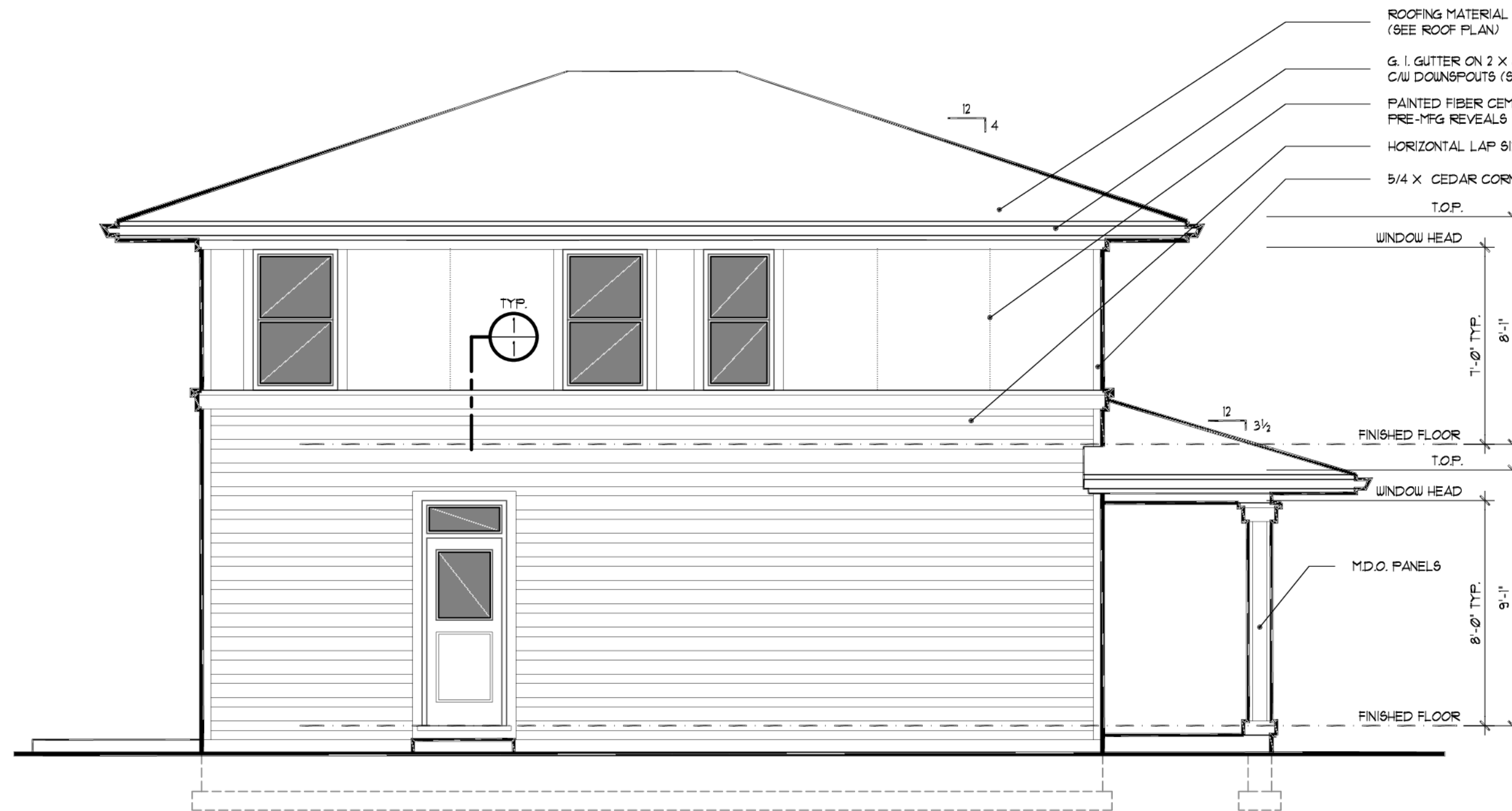


THE TYPE OF EXTERIOR FINISH, THE INSTALLATION AND THE WATERPROOFING DETAILS ARE ALL TO BE THE FULL RESPONSIBILITY OF THE OWNER/BUILDER. THIS DESIGNER ASSUMES NO RESPONSIBILITY FOR THE INTEGRITY OF THE BLDG ENVELOPE



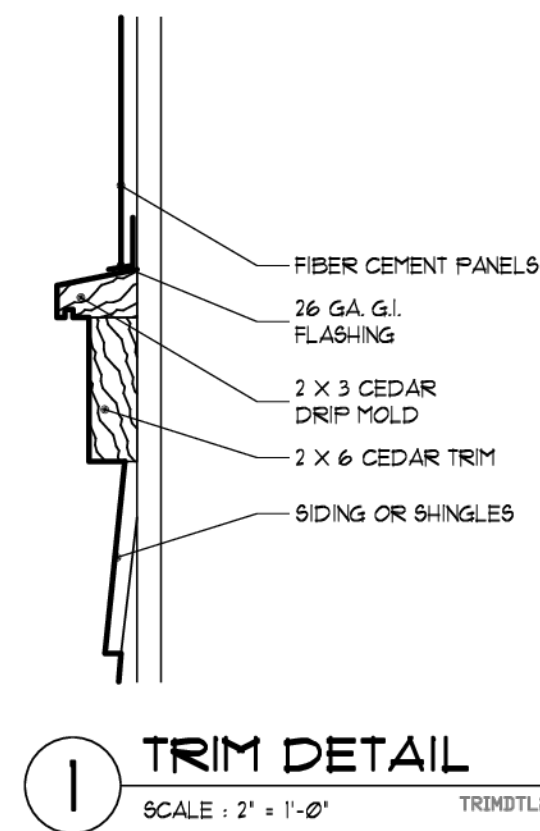
LEFT SIDE ELEVATION

SCALE: 1/4" = 1'-0"



REAR ELEVATION

SCALE: 1/4" = 1'-0"



TRIM DETAIL

SCALE: 2" = 1'-0"



RIGHT SIDE ELEVATION

SCALE: 1/4" = 1'-0"



FRONT ELEVATION

SCALE: 1/4" = 1'-0"

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THE CONTRACTOR ASSUMES FULL RESPONSIBILITY FOR THE CORRECT INSTALLATION OF ALL EXTERIOR FINISHES AND WEATHERPROOFING.

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WWW.MASCORDDESIGN.COM

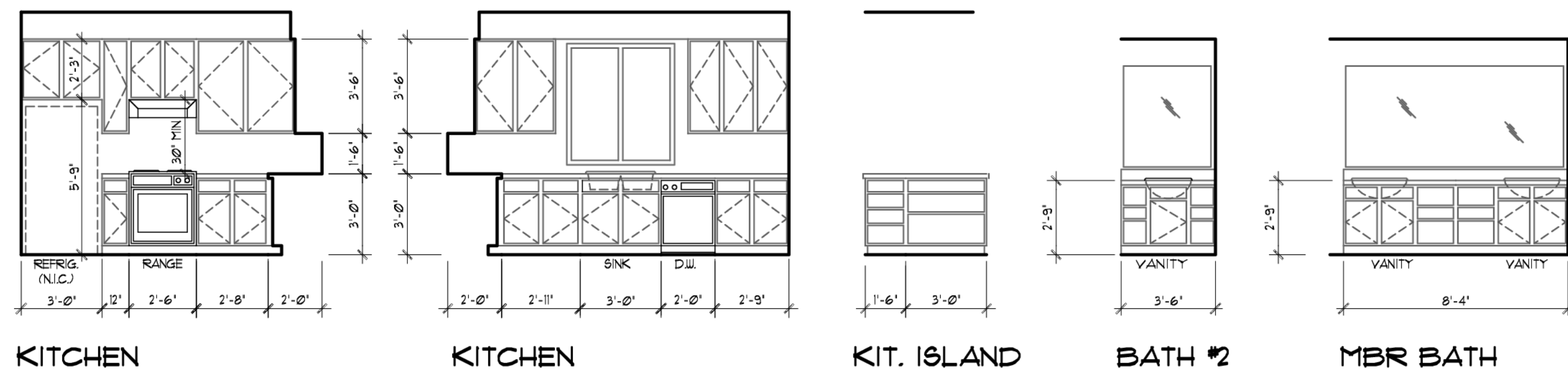
PROJECT MANAGER/EA
DRAWN 10/18/21 PJB

25# SNOW LOAD

UPPER FLOOR 784 SQ. FT.
MAIN FLOOR 855 SQ. FT.
TOTAL AREA 1639 SQ. FT.

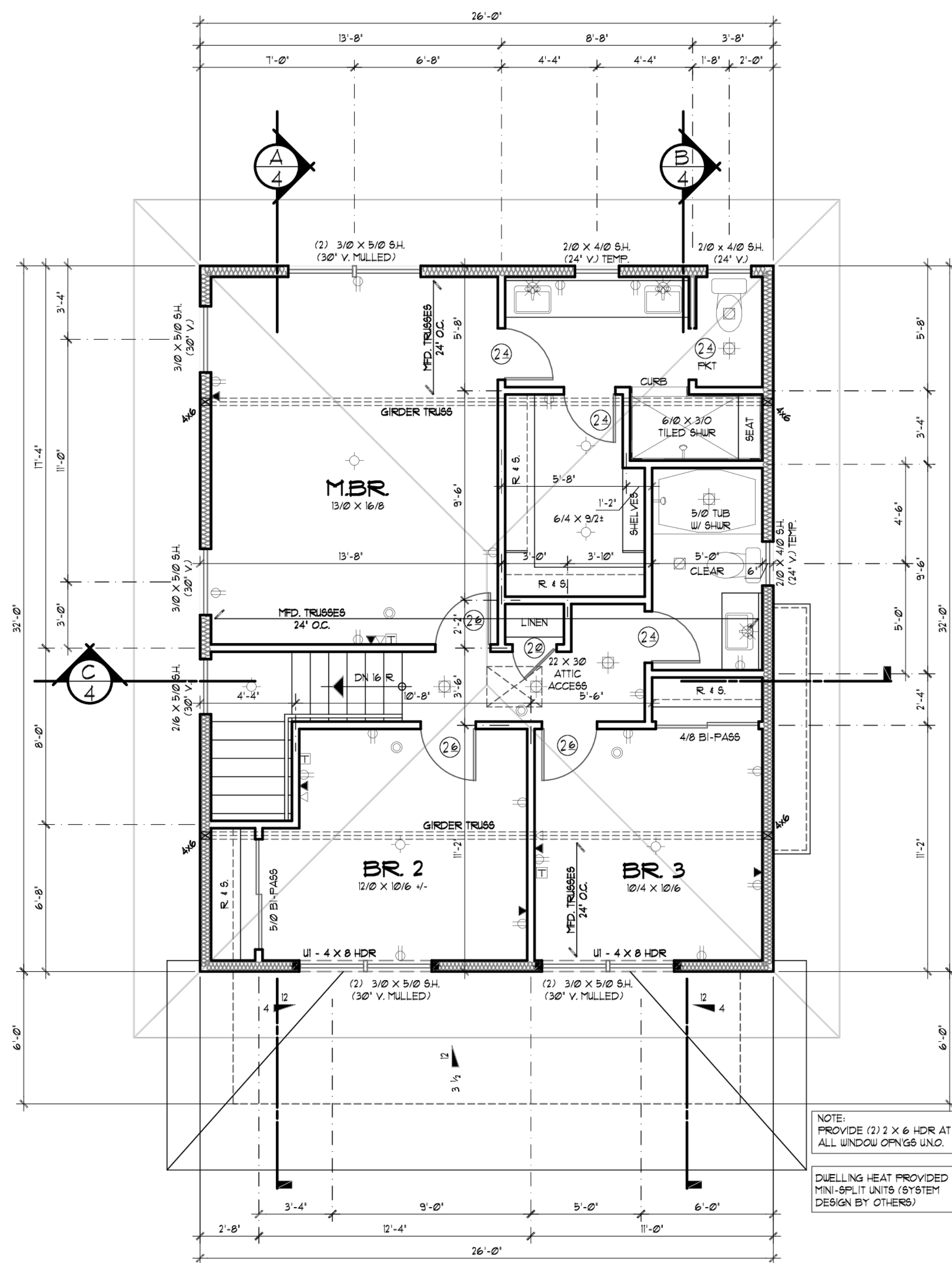
21149CB

1



CABINET ELEVATIONS

SCALE: 1/4" = 1'-0"



UPPER FLOOR PLAN

SCALE: 1/4" = 1'-0"

IF LATERAL ENGINEERING IS REQUIRED, REFER TO ENGINEERING SHEETS FOR LATERAL SPECIFICATIONS

LEGEND

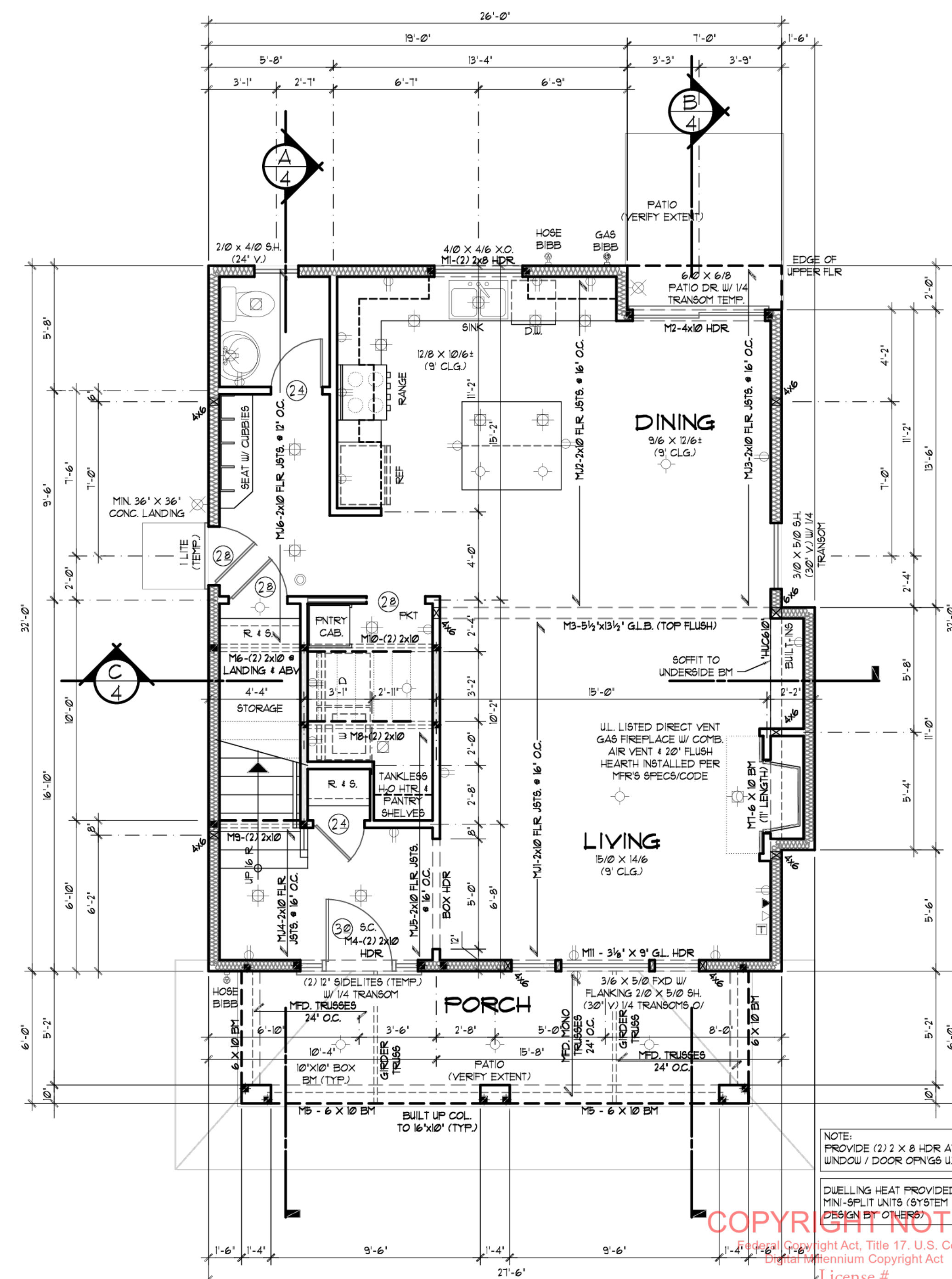
- RECESSED LIGHT
- RECESSED DIRECTIONAL LIGHT FIXTURE
- WALL-MOUNT LIGHT
- SURFACE-MOUNT LIGHT
- FLOOD LIGHT
- SURFACE MOUNTED FLUORESCENT
- RECESSED EXHAUST FAN VENTED TO THE EXTERIOR
- CEILING FAN
- DUPLEX OUTLET
- CEILING MOUNTED DUPLEX OUTLET
- 220V OUTLET
- FLUSH FLOOR MOUNTED OUTLET (VERIFY LOC.)
- TELEPHONE OUTLET
- DATA OUTLET
- TELEVISION OUTLET
- SPEAKER LOCATION
- SMOKE / CO DETECTOR (SEE GENERAL NOTES FOR OTHER SPEC'S)
- BEARING POINT LOCATION (PROVIDE SOLID BEARING - MIN. OF MEMBER WIDTH UNO.)
- POINT LOAD FROM ABOVE
- 4 X 4 POST FROM ROOF HIP, VALLEY OR RIDGE DOWN TO BEARING POINT ON WALL BELOW (MAX. OF 45" FROM VERT.)
- BEARING WALL SUPPORTING STRUCTURE ABOVE
- 4 X 10 HDR # BEARING WALL INT. DOOR & OPENINGS W/ MIN. (2) 2 X 6 SUPPORT EA END (UNO.)
- DROPPED STRUCT. MEMBER BEARING # WALL

