



**STRUCTURAL DESIGN**

**ENCLOSED BUILDING**

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

**20 January 2022  
Revision 0  
M&A Project No. 21263S**

**Prepared for:**

**Five Star Metal Buildings, LLC  
P.O. Box 1186  
Toast, NC 27049**

**Prepared by:**

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1009 East Avenue  
North Augusta, SC 29841**

**401 S. Main Street, Suite 200  
Mt. Airy, NC 27030**




<p align="center"><b>MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.</b></p>	<p>DRAWN BY: JG</p>	<p align="center">FIVE STAR METAL STRUCTURES, LLC P.O. BOX 1186 TOAST, NC 27049 30'-0"x20'-0" ENCLOSED STRUCTURE</p>		
	<p>CHECKED BY: PDH</p>			
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	<p>CLIENT: FIVE STAR</p>	<p>SHT. 1</p>	<p>DWG. NO: SK-3</p>	<p>REV: 0</p>

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**CHECKED BY: PDH**

**PROJECT MGR: WSM**

**CLIENT: FIVE STAR**

**FIVE STAR METAL STRUCTURES, LLC  
P.O. BOX 1186  
TOAST, NC 27049  
30'-0"x20'-0" ENCLOSED STRUCTURE**

**DATE: 1-20-22**

**SCALE: NTS**

**JOB NO: 21263S**

**SHT. 2**

**DWG. NO: SK-3**

**REV: 0**

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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 ALL APPLICABLE BUILDING CODES LISTED ON SHEET 3A.
3. DESIGN LOADS ARE AS FOLLOWS:
  - A) ROOF DEAD LOAD:
    - SELF-WEIGHT = 1.5 PSF
    - MEP = 10 PSF
    - COLLATERAL = 0 PSF
  - B) ROOF LIVE LOAD = 20 PSF
  - C) FLOOR LIVE LOAD = 100 PSF (4" CONCRETE SLAB-ON-GRADE)
  - D) GROUND SNOW LOAD = 40 PSF
    - = 30 PSF WITH U-CHANNEL PEAK BRACE (W ≤ 24'-0" (RISK CATEGORY I ONLY))
    - (NOTE: UNBALANCED LOADING DUE TO SNOW DRIFTING FROM AN ADJACENT TALLER STRUCTURE HAS NOT BEEN EVALUATED).
4. 3-SECOND GUST ULTIMATE WIND SPEED ( $V_{ULT}$ ) ≤ 140 MPH (NOMINAL WIND SPEED ≤ 108 MPH).
5. MAXIMUM RAFTER/COLUMN AND END COLUMN SPACING = 4.0 FEET (UNLESS NOTED OTHERWISE).
6. ENDWALL COLUMNS (COLUMNS) AND SIDE WALL COLUMNS ARE EQUIVALENT IN SIZE AND SPACING (UNLESS NOTED OTHERWISE).
7. RISK CATEGORY I/II (RISK CATEGORY I NOT FOR HUMAN HABITATION).
8. WIND EXPOSURE CATEGORY B/C.
9. STRUCTURAL ANALYSIS/DESIGN IS BASED ON TS MEETING THE REQUIREMENTS OF ASTM A653 GRADE 50 WITH MINIMUM YIELD STRENGTH (FY) OF 54 KSI AND GALVANIZING MEETING THE REQUIREMENTS OF G60.
10. SPECIFICATIONS APPLICABLE TO 26 GAUGE OR 29 GAUGE METAL PANELS FASTENED DIRECTLY TO 2 1/2" x 2 1/2" - 14 GAUGE TUBE STEEL (TS) FRAMING MEMBERS (UNLESS NOTED OTHERWISE). 2 1/4" x 2 1/4" - 12 GAUGE TS MAY BE USED AS OPTIONAL FRAMING MEMBERS.
11. CONNECTOR SLEEVES ARE MINIMUM 6" LONG, 2 1/4"x2 1/4"-14 GAUGE TUBE STEEL (TS) FRAMING MEMBERS (UNLESS NOTED OTHERWISE).
12. AVERAGE PANEL FASTENER SPACING ON-CENTERS = 6 INCHES.
13. 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 JOINT SEALANT.
14. GROUND ANCHORS SHALL BE INSTALLED THROUGH BASE RAIL AT OR WITHIN 6" OF EVERY COLUMN.
15. STANDARD GROUND ANCHORS (SOIL NAILS) CONSIST OF #4 REBAR W/ WELDED NUT x 36" LONG AND MAY BE USED IN SUITABLE SOILS. OPTIONAL ANCHORAGE MAY BE USED IN SUITABLE SOILS AND MUST BE USED IN UNSUITABLE SOILS AS NOTED.
16. WIND FORCES GOVERN OVER SEISMIC FORCES. SEISMIC PARAMETERS ANALYZED ARE:
  - SOIL SITE CLASS = D
  - RISK CATEGORY I/II
  - R = 3.25                       $I_E = 1.0$
  - $S_{DS} = 2.625 g$                $V = C_s W$
  - $S_{D1} = 2.13 g$
17. MAXIMUM THRESHOLD HEIGHT IS 1/2" FOR PERSONNEL DOORS UTILIZED AS MEANS OF EGRESS (RISK CATEGORY II ONLY).
18. CONTRACTOR TO PROVIDE ADEQUATE BRACING FOR STRUCTURE SO THAT IT WILL BE STABLE DURING ALL STAGES OF CONSTRUCTION. THE STRUCTURE AND FOUNDATION ARE DESIGNED FOR A COMPLETED CONDITION ONLY AND, THEREFORE, REQUIRE ADDITIONAL SUPPORT TO MAINTAIN STABILITY BEFORE COMPLETION.

