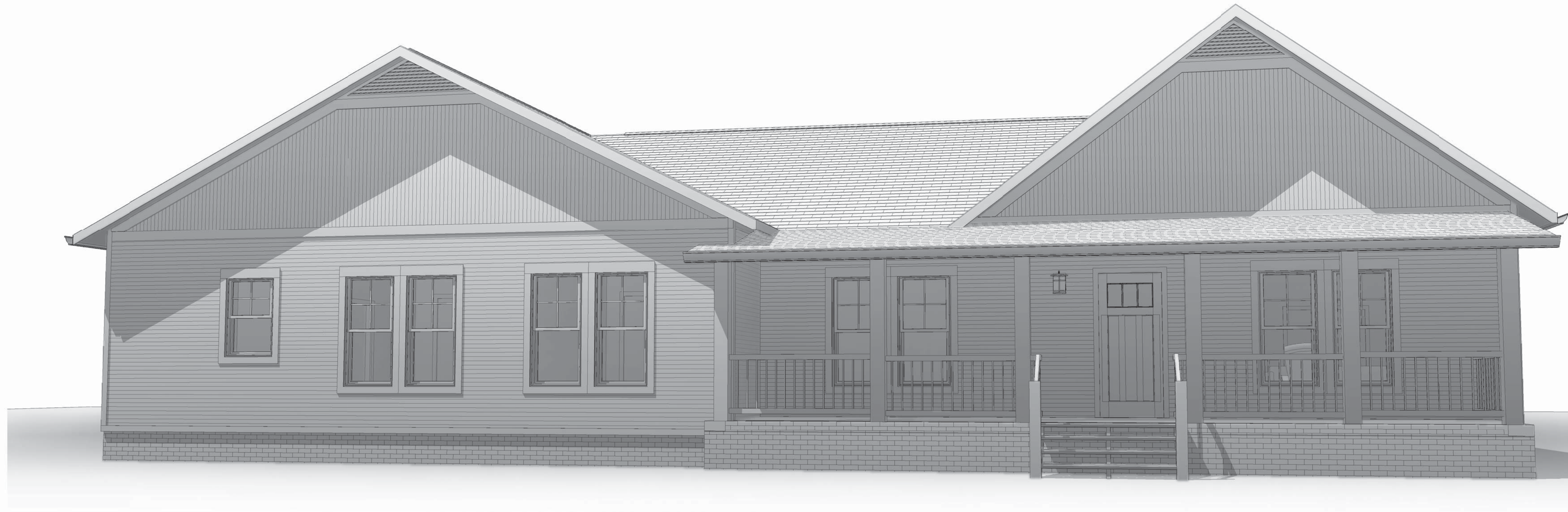


THE NORTH CAROLINA OFFICE OF RESILIENCY AND RECOVERY (NCORR)

O'Neill

BUILDING DATA
2,350 TOTAL HEATED SF
245 SF FRONT PORCH
65 SF REAR PORCH
37 SF EXTERIOR STORAGE

APPLICABLE CODES
2018 NORTH CAROLINA STATE BUILDING CODE: RESIDENTIAL
2018 NORTH CAROLINA STATE BUILDING CODE: ENERGY CONSERVATION CODE
2010 AMERICANS WITH DISABILITY ACT STANDARDS FOR ACCESSIBLE DESIGN
INTERNATIONAL CODE COUNCIL A117.1 - 2009 ACCESSIBLE AND USEABLE BUILDINGS AND FACILITIES (WHERE APPLICABLE BY AUTHORITIES HAVING JURISDICTION)



OWNER
 State of North Carolina Department of Public Safety
 NC Office of Recovery and Resiliency
 200 Park Offices Drive
 Durham, NC, 27713
 Contact: Ivan Duncan
 E-Mail: ivan.duncan@ncdps.gov
 Phone: (833) 275-7262

ARCHITECT
 Summit Design & Engineering Services
 1110 Navaho Drive, Suite 600
 Raleigh, NC 27609
 Contact: Bradley J. McClung, AIA, NCARB
 E-Mail: bradley.mcclung@summitde.net
 Phone: (919) 322-0115
 Fax: (919) 322-0116

STRUCTURAL
 Summit Design & Engineering Services
 1110 Navaho Drive, Suite 600
 Raleigh, NC 27609
 Contact: C. Christian Berg, PE
 E-Mail: chris.berg@summitde.net
 Phone: (919) 322-0115
 Fax: (919) 322-0116

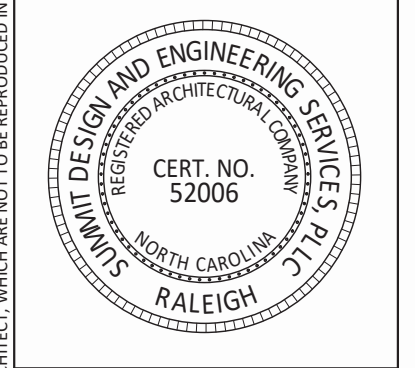
MEP
 Nick Kisley, PE
 115 Mackenan Drive
 Cary, NC 27511
 Contact: D. Nick Kisley, PE
 E-Mail: nkisley@yahoo.com
 Phone: (919) 460-9091
 Fax:

SHEET INDEX

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A300	WALL SECTION AND DETAILS
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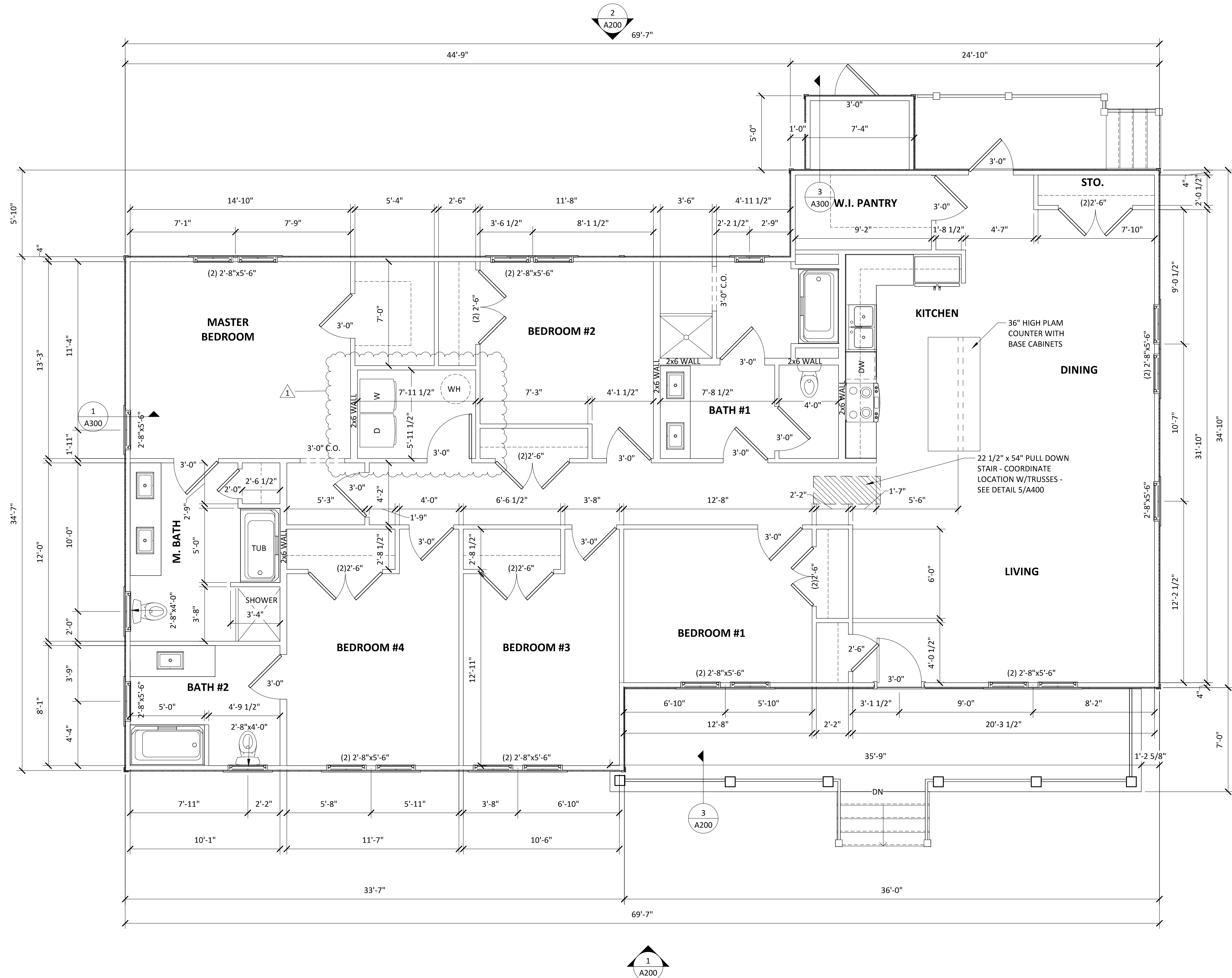


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20-0108.020

COVER SHEET
CS000

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



FLOOR PLAN NOTES

1. ALL INTERIOR WALLS ARE DRAWN @ 3 1/2" WIDE AND EXTERIOR WALLS ARE DRAWN WITH 1/2" SHEATHING @ 4" WIDE.
2. ALL DIMENSIONS ARE DRAWN TO FACE OF STUD OR INTERIOR WALLS AND TO EXTERIOR SHEATHING ON INTERIOR WALLS.
3. ALL DOORS SHALL BE 7'-0" TALL U.N.O.
4. ALL WINDOWS TO HAVE SCREENS.
5. PROVIDE PLASTIC COATED WIRE SHELVING W/ CLOTHES ROD IN COAT CLOSET & BEDROOM CLOSETS, ONE (1) SHELF IN LAUNDRY CLOSET & FOUR (4) SHELVES IN PANTRY.
6. UNLESS REQUIRED BY HOMEOWNER, ALL FIXTURES, BATHROOMS, AND KITCHENS DO NOT NEED TO BE ADA COMPLIANT. IN THE EVENT ADA ACCESSIBILITY IS REQUIRED, REFER TO ADA COMPLIANCE NOTES AND DIAGRAMS.
7. 1/2" GYPSUM WALLBOARD SHALL BE INSTALLED ON BOTTOM CHORD OF TRUSSES. GYPSUM BOARD SHALL BE LEVEL 4 OR 5 FINISH WITH 1 PRIMER COAT AND 2 FINISH COATS OF "CEILING WHITE" FLAT LATEX PAINT.
8. ALL INTERIOR WALLS SHALL BE FINISHED WITH 1/2" GYPSUM BOARD WITH A LEVEL 4 OR FINISH WITH 1 PRIMER COAT AND 2 FINISH COATS OF EGGSHELL LATEX PAINT. PAINT COLOR SHALL DETERMINED BY HOMEOWNER.
9. PROVIDE "GREEN" WALL BOARD FOR BATHROOM AND WALLS BEHIND COUNTER IN KITCHEN.
10. IF WALL TILE IS USED, PROVIDE CEMENTITIOUS BACKER BOARD FOR TILE APPLICATIONS.
11. G.C. SHALL PROVIDE BLOCKING FOR CABINERY AND COUNTERTOP SUPPORT. COORDINATE ATTACHMENT LOCATIONS WITH CABINERY SUPPLIER.

ADA COMPLIANCE NOTES

1. PROVIDE CONTINUOUS BLOCKING FOR GRAB BARS IN THE BATHROOM. REFER TO ADA.GOV, 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN FOR EXACT LOCATIONS. BLOCKING SHALL BE CONT. 2x6 WOOD STUDS FROM 32"-38" A.F.F.
2. IN UNITS WHERE ACCESSIBILITY IS REQUIRED, PROVIDE ADA COMPLIANT ROLL IN SHOWER, ADA COMPLIANT VANITY, AND GRAB BARS.
3. KITCHEN DESIGN SHALL BE DESIGNED IN ACCORDANCE WITH 2010 ADA OR SHALL BE DESIGNED TO BE EASILY CONVERTED.
4. IF A HANDICAP RAMP IS ACCESSIBLE, THE GEOMETRY SHALL BE BASED ON SITE CONDITIONS AND RAMP SHALL BE ADA COMPLIANT
5. REFER TO A500 FOR ADA DIAGRAMS, MOUNTING HEIGHTS, ETC.

ATTIC VENTILATION CALCULATIONS

THE TOTAL NET FREE AREA SHALL NOT BE LESS THAN 1/150 OF THE AREA OF THE SPACE VENTILATED. THE NET FREE CROSS-VENTILATION AREA SHALL BE PERMITTED TO BE REDUCED TO 1/300 PROVIDED AT LEAST 40 PERCENT AND NOT MORE THAN 50 PERCENT OF THE REQUIRED VENTING 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 BELOW THE RIDGE OR HIGHEST POINT OF THE SPACE, MEASURED VERTICALLY, WITH THE BALANCE OF THE VENTILATION PROVIDED BY EAVE OR CORNICE VENTS. WHERE THE LOCATION OF WALL OR ROOF FRAMING MEMBERS CONFLICTS WITH THE INSTALLATION OF UPPER VENTILATORS, INSTALLATION MORE THAN 3 FEET BELOW THE RIDGE OR HIGHEST POINT OF THE SPACE SHALL BE PERMITTED.

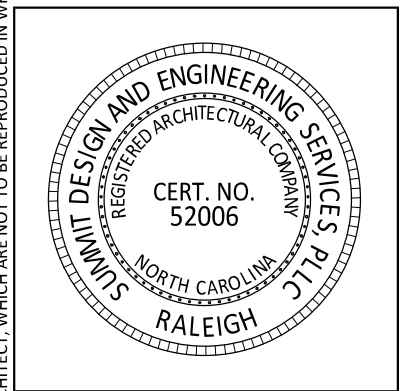
3,066	SQUARE FEET	TOTAL ATTIC / 150 =
20.4	SQUARE FEET	NET FREE AREA VENTILATION REQUIRED
10.2	SQUARE FEET	EAVE VENTILATION
10.2	SQUARE FEET	RIDGE OR ROOF EXHAUST VENTILATION

IT SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO ENSURE RIDGE VENT AND EAVE VENT PRODUCTS PROVIDE SUFFICIENT VENTILATION



THE NORTH CAROLINA OFFICE OF RESILIENCY AND RECOVERY (INCCOR)

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1	Revision 1 - WH Tank	6/7/2023

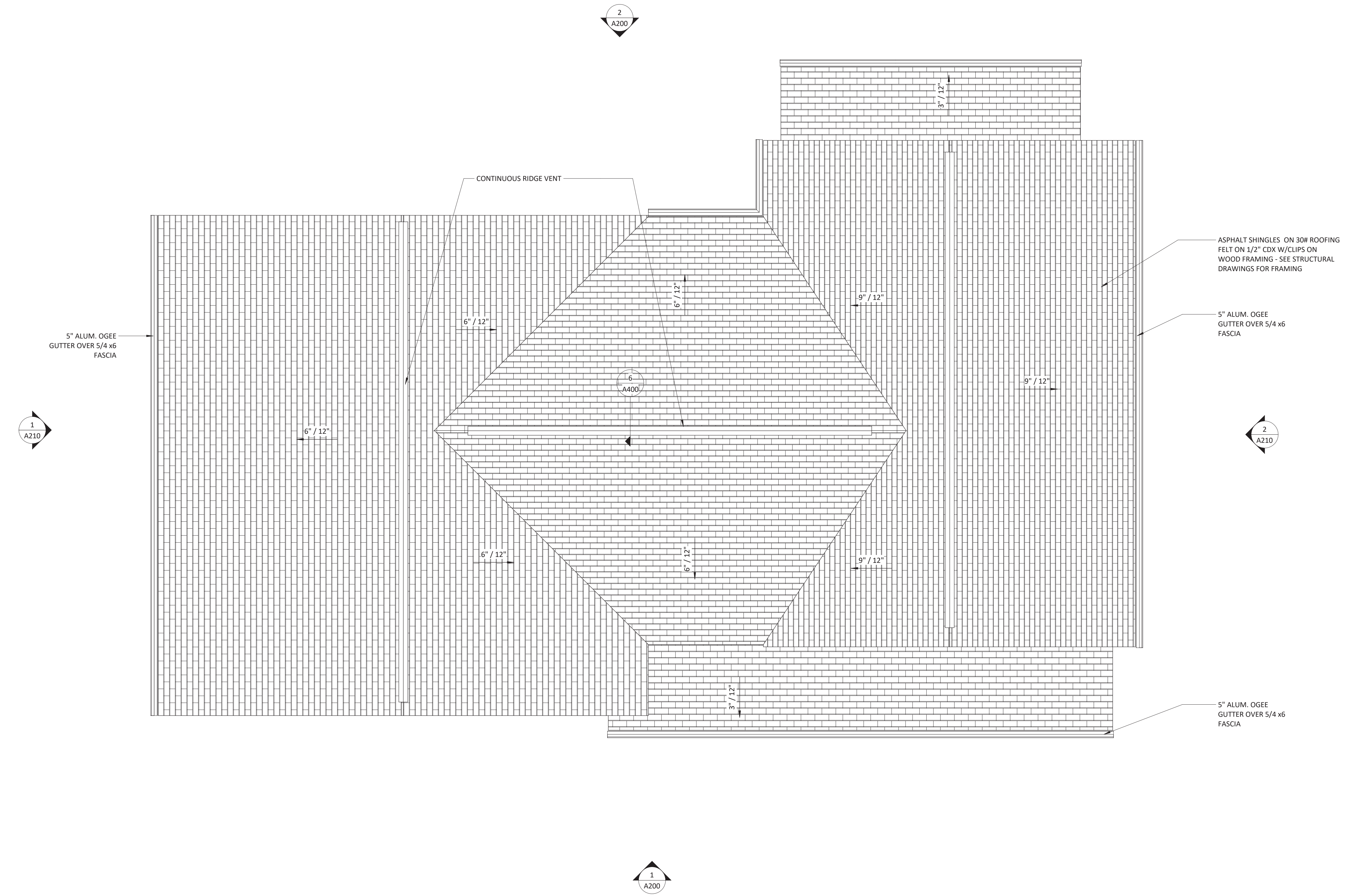
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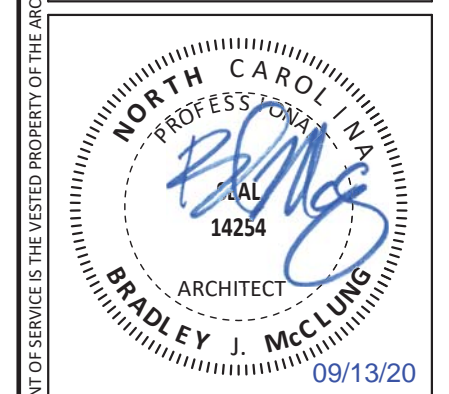
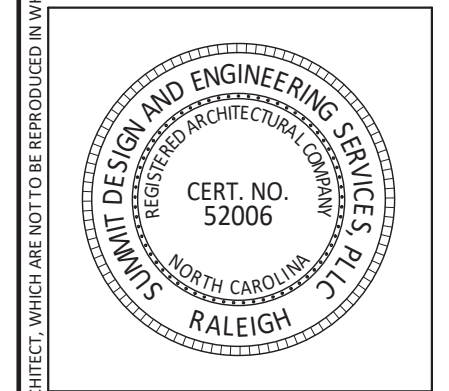
FLOOR PLAN AND NOTES