ENERGY ENVELOPE KEY

- WALL/DR/CLG. NSUL.
 - FOUNDATION NSUL.
- (SEE SHEET 'G' FOR INSULATION VALUES)

C.O. DET LOCATION

CARBON MONOXIDE ALARMS SHALL BE LOCATED IN EA. BEDROOM OR WITHIN 15 FEET OUTSIDE OF EA. BEDROOM DOOR, AT EVERY FLOOR LEVEL W/ BEDROOMS (SEE SHEET 'G' FOR ADD'L INFO)



MAIN FLOOR PLAN

SCALE: 1/4" = 1'-0"

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PROJECT MANAGER/EAS
 DRAWN 10/18/21 PJB

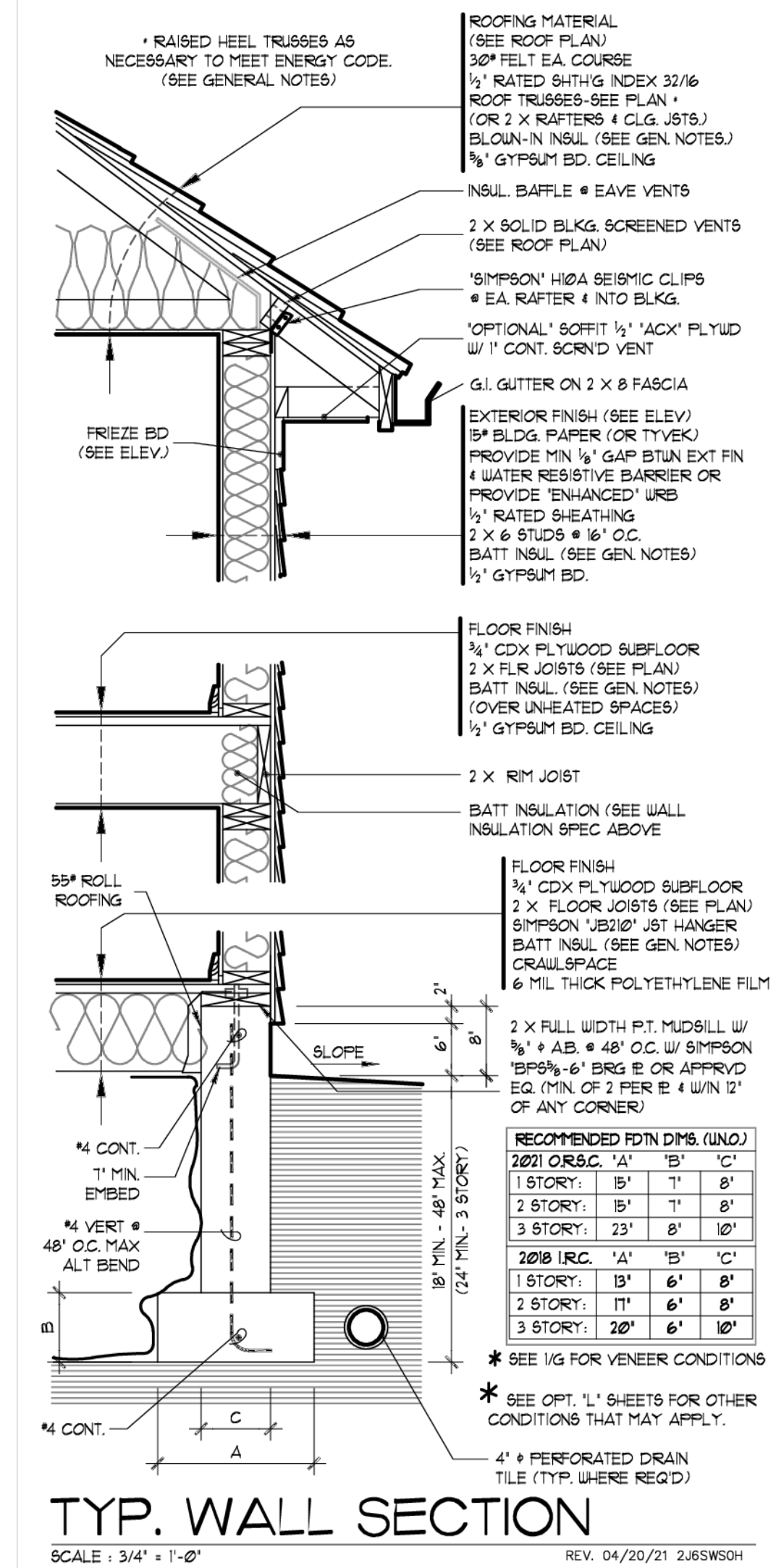
25# SNOW LOAD

UPPER FLOOR 84 SQ. FT.
 MAIN FLOOR 85 SQ. FT.
 TOTAL AREA 169 SQ. FT.

21149CB

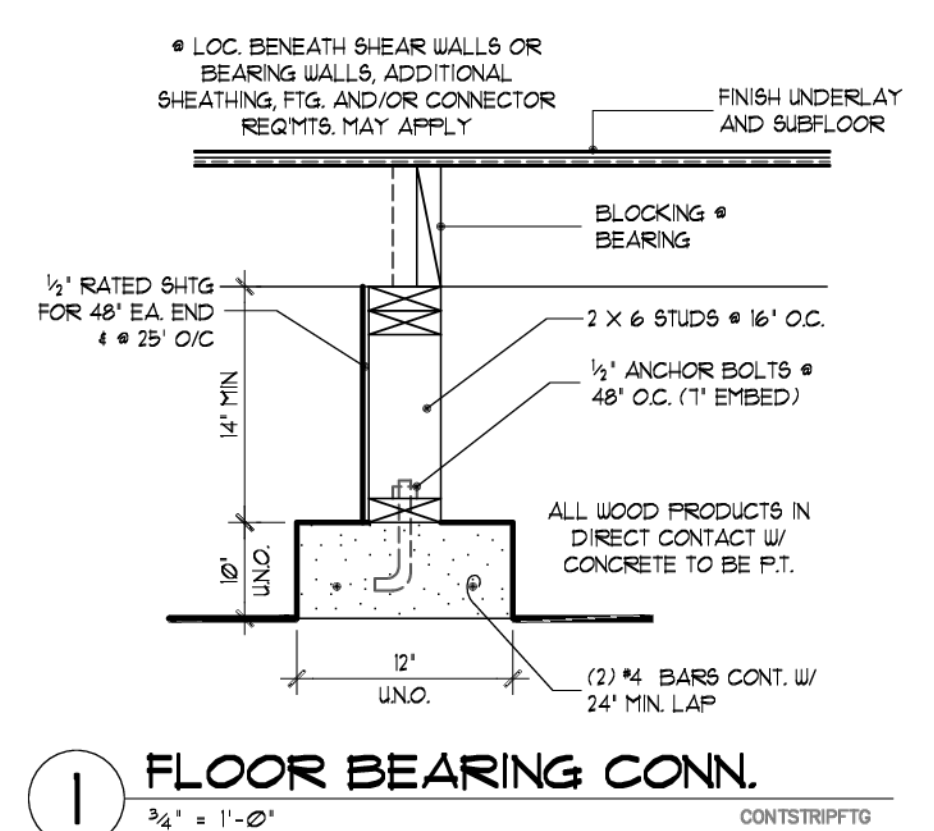
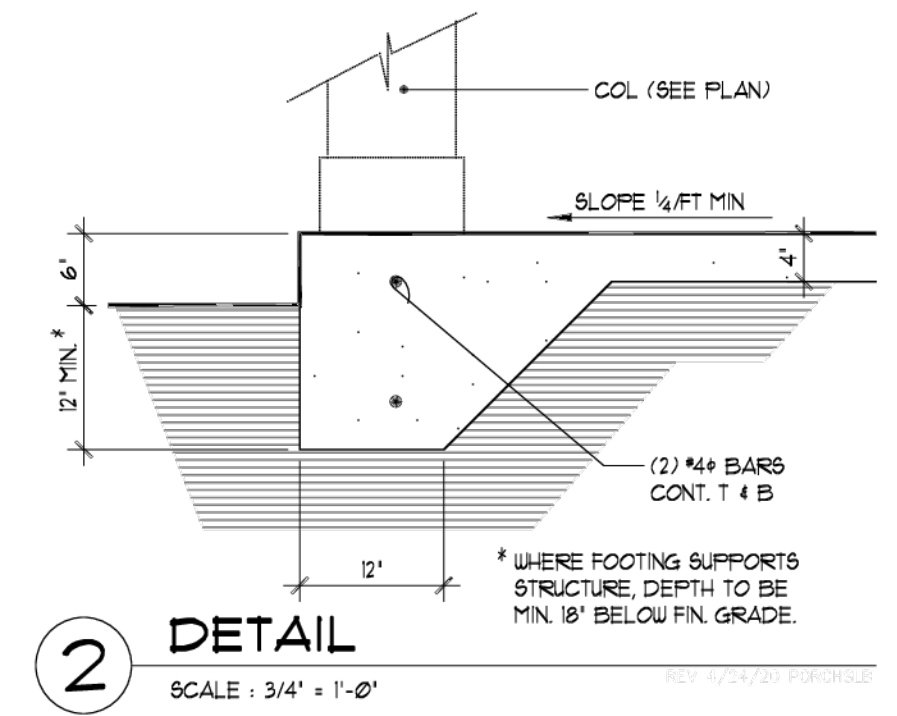
2

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FOUNDATION VENTILATION CALCULATIONS (SEE GENERAL NOTES FOR ADDITIONAL INFORMATION)

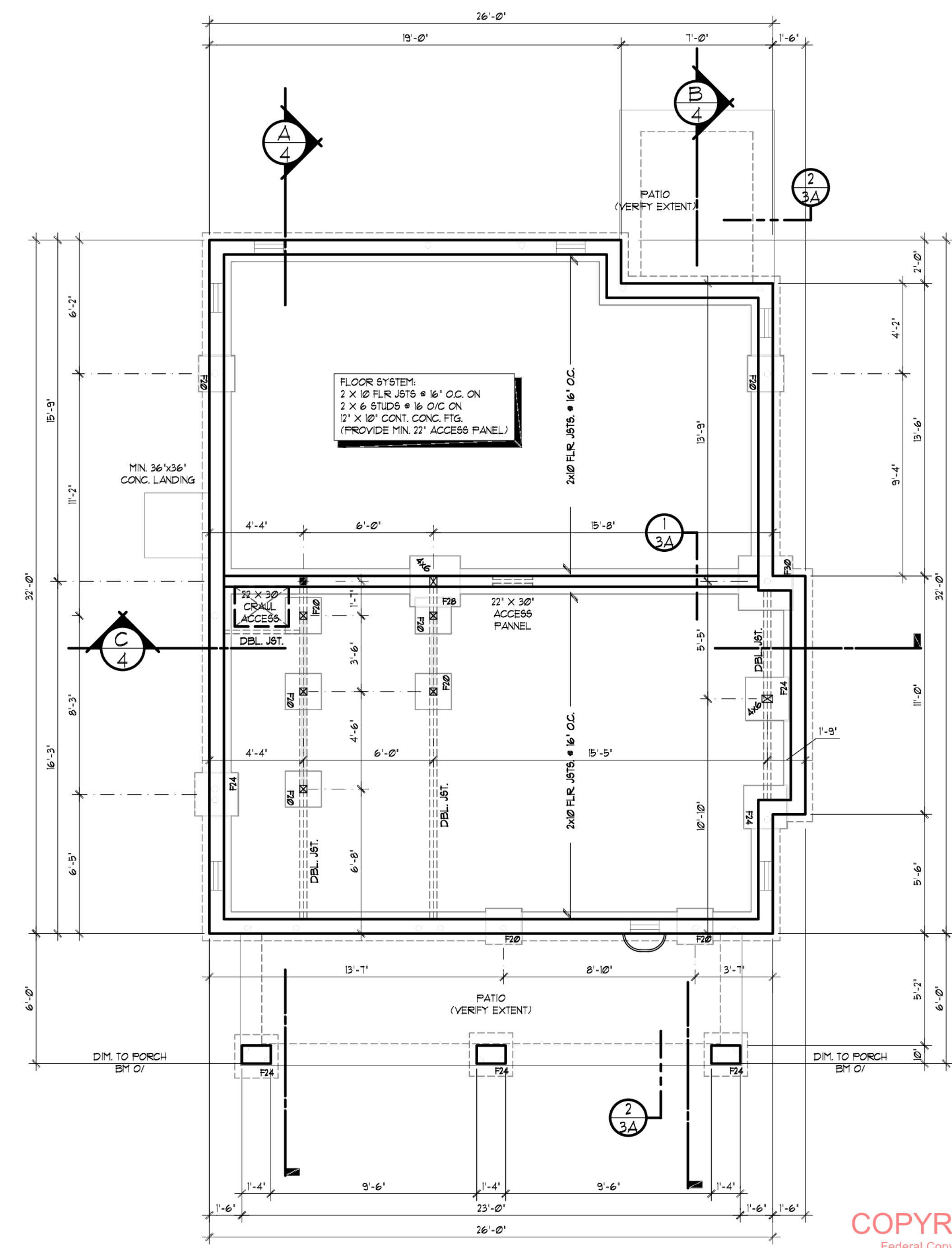
DESCRIPTION	UNDER-FLOOR AREA (FT ²)	NET AREA (N ²) PER VENT	QTY. OF VENTS REQ'D (WITHOUT CLASS-1 VAPOR BARRIER)	QTY. OF VENTS REQ'D (WITH CLASS-1 VAPOR BARRIER)	MECHANICAL VENTILATION RATE (CFM)	DEHUMIDIFICATION RATE (PINTS PER DAY)
AMOUNT/ QTY	757	45	17	2	151	53.0
CODE REF.			R4081 & R4082	R4081 & R4082	R4083 & NI0211	R4083.2.4
NOTES			1/50 th OF UNDER-FLOOR AREA (NO VAPOR BARRIER REQUIRED)	1/50 th OF UNDER-FLOOR AREA (VAPOR BARRIER REQUIRED)	MECHANICAL VENT CAPABLE OF 10 CFM PER 50 FT ² OF UNDER-FLOOR AREA	



