



**STRUCTURAL DESIGN  
ENCLOSED BUILDING**

**MAXIMUM 30'-0" WIDE X 15'-0" EAVE HEIGHT-  
BOX EAVE AND BOW FRAME**

**15 August 2018  
Revision 0  
M&A Project No. 18196S**

**Prepared for:**

**Shed Central  
3648 W. US Highway 421  
Wilkesboro, NC 28697**

**Prepared by:**

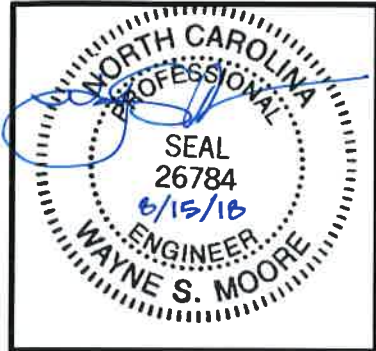

**Moore and Associates Engineering  
and Consulting, Inc.**

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**401 S. Main St., Suite 200  
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**CHECKED BY:** PDH  
**PROJECT MGR:** VSM  
**CLIENT:** SHED CENTRAL

SHED CENTRAL  
 3648 WEST U.S. HWY 421  
 WILKESBORO, NC 28697  
 30'-0" x 15'-0" ENCLOSED STRUCTURE

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**SHT.:** 1    **DWG. NO.:** SK-3    **REV.:** 0

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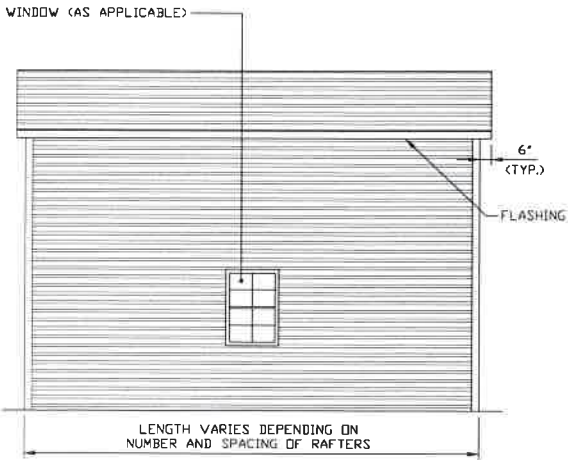
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## INSTALLATION NOTES AND SPECIFICATIONS

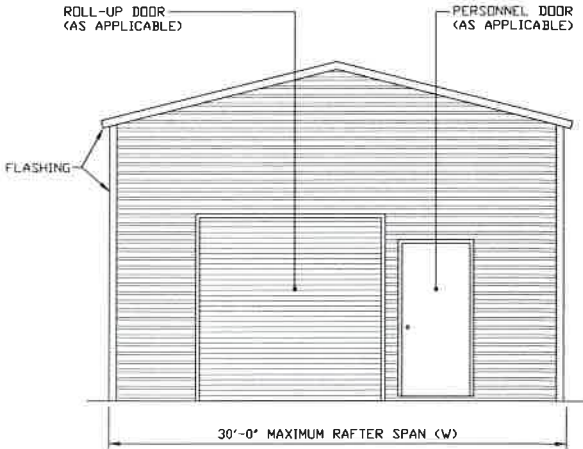
1. DESIGN IS FOR MAXIMUM 30'-0" WIDE x 15'-0" EAVE HEIGHT ENCLOSED STRUCTURES.
2. DESIGN WAS DONE IN ACCORDANCE WITH THE 2012 NORTH CAROLINA BUILDING CODE (2009 INTERNATIONAL BUILDING CODE).
3. DESIGN LOADS ARE AS FOLLOWS:
  - A) DEAD LOAD = 1.5 PSF
  - B) LIVE LOAD = 12 PSF
  - C) GROUND SNOW LOAD = 25 PSF
4. 3-SECOND GUST BASIC WIND SPEED (V) = 90 MPH.
5. MAXIMUM RAFTER/COLUMN AND END COLUMN SPACING = 5'-0" (UNLESS NOTED OTHERWISE).
6. RISK CATEGORY I.
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. SIDEWALL COLUMNS AND ENDWALL COLUMNS ARE SIMILAR IN SIZE, UNLESS NOTED OTHERWISE
10. AVERAGE FASTENER SPACING ON-CENTERS ALONG RAFTERS OR HAT CHANNELS, AND COLUMNS (INTERIOR OR END) = 6 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 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.
12. GROUND ANCHORS SHALL BE INSTALLED THROUGH BASE RAIL WITHIN 6" OF EACH COLUMN.
13. GROUND ANCHORS CONSIST OF #4 REBAR W/ WELDED NUT x 36" LONG IN SUITABLE SOIL CONDITIONS. OPTIONAL ANCHORAGE MAY BE USED IN SUITABLE SOILS AND MUST BE USED IN UNSUITABLE SOILS AS NOTED.
14. 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>= 1.522                V= C<sub>s</sub>W
  - S<sub>DI</sub>= 0.839

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**BOX EAVE FRAME RAFTER STRUCTURE**



**TYPICAL SIDE ELEVATION**  
SCALE: NTS



**TYPICAL END ELEVATION**  
SCALE: NTS

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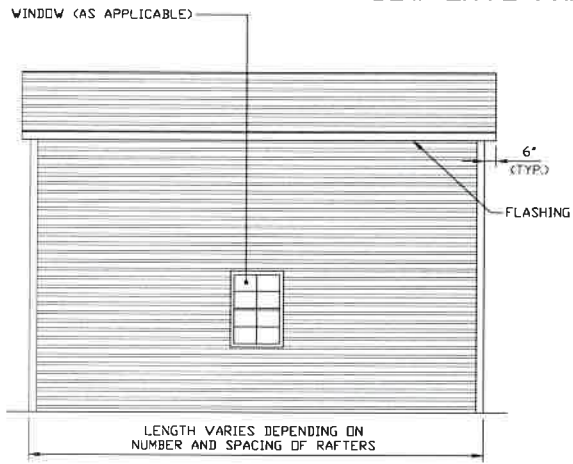
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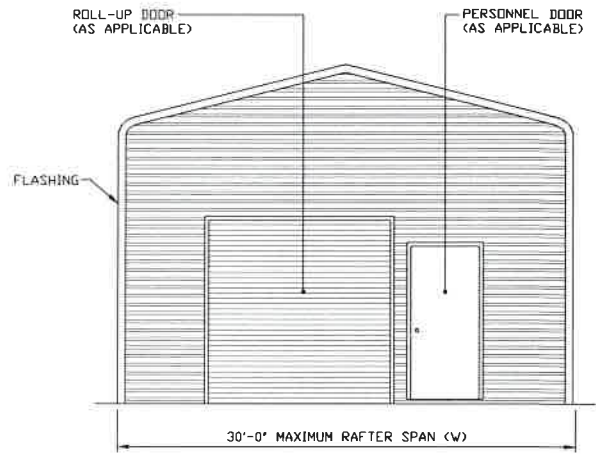
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## BOW EAVE FRAME RAFTER STRUCTURE



