

DESIGN LOADS

This residence is based on the following code and loads. Client is responsible for any variations and/or applicable local requirements.

- Building Codes
 - 2018 Residential Code (2015 International Residential Code with North Carolina Amendments)
 - Minimum Design Loads for Building and Other Structures, ASCE 7-16B
- Roof Dead Load 15 PSF
- Roof Live Load 20 PSF
- Typical Floor Dead Load 10 PSF
- Floor Live Loads
 - Rooms other than sleeping rooms 40 PSF
 - Sleeping Rooms 30 PSF
 - Stairs 40 PSF
 - Decks 40 PSF
 - Exterior Balconies 60 PSF
- Wind Loads / Data
 - Ultimate Design Wind Speeds 115 MPH
 - Wind Importance Factor, I_w 1.00
 - Exposure B
 - Walls (Component and Cladding) 25 PSF
 - Roofs (Component and Cladding)
 - Roof Slopes 2.25/12 to 7/12 34.8 PSF
 - Roof Slopes 7/12 to 12/12 21 PSF
- Seismic Loads / Data
 - Seismic Use Group 0.075
 - Spectral Response Coefficient, S_{DS} 0.17g and 0.33g
 - Site Class D
 - Seismic Importance Factor, I_s 1.00
 - Seismic Design Category B

FOUNDATIONS & CRAWL SPACES

- Foundations shall conform to the requirements of the Residential Building Code, Chapter 4. Should a conflict occur between these drawings and the aforementioned building code references the more stringent shall govern.
- The architect has not received a subsurface investigation. The foundation is based upon an assumed soil bearing capacity of 2000 psf net bearing. Verification of this assumed value is the responsibility of the owner or contractor should any adverse soil condition be encountered the architect must be contacted before proceeding.
- Foundations shall extend not less than 12 inches below the finished natural grade and in no case less than the frost line depth. Foundation walls are assumed to restrain earth pressures of 50 psf or less, unbalanced fill and foundation wall construction shall conform to tables 404.1 of the Residential Building Code. Site topography has not been provided to TightLines Designs. Report any unusual site conditions to TightLines Designs before construction.
- Any fill shall be placed under the direction or recommendation of a licensed professional engineer. The resulting soil shall be compacted to a minimum of 95 percent maximum dry density.
- Excavation for footings shall be lined temporarily with a 6 mil polyethylene if placement of concrete does not occur within 24 hours of excavation.
- No concrete shall be poured against any subgrade containing water, ice, frost, or loose material.
- Enlarged perimeter footings are to be poured monolithically with wall footings. Reinforcement for wall footings, if any, shall run continuously through column footings.
- Crawl space vents to be 8"x16" w/ min. 50% free air, and shall be located within 3' of each corner unless closed crawl space. Crawl space door may serve as vent.
- Install 6 mil. vapor barrier below all slabs and on ground area within all crawlspaces.
- Provide min. 18x24 access panel or larger as required by the Mechanical Code when mechanical equipment is located in the crawlspace.
- Remove earth as required to achieve a minimum clearance from ground to underside of floor joists of 18".
- Provide foundation drains at all foundation walls. Coordinate location to daylight with owner.

CONCRETE

- Concrete shall have normal weight aggregate and a minimum compressive strength (f_c) at 28 days as listed below.
 - Footings 3000 psi
 - Slabs-on-grade 4000 psi
 - Elevated Slabs 3500 psi
- Concrete shall be proportioned, mixed, and placed in accordance with ACI 318 latest edition "Building Code Requirements for Reinforced Concrete" and ACI 301 latest edition "Specifications for Structural Concrete for Buildings"
- Entrained air must be used in all concrete that will be exposed to freezing and thawing and deicing chemicals. Amount of air entrainment (percent) shall be in accordance with the following schedule with a range of +/- to +2 percentage points of the target value.
 - Footings 5%
 - Interior Slabs 0% see note below
 - Exterior Slabs 5%
- Note: It is recommended that interior slabs to be given a smooth, dense, hard-troweled finish not contain entrained air since blistering or delamination may occur. If slab will be exposed to deicing or other aggressive chemicals contact TightLines Designs for proper air entrainment requirements.
- No admixtures shall be added to any structural concrete without written permission of the architect.

CONCRETE SLABS ON GRADE

- Concrete slabs on grade shall be constructed in accordance with ACI 302.1r-16 "guide for concrete slab and slab construction".
- The architect is not responsible for differential settlement, slab cracking or other future defects resulting from unreported conditions.
- Control joints shall be spaced in slabs on grade at a maximum of 20'-0" O.C. Unless noted otherwise.
- Control joints shall be produced using conventional processes within 4 to 12 hours after the slab has been finished.
- Reinforcing steel shall not extend through the control joint.
- All welded wire fabric for concrete slab on grade shall be supplied in flat sheets
- All welded wire fabric for concrete slab on grade shall be placed 2" from top of slab. The WVF shall be securely supported during the concrete pour.

FOUNDATION & FLOOR FRAMING NOTES

- All dimensions stretched from the outside face of the foundation wall or the center line of piers.
 - Typical pier is 16"x16" w/ 24"x24"x8" footing, U.N.O.
 - Typical wall footing is 16" x 8" D, U.N.O.
 - All girders and joists to be SPF, U.N.O.
 - Typical floor joists to be 2x10s @ 16" o.c., U.N.O.
 - See sheet A1.1 & A3.1 for additional foundation & framing notes.
- FLOOR FRAMING NOTES**
- Floors shall be constructed in accordance with the requirements listed in the Residential Building Code Chapter 5.
 - Floors are designed for the uniformly distributed loads shown in the general structural notes. Special loading conditions must be reported to TightLines Designs; TightLines Designs is not responsible for floor defects resulting from unreported conditions.
 - P denotes a point load from above. Provide solid blocking to foundation w/ the same number of studs as above.
 - Install double joists or see truss manf. dvgs. for support under parallel non load bearing partitions above typ.
 - Floor sheathing shall be APA rated sheathing exposure 1 or 2, 5/4" T&G glued and attached to its supporting framing with 1-8d CC nail at 6" O.C. At panel edges and at 12" O.C. in panel field unless otherwise noted on the plans. Sheathing shall be applied perpendicular to framing. Panel end joints shall occur over framing.
 - Joists framing into the side of a girder shall be supported by a 2x2 ledger or by manuf. recommended hangers.

FLOOR PLAN NOTES:

- All interior walls drawn @ 3 1/2" wide & exterior walls drawn w/ sheathing @ 4" wide. All dimensions are drawn to face of stud on interior walls and to exterior sheathing on exterior walls.
- All windows to have screens.
- Provide plastic coated wire shelving w/ clothes rod in coat closet & bedroom closets, one (1) shelf in laundry closet & four (4) shelves in pantry.
- See above for additional framing notes.

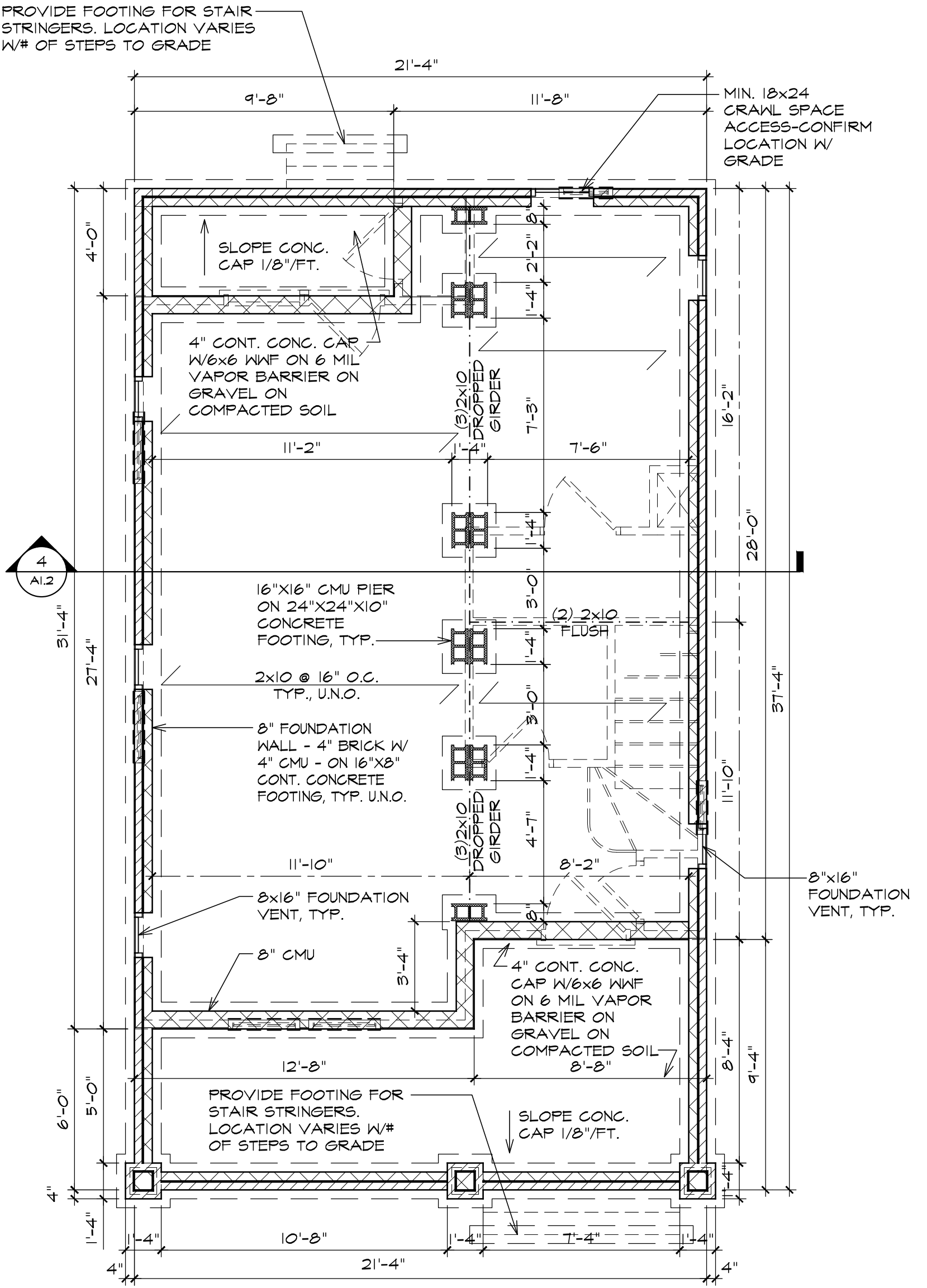


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 1191 TOTAL HEATED SF
 157 SF FRONT PORCH
 34 SF REAR PORCH

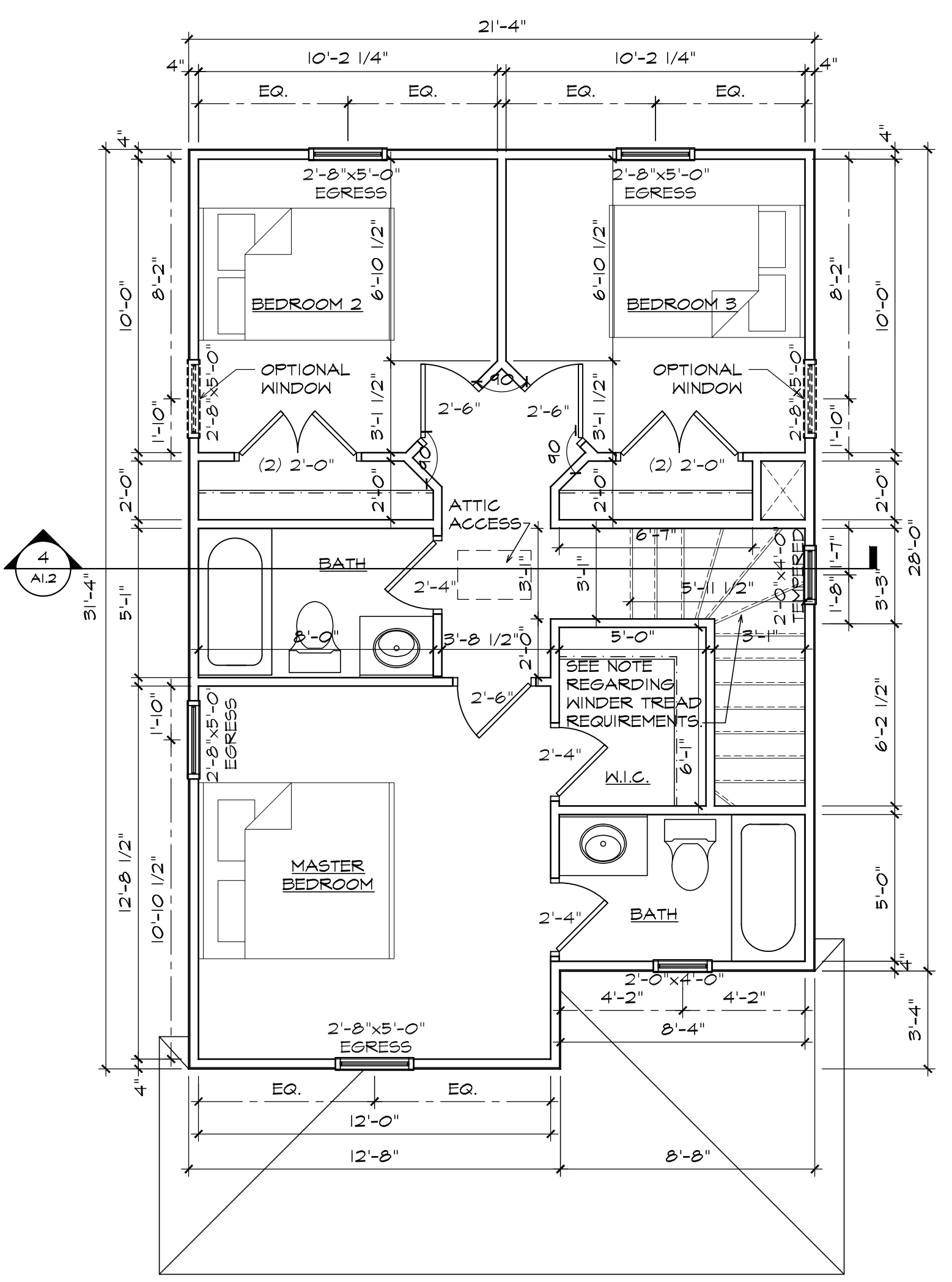
- GENERAL STRUCTURAL NOTES:**
- This structure is only stable in its completed form. The contractor shall provide all required temporary bracing during construction to stabilize the structure.
 - The architect is not responsible for construction sequences, methods, or techniques in connection with the construction of this structure. The architect will not be held responsible for the contractor's failure to conform to the construction documents, should any non-conformities occur.
 - Verification of assumed field conditions is not the responsibility of the architect. The contractor shall verify the field conditions for accuracy and report any discrepancies to TightLines Designs before construction begins.
 - This structure and all construction shall conform to all applicable sections of the residential code and any local laws where the structure is to be constructed.

FIELD SPECIFY REQUIRED ACCESS PANEL & LOCATION - SEE NOTES ON A1.1 FOR ADDITIONAL CRAWL SPACE DETAILS

CRAWL SPACE VENT CALC.:
 CRAWL SPACE W/ VAPOR BARRIER REQUIRES 1 SF VENT AREA PER 1500 SF CRAWL SPACE AREA
 601 SF CRAWL SPACE/1500 SF = 0.40 SF VENT AREA
 0.40 SF x 144 Sq.in/SF = 57.6 Sq.in.
 8"x16" VENTS W/50% FREE AIR SPACE = 64 Sq.in. FREE AIR PER VENT
 57.6 Sq.in./64 Sq.in. = 1 VENTS REQUIRED
 4 VENTS PROVIDED

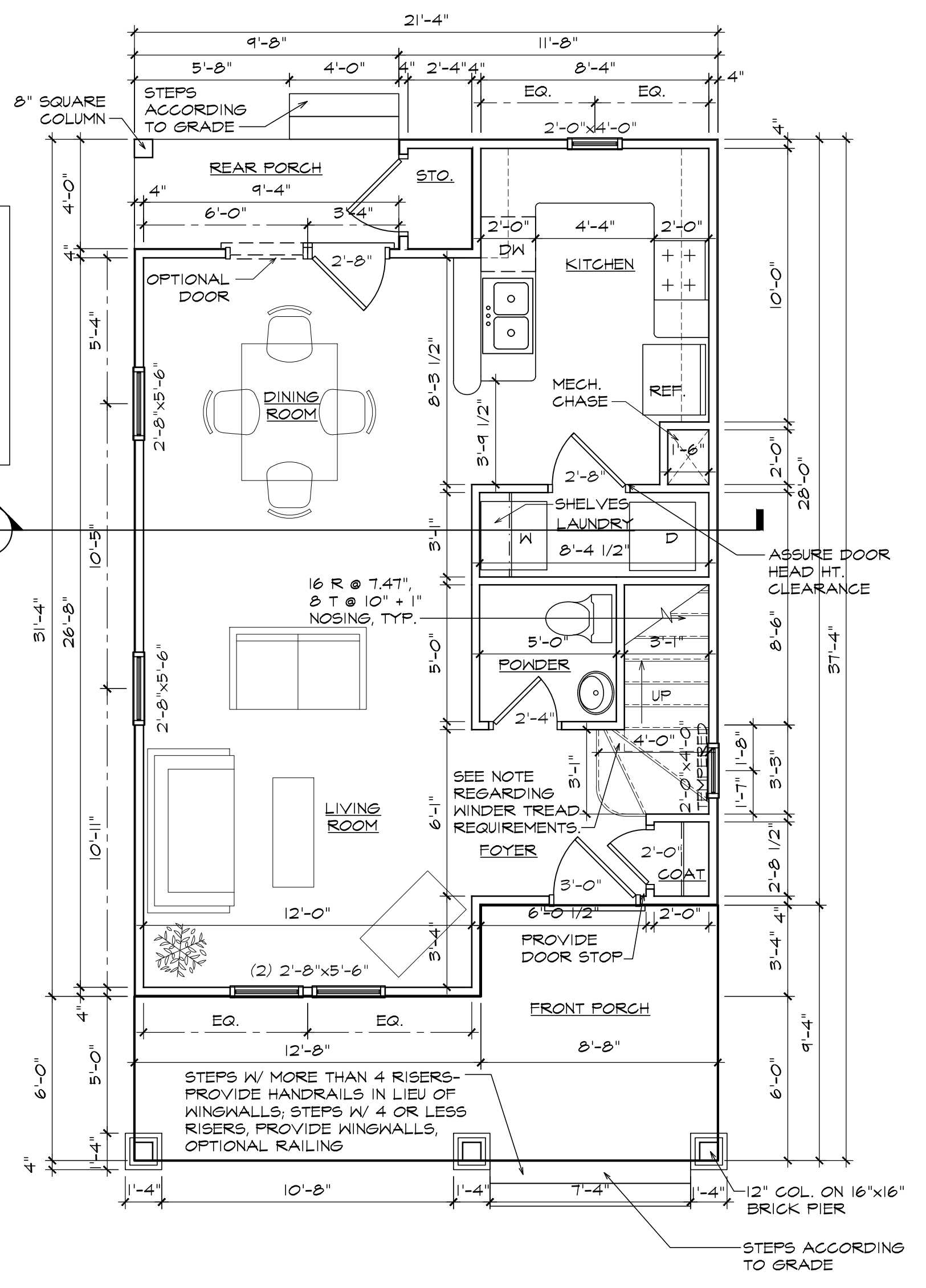


FOUNDATION PLAN



SECOND FLOOR PLAN

NOTE: STAIR WINDER TREADS TO COMPLY WITH SECTION R311.7.4.2 OF THE 2012 NRC. WINDER TREADS SHALL BE AT LEAST 9" IN DEPTH FROM A POINT 12" FROM THE NARROWER SIDE OF THE TREAD. SHALL HAVE A MINIMUM TREAD DEPTH OF 4" AT ANY POINT, AND SHALL NOT EXCEED THE SMALLEST TREAD DEPTH BY MORE THAN 3/8" AT THE 12" MARK LINE.



FLOOR PLAN

HIS PLAN IS AUTHORIZED FOR THIS ADDRESS ONLY AND IS NOT TO BE USED FOR ANY ADDITIONAL ADDRESSES WITHOUT THE PURCHASE OF ADDITIONAL LICENSES OR WRITTEN AUTHORIZATION FROM TIGHTLINES:
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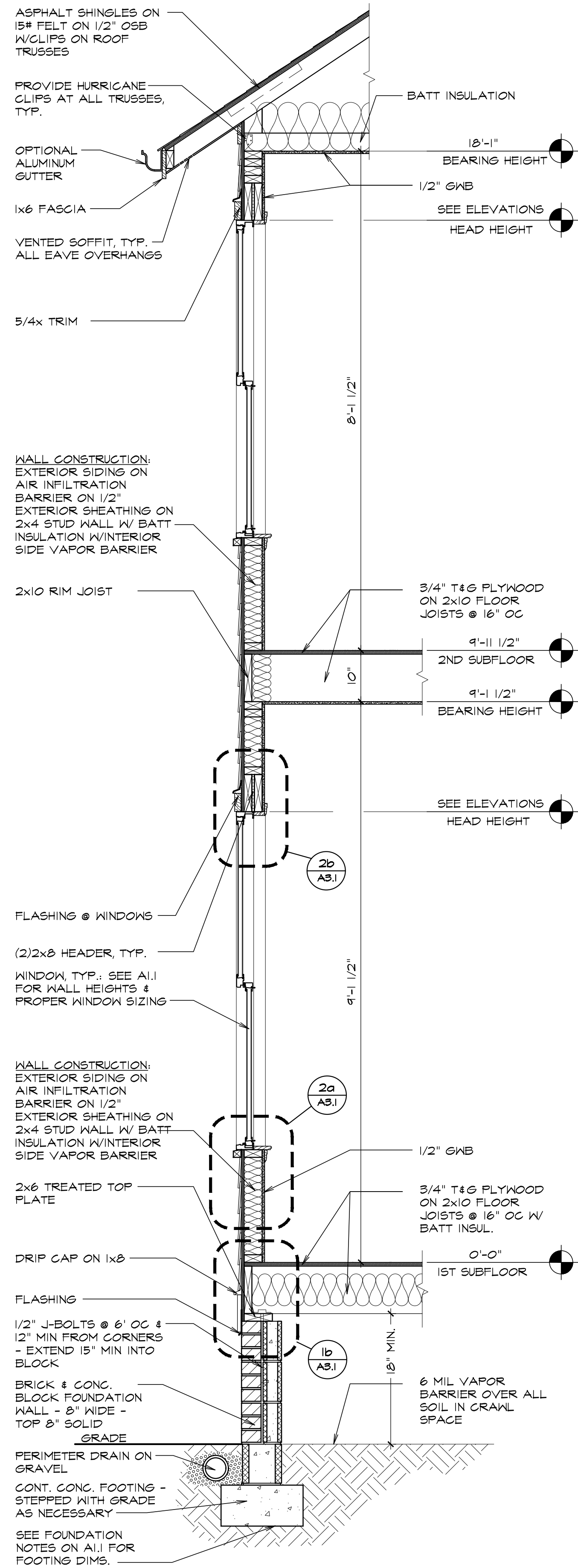
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PROPRIETARY DO NOT DISTRIBUTE