ISOLATED FOOTING SCHEDULE

TAG	PAD SIZE	REINFORCING	MAX. BRG.
-	18" DIA. x 1'	N.A.	2,414 *
F20	20"x20"x10"	N.A.	3,819 *
F24	24"x24"x12"	N.A.	5,402 *
F28	28"x28"x14"	N.A.	7,211 *
F30	30"x30"x15"	N.A.	8,203 *
F36	36"x36"x18"	(5) #4 BARS @ 1' O.C. E/W	12,031 *
F42	42"x42"x21"	(5) #4 BARS @ 8" O.C. E/W	16,551 *
F48	48"x48"x24"	(6) #4 BARS @ 9" O.C. E/W	21,600 *
F54	54"x54"x27"	(6) #4 BARS @ 9" O.C. E/W	27,331 *
F60	60"x60"x31"	(7) #4 BARS @ 9" O.C. E/W	33,750 *

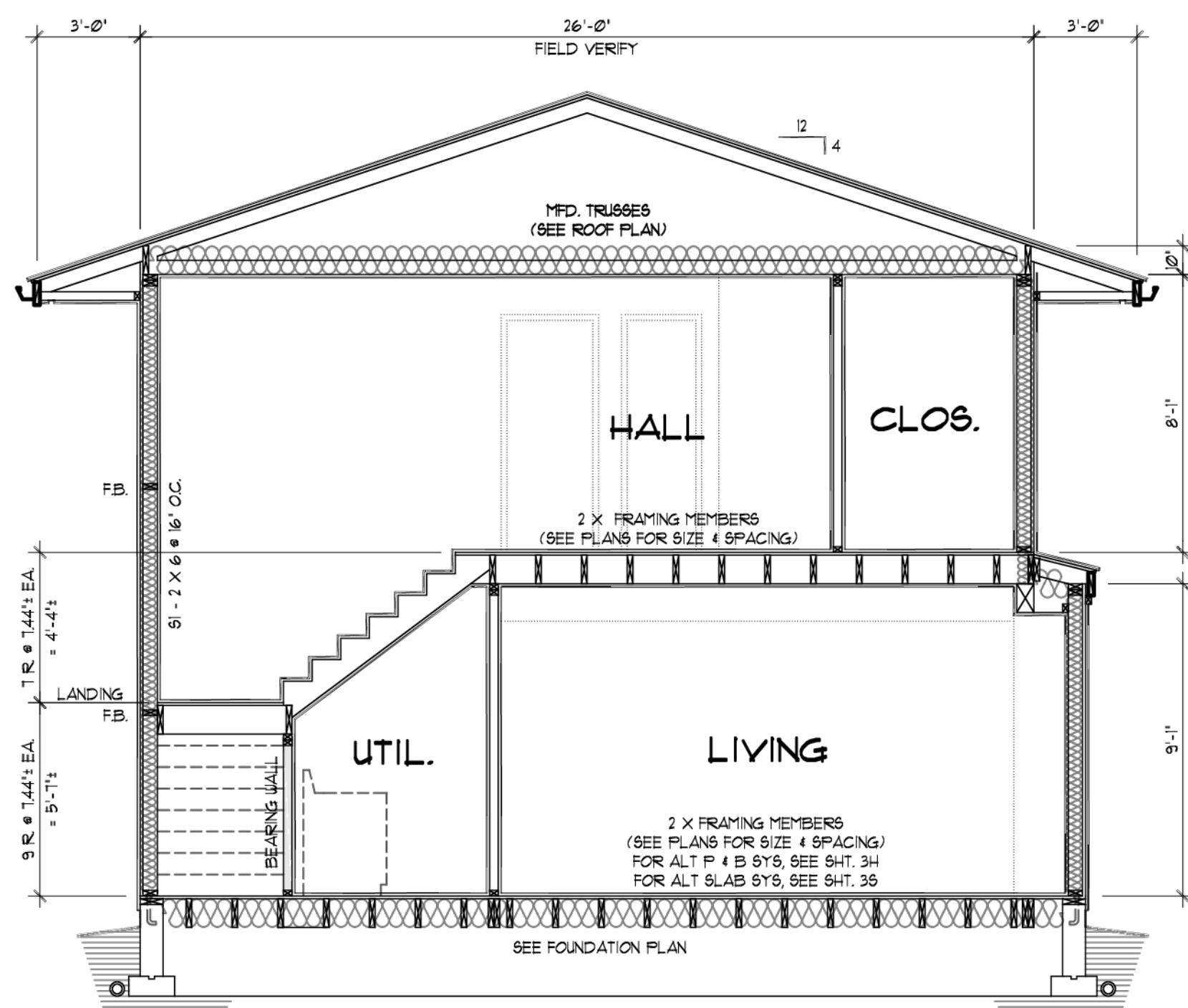
ASSUMED MIN. 4x4 1/2" D.F. COLUMN (UNO.) - SEE PLANS
 * 6x6 1/2" D.F. COLUMN FOR MAX. BRG.
 ** 5/8"x3/4" FBL. COLUMN FOR MAX. BRG. (OR 6x6 TO 18x21")
 *** 5/8"x5/8" FBL. COLUMN FOR MAX. BRG. (SEE POST-CONN. DETAIL) SOIL B.P. 1500 PSF



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IF LATERAL ENGINEERING IS REQUIRED, REFER TO ENGINEERING SHEETS FOR LATERAL SPECIFICATIONS

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C BUILDING SECTION
SCALE: 1/4" = 1'-0"

ROOF DESIGN NOTES

THIS ROOF HAS BEEN DESIGNED TO SUPPORT CEDAR SHAKE ROOFING MATERIALS AND COMPOSITION ROOFING OF VARIOUS TYPES. THE TABLE BELOW DESCRIBES IN DETAIL THE ASSUMPTIONS MADE IN THE DESIGN OF THE ROOF STRUCTURE OF THIS BUILDING.

ROOF LIVE LOAD (SNOW)	25.0 PSF	3.25 PSF	AVE.(WET)
FRAMING MATERIALS:	2.0 PSF	2.0 PSF	
SHEATHING MATERIALS:	15 PSF	33.25 PSF	ACTUAL REQ'D SAFETY FACTOR
MISC. MATERIALS:	15 PSF	6.75 PSF	
ROOFING TYPE	DRY / WET	40.0	PSF TL
MED SHAKES	2.0 / 3.25 PSF		
HVY SHAKES	3.0 / 4.0 PSF		
SHINGLES	2.0 / 3.25 PSF		
COMPOSITION	2.5 / 3.0 PSF		

GYPSUM MATERIALS: ADD 2.0 PSF FOR VAULTED AREAS (COVERED IN SAFETY FACTOR)

NOTE: HIPS, VALLEYS & RIDGES SHALL NOT BE LESS IN DEPTH THAN THE END CUT OF THE RAFTERS (FIELD VERIFY ALL CONDITIONS)

LEGEND

- 4 X 4 WOOD POST FROM RIDGE (HIP OR VALLEY) TO WALL BELOW (MIN. 2) 2 X 4 REQ'D AT WALL BEARING POINT) NOTE: SPLICES IN HIPS & VALLEYS CAN ONLY OCCUR @ POST DOWN LOCATIONS
- 49 SQ. IN. ROOF VENTS (SEE VENT TABLE FOR QTY. - 50%/50% SHOWN)
- 2X4 FURLIN WALL TO BM. OR WALL BELOW (FRAMG AT 24" O.C.)
- SHADED AREA DENOTES ROOF FRAMED OVER RAFTERS BELOW
- DOWNSPOUTS

COMP/SHAKE ROOF

MAXIMUM SPANS
FER 2004 WUPA TBL. RR-28
Ø DF. L/240
25" LL 4 15" DL

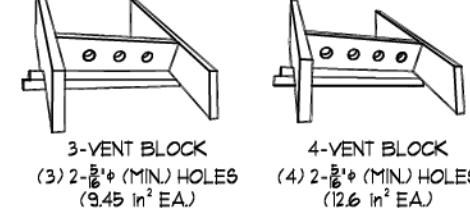
SIZE	SPACING	SPAN
2X6	17" O.C.	14'-0"
	16" O.C.	12'-1"
	24" O.C.	9'-10"
2X8	17" O.C.	11'-8"
	16" O.C.	10'-4"
	24" O.C.	8'-3"
2X10	17" O.C.	21'-1"
	16" O.C.	18'-9"
	24" O.C.	15'-3"
2X12	17" O.C.	25'-1"
	16" O.C.	21'-8"
	24" O.C.	17'-9"

ROOF VENTS			EAVE-BLOCKG			ROOF VENTS		
% EAVE	AREA (ft²)	% ROOF	AREA (ft²)	3-VENT	4-VENT	AREA (ft²)	3-VENT	4-VENT
60	219.4	40	186.2	30	23	4		
56.7	264.0	43.3	207.6	29	22	5		
53.3	248.2	46.7	217.4	27	20	5		
50	232.8	50	232.8	25	19	5		

PER 2006 IBC - 1506.2.2 THE MIN. NET FREE VENTILATING AREA SHALL BE 1/60 OF THE AREA OF THE VENTED SPACE.

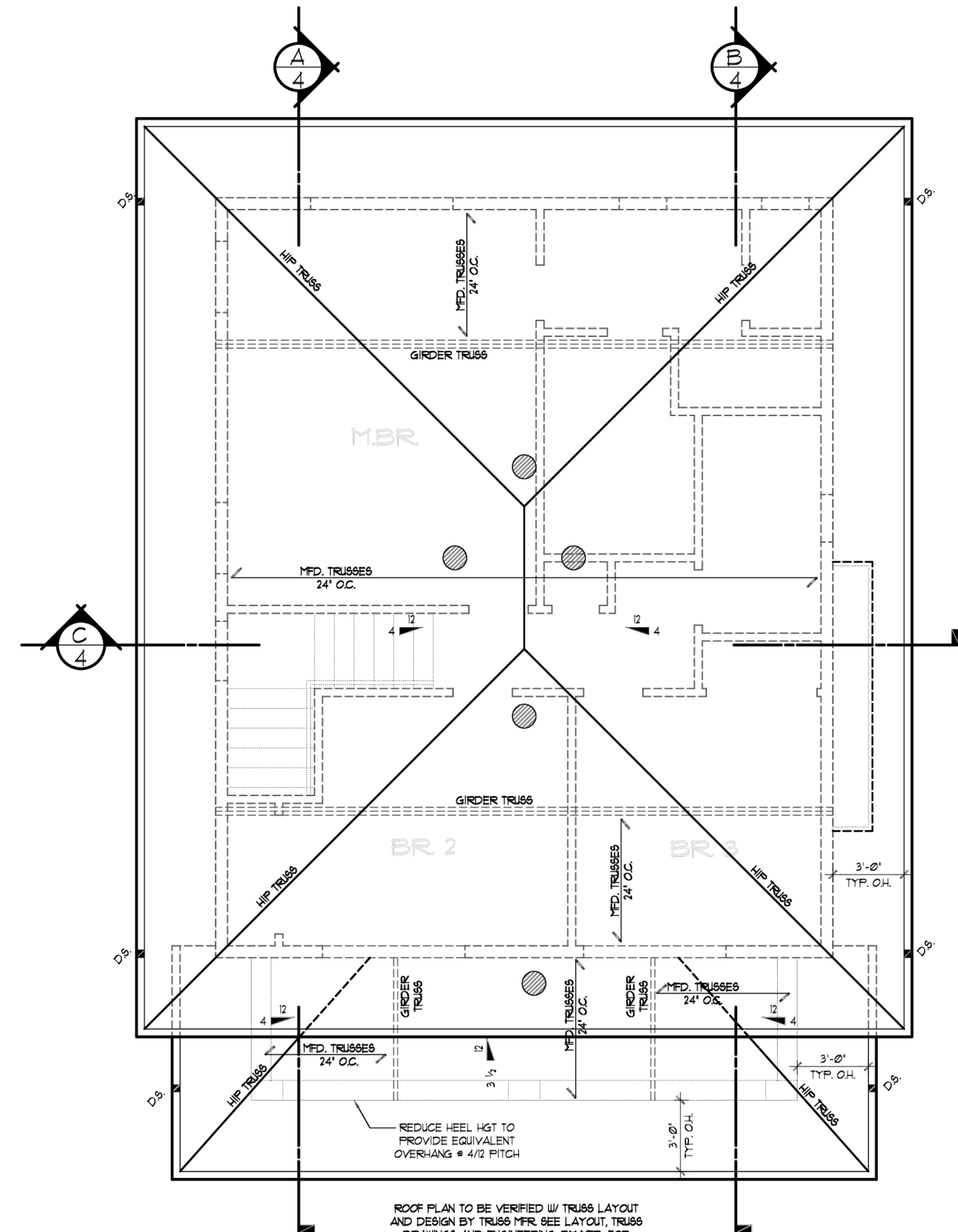
EXCEPTION: THE MIN. NET FREE VENTILATING AREA SHALL BE 1/60 OF THE VENTED SPACE PROVIDED BOTH OF THE FOLLOWING CONDITIONS ARE MET:
1. CLIMATE ZONES 6, 7, AND 8. A CLASS 1 OR 1 VAPOR RETARDER IS INSTALLED ON THE WARMER SIDE OF THE CEILING.
2. NOT LESS THAN 40 PERCENT AND NOT MORE THAN 50 PERCENT OF THE REQUIRED VENTILATING AREA IS PROVIDED BY VENTILATORS LOCATED IN THE UPPER PORTION OF THE ATTIC OR RAFTER SPACE. UPPER VENTILATORS SHALL BE LOCATED NOT MORE THAN 3 FEET FROM THE RIDGE OR HIGHEST POINT OF THE SPACE MEASURED VERTICALLY. THE BALANCE OF THE REQUIRED VENTILATING AREA PROVIDED SHALL BE LOCATED IN THE BOTTOM ONE-THIRD OF THE ATTIC SPACE. WHERE THE LOCATION OF WALL OR ROOF FRAMING MEMBERS CONFLICTS WITH THE INSTALLATION OF UPPER VENTILATORS, THE WALLS SHALL BE 1 FEET OR MORE BELOW THE RIDGE OR HIGHEST POINT OF THE SPACE SHALL BE PERMITTED.

