

# STRUCTURAL DESIGN STANDARD PACKAGE ENCLOSED BUILDING

## MAXIMUM 30'- 0" WIDE X 20'- 0" HEIGHT-BOX EAVE FRAME AND BOW FRAME

2 March 2021 Revision 1 M&A Project No. 19294S/21025S

#### Prepared for:

Best Metal Buildings, LLC 484 NW Turner Avenue Lake City, Florida 32055

#### Prepared by:

Moore and Associates Engineering and Consulting, Inc.

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Digitally signed by Wayne S Moore Date: 2021.03.03 12:50:47 -05'00'





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#### INSTALLATION NOTES AND SPECIFICATIONS

- 1. DESIGN IS FOR MAXIMUM 30'-0" WIDE x 20'-0" EAVE HEIGHT ENCLOSED STRUCTURES.
- 2. DESIGN WAS DONE IN ACCORDANCE WITH THE 2020 FLORIDA BUILDING CODE (FBC) 7TH EDITION, 2015 IBC, AND 2012 IBC.
- 3. DESIGN LOADS ARE AS FOLLOWS!

A) DEAD LOAD

= 1.5 PSF

- B) LIVE LOAD
- $\Box AD = 12 PSF$
- C) GROUND SNOW LOAD = 10 PSF (UNBALANCED SNOW LOAD DUE TO DRIFTING HAS NOT BEEN EVALUATED).
- 4. LOW ULTIMATE WIND SPEED (LW) = 105 TO 140 MPH (NOMINAL WIND SPEED = 81 TO 108 MPH): MAXIMUM RAFTER/POST AND END COLUMN SPACING = 5.0 FEET.
- 5. HIGH ULTIMATE WIND SPEED (HW) = 141 TO 170 MPH (NOMINAL WIND SPEED = 109 TO 132 MPH) MAXIMUM RAFTER/POST AND END COLUMN SPACING = 4.0 FEET.
- 6. END WALL COLUMNS (POST) ARE EQUIVALENT IN SIZE AND SPACING TO SIDE WALL POSTS (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"×2 1/2"-14 GAUGE TUBE STEEL (TS) FRAMING MEMBERS (UNLESS NOTED OTHERWISE). WHERE TS 2 1/2" × 2 1/2" 14 GAUGE IS SPECIFIED, TS 2 1/4" × 2 1/4" 12 GAUGE MAY BE USED AS AN OPTION.
- 10. AVERAGE FASTENER SPACING ON-CENTERS ALONG RAFTERS OR HAT CHANNELS, AND COLUMNS (INTERIOR DISTANCE OR EDGE DISTANCE) = 10° D.C. (MAX.) FOR LOW WIND AND 6° D.C. (MAX.) FOR HIGH WIND.
- 11. FASTENERS CONSIST OF #12-14×3/4" 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, ROOFING WITH SLOPES LESS THAN 3:12 MUST BE LAP SEALANT.
- 12. ANCHORS SHALL BE INSTALLED THROUGH BASE RAIL AT DR WITHIN 6' OF EACH COLUMN.
- 13. STANDARD GROUND ANCHORS (SOIL NAILS) CONSIST OF #4 REBAR W/ WELDED NUT x 36" LONG IN SUITABLE SOILS. OPTIONAL ANCHORAGE MAY BE USED IN SUITABLE SOILS AND MUST BE USED FOR WIND SPEEDS < 145 MPH. OPTIONAL ANCHORAGE MAY BE USED IN SUITABLE SOILS AND MUST BE USED IN UNSUITABLE SOILS AND FOR WIND SPEEDS > 145 MPH 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:

SDIL SITE CLASS = D RISK CATEGORY I

R = 3.25

 $I_E = 1.0$ 

 $S_{DS} = 2.039 g$  $S_{DI} = 1.258 g$  V= CsW

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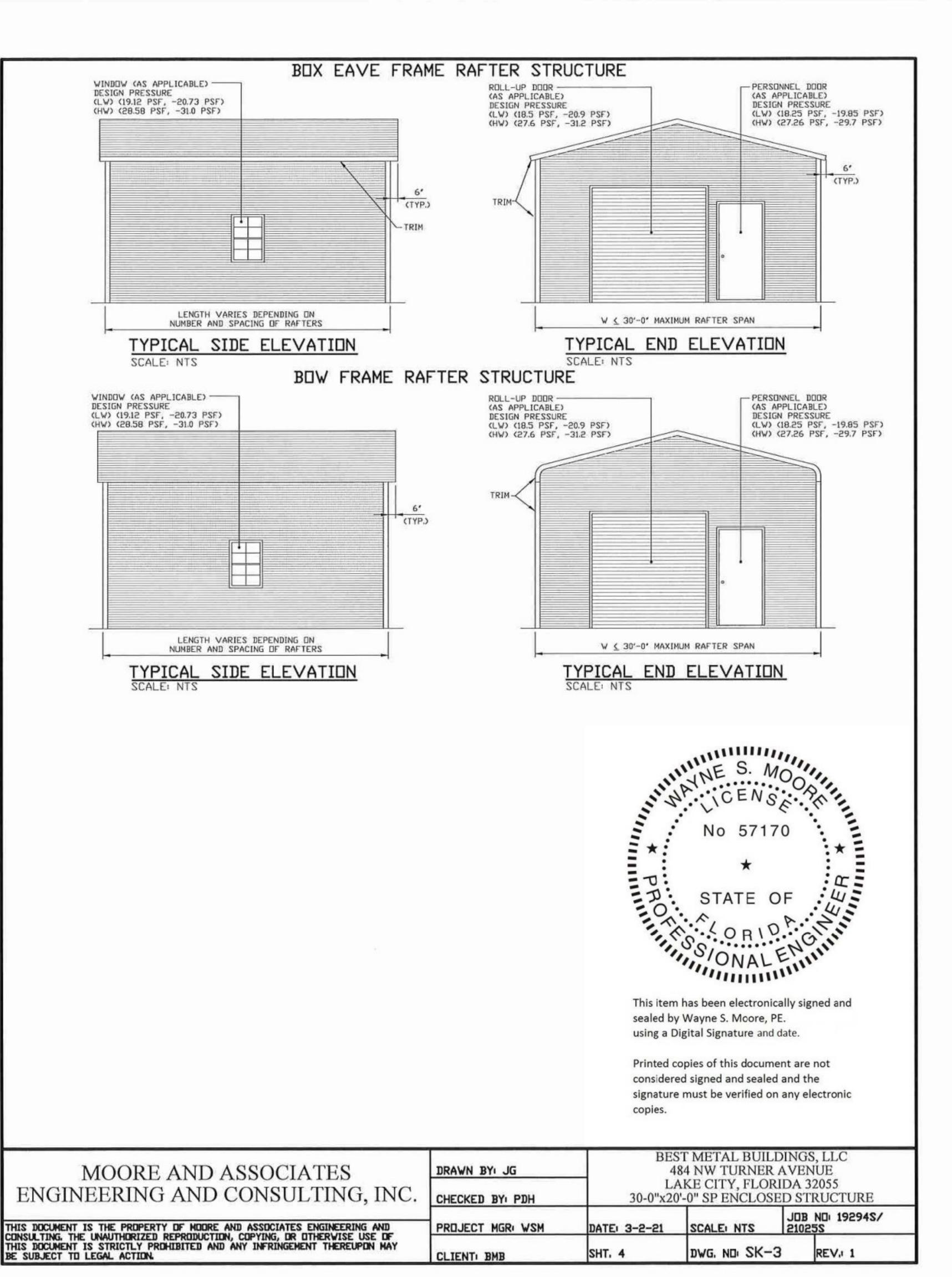
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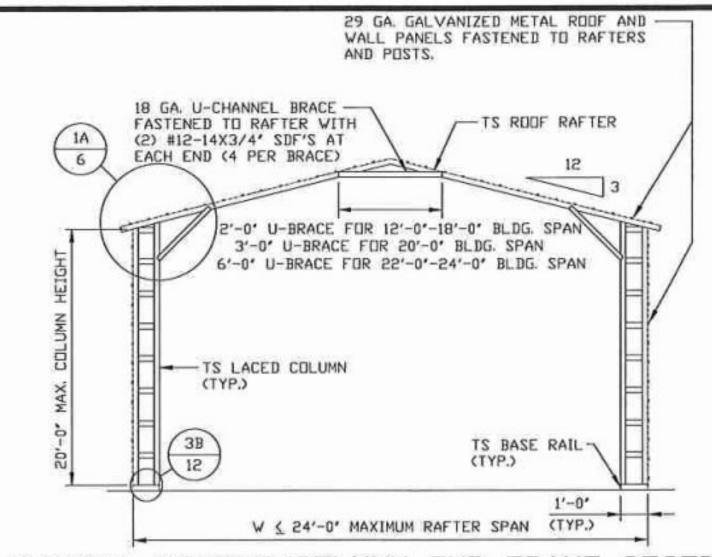
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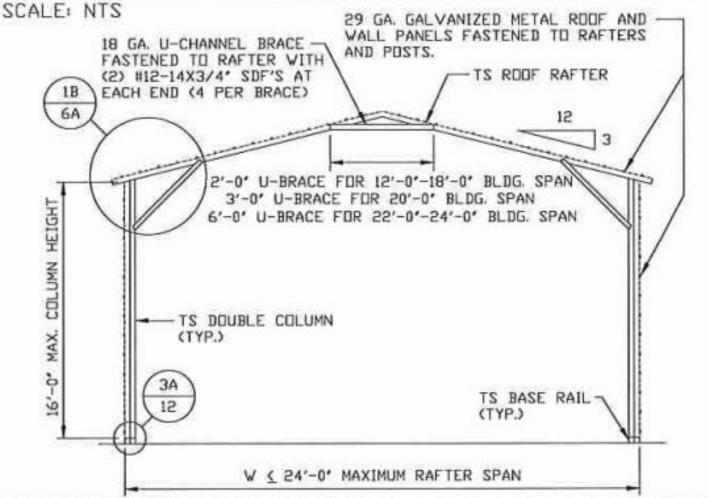
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CLIENT: BMB SHT. 3 DWG, ND: SK-3 REV.: 1