A100

9/11/2020 4:15:03 PM C:\Users\bradley.mccullough\Documents\20-01-070 O'Neill 5-3 V20 Central_Bradley.mcdrawing.ctb



1 ROOF PLAN
1/4" = 1'-0"



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DESIGN CRITERIA

- BUILDING CODE:**
NORTH CAROLINA STATE BUILDING CODE: RESIDENTIAL CODE, 2018 EDITION
- SNOW LOAD:**
IMPORTANCE FACTOR (I_s): 1.0
GROUND SNOW LOAD (P_g): 20 PSF
TERRAIN CATEGORY: C
EXPOSURE FACTOR (C_e): 1.0
THERMAL FACTOR (C_t): 1.0
- WIND LOAD:**
OCCUPANCY CATEGORY: II
BASIC WIND SPEED: UP TO 150 MPH
SITE CLASS: C
EXPOSURE CATEGORY: C
COMPONENTS & CLADDING: CALCULATED PER ASCE 7-10
- SEISMIC LOAD:**
IMPORTANCE FACTOR (I_s): 1.0
SITE CLASS: D
SEISMIC DESIGN CATEGORY: B
- LIVE LOADS:**
ROOF (MINIMUM): 20 PSF
FLOOR: 40 PSF
BALCONY / DECK: 60 PSF

GENERAL NOTES:

- STRUCTURAL MEMBERS, INCLUDING BEAMS, COLUMNS, JOISTS, TRUSSES, WALLS, SLABS AND BRACING ELEMENTS, ARE DESIGNED FOR THE FINAL DESIGN LOADS GIVEN ON THIS SHEET. THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY SHORING AND BRACING, AS REQUIRED. SHORING IS TO BE DESIGNED TO PRECLUDE OVERSTRESSING OF ANY STRUCTURAL ELEMENT (AS REQUIRED AT ANY STAGE OF CONSTRUCTION) UNTIL COMPLETION OF THIS PROJECT.
- THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ON-SITE SAFETY. AT A MINIMUM, THE CONTRACTOR IS TO RESEARCH AND IMPLEMENT ALL SAFETY REGULATIONS IN FORCE IN THE JURISDICTION OF THIS PROJECT. PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL BRING TO THE ATTENTION OF THE STRUCTURAL ENGINEER ANY STRUCTURAL DETAIL THAT WOULD PRODUCE AN UNSAFE CONDITION.

FOUNDATIONS

- ALL FOUNDATION WORK SHALL COMPLY WITH THE REQUIREMENTS OF THE 2018 NORTH CAROLINA RESIDENTIAL BUILDING CODE, CHAPTER 4.
- THE BUILDING STRUCTURE IS DESIGNED FOR SUPPORT OF SPREAD AND STRIP FOOTINGS WITH AN ASSUMED ALLOWABLE NET SOIL BEARING PRESSURE OF 2000 PSF ON UNDISTURBED SOILS OR FILL COMPACTED TO 98% MAXIMUM DRY DENSITY.
- ALL EXTERIOR FOUNDATIONS SHALL EXTEND BELOW THE FROST DEPTH SPECIFIC TO THE PROJECT SITE.
- CRAWL SPACE VENTS SHALL BE 8"X16" MINIMUM AND SHALL BE LOCATED WITHIN 3 FEET OF EACH BUILDING CORNER. CRAWL SPACE DOOR MAY SERVE AS A VENT.
- INSTALL A 6-MIL POLY VAPOR BARRIER CRAWL SPACE LINER.

CONCRETE

- ALL CONCRETE WORK SHALL COMPLY WITH THE SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS, ACI-301 AND THE BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, ACI-318.
- ALL REINFORCING STEEL IS TO BE TIED TO PREVENT DISPLACEMENT DURING CONCRETE PLACEMENT. TACK WELDING OF REINFORCING STEEL IS PROHIBITED.
- ALL REINFORCING STEEL IS TO BE CONTINUOUS. AT SPLICE, REINFORCING STEEL SHALL BE LAPPED A MINIMUM OF 38 BAR DIAMETERS (#6 AND SMALLER) OR 48 BAR DIAMETERS (#7 AND LARGER).
- ALL INTERSECTING STRIP FOOTINGS SHALL HAVE CORNER BARS.
- TYPICAL REINFORCING CLEAR COVER SHALL CONFORM TO ACI-318.

CONCRETE BLOCK MASONRY

- ALL MASONRY WORK SHALL COMPLY WITH THE SPECIFICATIONS FOR MASONRY STRUCTURES, ACI 530.1 AND THE BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES, ACI 530.
- HOLLOW MASONRY UNITS SHALL CONFORM TO ASTM C90, LIGHTWEIGHT, WITH A MINIMUM COMPRESSIVE STRENGTH F_m = 1500 PSI ON THE NET BLOCK AREA.
- MORTAR SHALL CONFORM TO ASTM C270 CEMENT TYPE M OR S. MINIMUM COMPRESSIVE STRENGTH TO BE 2000 PSI.
- MASONRY GROUT SHALL CONFORM TO ASTM C476 WITH A MAXIMUM AGGREGATE SIZE OF 3/8". MINIMUM COMPRESSIVE STRENGTH SHALL BE 3000 PSI AT 28 DAYS.

- REINFORCING STEEL (#3 AND LARGER) SHALL BE LAPPED A MINIMUM OF 72 BAR DIAMETERS.
- ALL BLOCK CELLS SHALL BE FILLED SOLID WITH GROUT WHERE REINFORCING BARS OCCUR.

SAWN LUMBER AND SHEATHING

- ALL LUMBER WORK SHALL COMPLY WITH THE NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION, ANSIAWC NDS.
- ALL MEMBERS SHALL BEAR AN APPROVED GRADE STAMP.
- ALL DIMENSIONAL LUMBER EXPOSED TO WEATHER OR IN CONTACT WITH MASONRY SHALL BE PRESERVATIVE TREATED.
- NAILS SHALL BE COMMON WIRE NAILS, UNLESS NOTED OTHERWISE.
- MULTI-PLY BEAMS SHALL BE FASTENED TOGETHER WITH 8d NAILS @ 16" O.C., T&B, STAGGERED.
- U.N.O. ALL SHEATHING SHALL BE FASTENED WITH 8d COMMON NAILS AT 6" AND 12" SPACING FOR EDGE AND FIELD, RESPECTIVELY. WALLS SHALL BE BLOCKED.
- WALL SHEATHING: 1/2" APA RATED OSB
ROOF SHEATHING: 3/4" APA RATED T&G PLYWOOD
SUBFLOOR: 3/4" APA RATED T&G PLYWOOD
- WALL PANEL HORIZONTAL EDGES SHALL HAVE 8d COMMON NAILS @ 3" O.C.
- ROOF SHEATHING NAILING AT FIELD SHALL BE REDUCED TO 6" SPACING FOR MINIMUM 48" DISTANCE FROM RIDGES, EAVES, AND GABLE ENDS.

STRUCTURAL COMPOSITE LUMBER

- ALL STRUCTURAL COMPOSITE LUMBER WORK SHALL COMPLY WITH THE NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION, ANSIAWC NDS.
- ALL MEMBERS SHALL BEAR AN APPROVED GRADE STAMP.
- STRUCTURAL COMPOSITE LUMBER (SCL) DESIGN IS BASED ON THE FOLLOWING MINIMUM DESIGN PROPERTIES:
LVL: F_b = 2,600 PSI F_c = 750 PSI
F_v = 285 PSI E = 1,900 KSI
GLULAM: 24F-V5 SPS/SP
- LVL MEMBERS SHALL BE PROTECTED FROM WEATHER ACCORDING TO THEIR MANUFACTURER'S RECOMMENDATIONS. GLULAM BEAMS ARE TO BE PRESERVATIVE TREATED IF THEY ARE EXPOSED TO WEATHER.

PRE-ENGINEERED WOOD TRUSSES

- ALL PRE-ENGINEERED WOOD TRUSS WORK SHALL COMPLY WITH THE NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION, ANSIAWC NDS.
- ALL MEMBERS SHALL BEAR AN APPROVED GRADE STAMP.
- TRUSS MANUFACTURER SHALL PROVIDE DRAWINGS AND CERTIFIED STRUCTURAL CALCULATIONS PREPARED AND SEALED BY A QUALIFIED ENGINEER, REGISTERED IN NORTH CAROLINA. MNFR DRAWINGS SHALL INCLUDE AN ERECTION PLAN WITH DETAILS SHOWING ALL REQUIRED TRUSS PLATES, BLOCKING, BRIDGING, CONNECTION MATERIALS AND OTHER ITEMS AS REQUIRED TO PROVIDE A COMPLETE INSTALLATION.
- CALCULATIONS SHALL CLEARLY INDICATE ALL DESIGN LOADS SHOWN ON THESE DRAWINGS AND OTHER LOADS AS REQUIRED. TRUSSES SHALL BE DESIGNED FOR "IN PLACE" LOADS AND MUST BE DESIGNED TO WITHSTAND ALL FABRICATING, TRANSPORTING, AND ERECTION STRESSES.
- THE TRUSS PLATE MANUFACTURER SHALL BE A MEMBER OF THE TRUSS PLATE INSTITUTE. THE TRUSS FABRICATOR SHALL PARTICIPATE IN AN APPROVED THIRD PARTY QUALITY ASSURANCE PROGRAM THAT MEETS TRUSS PLATE INSTITUTE REQUIREMENTS.
- DESIGN TRUSSES TO WITHSTAND LOADS SHOWN ON DRAWING WITHOUT DEFLECTIONS GREATER THAN L/360 FOR FLOOR TRUSSES AND L/240 FOR ROOF TRUSSES.
- TRUSSES SHALL BE DESIGNED FOR THE FOLLOWING SERVICE LOADS:
TOP CHORD LIVE: 20 PSF
TOP CHORD COLLATERAL: 15 PSF
BOT CHORD COLLATERAL: 10 PSF
BY TRUSS MNFR
WIND LOADS: CALCULATED BY TRUSS MNFR PER ASCE 7-10

MATERIALS

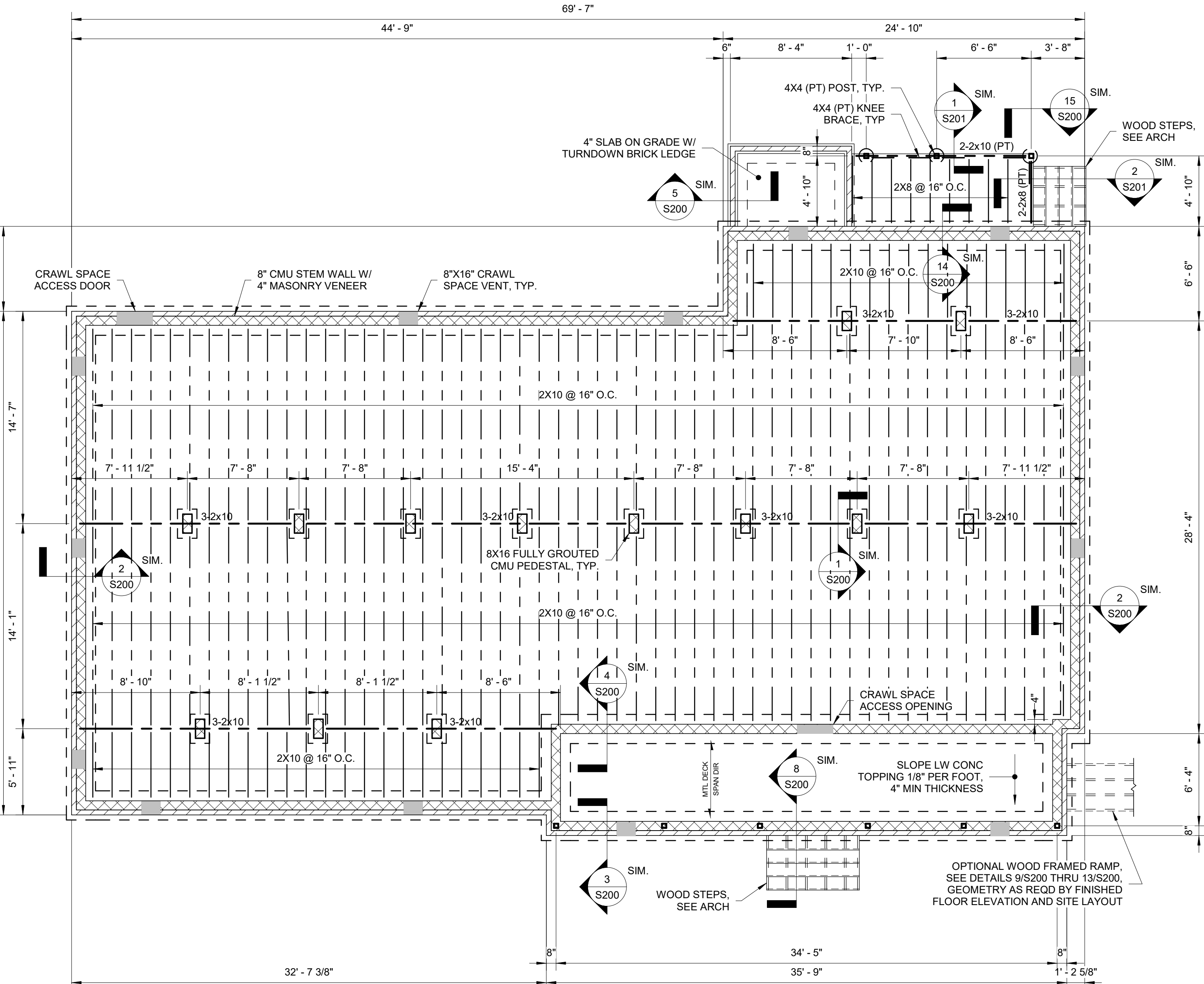
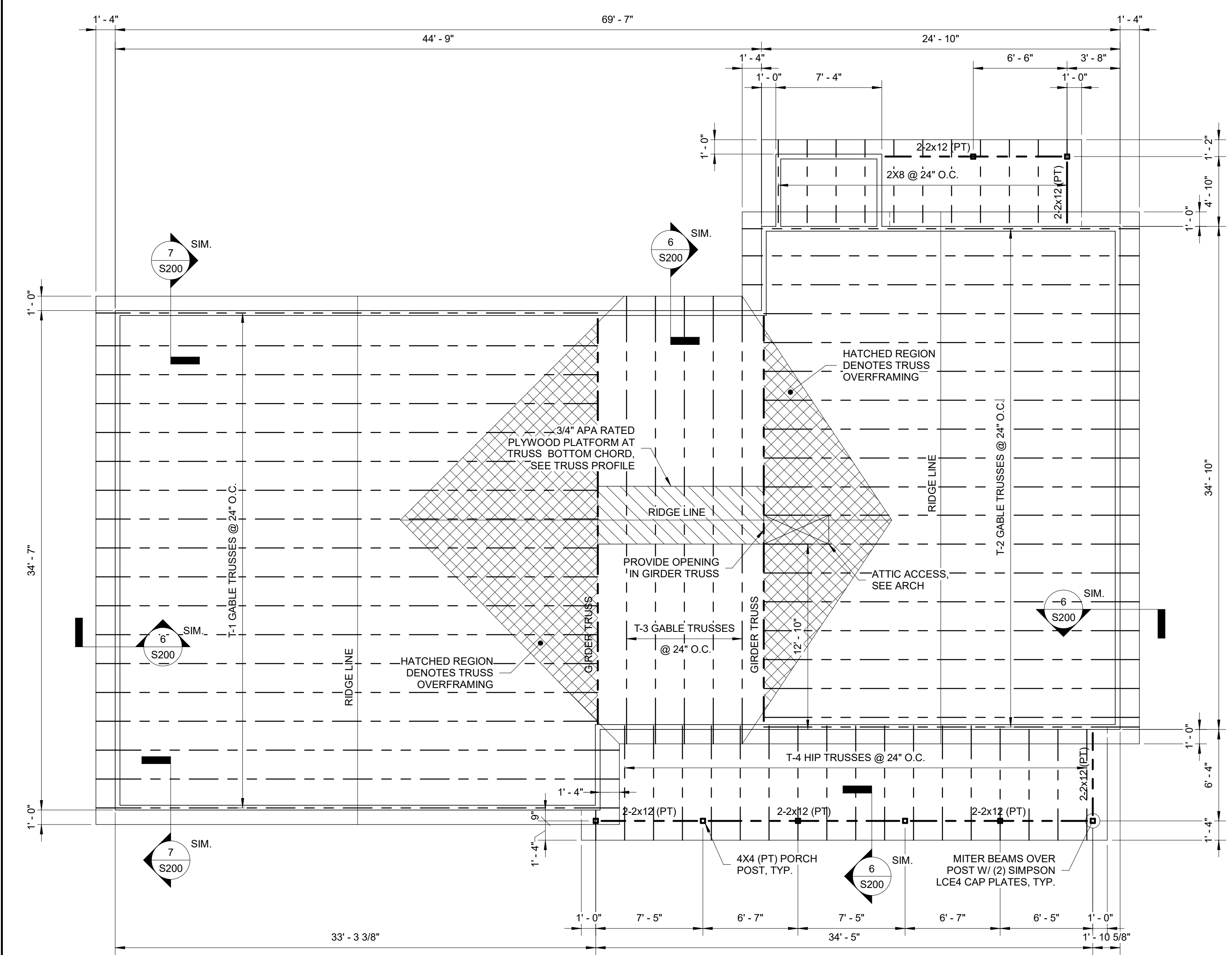
- STEEL**
BOLTS (WOOD FRAMING): ASTM A307
BOLTS (ANCHOR): ASTM F1554 GRADE 36
METAL DECKING: ASTM A653 GRADE 80 (GALV 80)
- REINFORCING STEEL**
GENERAL REINFORCING: ASTM A615, f_y = 60 KSI
WELDED WIRE FABRIC: ASTM A185, IN FLAT SHEETS

