Exterior Mineral Wool Tier 3 Assembly

*See **Appendix A - Exterior Mineral Wool Tier 3 Assembly Construction Details** for plans and construction details*

Description & Overview

The design of this assembly is similar to the Tier 1 2x6 assembly with 2" of mineral wool insulation wrapping the exterior of the 2x6 framing and floor assembly, from the foundation up to the underside of the top chord of the roof trusses. The wall assembly, from exterior to interior, contains:

- Exterior Cladding
- ¾" rainscreen strapping
- 2" mineral wool insulation
    - Connected with ¾" rainscreen strapping and screws as per manufacturers specifications
- Airtight WRB, vapour open
- Structural sheathing
- 2x6 stud wall with fibreglass batt cavity insulation
- Variable vapour barrier
- ½" gypsum board
- Interior finish

The roof and foundation for drafting and mock-up detailing were the same as the Tier 1 2x6 Assembly.

The window installed in the mock-up was the same as the Tier 1 2x6 Assembly. There were several options considered as to where the window would be located within the wall assembly. The placement of the window selected for this project was to install it in a similar way as the Tier 1 2x6 assembly. With the window installed with the flange mounted to the exterior face of the structural sheathing, it allowed for the exterior insulation to cover the nailing flanges, reducing thermal bridging. The other installation method considered was to install the window at the exterior face of the rainscreen. This would have required a custom structural buck to be build to extend the framing R.O. to the outer face of the wall and would have complicated the water control layer detailing at the window. Installing the window to the exterior of the rainscreen would have allowed for the siding to stop right at the window frame and not require a custom cladding return to the inset window when installed at the sheathing layer.

The decision to select this assembly was primarily influenced by researching common methods utilized by residential builders in Alberta to achieve tier 3 standards.

Materials

Materials used for mock-up wall construction are as follows:

- **Rainscreen Strapping**
  - 1x4 SPF lumber
  - Fasteners - #10 – 5” Construction Screws spaced per insulation manufacturers guidelines
  - Bug screen
- **2” Mineral wool**
  - Owens Corning Thermafiber Insulation – R 4.1/Inch
- **Airtight WRB**
  - Membrane - Siga Majvest 200 – Mechanically fastened
  - Sealing tape – Siga Wigluv in varying sizes.
  - Sill Pan Flashing – Siga Wigluv
- **Structural Wall**
  - 3/8” OSB structural sheathing
  - 2x6 SPF lumber
- **Cavity Insulation**
  - Owens Corning R-22 Pink Next gen Fiberglass Insulation
- **Vapour Barrier**
  - Siga Majrex
  - Sealing Tape – Siga Fentrim
- **Assembly Effective Thermal Performance**
  - RSI-4.58 or R-26.01

Construction

This assembly was very similar to the Tier 1 2x6 Assembly as far as structural framing was concerned. The air control layer for this assembly was the Siga Majvest 200 WRB. Maintaining a continuous air control layer was achieved with this membrane along with the following materials and methods:

- Taping to seal all joints and openings in the WRB.
- Installation of a strip of WRB between the top and cap plate of the wall at the truss connection, draping to the exterior and interior. Taping the joints to the WRB and VB.
- Taping electrical wire penetrations.
- Taping WRB to window frame on the sides and the top.
- Taping WRB to mechanical penetrations
- Foam backer rod and caulking to connect the window frame sill to the WRB at the sill.

Sealing the WRB to maintain airtightness was much easier than sealing the interior VB as there were fewer junctions and penetrations to detail. Additionally, being installed on the sheathing provided solid material for taping and rolling the tape joints to seal the WRB at all laps and penetrations.

The largest difference between this assembly and the Tier 1 Assembly is the installation of 2” of mineral wool and a rainscreen to the exterior of the WRB. The mineral wool was installed by initially tacking it in place with plastic cap nails. The ¾” rainscreen strapping was then installed at the same spacing as the structural framing, ensuring the fasteners attaching the strapping were imbedded into a structural member.

Custom made flashing was required for the areas that the flashing had to return all the way to the back side of the WRB. A bug screen was installed at the top and base of rainscreen sections in between the strapping to prevent bugs and small animals from entering the

assembly. A custom engineered wood window trim return was made for the exterior trim of the window.

Assembly Advantages

- Wrapping the exterior of the wall assembly in 2” of mineral wool insulation reduces the amount of thermal bridging through the wood structural framing members.
- The mineral wool insulation used for the mockup was moisture resistant. This allowed it to be installed as part of the WRB.
- The mineral wool insulation used for the mockup has fire resistant qualities.
- The structural framing is very similar to how most homes are currently being built (Tier 1 2x6 Assembly).
- Utilizing the WRB as the air control layer allowed for less challenging detailing, and a reduced chance of errors at junctions and penetrations compared to locating the air control layer to the interior of the assembly.
- Attaching the mineral wool with ¾” strapping material created a rainscreen for the assembly which would assist with moisture management.
- The framing and construction method for this assembly does not differ greatly from the Tier 1 2x6 assembly.
- Adding only 2” of exterior insulation allowed for the use of screws that can be found at most hardware or building supply stores.

Assembly Disadvantages

- High-performance membranes and materials were costly, and needed to be ordered from the manufacturer.
- Not all cladding systems can be accommodated with this exact assembly. For example, if stucco was to be installed, there would need to be a sheathing layer to the exterior of the rainscreen or other accommodations made.
- Overdriving rainscreen strapping screws can compress the mineral wool insulation, creating a wavy exterior finish.
- Considerable forethought, planning and organization is required, as mistakes can be more time consuming and difficult to fix than the Tier 1 2x6 Assembly.

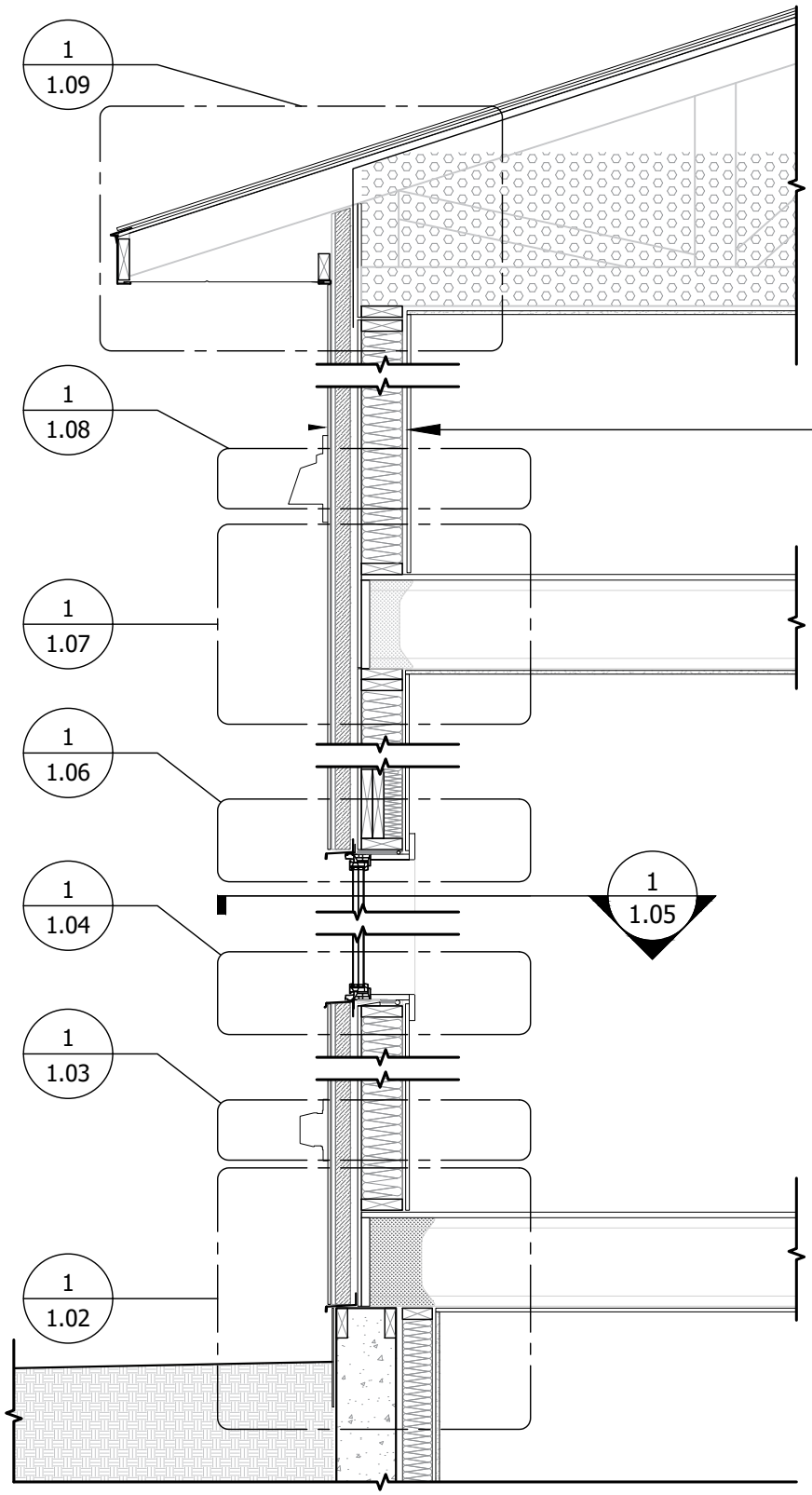
Cost Analysis

Upon completing a cost analysis of this assembly compared to the Tier 1 2x6 Assembly, the cost to construct this assembly for the model home came out to roughly 54% more.

GBTAC found that the largest cause of additional costs was due to the use of the high-quality membranes and tapes, followed by the mineral wool insulation.

Appendix A:

Exterior Mineral Wool Tier 3 Assembly Construction Details



EXT. MINERAL WOOL T3 WALL ASSEMBLY

EFFECTIVE RSI = 4.58; R-VALUE = 26.01

- EXTERIOR CLADDING
- ¾" RAINSCREEN STRAPPING
- 2" MINERAL WOOL INSULATION
  -C/W STRAPPING & SCREWS AS PER SPEC.
- AIRTIGHT WATER RESISTANT BARRIER, SHEET APPLIED MEMBRANE, VAPOUR OPEN
- ⅜" EXTERIOR SHEATHING
- 2X6 STUD WALL WITH FIBERGLASS BATT CAVITY INSULATION
- VARIABLE VAPOUR BARRIER
- ½" GYPSUM BOARD
- INTERIOR FINISH

NOTES

- EXT.= EXTERIOR
- T3= TIER 3

1 ENVELOPE SECTION

1/2" = 1'-0"

[redacted]

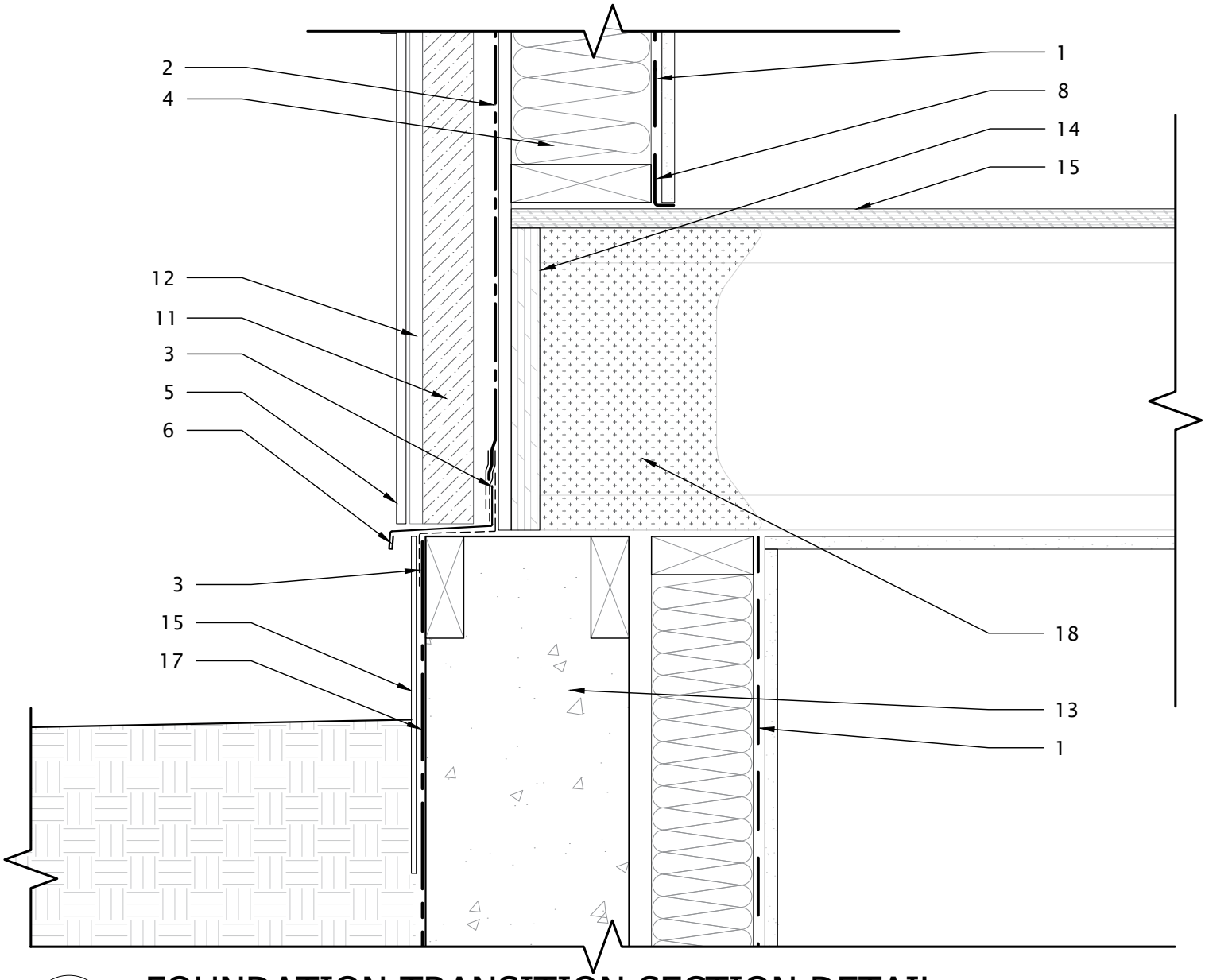
1301-16 AVENUE NW CALGARY AB, T2M 0L4

Drawing Title

EXT. MINERAL WOOL T3 WALL

Project Number	2024-009	Project Name	HIGH PERFORMANCE WALL ASSEMBLY				
Drawn by	PY	Checked by	BH, NM	Date	2025-04-30	Scale	1/2" = 1'- 0"
Project Address	N/A						
Issued For	ALBERTA ECOTRUST FOUNDATION						

1.01



1 FOUNDATION TRANSITION SECTION DETAIL

2" = 1'-0"

