

Sundance Housing Co-op Deep Energy Retrofit



retrofitcanada



Cross Pollination Knowledge
Share:
Zero Carbon Deep Energy
Retrofits



Location: Edmonton, AB

Year Built: 1976

Number of Townhouses: 59

Status of Renovation: 60% Number of Stories: 2

Anticipated Energy Reduction: 70%

Energy Use Intensity (EUI) BEFORE: kbtu/sf

Energy Use Intensity (EUI) AFTER: kbtu/sf
modeled

Roof: Before R-28, After R-76

Walls: Before R-15, After R-40

Windows: Before U-.4, After SHGC- 0.7,
U-0.18, SHGC-0.16,

Target Air Tightness: .75* ACH; CFM50:

Solar: 365 KW, 75% of Total Building Load

Passive House Certified No



Sundance Housing Co-op

Team: Butterwick Projects/ReNu Engineering

Sundance Housing Co-op





Tight jogs



Porches

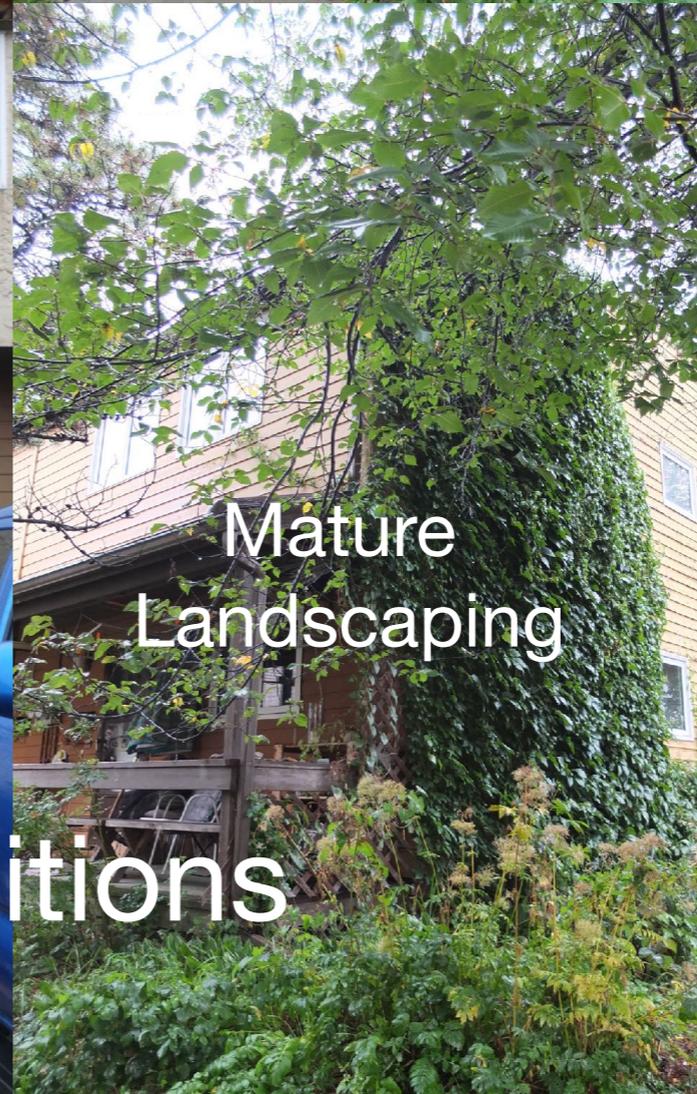
Utility Connections



Openings tight to inside corners

Member built additions

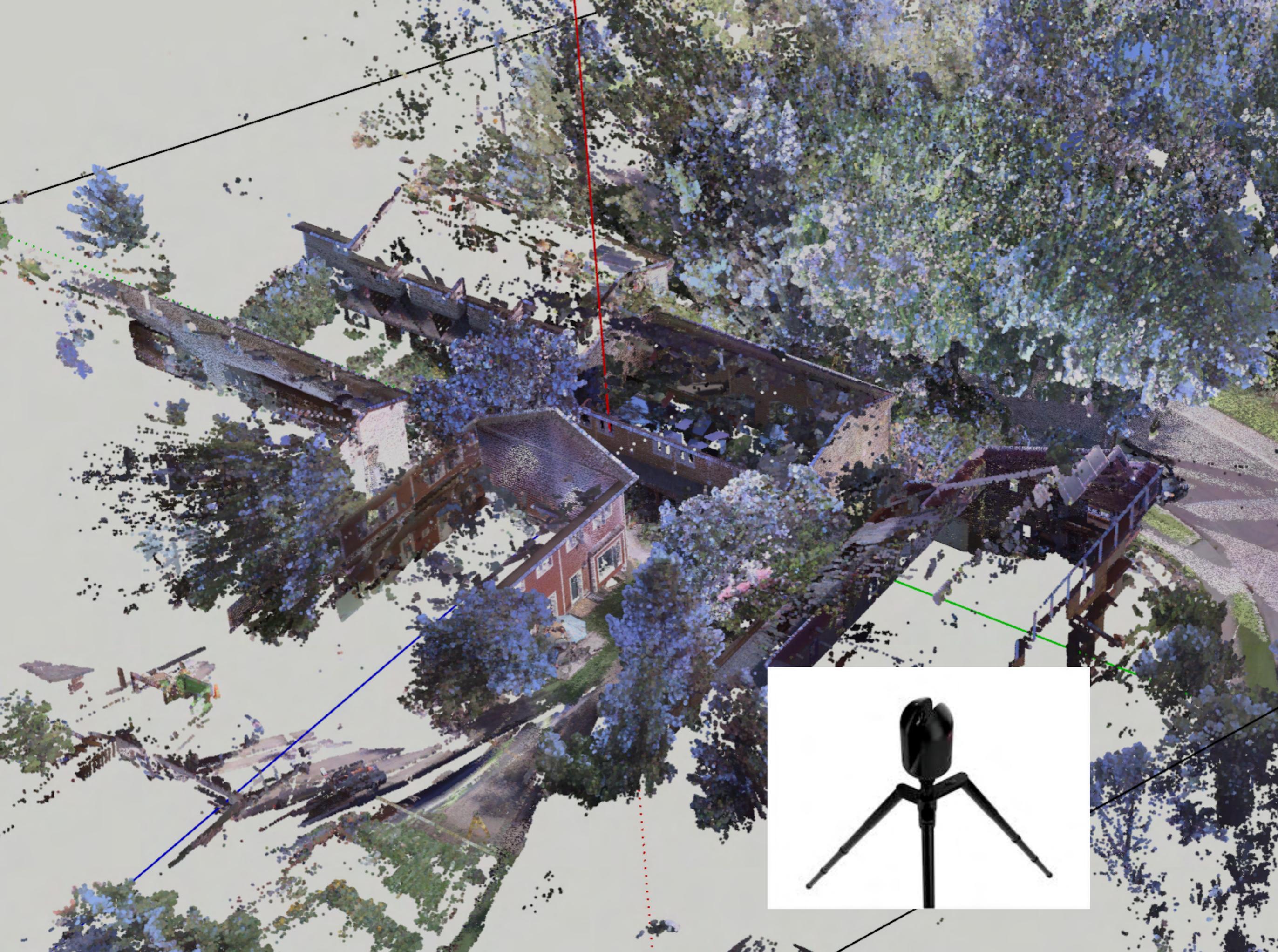
Site Conditions

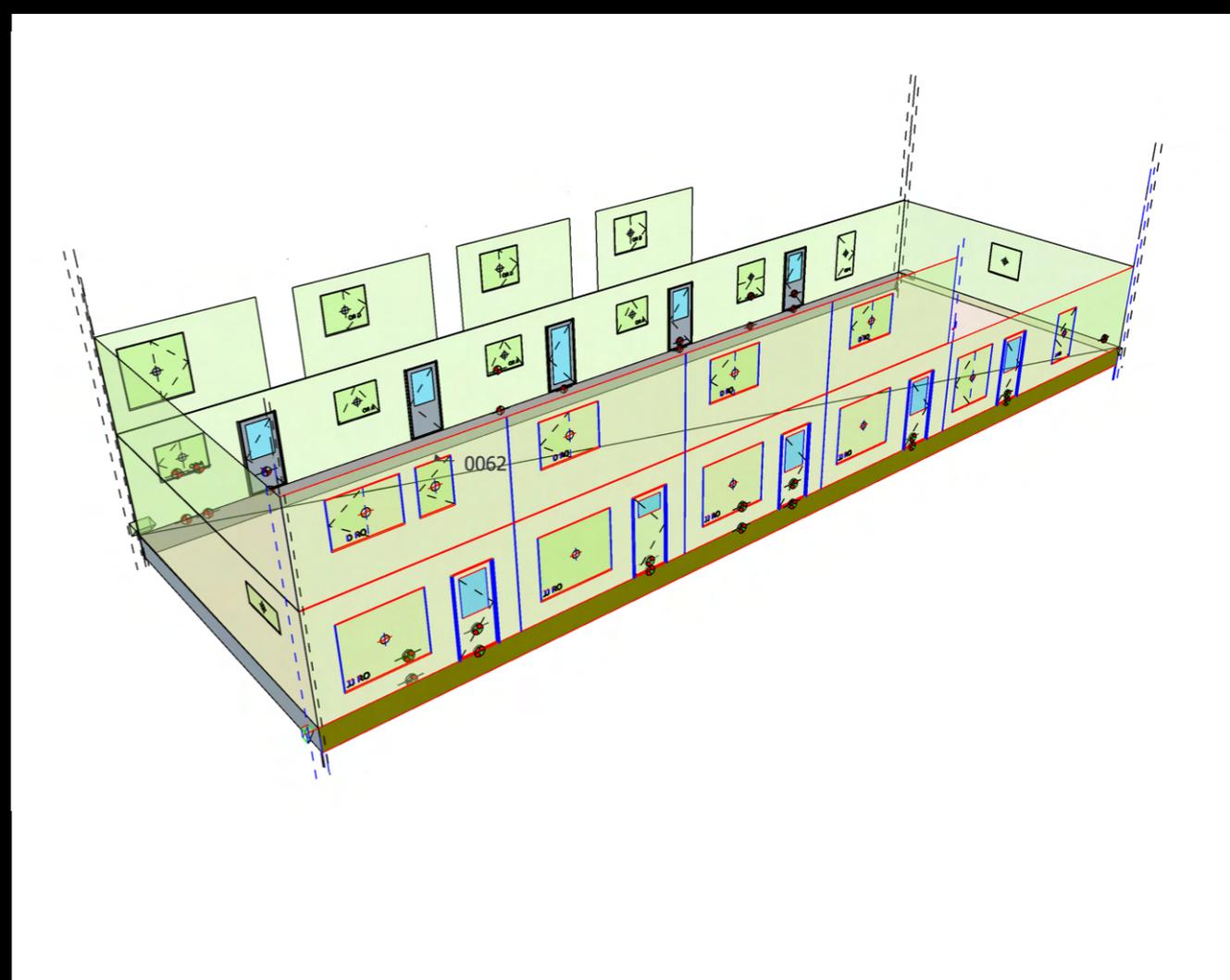
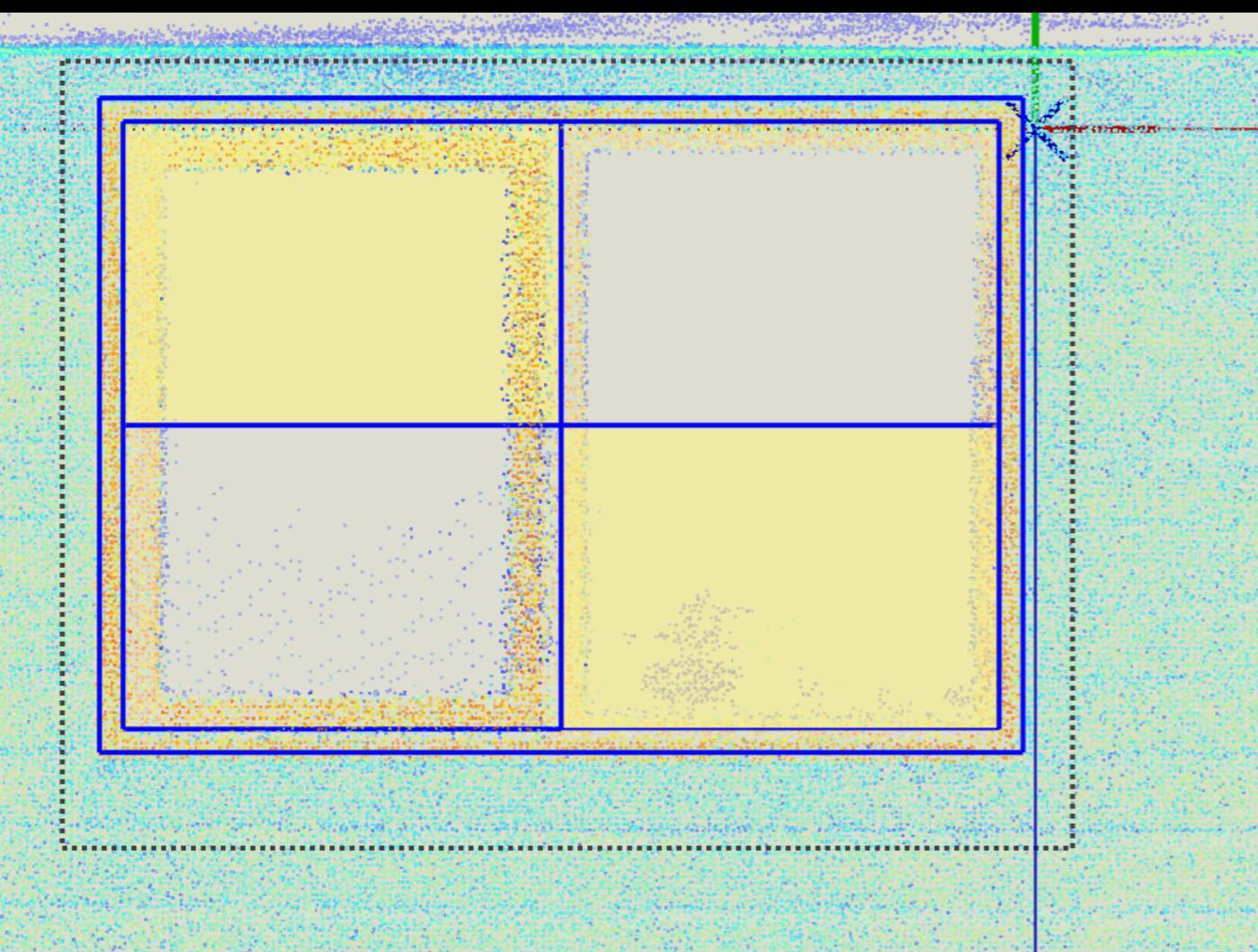
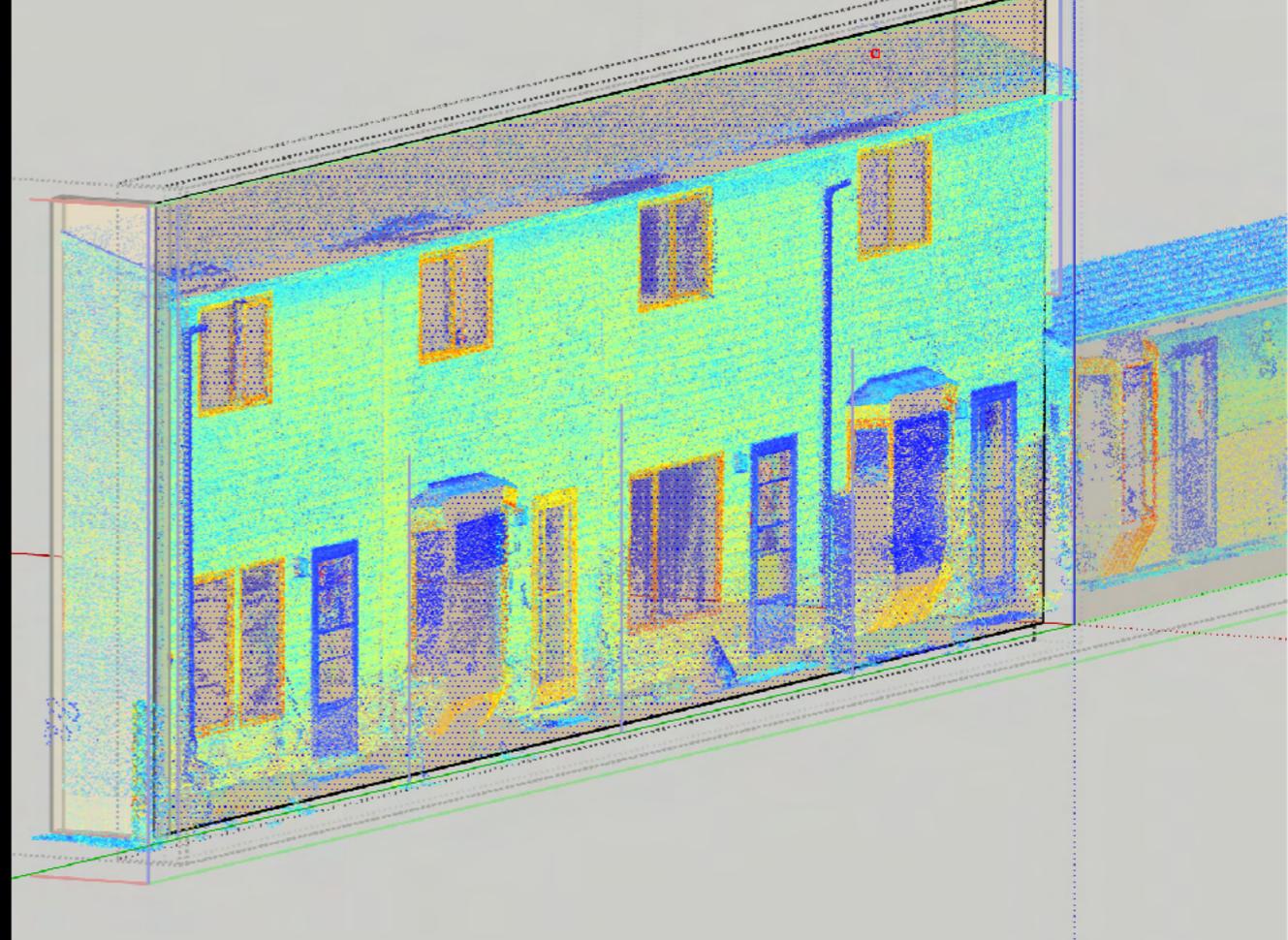
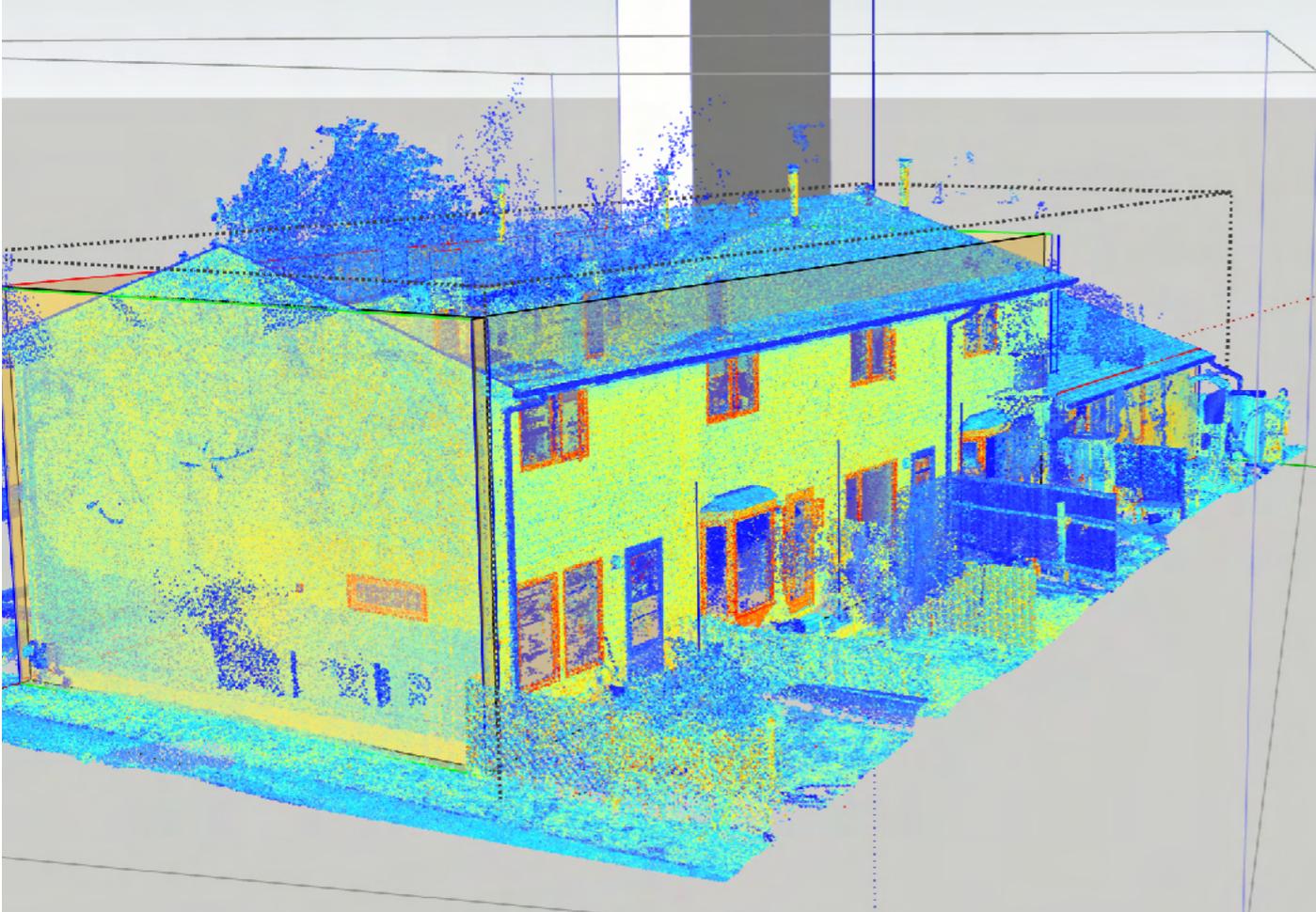


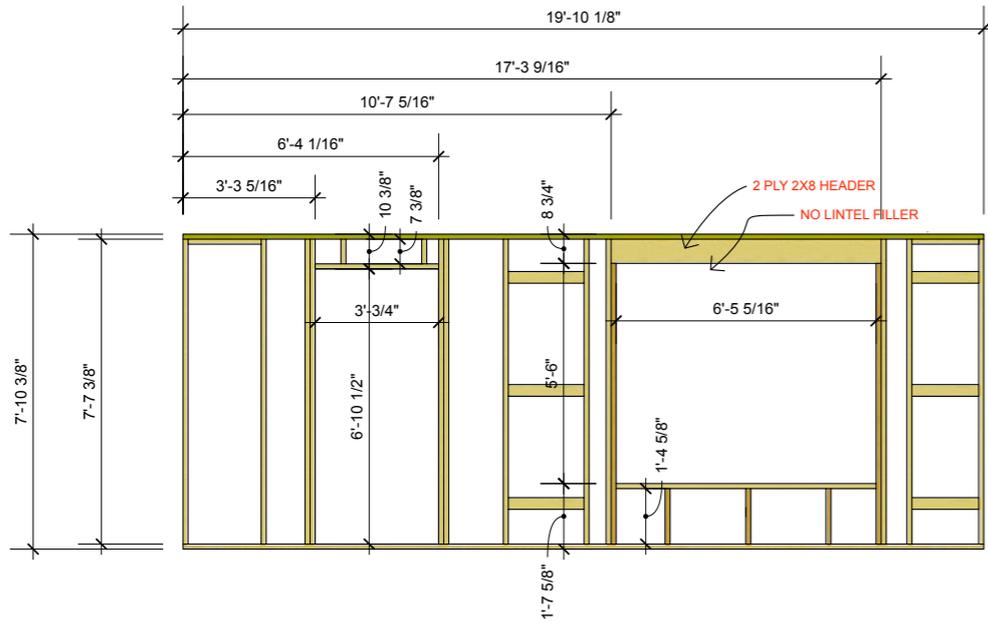
Mature Landscaping



Cantilevers



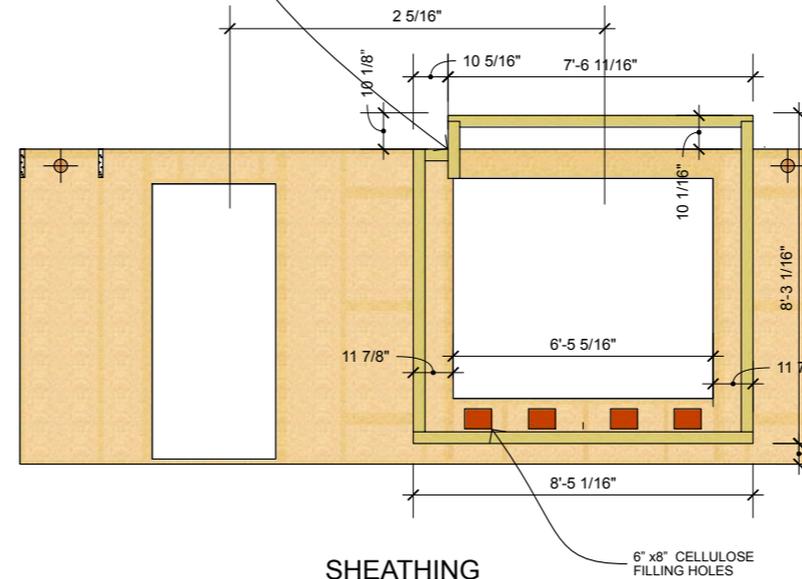




FRAME
Scale: 1/4" = 1'-0"

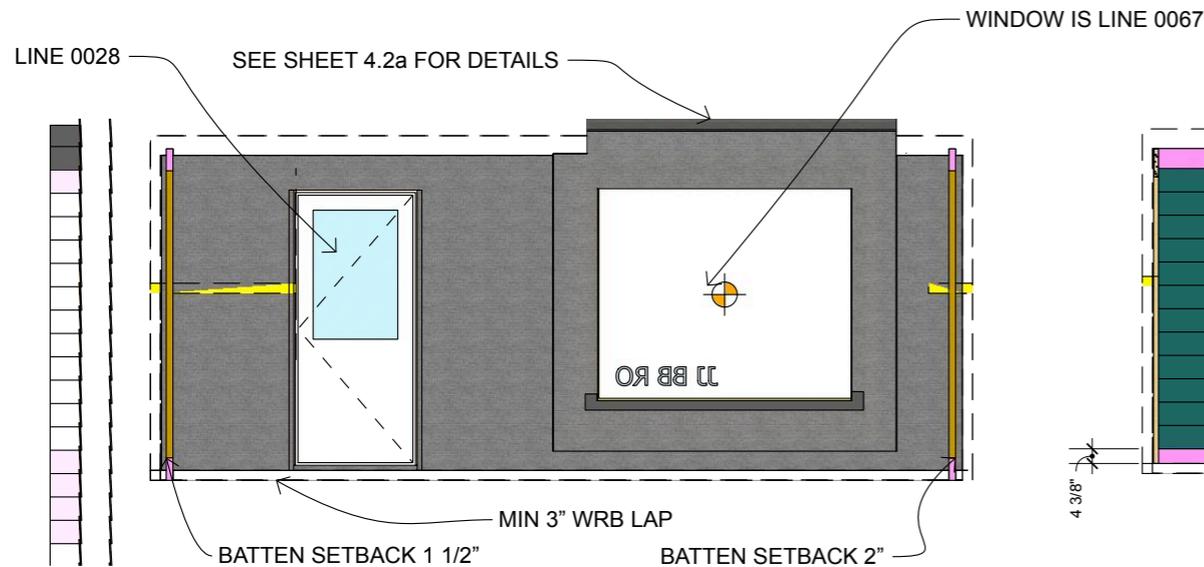
- NOTES:
1. TOP AND BOTTOM PLATES & WINDOW ROs & BUILD OUTS TO BE LSL LUMBER
 2. ALL OTHER FRAMING LUMBER TO BE #1&2 SPF OR EQUIVALENT
 3. STUDS SPACED @ 24" O.C. UNLESS OTHERWISE NOTED