**TYPICAL SIDE ELEVATION**  
SCALE: NTS



**TYPICAL END ELEVATION**  
SCALE: NTS

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**SHT. 3C**

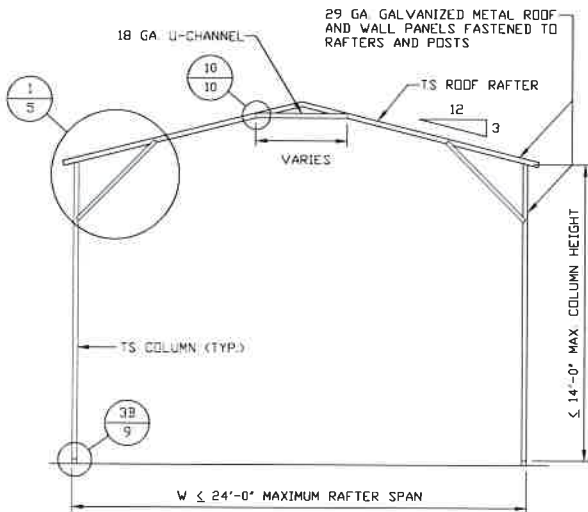
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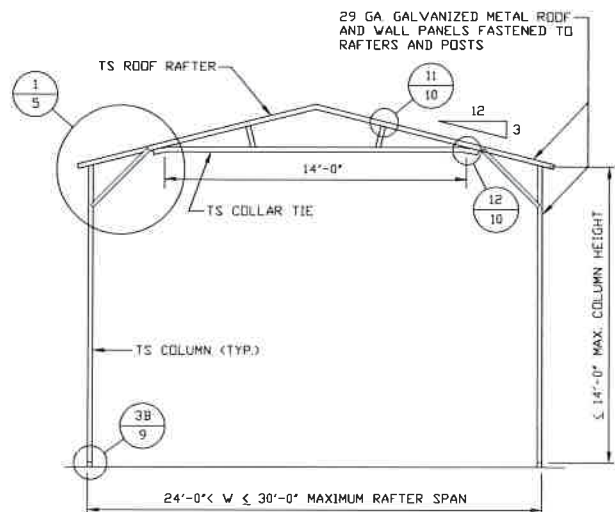
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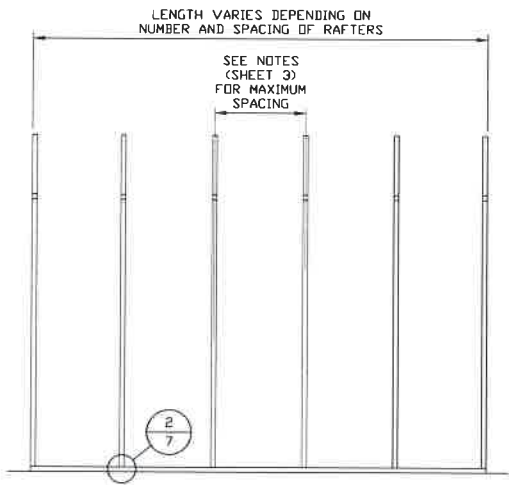
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**TYPICAL RAFTER/COLUMN FRAME SECTION**  
SCALE: NTS



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



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

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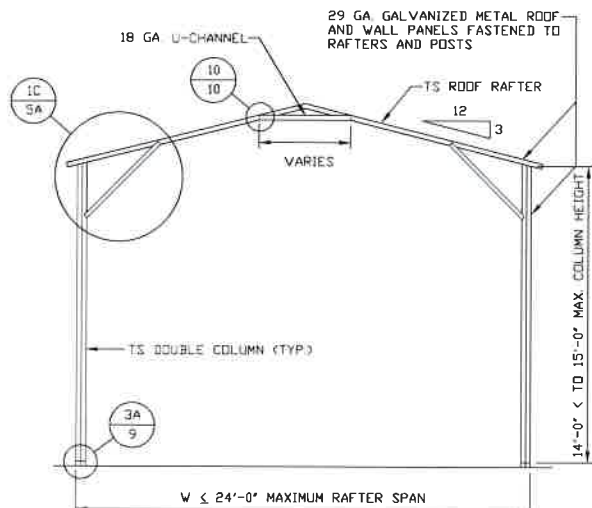
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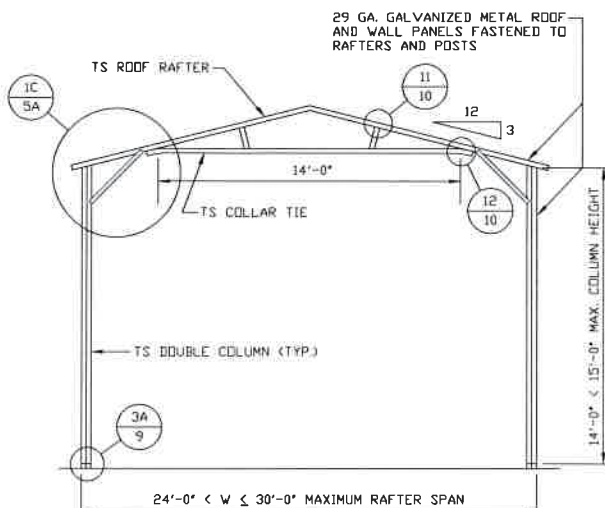
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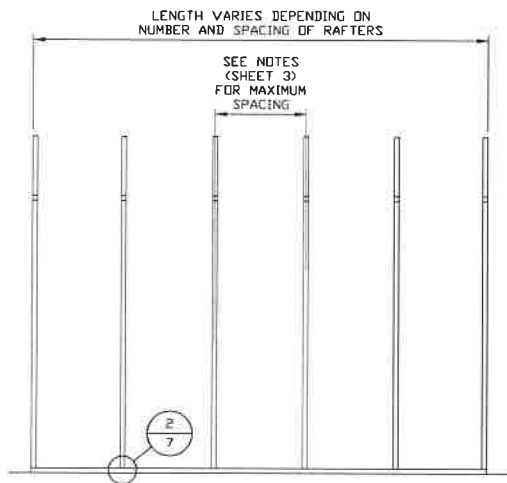
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SCALE: NTS



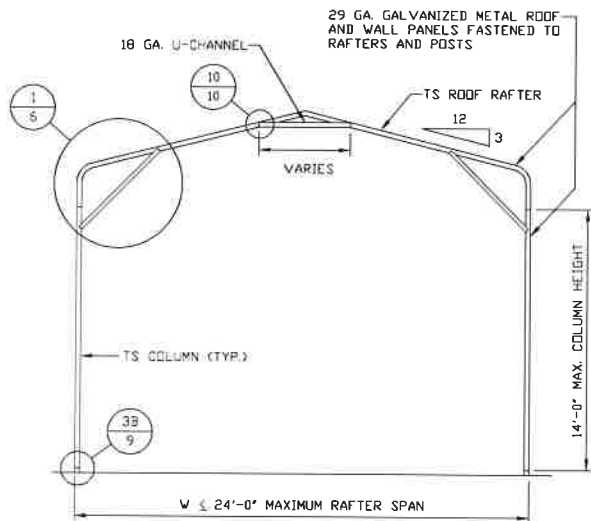
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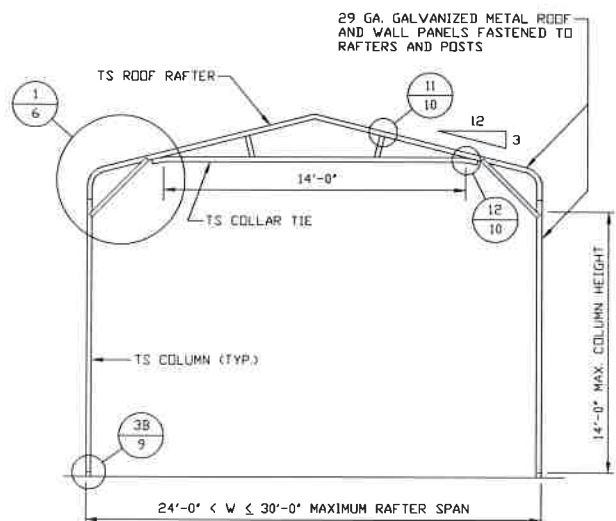
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SCALE: NTS

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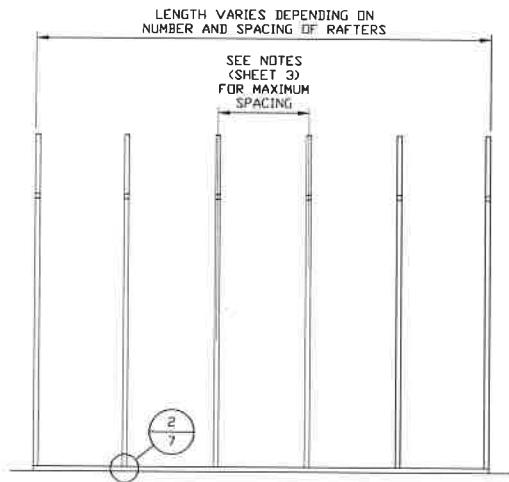




