

Plans Designed to the 2018 NORTH CAROLINA STATE RESIDENTIAL BUILDING CODE

CLIMATE ZONE	ZONE 3	ZONE 4	ZONE 5
FENESTRATION U-FACTOR	0.35	0.35	0.35
SKYLIGHT U-FACTOR	0.65	0.65	0.60
GLAZED FENESTRATION SHGC	0.30	0.30	0.30
CEILING R-VALUE	30	38	38
WALL R-VALUE	13	15	19
FLOOR R-VALUE	19	19	30
*BASEMENT WALL R-VALUE	10/13	10/13	10/13
**SLAB R-VALUE	0	0	10
* CRAWLSPACE WALL R-VALUE	5/13	10/13	10/13

- * "10/13" Means R-10 Sheathing Insulation or R-13 Cavity Insulation
- ** Insulation Depth with Monolithic Slab 18" or From Inspection Gap to bottom of Footing; Insulation Depth with Stem Wall Slab 24" or to bottom of Foundation Wall

DESIGNED FOR WIND SPEED OF 120 MPH

DESIGN PRESSURES FOR DOORS AND WINDOWS POSITIVE AND NEGATIVE IN PSF						
	MEAN ROOF HEIGHT (FT)					
VELOCITY (MPH)	15	25	35			
115	15	17	19			
120	20	23	25			
130	25	29	32			

ASSUMED MEAN ROOF HEIGHT 14'1"

Roof Truss Requirements

TRUSS DESIGN.

Trusses, if used, to be designed and engineered in accordance with these drawings. Any variation with these drawings must be brought to Frazier Designs attention before contruction begins.

KNEE WALL AND CEILING HEIGHTS.

All Finished knee wall heights and ceiling heights are shown furred down 10" from roof decking for insulation. If for any reason the truss manufacturer fails to meetor exceed designated heel heights, finished knee wall heights, or finished ceiling heights shown on these drawings the finished square footage may vary. Any discrepancy must be brought to Frazier Designs Attention, so that a suitable solution can be reached before construction begins. Any variation due to these conditions not being met is the responsibility of the truss manufacturer.

ANCHORAGE.

All required anchors for trusses due to uplift or bearing Anchorage in the 120 and 130 MPH Wind Zones shall be Continuous from the Roof to the footing. Bearing.

All trusses shall be designed for bearing on SPF # 2 Plates or Ledgers unless noted otherwise.

Plate Heights and Floor Systems.

See Elevation page(s) for plate heights

and floor system thicknesses.

ROOF VENTILATION

Section R806

R806.1 Ventilation required.

Enclosed Attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of the roof rafters shall have a a cross ventilation for each seperate space by ventilating openings protected against the entrance of rain or snow. Ventilation openings shallhave a least dimesion of 1/16 inch (1.6mm) minimum and 1/4 inch (6.4 mm) maximum. Ventilation openings having a least dimension larger than 1/4" inch (6.4mm) shall be provided with corrosion-resistant wire cloth screening, hardware cloth, or similar material with openings having a least dimension of 1/16 insh(1.6mm) minimum and 1/4 inch (6.4mm) maximum. Openings in roof framing members shall conform to the requirements of Section R802.7.

R806.2 Minimum Area.

The Total net free ventilating area shall not be less than 1/150 of thearea of the space ventilated except that reduction of the total area to 1/300 is permitted provided that at least 50 percent and not more than 80 percent of the required ventilating area is provided by ventilators located in the upper portion of the space th be ventilated at least 3 feet (914mm) above the eave or cornice vents with the balance of the required ventilation provided by eave or cornice vents. As an alternative, the net free cross-ventilation area my be reduced to 1/300 when a Class I or II vapor retarder is installed on the warm-in-winter side of the ceiling.

Exceptions:

1. Enclosed attic/rafter spaces requiring less than 1 square foot (0.0929 m2) of ventilation may be vented with continuous soffit ventilation only. 2. Enclosed attic/rafter spaces over unconditioned space may be vented with continuoussoffit vent only.

Square footage of roof to be vented = 6693 Sq. Ft. Net-Free Cross Ventilation Needed:

Without 50% to 80% of Venting 3'0" above Eave = 44.62 Sq.Ft. With 50% to 80% of Venting 3'0" above eave; or with Class I or II Vapor Retarder on Warm-In-Winter Side of Ceiling: 22.31 Sq.Ft.

STRUCTURAL NOTES

All construction shall conform t the latest requirements of the 2018 North Carolina Residential Building Code, plus all local codes and regulations. This document in no way shall be construed to supercede the code.

Job Site Practices And Safety:

Frazier Designs assumes no liability for contractors practices and procedures or safety program. Frazier Designs takes no responsibility for the contractor's failure to carry out the construction work in accordance with the contract documents. All members shall be framed, anchored, and braced in accordance with good construction practice and the building code.

Design Loads	Live Load	Dead Load	Deflection
USE	(PSF)	(PSF)	(LL)
Attics without storage	10	10	L/240
Attics with Limited storage	20	10	L/360
Attics with fixed stairs	40	10	L/360
Balconies and Decks	40	10	L/360
Fire Escapes	40	10	L/360
Guardrails and Handrails	200		
Guardrail in-fill conponents	50		
Passenger vehicle garages	50	10	L/360
Rooms other than sleeping	40	10	L/360
Sleeping rooms	30	10	L/360
Stairs	40		L/360
Snow	20		

Framing Lumber:

All non treated framing lumber shall be SPF # 2 (Fb=875 PSI) or SYP # 2 (Fb= 750 PSI) and all treated lumber shall be SYP # 2 (Fb= 750 PSI) unless noted otherwise.