- CONCRETE**
FOOTINGS: f_c = 3000 PSI, NORMAL-WEIGHT
SLAB-ON-GRADE: f_c = 3000 PSI, NORMAL-WEIGHT
ELEVATED SLABS: f_c = 3000 PSI, LIGHTWEIGHT (110 PCF MAX)
- DIMENSIONAL LUMBER**
JOISTS, RAFTERS, & GIRDERS: SPF NO.2 OR BETTER
WALL STUDS: SPF NO.2 OR BETTER

HEADER SCHEDULE			
MAX OPENING	SIZE	JACK STUDS	KING STUDS
4' - 0"	(2) 2X8	2X4	(2) 2x4
6' - 8"	(2) 2X10	(2) 2X4	(3) 2x4

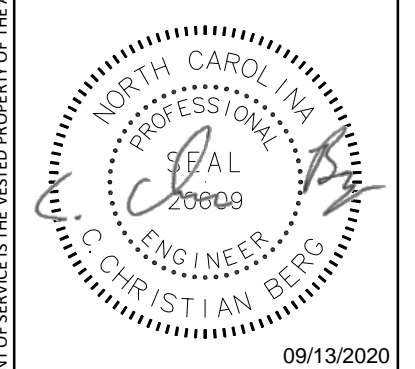
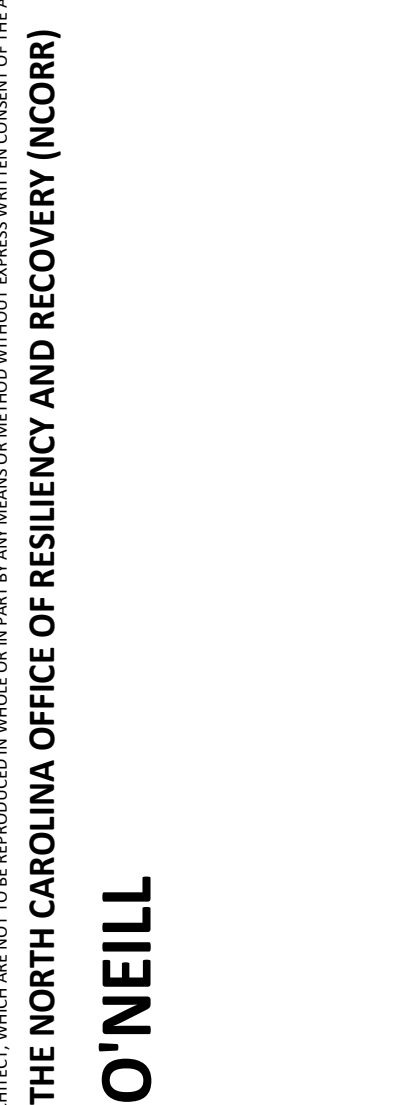
FACE MOUNTED HANGER SCHEDULE			
SIZE	SIMPSON PART NO.	SIZE	SIMPSON PART NO.
2x6	LUS26	2x10	LUS210
(2) 2x6	LUS26-2	(2) 2x10	HUS210-2
(3) 2x6	LUS26-3	(3) 2x10	HUS210-3
2x8	LUS28	2x12	LUS210
(2) 2x8	LUS28-2	(2) 2x12	HUS212-2
(3) 2x8	LUS28-3	(3) 2x12	HUS212-3

CRAWL SPACE VENT CALCS: CRAWL SPACE W/ VAPOR BARRIER REQUIRES 1 SF VENT AREA PER 1500 SF CRAWL SPACE AREA
2360 SF CRAWL SPACE /1500 SF = 1.57 SF VENT AREA
1.57 SF X 144 IN²/SF = 226 IN²
8"X16" VENTS W/ 50% FREE AIR SPACE = 64 IN² FREE AIR PER VENT
226 IN² /64 IN² = 4 VENTS REQUIRED -> 13 VENTS PROVIDED



2 ROOF FRAMING PLAN
3/16" = 1'-0"

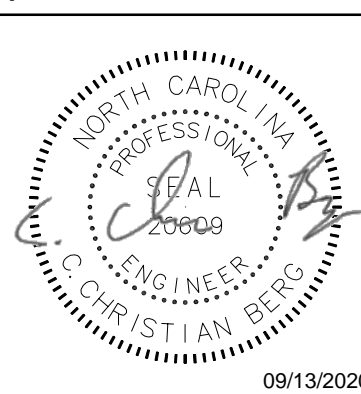
1 FOUNDATION & FLOOR FRAMING PLAN
3/16" = 1'-0"