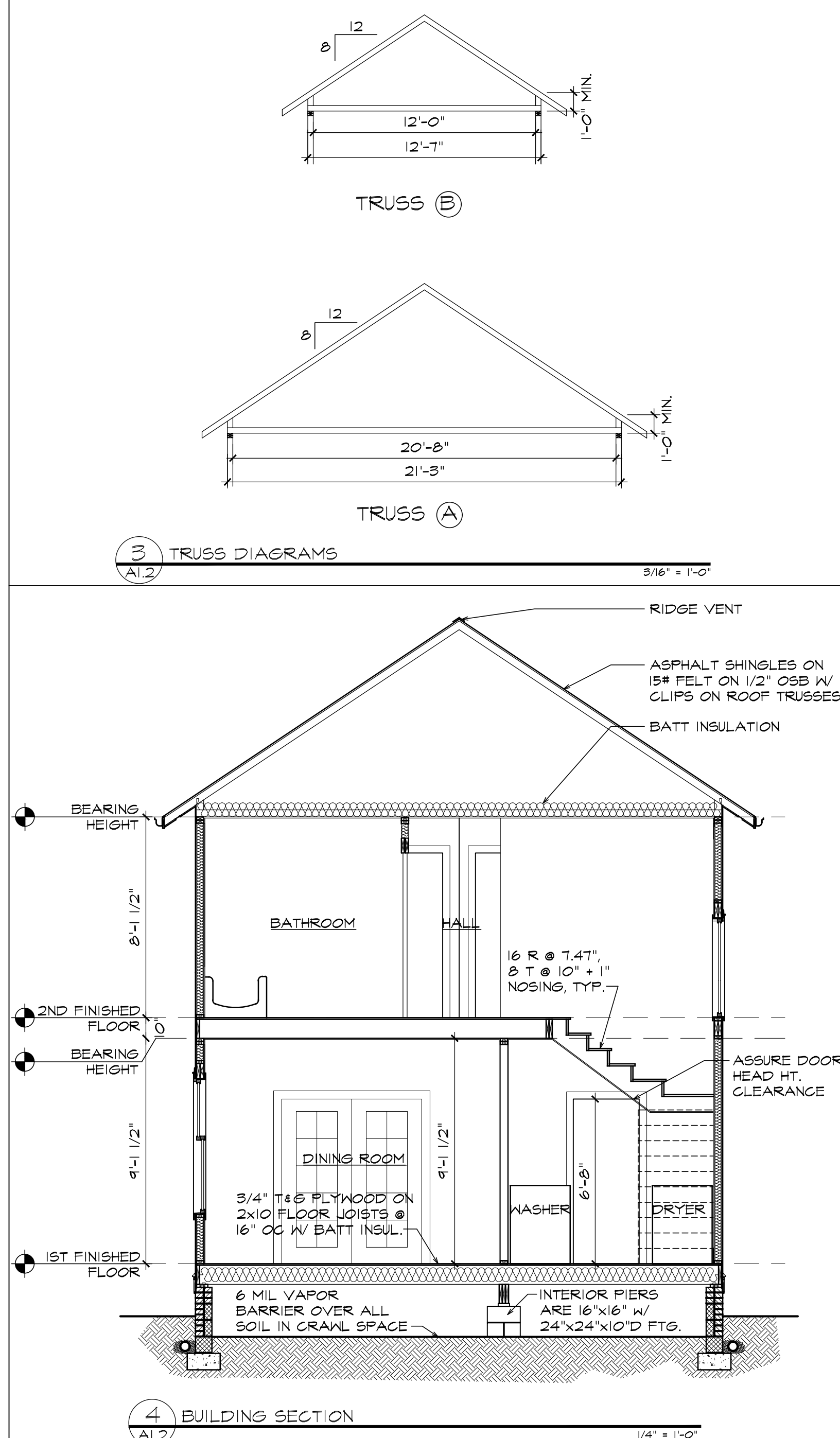
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Floor Plan, Foundation Plan, Notes

A1.1

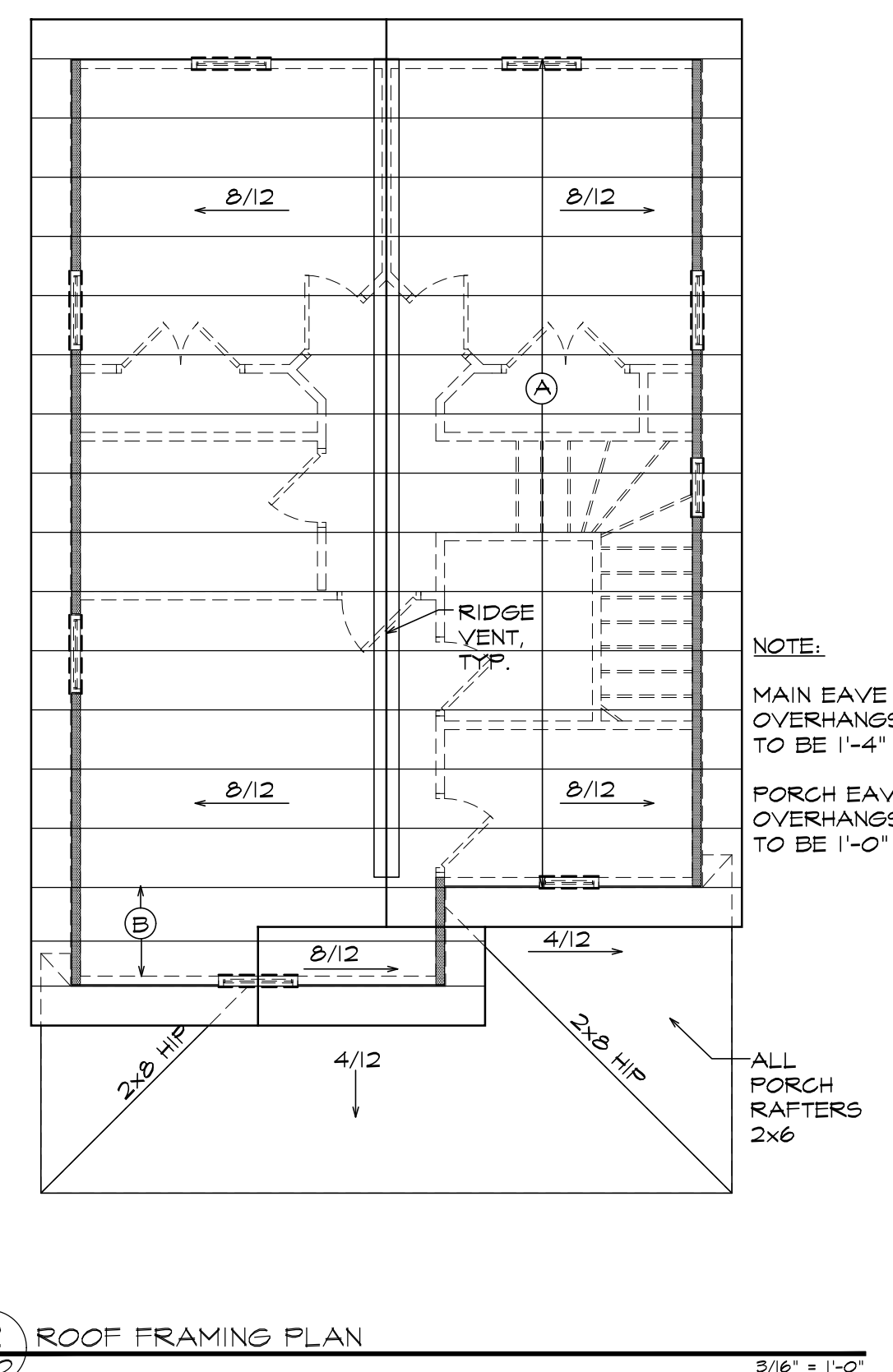


5 TYPICAL WALL SECTION
A1.2 3/4" x 1'-0"

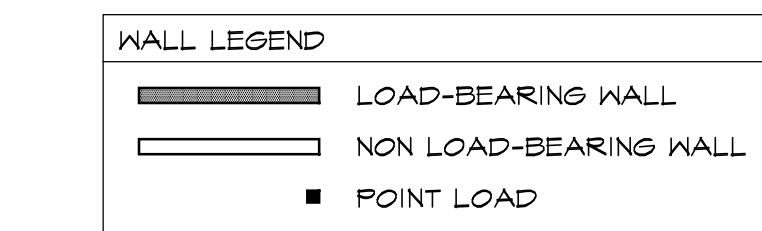


4 BUILDING SECTION
A1.2 1/4" x 1'-0"

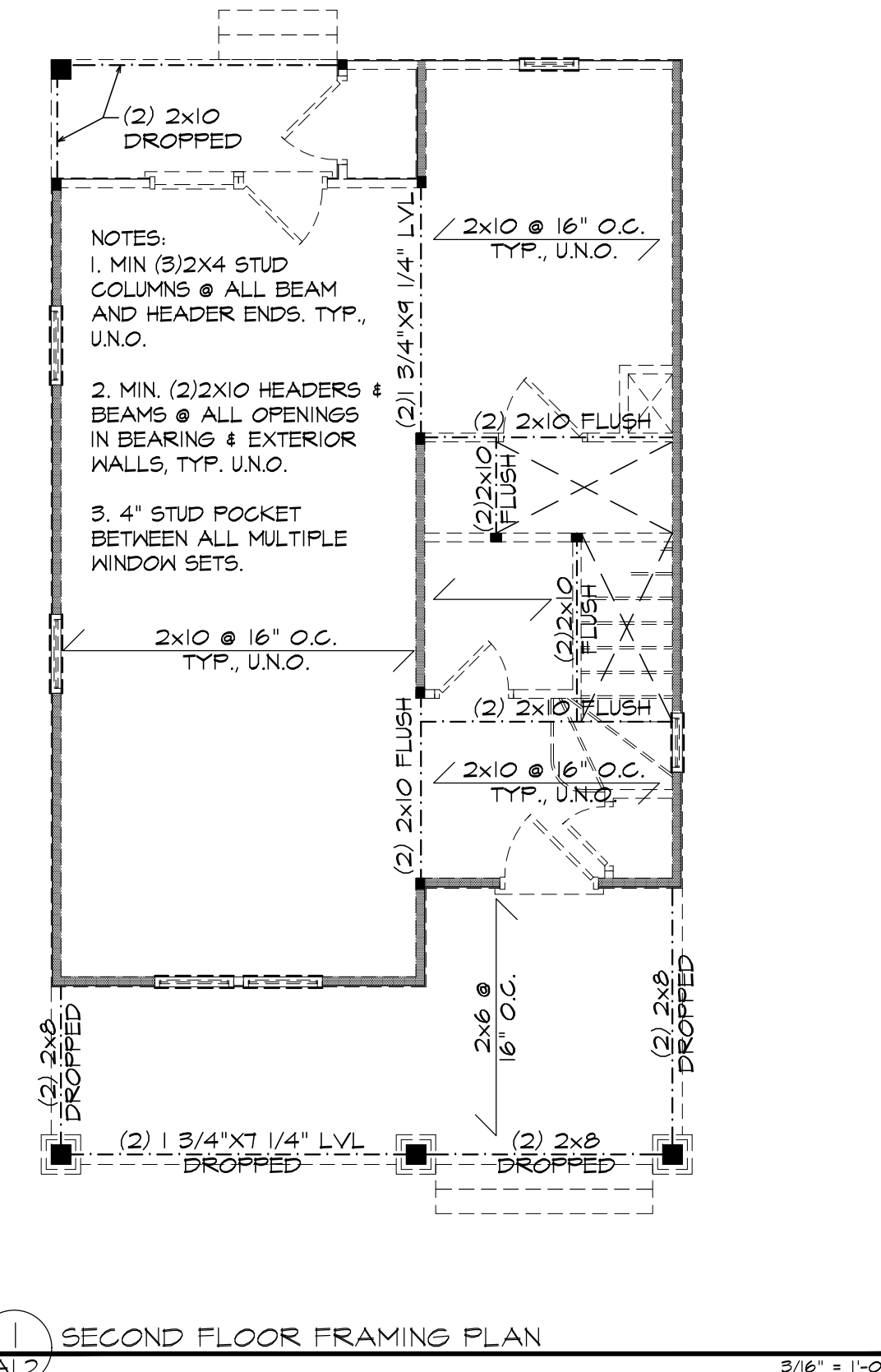
TRUSS NOTES:
 1) DIMENSIONS ARE OUTSIDE TO OUTSIDE OF STUDS.
 2) THESE ARE DIAGRAMATIC TRUSS CONFIGURATIONS. REFER TO ENGINEERED TRUSS DRAWINGS FOR ALL FINAL TRUSS DIMENSIONS, LAYOUTS AND CONSTRUCTION NOTES.
 3) ROOF TRUSSES TO BE DESIGNED & ENGINEERED BY A LICENSED ENGINEER.
 4) ALL TRUSS LOADS TO BEAR ON OUTSIDE WALLS OR U.N.O.
 5) COORDINATE TRUSS LAYOUT TO PROVIDE 20" x 30" MIN ATTIC ACCESS PANEL OR FULL DOWN STAIR AT LOCATION INDICATED ON I/A.1



2 ROOF FRAMING PLAN
A1.2 3/16" x 1'-0"



OVERHANG NOTES:
 1) RECOMMENDED RAKE OVERHANG: 1'-0"
 2) RECOMMENDED EAVE OVERHANG 1'-4" MIN.



1 SECOND FLOOR FRAMING PLAN
A1.2 3/16" x 1'-0"

ROOF VENT CALCULATIONS:
 640 SF ROOF AREA / 300 = 2.1 SF VENT REQUIRED
 2.1 x 50% = 1.05 SF VENT REQ'D IN UPPER ROOF AREA
 27 LF HORIZ. RIDGE VENT x .08 SF/LF = 2.16 SF VENT IN UPPER ROOF AREA

TABLE N1021.2 (R402.1.2)
 2008 EDITION RESIDENTIAL CODE
 INSULATION AND PENETRATION REQUIREMENTS BY COMPONENT

Component	U-Factor	SHGC	SHGC	SHGC	SHGC	SHGC	SHGC	SHGC	SHGC	SHGC
Roof	0.08	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Exterior Wall	0.08	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Interior Wall	0.08	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Floor	0.08	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Basement Floor	0.08	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Window	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Door	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15

a. R-values are minimum. U-factors and SHGC are maximum. When insulation is installed in a cavity which is less than the legal or design thickness of the insulation, the installed R-value of the insulation shall not be less than the R-value specified in the table.
 b. The fenestration U-factor column excludes skylights. The solar heat gain coefficient (SHGC) column applies to all glazed fenestration.
 c. "10/15" means R-10 continuous insulated sheathing on the interior or exterior of the home or R-15 cavity insulation at the interior of the basement wall or crawl space wall.
 d. R-5 shall be added to the required stud edge R-values for heated slabs. For nonheated slabs, insulation shall be applied from the inspection gap downward to the bottom of the footing or a maximum of 24 inches below grade whichever is less. For floating slabs, insulation shall extend to the bottom of the foundation wall or 24 inches, whichever is less. (See Appendix O)
 e. Details.
 f. Basement wall insulation is not required in warm-humid locations as defined by Figure N1011.7 and Table N1011.7.
 g. Or insulation sufficient to fill the framing cavity. R-4 minimum.
 h. The first value is cavity insulation, the second value is continuous insulation so "15/5" means R-15 cavity insulation plus R-5 continuous insulation. If structural sheathing cover 15 percent or less of the exterior, insulation sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.
 i. The second R-value applies when more than half the insulation is on the interior of the mass wall.
 j. In addition to the exemption in Section N1021.5, a maximum of two glazed fenestration product assemblies having a U-factor greater than 0.35 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty.
 k. In addition to the exemption in Section N1021.5, a maximum of two glazed fenestration product assemblies having a SHGC no greater than 0.70 shall be permitted to be substituted for minimum code compliant fenestration product assemblies without penalty.
 l. R-5.0 shall be deemed to satisfy the ceiling insulation requirement whenever the full height of uncompressed R-5.0 insulation extends over the wall top plate at the eaves. Otherwise R-5.0 insulation is required where adequate clearance exists or insulation must extend to either the insulation baffle or within 1" of the attic roof deck.
 m. Table values required except for roof edge where the space is limited by the pitch of the roof, there the insulation must fill the space up to the air baffle.
 n. R-4 fiberglass batts compressed and installed in the nominal 2x6 framing cavity is deemed to comply. Fiberglass batts rated R-4 or higher compressed and installed in 2x4 wall is not deemed to comply.
 o. Basement wall meeting the minimum mass wall specific heat content requirement may use the mass wall R-value as the minimum requirement.

TIMBER

1. Solid sawn wood framing shall conform to the specifications as listed in the National Forest Products Association "National Design Specification for Wood Construction" latest edition (NDS). The framing shall be of the species and grade as listed below:
 - 1.1. Joists, Rafters, and Wood Girders and Beams: Spruce Pine Fir No. 2
 - 1.2. Studs: Spruce Pine Fir No. 3 or Stud Grade
2. LVL or PSL shall the following minimum design stresses:
 - 2.1. E = 1.9 x 10E6
 - 2.2. Fb = 2600 PSI
 - 2.3. Fv = 285 PSI
 - 2.4. Fc = 700 PSI
3. Lumber in contact with concrete, masonry, or earth shall be pressure treated in accordance with AKPA standard C-15. All other exposed timber shall be treated in accordance with AKPA standard C-2.
4. Nails shall be common wire nails unless otherwise noted.
5. Lag screws shall conform to ANSI / ASME standard B18.2.1-19B. Lead holes for lag screws shall be in accordance with NDS specifications.
6. Beams containing multiple piles of lumber shall have each ply attached to its adjacent ply with 3 1/2d CC nails @ 12" O.C.
7. Flitch plate beams shall be attached w/ 1/2" through bolts at 24" O.C. staggered w/ (2) bolts 6" from each end.

SIZE	SET HANGER	SIZE	SET HANGER
2x6	U526	(2) 1/8 x 4.25 LVL	H410(MW)
(2) 2x6	U528-2	(2) 1/8 x 4.25 LVL	H408(SO10)
(2) 2x6	U528-3	(2) 1/8 x 4.25 LVL or (2) 1/8 x 1.875 LVL	H412 (Mw)
2x6	U526	(2) 1/8 x 4.25 LVL or (2) 1/8 x 1.875 LVL	H408(SO10)
(2) 2x6	U528-2	(2) 1/8 x 4 LVL	H416 (Mw)
(2) 2x6	U528-3	(2) 1/8 x 4 LVL	H408(SO10)
2x6	U526	(2) 1/8 x 4 LVL	H410(MW)
(2) 2x6	H420-2	(2) 1/8 x 4 LVL	H408(SO10)
(2) 2x6	H420-3	(2) 1/8 x 4 LVL	H416(MW)
(2) 2x6	H420-4	(2) 1/8 x 4 LVL	H408(SO10)

NOTES:
 1. SET Denotes Simpson Strong-Tie. Use hanger per schedule above (or equivalent metal hanger) unless hanger is noted on plans.
 2. Install hangers per manufacturer specifications.

WALL FRAMING NOTES

1. Unless otherwise noted on the plans, all framing is assumed to be standard wood framing. Framing shall comply with the requirements of the Residential Code, Chapter 6. Should a conflict occur between these drawings and the aforementioned code references the more stringent shall govern.
2. Studs for wall framing shall consist of 2x nominal framing and be constructed in accordance with the requirements listed below. Studs listed in the following schedule shall have a maximum height of 10'-0".

Location	Stud Size	Grade	Spacing
2.1 Interior non-bearing walls	2x4	Stud	24" O.C.
2.2 Interior bearing walls	2x4	Stud	16" O.C.
2.3 Exterior walls	2x4 spf	no.2	16" O.C.
3. Studs shall be continuous from the sole plate to the double top plate at the ceiling or roof. Studs shall only be discontinuous at beams / headers for window or door openings. King studs shall be continuous with the same requirement as stud walls.
4. All headers at ext. openings and at bearing walls shall be (2) 2x8 (unless noted otherwise). Provide continuous king studs on each side of the jack studs. Unless otherwise noted on the drawings provide jack studs in accordance with the following schedule:
 Opening
 4.1. less than 4'-0" 1 ea. End
 4.2. 4'-1" to 6'-0" 2 ea. End
 4.3. 6'-1" to 12'-0" 3 ea. End
 4.4. over 12'-0" 4 ea. End, or see plans
5. All beam bearing on timber framing shall have full bearing for the width of the beam and supported by a minimum of three studs, where beams bear onto a wall parallel to the beam the beam shall have a minimum bearing length of 4'-1/2".
6. Individual studs forming a column shall be attached together with one 10d CC nail @ 6" O.C. staggered. The stud column shall be continuous to the foundation or beam. The column shall be properly blocked at all floor levels to ensure proper load transfer.
7. All exterior walls shall be sheathed per section R602.10.5 of the Residential Code. Wall sheathing shall be APA rated structural I sheathing. Wall sheathing shall be attached to its supporting wall framing with 1-8d CC nail at 6" O.C. At panels edges and @ 12" O.C. in panel field unless otherwise noted on the plans. Sheathing shall have a span rating constant with the framing spacing. Apply air infiltration barrier over the sheathing as required by the Residential Code.

ROOF FRAMING NOTES

1. Unless otherwise noted on the plans, all framing is assumed to be standard wood framing. Framing shall comply with the requirements of the Residential Code, Chapter 6.
2. Rafters are designed for the uniformly distributed loads shown in the general structural notes. Special loading conditions must be reported to TightLines Designs. TightLines Designs is not responsible for defects resulting from unreported conditions.
3. Rafters shall be framed with roof trusses at 24" O.C. unless noted otherwise. Trusses shall be designed and/or reviewed by a licensed structural engineer.
4. At rafter and joist framing, a 2x4 collar tie (beam) shall be provided every third set of rafters. Ties shall be placed in the upper third of the rafter and attached to each rafter with 4-12d CC nails.
5. Proper roof drainage shall be maintained at all roof conditions.
6. Rafters shall be sheathed with 1/2" APA rated structural sheathing exposure 1 or 2. Roof sheathing shall be continuous over two supports and attached to its supporting roof framing with 1-8d CC nail at 6" O.C. At panels edges and @ 12" O.C. in panel field unless otherwise noted on the plans. Sheathing shall have a span rating constant with the framing spacing. Use suitable edge support by use of plywood clips or lumber blocking unless otherwise noted. Panel End joints shall occur over framing. Sheathing shall have a 1/8" gap at panel ends and edges as recommended in accordance with the APA.
7. Apply building felt over the sheathing as required by the Residential Code, with two layers for slopes 2/12 to 4/12 and one layer for slopes >4/12.
8. Attach a Simpson H2.5A Hurricane Tie at every connection between trusses and top plates.