Engineered Wood Beams:

Laminated veneer lumber (LVL) = Fb= 2600 PSI, Fv=285 PSI, E=1.9x106 PSI Parallel strand lumber (PSL) = Fb= 2900 PSI, Fv= 290 PSI, E= 2.0x106 PSI Laminated Strand Lumber (LSL) = Fb= 2250 PSI, Fv= 400 PSI, E = 1.55 x 106 PSI Install All connections per Manufacturers Instructions

Truss And I -Joist Members:

All Roof Truss and I-Joist Layouts shall be prepared in accordance with this document. Trusses and I-Joists shall be Installed according to the Manufacturers specifications. Any Change in Truss or I-Joist Layout shall be cooridinated with Frazier Designs.

Lintels:

Brick Lintels Shall be 3 1/2" x 3 1/2" x 1/4" Steel angle for up to 6'0" Span and 6" x 4" x 5/16" Steel angle with 6" leg vertical for spans up to 9'0" unless noted otherwise.

Concrete and Soils:

See Foundation Notes.

Foundation Structural Notes

120 MPH wind zone (1 1/2 to 2 1/2 story)

Continuous Footing:

24" wide and 8" thick minimum. 28" wide minimum at brick veneer Must extended 2" Min. to either side of supported wall. Girders:

(2) 2x8 girder unless noted otherwise.

8" x 16" piers with 8" solid masonry cap on 16" x 24" x 8" concrete footing with maximum pier height of 64" with hollow masonry and 160" with solid masonry unless otherwise noted.

Point Loads:

designates significant point load and should have solid blocking to pier, girder or foundation wall.

Anchor Bolts:

5/8" diameter anchor bolts embedded minimum 7" maximum 4'0" on center, within 12" of plate ends, and minimum two anchor bolts per plate.

Concrete:

Concrete shall hae a minimum 28 day strength of 3000 psi and maximum 5" slump. Air entrained in Table 402.2. All concrete shall be in accordance with ACI standards. All samples for pumping shall be taken from the exit end of the pump.

Lug Footings:

Lug Footings shall be 2'0" wide x 1'0" depth and shall run continuously underneath any wall that is deemed to be load bearing. See Detail for specs. Soils:

Allowable soil bearing pressure assumed to be 2000 PSF. The Contractor must contact a geotechnical engineer and a structural engineer if unsatisfactory subsurface conditions are encountered. The surface area adjacent to be foundation wall shall be provided with adequate drainage, and shall be graded so as to drain surface water away from foundation walls.

AIR LEAKAGE

Section N1102.4

N1102.4.1 Building Thermal Envelope.

The Building Thermal Envelope shall be durably sealed with an Air Barrier System to limit infiltration The sealing methods between dissimilar materials shall allow for differential expansion and contraction For all homes, where present, the following shall be caulked, gasketed, weather stripped or otherwise sealed with an air barrier material or solid material consistent with Appendix E-2.4 of this code:

1. Blocking and sealing floor/ceiling systems and under knee walls open to unconditoned or exterior space. 2. Capping and sealing shafts or chases, including flue shafts. 3. Capping and sealing soffit or dropped ceiling areas.





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RESIDENCE: FD-3977 Project: DIAGLE I MODEL:

