

**SECTION R402
MATERIALS**

R402.1 Wood foundations. Wood foundation systems shall be designed and installed in accordance with the provisions of this code.

R402.1.1 Fasteners. Fasteners used below *grade* to attach plywood to the exterior side of exterior *basement* or crawl-space wall studs, or fasteners used in knee wall construction, shall be of Type 304 or 316 stainless steel. Fasteners used above *grade* to attach plywood and all lumber-to-lumber fasteners except those used in knee wall construction shall be of Type 304 or 316 stainless steel, silicon bronze, copper, hot-dipped galvanized (zinc coated) steel nails, or hot-tumbled galvanized (zinc coated) steel nails. Electro-galvanized steel nails and galvanized (zinc coated) steel staples shall not be permitted.

R402.1.2 Wood treatment. All lumber and plywood shall be pressure-preservative treated and dried after treatment in accordance with AWP A U1 (Commodity Specification A, Use Category 4B and Section 5.2), and shall bear the *label* of an accredited agency. Where lumber and/or plywood is cut or drilled after treatment, the treated surface shall be field treated with copper naphthenate, the concentration of which shall contain a minimum of 2-percent copper metal, by repeated brushing, dipping or soaking until the wood absorbs no more preservative.

R402.2 Concrete. Concrete shall have a minimum specified compressive strength of f'_c , as shown in Table R402.2. Concrete subject to moderate or severe weathering as indicated in Table R301.2(1) shall be air entrained as specified in Table R402.2. The maximum weight of fly ash, other pozzolans, silica fume, slag or blended cements that is included in concrete mixtures for garage floor slabs and for exterior porches, carport slabs and steps that will be exposed to deicing chemicals shall not exceed the percentages of the total weight of cementitious materials specified in Section 19.3.3.4 of ACI 318. Materials used to produce concrete and testing thereof shall comply with the applicable standards listed in Chapters 19 and 20 of ACI 318 or ACI 332.

R402.2.1 Materials for concrete. Materials for concrete shall comply with the requirements of Section R608.5.1.

R402.3 Precast concrete. Precast concrete foundations shall be designed in accordance with Section R404.5 and shall be installed in accordance with the provisions of this code and the manufacturer's instructions.

R402.3.1 Precast concrete foundation materials. Materials used to produce precast concrete foundations shall meet the following requirements.

1. All concrete used in the manufacture of precast concrete foundations shall have a minimum compressive strength of 5,000 psi (34 470 kPa) at 28 days. Concrete exposed to a freezing and thawing environment shall be air entrained with a minimum total air content of 5 percent.
2. Structural reinforcing steel shall meet the requirements of ASTM A615, A706 or A996. The minimum yield strength of reinforcing steel shall be 40,000 psi (Grade 40) (276 MPa). Steel reinforcement for precast concrete foundation walls shall have a minimum concrete cover of $\frac{3}{4}$ inch (19.1 mm).
3. Panel-to-panel connections shall be made with Grade II steel fasteners.
4. The use of nonstructural fibers shall conform to ASTM C1116.
5. Grout used for bedding precast foundations placed upon concrete footings shall meet ASTM C1107.

R402.4 Masonry. Masonry systems shall be designed and installed in accordance with this chapter and shall have a minimum specified compressive strength of 1,500 psi (10.3 MPa).

**SECTION R403
FOOTINGS**

R403.1 General. All exterior walls shall be supported on continuous solid or fully grouted masonry or concrete footings, crushed stone footings, wood foundations, or other

**TABLE R402.2
MINIMUM SPECIFIED COMPRESSIVE STRENGTH OF CONCRETE**

TYPE OR LOCATION OF CONCRETE CONSTRUCTION	MINIMUM SPECIFIED COMPRESSIVE STRENGTH ^a (f'_c)		
	Weathering Potential ^b		
	Negligible	Moderate	Severe
Basement walls, foundations and other concrete not exposed to the weather	2,500	2,500	2,500 ^c
Basement slabs and interior slabs on grade, except garage floor slabs	2,500	2,500	2,500 ^c
Basement walls, foundation walls, exterior walls and other vertical concrete work exposed to the weather	2,500	3,000 ^d	3,000 ^d
Porches, carport slabs and steps exposed to the weather, and garage floor slabs	2,500	3,000 ^{d, e, f}	3,500 ^{d, e, f}