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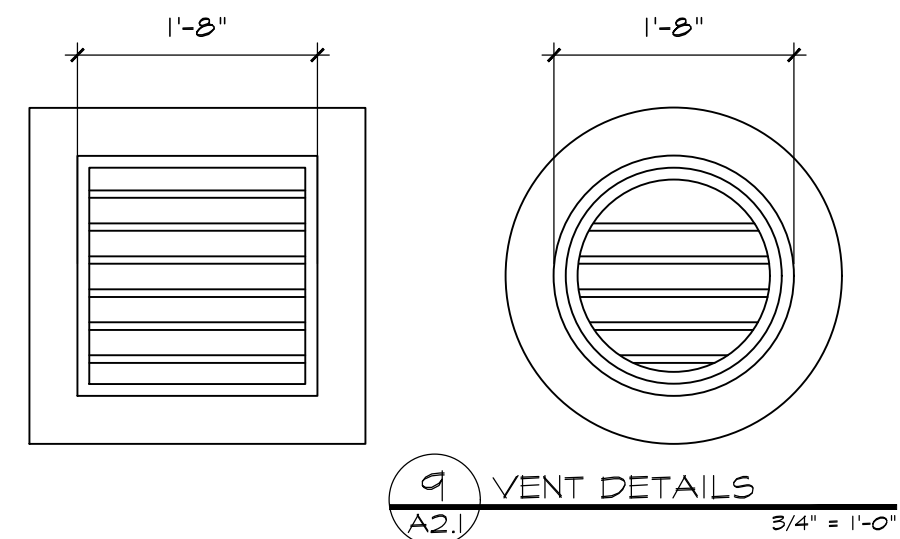
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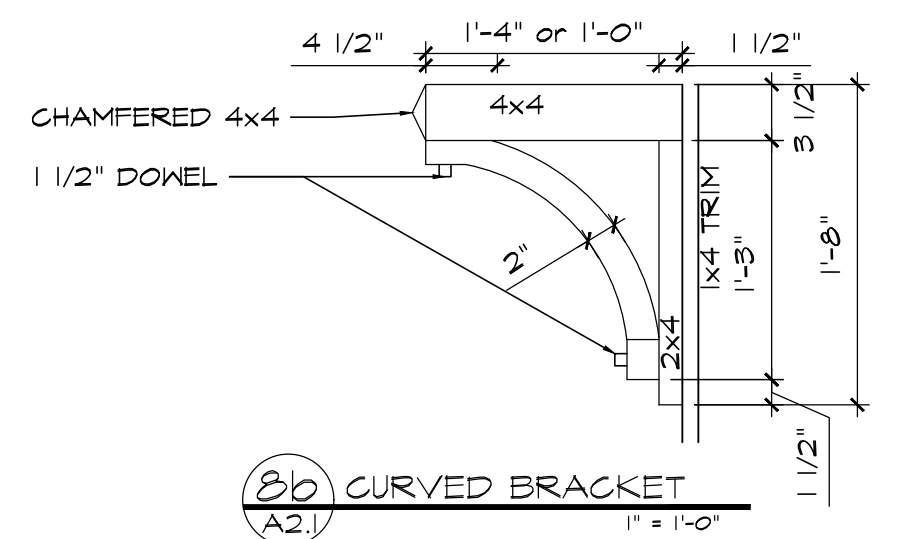
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Floor & Roof Framing, Trusses, Sections, & Insulation Notes

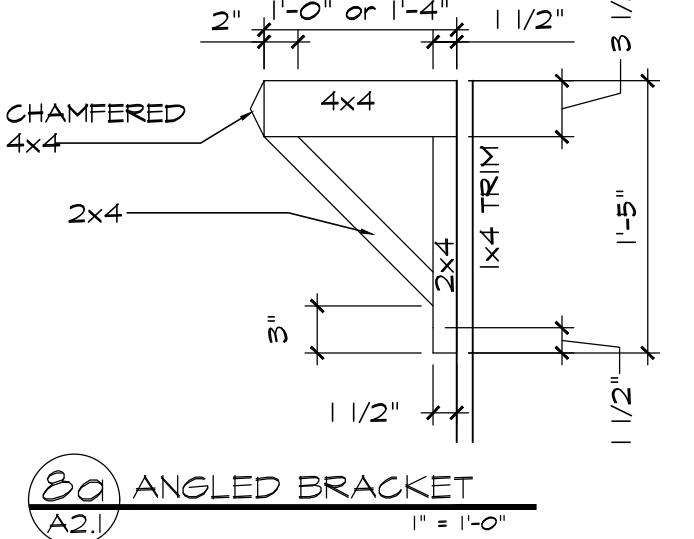
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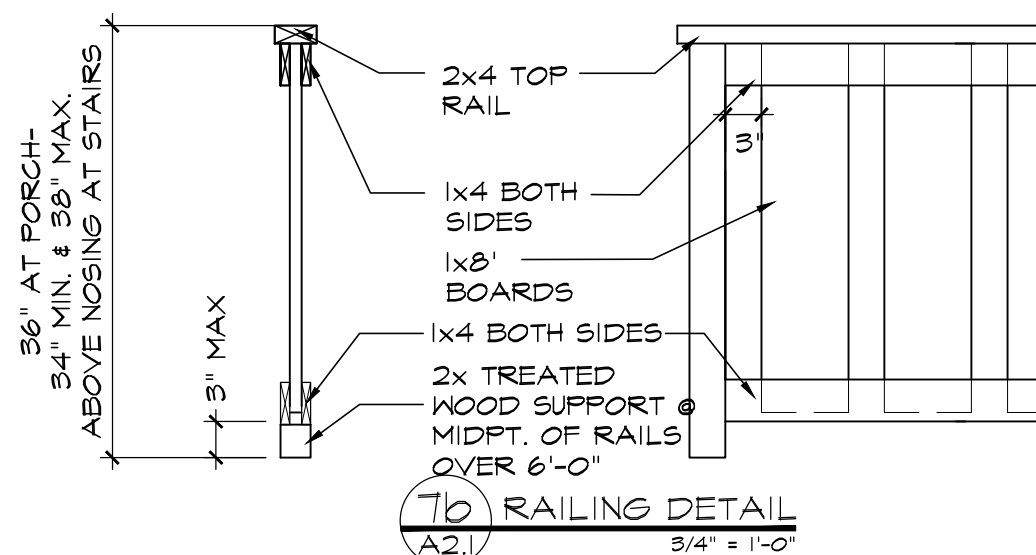
9 VENT DETAILS
3/4" = 1'-0"



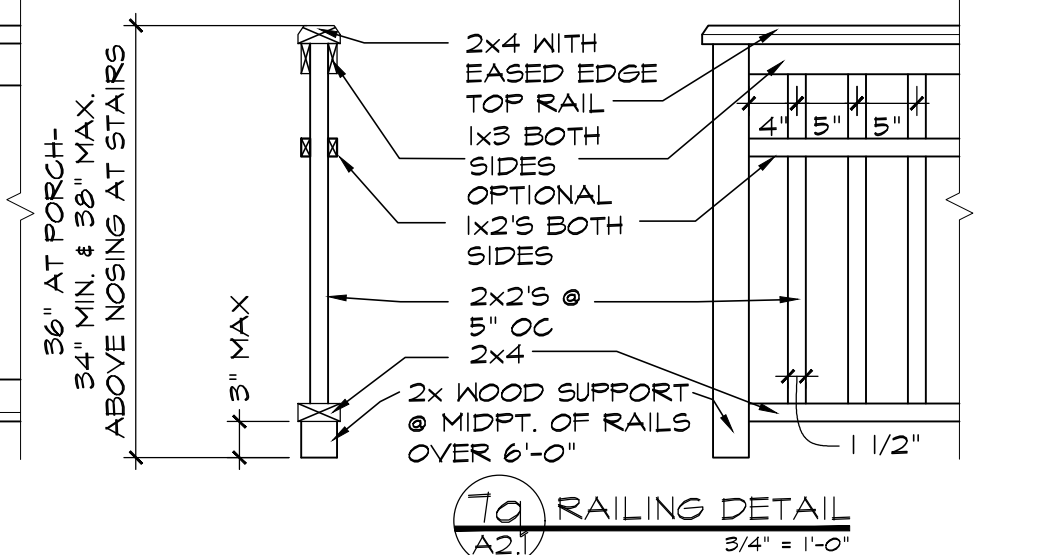
8b CURVED BRACKET
1" = 1'-0"



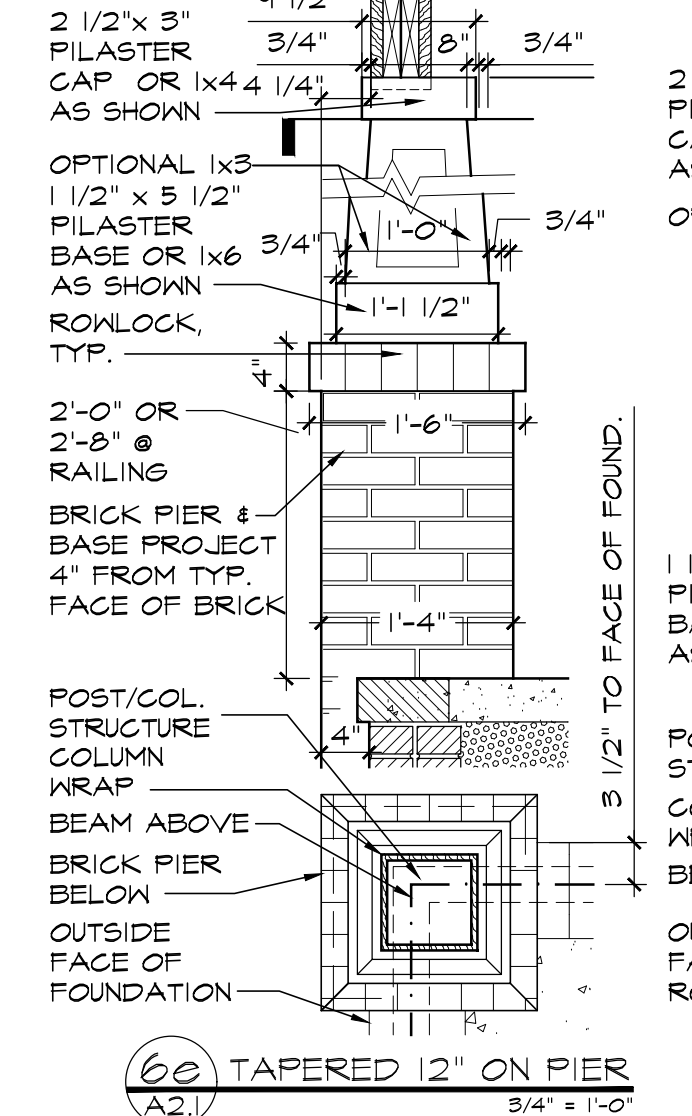
8c ANGLED BRACKET
1" = 1'-0"



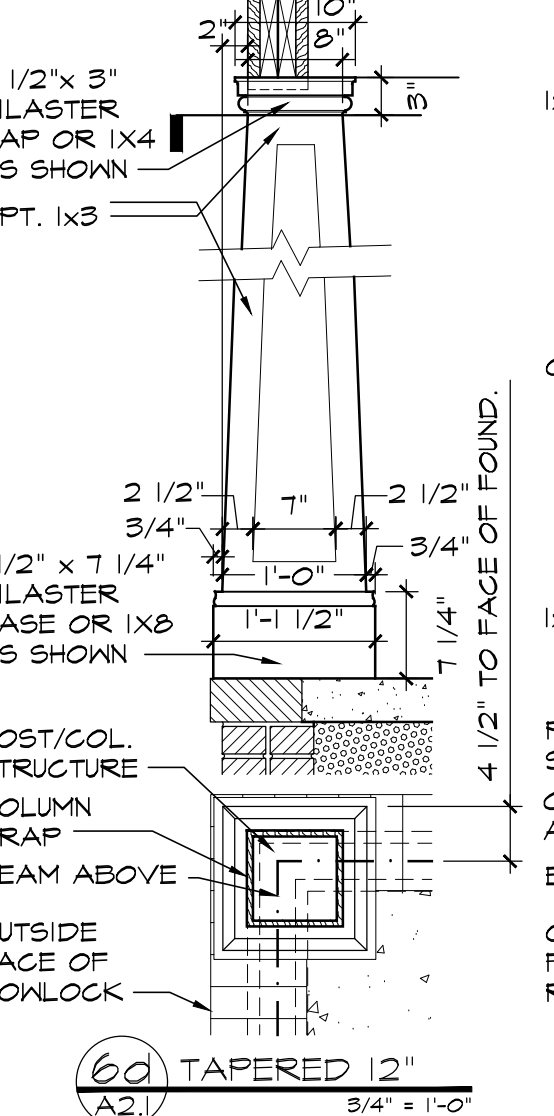
8a RAILING DETAIL
3/4" = 1'-0"



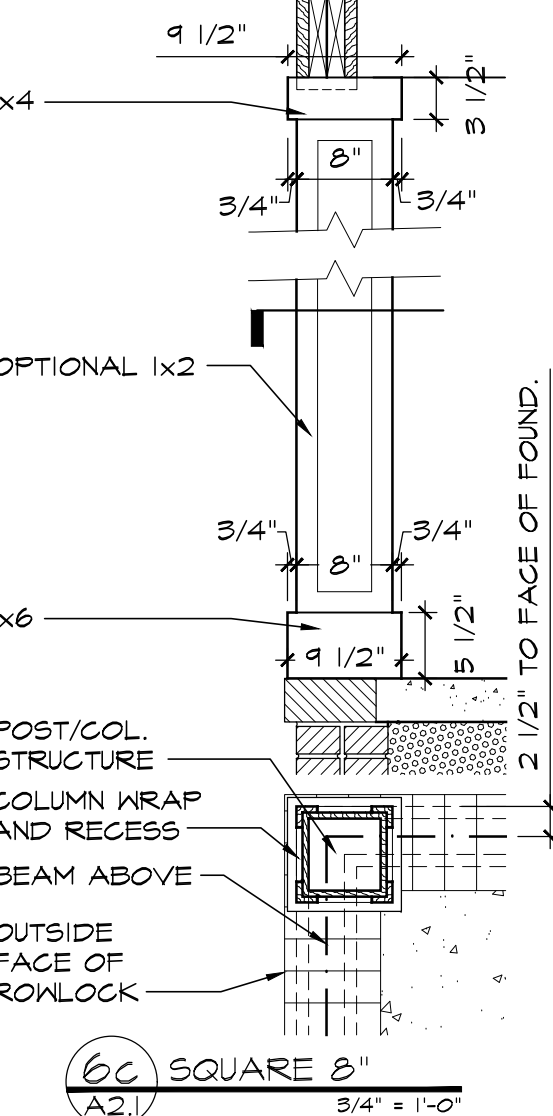
8b RAILING DETAIL
3/4" = 1'-0"



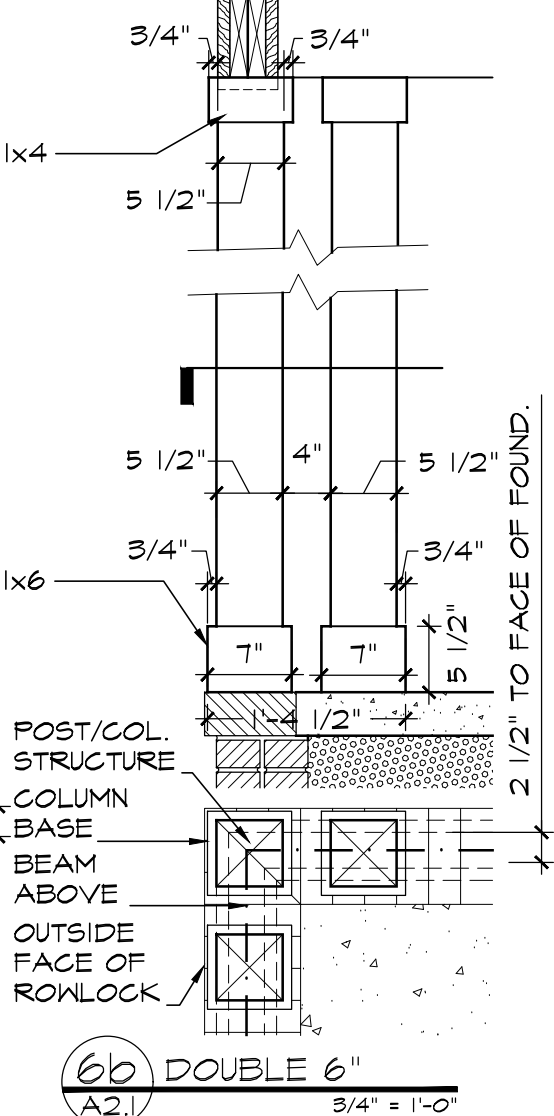
6e TAPERED 12" ON PIER
3/4" = 1'-0"



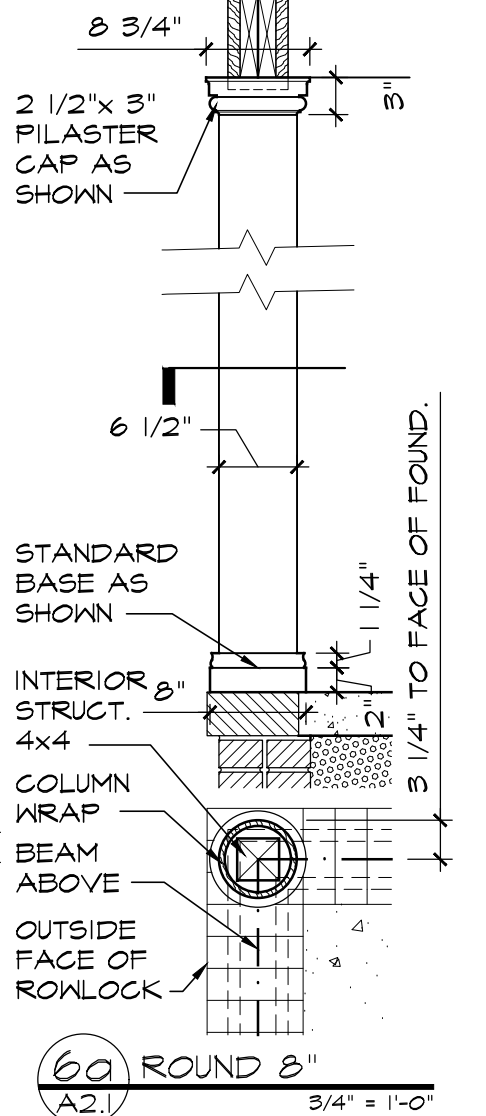
6d TAPERED 12" ON PIER
3/4" = 1'-0"



6c SQUARE 8" ON PIER
3/4" = 1'-0"



6b DOUBLE 6" ON PIER
3/4" = 1'-0"



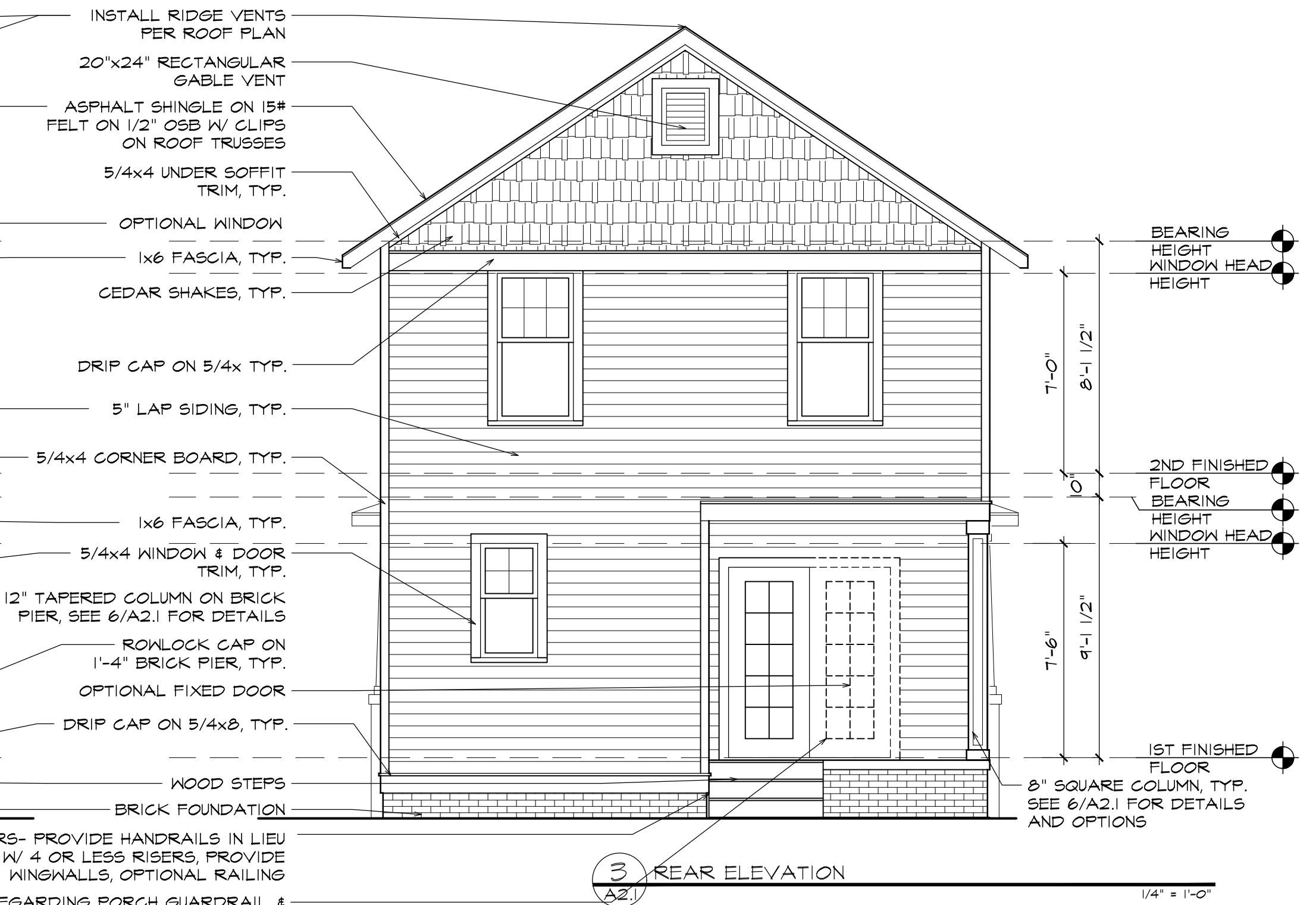
6a ROUND 8" ON PIER
3/4" = 1'-0"

GUARDRAIL AND HANDRAILS:
 1) INSTALL HANDRAILS AND GUARDS PER 2018 RESIDENTIAL BUILDING CODE SECTIONS R311.2.2 THROUGH R312. PORCHES, BALCONIES, RAMPS OR RAISED FLOOR SURFACES LOCATED MORE THAN 30" ABOVE THE FLOOR OR GRADE BELOW SHALL HAVE GUARDS NOT LESS THAN 36" IN HEIGHT. OPEN SIDES OF STAIRS WITH A TOTAL RISE OF MORE THAN 30" ABOVE THE FLOOR OR GRADE BELOW SHALL HAVE GUARDS NOT LESS THAN 34" IN HEIGHT MEASURED VERTICALLY FROM THE NOSING OF THE TREADS. REQUIRED GUARDS ON OPEN SIDES OF STAIRWAYS, RAISED FLOOR AREAS, BALCONIES AND PORCHES SHALL HAVE INTERMEDIATE RAILS OR ORNAMENTAL CLOSURES WHICH DO NOT ALLOW PASSAGE OF AN OBJECT 4" OR MORE IN DIAMETER. HORIZONTAL SPACING BETWEEN THE VERTICAL MEMBERS IN REQUIRED GUARDRAILS SHALL BE A MAXIMUM OF 4" AT THE NEAREST POINT BETWEEN MEMBERS.
 2) INSTALL HANDRAILS PER 2018 RESIDENTIAL BUILDING CODE SECTION R311.5.6 AT ALL PORCH STAIRS WITH MORE THAN 4 RISERS. HANDRAIL HEIGHT MEASURED VERTICALLY FROM THE SLOPED PLANE ADJOINING THE TREAD NOSING, OR FINISH SURFACE OF RAMP SLOPE, SHALL NOT BE LESS THAN 34" AND NOT MORE THAN 38".