1 VAPOUR BARRIER
2 AIRTIGHT WATER RESISTANT BARRIER
3 SELF ADHERED MEMBRANE
4 FIBREGLASS BATT INSULATION
5 CLADDING
6 FLASHING
7 SEALANT
8 NON-HARDENING SEALANT
9 COMPRESSED FOAM ROD
10 EXPANDING POLYURETHANE SPRAY FOAM
11 2" MINERAL WOOL INSULATION
12 RAINSCREEN STRAPPING
13 CAST-IN-PLACE CONCRETE
14 RIM BOARD
15 SUBFLOOR
16 PARGING
17 DAMPPROOFING
18 SPRAY FOAM INSULATION

[redacted]

1301-16 AVENUE NW CALGARY AB, T2M 0L4

Drawing Title

EXT. MINERAL WOOL T3 WALL

Project Number	2024-009	Project Name	HIGH PERFORMANCE WALL ASSEMBLY				
Drawn by	PY	Checked by	BH, NM	Date	2025-04-30	Scale	2" = 1'- 0"
Project Address	N/A						
Issued For	ALBERTA ECOTRUST FOUNDATION						

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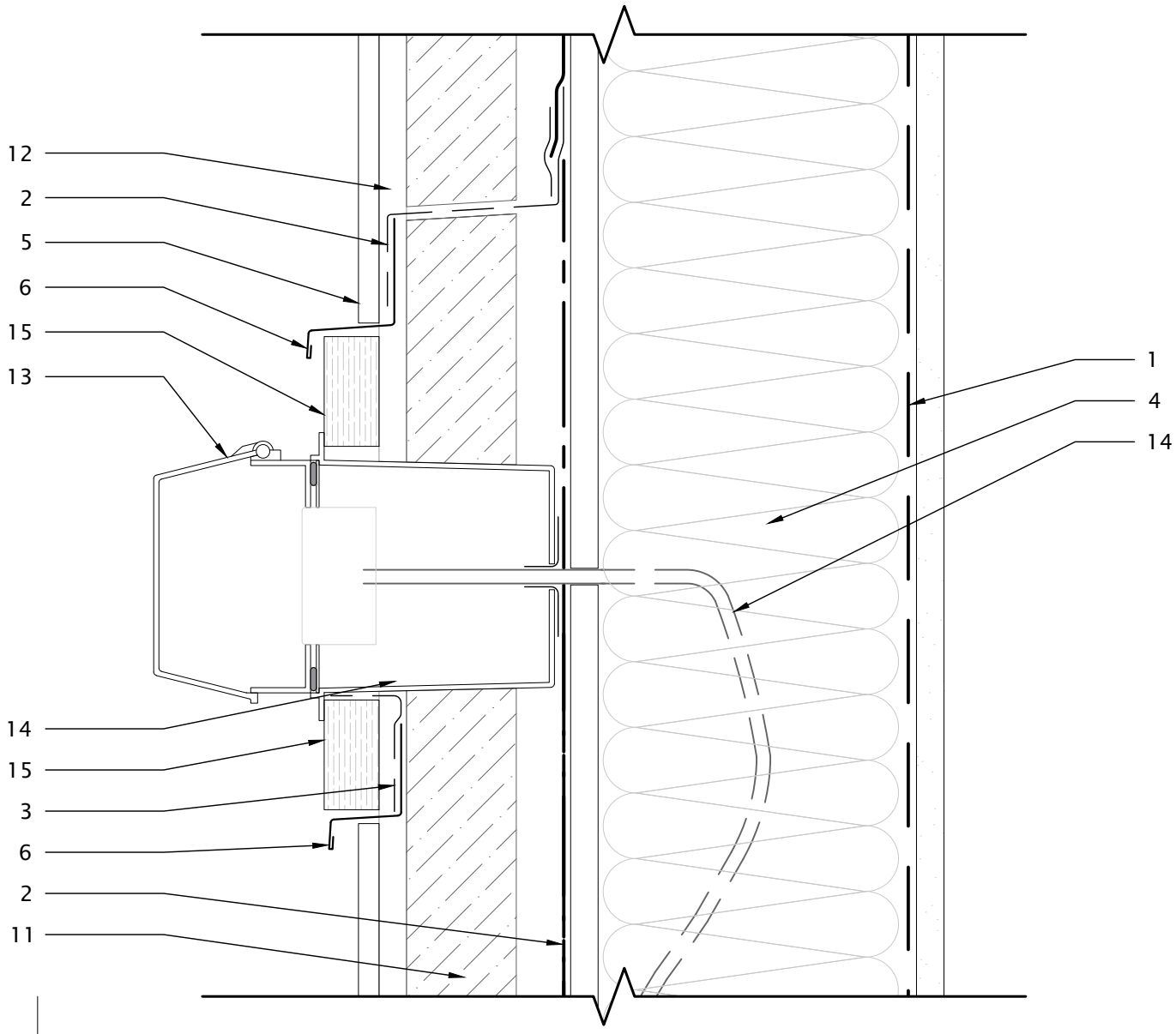

1 RECEPTACLE SECTION DETAIL

4" = 1'-0"

1 VAPOUR BARRIER
2 AIRTIGHT WATER RESISTANT BARRIER
3 SELF ADHERED MEMBRANE
4 FIBREGLASS BATT INSULATION
5 CLADDING
6 FLASHING
7 SEALANT
8 NON-HARDENING SEALANT
9 COMPRESSED FOAM ROD
10 EXPANDING POLYURETHANE SPRAY FOAM
11 2" MINERAL WOOL INSULATION
12 RAINSCREEN STRAPPING
13 IN USE RECEPTACLE ASSEMBLY
14 ELECTRICAL WIRE
15 BATTEN

[redacted]
1301-16 AVENUE NW CALGARY AB, T2M 0L4

Drawing Title

EXT. MINERAL WOOL T3 WALL

Project Number	2024-009	Project Name	HIGH PERFORMANCE WALL ASSEMBLY				
Drawn by	PY	Checked by	BH, NM	Date	2025-04-30	Scale	4" = 1'- 0"
Project Address	N/A						
Issued For	ALBERTA ECOTRUST FOUNDATION						

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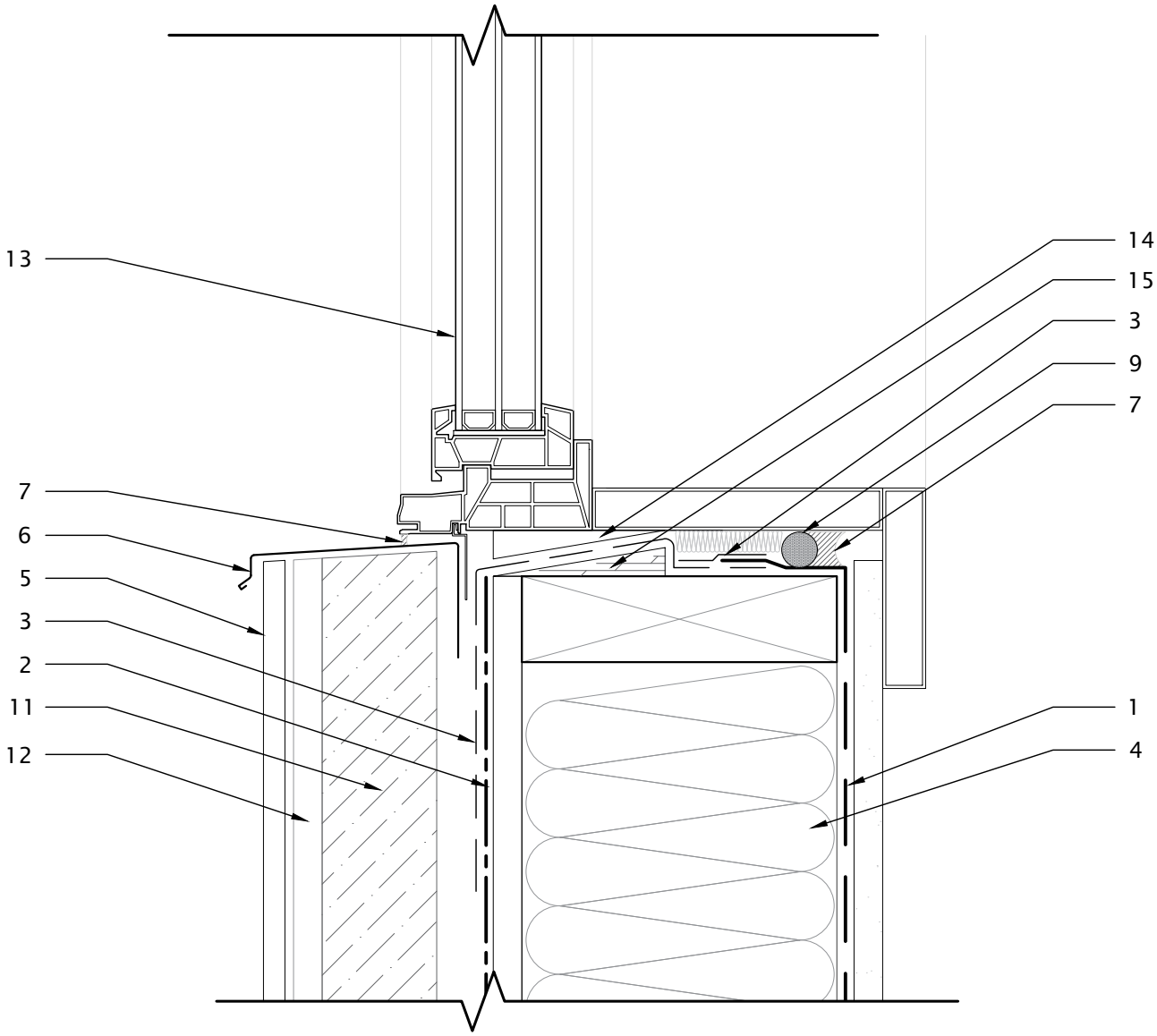

1 WINDOW SILL SECTION DETAIL

4" = 1'-0"

1 VAPOUR BARRIER
2 AIRTIGHT WATER RESISTANT BARRIER
3 SELF ADHERED MEMBRANE
4 FIBREGLASS BATT INSULATION
5 CLADDING
6 FLASHING
7 SEALANT
8 NON-HARDENING SEALANT
9 COMPRESSED FOAM ROD
10 EXPANDING POLYURETHANE SPRAY FOAM
11 2" MINERAL WOOL INSULATION
12 RAINSCREEN STRAPPING
13 GLAZING UNIT
14 WINDOW SUPPORT SHIM
15 BEVELED SIDING SLOPED DAM

[redacted]

1301-16 AVENUE NW CALGARY AB, T2M 0L4

Drawing Title

EXT. MINERAL WOOL T3 WALL

Project Number	2024-009	Project Name	HIGH PERFORMANCE WALL ASSEMBLY		
Drawn by	PY	Checked by	BH,NM	Date	2025-04-30
Scale	4" = 1'- 0"				

Project Address N/A

Issued For ALBERTA ECOTRUST FOUNDATION

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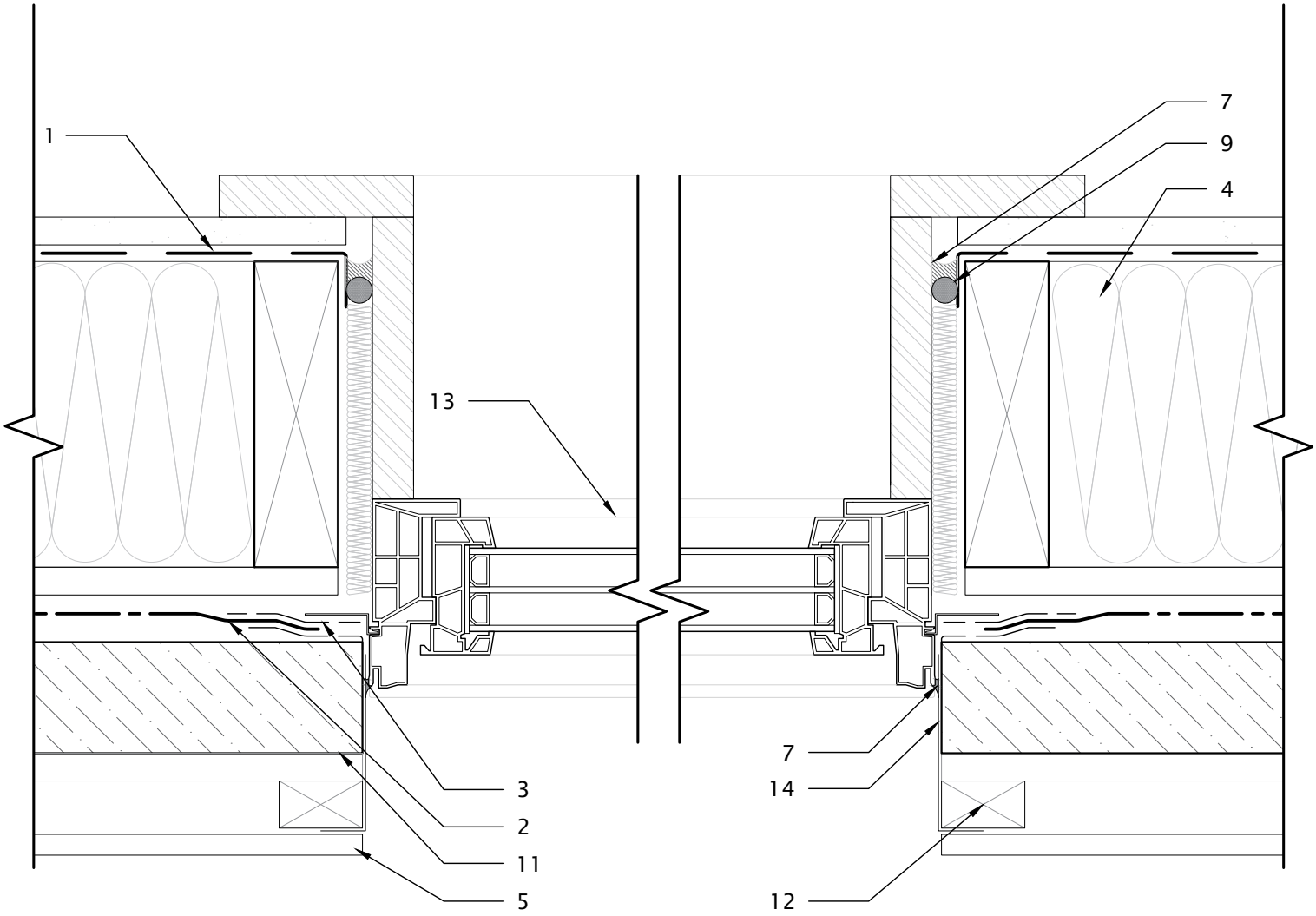

1 WINDOW JAMB PLAN DETAIL

4" = 1'-0"

1 VAPOUR BARRIER
2 AIRTIGHT WATER RESISTANT BARRIER
3 SELF ADHERED MEMBRANE
4 FIBREGLASS BATT INSULATION
5 CLADDING
6 FLASHING
7 SEALANT
8 NON-HARDENING SEALANT
9 COMPRESSED FOAM ROD
10 EXPANDING POLYURETHANE SPRAY FOAM
11 2" MINERAL WOOL INSULATION
12 RAINSCREEN STRAPPING
13 GLAZING UNIT
14 CLOSURE FLASHING