For SI: 1 pound per square inch = 6.895 kPa.

a. Strength at 28 days psi.

b. See Table R301.2(1) for weathering potential.

c. Concrete in these locations that is subject to freezing and thawing during construction shall be air-entrained concrete in accordance with Footnote d.

d. Concrete shall be air-entrained. Total air content (percent by volume of concrete) shall be not less than 5 percent or more than 7 percent.

e. See Section R402.2 for maximum cementitious materials content.

f. For garage floors with a steel-troweled finish, reduction of the total air content (percent by volume of concrete) to not less than 3 percent is permitted if the specified compressive strength of the concrete is increased to not less than 4,000 psi.

approved structural systems which shall be of sufficient design to accommodate all loads according to Section R301 and to transmit the resulting loads to the soil within the limitations as determined from the character of the soil. Footings shall be supported on undisturbed natural soils or engineered fill. Concrete footing shall be designed and constructed in accordance with the provisions of Section R403 or in accordance with ACI 332.

R403.1.1 Minimum size. The minimum width, W, and thickness, T, for concrete footings shall be in accordance with Tables R403.1(1) through R403.1(3) and Figure R403.1(1) as applicable. Minimum sizes for concrete and masonry footings shall also be required to provide adequate resistance to uplift and overturn of the building as determined from Table R401.1 and Section R403.1.2 or as calculated using engineered design in accordance with the *Florida Building Code, Building*. The footing width shall be based on the load-bearing value of the soil in accordance with Table R401.4.1. Footing projections, P, shall be not less than 2 inches (51 mm) and shall not exceed the thickness of the footing. Footing thickness and projection for fireplaces shall be in accordance with Section R1001.2. The size of footings supporting piers and columns shall be based on the tributary load and allowable soil pressure in accordance with Table R401.4.1. Footings for wood foundations shall be in accordance with the details set forth in Section R403.2, and Figures R403.1(2) and R403.1(3).

R403.1.2 Resistance to uplift. Uplift resistance of common foundations are given in Table R403.1.2. Uplift resistance of these foundations may be increased by increasing the size of the concrete footing. When determining the modified uplift resistance the added weight shall be reduced by multiplying by a factor of 0.6. Other foundation systems shall be engineered in accordance with the *Florida Building Code, Building*.

R403.1.4 Minimum depth. Exterior footings shall be placed not less than 12 inches (305 mm) below the undisturbed ground surface. Where applicable, the depth of footings shall also conform to Sections R403.1.4.1 through R403.1.4.2.

R403.1.4.1 Frost protection. Except where otherwise protected from frost, foundation walls, piers and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods:

1. Extended below the frost line specified in Table R301.2.(1).
2. Constructed in accordance with Section R403.3.
3. Constructed in accordance with ASCE 32.
4. Erected on solid rock.

Exceptions:

1. Protection of freestanding *accessory structures* with an area of 600 square feet (56 m²) or less, of light-frame construction, with an eave height of 10 feet (3048 mm) or less shall not be required.

2. Protection of freestanding *accessory structures* with an area of 400 square feet (37 m²) or less, of other than light-frame construction, with an eave height of 10 feet (3048 mm) or less shall not be required.
3. Decks not supported by a dwelling need not be provided with footings that extend below the frost line.

Footings shall not bear on frozen soil unless the frozen condition is permanent.

R403.1.5 Slope. The top surface of footings shall be level. The bottom surface of footings shall not have a slope exceeding one unit vertical in 10 units horizontal (10-percent slope). Footings shall be stepped where it is necessary to change the elevation of the top surface of the footings or where the slope of the bottom surface of the footings will exceed one unit vertical in 10 units horizontal (10-percent slope).

R403.1.6 Foundation anchorage. Wood sill plates and wood walls supported directly on continuous foundations shall be anchored to the foundation in accordance with this section.

