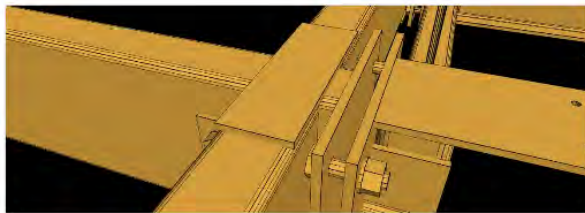
10/18/22, 9:39 PM



Yep. that should work Matt. thanks

[HZ#74](#)

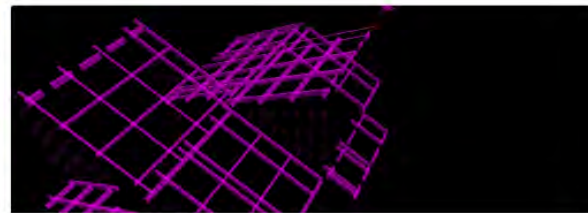
10/18/22, 9:39 PM



Yep. that should work Matt. thanks

[HZ#74](#)

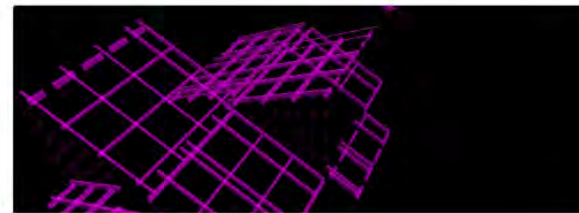
10/18/22, 9:39 PM



Example of searching dgz fastener

[HZ#794](#)

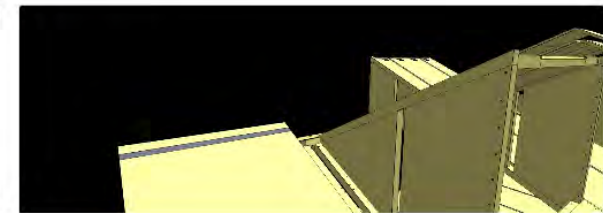
10/18/22, 9:09 PM



Example of searching dgz fastener

[HZ#794](#)

10/18/22, 9:09 PM



DGZ9360

[HZ#793](#)

10/17/22, 3:34 PM



Issues for [Hooper Residence](#)

FILTERS: [all projects] [Resolved] Assigned To Me [all types] [all perspectives]

