

Patricia Doorman  
2547 Christian Light Road

Fuquay Varina NC 27526

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2547 Christian Light Road



## STRUCTURAL DESIGN

### FULLY OPEN (CARPORT) BUILDING

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

28 October 2020

Revision 9

M&A Project No. 20217S

Prepared for:

Pre-Built Structures  
1330 W Jake Alexander Blvd.  
Salisbury, NC 28417

Prepared by:

Moore and Associates Engineering and Consulting, Inc.  
1009 East Avenue  
North Augusta, SC 29841

401 S. Main Street, Suite 200  
Mount Airy, NC 27030


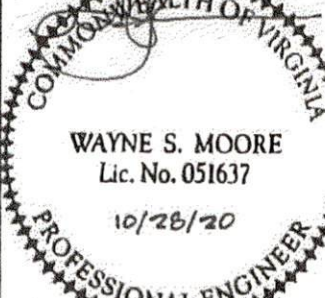






MOORE AND ASSOCIATES  
ENGINEERING AND CONSULTING

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ENGINEERING AND CONSULTING, INC.

DRAWN BY: LT

CHECKED BY: PDH

PROJECT MGR: WSM

CLIENT: PRE-BUILT

PRE-BUILT STRUCTURES

1330 W JAKE ALEXANDER BLVD.

SALISBURY, NC 28417

30'-0" x 16'-0" FULLY OPEN STRUCTURE

DATE: 10-28-20

SCALE: NTS

JOB NO: 20217S

SHT. 1

DWG. NO: SK-1

REV: 0

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### INSTALLATION NOTES AND SPECIFICATIONS

- 1 DESIGN IS FOR MAXIMUM 30'-0" WIDE x 16'-0" EAVE HEIGHT OPEN CARPORT STRUCTURES
- 2 DESIGN WAS DONE IN ACCORDANCE WITH THE 2018 NORTH CAROLINA BUILDING CODE, 2018 INTERNATIONAL BUILDING CODE (IBC) AND 2015 IBC
- 3 DESIGN LOADS ARE AS FOLLOWS:
  - A) DEAD LOAD = 15 PSF
  - B) LIVE LOAD = 12 PSF
  - C) GROUND SNOW LOAD = 35 PSF
  - = 30 PSF (WITH U-CHANNEL RAFTER TIE)

NOTE: UNBALANCED SNOW LOAD DUE TO DRIFTING HAS NOT BEEN EVALUATED
- 4 3-SECOND GUST ULTIMATE WIND SPEED ( $V_{ULT}$ ) =  $\leq$  145 MPH (NOMINAL WIND SPEED =  $\leq$  112 MPH)
- 5 MAXIMUM RAFTER/COLUMN AND END COLUMN SPACING = 5.0 FEET (UNLESS NOTED OTHERWISE)
- 6 ENDWALL COLUMNS (POSTS) AND SIDE WALL COLUMNS ARE EQUIVALENT IN SIZE AND SPACING (UNLESS NOTED OTHERWISE)
- 7 RISK CATEGORY I
- 8 WIND EXPOSURE CATEGORY B.
- 9 SPECIFICATIONS APPLICABLE TO 29 GAUGE METAL PANELS FASTENED DIRECTLY TO 2 1/2" x 2 1/2" - 14 GAUGE THIN STEEL (TS) FRAMING MEMBERS (UNLESS NOTED OTHERWISE) 2 1/4" x 2 1/4" - 12 GAUGE TS MAY BE USED AS OPTIONAL FRAMING MEMBERS
- 10 AVERAGE FASTENER SPACING ON-CENTERS ALONG RAFTERS OR HAT CHANNELS, AND COLUMNS (INTERIOR OR END) = 10 INCHES
- 11 FASTENERS CONSIST OF #12-14x3/4" SELF-DRILLING FASTENER (SDF). USE CONTROL SEAL WASHER WITH EXTERIOR FASTENERS. SPECIFICATIONS APPLICABLE ONLY FOR MEAN ROOF HEIGHT OF 16 FEET OR LESS, AND ROOF SLOPES OF 3:12 (3:12 PITCH) OR LESS SPACING REQUIREMENTS FOR OTHER ROOF HEIGHTS AND/OR SLOPES MAY VARY. ROOF SLOPES LESS THAN 3:12 REQUIRE USE OF JOINT SEALANT
- 12 ANCHORS SHALL BE INSTALLED THROUGH BASE RAIL WITHIN 6" OF EACH COLUMN
- 13 STANDARD GROUND ANCHORS (SOIL NAILS) CONSIST OF #4 REBAR W/ WELDED NUT x 30" LONG AND MAY ONLY BE USED IN CONJUNCTION WITH OTHER (OPTIONAL) ANCHOR DEVICES AND ONLY IN SUITABLE SOILS. OPTIONAL ANCHORAGE MAY BE USED IN SUITABLE SOILS AND MUST BE USED IN UNSUITABLE SOILS AS NOTED. COORDINATE WITH LOCAL CODES/ORDINANCES REGARDING MINIMUM LENGTH FOR FROST DEPTH PROTECTION
14. WIND FORCES GOVERN OVER SEISMIC FORCES. SEISMIC PARAMETERS ANALYZED ARE:
  - SOIL SITE CLASS = D
  - RISK CATEGORY I
  - R = 325  $I_e = 1.0$
  - $S_{BS} = 2.039 g$   $V = C_s W$
  - $S_{D1} = 1.258 g$

