



Buildings & Garages

Pilot Mountain, North Carolina

STRUCTURAL DESIGN ENCLOSED BUILDING

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

2 September 2020

Revision 4

M&A Project No. 18184S/18348S/19129S/20229S

Prepared for:

JR Buildings and Garages
316 Nelson Street
Pilot Mountain, NC 27041

Prepared by:

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and Consulting, Inc.

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North Augusta, SC 29841

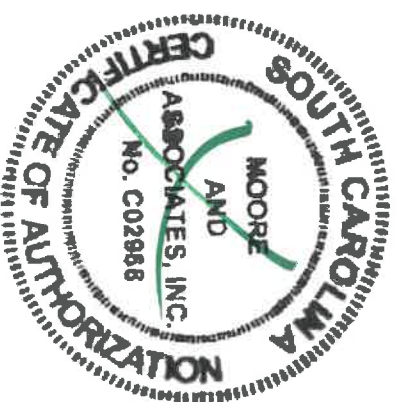
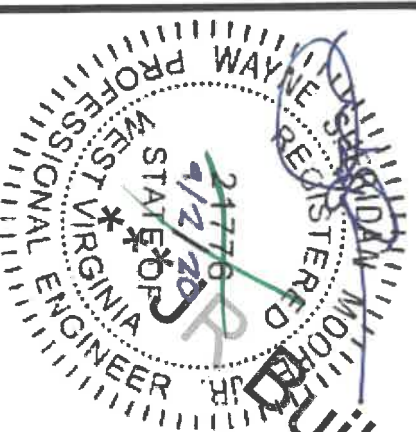
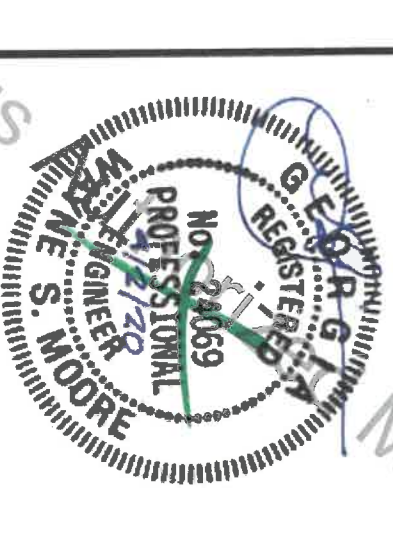
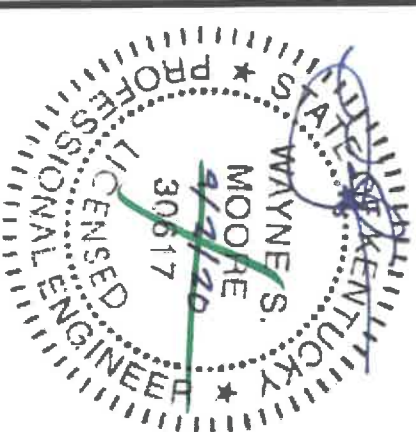
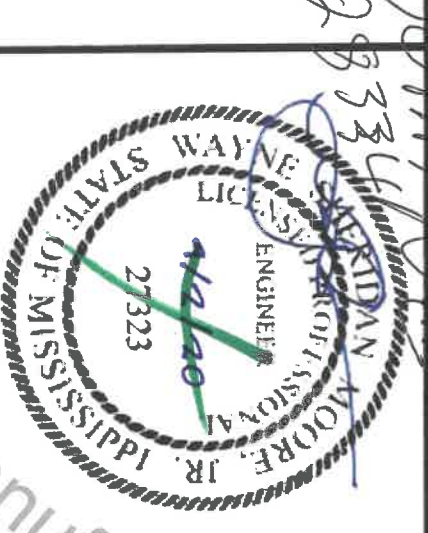
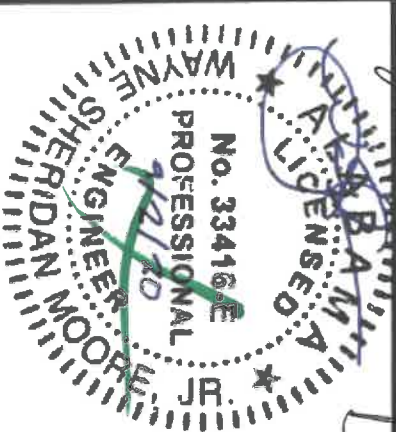
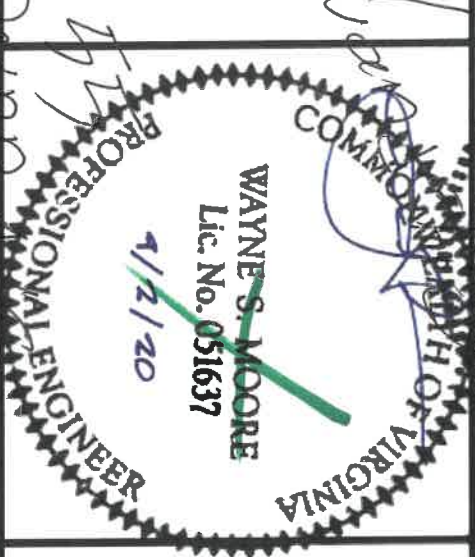
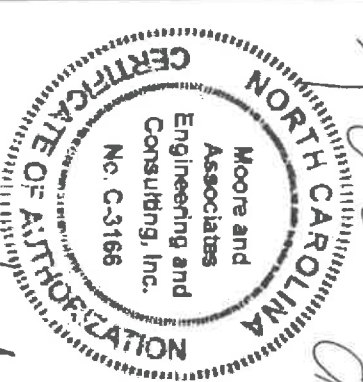
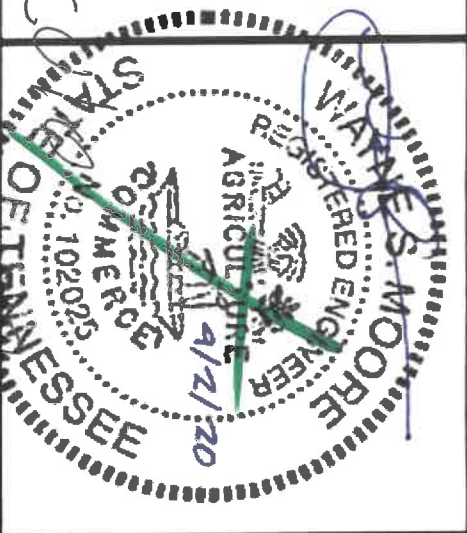
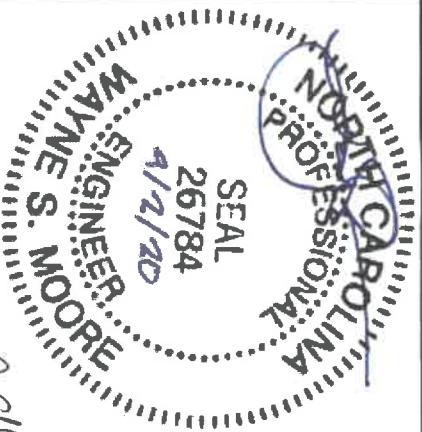
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DRAWN BY: LT	JK BUILDINGS & GARAGES 316 NELSON STREET PILLOT MOUNTAIN, NC 27041		
CHECKED BY: PH	30'-0"X16'-0" ENCLOSED STRUCTURE		
PROJECT MGR: VSH	DATE: 9-2-20	SCALE: NTS	JOB NO: 18184S/ 18348S/19129S/20229S
CLIENT: JR BUILDINGS	SHT. 1	DWG. NO: SK-3	REV: 4

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CLIENT: JR BUILDINGS	SHT. 2	DWG. NO: SK-3	REV: 4

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, 2018 INTERNATIONAL BUILDING CODE (IBC), 2015 IBC, 2012 IBC AND 2009 IBC.
3. DESIGN LOADS ARE AS FOLLOWS:

A) DEAD LOAD

= 1.5 PSF

B) LIVE LOAD

= 12 PSF

C) GROUND SNOW LOAD

= 35 PSF

= 30 PSF (W ≤ 24'-0" WITH U-CHANNEL COLLAR TIE)

* DIFFERENTIAL LOADING DUE TO SNOW DRIFT NOT ANALYZED.
4. ULTIMATE 3-SECOND GUST WIND SPEED (V_{ULT}) = ≤ 145 MPH (NOMINAL WIND SPEED = ≤ 112 MPH).
5. MAXIMUM RAFTER/COLUMN AND END COLUMN SPACING = 5.0 FEET (UNLESS NOTED OTHERWISE).
6. END WALL COLUMNS/POSTS AND SIDEWALL COLUMNS/POSTS AND ARE SIMILAR IN SIZE AND SPACING (UNLESS NOTED OTHERWISE).
7. RISK CATEGORY 1.
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 TUBE STEEL (TS) FRAMING MEMBERS (UNLESS NOTED OTHERWISE).
10. AVERAGE FASTENER SPACING ON-CENTERS ALONG RAFTERS OR HAT CHANNELS, AND COLUMNS (INTERIOR OR END) = 8 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 14° (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 LAP JOINT SEALANT.
12. GROUND 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. SOIL NAILS MAY BE USED FOR WIND SPEEDS ≤ 145 MPH AND IN SUITABLE SOIL CONDITIONS. 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 1

R = 3.25

I_e = 1.0

S_{DS} = 2.039 g

V = C_sW

S_m = 1.258 g

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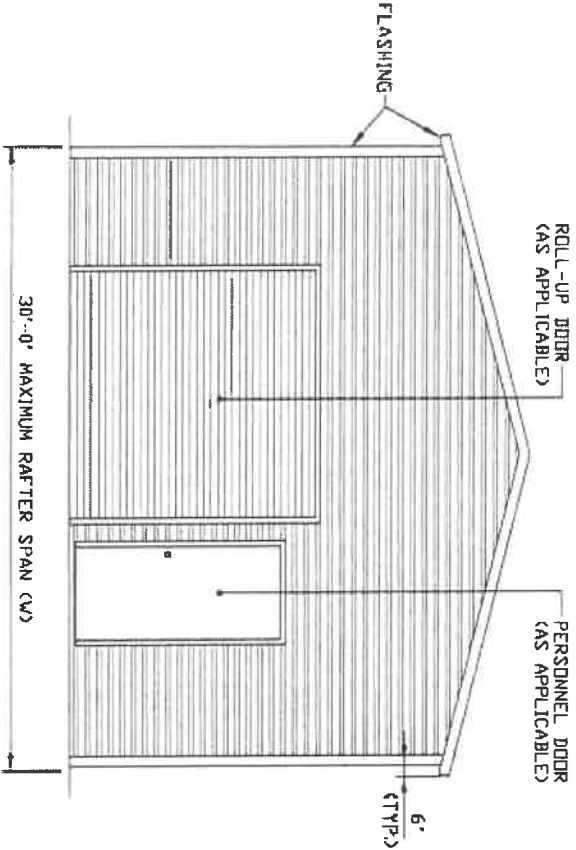
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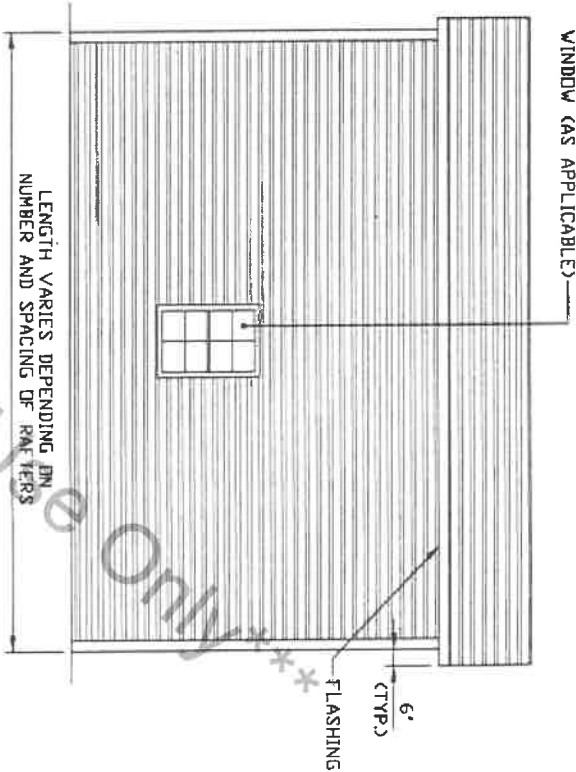
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BOX EAVE FRAME RAFTER STRUCTURE

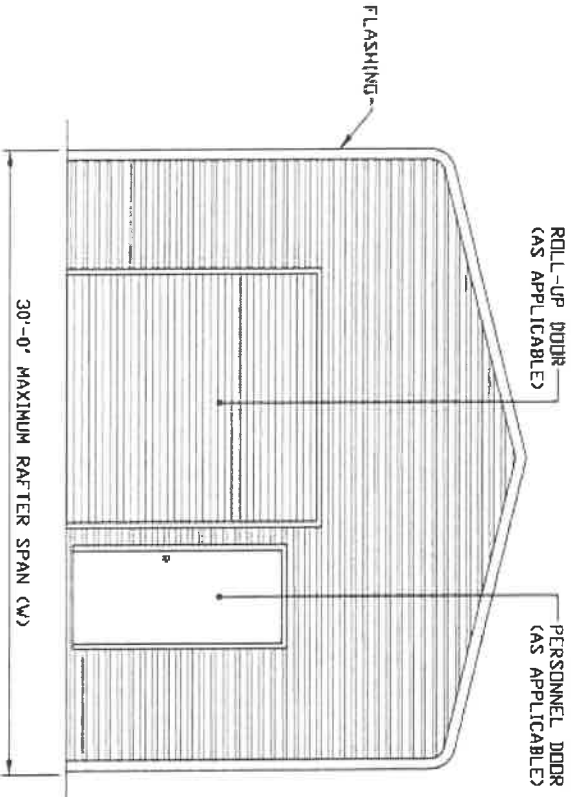


TYPICAL END ELEVATION
SCALE: NTS

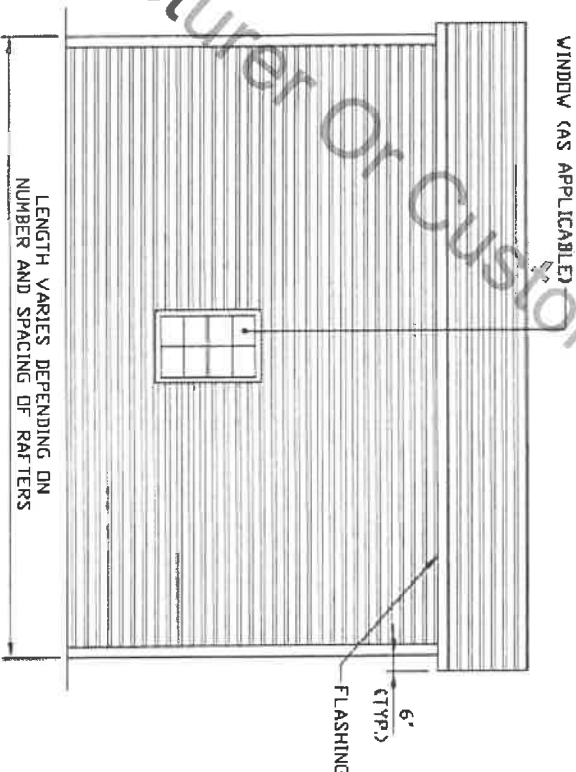


TYPICAL SIDE ELEVATION
SCALE: NTS

BOW EAVE FRAME RAFTER STRUCTURE



TYPICAL END ELEVATION
SCALE: NTS



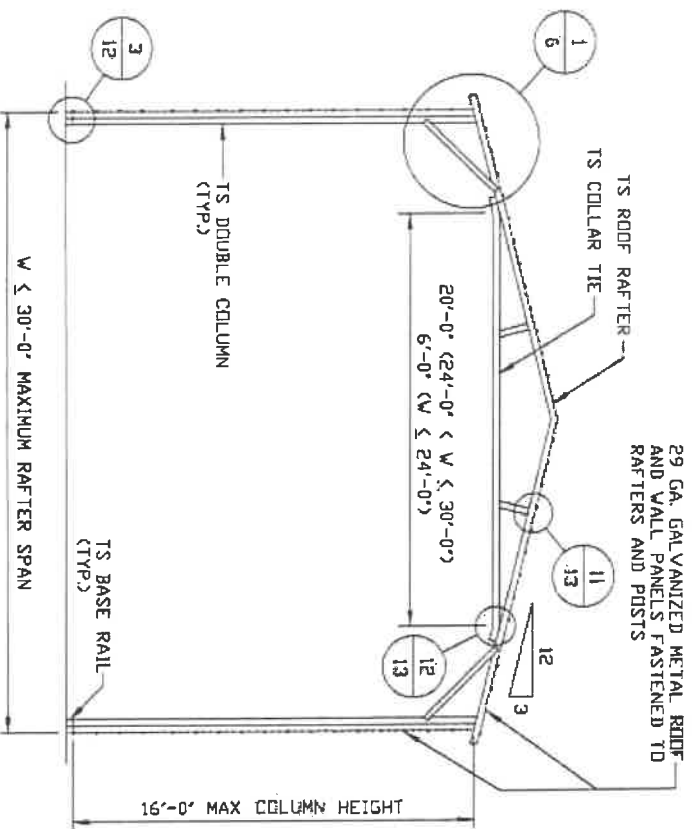
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SCALE: NTS