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**SCALE: NTS**

**JOB NO: 21263S**

**SHT. 3**

**DWG. NO: SK-3**

**REV: 0**

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## LIST OF APPLICABLE BUILDING CODES

2018 INTERNATIONAL BUILDING CODE (IBC 2018)

2015 INTERNATIONAL BUILDING CODE (IBC 2015)

2012 INTERNATIONAL BUILDING CODE (IBC 2012)

BUILDING CODE 2015 OF ALABAMA  
(ADOPTS THE IBC 2015 WITHOUT AMENDMENTS)

GEORGIA STATE MINIMUM STANDARD BUILDING CODE  
(ADOPTS THE IBC 2018 WITH AMENDMENTS)

2018 KENTUCKY BUILDING CODE  
(ADOPTS THE IBC 2015 WITH AMENDMENTS)

2018 NORTH CAROLINA BUILDING CODE  
(ADOPTS THE IBC 2015 WITH AMENDMENTS)

OHIO BUILDING CODE 2017  
(ADOPTS THE IBC 2015 WITH AMENDMENTS)

BUILDING CODE 2015 OF PENNSYLVANIA  
(ADOPTS THE IBC 2015 WITH AMENDMENTS)  
2018 PHILADELPHIA BUILDING CODE  
(ADOPTS THE IBC 2018 WITH AMENDMENTS)

2018 SOUTH CAROLINA BUILDING CODE  
(ADOPTS THE IBC 2018 WITH AMENDMENTS)

BUILDING CODE 2012 OF TENNESSEE  
(ADOPTS THE IBC 2012 WITH AMENDMENTS)

2018 VIRGINIA CONSTRUCTION CODE  
(ADOPTS THE IBC 2018 WITH AMENDMENTS)

BUILDING CODE 2015 OF WEST VIRGINIA  
(ADOPTS THE IBC 2015 WITH AMENDMENTS)

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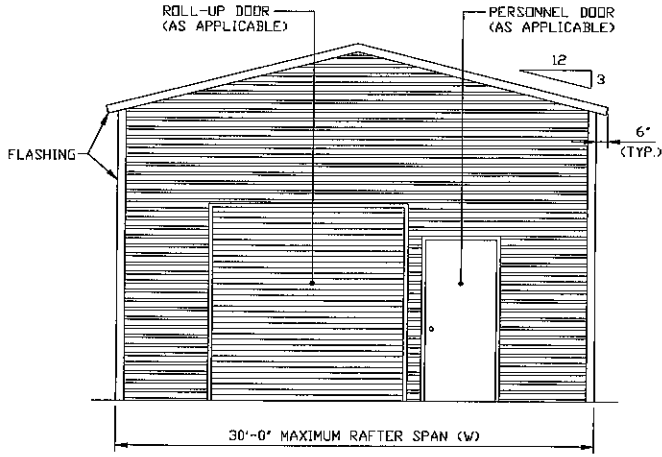
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**DWG. NO: SK-3**

**REV: 0**

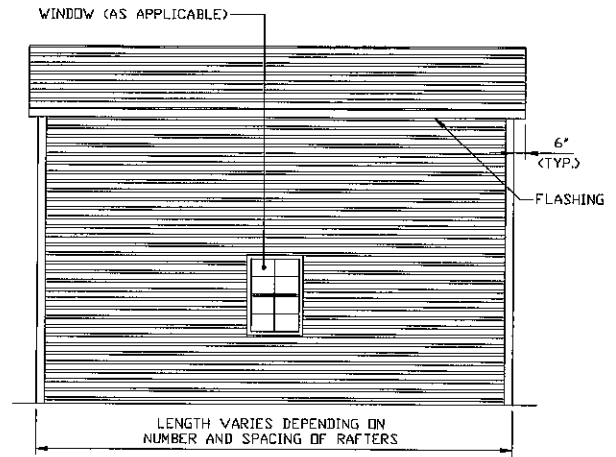
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**BOX EAVE FRAME RAFTER STRUCTURE**



**TYPICAL END ELEVATION**

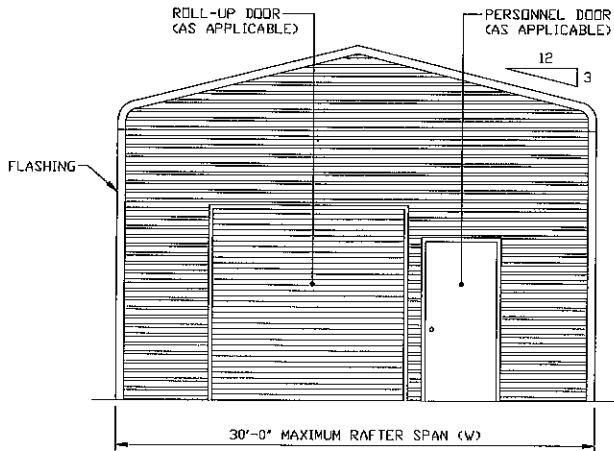
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**TYPICAL SIDE ELEVATION**

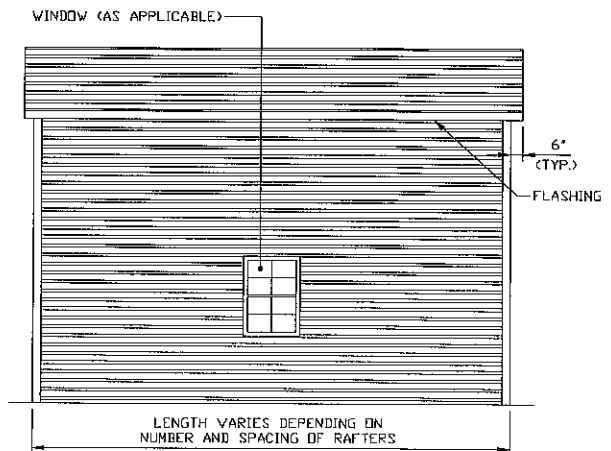
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**BOW EAVE FRAME RAFTER STRUCTURE**