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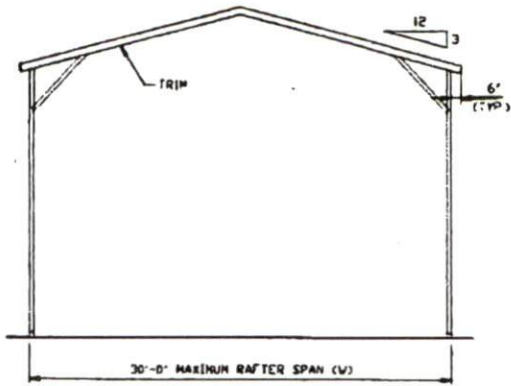
<b>MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.</b>	DRAWN BY: LT	PRE-BUILT STRUCTURES 1330 W JAKE ALEXANDER BLVD. SALISBURY, NC 28417		
	CHECKED BY: PDH	3.0'x16'-0" FULLY OPEN STRUCTURE		
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	CLIENT: PRE-BUILT	SHT. 3	DWG NO SK-1	REV: 0

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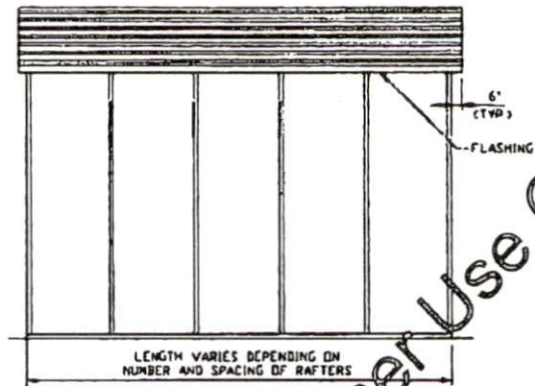
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### BOX EAVE FRAME RAFTER STRUCTURE

