



Larry Babbitt  
408 Bethel Church Rd.  
Harnett, NC 27501

## STRUCTURAL DESIGN

## ENCLOSED BUILDING

MAXIMUM 30'- 0" WIDE X 16'- 0" EAVE HEIGHT-  
BOX EAVE FRAME AND BOW FRAME

24 October 2018

Revision 1

M&A Project No. 17171S/18253S

Prepared for:

Carport Central, Inc.  
737 South Main Street  
Mt. Airy, NC 27030

Prepared by:

Moore and Associates Engineering and Consulting, Inc.

1009 East Avenue  
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MOORE AND ASSOCIATES  
ENGINEERING AND CONSULTING


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ENGINEERING AND CONSULTING, INC.

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PROJECT MGR: WSH

DATE: 10-24-18

SCALE: NTS

JOB NO:  
17171S/18253S



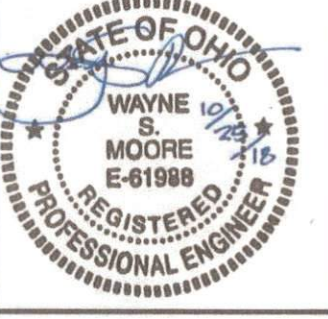

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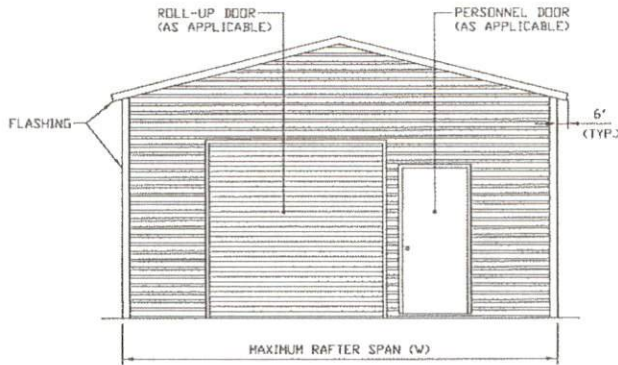
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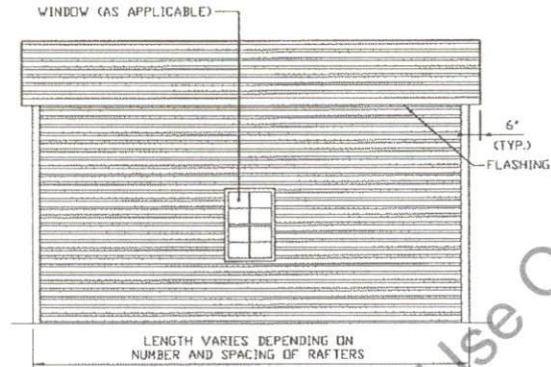
<p align="center"><b>MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.</b></p>	<p><b>DRAWN BY:</b> LT</p>	<p>Larry Babbitt 408 Bethel Church Rd. Harnett, NC 27501</p>		
	<p><b>CHECKED BY:</b> PDH</p>	<p><b>PROJECT MGR:</b> VSM</p>	<p><b>DATE:</b> 10-24-18</p>	<p><b>SCALE:</b> NTS</p>
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**BOX EAVE FRAME RAFTER STRUCTURE (Sheets 4, 5, 8, 9, 11, 12, 13, AND 15)**



**TYPICAL END ELEVATION-HORIZONTAL ROOF**

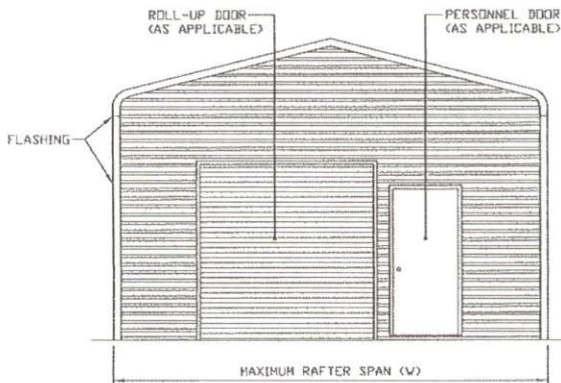
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**TYPICAL SIDE ELEVATION-HORIZONTAL ROOF**

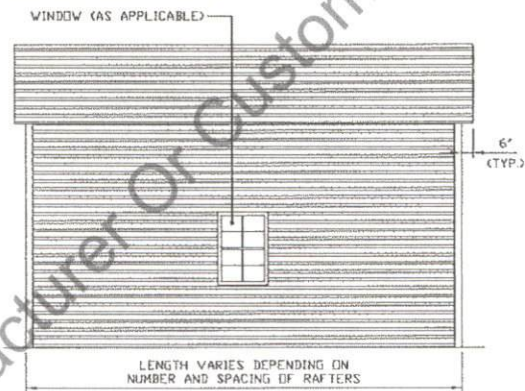
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**BOX FRAME RAFTER STRUCTURE (Sheets 6, 7, 8, 10, 11, 12, AND 14)**