**TYPICAL RAFTER/COLUMN FRAME SECTION**  
SCALE: NTS



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



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

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SHT. 4B

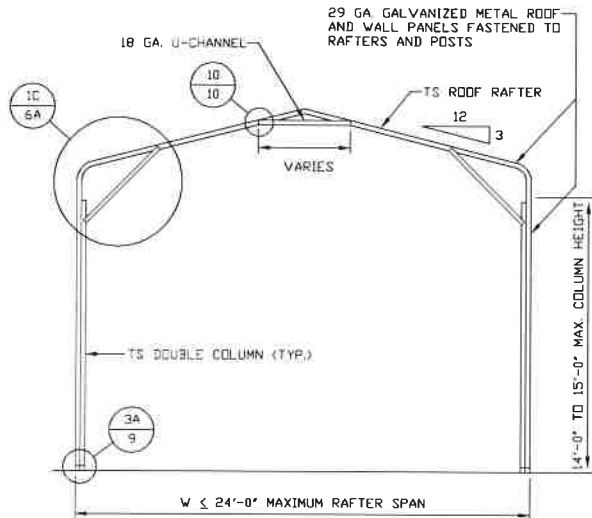
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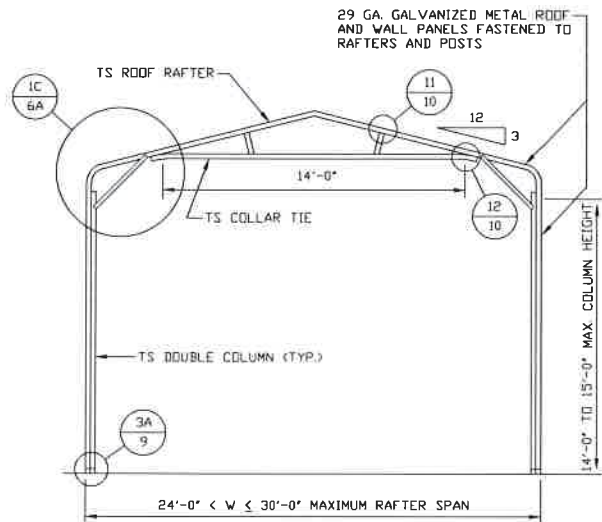
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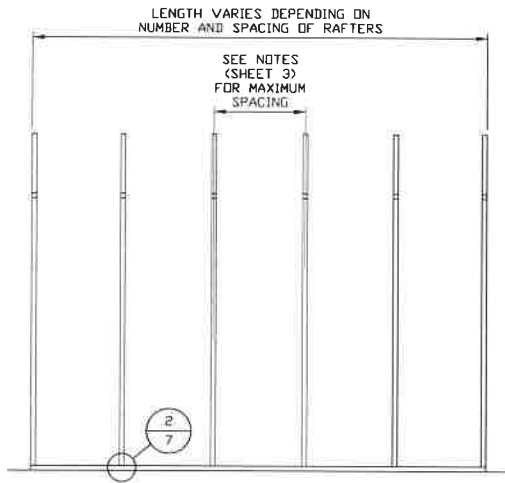
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**TYPICAL RAFTER/COLUMN FRAME SECTION**  
SCALE: NTS



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



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

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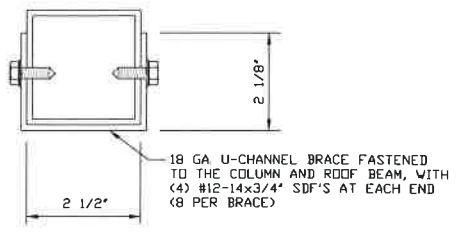
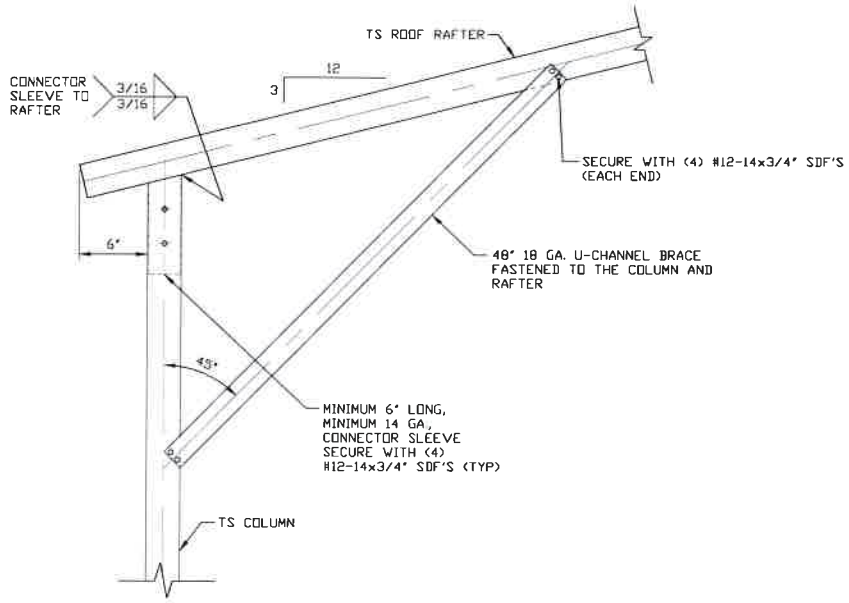
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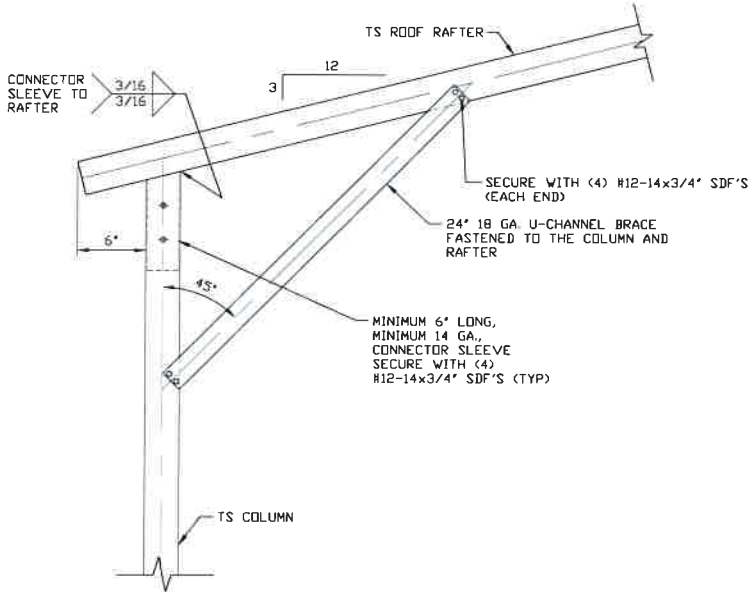
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**BRACE SECTION**  
SCALE: NTS