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GENERAL NOTES & PLANS

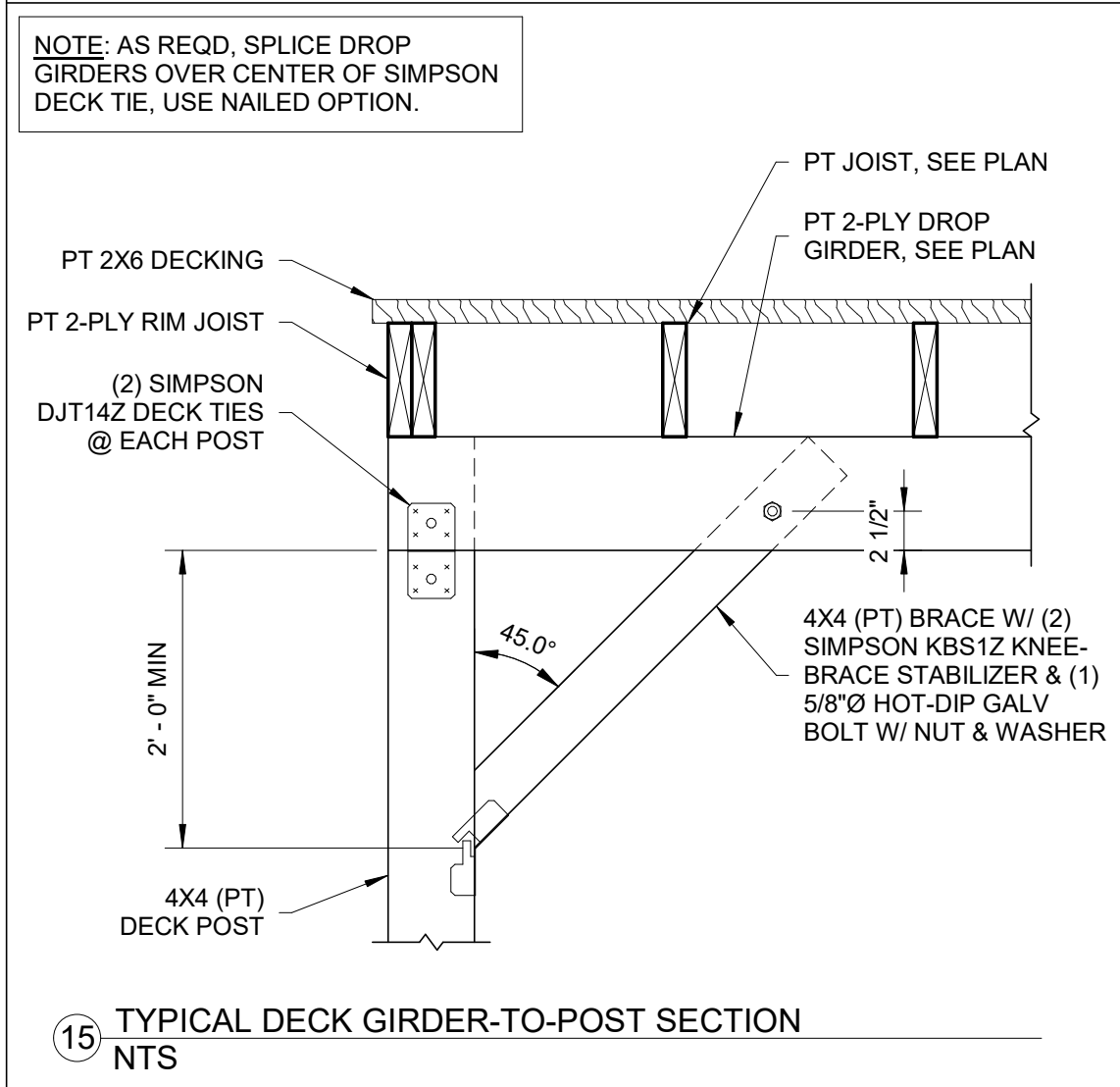
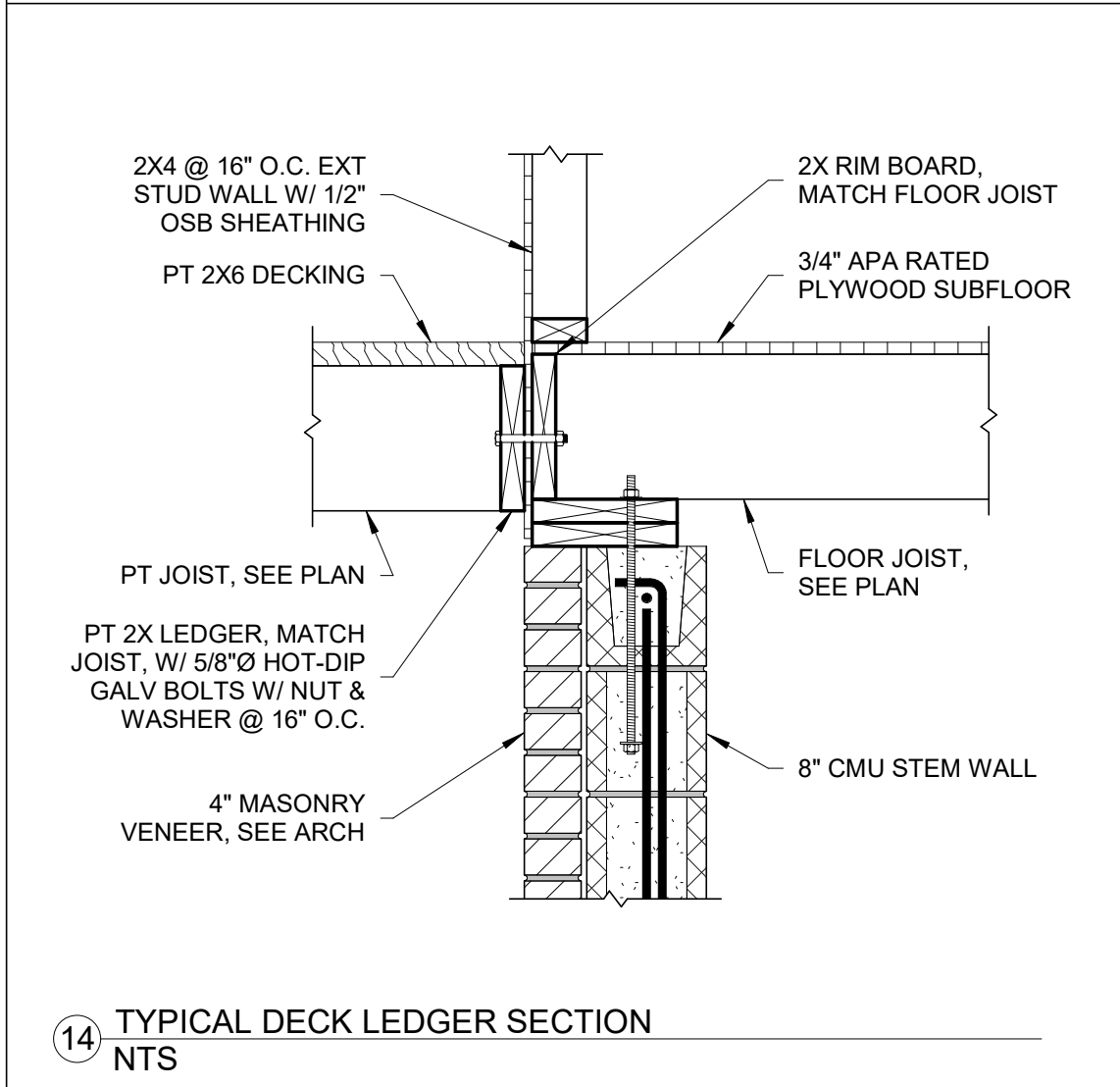
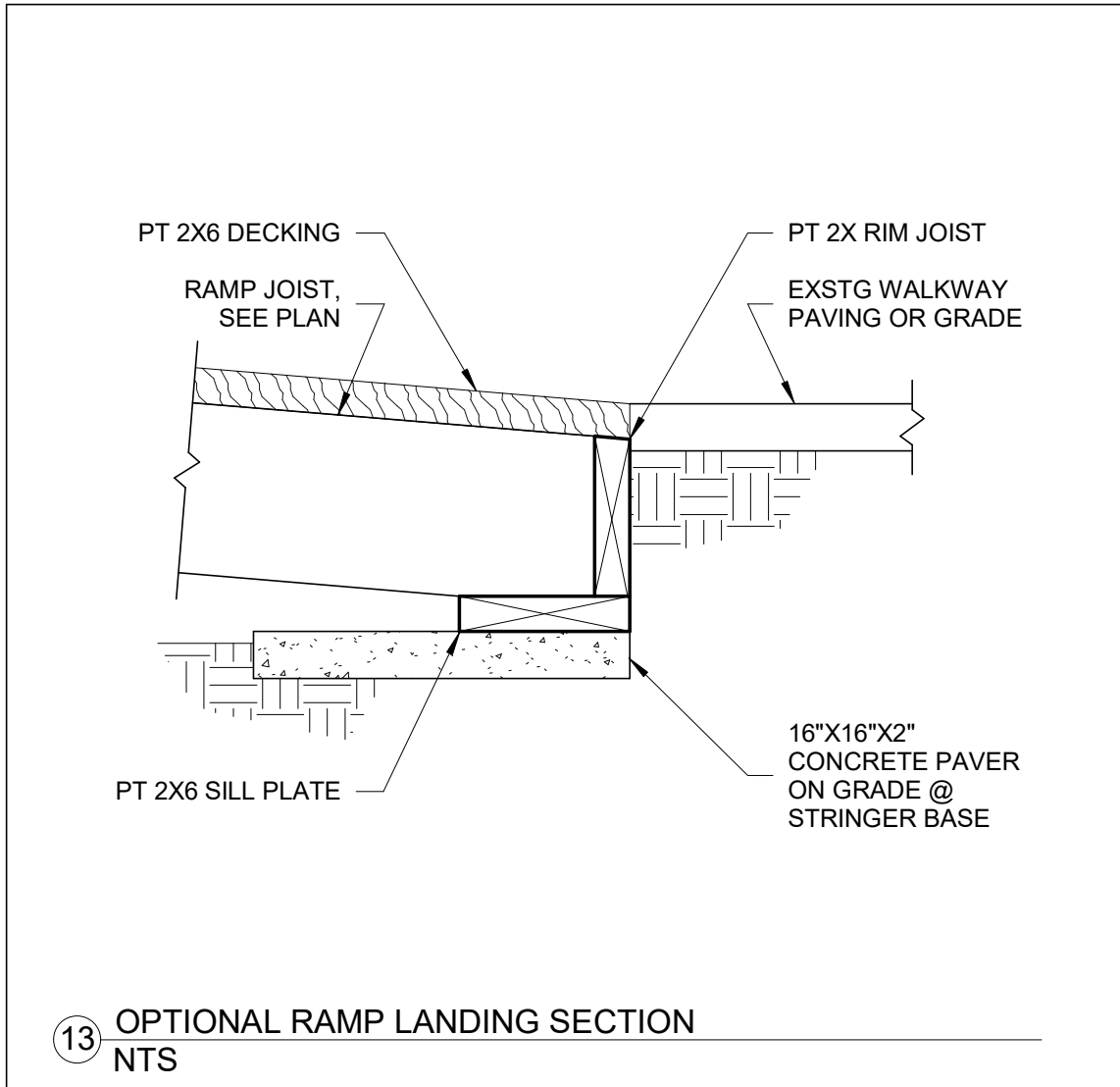
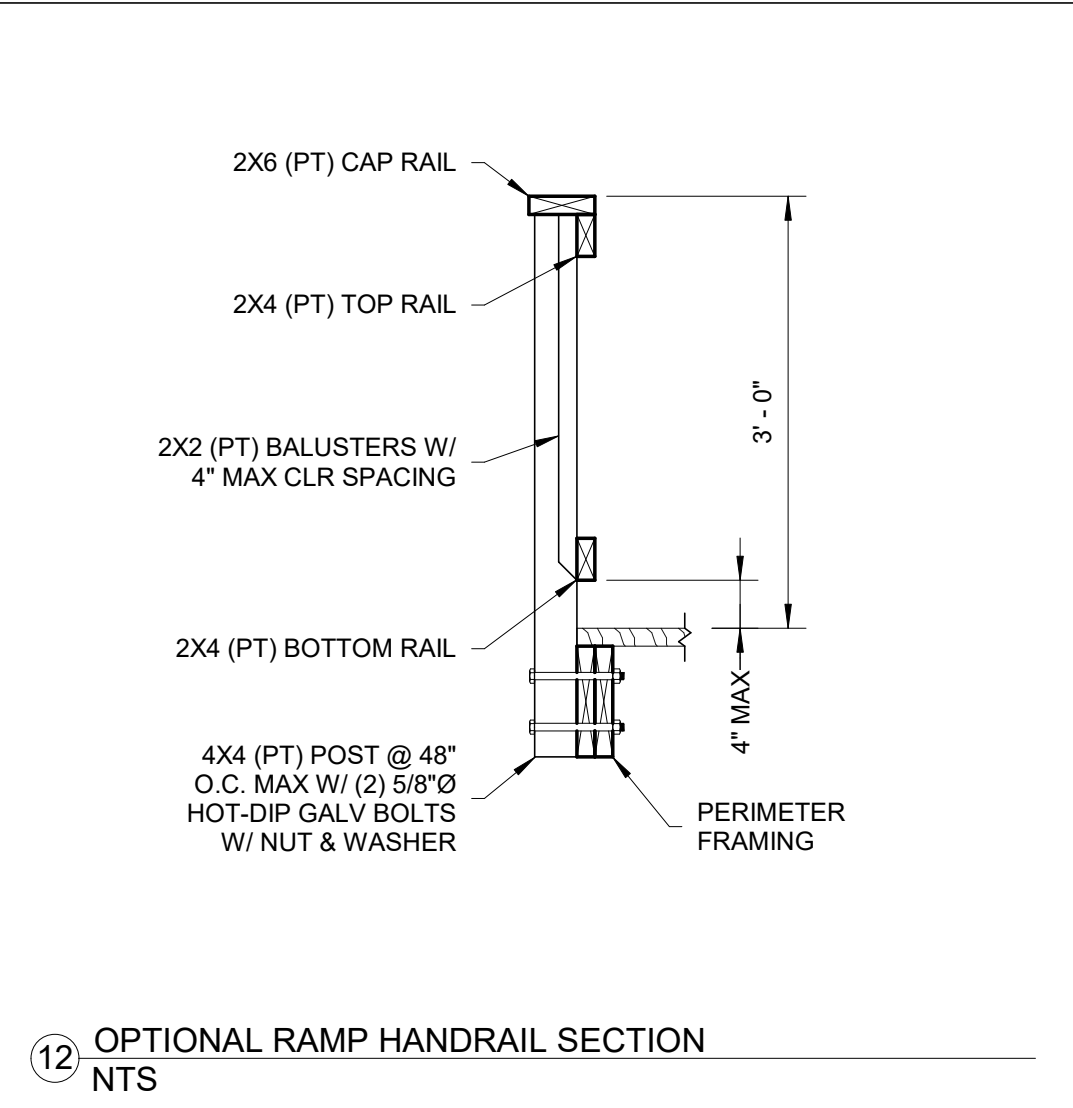
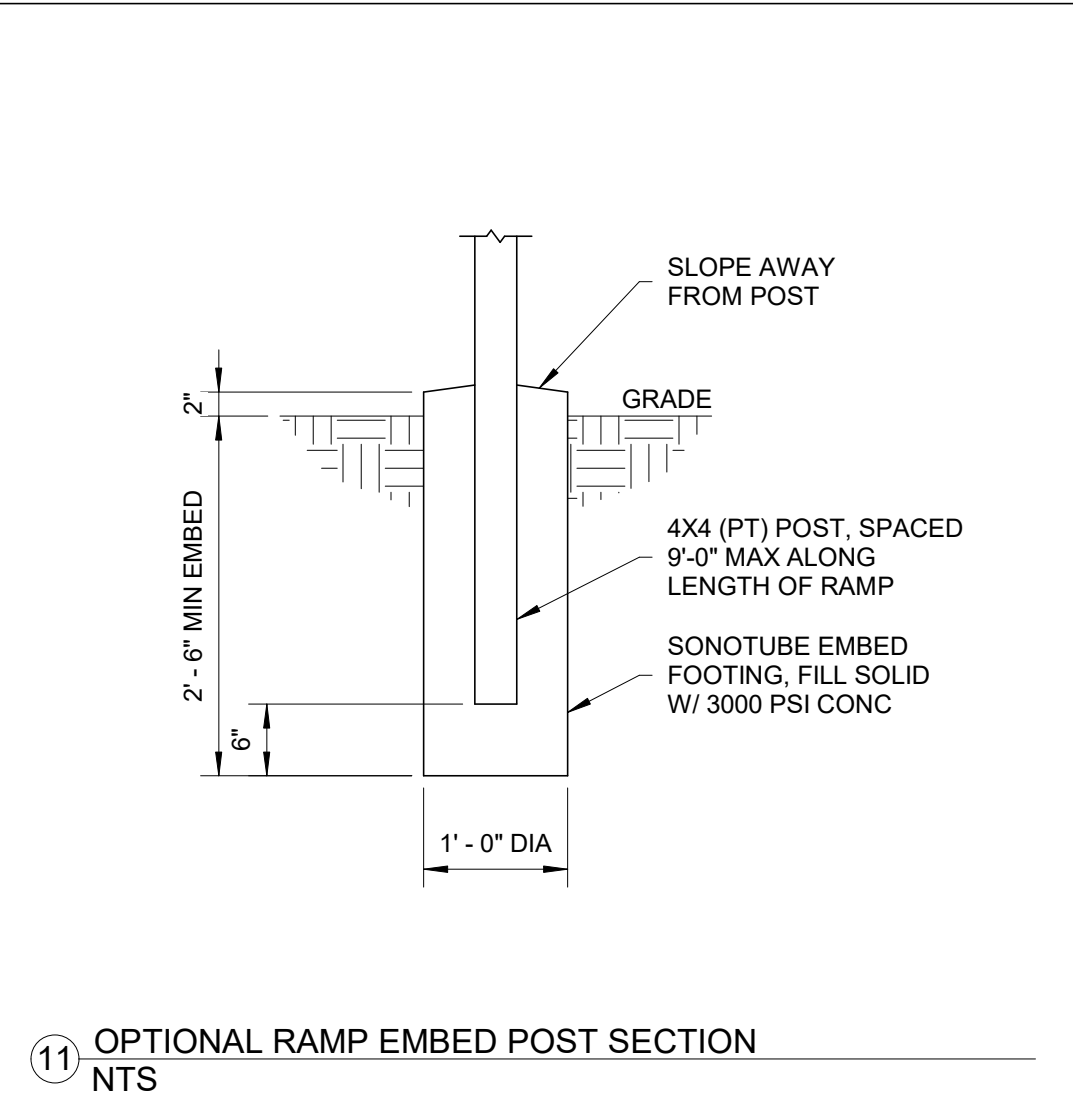
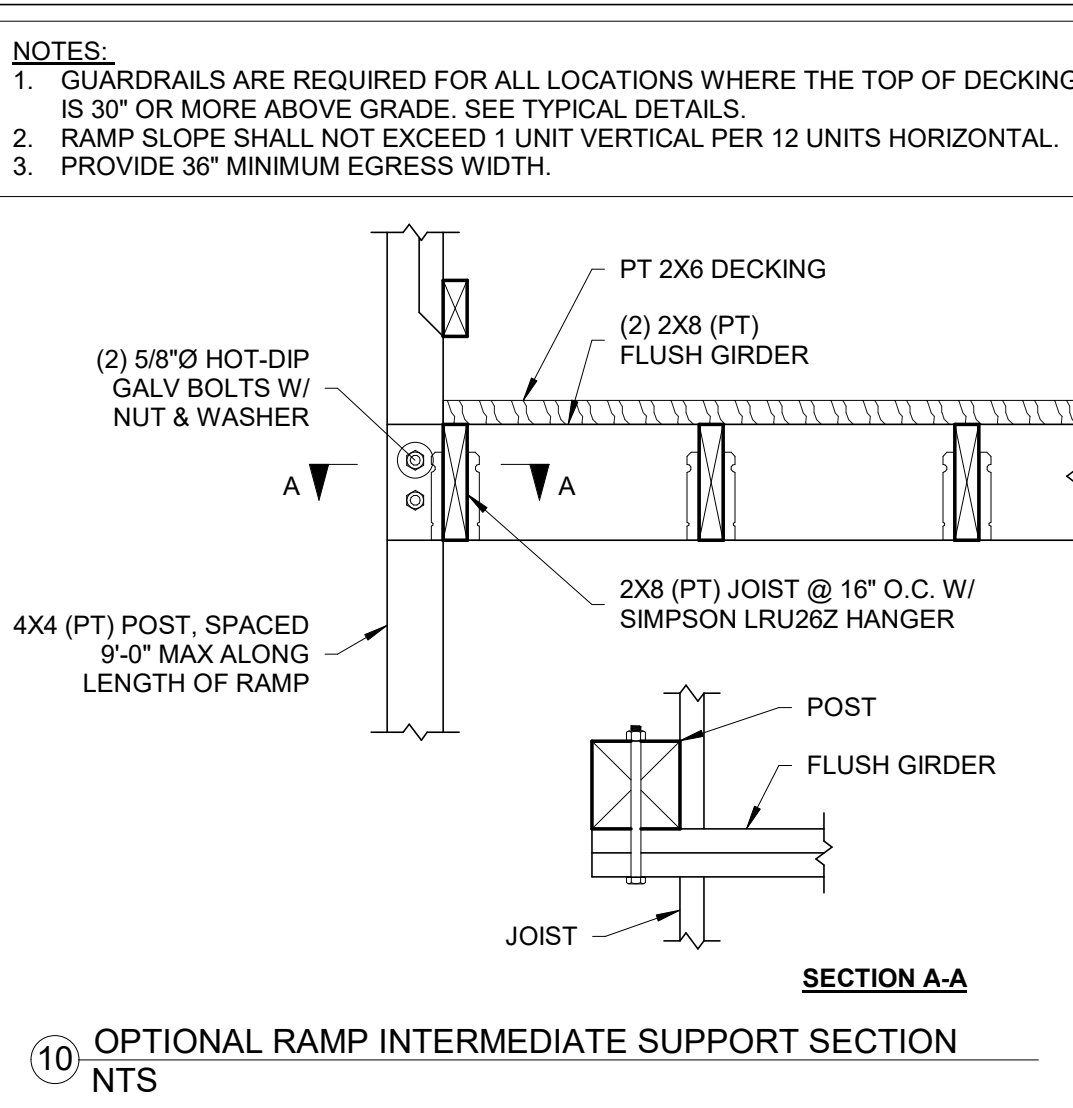
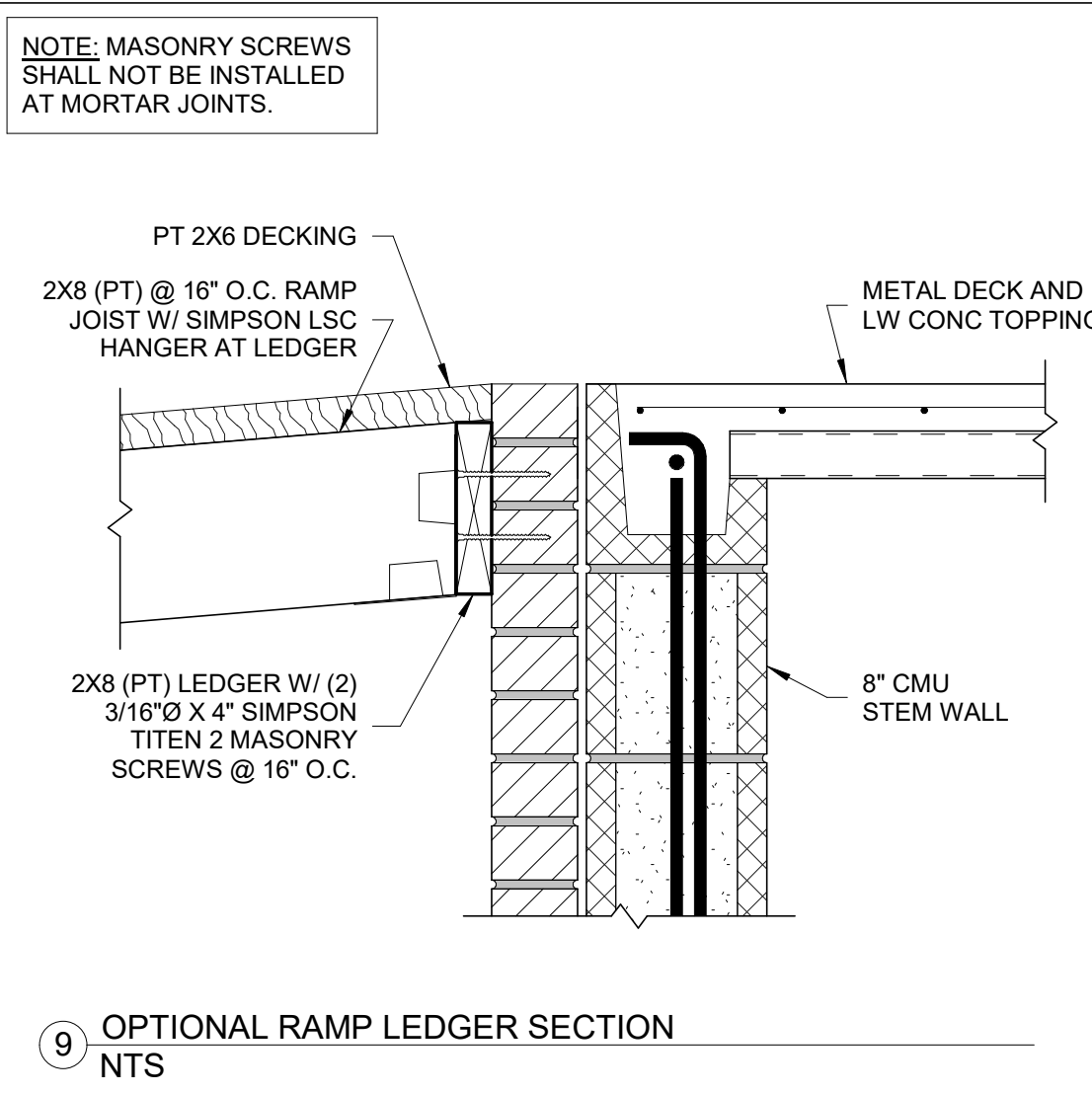