New Issue Send Print Print Selected

Issue #	Created On	Issue	Type	Status	Assigned To	Perspective	Newest Comment
#4	11/22/21, 10:31 AM	First Hooper Issue	Needs Input	Resolved	davidh	Architectural	
#11	11/22/21, 1:28 PM	Window Collision?	Needs Input	Resolved	steveh	Architectural	
#22	11/23/21, 6:55 AM	steel saddle for gl @ family rm corner of foundation	Needs Input	Resolved	steveh	Structural	
#35	11/27/21, 9:38 AM	Holddown next to hss col?	Needs Input	Resolved	steveh	Structural	new details provided by Matt - new steel ifc coming from Brandon
#37	11/28/21, 6:36 AM	Builder scope nailers on hss columns - connection method	Needs Input	Resolved	steveh	Architectural	resolved - need ifc update from brandon which will include threaded studs
#38	11/28/21, 10:40 AM	what does this designate?	Needs Input	Resolved	steveh	Structural	The numbers in parenthesis refer to notes 1-9 listed below the shear wall schedule.
#42	12/1/21, 6:48 AM	garage man door - rough opening	Needs Input	Resolved	steveh	Architectural	Talked to Luke..he said that since RSA isn't responding to it we'll just have to make it a smaller door. no change required. closing the issue.
#52	12/2/21, 3:52 AM	request for header framing substitution	Needs Input	Resolved	steveh	Architectural	Trimmer stud can be used in lieu of hangers. DBL full height 2x king studs still required. MBE to follow up with revision sketch.
#53	12/2/21, 4:35 AM	how to nail hanger on outside face?	Needs Input	Resolved	steveh	Architectural	
#54	12/2/21, 5:33 AM	threaded stud at midpoint bottom side of garage doors steel beams	Needs Input	Resolved	steveh	Architectural	structurally acceptable to provide additional threaded rod to support wall below.
#55	12/2/21, 7:10 AM	need connection at bottom of gl post - master bdrm balcony corner	Needs Input	Resolved	steveh	Structural	talked to Tom and Matt about this. New detail is included with the thermal break detail.
#57	12/3/21, 7:45 AM	need alt gl connector at this location	Needs Input	Resolved	steveh	Structural	
#58	12/3/21, 8:08 AM	three way GL Connection @ 1/3 framing for upper level needed	Needs Input	Resolved	steveh	Architectural	My apologies Matt.. I stupidly didn't have my load path members turned on and I see the steel connection. Sorry man!
#59	12/3/21, 9:34 AM	CLT Cutout @ fireplace - request for verify	Needs Input	Resolved	steveh	Architectural	no response from RSA. will mark up on final geometry review drawings - closing this issue.
#61	12/3/21, 4:19 PM	framing corner @ family rm window	Needs Input	Resolved	steveh	Structural	
#67	12/5/21, 7:15 PM	steel plates need to notched into b.o. gl per ro	Needs Input	Resolved	steveh	Architectural	Ok. Notch plate into bottom of beam for flush bottom connection. Do not overcut notch.
#68	12/5/21, 7:36 PM	Balcony framing height differs from detail	Needs Input	Resolved	steveh	Structural	See forwarded email from RSA's response from this morning.
#69	12/5/21, 8:12 PM	elevation of plates on thermal break connections?	Needs Input	Resolved	steveh	Structural	column cap will be shop welded. Stiffener plates will have to be field welded.
#70	12/5/21, 8:39 PM	garage balcony channel - should it be set a bit lower?	Needs Input	Resolved	steveh	Structural	Steel to be aligned to top of CLT floor panel. Relationship

- Hooper Residence
 - From Architect
 - Holzraum Deliverables
 - SIMM - Models & View...
 - BUILDER COORDINATI...
 - INSTALLATION SUPPOR...
 - Install Photos
 - Sequence 15 - BRB Install
 - SIMM - Model & Viewe...
 - Nuggets . Cores . Kerfs
 - Nuggets
 - Cores
 - Kerfs
 - Fasteners
 - IFC for BIM AC360 collab
 - IFC
 - Cores, Kerfs, Nuggets

Hooper Residence > Holzraum Deliverables > INSTALLATION SUPPORT DRAWINGS

Name	Date Uploaded	Size
Install Photos		
Sequence 15 - BRB Install		
Foundation Verification Sheet GR2.pdf	8/31/22, 11:48 PM	785.3 KB
Hooper - Sill Plate Install Model - 9.1.22.html	9/1/22, 10:13 AM	48.2 MB
Install Drawings - Below the Lid.pdf	9/12/22, 3:05 PM	60.1 MB
walls and loadbath at hbs8240.3d	9/28/22, 1:52 PM	74.6 MB
Hooper - LOOSE WOOD LOADPATH SHOPS.pdf	10/1/22, 2:43 PM	1.2 MB
Hooper - BRB Nailers - 10-3-2022.pdf	10/3/22, 6:26 AM	1.8 MB
BRB Sill Plate Layout GR3.0 & GR3.1.pdf	8/31/22, 11:36 PM	4.7 MB
HOOPER - STEEL VERIFY 9-14-22.pdf	9/14/22, 1:53 PM	1.1 MB
HOOPER - 3.1-7.0-7.1-7.2-7.3.pdf	9/14/22, 8:33 PM	5.1 MB
Hooper Install Support Drawings REV1 - 10-1-2022.pdf	10/1/22, 6:38 PM	8.6 MB
Sequence 14 - Roof Zone 2-3-4 Install.pdf	11/17/22, 10:01 PM	5.1 MB
Sequence 14 - Roof Zone 1 Install.pdf	11/20/22, 8:51 AM	12.1 MB
SB LOCATIONS.html	11/20/22, 2:10 PM	112.2 MB
Sequence 15 ribs and fasteners 11-29-2022.html	11/29/22, 6:37 AM	127.2 MB
Sequence 15 - Roof Zones 1-2-3.3d	11/29/22, 6:40 AM	78.2 MB
SEQUENCE 16 - CLT STATIC PANELS.pdf	2/23/23, 10:58 AM	1.6 MB
STATIC PANEL INSTALL VIEWER.html	2/23/23, 10:58 AM	109.1 MB