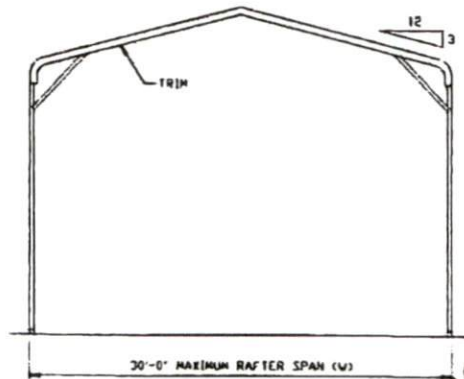


**TYPICAL END ELEVATION**  
SCALE: NTS

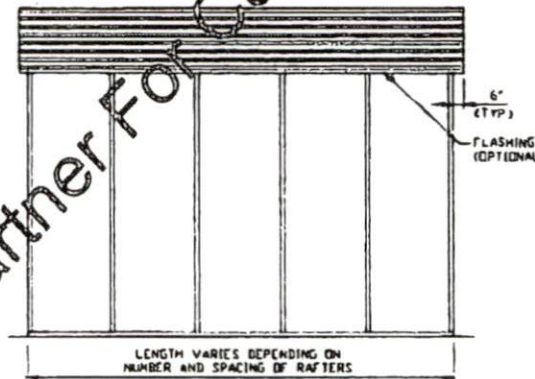


**TYPICAL SIDE ELEVATION**  
SCALE: NTS

### BOX EAVE FRAME RAFTER STRUCTURE



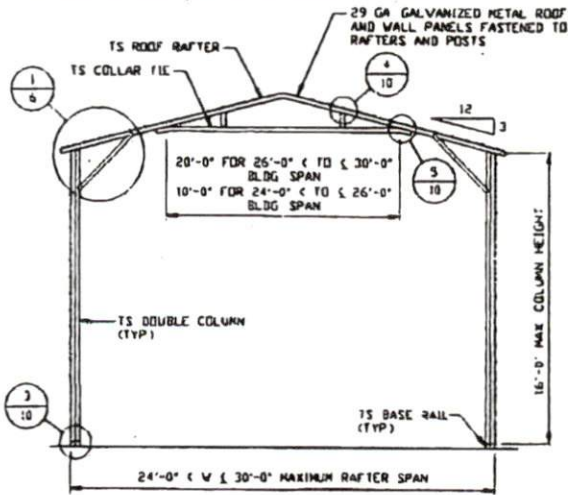
**TYPICAL END ELEVATION**  
SCALE: NTS



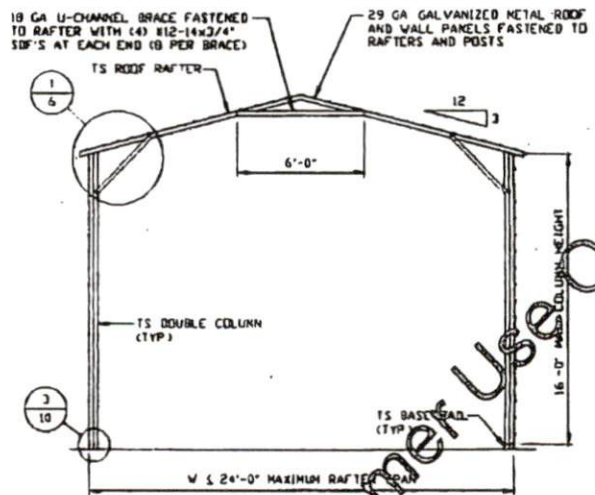
**TYPICAL SIDE ELEVATION**  
SCALE: NTS

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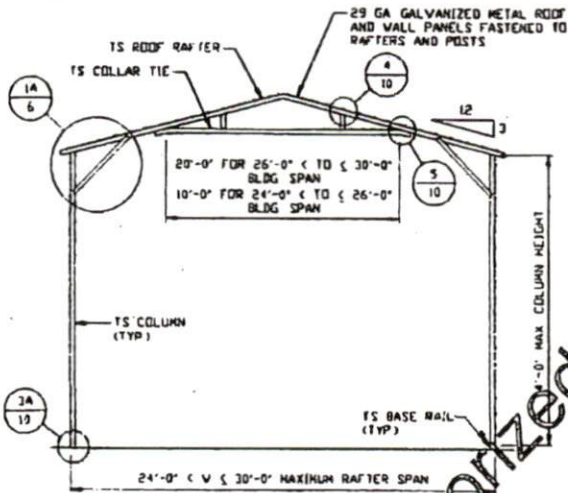
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	CHECKED BY: PDM	PROJECT MGR: VSM	DATE: 10-28-20	SCALE: NTS
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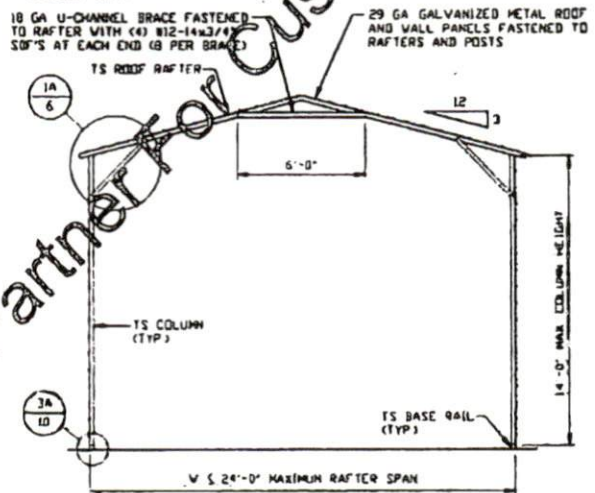
**TYPICAL RAFTER/COLUMN FRAME SECTION**  
SCALE: NTS