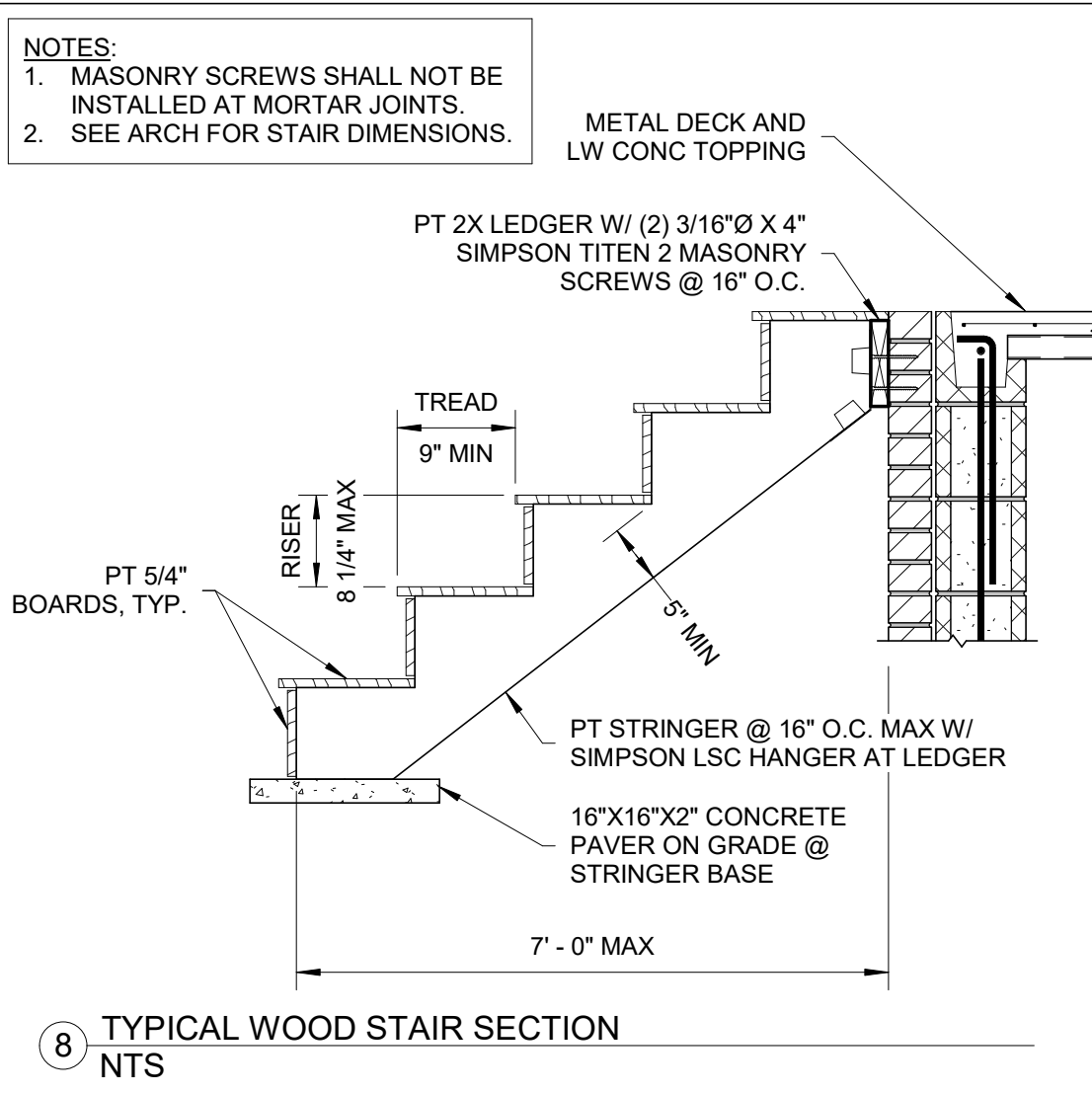
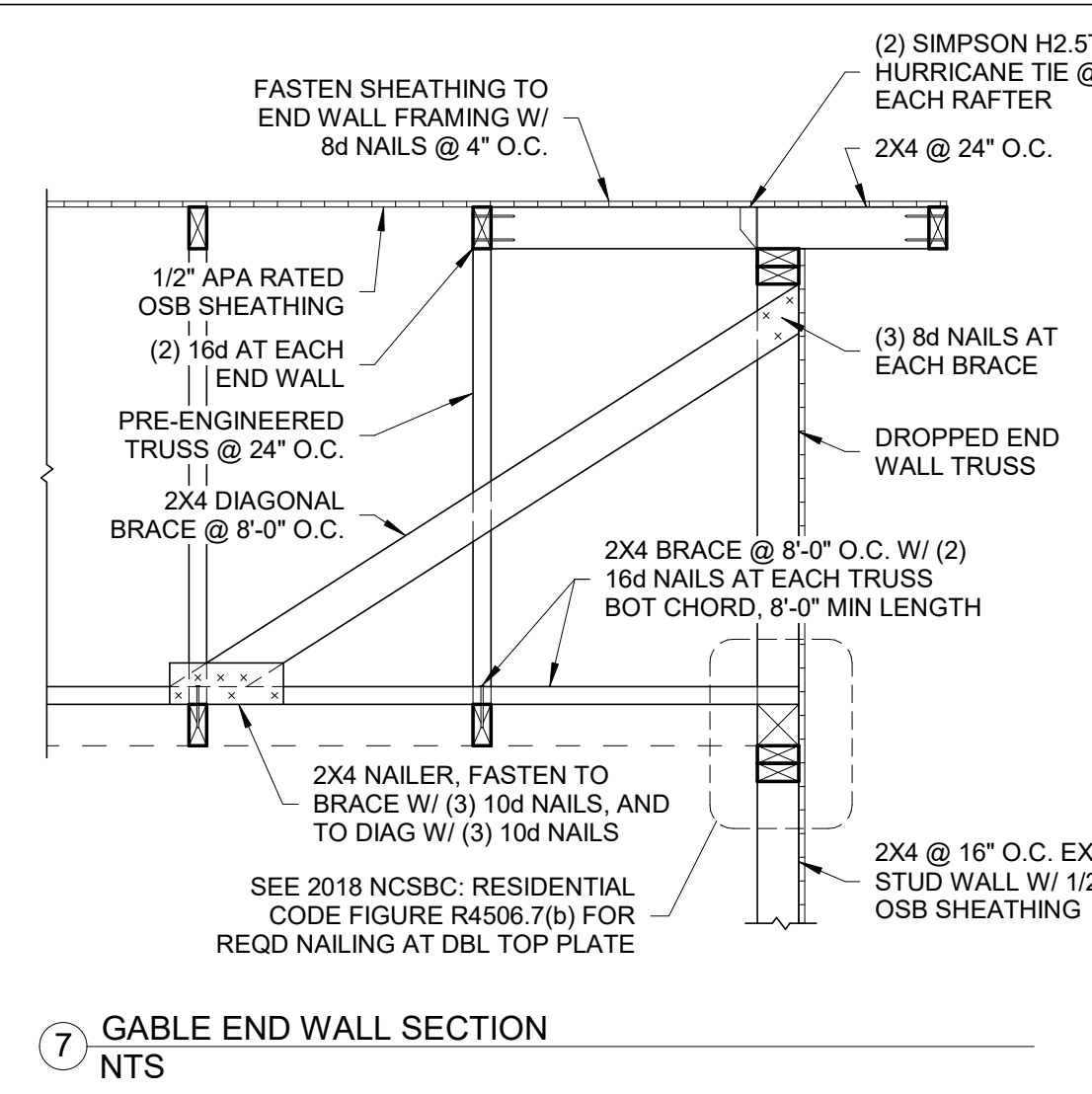
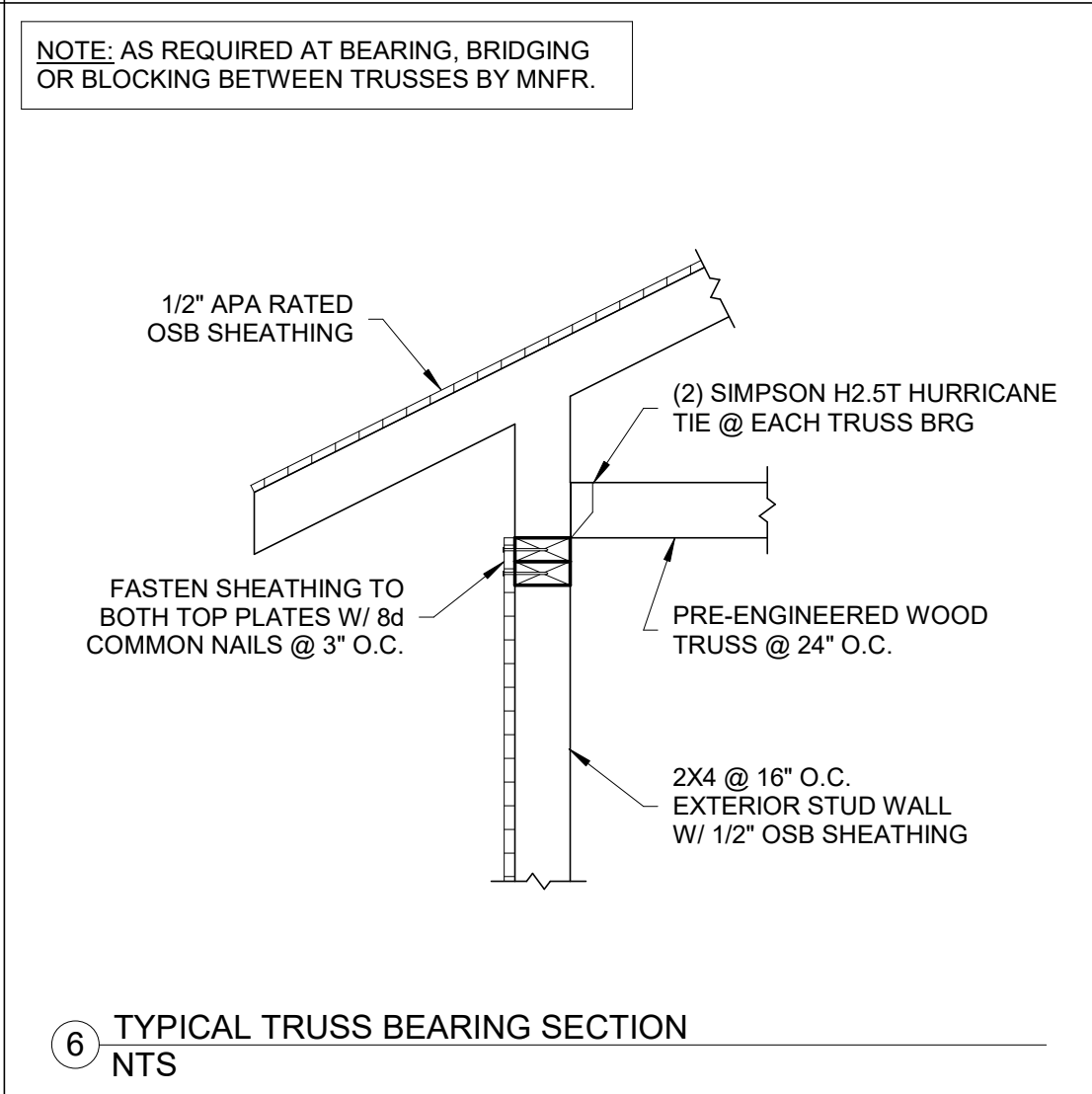
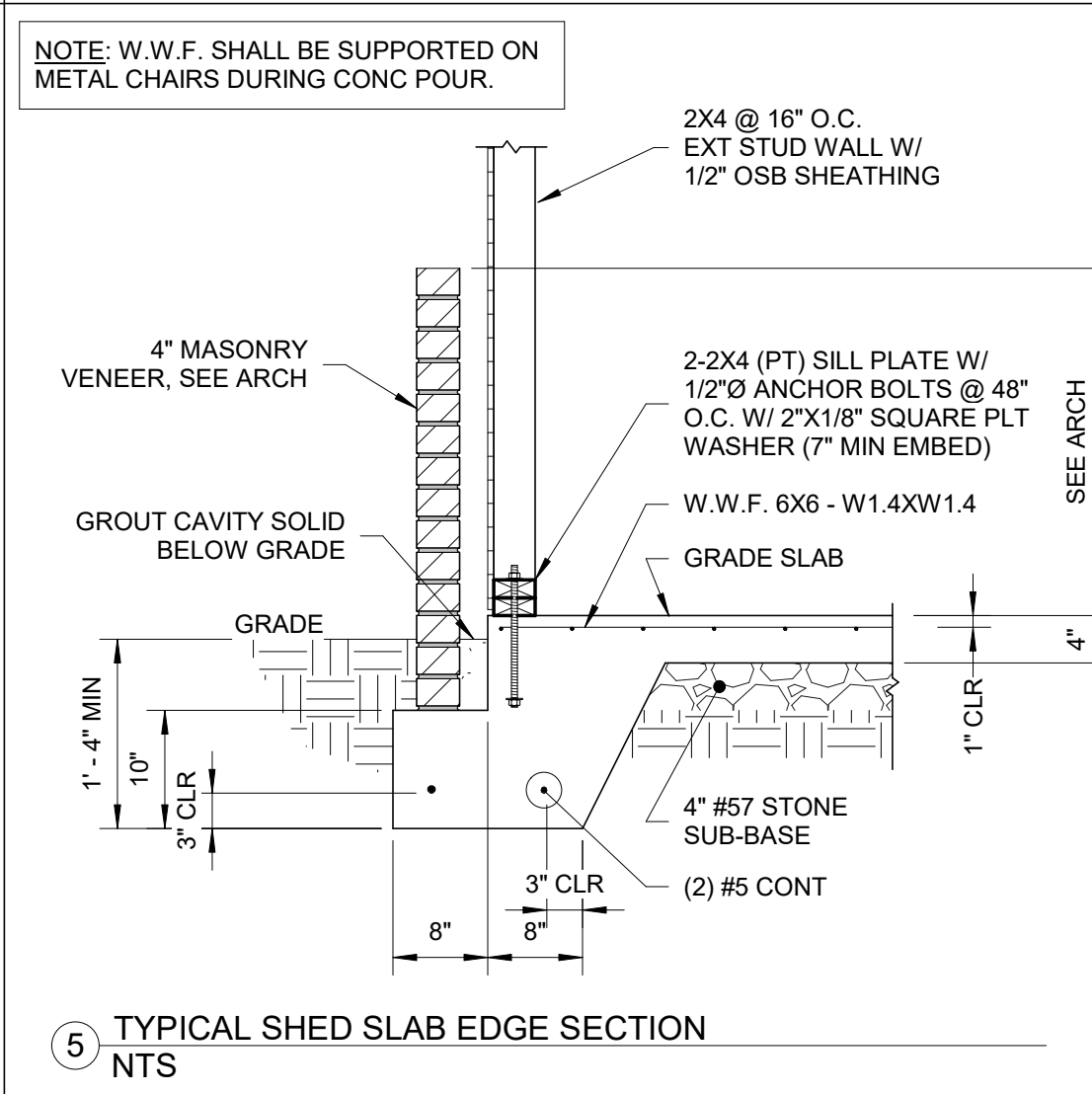
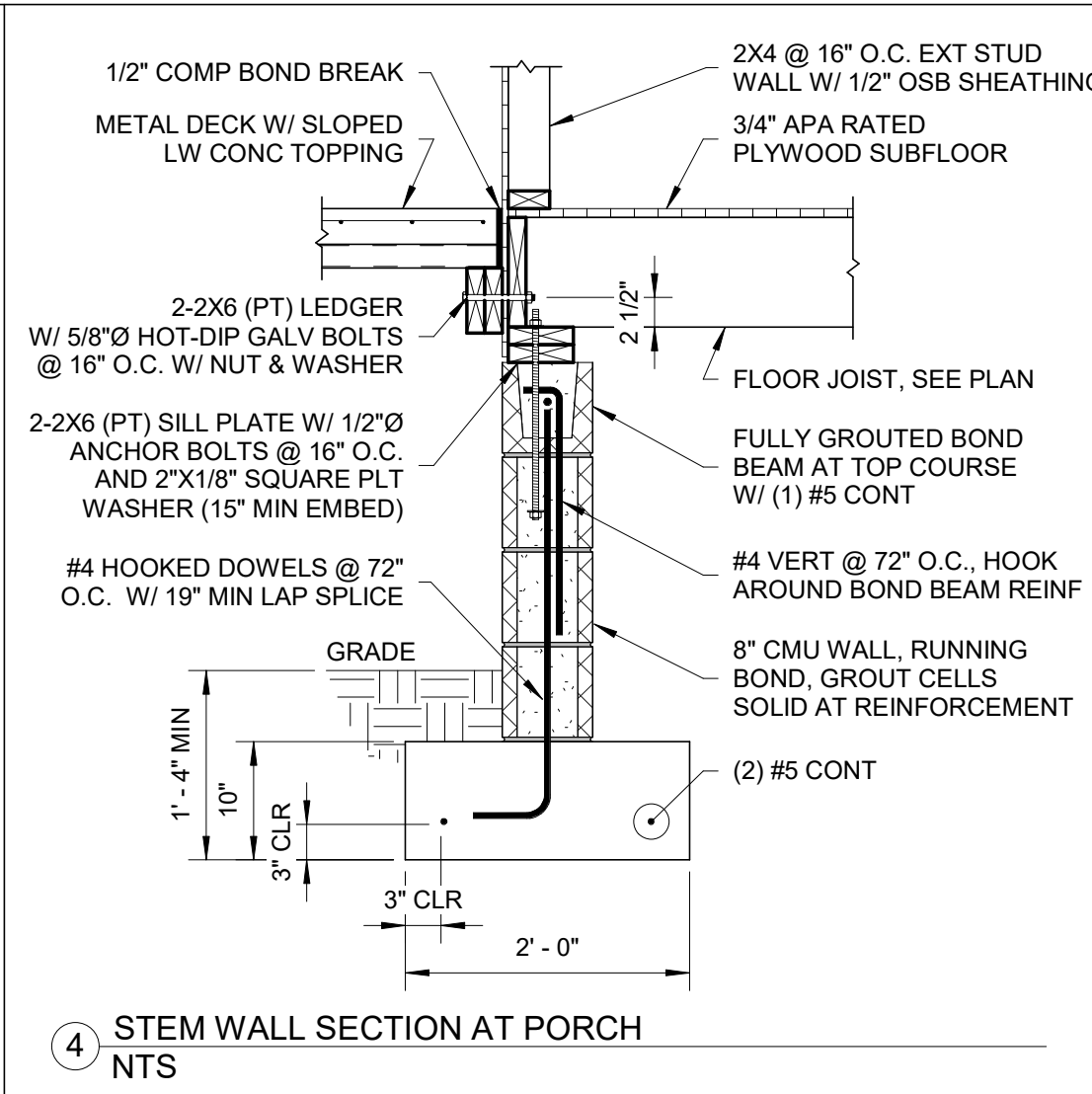
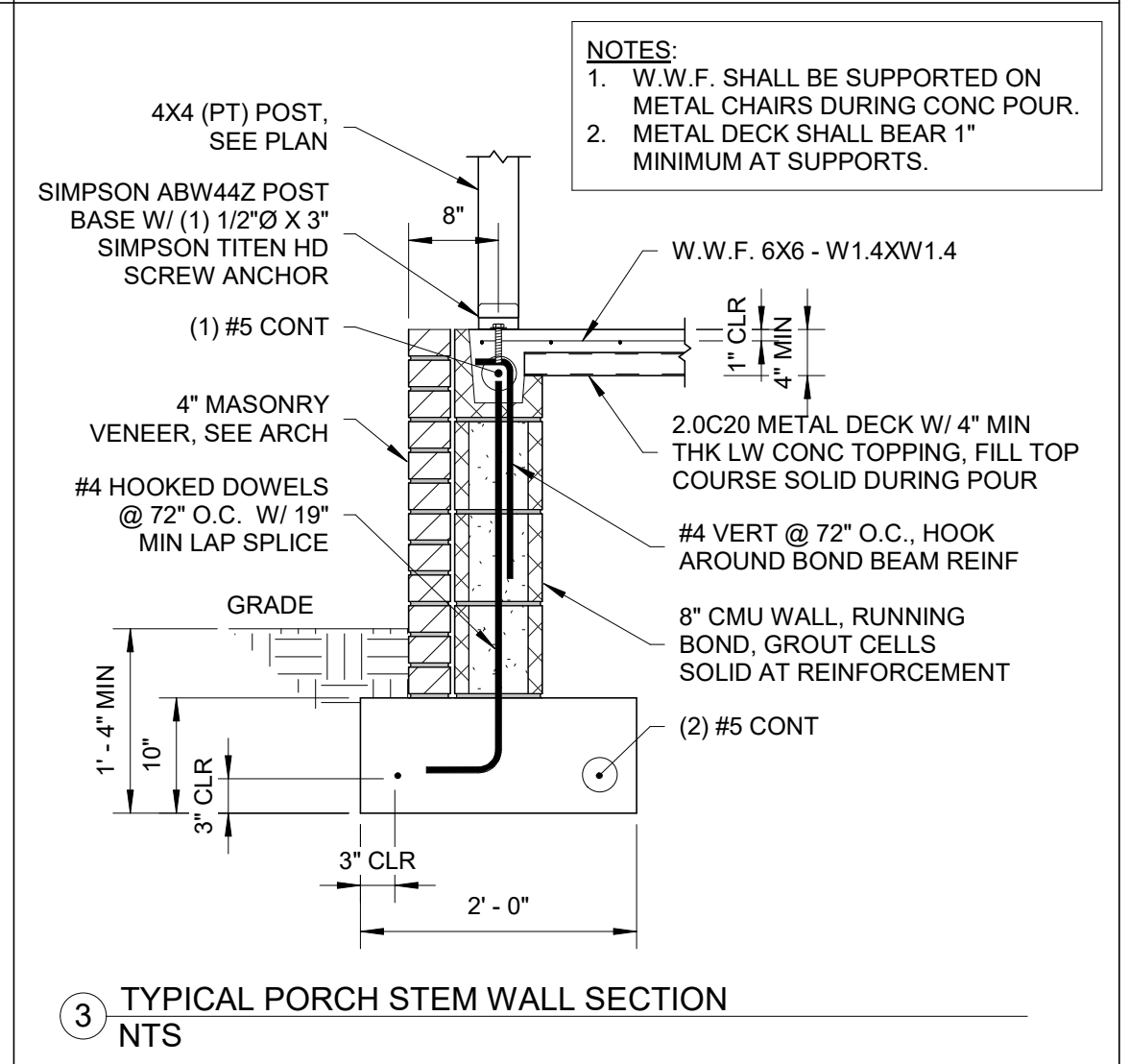
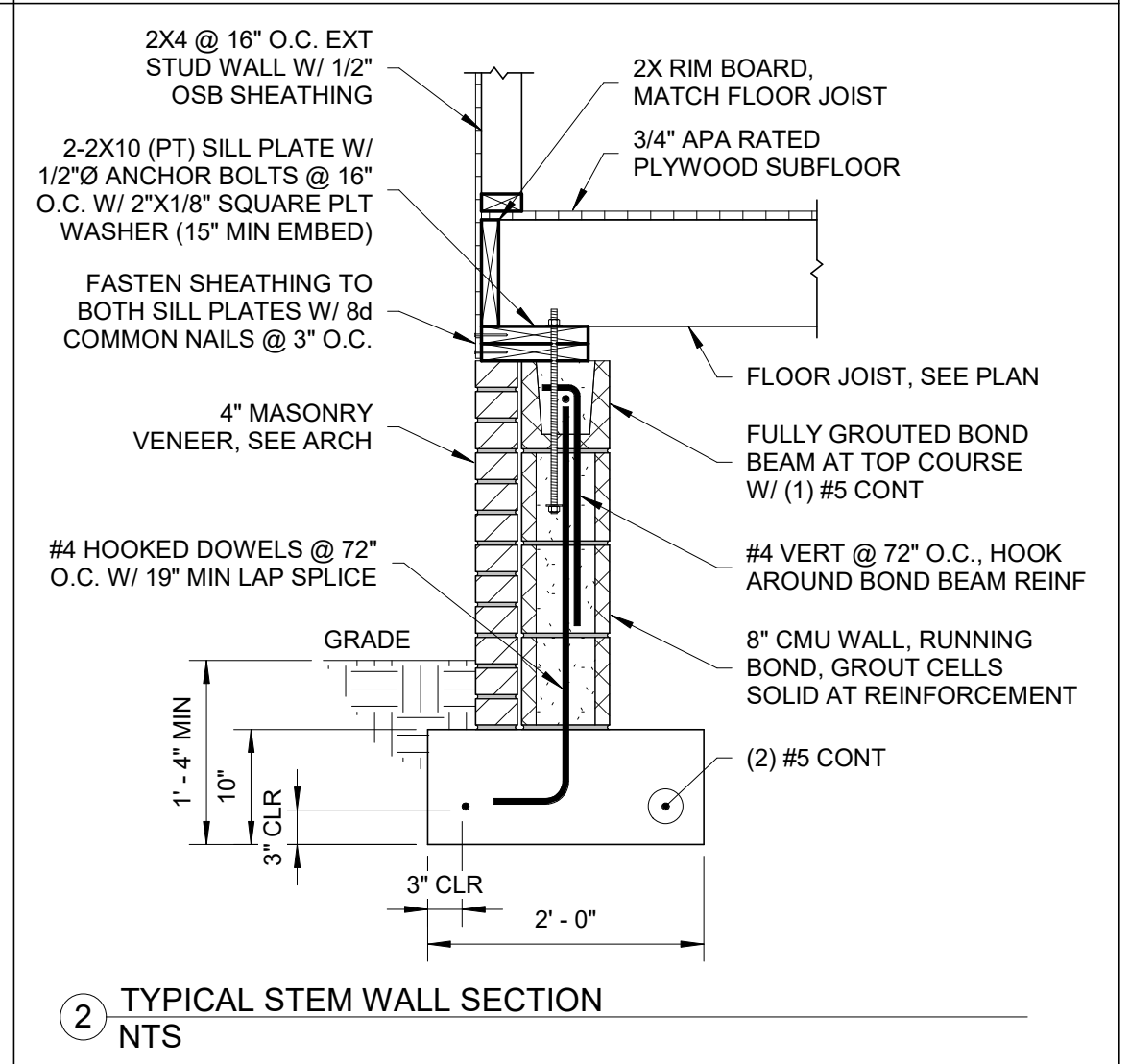
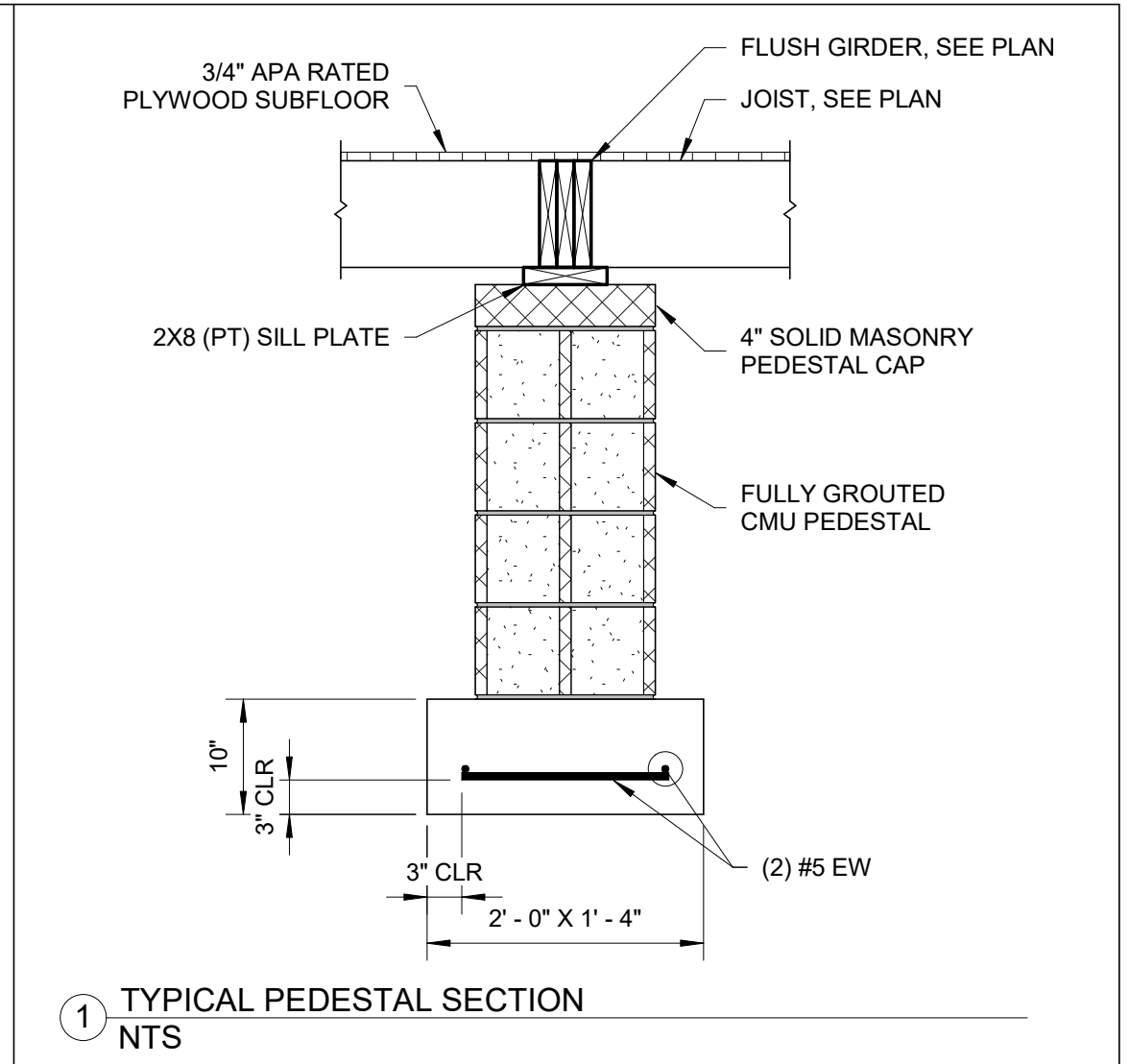
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DETAILS