**TYPICAL END ELEVATION**

SCALE: NTS



**TYPICAL SIDE ELEVATION**

SCALE: NTS

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SHT. 4

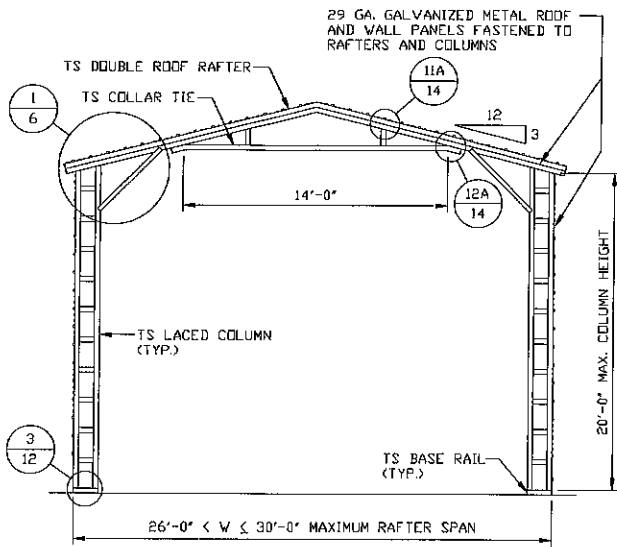
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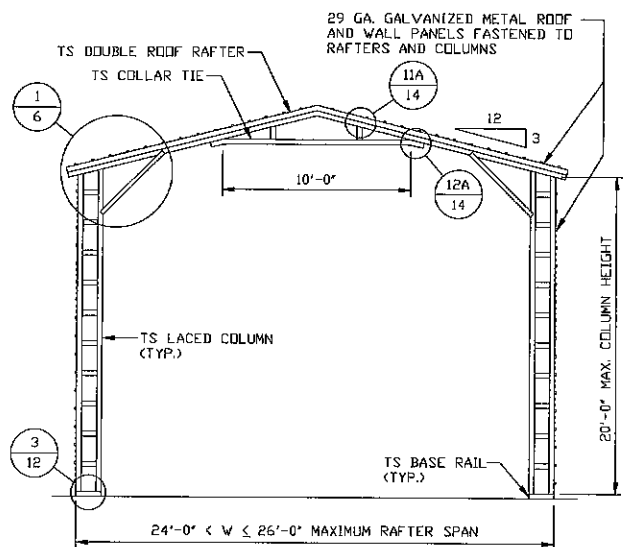
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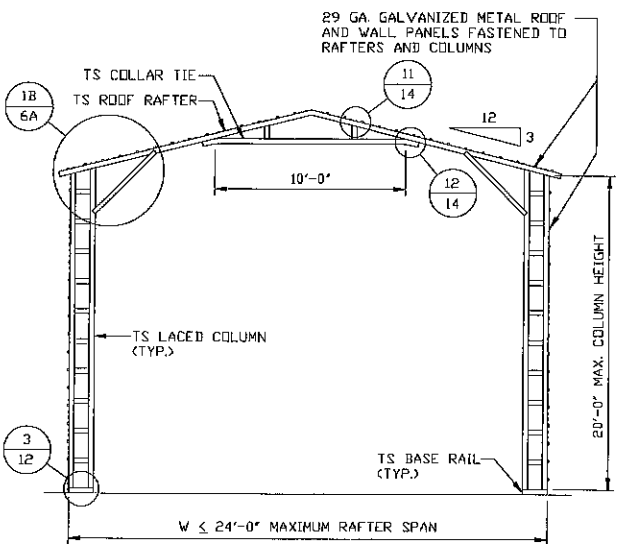
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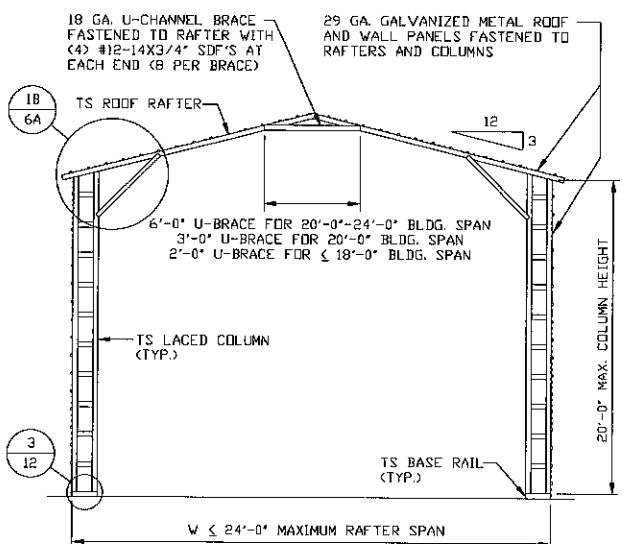
**TYPICAL RAFTER/COLUMN FRAME SECTION**  
SCALE: NTS



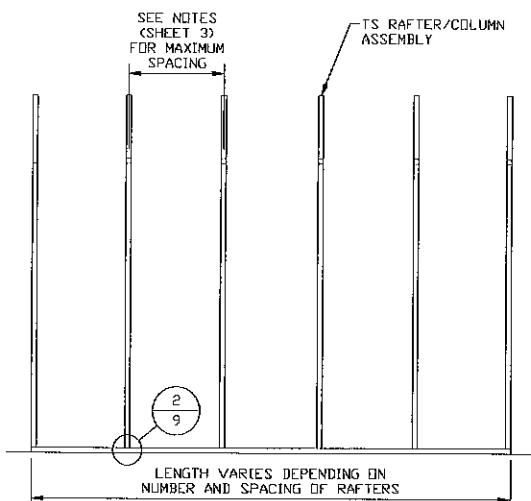
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**TYPICAL RAFTER/COLUMN FRAME SECTION**  
SCALE: NTS