[redacted]
1301-16 AVENUE NW CALGARY AB, T2M 0L4

Drawing Title

EXT. MINERAL WOOL T3 WALL

Project Number	2024-009	Project Name	HIGH PERFORMANCE WALL ASSEMBLY
Drawn by	PY	Checked by	BH, NM
Date	2025-04-30	Scale	4" = 1'- 0"
Project Address	N/A		
Issued For	ALBERTA ECOTRUST FOUNDATION		

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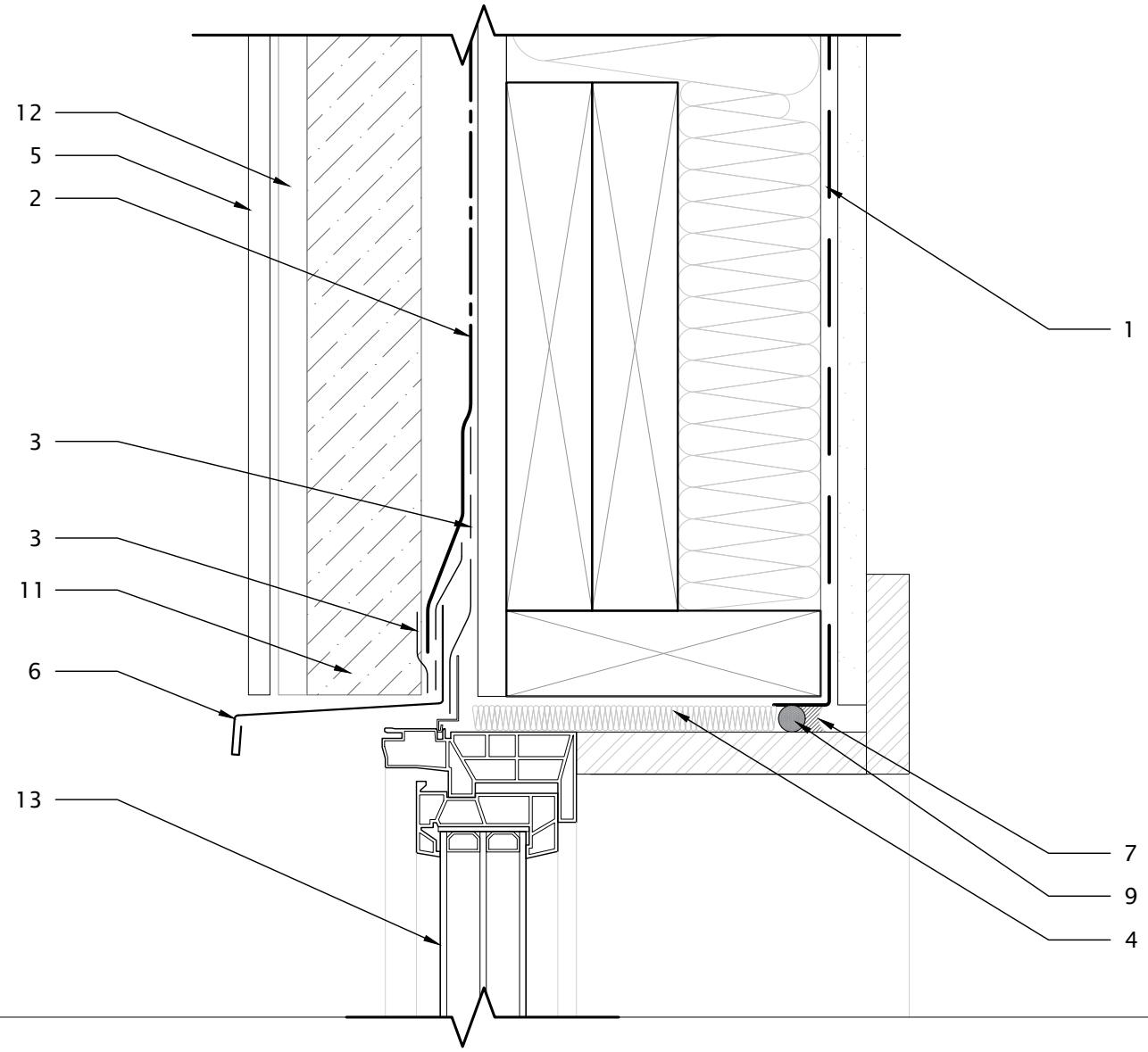

1 WINDOW HEAD SECTION DETAIL

4" = 1'-0"

1 VAPOUR BARRIER
2 AIRTIGHT WATER RESISTANT BARRIER
3 SELF ADHERED MEMBRANE
4 FIBREGLASS BATT INSULATION
5 CLADDING
6 FLASHING
7 SEALANT
8 NON-HARDENING SEALANT
9 COMPRESSED FOAM ROD
10 EXPANDING POLYURETHANE SPRAY FOAM
11 2" MINERAL WOOL INSULATION
12 RAINSCREEN STRAPPING
13 GLAZING UNIT

[redacted]

1301-16 AVENUE NW CALGARY AB, T2M 0L4

Drawing Title

EXT. MINERAL WOOL T3 WALL

Project Number	2024-009	Project Name	HIGH PERFORMANCE WALL ASSEMBLY				
Drawn by	PY	Checked by	BH, NM	Date	2025-04-30	Scale	4" = 1'- 0"
Project Address	N/A						
Issued For	ALBERTA ECOTRUST FOUNDATION						

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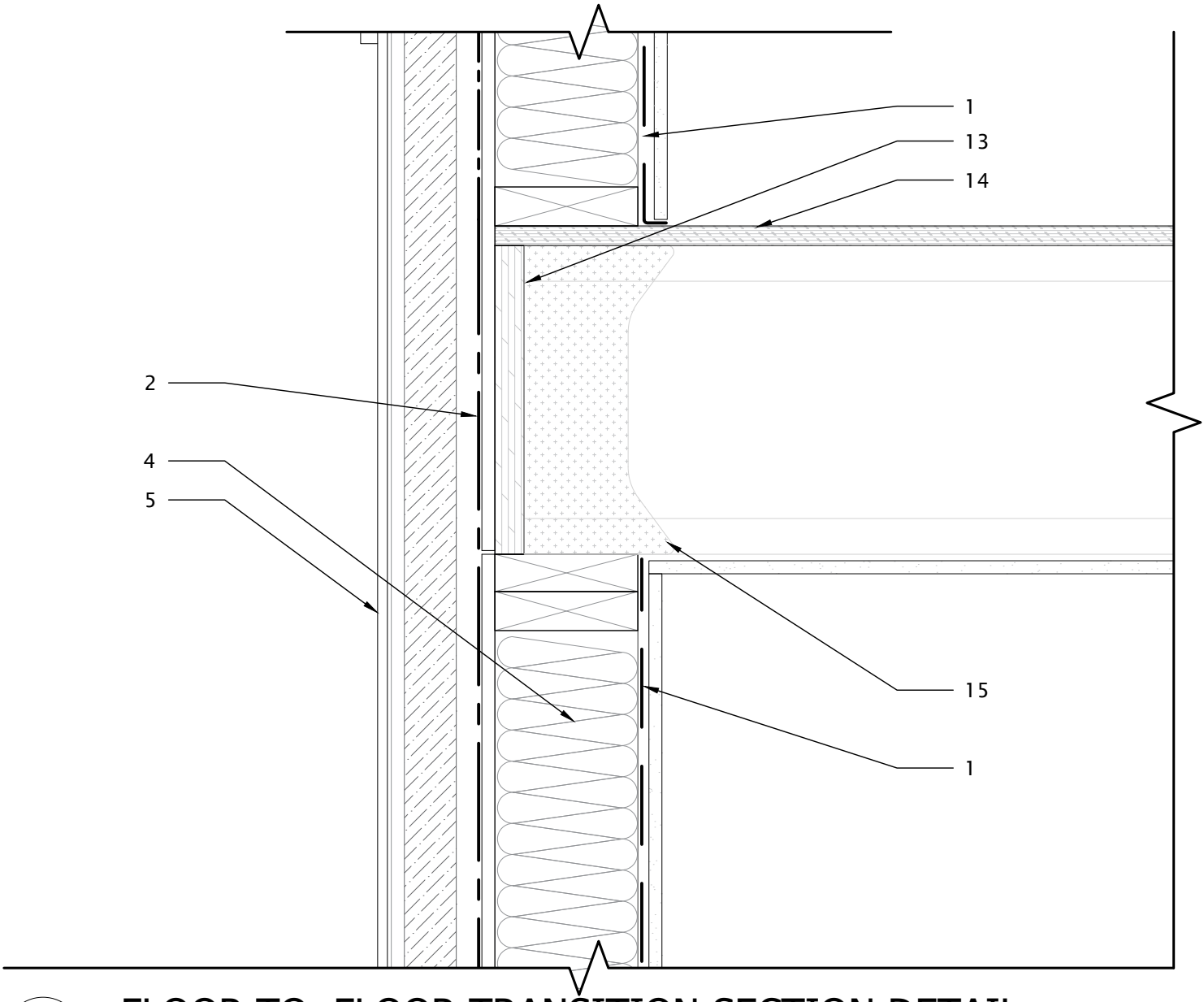

1 FLOOR TO FLOOR TRANSITION SECTION DETAIL

2" = 1'-0"

1 VAPOUR BARRIER
2 AIRTIGHT WATER RESISTANT BARRIER
3 SELF ADHERED MEMBRANE
4 FIBREGLASS BATT INSULATION
5 CLADDING
6 FLASHING
7 SEALANT
8 NON-HARDENING SEALANT
9 COMPRESSED FOAM ROD
10 EXPANDING POLYURETHANE SPRAY FOAM
11 2" MINERAL WOOL INSULATION
12 RAINSCREEN STRAPPING
13 RIM BOARD
14 SUBFLOOR
15 SPRAY FOAM INSULATION

[redacted]
1301-16 AVENUE NW CALGARY AB, T2M 0L4

Drawing Title

EXT. MINERAL WOOL T3 WALL

Project Number	2024-009	Project Name	HIGH PERFORMANCE WALL ASSEMBLY		
Drawn by	PY	Checked by	BH, NM	Date	2025-04-30
Scale	2" = 1'- 0"				
Project Address	N/A				
Issued For	ALBERTA ECOTRUST FOUNDATION				

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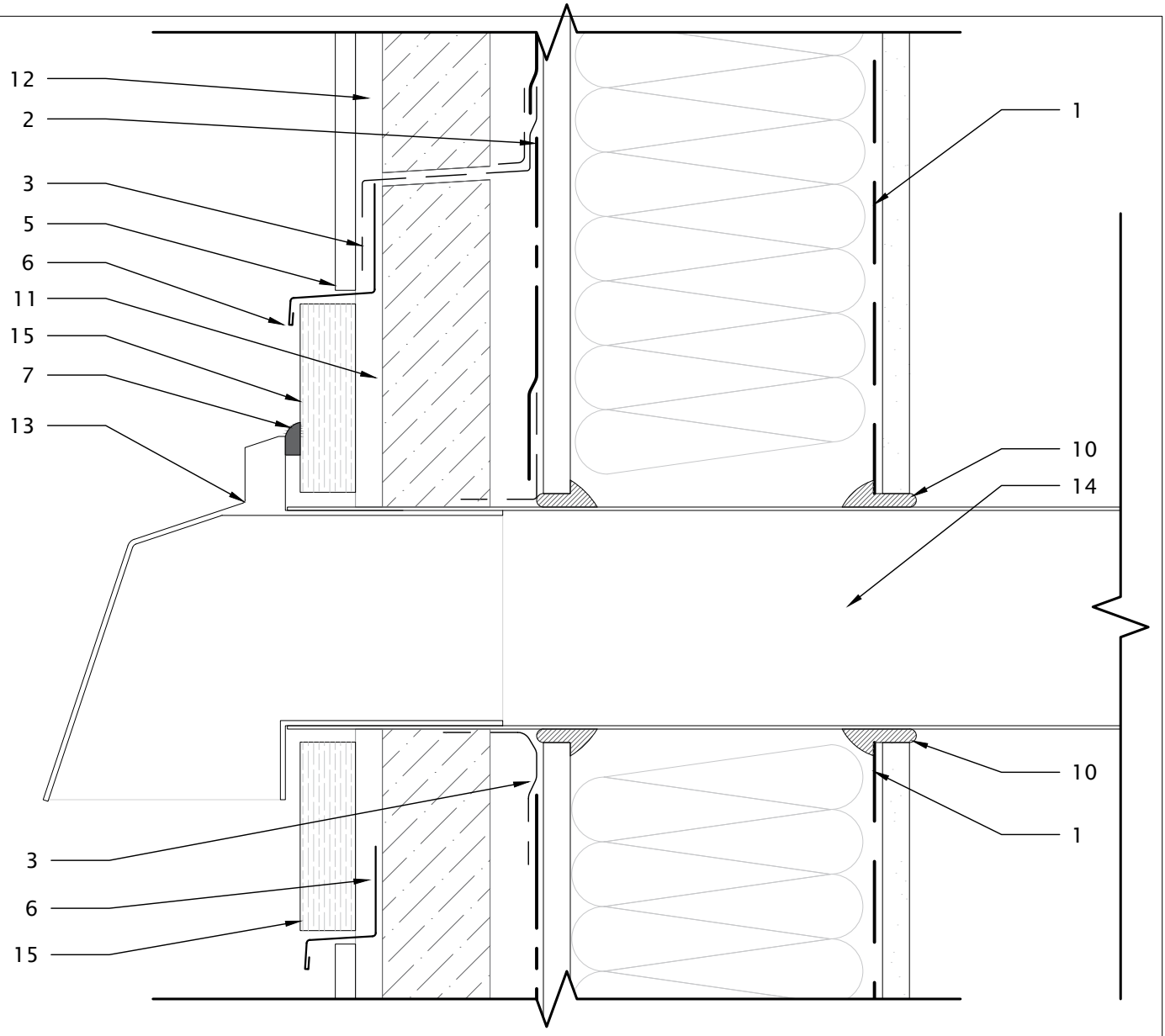

1 DUCT OPENING SECTION DETAIL

4" = 1'-0"

1 VAPOUR BARRIER
2 AIRTIGHT WATER RESISTANT BARRIER
3 SELF ADHERED MEMBRANE
4 FIBREGLASS BATT INSULATION
5 CLADDING
6 FLASHING
7 SEALANT
8 NON-HARDENING SEALANT
9 COMPRESSED FOAM ROD
10 EXPANDING POLYURETHANE SPRAY FOAM
11 2" MINERAL WOOL INSULATION
12 RAINSCREEN STRAPPING
13 DUCT HOOD
14 DUCT
15 BATTEN

1301-16 AVENUE NW CALGARY AB, T2M 0L4

Drawing Title

EXT. MINERAL WOOL T3 WALL

Project Number	2024-009	Project Name	HIGH PERFORMANCE WALL ASSEMBLY				
Drawn by	PY	Checked by	BH, NM	Date	2025-04-30	Scale	4" = 1'- 0"
Project Address	N/A						
Issued For	ALBERTA ECOTRUST FOUNDATION						

