CHRISTOPHER BRILEY, CPHC, LEED-AP

Principal of BRIBURN, Portland, Maine
Maine Licensed Architect
Certified Passive House Consultant
Loves This Stuff

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architecture for life™

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A Tale of Two Passive Houses

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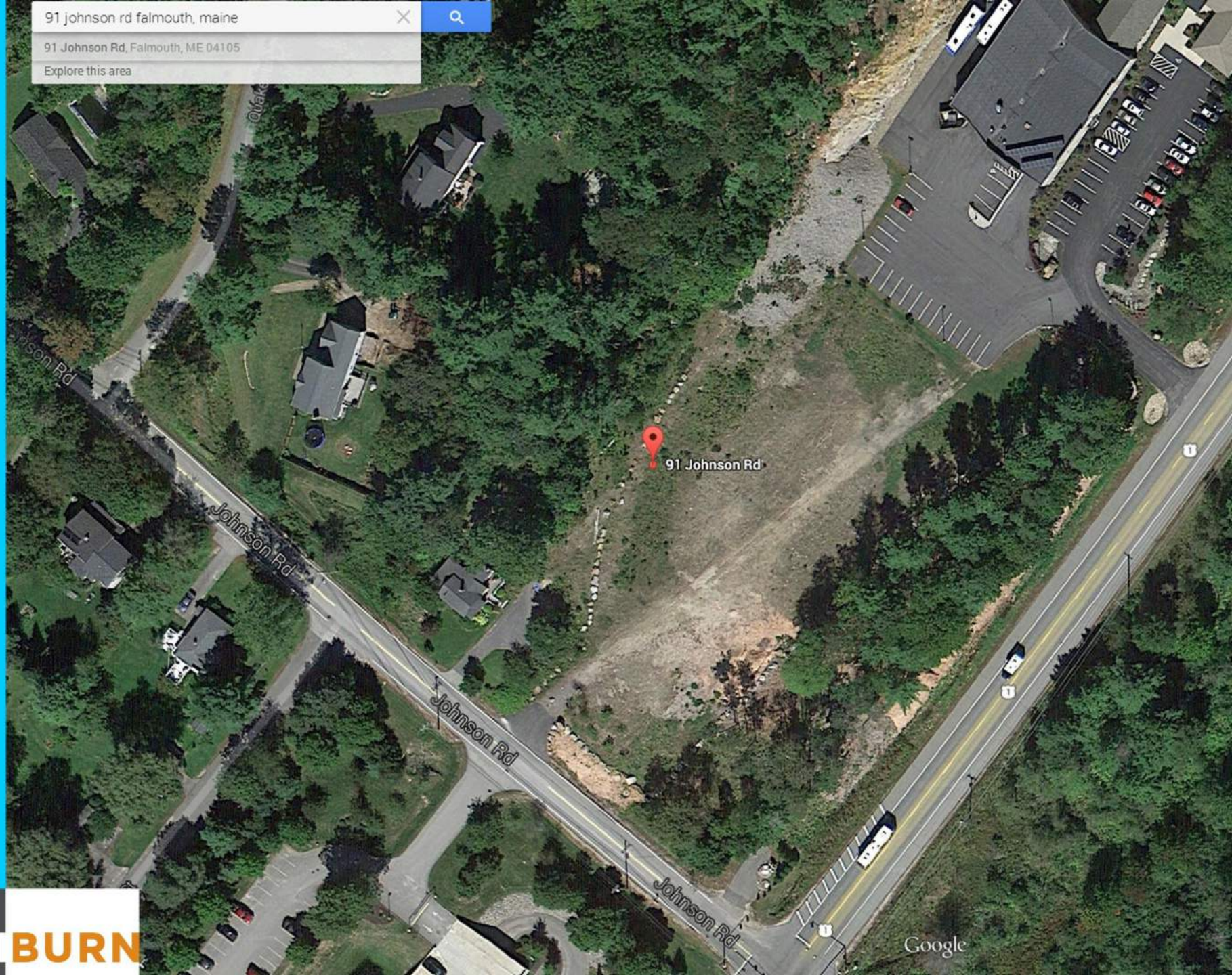
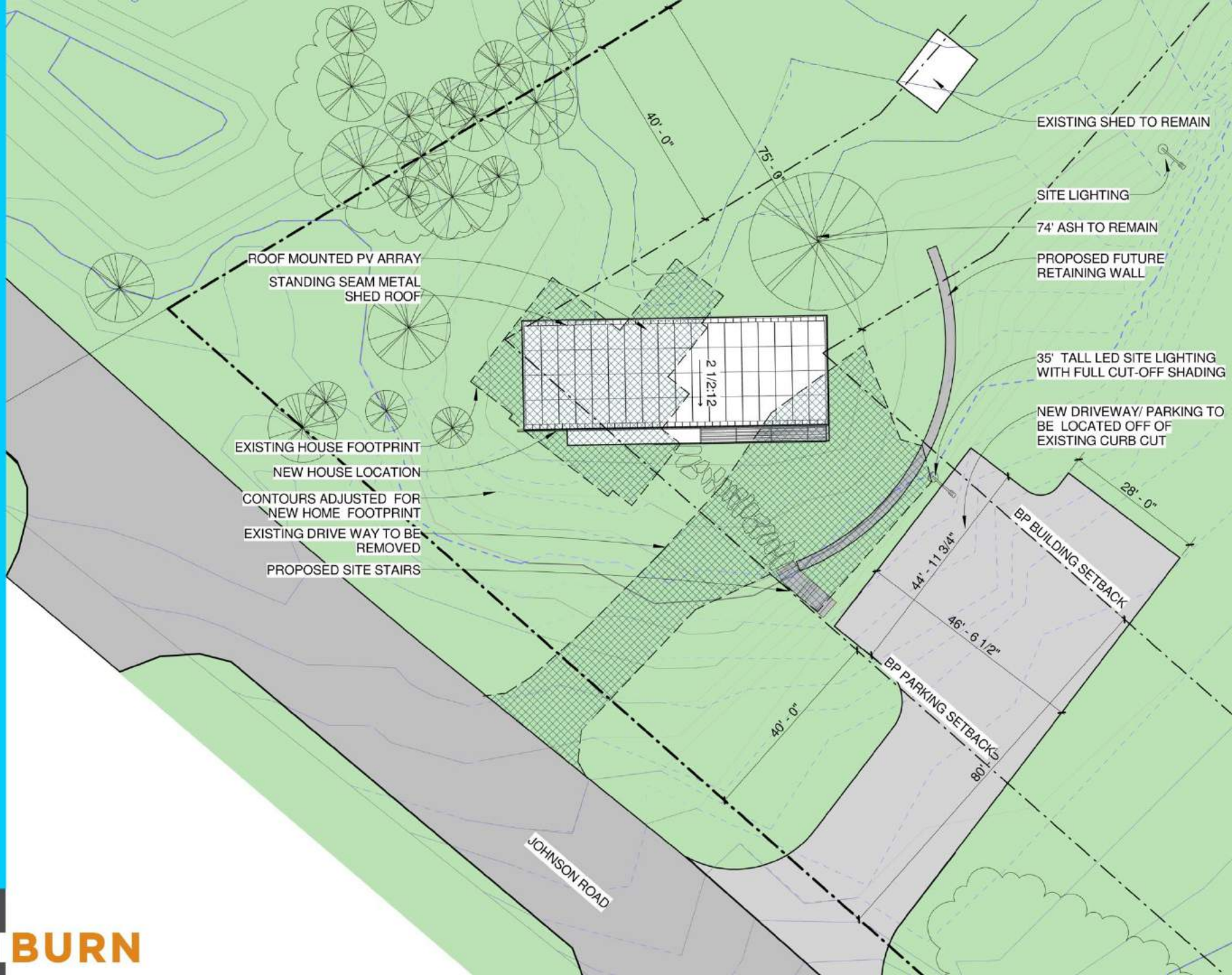

91 johnson rd falmouth, maine
91 Johnson Rd, Falmouth, ME 04105
Explore this area
91 Johnson Rd
Johnson Rd
Johnson Rd
Johnson Rd
Google


EXISTING SHED TO REMAIN
SITE LIGHTING
74' ASH TO REMAIN
PROPOSED FUTURE RETAINING WALL
ROOF MOUNTED PV ARRAY
STANDING SEAM METAL SHED ROOF
2 1/2:12
35' TALL LED SITE LIGHTING WITH FULL CUT-OFF SHADING
NEW DRIVEWAY/ PARKING TO BE LOCATED OFF OF EXISTING CURB CUT
EXISTING HOUSE FOOTPRINT
NEW HOUSE LOCATION
CONTOURS ADJUSTED FOR NEW HOME FOOTPRINT
EXISTING DRIVE WAY TO BE REMOVED
PROPOSED SITE STAIRS
40' - 0"
75' - 0"
28' - 0"
BP BUILDING SETBACK
44' - 11 3/4"
46' - 6 1/2"
BP PARKING SETBACKS
40' - 0"
80' - 1"
JOHNSON ROAD

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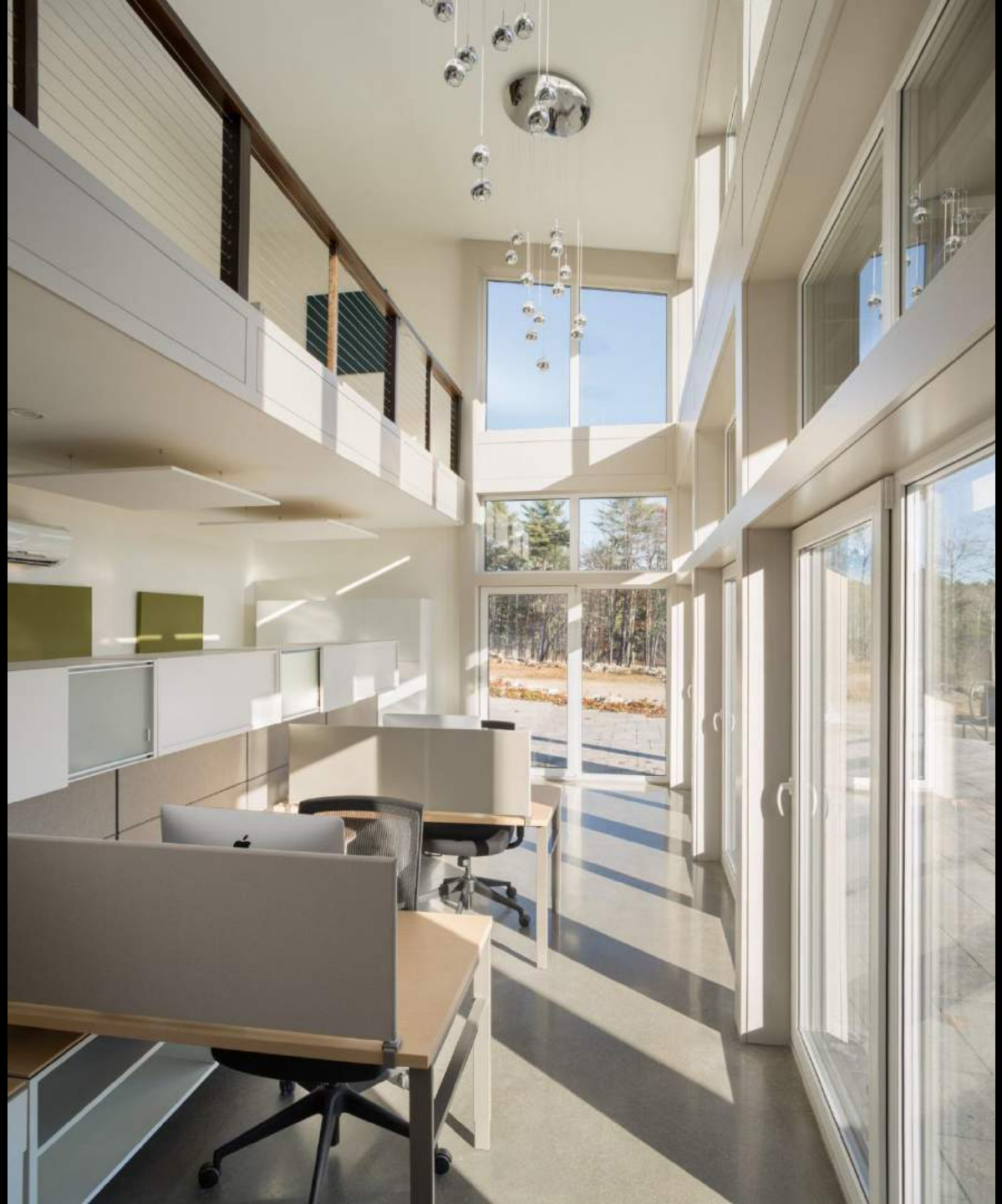

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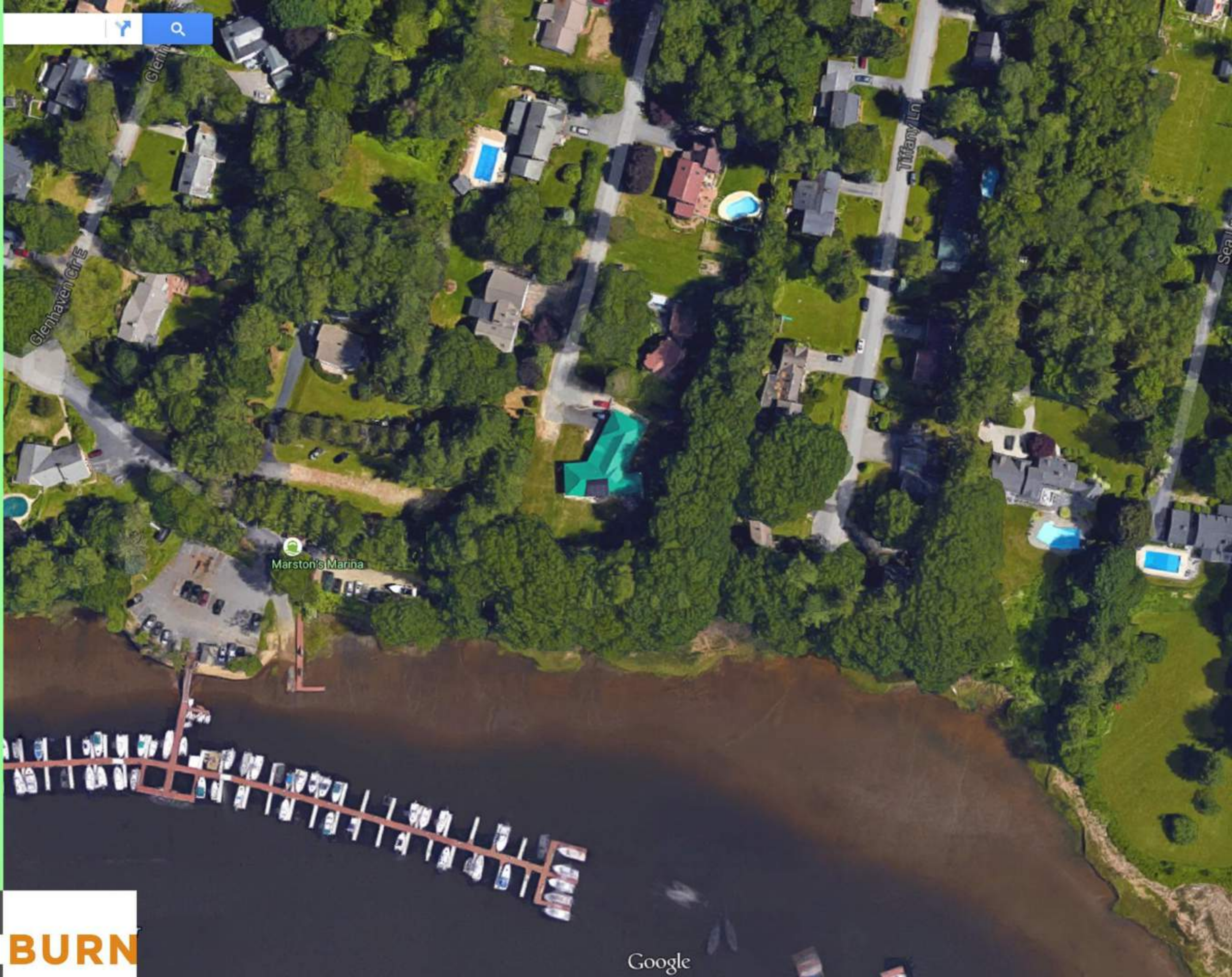

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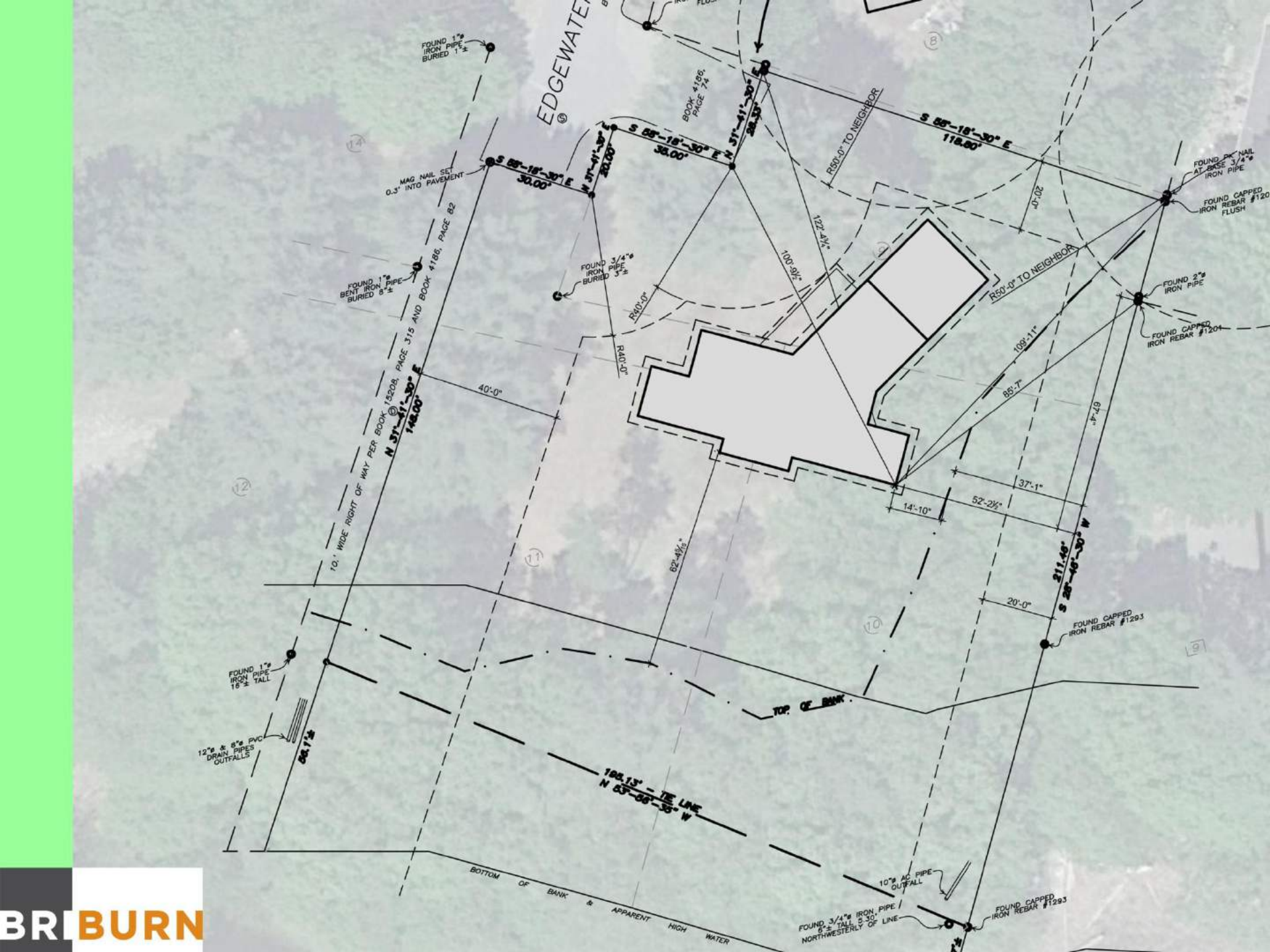
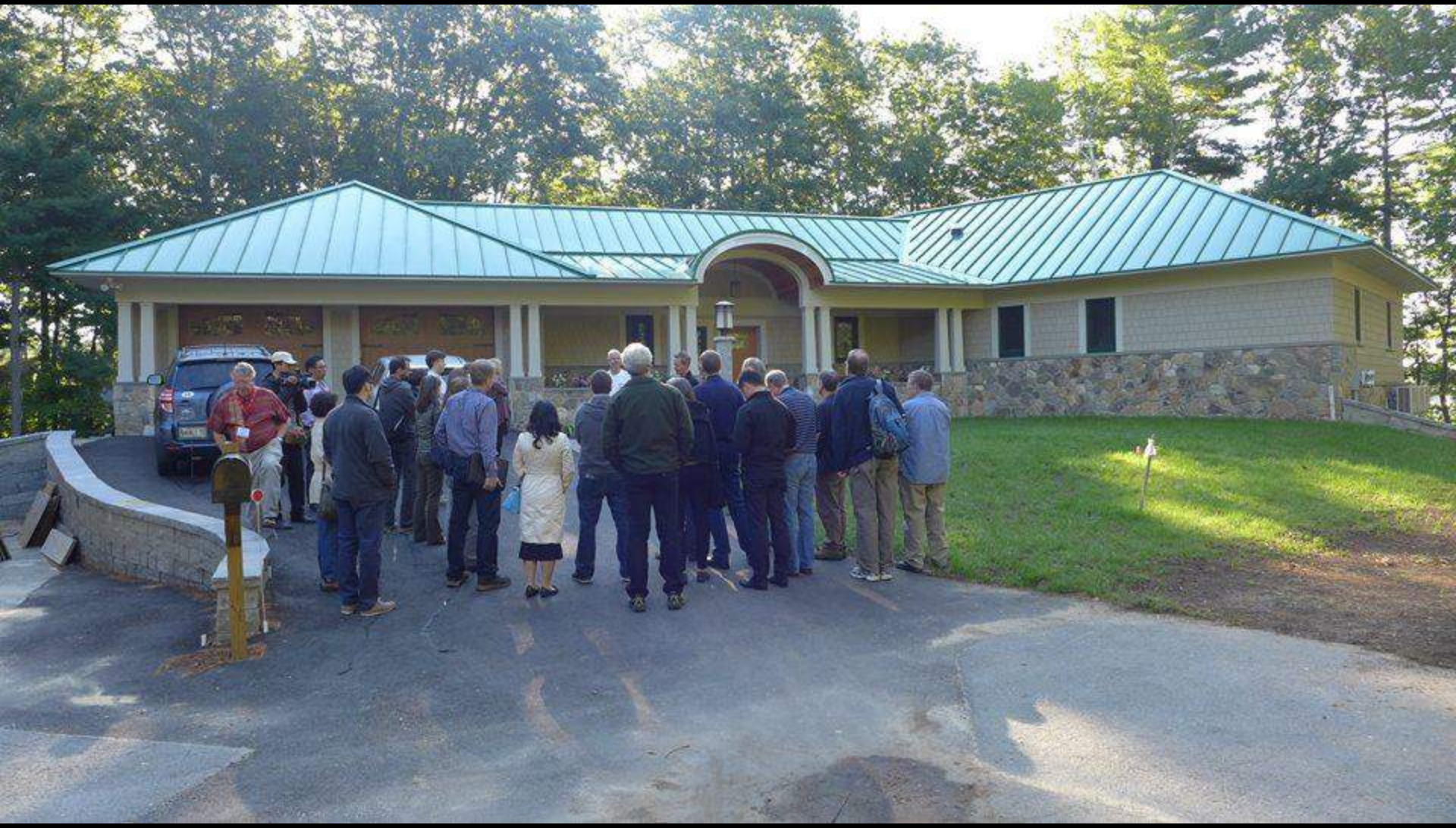

EDGEWATER
FOUND 1"ø IRON PIPE BURIED 1'±
MAG NAIL SET 0.3' INTO PAVEMENT
S 85°-18'-30" E 30.00'
N 31°-41'-30" E 148.00'
S 85°-18'-30" E 35.00'
N 31°-41'-30" E 20.00'
S 85°-18'-30" E 118.80'
BOOK 4186, PAGE 74
R50'-0" TO NEIGHBOR
FOUND PK NAIL AT BASE 3/4"ø IRON PIPE
FOUND CAPPED IRON REBAR #1204 FLUSH
FOUND 1"ø BENT IRON PIPE BURIED 8"±
FOUND 3/4"ø IRON PIPE BURIED 3"±
R40'-0"
122'-4½"
100'-9½"
20'-0"
FOUND 2"ø IRON PIPE
FOUND CAPPED IRON REBAR #1204
109'-11"
85'-7"
49'-4"
40'-0"
37'-1"
14'-10"
52'-2½"
10.' WIDE RIGHT OF WAY PER BOOK 1520B, PAGE 315 AND BOOK 4186, PAGE 82
62'-4⅝"
N 25°-46'-30" W 211.46'
20'-0"
FOUND CAPPED IRON REBAR #1293
FOUND 1"ø IRON PIPE 18"± TALL
TOP OF BANK
12"ø & 8"ø PVC DRAIN PIPES OUTFALLS
64.1'±
198.13' – TIE LINE N 83°-56'-35" W
BOTTOM OF BANK & APPARENT HIGH WATER
10"ø AC PIPE OUTFALL
FOUND 3/4"ø IRON PIPE 6"± TALL 5.30' NORTHWESTERLY OF LINE
FOUND CAPPED IRON REBAR #1293