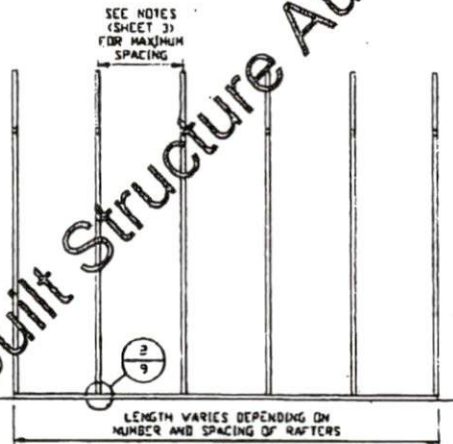
**TYPICAL RAFTER/COLUMN FRAME SECTION**  
SCALE: NTS



**TYPICAL RAFTER/COLUMN FRAME SECTION**  
SCALE: NTS



**TYPICAL RAFTER/COLUMN FRAME SECTION**  
SCALE: NTS



**TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION**  
SCALE: NTS

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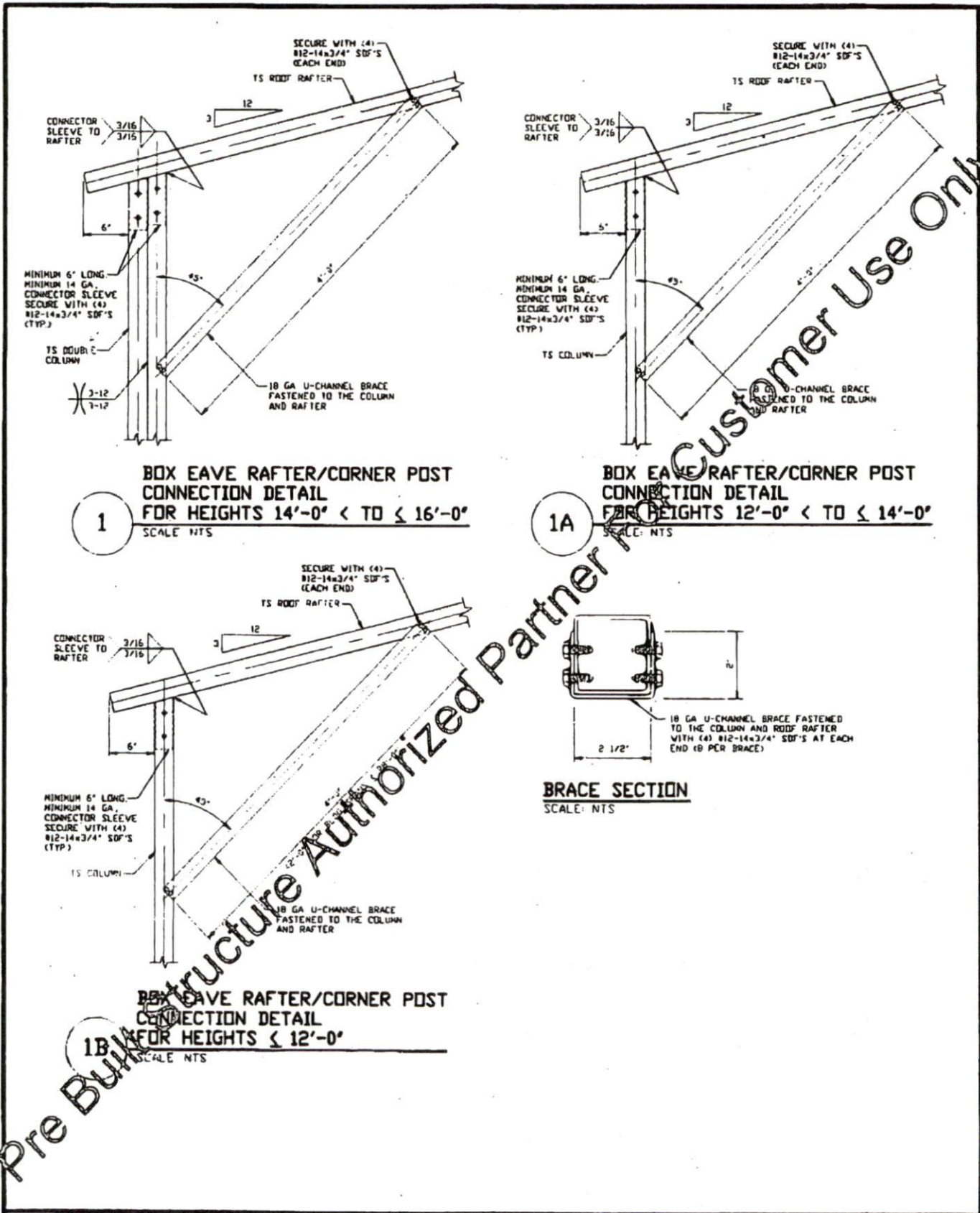
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DWG. NO: SK-1  
REV: 0