Projects / Hooper Residence Active

hooper

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- Issues
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- Invite Users
- Wiki

Details

Address:	Big Sky, Montana	PHIUS Certification:	No
Architect:	Reid Smith Architects	Level One (sqft):	2485
Builder:	Blue Ribbon Builders	Level Two (sqft):	3389
Project Owner:		Level Three (sqft):	1887
Energy Modeler:		Structural Engineer:	Madden & Baughman Engineering
MEP Engineer:	Central Heating and Cooling		

Project Image



Description

High Performance Single Family Residence

Milestones & Tasks

Energy Model Cases

Case	Heating Demand of Target	Cooling Demand of Target	Heating Load of Target	Cooling Load of Target	Source Energy of Target
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Data Imports

Users

Username	Role	Action
Brandon Beachy	Contributor	
Brandon Wier	Project Admin	
Craig Toohy	Contributor	
davidh	Project Admin	
dheslerjr	Contributor	
Don Beebe	Contributor	
Emily Dodson	Project Admin	
Erik Renna	Project Admin	
ilka_cassidy	Project Admin	
Jason Simpson	Contributor	
John Finney BRB	Project Admin	
jpratschke	Project Admin	

Documents

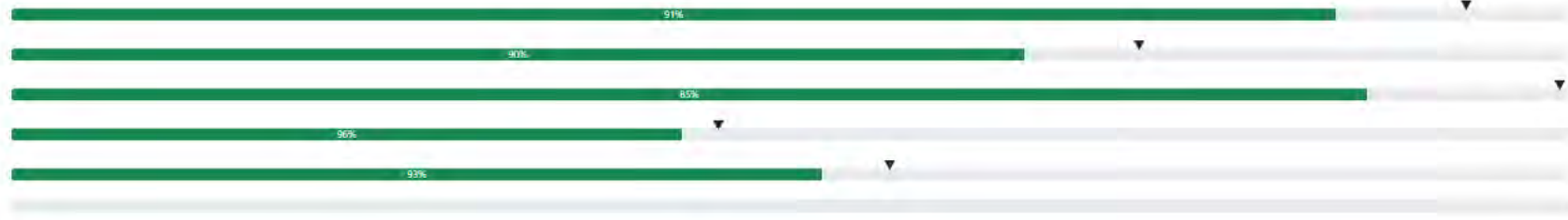
- From Architect
- Holzraum Deliverables
- IFC

Projects / Foster Drive / Energy

1: Phius submission #2

SHGC 0.45 No Insulated service cavity

Heating demand:	7.62 kBtu/sqft/year
Cooling demand:	5.87 kBtu/sqft/year
Heating load:	5.24 Btu/hr/sqft
Cooling load:	2.6 Btu/hr/sqft
Source energy:	5203 kWh/person/year
Site energy:	9.21 kBtu/sqft/yr



Edit

2: Phius submission #2 low SHGC

SHGC 0.38 Insulated service cavity

Heating demand:	7.78 kBtu/sqft/year
Cooling demand:	5.11 kBtu/sqft/year
Heating load:	5.22 Btu/hr/sqft
Cooling load:	2.31 Btu/hr/sqft
Source energy:	5128 kWh/person/year
Site energy:	9.08 kBtu/sqft/yr



Edit

3: Phius submission #2 low SHGC, 0.04 CFM/sf

SHGC 0.38 No Insulated Service Cavity, Increased airtightness 0.04 CFM/sf (ACH 0.6)