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



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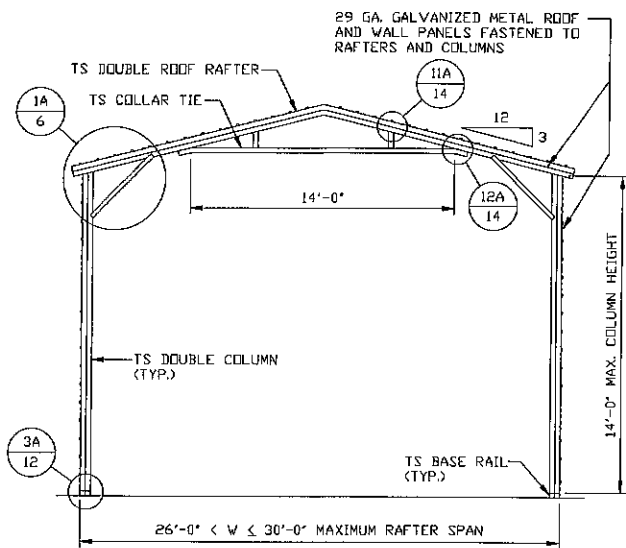
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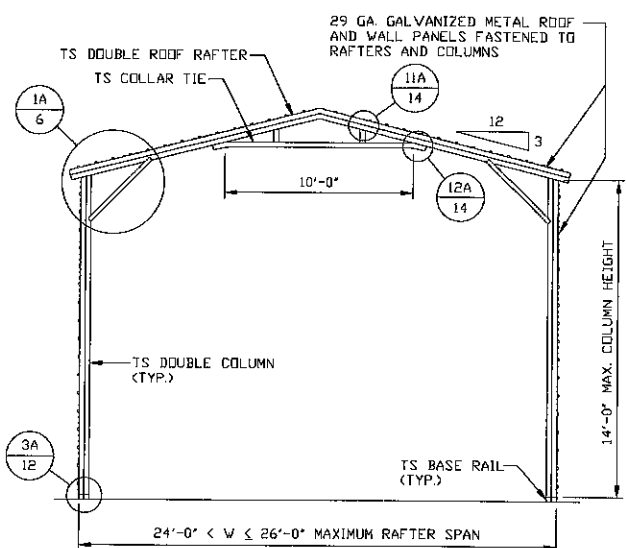
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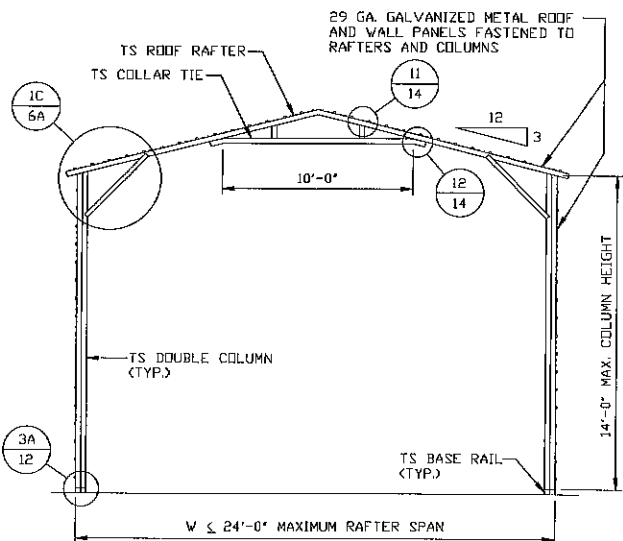
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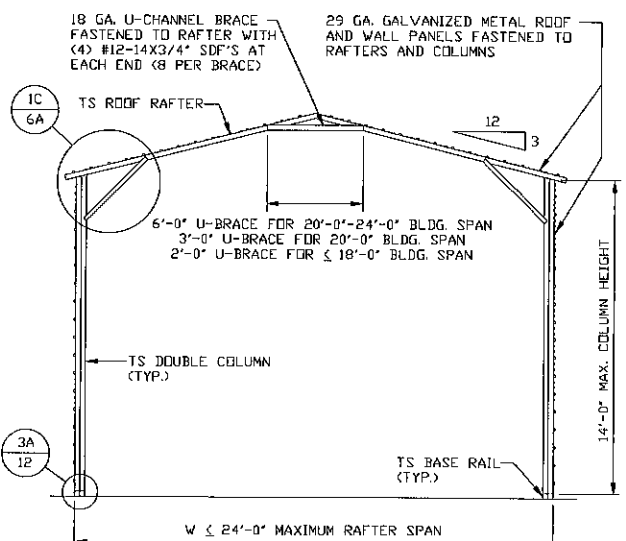
**TYPICAL RAFTER/COLUMN FRAME SECTION**  
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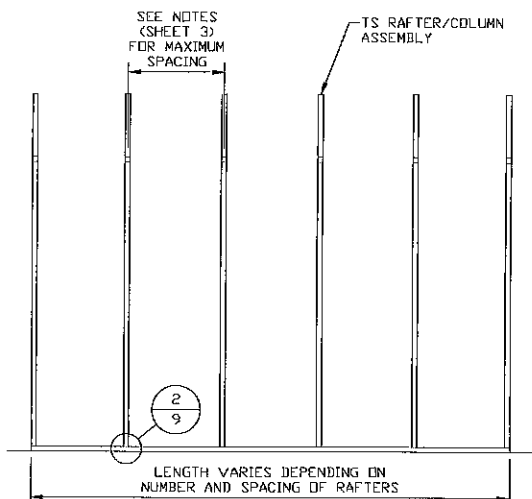
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SCALE: NTS



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



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

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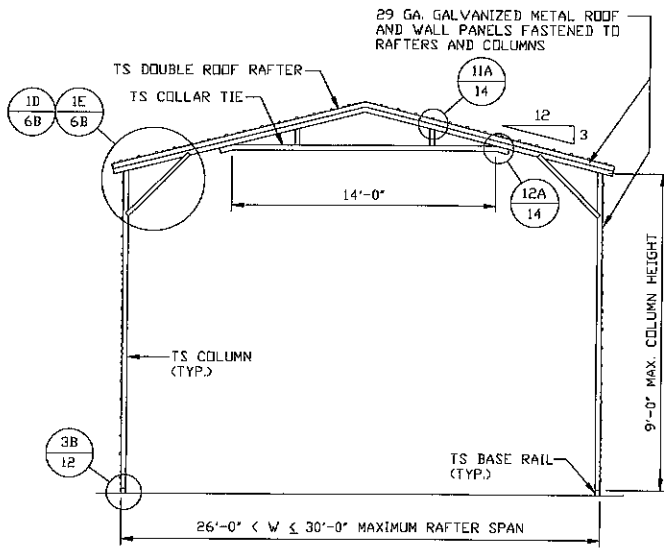
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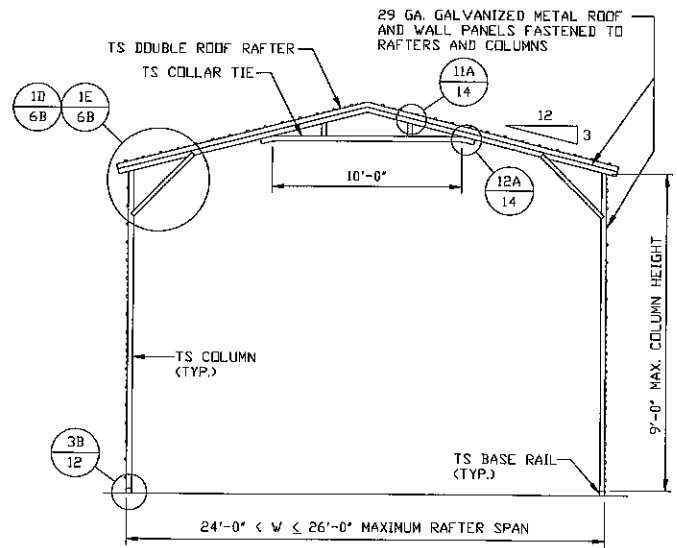
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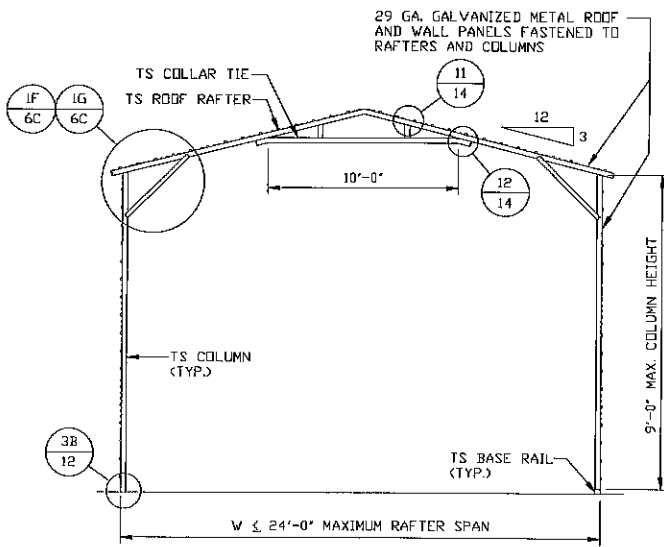