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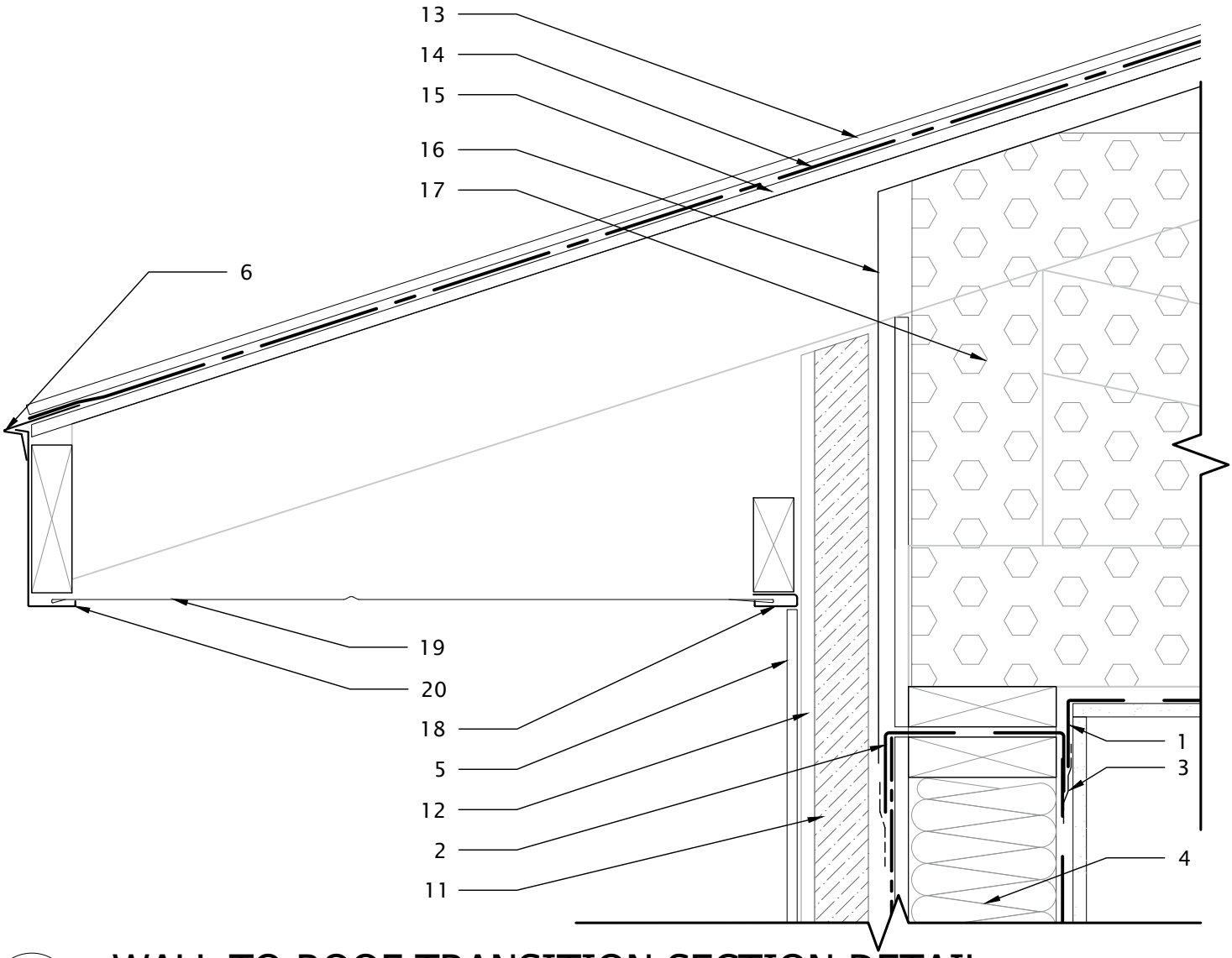

1 WALL TO ROOF TRANSITION SECTION DETAIL

2" = 1'-0"

1 VAPOUR BARRIER
2 AIRTIGHT WATER RESISTANT BARRIER
3 SELF ADHERED MEMBRANE
4 FIBREGLASS BATT INSULATION
5 CLADDING
6 FLASHING
7 SEALANT
8 NON-HARDENING SEALANT
9 COMPRESSED FOAM ROD
10 EXPANDING POLYURETHANE SPRAY FOAM
11 2" MINERAL WOOL INSULATION
12 RAINSCREEN STRAPPING
13 ROOFING SHINGLE
14 ROOFING UNDERLAYMENT MEMBRANE
15 ROOFING SHEATHING
16 INSULATION STOP
17 BLOWN INSULATION
18 J-CHANNEL
19 SOFFIT
20 FASCIA

[redacted]

1301-16 AVENUE NW CALGARY AB, T2M 0L4

Drawing Title

EXT. MINERAL WOOL T3 WALL

Project Number	2024-009	Project Name	HIGH PERFORMANCE WALL ASSEMBLY				
Drawn by	PY	Checked by	BH, NM	Date	2025-04-30	Scale	2" = 1'- 0"
Project Address	N/A						
Issued For	ALBERTA ECOTRUST FOUNDATION						

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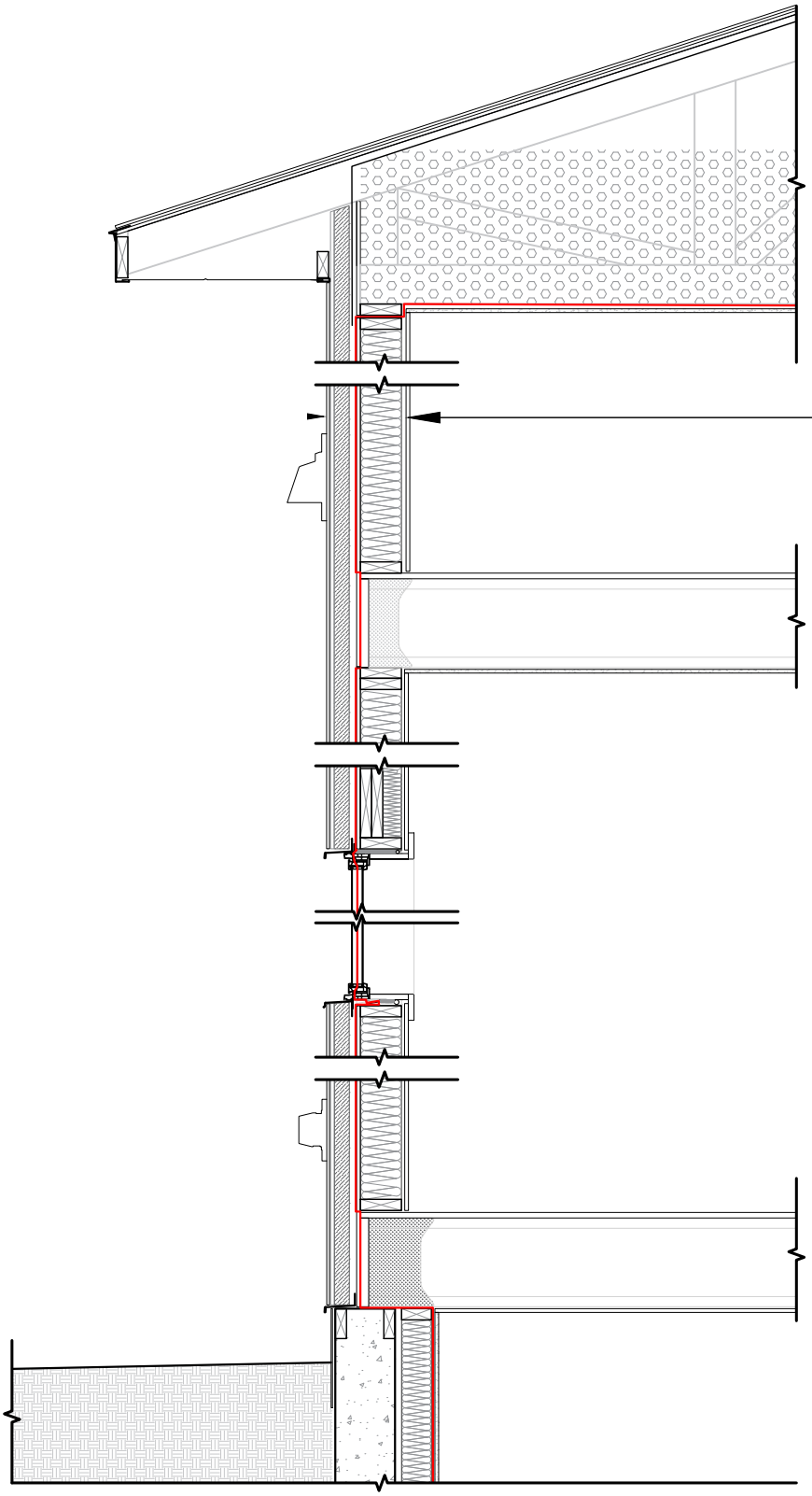

EXT. MINERAL WOOL T3 WALL ASSEMBLY

EFFECTIVE RSI = 4.58; R-VALUE = 26.01

- EXTERIOR CLADDING
- ¾" RAINSCREEN STRAPPING
- 2" MINERAL WOOL INSULATION
  -C/W STRAPPING & SCREWS AS PER SPEC.
- AIRTIGHT WATER RESISTANT BARRIER, SHEET APPLIED MEMBRANE, VAPOUR OPEN
- ⅜" EXTERIOR SHEATHING
- 2X6 STUD WALL WITH FIBERGLASS BATT CAVITY INSULATION
- VARIABLE VAPOUR BARRIER
- ½" GYPSUM BOARD
- INTERIOR FINISH

AIR BARRIER

NOTES

- EXT.= EXTERIOR
- T3= TIER 3

1 AIR BARRIER CONTINUITY

1/2" = 1'-0"

1301-16 AVENUE NW CALGARY AB, T2M 0L4

Drawing Title

EXT. MINERAL WOOL T3 WALL

Project Number	2024-009	Project Name	HIGH PERFORMANCE WALL ASSEMBLY				
Drawn by	PY	Checked by	BH, NM	Date	2025-04-30	Scale	1/2" = 1'- 0"
Project Address	N/A						
Issued For	ALBERTA ECOTRUST FOUNDATION						

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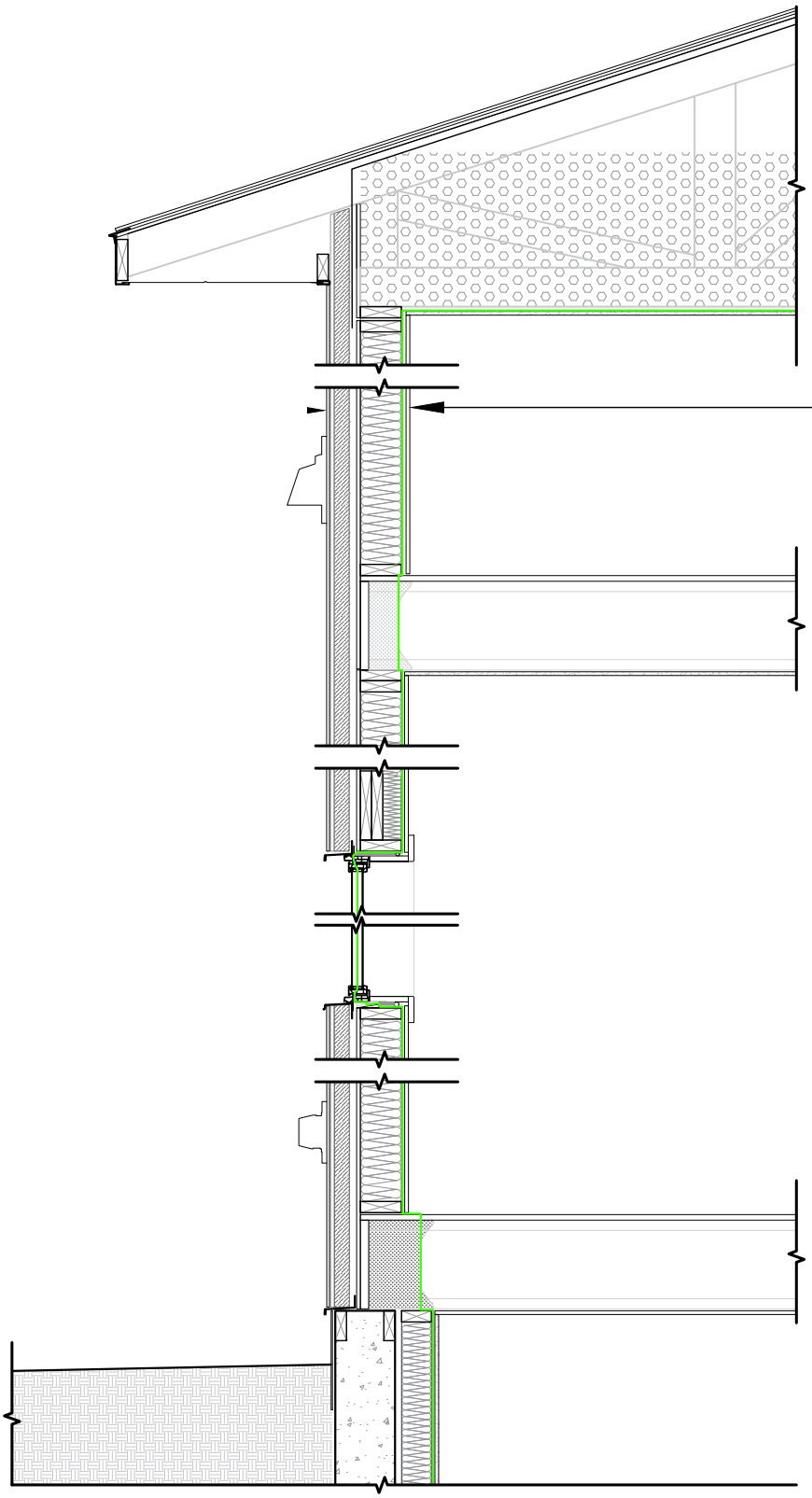

EXT. MINERAL WOOL T3 WALL ASSEMBLY

EFFECTIVE RSI = 4.58; R-VALUE = 26.01

- EXTERIOR CLADDING
- ¾" RAINSCREEN STRAPPING
- 2" MINERAL WOOL INSULATION
  -C/W STRAPPING & SCREWS AS PER SPEC.
- AIRTIGHT WATER RESISTANT BARRIER, SHEET APPLIED MEMBRANE, VAPOUR OPEN
- ⅜" EXTERIOR SHEATHING
- 2X6 STUD WALL WITH FIBERGLASS BATT CAVITY INSULATION
- VARIABLE VAPOUR BARRIER
- ½" GYPSUM BOARD
- INTERIOR FINISH

VAPOUR BARRIER

NOTES

- EXT.= EXTERIOR
- T3= TIER 3

1 VAPOUR BARRIER CONTINUITY

1/2" = 1'-0"

[redacted]

1301-16 AVENUE NW CALGARY AB, T2M 0L4

Drawing Title

EXT. MINERAL WOOL T3 WALL

Project Number	2024-009	Project Name	HIGH PERFORMANCE WALL ASSEMBLY				
Drawn by	PY	Checked by	BH, NM	Date	2025-04-30	Scale	1/2" = 1'- 0"
Project Address	N/A						
Issued For	ALBERTA ECOTRUST FOUNDATION						