BUILDE

DATE PRINTED: AUG_2024

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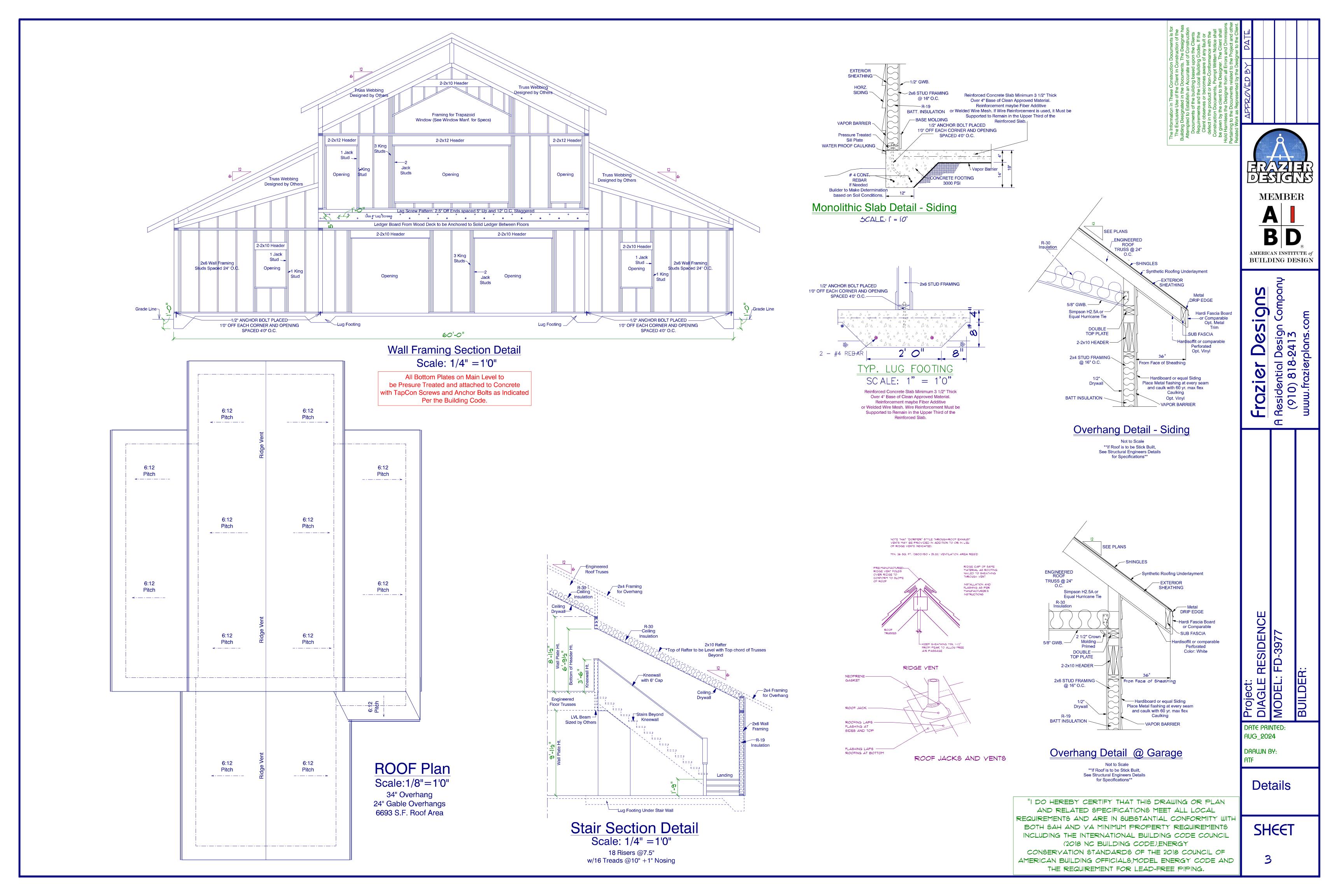
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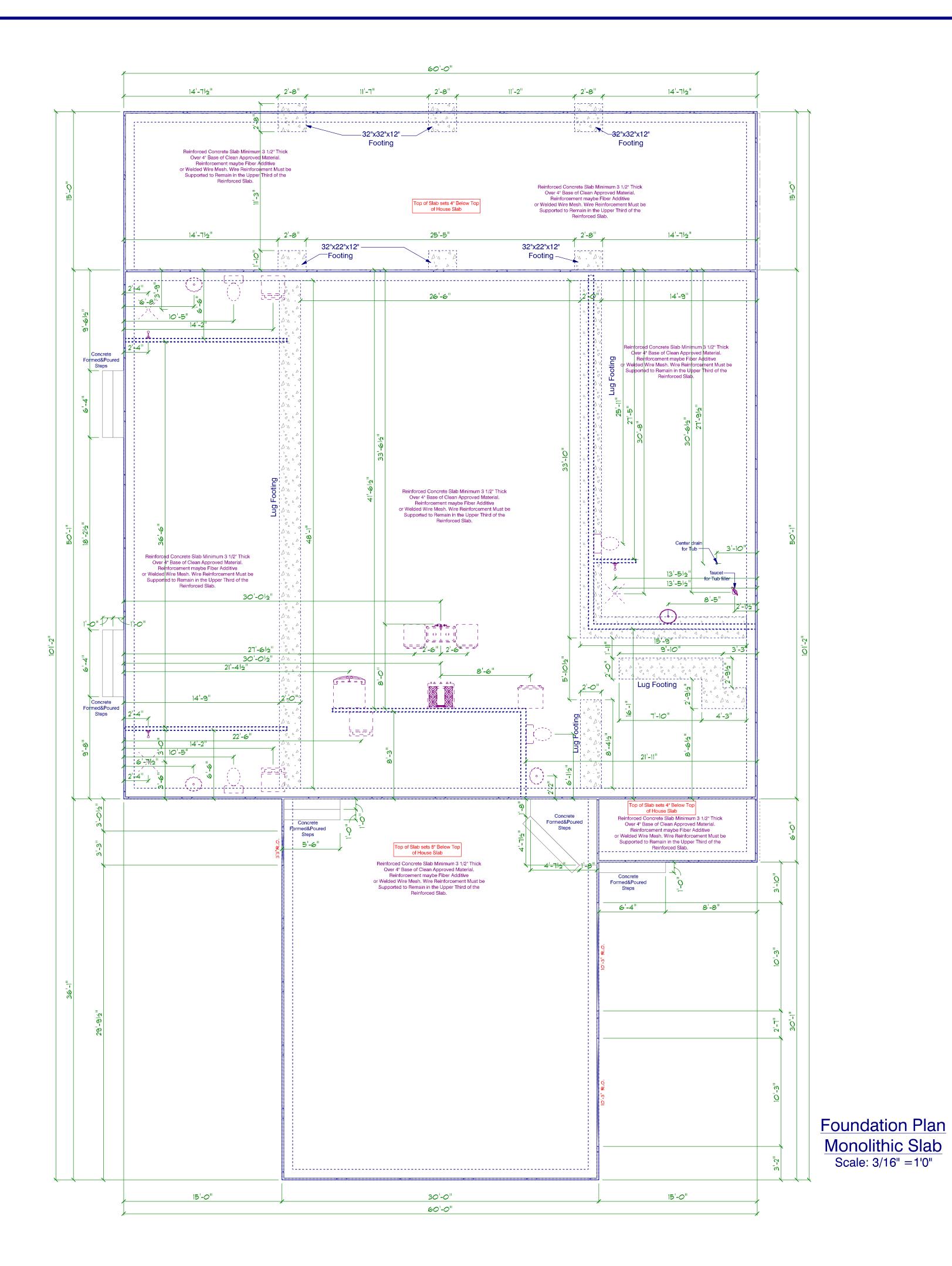
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AND RELATED SPECIFICATIONS MEET ALL LOCAL REQUIREMENTS AND ARE IN SUBSTANTIAL CONFORMITY WITH BOTH SAH AND VA MINIMUM PROPERTY REQUIREMENTS INCLUDING THE INTERNATIONAL BUILDING CODE COUNCIL (2018 NC BUILDING CODE), ENERGY CONSERVATION STANDARDS OF THE 2018 COUNCIL OF AMERICAN BUILDING OFFICIALS, MODEL ENERGY CODE AND

THE REQUIREMENT FOR LEAD-FREE PIPING.