NOTCH TO ACCOMADATE CANTILEVER
SEE ADDITIONAL BOX BAY DETAILS ON 4.3a



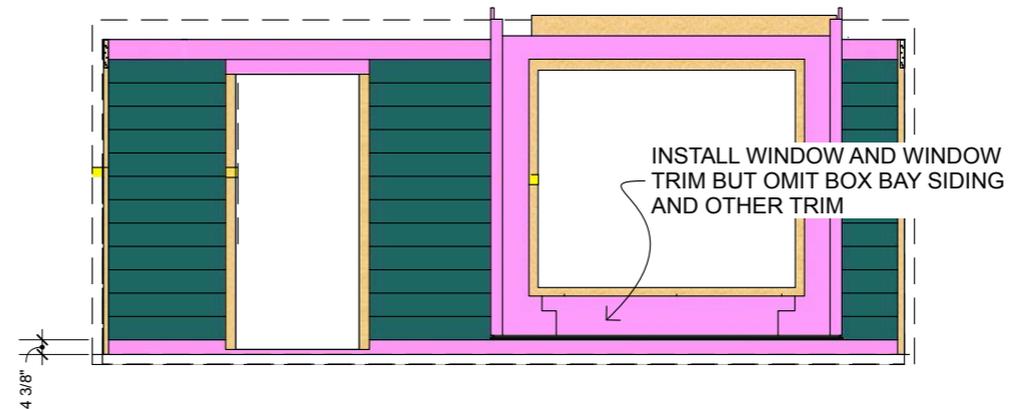
SHEATHING
Scale: 1/4" = 1'-0"

- NOTES:
1. SHEATHING 7/16" OSB OR 1/2" SPRUCE PLYWOOD
 2. FLUSH SHEATHING ON ALL EDGES
 3. HORIZONTAL GAP BETWEEN SHEATHING SHEETS TO BE MIN 3/8" AND CAN BE UP TO 1 1/2"



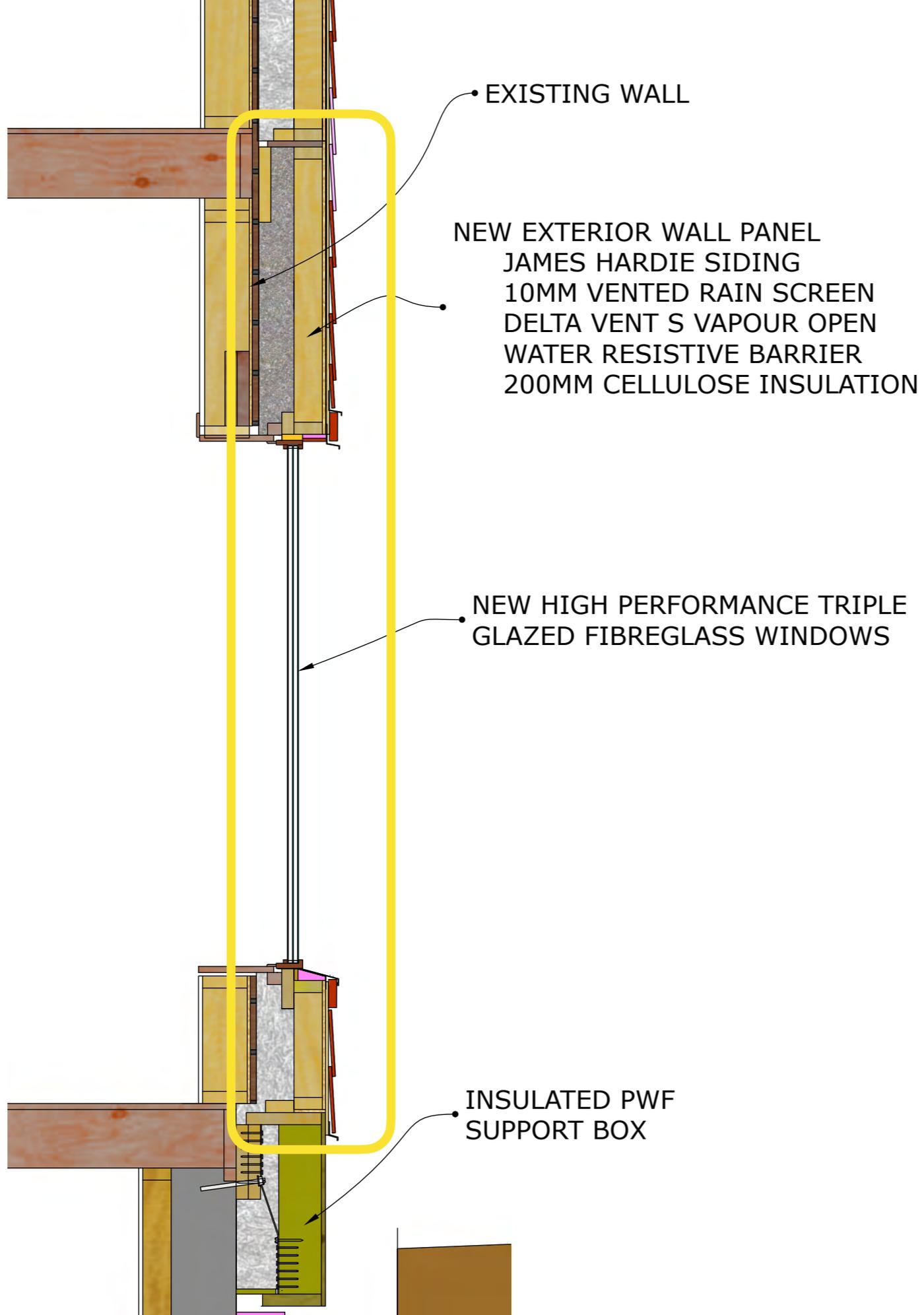
WRB AND RAINSCREEN BATTENS
Scale: 1/4" = 1'-0"

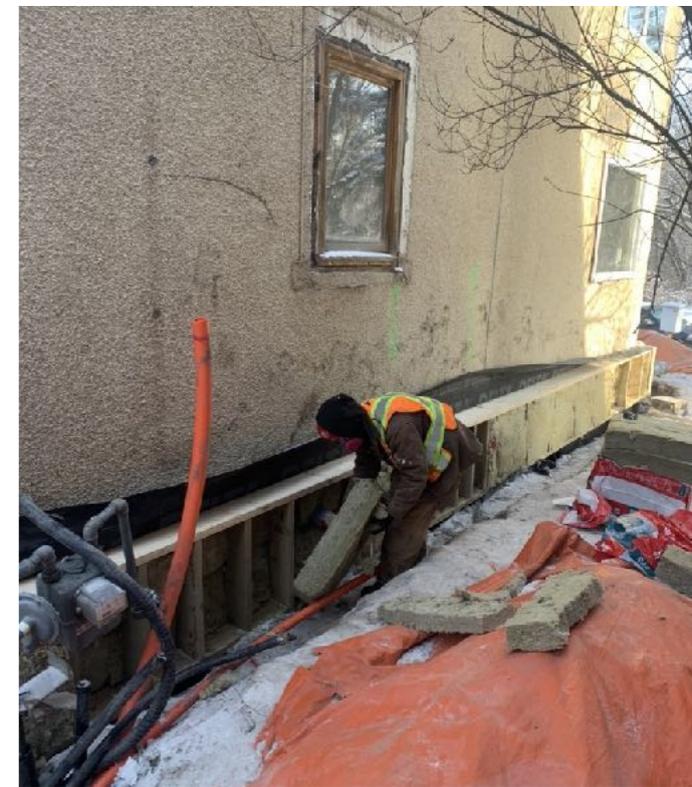
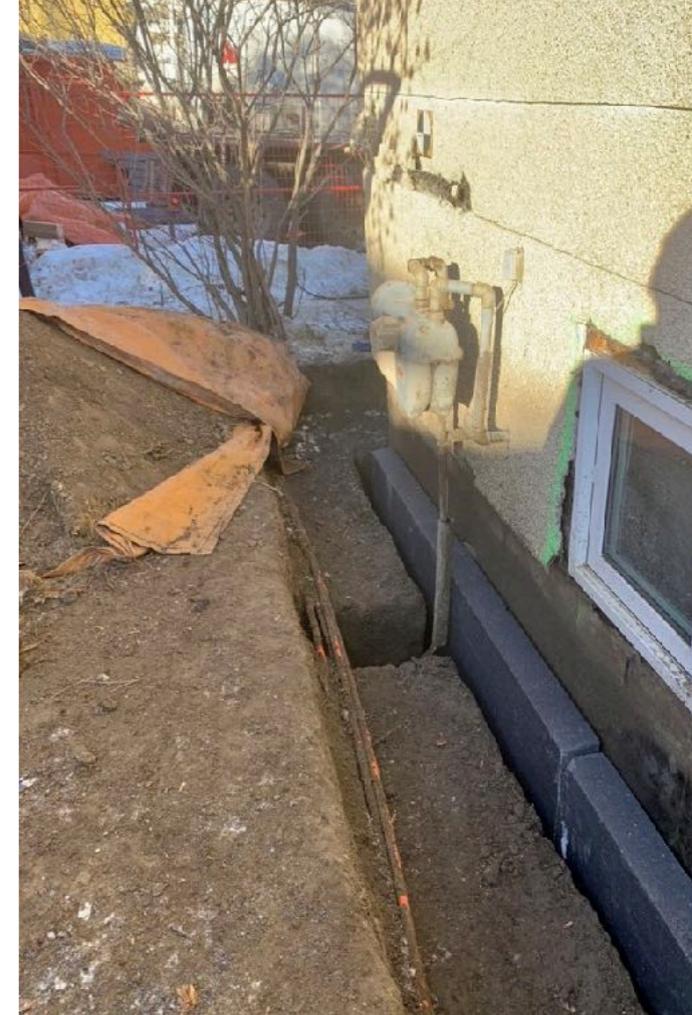
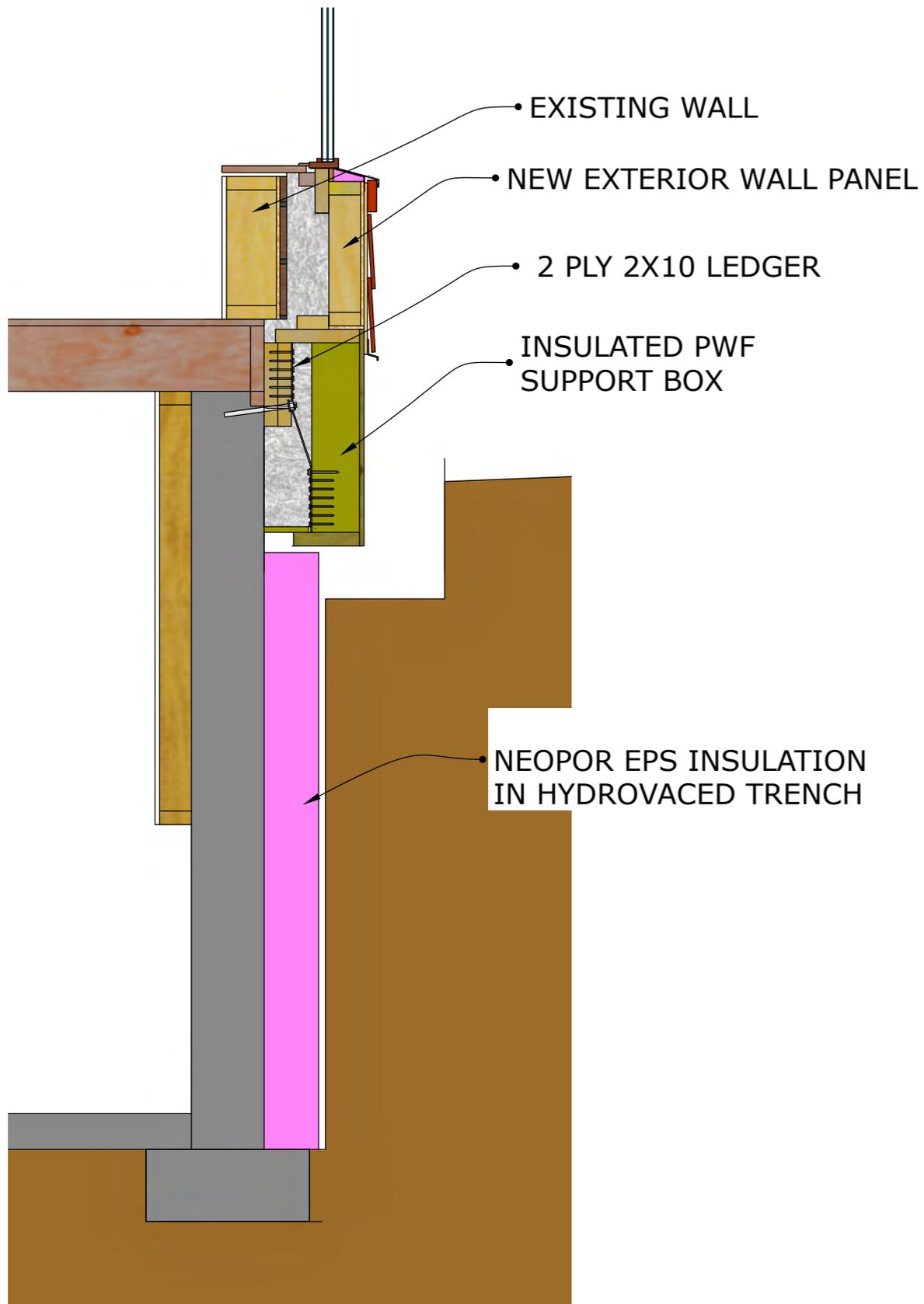
- NOTES:
1. WRB TO BE DELTA VENTS PLUS SEALED PER 1.2 ON DETAIL SET
 2. BATTENS AS REQ'D FOR SIDING. SEE 1.3 ON DETAIL SET
 3. DO NOT INSTALL BATTENS OVER LIFTING HOLES OR BLOWING HOLES
 4. DO NOT CUT WRB AT CELLULOSE FILL HOLES
 5. STAPLE WRB LAP ALLOWANCE TO EXPOSED BATTENS AFTER SIDING