NOTES:
1. GUARDRAILS ARE REQUIRED FOR ALL LOCATIONS WHERE THE TOP OF DECKING IS 30" OR MORE ABOVE GRADE. SEE TYPICAL DETAILS.
2. RAMP SLOPE SHALL NOT EXCEED 1 UNIT VERTICAL PER 12 UNITS HORIZONTAL.
3. PROVIDE 36" MINIMUM EGRESS WIDTH.

NOTES:
1. MASONRY SCREWS SHALL NOT BE INSTALLED AT MORTAR JOINTS.
2. SEE ARCH FOR STAIR DIMENSIONS.

NOTE: W.W.F. SHALL BE SUPPORTED ON METAL CHAIRS DURING CONC POUR.

NOTE: MASONRY SCREWS SHALL NOT BE INSTALLED AT MORTAR JOINTS.

NOTE: AS REQUIRED AT BEARING, BRIDGING OR BLOCKING BETWEEN TRUSSES BY MNFR.

NOTES:
1. W.W.F. SHALL BE SUPPORTED ON METAL CHAIRS DURING CONC POUR.
2. METAL DECK SHALL BEAR 1" MINIMUM AT SUPPORTS.

13 OPTIONAL RAMP LANDING SECTION NTS

10 OPTIONAL RAMP INTERMEDIATE SUPPORT SECTION NTS

7 GABLE END WALL SECTION NTS

4 STEM WALL SECTION AT PORCH NTS

1 TYPICAL PEDESTAL SECTION NTS

14 TYPICAL DECK LEDGER SECTION NTS

11 OPTIONAL RAMP EMBED POST SECTION NTS

8 TYPICAL WOOD STAIR SECTION NTS

5 TYPICAL SHED SLAB EDGE SECTION NTS

2 TYPICAL STEM WALL SECTION NTS

15 TYPICAL DECK GIRDER-TO-POST SECTION NTS

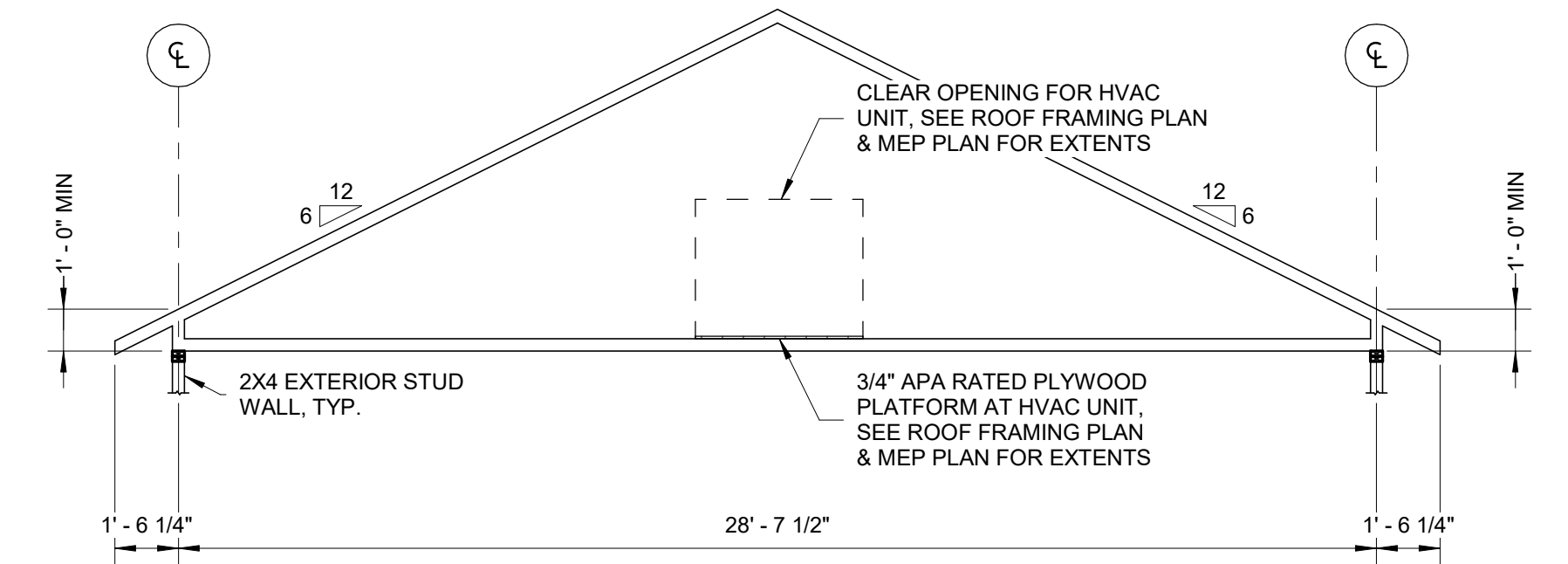
12 OPTIONAL RAMP HANDRAIL SECTION NTS

9 OPTIONAL RAMP LEDGER SECTION NTS

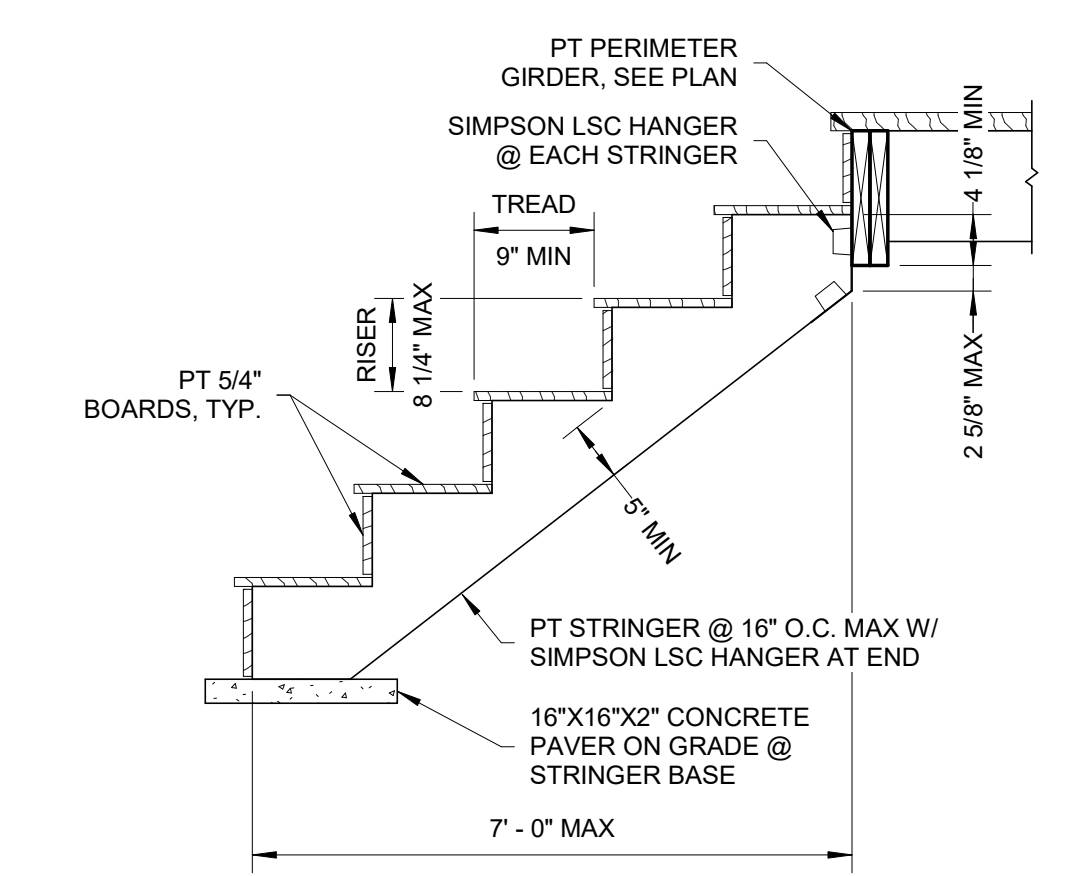
6 TYPICAL TRUSS BEARING SECTION NTS

3 TYPICAL PORCH STEM WALL SECTION NTS

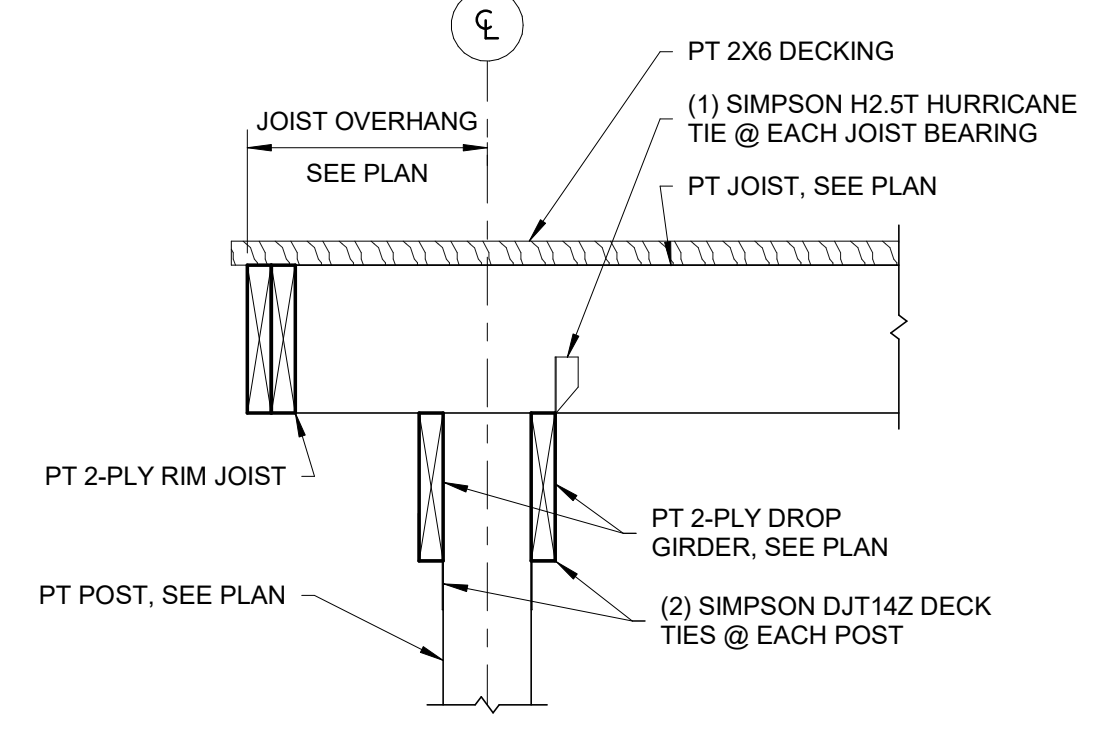
NOTE: TRUSS BOTTOM CHORD SHALL BE DESIGNED FOR AN ADDITIONAL 50 PSF MECH LIVE LOAD AT HVAC PLATFORM.