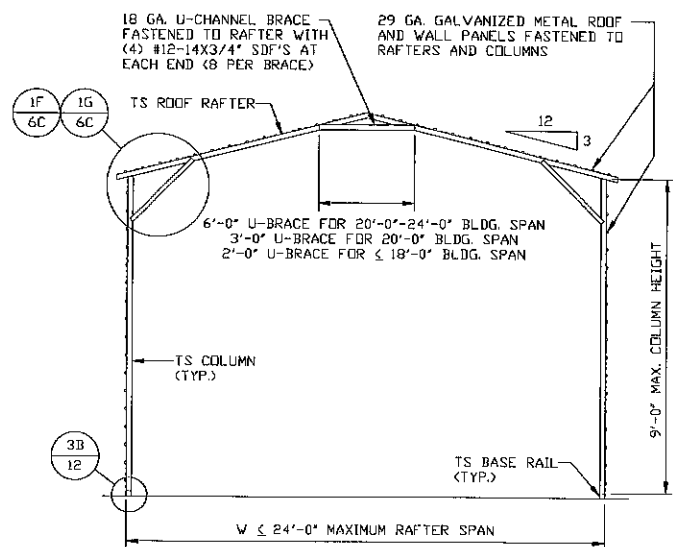
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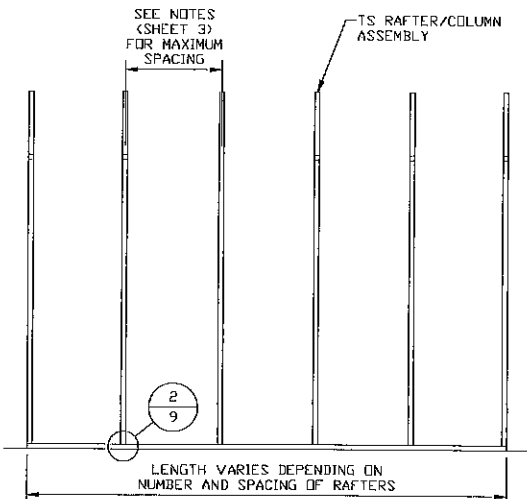
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**TYPICAL RAFTER/COLUMN FRAME SECTION**  
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**TYPICAL RAFTER/COLUMN FRAMING SECTION**  
SCALE: NTS



**TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION**  
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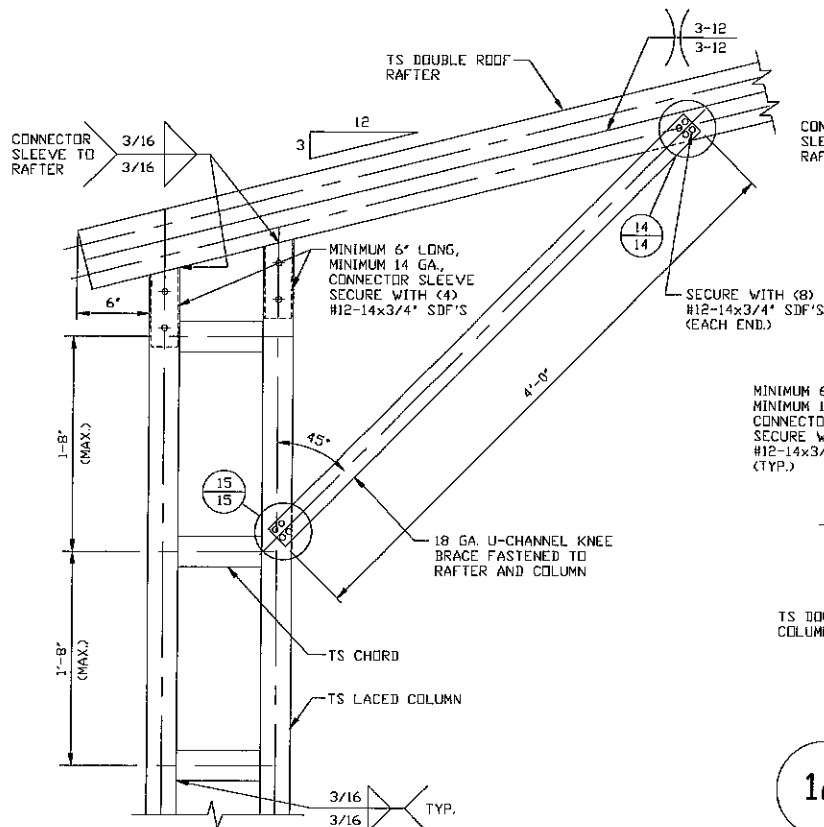
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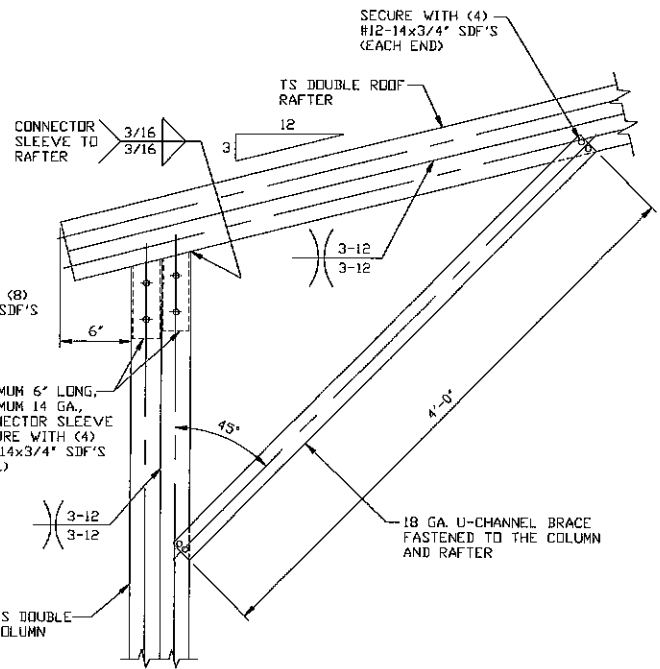
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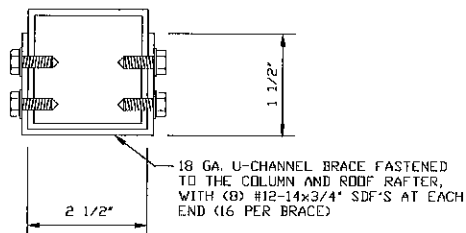
**BOX EAVE RAFTER/CORNER COLUMN CONNECTION DETAIL FOR HEIGHTS 14'-0" < TO <= 20'-0"**