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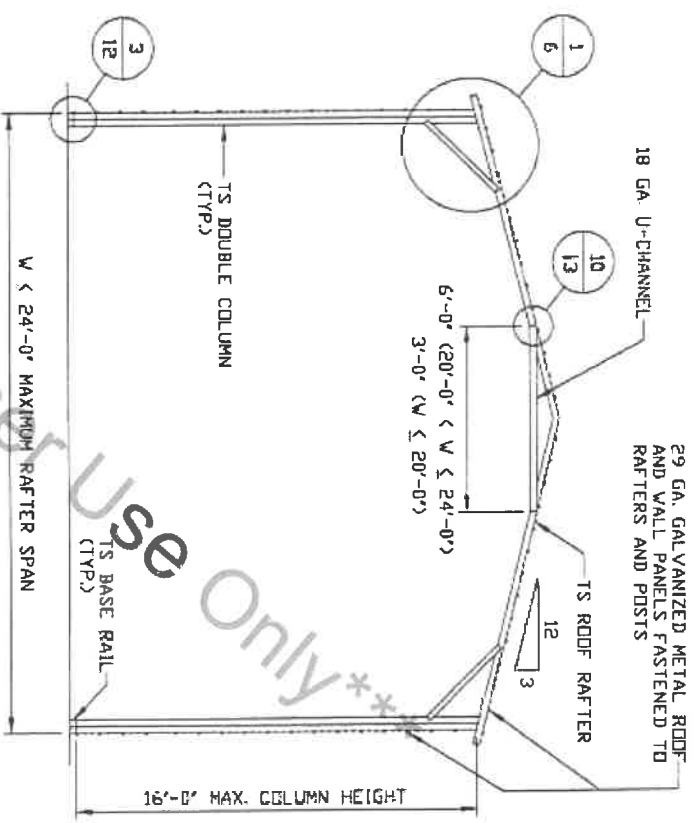
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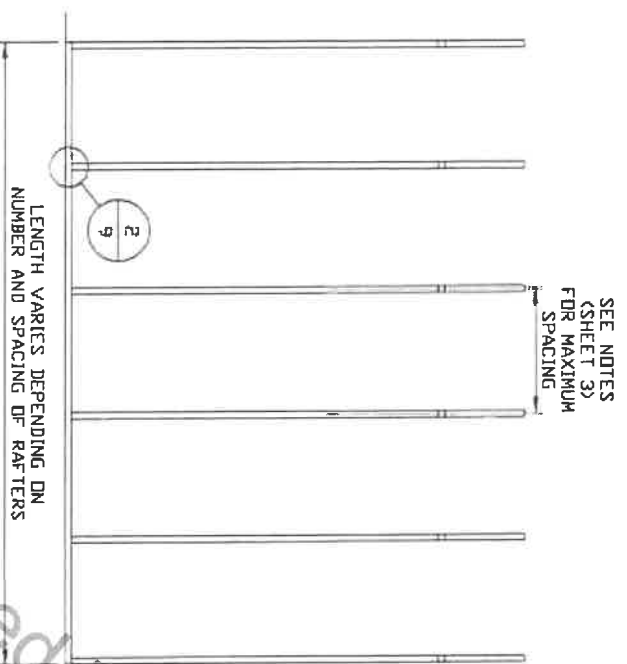
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CLIENT: JR BUILDINGS	SHT. 4	DWG. NO: SK-3		



TYPICAL RAFTER/COLUMN FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN FRAME SECTION
SCALE: NTS

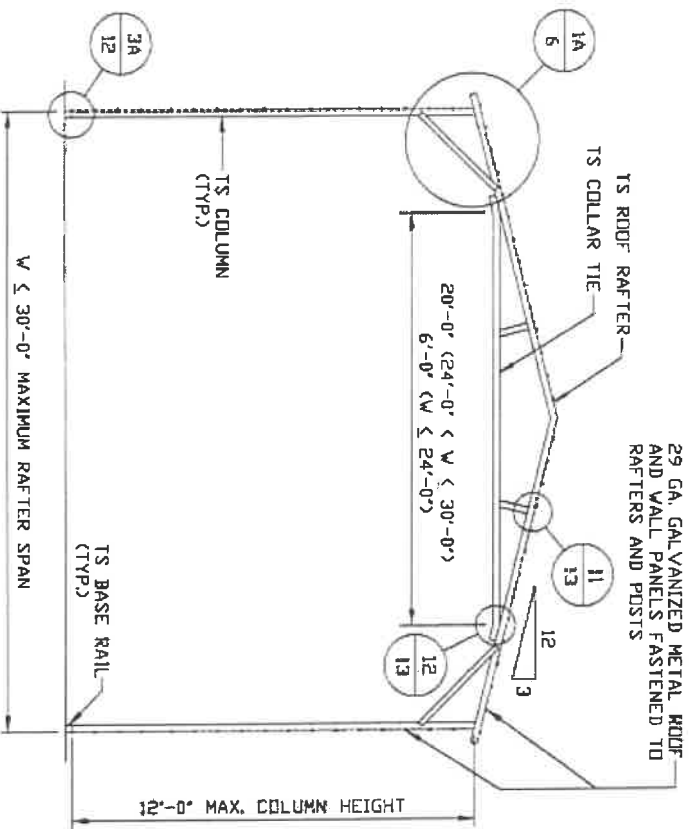


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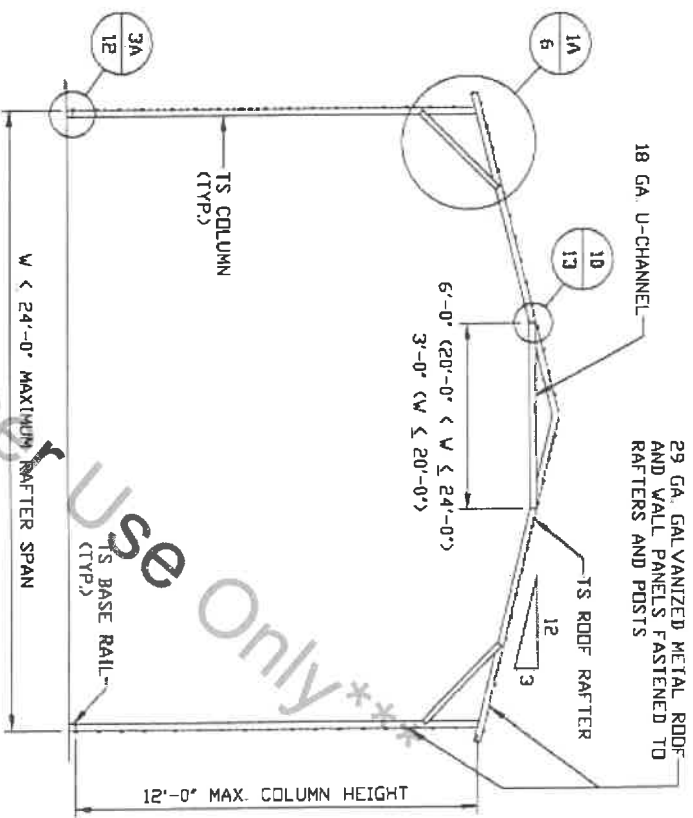
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PROJECT MGR: VSM			
CLIENT: JR BUILDINGS		SHT. 5	DWG. NO: SK-3
			REV. 4

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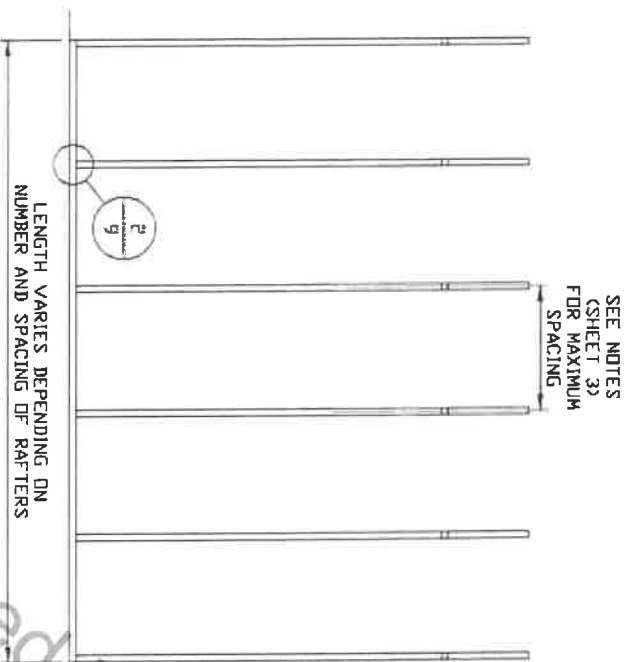
JOB NO: 181845/
183485/191295/202295



TYPICAL RAFTER/COLUMN FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN FRAME SECTION
SCALE: NTS



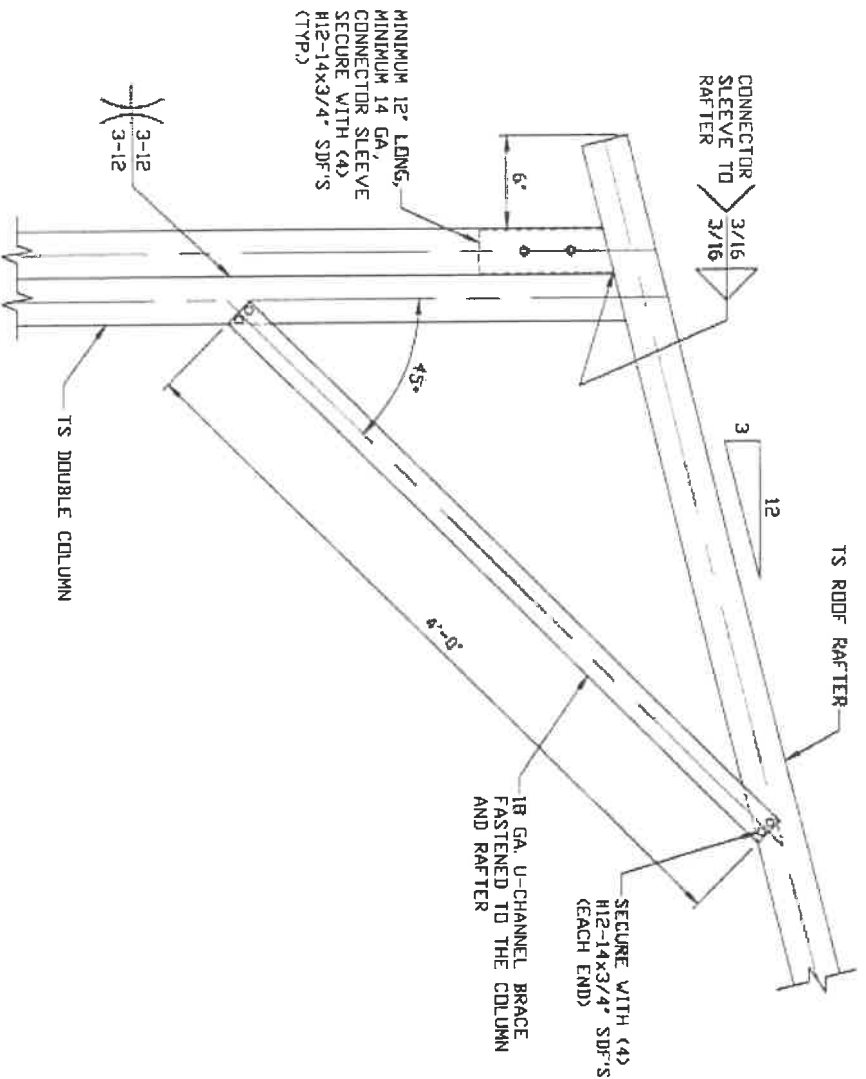
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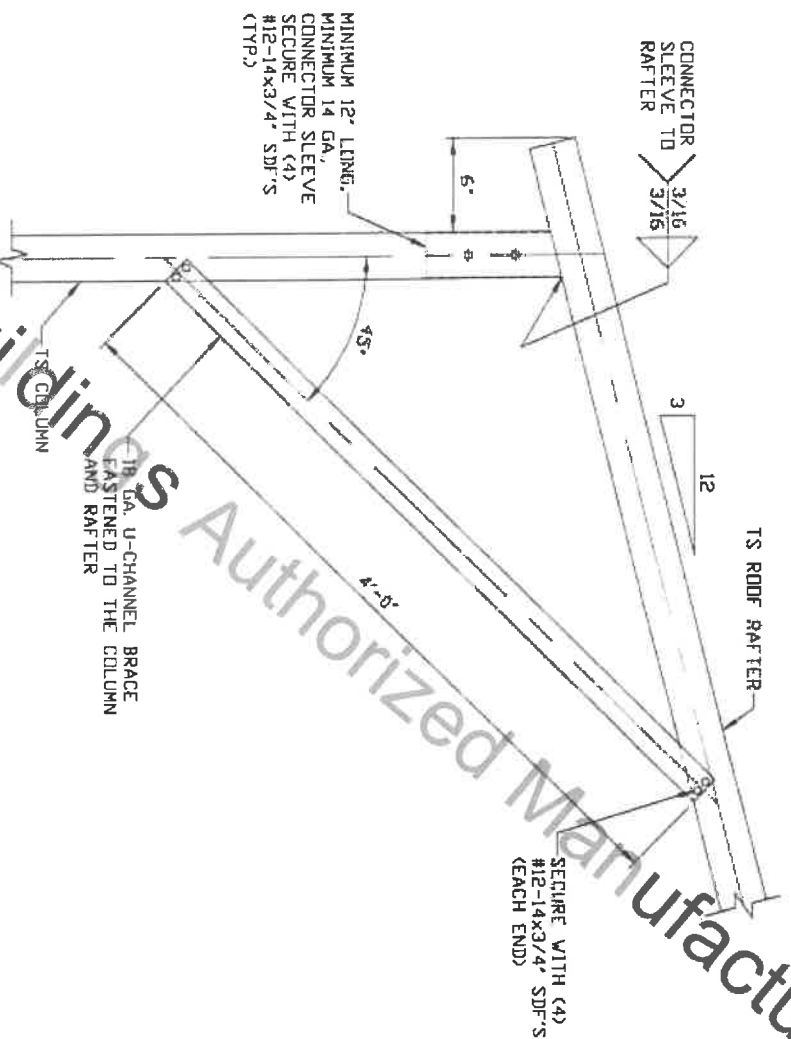


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**BOX EAVE RAFTER/CORNER POST
CONNECTION DETAIL
FOR HEIGHTS 12'-0" < TD < 16'-0"**

SCALE: NTS

NOTE: 2'-0" KNEE BRACE MAY BE USED FOR
BUILDING WIDTHS < 24'-0".