BRIBURN



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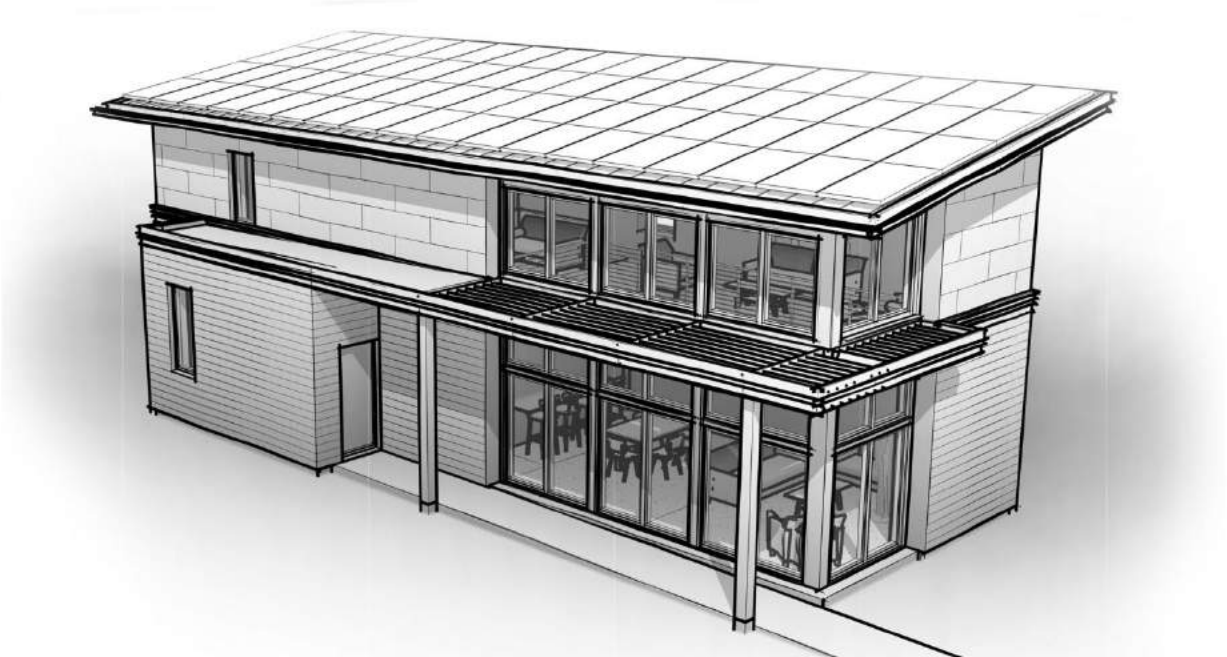
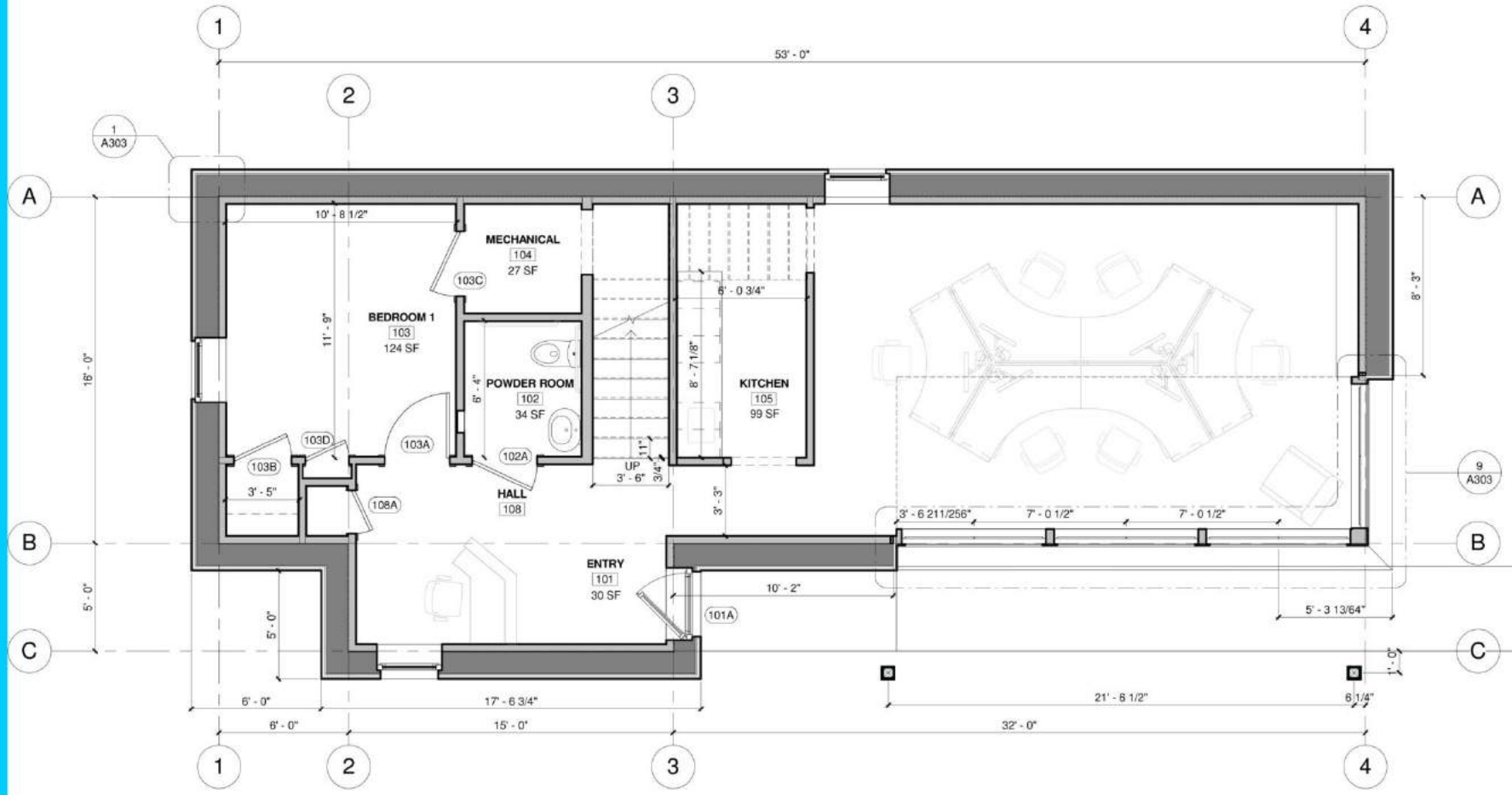
Geometry





FIRST FLOOR PALN

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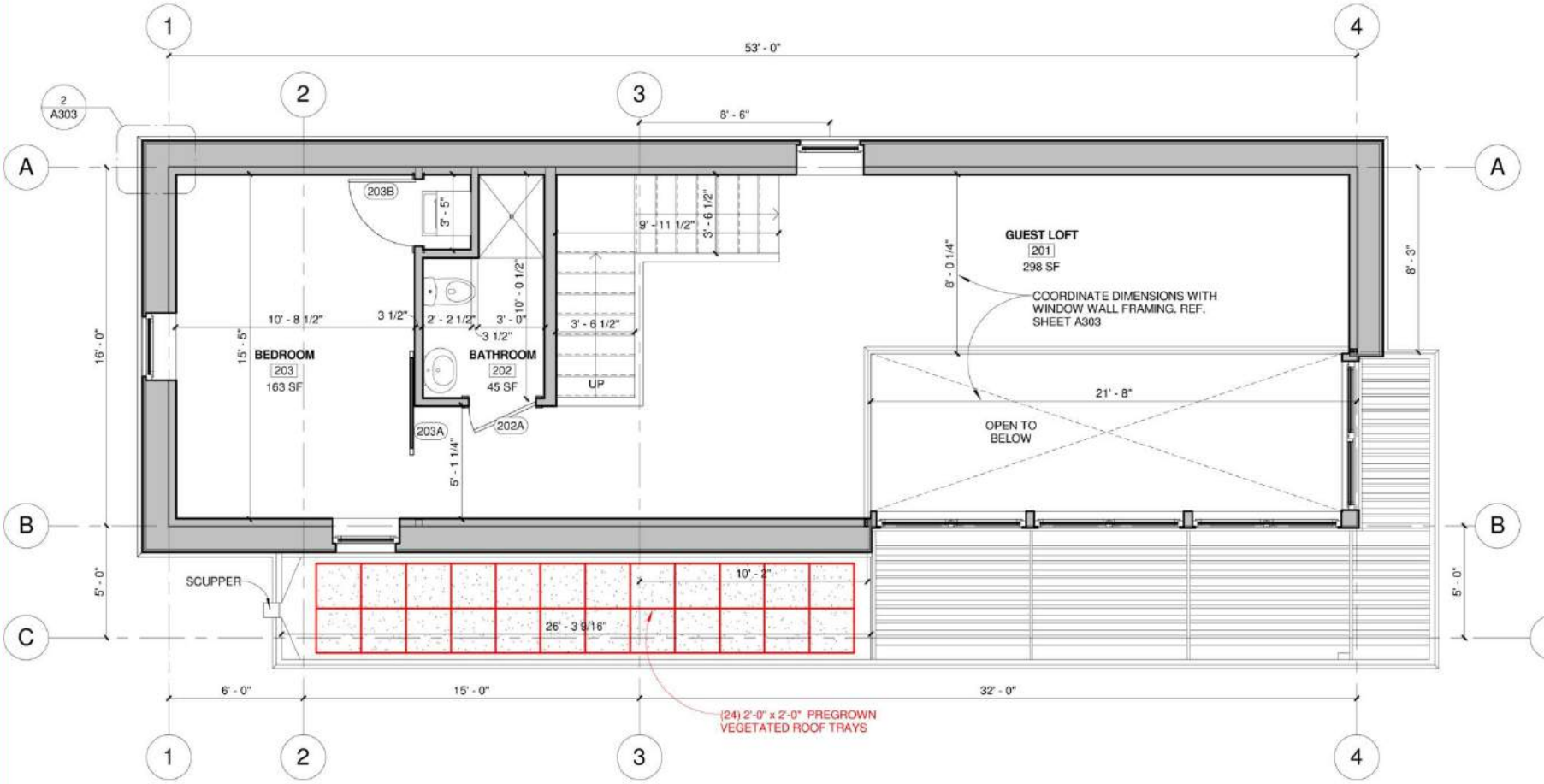
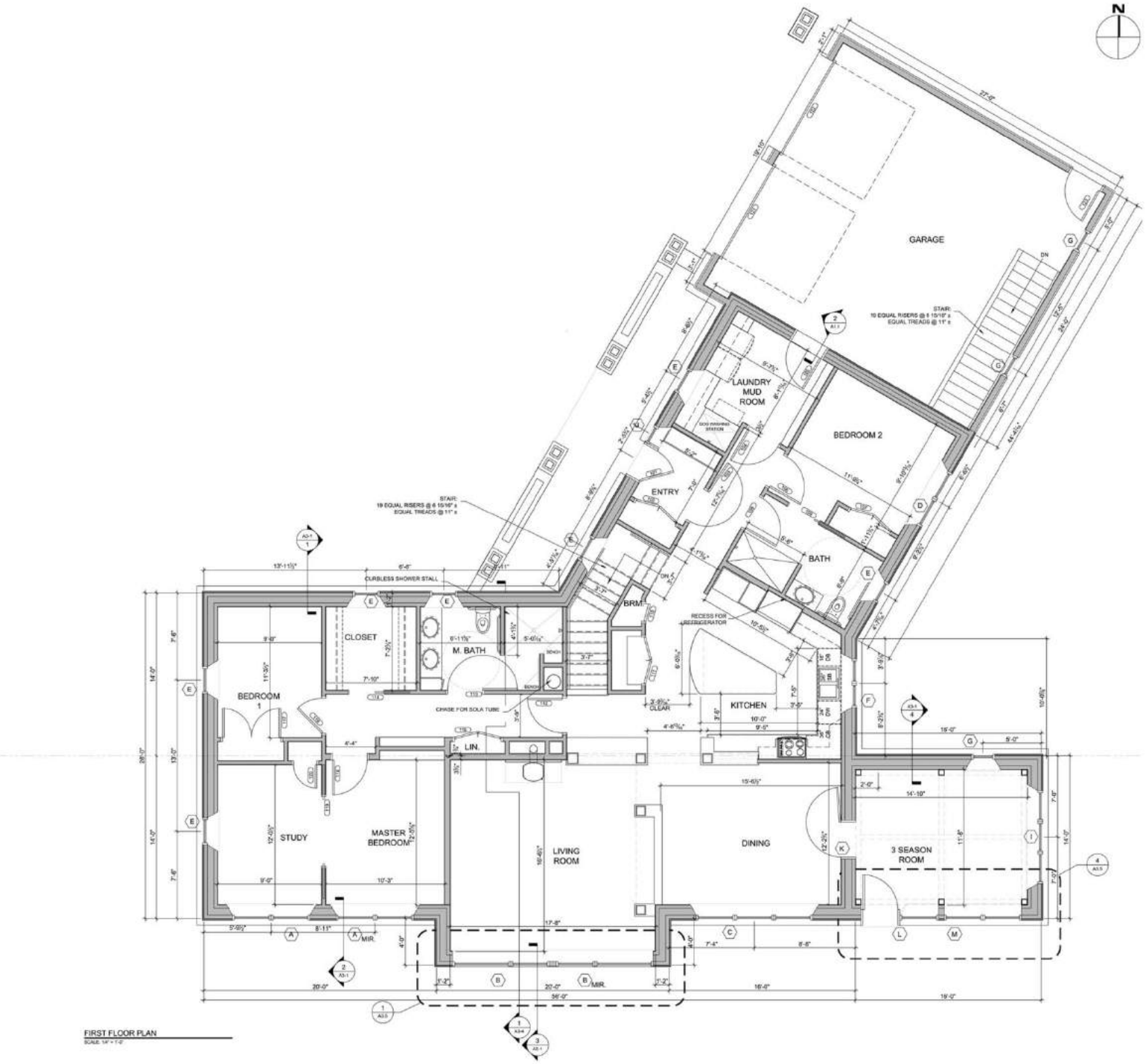


FIRST FLOOR PALN



FIRST FLOOR PLAN
SCALE: 1/4" = 1'-0"

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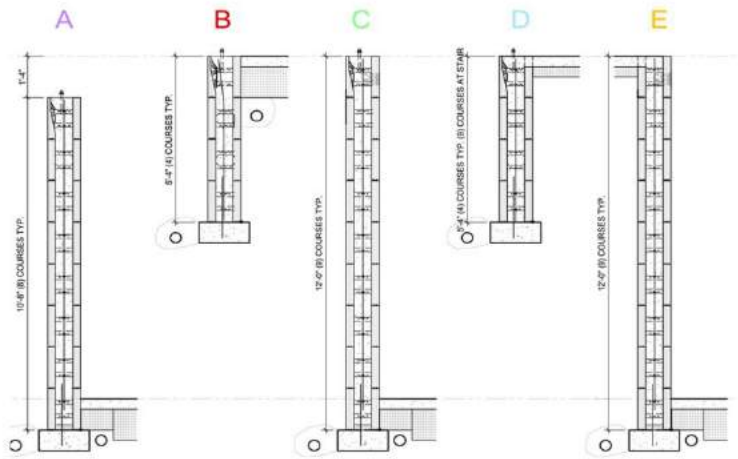
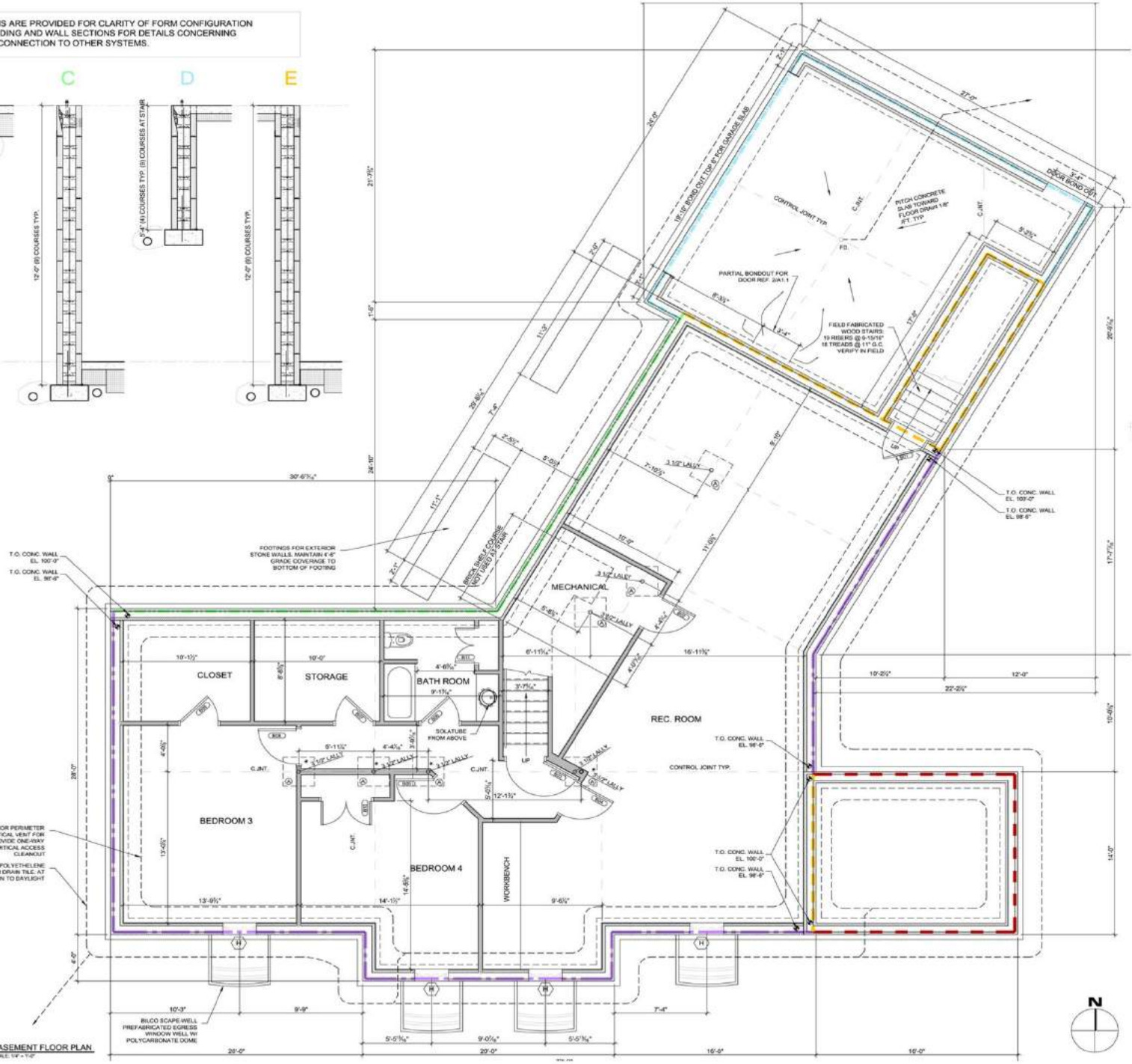
NOTE: FOUNDATION WALL SECTIONS ARE PROVIDED FOR CLARITY OF FORM CONFIGURATION AND WALL HEIGHT. REFER TO BUILDING AND WALL SECTIONS FOR DETAILS CONCERNING INSULATION, SEALING, FINISH AND CONNECTION TO OTHER SYSTEMS.





BASEMENT FLOOR PLAN
SCALE: 1/4" = 1'-0"

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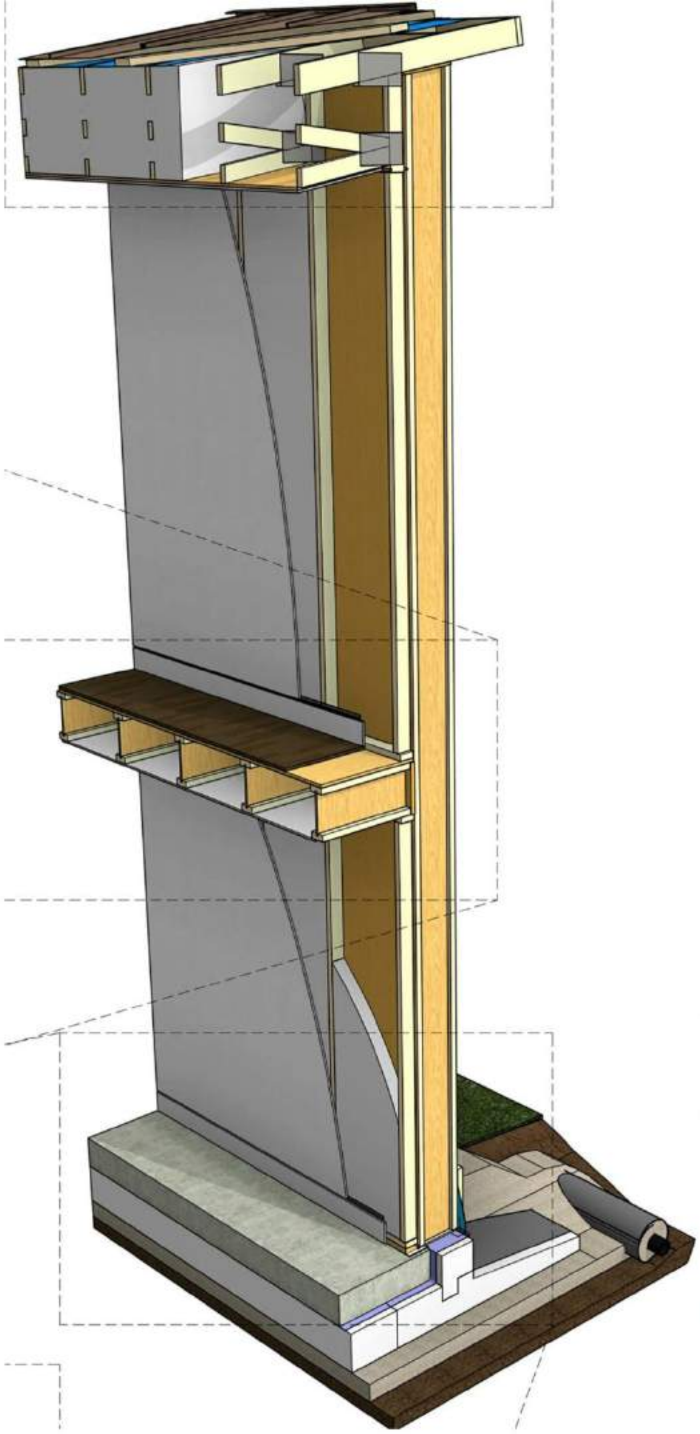
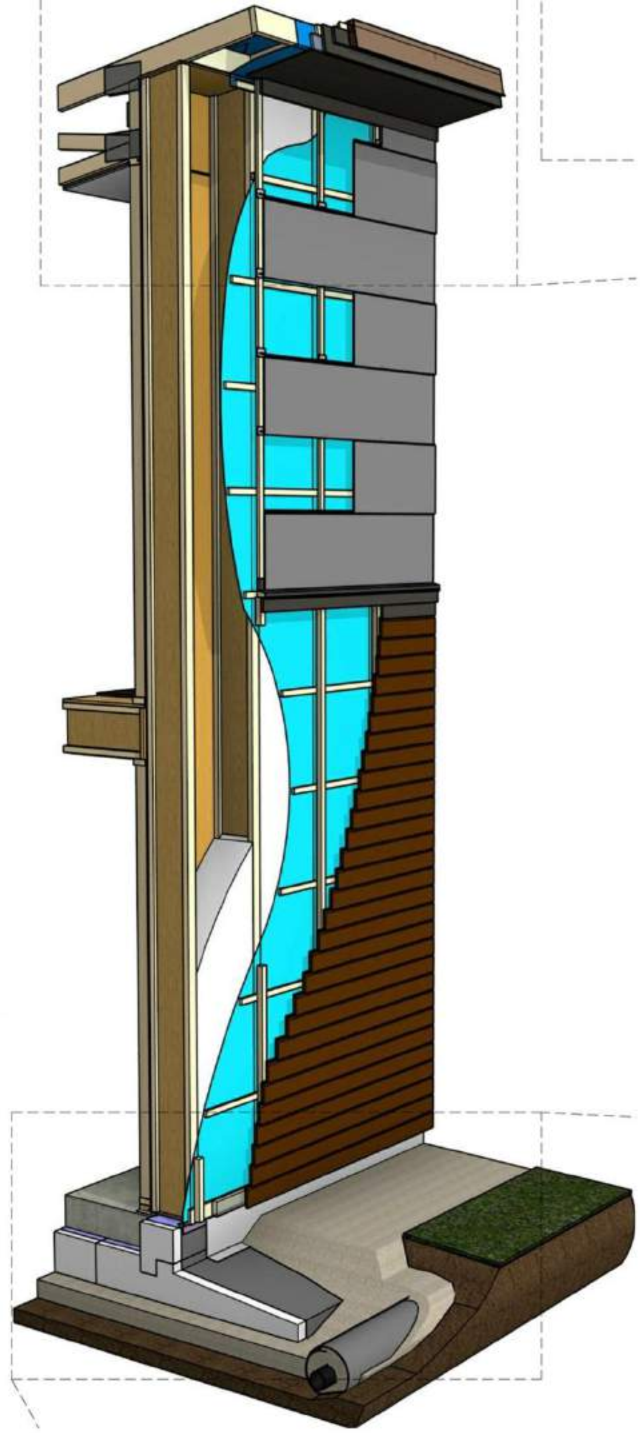
Building Envelope





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8" REINFORCED CONCRETE POLISHED SLAB - SEE STRUCTURAL DRAWINGS FOR SLAB REINFORCEMENT

2x4 CONT. SILL w/ 1" DIA. HOLES AT NUTS TYPICAL

2x4 CONT. TAMARACK SILL w/ 1/2" X 8" LONG HOOKED ANCHOR BOLTS @ 3'-0" O.C PLUS 1'-0" FROM BUILDING CORNERS, ENDS OF PLATES AND OPENINGS. TYPICAL

CONTINUOUS SEALANT

SILL SEAL GASKET AND CAPILLARY BREAK. (5 1/2" PROTECTO ENERGY PLATE LINER OR APPROVED EQUAL) SEAL TO VAPOR BARRIER.

REINFORCED POLY VAPOR BARRIER.

WRB. (SIGA MAJCOAT OR APPROVED EQUAL)

TYPE IX EPS FOAM PROFILE 'B'

THREE WAY TAPE (PROTECTO WRAP TRIPLE GUARD OR APPROVED EQUAL)

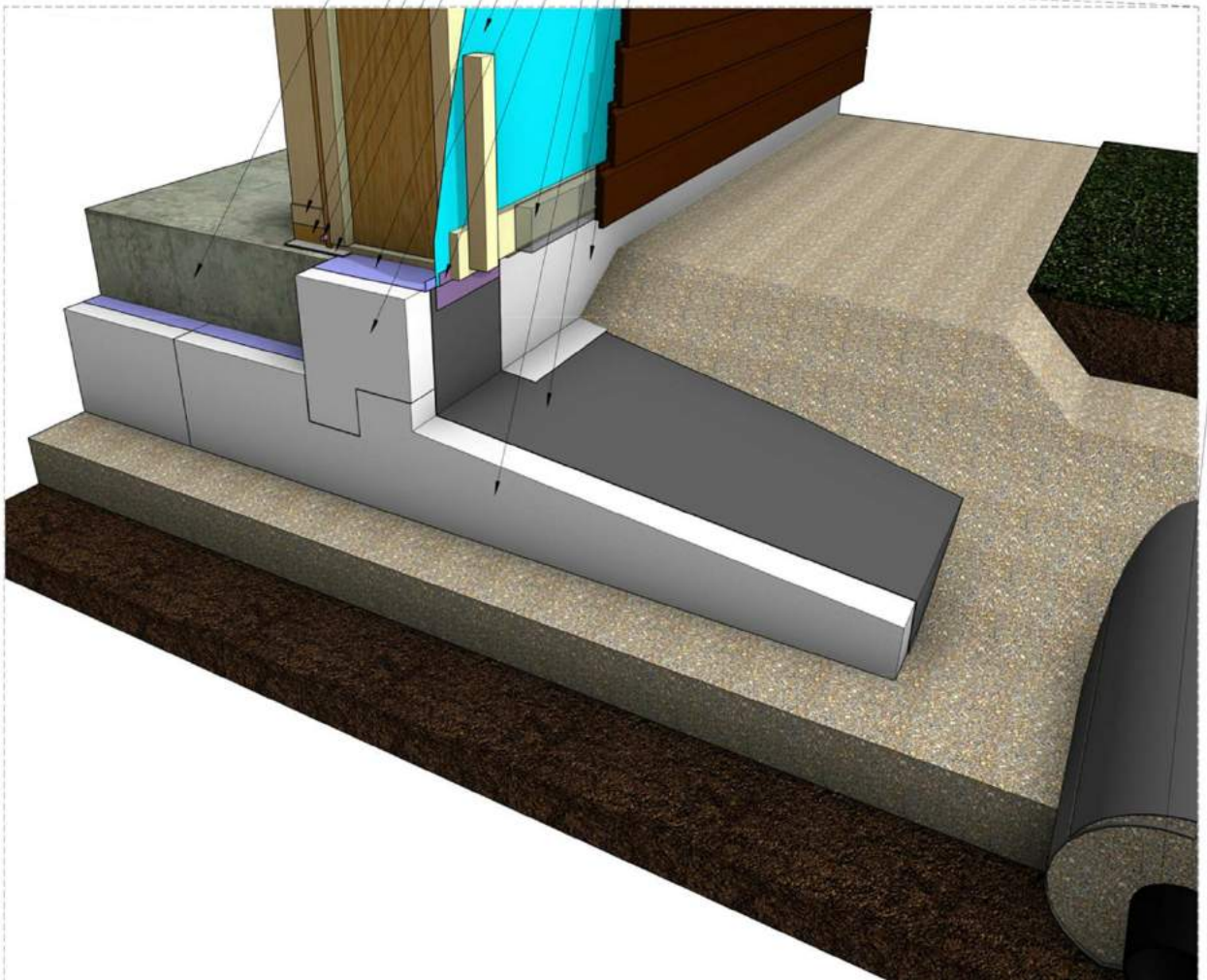
RIGID VENT STRIP AND INSECT BARRIER (COR-A-VENT SV5 2 LAYERS OR APPROVED EQUAL)

TYPE IX EPS FOAM PROFILE 'A'