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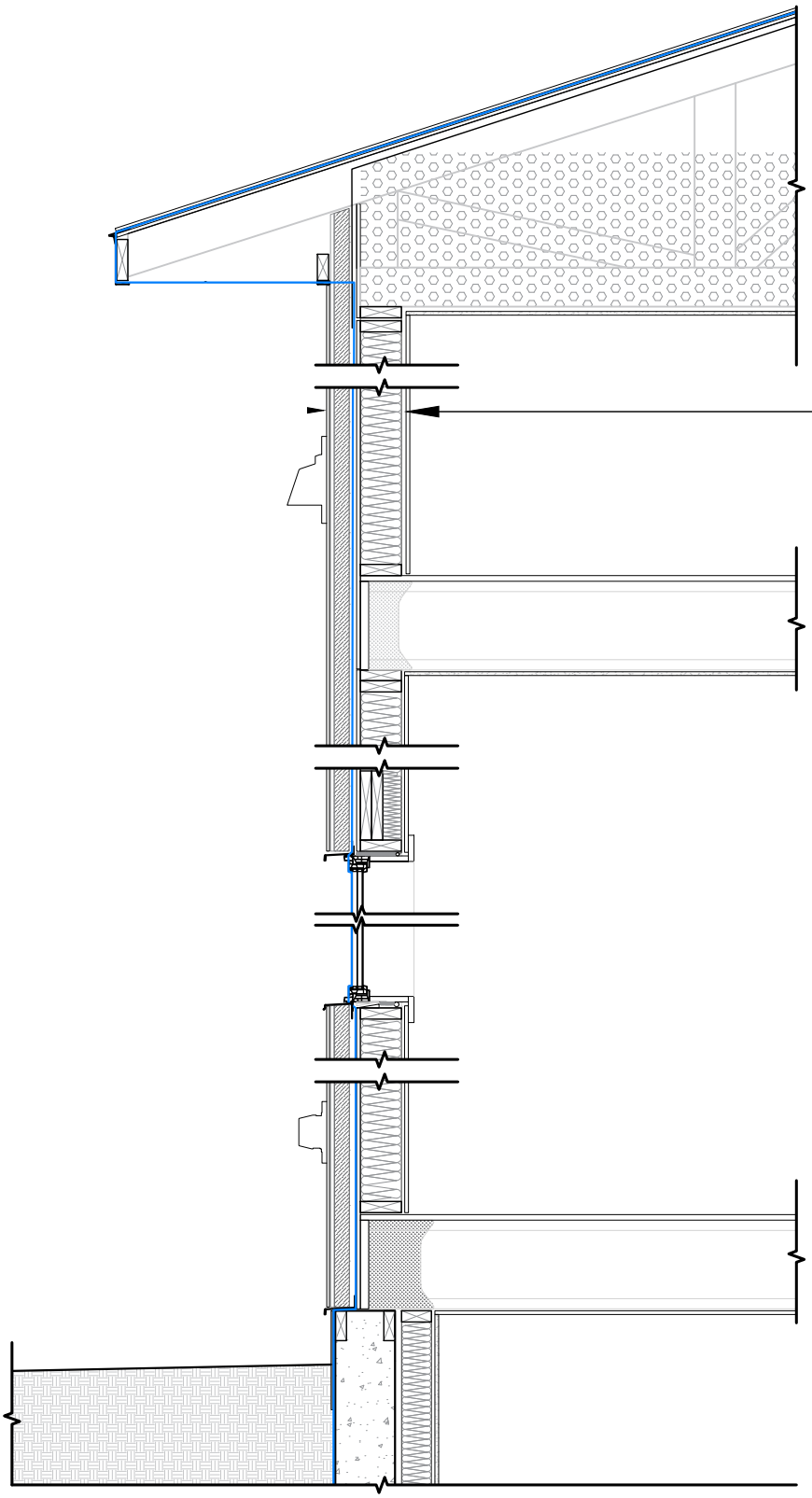


EXT. MINERAL WOOL T3 WALL ASSEMBLY

EFFECTIVE RSI = 4.58; R-VALUE = 26.01

- EXTERIOR CLADDING
- ¾" RAINSCREEN STRAPPING
- 2" MINERAL WOOL INSULATION
  -C/W STRAPPING & SCREWS AS PER SPEC.
- AIRTIGHT WATER RESISTANT BARRIER, SHEET APPLIED MEMBRANE, VAPOUR OPEN
- ⅜" EXTERIOR SHEATHING
- 2X6 STUD WALL WITH FIBERGLASS BATT CAVITY INSULATION
- VARIABLE VAPOUR BARRIER
- ½" GYPSUM BOARD
- INTERIOR FINISH

LEGEND

WATER BARRIER

NOTES

- EXT.= EXTERIOR
- T3= TIER 3

1 WATER BARRIER CONTINUITY

1/2" = 1'-0"

[redacted]

1301-16 AVENUE NW CALGARY AB, T2M 0L4

Drawing Title

EXT. MINERAL WOOL T3 WALL

Project Number	2024-009	Project Name	HIGH PERFORMANCE WALL ASSEMBLY				
Drawn by	PY	Checked by	BH, NM	Date	2025-04-30	Scale	1/2" = 1'- 0"
Project Address	N/A						
Issued For	ALBERTA ECOTRUST FOUNDATION						

1.12

Appendix B:

Wall Assembly Effective Thermal Resistance Calculations

Project Name: **High-Performance Wall Assembly Project**

Project Address:

Assembly Name: **Exterior Mineral Wool Tier 3 Wall Assembly**

Materials in Assembly					RSI, $(m^2*K)/W$	R-Value
Outside Air Film					0.03	0.17
Rainscreen Framing (20mm x 0.0085 RSI/mm)	RSI_F =	0.17	% area of framing =	20	$RSI_{Parallel}$=	
Rainscreen Air Cavity (20mm)	RSI_C =	0.18	% area of cavity =	80	0.18	1.02
Exterior Mineral Wool (51mm)					1.41	8.02
Building Paper					0.00	0.00
OSB Sheathing (9.5mm)					0.0930	0.53
Stud @ 610 (140mm x 0.0085 RSI/mm)	RSI_F =	1.19	% area of framing =	20	$RSI_{Parallel}$=	
Batt Insulation (R22)	RSI_C =	3.87	% area of cavity =	80	2.67	15.15
Vapour Barrier					0.00	0.00
Gypsum (12.7mm)		0.8			0.08	0.45
Interior Air Film		57.6			0.12	0.68
			Calculated RSI_{EFF}=		**4.58**	**26.01**
			9.36 Prescriptive RSI Required =		3.08	17.49
			W/HRV		2.97	16.86

Parallel Path Flow Calculations

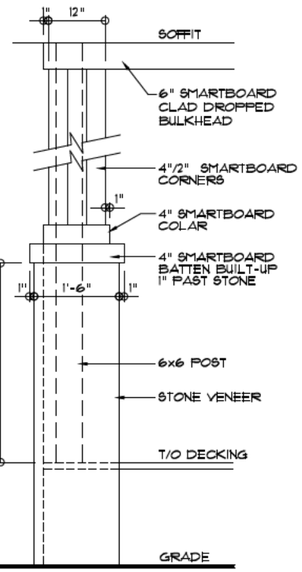
140mm stud with Batt Insulation (R22)

$$RSI_{Parallel} = \frac{100}{\frac{20}{1.19} + \frac{80}{3.87}} = 2.67 \text{ (m2*K)/W}$$

Appendix C:

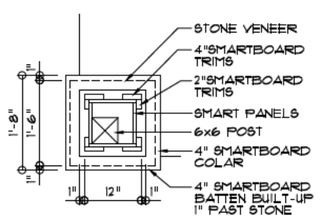
Cost Analysis Model Home

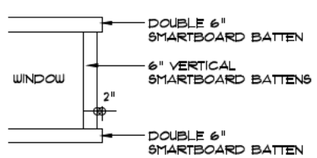
[redacted]



COLUMN DETAIL

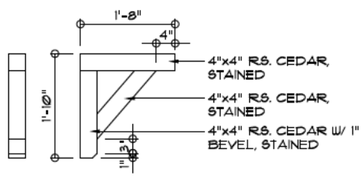
SCALE: 3/8" = 1'-Ø"





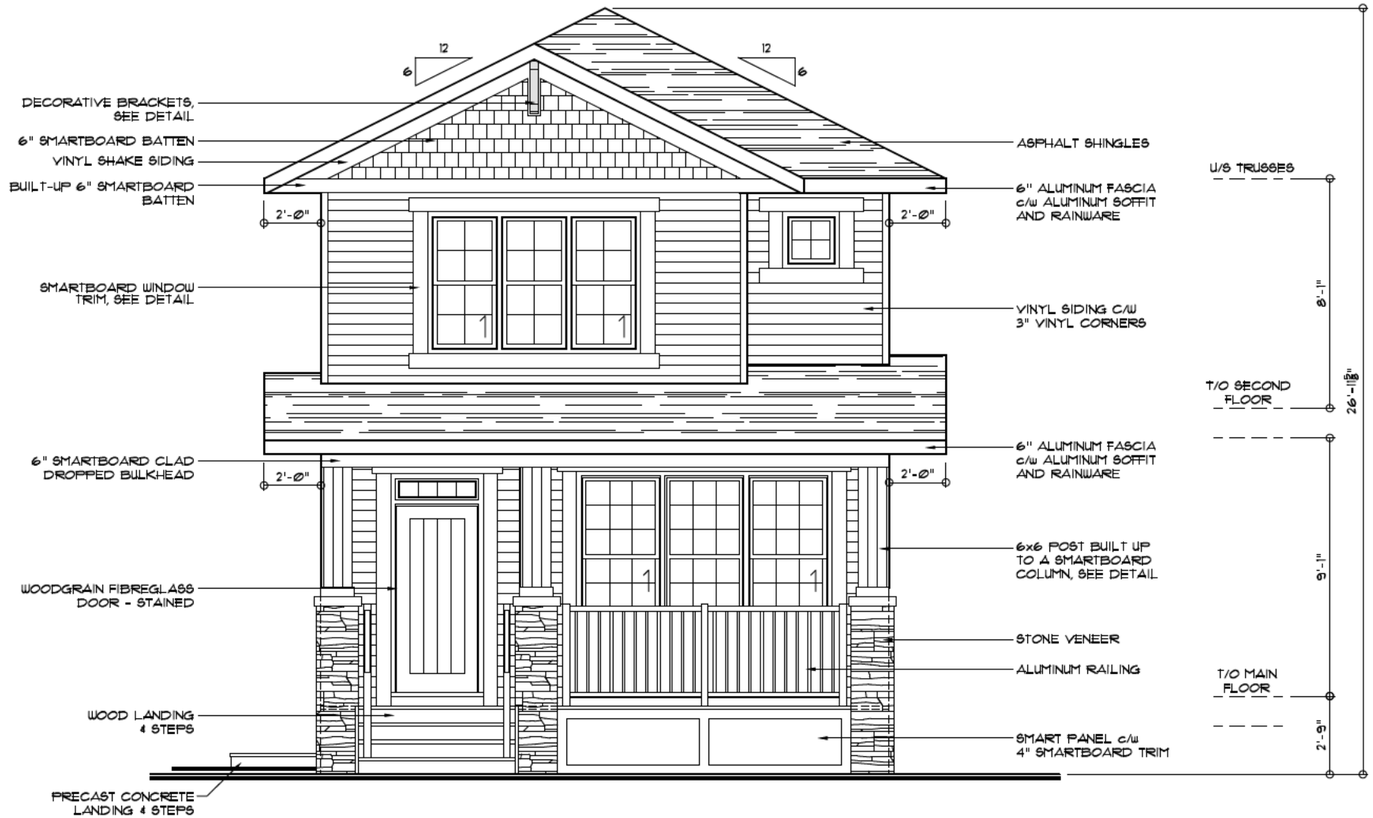
WINDOW TRIM DETAIL

SCALE: 3/16" = 1'-Ø"



BRACKET DETAIL

SCALE: 3/8" = 1'-Ø"



FRONT ELEVATION

SCALE: 3/16" = 1'-Ø"

[redacted]

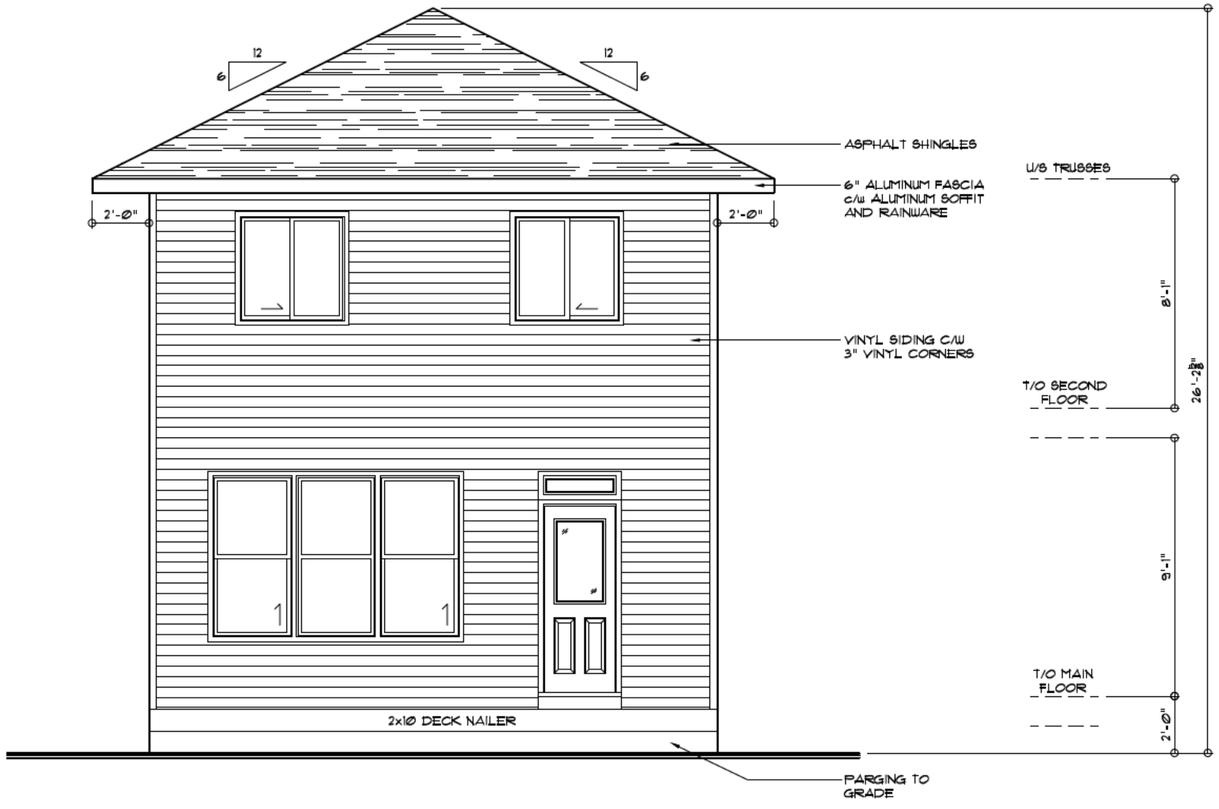
ADDRESS: [redacted]

TOTAL AREA:	1440	sq.ft.
MAIN FLOOR:	700	sq.ft.
UPPER FLOOR:	740	sq.ft.
GARAGE:	N/A	sq.ft.
BSMNT DEV:	N/A	sq.ft.
DECK:	N/A	sq.ft.