**1A**  
**BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL FOR HEIGHTS 12'-0" < TO ≤ 14'-0"**  
SCALE: NTS



**1B**  
**BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL FOR HEIGHTS ≤ 12'-0"**  
SCALE: NTS

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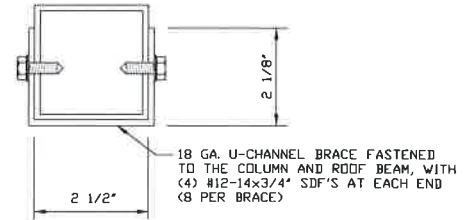
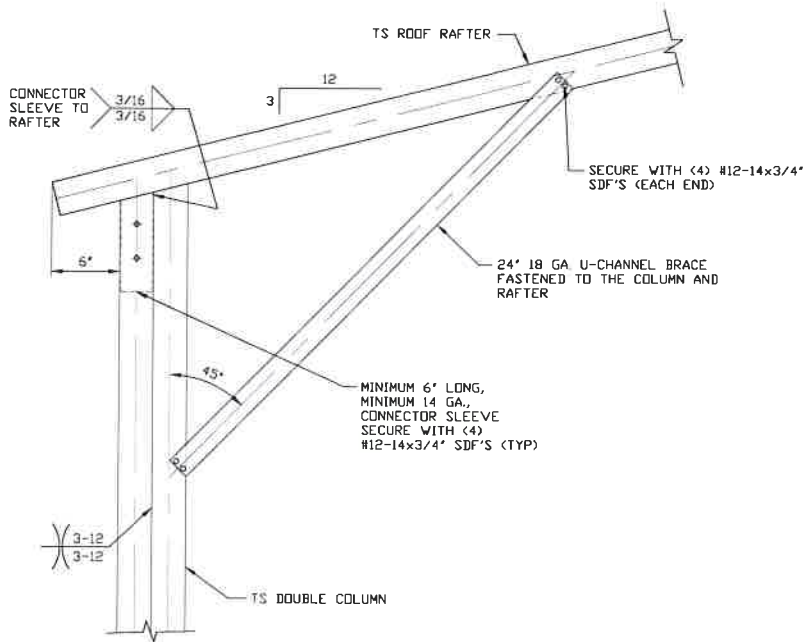
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**SCALE: NTS**  
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**SHT. 5**  
**DWG. NO: SK-3**  
**REV: 0**



**BRACE SECTION**  
SCALE: NTS

**BOX EAVE RAFTER/CORNER POST  
CONNECTION DETAIL  
FOR HEIGHTS 14'-0" < TO ≤ 15'-0"**

1C

SCALE: NTS

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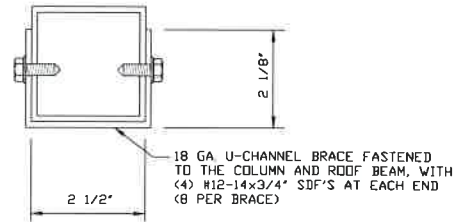
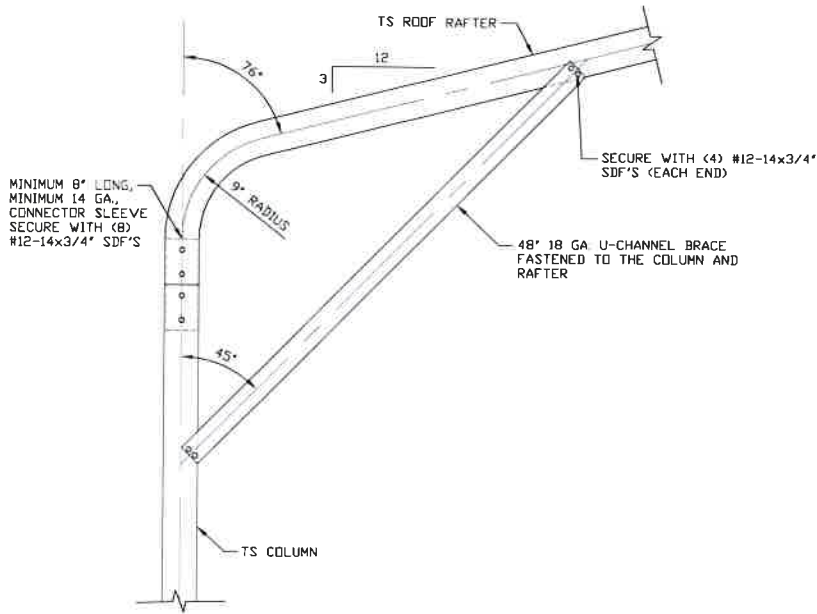
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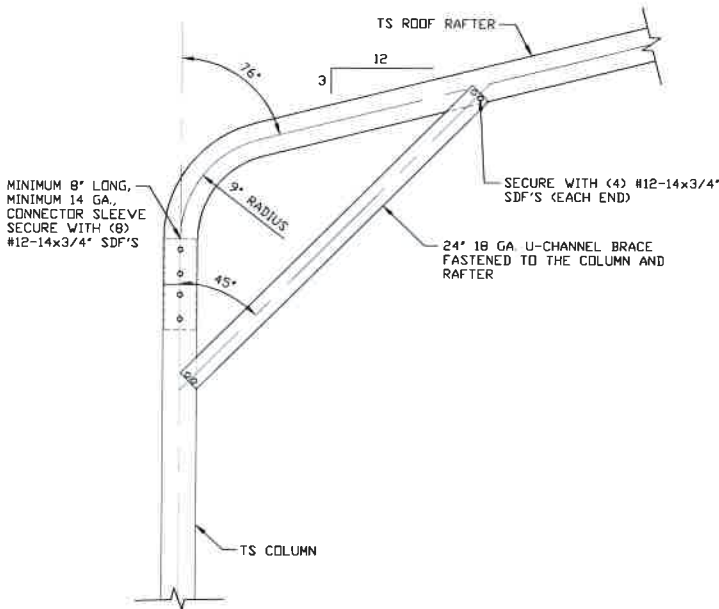
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**BRACE SECTION**  
SCALE: NTS

**1A**  
**BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL**  
**FOR HEIGHTS 12'-0" < TO <= 14'-0"**  
SCALE: NTS



**1B**  
**BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL**  
**FOR HEIGHTS <= 12'-0"**  
SCALE: NTS

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**SHT. 6**

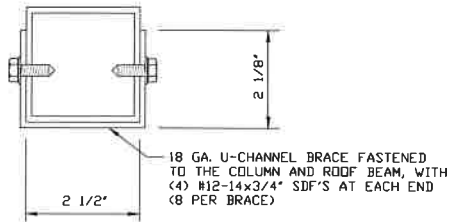
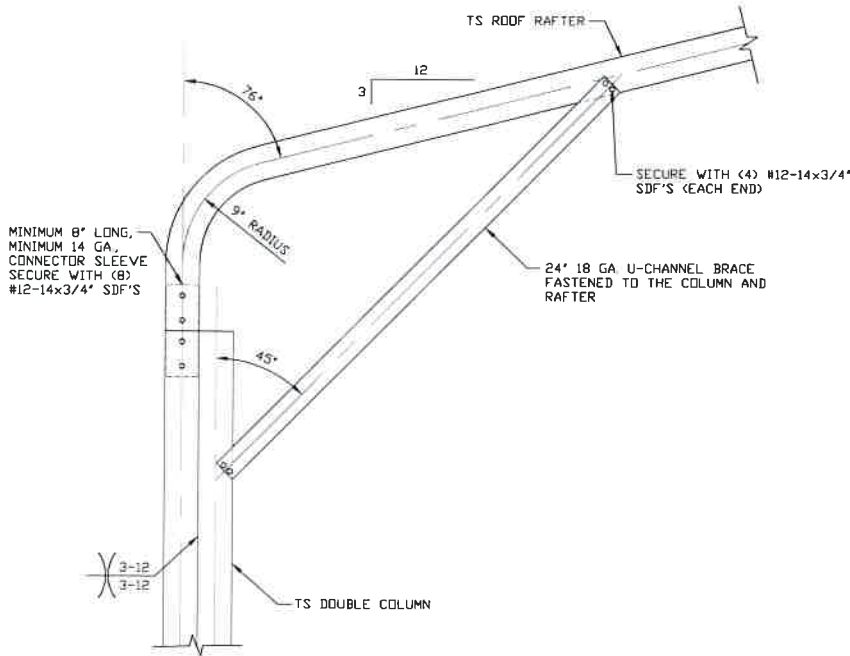
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**BRACE SECTION**  
SCALE: NTS