BITUMINOUS MEMBRANE DAMPPROOFING AND INSECT BARRIER

4" DRAIN TILE SURROUNDED BY 6" CRUSHED STONE AND FILTER FABRIC

PREFINISHED COIL STOCK METAL



1/2" GWB

INTERIOR STUD CAVITIES FILLED WITH DENSE PACKED CELLULOSE, MINERAL WOOL, OR FORMALDEHYDE FREE FIBERGLASS BATT INSULATION

1/2"x3/4" ARCHITECTURAL Z SHADOW BEAD

1/2" PAINTED POPLAR TRIM BOARD

1/2" APA RATED SHEATHING SEAL AS VAPOR RETARDER

2x4 CONT. SILL w/ 1" DIA. HOLES AT NUTS TYPICAL

CONTINUOUS SEALANT

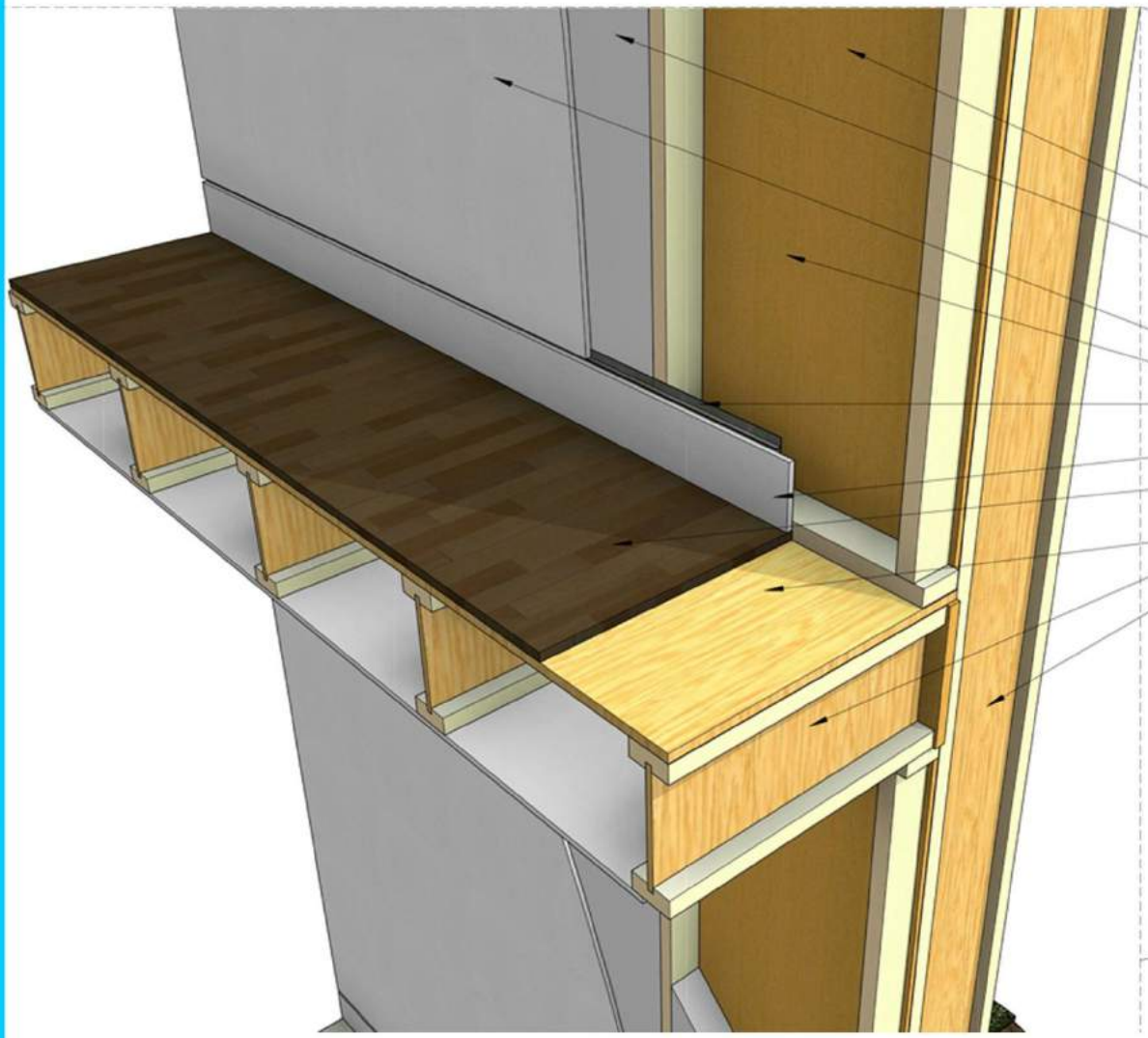
2x4 CONT. TAMARACK SILL w/ 1/2" X 8" LONG HOOKED ANCHOR BOLTS @ 3'-0" O.C. PLUS 1'-0" FROM BUILDING CORNERS, ENDS OF PLATES AND OPENINGS. TYPICAL

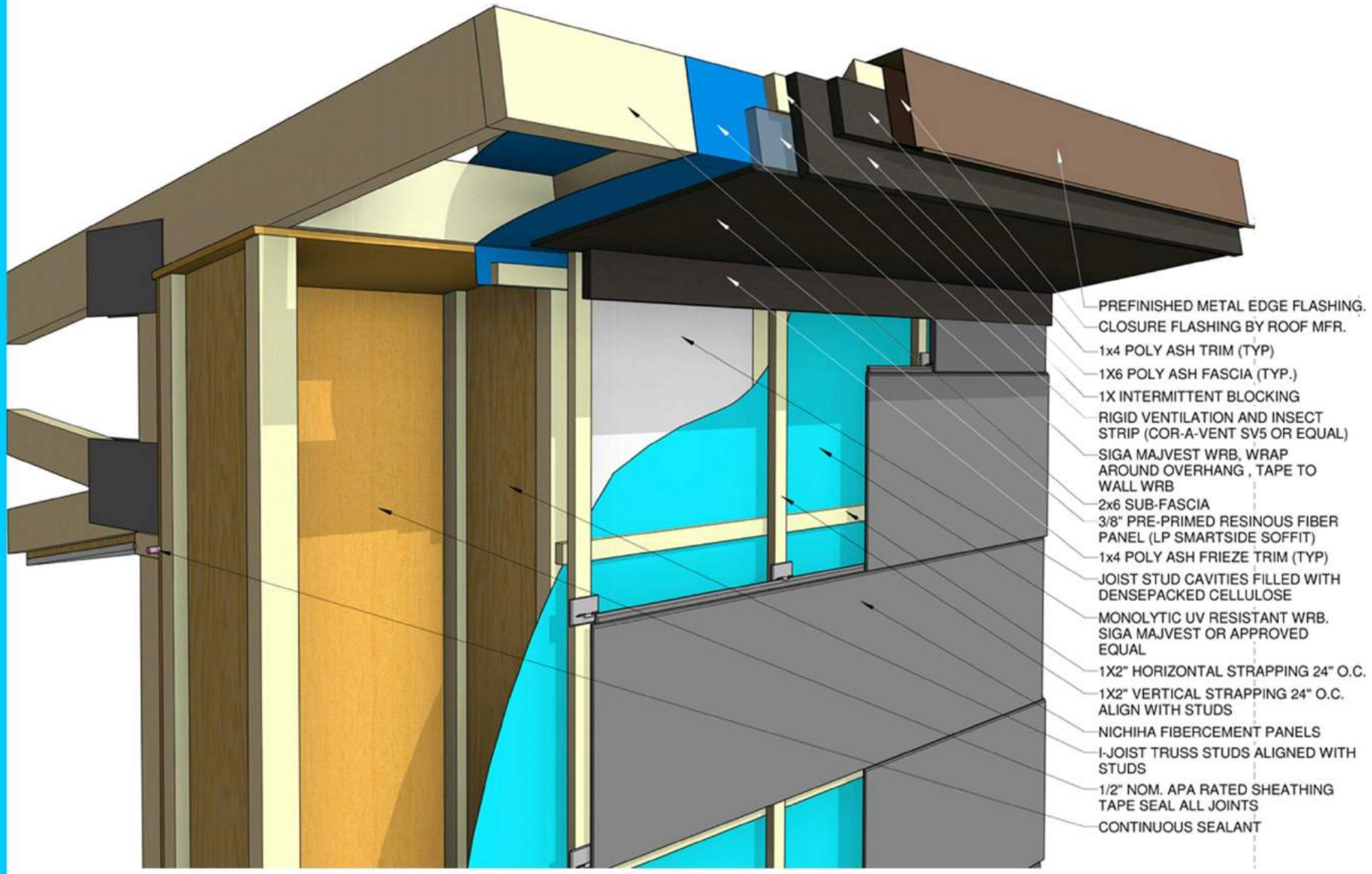
SILL SEAL GASKET AND CAPILLARY BREAK. (5 1/2" PROTECTO ENERGY PLATE LINER OR APPROVED EQUAL) SEAL TO VAPOR BARRIER.

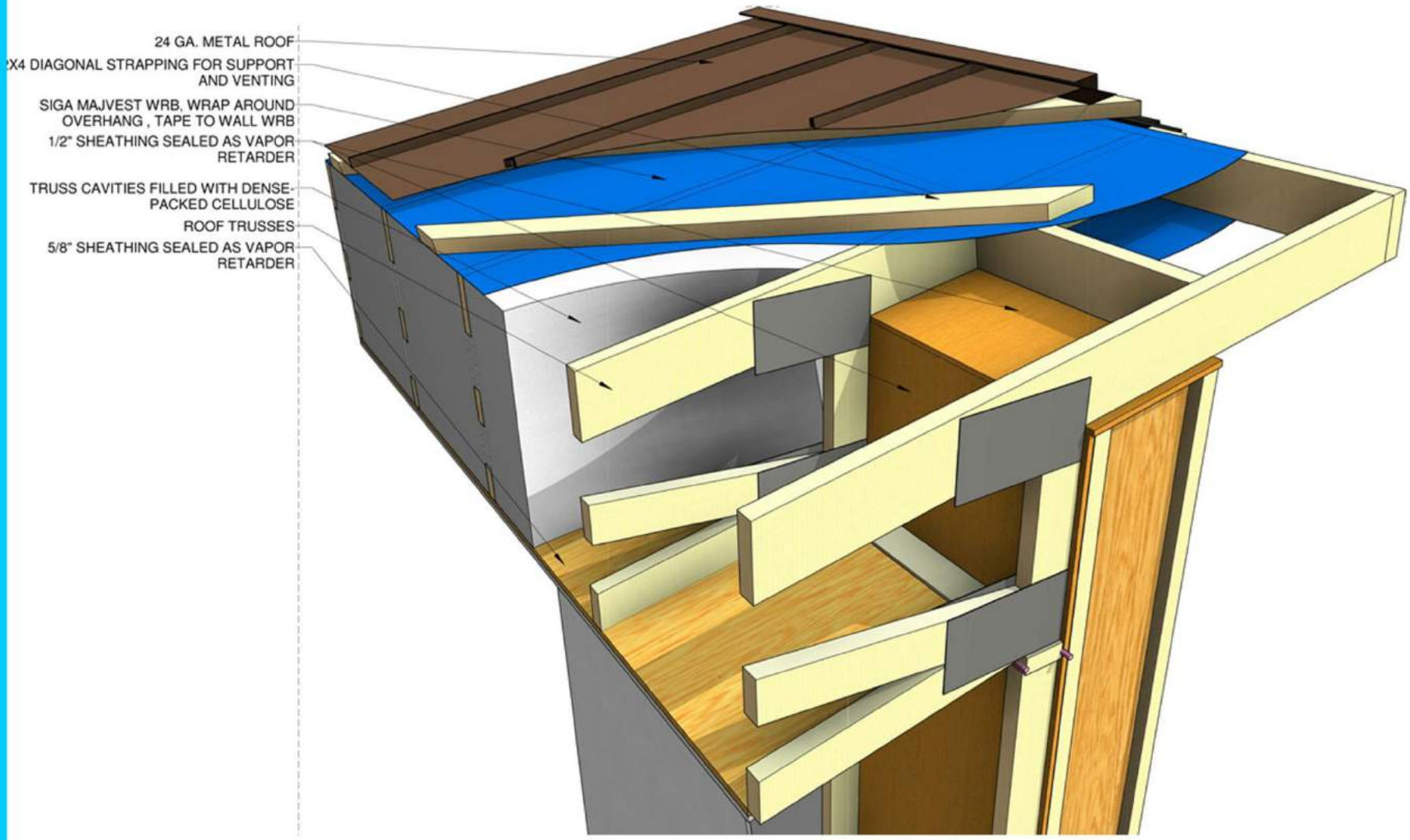
8" REINFORCED CONCRETE POLISHED SLAB - SEE STRUCTURAL DRAWINGS FOR SLAB REINFORCEMENT

REINFORCED POLY VAPOR BARRIER.

8" THICK SHEETS OF TYPE IX EPS FOAM WITH TAPED SEAMS

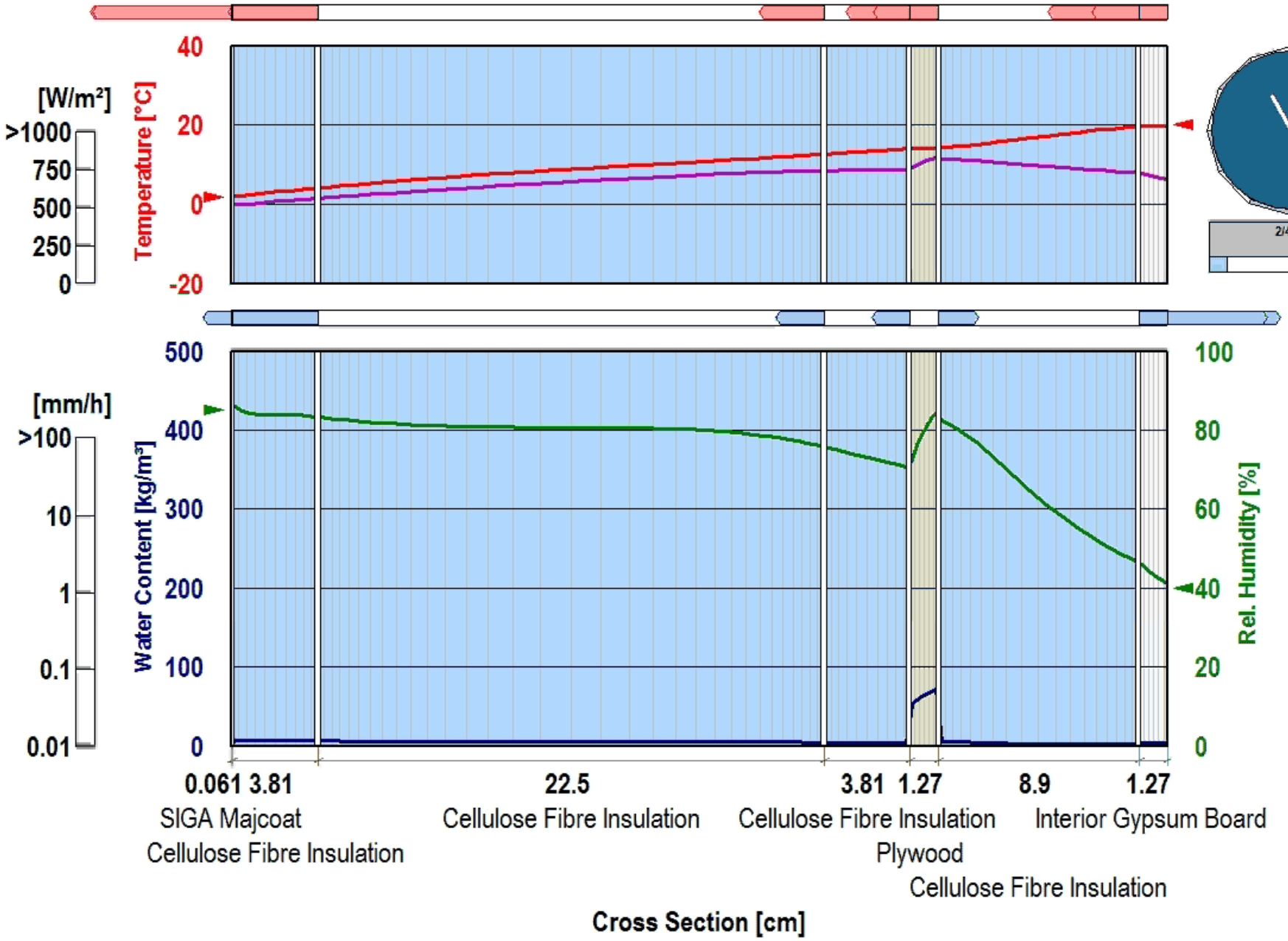

1/2" APA RATED SHEATHING SEAL AS VAPOR RETARDER
INTERIOR STUD CAVITIES FILLED WITH DENSE PACKED CELLULOSE, MINERAL WOOL, OR FORMALDEHYDE FREE FIBERGLASS BATT INSULATION
1/2" GWB
1/2" APA RATED SHEATHING SEAL AS VAPOR RETARDER
1/2"x3/4" ARCHITECTURAL Z SHADOW BEAD
1/2" PAINTED POPLAR TRIM BOARD
3/4" HARDWOOD FLOOR STAINED WITH STEELWOOL AND VINEGAR SOLUTION AND SEALED
3/4" ADVANTECH SUBFLOOR
WOOD I-JOIST FLOORING SYSTEM
I-JOIST TRUSS STUDS ALIGNED WITH STUDS

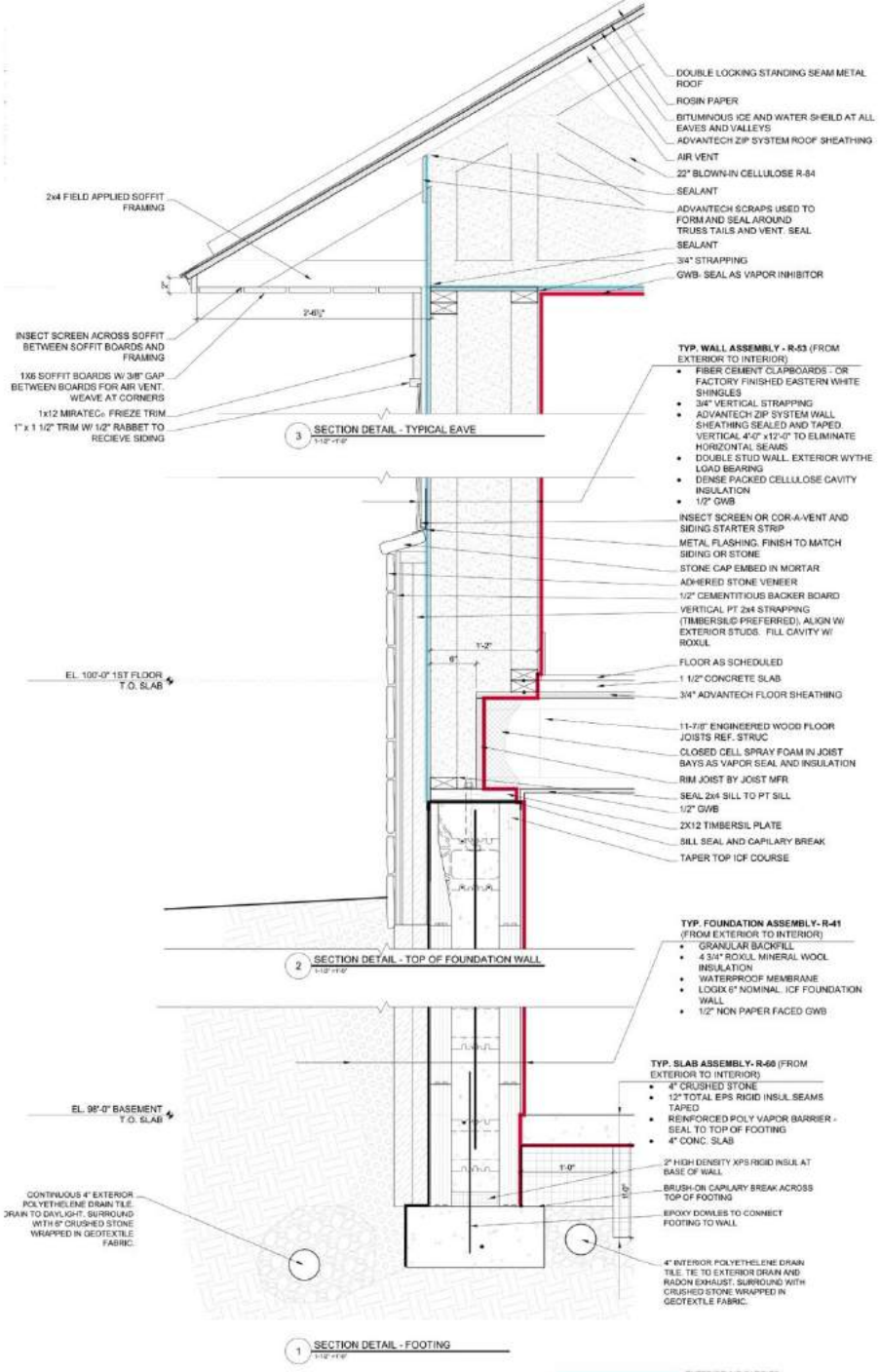

PREFINISHED METAL EDGE FLASHING.
CLOSURE FLASHING BY ROOF MFR.
1x4 POLY ASH TRIM (TYP)
1X6 POLY ASH FASCIA (TYP.)
1X INTERMITTENT BLOCKING
RIGID VENTILATION AND INSECT STRIP (COR-A-VENT SV5 OR EQUAL)
SIGA MAJVEST WRB, WRAP AROUND OVERHANG , TAPE TO WALL WRB
2x6 SUB-FASCIA
3/8" PRE-PRIMED RESINOUS FIBER PANEL (LP SMARTSIDE SOFFIT)
1x4 POLY ASH FRIEZE TRIM (TYP)
JOIST STUD CAVITIES FILLED WITH DENSEPACKED CELLULOSE
MONOLYTIC UV RESISTANT WRB. SIGA MAJVEST OR APPROVED EQUAL
1X2" HORIZONTAL STRAPPING 24" O.C.
1X2" VERTICAL STRAPPING 24" O.C. ALIGN WITH STUDS
NICHIHA FIBERCEMENT PANELS
I-JOIST TRUSS STUDS ALIGNED WITH STUDS
1/2" NOM. APA RATED SHEATHING TAPE SEAL ALL JOINTS
CONTINUOUS SEALANT


24 GA. METAL ROOF
2X4 DIAGONAL STRAPPING FOR SUPPORT AND VENTING
SIGA MAJVEST WRB, WRAP AROUND OVERHANG , TAPE TO WALL WRB
1/2" SHEATHING SEALED AS VAPOR RETARDER
TRUSS CAVITIES FILLED WITH DENSE-PACKED CELLULOSE
ROOF TRUSSES
5/8" SHEATHING SEALED AS VAPOR RETARDER


ZIPsystem
FROM THE CREATORS OF
AdvanTech Flooring

WUFI®Passive, Component 2: Walls, North (A0°, 1199.29 ft²)




DOUBLE LOCKING STANDING SEAM METAL ROOF
ROSIN PAPER
BITUMINOUS ICE AND WATER SHEILD AT ALL EAVES AND VALLEYS
ADVANTECH ZIP SYSTEM ROOF SHEATHING
AIR VENT
22" BLOWN-IN CELLULOSE R-84
SEALANT
ADVANTECH SCRAPS USED TO FORM AND SEAL AROUND TRUSS TAILS AND VENT. SEAL
SEALANT
3/4" STRAPPING
GWB- SEAL AS VAPOR INHIBITOR
2x4 FIELD APPLIED SOFFIT FRAMING
2'-4½"
INSECT SCREEN ACROSS SOFFIT BETWEEN SOFFIT BOARDS AND FRAMING
1X6 SOFFIT BOARDS W/ 3/8" GAP BETWEEN BOARDS FOR AIR VENT. WEAVE AT CORNERS
1x12 MIRATEC® FRIEZE TRIM
1" x 1 1/2" TRIM W/ 1/2" RABBET TO RECIEVE SIDING
3 SECTION DETAIL - TYPICAL EAVE
1-1/2" = 1'-0"
TYP. WALL ASSEMBLY - R-53 (FROM EXTERIOR TO INTERIOR)
FIBER CEMENT CLAPBOARDS - OR FACTORY FINISHED EASTERN WHITE SHINGLES
3/4" VERTICAL STRAPPING
ADVANTECH ZIP SYSTEM WALL SHEATHING SEALED AND TAPED VERTICAL 4'-0" x 12'-0" TO ELIMINATE HORIZONTAL SEAMS
DOUBLE STUD WALL. EXTERIOR WYTHE LOAD BEARING
DENSE PACKED CELLULOSE CAVITY INSULATION
1/2" GWB
INSECT SCREEN OR COR-A-VENT AND SIDING STARTER STRIP
METAL FLASHING. FINISH TO MATCH SIDING OR STONE
STONE CAP EMBED IN MORTAR
ADHERED STONE VENEER
1/2" CEMENTITIOUS BACKER BOARD
VERTICAL PT 2x4 STRAPPING (TIMBERSIL® PREFERRED), ALIGN W/ EXTERIOR STUDS. FILL CAVITY W/ ROXUL
1'-2"
6"
EL. 100'-0" 1ST FLOOR T.O. SLAB
FLOOR AS SCHEDULED
1 1/2" CONCRETE SLAB
3/4" ADVANTECH FLOOR SHEATHING
11-7/8" ENGINEERED WOOD FLOOR JOISTS REF. STRUC
CLOSED CELL SPRAY FOAM IN JOIST BAYS AS VAPOR SEAL AND INSULATION
RIM JOIST BY JOIST MFR
SEAL 2x4 SILL TO PT SILL
1/2" GWB
2X12 TIMBERSIL PLATE
SILL SEAL AND CAPILARY BREAK
TAPER TOP ICF COURSE
2 SECTION DETAIL - TOP OF FOUNDATION WALL
1-1/2" = 1'-0"
TYP. FOUNDATION ASSEMBLY- R-41 (FROM EXTERIOR TO INTERIOR)
GRANULAR BACKFILL
4 3/4" ROXUL MINERAL WOOL INSULATION
WATERPROOF MEMBRANE
LOGIX 6" NOMINAL. ICF FOUNDATION WALL
1/2" NON PAPER FACED GWB
TYP. SLAB ASSEMBLY- R-60 (FROM EXTERIOR TO INTERIOR)
4" CRUSHED STONE
12" TOTAL EPS RIGID INSUL SEAMS TAPED
REINFORCED POLY VAPOR BARRIER - SEAL TO TOP OF FOOTING
4" CONC. SLAB
EL. 98'-0" BASEMENT T.O. SLAB
1'-0"
2" HIGH DENSITY XPS RIGID INSUL AT BASE OF WALL
BRUSH-ON CAPILARY BREAK ACROSS TOP OF FOOTING
EPOXY DOWLES TO CONNECT FOOTING TO WALL
CONTINUOUS 4" EXTERIOR POLYETHELENE DRAIN TILE. DRAIN TO DAYLIGHT. SURROUND WITH 6" CRUSHED STONE WRAPPED IN GEOTEXTILE FABRIC.
4" INTERIOR POLYETHELENE DRAIN TILE. TIE TO EXTERIOR DRAIN AND RADON EXHAUST. SURROUND WITH CRUSHED STONE WRAPPED IN GEOTEXTILE FABRIC.
1 SECTION DETAIL - FOOTING
1-1/2" = 1'-0"
EXTERIOR AIR BARRIER
VAPOR RETARDER