Cold-formed steel framing shall be anchored directly to the foundation or fastened to wood sill plates anchored to the foundation. Anchorage of cold-formed steel framing and sill plates supporting cold-formed steel framing shall be in accordance with this section and Section R505.3.1 or R603.3.1.

Wood sole plates at all exterior walls on monolithic slabs, wood sole plates of *braced wall panels* at building interiors on monolithic slabs and all wood sill plates shall be anchored to the foundation with minimum 1/2-inch-diameter (12.7 mm) anchor bolts spaced a maximum of 6 feet (1829 mm) on center or *approved* anchors or anchor straps spaced as required to provide equivalent anchorage to 1/2-inch-diameter (12.7 mm) anchor bolts. Bolts shall extend a minimum of 7 inches (178 mm) into concrete or grouted cells of concrete masonry units. The bolts shall be located in the middle third of the width of the plate. A nut and washer shall be tightened on each anchor bolt. There shall be a minimum of two bolts per plate section with one bolt located not more than 12 inches (305 mm) or less than seven bolt diameters from each end of the plate section. Interior bearing wall sole plates on monolithic slab foundation that are not part of a *braced wall panel* shall be positively anchored with *approved* fasteners. Sill plates and sole plates shall be protected against decay and termites where required by Sections R317 and R318.

Exceptions:

1. Walls 24 inches (610 mm) total length or shorter connecting offset braced wall panels shall be anchored to the foundation with a minimum of one anchor bolt located in the center third of the plate section and shall be attached to adjacent braced wall panels at corners as shown in Item 9 of Table R602.3(1).

*

THIS ITEM HAS BEEN ELECTRONICALLY SIGNED AND SEALED BY MARK V. RICHTER, P.E. USING A DIGITAL SIGNATURE. PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

03-30-2020

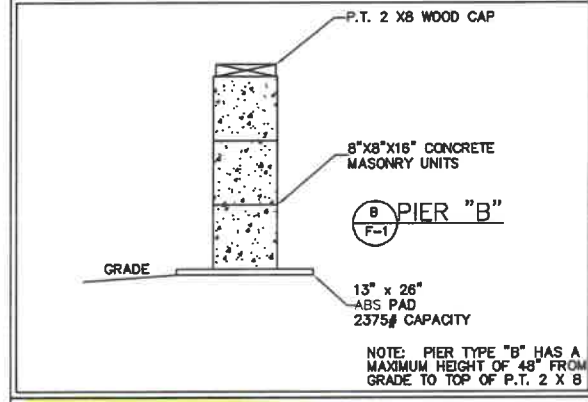
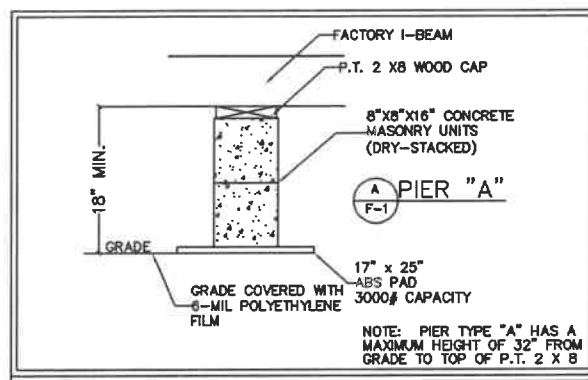
SENYB ENGINEERING, LLC
CA LIC. NO: 30244