1C

**BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL**  
**FOR HEIGHTS 14'-0" < TO ≤ 15'-0"**  
SCALE: NTS

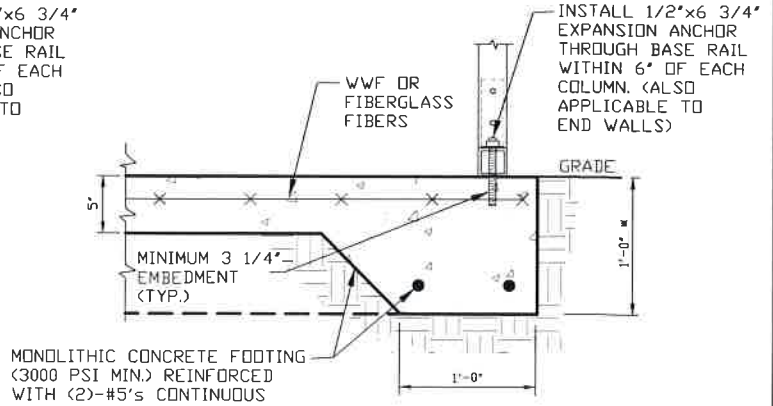
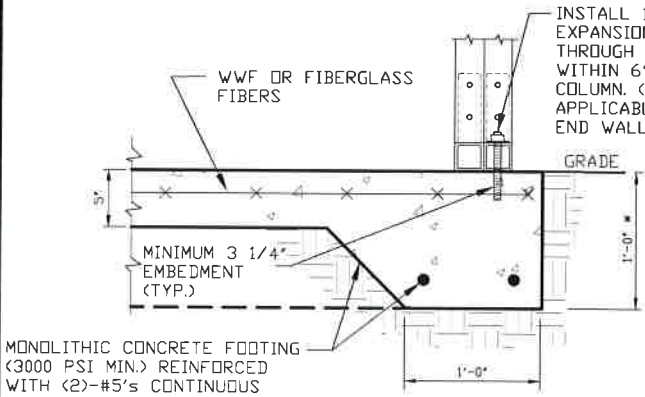
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**SHT.** 6A  
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## BASE RAIL ANCHORAGE OPTIONS



**2A** **CONCRETE MONOLITHIC SLAB  
BASE RAIL ANCHORAGE**  
SCALE: NTS  
MINIMUM ANCHOR EDGE DISTANCE IS 4".  
\* COORDINATE WITH LOCAL CODES/ORD.

**2B** **CONCRETE SLAB BASE  
RAIL ANCHORAGE**  
SCALE: NTS  
MINIMUM ANCHOR EDGE DISTANCE IS 4".  
\* COORDINATE WITH LOCAL CODES/ORD.

### 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) 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.

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**DRAWN BY: AM**

**CHECKED BY: PH**

**PROJECT MGR: VSM**

**CLIENT: SHED CENTRAL**

SHED CENTRAL  
3648 W. US HIGHWAY 421  
WILKESBORO, NC 28697  
30'-0"x15'-0" ENCLOSED STRUCTURE

**DATE: 8-15-18**

**SCALE: NTS**

**JOB NO: 18196S**

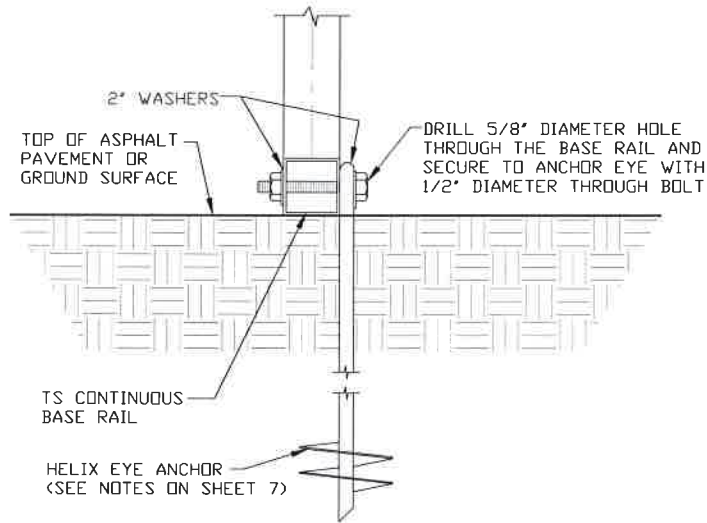
**SHT. 7**

**DWG. NO: SK-3**

**REV: 0**

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## BASE RAIL ANCHORAGE OPTIONS



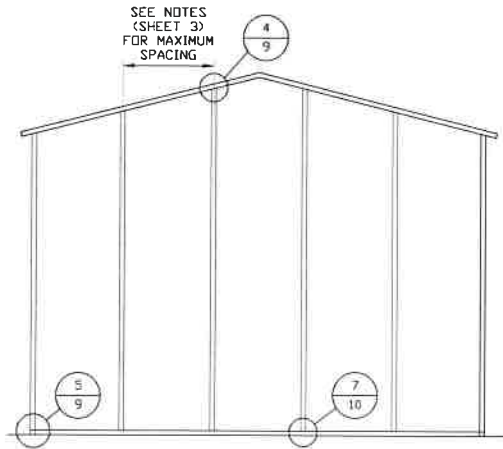
2C

**GROUND BASE HELIX ANCHORAGE**  
 SCALE: NTS

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	CLIENT: SHED CENTRAL	SHT. 7A	DWG. NO: SK-3	REV: 0

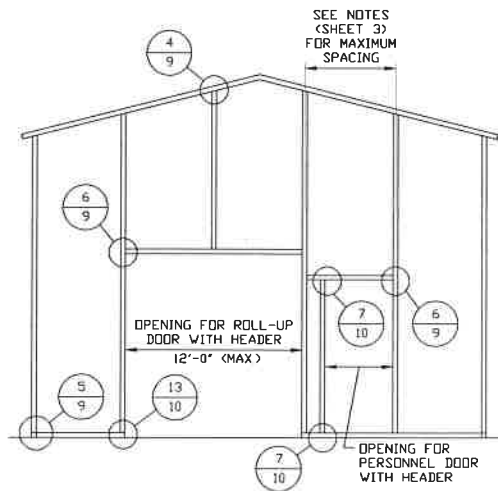


## BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS



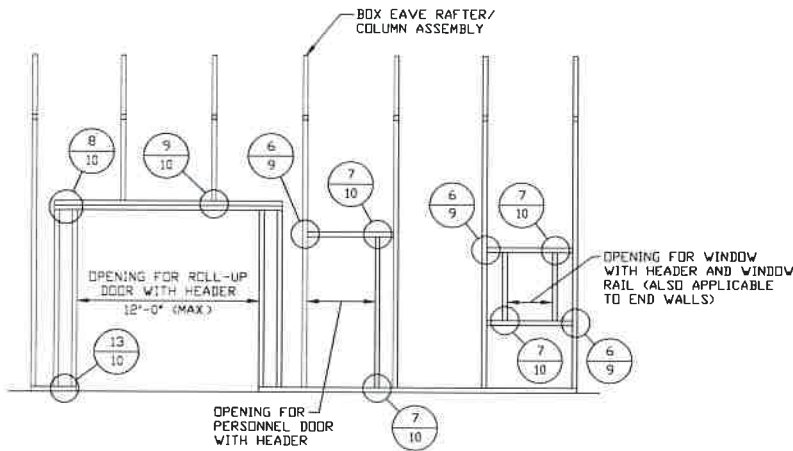
**TYPICAL BOX EAVE RAFTER  
END WALL FRAMING SECTION**

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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**CLIENT: SHED CENTRAL**

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WILKESBORO, NC 28697  
30'-0" x 15'-0" ENCLOSED STRUCTURE