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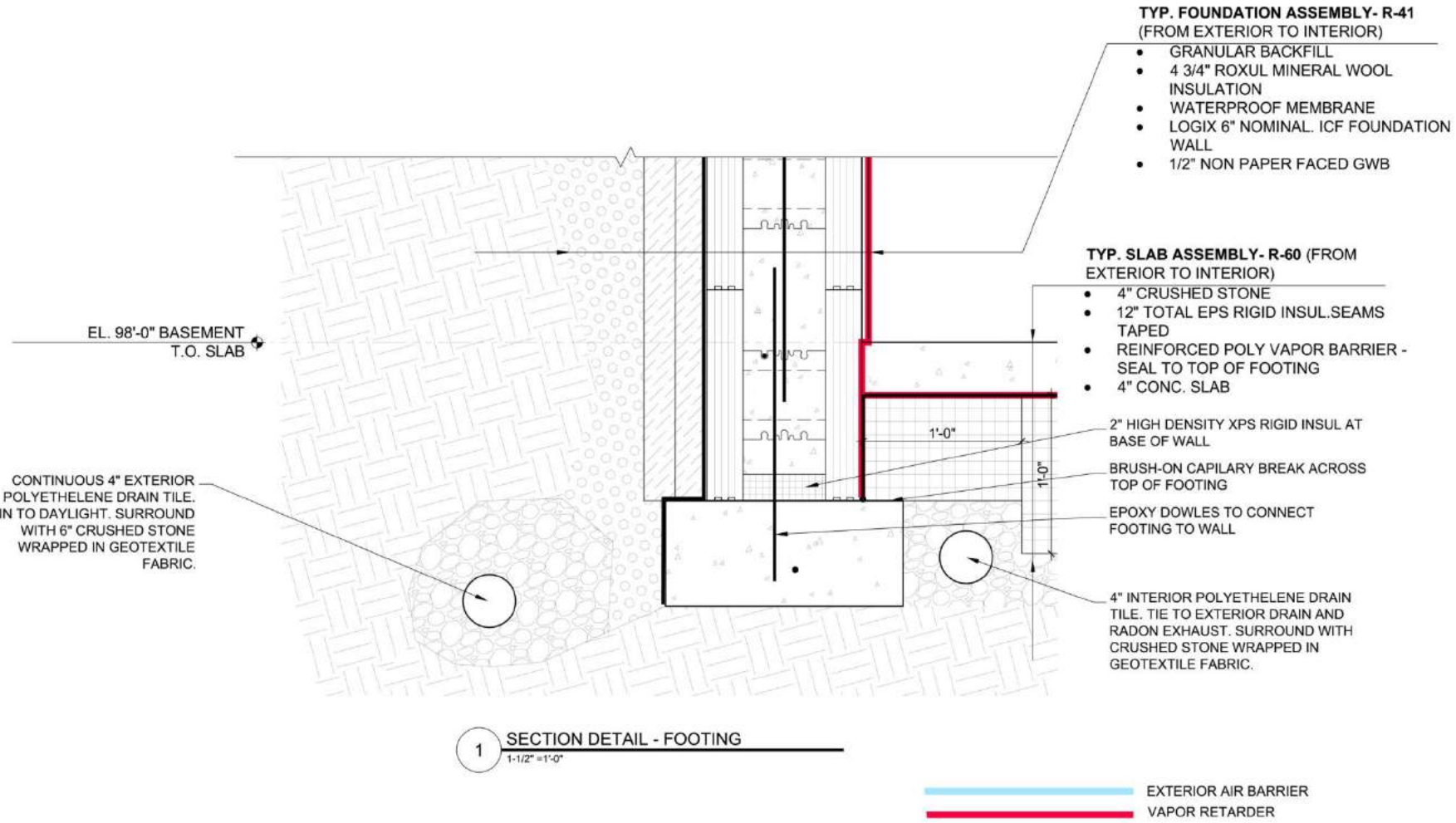
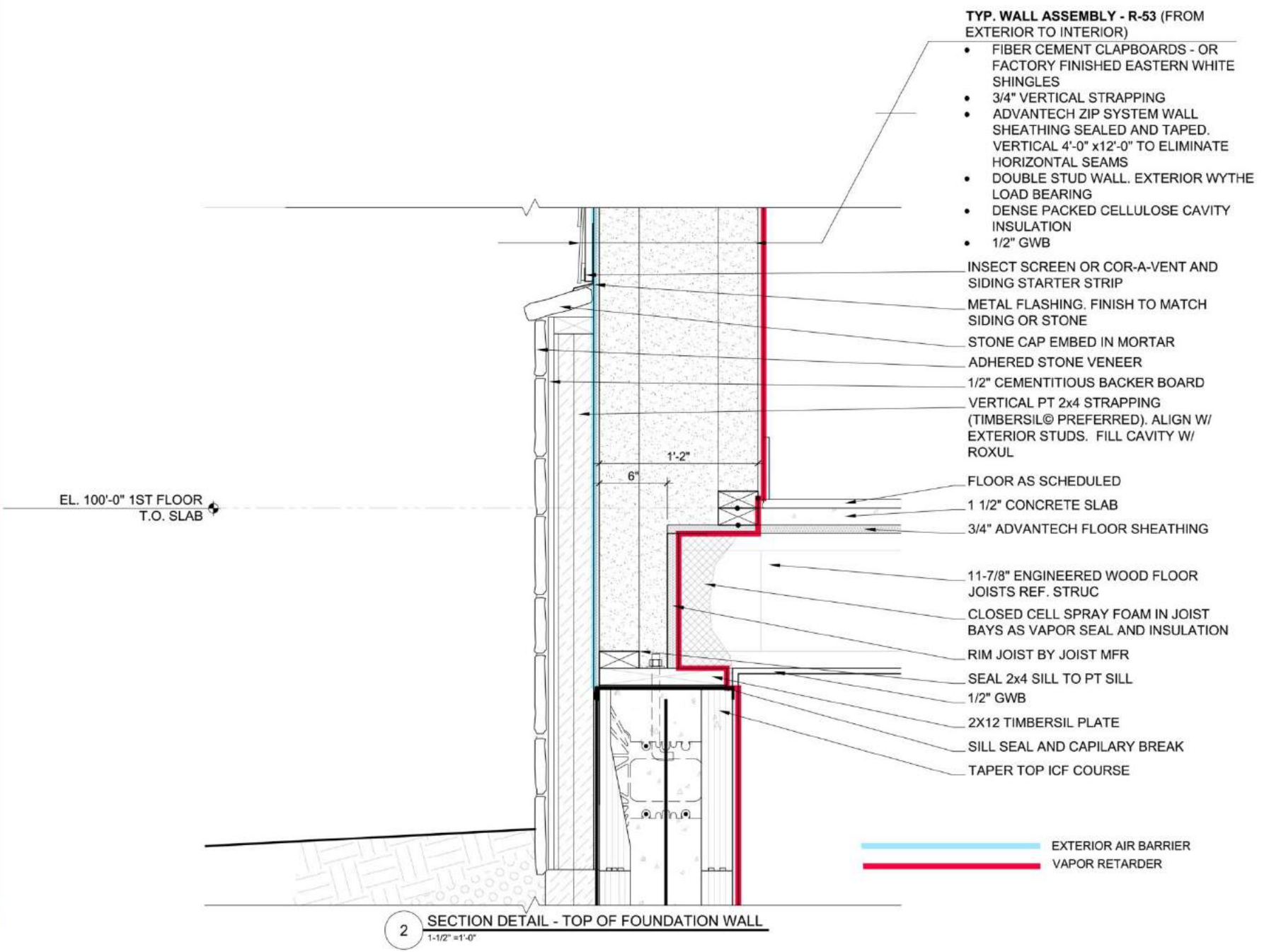


1 SECTION DETAIL - FOOTING
1-1/2" =1'-0"



2 SECTION DETAIL - TOP OF FOUNDATION WALL
1-1/2" =1'-0"

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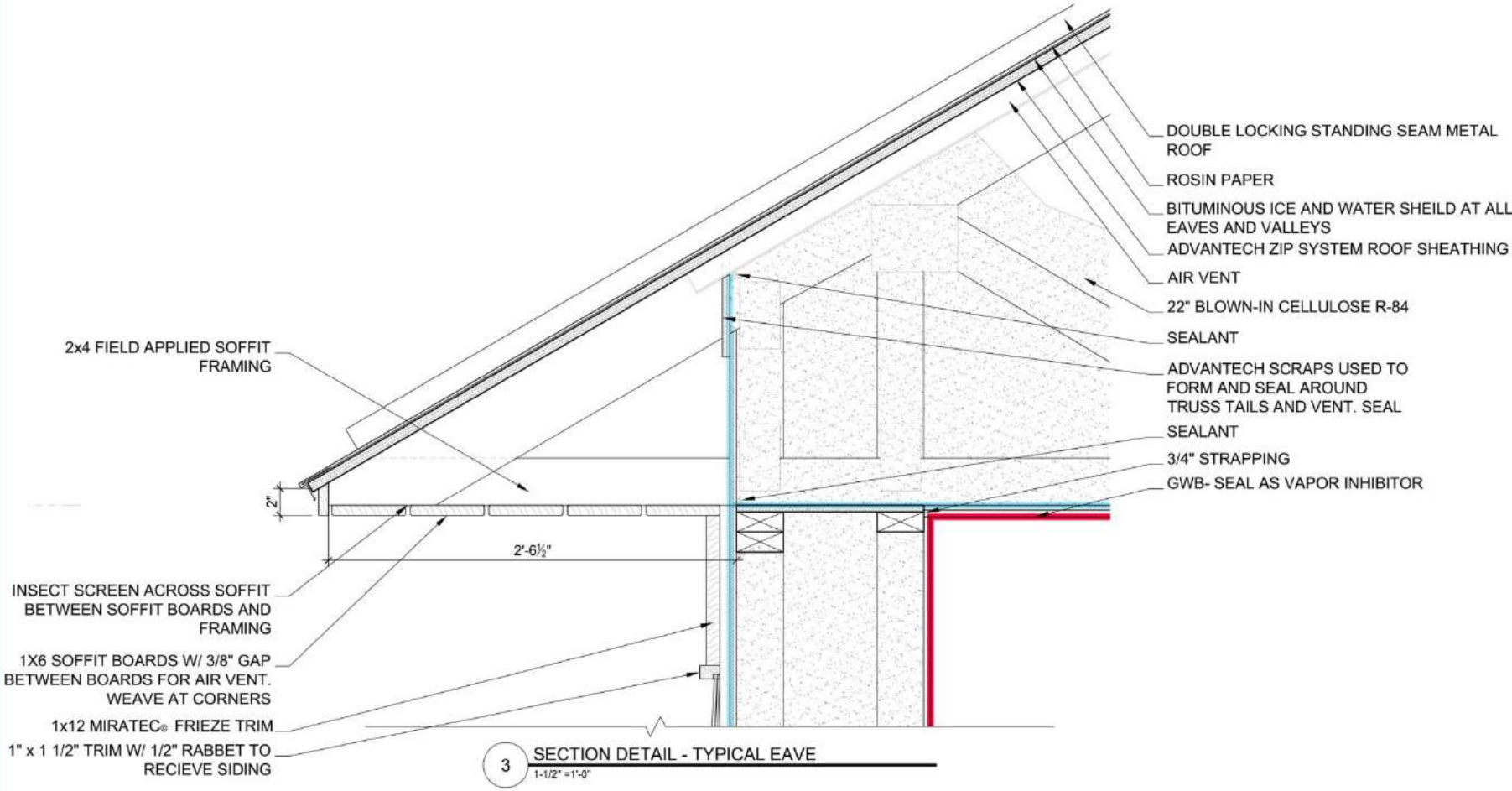

3 SECTION DETAIL - TYPICAL EAVE
1-1/2" =1'-0"

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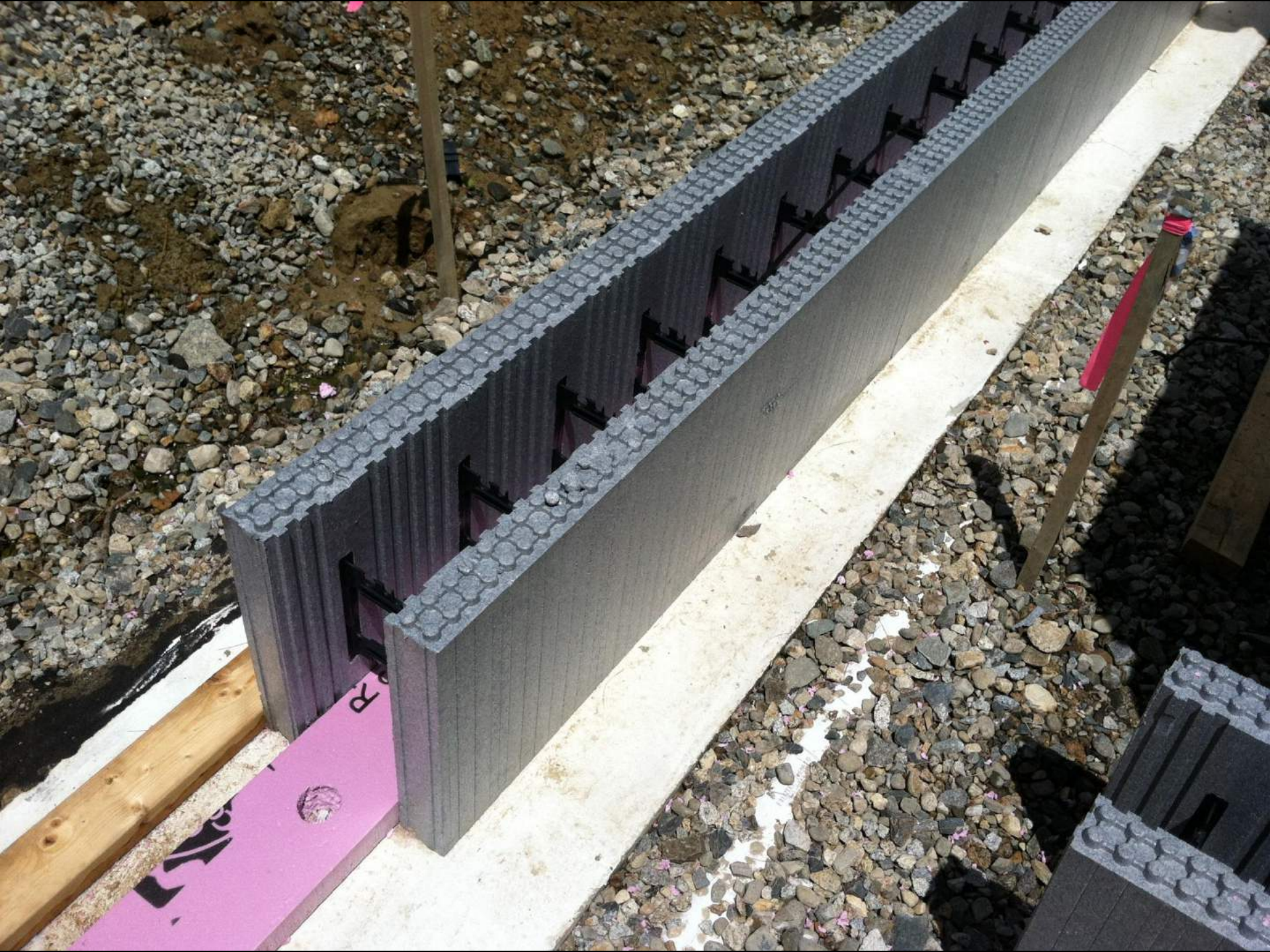


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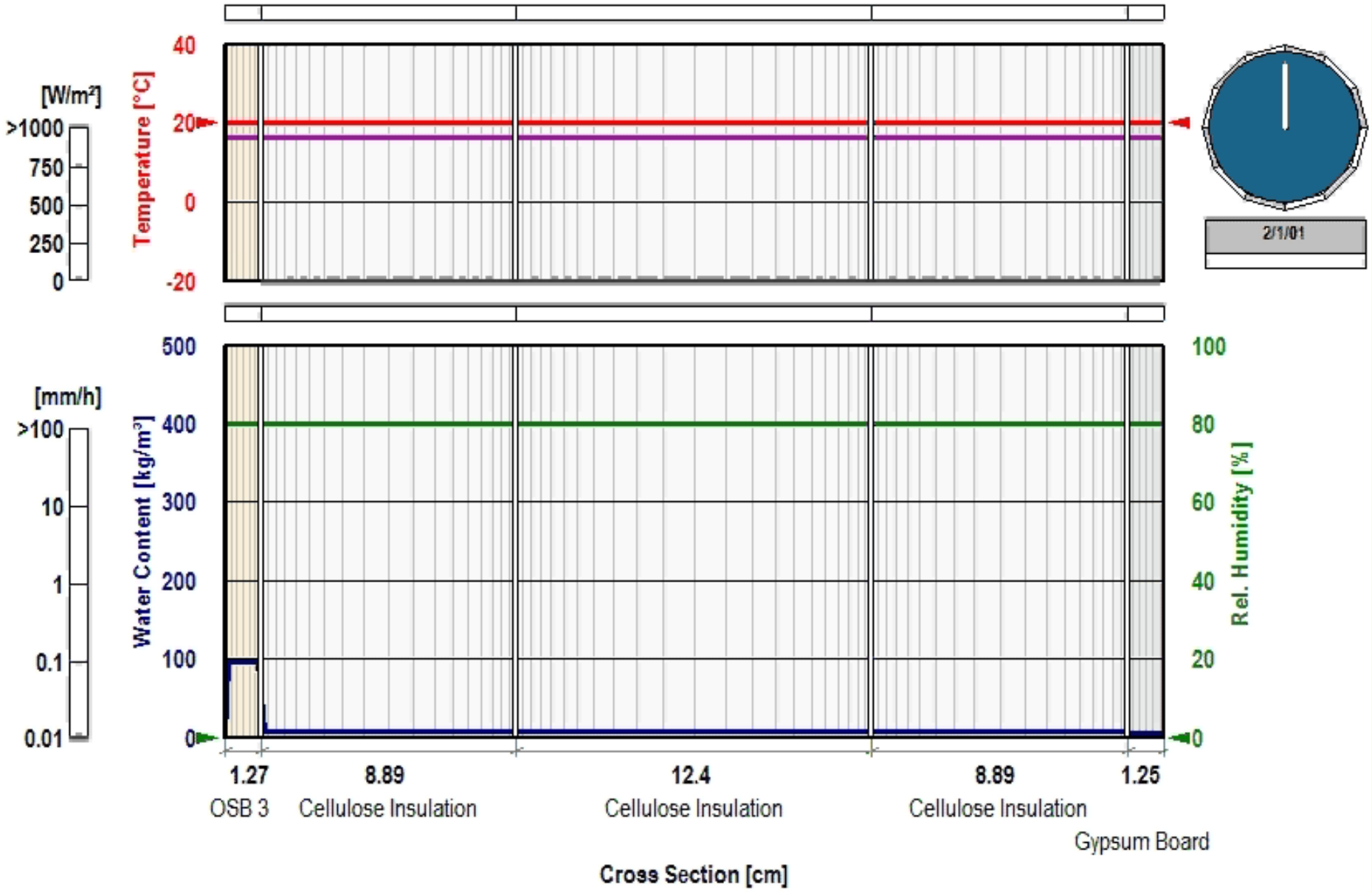
ROOF AND WALL


A RIGBY
STORAGE
PUR FILL 10 TR
EXTREMELY
FLAMMABLE


NELMA
S-DRY 2

WUFI®Passive, Component 2: Walls, North (A0°, 1199.29 ft²)



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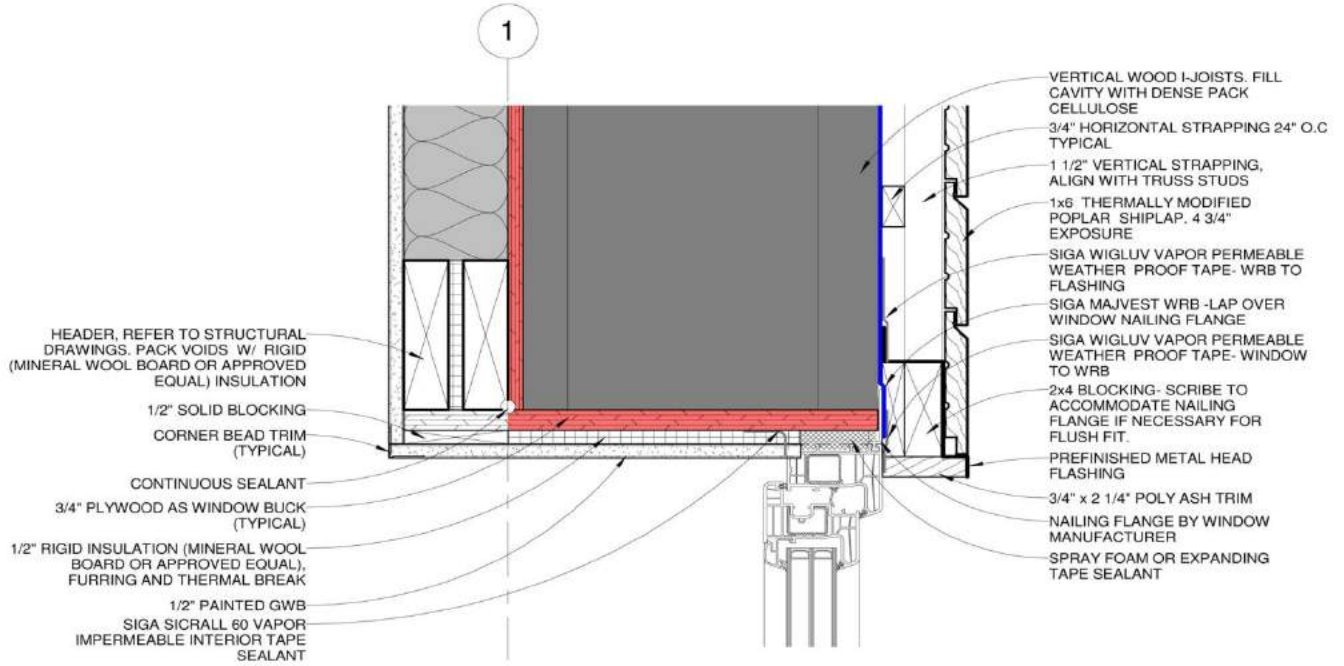
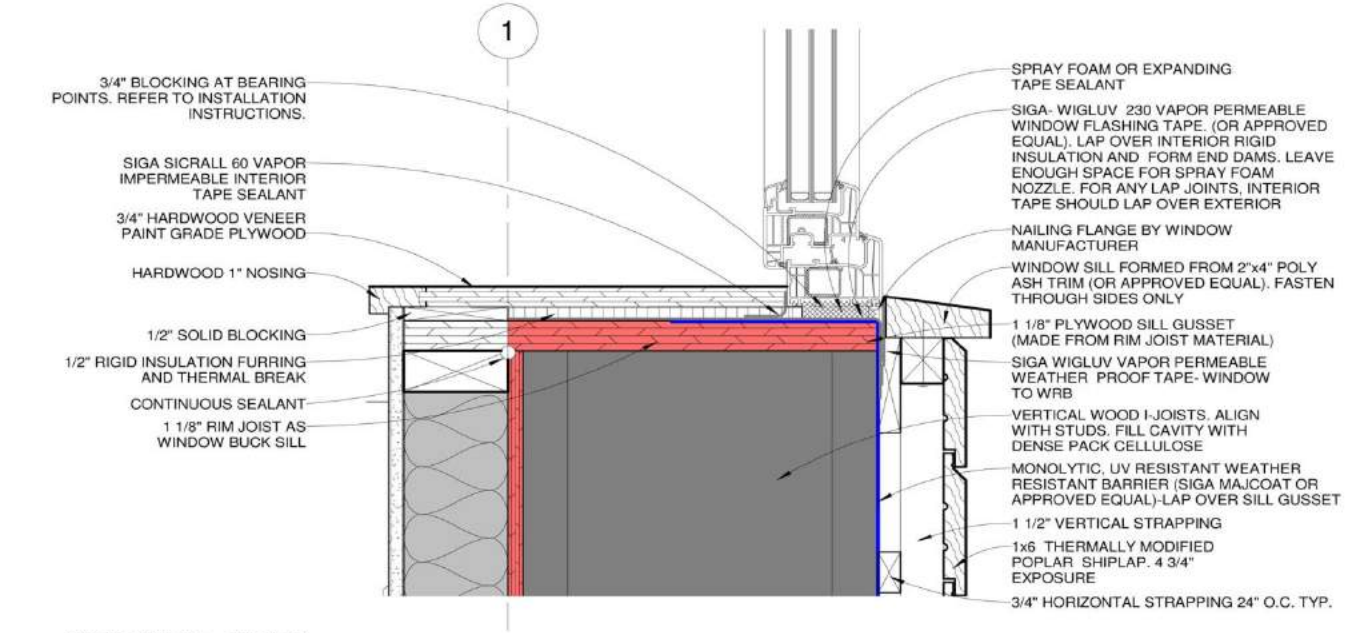
Windows



4 WINDOW HEAD - TYPICAL
3" = 1'-0"



3 WINDOW SILL - TYPICAL
3" = 1'-0"

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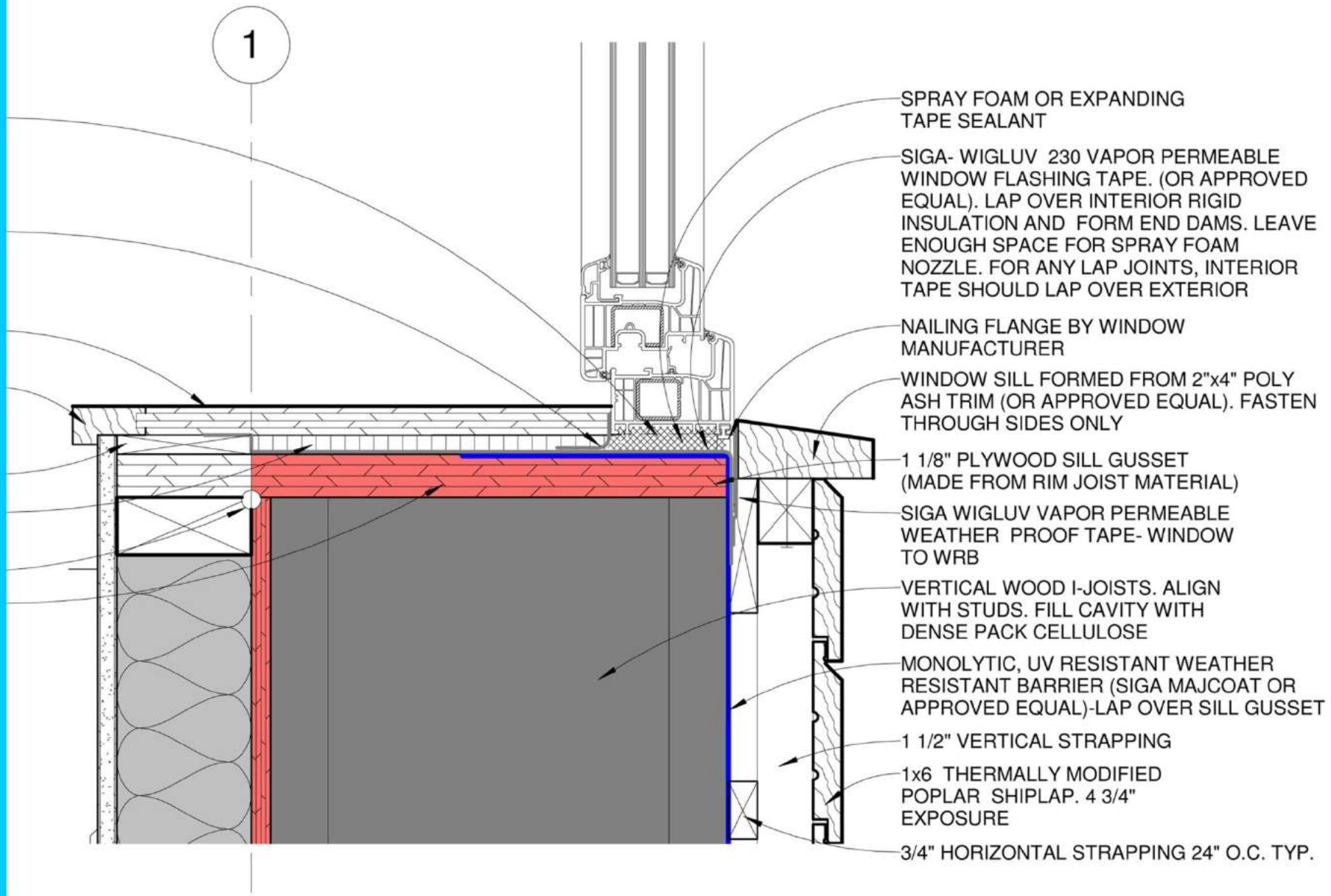
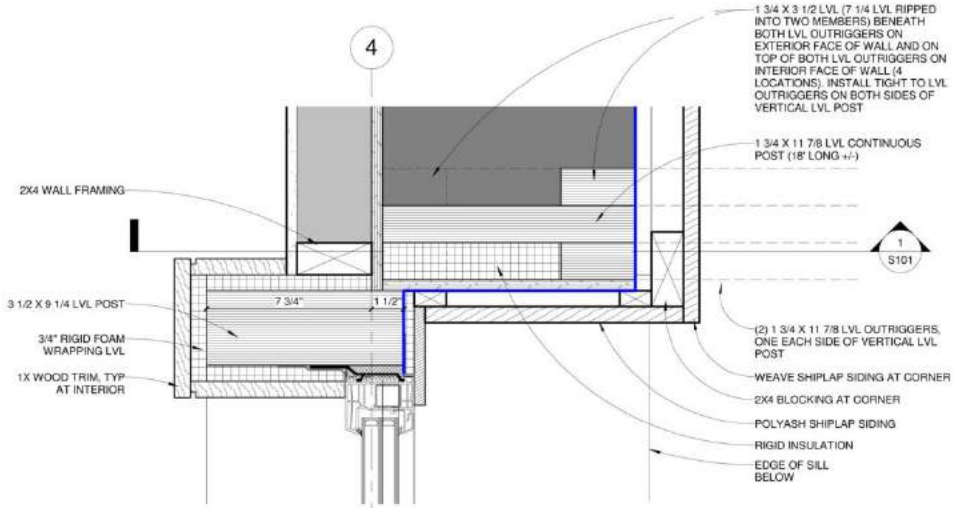
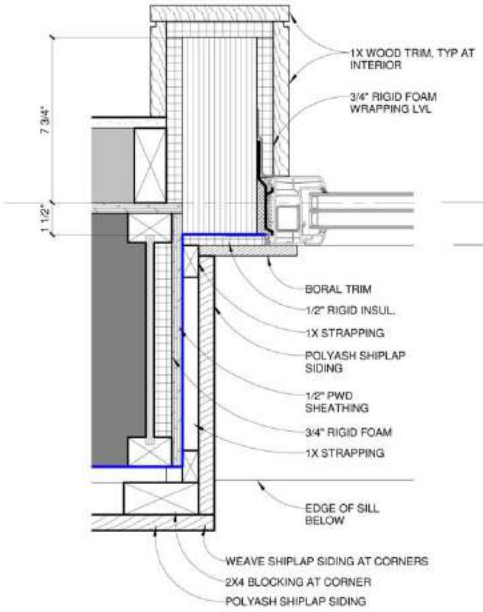
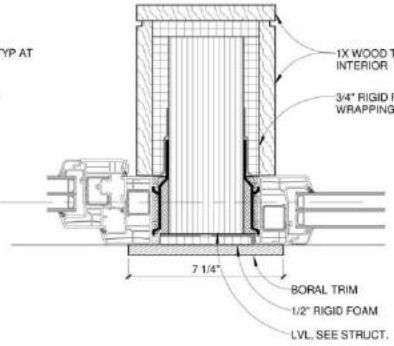

1
SPRAY FOAM OR EXPANDING TAPE SEALANT
SIGA- WIGLUV 230 VAPOR PERMEABLE WINDOW FLASHING TAPE. (OR APPROVED EQUAL). LAP OVER INTERIOR RIGID INSULATION AND FORM END DAMS. LEAVE ENOUGH SPACE FOR SPRAY FOAM NOZZLE. FOR ANY LAP JOINTS, INTERIOR TAPE SHOULD LAP OVER EXTERIOR
NAILING FLANGE BY WINDOW MANUFACTURER
WINDOW SILL FORMED FROM 2"x4" POLY ASH TRIM (OR APPROVED EQUAL). FASTEN THROUGH SIDES ONLY
1 1/8" PLYWOOD SILL GUSSET (MADE FROM RIM JOIST MATERIAL)
SIGA WIGLUV VAPOR PERMEABLE WEATHER PROOF TAPE- WINDOW TO WRB
VERTICAL WOOD I-JOISTS. ALIGN WITH STUDS. FILL CAVITY WITH DENSE PACK CELLULOSE
MONOLYTIC, UV RESISTANT WEATHER RESISTANT BARRIER (SIGA MAJCOAT OR APPROVED EQUAL)-LAP OVER SILL GUSSET
1 1/2" VERTICAL STRAPPING
1x6 THERMALLY MODIFIED POPLAR SHIPLAP. 4 3/4" EXPOSURE
3/4" HORIZONTAL STRAPPING 24" O.C. TYP.