EAVE BLOCKING



ENERGY ENVELOPE KEY

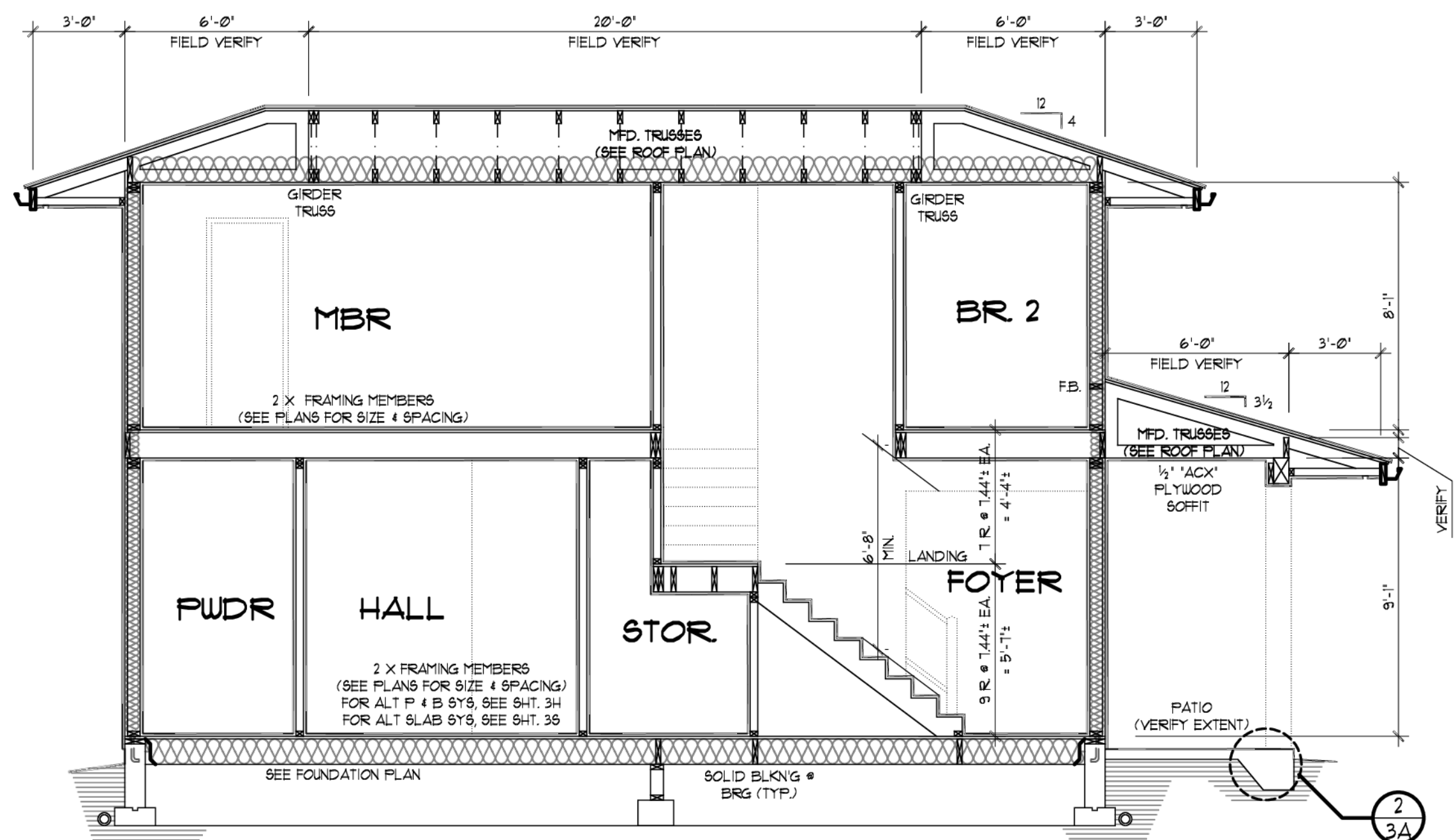
- WALL/FLR/CLG. INSUL.
- FOUNDATION INSUL.
- (SEE SHEET 'G' FOR INSULATION VALUES)



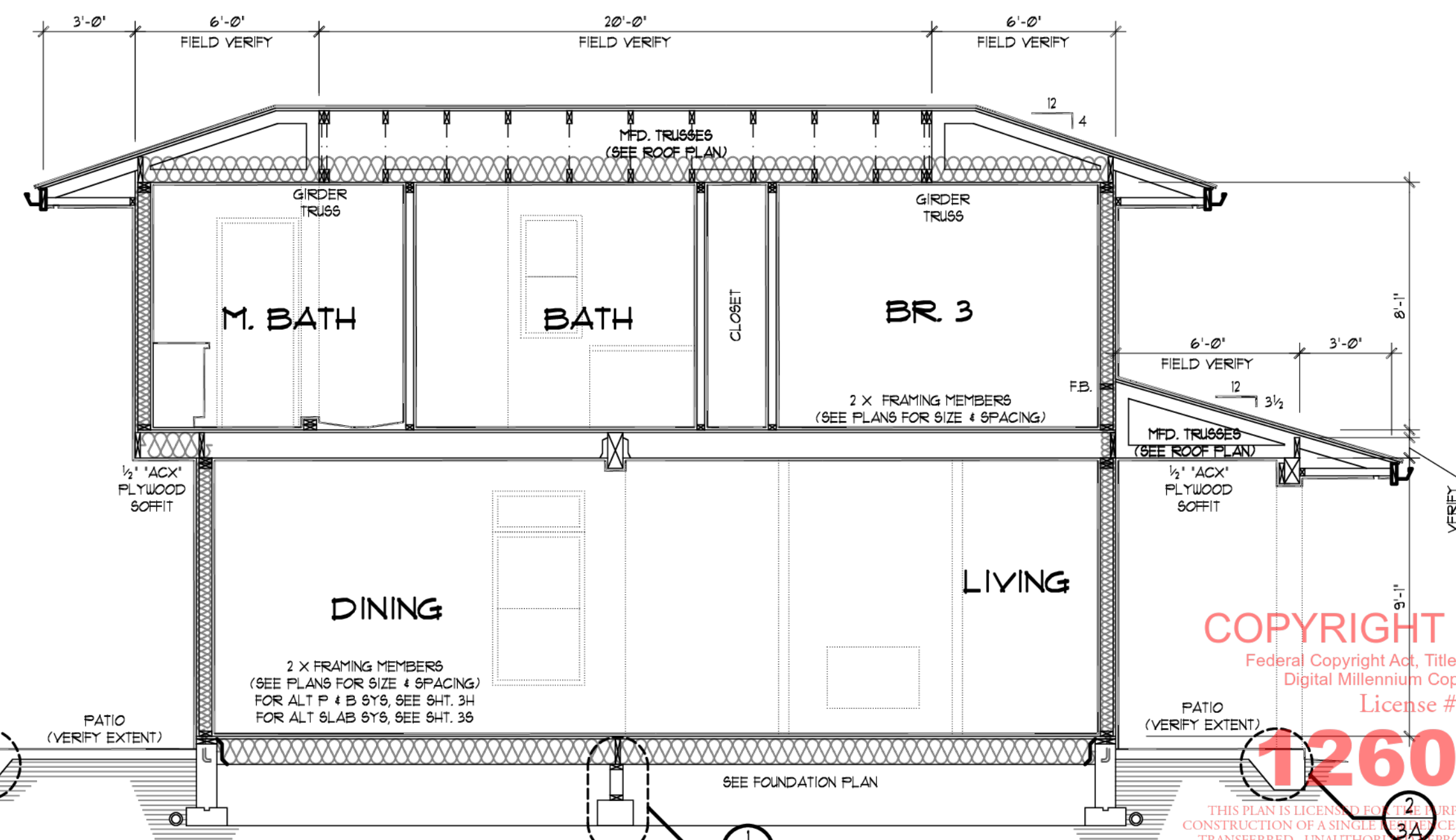
ROOF PLAN

SCALE: 1/4" = 1'-0"

IF LATERAL ENGINEERING IS REQUIRED, REFER TO ENGINEERING SHEETS FOR LATERAL SPECIFICATIONS



A BUILDING SECTION
SCALE: 1/4" = 1'-0"



B BUILDING SECTION
SCALE: 1/4" = 1'-0"

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25# SNOW LOAD

UPPER FLOOR	78 SQ. FT.
MAIN FLOOR	85 SQ. FT.
TOTAL AREA	163 SQ. FT.

21149CB
4

DISCLAIMER

12/27/19

THESE PLANS HAVE BEEN LICENSED TO THE CUSTOMER FOR USE IN THE CONSTRUCTION OF ONE BUILDING ONLY AND ARE SUBJECT TO THE CONDITIONS OF LICENSE ACCEPTED BY THE CUSTOMER...

MASCORD PREPARES ITS PLANS CAREFULLY FOR USE BY ITS CUSTOMERS. HOWEVER, ADAPTATION OF THE PLANS TO SPECIFIC STATE AND LOCAL BUILDING CODES AND REGULATIONS AND SPECIFIC SITE CONDITIONS IS THE RESPONSIBILITY OF THE CONTRACTOR...

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GENERAL NOTES:

12/27/19

1. ALL WORK IS TO COMPLY WITH THE LATEST ADOPTED VERSION OF THE 2018 INTERNATIONAL RESIDENTIAL CODE (IRC) AND/OR ANY APPLICABLE STATE, COUNTY OR LOCAL JURISDICTION.

2. THE CONTRACTOR IS RESPONSIBLE TO CHECK THE PLANS AND IS TO NOTIFY THE DESIGNER OF ANY ERRORS OR OMISSIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION. OWNER/CONTRACTOR SHALL VERIFY WITH LOCAL BLDG. DEPT. WHICH CLIMATE ZONE THE PROJECT WILL BE BUILT IN.

3. WRITTEN DIMENSIONS SHALL HAVE PRECEDENCE OVER SCALED DIMENSIONS. DO NOT SCALE THE DRAWINGS.

Table with 4 columns: USE, ULL, DL, and D.L. Rows include UNINHAB ATTIC W/O STORAGE, UNINHAB ATTIC W/ LIMITED STORAGE, HABITABLE ATTICS SERVED BY STAIR BALCONIES, etc.

(IF YOUR LOCAL AREA REQUIRES DIFFERENT DESIGN LOADS CONSULT WITH A LOCAL QUALIFIED PROFESSIONAL TO DETERMINE THE APPROPRIATE REVISIONS.)

INSULATION AND PENETRATION REQUIREMENTS BY COMPONENT:

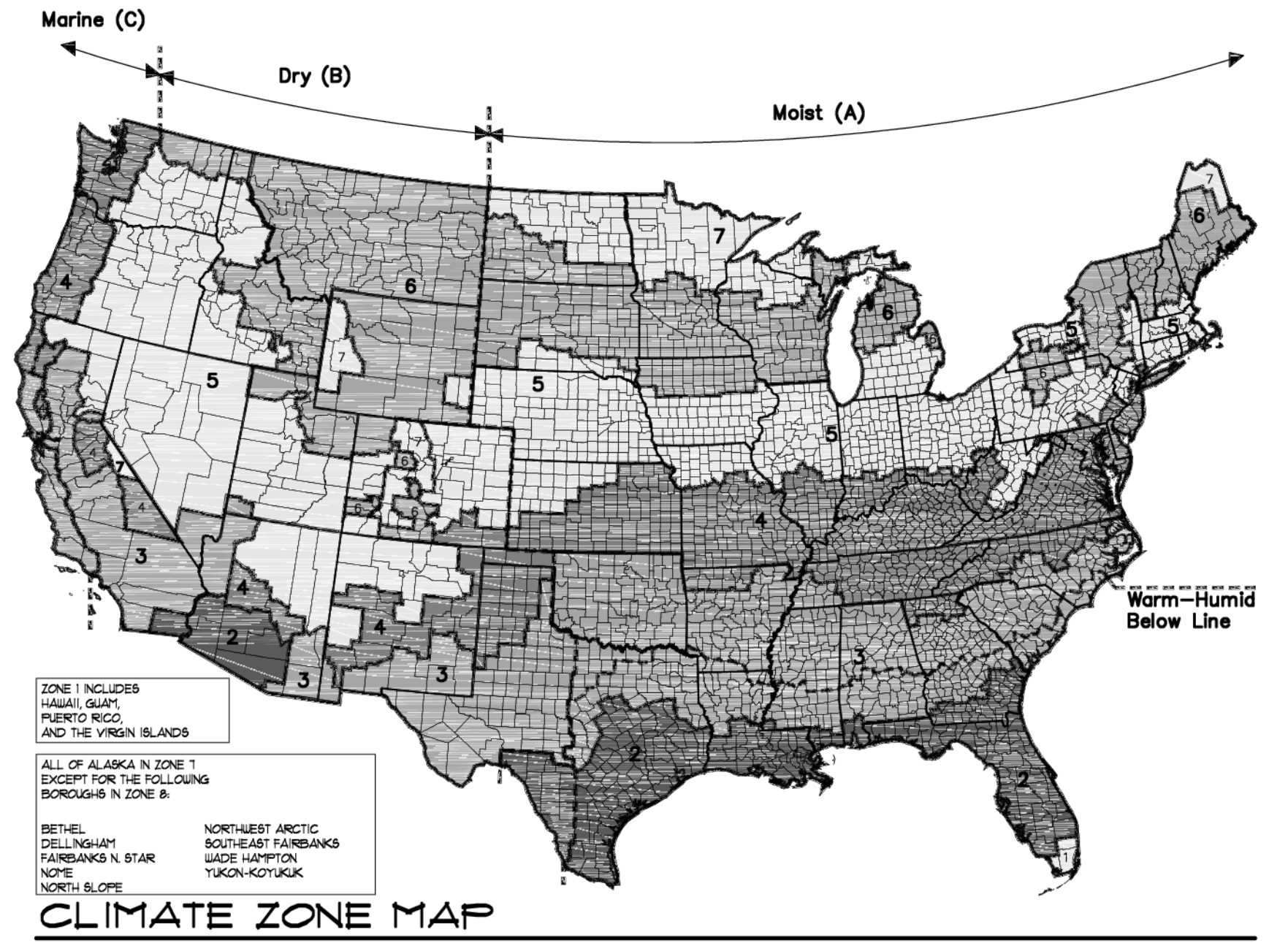
Table with 10 columns for climate zones 1-6, 1 and 6, and 6. Rows include FENESTRATION U-FACTOR, SKYLIGHT U-FACTOR, GLAZED FENESTRATION SHGC, etc.

R-values are minimums. U-factors and SHGC are maximums. When installed in a cavity which is less than the label or design thickness of the insul, the installed R-value of the insul shall not be less than the R-value specified in the table.

1. AIR BARRIER, CONT. AIR BARRIER SHALL BE INSTALLED IN THE BLDG. ENVELOPE. BREAKS/JUNCTIONS IN THE AIR BARRIER SHALL BE SEALED AND PERMEABLE INSUL. SHALL NOT BE USED AS A SEALING MATERIAL. INSUL. SHALL BE INSTALLED PER MANUF. GUIDELINES.

INFILTRATION: THE SEALING METHODS BETWEEN DISSIMILAR MATERIALS SHALL ALLOW FOR DIFFERENTIAL EXPANSION AND CONTRACTION. THE FOLLOWING SHALL BE CALCULATED, GASKETED, WEATHERSTRIPPED OR OTHERWISE SEALED WITH AN AIR BARRIER MATERIAL, SUITABLE FILM OR SOLID MATERIAL.