**TYPICAL END ELEVATION**

SCALE: NTS



**TYPICAL END ELEVATION**

SCALE: NTS

**INSTALLATION NOTES AND SPECIFICATIONS**

1. DESIGN IS FOR MAXIMUM 30'-0" WIDE x 16'-0" EAVE HEIGHT ENCLOSED STRUCTURES.
2. DESIGN WAS DONE IN ACCORDANCE WITH THE 2018 NORTH CAROLINA BUILDING CODE, 2006 INTERNATIONAL BUILDING CODE (IBC), 2009 IBC, 2012 IBC, AND 2015 IBC.
3. DESIGN LOADS ARE AS FOLLOWS:
  - A) DEAD LOAD = 1.5 PSF
  - B) LIVE LOAD = 12 PSF
  - C) GROUND SNOW LOAD = 30 PSF (< 26'-0"), 35 PSF (26'-0" < W < 30'-0")
4. ULTIMATE WIND SPEED 105 TO 145 MPH (NOMINAL WIND SPEED 82 TO 113 MPH); MAXIMUM RAFTER/COLUMN AND END COLUMN SPACING = 5.0 FEET (UNLESS NOTED OTHERWISE).
5. END WALL COLUMNS (POST) ARE SIMILAR TO SIDE WALL POSTS UNLESS NOTED OTHERWISE.
6. LOW HAZARD RISK CATEGORY I (WIND).
7. WIND EXPOSURE CATEGORY B.
8. SPECIFICATIONS APPLICABLE TO 29 GAUGE METAL PANELS FASTENED DIRECTLY TO 2 1/2" x 2 1/2" - 14 GAUGE TUBE STEEL (TS) FRAMING MEMBERS (UNLESS NOTED OTHERWISE).
9. AVERAGE FASTENER SPACING ON-CENTERS ALONG RAFTERS OR HAT CHANNELS, AND COLUMNS (INTERIOR OR END) = 8 INCHES.
10. FASTENERS CONSIST OF 1/4"x3/4" (UNLESS OTHERWISE NOTED) SELF-DRILLING FASTENER (SDF), USE CONTROL SEAL WASHER WITH EXTERIOR FASTENERS. SPECIFICATIONS APPLICABLE ONLY FOR MEAN ROOF HEIGHT OF 20 FEET OR LESS, AND ROOF SLOPES OF 14" (3:12) PITCH OR LESS SPACING REQUIREMENTS FOR OTHER ROOF HEIGHTS AND/OR SLOPES MAY VARY.
11. GROUND ANCHORS SHALL BE INSTALLED THROUGH BASE RAIL WITHIN 6" OF EACH COLUMN.
12. GROUND ANCHORS CONSIST OF #4 REBAR W/ WELDED NUT x 36" LONG IN SUITABLE SOIL CONDITIONS. OPTIONAL ANCHORAGE MAY BE USED IN UNSUITABLE SOILS AND MUST BE USED IN UNSUITABLE SOILS AS NOTED.
13. WIND FORCES GOVERN OVER SEISMIC FORCES. SEISMIC PARAMETERS ANALYZED ARE:
  - SOIL SITE CLASS = D
  - RISK CATEGORY I/II/III
  - R = 3.25                      I<sub>E</sub> = 1.0
  - S<sub>DS</sub> = 2.039 g              V = C<sub>s</sub>W
  - S<sub>D1</sub> = 1.258 g

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SHT. 3

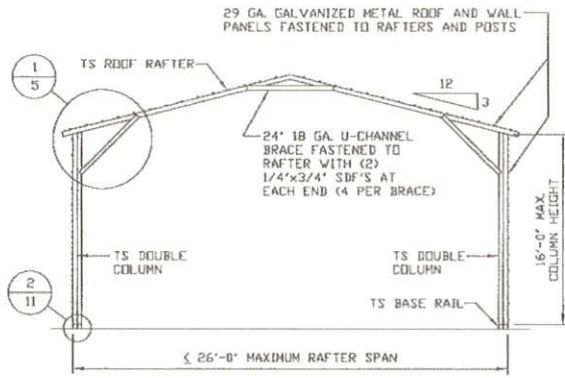
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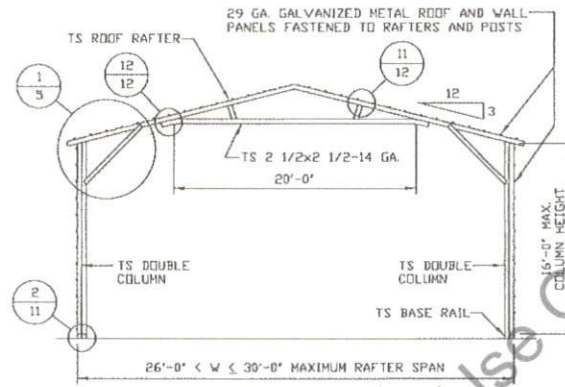
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171713/18253S