SCALE: NTS



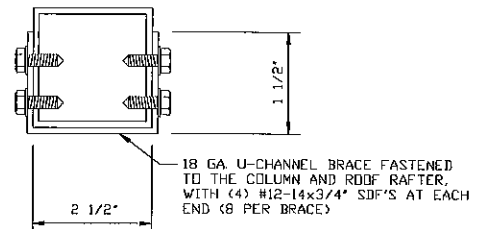
**BOX EAVE RAFTER/CORNER COLUMN CONNECTION DETAIL FOR HEIGHTS 9'-0" < TO <= 14'-0"**

SCALE: NTS



**BRACE SECTION**

SCALE: NTS



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SHT. 6

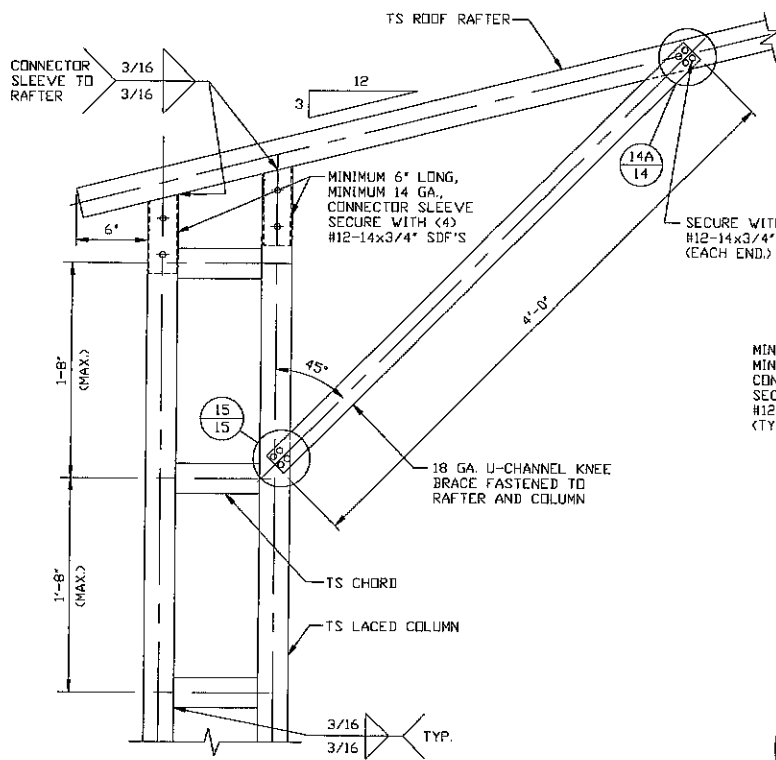
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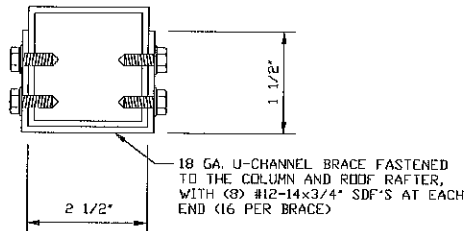
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**BOX EAVE RAFTER/CORNER COLUMN CONNECTION DETAIL FOR HEIGHTS 14'-0" < TO <= 20'-0"**

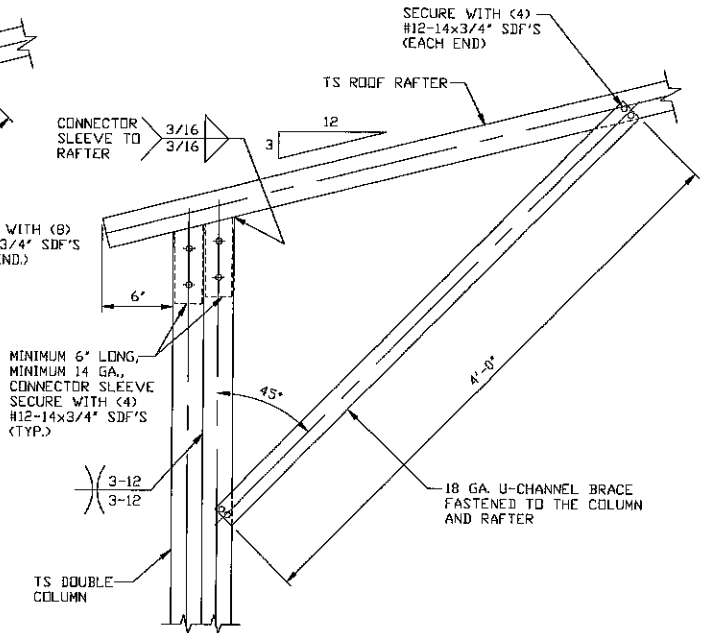
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**BRACE SECTION**