**DATE: 8-15-18**

**SHT. 8**

**SCALE: NTS**

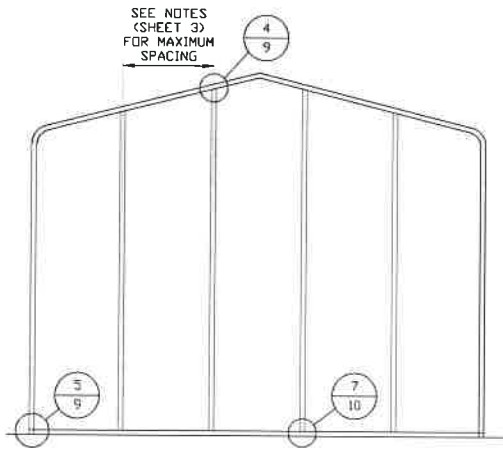
**DWG. NO: SK-3**

**JOB NO: 18196S**

**REV: 0**

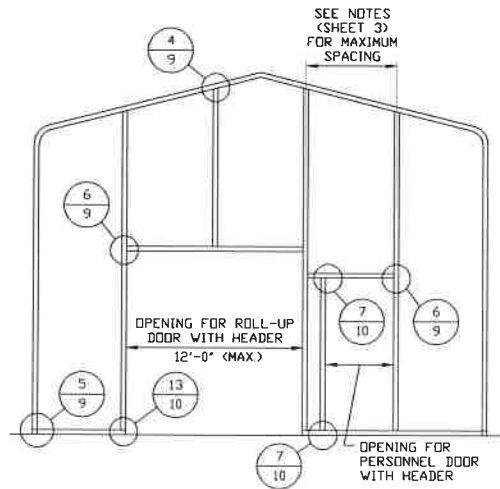
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# BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS



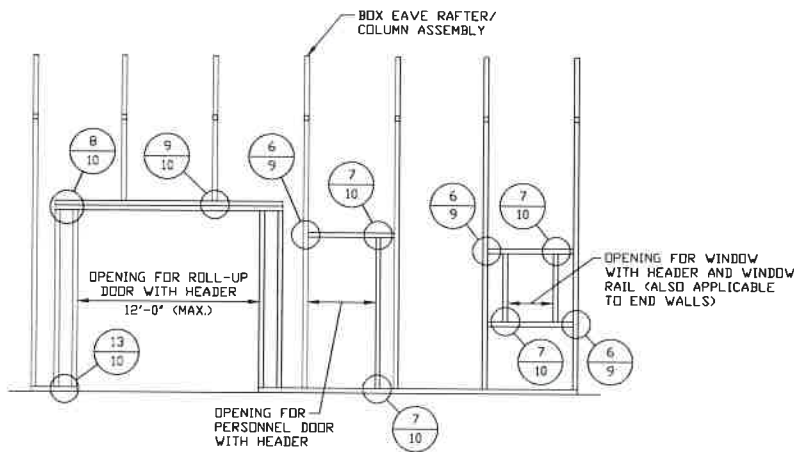
**TYPICAL BOX EAVE RAFTER  
END WALL FRAMING SECTION**

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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**PROJECT MGR: WSM**

**CLIENT: SHED CENTRAL**

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**DATE: 8-15-18**

**SHT. 8A**

**SCALE: NTS**

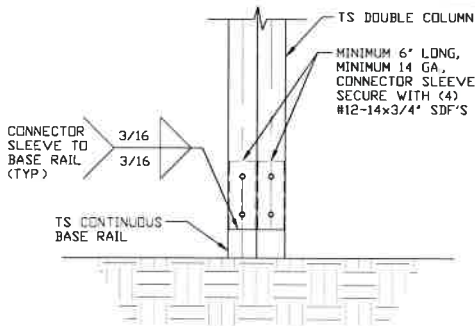
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**JOB NO: 18196S**

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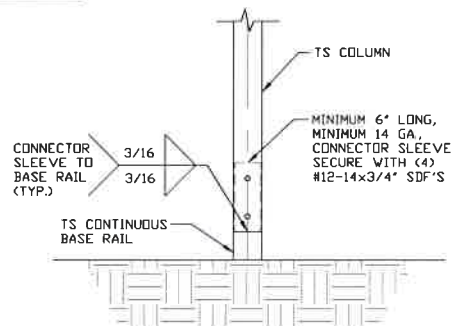
# CONNECTION DETAILS



**3A**

## POST/BASE RAIL CONNECTION DETAIL

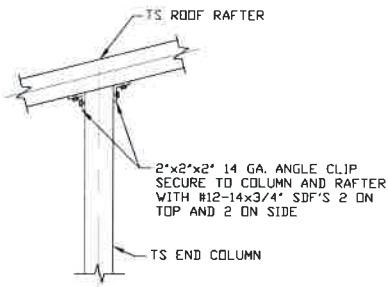
SCALE: NTS



**3B**

## POST/BASE RAIL CONNECTION DETAIL

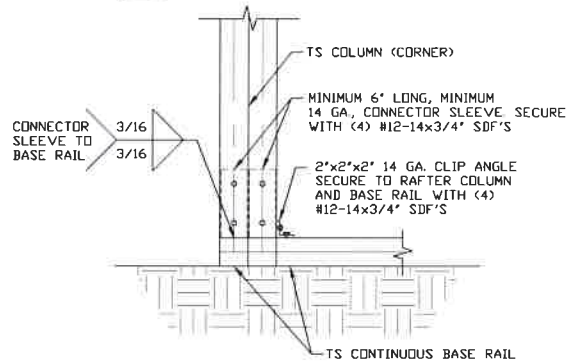
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**4**

## END COLUMN/RAFTER CONNECTION DETAIL

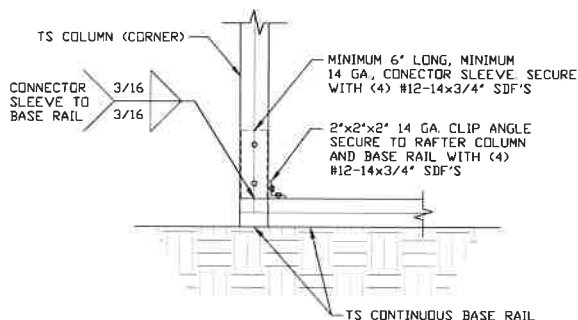
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**5A**

## END COLUMN/BASE RAIL CONNECTION DETAIL

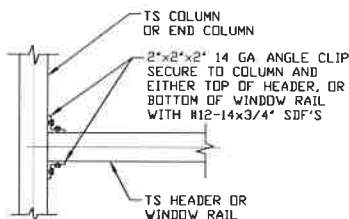
SCALE: NTS



**5B**

## END COLUMN/BASE RAIL CONNECTION DETAIL

SCALE: NTS



**6**

## COLUMN OR WINDOW RAIL TO POST CONNECTION DETAIL

SCALE: NTS

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PROJECT MGR: VSM

CLIENT: SHED CENTRAL

SHED CENTRAL  
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30'-0" x 15'-0" ENCLOSED STRUCTURE