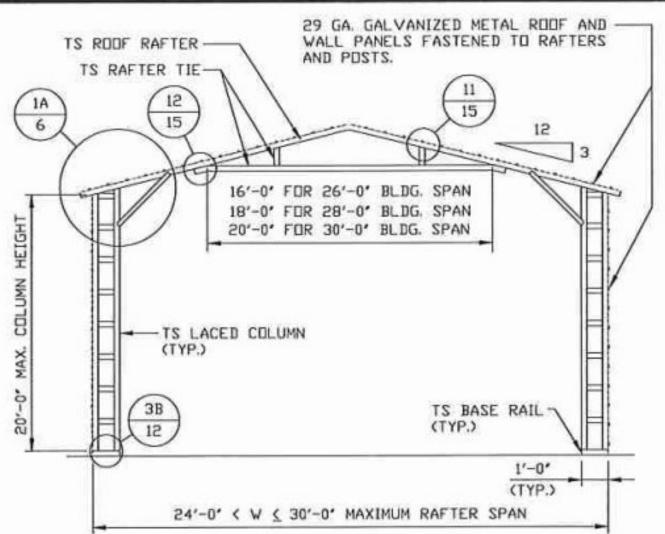




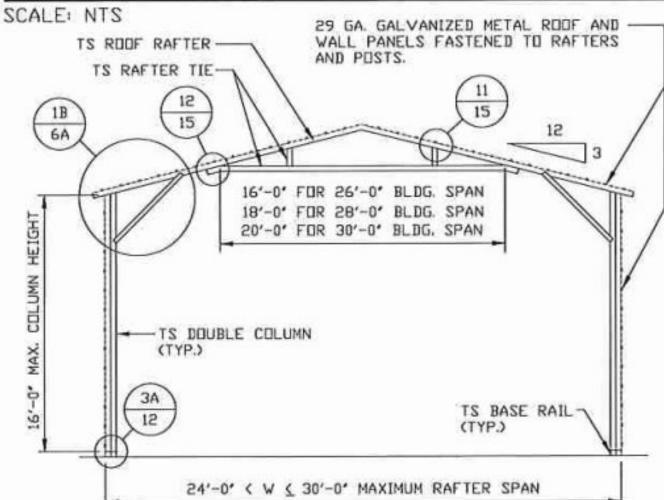
#### TYPICAL RAFTER/COLUMN END FRAME SECTION



TYPICAL RAFTER/COLUMN END FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN END FRAME SECTION



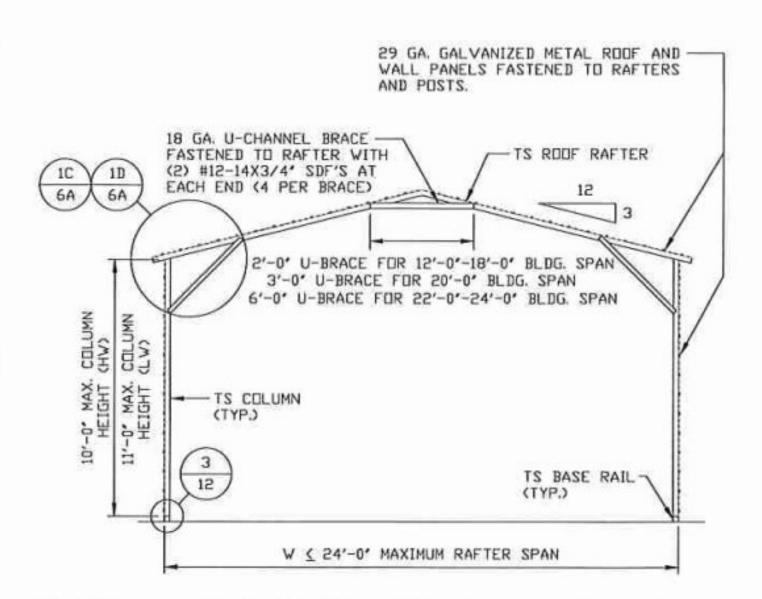
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SCALE: NTS



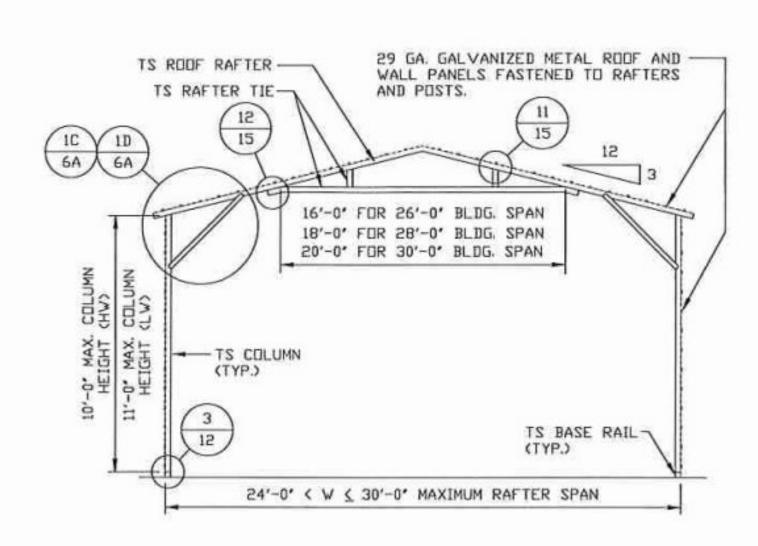
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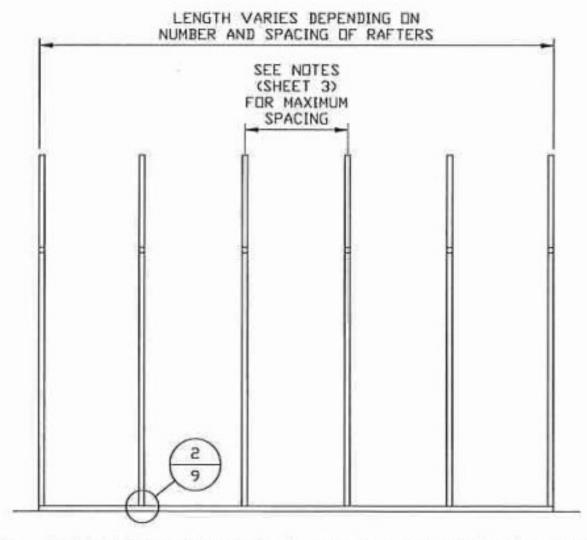
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## TYPICAL RAFTER/COLUMN END FRAME SECTION SCALE: NTS



## TYPICAL RAFTER/COLUMN END FRAME SECTION SCALE: NTS

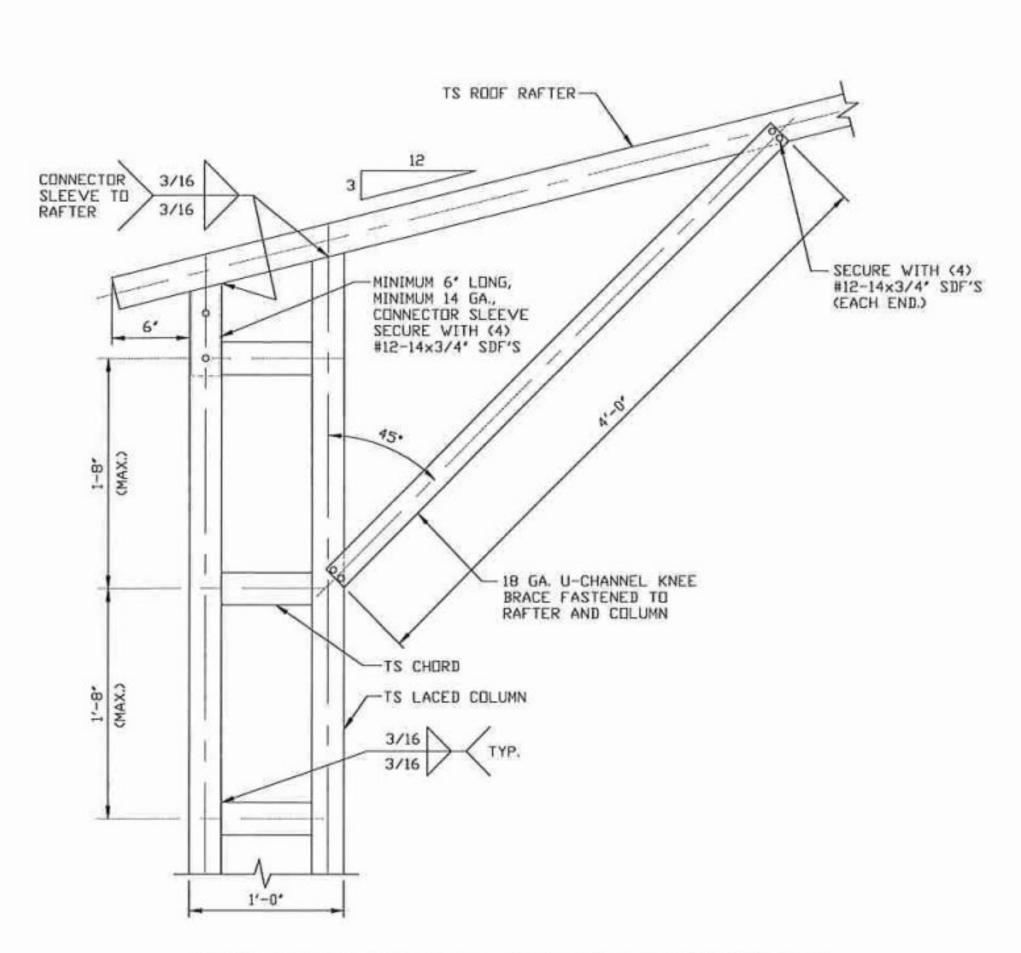


TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION SCALE: NTS

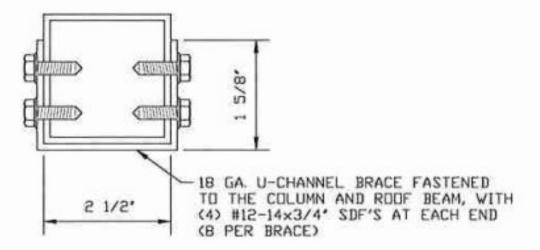


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BOX EAVE RAFTER COLUMN CONNECTION
DETAIL FOR HEIGHTS 16'-0' < TO < 20'-0'
SCALE: NTS