TESTING: DUELLING SHALL BE TESTED TO VERIFY LEAKAGE RATE DOES NOT EXCEED 5 AIR CHANGES PER HOUR IN ZONE 1 & 2, AND 3 AIR CHANGES PER HOUR IN ZONES 3-6. BLEEDER OR TEST AT A PRESSURE OF 0.2 IN. WG (30 PASCALS), WHERE REQD BY APPLICABLE LOCAL, TESTING SHALL BE CONDUCTED BY AN APPROVED THIRD PARTY. SEE INT612.1 (R462.412) FOR TESTING PROCEDURES AND DOCUMENTATION REQS.



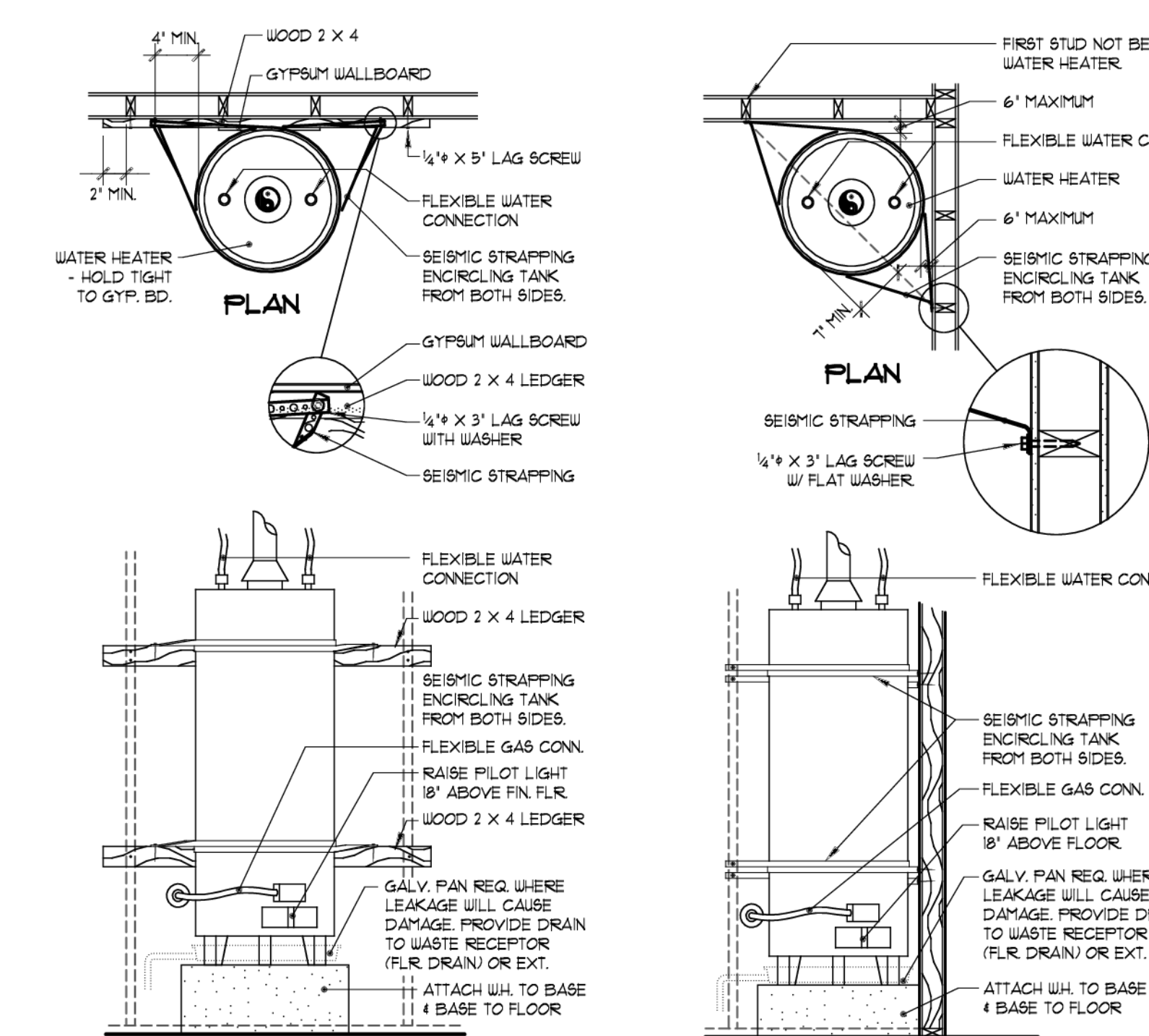
CLIMATE ZONE MAP

FOUNDATION NOTES:

12/27/19

- 1. FOOTINGS ARE TO BEAR ON UNDISTURBED LEVEL SOILD, DEVOID OF ANY ORGANIC MATERIAL AND STEEPED AS REQUIRED TO MAINTAIN THE REQUIRED GRADE BELOW THE FINAL GRADE.
2. CONTINUOUS FOOTINGS ARE DESIGNED PER 2018 IRC TABLE R403(1) - 60# R.C. BEARING WALL OR 3000 P.S.F. 3/4" SOUL LOAD, LIGHT FRAME CONSTRUCTION BASED ON 3" WIDE HOUSE WITH CENTER BEARING WALL.
3. MAX. SLOPE OF GUTS AND FILLS TO BE TWO (2) HORIZ. TO ONE (1) VERT. FOR BLDG. STRUCTURES AND FINDS.
4. ANY FILL UNDER GARAGE SUPPORTED SLABS TO BE A MIN OF 4" GRANULAR MAT. COMPACTED TO 98%.
5. CONCRETE - MIX AND 28 DAY STRENGTH OF CONCRETE.

Table with 2 columns: DESCRIPTION and VALUE. Rows include BASEMENT WALLS & FOUNDATIONS NOT EXPOSED TO WEATHER (2500 PSI), BASEMENT INTERIOR SLABS ON GRADE (2500 PSI), BASEMENT WALLS & FOUNDATIONS EXPOSED TO WEATHER, AND GARAGE SLABS (3000 PSI), PORCHES, STEPS, & CARPORT SLABS EXPOSED TO WEATHER (3500 PSI).



FRAMING NOTES:

12/27/19

- 1. ALL EXTERIOR WALL OPENINGS & BEARING WALL OPENINGS TO HAVE 4 X 10 HEADERS UNLESS OTHERWISE INDICATED. IF BUILDING BUILT WITH 80% 1" STUDS USE 4 X 8 HEADERS UNLESS OTHERWISE NOTED ON THE PLAN.
2. ALL EXTERIOR WALLS TO BE BUILT OF 2 X 6 @ 16" O.C. TYPICALLY UNLESS NOTED OTHERWISE. ALL INTERIOR WALLS SUPPORTING TWO OR MORE FLOORS AND 1 OR MORE ROOF/CEILING ASSEMBLIES SHALL BE 2 X 6 @ 16" O.C. FOUNDATION CRIPPLE WALLS SHALL BE FRAMED OF STUDS NOT LESS IN SIZE THAN THE STUDS ABOVE. WHEN EXCEEDING 4'-0" IN HEIGHT, SUCH WALLS SHALL BE STRAPPED BY STUDS FOUNDING THE SIZE REQUIRED FOR AN ADDITIONAL STORY UNLESS SPECIFIED OTHERWISE.
3. ALL METAL CONNECTORS TO BE 'SIMPSON' OR EQUIVALENT. UNDO JOISTS HANG ON FLUSH BEAMS TO BE ATTACHED WITH U240 OR EQUIVALENT. MULTIPLE JOISTS USE U240-U240-3 AS REQUIRED. USE OF 100 X 100 X 100 NAILS ARE ALLOWED WITH THESE TYPES OF HANGERS UNLESS NOTED ON THE PLANS. SEE NAIL CONNECTION CHART FROM CONNECTOR MANUFACTURERS. CATALOGS AND OTHER NOTES AND RESTRICTIONS THAT MAY APPLY. 'USE' CONNECTORS CONSIDERED APPROVED EQUAL.

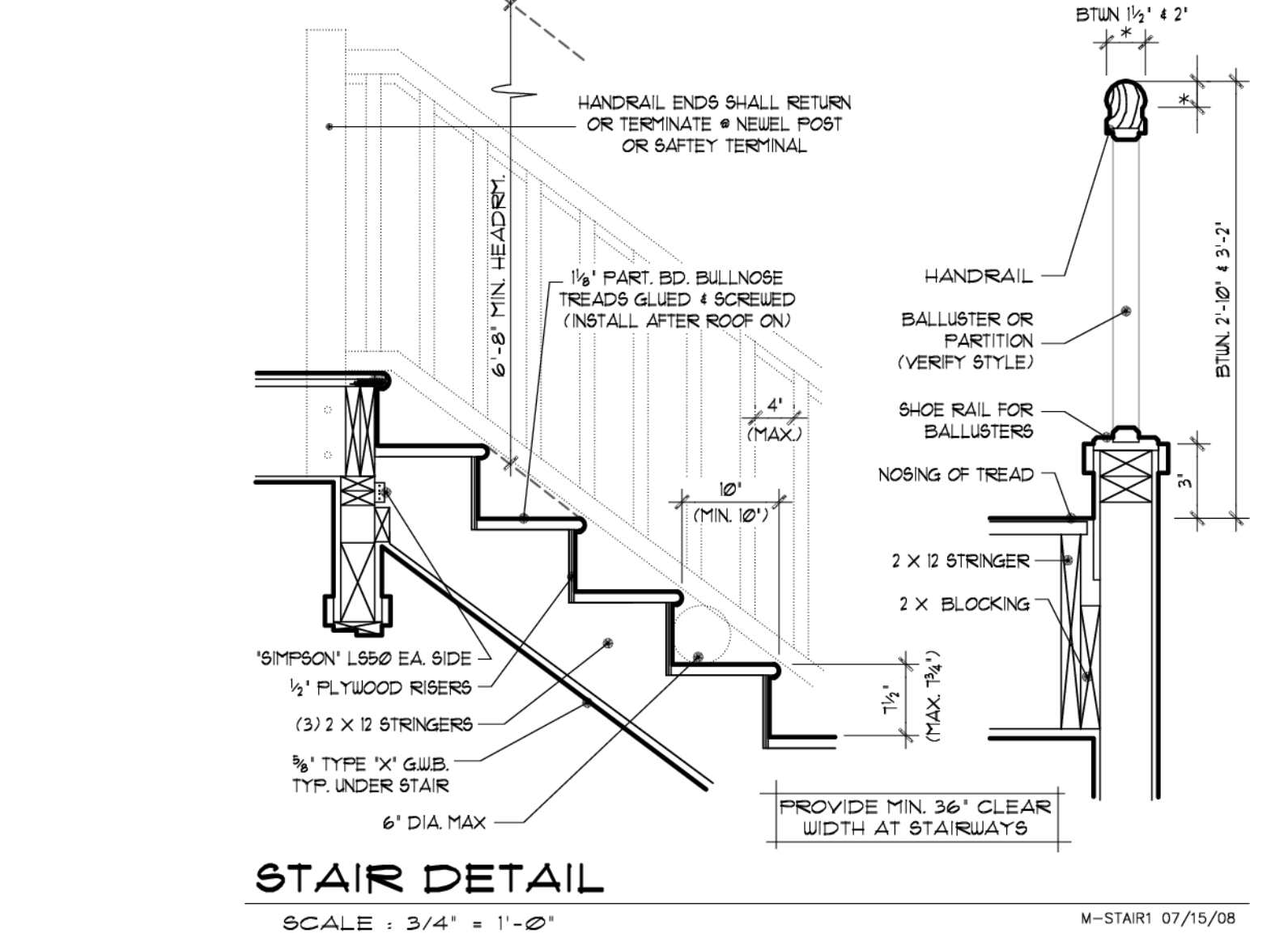
- 4. PROVIDE DOUBLE JOISTS UNDER ALL WALLS ABOVE. RUNNING PARALLEL TO JOISTS AND SOLID BLOCKING BELOW ALL BEARING WALLS RUNNING PERPENDICULAR TO JOIST JOISTS.
5. PROVIDE POSITIVE VENTILATION AT EACH END OF EACH RAFTER AT VALTED CLG AREAS. AND INSULATION BATTERIES AT EAVE VENTS BETWEEN RAFTERS. RAFTER VENTILATION IS ALSO REQUIRED AT BLOCKING LOCATIONS ABOVE THE FLATE.
6. PROVIDE FIRE BLOCKING PER 2018 IRC R602.11 & DRAFT STOPPS PER 2018 IRC R602.12
7. HIPS, VALLEYS & RIDGES SHALL NOT BE LESS IN DEPTH THAN THE END CUT OF THE RAFTER.
8. UNLESS NOTED OTHERWISE, CONNECT POST TO BEAM WITH 'SIMPSON' BC SERIES CAP/BASE OR ARTIFICIAL LIGHT SOURCE LOCATED IN THE IMMEDIATE VICINITY OF THE 'SIMPSON' SERIES BASES UNDO & AT INTERIOR GARAGE POSTS AT FINISH FLOOR, (POST NOT EMBEDDED) USE 'SIMPSON' CB SERIES BASES. 'USE' CONNECTORS CONSIDERED APPROVED EQUAL.
9. FASTENERS FOR PRESERVATIVE-TREATED WOOD INCLUDING NUTS AND WASHERS SHALL BE HOT-DIPPED, ZINC-COATED GALVANIZED STEEL OR STAINLESS STEEL.
10. LUMBER SPECIES:
A. POSTS, BEAMS, HEADERS JOISTS AND RAFTERS: NO. 1 DOUGLASS FIR
B. WALLS, PLATES, BLOCKING BRIDGING ETC.: NO. 2 DOUGLASS FIR
C. STUDS: STUD GRADE D.F.
D. STUDS OVER 10' HIGH: NO. 2 OR BETTER D.F.
E. POST & BEAM DECKING: UTILITY GRADE D.F.
F. FLYWOOD SHEATHING: 1/2" CDX PLY. 32/46
G. G-1/4" LAM BEAMS (EXT. ADH. EXT. CONDITIONS): 10-3400. DRY ADH.
H. FRI. MATERIALS: Fd = 2500 E + 2.0 Fv = 250
LVL MATERIALS: Fd = 2500 E + 2.0 Fv = 285
LVL MATERIALS: Fd = 2350 E + 1.95 Fv = 925
I. FRI. INDICATES PARALLEL STRAND LUMBER
J. FRI. INDICATES LAMINATED VENEER LUMBER
K. LAMINATED STRAND LUMBER
L. METAL HANGERS & FASTENERS USED WITH P.T. LUMBER TO BE STAINLESS STEEL OR HOT-DIPPED GALVANIZED.
11. FASTENING SCHEDULE:

Table with 4 columns: JOISTS, FLOOR, CEILING, JOISTS, CEILING, CEILING. Rows include 2 X 6, 2 X 8, 2 X 10, 2 X 12.