REV.: 1

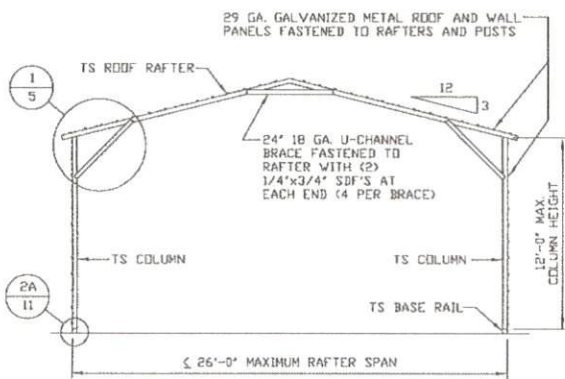
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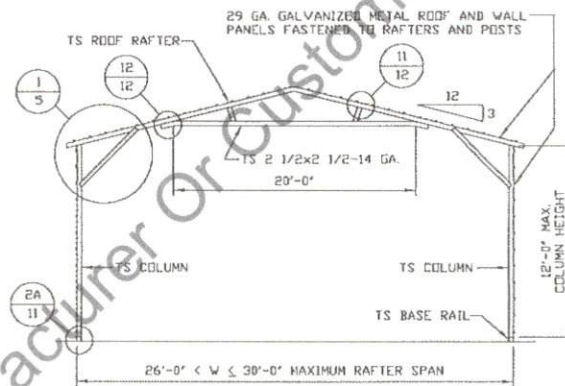
TYPICAL RAFTER/COLUMN END FRAME SECTION  
SCALE: NTS