SIDING AND TRIM
Scale: 1/4" = 1'-0"

- NOTES:
1. SIDING TO BE INSTALLED AFTER WINDOW AND DOOR FLASHING AND TRIM (NOT SHOWN) SEE 1.7-1.8 ON DETAIL SET
 2. SIDING TO BE SET BACK AT PANEL EDGES PER DIMENSIONS SHOWN
 3. OMIT SIDING TO MAINTAIN ACCESS TO CELLULOSE BLOWING HOLES. JOINT LOCATIONS PER EFFICIENT MATERIAL USE AND INSTALLER DISCRETION.
 4. MISSING SIDING TO BE FIELD INSTALLED BY BUTTERWICK





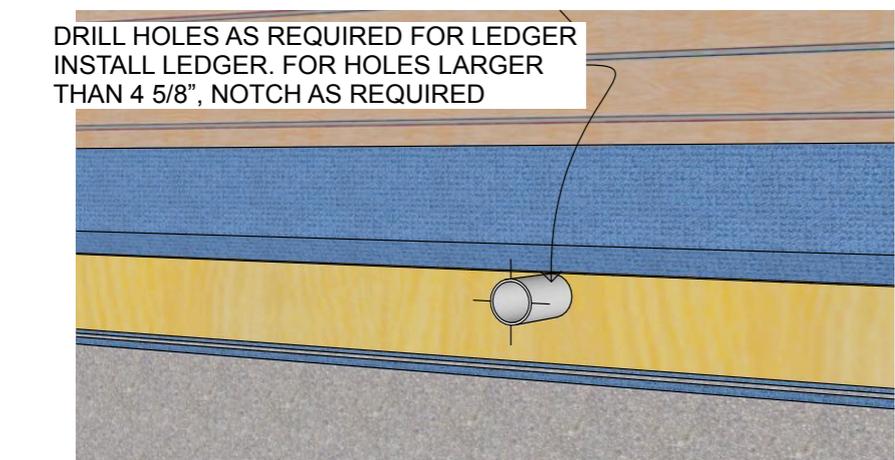
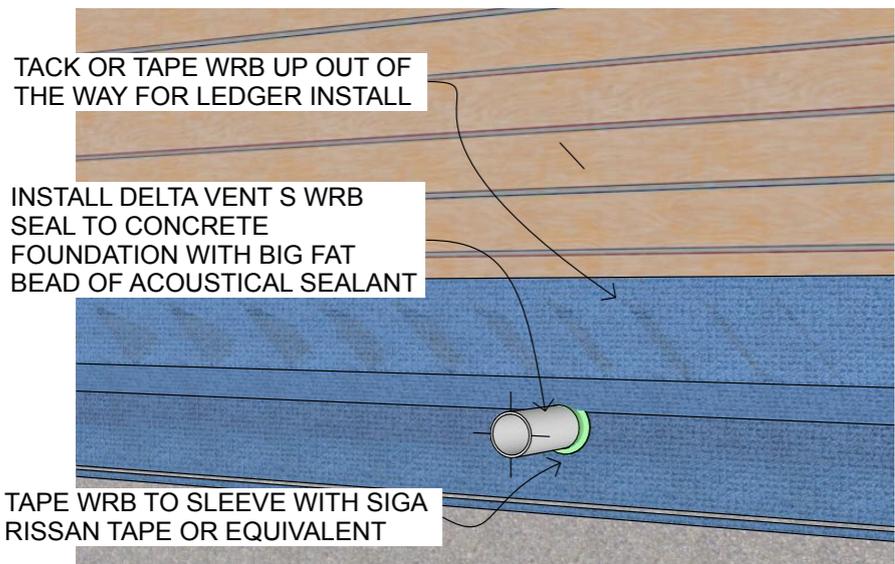
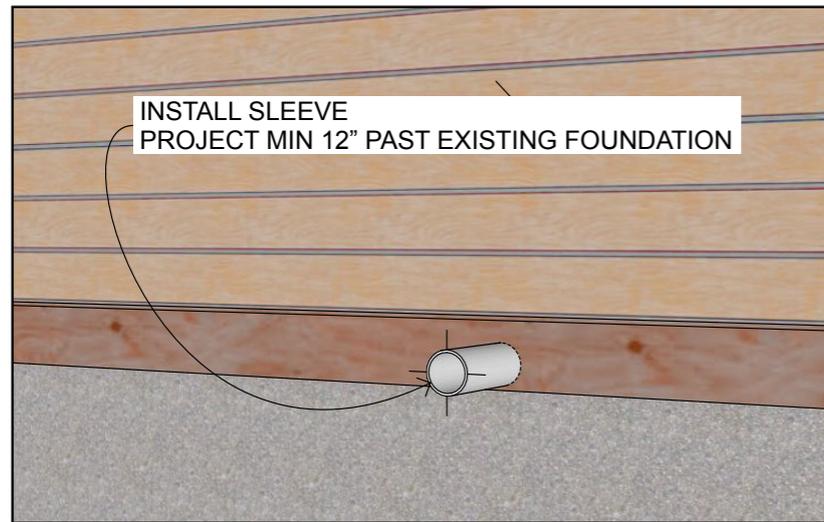
Foundation Insulation and Panel Support



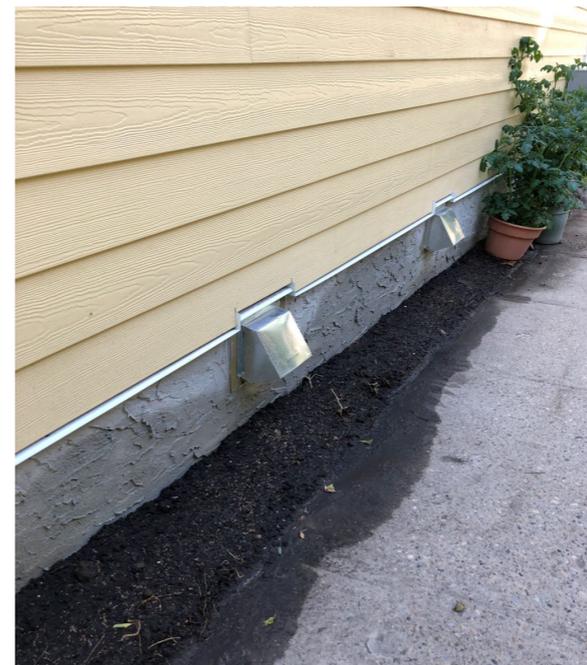
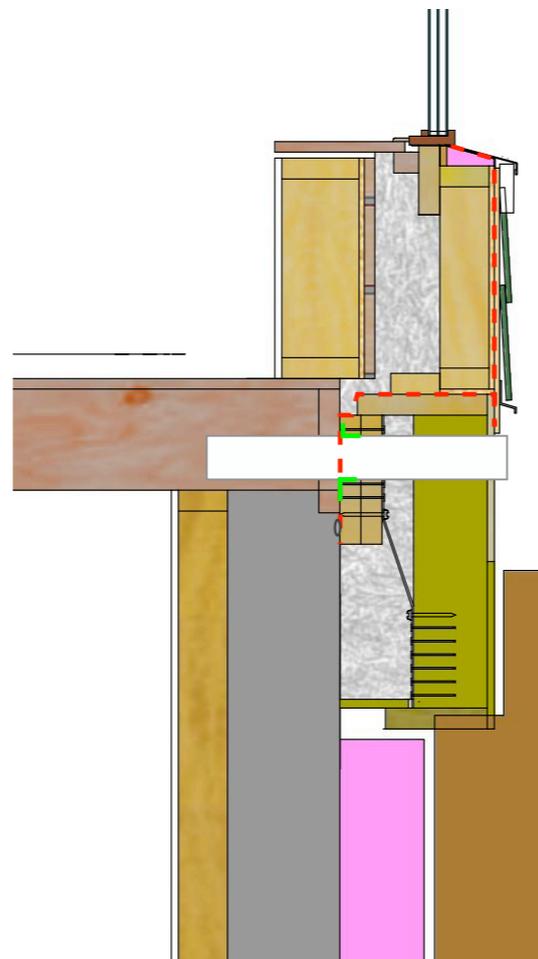
Building Prep



Air sealing around service penetrations



- New HRV vents
- ASHP line sets and power
- Existing dryer vents
- Hose bibs
- Electrical service
- Exterior electrical