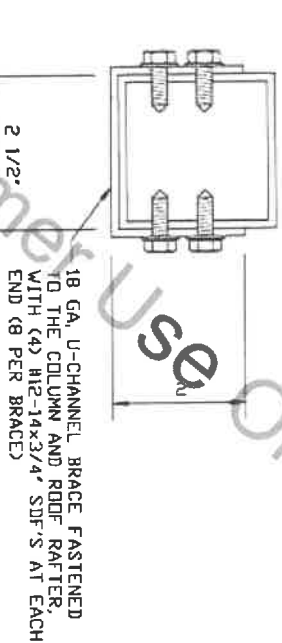


1A

**BOX EAVE RAFTER/CORNER POST
CONNECTION DETAIL
FOR HEIGHTS < 12'-0"**

SCALE: NTS

NOTE: 2'-0" KNEE BRACE MAY BE USED
FOR BUILDING WIDTHS < 24'-0"
AND < 11'-0" EAVE HEIGHT



BRACE SECTION

SCALE: NTS

18 GA. U-CHANNEL BRACE FASTENED
TO THE COLUMN AND ROOF RAFTER
WITH (4) #12-14x3/4" SDF'S AT EACH
END (8 PER BRACE)

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CLIENT: JR BUILDINGS

JR BUILDINGS & GARAGES

316 NELSON STREET

PILLOT MOUNTAIN, NC 27041

30'-0" x 16'-0" ENCLOSED STRUCTURE

DATE: 9-2-20

SCALE: NTS

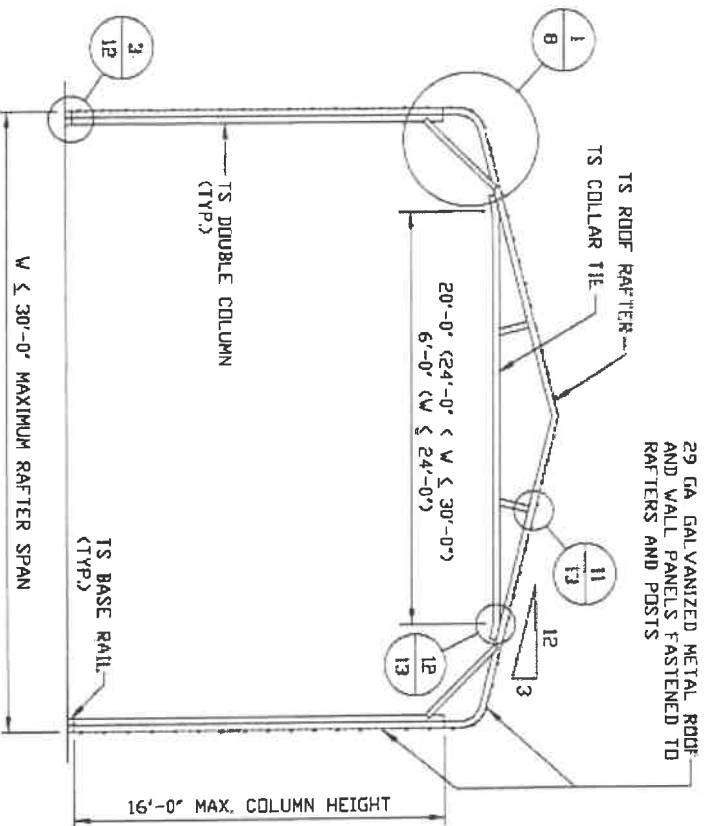
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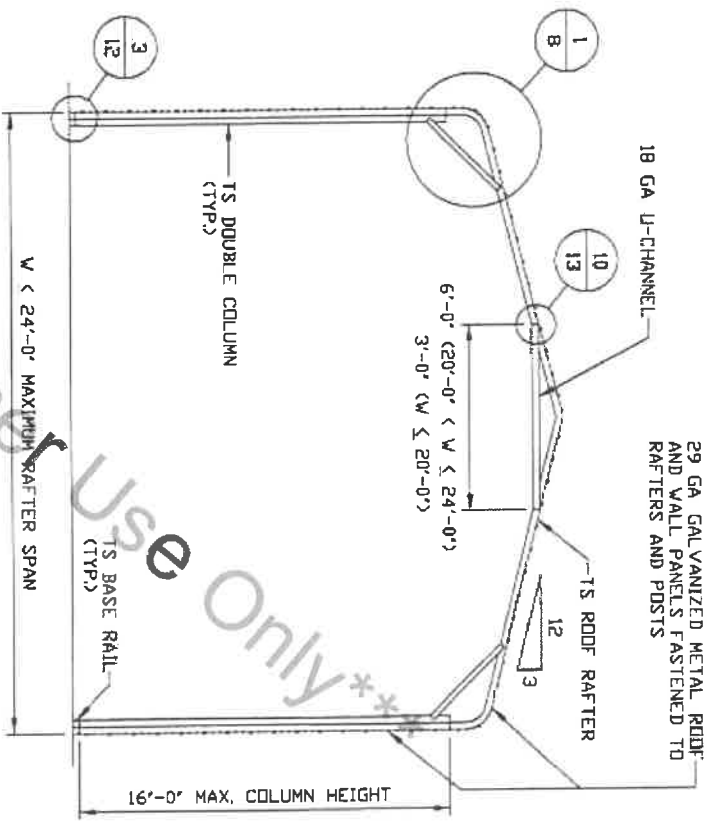
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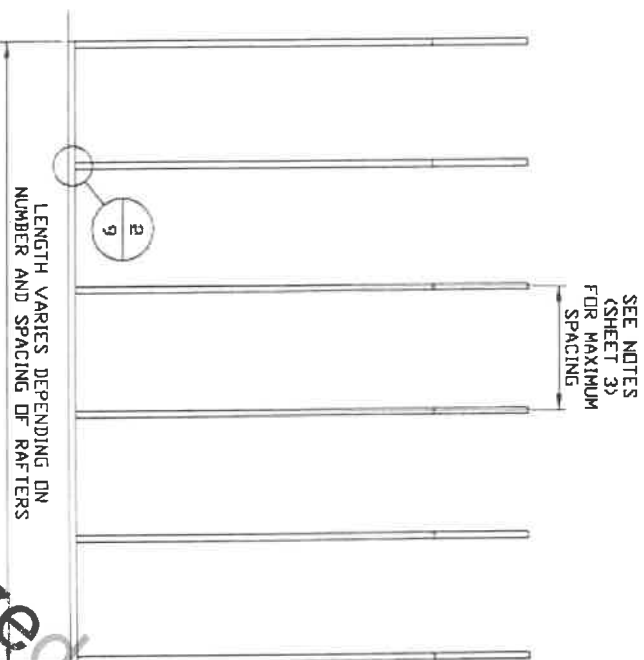
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TYPICAL RAFTER/COLUMN FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN FRAME SECTION
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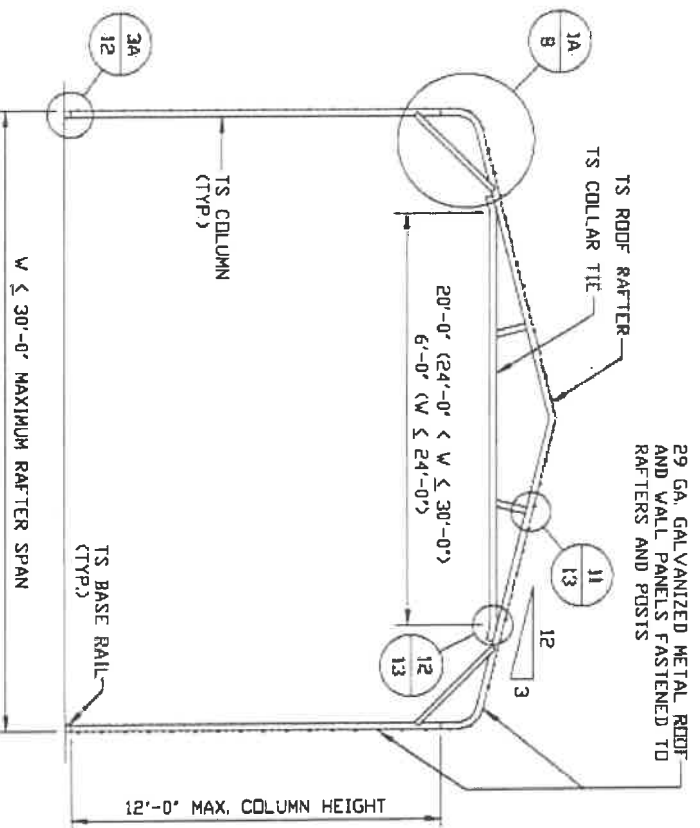


TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION
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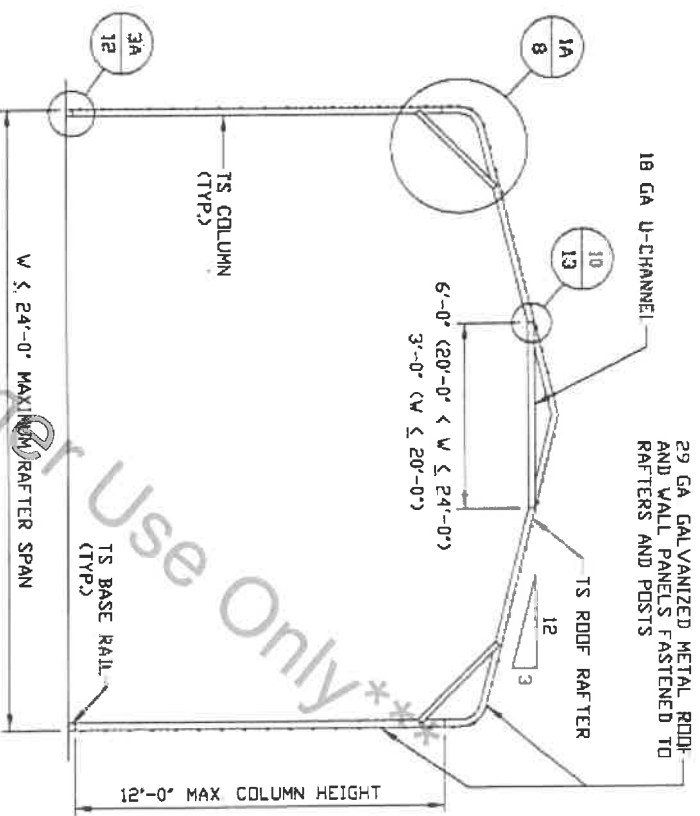
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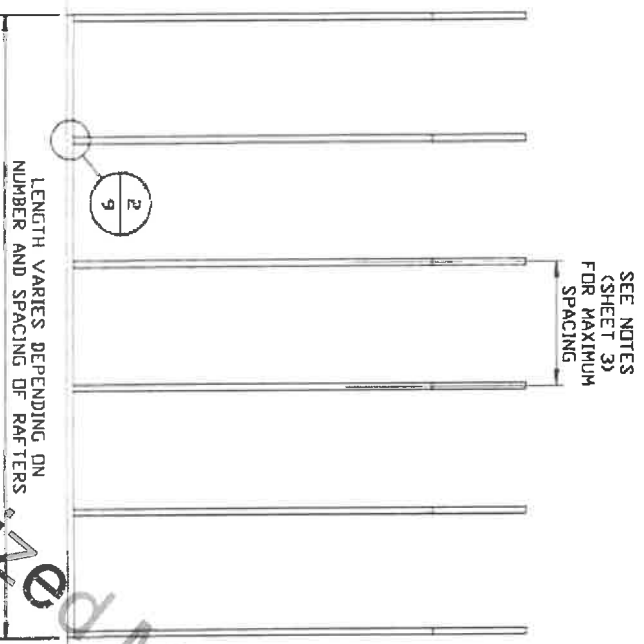
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TYPICAL RAFTER/COLUMN FRAME SECTION
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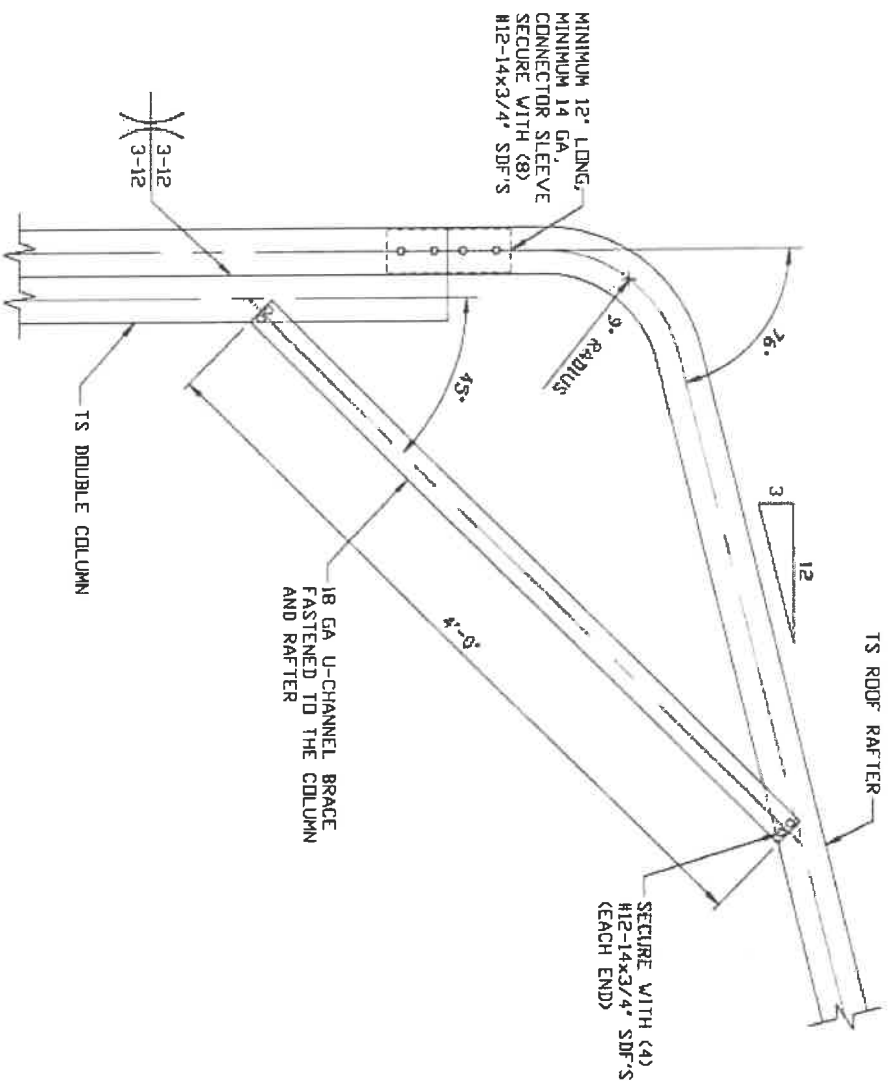
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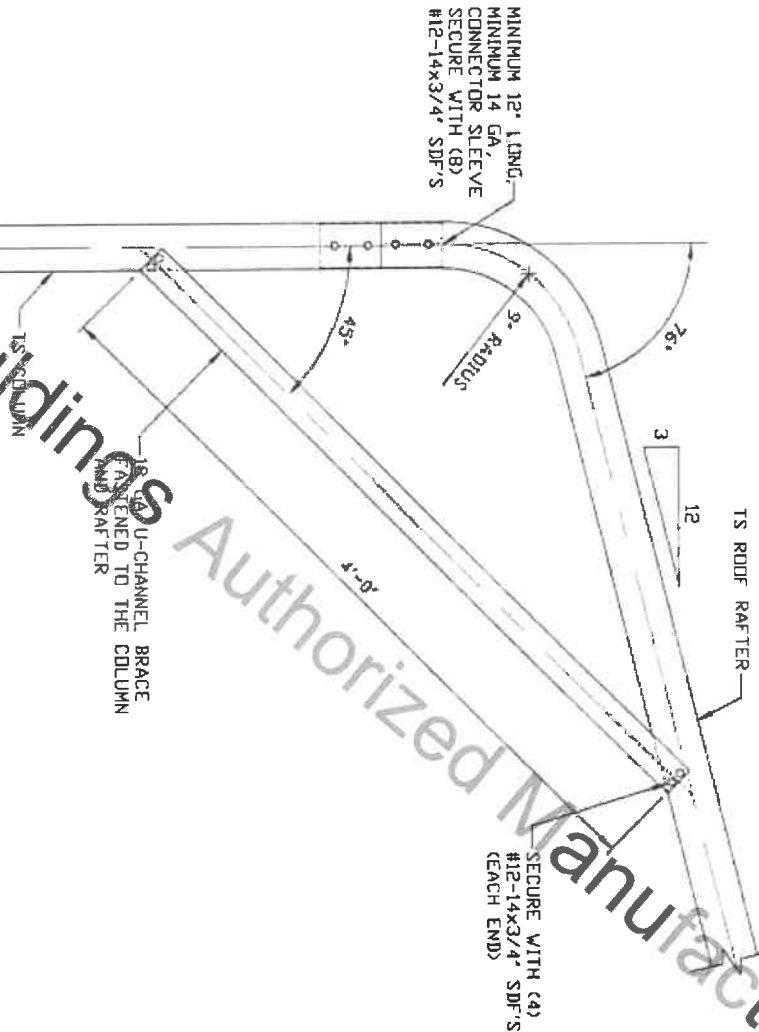
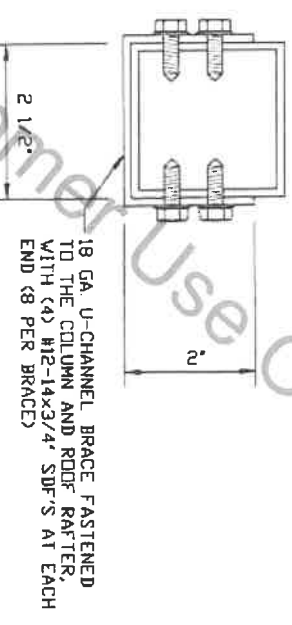