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	CHECKED BY: DM	30'-0" x 16'-0" FULLY OPEN STRUCTURE		
PROJECT MGR: WSH	DATE: 10-28-20	SCALE: NTS	JOB NO: 20217S	
CLIENT: PRE-BUILT	SHT. 6	DWG. NO: SK-1	REV: 0	

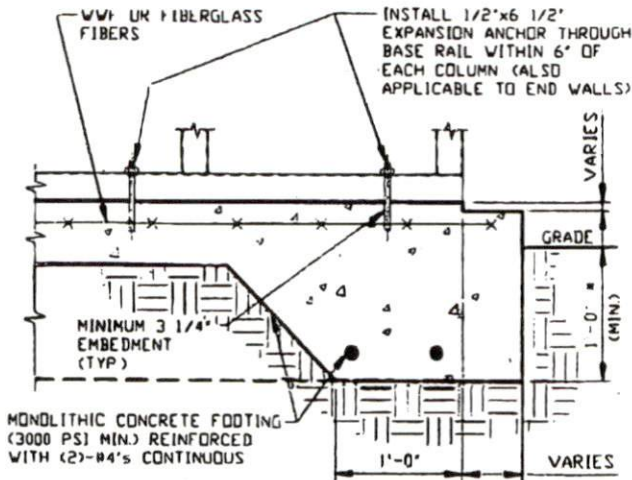
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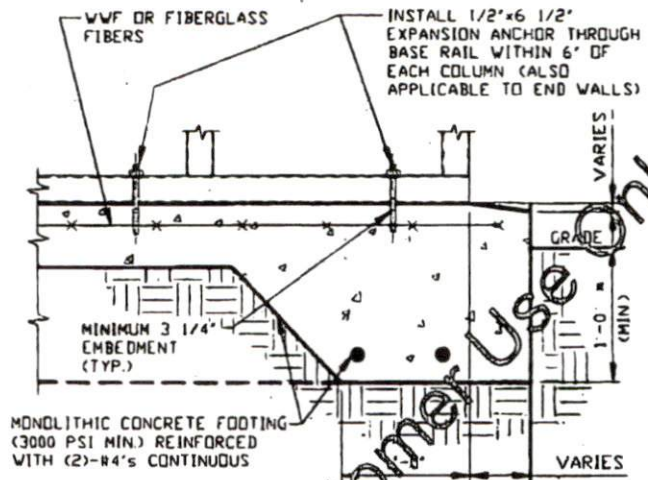
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### BASE RAIL ANCHORAGE OPTIONS



**2 CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE**

SCALE: NTS  
MINIMUM ANCHOR EDGE DISTANCE IS 4"  
\* COORDINATE WITH LOCAL CODES/ORD. REGARDING MINIMUM FROST DEPTH REQ.