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CO-OP DEEP ENERGY
RETROFIT

87 ST & 99 AVE
EDMONTON, AB
T5H4B4

TYPICAL SITE DETAILS

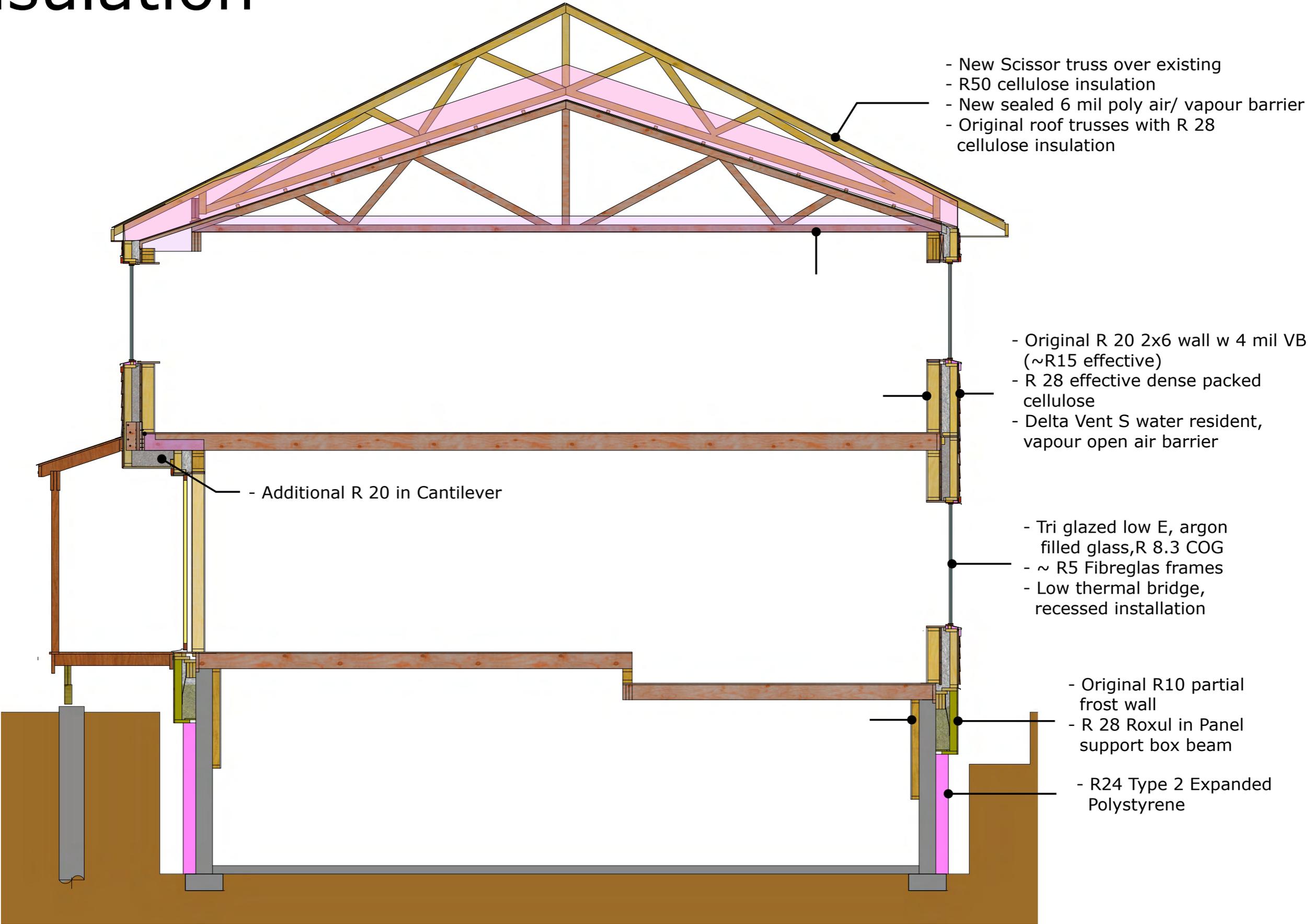
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ISSUED FOR PERMIT
& CONSTRUCTION
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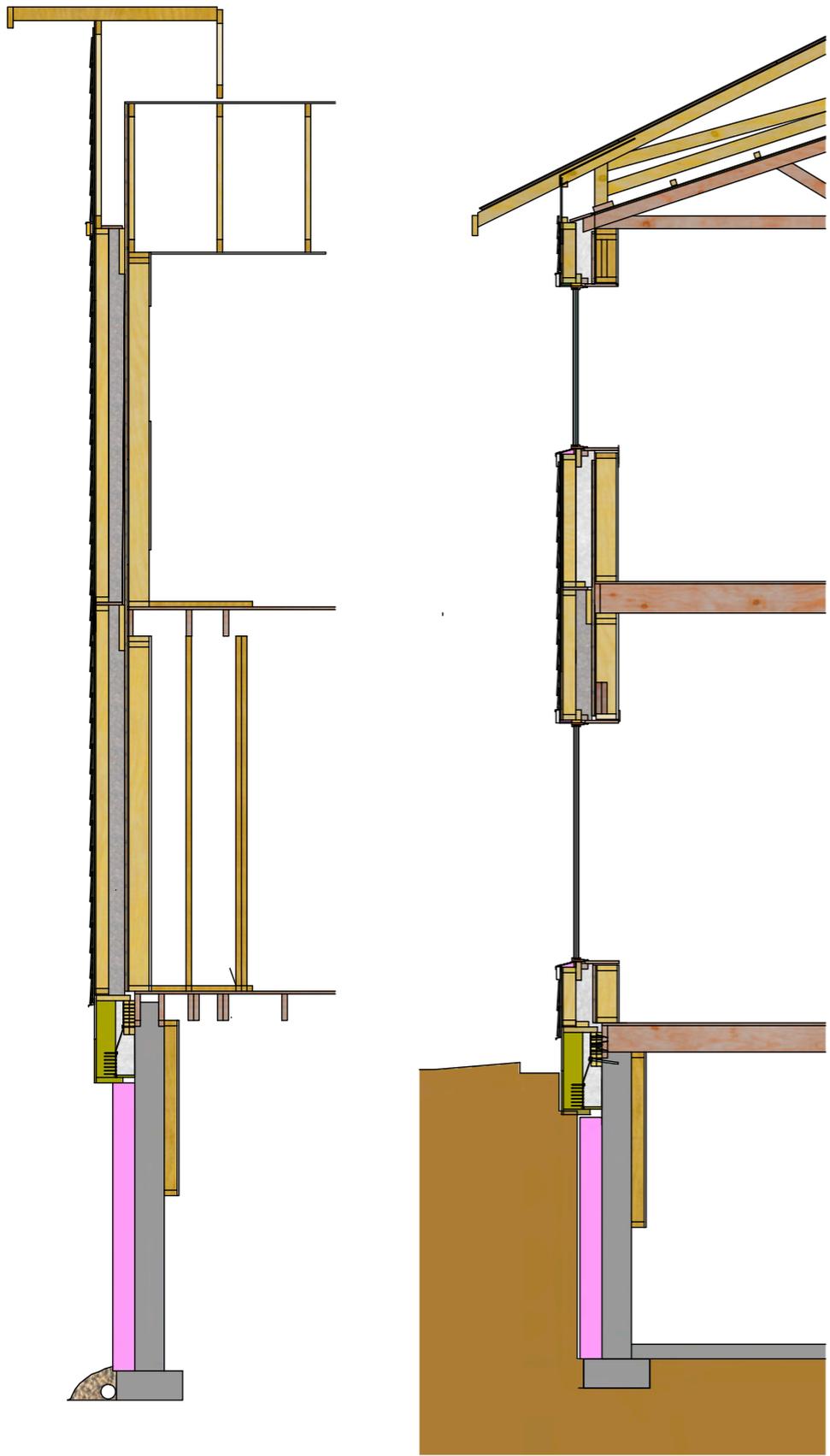
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RIM PENETRATIONS



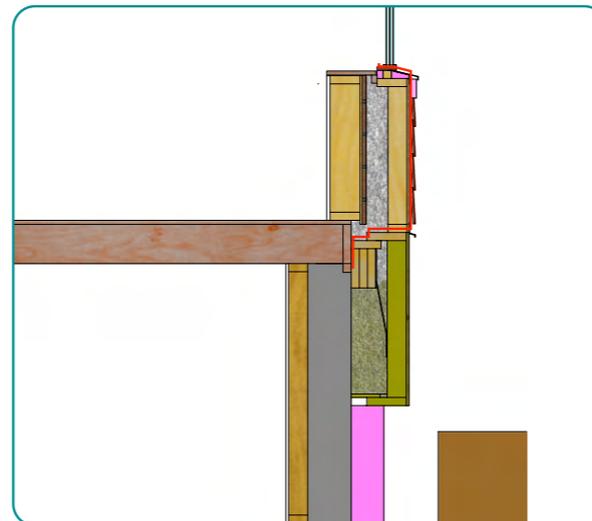
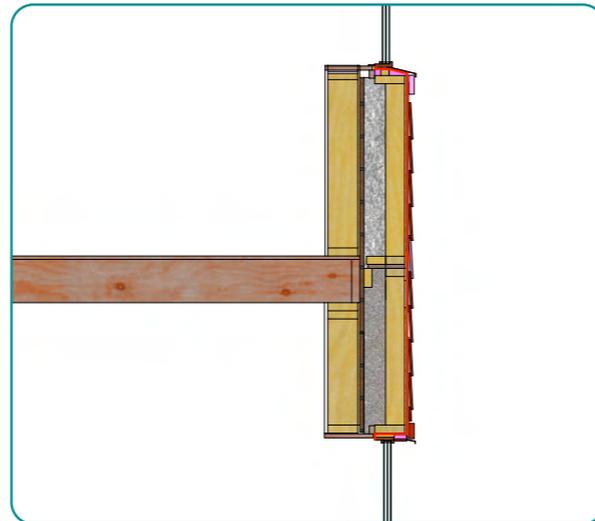
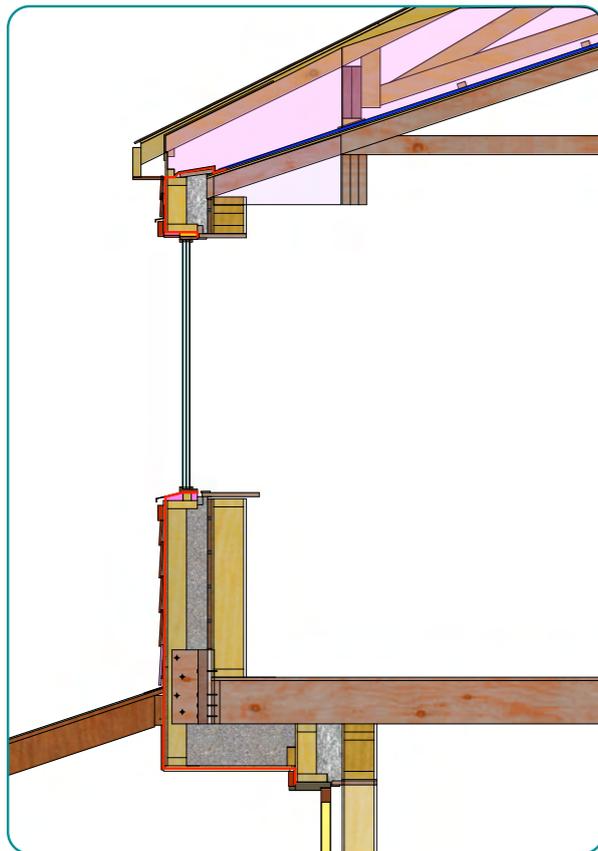
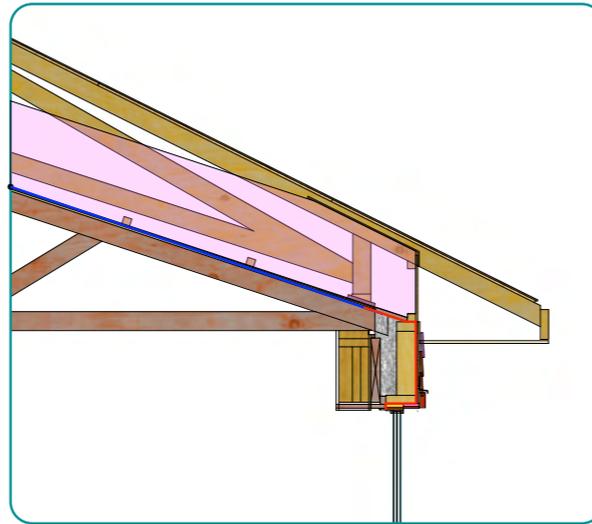
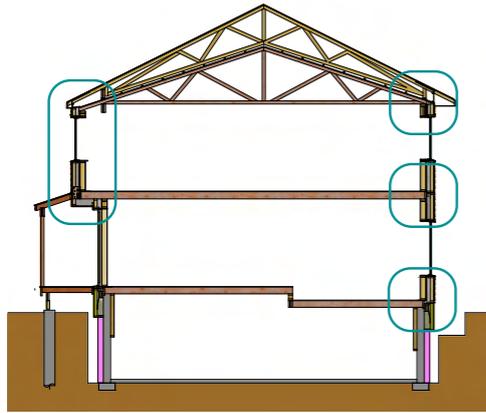
Insulation





Site Installed Cellulose Insulation

Air and Water Sealing



— 6Mil Poly Air/ Vapour Barrier

— Delta Vent S Vapour Open,
Water Resistant, Air Barrier







Siding

PowerPoint ribbon with tabs: Layout, Reset, Section, Font (B, I, U, abc, X^2, X_2, AV, Aa), Paragraph (bullets, indent, align), Drawing (lines, shapes, arrows), SmartArt, Picture, Shapes, Text Box, Arrange, Quick Styles, Shape Fill, Shape Outline.

Slides 2-8: Introduction and project overview. Slide 2: 'The deep energy retrofit of your building...'. Slide 3: 'Who Are We?'. Slide 4: 'Scope Of This Document'. Slide 5: 'Communications Plan'. Slide 6: 'Communications Plan (Continued)'. Slide 7: 'Who Should You Ask?'. Slide 8: 'Emergency Contact - 24/7'.

Slides 11-17: Construction phases and schedules. Slide 11: 'Deep Energy Retrofit Process (Continued)'. Slide 12: 'INSULATION'. Slide 13: 'HRV (Heat Recovery Ventilator)'. Slide 14: 'Schedule Shifts'. Slide 15: 'Schedule'. Slide 16: 'Pre-Prep Work (Week of Aug 30)'. Slide 17: '1. Foundation Prep - Week 1'.

Slides 20-26: Foundation preparation details. Slide 20: '1. Foundation Prep - Weeks 2-3'. Slide 21: '1. Foundation Prep - Weeks 2-3 (Continued)'. Slide 22: '1. Foundation Prep - Weeks 2-3'. Slide 23: '1. Foundation Prep - Week 3'. Slide 24: '1. Foundation Prep - Week 4'. Slide 25: '1. Foundation Prep - Week 4'. Slide 26: '1. Foundation Prep - Week 4'.

Managing Expectations

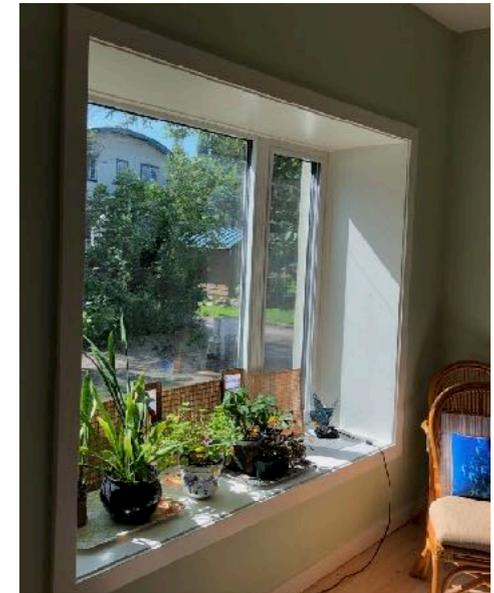
Getting it done with minimal disruption to the residents

Slides 29-35: Exterior panel preparation. Slide 29: '2. Exterior Panel Prep - Weeks 4-5'. Slide 30: '2. Exterior Panel Prep - Weeks 4-5'. Slide 31: '2. Exterior Panel Prep - Weeks 4-5'. Slide 32: '2. Exterior Panel Prep - Weeks 4-5'. Slide 33: '2. Exterior Panel Prep - Weeks 4-5'. Slide 34: '2. Exterior Panel Prep - Weeks 4-5'. Slide 35: '2. Exterior Panel Prep - Weeks 4-5'.

Slides 38-45: Panel installation and exterior framing. Slide 38: '5. Panel Install - Weeks 4-7'. Slide 39: '5. Panel Install - Weeks 4-7 (Continued)'. Slide 40: '6. Panel Install - Weeks 4-7'. Slide 41: '5. Panel Install - Weeks 4-7'. Slide 42: '5. Panel Install - Weeks 4-7'. Slide 43: '6. Exterior Framing - Weeks 7-8'. Slide 44: '6. Exterior Framing - Weeks 7-8'. Slide 45: '7. Interior...'