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**BOX EAVE RAFTER/CORNER POST
CONNECTION DETAIL
FOR HEIGHTS 12'-0" < TD ≤ 16'-0"**

SCALE: NTS
NOTE: 2'-0" KNEE BRACE MAY BE USED FOR
BUILDING WIDTHS ≤ 24'-0".

BRACE SECTION
SCALE: NTS



*1A

**BOX EAVE RAFTER/CORNER POST
CONNECTION DETAIL
FOR HEIGHTS ≤ 12'-0"**

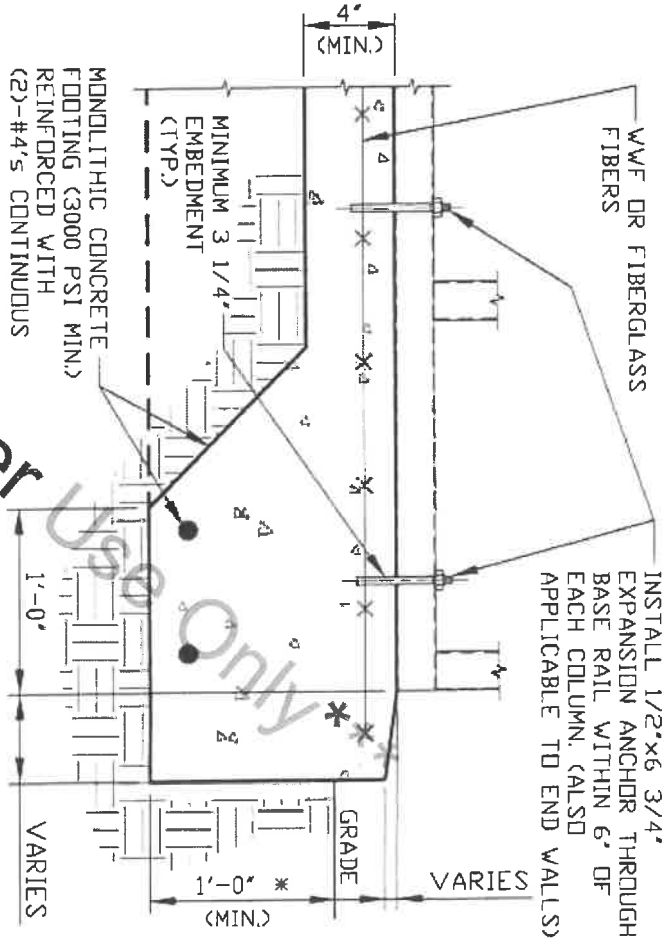
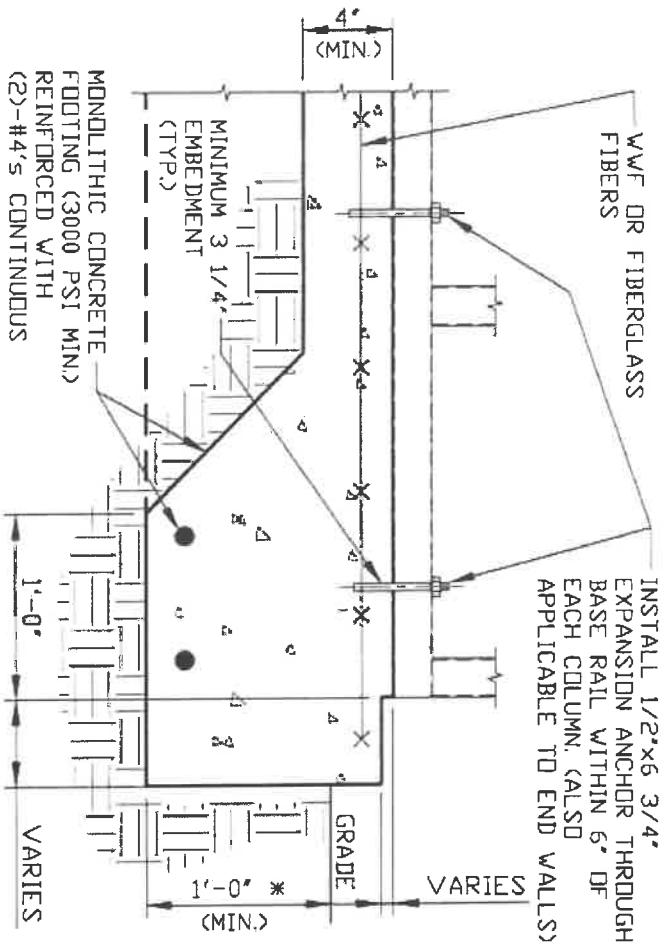
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NOTE: 2'-0" KNEE BRACE MAY BE USED
FOR BUILDING WIDTHS ≤ 24'-0"
AND ≤ 11'-0" EAVE HEIGHT

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CLIENT: JR BUILDINGS		SHT. 8		DWG. NO: SK-3	REV: 4

BASE RAIL ANCHORAGE OPTIONS



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:

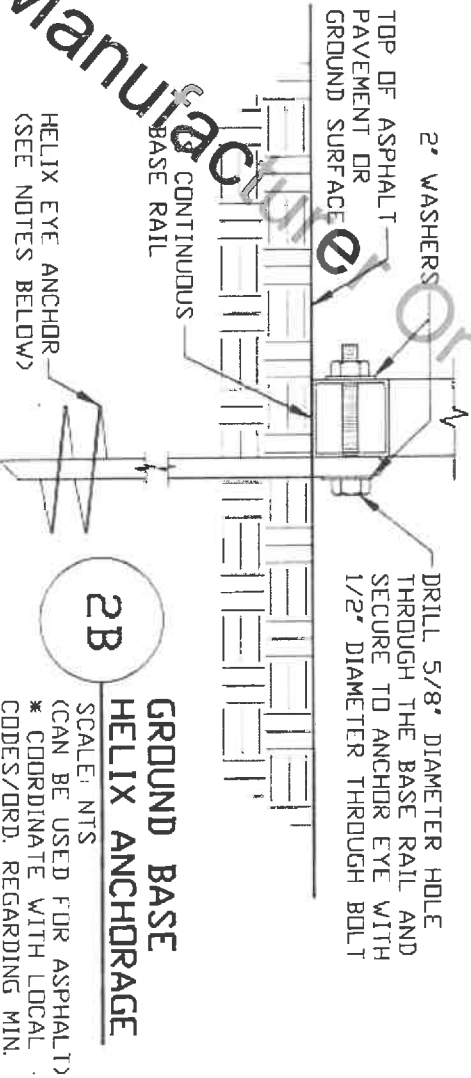
THE TURNDOWN REINFORCING STEEL SHALL BE ASTM A615 GRADE 60. THE SLAB REINFORCEMENT SHALL BE WELDED WIRE FABRIC MEETING ASTM A185 OR FIBERGLASS FIBER REINFORCEMENT.

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:

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) 6" 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.

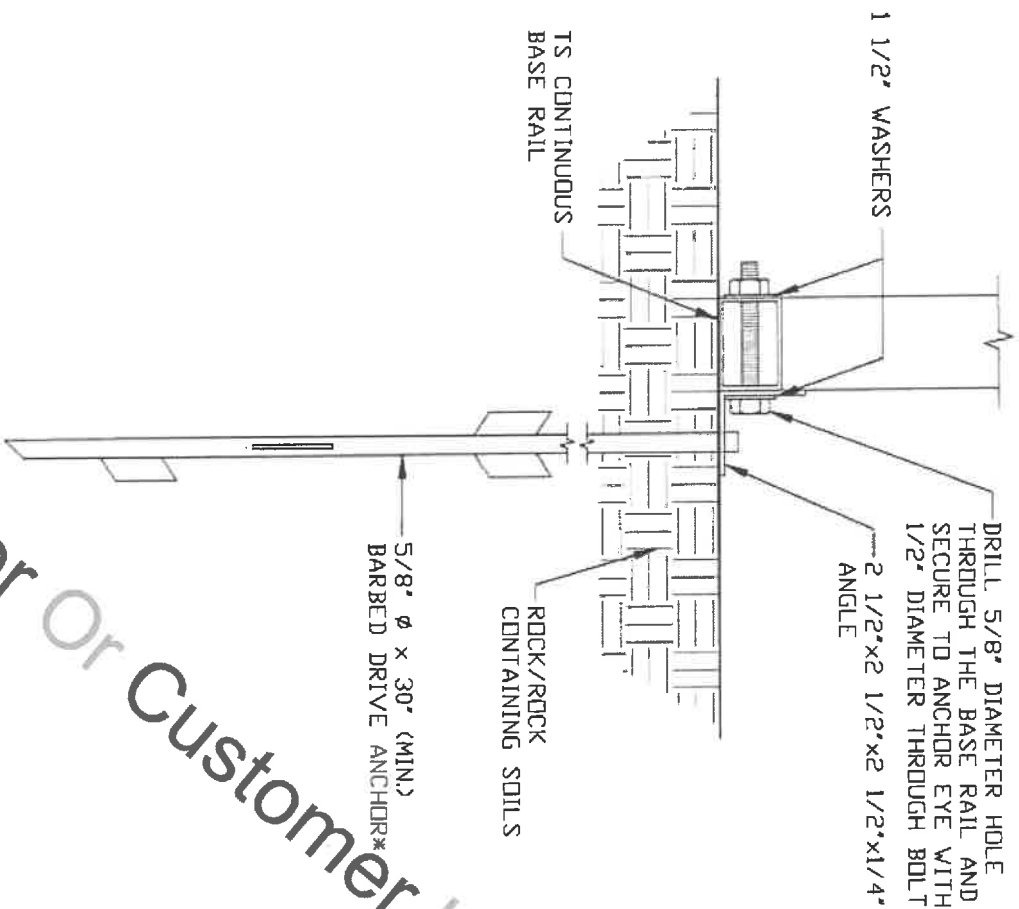


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CHECKED BY: PH	316 NELSON STREET		
PROJECT MGR: VSM	PILLOT MOUNTAIN, NC 27041		
DATE: 9-2-20	SCALE: NTS	JOB NO: 181845/	183485/191295/202295
SHT. 9	DWG. NO: SK-3	REV. 4	

BASE RAIL ANCHORAGE OPTIONS



2C

BARBED DRIVE ANCHORAGE

SCALE: NTS

* COORDINATE WITH LOCAL CODES/ORD. REGARDING MINIMUM FROST DEPTH REQ.