REVISIONS:

MODEL: 2 STOREY

ELEVATION: CRAFTSMAN



[redacted]

ADDRESS: [redacted]

TOTAL AREA:	1440	sq.ft.
MAIN FLOOR:	700	sq.ft.
UPPER FLOOR:	740	sq.ft.
GARAGE:	N/A	sq.ft.
BSMNT DEV:	N/A	sq.ft.
DECK:	N/A	sq.ft.

REVISIONS:

MODEL: 2 STOREY

ELEVATION: CRAFTSMAN

UNPROTECTED OPENINGS

LIMITING DISTANCE:	3.08 m
ALLOWABLE OPENINGS:	9.00 %
EXPOSED BUILDING FACE:	743.33 sq.ft.
UNPROTECTED OPENINGS:	46.84 sq.ft.
ACTUAL OPENINGS:	6.30%

[redacted]

ADDRESS: [redacted]

TOTAL AREA:	1440	sq.ft.
MAIN FLOOR:	700	sq.ft.
UPPER FLOOR:	740	sq.ft.
GARAGE:	N/A	sq.ft.
BSMNT DEV:	N/A	sq.ft.
DECK:	N/A	sq.ft.

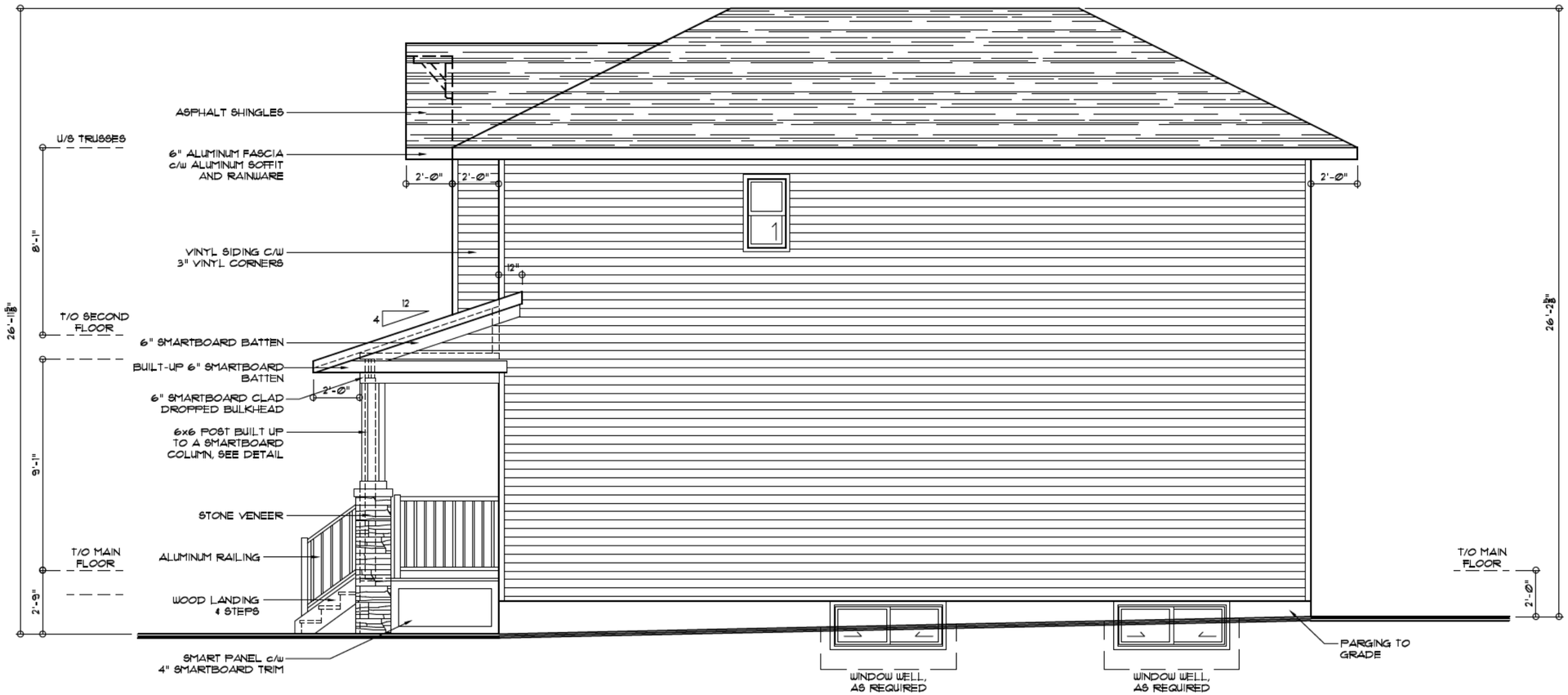
REVISIONS:

MODEL: 2 STOREY

ELEVATION: CRAFTSMAN

UNPROTECTED OPENINGS

LIMITING DISTANCE:	1.22 m
ALLOWABLE OPENINGS:	7.00 %
EXPOSED BUILDING FACE:	739.05 sq.ft.
UNPROTECTED OPENINGS:	27.50 sq.ft.
ACTUAL OPENINGS:	3.72%



RIGHT ELEVATION

SCALE: 3/16" = 1'-0"

[redacted]

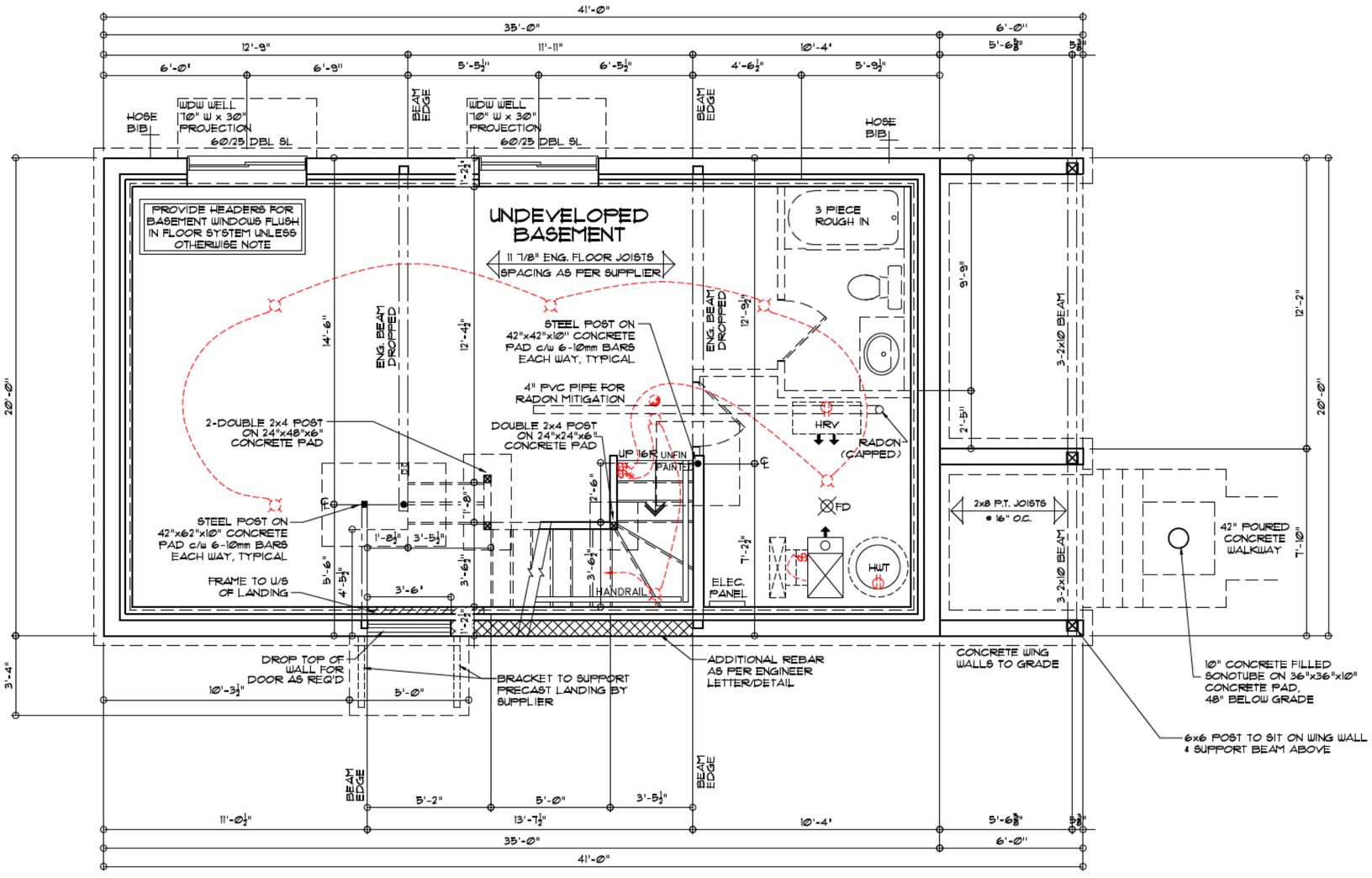
ADDRESS: [redacted]

TOTAL AREA:	1440	sq.ft.
MAIN FLOOR:	700	sq.ft.
UPPER FLOOR:	740	sq.ft.
GARAGE:	N/A	sq.ft.
BSMNT DEV:	N/A	sq.ft.
DECK:	N/A	sq.ft.

REVISIONS:

MODEL: 2 STOREY

ELEVATION: CRAFTSMAN



FOUNDATION PLAN

SCALE: 3/16" = 1'-0"

STANDARD WALL SCONCE HEIGHT AT LANDING OR RISERS: 6'-8"

[redacted]

ADDRESS: [redacted]

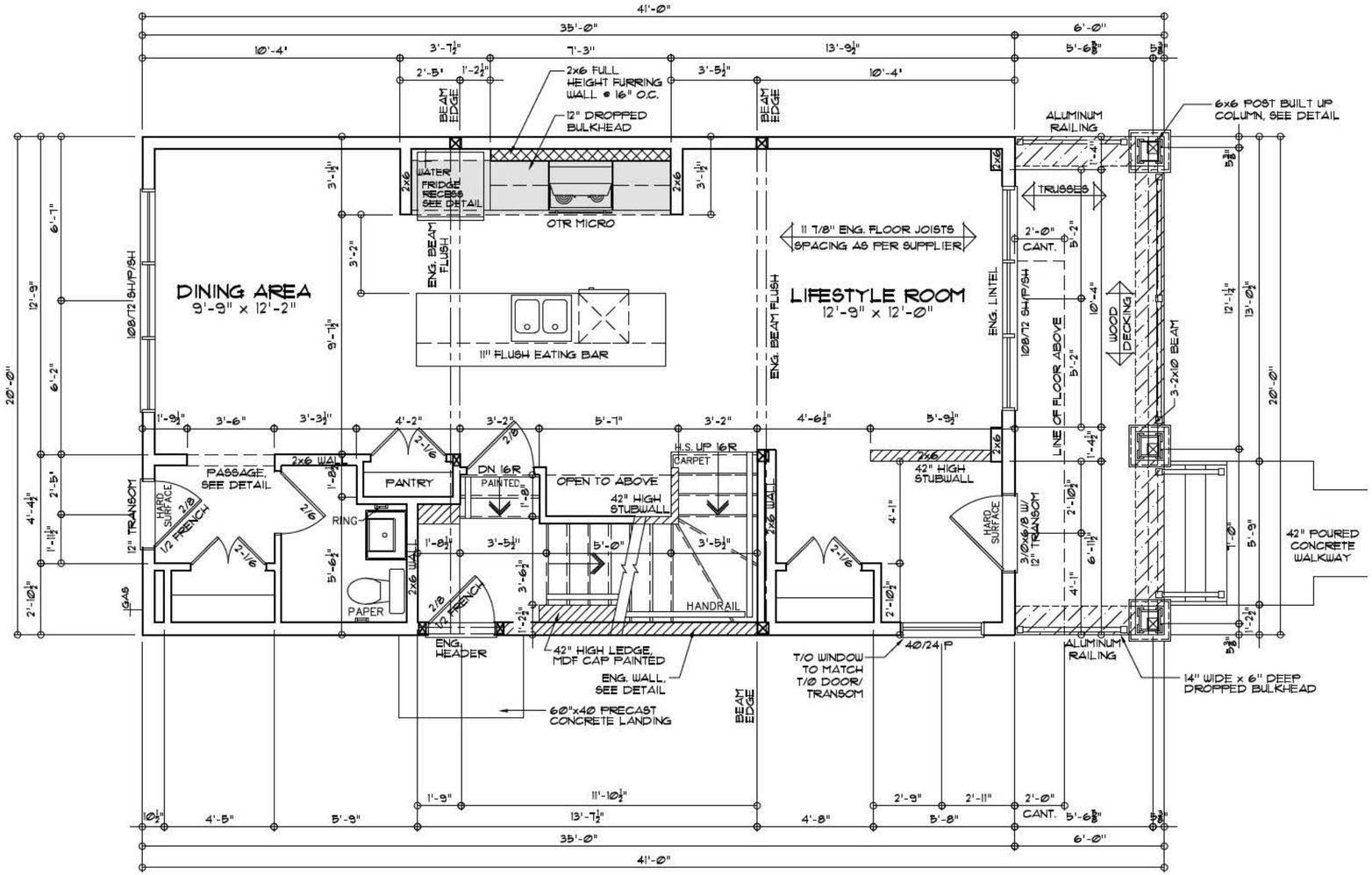
TOTAL AREA:	1440	sq.ft.
MAIN FLOOR:	700	sq.ft.
UPPER FLOOR:	740	sq.ft.
GARAGE:	N/A	sq.ft.
BSMNT DEV:	N/A	sq.ft.
DECK:	N/A	sq.ft.