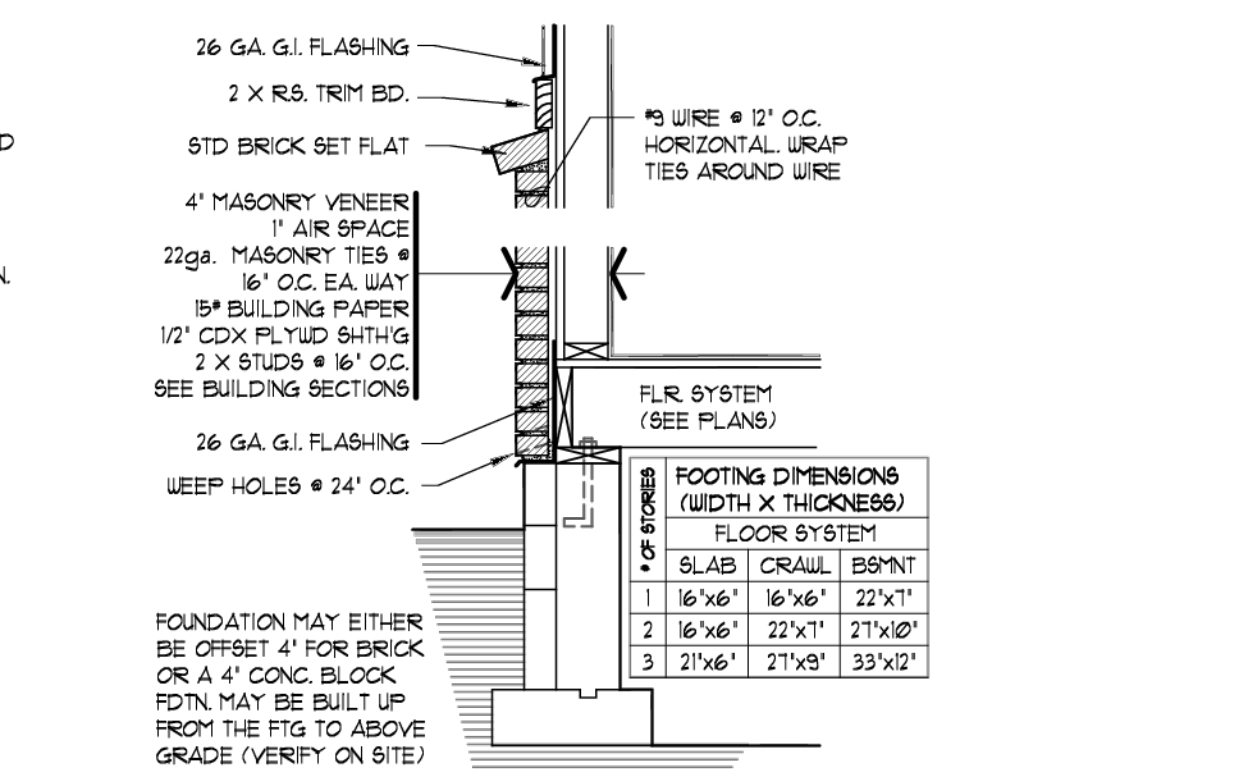
SPAN TABLES table with columns for JOISTS, FLOOR, CEILING, JOISTS, CEILING, CEILING. Rows include 2 X 6, 2 X 8, 2 X 10, 2 X 12.



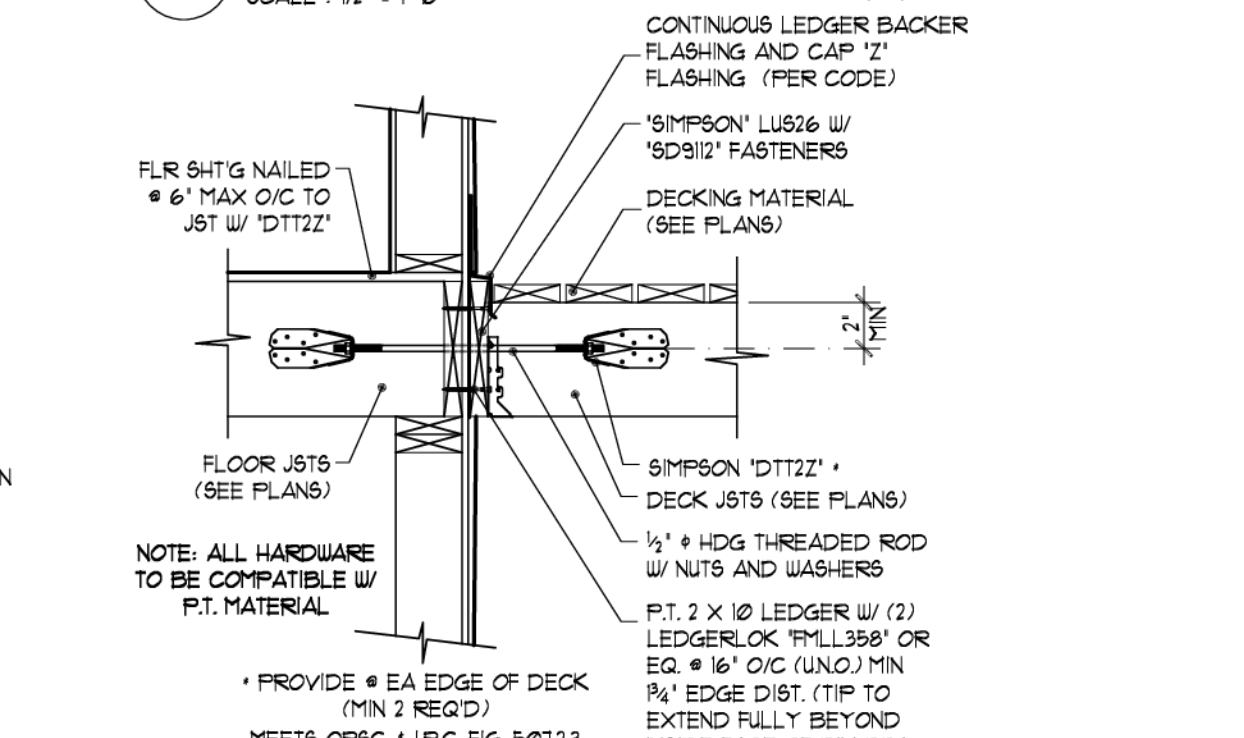
STAIR DETAIL SCALE: 3/4" = 1'-0"



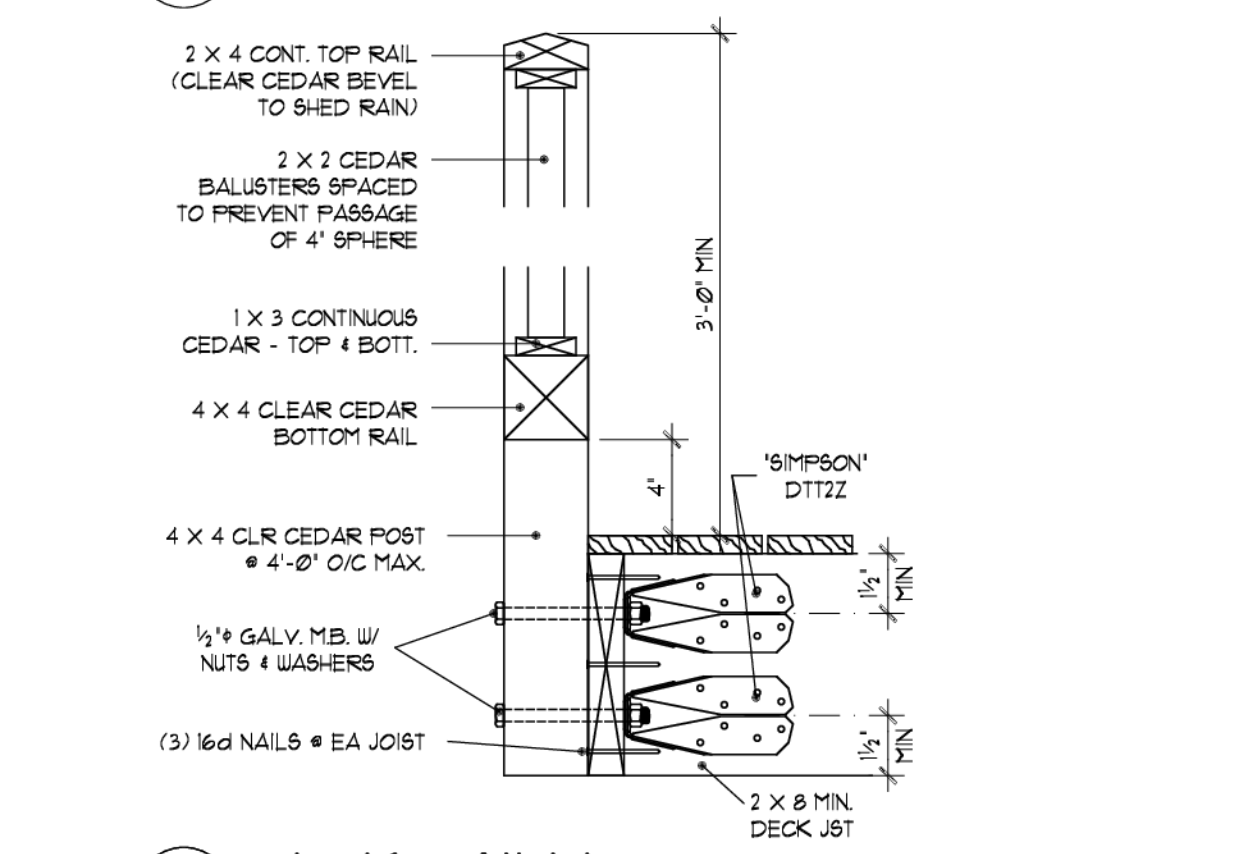
STEP FOOTING DETAIL SCALE: 1/2" = 1'-0"



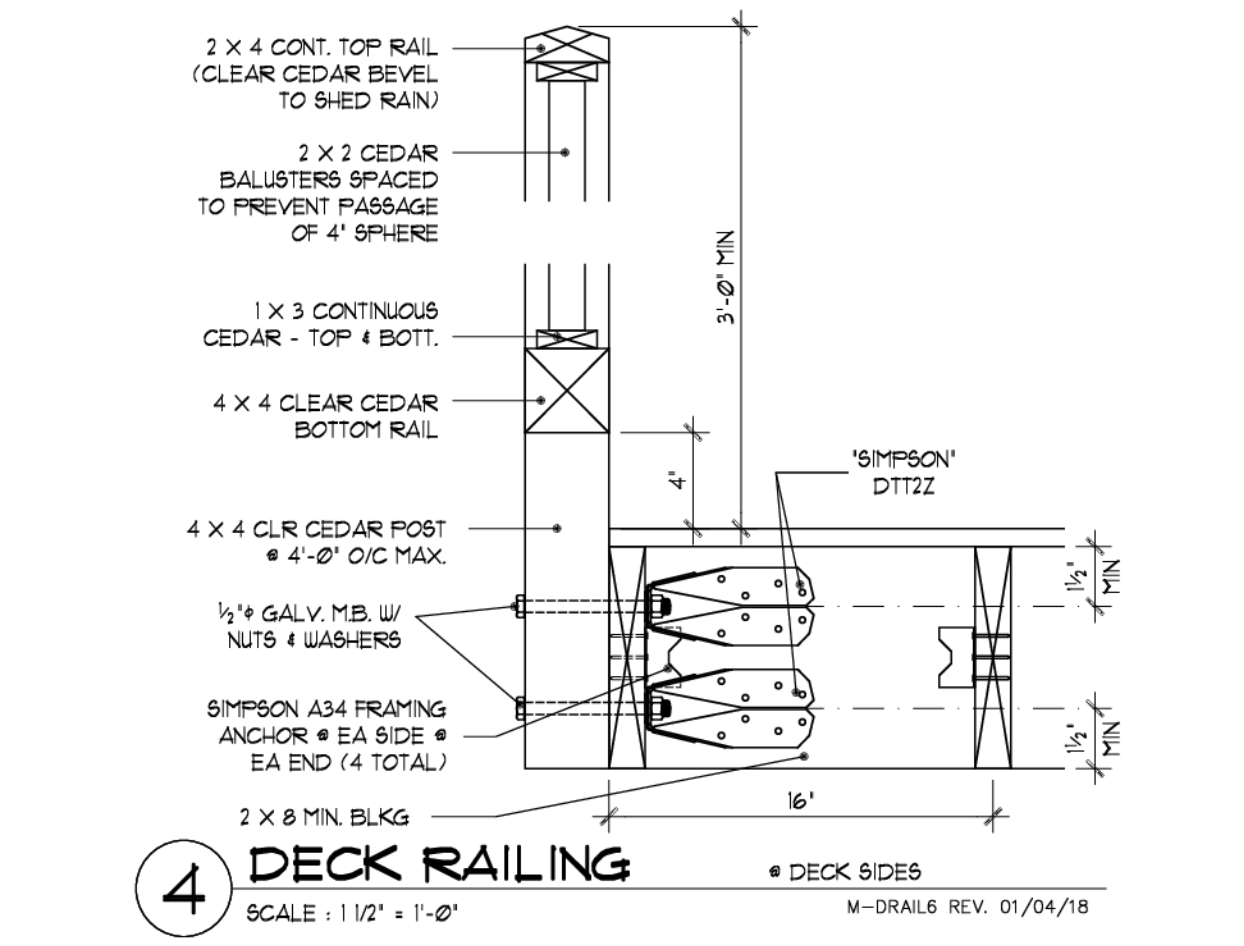
MASONRY VENEER DTL SCALE: 1/2" = 1'-0"



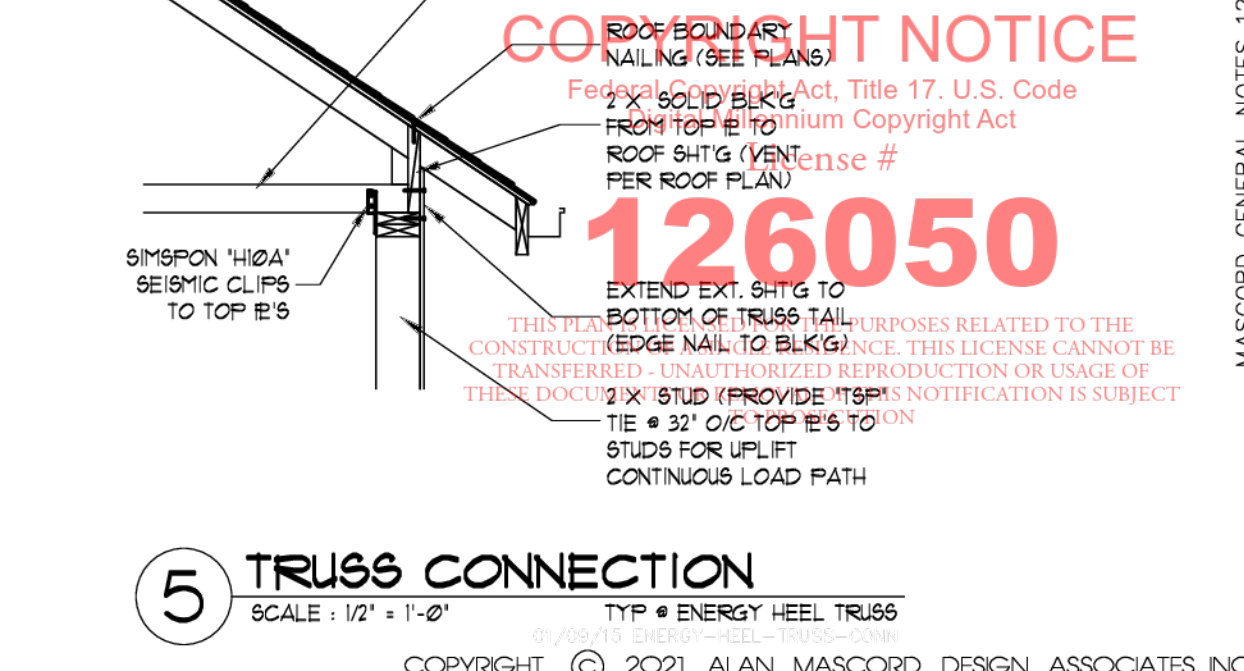
DECK LEDGER (TYP UNO) SCALE: 1/2" = 1'-0"