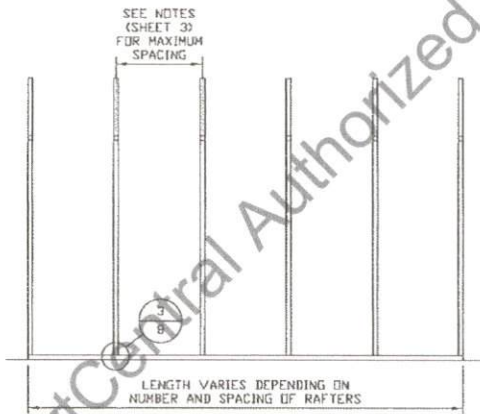
TYPICAL RAFTER/COLUMN END FRAME SECTION  
SCALE: NTS



TYPICAL RAFTER/COLUMN END FRAME SECTION  
SCALE: NTS



TYPICAL RAFTER/COLUMN END FRAME SECTION  
SCALE: NTS



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION  
SCALE: NTS

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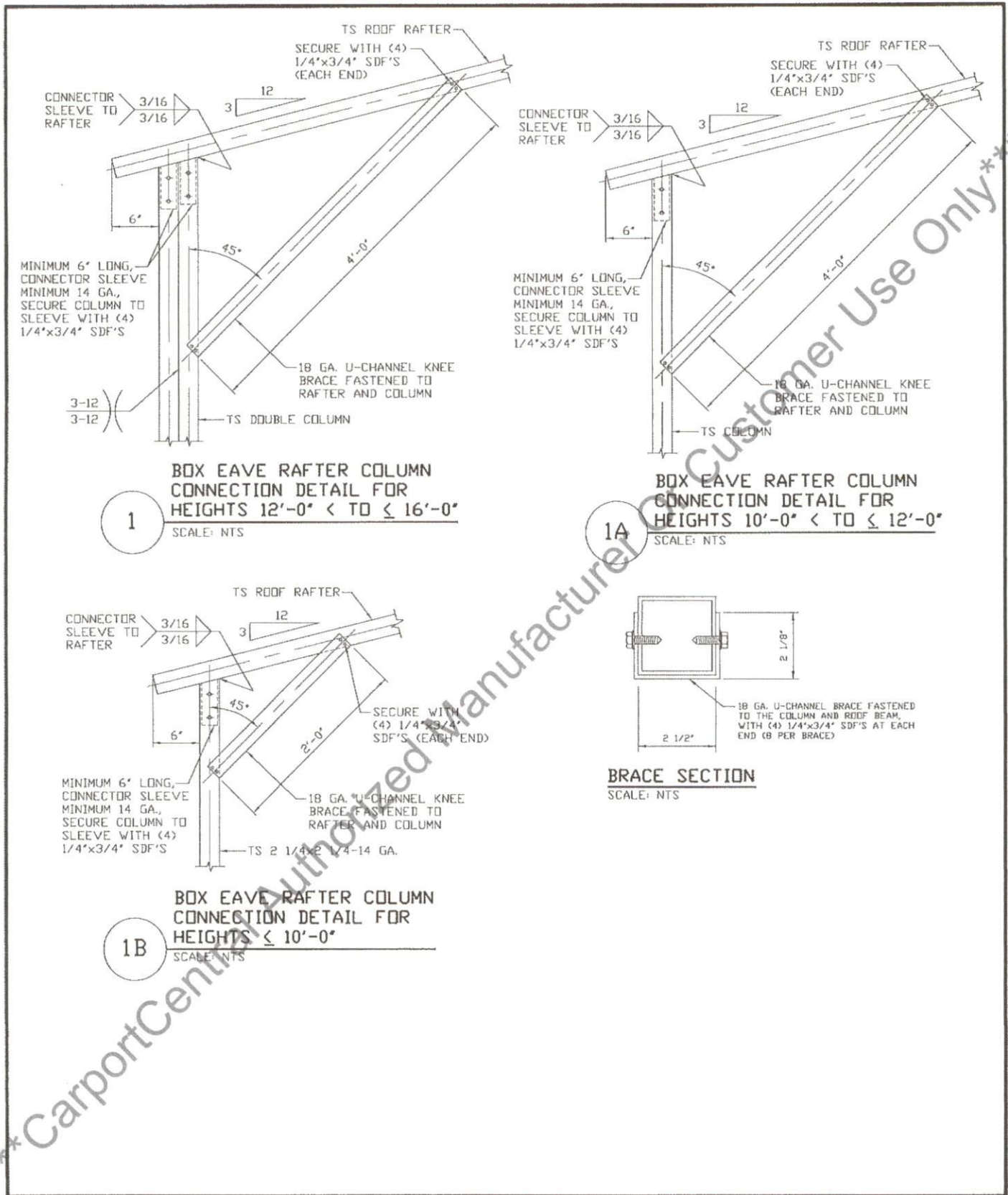
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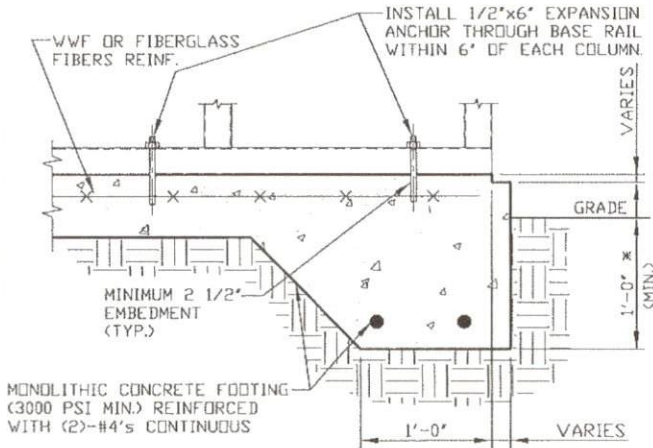
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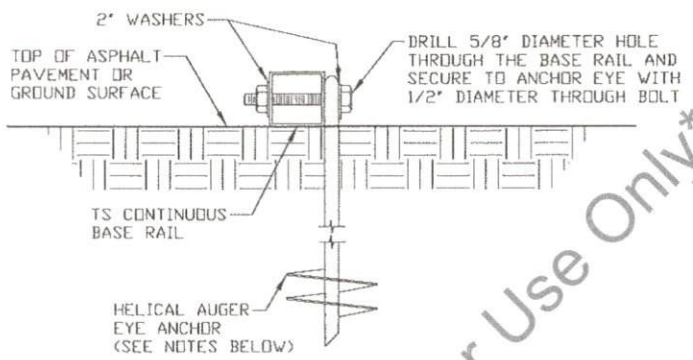
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### BASE RAIL ANCHORAGE OPTIONS



**3A CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE**  
 SCALE: NTS  
 MINIMUM ANCHOR EDGE DISTANCE IS 4".



**3B HELICAL AUGER ANCHORAGE**  
 SCALE: NTS (CAN BE USED FOR ASPHALT)

**GENERAL NOTES**

NOTE: CONCRETE MONOLITHIC SLAB DESIGN BASED ON MINIMUM SOIL BEARING CAPACITY OF 1,500 PSF.

**CONCRETE:**  
 CONCRETE SHALL HAVE A MINIMUM SPECIFIED COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS.

**COVER OVER REINFORCING STEEL:**  
 FOR FOUNDATIONS, MINIMUM CONCRETE COVER OVER REINFORCING BARS SHALL BE PER ACI-318;  
 3" IN FOUNDATIONS WHERE THE CONCRETE IS CAST AGAINST AND PERMANENTLY IN CONTACT WITH THE EARTH OR EXPOSED TO THE EARTH OR WEATHER, AND 1 1/2" ELSEWHERE.

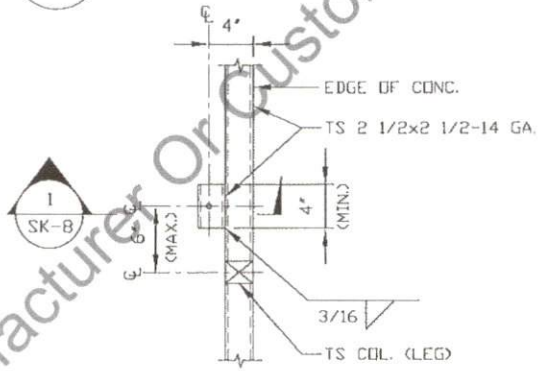
**REINFORCING STEEL:**  
 THE TURNDOWN REINFORCING STEEL SHALL BE ASTM A615 GRADE 60. THE SLAB REINFORCEMENT SHALL BE WELDED WIRE FABRIC MEETING ASTM A185 OR FIBERGLASS FIBER REINFORCEMENT.