DATE: 8-15-18

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JOB NO: 18196S

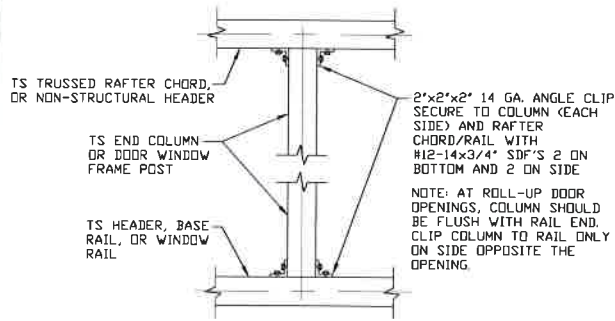
SHT. 9

DWG. NO: SK-3

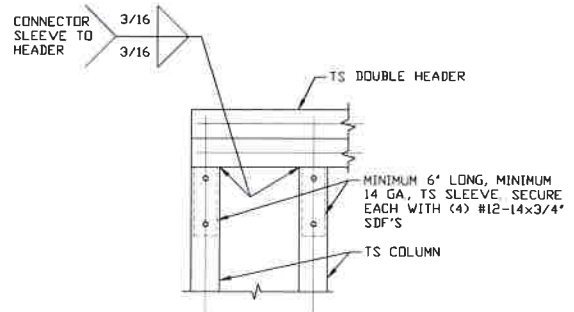
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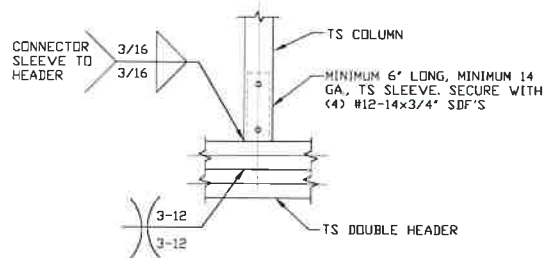
# CONNECTION DETAILS



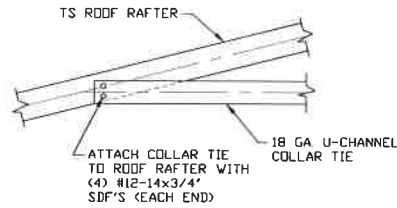
**7** COLUMN TO HEADER, BASE RAIL, OR WINDOW RAIL CONNECTION DETAIL  
SCALE: NTS



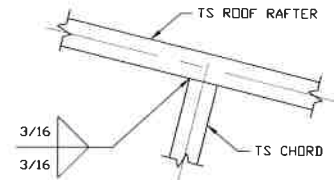
**8** DOUBLE HEADER/COLUMN CONNECTION DETAIL  
SCALE: NTS



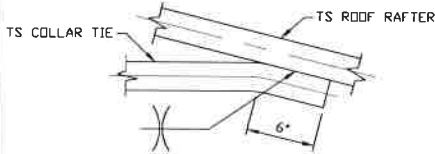
**9** COLUMN/DOUBLE HEADER CONNECTION DETAIL  
SCALE: NTS



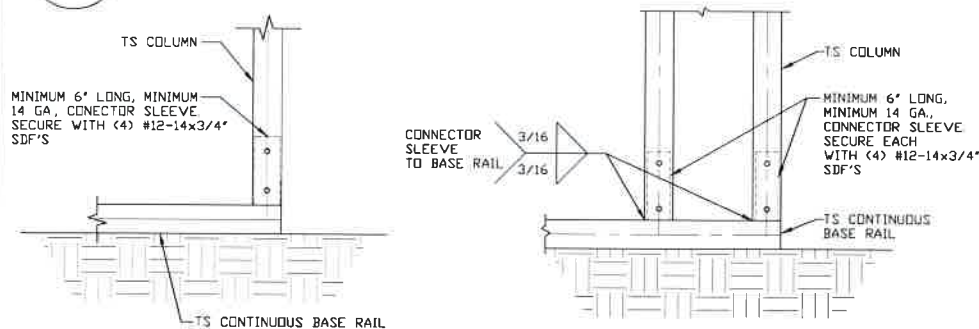
**10** COLLAR TIE CONNECTION DETAIL  
SCALE: NTS



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



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



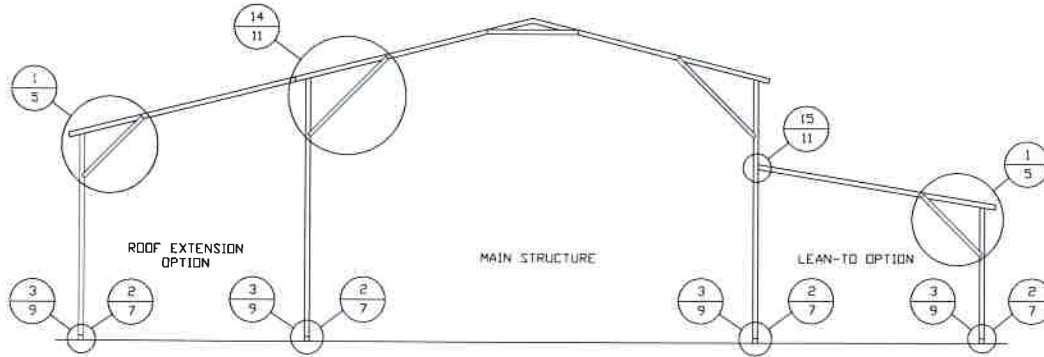
**13** COLUMN/BASE RAIL CONNECTION DETAIL  
SCALE: NTS

**13A** COLUMN/BASE RAIL CONNECTION DETAIL  
SCALE: NTS

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PROJECT MGR: WSM	DATE: 8-15-18	SCALE: NTS	JOB NO: 18196S	
CLIENT: SHED CENTRAL	SHT. 10	DWG. NO: SK-3	REV: 0	

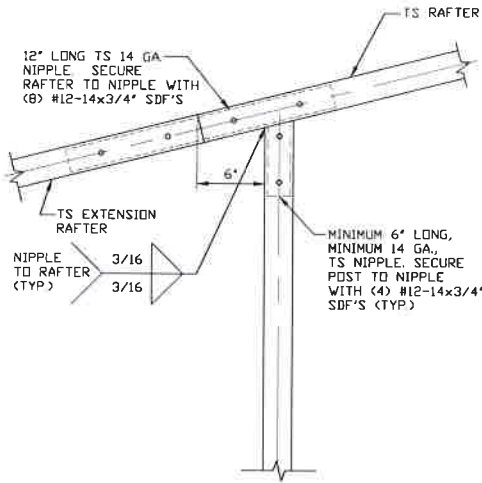
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# BOX EAVE RAFTER LEAN-TO OPTIONS



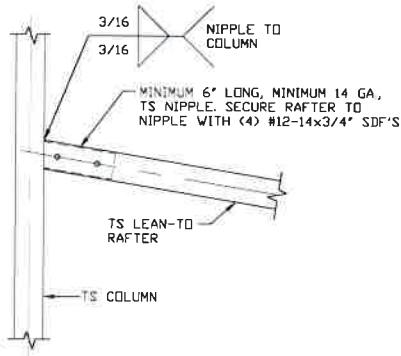
**TYPICAL BOX EAVE RAFTER LEAN-TO OPTIONS FRAMING SECTION (BOTH OPTIONS SHOWN)**

SCALE: NTS  
 MAXIMUM WIDTH OF ROOF EXTENSION AND LEAN-TO OPTION IS 12'-0".



**14** **ROOF EXTENSION RAFTER/CORNER POST DETAIL FOR WIDTHS  $\leq$  12'-0"**

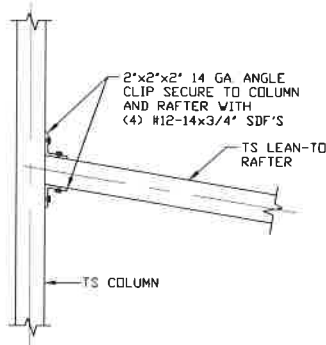
SCALE: NTS



**15A**

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

SCALE: NTS



**15B**

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

SCALE: NTS

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**PROJECT MGR: WSM**

**CLIENT: SHED CENTRAL**

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 30'-0" x 15'-0" ENCLOSED STRUCTURE