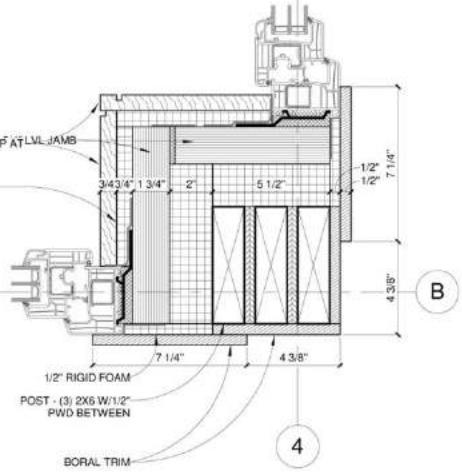


3 WINDOW WALL - CORNER DETAIL 2
3" = 1'-0"





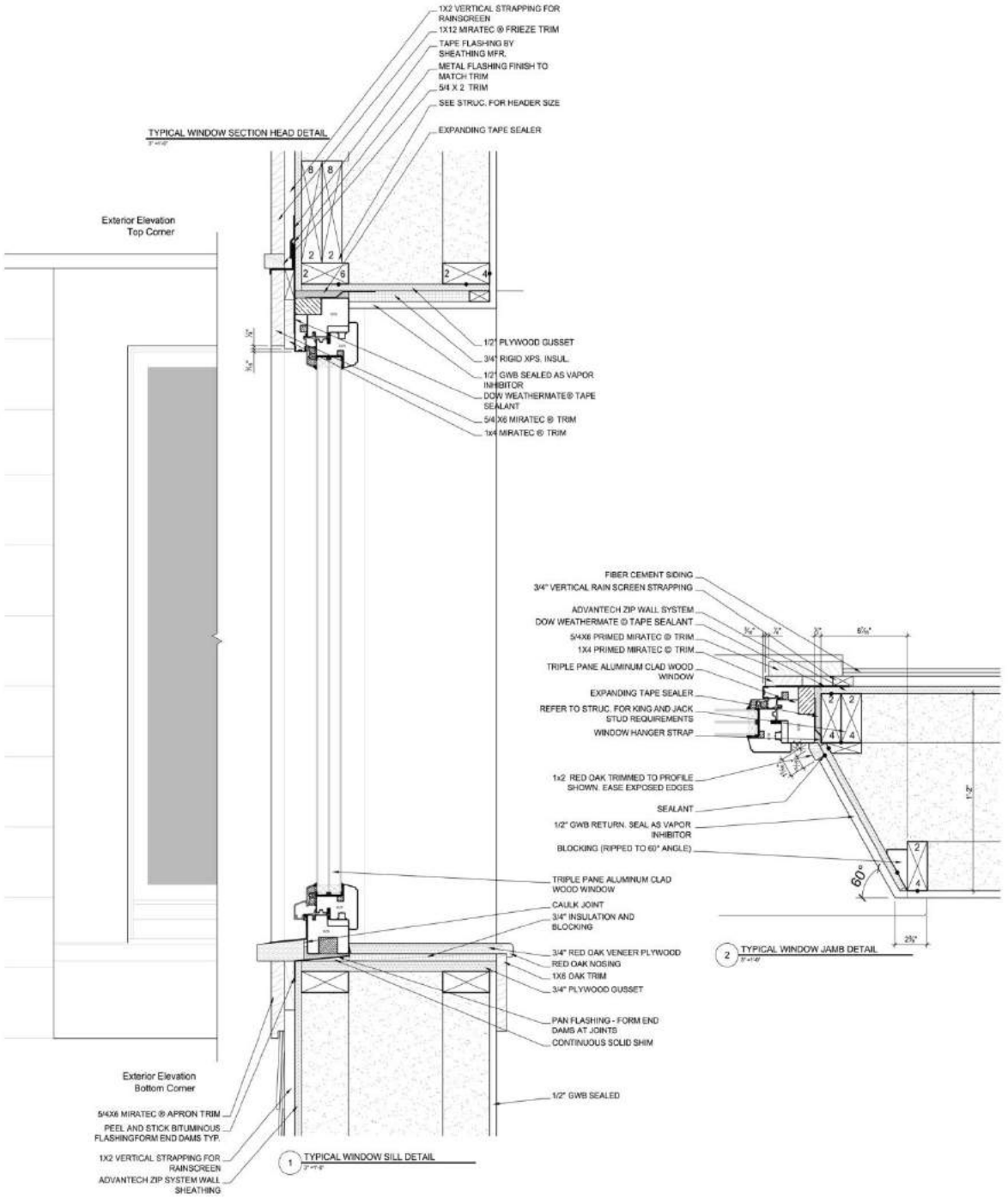
6 WINDOW WALL - MULLION DETAIL
3" = 1'-0"



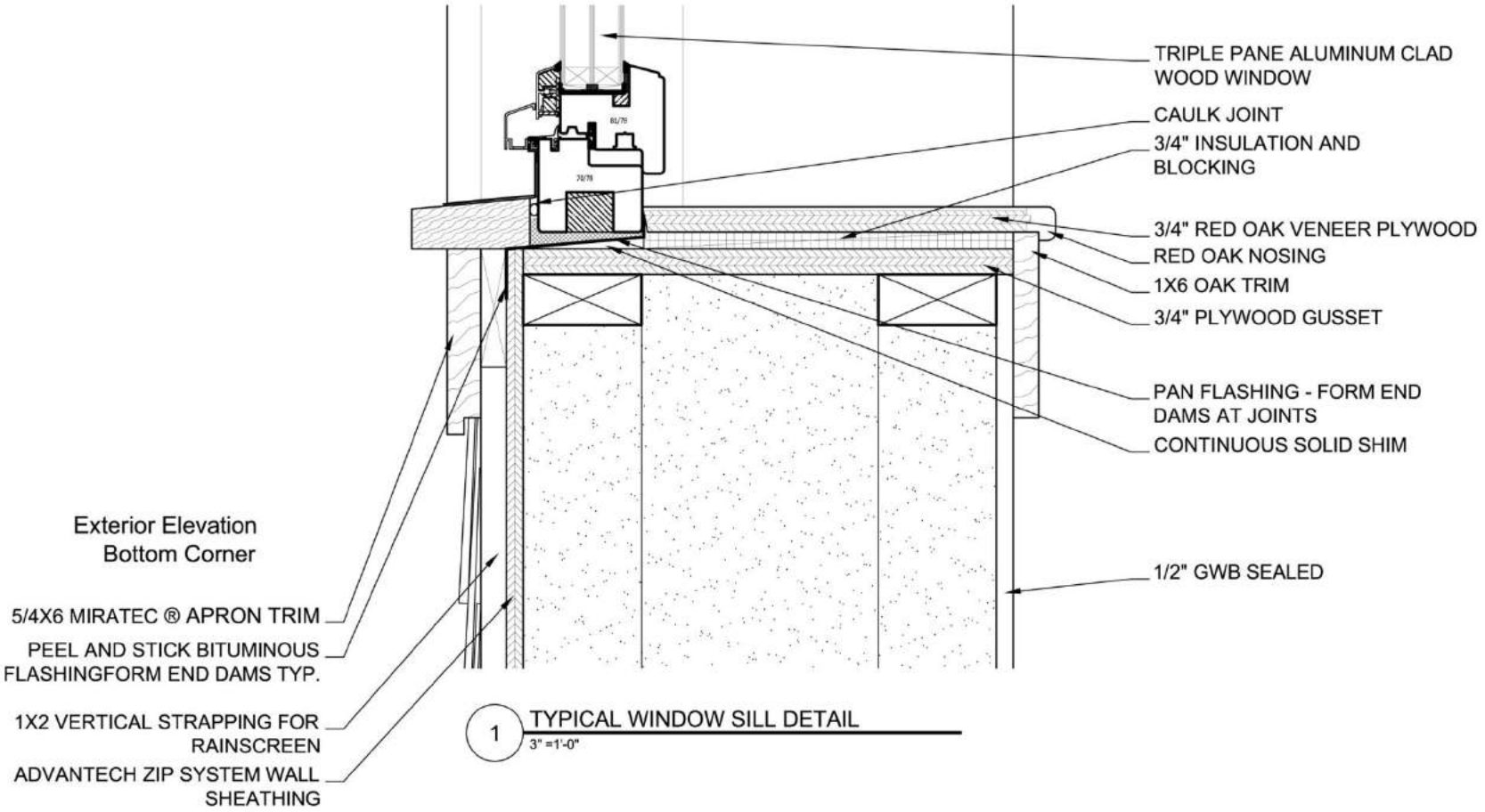
7 WINDOW WALL-CORNER DETAIL
3" = 1'-0"

5 WINDOW WALL - MULLION AT TRUSS WALL
3" = 1'-0"

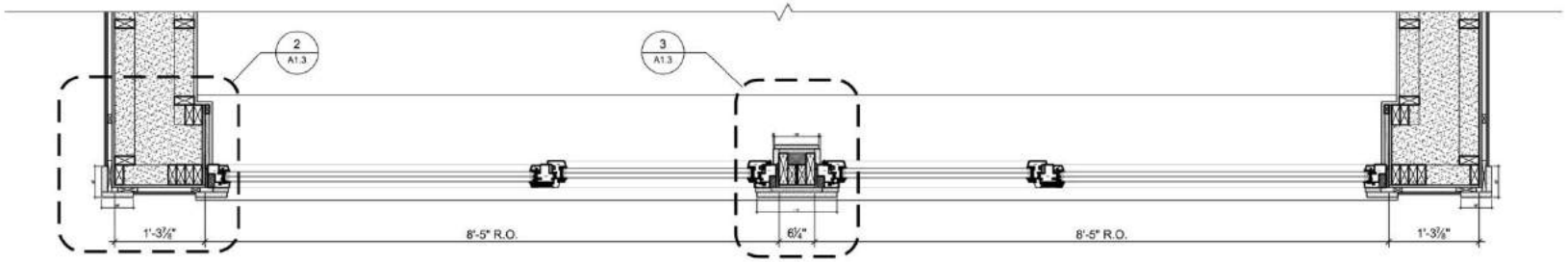
BRBURN


1X2 VERTICAL STRAPPING FOR RAINSCREEN
1X12 MIRATEC ® FRIEZE TRIM
TAPE FLASHING BY SHEATHING MFR.
METAL FLASHING FINISH TO MATCH TRIM
5/4 X 2 TRIM
SEE STRUC. FOR HEADER SIZE
EXPANDING TAPE SEALER
TYPICAL WINDOW SECTION HEAD DETAIL
Exterior Elevation Top Corner
1/2" PLYWOOD GUSSET
3/4" RIGID XPS. INSUL.
1/2" GWB SEALED AS VAPOR INHIBITOR
DOW WEATHERMATE® TAPE SEALANT
5/4X6 MIRATEC ® TRIM
1X4 MIRATEC ® TRIM
FIBER CEMENT SIDING
3/4" VERTICAL RAIN SCREEN STRAPPING
ADVANTECH ZIP WALL SYSTEM
DOW WEATHERMATE © TAPE SEALANT
5/4X6 PRIMED MIRATEC © TRIM
1X4 PRIMED MIRATEC © TRIM
TRIPLE PANE ALUMINUM CLAD WOOD WINDOW
EXPANDING TAPE SEALER
REFER TO STRUC. FOR KING AND JACK STUD REQUIREMENTS
WINDOW HANGER STRAP
1x2 RED OAK TRIMMED TO PROFILE SHOWN. EASE EXPOSED EDGES
SEALANT
1/2" GWB RETURN. SEAL AS VAPOR INHIBITOR
BLOCKING (RIPPED TO 60° ANGLE)
60°
2 TYPICAL WINDOW JAMB DETAIL
TRIPLE PANE ALUMINUM CLAD WOOD WINDOW
CAULK JOINT
3/4" INSULATION AND BLOCKING
3/4" RED OAK VENEER PLYWOOD
RED OAK NOSING
1X6 OAK TRIM
3/4" PLYWOOD GUSSET
PAN FLASHING - FORM END DAMS AT JOINTS
CONTINUOUS SOLID SHIM
1/2" GWB SEALED
Exterior Elevation Bottom Corner
5/4X6 MIRATEC ® APRON TRIM
PEEL AND STICK BITUMINOUS FLASHINGFORM END DAMS TYP.
1X2 VERTICAL STRAPPING FOR RAINSCREEN
ADVANTECH ZIP SYSTEM WALL SHEATHING
1 TYPICAL WINDOW SILL DETAIL

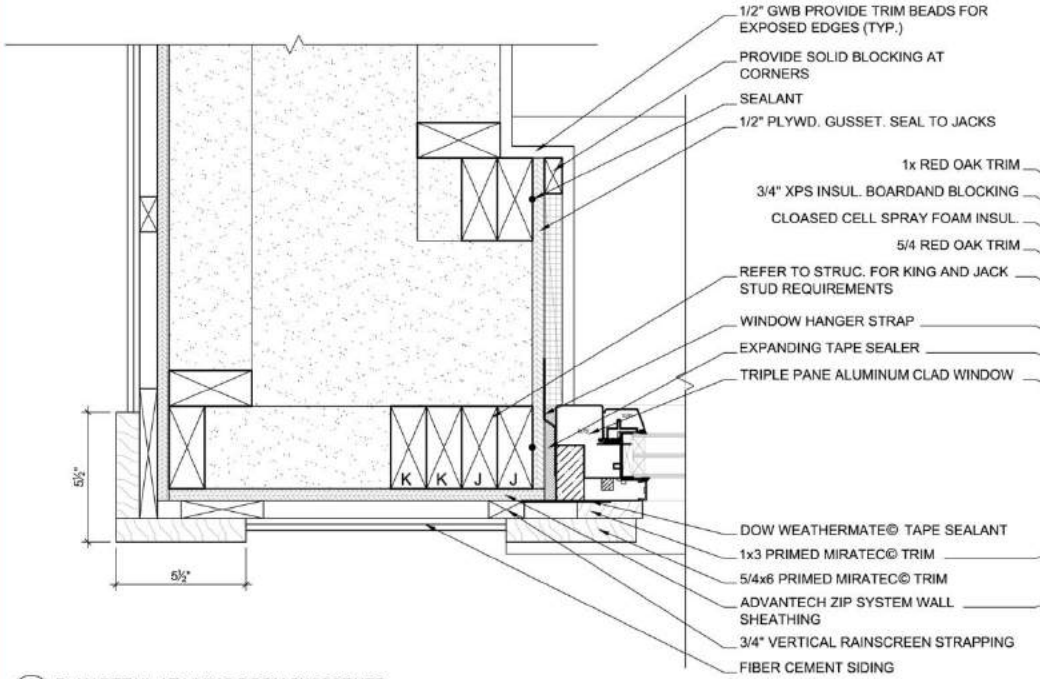
BRIBURN


TRIPLE PANE ALUMINUM CLAD WOOD WINDOW
CAULK JOINT
3/4" INSULATION AND BLOCKING
3/4" RED OAK VENEER PLYWOOD
RED OAK NOSING
1X6 OAK TRIM
3/4" PLYWOOD GUSSET
PAN FLASHING - FORM END DAMS AT JOINTS
CONTINUOUS SOLID SHIM
1/2" GWB SEALED
Exterior Elevation
Bottom Corner
5/4X6 MIRATEC ® APRON TRIM
PEEL AND STICK BITUMINOUS FLASHINGFORM END DAMS TYP.
1X2 VERTICAL STRAPPING FOR RAINSCREEN
ADVANTECH ZIP SYSTEM WALL SHEATHING
1
TYPICAL WINDOW SILL DETAIL
3" =1'-0"

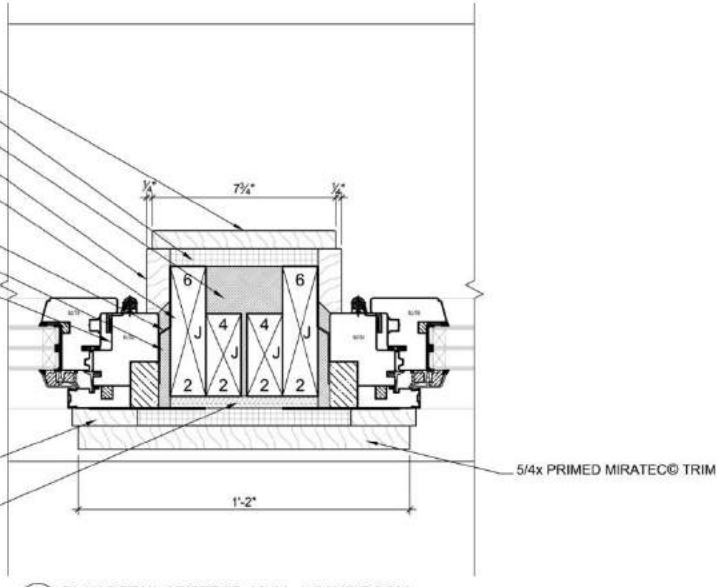
BRIBURN



1 PLAN DETAIL AT LIVING ROOM SOUTH WALL
3/4" = 1'-0"



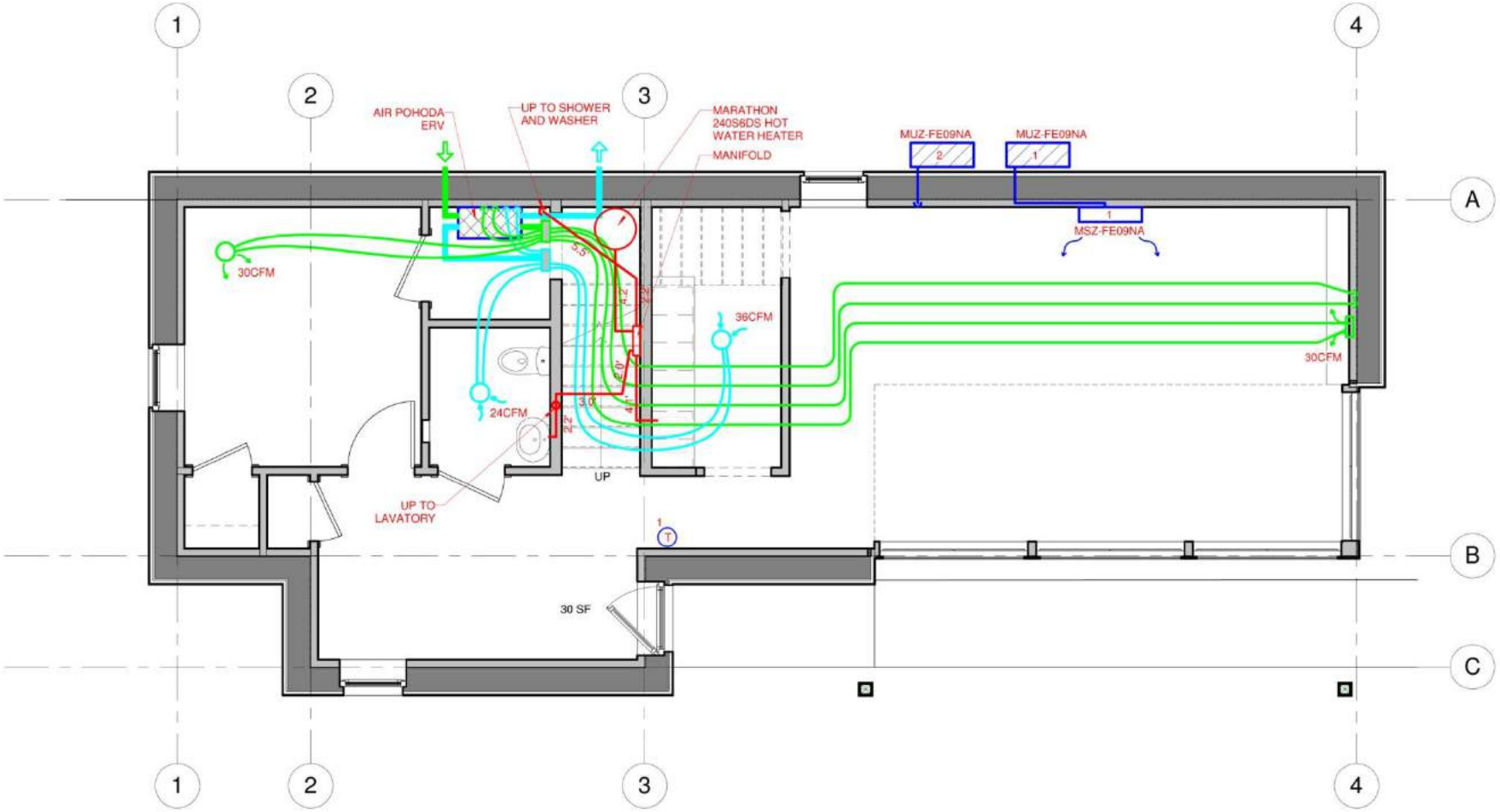
2 PLAN DETAIL AT LIVING ROOM SW CORNER
1 1/2" = 1'-0"



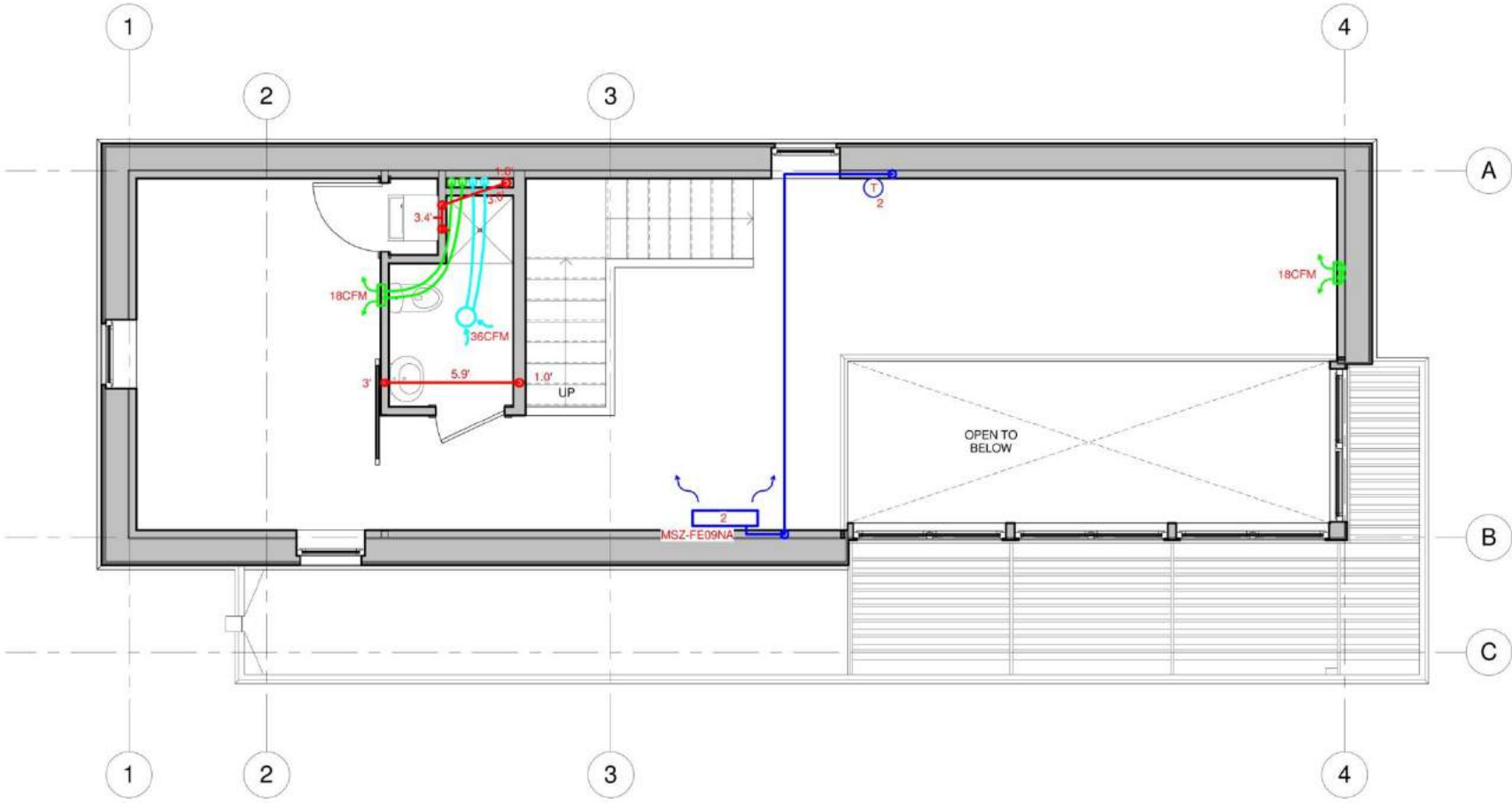
3 PLAN DETAIL AT STRUC. MULL - LIVING ROOM
1 1/2" = 1'-0"