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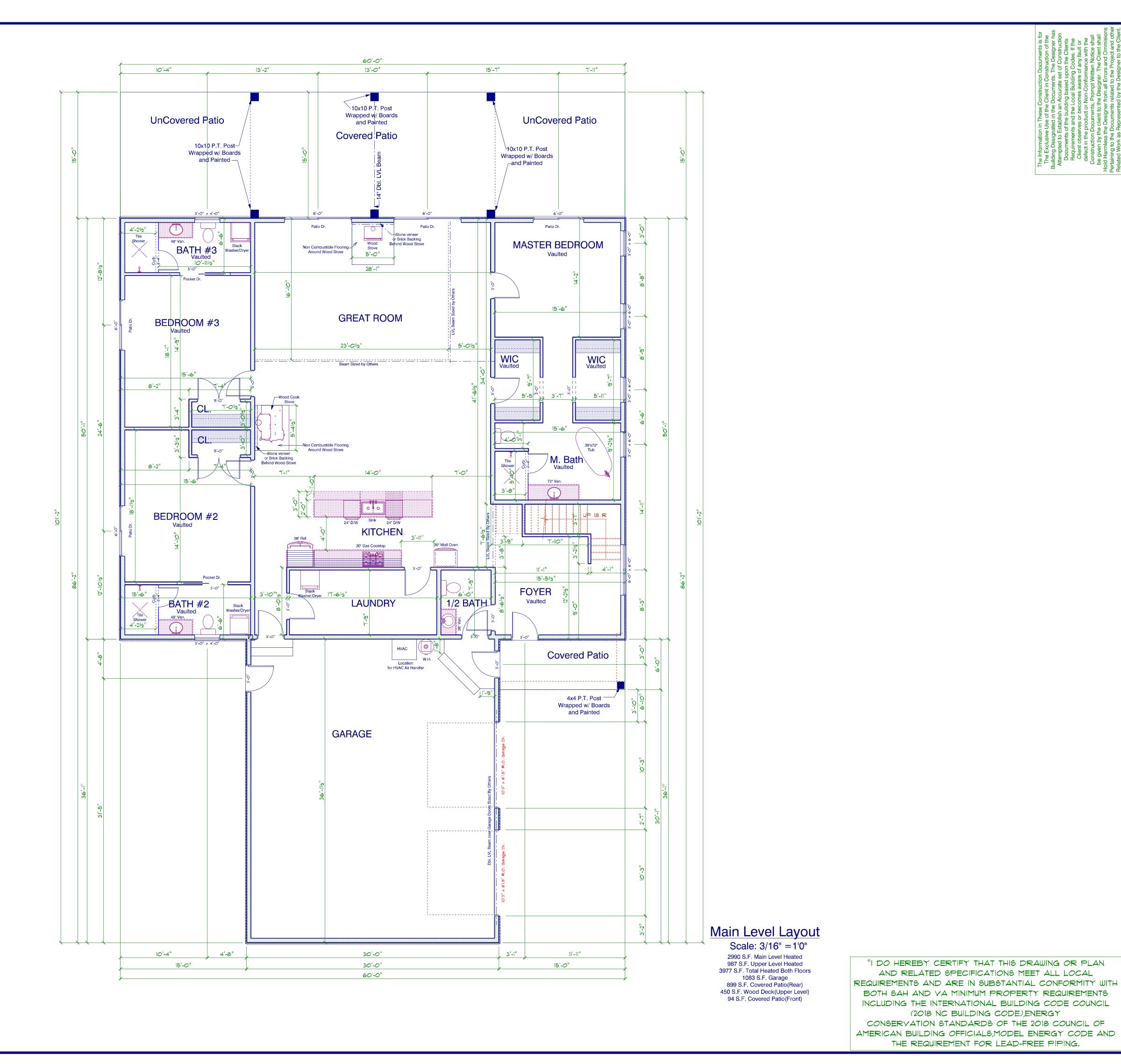
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Foundation Plan

Monolithic Slab

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Main Level Layout

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5

4'-41/2" 7'-81/2" Wood Deck Balcony OPEN BELOW Sloped Ceiling Sloped Ceiling 5'-71/2" ले LOFT Sloped Ceiling Sloped Ceiling High Sloped Kheewall with Cap BATH OPEN TO BELOW Sloped Ceiling Slider Window 9'-9" Upper Level Layout Scale: 3/16" = 1'0"
987 S.F. Heated Upper Level

The Exclusive Use of the Client in Construction of the Building Designated in the Documents. The Designer has Attempted to Establish an Accurate set of Construction Documents of the building based upon the Clients Requirements and the Local Building Codes. If the Client observes or becomes aware of any fault or defect in the product or Non-Conformance with the Construction Documents, Prompt Written Notice shall be given by the client to the Designer. The Client shall lold Harmless the Designer from all Errors and Ommision ertaining to the Documents related to the Project and other leated Work as Represented by the Designer to the Client APPROVED BY