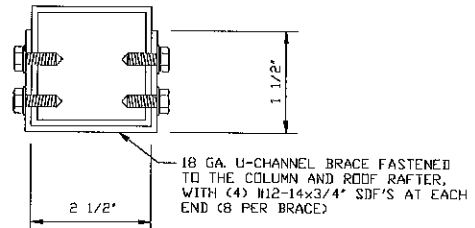
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**BOX EAVE RAFTER/CORNER COLUMN CONNECTION DETAIL FOR HEIGHTS 9'-0" < TO <= 14'-0"**

1C

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**BRACE SECTION**

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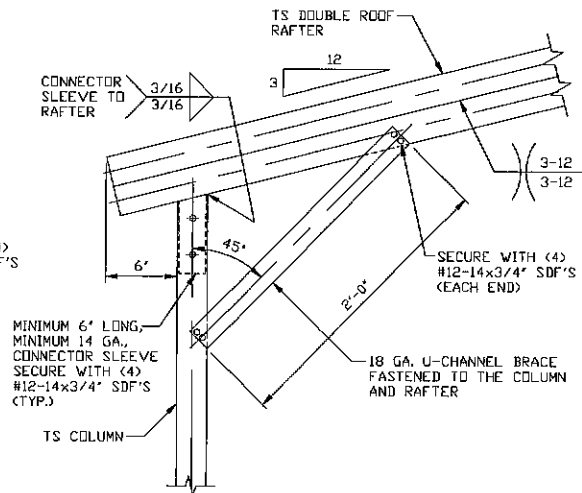
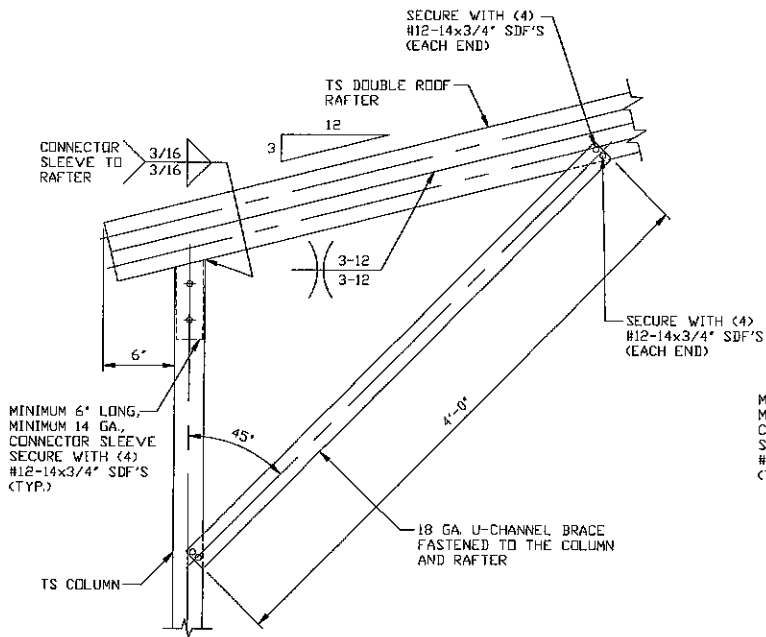
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DWG. NO: SK-3

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**BOX EAVE RAFTER/CORNER COLUMN CONNECTION DETAIL FOR HEIGHTS 8'-0" < TO <= 9'-0"**

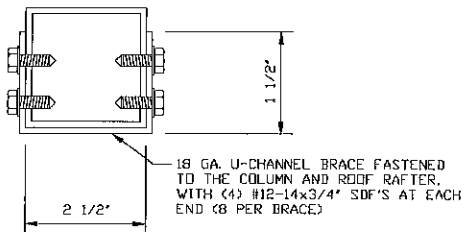
1D

SCALE: NTS

NOTE: MAXIMUM SINGLE TUBE COLUMN HEIGHT IS 8'-0" WHEN A LEAN-TO IS ATTACHED FOR GROUND SNOW > 10 PSF. A 2'-0" LONG KNEE BRACE IS REQUIRED FOR THIS SCENARIO.

NOTE: MAXIMUM SINGLE TUBE COLUMN HEIGHT IS 12'-0" FOR RISK CATEGORY I, WIND EXPOSURE CATEGORY B STRUCTURES WITH WIND SPEEDS <= 138 MPH AND GROUND SNOW <= 10 PSF.

MAXIMUM SINGLE TUBE COLUMN HEIGHT IS 14'-0" FOR RISK CATEGORY I, WIND EXPOSURE CATEGORY B STRUCTURES WITH WIND SPEEDS <= 107 MPH AND GROUND SNOW <= 10 PSF.



**BRACE SECTION**

SCALE: NTS

**BOX EAVE RAFTER/CORNER COLUMN CONNECTION DETAIL FOR HEIGHTS <= 8'-0"**

1E

SCALE: NTS

**MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.**

DRAWN BY: JG

CHECKED BY: PDH

PROJECT MGR: WSM

CLIENT: FIVE STAR

FIVE STAR METAL STRUCTURES, LLC  
P.O. BOX 1186  
TOAST, NC 27049  
30'-0"x20'-0" ENCLOSED STRUCTURE

DATE: 1-20-22

SHT. 6B

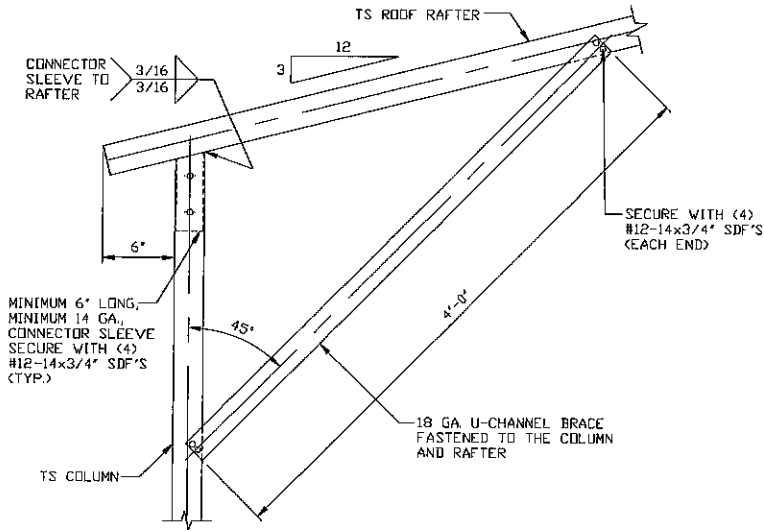
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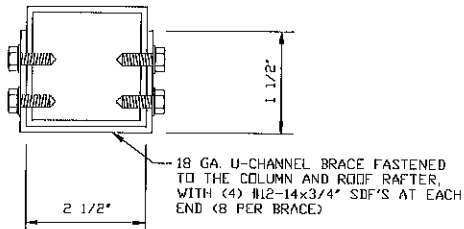
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SCALE: NTS

NOTE: MAXIMUM SINGLE TUBE COLUMN HEIGHT IS 8'-0" WHEN A LEAN-TO IS ATTACHED FOR GROUND SNOW > 10 PSF. A 2'-0" LONG KNEE BRACE IS REQUIRED FOR THIS SCENARIO.