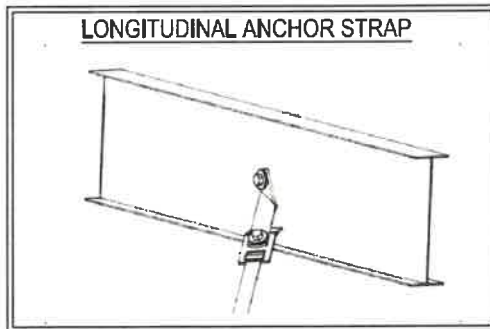
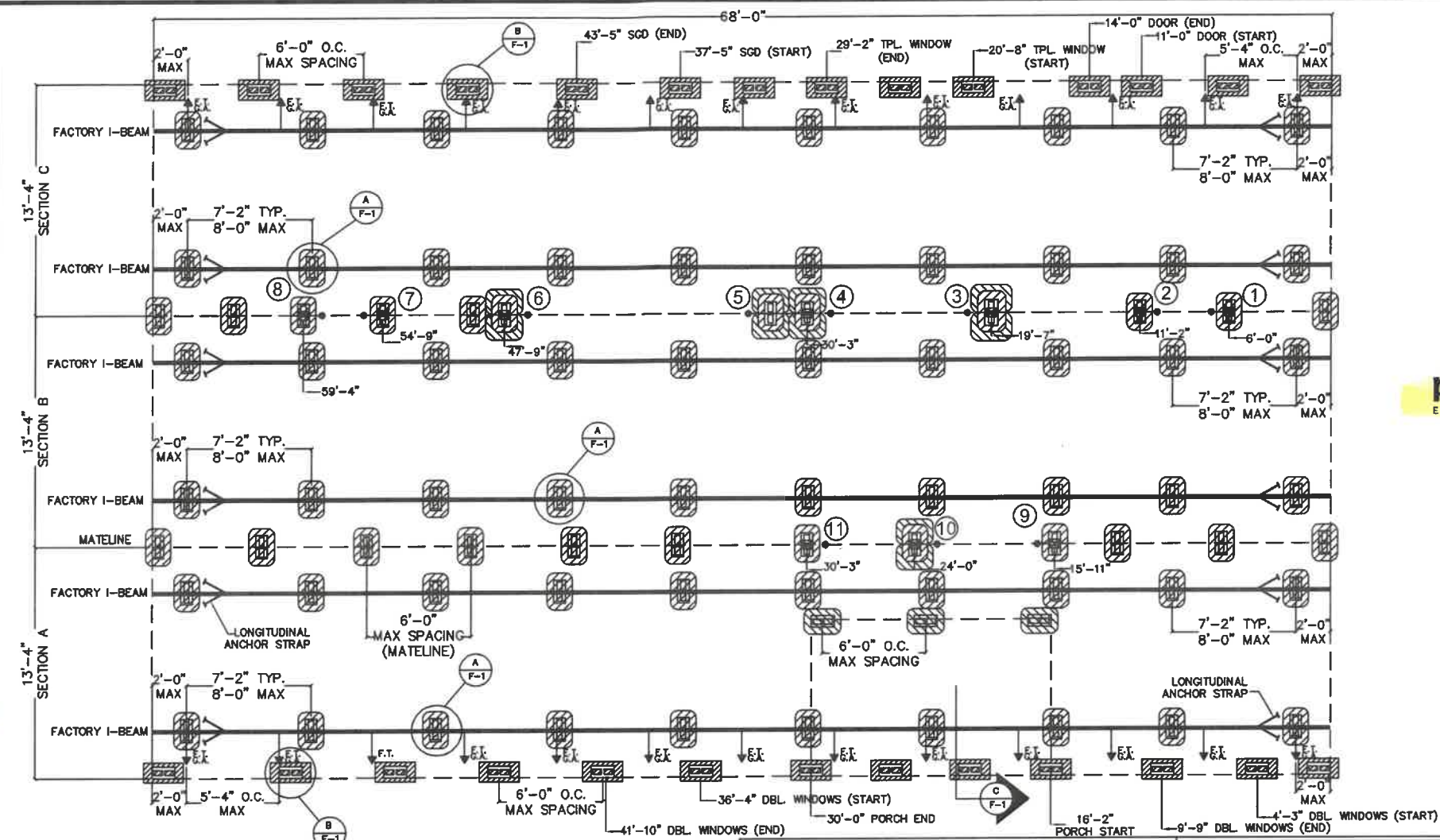
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Date: 2020.03.30 17:16:57 -04'00'

COLUMN LOADS

- ① = 1894 LBS.
- ② = 1894 LBS.
- ③ = 3912 LBS.
- ④ = 4094 LBS.
- ⑤ = 6264 LBS.
- ⑥ = 6080 LBS.
- ⑦ = 1650 LBS.
- ⑧ = 1680 LBS.
- ⑨ = 2902 LBS.
- ⑩ = 5286 LBS.
- ⑪ = 2200 LBS.