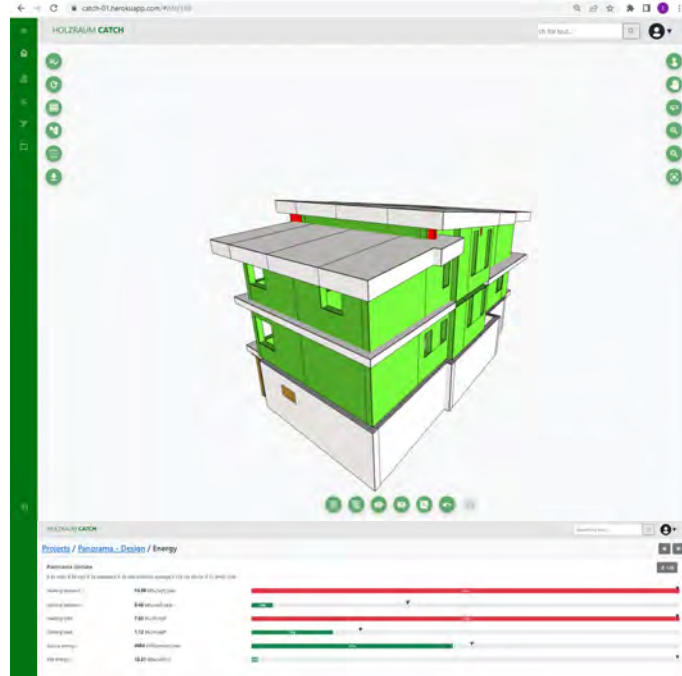
Heating demand:	7.98 kBtu/sqft/year
Cooling demand:	5.11 kBtu/sqft/year
Heating load:	4.93 Btu/hr/sqft
Cooling load:	2.33 Btu/hr/sqft
Source energy:	5165 kWh/person/year
Site energy:	9.15 kBtu/sqft/yr



Edit



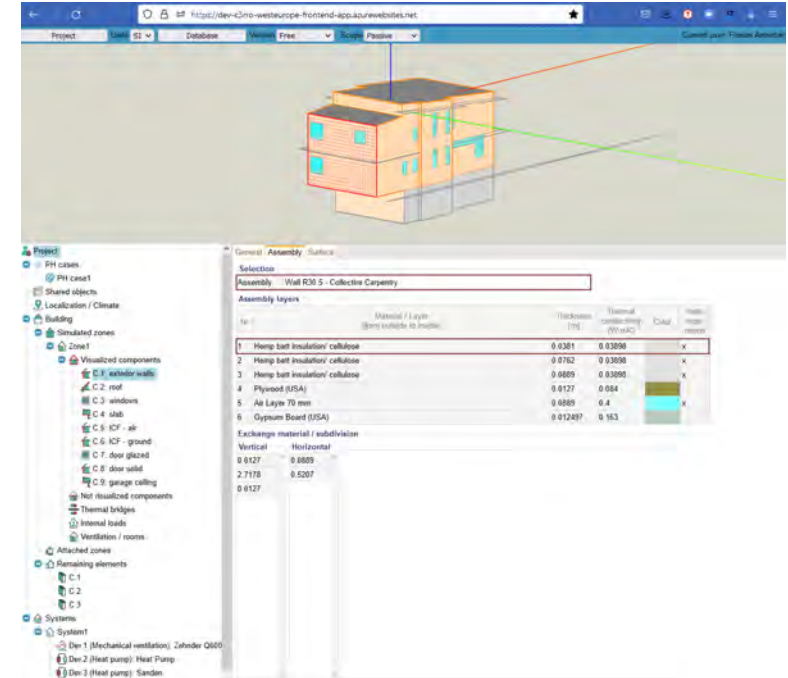
IFC File →



Calculation Request →
← Simulation Results

Building Geometry / Info →
← Model Updates / Results

Thermal Bridge Nugget →
← Simulation Results



Enabling better buildings by making holistic building simulation common place

BUILDINGENERGY BOSTON

A Necessary Evolution: Three Companies Instigate Change via Offsite Construction

UNITY HOMES



Beth Campbell

B.PUBLIC PREFAB



Edie Dillman

HOLZRAUM SYSTEM | Passive House Accelerator



Ilka Cassidy

Northeast Sustainable Energy Association (NESEA)
March 29, 2023

Thank You