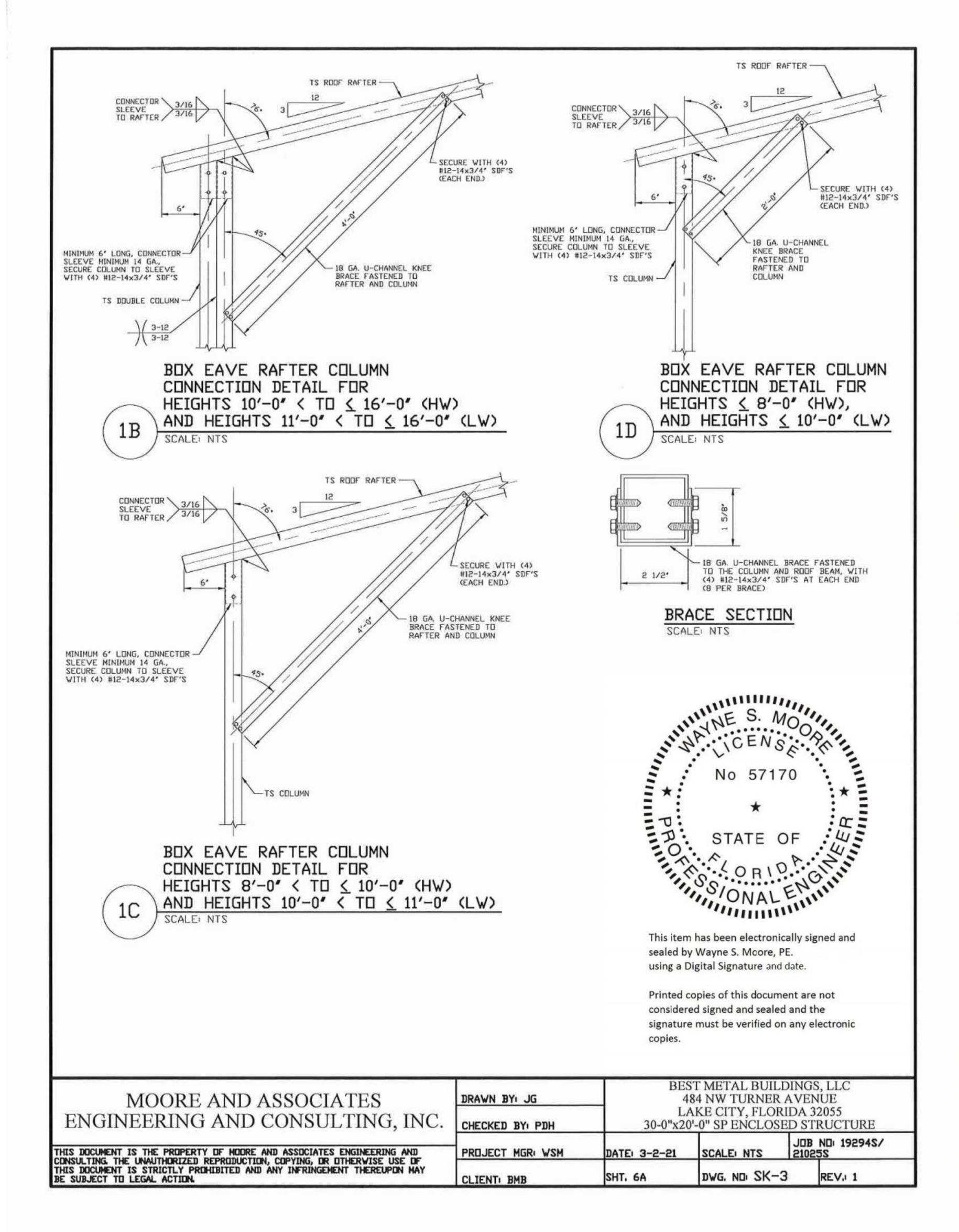


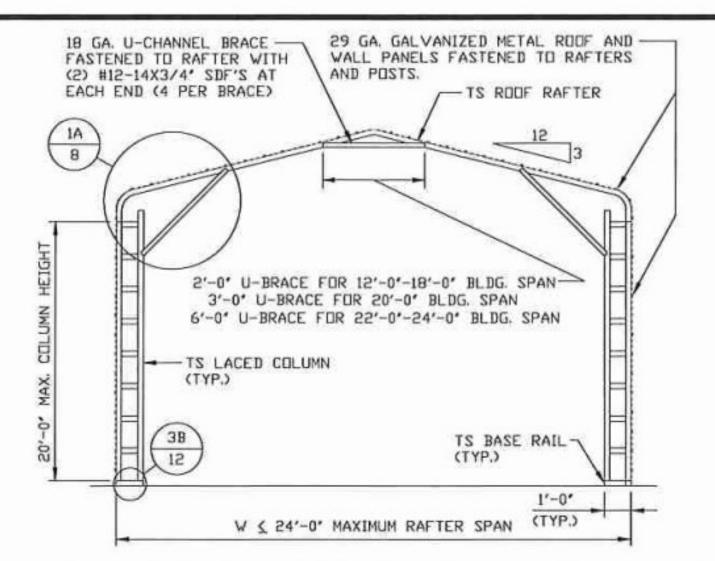
BRACE SECTION
SCALE: NTS



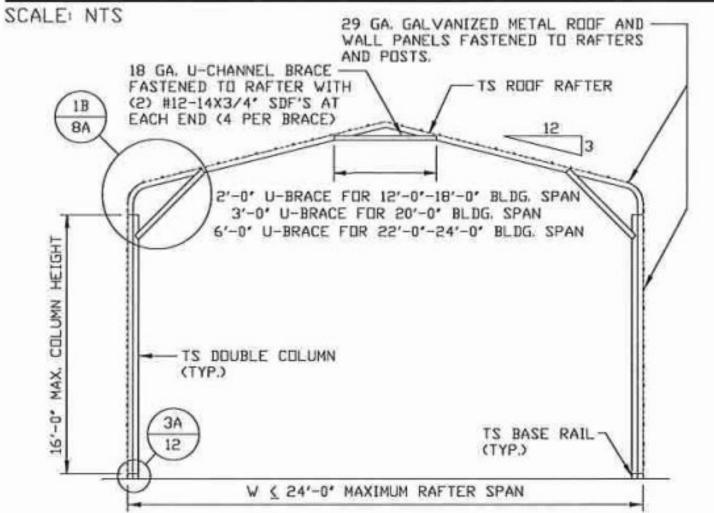
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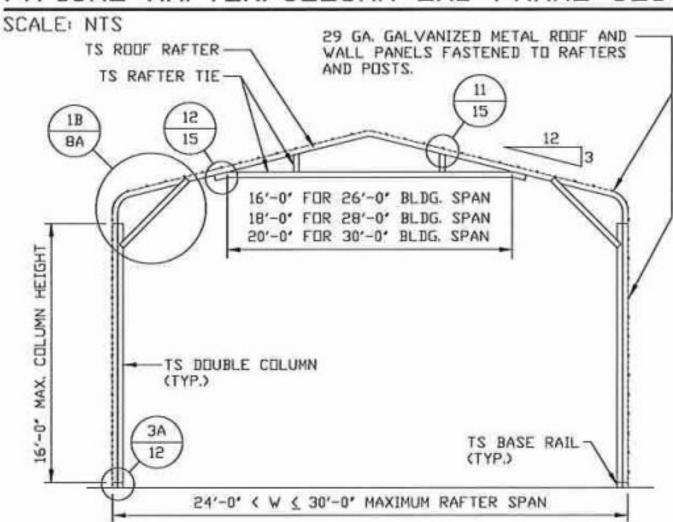
#### TYPICAL RAFTER/COLUMN END FRAME SECTION



## TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE: NTS

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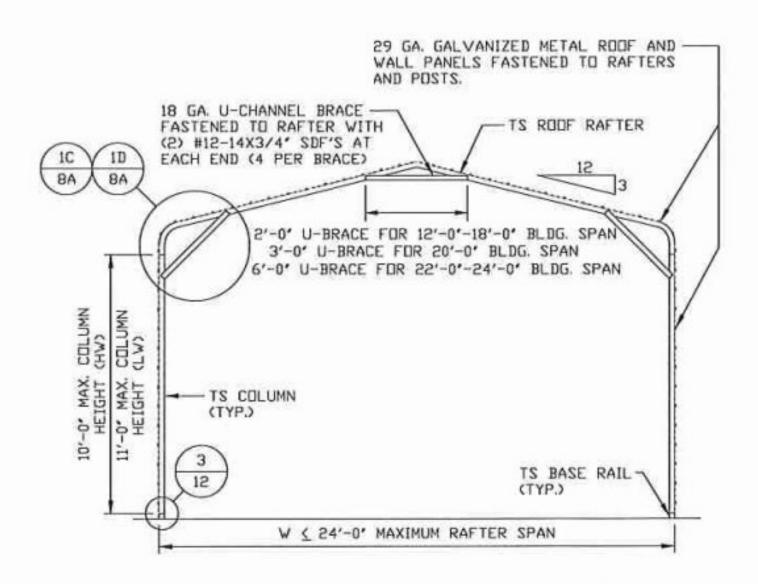
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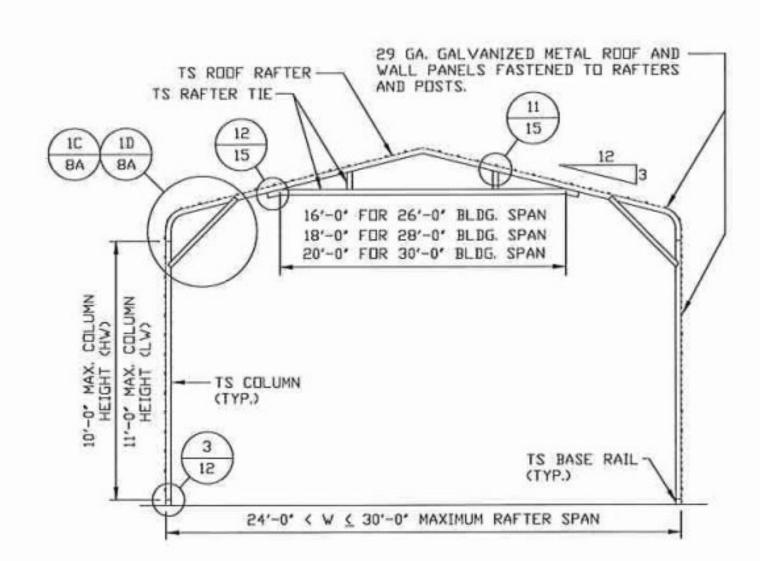
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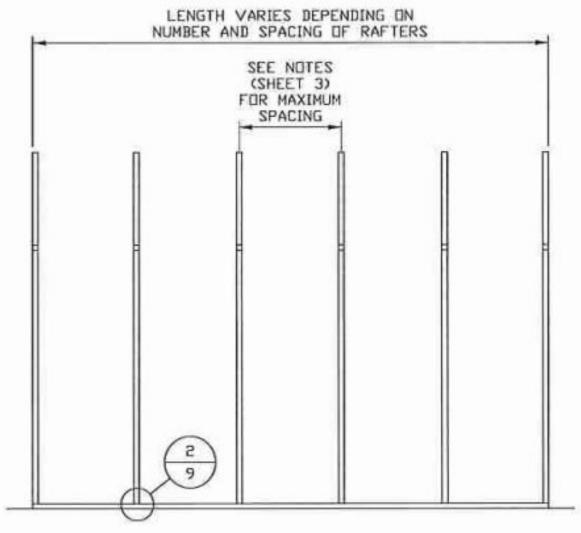
## TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE: NTS



## TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE: NTS



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

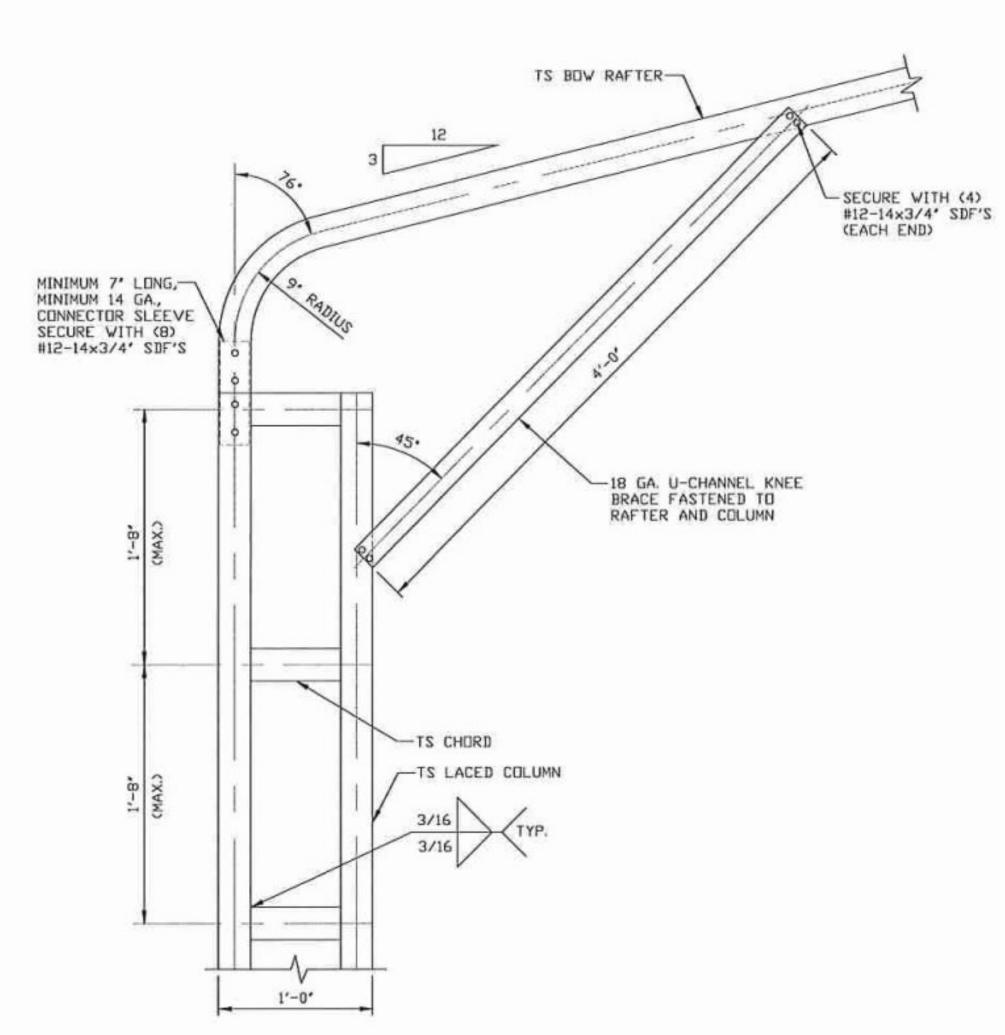
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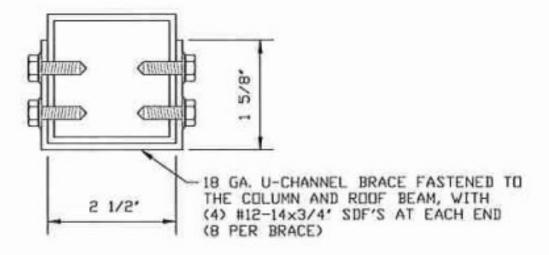
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BOW EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 16'-0' < TO \( \lambda \) 20'-0"

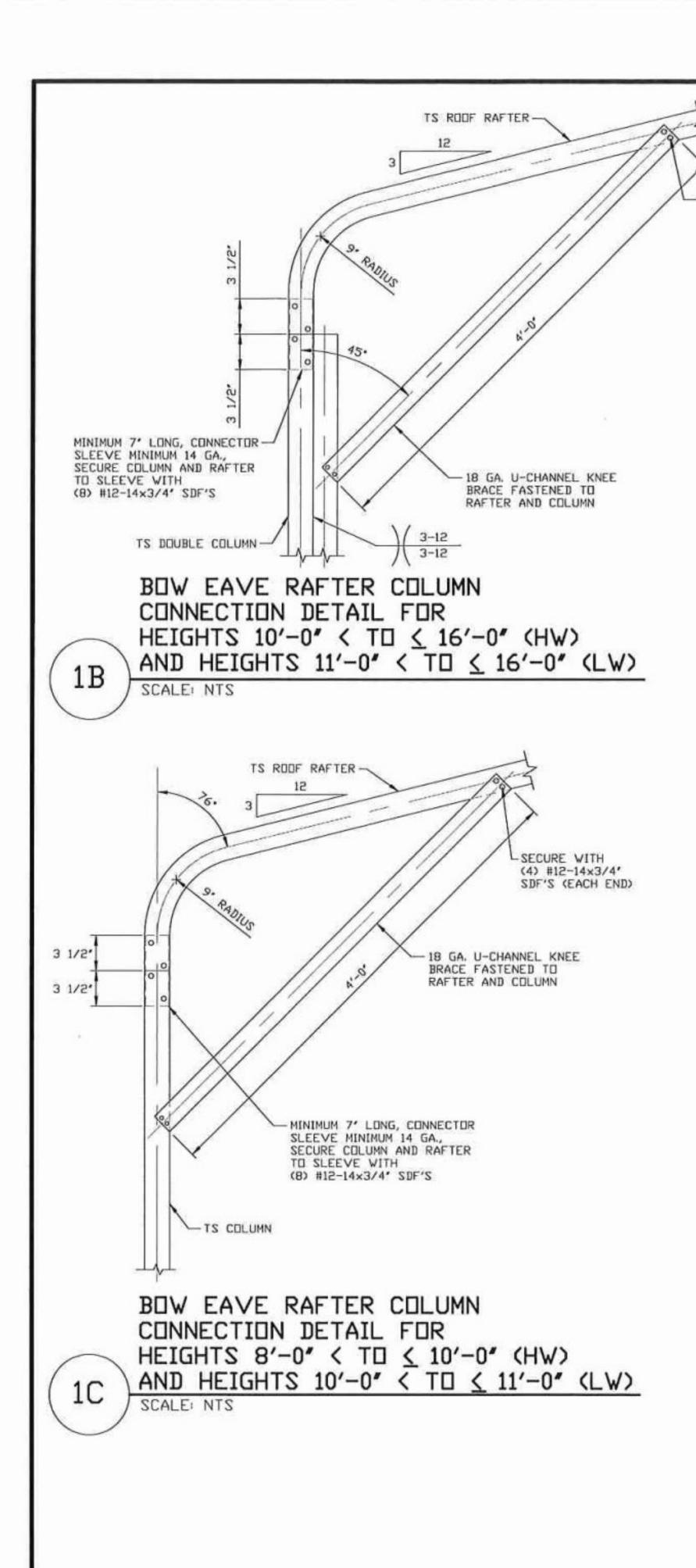


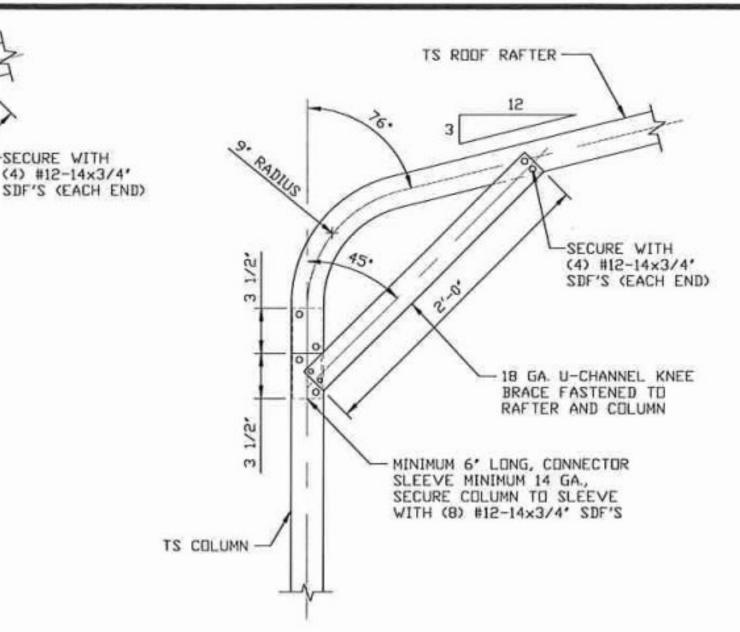
BRACE SECTION
SCALE: NTS



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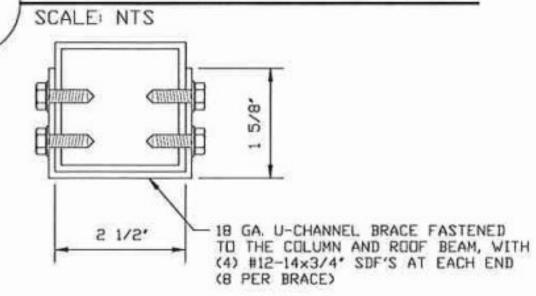




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BOW EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS < 8'-0" (HW) AND HEIGHTS < 10'-0" (LW)



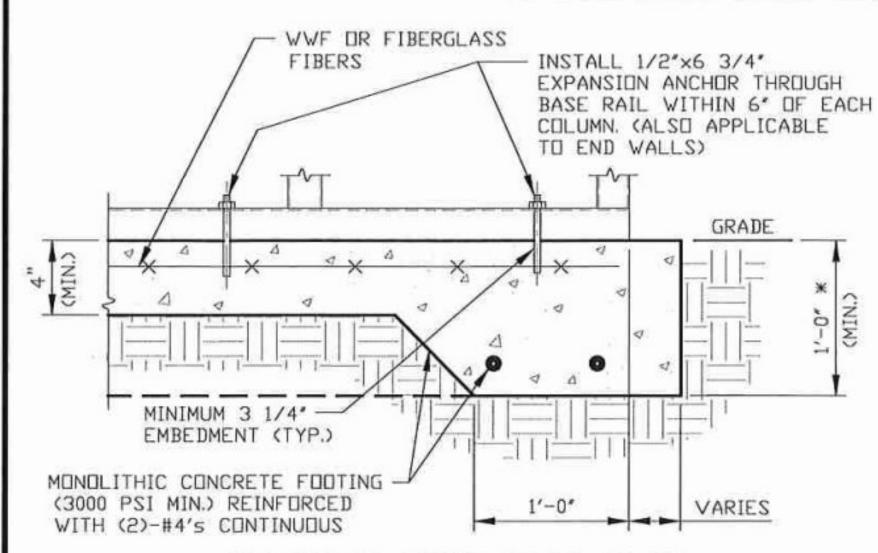
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#### BASE RAIL ANCHORAGE OPTIONS





#### CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE

SCALE: NTS MINIMUM ANCHOR EDGE DISTANCE IS 4".

\* COORDINATE WITH LOCAL BUILDING CODE AND/OR BUILDING OFFICIAL REGARDING REQUIRED FOOTING DEPTH.

#### **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:

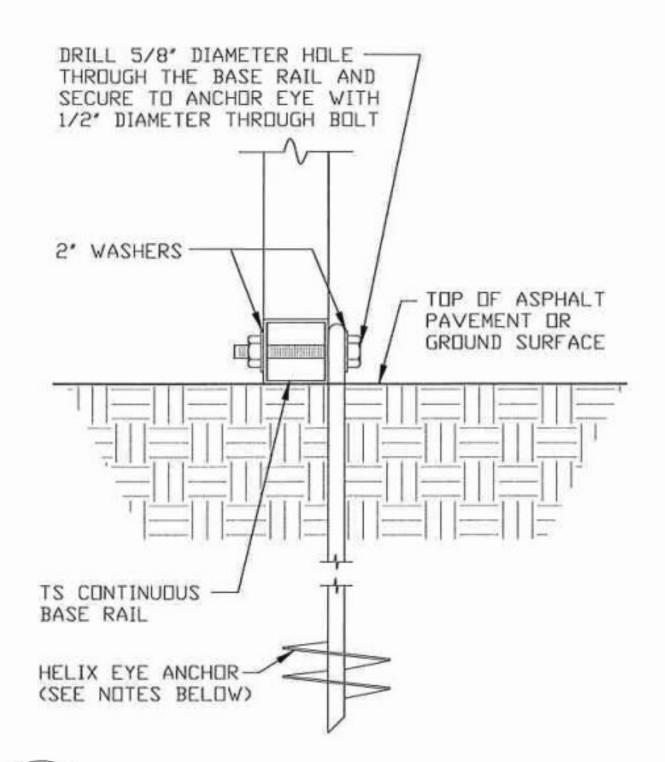
THE TURNDOWN REINFORCING STEEL SHALL BE ASTM A615 GRADE 60. THE SLAB REINFORCEMENT SHALL BE WELDED WIRE FABRIC MEETING ASTM A185 OR FIBERGLASS FIBER REINFORCEMENT.