**REINFORCEMENT MAY BE BENT IN THE SHOP OR THE FIELD PROVIDED:**

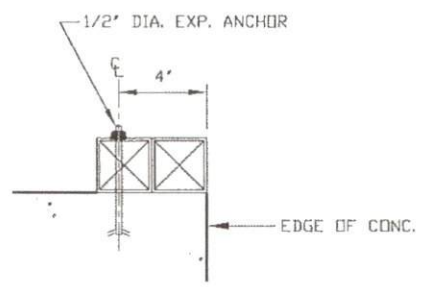
1. REINFORCEMENT IS BENT COLD.
2. THE DIAMETER OF THE BEND, MEASURED ON THE INSIDE OF THE BAR, IS NOT LESS THAN SIX-BAR DIAMETERS.
3. REINFORCEMENT PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE FIELD BENT.

**HELICAL AUGER ANCHOR NOTES:**

1. FOR VERY DENSE AND/OR CEMENTED SANDS, COARSE GRAVEL AND COBBLES, CALICHE, PRELOADED SILTS AND CLAYS, USE MINIMUM (2) 4" HELICES WITH MINIMUM 30" EMBEDMENT OR SINGLE 6" HELIX WITH MINIMUM 50" EMBEDMENT
2. FOR CORAL USE MINIMUM (2) 4" HELICES WITH MINIMUM 30" EMBEDMENT OR SINGLE 6" HELIX WITH MINIMUM 50" EMBEDMENT.
3. FOR MEDIUM DENSE COARSE SANDS, SANDY GRAVELS, VERY STIFF SILTS, AND CLAYS USE MINIMUM (2) 4" HELICES WITH MINIMUM 30" INCH EMBEDMENT OR SINGLE 6" HELIX WITH MINIMUM 50" EMBEDMENT.
4. FOR LOOSE TO MEDIUM DENSE SANDS, FIRM TO STIFF CLAYS AND SILTS, ALLUVIAL FILL, USE MINIMUM (2) 6" HELICES WITH MINIMUM 50" EMBEDMENT.
5. FOR VERY LOSE TO MEDIUM DENSE SANDS, FIRM TO STIFFER CLAYS AND SILTS, ALLUVIAL FILL, USE MINIMUM (2) 8" HELICES WITH MINIMUM 60" EMBEDMENT.



**TYPICAL ANCHOR DETAIL WHEN BASE RAIL IS NEAR EDGE OF CONCRETE**  
 SCALE: NTS



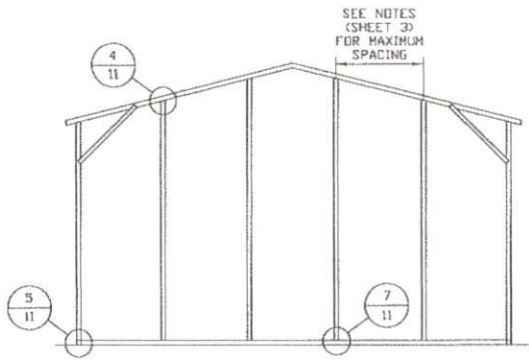
**SECTION 1 SK-B**  
 SCALE: NTS

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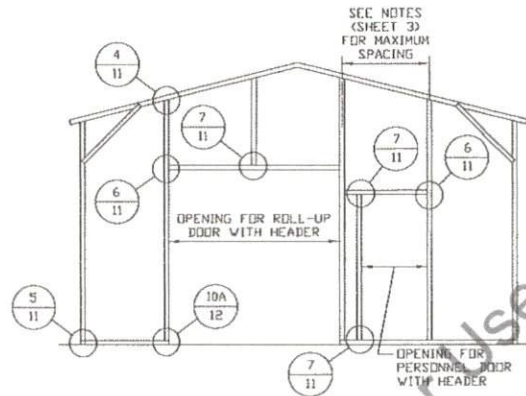
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<b>CHECKED BY:</b> PDH	<b>PROJECT MGR:</b> WSM	<b>DATE:</b> 10-24-18	<b>SCALE:</b> NTS
<b>CLIENT:</b> CC	<b>SHT.</b> 8	<b>DWG. NO:</b> SK-3	<b>REV:</b> 1
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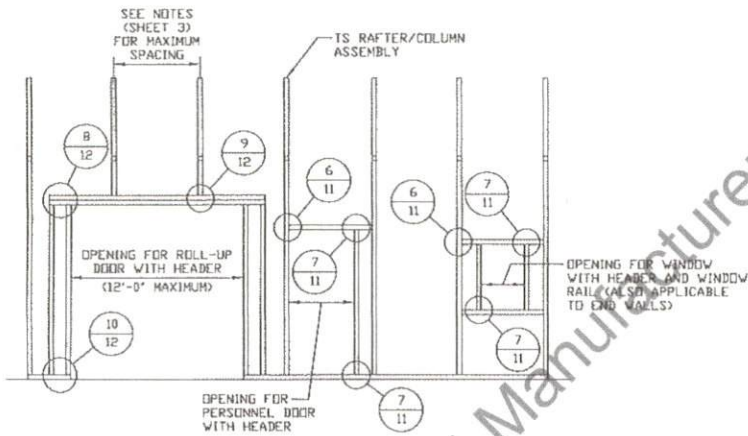
### BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS