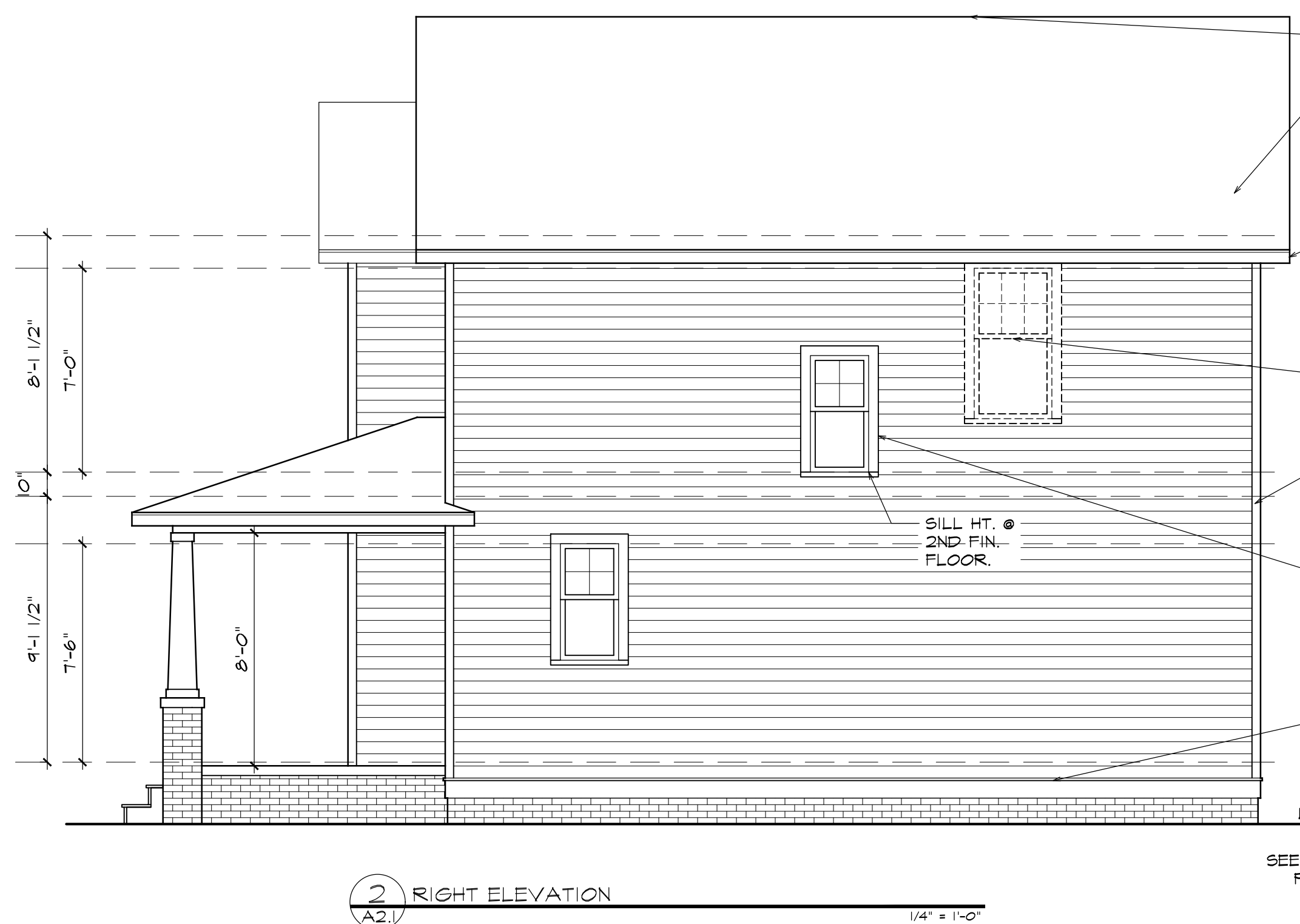
CLADDING VALUES
 PROVIDE POS. AND NEG. WALL & ROOF CLADDING DESIGN VALUES. PLANS MAY STATE THAT WALL CLADDING IS DESIGNED FOR 24.1 LBS/SF OR GREATER POS. OR NEG. PRESSURE FOR HOUSES W/ MEAN ROOF HGT. OF 30 FT. OR LESS. ROOF VALUES, BOTH POS. & NEG., SHALL BE DESIGNED AS FOLLOWS:
 - 45.4 LBS/SF FOR ROOF PITCHES OF 0/12 TO 2.25/12
 - 24.8 LBS/SF FOR ROOF PITCHES OF 2.25/12 TO 7/12
 - 21 LBS/SF FOR ROOF PITCHES OF 7/12 TO 12/12
 VALUES STATED ARE FOR ROOFS WITH A MEAN HGT. OF 30 FT. OR LESS. ROOFS W/ MEAN HGTS. GREATER THAN 30 FT. MUST SHOW SPECIFIC INFORMATION FOR CLADDING.
 MEAN ROOF HEIGHT: 23'-6"



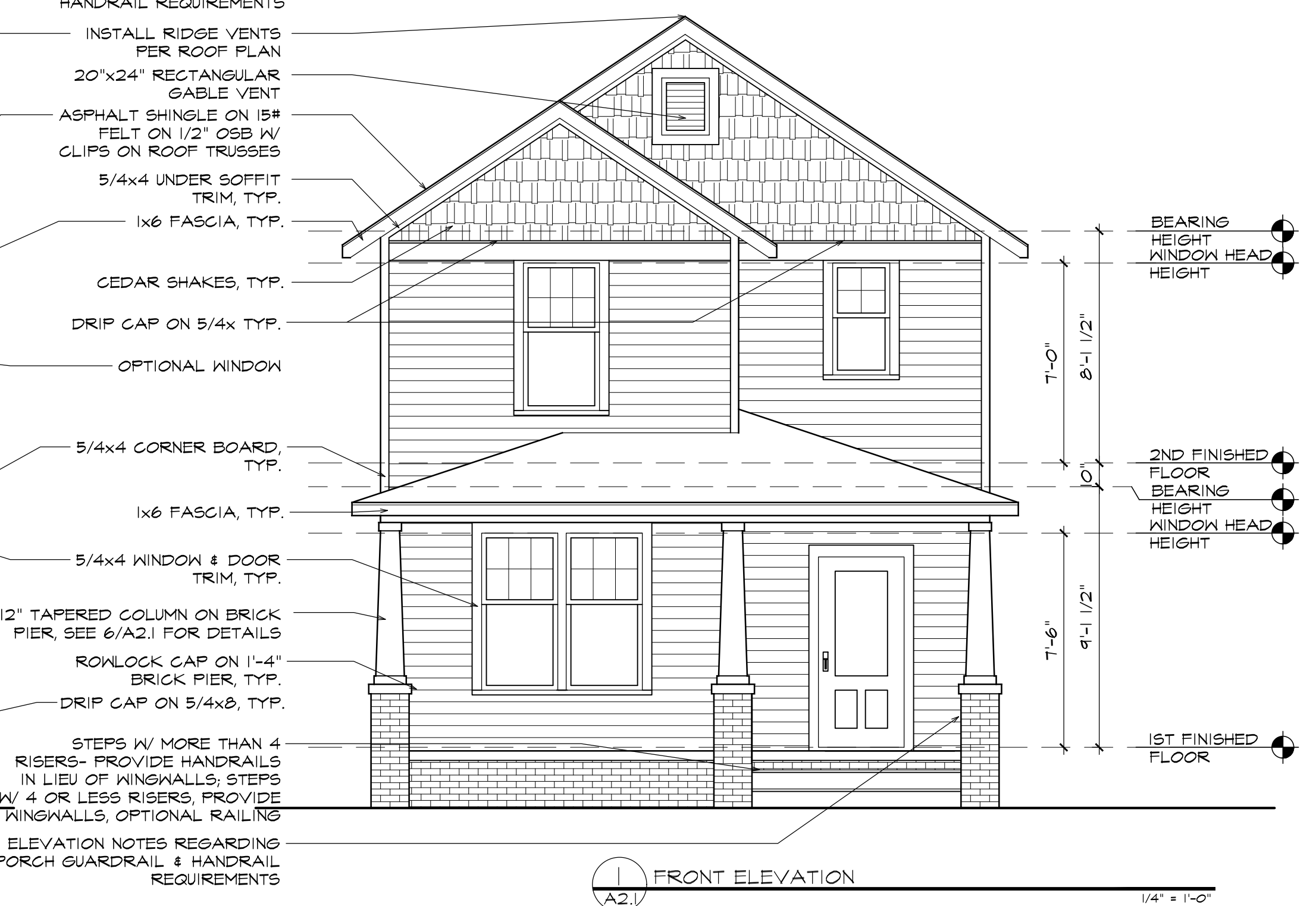
4 LEFT ELEVATION
1/4" = 1'-0"



3 REAR ELEVATION
1/4" = 1'-0"



2 RIGHT ELEVATION
1/4" = 1'-0"



1 FRONT ELEVATION
1/4" = 1'-0"

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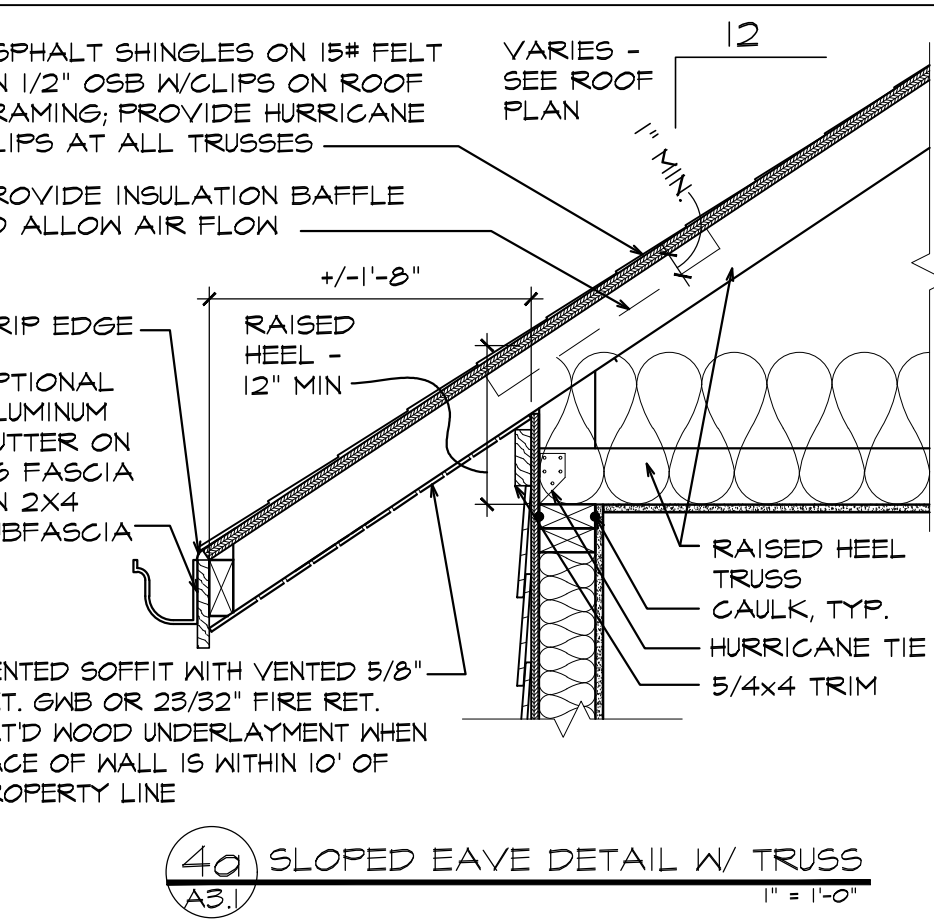
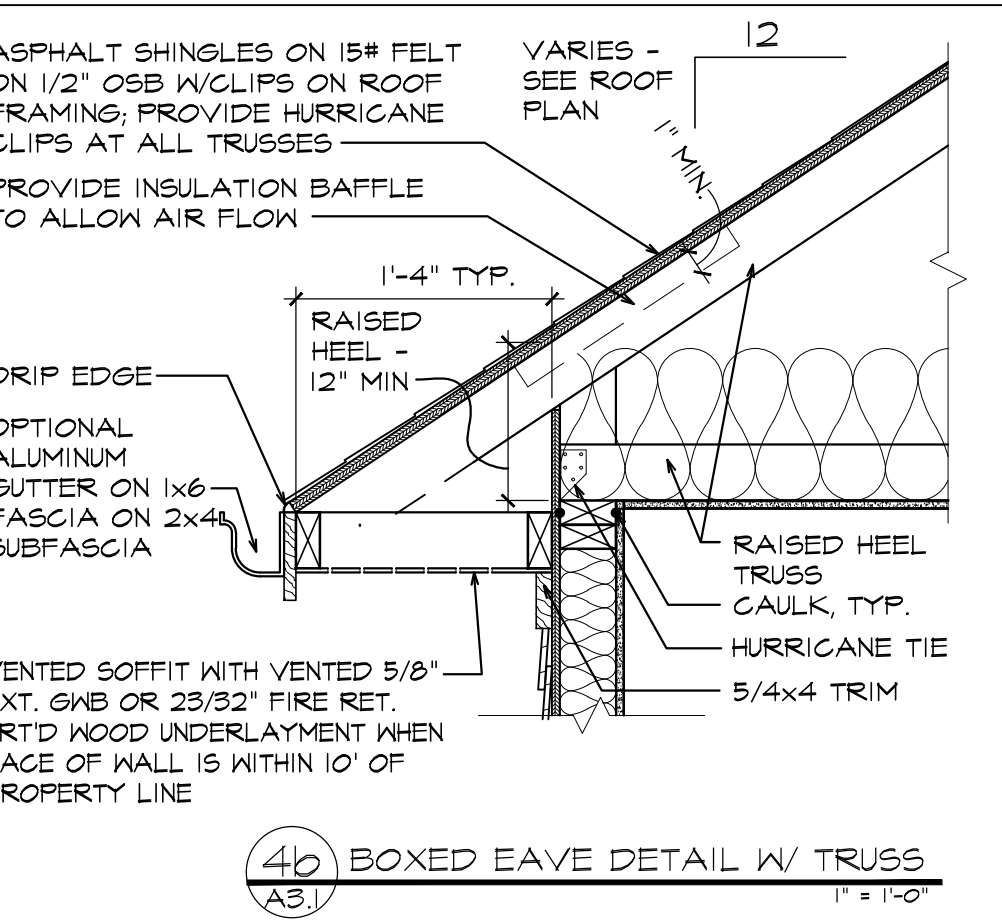
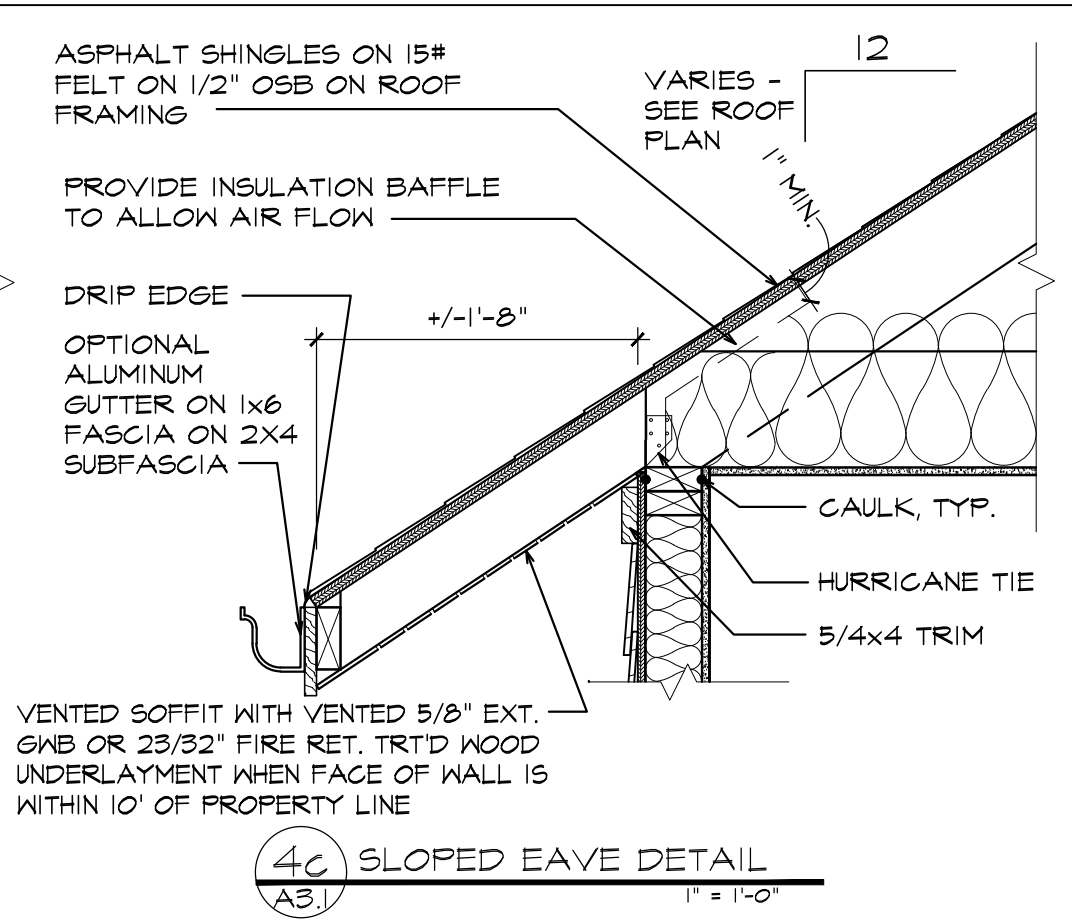
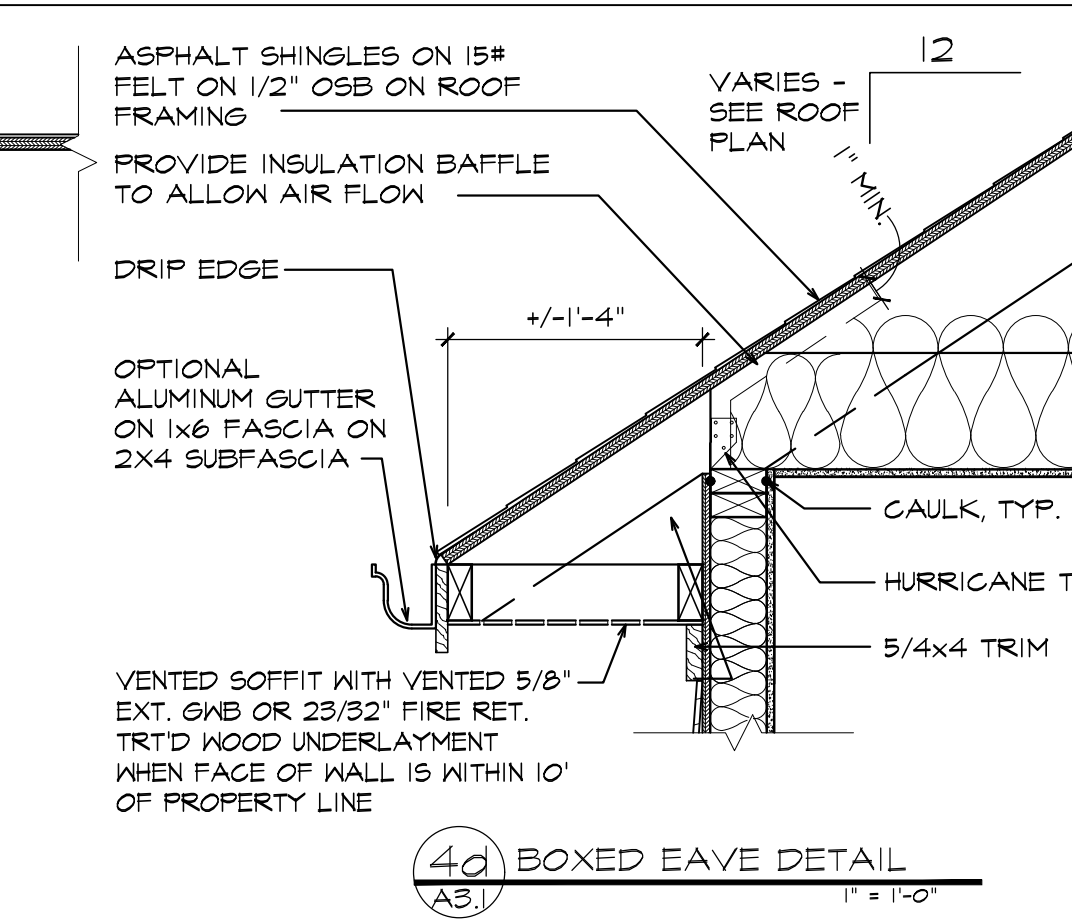
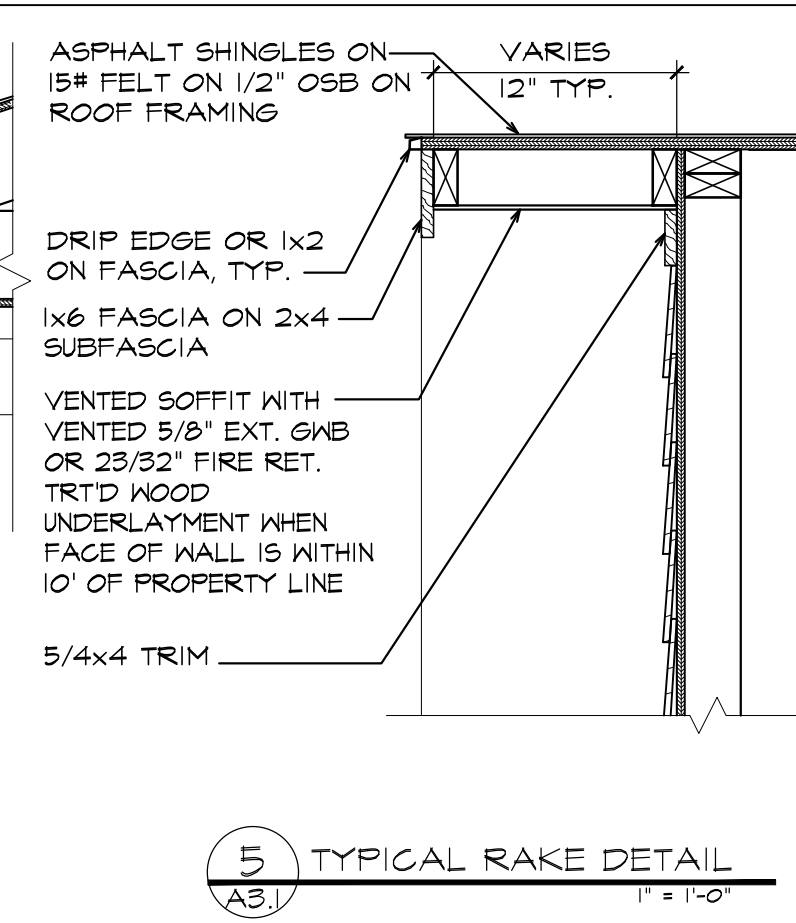
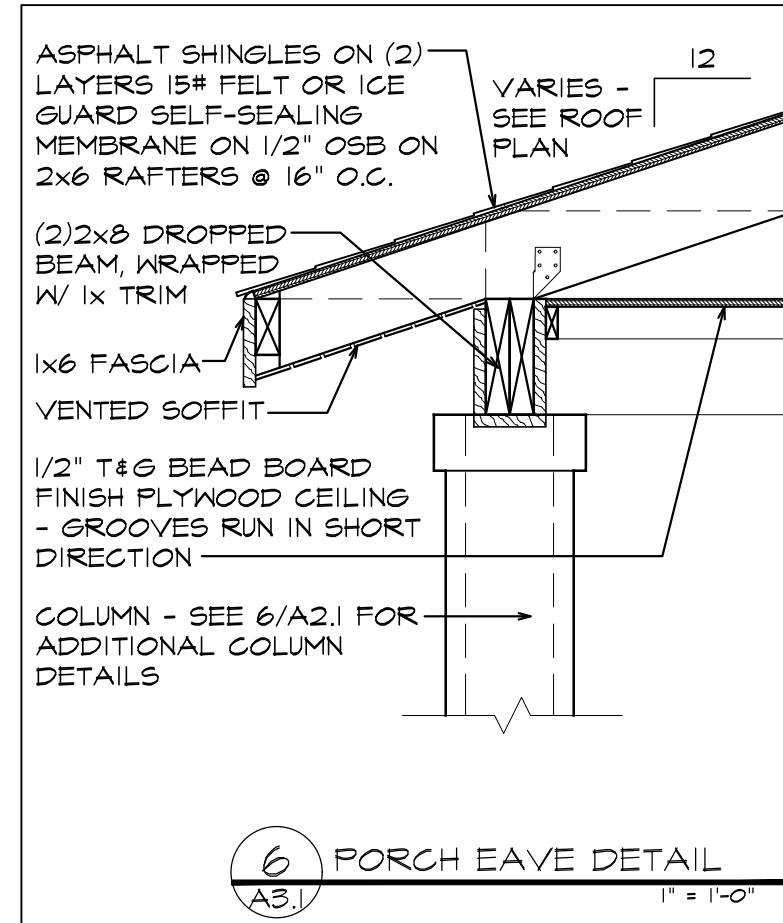
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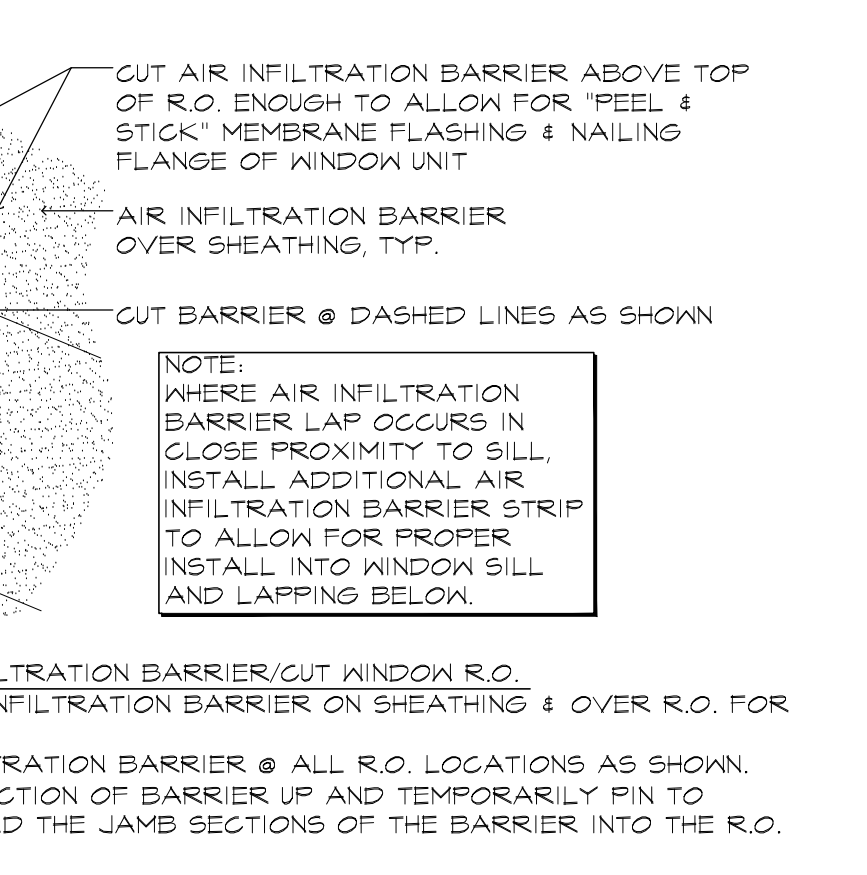
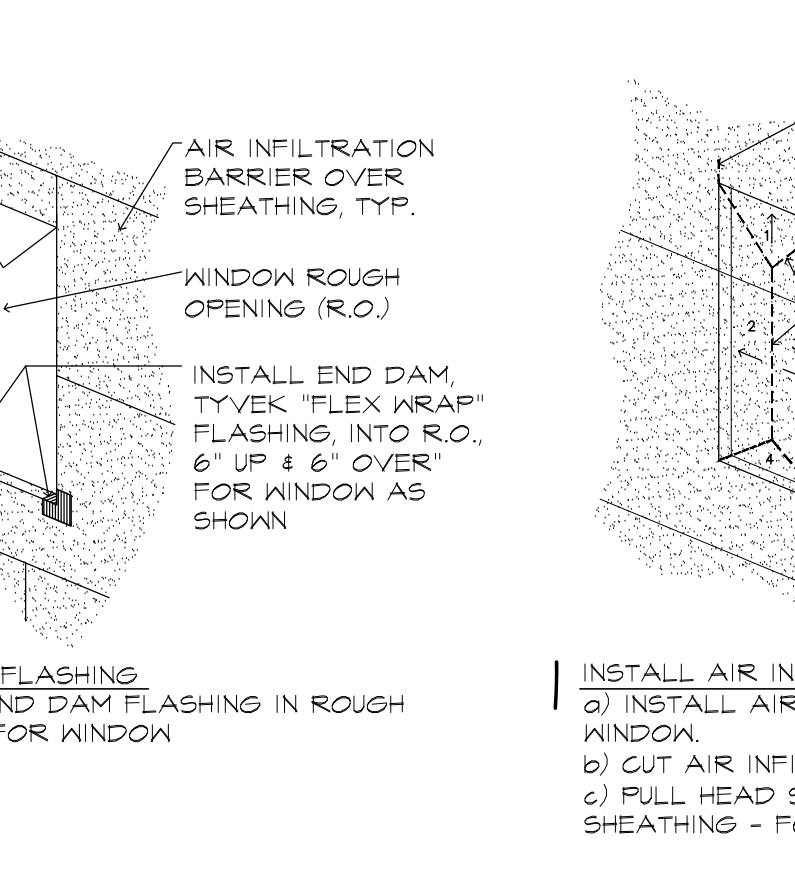
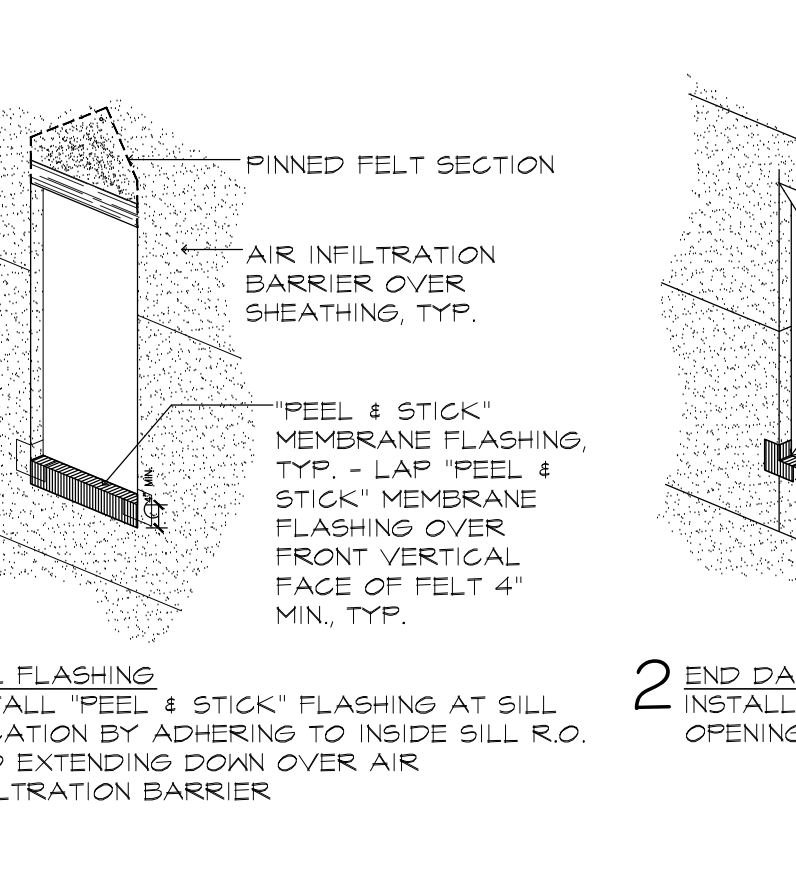
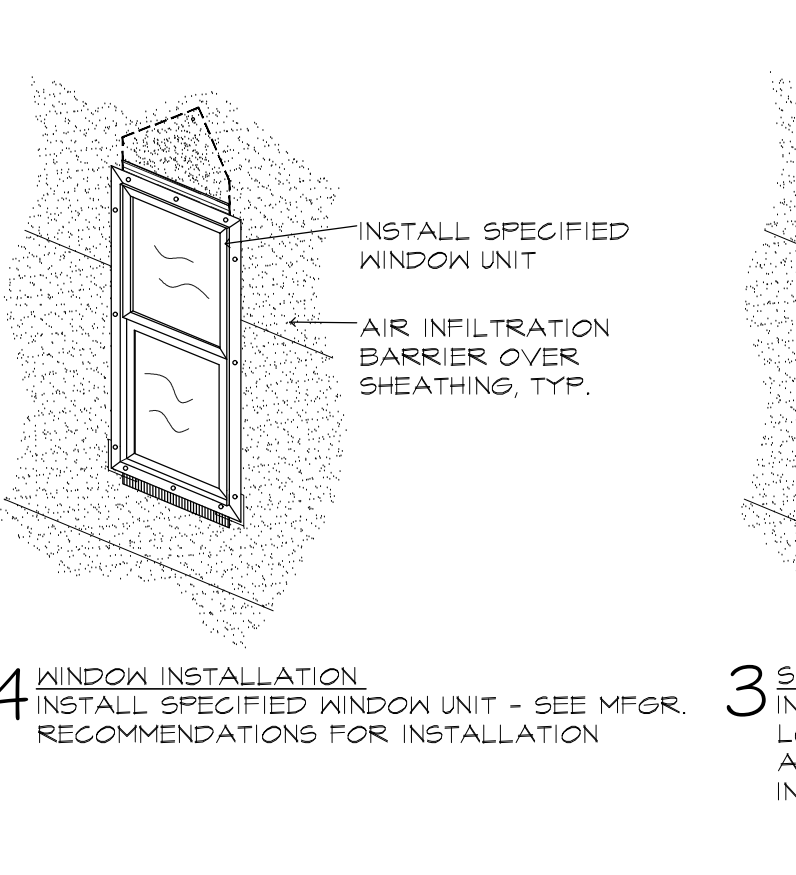
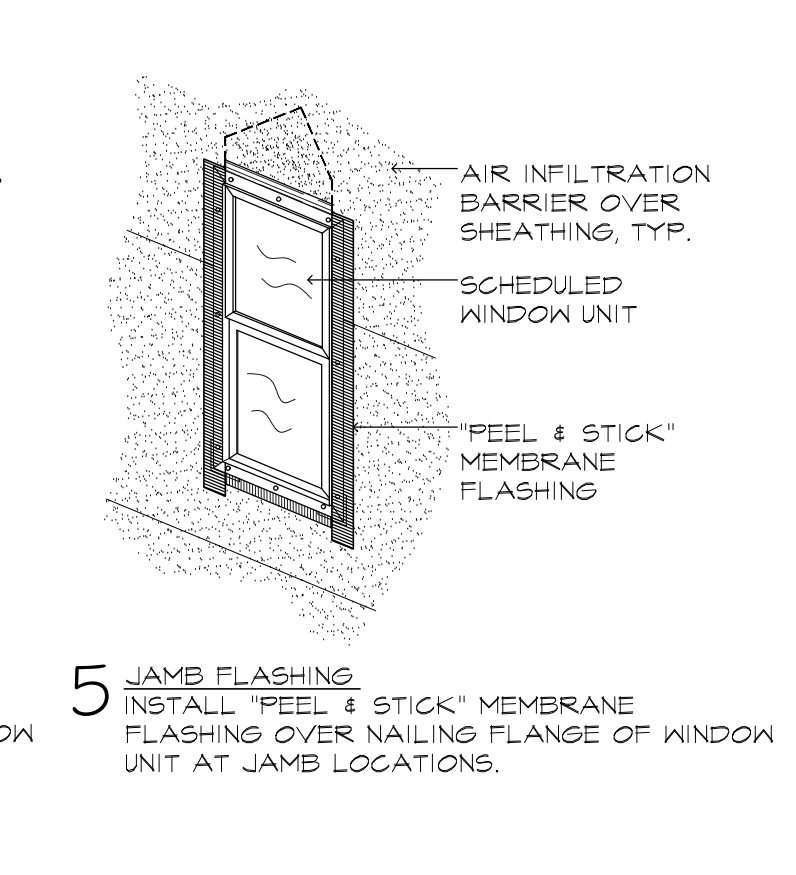
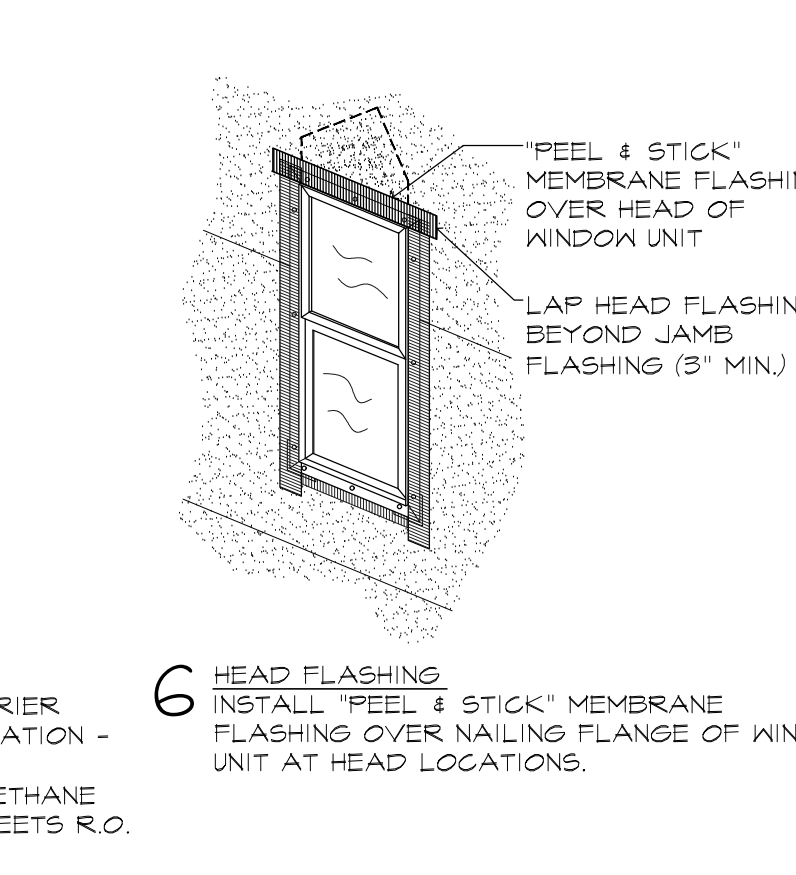
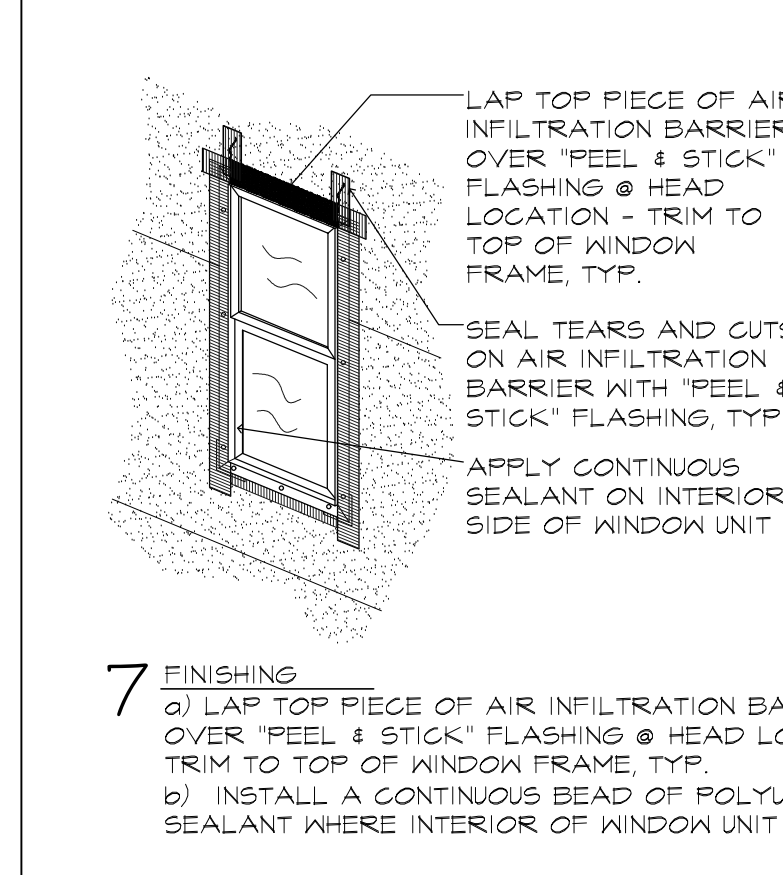
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Elevations, Details, & Notes