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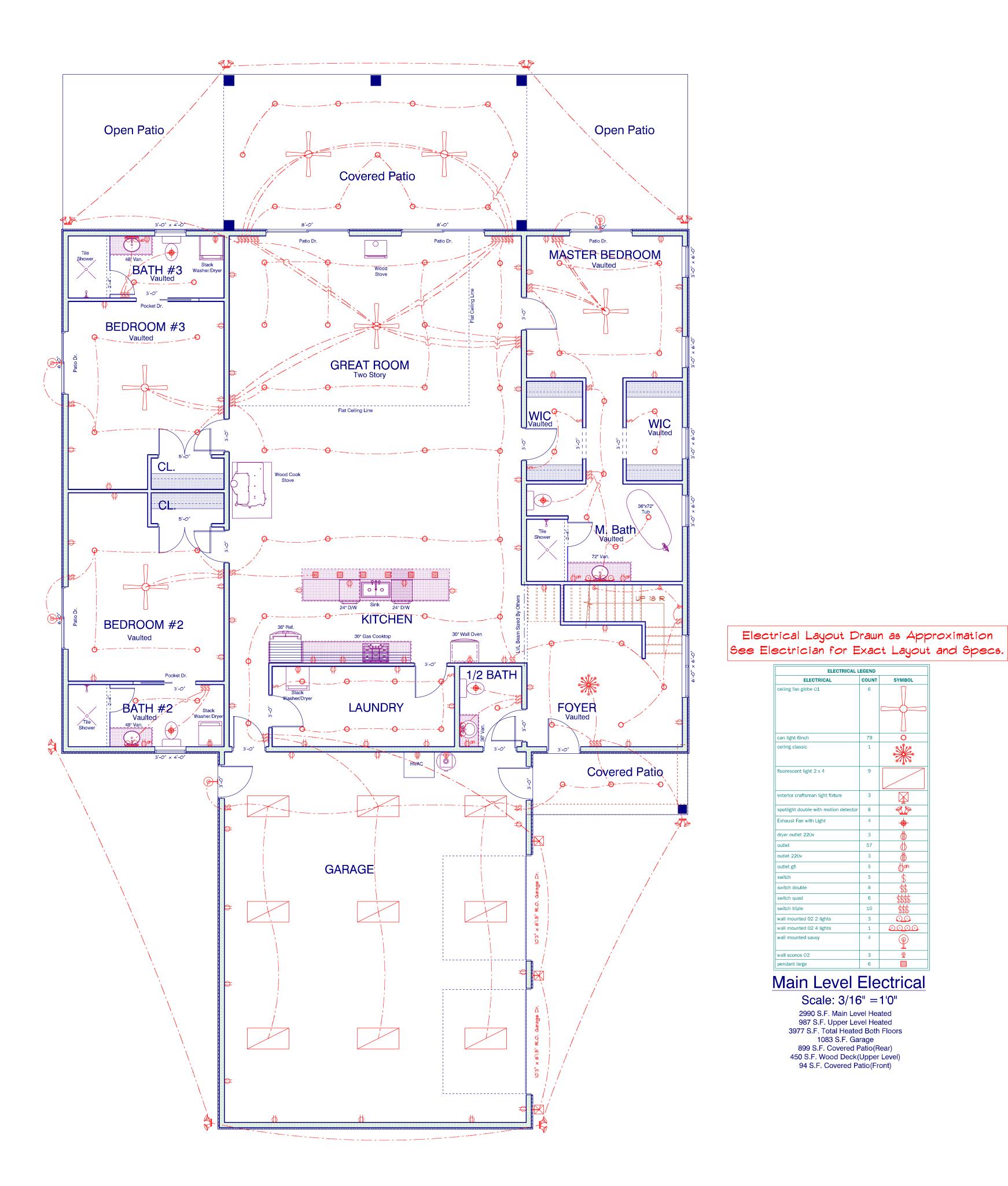
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(2018 NC BUILDING CODE), ENERGY
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Upper Level Layout

SHEET

6



ELECTRICAL LEGEND

57 3 5

5

8 6 10

Scale: 3/16" = 1'0"

2990 S.F. Main Level Heated 987 S.F. Upper Level Heated 3977 S.F. Total Heated Both Floors

1083 S.F. Garage 899 S.F. Covered Patio(Rear) 450 S.F. Wood Deck(Upper Level)

94 S.F. Covered Patio(Front)

3 <u>0</u> 0

uorescent light 2 x 4

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Main Level **Electrical**

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THE REQUIREMENT FOR LEAD-FREE PIPING.

SHEET

Wood Deck OPEN BELOW Sloped Ceiling Sloped Ceiling 42" High Kneewall with Cap Sloped Ceiling **OPEN TO BELOW** Sloped Ceiling STOR. Electrical Drawn as Approximation Consult Electrician for Exact Layout and Specs. ELECTRICAL LEGEND 2 **Upper Level Electrical** Scale: 3/16" = 1'0"
987 S.F. Heated Upper Level

Attempted to Establish an Accurate set of Construction Documents of the building based upon the Clients Requirements and the Local Building Codes. If the Client observes or becomes aware of any fault or defect in the product or Non-Conformance with the Construction Documents, Prompt Written Notice shall be given by the client to the Designer. The Client shall fold Harmless the Designer from all Errors and Ommision ertaining to the Documents related to the Project and other leated Work as Represented by the Designer to the Client client and the Client APPROVED BY

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Upper Level Electrical

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INCLUDING THE INTERNATIONAL BUILDING CODE COUNCIL

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APPENDIX M **WOOD DECKS**

This appendix is a North Carolina addition to the 2009 International Residential Code. (The provisions contained in this appendix are adopted as part of this code.)

GENERAL

AM101.1 General. A deck is an exposed exterior wood floor structure which may be attached to the structure or freestanding. Roofed porches (open or screened-in) may be constructed using these provisions.