DECK RAILING SCALE: 1/2" = 1'-0"



DECK RAILING SCALE: 1/2" = 1'-0"



TRUSS CONNECTION SCALE: 1/2" = 1'-0"

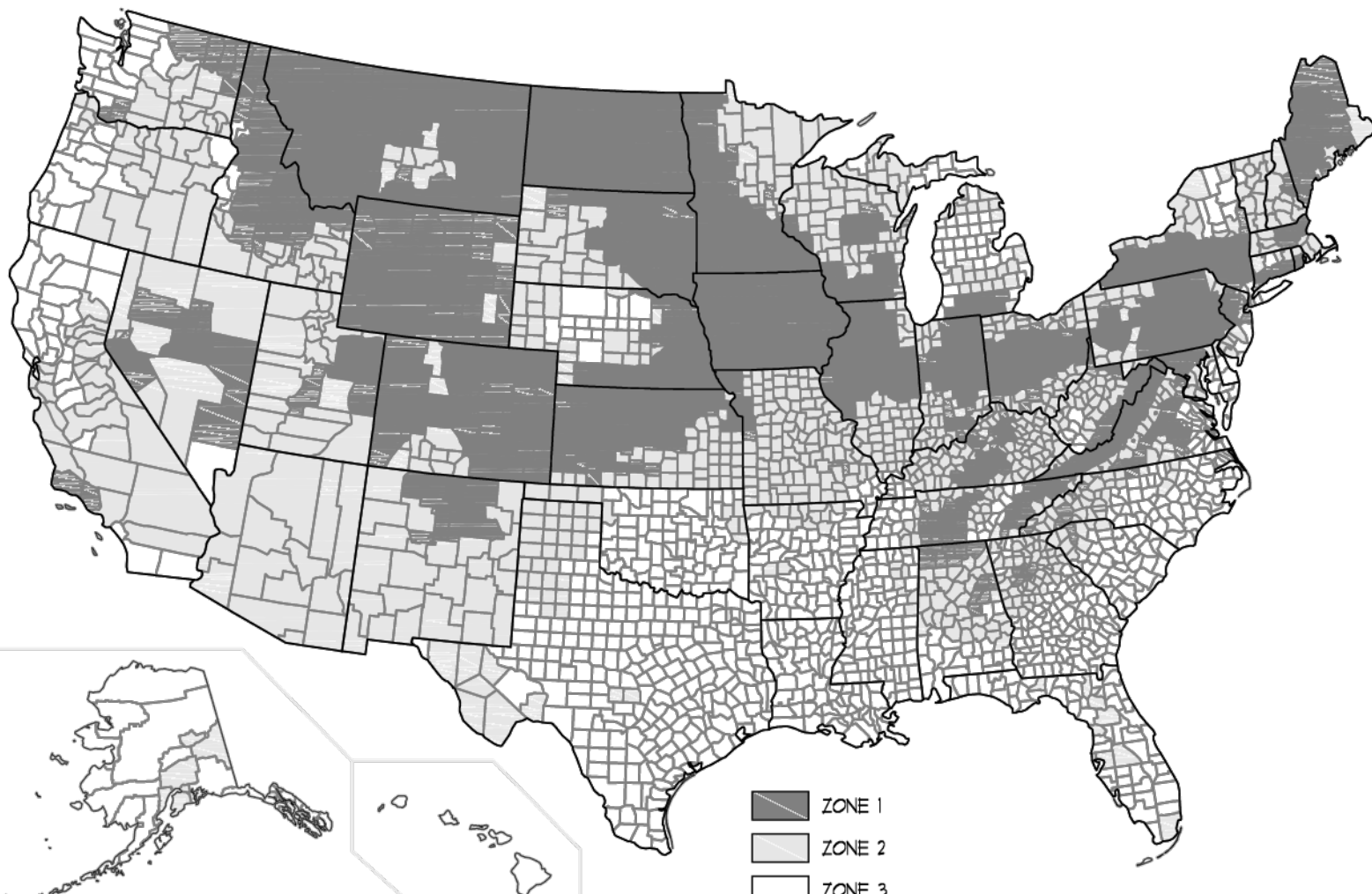
25# SNOW LOAD information including height, width, and total area for snow load calculation.

21149CB-010418

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CLIMATE ZONE MAP

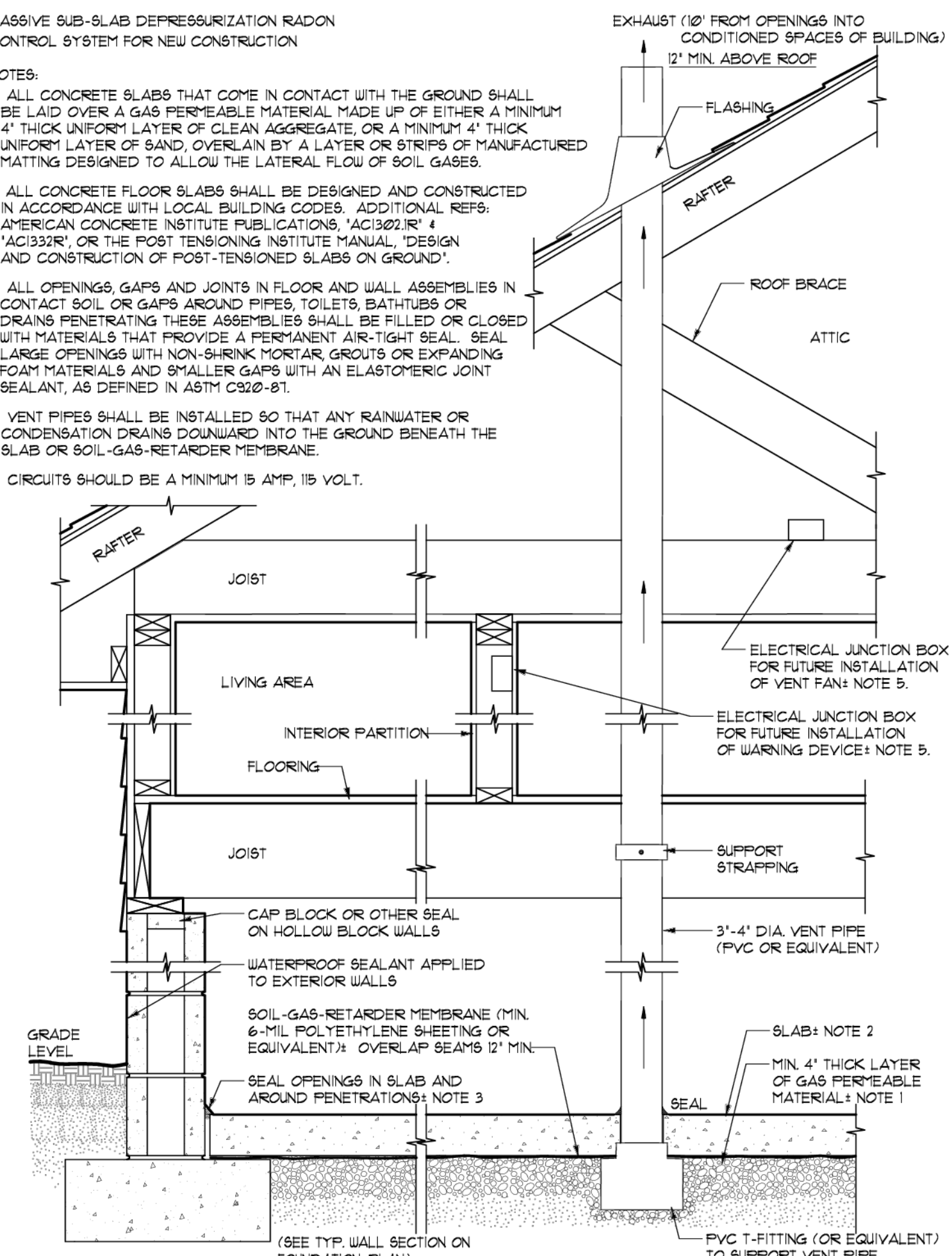


EPA RADON ZONES

DISCLAIMER: THE PURPOSE OF THIS MAP IS TO ASSIST NATIONAL STATE AND LOCAL ORGANIZATIONS TO TARGET THEIR RESOURCES AND TO IMPLEMENT RADON-RESISTANT BUILDING CODES. ALL HOMES SHOULD BE TESTED REGARDLESS OF GEOGRAPHIC LOCATION. EPA RECOMMENDS THAT THIS MAP BE SUPPLEMENTED WITH ANY AVAILABLE LOCAL DATA IN ORDER TO FURTHER UNDERSTAND AND PREDICT THE RADON POTENTIAL FOR A SPECIFIC AREA.

PASSIVE SUB-SLAB DEPRESSURIZATION RADON CONTROL SYSTEM FOR NEW CONSTRUCTION

- NOTES:
1. ALL CONCRETE SLABS THAT COME IN CONTACT WITH THE GROUND SHALL BE LAID OVER A GAS PERMEABLE MATERIAL MADE UP OF EITHER A MINIMUM 4" THICK UNIFORM LAYER OF CLEAN AGGREGATE, OR A MINIMUM 4" THICK UNIFORM LAYER OF SAND, OVERLAIN BY A LAYER OF STRIPS OF MANUFACTURED MATTING DESIGNED TO ALLOW THE LATERAL FLOW OF SOIL GASES.
 2. ALL CONCRETE FLOOR SLABS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH LOCAL BUILDING CODES. ADDITIONAL REFS: AMERICAN CONCRETE INSTITUTE PUBLICATIONS, "AC1302R" & "AC1302R" & "AC1332R" OR THE POST TENSIONING INSTITUTE MANUAL, "DESIGN AND CONSTRUCTION OF POST-TENSIONED SLABS ON GROUND".
 3. ALL OPENINGS, GAPS AND JOINTS IN FLOOR AND WALL ASSEMBLIES IN CONTACT WITH SOIL OR GAPS AROUND PIPES, TOILETS, BATHUBS OR DRAINS PENETRATING THESE ASSEMBLIES SHALL BE FILLED OR CLOSED WITH MATERIALS THAT PROVIDE A PERMANENT AIR-TIGHT SEAL. SEAL LARGE OPENINGS WITH NON-SHRINK MORTAR, GROUTS OR EXPANDING FOAM MATERIALS AND SMALLER GAPS WITH AN ELASTOMERIC JOINT SEALANT, AS DEFINED IN ASTM C920-01.
 4. VENT PIPES SHALL BE INSTALLED SO THAT ANY RAINWATER OR CONDENSATION DRAINS DOWNWARD INTO THE GROUND BENEATH THE SLAB OR SOIL-GAS-RETARDER MEMBRANE.
 5. CIRCUITS SHOULD BE A MINIMUM 15 AMP, 115 VOLT.



SLAB ON-GRADE/BELOW-GRADE (BASEMENTS) SUB-MEMBRANE DEPRESSURIZATION SYSTEM

RADON MITIGATION

THE FOLLOWING CONSTRUCTION TECHNIQUES AND MEASURES ARE INTENDED TO MITIGATE RADON ENTRY IN NEW CONSTRUCTION. THESE TECHNIQUES MAY BE REQUIRED ON A JURISDICTION BY JURISDICTION BASIS. FOR EXAMPLE, IN THE STATE OF OREGON, PER 2011 ORS 650.005, THE COUNTIES OF MULTNOMAH, WASHINGTON, CLATSOP, FOLK, YAMHILL, HOOD RIVER AND BAKER REQUIRE RADON MITIGATION, AS DO THE COUNTIES OF CLATSOP, FERRY, OKANOGAN, PEND OREILLE, SKAMANIA, SPOKANE AND STEVENS, IN THE STATE OF WASHINGTON, PER 2015 I.R.C./WAC 91-51-600(1) (AF10) & AF103.

FOLLOWING THE U.S. EPA MODEL STANDARDS AND TECHNIQUES FOR CONTROL OF RADON IN NEW RESIDENTIAL BUILDINGS, THESE SPECIFICATIONS MEET MOST NATIONAL CODES. THE BUILDER AND HOME OWNER SHOULD CHECK FOR ANY LOCAL VARIANTS TO THESE GUIDELINES.

BUILDING TIGHTNESS MEASURES

- THE FOLLOWING ARE POINTS OF ENTRY TO PROTECT FROM PASSAGE OF RADON GAS INTO LIVING SPACE - PROVIDE POLYURETHANE CAULK OR EQUIVALENT SEALANT AT THE FOLLOWING CRITICAL POINTS:
- SLAB ON-GRADE AND BASEMENT WALLS**
- CRACKS IN CONCRETE SLABS
 - COLD JOINT BETWEEN TWO CONCRETE POURS
 - PORES AND JOINTS IN CONCRETE BLOCKS
 - FLOOR-TO-WALL, CRACK OR FRENCH DRAIN
 - EXPOSED SOIL, AS IN A SUMP
 - KEEPING (DRAIN) TILE, IF DRAINED TO OPEN SUMP
 - MORTAR JOINTS
 - LOOSE FITTING PIPE PENETRATIONS
 - OPEN TOPS OF BLOCK WALLS
 - WATER FROM SOME WELLS
 - UNTRAPPED FLOOR DRAIN TO A DRY WELL OR SEPTIC SYSTEM.

- CRAWL SPACE**
- CRACKS IN SUBFLOORING AND FLOORING
 - SPACES BEHIND STUD WALLS AND BRICK VENEER WALLS THAT REST ON UNCAULKED HOLLOW-BLOCK FOUNDATION
 - ELECTRICAL PENETRATIONS
 - LOOSE-FITTING PIPE PENETRATIONS
 - OPEN TOPS OF BLOCK WALLS
 - WATER FROM SOME WELLS
 - HEATING DUCT REGISTER PENETRATIONS
 - COLD-AIR RETURN DUCTS IN CRAWL SPACE

CONDENSATE DRAINS SHALL BE RUN TO THE EXTERIOR USING NON PERFORATED PIPE OR SHALL BE PROVIDED WITH AN APPROVED TRAP.

SUMP PITS THAT SERVE AS END POINT FOR A SUB-SLAB OR EXTERIOR DRAIN TILE LOOP SYSTEM, AND SUMP PITS WHICH ARE NOT SEALED FROM THE SOIL, SHALL BE FITTED WITH A GASKETED OR SEALED LID. WHERE THE SUMP IS USED AS THE SUCTION POINT IN A SUB-SLAB DECOMPRESSION SYSTEM, THE LID MUST BE DESIGNED TO ACCOMMODATE THE VENT PIPE. WHERE USED AS A FLOOR DRAINING, THE SUMP PIT LID SHALL HAVE A TRAPPED INLET.

DUCTWORK WHICH PASSES THROUGH OR BENEATH A CONCRETE FLOOR SLAB SHALL BE FREE OF SEAMS AND MUST BE PERFORMANCE TESTED.