**2A CONCRETE SLAB BASE RAIL ANCHORAGE**

SCALE: NTS  
MINIMUM ANCHOR EDGE DISTANCE IS 4"  
\* COORDINATE WITH LOCAL CODES/ORD. REGARDING MINIMUM FROST DEPTH REQ.

### 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:

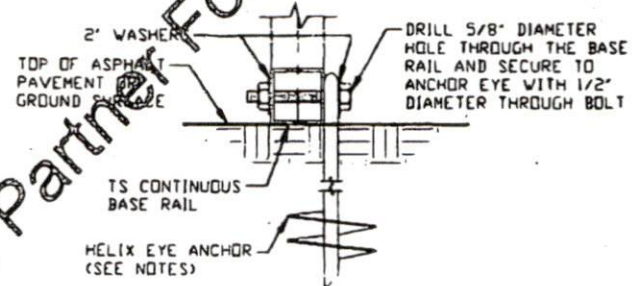
THE TURNDOWN REINFORCING STEEL SHALL BE ASTM A615 GRADE 60. THE SLAB REINFORCEMENT SHALL BE WELDED WIRE FABRIC MEETING ASTM A185 OR FIBERGLASS FIBER REINFORCEMENT.

#### 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 DIAMETER.
- 3 REINFORCEMENT PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE FIELD BENT

#### HELIX 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" EMBEDMENT OR SINGLE 6" HELIX WITH MINIMUM 50" EMBEDMENT.
- 4 FOR BOUND TO MEDIUM DENSE SANDS, FIRM TO STIFF CLAYS AND SILTS ALLUVIAL FILL, USE MINIMUM (2) 6" HELICES WITH MINIMUM 30" EMBEDMENT.
- 5 FOR VERY LOOSE TO MEDIUM DENSE SANDS, FIRM TO STIFFER CLAYS AND SILTS, ALLUVIAL FILL, USE MINIMUM (2) 8" HELICES WITH MINIMUM 60" EMBEDMENT.



**2B GROUND BASE HELIX ANCHORAGE**

SCALE: NTS  
(CAN BE USED FOR ASPHALT)  
\* COORDINATE WITH LOCAL CODES/ORD. REGARDING MINIMUM FROST DEPTH REQ.

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CHECKED: BY: PM

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CLIENT: PRE-BUILT

PRE-BUILT STRUCTURES  
1330 W JAKE ALEXANDER BLVD.  
SALISBURY, NC 28417  
30'-0" x 16'-0" FULLY OPEN STRUCTURE

DATE: 10-29-20

SCALE: NTS

JOB NO: 202175

SHT. 9

DWG. NO: SK-1

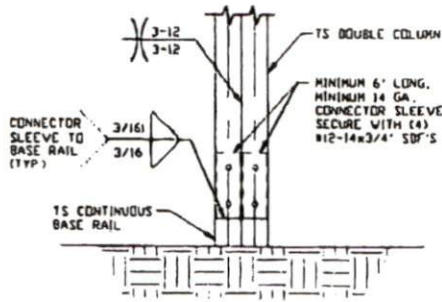
REV: 0

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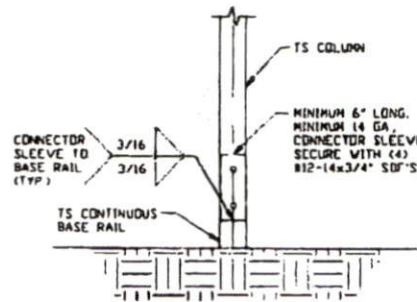
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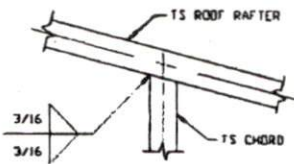
### CONNECTION DETAILS