# 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.

#### HELIX ANCHOR NOTES:

- 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
- 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 LODSE TO MEDIUM DENSE SANDS, FIRM TO STIFF CLAYS AND SILTS ALLUVIAL FILL, USE MINIMUM (2) 6" HELICES WITH MINIMUM 50" 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 BUILDING CODE AND/OR BUILDING OFFICIAL REGARDING REQUIRED FOOTING DEPTH (LENGTH).



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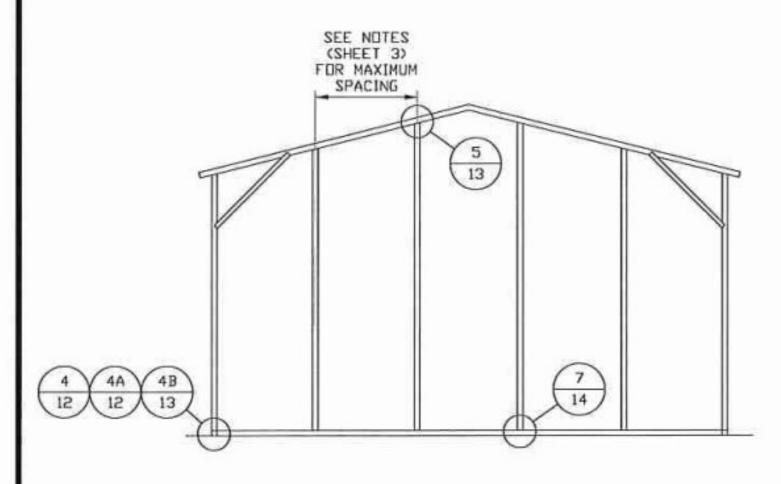
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## TYPICAL END WALL AND SIDE WALL FRAMING SECTIONS (BOX EAVE)



TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION SCALE: NTS

DPENING FOR ROLL-UP TO GET THE PERSONNEL DOOR WITH HEADER PERSONNEL DOOR WITH HEADER PERSONNEL DOOR WITH HEADER TYPICAL BOX FAVE RAFTER END

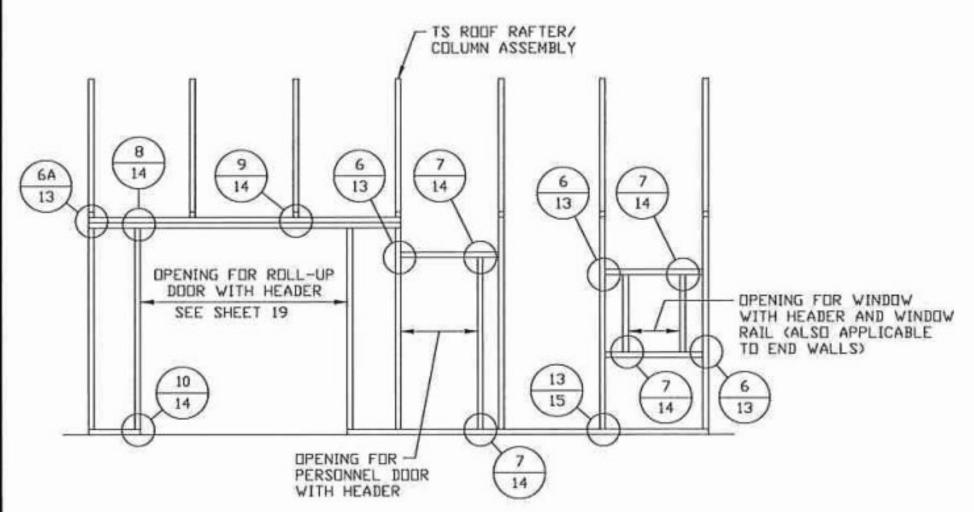
TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

(SHEET 3)

FOR MAXIMUM

SPACING

SCALE: NTS



TYPICAL BOX EAVE RAFTER SIDE WALL OPENINGS FRAMING SECTION

SCALE: NTS



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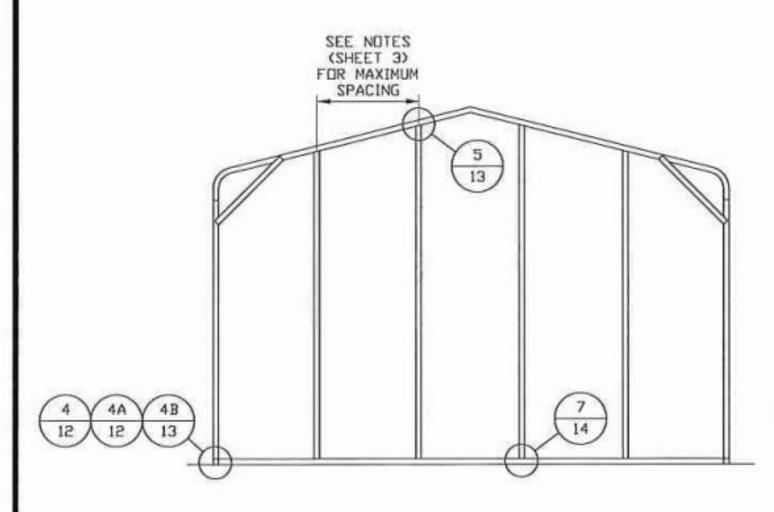
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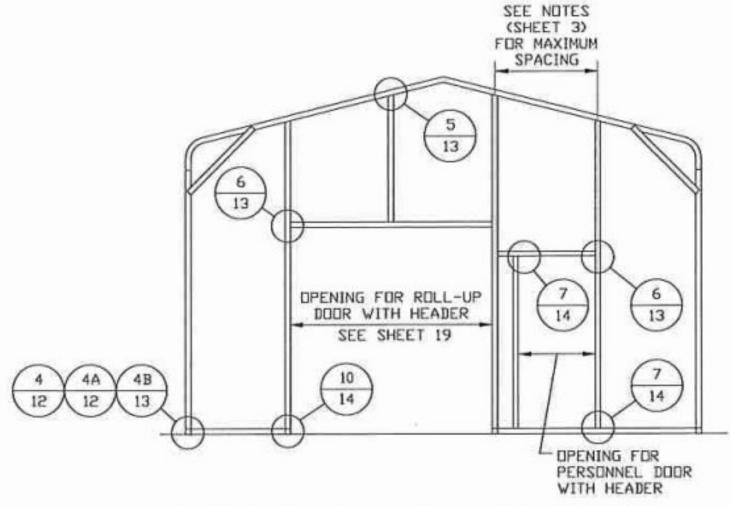
DRAWN BY: JG CHECKED BY: PDH		ST METAL BUII 184 NW TURNEI AKE CITY, FLO 0'-0" SP ENCLOS	R AVE RIDA	NÚE 32055	
PROJECT MGR: WSM	DATE: 3-2-21	SCALE: NTS	JDB ND: 19294S/ 21025S		
CLIENT: BMB	SHT. 10	DWG. NO SK-	-3	REV. 1	

## TYPICAL END WALL AND SIDE WALL FRAMING SECTIONS (BOW EAVE)



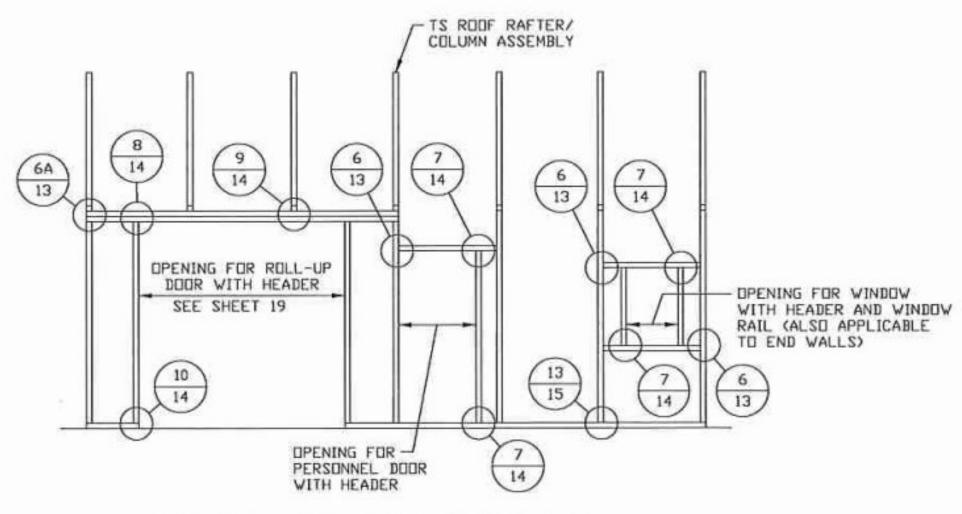
# TYPICAL BOW RAFTER END WALL FRAMING SECTION

SCALE: NTS



#### TYPICAL BOW RAFTER END WALL OPENINGS FRAMING SECTION

SCALE: NTS



# TYPICAL BOW RAFTER SIDE WALL OPENINGS FRAMING SECTION

SCALE: NTS



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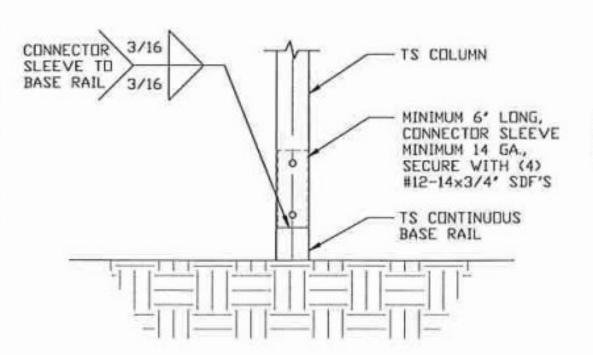
DRAWN BY: JG	_
CHECKED BY: PDH	

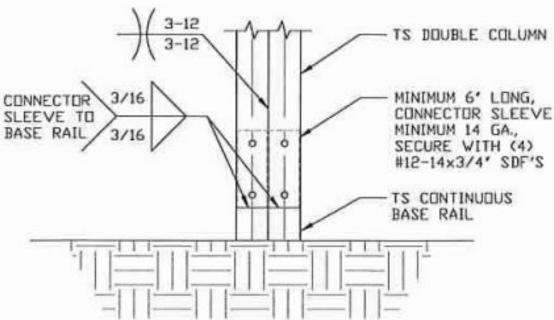
BEST METAL BUILDINGS, LLC 484 NW TURNER AVENUE LAKE CITY, FLORIDA 32055 30-0"x20'-0" SP ENCLOSED STRUCTURE