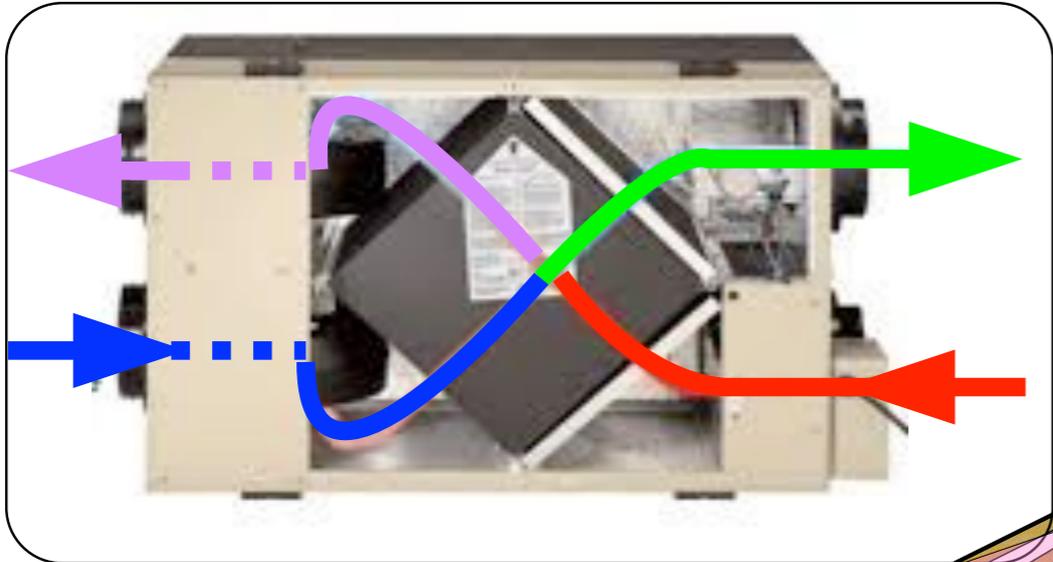
Slides 47-54: Roof construction and exterior finishing. Slide 47: '8. Roof Construction - Weeks 9-10'. Slide 48: '8. Roof Construction - Weeks 9-10'. Slide 49: '8. Roof Construction - Weeks 9-10'. Slide 50: '8. Roof Construction - Weeks 9-10'. Slide 51: '9. Porches, Siding and Exterior Finishing - Weeks 10-14'. Slide 52: '9. Porches, Siding and Exterior Finishing - Weeks 10-14 (Continued)'. Slide 53: '9. Porches, Siding and Exterior Finishing'. Slide 54: '9. Porches, Siding and Exterior Finishing'.

Slides 50-54: Final project information. Slide 50: 'Overall project questions???' with contact info for Lynn Henry. Slide 51: 'Screenshot'. Slide 52: '11. Inspection and Sign Off - Weeks 13-14'. Slide 53: '11. Inspection and Sign Off - Weeks 13-14'. Slide 54: '11. Inspection and Sign Off - Weeks 13-14'.

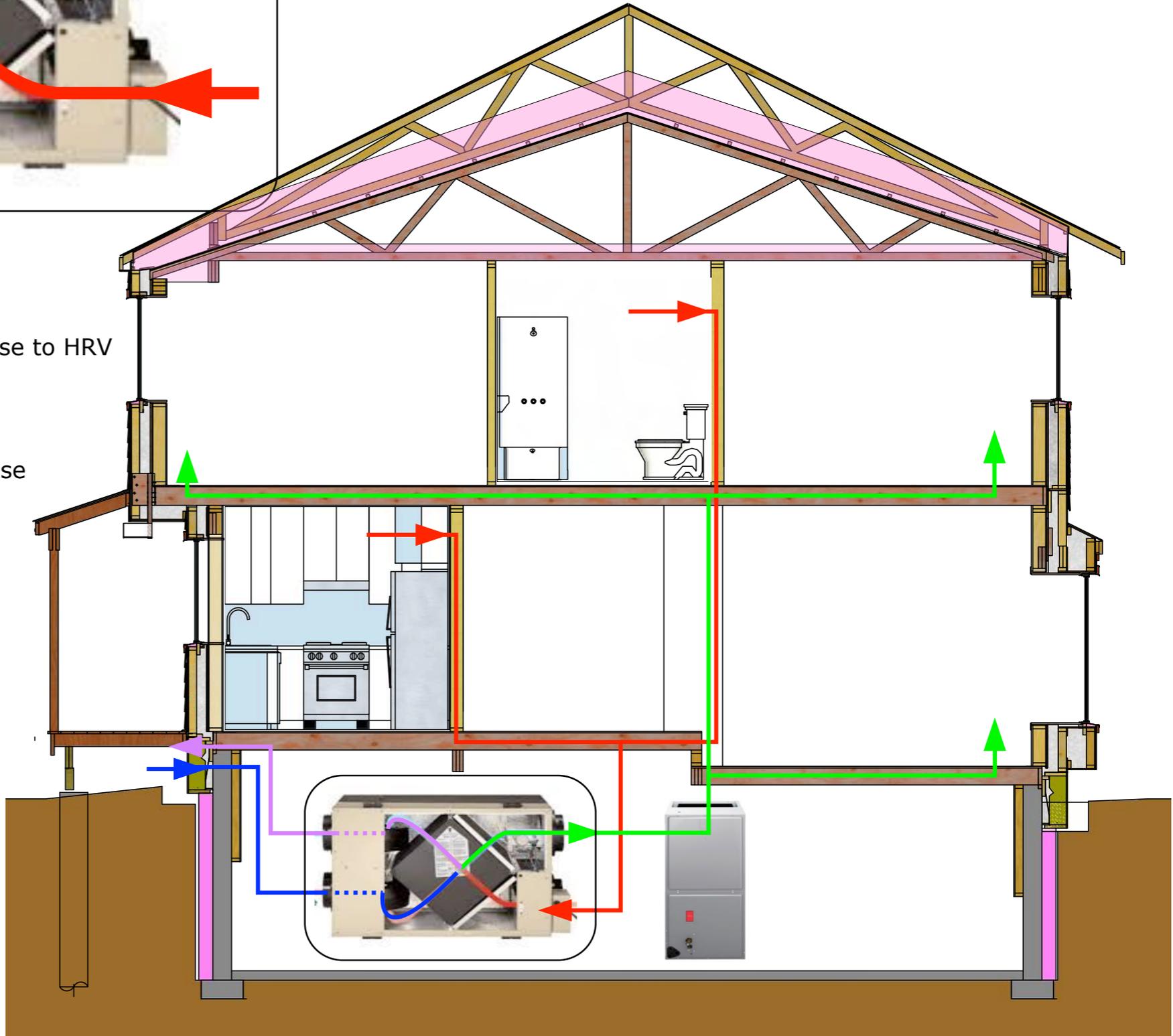


Making Life Better

HRV Ducting

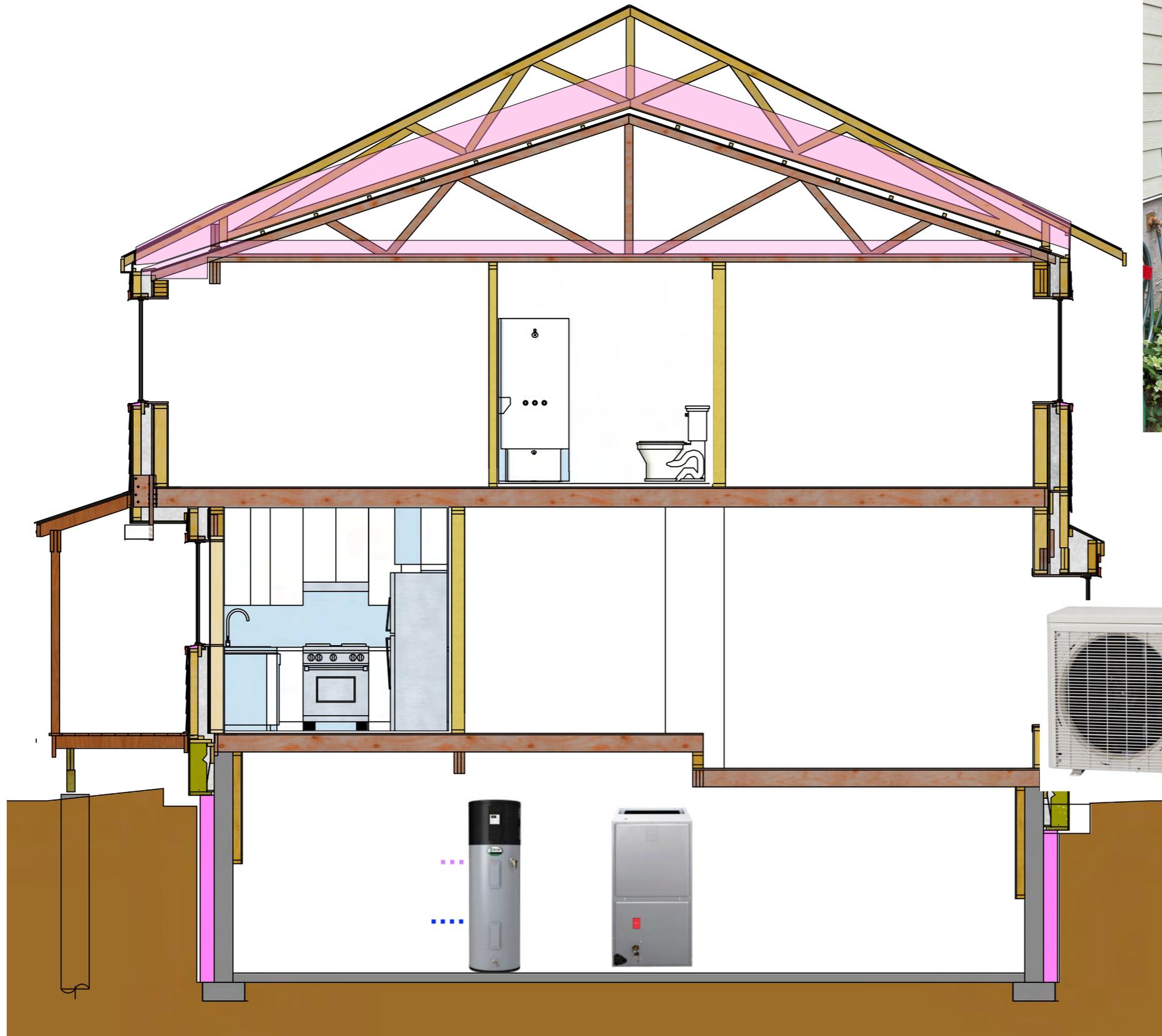


-  Cold Fresh Air to HRV
-  Warm Stale Air from House to HRV
-  Cooled Stale Air Exhaust
-  Warmed Fresh Air to House