**DATE: 8-15-18**

**SHT. 11**

**SCALE: NTS**

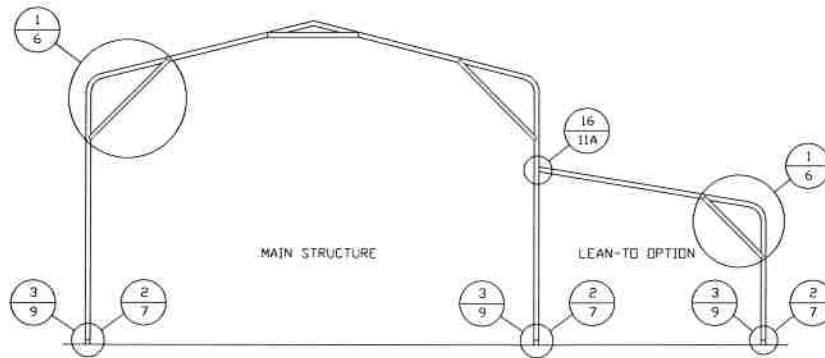
**DWG. NO: SK-3**

**JOB NO: 18196S**

**REV: 0**

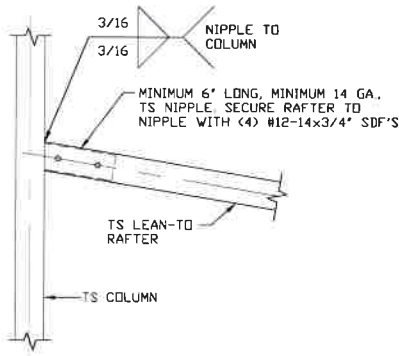
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## BOW EAVE RAFTER LEAN-TO OPTIONS



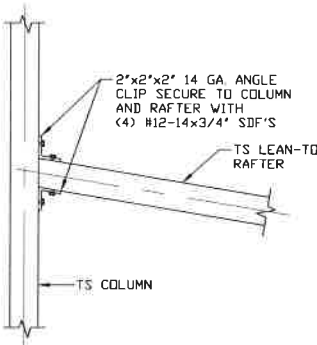
### TYPICAL BOW EAVE RAFTER LEAN-TO OPTIONS FRAMING SECTION

SCALE: NTS  
MAXIMUM WIDTH OF LEAN-TO OPTION IS 12'-0".



16A

**LEAN-TO RAFTER TO  
RAFTER POST  
CONNECTION DETAIL  
FOR WIDTHS  $\le 12'-0''$**   
SCALE: NTS



16B

**LEAN-TO RAFTER  
TO RAFTER POST  
CONNECTION DETAIL  
FOR WIDTHS  $\le 12'-0''$**   
SCALE: NTS

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CLIENT: SHED CENTRAL

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3648 W. US HIGHWAY 421  
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30'-0" x 15'-0" ENCLOSED STRUCTURE

DATE: 8-15-18

SCALE: NTS

JOB NO: 18196S

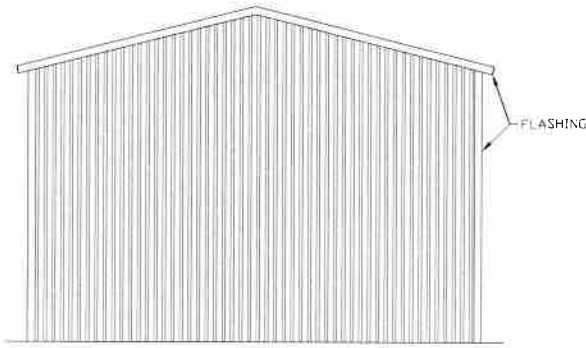
SHT. 11A

DWG. NO: SK-3

REV: 0

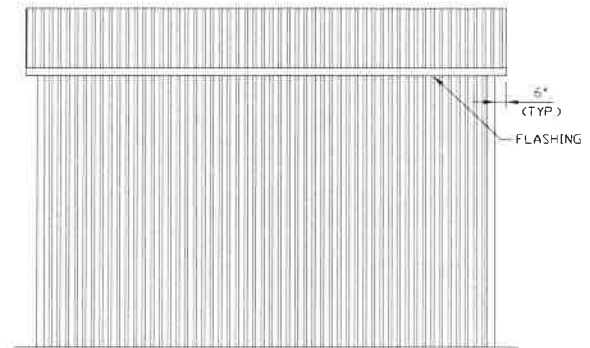
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## VERTICAL ROOF/SIDING OPTION



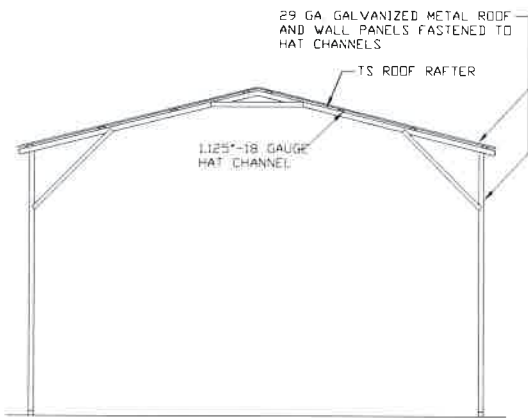
**TYPICAL END ELEVATION  
VERTICAL ROOF/SIDING**

SCALE: NTS



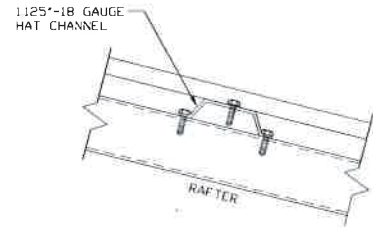
**TYPICAL SIDE ELEVATION  
VERTICAL ROOF/SIDING**

SCALE: NTS



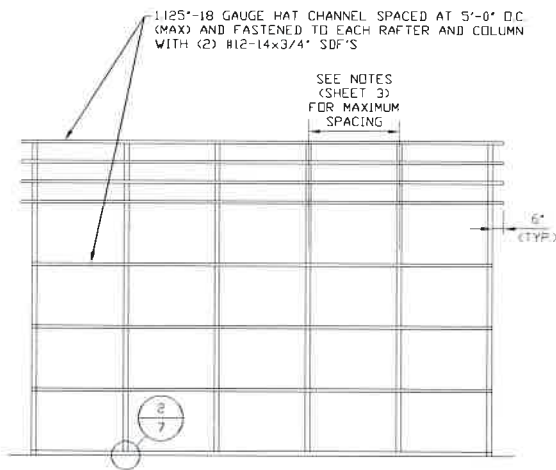
**TYPICAL SECTION  
VERTICAL ROOF/SIDING OPTION**

SCALE: NTS



**PANEL ATTACHMENT**

(ALTERNATE FOR VERTICAL ROOF PANELS)  
SCALE: NTS



**TYPICAL FRAMING SECTION  
VERTICAL ROOF/SIDING OPTION**

SCALE: NTS

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**DATE: 8-15-18**

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**JOB NO: 18196S**

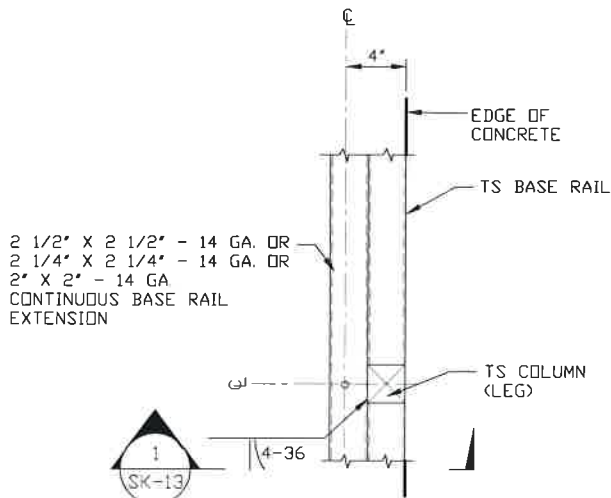
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**DWG. NO: SK-3**

**REV: 0**

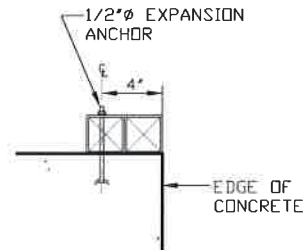
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## ADDITIONAL BASE RAIL ANCHORAGE OPTION



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

SCALE: NTS



**SECTION 1**  
SCALE: NTS

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**SHT. 13**

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