 PROJECT MGRI WSM
 DATE: 3-2-21
 SCALE: NTS
 JDB ND: 19294S/21025S

 CLIENT: BMB
 SHT. 11
 DWG. ND: SK-3
 REV.: 1

### CONNECTION DETAILS



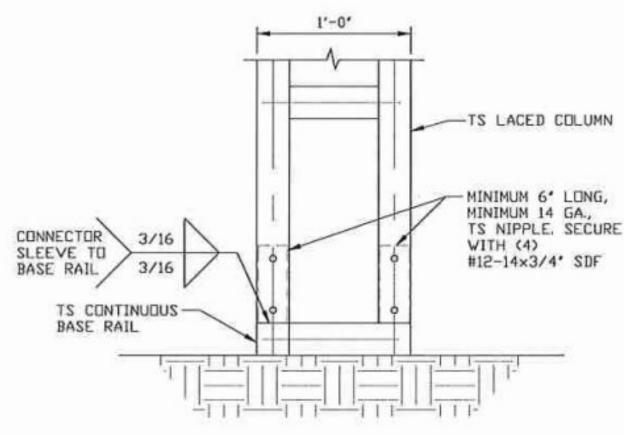


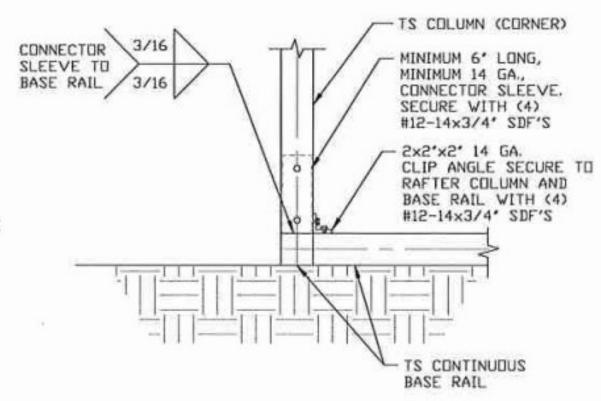
RAFTER COLUMN/BASE RAIL CONNECTION DETAIL

SCALE: NTS

RAFTER COLUMN/BASE RAIL CONNECTION DETAIL

SCALE: NTS





END COLUMN/BASE RAIL CONNECTION DETAIL **3B** SCALE: NTS

END COLUMN/BASE RAIL CONNECTION DETAIL SCALE: NTS

TS DOUBLE COLUMN (CORNER) MINIMUM 6' LONG, MINIMUM 14 GA., CONNECTOR SLEEVE. SECURE WITH (4) #12-14x3/4' SDF'S 2'x2'x2' 14 GA. CLIP ANGLE SECURE TO RAFTER COLUMN AND BASE RAIL WITH (4) #12-14x3/4' SDF'S

CONNECTOR 3/16 SLEEVE TO BASE RAIL 3/16 TS CONTINUOUS BASE RAIL

END COLUMN/BASE RAIL CONNECTION DETAIL SCALE: NTS

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BEST METAL BUILDINGS, LLC DRAWN BY: JG **484 NW TURNER AVENUE** LAKE CITY, FLORIDA 32055 30-0"x20'-0" SP ENCLOSED STRUCTURE CHECKED BY: PDH JDB NO 19294S/ PROJECT MGRI WSM DATE: 3-2-21 SCALE: NTS 210255 DWG. NO SK-3 SHT. 12 REV. 1 CLIENT: BMB

#### **CONNECTION DETAILS** 1'-0' TS ROOF RAFTER-TS LACED COLUMN (CORNER) 2'x2'X2' 14 GA. ANGLE MINIMUM 6' LONG, MINIMUM CLIP SECURE TO COLUMN 14 GA., TS NIPPLE. SECURE AND RAFTER WITH WITH (4) #12-14x3/4' SDF #12-14x3/4' SDF'S 2 DN CONNECTOR SLEEVE TO 3/16 1 1/2'x1 1/2'x2' 16 GA. TOP AND 2 ON SIDE CLIP ANGLE SECURE TO BASE RAIL 3/16 RAFTER COLUMN AND BASE RAIL WITH (4) - TS END COLUMN #12-14x3/4' SDF'S END COLUMN/RAFTER TS CONTINUOUS CONNECTION DETAIL BASE RAIL SCALE: NTS END COLUMN/BASE RAIL CONNECTION DETAIL 4B SCALE: NTS 3/16 TS ROOF RAFTER 3/16 7' TS COLUMN MINIMUM 6' LONG MINIMUM TS COLUMN CONNECTOR 14 GA. CONNECTOR SLEEVE OR END COLUMN SLEEVE SECURE WITH (4) 3/16 TO HEADER #12-14x3/4' SDF'S

TS COLUMN

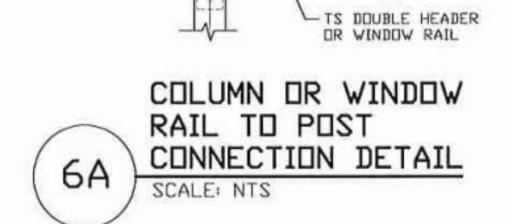
OR END COLUMN

2'x2'X2' 14 GA. ANGLE CLIP
SECURE TO COLUMN AND
EITHER TOP OF HEADER, OR
BOTTOM OF VINDOW RAIL
WITH #12-14x3/4' SDF'S

TS HEADER OR
WINDOW RAIL

6 COLUMN OR WINDOW RAIL/GIRT TO POST CONNECTION DETAIL

SCALE: NTS



TS COLUMN

3-12

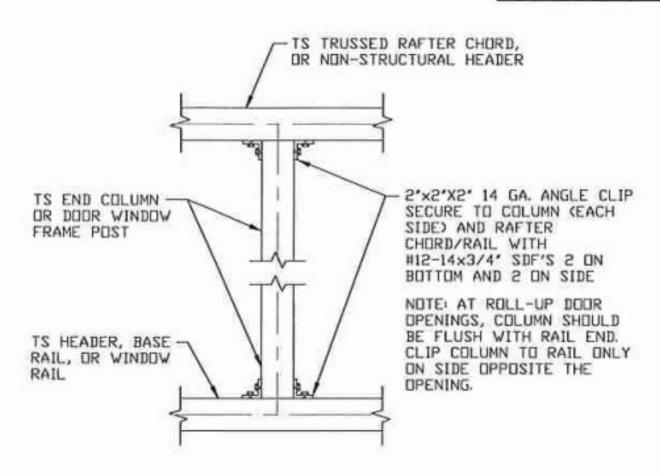
3-12



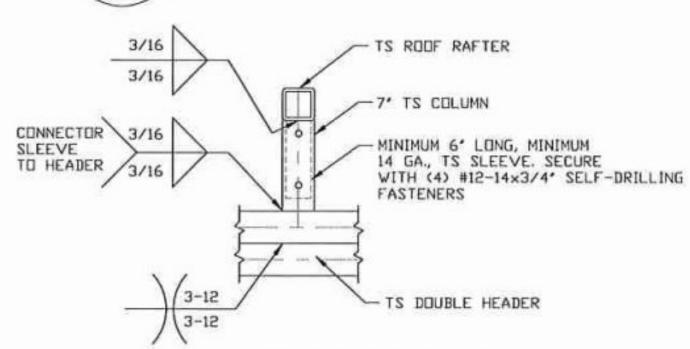
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MOORE AND ASSOCIATES	DRAWN BY: JG	BEST METAL BUILDINGS, LLC 484 NW TURNER AVENUE				
ENGINEERING AND CONSULTING, INC.	CHECKED BY: PDH	The second secon	AKE CITY, FLOI 0'-0" SP ENCLOS			
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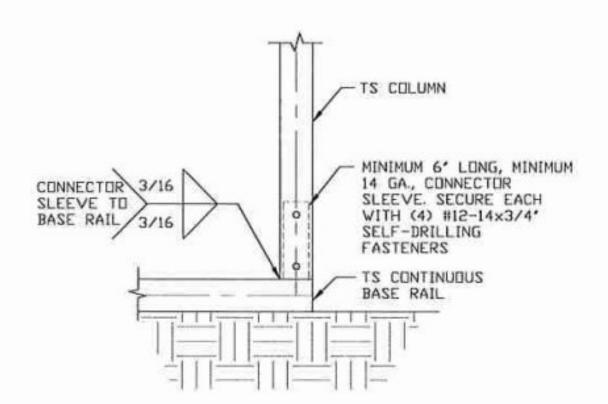
#### CONNECTION DETAILS



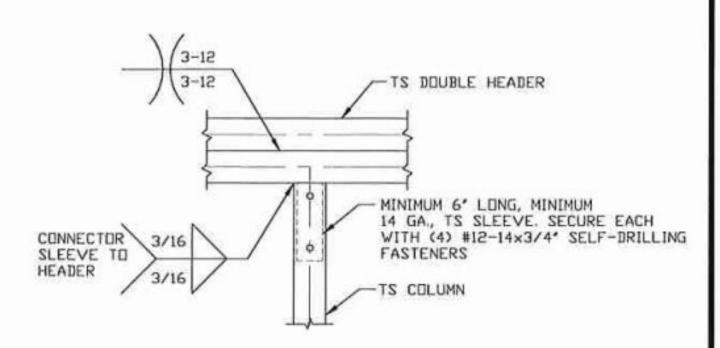
# 7 COLUMN TO WINDOW RAIL CONNECTION DETAIL SCALE: NTS



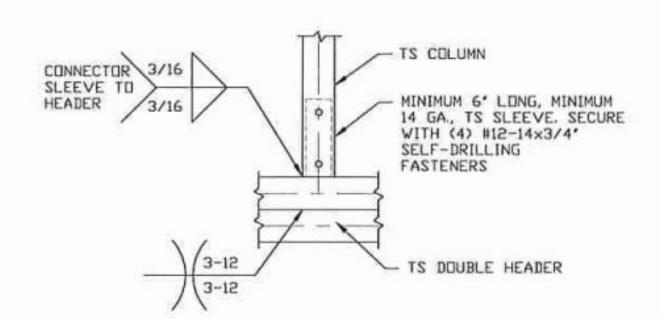
# 9 COLUMN/DOUBLE HEADER CONNECTION DETAIL SCALE: NTS



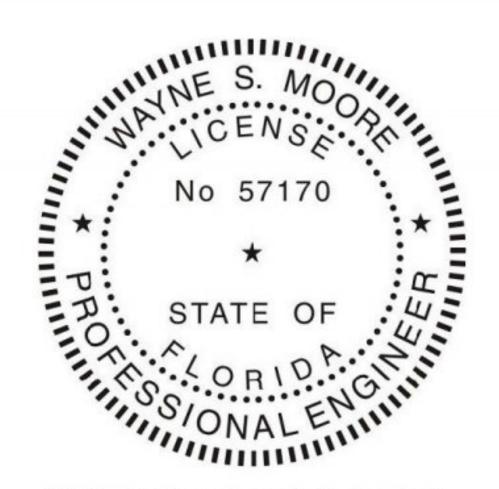




# 8 DOUBLE HEADER/COLUMN CONNECTION DETAIL SCALE: NTS







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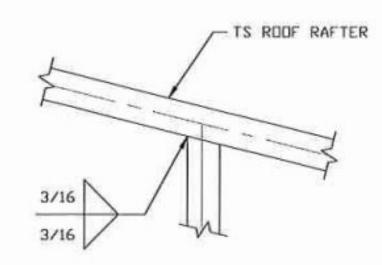
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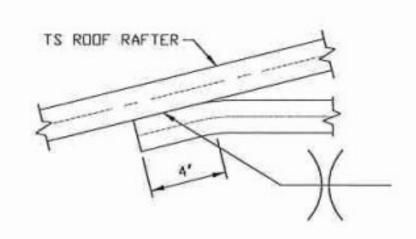
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CHECKED BY: PDH	LAKE CITY, FLORIDA 32055 30-0"x20'-0" SP ENCLOSED STRUCTURE					
PROJECT MGR: WSM	DATE: 3-2-21	SCALE: NTS	JDB 2102	ND: 19294S/		
CLIENT: BMB	SHT. 14	DWG. NO SK-	-3	REV. 1		