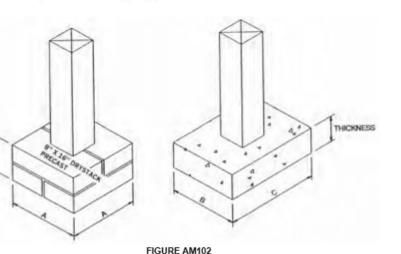
AM101.2 Deck design. Computer deck design programs may be accepted by the code enforcement official.

SECTION AM102 FOOTERS

AM102.1 Footers. Support post shall be supported by a minimum footing per Figure AM102 and Table AM102.1. Minimum footing depth shall be 12-inches below finished grade per Section R403.1.4. Tributary area is calculated per Figure



AM103.1 Flashing. When attached to a structure, the structure to which attached shall have a treated wood band for the length of the deck, or corrosion-resistant flashing shall be used to prevent moisture from coming in contact with the untreated framing of the structure. Aluminum flashing shall not be used in conjunction with deck construction. The deck band and the structure band shall be constructed in contact with each other except on brick veneer structures and where plywood sheathing is required and properly flashed. Siding shall not be installed between the structure and the deck band. If attached to a brick structure, neither the flashing nor a treated band for brick structure is required. In addition, the treated deckband shall be constructed in contact with the brick veneer. Flashing shall be installed per Figure AM103.



TARLE AM102 1

SIZE (in	ches)	TRIBUTARY AREA	THICKNESS (inches)	
AxA	BxC	(sq. ft.)	Precast	Cast-in-Place
8 × 16	8 × 16	36	4	6
12 × 12	12 × 12	40	4	6
16 × 16	16 × 16	70	8	8
2113	16 × 24	100	<u> </u>	8
_	24 × 24	150	_	8

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m². a. Footing values are based on single floor and roof loads Support post must rest in center 1/2 of footer c. Top of footer shall be level for full bearing support of post

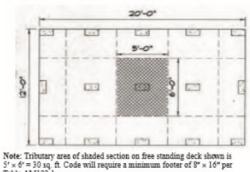


FIGURE AM102.1

DECK ATTACHMENT

AM104.1 Deck attachment. When a deck is supported at the structure by attaching the deck to the structure, the following attachment schedules shall apply for attaching the deck band to

METHOD	FASTENERS	8' MAX JOIST SPAN"	16' MAX JOIST SPAN"
1	5/3" Hot dipped galv. bolts with nut and washerb and 12d Common hot dipped galv. nails ^c	1 @ 3'-6" o.c. and 2 @ 8" o.c.	1 @ 1'-8" o.c. and 3 @ 6" o.c
	OR		
2	Self-drilling screw fastenerd	12" o.c staggered	6" o.c stargered

Attachment interpolation between 8 foot and 16 foot joists span is allowed.

b. Minimum edge distance for bolts is 21/2 inches.

c. Nails must penetrate the supporting structure band a minimum of 1½ inches.
d. Self-drilling acrew fastener shall be an approved acrew having a minimum shank diameter of 0.195" and a length long enough to penetrate through the supporting structure band. The structure band shall have a minimum depth of 14. Screw shall have an evaluated allowable shear load for Southern Pine to Southern Pine lumber of 250 pounds and shall have a corrosion resistant finish equivalent to hot dipped galvanized. Minimum edge distance for screws is $14_{\perp s}$." A maximum of $4_{\perp s}$ thick wood structural panel is pe to be located between the deck ledger and the structure band.

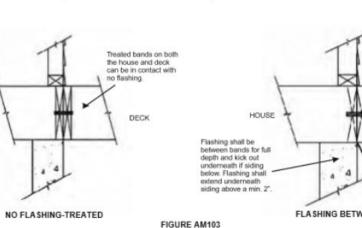
FA STENERS	8' MAX JOIST SPAN"	16' MAX JOIST SPAN
5/3" Hot dipped galv. bolts with nut and washer ^b	1@ 2'-4" o.c.	1@ 1'-4" o.c.

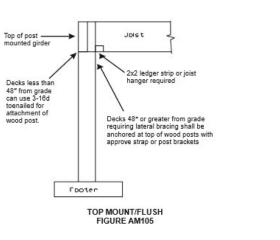
 Minimum edge distance for bolts is 2¹/₂ inches. AM104.1.3 Masonry ledge support. If the deck band is supported by a minimum of 1/2 inch masonry ledge along the foundation wall, 5/4 inch hot dipped galvanized bolts with washers spaced at 48 inches o.c. may be used for support.

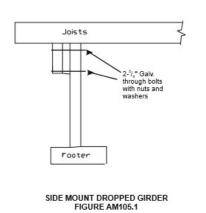
AMI04.1.4 Other means of support. Joist hangers or other means of attachment may be connected to house band and shall be properly flashed.

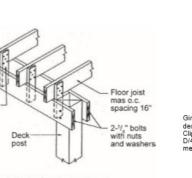
GIRDER SUPPORT AND SPAN

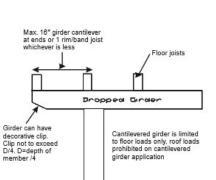
AM105.1 Girder support and span. Girders shall bear eral displacement or be connected to the side of posts with two sinch hot dipped galvanized bolts with nut and washer. Girder spans are per Tables R502.5(1) and (2). Girder support may be installed per Figure AM105 for top mount; Figure AM105.1 for side mount and Figure AM105.2 for split girder detail. Girders may also be cantilevered off ends of support post no more than 1 joist spacing or 16 inches, whichever is greater per











Footer

SECTION AM107

SPLIT GIRDER DETAIL FIGURE AM105.2

CANTILEVERED DROPPED GIRDER DETAIL

19.2" o.c.

24"-36" o.c.