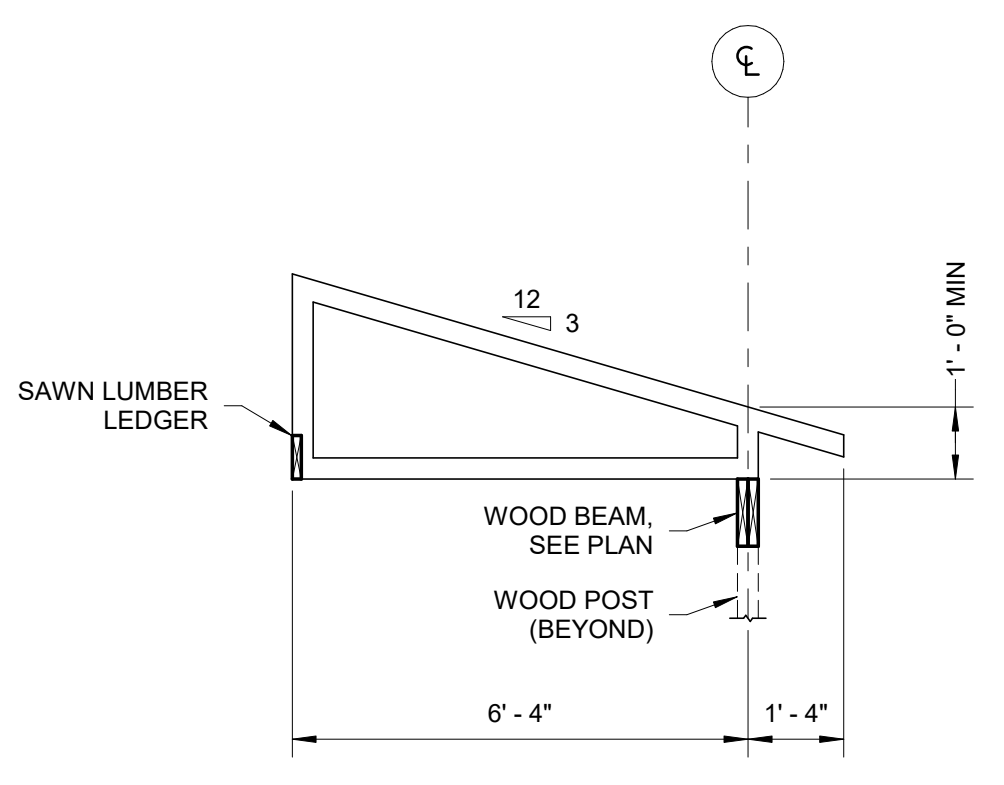
5 GABLE TRUSS PROFILE, T-3
1/4" = 1'-0"



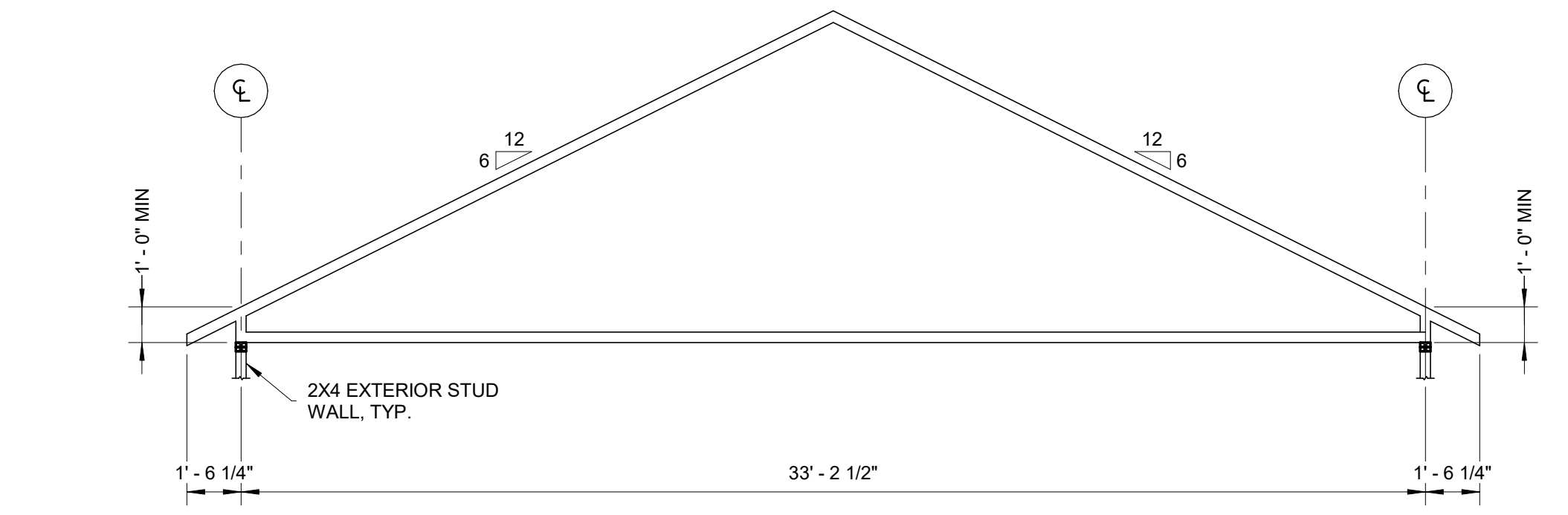
2 TYPICAL DECK STAIR SECTION
NTS



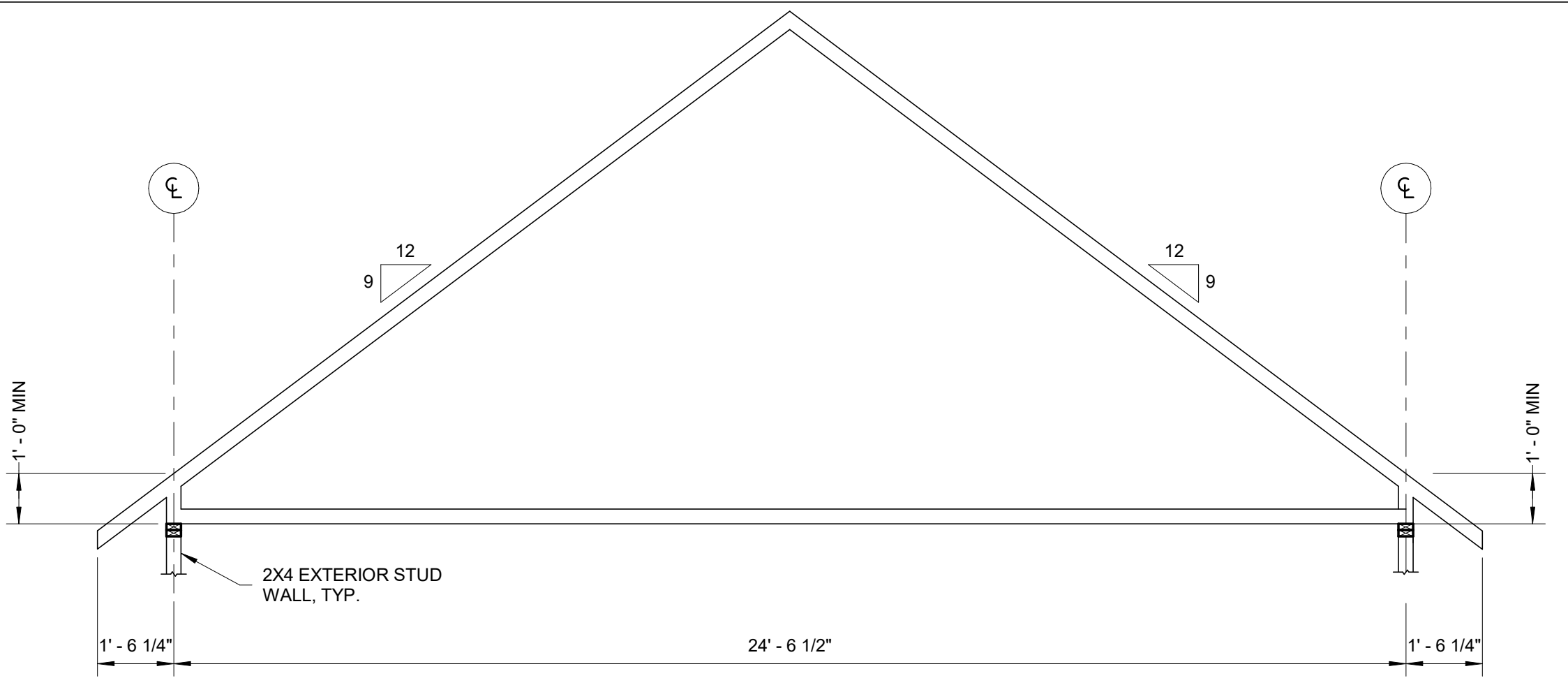
1 TYPICAL DECK JOIST SECTION
NTS



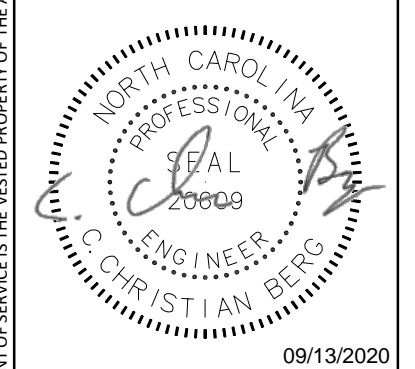
6 HIP TRUSS PROFILE, T-4
3/8" = 1'-0"



3 GABLE TRUSS PROFILE, T-1
1/4" = 1'-0"



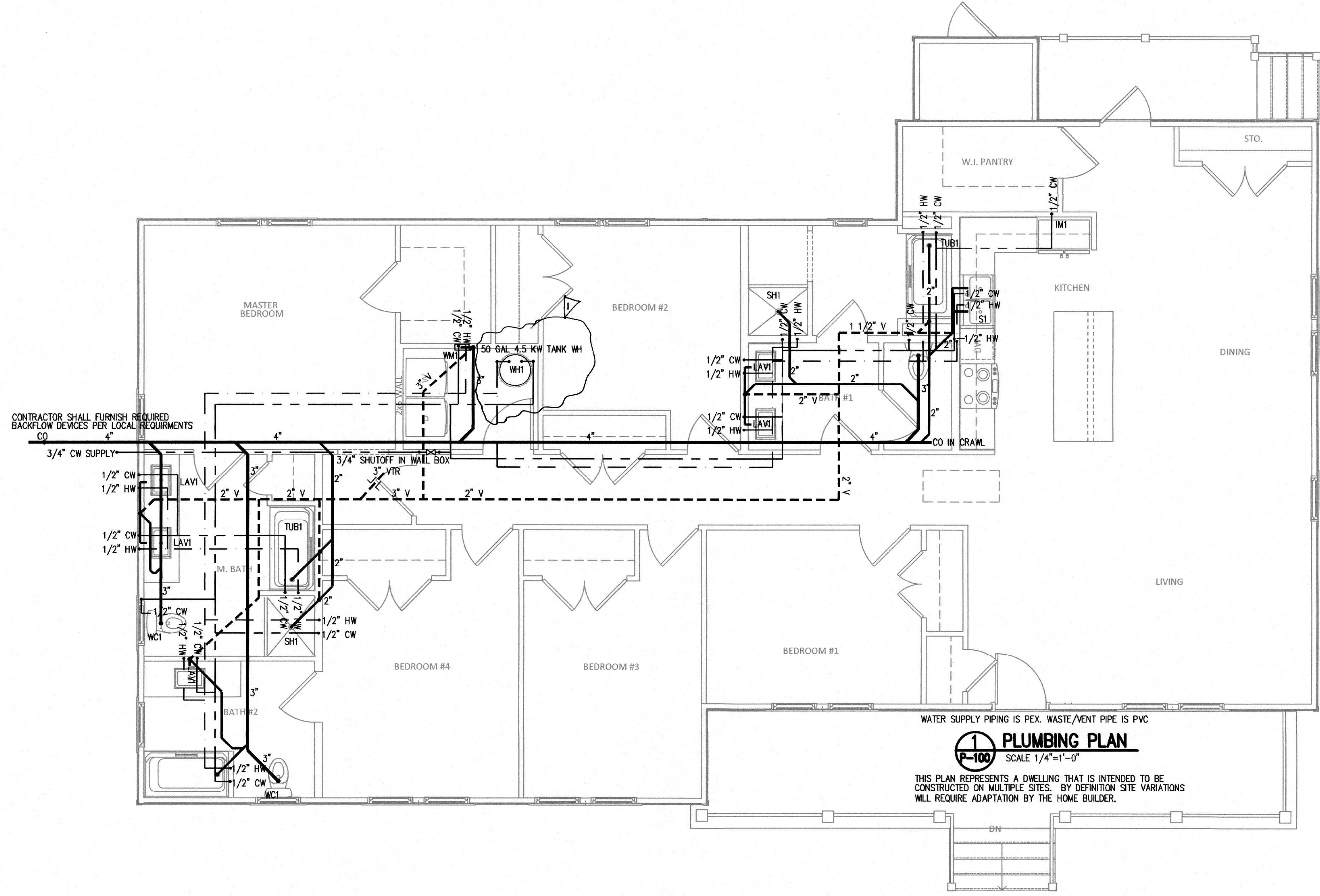
4 GABLE TRUSS PROFILE, T-2
3/8" = 1'-0"



NO	REVISIONS	DATE

DRAWN BY: UO
CHECKED BY: JWB
FIRST ISSUE DATE: 09/13/2020
PROJECT NO.
20-0170.400

DETAILS & TRUSS PROFILES



CONTRACTOR SHALL FURNISH REQUIRED BACKFLOW DEVICES PER LOCAL REQUIREMENTS

WATER SUPPLY PIPING IS PEX. WASTE/VENT PIPE IS PVC

PLUMBING PLAN
SCALE 1/4"=1'-0"

THIS PLAN REPRESENTS A DWELLING THAT IS INTENDED TO BE CONSTRUCTED ON MULTIPLE SITES. BY DEFINITION SITE VARIATIONS WILL REQUIRE ADAPTATION BY THE HOME BUILDER.

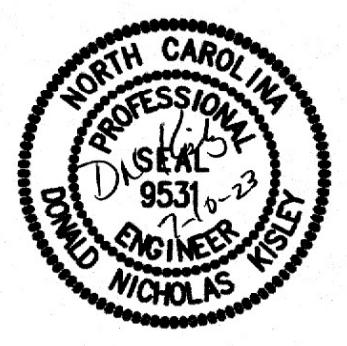
8/19/2020 5:47:33 PM C:\Users\Bradley.mccord\Documents\20-0170 Josephine 1:1 V20 Central_Bradley.mccord.rvt

SUMMIT
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1110 Navaho Drive, Suite 600 Raleigh, NC 27609
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www.summitDE.net

NICK KISLEY P. E.
115 MACKENAN DRIVE
CARY, N.C. 27511 (919) 460-9091

THE NORTH CAROLINA OFFICE OF RESILIENCY AND RECOVERY (NCORR)

O'NEILL



NO	REVISIONS	DATE
1	TRM & LM	7-16-22

DRAWN BY: DNK
CHECKED BY: DNK
FIRST ISSUE DATE: 09/13/2020
PROJECT NO.
20-0108.020

PME FLOOR PLANS

P-100

Home Energy Rating Certificate

Projected Report
Based on Plans

Rating Date:
Registry ID:
Ekotrope ID: jL96Gexd



HERS® Index Score:

67

Your home's HERS score is a relative performance score. The lower the number, the more energy efficient the home. To learn more, visit www.hersindex.com

Annual Savings

\$1,532

*Relative to an average U.S. home

Home:

Wilmington, NC 28403

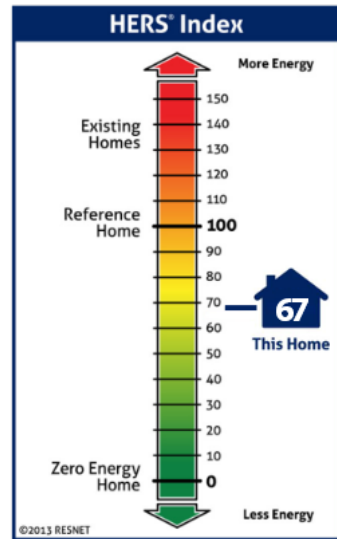
Builder:
NCORR

Your Home's Estimated Energy Use:

	Use [MBtu]	Annual Cost
Heating	14.7	\$430
Cooling	8.1	\$245
Hot Water	8.0	\$236
Lights/Appliances	18.3	\$544
Service Charges		\$185
Generation (e.g. Solar)	0.0	\$0
Total:	49.1	\$1,641

This home meets or exceeds the criteria of the following:

2009 International Energy Conservation Code
2006 International Energy Conservation Code



Home Feature Summary:

Home Type:	Single family detached
Model:	O'Neill
Community:	N/A
Conditioned Floor Area:	2,351 ft ²
Number of Bedrooms:	5
Primary Heating System:	Air Source Heat Pump • Electric • 8.2 HSPF
Primary Cooling System:	Air Source Heat Pump • Electric • 14 SEER
Primary Water Heating:	Residential Water Heater • Electric • 0.92 UEF
House Tightness:	5 ACH50
Ventilation:	None
Duct Leakage to Outside:	94 CFM @ 25Pa (4 / 100 ft ²)
Above Grade Walls:	R-15
Ceiling:	Attic, R-38
Window Type:	U-Value: 0.35, SHGC: 0.3
Foundation Walls:	N/A
Framed Floor:	R-19

Rating Completed by:

Energy Rater: Matthew Vande
RESNET ID: 8716644

Rating Company: Vandemusser Design
26 Crabapple Lane
8283484723

Rating Provider: Vandemusser Design
26 Crabapple Lane
8283484723

Matthew Vande, Certified Energy Rater
Digitally signed: 8/25/23 at 4:42 PM



Energy savings calculated without modifications to the energy model. (As Modeled)

Ekotrope RATER - Version:4.1.1.3228

The Energy Rating Disclosure for this home is available from the Approved Rating Provider.