### **CONNECTION DETAILS**

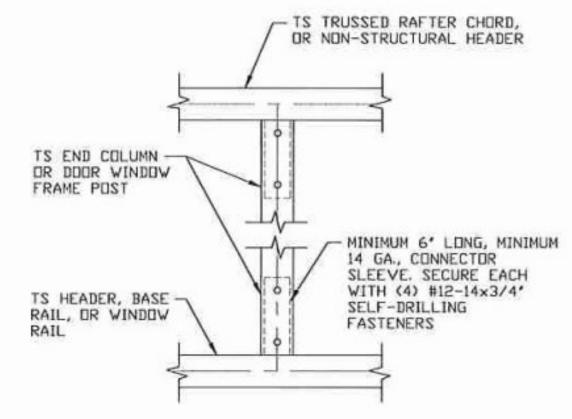




RAFTER TO CHORD CONNECTION DETAIL

SCALE: NTS

12 COLLAR TIE CONNECTION DETAIL



COLUMN TO HEADER OR BASE RAIL

SCALE: NTS



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#### BOX EAVE RAFTER LEAN-TO OPTIONS 14A V 14B 16 16A 16A ROOF EXTENSION OPTION MAIN STRUCTURE LEAN-TO OPTION 5 12 SEE SHEET 16 & 16A SEE SHEET 16A FOR MAX. FOR MAX. LEAN-TO SPAN LEAN-TO SPAN 30'-0' MAXIMUM RAFTER SPAN

TYPICAL BOX EAVE RAFTER LEAN-TO OPTIONS FRAMING SECTION (BOTH OPTIONS SHOWN)

SCALE: NTS

(MAXIMUM WIDTH OF SINGLE MEMBER ROOF EXTENSION LEAN-TO IS 12'-0".)

(MAXIMUM WIDTH OF DOUBLE MEMBER ROOF EXTENSION LEAN-TO IS 16'-0'.)

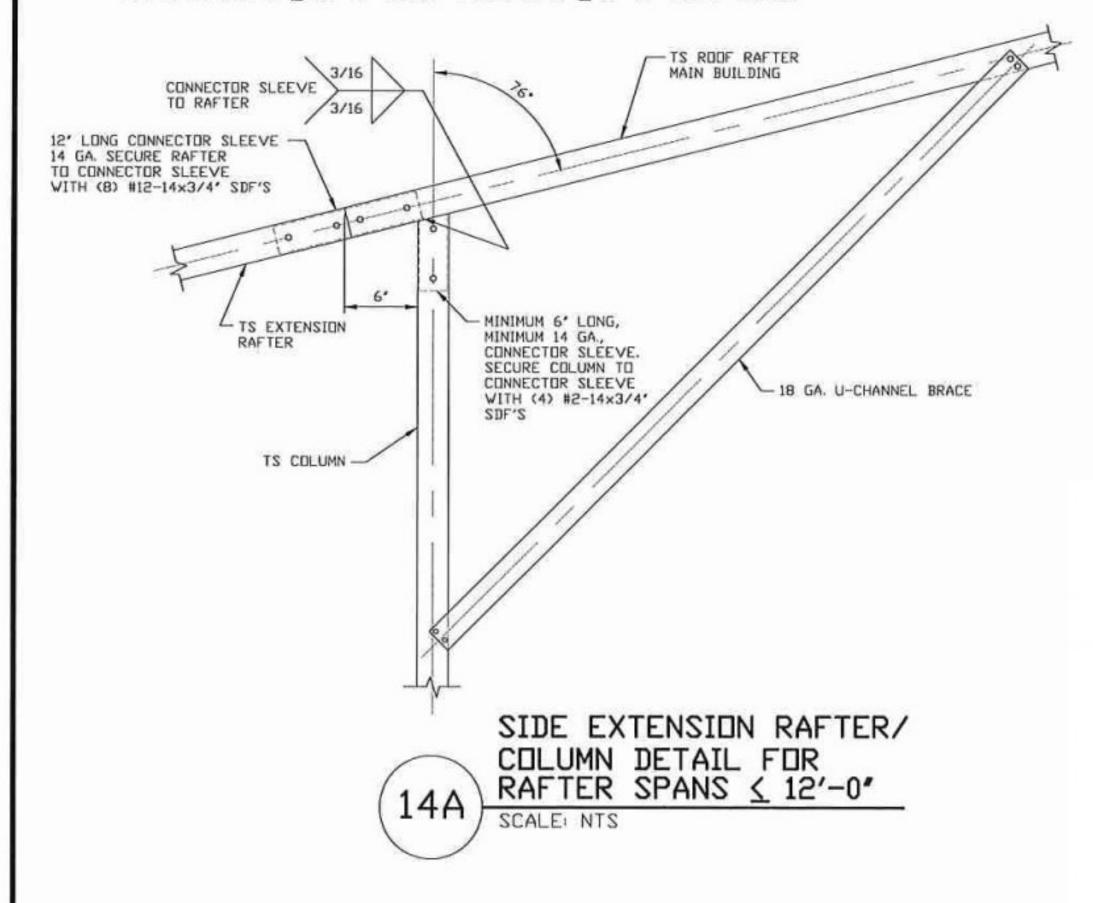
MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE LACED COLUMNS FOR EAVE HEIGHTS 16'-0" < T□ < 20'-0".

MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE DOUBLE COLUMNS FOR

EAVE HEIGHTS 10'-0" < TO < 16'-0" <HIGH WIND> AND 11'-0" < TO < 16'-0" <LOW WIND>.

MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR

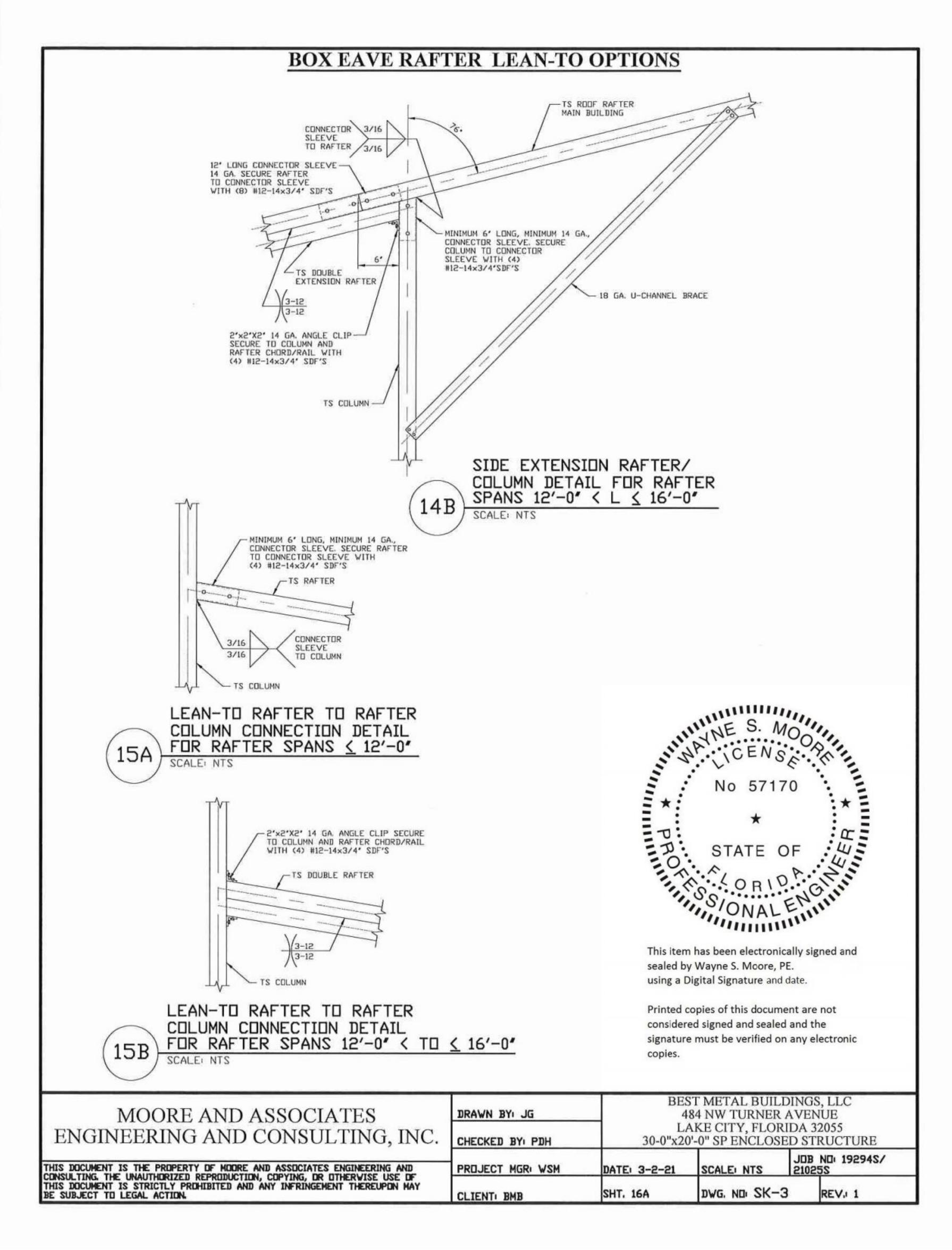
EAVE HEIGHTS ≤ 10'-0" (HIGH WIND) AND ≤ 11'-0" (LOW WIND).