REVISIONS:

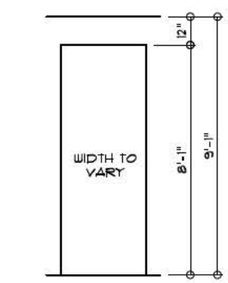
MODEL: 2 STOREY

ELEVATION: CRAFTSMAN

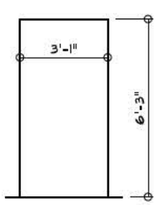
NOTE:
MAIN FLOOR WINDOWS
TO BE 7'-11" HIGH UNLESS
OTHERWISE NOTED



MAIN FLOOR PLAN
SCALE: 3/16" = 1'-0"



PASSAGE DETAIL
MAIN
SCALE: 3/16" = 1'-0"



NOTE:
DIMENSIONS ARE
TO FINISHED MATERIAL

FRIDGE
RECESS DETAIL
SCALE: 3/16" = 1'-0"

[redacted]

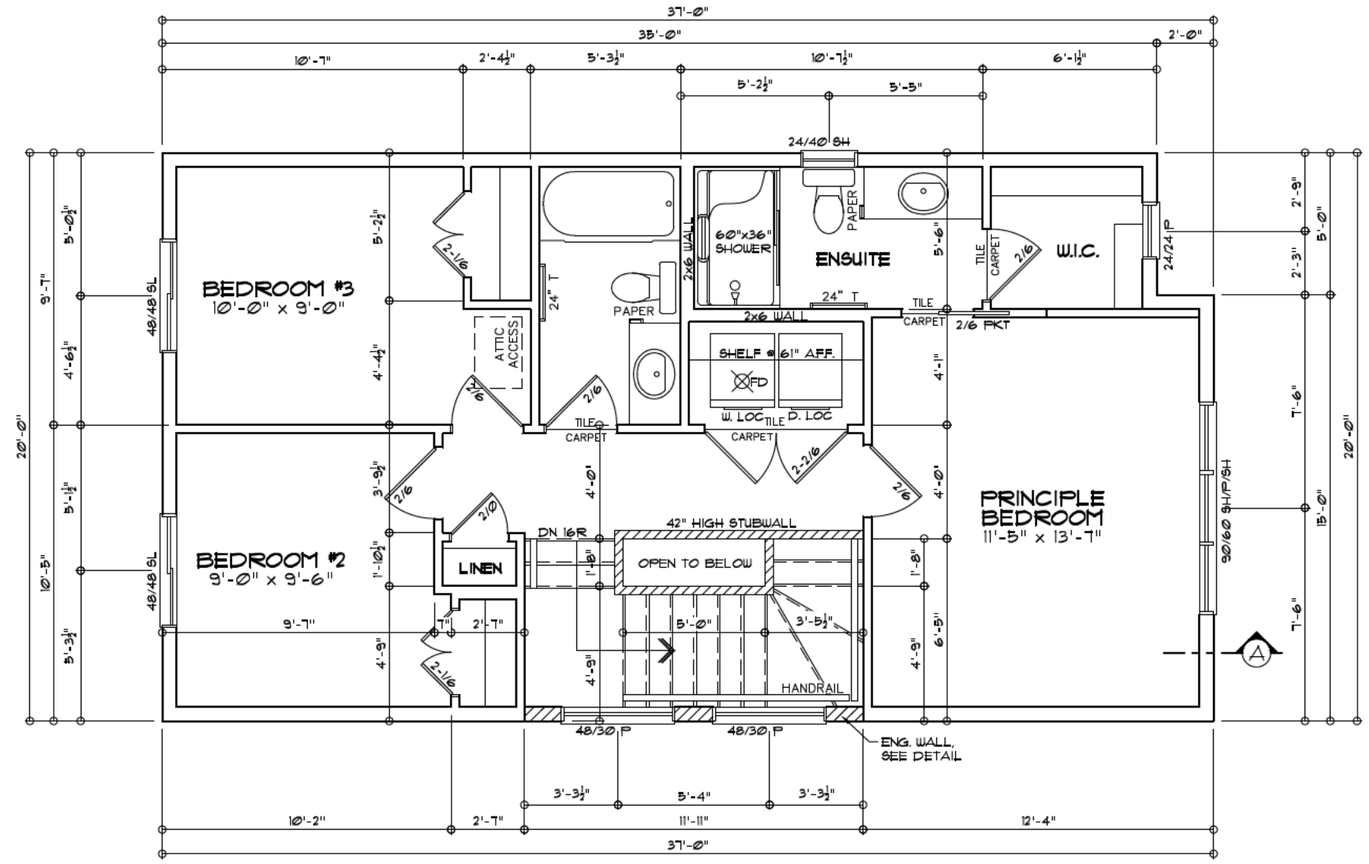
ADDRESS: [redacted]

TOTAL AREA:	1440	sq.ft.
MAIN FLOOR:	700	sq.ft.
UPPER FLOOR:	740	sq.ft.
GARAGE:	N/A	sq.ft.
BSMNT DEV:	N/A	sq.ft.
DECK:	N/A	sq.ft.

REVISIONS:

MODEL: 2 STOREY
ELEVATION:
CRAFTSMAN

NOTE:
UPPER FLOOR WINDOWS
TO BE 6'-11" HIGH



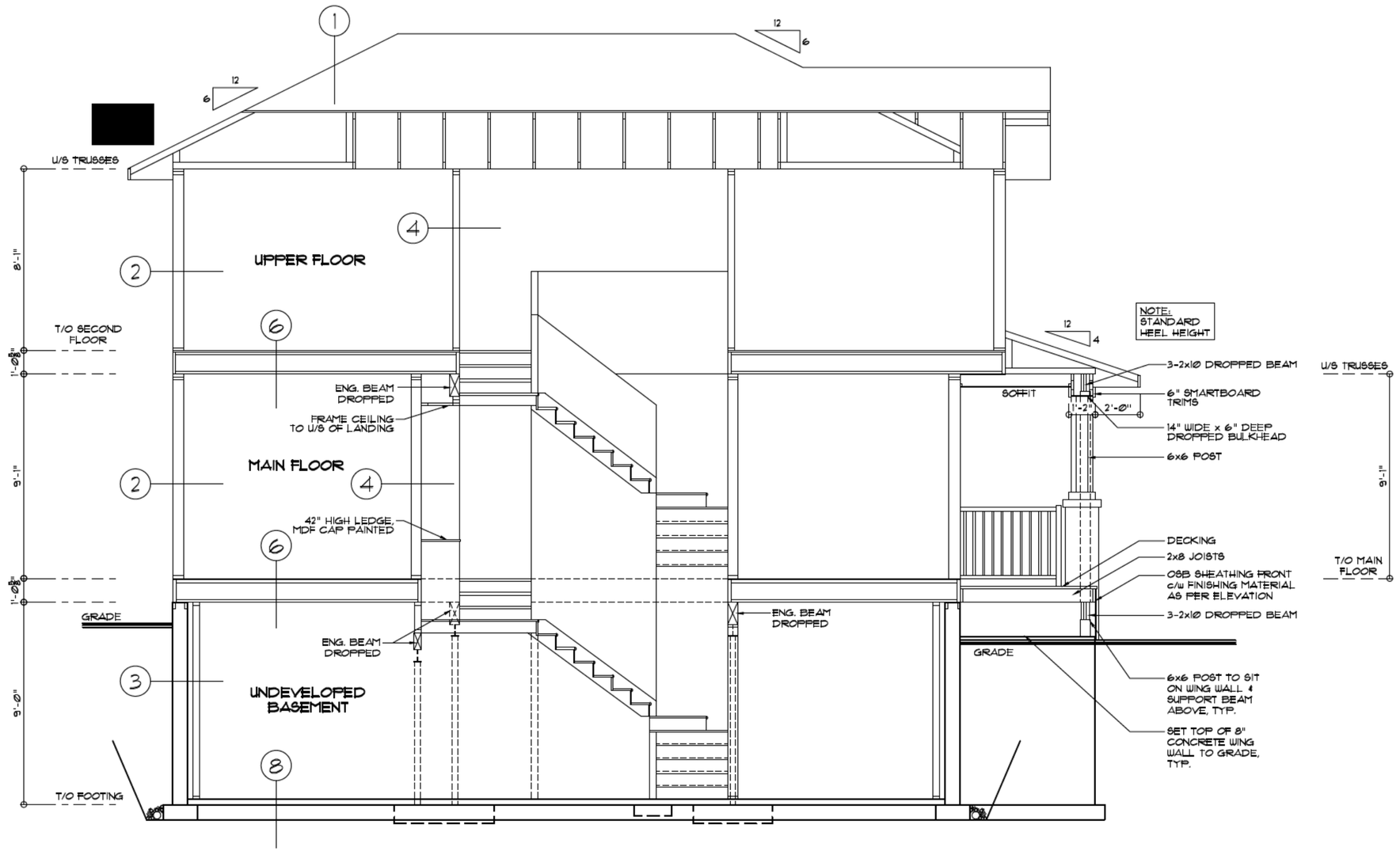
UPPER FLOOR PLAN

SCALE: 3/16" = 1'-0"

[redacted]	ADDRESS: [redacted]		
	TOTAL AREA: 1440 sq.ft. MAIN FLOOR: 700 sq.ft. UPPER FLOOR: 740 sq.ft. GARAGE: N/A sq.ft. BSMNT DEV: N/A sq.ft. DECK: N/A sq.ft.	REVISIONS:	MODEL: 2 STOREY ELEVATION: CRAFTSMAN PAGE 7 OF 10

NOTE:
MAIN FLOOR WINDOWS TO BE 7'-11" HIGH UNLESS OTHERWISE NOTED

UPPER FLOOR WINDOWS TO BE 6'-11" HIGH UNLESS OTHERWISE NOTED



CROSS SECTION A

SCALE: 3/16" = 1'-0"

GENERAL NOTES

-ALL CONSTRUCTION TO CONFORM TO CURRENT A.B.C., FIRE CODES AND 9.36 PERFORMANCE ENERGY MODEL DETAILS
-SPECIFICATIONS, CHANGE REQUESTS SHALL OVERRIDE PLANS
-FINAL GRADING AND SITE CONDITIONS MAY VARY EXTERIOR APPEARANCE
-SECTION NOTES ARE GENERAL AND MAY VARY OR NOT APPLY TO ALL PLANS
-ALUMINUM FASCIA AND EAVESTROUGH AS NOTED
-ALUMINUM VENTED SOFFIT ON FRONT AND REAR ELEVATIONS ONLY.
-NON-VENTED ALUMINUM SOFFIT ON SIDE ELEVATIONS
-TRUSS MANUFACTURER TO VERIFY ALL ROOF SLOPES AND TRUSS DESIGN PRIOR TO FABRICATION

LINTEL NOTES:
-ALL EXTERIOR LINTELS TO BE 2-2x10 SPF UNLESS NOTED
-ALL LINTELS OVER 6'-0" MUST HAVE A DOUBLE CRIPPLE
-INSULATE & DRYWALL WALLS WITHIN 4'0" OF FURNACE & HWT
-INSULATE & DRYWALL WALLS ADJACENT TO STAIRS AND LANDING
-INSULATE AND DRYWALL WALLS AT BASEMENT LAUNDRY WHEN APPLICABLE
-ANY DISCREPANCIES TO BE REPORTED TO THE DESIGNER PRIOR TO CONSTRUCTION

[redacted]

ADDRESS: [redacted]

TOTAL AREA:	1440 sq.ft.
MAIN FLOOR:	700 sq.ft.
UPPER FLOOR:	740 sq.ft.
GARAGE:	N/A sq.ft.
BSMNT DEV:	N/A sq.ft.
DECK:	N/A sq.ft.

REVISIONS:

MODEL: 2 STOREY
ELEVATION: CRAFTSMAN

Appendix D:

Wall Assembly Affordability and Constructability Analysis

Cost per sq/ft of Wall Affordability Analysis

Assembly	Cost/sqft of Wall	Notes
Tier 1 2x6	**Baseline Cost**	Assembly built with materials commonly used in current residential construction. These include; • Tyvek WRB. • 6 mil poly vapour barrier.
Exterior Mineral Wool Tier 3	**153%** higher than baseline	Incorporates high-performance building materials at an additional cost. These include; • Siga Majvest WRB (Roughly twice as much per sq/ft coverage of Tyvek). • Siga Majrex vapour barrier (roughly 9x as much per sq/ft coverage of 6 mil poly). • Siga WRB and VB tapes for air sealing. Other Additional Costs: • Exterior mineral wool insulation. • Rainscreen material.
Double Stud Net Zero	**64%** higher than baseline	Incorporates a combination of more commonly used construction materials and high-performance building materials at an additional cost. These include; • Typar WRB (similar in price to Tyvek). • Siga Majrex vapour barrier (roughly 9x as much per sq/ft coverage of 6 mil poly). • Siga VB tapes for air sealing. Other Additional Costs: • Framing of 2 walls. • Additional insulation to fill wall cavity.
Exterior Foam Net Zero	**465%** higher than baseline	Incorpotates high-performance building materials at an additional cost. These include; • Soprema Sopraseal Stick WRB (Roughly 11x as much per sq/ft coverage of Tyvek). •Soprema sill flashing. Other Additional Costs: • Exterior XPS insulation. • Rainscreen material. • Fasteners for screwing through a large amount of insulation.
Fire Resistant Retrofit	**206%** higher than baseline	Incorporates high-performance building materials at an additional cost. These include; • ProClima Mento WRB (Roughly 3x as much per sq/ft coverage of Tyvek. • ProClima tapes for air sealing. Other Additional Costs: • Exterior mineral wool insulation. • Rainscreen material. • Thermal Clips.
Larsen Truss Retrofit	**165%** higher than baseline	Incorporates common building materials similar to the baseline home; • Typar WRB (similar cost as Tyvek). Additional Costs: • Framing material for the Larsen Truss. • Rainscreen material. • WRB tape for air sealing. • Insulation for Larsen Truss cavity. • Soprema liquid applied membrane for window bucks and air sealing.

• No monetary value has been noted as there are many variables that could impact the comparability of these costs.
• This chart is a direct comparison of the cost of the material to construct ***ONLY*** *the wall assembly of the model home.*
• This chart only compares the materials selected for each physical mock-up. It cannot be considered a 1 to 1 comparison as different materials selected have different costs, possibly resulting in inflated prices for certain assemblies.