SECTION AM106 JOIST SPANS AND CANTILEVERS

AM106.1 Joist spans and cantilevers. Joists spans shall be based upon Table R502.3.1(2) with 40 lbs per sq. ft. live load and 10 lbs per sq. ft. dead load. Floor joists for exterior decks may be cantilevered per Table R502.3.3 (1).

AM107.1 Floor decking. Floor decking shall be No. 2 grade treated Southern Pine or equivalent. The minimum floor deck-ing thickness shall be as follows: DECKING (nominal)

1" T&G

11/4" S4S

2" S4S

SECTION AM108

POST	POST SIZE	
as follows:	num height of deck support posts	4x4
Post size ^a	Max. Post Height ^{b,o}	6x6
4x4 6x6	8'-0" 20'-0"	AM109.
a. This table is based on No. 2 South	nern Pine posts.	decks or for attac

b. From top of footing to bottom of girder. c. Decks with post heights exceeding these requirements shall be designed by a

SECTION AM109 DECK BRACING

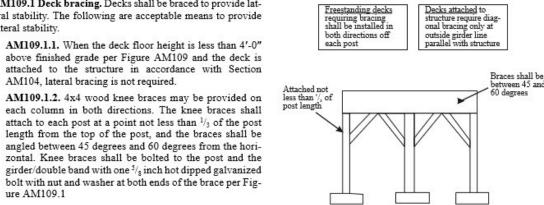
AM109.1 Deck bracing. Decks shall be braced to provide lateral stability. The following are acceptable means to provide lateral stability.

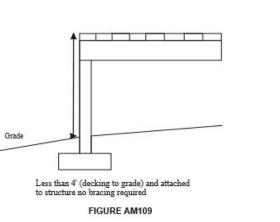
AM109.1.1. When the deck floor height is less than 4'-0" above finished grade per Figure AM109 and the deck is attached to the structure in accordance with Section AM104, lateral bracing is not required. AM109.1.2. 4x4 wood knee braces may be provided on each column in both directions. The knee braces shall attach to each post at a point not less than 1/3 of the post length from the top of the post, and the braces shall be angled between 45 degrees and 60 degrees from the horizontal. Knee braces shall be bolted to the post and the girder/double band with one 5/8 inch hot dipped galvanized

AM109.1.3. For freestanding decks without knee braces or diagonal bracing, lateral stability may be provided by embedding the post in accordance with Figure AM109.2

POST SIZE	MAXIMUM TRIBUTARY AREA	MAXIMUM POST HEIGHT	EMBEDMENT DEPTH	CONCRETE DIAMETER
4x4	48 SF	4'-0"	2'-6"	1'-0"
6x6	120 SF	6'-0"	3'-6"	1'-8"

AM109.1.4. 2x6 diagonal vertical cross bracing may be provided in two perpendicular directions for freestanding decks or parallel to the structure at the exterior column line for attached decks. The 2x6's shall be attached to the posts with one 5/8 inch hot dipped galvanized bolt with nut and washer at each end of each bracing member per Figure AM109.1.5. For embedment of piles in Coastal Regions, see Chapter 45.





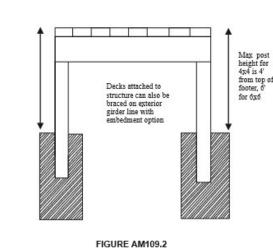
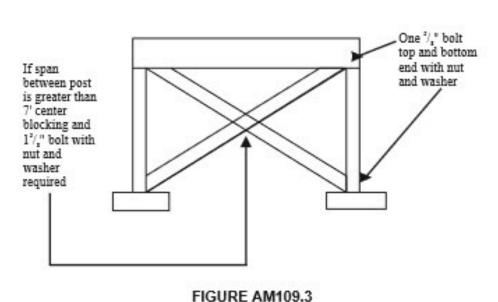
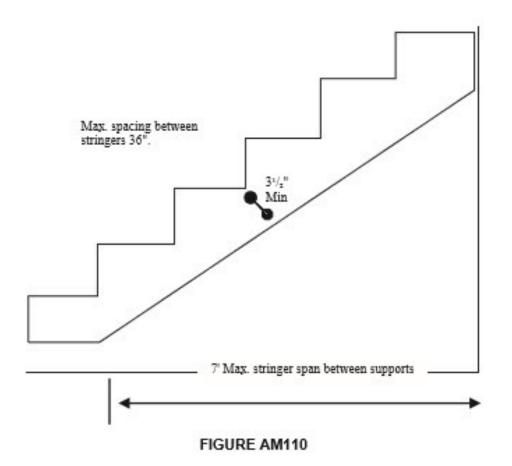


FIGURE AM109.1



SECTION AM110 STAIRS

AM110.1 Stairs shall be constructed per Figure AM110. Stringer spans shall be no greater than 7 foot span between supports. Spacing between stringers shall be based upon decking material used per AM107.1. Each Stringer shall have minimum 31/2 inches between step cut and back of stringer. If used, suspended headers shall shall be attached with 3/8 inch galvinized bolts with nuts and washers to securely support stringers at the