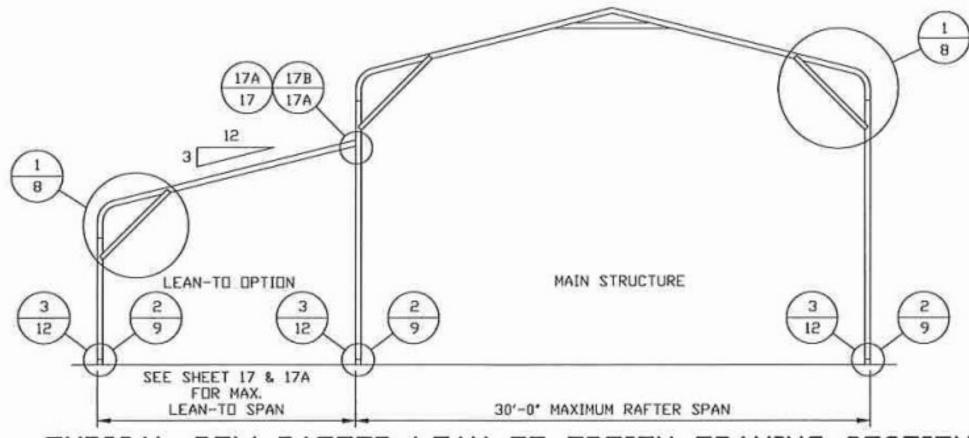


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#### BOW EAVE RAFTER LEAN-TO OPTIONS



TYPICAL BOW RAFTER LEAN-TO OPTION FRAMING SECTION

SCALE: NTS

(MAXIMUM WIDTH DF SINGLE MEMBER ROOF EXTENSION LEAN-TO IS 12'-0".)

(MAXIMUM WIDTH DF DOUBLE MEMBER ROOF EXTENSION LEAN-TO IS 16'-0".)

MAIN BUILDING COLUMNS WITH LEAN-TO DR ROOF EXTENSION ATTACHED ARE REQUIRED

TO BE LACED COLUMNS FOR EAVE HEIGHTS 16'-0" < TO ≤ 20'-0".

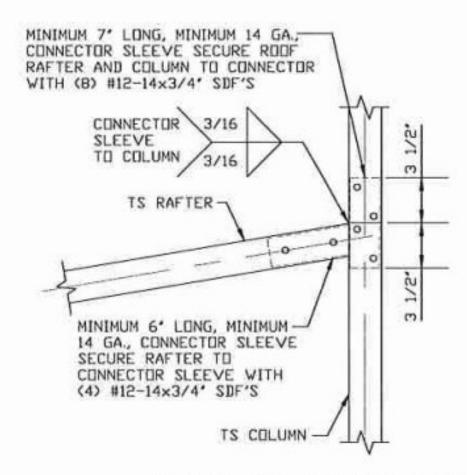
MAIN BUILDING COLUMNS WITH LEAN-TO DR ROOF EXTENSION ATTACHED ARE REQUIRED

TO BE DOUBLE COLUMNS FOR EAVE HEIGHTS 10'-0" < TO ≤ 16'-0" (HIGH WIND) AND

11'-0" < TO ≤ 16'-0" (LOW WIND).

MAIN BUILDING COLUMNS WITH LEAN-TO DR ROOF EXTENSION ATTACHED ARE REQUIRED

TO BE SINGLE COLUMNS FOR EAVE HEIGHTS ≤ 10'-0" (HIGH WIND) AND ≤ 11'-0" (LOW WIND).



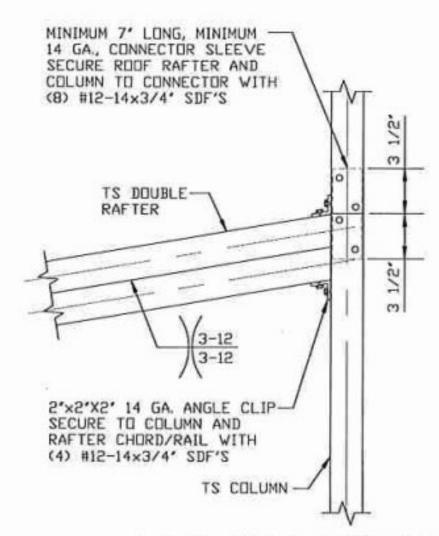
LEAN-TO RAFTER TO RAFTER
COLUMN CONNECTION DETAIL
FOR RAFTER SPANS < 12'-0"



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## BOW EAVE RAFTER LEAN-TO OPTIONS



LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR RAFTER SPANS 12'-0" < TO < 16'-0"

17B

SCALE: NTS



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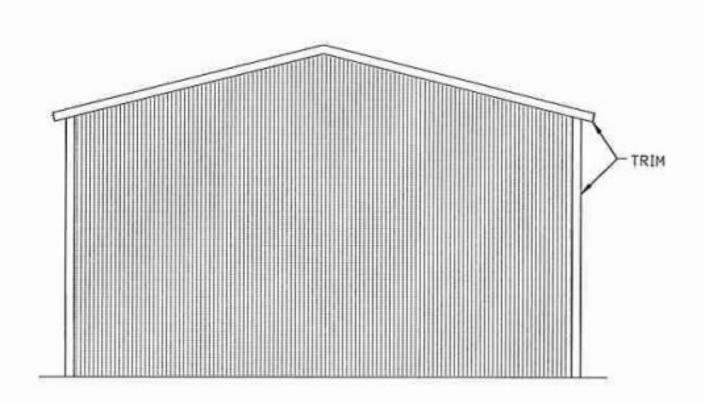
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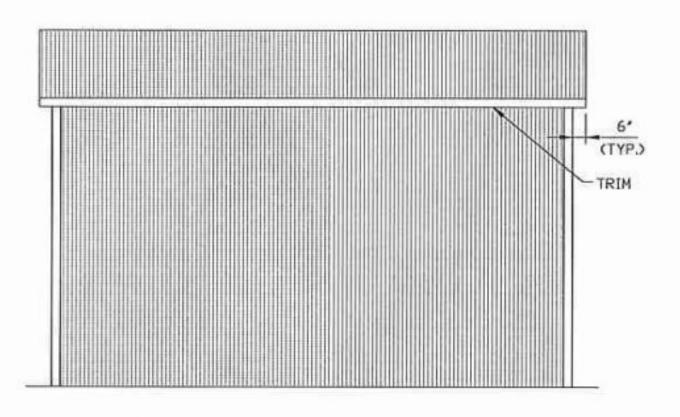
DRAWN BY: JG	4	ST METAL BUII 84 NW TURNEI AKE CITY FLO	RAVE	NÚE
CHECKED BY: PDH	LAKE CITY, FLORIDA 32055 30-0"x20'-0" SP ENCLOSED STRUCTURE			
PROJECT MGR: WSM	DATE: 3-2-21	SCALE: NTS	JDB 2102	NO 19294S/
CLIENT: BMB	SHT. 17A	DWG. NO SK-	-3	REV. 1

### BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



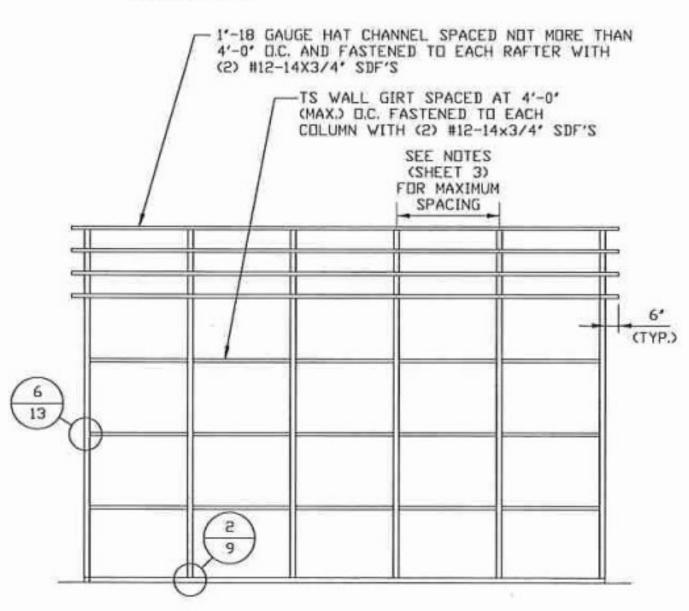
TYPICAL END ELEVATION VERTICAL ROOF/SIDING

SCALE: NTS



# TYPICAL SIDE ELEVATION VERTICAL ROOF/SIDING

SCALE: NTS



TYPICAL FRAMING SECTION VERTICAL ROOF/SIDING OPTION

1'-18 GAUGE
HAT CHANNEL

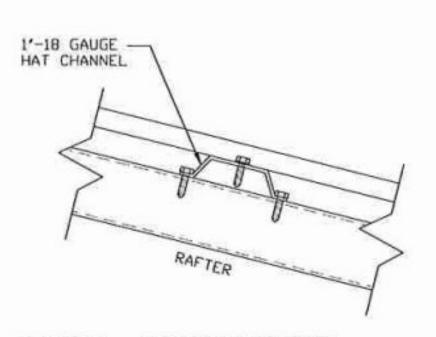
TS WALL GIRTS

3
12

29 GA. GALVANIZED METAL ROOF-AND WALL PANELS FASTENED TO

# TYPICAL SECTION VERTICAL ROOF/SIDING OPTION

SCALE: NTS



#### PANEL ATTACHMENT

(ALTERNATE FOR VERTICAL ROOF PANELS)
SCALE: NTS



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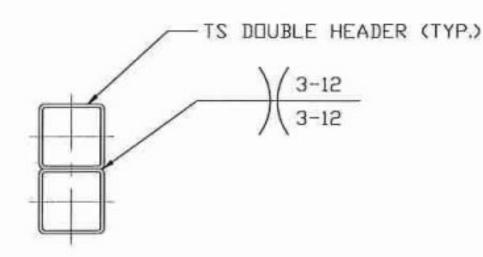
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SCALE: NTS

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CHECKED BY: PDH	LAKE CITY, FLORIDA 32055 30-0"x20'-0" SP ENCLOSED STRUCTURE					
PROJECT MGR: WSM	DATE: 3-2-21	SCALE: NTS	JDB 2102	NO: 19294S/ 5S		
CLIENT: BMB	SHT. 18	DWG. NO: SK-3 REV.: 1				

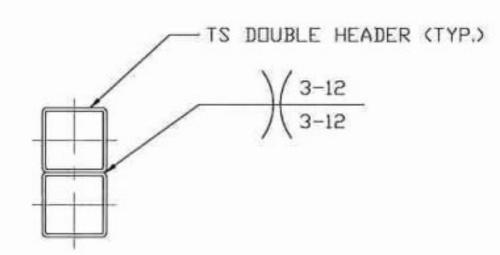
### **HEADER OPTIONS**

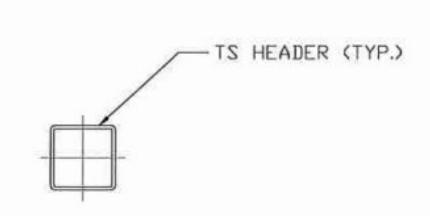
### SIDE WALL HEADER OPTION



# HEADER DETAIL FOR LENGTHS & 16'-0"

## END WALL HEADER OPTIONS





HEADER DETAIL FOR LENGTHS 14'-0" < TO < 16'-0"

HEADER DETAIL FOR LENGTHS < 14'-0"



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CHECKED BY: PDH					
PROJECT MGR: WSM	DATE: 3-2-21	SCALE: NTS	JDB 2102	NO: 19294S/ 5S	
CLIENT: BMB	SHT. 19	DWG. NO SK-3		REV. 1	