BRIBURN

HVAC

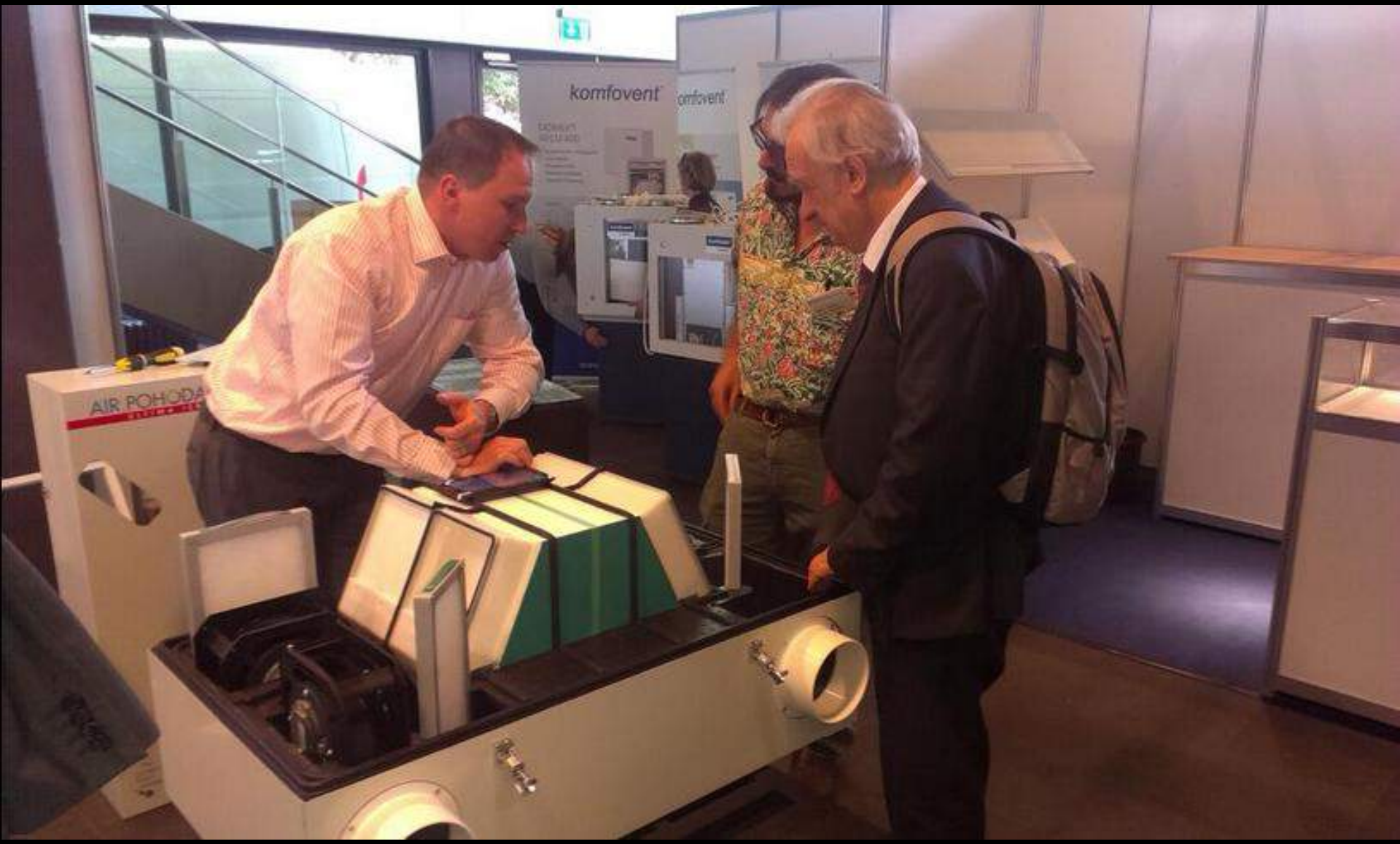


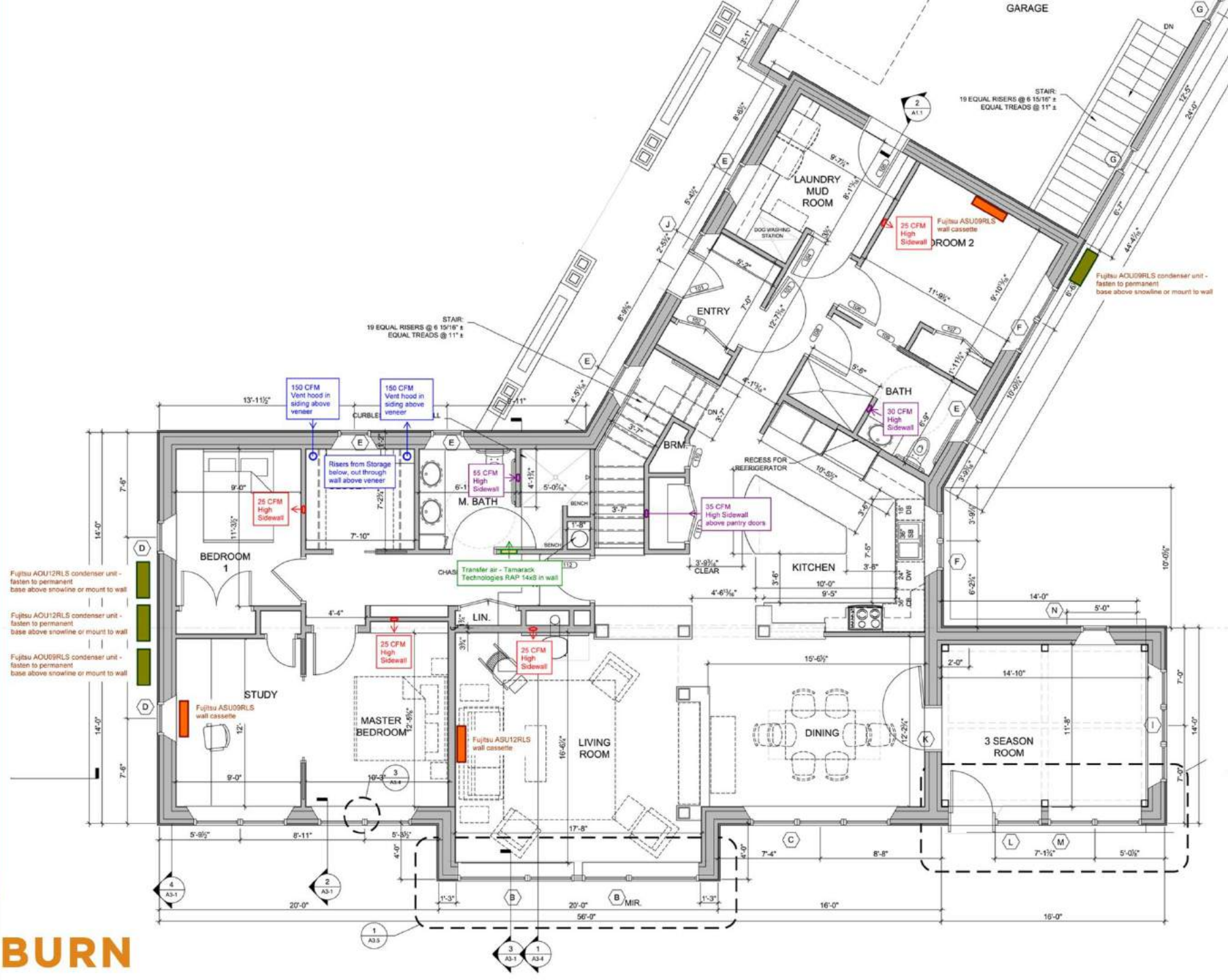
1 1ST FLOOR PLAN - MECHANICAL
1/4" = 1'-0"



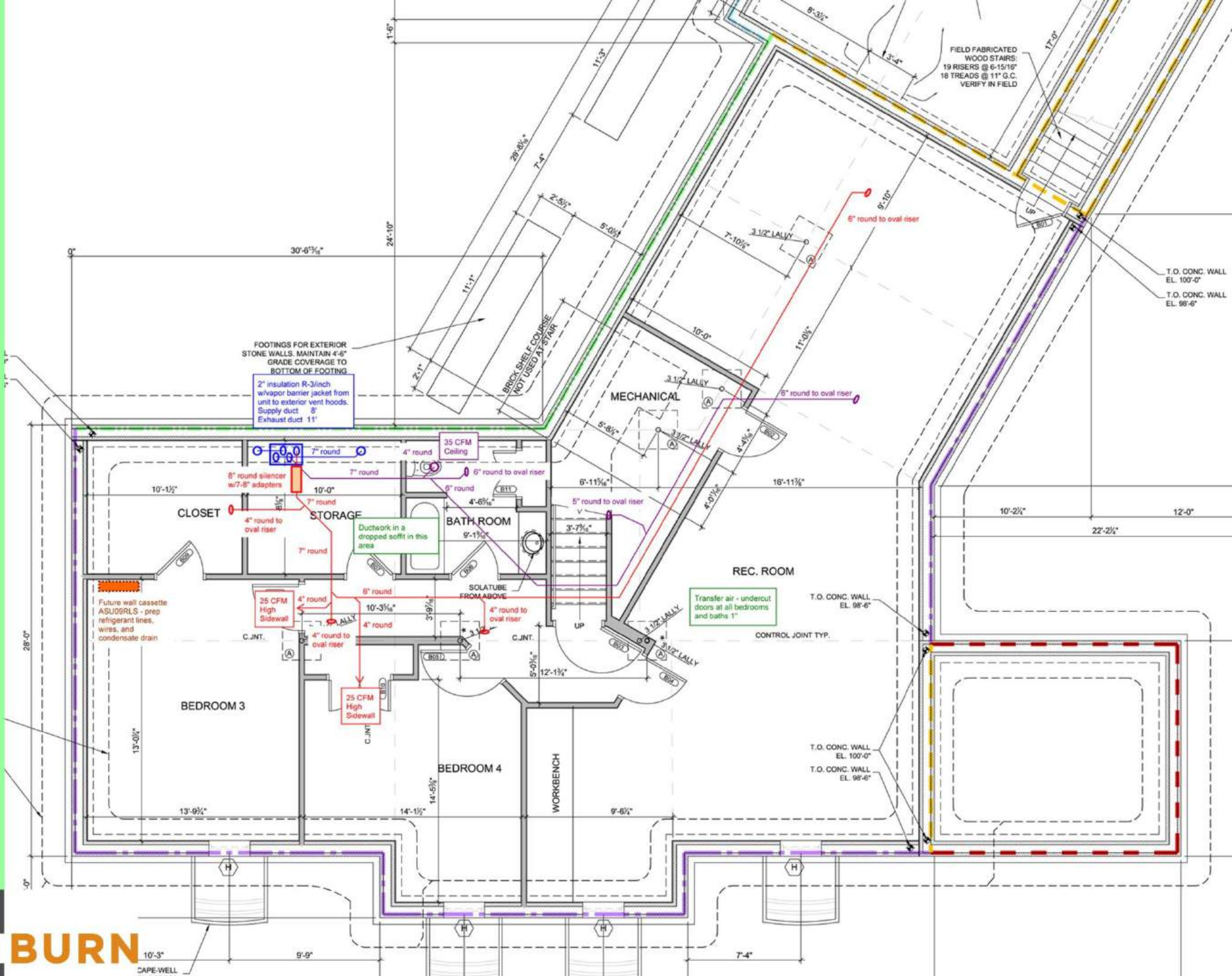
2 2ND FLOOR PLAN - Mechanical
1/4" = 1'-0"


AIR POHODA


komfovent
AIR POHODA


GARAGE
STAIR:
19 EQUAL RISERS @ 6 15/16" ±
EQUAL TREADS @ 11" ±
LAUNDRY
MUD
ROOM
DOG WASHING STATION
25 CFM
High
Sidewall
Fujitsu ASU09RLS
wall cassette
ROOM 2
Fujitsu AOU09RLS condenser unit -
fasten to permanent
base above snowline or mount to wall
ENTRY
STAIR:
19 EQUAL RISERS @ 6 15/16" ±
EQUAL TREADS @ 11" ±
BATH
30 CFM
High
Sidewall
150 CFM
Vent hood in
siding above
veneer
150 CFM
Vent hood in
siding above
veneer
BRM.
RECESS FOR
REFRIGERATOR
Risers from Storage
below, out through
wall above veneer
55 CFM
High
Sidewall
M. BATH
35 CFM
High Sidewall
above pantry doors
25 CFM
High
Sidewall
BEDROOM
1
Transfer air - Tamarack
Technologies RAP 14x8 in wall
KITCHEN
CLEAR
Fujitsu AOU12RLS condenser unit -
fasten to permanent
base above snowline or mount to wall
Fujitsu AOU12RLS condenser unit -
fasten to permanent
base above snowline or mount to wall
Fujitsu AOU09RLS condenser unit -
fasten to permanent
base above snowline or mount to wall
LIN.
25 CFM
High
Sidewall
25 CFM
High
Sidewall
STUDY
Fujitsu ASU09RLS
wall cassette
MASTER
BEDROOM
Fujitsu ASU12RLS
wall cassette
LIVING
ROOM
DINING
3 SEASON
ROOM
MIR.

BRBURN


FIELD FABRICATED WOOD STAIRS: 19 RISERS @ 6-15/16" 18 TREADS @ 11" O.C. VERIFY IN FIELD
T.O. CONC. WALL EL. 100'-0"
T.O. CONC. WALL EL. 98'-6"
6" round to oval riser
3 1/2" LALLY
FOOTINGS FOR EXTERIOR STONE WALLS. MAINTAIN 4'-6" GRADE COVERAGE TO BOTTOM OF FOOTING
BRICK SHELF COURSE NOT USED AT STAIR
2" insulation R-3/inch w/vapor barrier jacket from unit to exterior vent hoods. Supply duct 8' Exhaust duct 11'
MECHANICAL
6" round to oval riser
7" round
4" round
35 CFM Ceiling
8" round silencer w/7-8" adapters
7" round
6" round to oval riser
6" round
5" round to oval riser
CLOSET
STORAGE
BATH ROOM
4" round to oval riser
Ductwork in a dropped soffit in this area
7" round
REC. ROOM
SOLATUBE FROM ABOVE
6" round
Future wall cassette ASU09RLS - prep refrigerant lines, wires, and condensate drain
25 CFM High Sidewall
4" round
4" round to oval riser
4" round to oval riser
4" round
Transfer air - undercut doors at all bedrooms and baths 1"
CONTROL JOINT TYP.
C.JNT.
UP
25 CFM High Sidewall
BEDROOM 3
BEDROOM 4
WORKBENCH
CAPE-WELL

BRIBURN


NORBERT

BRBURN

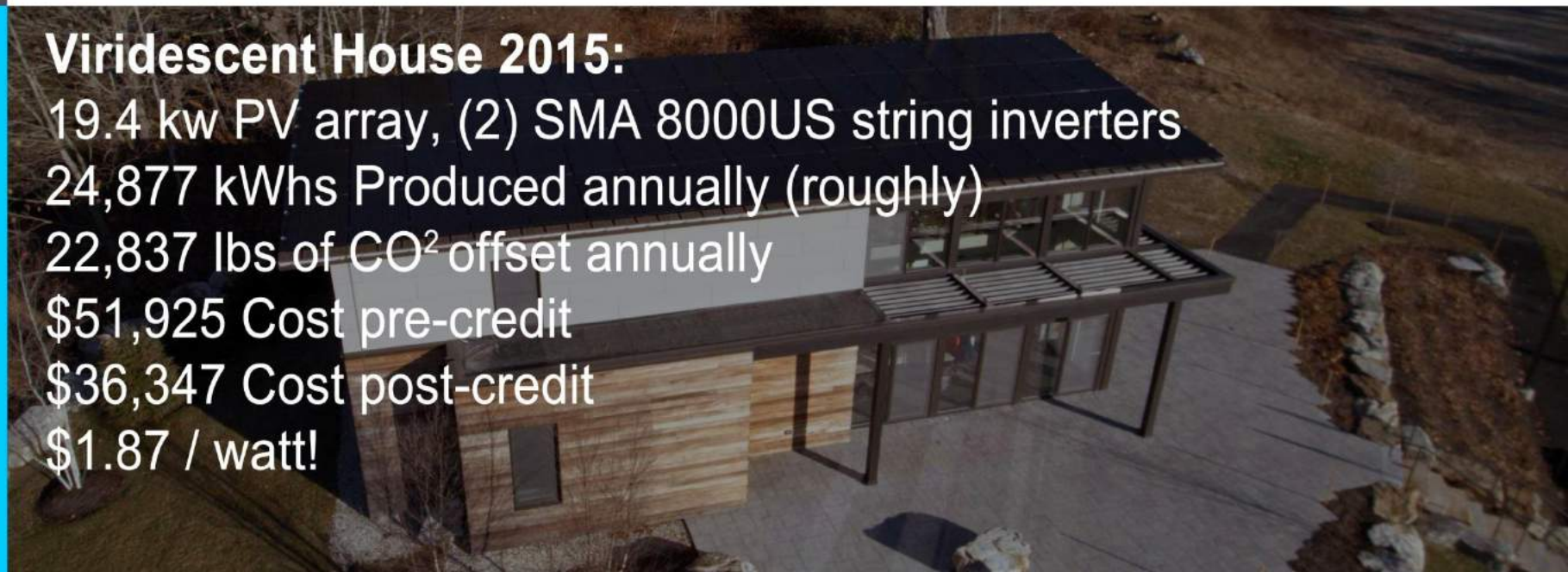
Renewables

Edgewater House 2012:

5.4 kw PV array, (1) SPR 5000m inverter
6,970 kWhs Produced annually (roughly)
9,050 lbs of CO^2 offset annually
$29,489 Cost pre-credit
$18,642 Cost post-credit, post state rebate
$3.45 / watt

BRIBURN

Renewables



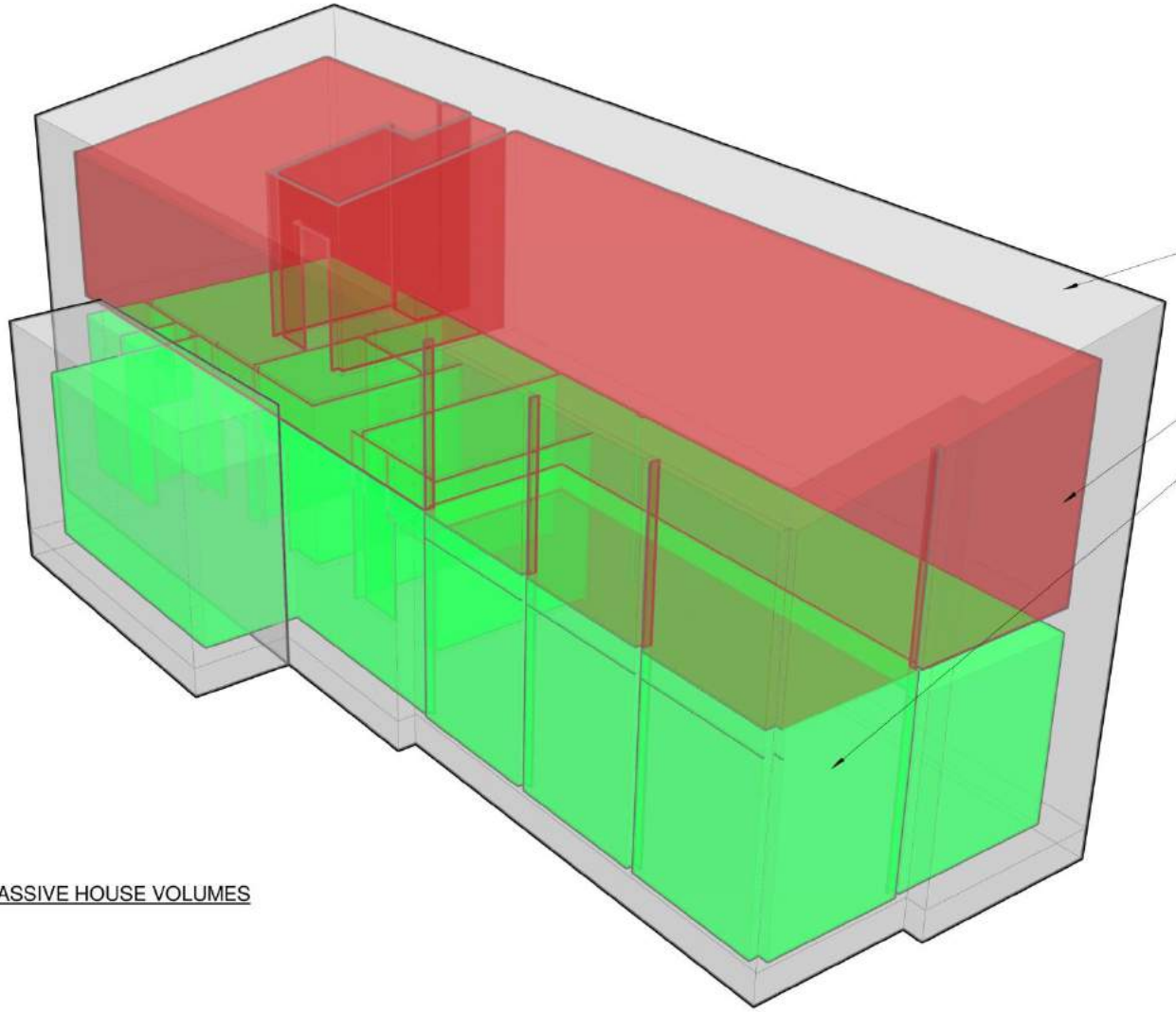
Viridescent House 2015:

19.4 kw PV array, (2) SMA 8000US string inverters
24,877 kWhs Produced annually (roughly)
22,837 lbs of CO^2 offset annually
$51,925 Cost pre-credit
$36,347 Cost post-credit
$1.87 / watt!

BRIBURN

Verification

ACH50 = cfm50 x 60 / Volume
cfm50 = Volume x ACH50 / 60
148.64 = 14,864 ft^3 x 0.6ACH50 / 60



GROSS ENCLOSED VOLUME = 23,006.54 FT3

2ND BLOWER DOOR VOLUME =7140.20 FT3

1ST BLOWER DOOR VOLUME = 7724.09 FT3

TOTAL BLOWER DOOR VOLUME = 14,864.29 FT3
(WINDOW NICHES NOT INCLUDED)

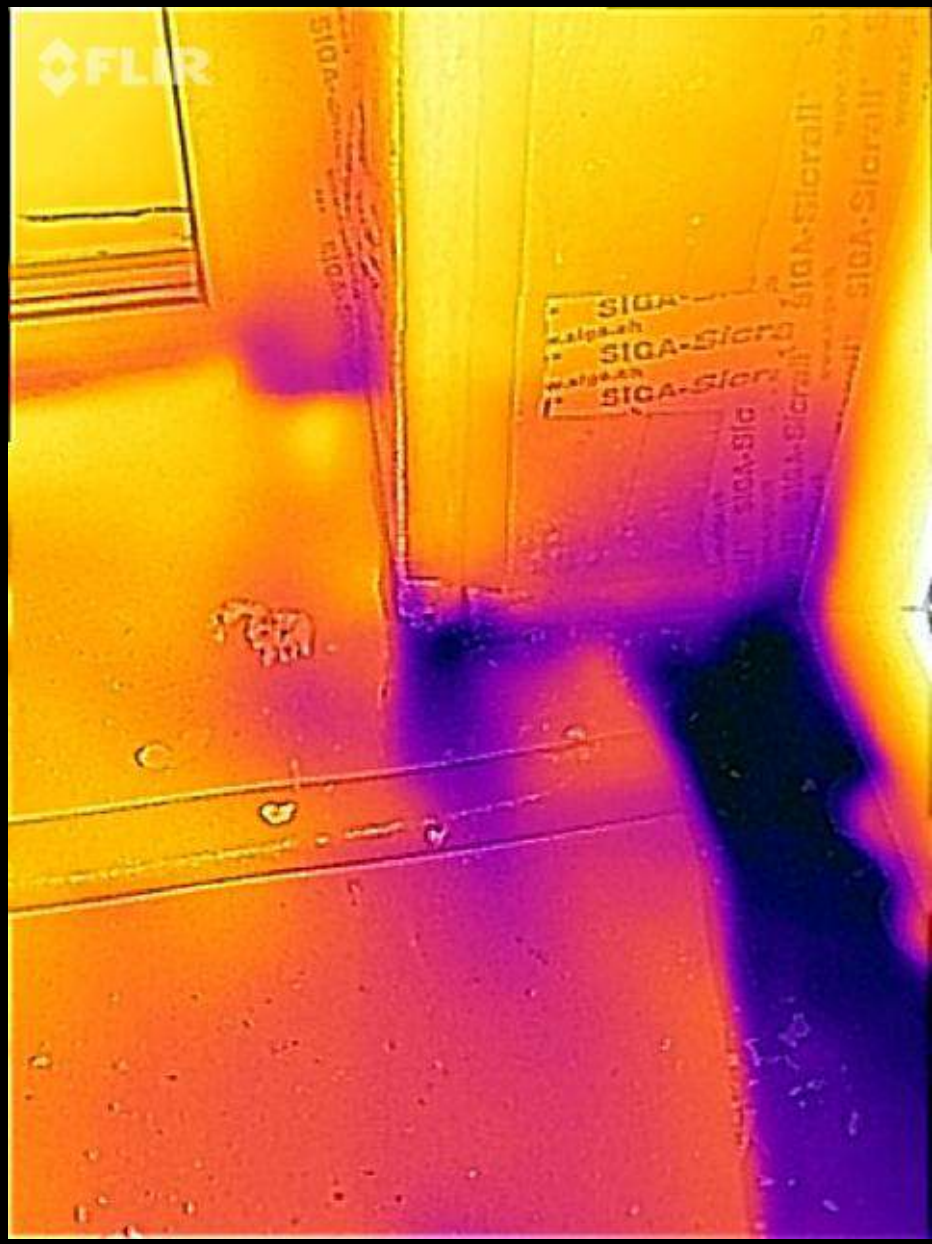
TREATED FLOOR AREA:
1ST FLOOR 100% x 808 FT2 = 774.0FT2
1ST FLOOR 60% X 51 FT2 = 30.6 FT2
1ST FLOOR 50% x 7 FT2 = 3.5 FT2
2ND FLOOR 100% x 634 FT2 =580.0 FT2
TFA TOTAL= 1388.1 FT2