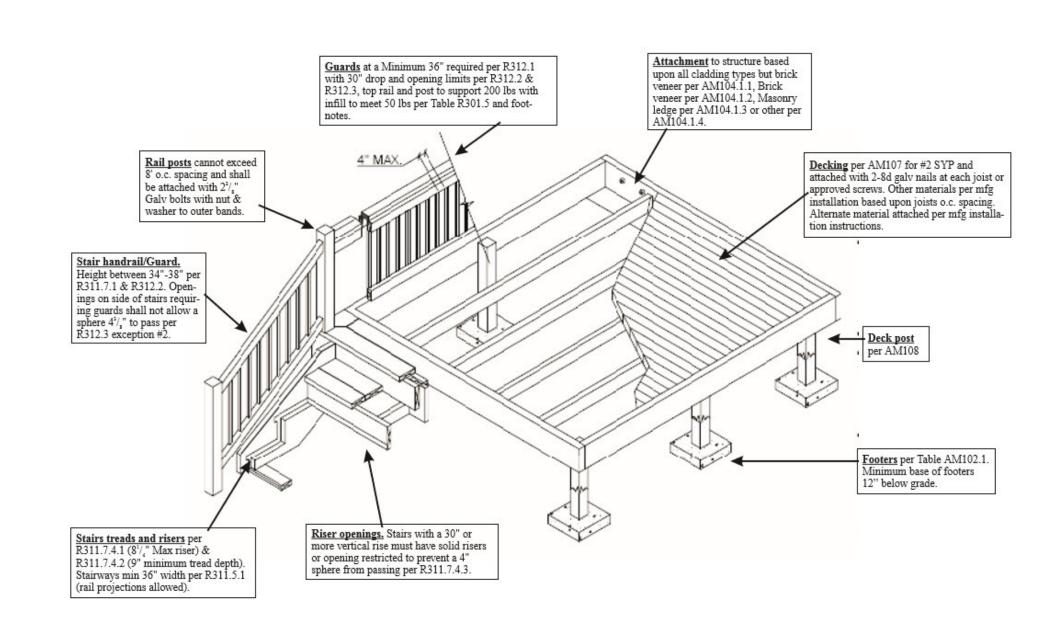
SECTION AM111 HANDRAILS, GUARDS AND GENERAL

AM111.1 Handrails, guards and general. Deck handrails, guards and general construction shall be per Figure AM111.

TABLE R507.5 DECK JOIST SPANS FOR COMMON LUMBER SPECIES' (ft. - in.)

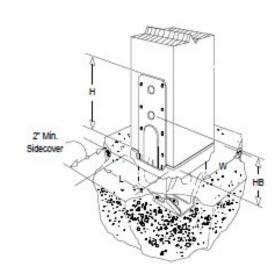
SPECIES*	SIZE	SPACING OF DECK JOISTS WITH NO CANTILEVER®			SPACING OF DI	ECK JOISTS WITH (inches)	CANTILEVERS
		12	16	24	12	16	24
9.1	2 × 6	9-11	9-0	7-7	6-8	6-8	6-8
Southern pine	2 × 8	13-1	11-10	9-8	10-1	10-1	9-8
	2 × 10	16-2	14-0	11-5	14-6	14-0	11-5
	2 × 12	18-0	16-6	13-6	18-0	16-6	13-6
Douglas fir-larch ^d , hem-fir ^d spruce-pine-fir ^d	2 × 6	9-6	8-8	7-2	6-3	6-3	6-3
	2 × 8	12-6	11-1	9-1	9-5	9-5	9-1
	2 × 10	15-8	13-7	11-1	13-7	13-7	11-1
	2 × 12	18-0	15-9	12-10	18-0	15-9	12-10
Deduced	2 × 6	8-10	8-0	7-0	5-7	5-7	5-7
Redwood, western cedars,	2 × 8	11-8	10-7	8-8	8-6	8-6	8-6
ponderosa pinee,	2 × 10	14-11	13-0	10-7	12-3	12-3	10-7
red pine ^e	2 × 12	17-5	15-1	12-4	16-5	15-1	12-4

- For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.
- No. 2 grade with wet service factor.
- b. Ground snow load, live load = 40 psf, dead load = 10 psf, $L/\Delta = 360$.
- c. Ground snow load, live load = 40 psf, dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever with a 220-pound point load applied to end.
- d. Includes incising factor.
- e. Northern species with no incising factor
- Cantilevered spans not exceeding the nominal depth of the joist are permitted.



Floor joist cantilevers allowed per Table R502.3.3(1)

FIGURE AM111



Installation:

- . Embed into wet concrete up to the bottom of the 1" standoff base plate. A 2" minimum side cover is required to obtain the full load. Holes in the bottom of the straps allow for free concrete flow.
- Allow concrete to cure before installation of the post.

Typical PBS

	Dimensions (in.)				Post Fasteners			
Model No.				ш	Martin	en e	Machin	ne Bolts
	W	L	Н	НВ	Nails	SD Screws	Qty.	Dia.
PBS44AHDG	3 9/16	3 1/2	6 1/4	3 7/16	14-16d	14-SD #10x11/2	2	1/2
PBS66HDG	5 1/2	5 3/8	6 1/2	3 11/16	14-16d	-	2	1/2

Lateral Bracing per AM 109. AM109.1.1 height required; AM109.1.2 knee bracing; AM109.1.3 freestanding

embedment; AM109.1.4 diagonal brac-ing; AM109.1.5 Coastal embedment.

"I DO HEREBY CERTIFY THAT THIS DRAWING OR PLAN AND RELATED SPECIFICATIONS MEET ALL LOCAL REQUIREMENTS AND ARE IN SUBSTANTIAL CONFORMITY WITH BOTH SAH AND VA MINIMUM PROPERTY REQUIREMENTS INCLUDING THE INTERNATIONAL BUILDING CODE COUNCIL (2018 NC BUILDING CODE), ENERGY CONSERVATION STANDARDS OF THE 2018 COUNCIL OF

AMERICAN BUILDING OFFICIALS, MODEL ENERGY CODE AND THE REQUIREMENT FOR LEAD-FREE PIPING.







RESIDENCE: FD-3977

AUG_2024

DRAWN BY:

Deck **Details**

SHEET

^{1.} Refer to current Wood Construction Connectors catalog for additional information.