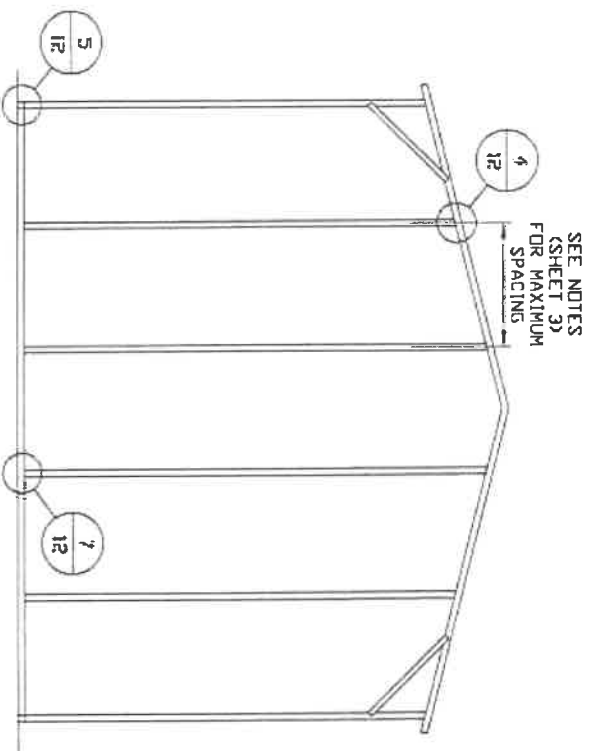
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PROJECT MGR: VSM	DATE: 9-2-20	SCALE: NTS	JOB NO: 18184S/ 18346S/19129S/20229S	
CLIENT: JR BUILDINGS	SHT. 9A	DWG. NO: SK-3	REV: 4	

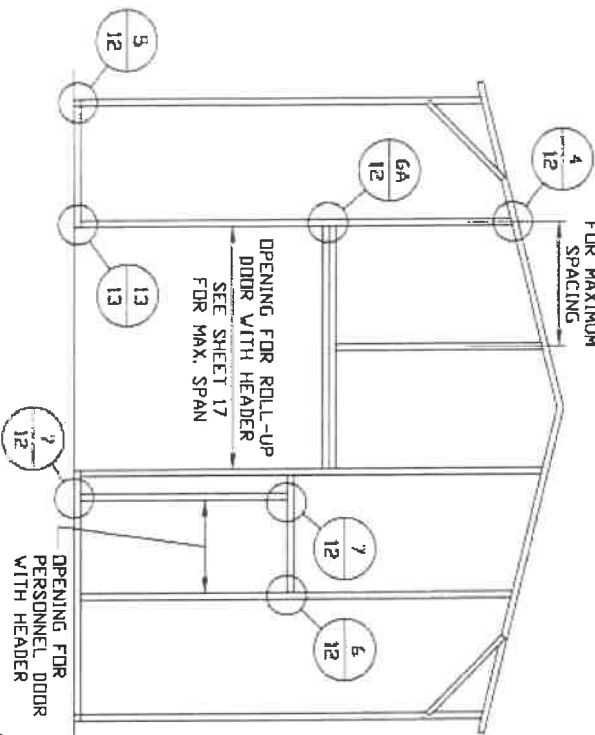
BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS



TYPICAL BOX EAVE RAFTER
END WALL FRAMING SECTION

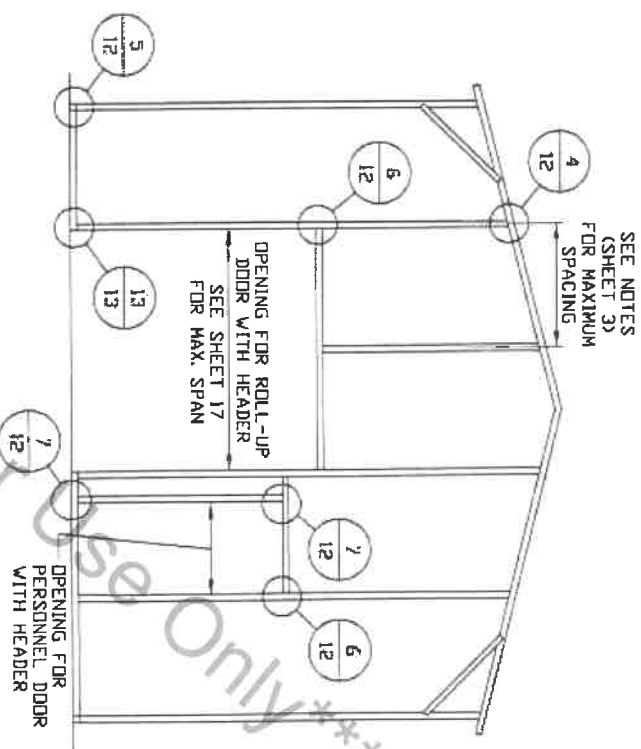
SCALE: NTS

SEE NOTES
(SHEET 3)
FOR MAXIMUM
SPACING



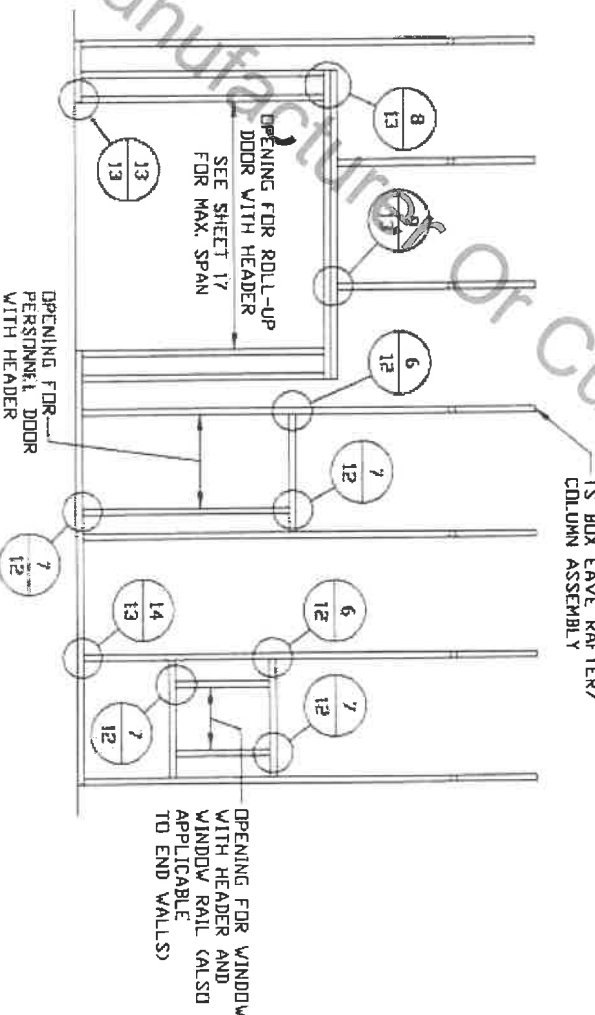
TYPICAL BOX EAVE RAFTER END
WALL OPENINGS FRAMING SECTION

SCALE: NTS



TYPICAL BOX EAVE RAFTER END
WALL OPENINGS FRAMING SECTION

SCALE: NTS



TYPICAL BOX EAVE RAFTER
SIDE WALL OPENINGS FRAMING SECTION

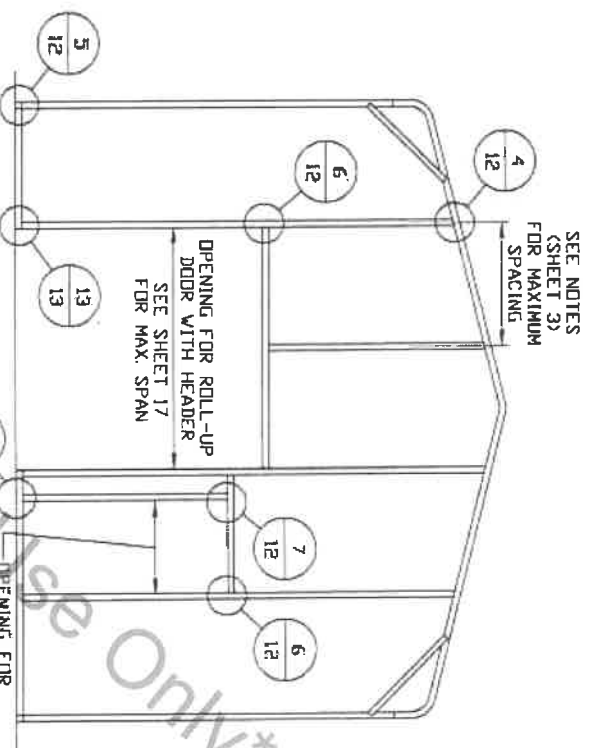
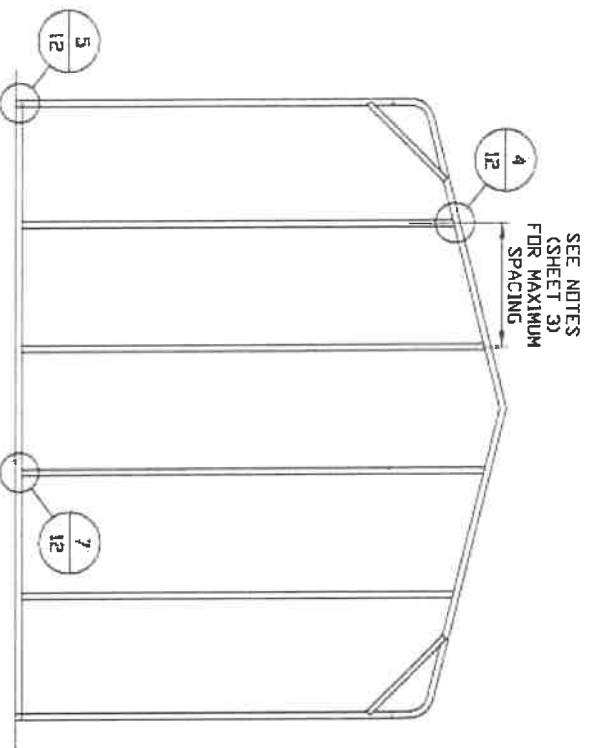
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CHECKED BY: PH	30'-0"x16'-0" ENCLOSED STRUCTURE		
PROJECT MGR: VSM	DATE: 9-2-20	SCALE: NTS	JDB NO: 181845/ 183485/191295/202295
CLIENT: JR BUILDINGS	SHT. 10	DWG. NO: SK-3	REV. 4

BOW EAVE RAFTER END WALL AND SIDE WALL OPENINGS

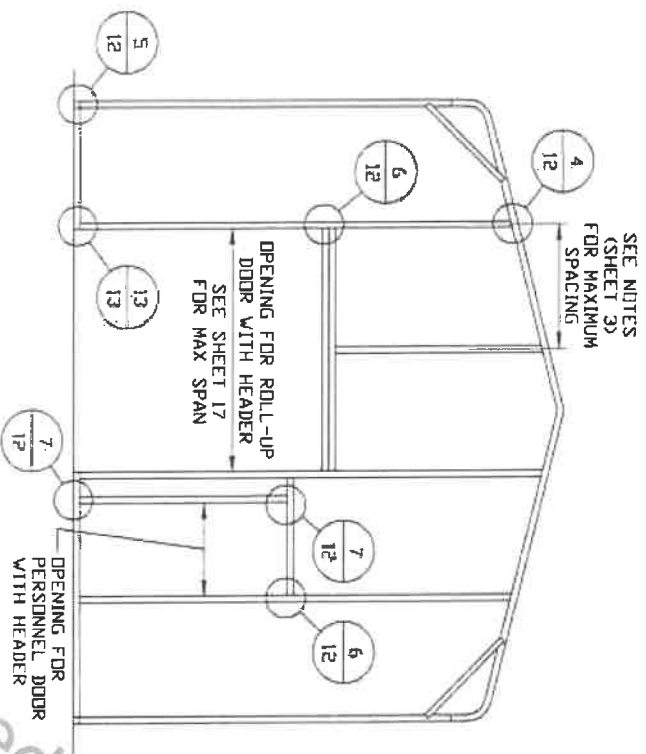


**TYPICAL BOW EAVE RAFTER
END WALL FRAMING SECTION**

SCALE: NTS

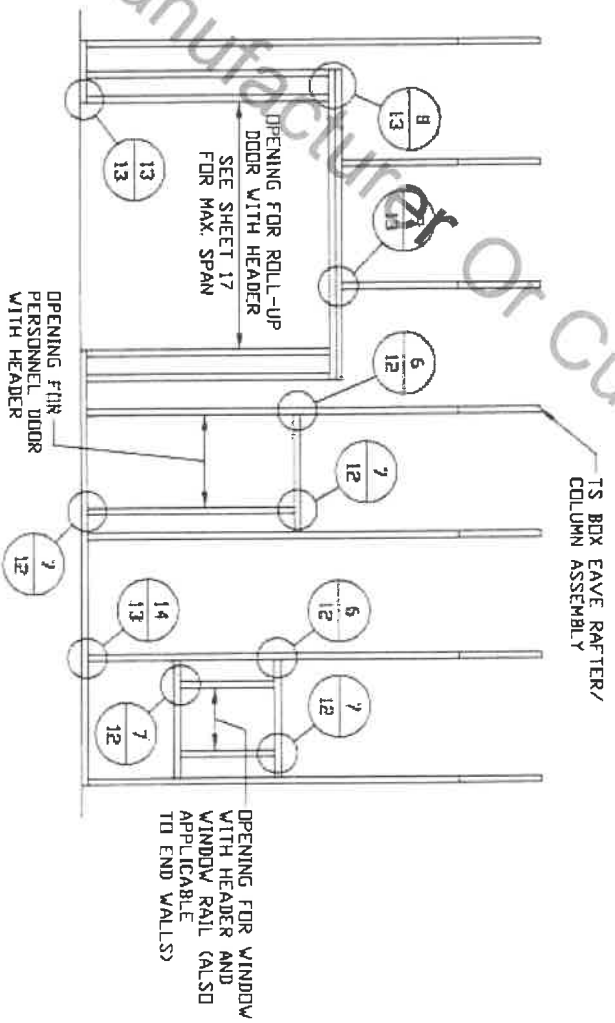
**TYPICAL BOW EAVE RAFTER END
WALL OPENINGS FRAMING SECTION**

SCALE: NTS



**TYPICAL BOW EAVE RAFTER END
WALL OPENINGS FRAMING SECTION**

SCALE: NTS



**TYPICAL BOW EAVE RAFTER
SIDE WALL OPENINGS FRAMING SECTION**

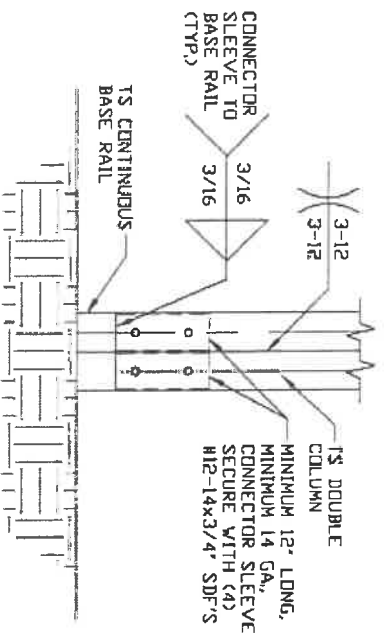
SCALE: NTS

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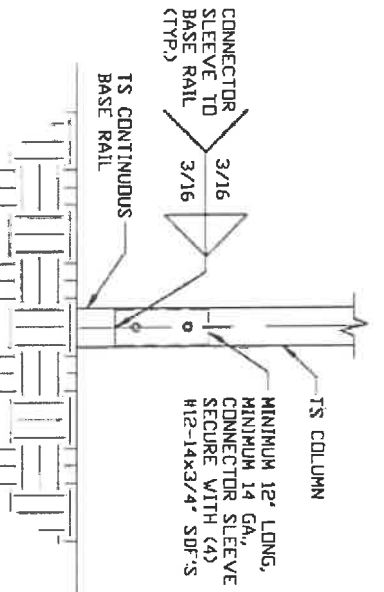
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PROJECT MGR: VSM	DATE: 9-2-20	SCALE: NTS	JDB NO: 18184S/ 18348S/19129S/20229S
CLIENT: JR BUILDINGS	SHT. 11	DWG. NO: SK-3	REV: 4