**TYPICAL BOX EAVE RAFTER  
END WALL FRAMING SECTION**  
SCALE: NTS



**TYPICAL BOX EAVE RAFTER END  
WALL OPENINGS FRAMING SECTION**  
SCALE: NTS



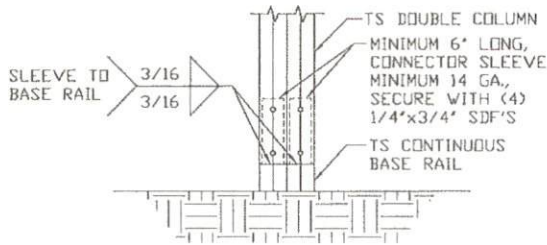
**TYPICAL BOX EAVE RAFTER  
SIDE WALL OPENINGS FRAMING SECTION**  
SCALE: NTS

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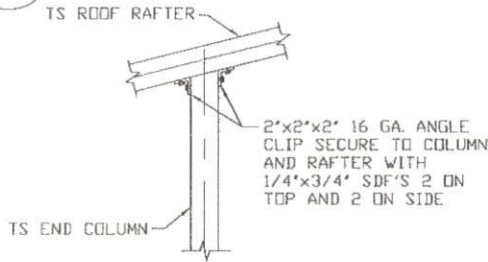
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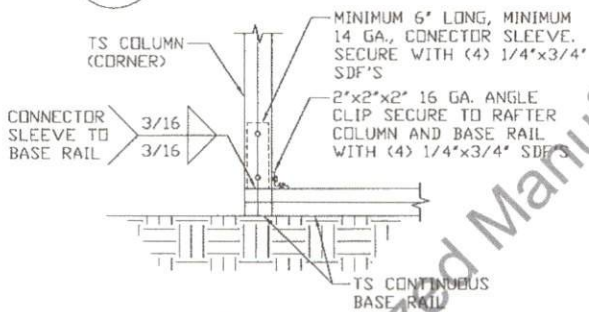
### BOW AND BOX EAVE RAFTER WALL OPENING DETAILS



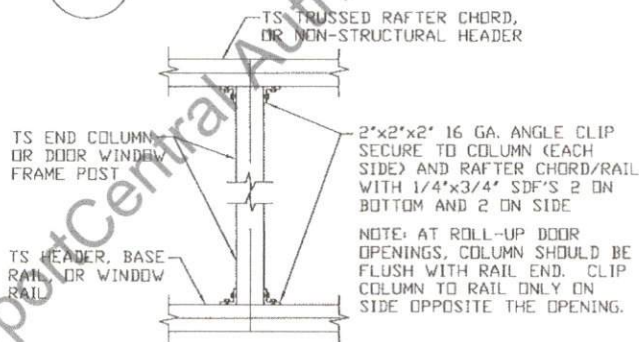
**2** RAFTER COLUMN/BASE RAIL CONNECTION DETAIL  
SCALE: NTS



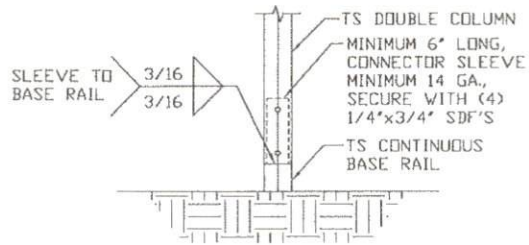
**4** END COLUMN/RAFTER CONNECTION DETAIL  
SCALE: NTS



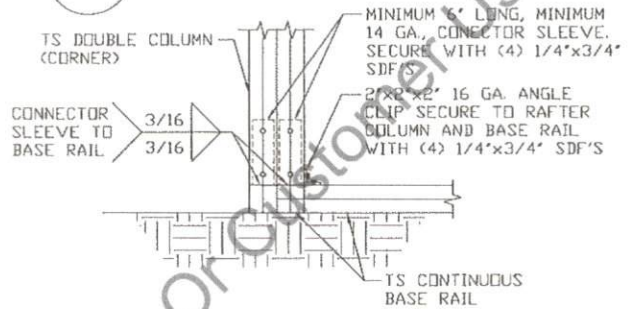
**5A** END COLUMN/BASE RAIL CONNECTION DETAIL  
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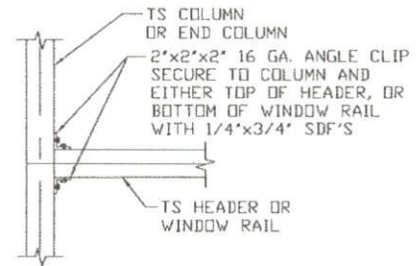
**7** COLUMN TO HEADER, BASE RAIL, OR WINDOW RAIL CONNECTION DETAIL  
SCALE: NTS