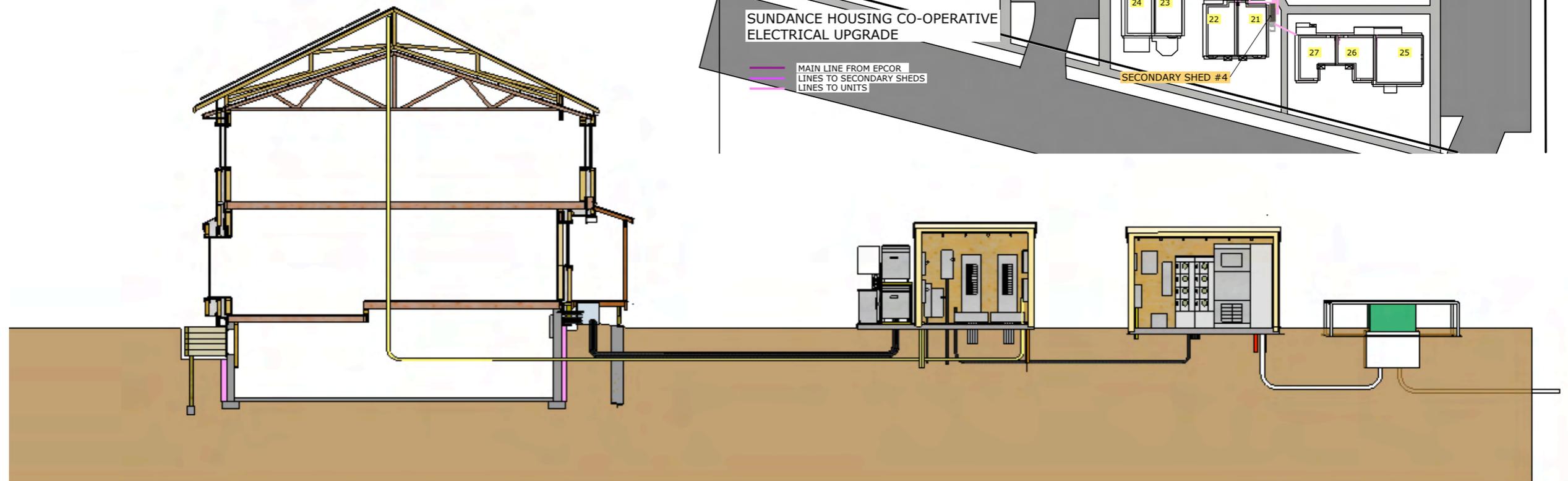
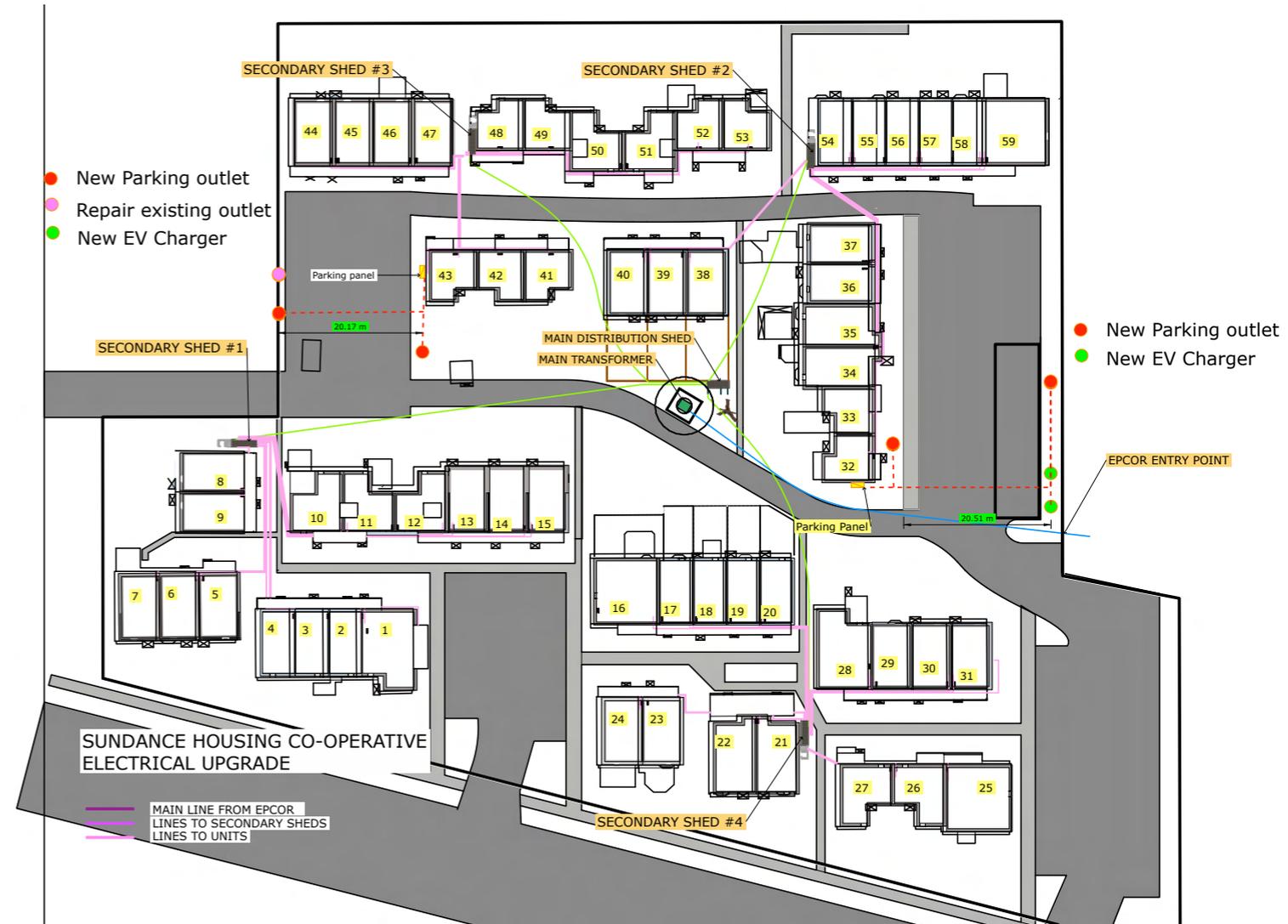


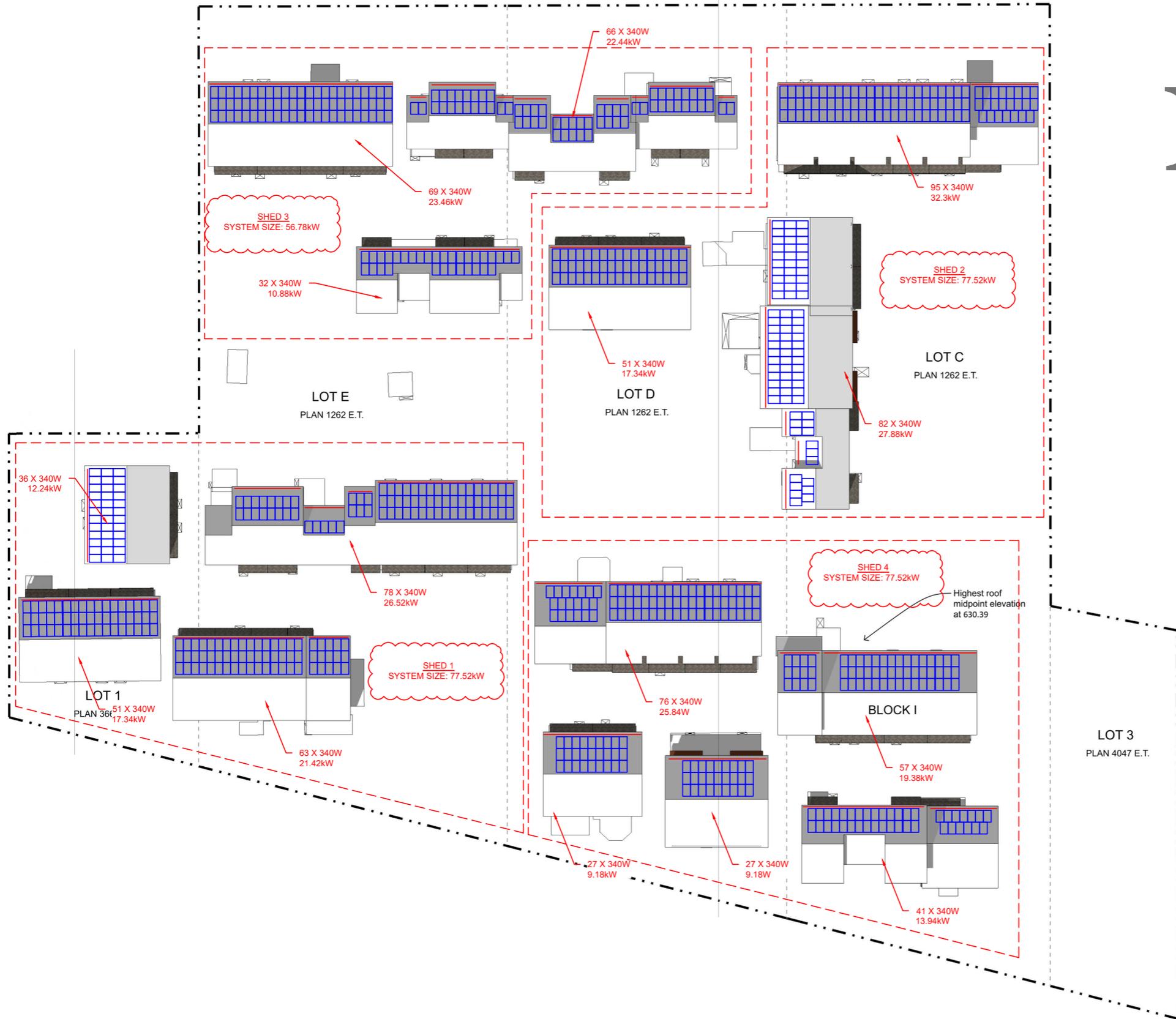
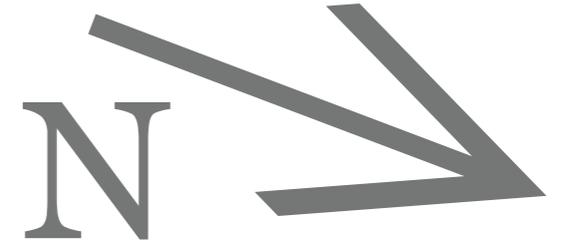
Air Source Heat Pumps

For Heating, Cooling and Hot Water



Electrical Service Upgrade





Costs

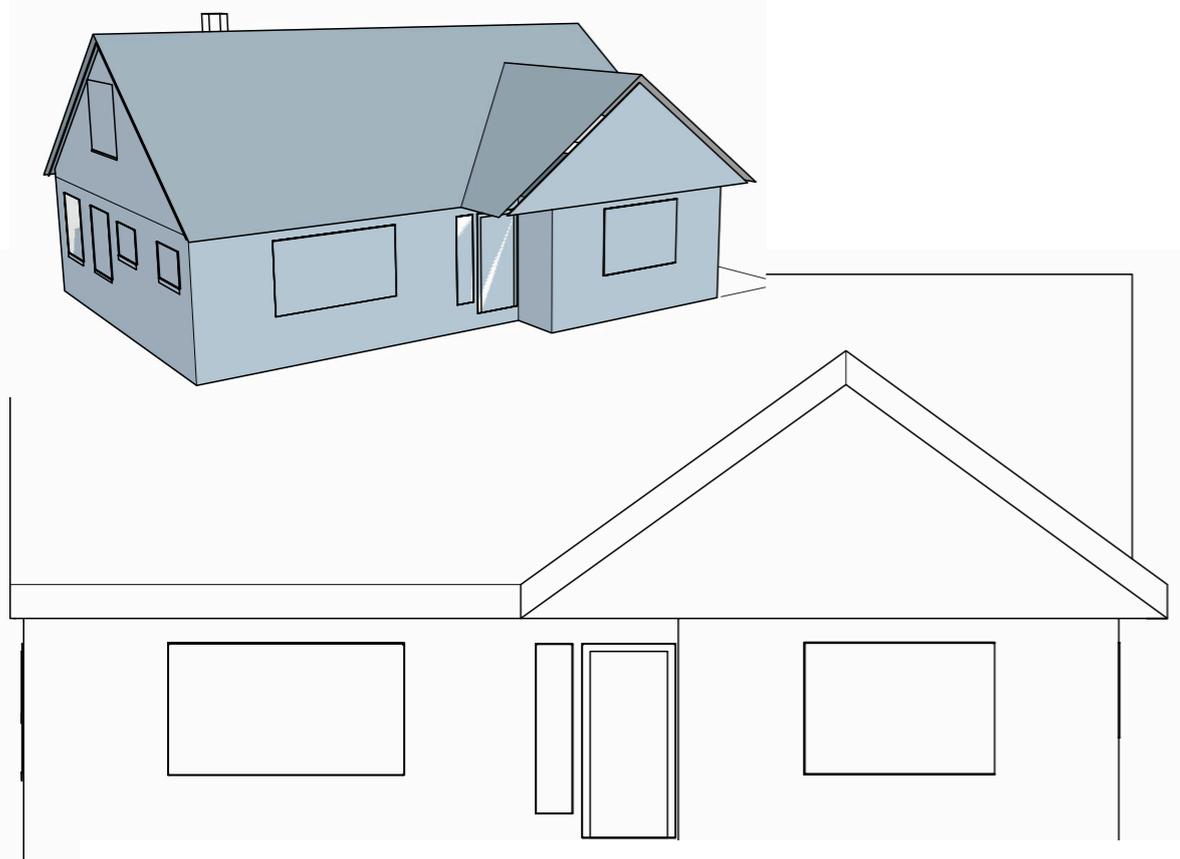
	Cost per Unit	Total Cost
Design	\$2,025	\$115,412
Foundation including Insulation	\$9,764	\$556,527
Building Preparation	\$2,642	\$150,600
Panel Purchase including Windows and Insulation	\$27,869	\$1,588,505
Roof	\$11,907	\$678,674
Exterior Finish Including Rebuilding Porches*	\$13,729	\$782,543
Mechanical	\$17,193	\$980,009
Interior Finish	\$6,050	\$344,856
Project Management	\$19,651	\$1,120,095
Total Design and Construction	\$110,828	\$6,317,221
Electrical System Upgrade	\$10,478	\$597,260
Solar	\$8,649	\$493,000
Total with Solar and Electrical System Replacement	\$129,956	\$7,407,481