- STRUCTURAL LOAD LIMITATIONS:**
CODE EDITION: 2017 FLORIDA BUILDING CODE (6TH EDITION) & ASCE 7-16
- ULTIMATE DESIGN WIND SPEED: 140 mph WIND SPEED
 - NOMINAL DESIGN WIND SPEED: 108 mph WIND SPEED
 - WIND EXPOSURE CATEGORY: "C"
 - IMPORTANCE FACTOR: 1.0
 - DESIGN ROOF LIVE LOAD: 20 PSF
 - DESIGN FLOOR LIVE LOAD: 40 PSF
 - MIN. ASSUMED SOIL BEARING CAPACITY: 1500 PSF
 - OCCUPANCY CLASSIFICATION: R3
 - CONSTRUCTION TYPE: VB
 - THIS BUILDING IS NOT DESIGNED FOR PLACEMENT IN A HIGH VELOCITY HURRICANE ZONE AS DEFINED BY THE FBC.
 - THIS BUILDING IS NOT DESIGNED TO BE SUBMERGED OR SUBJECT TO WAVE ACTION WHEN LOCATED IN A FLOOD PRONE OR ZONE AREA. THE BOTTOM OF THE STRUCTURAL I-BEAM MUST BE LOCATED ABOVE THE BUILDING SITE FLOOD PLANE LEVEL FOR THIS BUILDING TO BE LOCATED IN A FLOOD PRONE OR ZONE AREA OR THE GRADE AT THE BUILDING SITE MUST BE ABOVE THE FLOOD PLANE LEVEL.



LEGEND

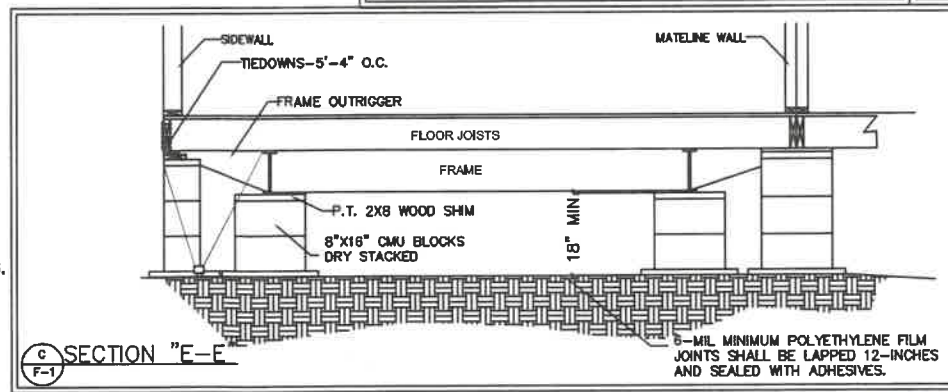
- 17.5"x25.5" ABS PAD = 3000 LBS. CAPACITY
- 13"x26" ABS PAD = 2375 LBS. CAPACITY
- (3) 17.5"x25.5" ABS PAD = 6000 LBS. CAPACITY (TOP PAD IS LAID IN THE OPPOSITE DIRECTION TO THE BOTTOM PADS)

SYMBOLS

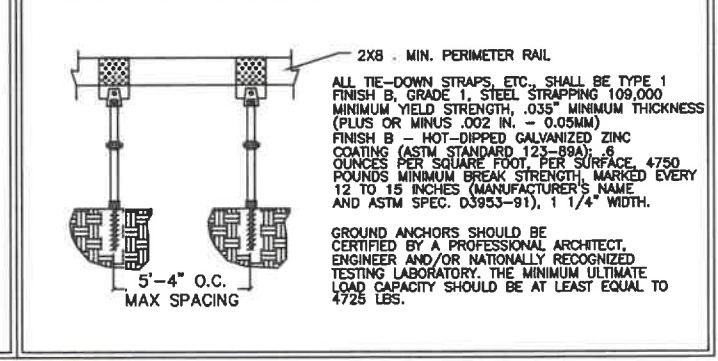
- F.T. -FRAME TIE-DOWN FASTENED TO GROUND ANCHOR
- G.A. -COLUMN ANCHOR STRAP FASTENED TO GROUND ANCHOR
- LONGITUDINAL ANCHOR STRAP LOCATIONS