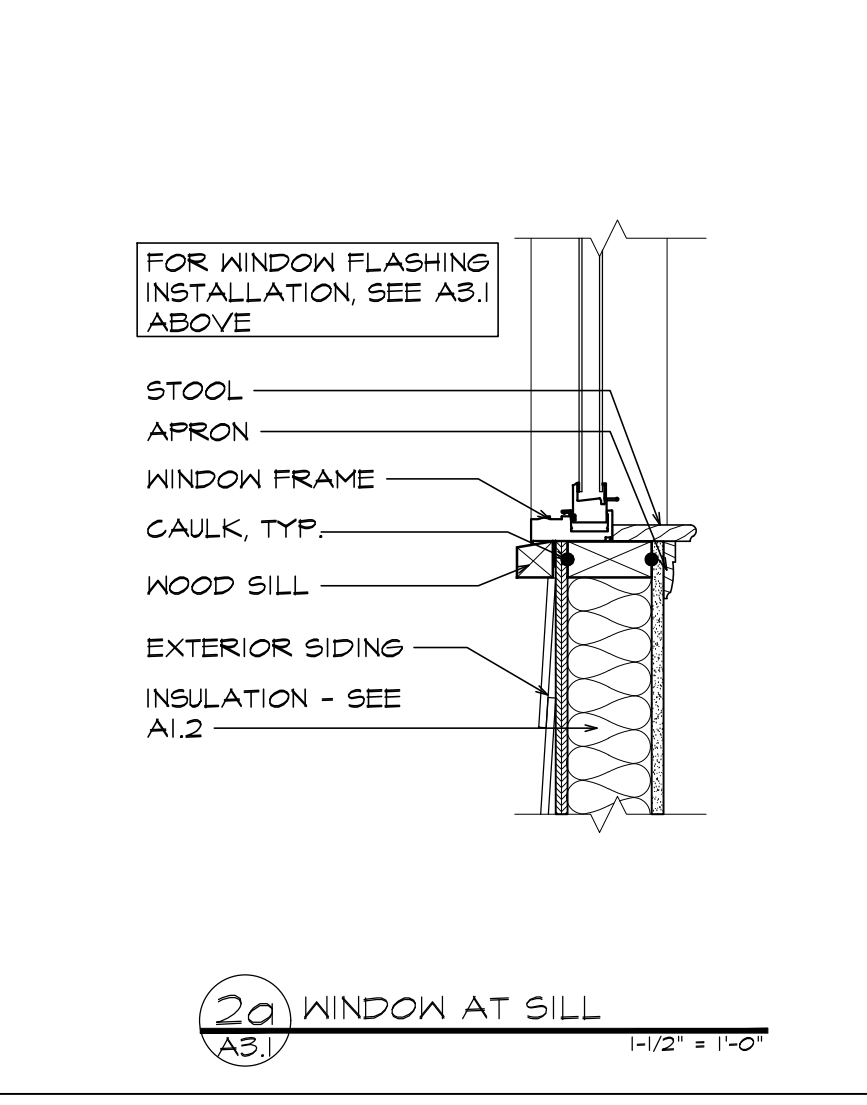
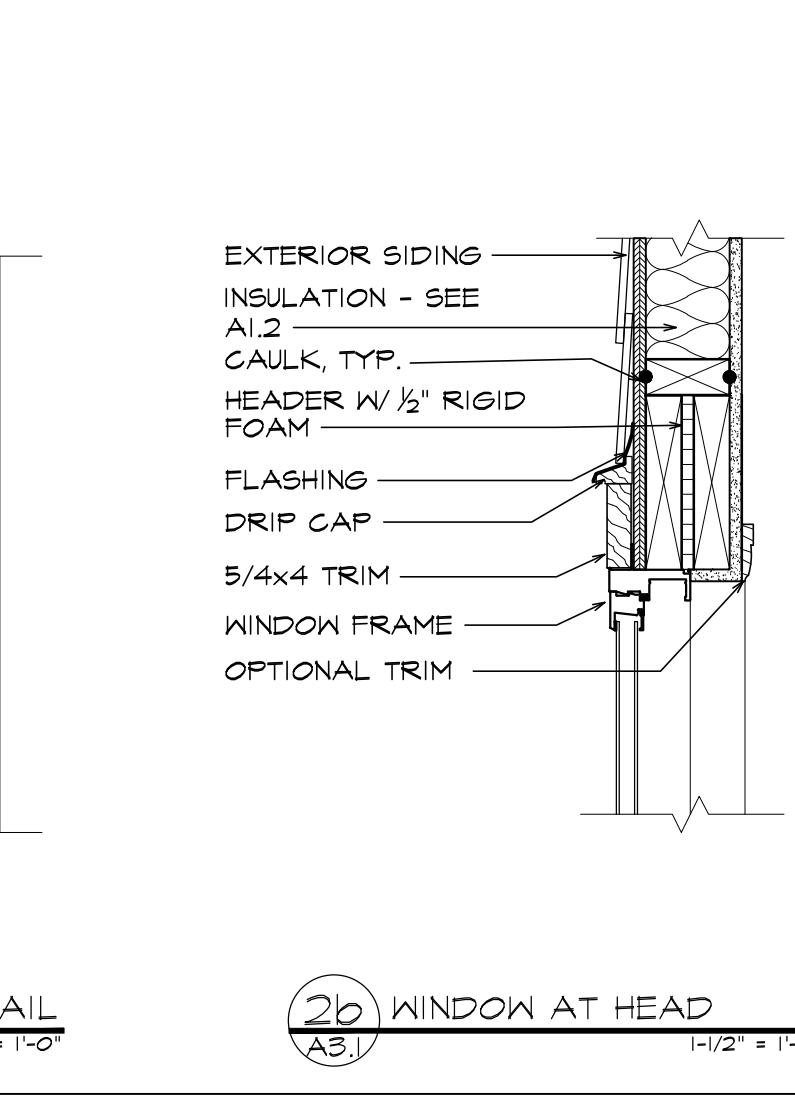
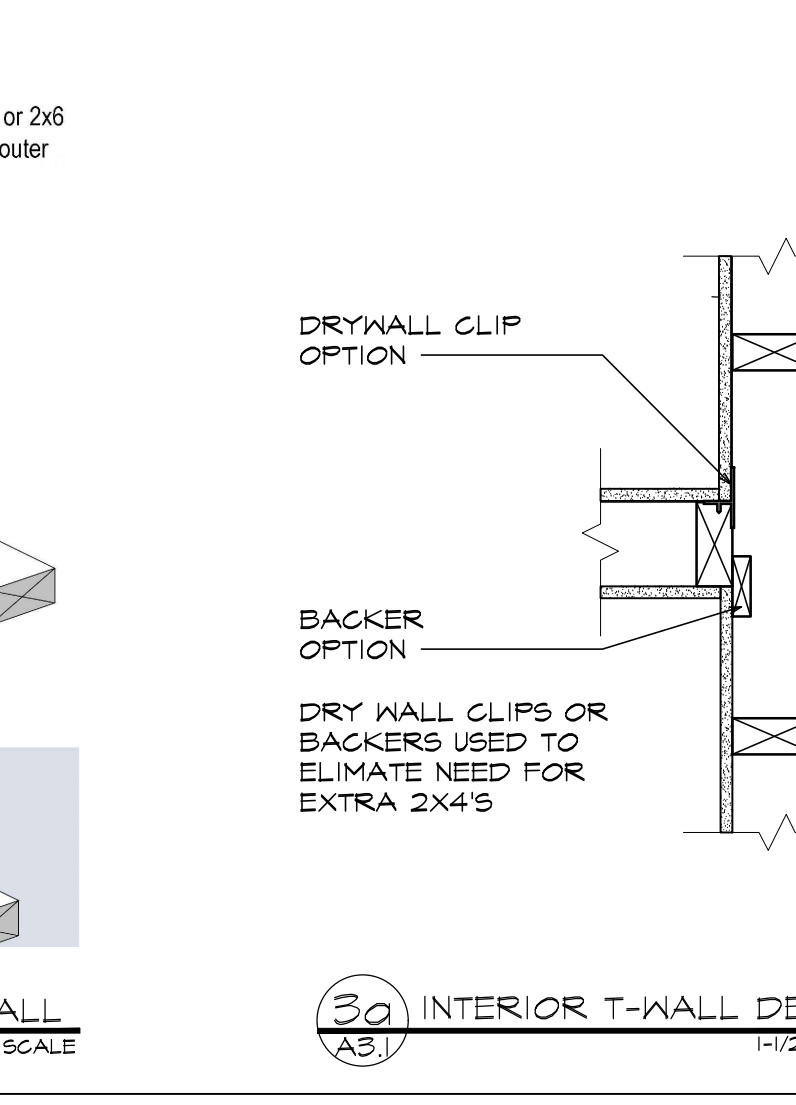
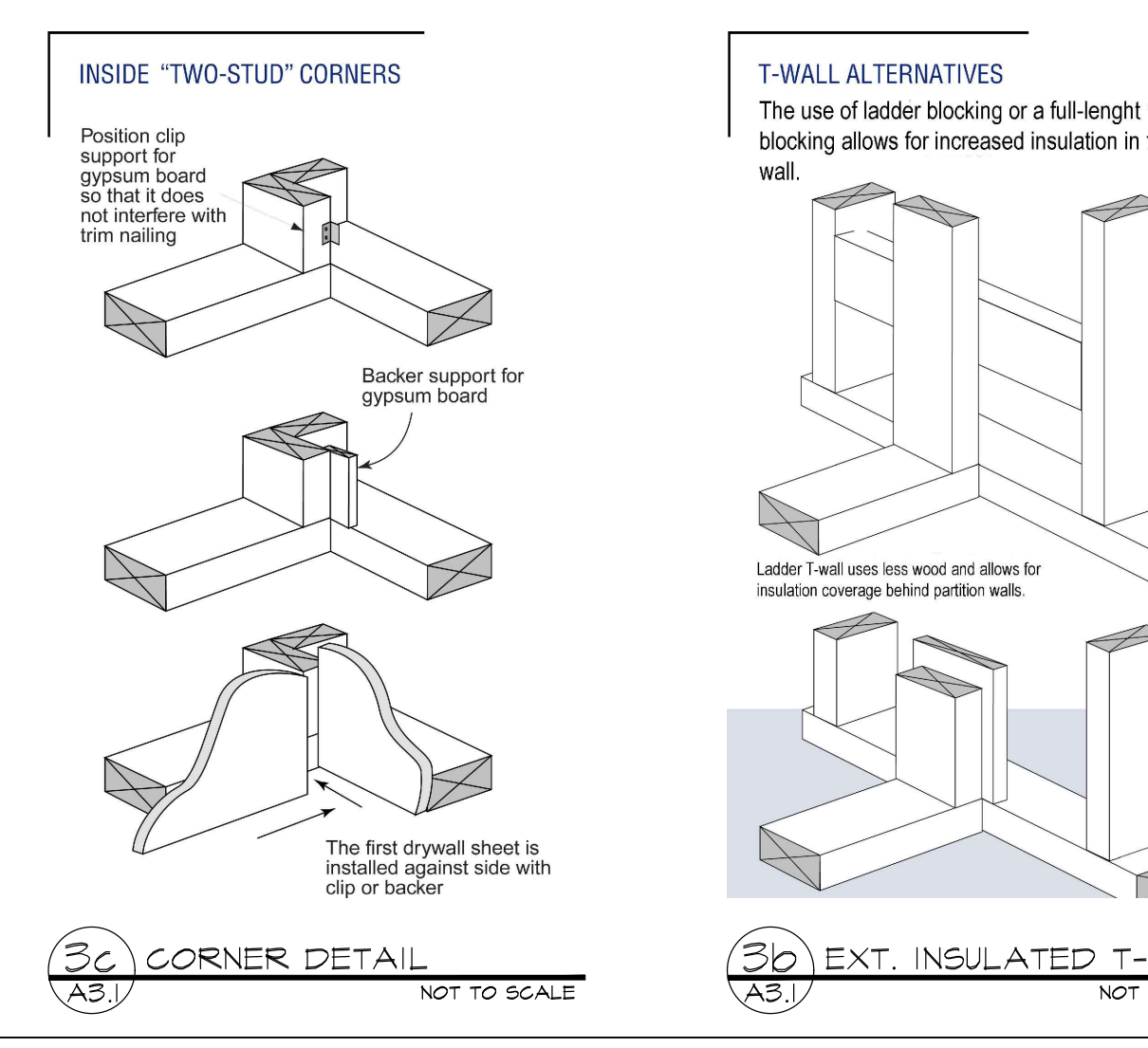
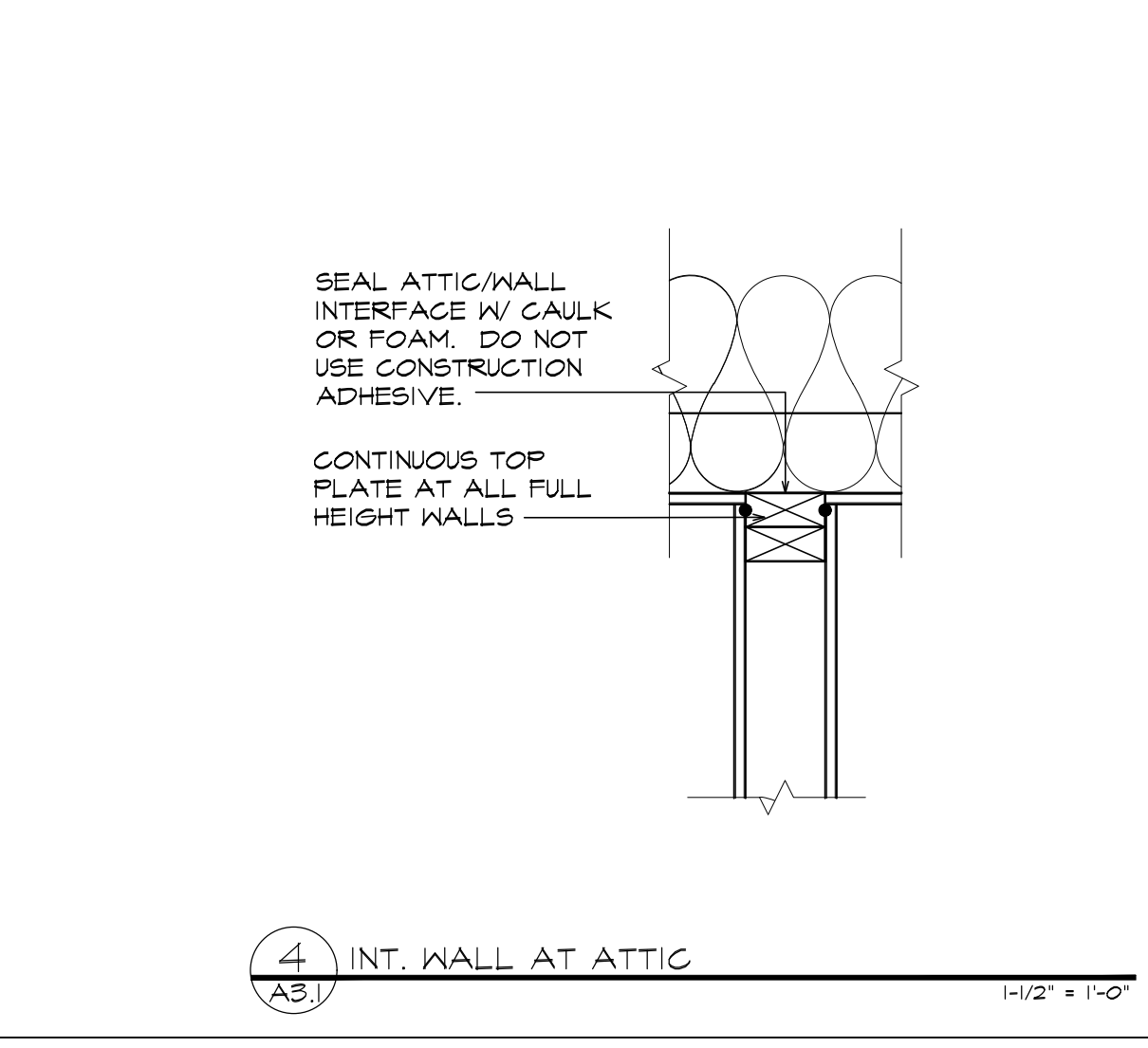
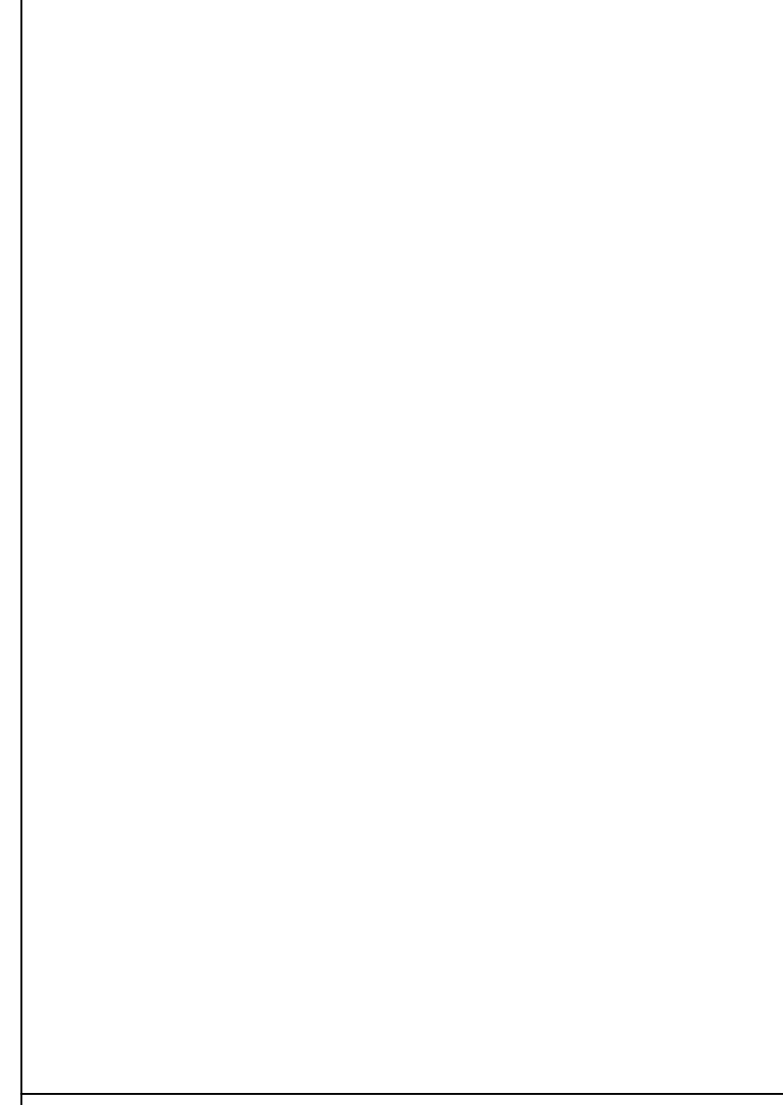
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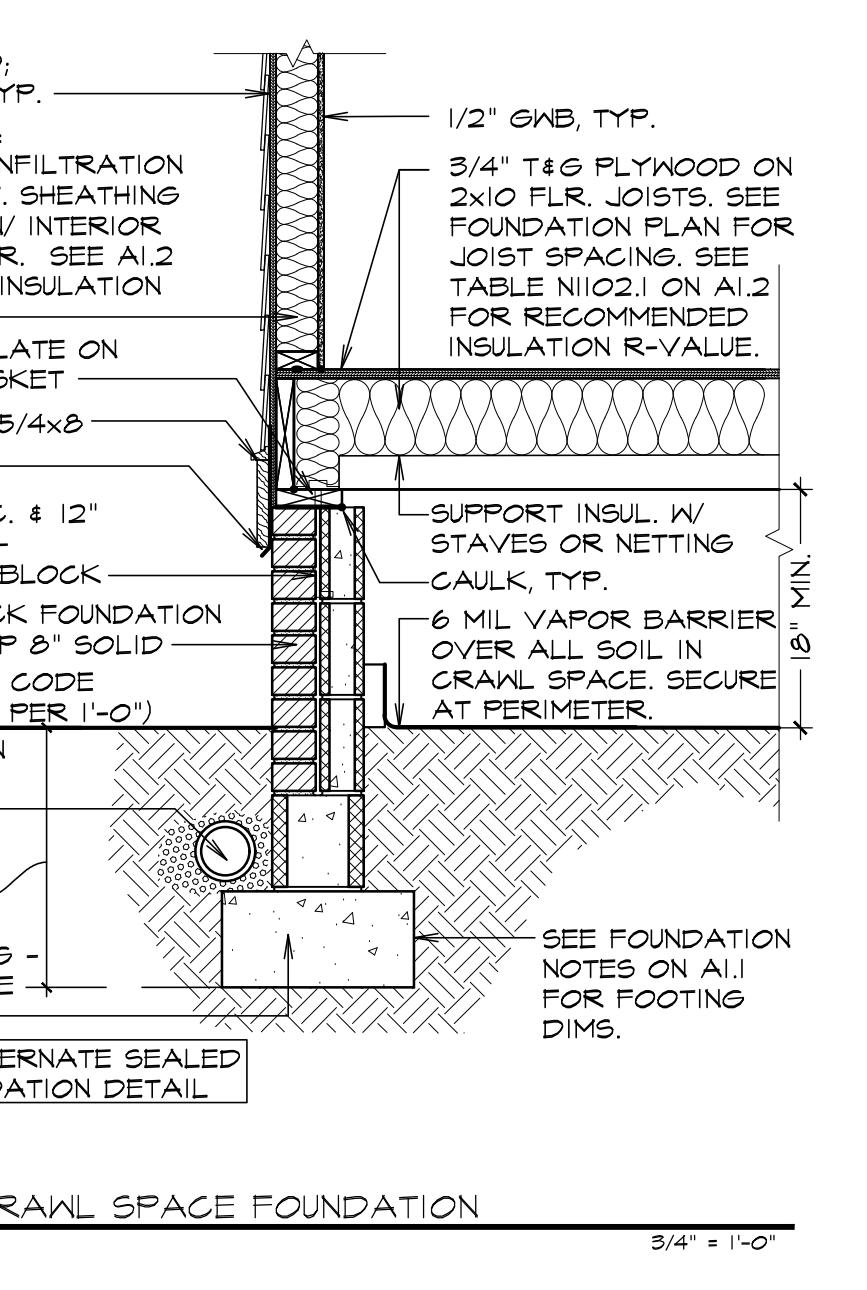
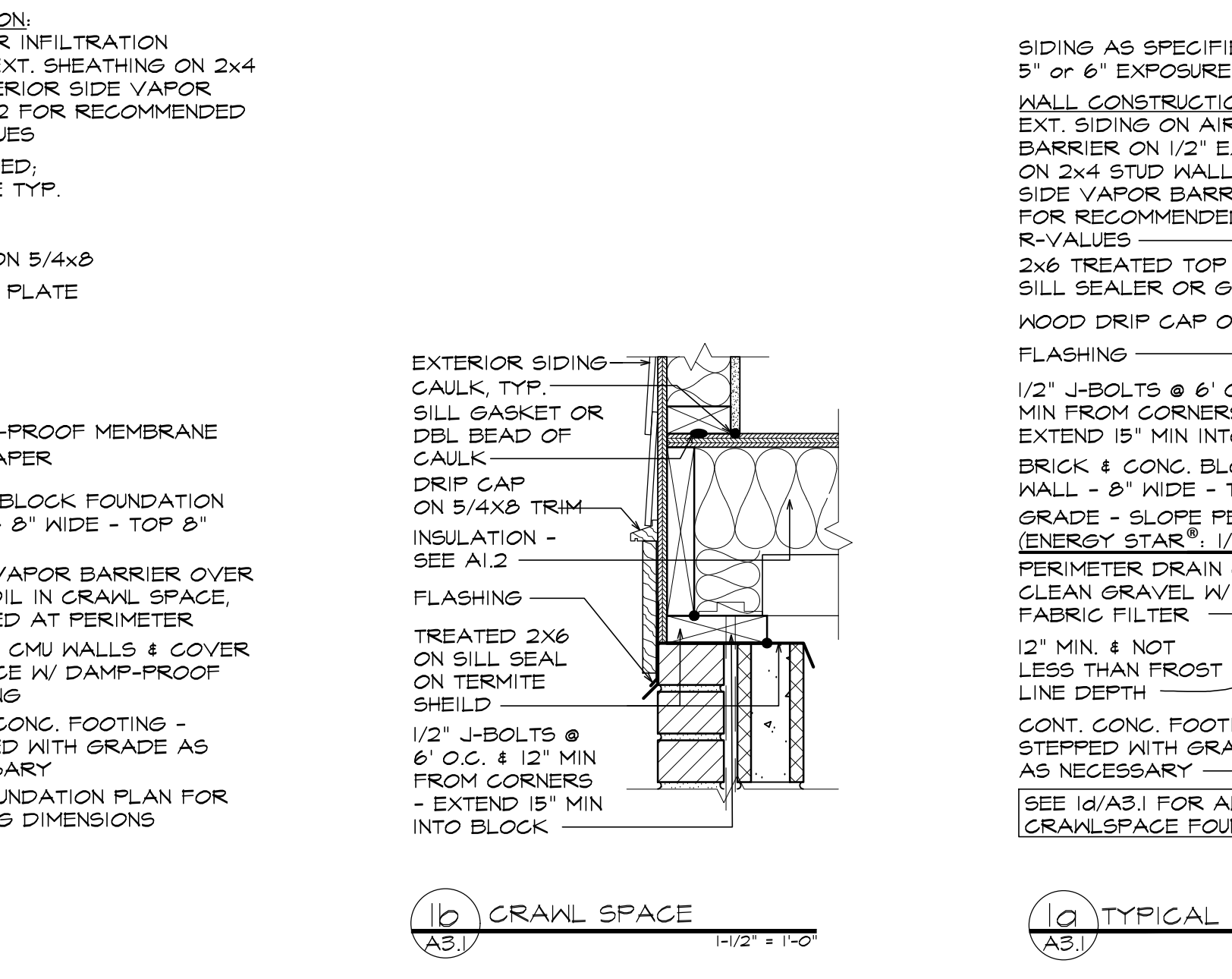
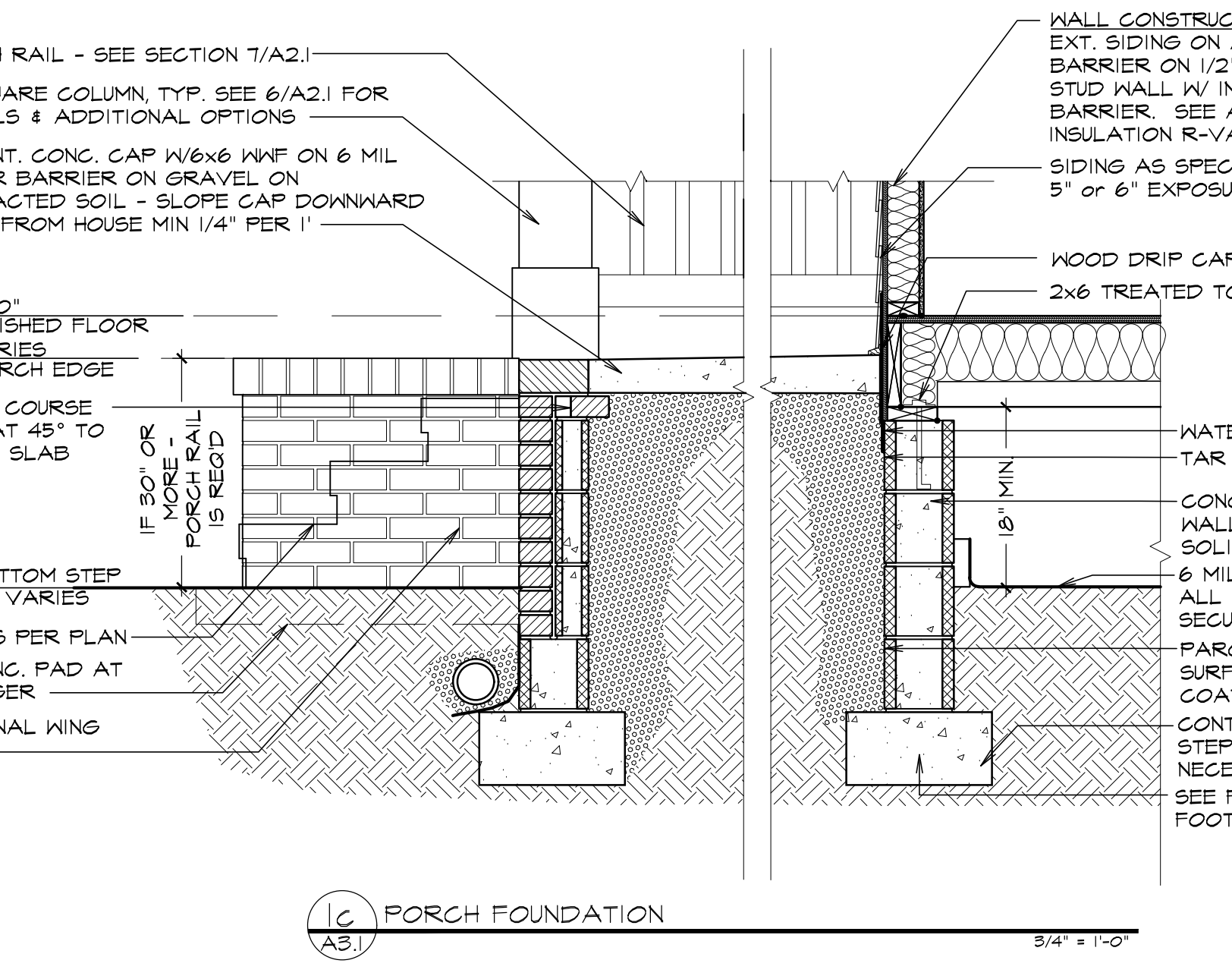
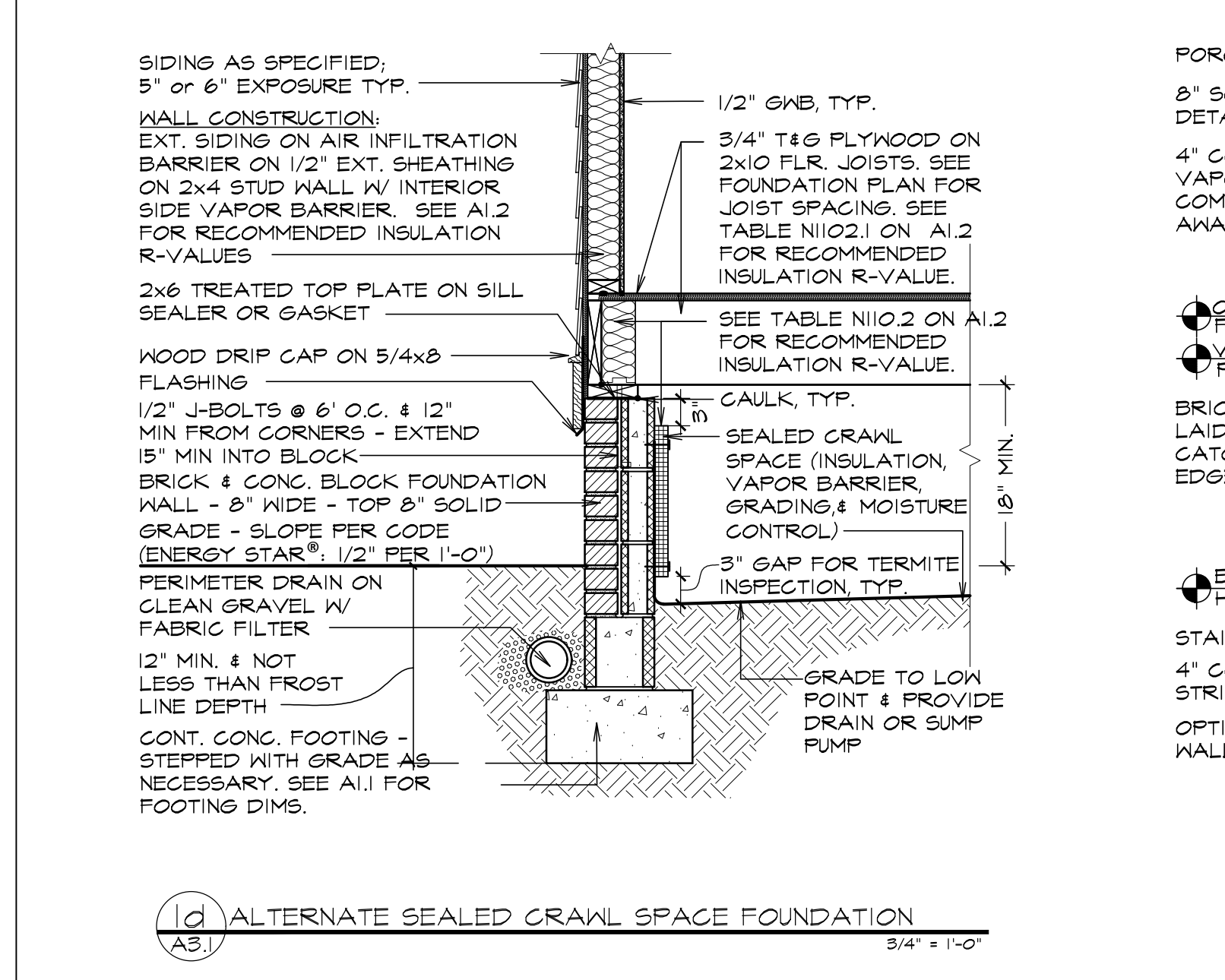
RAKE & EAVE DETAILS