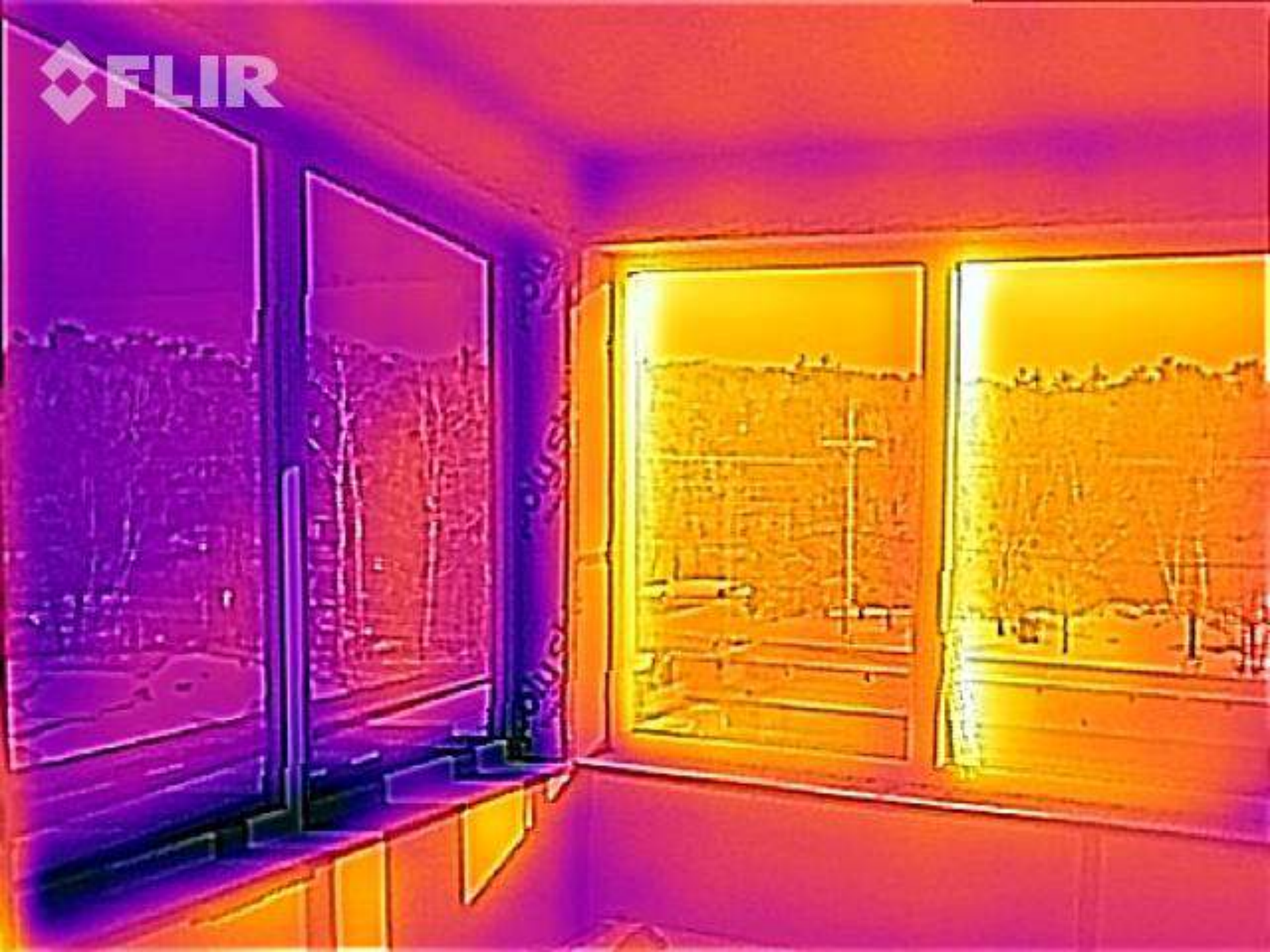
REFERENCE (VENTILATION) VOLUME:
1388.1 FT2 x 8.2 FT. = 11382.42 FT3

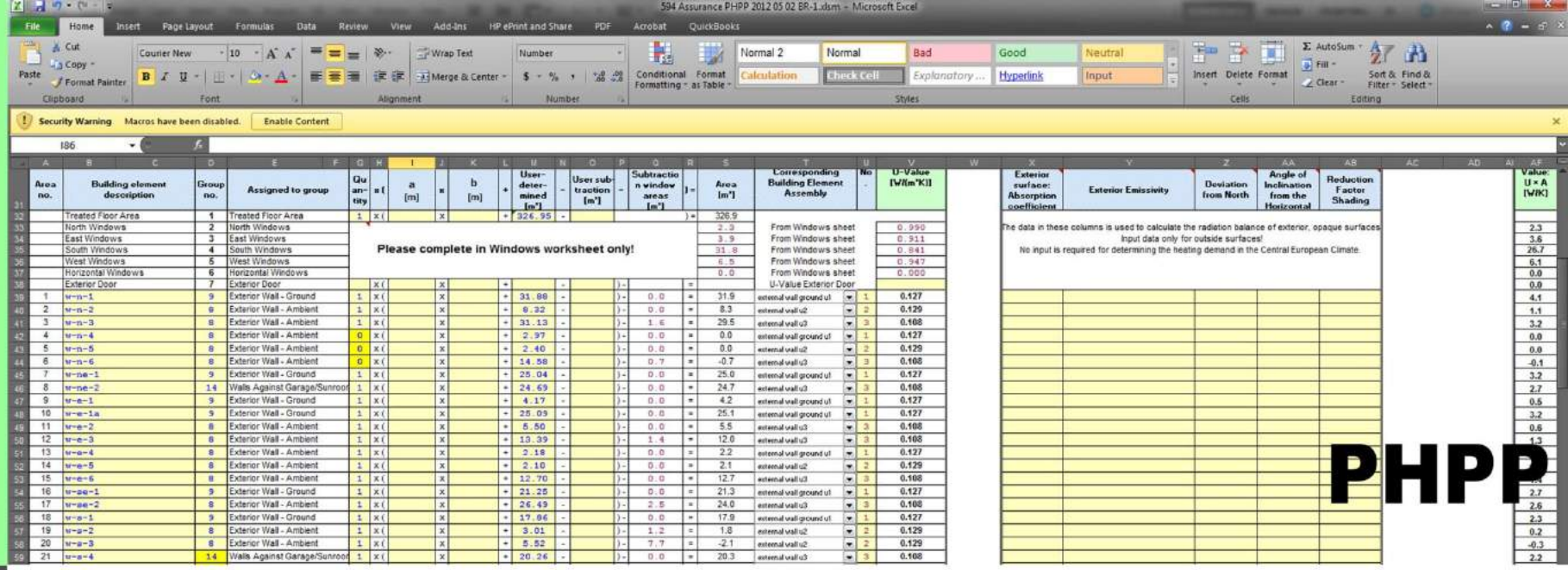
1 PASSIVE HOUSE VOLUMES

BRIBURN
architecture for life™


FLIR

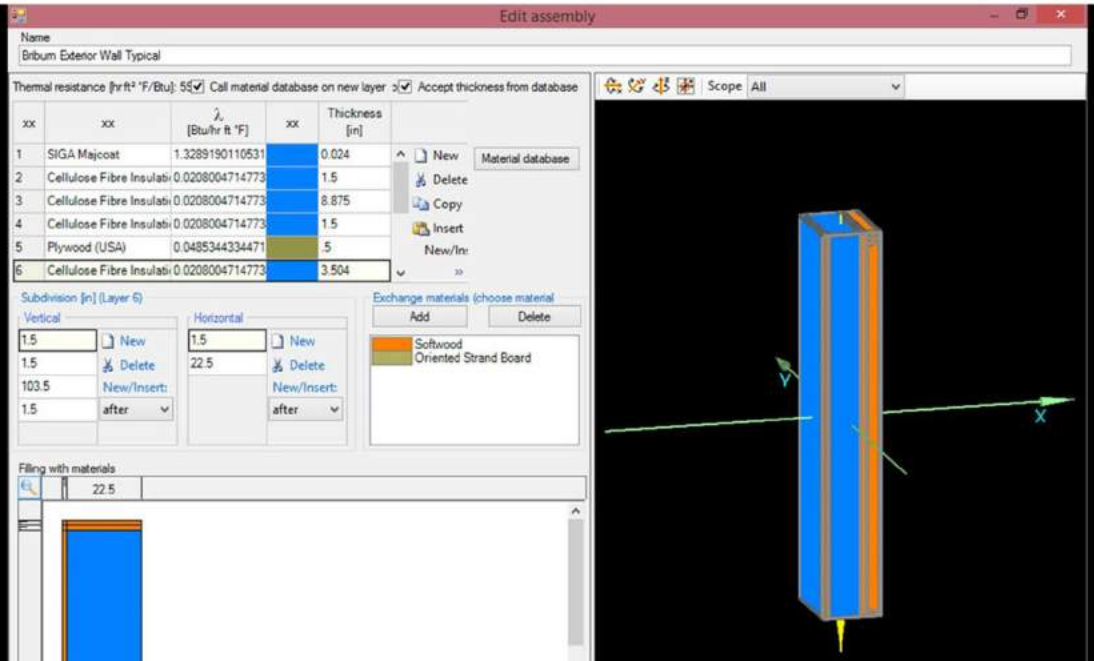

FLIR
SIGA-Sicrall
SIGA-Sicrall
SIGA-Sicrall


FLIR



BRIBURN

Energy Modeling



BUILDING INFORMATION

General information

Type:	**Residential**
Year of construction:	**2015**
Dwelling units:	**1**
Number of occupants:	**3.7 (Verification)**

Boundary conditions

Climate:	**PORTLAND INTL JETPORT ME**		
Internal heat gains:	**0.7**	Btu/hr ft²	
Interior temperature:	**68**	°F	
Overheat temperature:	**77**	°F	

Building geometry

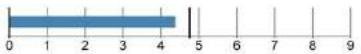
Enclosed volume:	**23006**	ft³
Total area envelope:	**5278.8**	ft²
AV ratio:	**0.2**	1/ft
Treated floor area:	**1388**	ft²

PASSIVEHOUSE REQUIREMENTS

Certificate criteria: European

Heating demand

specific:	**4.4**	kBtu/ft²yr
total:	6083.1	kBtu/yr
peak (month):	1.6	kBtu/ft²

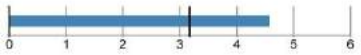


Cooling demand

specific:	**1**	kBtu/ft²yr
total:	1437.9	kBtu/yr
peak (month) - sensible:	0.5	kBtu/ft²
latent:	0.1	kBtu/ft²yr

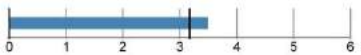
Heating load

specific:	**4.6**	Btu/hr ft²
total:	6346.8	Btu/hr



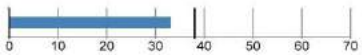
Cooling load

specific:	**3.5**	Btu/hr ft²
total:	4850.7	Btu/hr



Primary energy

specific:	**33.1**	kBtu/ft²yr
total:	45964.9	kBtu/yr

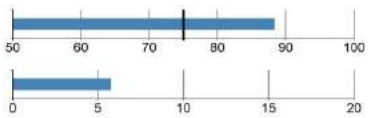


Air tightness ACH50

0.6 1/hr

PASSIVEHOUSE RECOMMENDATIONS

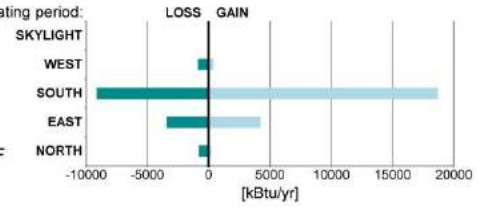
HRV efficiency:	**88.3**	%
Frequency of overheating: Cooling system is not required	**5.7**	%



BUILDING ELEMENTS

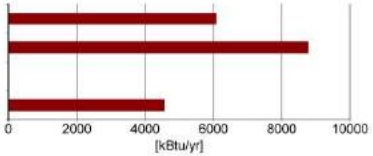
Windows

Average SHGC:	**0.49**	
Average solar reduction factor heating:	**0.41**	
Average solar reduction factor cooling:	**0.33**	
Average U-value:	**0.151**	Btu/hr ft² °F
Total glazing area:	**361.9**	ft²



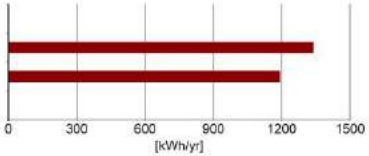
HVAC

Total heating demand:	**6083**	kBtu/yr
Total DHW energy demand:	**8773**	kBtu/yr
Solar DHW contribution:	**0**	kBtu/yr
Auxiliary electricity:	**4565**	kBtu/yr



Electricity

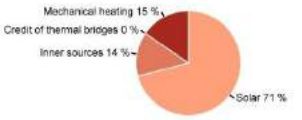
Direct heating / DHW:	**0**	kWh/yr
HVAC auxiliary energy:	**1338**	kWh/yr
Appliances:	**1192**	kWh/yr
Output PV system:	**0**	kWh/yr
Total electricity demand:	**2530**	kWh/yr



HEAT FLOW

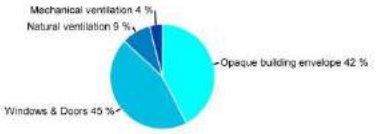
Heat gains

Solar:	**23578**	kBtu/yr
Inner sources:	**4540**	kBtu/yr
Credit of thermal bridges:	**0**	kBtu/yr
Mechanical heating:	**6083**	kBtu/yr



Heat losses

Opaque building envelope:	**14498**	kBtu/yr
Windows & Doors:	**15225**	kBtu/yr
Natural ventilation:	**3110**	kBtu/yr
Mechanical ventilation:	**1367**	kBtu/yr

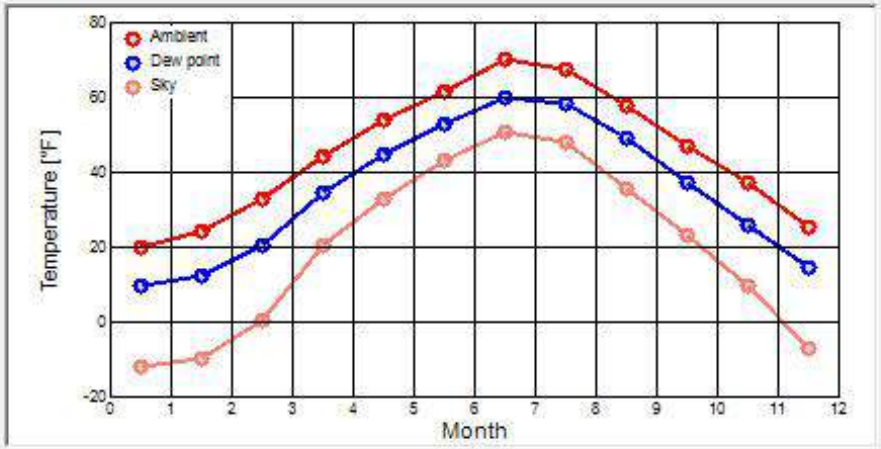


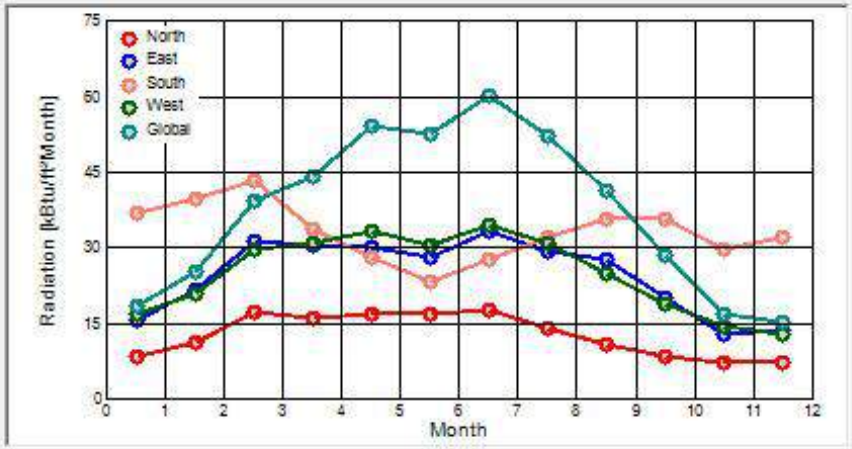
Localization | Climate | Primary energy/CO2-factor

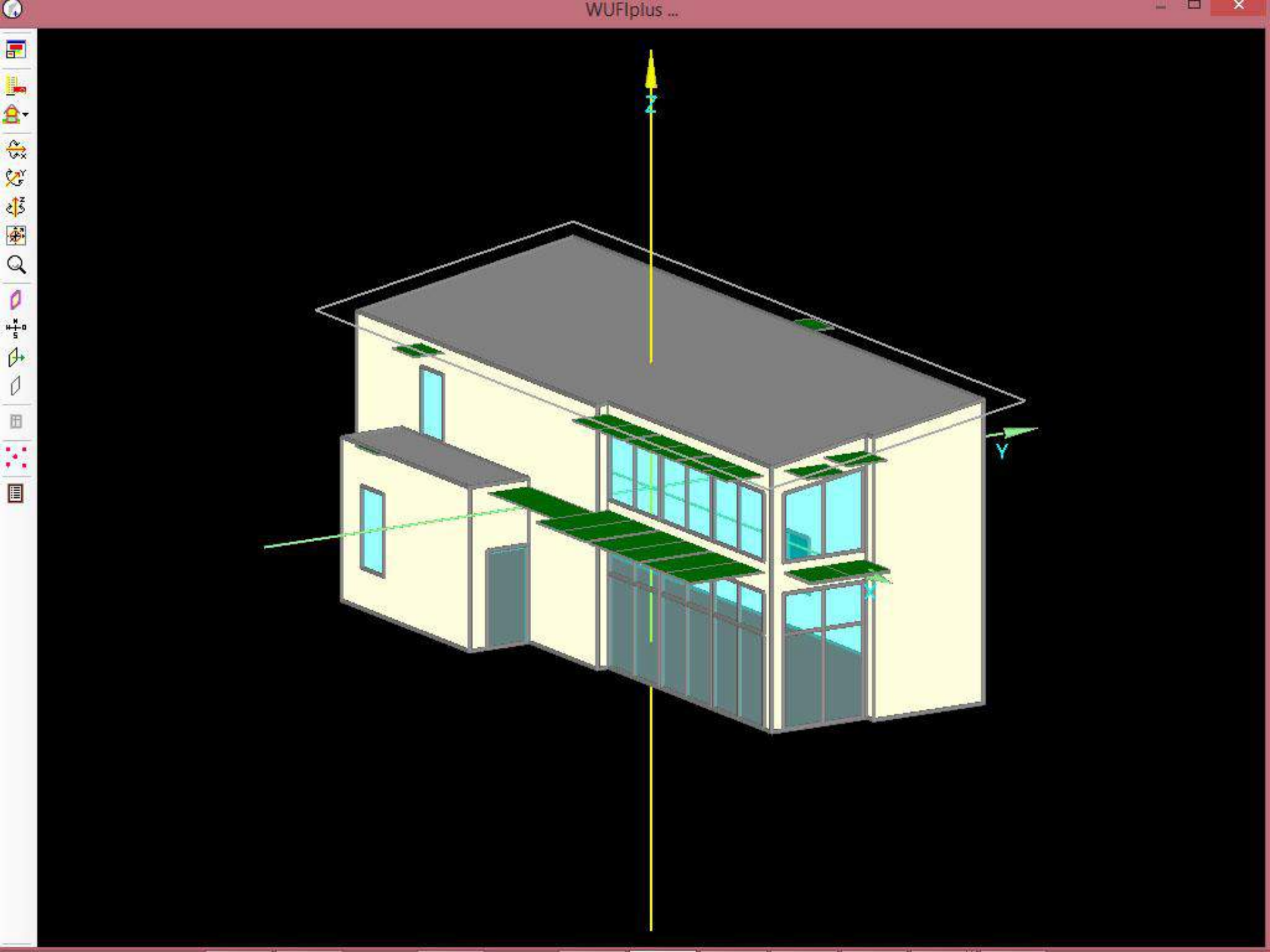
Data: PORTLAND INTL JETPORT ME

Specification	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Heating W. 1	Heating W. 2	Cooling weather
Temperature [°F]															
Ambient	19.9	24.1	32.7	44.1	54	61.5	70	67.6	57.7	47.1	37	25.5	5.4	31.1	78.3
Dew point*	9.5	12.4	20.5	34.7	44.6	52.7	60.1	58.5	48.9	37.2	26.1	14.4			
Sky*	-11.9	-9.8	0.5	20.3	33.1	43.2	50.9	47.8	35.6	23	9.7	-6.9			
Ground*															
Solar radiation [kBtu/ft²Month]													Solar radiation [Btu/hr ft²]		
North	8.6	11.1	17.1	16.2	16.8	16.8	17.8	13.9	10.8	8.6	7.3	7.3	12.7	7.9	26.9
East	15.5	21.6	31.4	30.4	30.1	28.2	33.3	29.5	27.6	20	13	13.6	24.7	12.7	54.5
South	37.1	39.6	43.4	33.9	28.2	23.5	27.9	32	35.8	35.8	29.8	32.3	58.6	20.9	42.8
West	16.8	20.9	29.8	30.7	33.3	30.4	34.6	31.1	25	18.7	14.3	12.7	26.3	12	61.8
Global	18.4	25.4	39.3	44.4	54.2	52.6	60.2	52.3	41.2	28.5	16.8	15.2	28.5	13.9	103.7

* Optional input (Dew point: no estimation possible, for missing data sensible cooling cannot be calculated, Sky/Ground: if not defined, temperatures will be estimated)






WUFIplus ...
Z
Y
X

Edit assembly

Name

Bribum Exterior Wall Typical

Thermal resistance [hr ft² °F/Btu]: 59 ☑ Call material database on new layer ☑ Accept thickness from database

xx	xx	λ [Btu/hr ft °F]	xx	Thickness [in]
1	SIGA Majcoat	1.3289190110531		0.024
2	Cellulose Fibre Insulati	0.0208004714773		1.5
3	Cellulose Fibre Insulati	0.0208004714773		8.875
4	Cellulose Fibre Insulati	0.0208004714773		1.5
5	Plywood (USA)	0.0485344334471		.5
6	Cellulose Fibre Insulati	0.0208004714773		3.504

New | Delete | Copy | Insert | New/In: | Material database

Subdivision [in] (Layer 6)

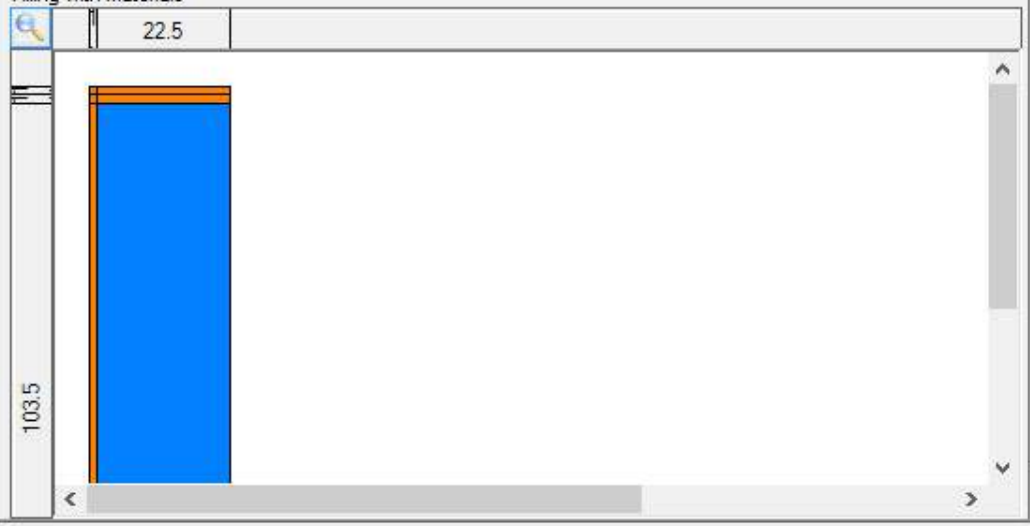
Vertical: 1.5 / 1.5 / 103.5 / 1.5 — New | Delete | New/Insert: after

Horizontal: 1.5 / 22.5 — New | Delete | New/Insert: after

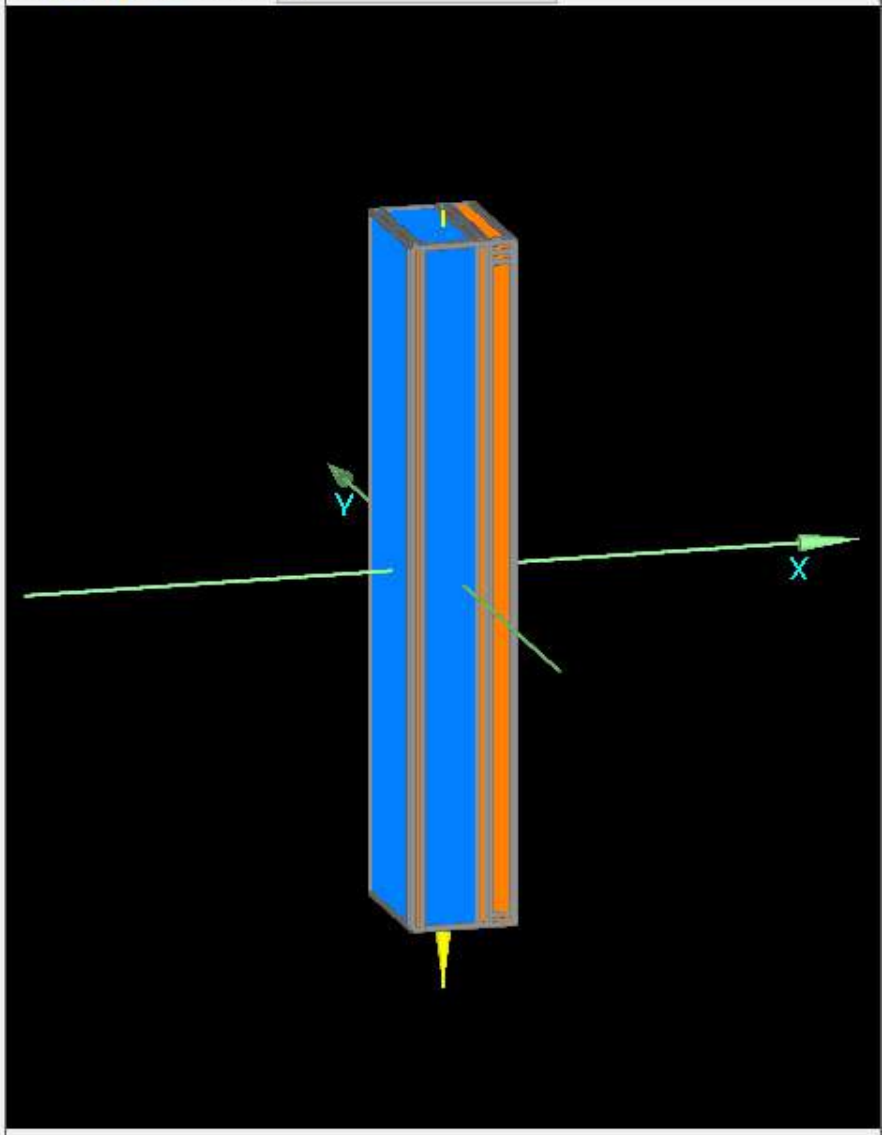
Exchange materials (choose material): Add | Delete

Softwood
Oriented Strand Board

Filling with materials



Scope: All



Status: OK

OK | Cancel

Passive House Verification

Building:	Normand Residence
Location and Climate:	PHI/NASA Saco Maine
Street:	18 Edgewater Lane
Postcode/City:	Saco, Maine
Country:	
Building Type:	
Home Owner(s) / Client(s):	Roger & Lynn Normand
Street:	18 Edgewater Lane
Postcode/City:	Saco, Maine
Architect:	Green Design Studio
Street:	
Postcode/City:	
Mechanical System:	
Street:	
Postcode/City:	
Year of Construction:	2012
Number of Dwelling Units:	1
Enclosed Volume V_e:	1622.0 m³
Number of Occupants:	9.3
Interior Temperature:	20.0 °C
Internal Heat Gains:	2.1 W/m²

Specific Demands with Reference to the Treated Floor Area

Treated Floor Area: 326.9 m²

	Applied:	Monthly method	PH Certificate:	Fulfilled?
Specific Space Heating Demand:	13	kWh/(m²a)	15 kWh/(m²a)	Yes
Heating Load:	11	W/m²	10 W/m²	
Pressurization Test Result:	0.6	h⁻¹	0.6 h⁻¹	Yes
Specific Primary Energy Demand (DHW, Heating, Cooling, Auxiliary and Household Electricity):	85	kWh/(m²a)	120 kWh/(m²a)	Yes
Specific Primary Energy Demand (DHW, Heating and Auxiliary Electricity):	29	kWh/(m²a)		
Specific Primary Energy Reduction through Solar Electricity:		kWh/(m²a)		
Frequency of Overheating:		%	over 25 °C	
Specific Useful Cooling Energy Demand:	5	kWh/(m²a)	15 kWh/(m²a)	Yes
Cooling Load:	8	W/m²		

We confirm that the values given herein have been determined following the PHPP methodology and based on the characteristic values of the building. The calculations with PHPP are attached to this application.