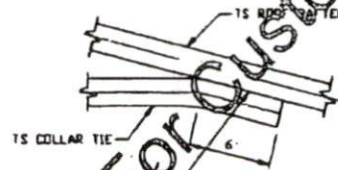
**3** POST/BASE RAIL CONNECTION DETAIL  
SCALE: NTS



**3A** POST/BASE RAIL CONNECTION DETAIL  
SCALE: NTS



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



**COLLAR TIE CONNECTION DETAIL**  
SCALE: NTS

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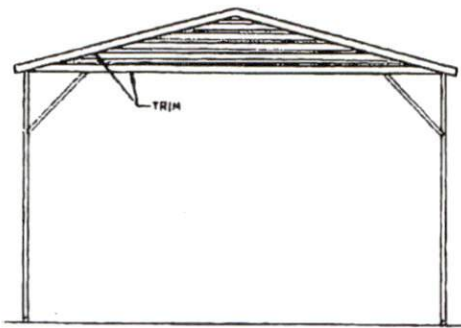


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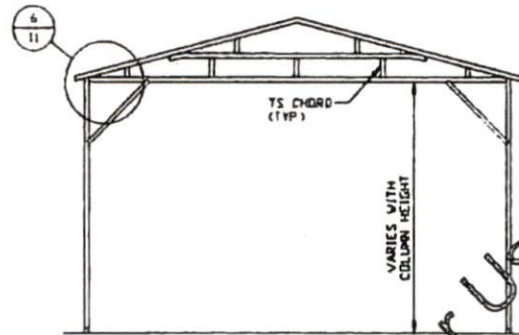
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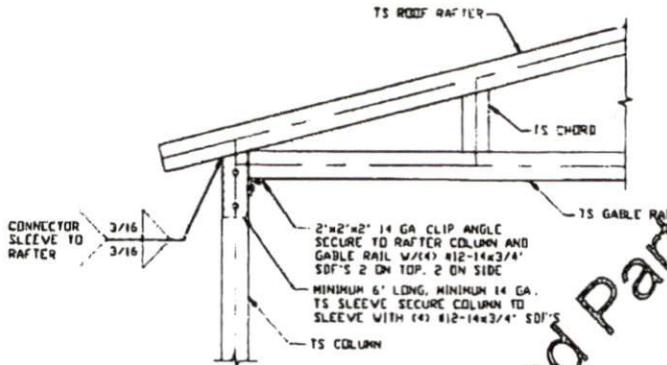
### BOX EAVE RAFTER GABLE END OPTION



TYPICAL BOX EAVE RAFTER GABLE END ELEVATION  
SCALE: NTS



TYPICAL BOX EAVE RAFTER GABLE END FRAMING SECTION  
SCALE: NTS



6 BOX EAVE RAFTER GABLE RAIL TO RAFTER COLUMN CONNECTION DETAIL  
SCALE: NTS  
NOTE: KNEE BRACE NOT SHOWN FOR CLARITY

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SHT. 11

SCALE: NTS

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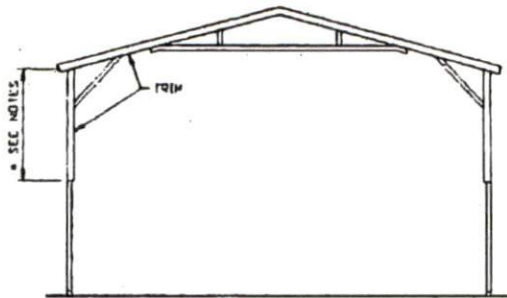
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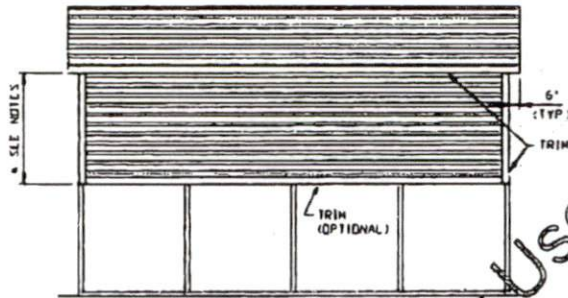
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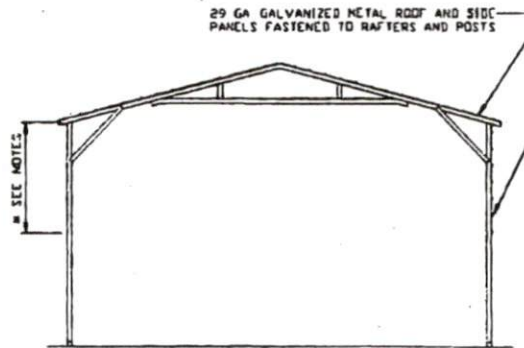
### BOX EAVE RAFTER EXTRA SIDE PANEL OPTION