WINDOW INSTALLATION



FRAMING DETAILS



FOUNDATION DETAILS

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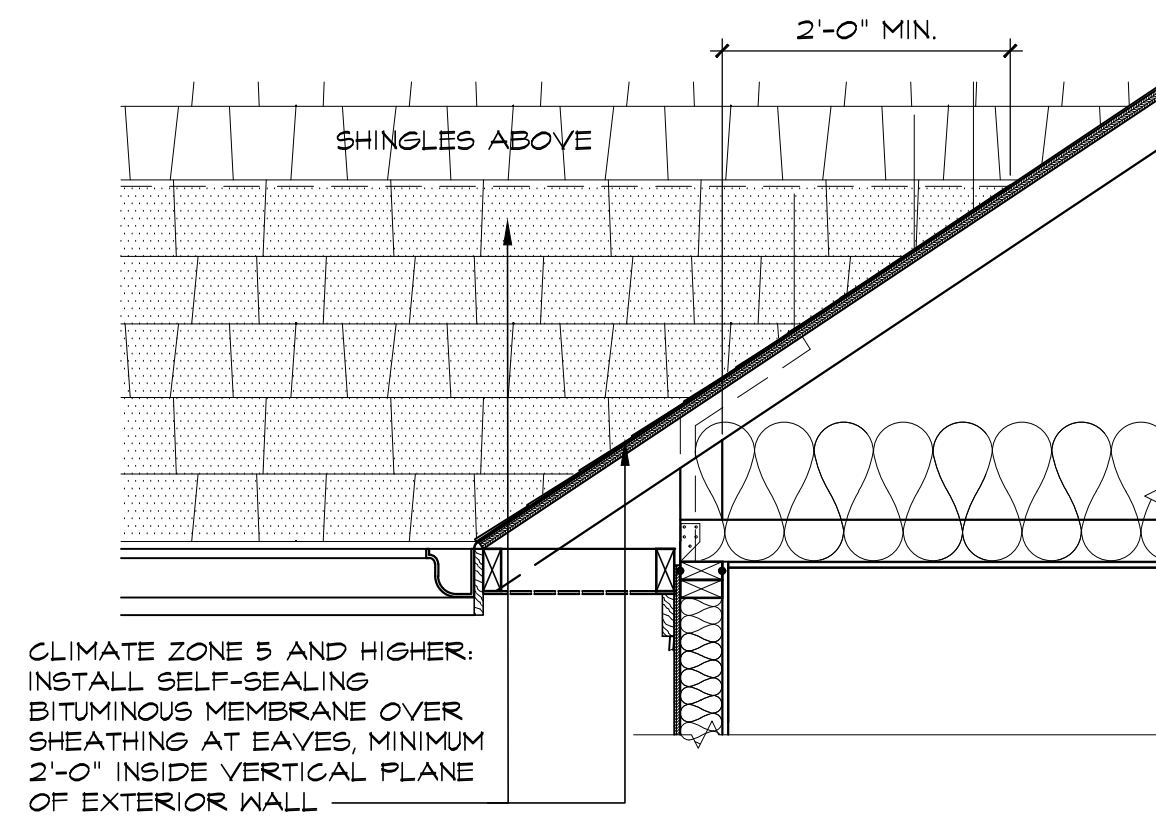
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Construction Details