**2A** RAFTER COLUMN/BASE RAIL CONNECTION DETAIL  
SCALE: NTS



**5** END COLUMN/BASE RAIL CONNECTION DETAIL  
SCALE: NTS



**6** COLUMN OR WINDOW RAIL TO POST CONNECTION DETAIL  
SCALE: NTS

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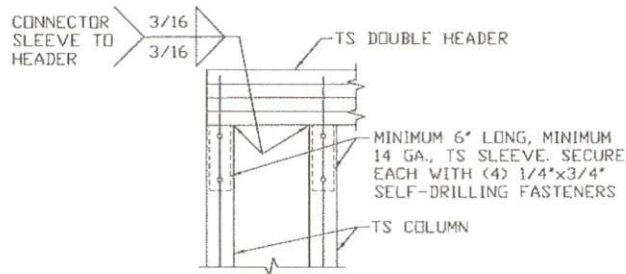
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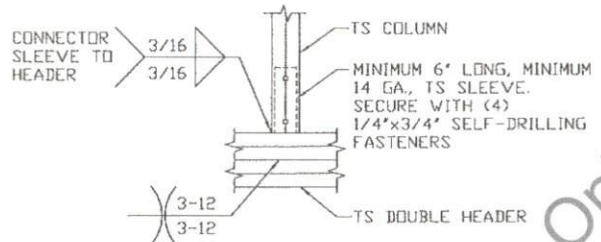
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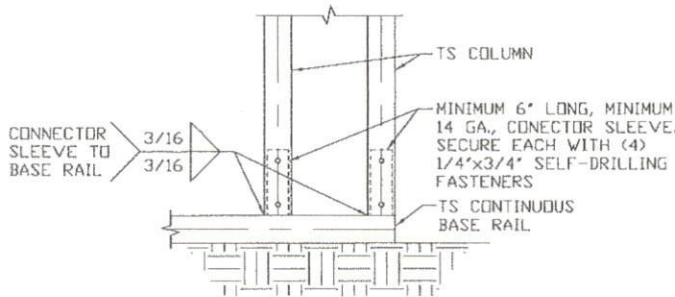
### BOW AND BOX EAVE RAFTER WALL OPENING DETAILS



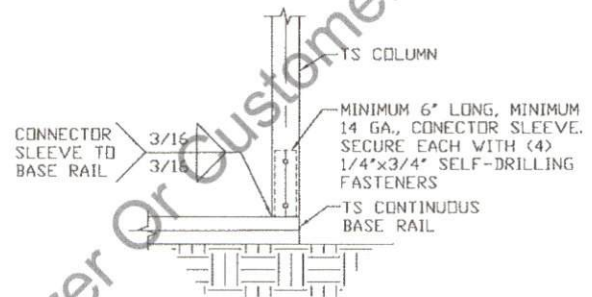
**8** DOUBLE HEADER/COLUMN CONNECTION DETAIL  
SCALE: NTS



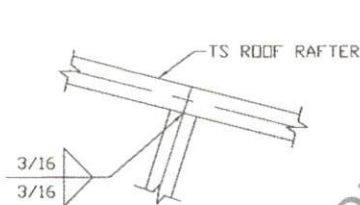
**9** COLUMN/DOUBLE HEADER CONNECTION DETAIL  
SCALE: NTS



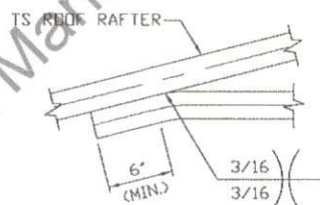
**10** COLUMN/BASE RAIL CONNECTION DETAIL  
SCALE: NTS



**10A** COLUMN/BASE RAIL CONNECTION DETAIL  
SCALE: NTS



**11** RAFTER TO CHORD CONNECTION DETAIL  
SCALE: NTS

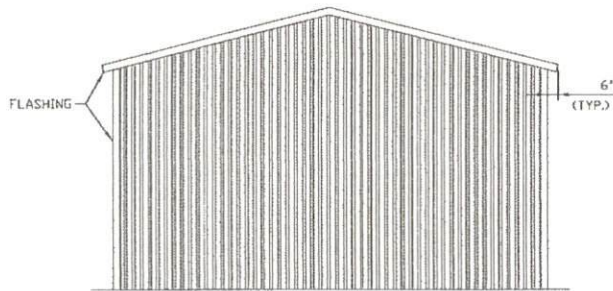


**12** COLLAR TIE CONNECTION DETAIL  
SCALE: NTS

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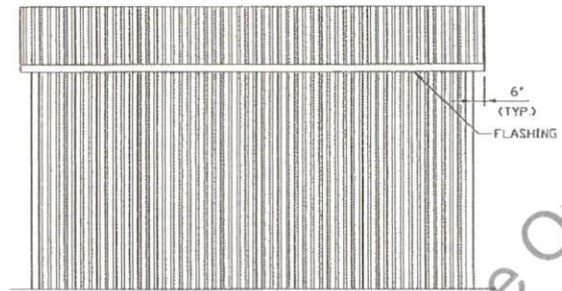
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### BOX EAVE RAFTER VERTICAL ROOF OPTION