Three House Panelized Deep Energy Retrofit



In partnership with Climate Action Edmonton and
with funding support from SSRIA

*Smart, Sustainable, Resilient Infrastructure Association



Geometry Extraction using Drone Based Photogrammetry

SSRIA SF Residence #1

Edmonton

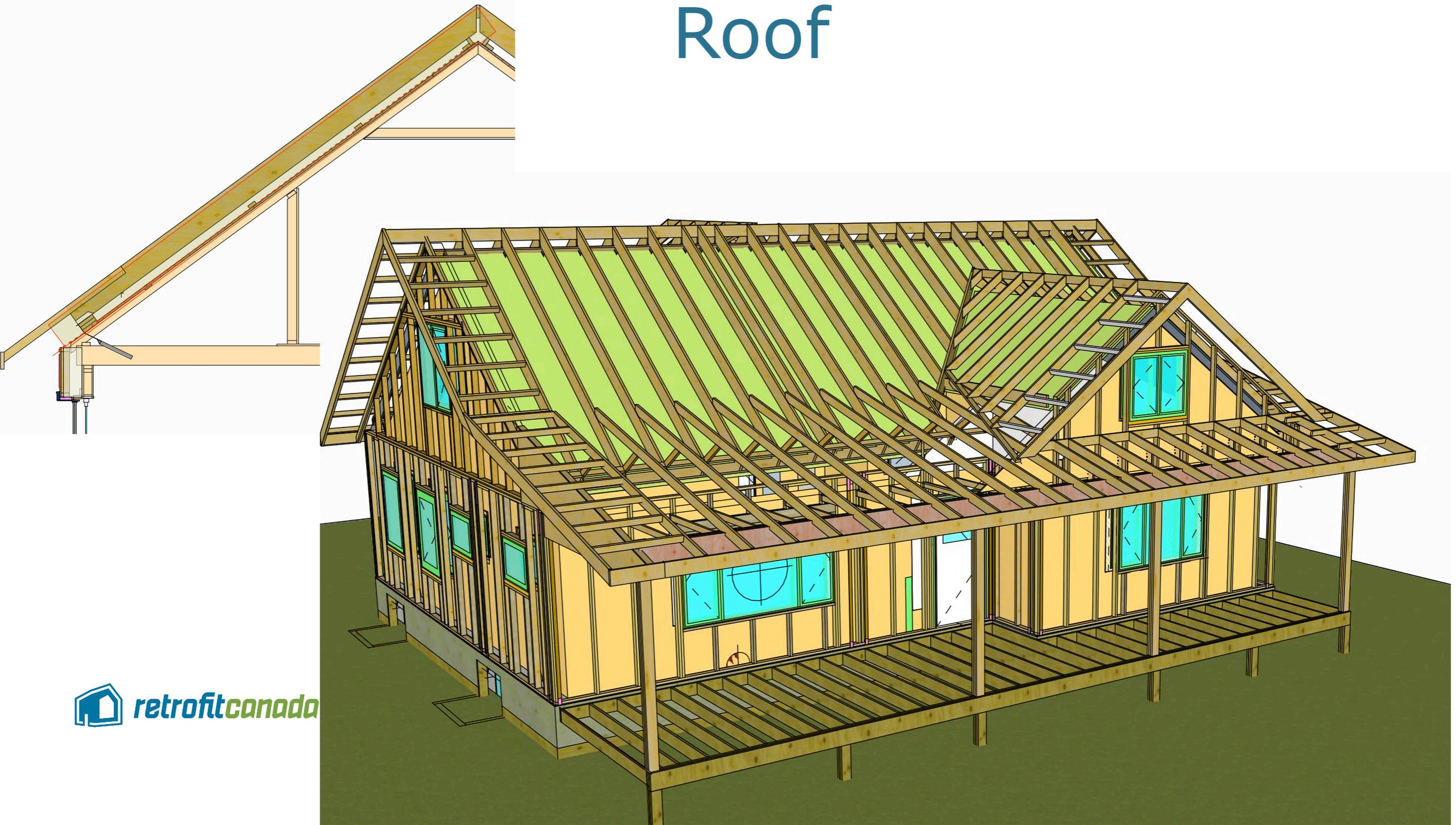
Wall Panels



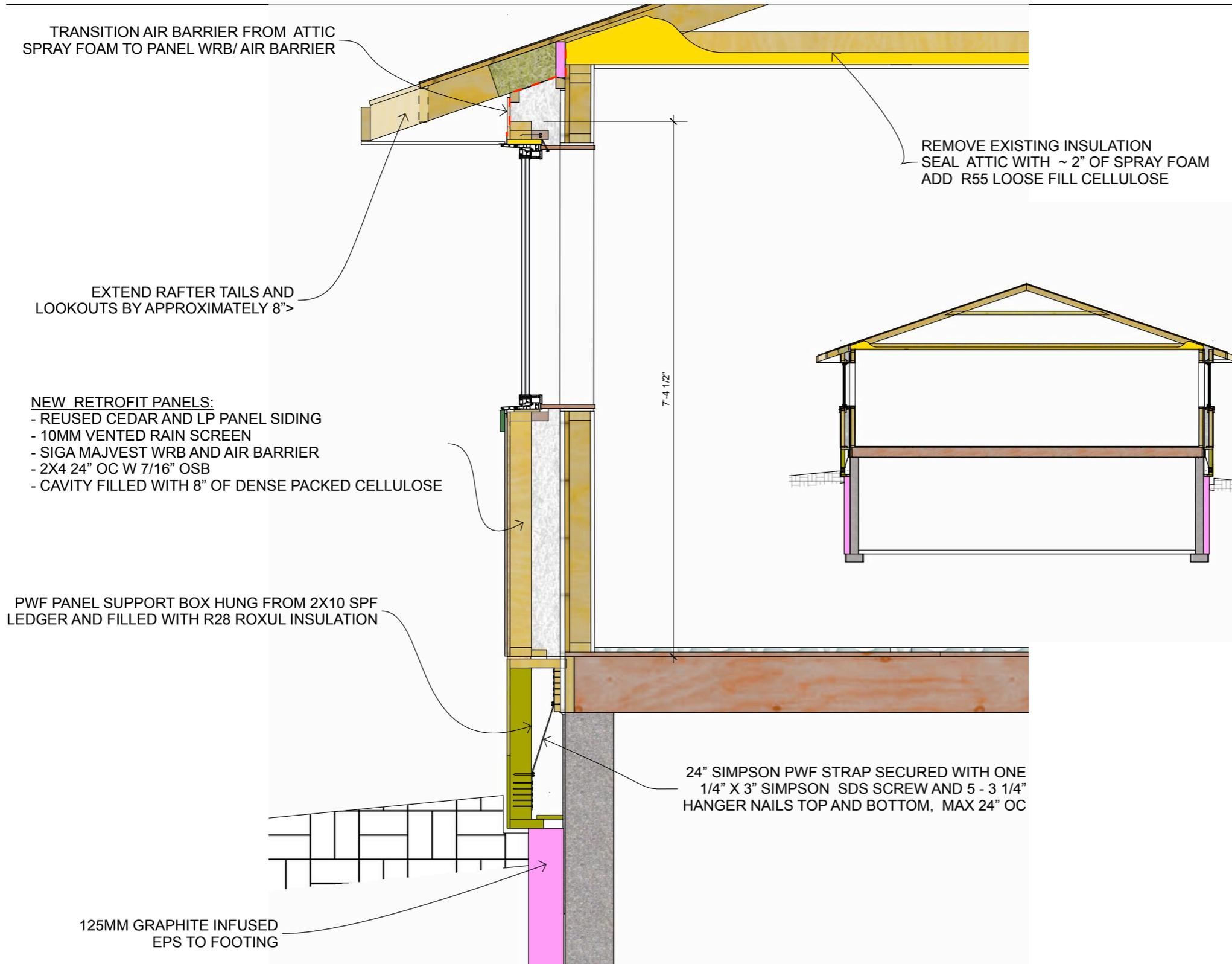
SSRIA SF Residence #1

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Roof



Alternate Roof Treatment



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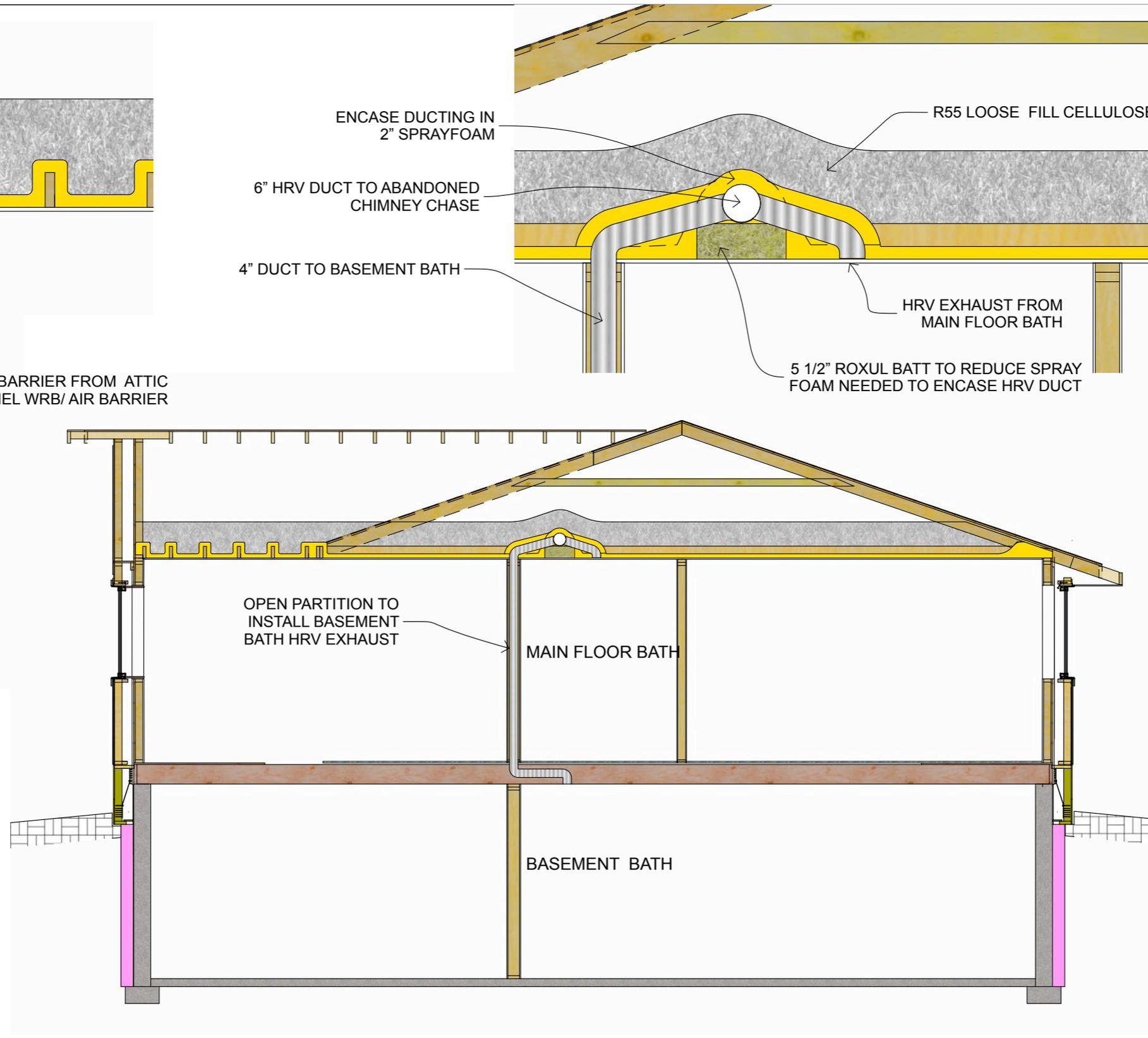
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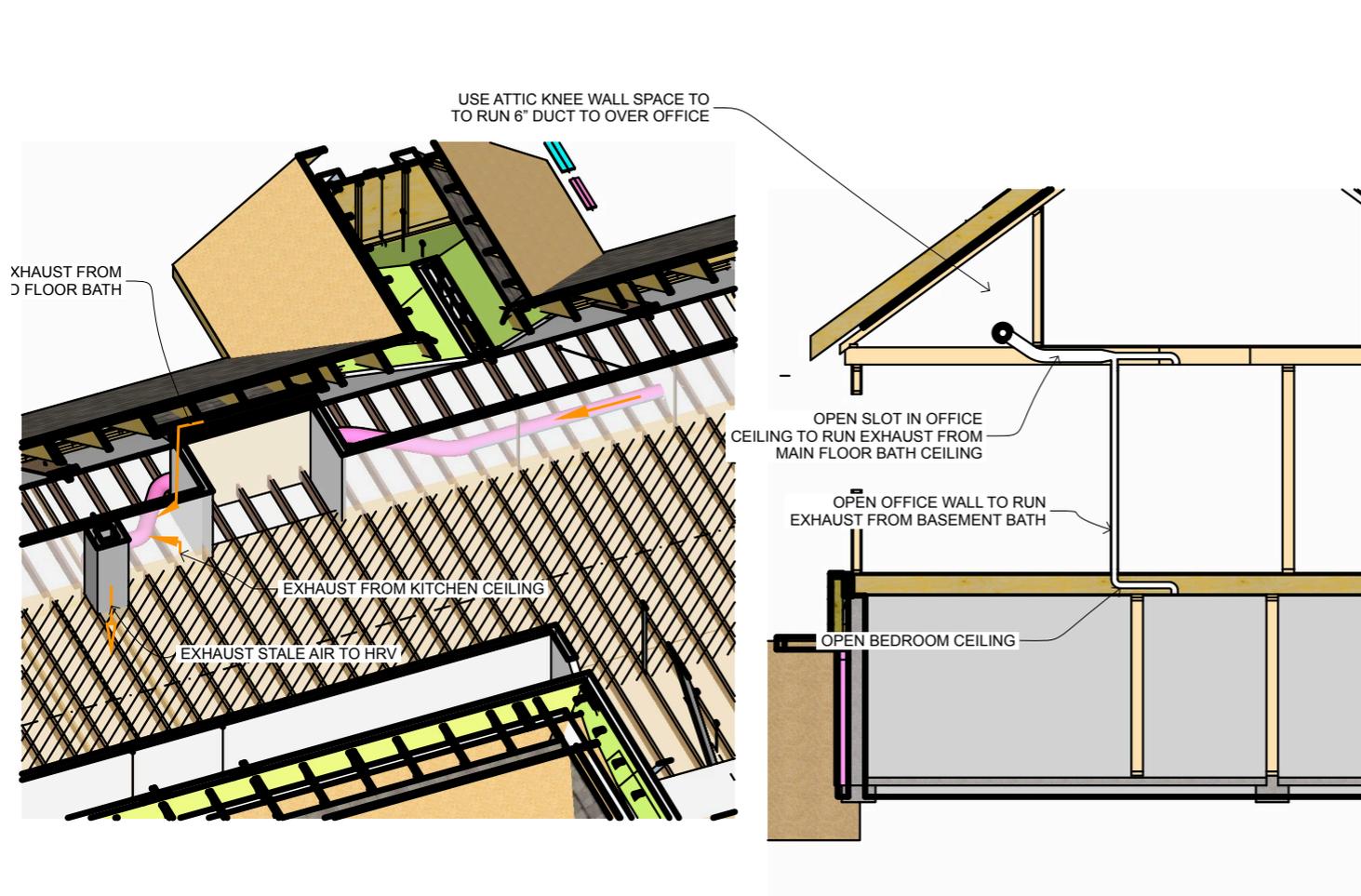
SECTION 2



SSRIA SF Residence #1

Edmonton

Mechanical



- Replace furnace with air source heat pump
- Replace hot water tank with air source heat pump water heater
- Install new HRV
- Duct new air HRV from bathrooms and kitchen



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