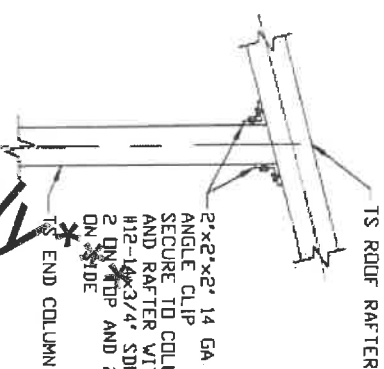
CONNECTION DETAILS



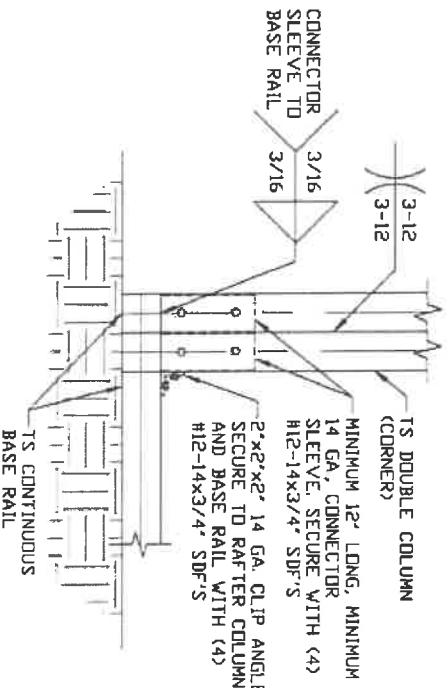
3 POST/BASE RAIL CONNECTION DETAIL
SCALE: NTS



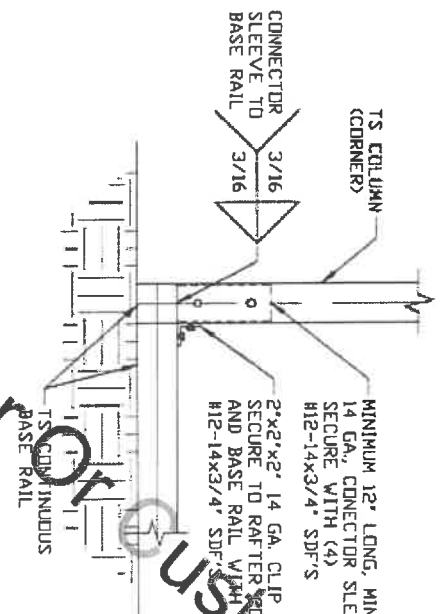
3A POST/BASE RAIL CONNECTION DETAIL
SCALE: NTS



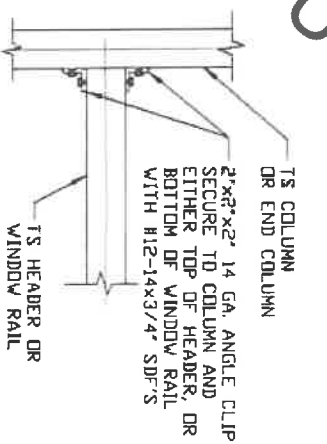
4 END COLUMN/RAFTER CONNECTION DETAIL
SCALE: NTS



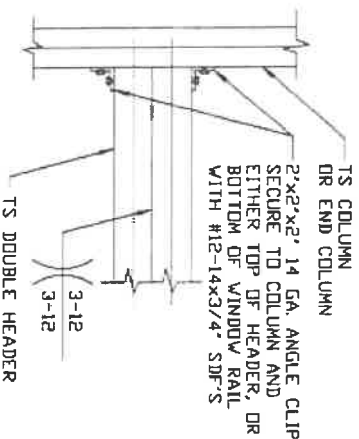
5 END COLUMN/BASE RAIL CONNECTION DETAIL
SCALE: NTS



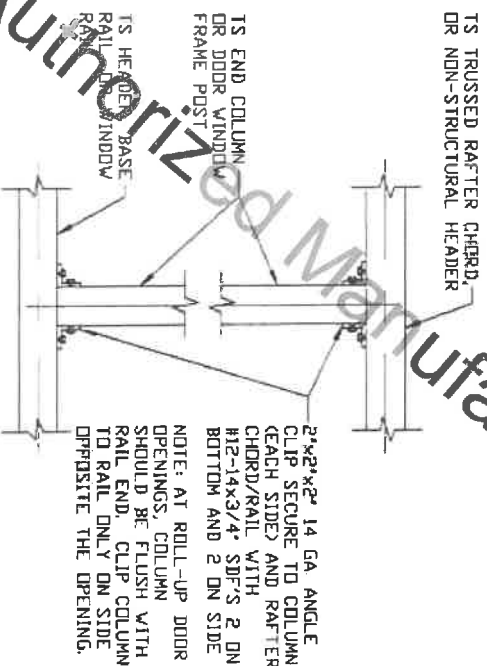
5A END COLUMN/BASE RAIL CONNECTION DETAIL
SCALE: NTS



6 COLUMN OR WINDOW RAIL/WALL GIRT TO POST CONNECTION DETAIL
SCALE: NTS



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



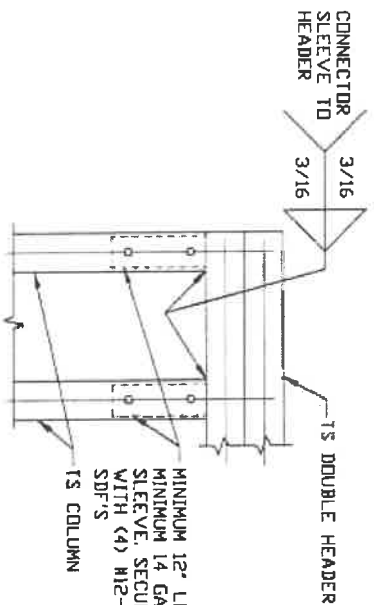
7 COLUMN TO HEADER, BASE RAIL, OR WINDOW RAIL CONNECTION DETAIL
SCALE: NTS

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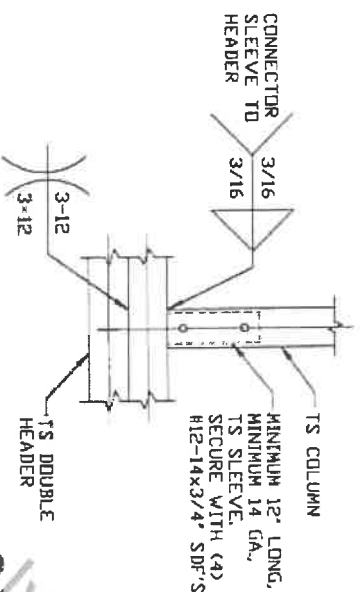
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PROJECT MGR: VSM	DATE: 9-2-20	SCALE: NTS	JOB NO: 181845/ 183485/191295/202295
CLIENT: JR BUILDINGS	SHT. 12	DWG. NO: SK-3	REV: 4

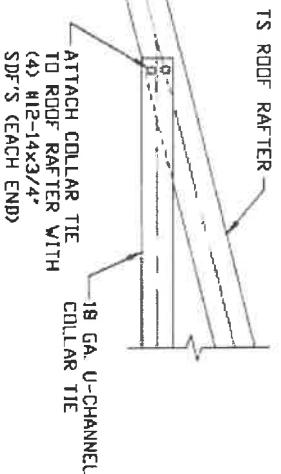
CONNECTION DETAILS



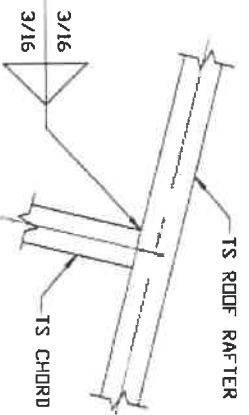
8 DOUBLE HEADER/COLUMN CONNECTION DETAIL
SCALE: NTS



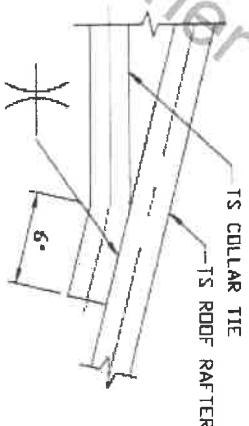
9 COLUMN/DOUBLE HEADER CONNECTION DETAIL
SCALE: NTS



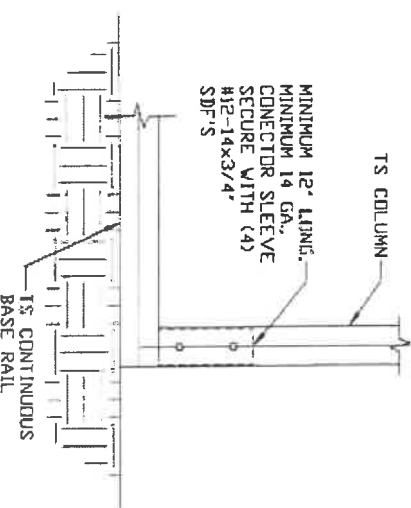
10 COLLAR TIE CONNECTION DETAIL
SCALE: NTS



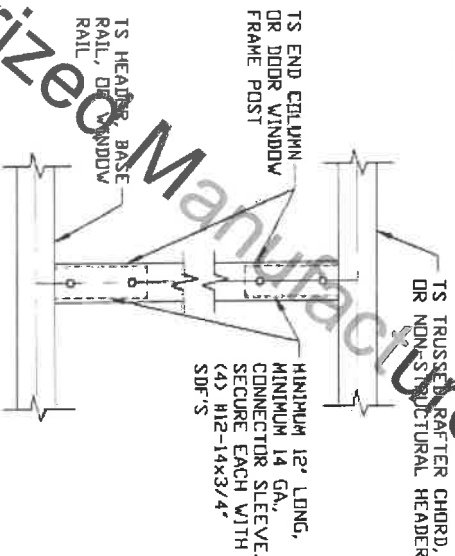
11 RAFTER TO CHORD CONNECTION DETAIL
SCALE: NTS



12 COLLAR TIE CONNECTION DETAIL
SCALE: NTS



13 COLUMN/BASE RAIL CONNECTION DETAIL
SCALE: NTS



14 COLUMN TO HEADER OR BASE RAIL CONNECTION DETAIL
SCALE: NTS

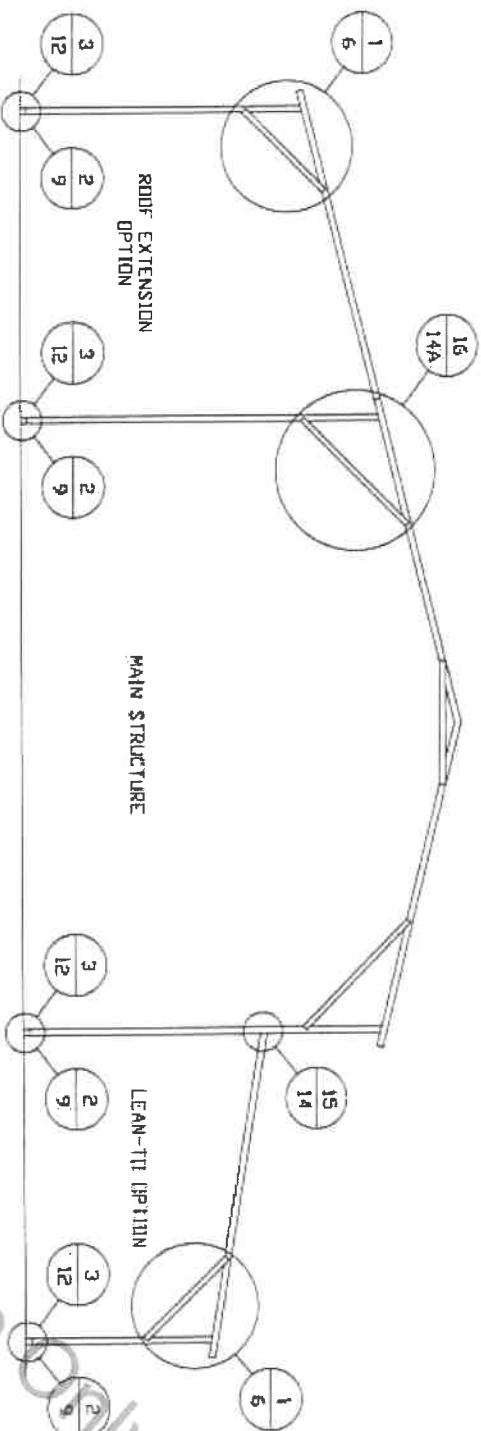
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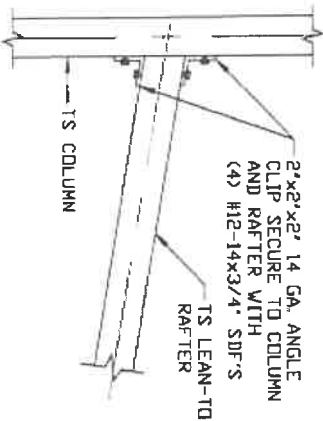
DRAWN BY: LT		JR BUILDINGS & GARAGES	
CHECKED BY: PH		316 NELSON STREET	
PROJECT MGR: VSM		PILOT MOUNTAIN, NC 27041	
DATE: 9-2-20		30'-0"x16'-0" ENCLOSED STRUCTURE	
SHT. 13		SCALE: NTS	JOB NO: 181845/
DVG. NO: SK-3		REV. 4	183485/191295/202295

BOX EAVE RAFTER LEAN-TO OPTIONS

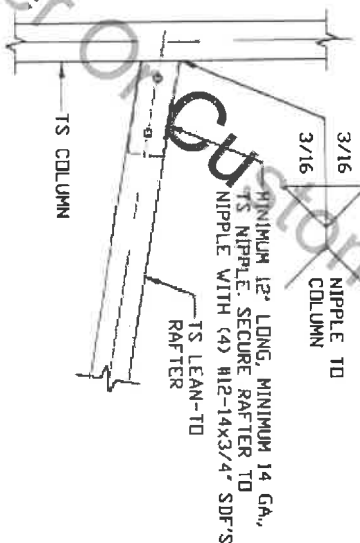


TYPICAL BOX EAVE RAFTER LEAN-TO OPTIONS FRAMING SECTION (BOTH OPTIONS SHOWN)

SCALE: NTS
MAXIMUM WIDTH OF ROOF EXTENSION AND LEAN-TO OPTION IS 12'-0".
FOR SHARED COLUMN HEIGHTS REFERENCE RAFTER COLUMN CONNECTION DETAILS FOR APPROPRIATE COLUMN HEIGHT AND TUBING SPECIFICATIONS.