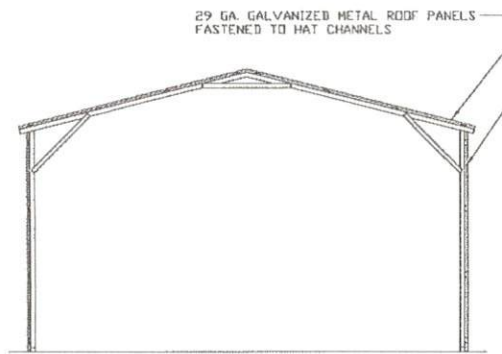
**TYPICAL END ELEVATION  
VERTICAL ROOF**

SCALE: NTS



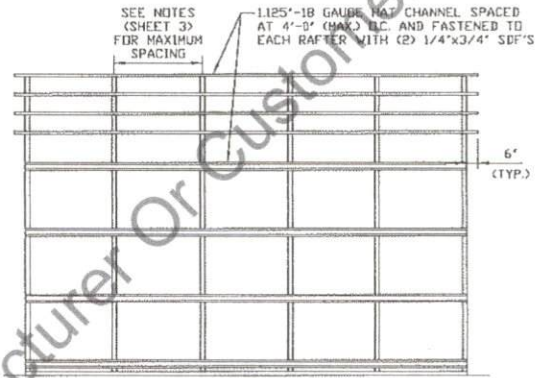
**TYPICAL SIDE ELEVATION  
VERTICAL ROOF**

SCALE: NTS



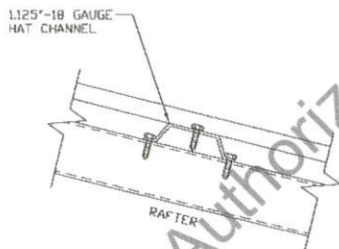
**TYPICAL SECTION  
VERTICAL ROOF OPTION**

SCALE: NTS



**TYPICAL FRAMING SECTION  
VERTICAL ROOF OPTION**

SCALE: NTS



**ROOF PANEL ATTACHMENT**

(ALTERNATE FOR VERTICAL ROOF PANELS)

SCALE: NTS

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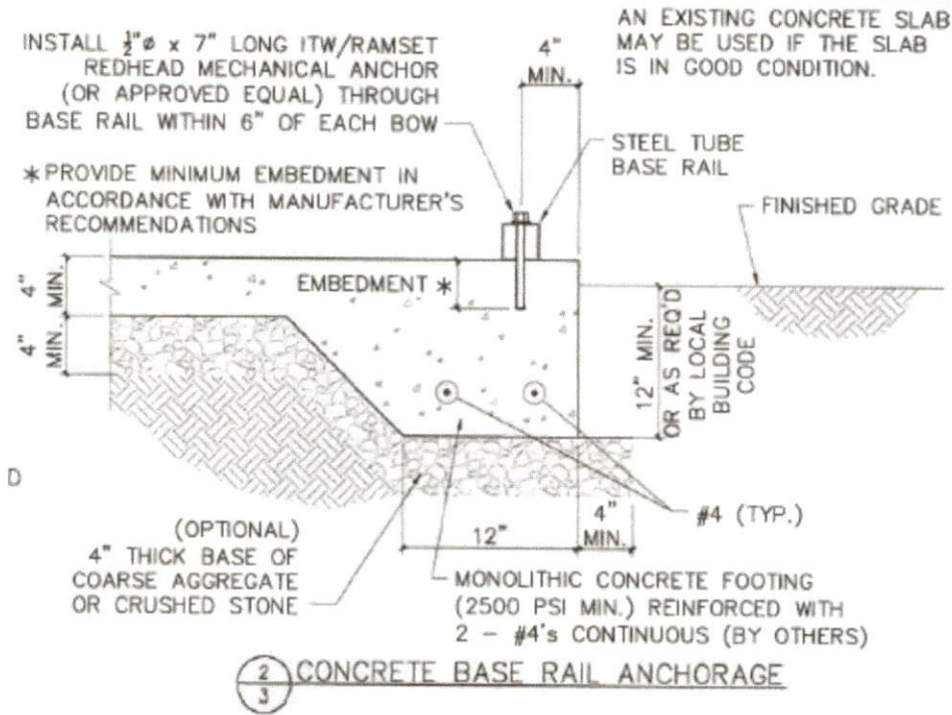
DWG. NO: SK-3

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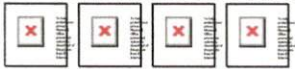
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**From:** Dustin Nichols <dustin@carportcentral.com>  
**Sent:** Tuesday, August 6, 2019 9:38 AM  
**To:** hbabbitt@ncparkrentals.com  
**Subject:** CPC- Dustin Nichols

**30x40 Concrete Pad, 4" Or Thicker. Footer Suggested**



Dustin Nichols  
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