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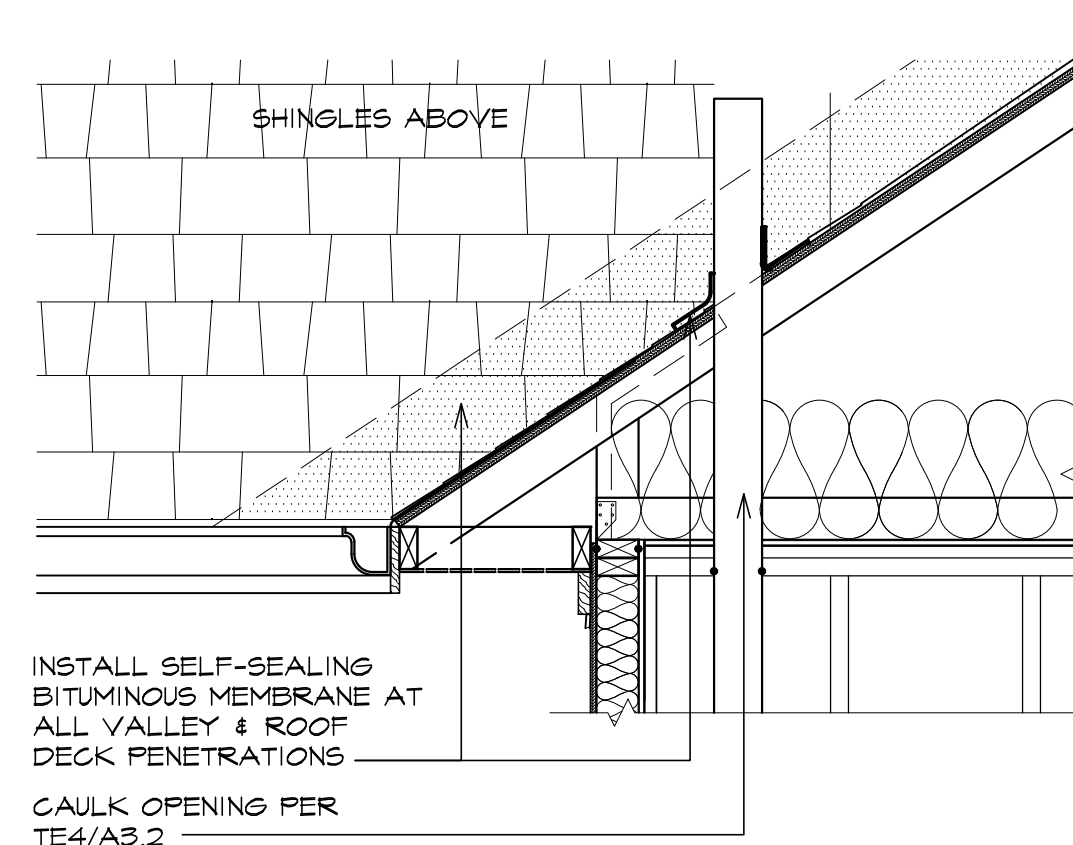
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Foundation, Wall & Roof Framing Details
A3.1



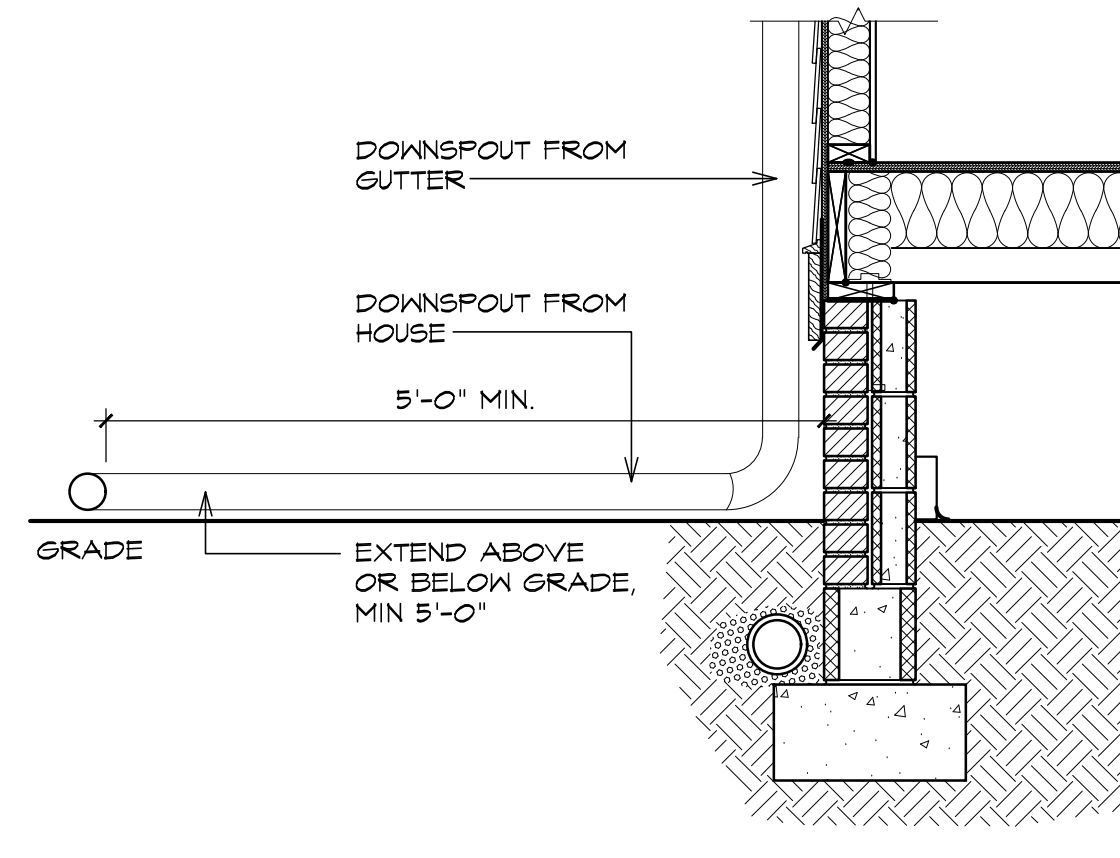
CLIMATE ZONE 5 AND HIGHER:
INSTALL SELF-SEALING
BITUMINOUS MEMBRANE OVER
SHEATHING AT EAVES, MINIMUM
2'-0" INSIDE VERTICAL PLANE
OF EXTERIOR WALL

WM 4 BITUMINOUS MEMBRANE AT EAVES
A3.2 *SEE A3.1 FOR TYPICAL RAKE & EAVE DETAILS* 3/4" x 1'-0"



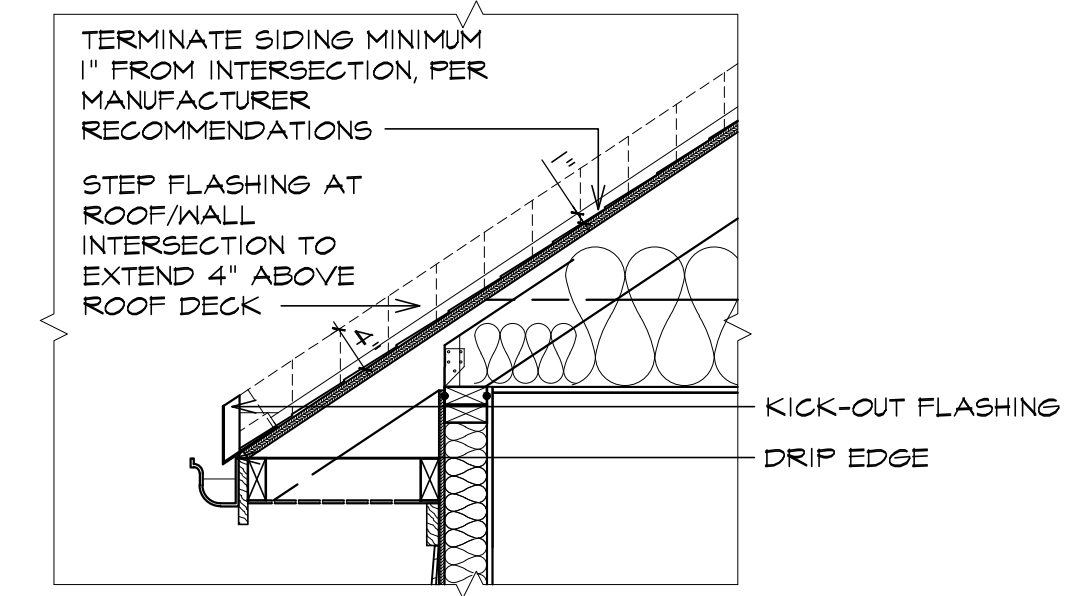
INSTALL SELF-SEALING
BITUMINOUS MEMBRANE AT
ALL VALLEY & ROOF
DECK PENETRATIONS
CAULK OPENING PER
TE4/A3.2

WM 3 ROOF DECK PENETRATIONS
A3.2 *SEE A3.1 FOR TYPICAL RAKE & EAVE DETAILS* 3/4" x 1'-0"



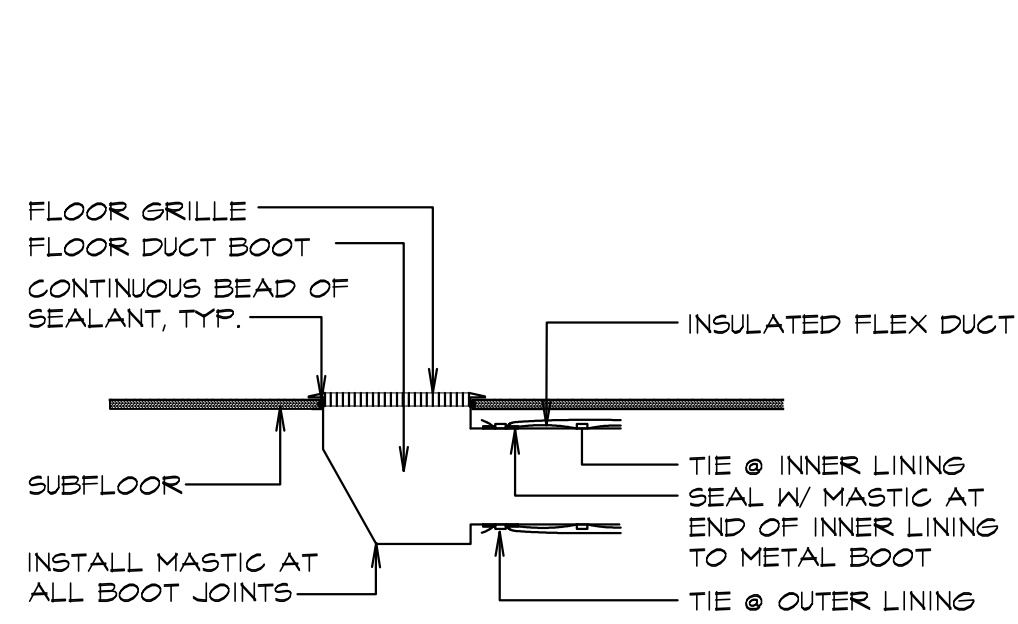
DOWNSPOUT FROM
GUTTER
DOWNSPOUT FROM
HOUSE
5'-0" MIN.
GRADE
EXTEND ABOVE
OR BELOW GRADE,
MIN 5'-0"

WM 2 GUTTERS & DOWNSPOUTS
A3.2 *SEE A3.1 FOR TYPICAL FOUNDATION DETAILS* 3/4" x 1'-0"

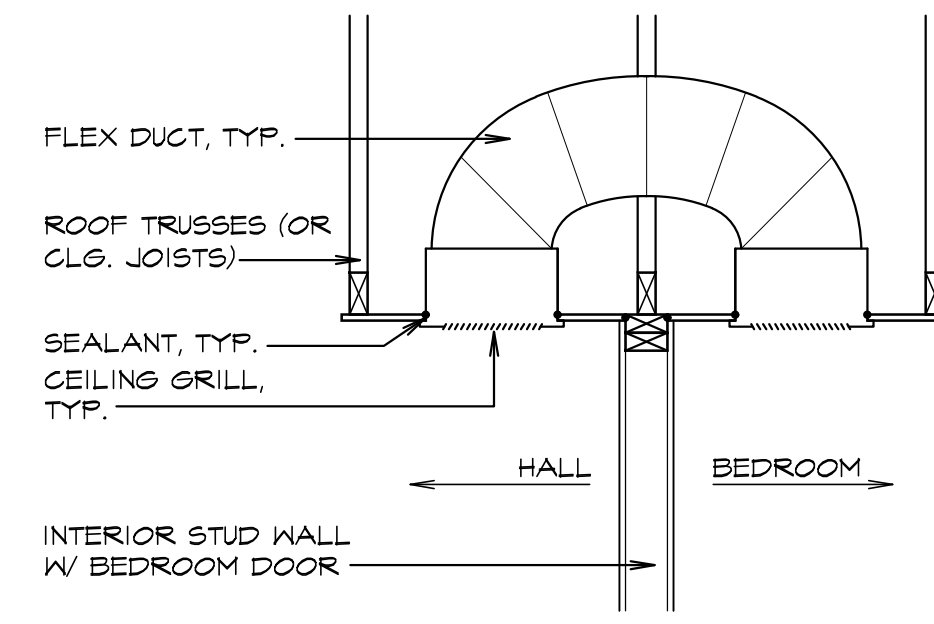


TERMINATE SIDING MINIMUM
1" FROM INTERSECTION, PER
MANUFACTURER
RECOMMENDATIONS
STEP FLASHING AT
ROOF/WALL
INTERSECTION TO
EXTEND 4" ABOVE
ROOF DECK
KICK-OUT FLASHING
DRIP EDGE

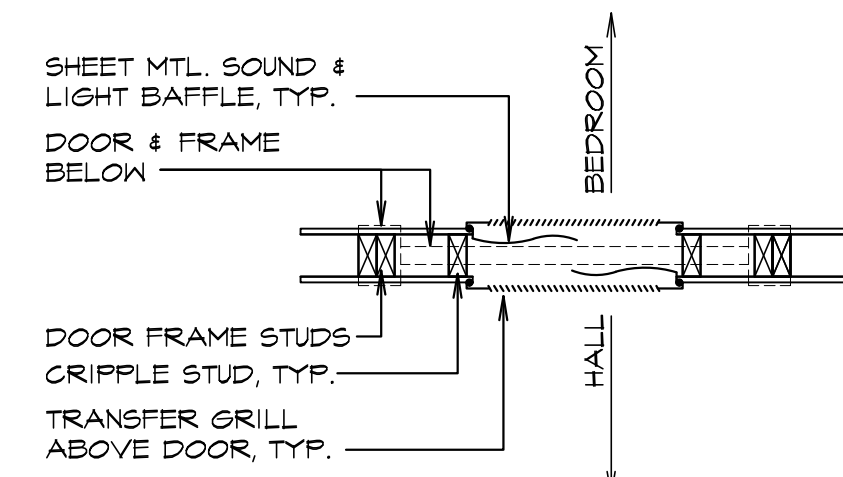
WM 1 KICK-OUT FLASHING AT ROOF/WALL INTERSECTION
A3.2 *SEE A3.1 FOR TYPICAL RAKE & EAVE DETAILS* 3/4" x 1'-0"



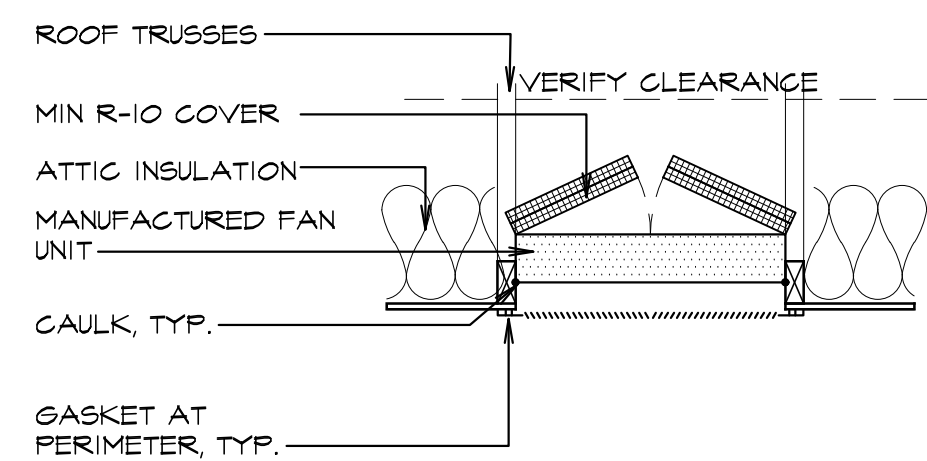
HC 1 TYPICAL DUCT BOOT SEAL
A3.2 3/4" x 1'-0"



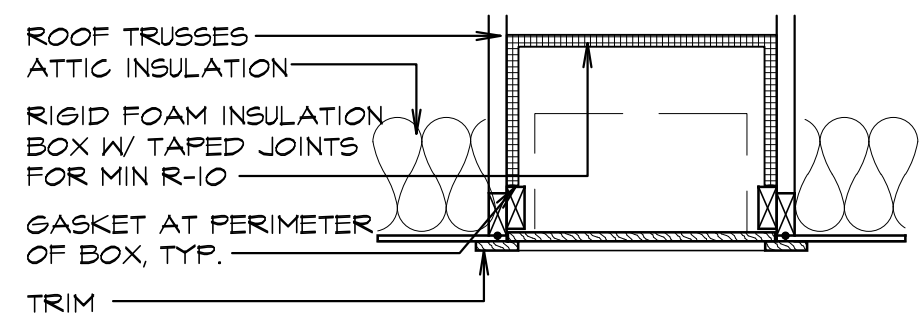
HC 2 BEDROOM PRESSURE BALANCE: JUMPER DUCT
A3.2 3/4" x 1'-0"



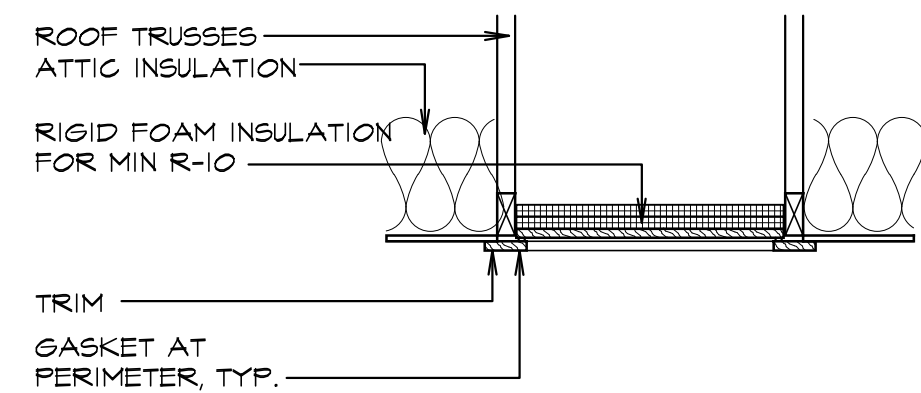
HC 1 BEDROOM PRESSURE BALANCE: TRANSFER GRILL
A3.2 3/4" x 1'-0"



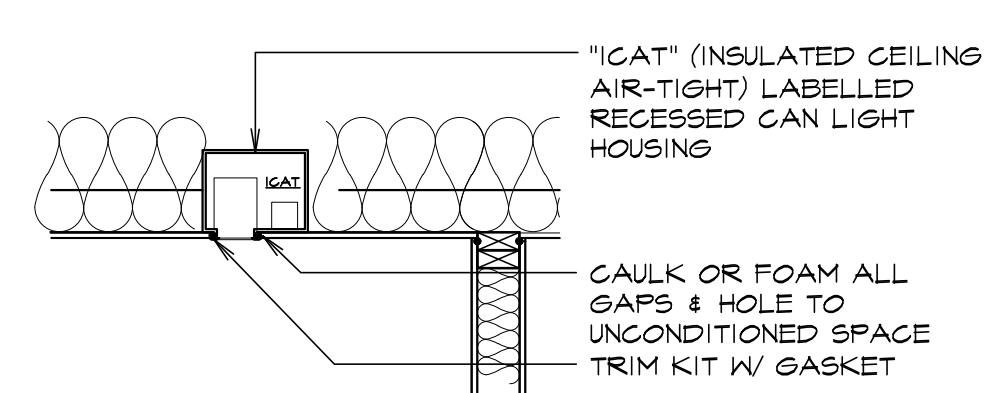
TE 9 TYPICAL WHOLE HOUSE FANS
A3.2 3/4" x 1'-0"



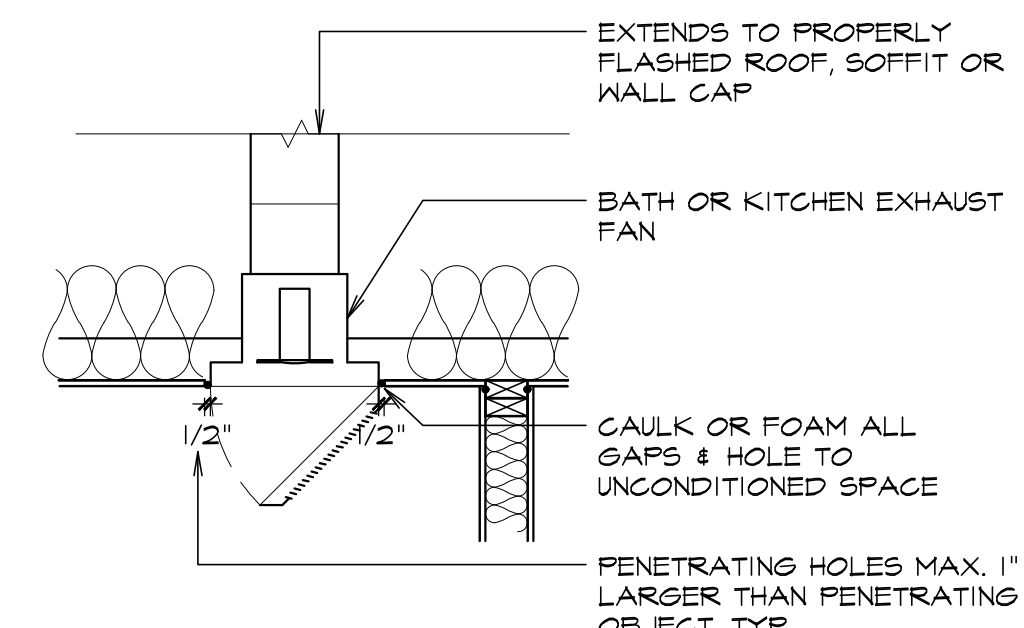
TE 8 TYPICAL ATTIC PULL-DOWN STAIRS
A3.2 3/4" x 1'-0"