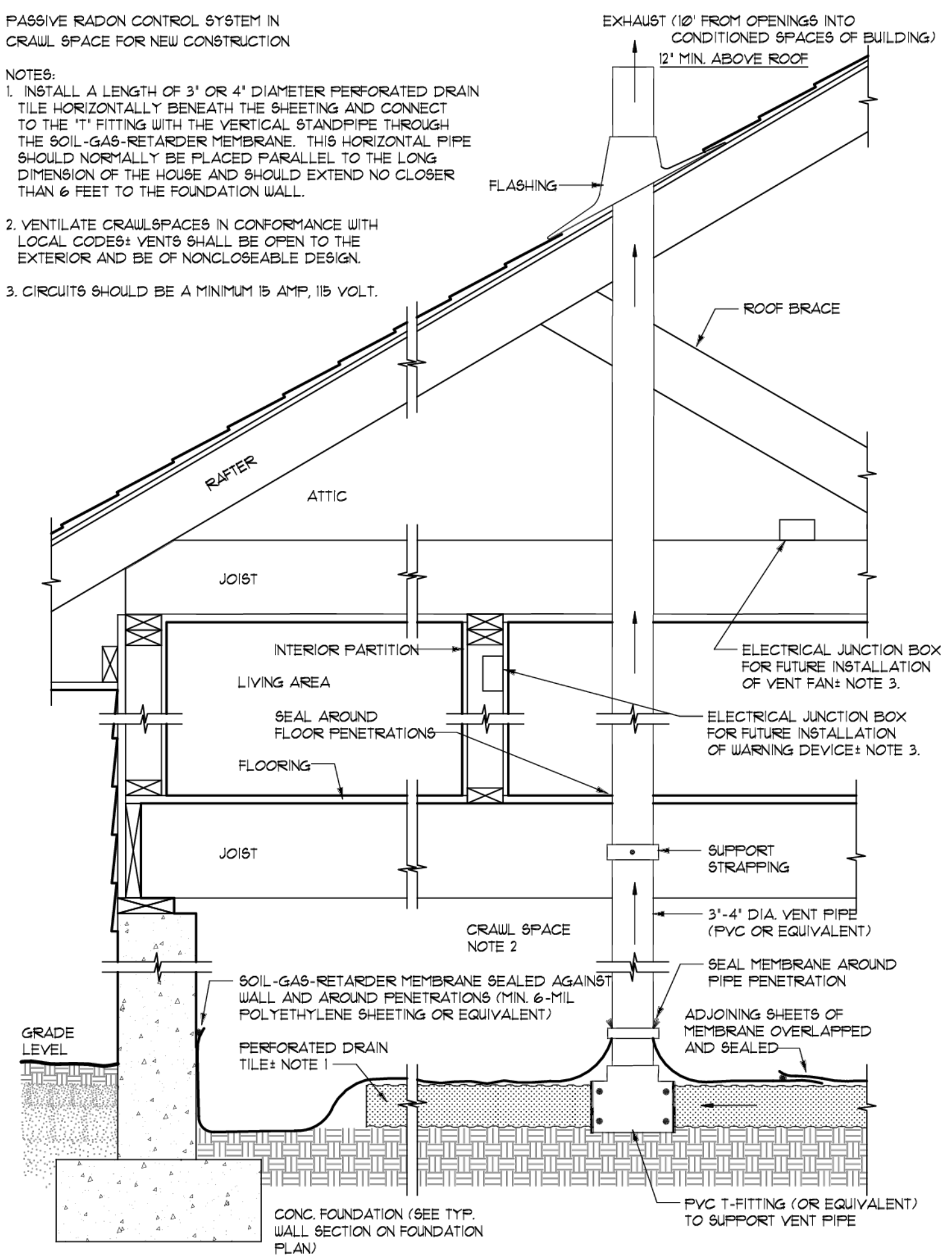
DUCTWORK PASSING THROUGH A CRAWLSPACE MUST HAVE ALL SEAMS AND JOINTS SEALED (PER M1601.1). ALL JOINTS OF DUCT SYSTEMS USED IN THE HEATING OR COOLING OF A CONDITIONED SPACE SHALL BE SEALED BY MEANS OF TAPE, MASTIC, AEROSOL SEALANT, GASKETING OR OTHER APPROVED CLOSURE SYSTEMS. WHERE MASTIC IS USED TO SEAL OPENINGS GREATER THAN 1/4", A COMBINATION OF MASTIC AND MESH SHALL BE USED.

CRAWLSPACE ACCESS OR UNDER-FLOOR MECHANICAL EQUIPMENT ACCESS, OR ANY OTHER ACCESS POINT FROM THE HABITABLE SPACE INTO THE CRAWL SPACE, SUCH AS DOORS OR PANELS, MUST BE CLOSED AND GASKETED TO CREATE AN AIRTIGHT SEPARATION.

AIR HANDLING UNITS IN CRAWL SPACES SHALL BE SEALED TO PREVENT AIR FROM BEING DRAIN INTO THE UNIT.

PASSIVE RADON CONTROL SYSTEM IN CRAWL SPACE FOR NEW CONSTRUCTION

- NOTES:
1. INSTALL A LENGTH OF 3" OR 4" DIAMETER PERFORATED DRAIN TILE HORIZONTALLY BENEATH THE SHEETING AND CONNECT TO THE 1" FITTING WITH THE VERTICAL STANDPIPE THROUGH THE SOIL-GAS-RETARDER MEMBRANE. THIS HORIZONTAL PIPE SHOULD NORMALLY BE PLACED PARALLEL TO THE LONG DIMENSION OF THE HOUSE AND SHOULD EXTEND NO CLOSER THAN 6 FEET TO THE FOUNDATION WALL.
 2. VENTILATE CRAWLSPACES IN CONFORMANCE WITH LOCAL CODES. VENTS SHALL BE OPEN TO THE EXTERIOR AND BE OF NONCLOSEABLE DESIGN.
 3. CIRCUITS SHOULD BE A MINIMUM 15 AMP, 115 VOLT.



CRAWLSPACE SUB-MEMBRANE DEPRESSURIZATION SYSTEM

CRAWL SPACE RADON MITIGATION

IN ADDITION TO THE CRAWL SPACE SEALING REQUIREMENTS, ONE OF THREE RADON MITIGATION METHODS SHALL BE IMPLEMENTED.

- METHOD #1 - MECHANICAL VENTILATION (AF1033, EXCEPTION)**
- PROVIDE AN APPROVED MECHANICAL CRAWL SPACE VENTILATION SYSTEM OR OTHER EQUIVALENT SYSTEM.
- METHOD #2 - PASSIVE SUB-MEMBRANE DEPRESSURIZATION SYSTEM (AF1033.1)**
- PROVIDE FOUNDATION VENTILATION SYSTEM (SEE FOUNDATION NOTES FOR CRAWLSPACE VENTING LOCATION REQUIREMENTS).
 - PROVIDE A SOIL-GAS RETARDER, SUCH AS 6 MIL POLYETHYLENE OR EQUIVALENT (SEE GAS RETARDER NOTES).
 - PROVIDE A VENT STACK (SEE VENT STACK NOTES).

- METHOD #3 - CRAWLSPACE VENTILATION AND BUILDING TIGHTNESS**
- PROVIDE NO LESS THAN ONE NET SQ. FT. OF CRAWLSPACE FOUNDATION VENT AREA PER EACH 50 SQ. FT. OF UNDER-FLOOR AREA (SEE FOUNDATION NOTES FOR CRAWLSPACE VENTING LOCATION REQUIREMENTS).
 - OPERABLE LOUVERS, DAMPERS, OR OTHER MEANS TO TEMPORARILY CLOSE OFF VENT OPENINGS ARE NOT ALLOWED TO MEET THE REQUIREMENTS OF THIS RADON MITIGATION METHOD.
 - DUELLINGS SHALL BE TESTED WITH A BLOWER DOOR DEPRESSURIZING THE DUELLING TO 50 Pascals FROM AMBIENT CONDITIONS AND FOUND TO EXHIBIT NO MORE THAN 50 AIR CHANGES PER HOUR.
 - INSTALL A MECHANICAL EXHAUST, SUPPLY, OR COMBINATION VENTILATION SYSTEM PROVIDING WHOLE-BUILDING VENTILATION RATES AS PER TABLE N1001(3).

VENTILATION AIR REQUIREMENTS (cfm)

FLOOR AREA (FT ²)	NUMBER OF BEDROOMS			
	0-1	2-3	4-5	6-7
<1500	30	45	60	75
1501-3000	45	60	75	90
3001-4500	60	75	90	105
4501-6000	75	90	105	120
6001-7500	90	105	120	135
>7500	105	120	135	150

SLAB-ON-GRADE/BASEMENT RADON MITIGATION

A PASSIVE SUB-SLAB DEPRESSURIZATION SYSTEM SHALL BE INSTALLED DURING CONSTRUCTION IN BASEMENT OR SLAB-ON-GRADE BUILDINGS. FOLLOW THE NOTES HERE REGARDING BUILDING TIGHTNESS MEASURES AND ASSEMBLE THE FOLLOWING ELEMENTS OF THIS MITIGATION SYSTEM.

- PROVIDE A RADON VENT PIPE EXTENDING FROM A GAS PERMEABLE LAYER BENEATH THE SLAB FLOOR SYSTEM, THROUGH THE FLOORS OF THE DUELLING TO TERMINATING AT THE ROOF.
- SEE NOTES REGARDING VENT PIPE, SOIL-GAS-RETARDER AND SLAB SUB-FLOOR PREPARATION.

SLAB SUB-FLOOR PREPARATION

A LAYER OF GAS-PERMEABLE MATERIAL SHALL BE PLACED UNDER ALL CONCRETE SLABS AND OTHER FLOOR SYSTEMS THAT DIRECTLY CONTACT THE GROUND, AND ARE WITHIN THE WALLS OF THE LIVING SPACES OF THE BUILDING. THE GAS-PERMEABLE LAYER SHALL CONSIST OF ONE OF THE FOLLOWING:

1. A UNIFORM LAYER OF CLEAN AGGREGATE, A MINIMUM OF 4 INCHES THICK. THE AGGREGATE SHALL CONSIST OF MATERIAL SMALL ENOUGH TO PASS THROUGH A 2" SIEVE AND BE RETAINED BY A 1/4" SIEVE.
2. A UNIFORM LAYER OF SAND (NATIVE OR FILL), A MINIMUM OF 4 INCHES THICK, OVERLAIN BY A LAYER OR STRIPS OF GEO-TEXTILE DRAINAGE MATTING DESIGNED TO ALLOW THE LATERAL FLOW OF SOIL GASES.

SOIL-GAS-RETARDER

- THE SOIL IN CRAWLSPACES SHALL BE COVERED WITH A CONTINUOUS LAYER OF MINIMUM 6-MIL POLYETHYLENE SOIL-GAS-RETARDER. THE GROUND COVER SHALL BE LAPPED A MINIMUM OF 12 INCHES AT JOINTS AND SHALL EXTEND TO ALL FOUNDATION WALLS ENCLOSED THE CRAWL SPACE AREA.
- THE SHEETING SHALL FIT CLOSELY AROUND ANY PIPE, WIRE OR OTHER PENETRATIONS OF THE MATERIAL.
- ALL FRACTURES OR TEARS IN THE MATERIAL SHALL BE SEALED OR COVERED WITH ADDITIONAL SHEETING.

VENT PIPE (RADON)

- A PLUMBING TEE OR OTHER APPROVED CONNECTION SHALL BE INSTALLED HORIZONTALLY BENEATH THE SOIL-GAS-RETARDER SHEETING AND CONNECTED TO A 3" OR 4" DIAMETER FITTING WITH A VERTICAL VENT PIPE INSTALLED THROUGH THE SHEETING.
- THE VENT PIPE SHALL BE EXTENDED UP THROUGH THE BUILDING FLOORS TO TERMINATE AT LEAST 12 INCHES ABOVE THE ROOF SURFACE IN A LOCATION AT LEAST 10 FEET AWAY FROM ANY WINDOW OR OTHER OPENING INTO THE CONDITIONED SPACES OF THE BUILDING THAT IS LESS THAN 2 FEET BELOW THE EXHAUST POINT, AND 10 FEET FROM ANY WINDOW OR OTHER OPENING IN ADJOINING OR ADJACENT BUILDINGS.
- IN BUILDINGS WHERE INTERIOR FOOTINGS OR OTHER BARRIERS SEPARATE THE SUB-SLAB AGGREGATE OR OTHER GAS-PERMEABLE MATERIAL, EACH AREA SHALL BE FITTED WITH AN INDIVIDUAL VENT PIPE.
- MULTIPLE VENT PIPES SHALL CONNECT TO A SINGLE VENT THAT TERMINATES ABOVE THE ROOF OR EACH INDIVIDUAL VENT PIPE SHALL TERMINATE ABOVE THE ROOF.
- ALL COMPONENTS OF THE RADON VENT PIPE SYSTEM SHALL BE INSTALLED TO PROVIDE POSITIVE DRAINAGE TO THE GROUND BENEATH THE SLAB OR SOIL-GAS-RETARDER.
- RADON VENT PIPES SHALL BE ACCESSIBLE FOR FUTURE FAN INSTALLATION THROUGH AN ATTIC OR OTHER AREA OUTSIDE THE HABITABLE SPACE, OR AN APPROVED ROOF TOP ELECTRICAL SUPPLY MAY BE PROVIDED FOR FUTURE USE FOR A POWERED RADON VENT FAN.
- ALL EXPOSED AND VISIBLE INTERIOR RADON VENT PIPES SHALL BE IDENTIFIED WITH AT LEAST ONE LABEL ON EACH FLOOR AND IN ACCESSIBLE ATTICS. THE LABEL SHALL READ: "RADON REDUCTION SYSTEM".

POWER SOURCE REQUIREMENT

- TO ACCOMMODATE FUTURE INSTALLATION OF AN ACTIVE SUB-MEMBRANE OR SUB-SLAB DEPRESSURIZATION SYSTEM, AN ELECTRICAL CIRCUIT TERMINATED IN AN APPROVED BOX SHALL BE INSTALLED DURING CONSTRUCTION IN THE ATTIC OR OTHER ANTICIPATED LOCATION OF VENT PIPE FANS. AN ELECTRICAL SUPPLY SHALL ALSO BE ACCESSIBLE IN ANTICIPATED LOCATION OF SYSTEM FAILURE ALARMS.

COMBINATION FOUNDATIONS

- COMBINATION BASEMENT/CRAWL SPACE OR SLAB ON-GRADE/CRAWL SPACE FOUNDATIONS SHALL HAVE SEPARATE RADON MITIGATION SYSTEMS. EACH TYPE OF FOUNDATION AREA PASSIVE SUB-SLAB AND PASSIVE SUB-MEMBRANE RADON VENT PIPES MUST BE CONNECTED TO A SINGLE VENT TERMINATING ABOVE THE ROOF, OR EACH VENT MAY INDIVIDUALLY CONTINUE TO TERMINATE ABOVE THE ROOF (SEE VENT PIPE NOTES).

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25# SNOW LOAD

84 SO. FT.
85 SO. FT.
86 SO. FT.
87 SO. FT.
88 SO. FT.
89 SO. FT.
90 SO. FT.
91 SO. FT.
92 SO. FT.
93 SO. FT.
94 SO. FT.
95 SO. FT.
96 SO. FT.
97 SO. FT.
98 SO. FT.
99 SO. FT.
100 SO. FT.

UPPER FLOOR
MAIN FLOOR
TOTAL AREA

21149CB

R

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