15
SCALE: NTS
LEAN-TO RAFTER TO
RAFTER POST
CONNECTION DETAIL
FOR WIDTHS < 12'-0"



15A
SCALE: NTS
OPTIONAL LEAN-TO
RAFTER TO RAFTER
POST CONNECTION DETAIL
FOR WIDTHS < 12'-0"

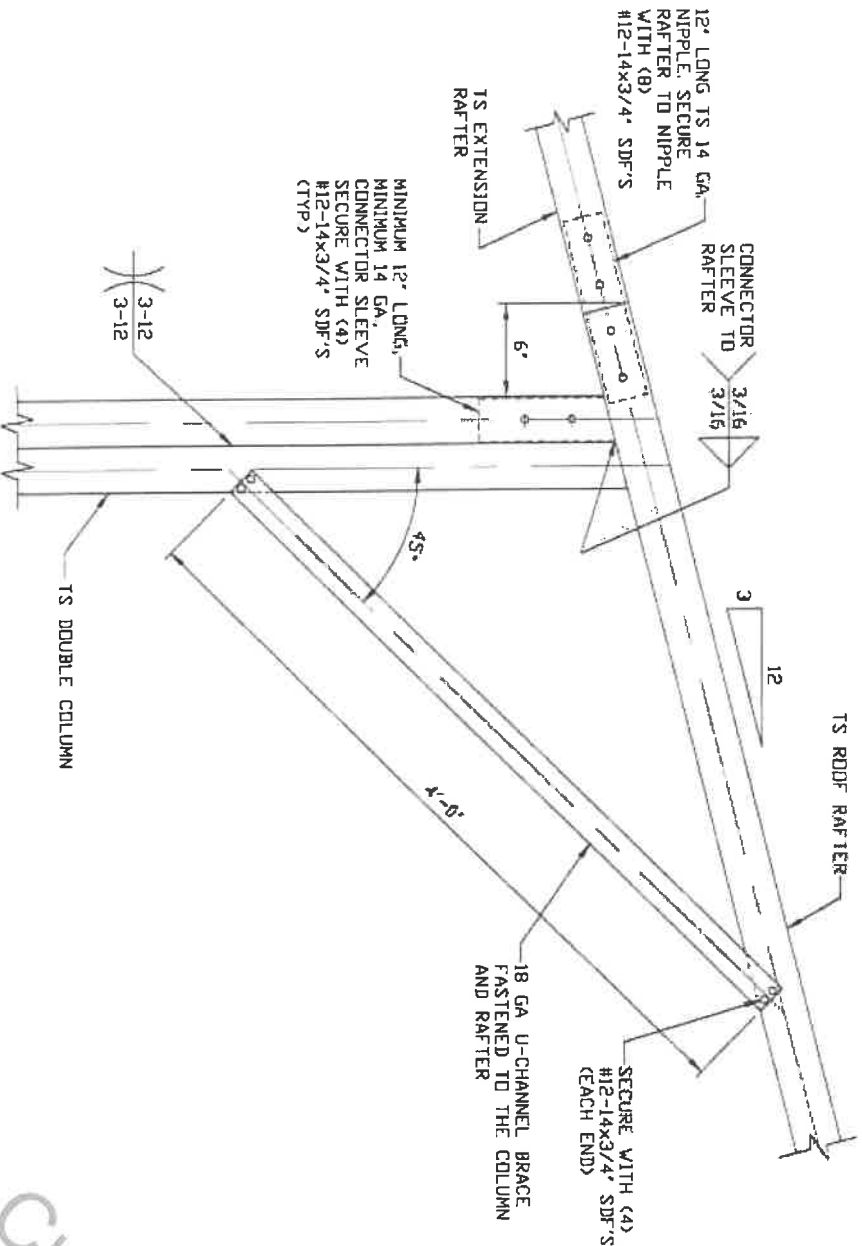
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CHECKED BY: PH	30'-0"x16'-0" ENCLOSED STRUCTURE		
PROJECT MGR: VSH	DATE: 9-2-20	SCALE: NTS	JOB NO: 18184S/ 18348S/19129S/20229S
CLIENT: JR BUILDINGS	SHT. 14	DWG. NO: SK-3	REV: 4

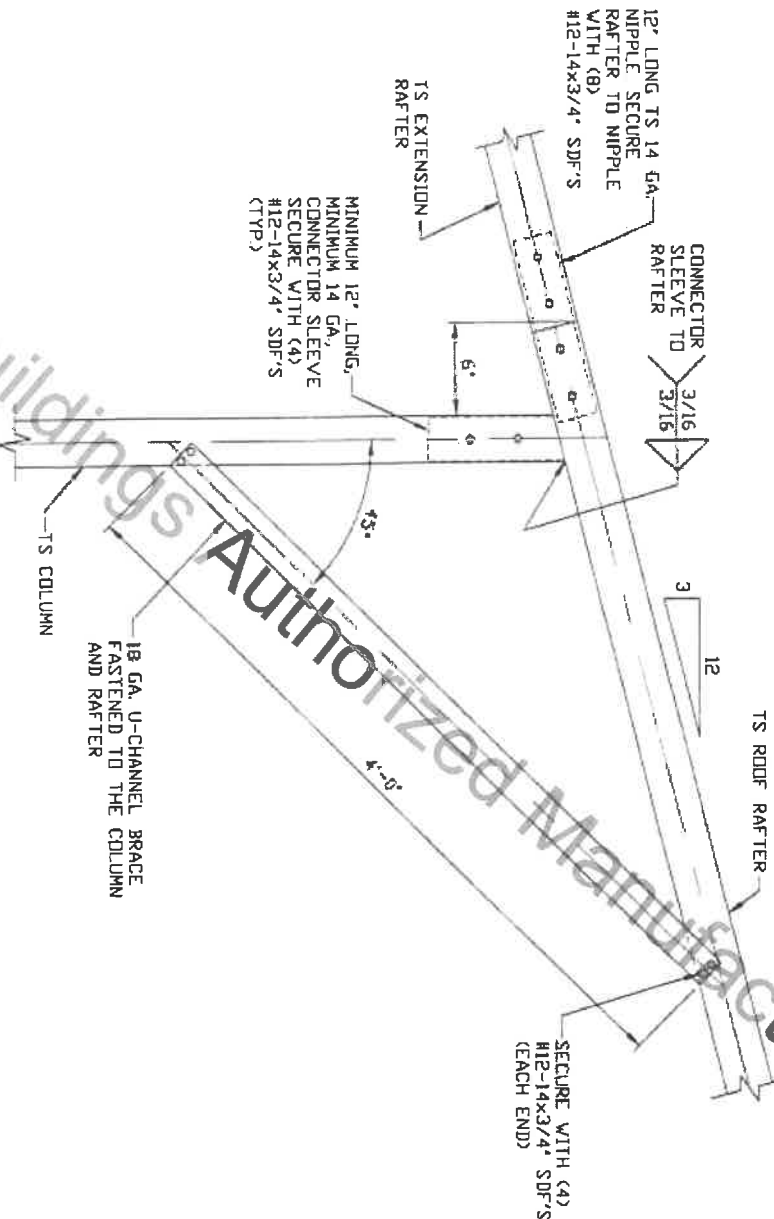
BOX EAVE RAFTER LEAN-TO OPTIONS FOR RAFTER SPANS ≤ 12'-0"



16

SIDE EXTENSION RAFTER/
COLUMN DETAIL FOR
HEIGHTS 12'-0" < TD ≤ 16'-0"

SCALE: NTS



16A

SIDE EXTENSION RAFTER/
COLUMN DETAIL FOR
HEIGHTS ≤ 12'-0"

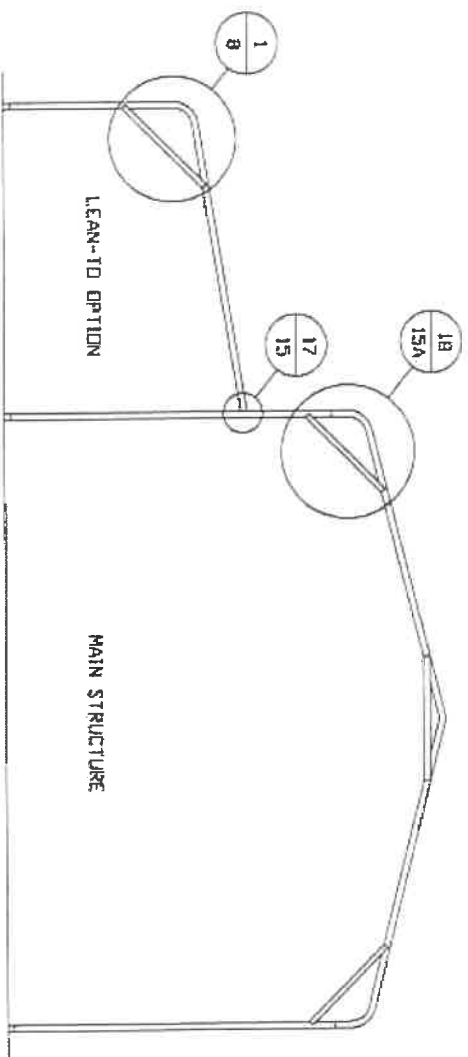
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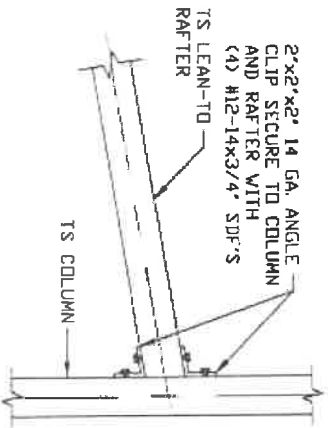
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CHECKED BY: PH	30'-0"x16'-0" ENCLOSED STRUCTURE		
PROJECT MGR: VSM	DATE: 9-2-20	SCALE: NTS	JOB NO: 181845/ 183485/191295/202295
CLIENT: JR BUILDINGS	SHT. 14A	DWG. NO: SK-3	REV. 4

BOW EAVE RAFTER LEAN-TO OPTIONS



TYPICAL BOW EAVE RAFTER LEAN-TO OPTIONS FRAMING SECTION

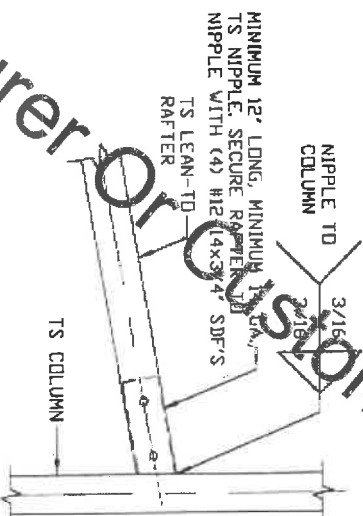
SCALE: NTS
MAXIMUM WIDTH OF LEAN-TO OPTION IS 12'-0".
FOR SHARED COLUMN HEIGHTS REFERENCE RAFTER COLUMN CONNECTION DETAILS FOR APPROPRIATE COLUMN HEIGHT AND TUBING SPECIFICATIONS.



LEAN-TO RAFTER TO
RAFTER POST
CONNECTION DETAIL
FOR WIDTHS \leq 12'-0"

17

SCALE: NTS



OPTIONAL LEAN-TO
RAFTER TO RAFTER
POST CONNECTION DETAIL
FOR WIDTHS \leq 12'-0"