FOUNDATION NOTES:

- BLOCKING SPACING BASED ON 20PSF LIVE LOAD ON ROOF AND 1500 PSF SOIL BEARING CAPACITY.
- CONCRETE BLOCKS ARE ONLY RATED AT 8000 POUNDS, 8000 POUND PIERS OR HIGHER MUST BE DOUBLE BLOCKED.
- ALL SIDEWALL ANCHORS ARE SPACED PER PLAN AND FOUR FOOT GROUND ANCHOR MAY BE USED.
- WOOD SHIMS MAY BE INSTALLED WHEN NECESSARY BETWEEN THE I-BEAM AND THE TOP OF THE PIER. SHIMS SHALL BE FREE OF KNOTS, SPLITS, AND SIMILAR IMPERFECTIONS. SHIMS SHALL BE OF P.T. LUMBER, CEDAR, OR ABS AND BEARING AT ALL CONTACT POINTS SHALL NOT BE LESS THAN 2/3 OF THE BEARING PRIOR TO ADDING THE SHIMS.
- ALL TIE DOWN ANCHORS SHALL HAVE A MINIMUM 4,725 LB. ULTIMATE CAPACITY AND SHALL BE INSTALLED PER THE MANUFACTURER'S SPECIFICATIONS.
- THE STEEL FRAME OF HOME IS NOT FOR USE OF RELOCATION OF HOME AFTER SETUP, AND IS INTENDED FOR USE AS A PERMANENT FOUNDATION.
- ALL PIERS SHALL BE CONSTRUCTED OF 8" X 8" X 16" CONCRETE MASONRY UNITS CONFORMING TO ASTM C90.
- INSTALL BLOCK PIER ON EACH SIDE OF ALL EXTERIOR DOOR OPENINGS.
- I-BEAM SUPPORT PIERS MAY BE INSTALLED LATERALLY (90 DEGREES FROM THE ORIENTATION SHOWN ON THE FOUNDATION PLAN). MUST BE LOCATED DIRECTLY BELOW THE I-BEAM CENTERLINE.
- ALL MASONRY PIERS MAY BE INSTALLED IN A DRY STACK SUBJECT TO LOCAL JURISDICTION



GROUND ANCHOR INSTALLATION



Senyb Engineering Services
50 W. Central Ave, Ste. B
Lake Wales, FL 33853
Phone: 863-589-5980
Fax: 1-866-865-2044

THESE STANDARDS AND PLANS MEET THE 2017 F.B.C. - RESIDENTIAL (6TH EDITION)

V_{ULT} = ULTIMATE DESIGN WIND SPEED = 140 MPH (RISK CATEGORY II BUILDING)
V_{NOM} = NOMINAL DESIGN WIND SPEED = 108 MPH (RISK CATEGORY II BUILDING) (TABLE 1609.3.1)

MARK V. RICHTER, P.E. # 56196
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LAKE WALES, FL 33853
OFFICE: 863-589-5980



DRAWING INFORMATION

NAME: M.B.J.
DATE: 03-25-2020
SCALE: NOT PRINTED TO SCALE

CUSTOMER: COGBURN
ADDRESS: 5859 LAKE AVE., SANFORD, FL 32773
MODEL # 40684BMO: 40'-0" X 68'-0" - TRADEWINDS (ON-FRAME)

FOUNDATION PLAN AND DETAILS PROVIDED BY
SENYB ENGINEERING SERVICES
LAKE WALES, FLORIDA 33853

DESIGNED FOR 20 PSF ROOF LIVE LOAD AND 1500 PSF SOIL BEARING CAPACITY

F-1
SHEET 1 OF 1