Constructability Analysis

Assembly	Material Availability	Difficulties/Issues	Constructability Rating (1-5)
Tier 1 2x6	• All material used was available at common hardware/construction material supply stores. • Material was all readily available as this is a commonly built assembly across Alberta.	• Accoustical sealant can be messy and inconsistent.	**1** **Baseline** •Easiest to construct.
Exterior Mineral Wool Tier 3	• Framing and cavity insulation materials were readily available at common hardware/material supply stores. • SIGA WRB, VB and tapes was not readily available and needed to be ordered in. This required a small lead time. • Exterior mineral wool insulation was not readily available and needed to be ordered. This required a significant lead time. • Rainscreen framing material and fasteners were readily available at common stores. • Custom made flashing was required. GBTAC made these on site with the use of a Break. If GBTAC did not have this tool, this material would need to be custom ordered.	• WRB was the air control layer, so ensuring continuous membrane behind flashings and penetrations increased the difficulty of installing the WRB. • Ensuring the screws that hold on the rainscreen strapping properly embed in a structural member of the wall. • Ensuring proper flashing installation and detailing around the window. • Custom exterior window trim detail was required. • Order of operations for the framer. WRB membrane was required to transfer into the interior at the roof so as to transfer the air control layer to the underside of the roof ceiling.	**2.5** • Relatively simple to construct. • Exterior insulation is the major change from the baseline that makes it more difficult
Double Stud Net Zero	• All materials used in this assembly were readily available at common hardware/material supply stores aside from the VB. • VB and tapes was not readily available and needed to be ordered in. This required a small lead time.	• Double walls could be heavy and difficult to move around. • Custom window jambs are required to be made to cover the large window rough opening to the interior of the window. • Order of operation for the framer. VB needs to be wrapped under the plates of the walls before the walls are installed. • Proper installation of the 3 layers of insulation in the cavity to ensure there is no settlement.	**2** • Simple Construction . • Not to dissimilar to the baseline with adding a second wall and extra insulation increasing the difficulty.
Exterior Foam Net Zero	• Framing material readily available at common hardware/material supply stores. • WRB was not readily available and needed to be ordered in. This required a small lead time. • XPS and fasteners were readily available at some material supply stores, but had the possibility to need to be ordered in with a small lead time. • Custom flashing needed to be made. This was made onsite with a break, otherwise this would have been needed to be ordered from a supplier.	• WRB was the air control layer, so ensuring continuous membrane behind flashings and penetrations increased the difficulty of installing the WRB. • Ensuring the screws that hold on the rainscreen strapping properly embed in a structural member of the wall. • Ensuring proper flashing installation and detailing around the window. • Custom exterior window trim detail was required. • Installing through flashing in the correct spot at the wall proved difficult. • Peel and stick membrane required at least 2 workers to install as it was difficult to remove the backing without adhering the membrane to itself.	**5** • Most difficult to construct. • Long screws and the amount of exterior insulation made this assembly difficult to construct.
Fire Resistant Retrofit	• ProClima WRB and tapes wer not readily available and needed to be ordered in. This required a small lead time. • Exterior mineral wool insulation was not readily available and needed to be ordered. This required a significant lead time. • Rainscreen framing material and fasteners were readily available at common stores. • Custom made flashing was required. GBTAC made these on site with the use of a Break. If GBTAC did not have this tool, this material would need to be custom ordered. • Soprema thermal clips had to be ordered in with minimal lead time.	• Attaching the rainscreen strapping to the metal thermal clips proved quite difficult at times.	**3** • Somewhat difficult to construct. • If good screws are used that screw into the metal thermal clips well, the construction would be slightly easier.
Larsen Truss Retrofit	• All framing material and the WRB material was readily available at common hardware/material supply stores. • Dense pack cellulose needed to be installed by a professional installer. Lead time for booking the installer was required. • Liquid applied membrane for window bucks was required to be ordered in with a small lead time.	• Installing the liquid applied membrane could not be done at a lower temperature.	**2.5** • Relatively simple to construct. • Amount of labour and correct installation of the Larsen Truss raises the difficulty.

• Constructability values are based on the previous experience of the GTAC Staff and conversations with industry

Exterior Mineral Wool Tier 3 Assembly

SIG


SIGA
Wigluv
Wigluv


SIGA
Wigluv
SIGA

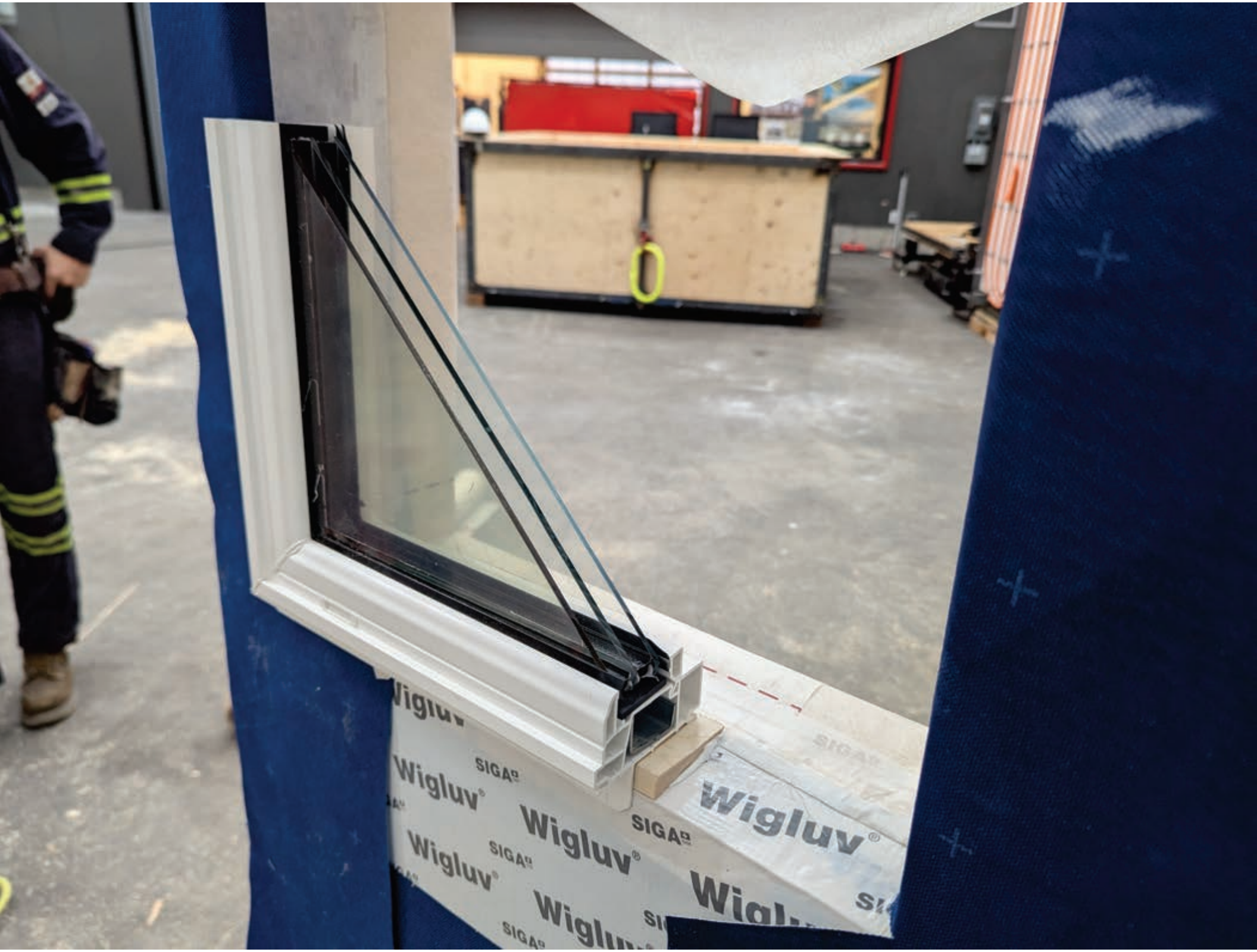

SIGA


MADE IN CANADA
THIS SIDE DOWN
ESTE LADO ABAJO
Wigluv
SIGA


JOHNSTON


THIS SIDE DOWN
ESTE LADO ABAJO
SIGA
Wigluv


THIS SIDE DOWN
ESTE LADO ABAJO
PANELES ESPECIALES
EN LAS ORILLAS
EN LOS LADOS
SIGA
Wigluv


Wigluv
SIGA
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BOSCH
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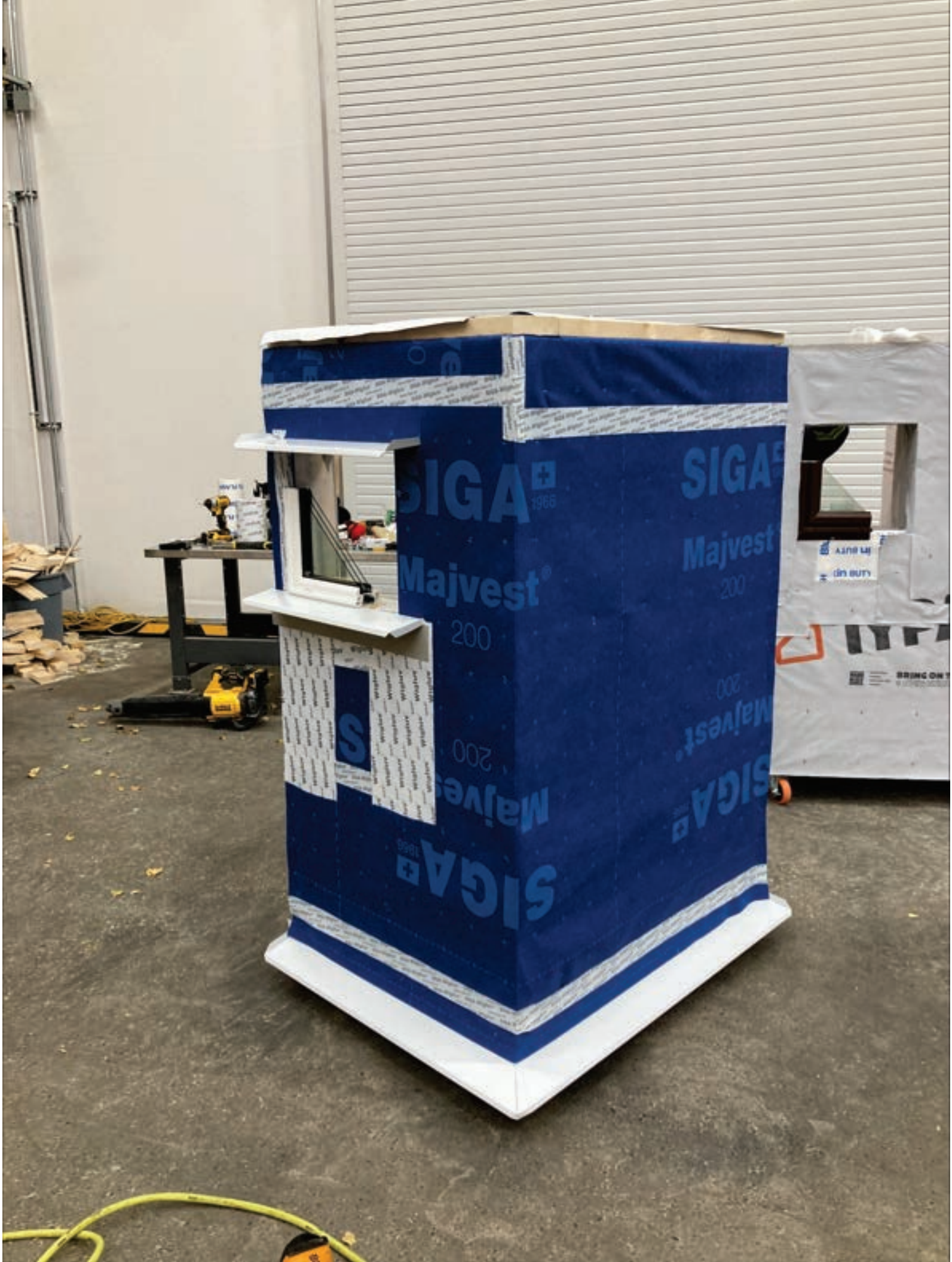
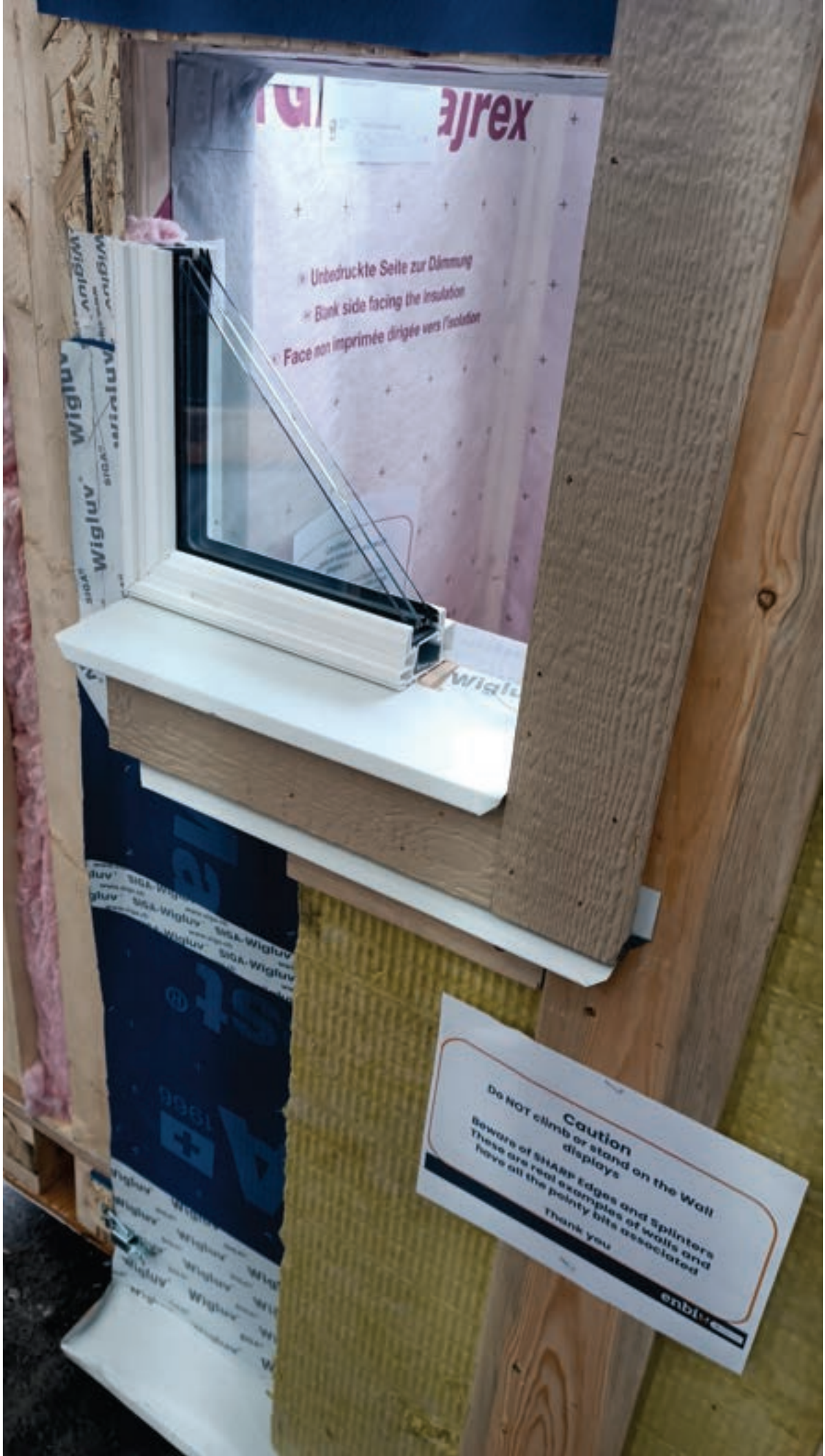

SIGA
1966
Majvest
200


SIGA
Majves
200
Wigluv


SIGA
Majves
200
200
SIGA
1966


ajrex
Unbedruckte Seite zur Dämmung
Blank side facing the insulation
Face non imprimée dirigée vers l'isolation
Wiglu
Caution
Do NOT climb or stand on the Wall displays
Beware of SHARP Edges and Splinters
These are real examples of walls and have all the pointy bits associated
Thank you
enbi


Caution
Do NOT climb or stand on the Wall displays
Thank you
Wigluv
SIGA-Wigluv


High Performance (Tier 3) Wall - Exterior Mineral Fibre Insulation
High Performance (Tier 3) Wall - Exterior Mineral Fibre Insulation
High Performance (Tier 3) Wall - Exterior Mineral Fibre Insulation
SIGA
www.siga.ch


SIGA-Wigluv

Caution
Do NOT climb or stand
displays
Beware of SHARP Edges and Sp
These are real examples of wall
have all the pointy bits associat
Thank you
enbi
200


SIGA
siga.ch