17A

SCALE: NTS

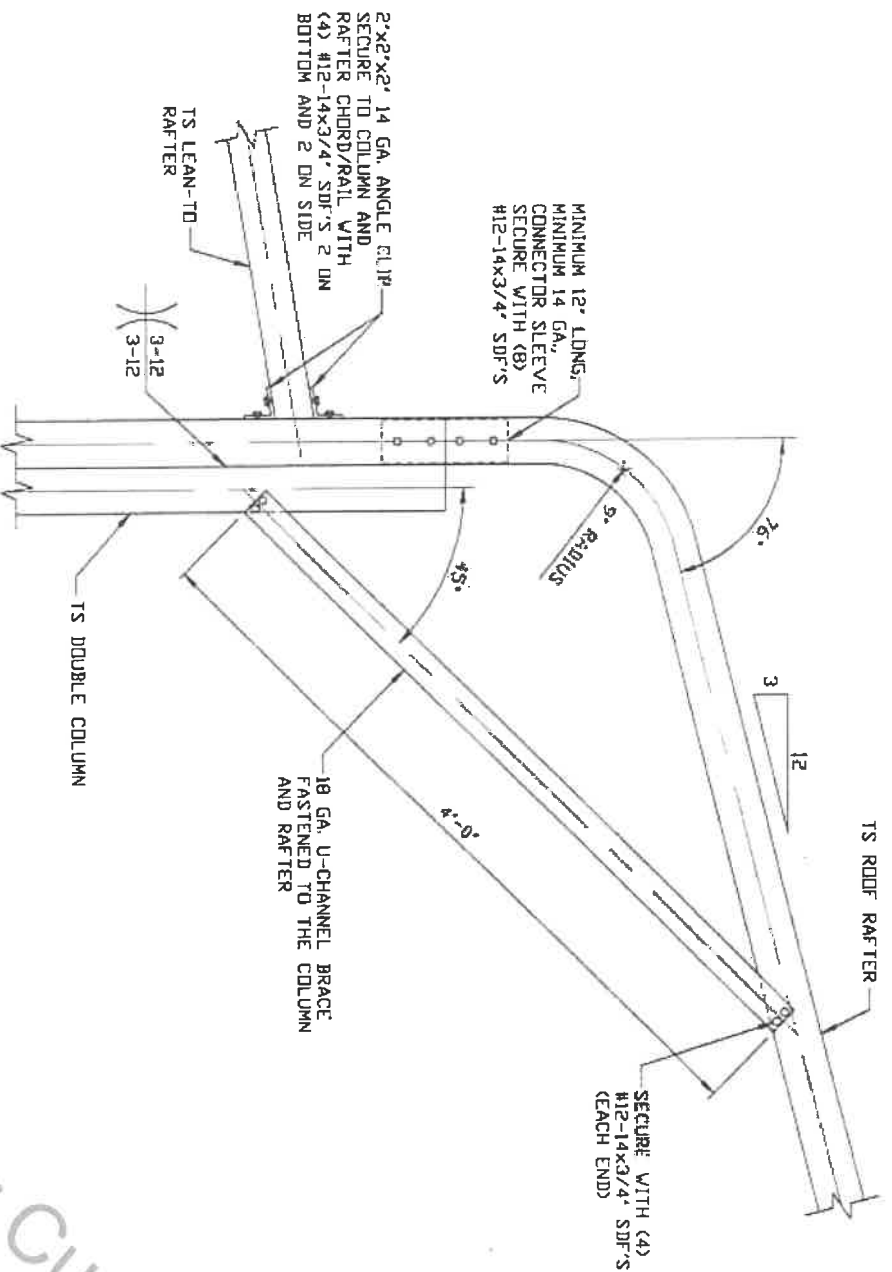
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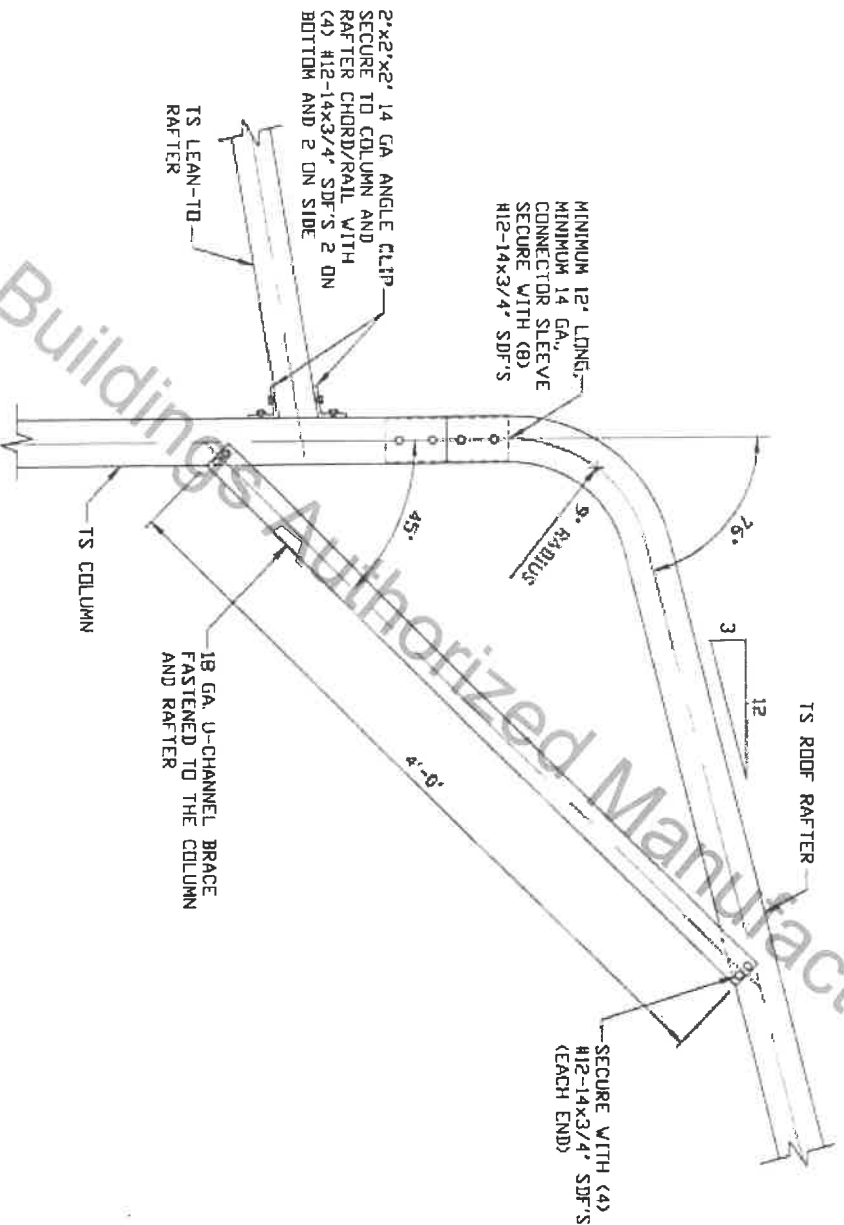
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PROJECT MGR: VSM		PILLOT MOUNTAIN, NC 27041	
DATE: 9-2-20		30'-0" X 16'-0" ENCLOSED STRUCTURE	
SHT. 15		SCALE: NTS	JOB NO: 18184S/
DVG. NO: SK-3		18348S/19129S/20229S	REV: 4

BOWEAVE RAFTER LEAN-TO OPTIONS FOR RAFTER SPANS $\leq 12'-0"$



18 SIDE EXTENSION RAFTER/
COLUMN DETAIL FOR
HEIGHTS 12'-0" < TD ≤ 16'
SCALE: NTS

SCALE: NTS



184 SIDE EXTENSION RAFTER/
COLUMN DETAIL FOR
HEIGHTS $\leq 12'-0"$

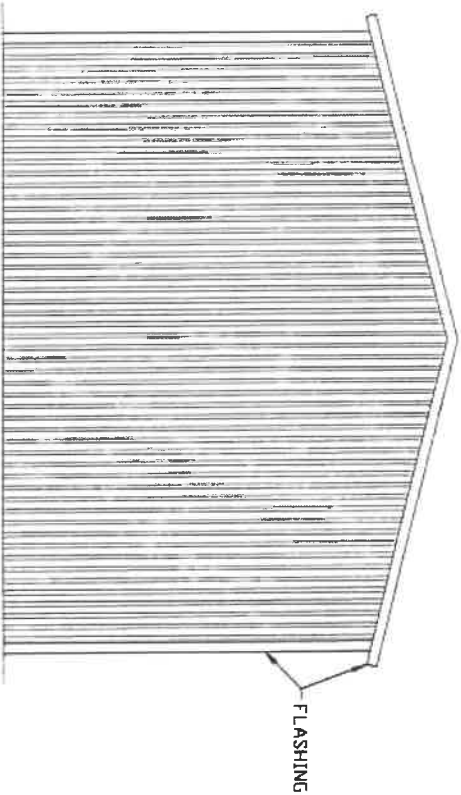
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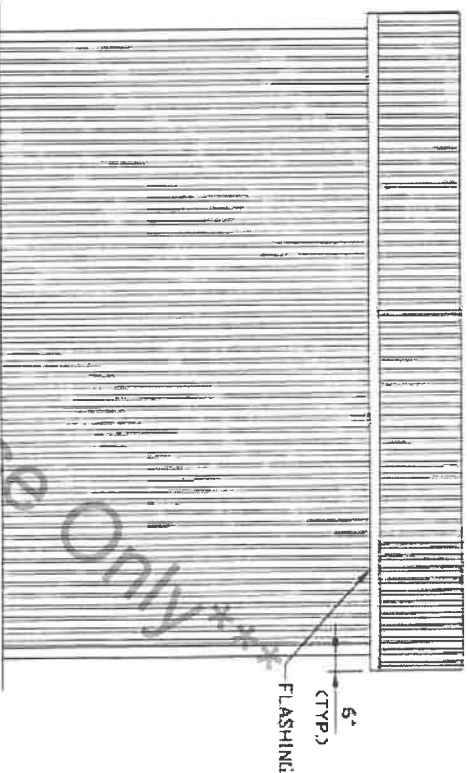
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PROJECT MGR: VSM	DATE: 9-2-20	SCALE: NTS	JOB NO: 18184S/ 1834BS/19129S/20229S
CLIENT: JR BUILDINGS	SHT. 15A	DWG. NO: SK-3	REV: 4

BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



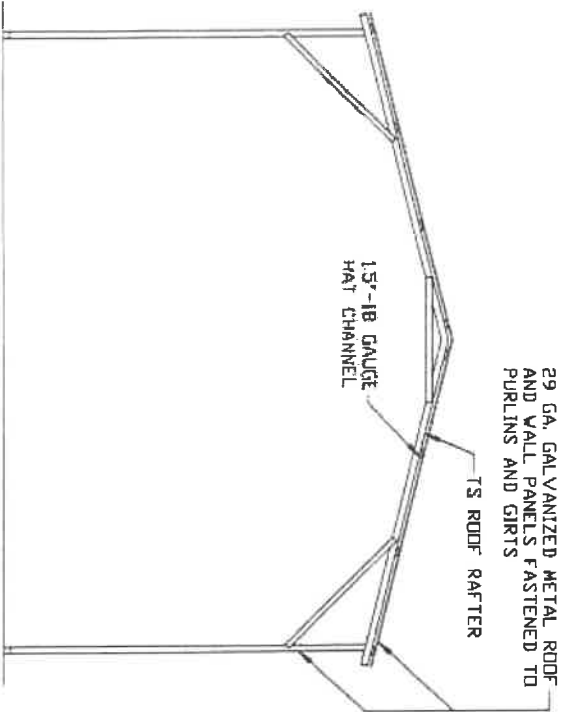
TYPICAL END ELEVATION
VERTICAL ROOF/SIDING

SCALE: NTS



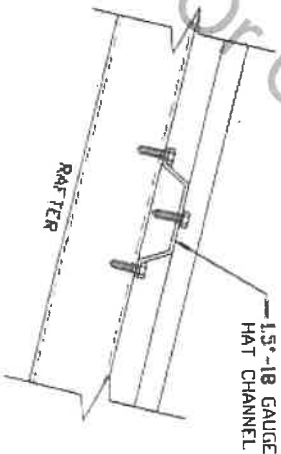
TYPICAL SIDE ELEVATION
VERTICAL ROOF/SIDING

SCALE: NTS



TYPICAL SECTION VERTICAL
ROOF/SIDING OPTION

SCALE: NTS



PANEL ATTACHMENT

(ALTERNATE FOR VERTICAL ROOF PANELS)
SCALE: NTS

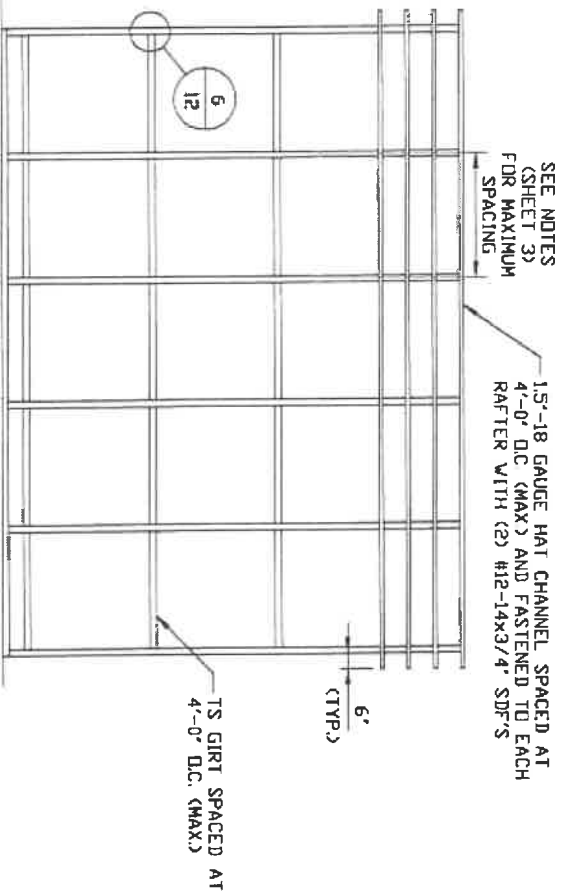
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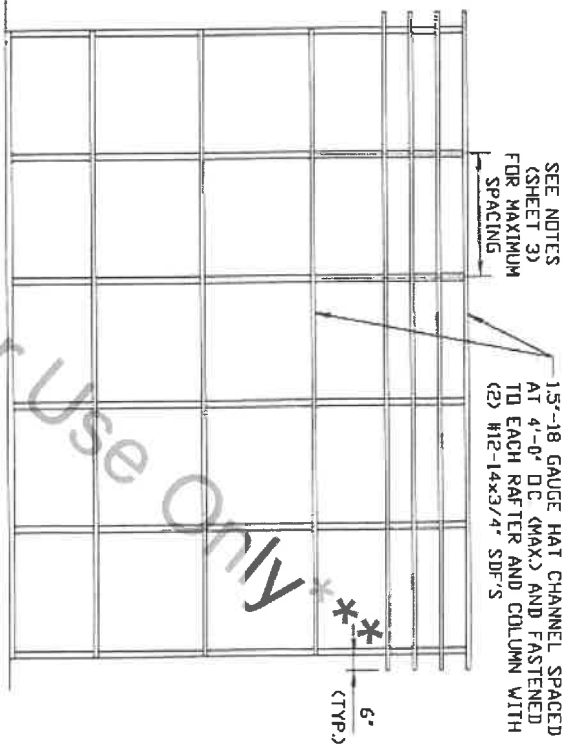
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CHECKED BY: PH	30'-0"x16'-0" ENCLOSED STRUCTURE			
PROJECT MGR: VSM	DATE: 9-2-20	SCALE: NTS	JOB NO: 18184S/ 18348S/19129S/20229S	
CLIENT: JR BUILDINGS	SHT. 16	DWG. NO. SK-3	REV. 4	

BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



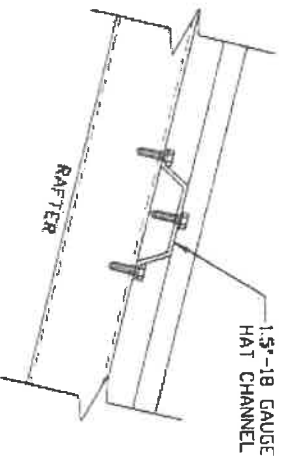
TYPICAL FRAMING SECTION VERTICAL ROOF/SIDING OPTION WITH TS GIRTS

SCALE: NTS



TYPICAL FRAMING SECTION VERTICAL ROOF/SIDING OPTION WITH HAT CHANNEL GIRTS

SCALE: NTS



PANEL ATTACHMENT
(ALTERNATE FOR VERTICAL ROOF PANELS)

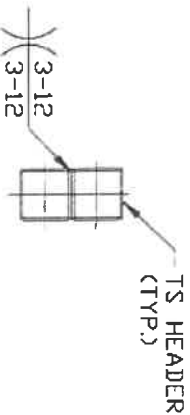
SCALE: NTS

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DRAWN BY: LT	CHECKED BY: PH	30'-0"x16'-0" ENCLOSED STRUCTURE	
PROJECT MGR: VSM	DATE: 9-2-20	SCALE: NTS	JOB NO: 181845/ 183485/191295/202295
CLIENT: JR BUILDINGS	SHT. 16A	DWG. NO: SK-3	REV.: 4

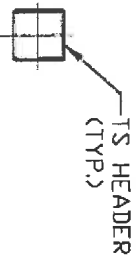
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SIDE WALL HEADER OPTIONS



HEADER DETAIL FOR
7'-0" < LENGTH ≤ 12'-0"

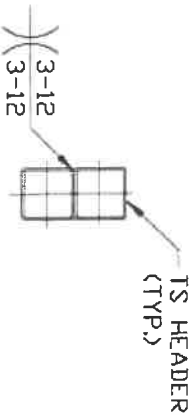
SCALE: NTS



HEADER DETAIL FOR
DOOR OPENINGS ≤ 7'-0"

SCALE: NTS

END WALL HEADER OPTIONS



HEADER DETAIL FOR
12'-0" < LENGTH ≤ 20'-0"

SCALE: NTS



HEADER DETAIL FOR
DOOR OPENINGS ≤ 12'-0"

SCALE: NTS

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DRAWN BY: LT		JR BUILDINGS & GARAGES 316 NELSON STREET PILLOT MOUNTAIN, NC 27041			
CHECKED BY: PH		30'-0" x 16'-0" ENCLOSED STRUCTURE			
PROJECT MGR: VSM		DATE: 9-2-20	SCALE: NTS	JOB NO: 18184S/ 18348S/19129S/20229S	
CLIENT: JR BUILDINGS		SHT. 17	DWG. NO: SK-3	REV: 4	