This report does not constitute any warranty or guarantee.

North Carolina 2018 - Simulated Performance Alternative (N1105)



Property
Wilmington, NC 28403
Model: O'Neill

Organization
Vandemusser Design
Matthew Vande
8283484723

Inspection Status
Results are projected

20029-02 TASK 26 O'Neill 2351 SF
O'Neill BASE SPEC new WH

Builder
NCORR

This report is based on a proposed design and does not confirm field enforcement of design elements.

Annual Energy Cost

Design	North Carolina 2018 Performance	As Designed
Heating	\$452	\$459
Cooling	\$382	\$365
Water Heating	\$343	\$343
Mechanical Ventilation	\$0	\$0
SubTotal - Used to determine compliance	\$1,177	\$1,167
Lights & Appliances w/out Ventilation	\$539	\$539
Onsite generation	\$0	\$0
Total	\$1,716	\$1,706

R405.3 Source Energy Exception: The proposed home uses 1.07 MBtu LESS source energy than the reference home.

Requirements

✓	R405.3	Performance-based compliance passes by 0.9%	The proposed house meets the North Carolina 2018 Performance reference energy bill requirement by \$10.01 (1.07 MBtu).
✓	R402.4.2.2	Air Leakage Testing	Air sealing is 0.26 CFM50 / ft ² Shell Area. It must not exceed 0.30 CFM50 / ft ² Shell Area.
✓	R402.5	Area-weighted average fenestration SHGC	Area-weighted average fenestration SHGC is 0.274. The maximum allowed value is 0.5.
✓	R402.5	Area-weighted average fenestration U-Factor	
✓	R404.1	Lighting Equipment	At least 75.0% of fixtures shall be high-efficacy lamps, currently 100.0% are high-efficacy.
✓	Mandatory Checklist	Mandatory code requirements that are not checked by Ekotrope must be met.	2015 IECC Mandatory Checklist must be checked as complete.
✓	R403.3.1	Duct Insulation	Duct insulation meets the requirements specified in North Carolina 2018 Code Section 403.3.1.

Design exceeds requirements for North Carolina 2018 Performance compliance by 0.9%.

As a 3rd party extension of the code jurisdiction utilizing these reports, I certify that this energy code compliance document has been created in accordance with the requirements of Chapter 4 of the adopted International Energy Conservation Code based on NEW HANOVER County. If rating is Projected, I certify that the building design described herein is consistent with the building plans, specifications, and other calculations submitted with the permit application. If rating is Confirmed, I certify that the address referenced above has been inspected/tested and that the mandatory provisions of the IECC have been installed to meet or exceed the intent of the IECC or will be verified as such by another party.

Name: Matthew Vande

Signature: 

Organization: Vandemusser Design

Digitally signed: 8/25/23 at 4:42 PM

Ekotrope RATER - Version 4.1.1.3228

North Carolina 2018 Performance compliance results calculated using Ekotrope RATER's energy and code compliance algorithm, including appropriate amendments.
Ekotrope RATER is a RESNET Accredited HERS Rating Tool. All results are based on data entered by Ekotrope users.
Ekotrope disclaims all liability for the information shown on this report.

North Carolina 2018 - R402.1.5 Total UA



Property
Wilmington, NC 28403
Model: O'Neill

Organization
Vandemusser Design
Matthew Vande
8283484723

Inspection Status
Results are projected

20029-02 TASK 26 O'Neill 2351 SF
O'Neill BASE SPEC new WH

Builder
NCORR

This report is based on a proposed design and does not confirm field enforcement of design elements.

Building UA

Elements	NC Reference	As Designed
Ceilings	70.5	84.6
Above-Grade Walls	127.9	120.8
Windows, Doors and Skylights	111.5	104.7
Slab Floor:	0.0	0.0
Framed Floors	110.5	118.2
Foundation Walls	0.0	0.0
Rim Joists	0.0	0.0
Overall UA (Design must be equal or lower):	420.4	428.3

Requirements

⚠	R402.1.5	Total UA alternative compliance fails by 1.9%.	Specified envelope UA is 428 BTU / hF. This exceeds the maximum of 420 BTU / hF by 1.9%.
✅	402.3.2	Average SHGC: 0.27 Max SHGC: 0.30	Average SHGC of 0.27 is greater than the maximum of 0.30.
✅	R402.4.2.2	Air Leakage Testing	Air sealing is 0.26 CFM50 / ft ² Shell Area. It must not exceed 0.30 CFM50 / ft ² Shell Area.
✅	R402.5	Area-weighted average fenestration SHGC	Area-weighted average fenestration SHGC is 0.274. The maximum allowed value is 0.5.
✅	R402.5	Area-weighted average fenestration U-Factor	
✅	R404.1	Lighting Equipment	At least 75.0% of fixtures shall be high-efficacy lamps, currently 100.0% are high-efficacy.
✅	Mandatory Checklist	Mandatory code requirements that are not checked by Ekotrope must be met.	2015 IECC Mandatory Checklist must be checked as complete.
✅	R403.3.1	Duct Insulation	Duct insulation meets the requirements specified in North Carolina 2018 Code Section 403.3.1.
✅	403.3.3	Duct Testing	

Design fails to meet the requirement for North Carolina 2018 Prescriptive compliance by 1.9%.

Name: Matthew Vande

Signature: 

Organization: Vandemusser Design

Digitally signed: 8/25/23 at 4:42 PM

Ekotrope RATER - Version 4.1.1.3228

North Carolina 2018 Prescriptive compliance results calculated using Ekotrope RATER's energy and code compliance algorithm, including appropriate amendments.
Ekotrope RATER is a RESNET Accredited HERS Rating Tool. All results are based on data entered by Ekotrope users.
Ekotrope disclaims all liability for the information shown on this report.

North Carolina 2018 ERI Compliance Report Projected Energy Rating Index Report

Property

Builder: NCORR
Address: Wilmington, NC 28403

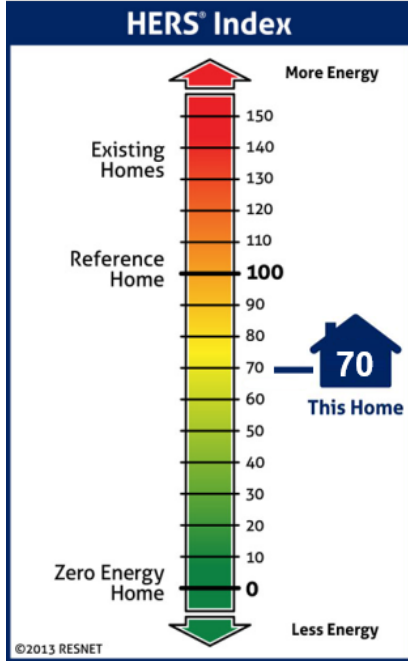
Organization

Company: VandeMusser Design
Phone: 8283484723
Rater: Matthew Vande

Energy Rating Index Information

Projected Rating
Rating No:
Date Rated:
Rater ID (RTIN): 8716644

DOES NOT PASS



Estimated Annual Energy Consumption*		
	Rated Home Calculated Energy Use (MBtu)	Rated Home Cost (\$/yr)
Heating	14.7	\$430
Cooling	8.1	\$245
Water Heating	8.0	\$236
Lights & Appliances	18.3	\$544
Photovoltaics	0.0	\$0
Service charge	-	\$185
Total	49.1	\$1,641

*Based on standard operating conditions

ERI with PV: 70

ERI without PV: 70

Annual Estimates	
Electric (kWh): 14,374.3	CO2 Emissions (Tons): 8.9
Natural Gas (Therms): 0.0	Energy Savings (\$) **: N/A

**Based on the North Carolina 2018 ERI Compliance Report Reference design home

Maximum Energy Rating Index: 61

This Home's Energy Rating Index: 70

FAIL

This home DOES NOT MEET the Energy Rating Index Score requirement of North Carolina 2018 ERI Compliance Report for Climate Zone 3. It DOES NOT MEET all of the requirements verified by Ekotrope. Mandatory requirements are summarized on the 2nd page of this report, some of which are not verified by Ekotrope.

Name: Matthew Vande

Signature:

Organization: VandeMusser Design

Digitally signed: 8/25/23 at 4:42 PM

Rating Provider Data and Seal

Company: VandeMusser Design
Address: 26 Crabapple Lane
Phone #: 8283484723
Fax #: 8282538347



To determine if a provider is properly accredited go to: www.resnet.us/professional/programs/search_directory

(Projected. Confirmation required.)

Climate Zone 3		Mandatory Requirements
Provision Number	Topic	Compliance Decision
North Carolina 2012 Table 402.1.1 or 402.1.3	Building thermal envelope minimum insulation levels and maximum fenestration U-factor and SHGC	PASS
R401.3	Post a permanent certificate listing the level of efficiencies installed in the house	Certificate required for CO
R402.4.2.2	Envelope air leakage maximum leakage rate	PASS
R402.4.1 / Table R402.4.1.1	Comply with air sealing and insulation requirements in Table R402.4.1.1	Checklist required for CO
R402.4.4	Rooms containing fuel-burning appliances	PASS*
R402.5	Maximum fenestration U-factor and SHGC	(U-Factor) PASS (SHGC) PASS
R403.1.2	Heat pump controls	PASS*
R406.2	Ducts outside of conditioned space to be insulated to a minimum of R-6.	PASS*
R403.3.2	Duct sealing on all ducts	PASS*
R403.3.5	Building cavities not used as ducts.	PASS*
R403.5.1	Heated water circulation and temperature maintenance systems comply	PASS*
R403.6	Mechanical ventilation meeting the requirements of the IRC or IMC. Outdoor air and exhaust dampers installed	PASS*
R403.7	ACCA Manual J and S conducted for all heating and cooling systems.	ACCA forms required for permit
R403.8	Systems serving multiple dwelling units to meet the mechanical requirements of IECC commercial code	PASS*
R403.9	Snow melt and ice system controls installed where applicable	PASS*
R403.10	Pools and permanent spa energy consumption meet requirements for heaters, time clocks and covers	PASS*
R403.11	Portable spas meet the requirements of APSP-14.	PASS*
R404.1	High efficacy lights installed in 75% of permanently installed fixtures.	PASS

* This is a projected rating. These items must eventually be field-verified by the Rater, Field Inspector, Code Inspector, or Builder.

Ekotrope RATER - Version 4.1.1.3228

North Carolina 2018 ERI compliance results calculated using Ekotrope RATER's energy and code compliance algorithm. Ekotrope RATER is a RESNET Accredited HERS Rating Tool. All results are based on data entered by Ekotrope users. Ekotrope disclaims all liability for the information shown on this report.

Energy Code Inspection Checklist



Property

Wilmington, NC 28403
Model: O'Neill

Organization

Vandemusser Design
Matthew Vande
8283484723

Inspection Status

Results are projected

20029-02 TASK 26 O'Neill 2351 SF
O'Neill BASE SPEC new WH

Builder

NCORR

General Building Information

Conditioned Area (sq ft)	2,351
Conditioned Volume (cubic ft)	21,159
Insulated Shell Area (sq ft)	6,681.1

The building energy model in Ekotrope reflects the building assemblies and energy features listed below. Sometimes energy features will change in the field from what has been modeled. The inspection process should identify any changes and ensure that the home continues to meet the applicable energy code.

Slab

None Present

Framed Floor



Name: Over Crawl (2,351 s.f.)
R-0 continuous insulation, R-19 cavity insulation
Insulation Grade: I

Foundation Wall

None Present

Above Grade Wall



Name: Wall (1,979.1 s.f.)
R-0 continuous insulation, R-15 cavity insulation
Insulation Grade: I

Rim Joist

None Present

Ceiling / Roof



Name: flat ceiling batts (2,351 s.f.)
R-0 continuous insulation, R-38 cavity insulation
Insulation Grade: I

Opaque Door

None Present

Energy Code Inspection Checklist



Property

Wilmington, NC 28403
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Matthew Vande
8283484723

Inspection Status

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20029-02 TASK 26 O'Neill 2351 SF
O'Neill BASE SPEC new WH

Builder

NCORR

Glazing

- Name: front 1/4 lite entry (20 s.f.), U: 0.180, SHGC: 0.09, Orientation: NORTH_WEST
- Name: rear 1/4 lite entry (20 s.f.), U: 0.180, SHGC: 0.09, Orientation: SOUTH_EAST
- Name: front bath 2840 (10.68 s.f.), U: 0.350, SHGC: 0.3, Orientation: NORTH_WEST
- Name: front bedrms (2)2856 x2 (58.63 s.f.), U: 0.350, SHGC: 0.3, Orientation: NORTH_WEST
- Name: front bedrm_liv rm (2)2856 x2 (58.63 s.f.), U: 0.350, SHGC: 0.3, Orientation: NORTH_WEST
- Name: right (2)2856 (29.315 s.f.), U: 0.350, SHGC: 0.3, Orientation: SOUTH_WEST
- Name: right 2856 (14.6575 s.f.), U: 0.350, SHGC: 0.3, Orientation: SOUTH_WEST
- Name: rear 2040 (8 s.f.), U: 0.350, SHGC: 0.3, Orientation: SOUTH_EAST
- Name: rear (2)2856 x2 (58.6 s.f.), U: 0.350, SHGC: 0.3, Orientation: SOUTH_EAST
- Name: left 2856 x2 (29.3 s.f.), U: 0.350, SHGC: 0.3, Orientation: NORTH_EAST
- Name: left 2840 (10.7 s.f.), U: 0.350, SHGC: 0.3, Orientation: NORTH_EAST

Skylight

None Present

Mechanical Ventilation

None Present

Mechanical Equipment

- heat pump • Electric • 100% Heating Load @ 8.2 HSPF, 100% Cooling Load @ 14 SEER
- Water Heater • Electric • 100% Hot Water Load @ 0.92 UEF

Energy Code Inspection Checklist



Property

Wilmington, NC 28403
Model: O'Neill

Organization

Vandemusser Design
Matthew Vande
8283484723

Inspection Status

Results are projected

20029-02 TASK 26 O'Neill 2351 SF
O'Neill BASE SPEC new WH

Builder

NCORR

Air Leakage Control



Test Status: Blower-door tested

House is air-sealed as to achieve 1,763 CFM50 (5.00 ACH50) or less at final blower-door test.

Infiltration Requirements for IECC in Climate Zone 3

2009 IECC Infiltration limit for the design home is 7 ACH50.

2012 IECC Infiltration limit for the design home is 3 ACH50.

2015 IECC Infiltration limit for the design home is 3 ACH50.

2018 IECC Infiltration limit for the design home is 3 ACH50.

2021 IECC Infiltration limit for the design home is 5 ACH50.

Duct Leakage

Duct System 1

NOT entirely within conditioned space, testing required

Leakage to Outside specified as: 94 CFM @ 25Pa (4 / 100 ft²)

Total Leakage specified as: 188 CFM @ 25Pa (Post-Construction)

Duct Leakage Code Requirements for IECC

2009 IECC:

Postconstruction Leakage Test: Duct Leakage to Outdoors \leq 8 CFM25 / 100 sq ft CFA.

Rough in Test with AHU: Total Duct Leakage \leq 6 CFM25 / 100 sq ft CFA.

Rough in Test without AHU: Total Duct Leakage \leq 4 CFM25 / 100 sq ft CFA.

2012 IECC Mandatory, 2015, 2018, & 2021 IECC Prescriptive Paths:

Postconstruction Leakage Test: Total Duct Leakage \leq 4 CFM25 / 100 sq ft CFA.

Rough in Test with AHU: Total Duct Leakage \leq 4 CFM25 / 100 sq ft CFA.

Rough in Test without AHU: Total Duct Leakage \leq 3 CFM25 / 100 sq ft CFA.

* Note: IECC 2021 requires Total Duct Leakage \leq 8 CFM25 / 100 sq ft CFA when all ducts and air handlers are within the building thermal envelope.

2015 and 2018 IECC Performance Paths (Cost Compliance):

Leakage testing is required UNLESS all ducts and air handlers are located entirely within the thermal envelope.

There is no pass/fail threshold for duct leakage on the performance path.

Energy Code Inspection Checklist



Property

Wilmington, NC 28403
Model: O'Neill

Organization

Vandemusser Design
Matthew Vande
8283484723

Inspection Status

Results are projected

20029-02 TASK 26 O'Neill 2351 SF
O'Neill BASE SPEC new WH

Builder

NCORR

Project Notes

9/25/20 MV:

model input per specs provided by Summit Engineering

Assumptions made:

1. advanced framing techniques
2. medium color exterior walls
3. 2x4 bottom chord roof trusses at 24" o/c
4. dark color shingles
5. windows rotated to worst orientation
6. heat pump to be located in vented crawl
7. 50-gallon 0.92UEF electric tank water heater located in conditioned space
8. duct leakage - assume 8% total leakage / 4% leakage to outside
9. assume 2 returns in house - 1 in bedroom / 1 in living room
10. all duct work in vented crawl space / ducts insulated to R8
11. no fresh air ventilation system installed
12. no ceiling fans
13. programmable adaptive recovery thermostat (for heat pumps)
14. low-flow water fixtures
15. 25 foot distance from water heater to farthest fixture / no pipe insulation
16. 100% LED lighting
17. Energy Star front-load washer / dryer
18. Energy Star refrigerator / dishwasher
19. 5.0 ACH50 blower door test
20. front door - 1/4 lite insulated (U-value .18 / SHGC .09)
21. heat pump - 14 SEER / 8.2 HSPF
22. windows - U-value 0.35 / SHGC - 0.30

IMPROVEMENTS

1. floor - R30 batts in lieu of R19
2. windows - U-value = 0.33 / SHGC = 0.21
3. HVAC - 15 SEER / 8.5 HSPF
4. change ceiling from R38 batts to R38 FG blown
5. WINDOWS - U-Factor .30, SHGC .28