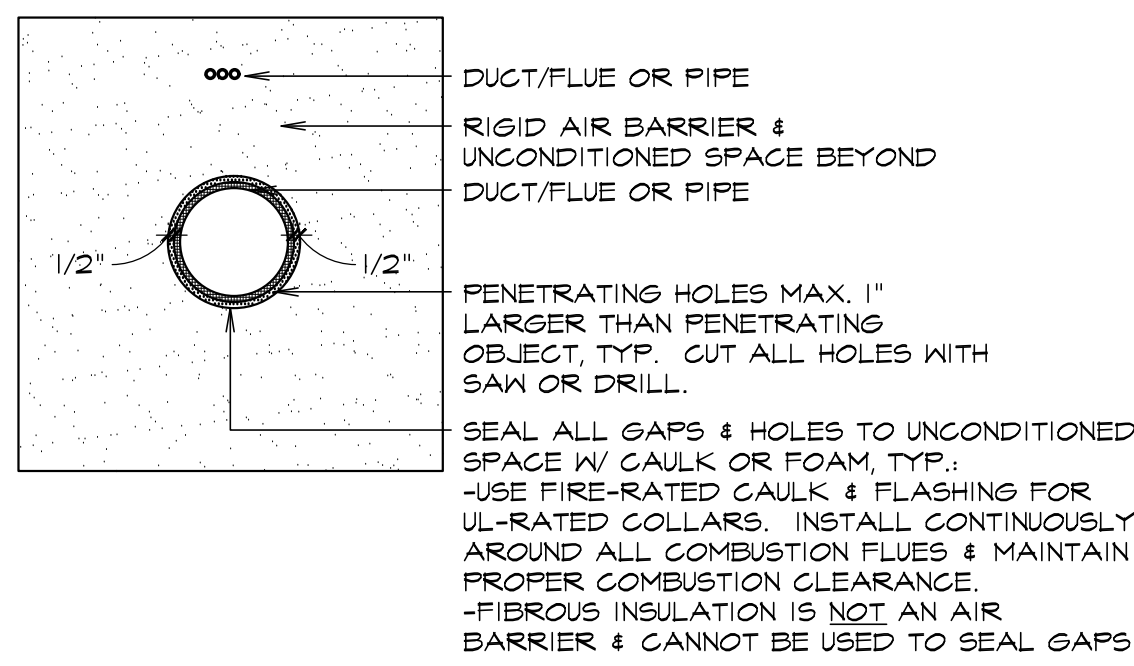
TE 7 TYPICAL ATTIC ACCESS PANEL
A3.2 3/4" x 1'-0"



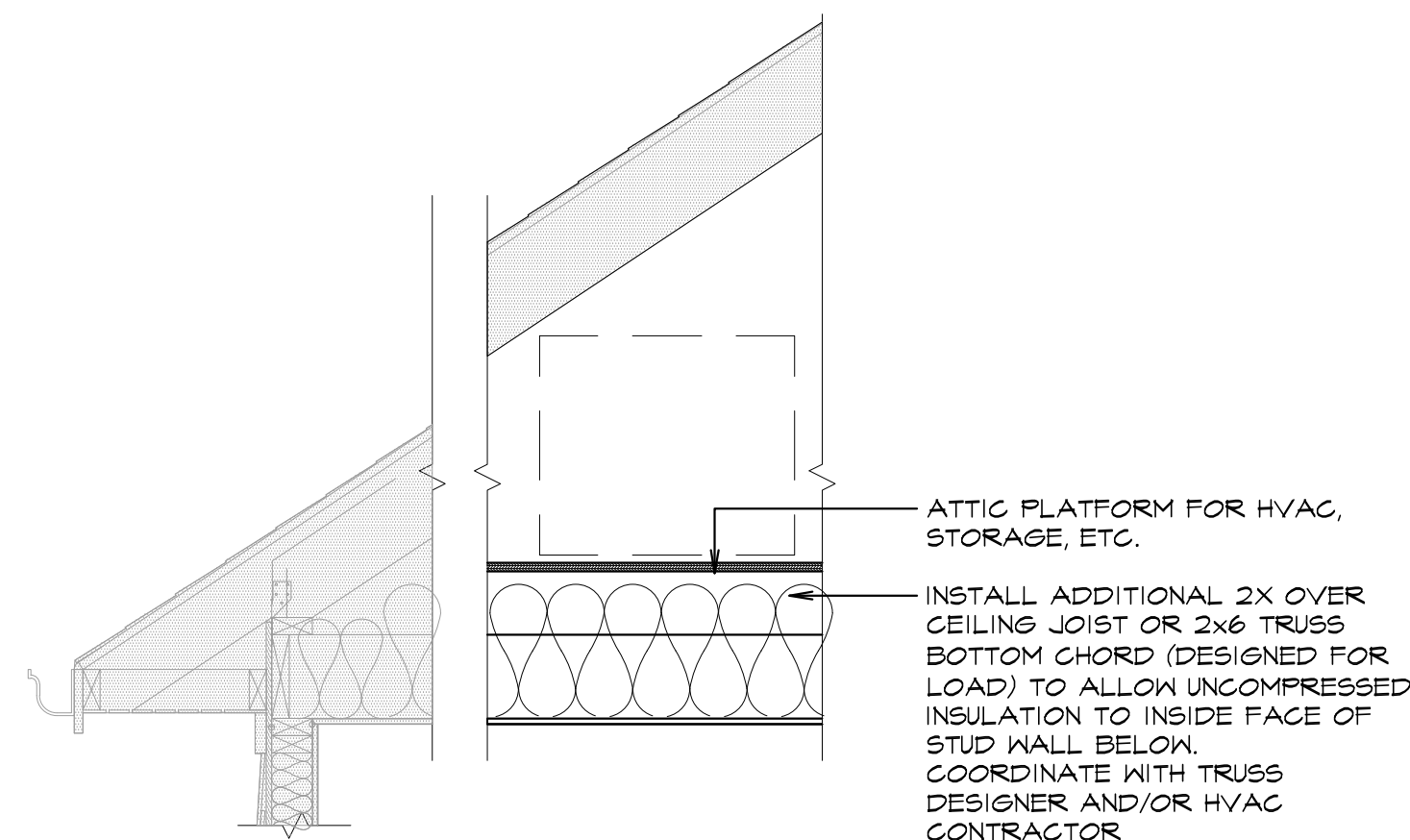
TE 6 TYPICAL ICAT RECESSED LIGHTING FIXTURES
A3.2 3/4" x 1'-0"



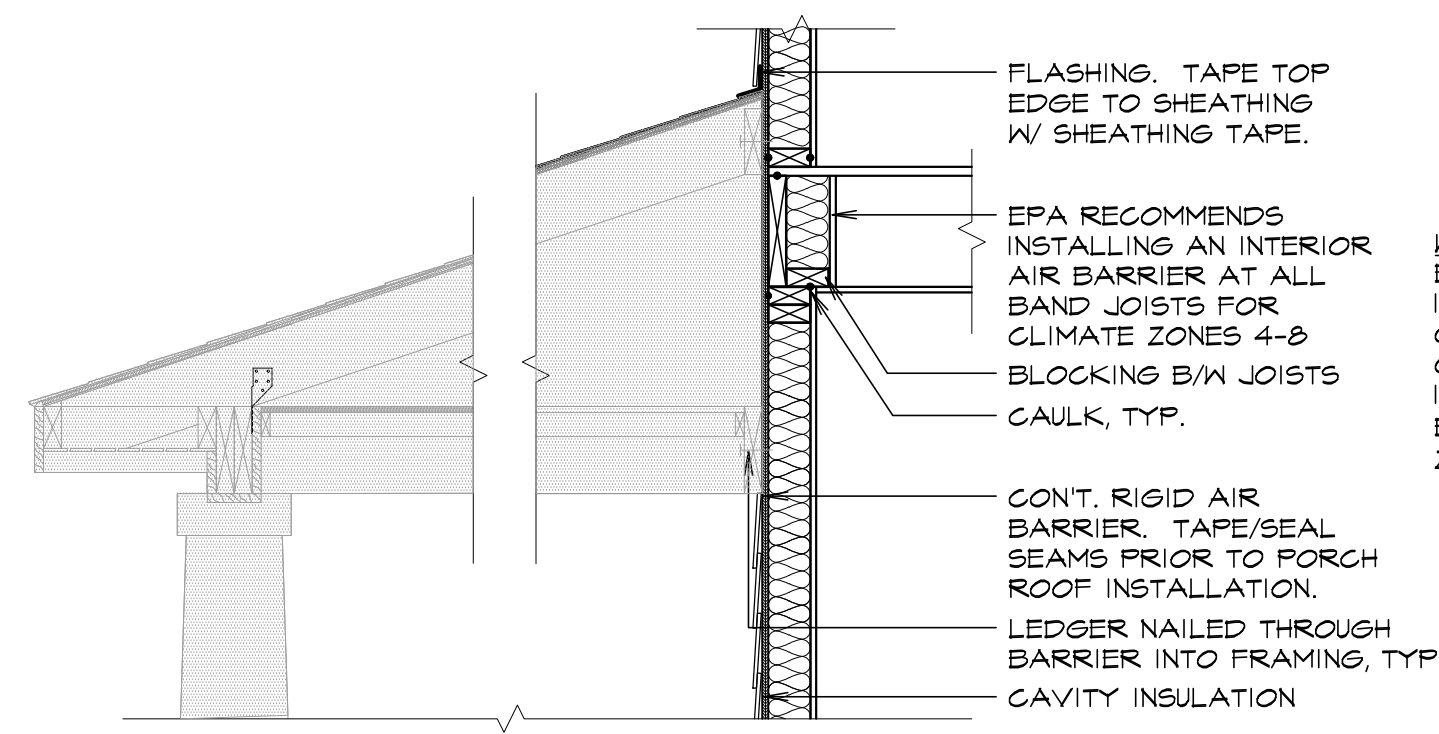
TE 5 TYPICAL BATH & KITCHEN EXHAUST FANS
A3.2 3/4" x 1'-0"



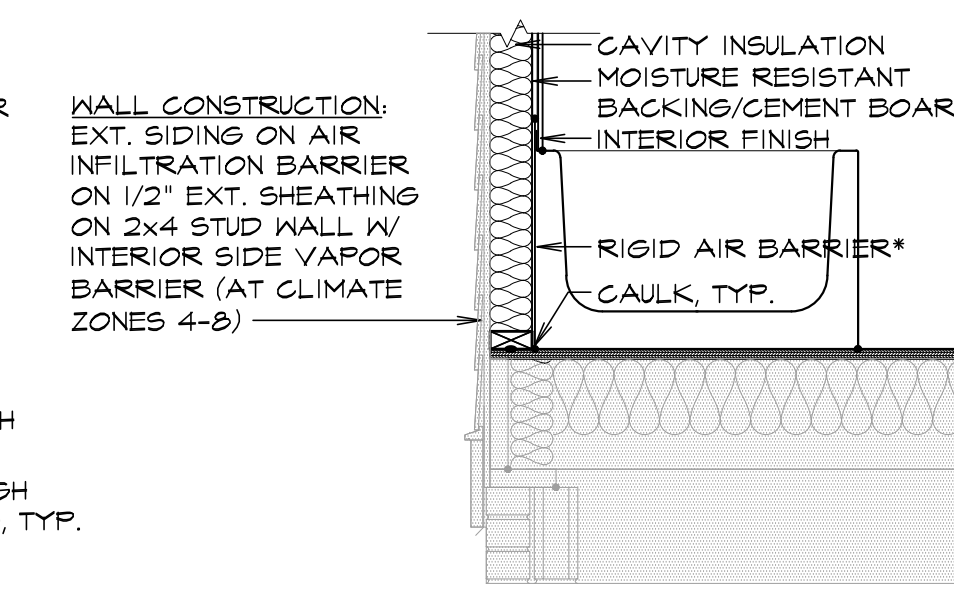
TE 4 TYPICAL PENETRATIONS TO UNCONDITIONED SPACE
A3.2 3/4" x 1'-0"



TE 3 TYPICAL INSULATION AT ATTIC PLATFORM
A3.2 3/4" x 1'-0"



TE 2 TYPICAL WALL ADJOINING PORCH ROOF
A3.2 3/4" x 1'-0"



TE 1 TYPICAL TUB/SHOWER AT EXTERIOR WALL
A3.2 *RIGID AIR BARRIER MAY BE GYPSUM BOARD, PLYWOOD, OSB, OR RIGID FOAM BOARD* 3/4" x 1'-0"

WATER MANAGEMENT

HVAC QUALITY

THERMAL ENCLOSURE

THIS PAGE CONTAINS ILLUSTRATED DETAILS THAT ARE REQUIRED FOR ENERGY STAR® CERTIFICATION AND ARE RECOMMENDED FOR THE CONSTRUCTION OF ANY TIGHTLINE HOUSE. THIS SHEET IS NOT A COMPREHENSIVE CHECKLIST FOR ANY CERTIFICATION PROCESS.

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revisions _____ date _____

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A3.2

Green Opportunities

Green Opportunities is a collection of ideas for achieving more sustainable construction habits and a greener home. *The italic text elaborates about the intent and its relationship to TightLines Designs.* We highly recommend participation in a green certification program to ensure that your home conserves energy, natural resources, and maintains optimal indoor air quality. Take a look at the resources below to get started finding a certification program that is right for you.

Green Certification Programs

Program	Intent	Website
National Association of Home Builders LEED for Homes	National Rating System for Energy, Resources, & Indoor Air Quality	http://www.nahbgreen.org/Guidelines/ansistandard.aspx
Enterprise Green Communities	National Rating System for Energy, Resources, & Indoor Air Quality	http://www.greenhomeguide.org/
Earthcraft	Framework for developers to pursue green building in affordable multi- and single-family developments	http://www.greencommunitiesonline.org/
Earthcraft	Southeast Rating System for Energy, Resources, & Indoor Air Quality	http://www.earthcrafthouse.com/
Greenbuilt North Carolina	Statewide Rating System for Energy, Resources, & Indoor Air Quality	http://www.greenbuilt.org/

LOCATION

Site Selection	<ul style="list-style-type: none"> Built above 100-year floodplain Not built on habitat for threatened or endangered species Not built within 100 ft of water, including wetlands Not built on land that was public parkland prior to acquisition Not built on land with prime soils, unique soils, or soils of state significance 	Selecting an appropriate site is the first step in building a green home. The intent is to minimize the home's impact on the environment and to preserve significant species, open space, soil, or community amenities.
Preferred Locations	<ul style="list-style-type: none"> Edge Development Infill Previously Developed Greyfield/Brownfield Site 	
Infrastructure	<ul style="list-style-type: none"> Existing Infrastructure Community Resources/Transit 	Minimize site disturbance on- and off-site.
Community Resources/Transit	<ul style="list-style-type: none"> Community Resources/Transit 	Reduce the use of fossil fuels by building near shopping centers, parks/greenways, and mass transit systems.

SUSTAINABLE SITES

Site Stewardship	<ul style="list-style-type: none"> Stockpile and protect topsoil from erosion Control the path and velocity of runoff with silt fencing or equivalent Protect sewer inlets, streams, and lakes with straw bales, silt fencing, etc. Provide swales to divert surface water from hillsides Use tiers, erosion blankets, compost blankets, etc. on sloped areas 	Preventing erosion aids in maintaining soil quality and prevents soil runoff that pollutes lakes and streams.
Minimize Disturbed Area of Site	<ul style="list-style-type: none"> Develop tree/plant preservation plan with "no-disturbance" zones Rehabilitate lot; undo soil compaction and remove invasive plants Maximize number of units per acre or build on smaller lot 	

Landscaping

Basic Landscaping Design	<ul style="list-style-type: none"> Use drought tolerant turf Do not use turf in densely shaded areas Do not use turf in areas with slope of 25% Add mulch or soil amendments as appropriate Till compacted soil to at least 6 inches 	Using water responsibly includes limiting the use of potable water for irrigation. This can be done by selecting drought- tolerant plants, limiting turf, and mulching.
Limit Conventional Turf		
Drought-Tolerant Plants		
Reduce Overall Irrigation Demand		
Group plants with similar water needs (hydrozoning)		

Reduce Local Heat Island Effects

Reduce Local Heat Island Effects	<ul style="list-style-type: none"> Locate trees/plantings to provide shade for hardscapes Install light colored hardscapes Do not use turf in areas with slope of 25% 	The heat island effect occurs when areas experience unnaturally elevated temperatures that are caused by increased heat retention in man-made materials such as dark roofs or asphalt. Heat islands affect human comfort and wildlife patterns. Heat islands can be avoided by selecting light colored building materials or shading heat retaining materials.
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Storm Water Management

Maximize Permeable Area of Lot	<ul style="list-style-type: none"> Vegetative landscape Permeable paving Impermeable surfaces directed to infiltration features 	Runoff from hard surfaces washes pollutants directly into water systems that are used to yield food or drinking water to residents. Also, it is important that soils retain rainwater to naturally irrigate landscapes.
Permanent Erosion Control Options	<ul style="list-style-type: none"> For portions of lot on steep slope, use terracing and retaining walls Plant trees, shrubs or groundcover 	
Management of Runoff From Roof	<ul style="list-style-type: none"> Install permanent storm water controls to manage runoff from the home Install vegetated roof 	

Nontoxic Pest Control

Pest Control Alternatives	<ul style="list-style-type: none"> Keep all wood at least 12" above soil Seal external cracks, joints etc. with caulking and install pest-proof screens Include no wood-to-concrete connections, or separate connections with dividers Install landscaping so mature plants are 24" from home 	
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WATER EFFICIENCY

Water Reuse		Rain barrels are a simple and inexpensive way to collect rainwater from your home's roof for irrigation use.
Rainwater Harvesting System		
Graywater Reuse System		For example: flushing your toilet or irrigating your lawn with bathtub, lavatory, or laundry water.
Use of Municipal Recycled Water System		For example: using non-potable water for car washing or irrigation.

Irrigation System

High-Efficiency Irrigation System	<ul style="list-style-type: none"> Irrigation system designed by EPA Water Sense certified professional Irrigation system with head-to-head coverage Install central shut-off valve Install sub-meter for the irrigation system Use drip irrigation for planting beds Create separate zones for each type of bedding Install timer or controller for each watering zone Install pressure-regulating devices High-efficiency nozzles with distribution uniformity of at least 0.70 Check valves in heads Install moisture sensor or rain delay controller 	If irrigation is desired, installing an efficient system is the responsible solution.
Reduce Overall Irrigation Demand		

Indoor Water Use

High-Efficiency Fixtures and Fittings	<ul style="list-style-type: none"> Average flow rate of lavatory faucets is ≤ 2.0 gpm Average flow rate for all showers is ≤ 2.0 gpm per stall Average flow rate for all toilets is ≤ 1.3 gpf; or toilets are dual flush or toilets must meet the EPA Water Sense specification 	Availability of drinking water is becoming a growing concern for communities across the United States. Do your part to reduce wasteful water use and ensure ample resources for future generations.
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ENERGY & ATMOSPHERE

Optimize Energy Performance		See sheet A3.2 for ENERGY STAR® Details.
Performance of ENERGY STAR® for Homes		Contact a Certified Energy Rater to learn more about the opportunities to increase energy performance.
Exceptional Energy Performance		Often energy performance is an excellent investment due to a short pay-back period. Find a Certified Energy Rater at http://www.resnet.us/

Water Heating

Efficient Hot Water Distribution System options	<ul style="list-style-type: none"> Structured plumbing system Central manifold distribution system Compact design of conventional system 	
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Pipe Insulation

Residential Refrigerant Management		
Refrigerant Charge Test		
Appropriate HVAC Refrigerant Options	<ul style="list-style-type: none"> Use no refrigerants Use non-HCFC refrigerants Use refrigerants that complies with global warming potential equation 	

MATERIALS & RESOURCES

Material Efficient Framing		
Framing Efficiency Options	<ul style="list-style-type: none"> Precut framing packages Open-web floor trusses Structural insulated panel walls Structural insulated panel roof Structural insulated panel floors Stud spacing greater than 16" on center Ceiling joist spacing greater than 16" on center Floor joist spacing greater than 16" on center Roof rafter spacing greater than 16" on center Size headers for loads; ladder blocking; drywall clips; 2-stud corners 	Framing Efficiency refers to efficient use of materials and the ability to insulate properly to allow for energy efficiency within the home. TightLines Designs feature open web floor trusses (2-story homes) and roof trusses (all homes excluding 1.5-story). See sheet A3.1 for ladder blocking, drywall clips, and 2-stud corner diagrams.
Off-site Fabrication Options	<ul style="list-style-type: none"> Panelized construction Modular, prefabricated construction 	

Environmentally Preferable Products

Wood Products	<ul style="list-style-type: none"> Use non-tropical wood Use reclaimed wood FSC (Forest Stewardship Council) Certified Tropical Wood 	
Environmentally Preferable Products	<ul style="list-style-type: none"> Low emission Produced locally 	

Waste Management

Construction Waste Management Planning	<ul style="list-style-type: none"> Determine where waste can be diverted for reuse or recycling Identify vendor that can sort and divert waste from landfill 	
Construction Waste Reduction	<ul style="list-style-type: none"> Document amount of waste diverted from landfill 	
Designated cutting area		Having a designated cutting area discourages wasteful practices. Example: if blocking is needed, blocking can be gathered from the scraps in the cutting area, rather than cutting a long board into small pieces.
On-site recycling		On-site recycling for plastic and aluminum drink bottles keeps the project green throughout the construction phase.

INDOOR ENVIRONMENTAL QUALITY

ENERGY STAR with Indoor Air Plus		Simple steps to ensure healthy indoor air can make a tremendous difference in the health of your family. Visit http://epa.gov/indoorairplus/ for more information.
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Combustion Venting

Basic Combustion Venting Measures	<ul style="list-style-type: none"> No unvented combustion appliances Carbon monoxide monitors on each floor No fireplace installed Space, water heating equipment designed with closed combustion, power-vented exhaust, or located in open-air facility 	Properly venting and monitoring combustion devices ensures the safety of homeowners from fire and carbon monoxide poisoning.
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Moisture Control

Moisture Load Control Options	<ul style="list-style-type: none"> Additional dehumidification system Central HVAC system equipped with additional dehumidification mode 	
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Outdoor Air Ventilation

Outdoor Air Ventilation		Provide additional fresh air into the home with enhanced outdoor air ventilation.
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Local Exhaust

Basic Local Exhaust	<ul style="list-style-type: none"> Bathroom and kitchen exhaust meets ASHRAE Std. 62.2 air flow requirement Fans and ducts designed and installed to ASHRAE Std. 62.2 Air exhausted to outdoors ENERGY STAR labeled bathroom exhaust fans 	Amplly exhausting damp kitchen and bath air from the home prevents the opportunity for mold and mildew growth.
Enhanced Local Exhaust Options	<ul style="list-style-type: none"> Occupancy sensor Automatic humidstat controller Automatic timer tied to switch Continuously operating exhaust fan 	

Distribution of Space Heating and Cooling

Room-by-Room Load Calculations		
Return Air Flow/Room-by-Room Controls Options		
Forced Air Systems	<ul style="list-style-type: none"> Return air opening of 1 sq. inch per cfm of supply Limited pressure differential between closed room and adjacent spaces 	
Nonducted HVAC Systems	<ul style="list-style-type: none"> Flow control valves on every radiator 	
Third Party Performance Test/Multiple Zones		
Forced Air Systems	<ul style="list-style-type: none"> Have supply air flow rates in each room tested and confirmed 	
Nonducted HVAC Systems	<ul style="list-style-type: none"> Install at least two distinct zones with independent thermostat control 	

Air Filtering

Higher Quality Air Filters		A simple option to remove dust and pollutants from indoor air.
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Contaminant Control

Indoor Contaminant Control during Construction		Prevent dust from settling in ductwork.
Indoor Contaminant Control	<ul style="list-style-type: none"> Design and install permanent walk-off mats at each entry Design shoe removal and storage space near primary entryway Install central vacuum system with exhaust to outdoors 	
Pre-occupancy Flush		

Radon Protection

Radon-Resistant Construction		
Radon Testing		

Garage Pollutant Protection

No HVAC in Garage		
Minimize Pollutants from Garage	<ul style="list-style-type: none"> Seal all penetrations and connecting floor and ceiling joist bays Paint walls and ceilings of shared walls, including garage Weather-strip all doors leading into home Carbon monoxide detectors in rooms that share a door with garage Seal all penetrations and cracks at the base of walls 	
Exhaust Fan in Garage	<ul style="list-style-type: none"> Fan runs continuously Fan designed with automatic timer control 	
Detached Garage or No Garage		With a TightLines Design, you can often receive green certification points for not having a garage.

AWARENESS & EDUCATION

Education of the Homeowner or Tenant		
Basic Operations Training	<ul style="list-style-type: none"> Operations and training manual One-hour walkthrough with occupant(s) 	
Public Awareness	<ul style="list-style-type: none"> Open House Website about features and benefits of green homes Newspaper article on the project Display signage on exterior of home designating green accolades 	

THIS PAGE CONTAINS A LIST OF SUGGESTIONS THAT TIGHTLINES DESIGNS BELIEVES WILL BE BENEFICIAL IN THE CONSTRUCTION OF A TIGHTLINES HOUSE. THIS IS NOT INTENDED AS A SPECIFICATION SHEET, NOR IS IT A COMPREHENSIVE CHECK LIST FOR ANY CERTIFICATION PROCESS.

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creating great places to live

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