Issued on:

signed:

PHPP Project Specification Sheet

Project: *Normand Residence*
Location: *Saco, Maine*
Client: *Roger & Lynn Normand*
Date: *2012.04.15*

Verification and Standard Criteria	Current Performance		Passive House Certificate	
Specific Space Heating Demand:	3.97	kBTU/(ft²yr)	<=4.75	kBTU/(ft²yr)
Air Tightness	0.60	h-1	<=0.6	h-1
Specific Primary Energy Demand	27	kBTU/(ft²yr)	<=38	kBTU/(ft²yr)
Percentage of Overheating		%	<=10	%

U values

1	external wall grounc	44.7	(hr.ft²F)/BTU
2	external wall u2	44.1	(hr.ft²F)/BTU
3	external wall u3	52.6	(hr.ft²F)/BTU
4	floor slab	51.0	(hr.ft²F)/BTU
5	flat roof	60.8	(hr.ft²F)/BTU
6			(hr.ft²F)/BTU
7			(hr.ft²F)/BTU
8			(hr.ft²F)/BTU
9			(hr.ft²F)/BTU
10			(hr.ft²F)/BTU

Area's and Volumes

Surface Area Envel	A_E	10014.0	ft²
Treated Floor Area	A_{TFA}	3519.3	ft²
Ventilation Volume	V_v	28865.3	ft³
Enclosed Volume	V_e	57281.2	ft³
Blower Door Volum	V_{n50}	37774.3	ft³

Window Specification

		Windows S		Windows N,E,W	
G	Solar Heat Gain Coefficient	0.63	%	0.50	%
U_g	U-Value of Glass	0.11	BTU/(hr.ft²F)	0.09	BTU/(hr.ft²F)
U_f	U-Value of Frame	0.13	BTU/(hr.ft²F)	0.13	BTU/(hr.ft²F)
ψ_g	Thermal Bridge Spacer	0.020	BTU/(hr.ft F)	0.020	BTU/(hr.ft F)
ψ_{fb}	Thermal Bridge Instalation	0.029	BTU/(hr.ft F)	0.029	BTU/(hr.ft F)

Ventilation Data

Heat Recovery Efficiency	84%	%
Electric Efficiency	0.72	W/cfm

Ventilation Intake

Duct Thickness	6.299212598	in				
Required Duct Insulation	3.937007874	in	Lambda	0.02023	BTU/(hr.ft F)	Reflective no
Ψ-value Supply or Ambient Air Duct	0.139	BTU/(hr.ft F)				

Ventilation Extract

Duct Thickness	6.299212598	in				
Required Duct Insulation	3.937007874	in	Lambda	0.02023	BTU/(hr.ft F)	Reflective no
Ψ-value Supply or Ambient Air Duct	0.139	BTU/(hr.ft F)				

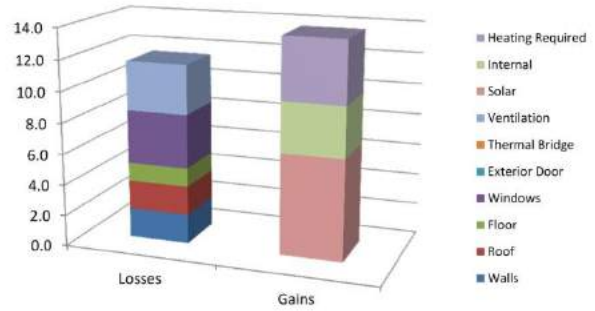
The dwelling analysed by the PHPP software conforms with the standards of the Passive House Institute provided the dwelling is built in accordance with the recommendations listed below and the U Values set out in the above schedule In order to obtain certification all changes to design and detail must be further approved by PHA

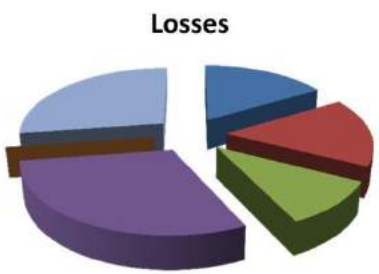
PHPP Performance Summary Sheet

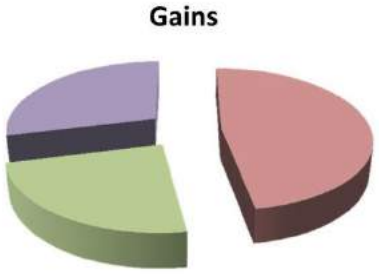
Project: *Normand Residence*
Location: *Saco, Maine*
Client: *Roger & Lynn Normand*
Date: *2012.04.15*

Losses	Entire Building	Per ft² of TFA
Element	**kBTU/yr**	**kBTU/ft²yr**
Walls	6682	1.90
Roof	6608	1.88
Floor	4219	1.20
Windows	12167	3.46
Exterior Door	0	0.00
Thermal Bridge	0	0.00
Ventilation	11166	3.17

Gains	Entire Building	Per m² of TFA
Type	**kBTU/yr**	**kBTU/ft²yr**
Solar	23052.1	6.55
Internal	11501.9	3.27
Heating Required	13979.7	3.97
Residual Heating		
Heating Required	13979.7	3.97







Welcome, Carsten (Dragonfly Cove) Not Carsten?

Settings | Support | Log Out

HOME | Circuits | Controls | Alerts | Ways to Save | Report Card | Local Weather

eMonitor Status:

Current use: 0.07 kW | $0/hr

Outside Temp: 63°F

Switch location

Share My eMonitorWindow

Utility Meter

70w
Power Usage Now

Power Production

Top Appliances/Circuits On Now

- Refrigerator (92w)
- Dehumidifier (21w)
- Garage Doors +Lt (9w)
- Nicholas' Room (7w)
- Living Rm Lt (7w)

30-Day Carbon Footprint

ME Avg.	My CO_2
483 lbs.	0 lbs.

30-Day Phantom Power $3

Where I've used electricity in the past 30 days: Top 12 Circuits

Click a slice or label for detail / View All Circuits

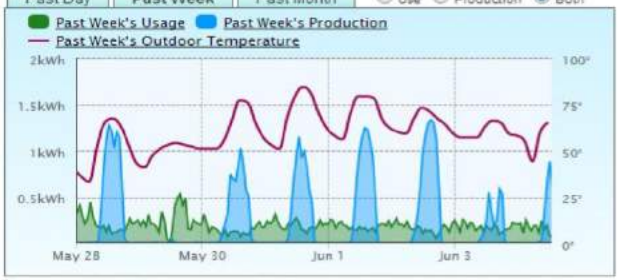
kWh Cost

Electricity Usage in kWh by Month

Top 4 Users by kWh - Last 30 days

Past Year | Past Month | kWh | Cost

Past Day | Past Week | Past Month | Use | Production | Both



Click and drag in the plot area to zoom in.

View History Details

Export Data

Share your eMonitor experiences on Facebook

SUNNY PORTAL US-English

Viridescent

- PV System Overview
- PV System Profile
- Energy and Power
- Annual Comparison
- PV System Monitoring
- PV System Logbook: 0
- Inverter

PV System Overview | Viridescent

PV System Data

Current power

12.15 kW

Energy and Power »

Energy

41.21 kWh
Today

Total: 11.811 MWh

CO2 avoided

29 kg
Today

Total: 8.3 t

PV system information

PV system power:
17.20 kWp
Commissioning:
4/30/2015

PV system profile »

Weather for falmouth

29 °C
Cloudless

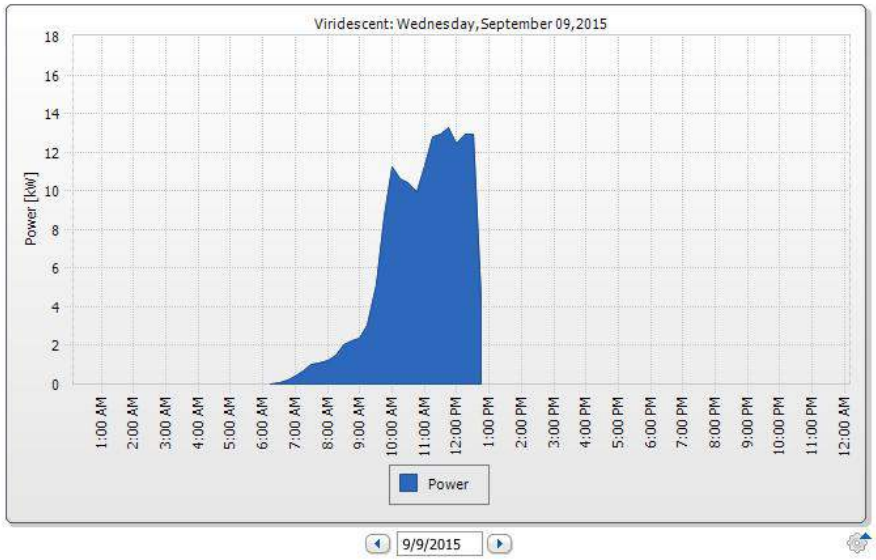
Tomorrow »

Location

04105 falmouth
United States

Enlarge map »

Day | Month | Year | Total



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BRBURN

Cost


Edgewater House 2012:
$870,000
At 4620 ft²
$188.31/ ft²

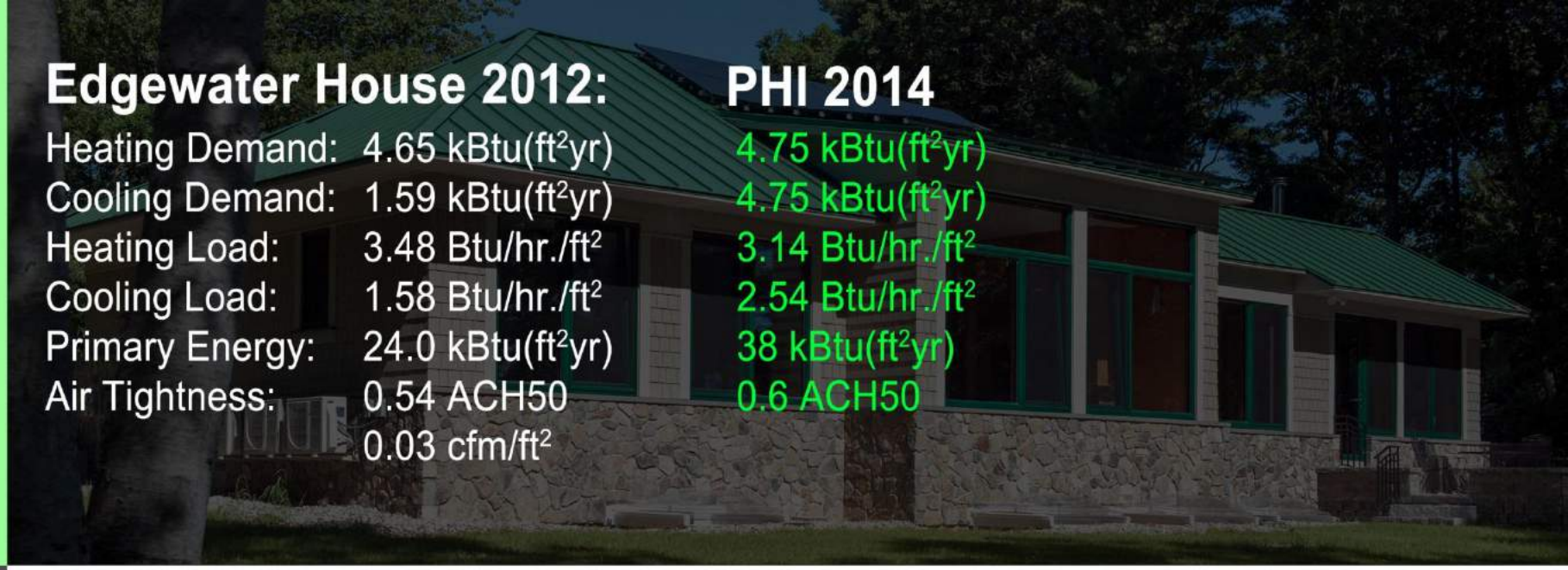
BR BURN

Cost


Viridescent House 2015:
$386,000
At 1800 ft²
$214.44/ft²

BRBURN

Performance



Edgewater House 2012:

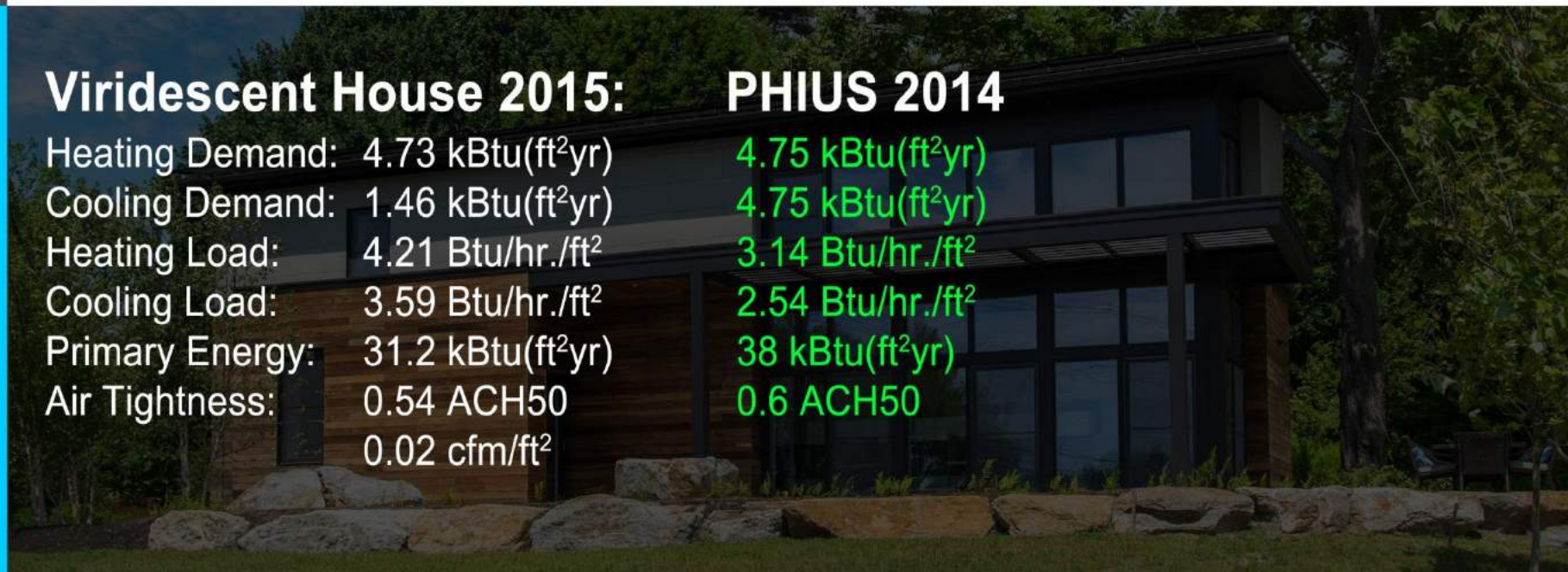
Heating Demand:	4.65 kBtu(ft²yr)
Cooling Demand:	1.59 kBtu(ft²yr)
Heating Load:	3.48 Btu/hr./ft²
Cooling Load:	1.58 Btu/hr./ft²
Primary Energy:	24.0 kBtu(ft²yr)
Air Tightness:	0.54 ACH50
	0.03 cfm/ft²

PHI 2014

4.75 kBtu(ft²yr)
4.75 kBtu(ft²yr)
3.14 Btu/hr./ft²
2.54 Btu/hr./ft²
38 kBtu(ft²yr)
0.6 ACH50

BRBURN

Performance

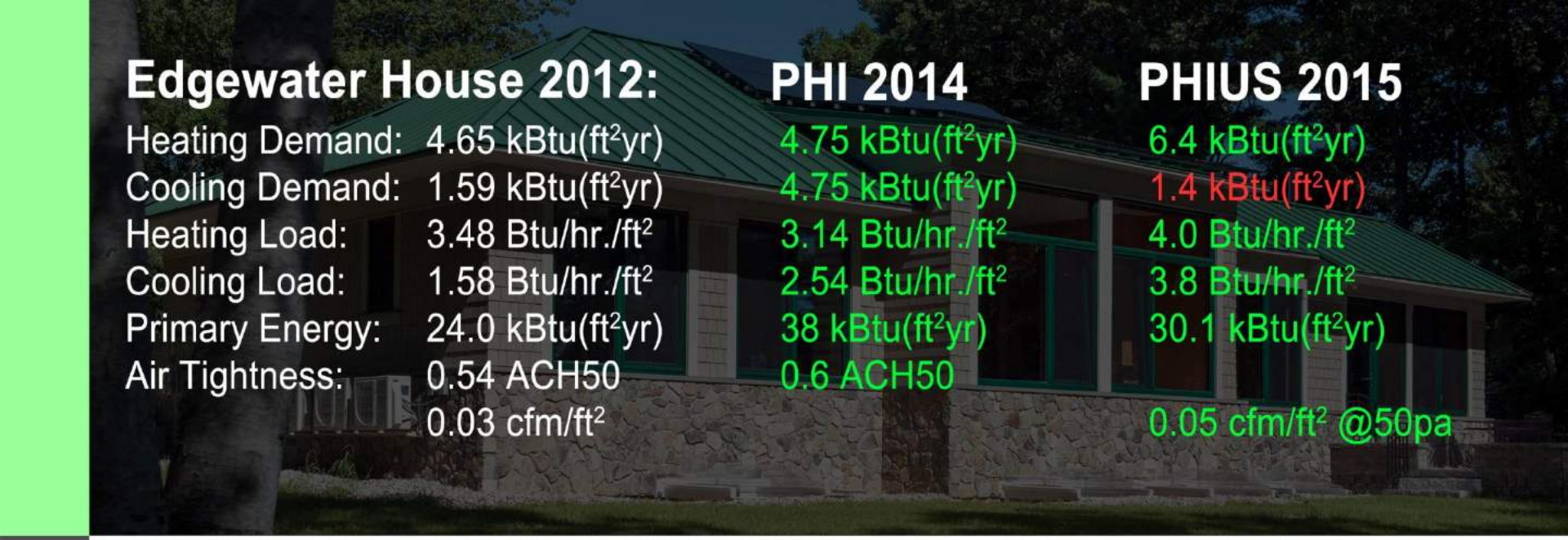


Viridescent House 2015:

Heating Demand:	4.73 kBtu(ft²yr)
Cooling Demand:	1.46 kBtu(ft²yr)
Heating Load:	4.21 Btu/hr./ft²
Cooling Load:	3.59 Btu/hr./ft²
Primary Energy:	31.2 kBtu(ft²yr)
Air Tightness:	0.54 ACH50
	0.02 cfm/ft²

PHIUS 2014

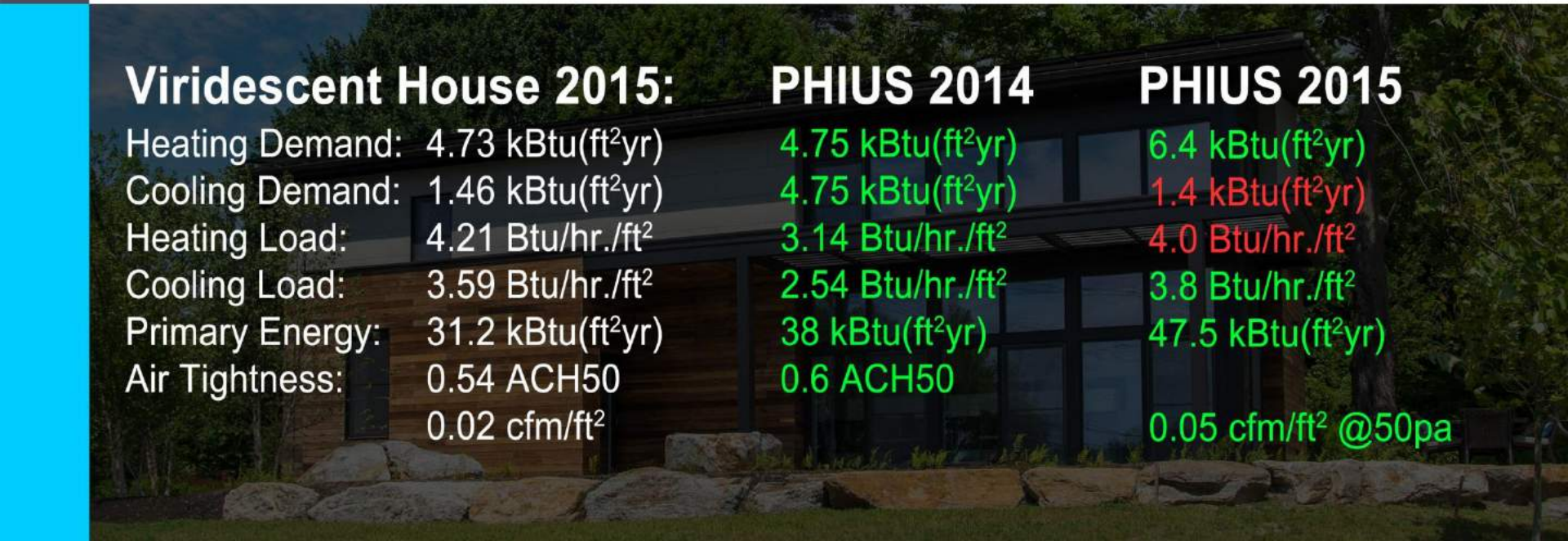
4.75 kBtu(ft²yr)
4.75 kBtu(ft²yr)
3.14 Btu/hr./ft²
2.54 Btu/hr./ft²
38 kBtu(ft²yr)
0.6 ACH50



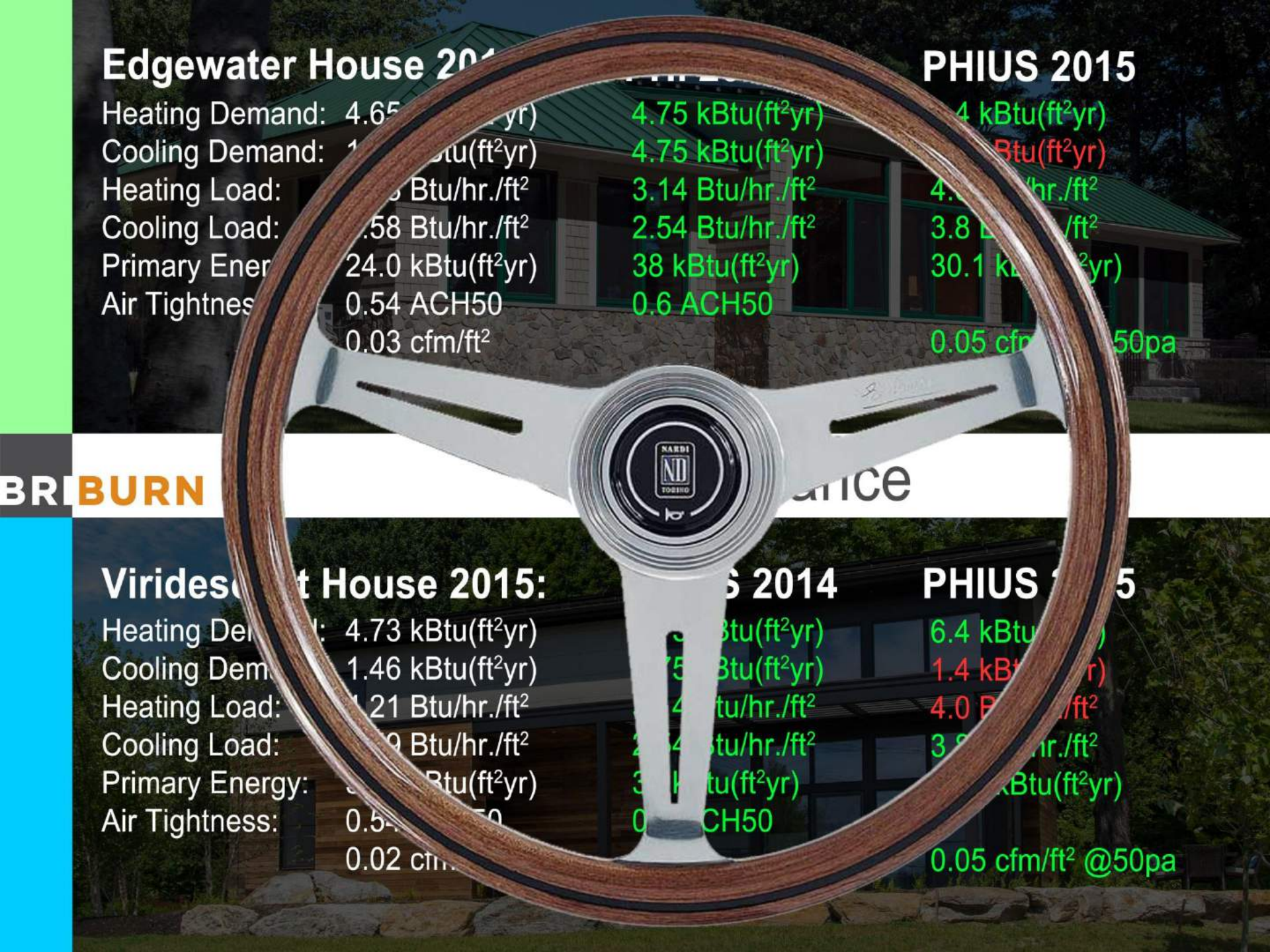
Edgewater House 2012:		PHI 2014	PHIUS 2015
Heating Demand:	4.65 kBtu(ft²yr)	4.75 kBtu(ft²yr)	6.4 kBtu(ft²yr)
Cooling Demand:	1.59 kBtu(ft²yr)	4.75 kBtu(ft²yr)	1.4 kBtu(ft²yr)
Heating Load:	3.48 Btu/hr./ft²	3.14 Btu/hr./ft²	4.0 Btu/hr./ft²
Cooling Load:	1.58 Btu/hr./ft²	2.54 Btu/hr./ft²	3.8 Btu/hr./ft²
Primary Energy:	24.0 kBtu(ft²yr)	38 kBtu(ft²yr)	30.1 kBtu(ft²yr)
Air Tightness:	0.54 ACH50	0.6 ACH50	
	0.03 cfm/ft²		0.05 cfm/ft² @50pa

BRBURN

Performance



Viridescent House 2015:		PHIUS 2014	PHIUS 2015
Heating Demand:	4.73 kBtu(ft²yr)	4.75 kBtu(ft²yr)	6.4 kBtu(ft²yr)
Cooling Demand:	1.46 kBtu(ft²yr)	4.75 kBtu(ft²yr)	1.4 kBtu(ft²yr)
Heating Load:	4.21 Btu/hr./ft²	3.14 Btu/hr./ft²	4.0 Btu/hr./ft²
Cooling Load:	3.59 Btu/hr./ft²	2.54 Btu/hr./ft²	3.8 Btu/hr./ft²
Primary Energy:	31.2 kBtu(ft²yr)	38 kBtu(ft²yr)	47.5 kBtu(ft²yr)
Air Tightness:	0.54 ACH50	0.6 ACH50	
	0.02 cfm/ft²		0.05 cfm/ft² @50pa


Edgewater House 20
PHIUS 2015
Heating Demand: 4.65 yr)
4.75 kBtu(ft²yr)
4 kBtu(ft²yr)
Cooling Demand: 1 tu(ft²yr)
4.75 kBtu(ft²yr)
Btu(ft²yr)
Heating Load: Btu/hr./ft²
3.14 Btu/hr./ft²
hr./ft²
Cooling Load: .58 Btu/hr./ft²
2.54 Btu/hr./ft²
3.8 /ft²
Primary Ener 24.0 kBtu(ft²yr)
38 kBtu(ft²yr)
30.1 k yr)
Air Tightnes 0.54 ACH50
0.6 ACH50
0.03 cfm/ft²
0.05 cfr 50pa
BR BURN
ance
Viridesc t House 2015:
S 2014
PHIUS 5
Heating Del : 4.73 kBtu(ft²yr)
tu(ft²yr)
6.4 kBtu)
Cooling Dem 1.46 kBtu(ft²yr)
Btu(ft²yr)
1.4 kB r)
Heating Load: 1.21 Btu/hr./ft²
tu/hr./ft²
4.0 /ft²
Cooling Load: 9 Btu/hr./ft²
tu/hr./ft²
nr./ft²
Primary Energy: Btu(ft²yr)
tu(ft²yr)
kBtu(ft²yr)
Air Tightness: 0.5 50
CH50
0.02 cf
0.05 cfm/ft² @50pa