**TYPICAL END ELEVATION  
EXTRA SIDE PANELS**  
SCALE: NTS



**TYPICAL SIDE ELEVATION  
EXTRA SIDE PANELS**  
SCALE: NTS



**TYPICAL RAFTER/COLUMN FRAME  
SECTION - EXTRA SIDE PANELS**  
SCALE: NTS

**NOTES:**

- \* 16'-0" PANEL (FOR EAVE HEIGHTS 14'-0" ≤ 16'-0")
- \* NO PANELS (FOR EAVE HEIGHTS < 14'-0")

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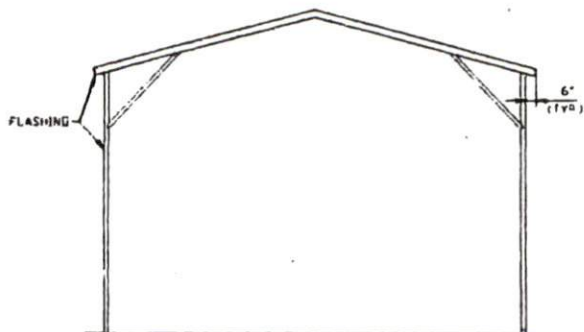
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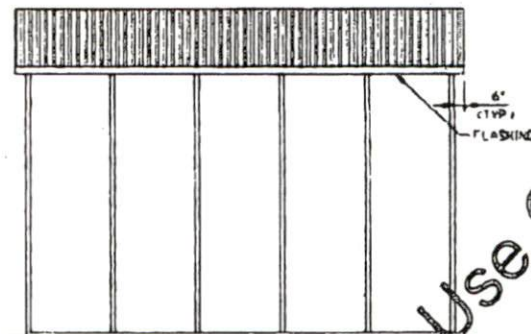
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### BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



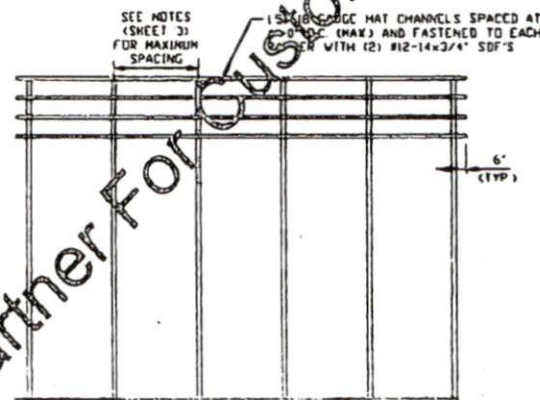
**TYPICAL END ELEVATION  
VERTICAL ROOF/SIDING**  
SCALE: NTS



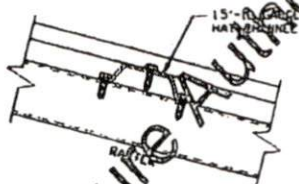
**TYPICAL SIDE ELEVATION  
VERTICAL ROOF/SIDING**  
SCALE: NTS



**TYPICAL SECTION VERTICAL  
ROOF/SIDING OPTION**  
SCALE: NTS



**TYPICAL FRAMING SECTION VERTICAL  
ROOF/SIDING OPTION WITH TS GIRTS**  
SCALE: NTS



**ROOF PANEL ATTACHMENT**  
(ALTERNATIVE FOR VERTICAL ROOF PANELS)  
SCALE: NTS

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