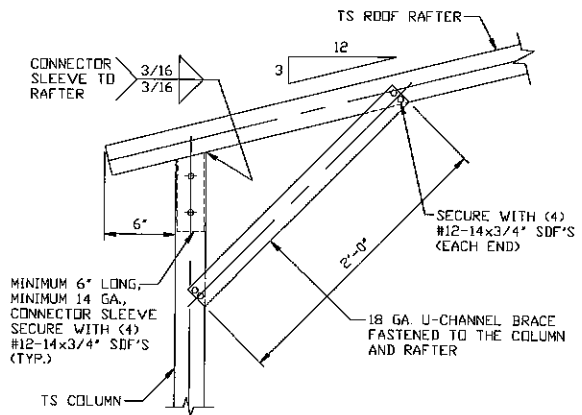
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**BRACE SECTION**

SCALE: NTS



**BOX EAVE RAFTER/CORNER COLUMN CONNECTION DETAIL FOR HEIGHTS <= 8'-0"**

1G

SCALE: NTS

**MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.**

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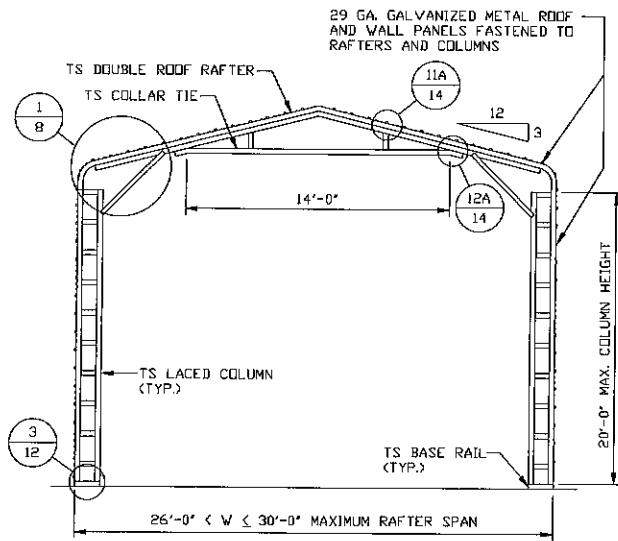
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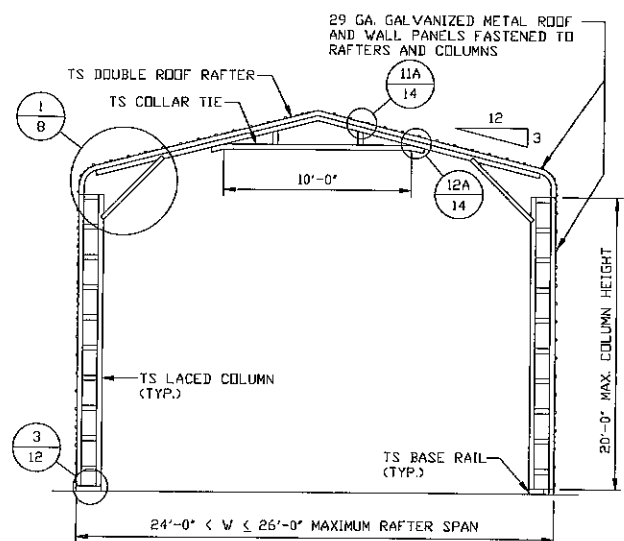
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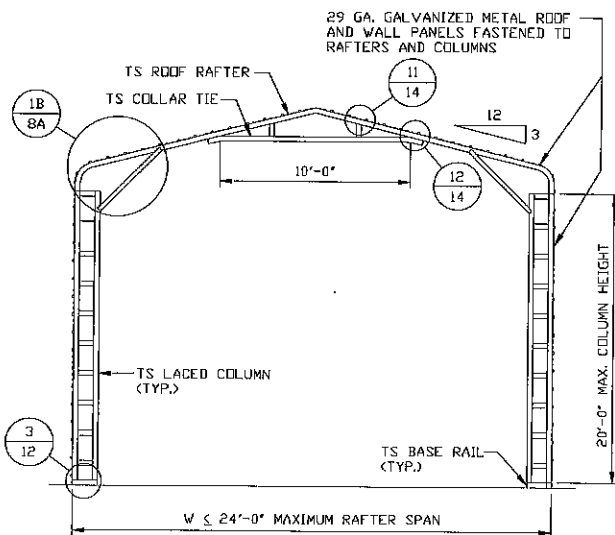
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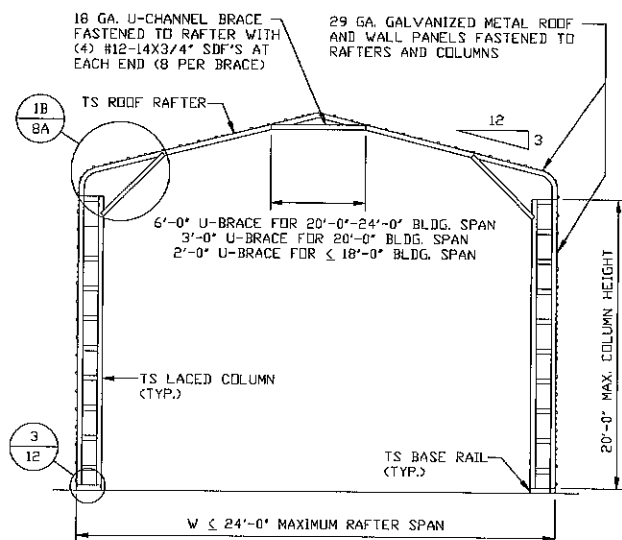
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SCALE: NTS



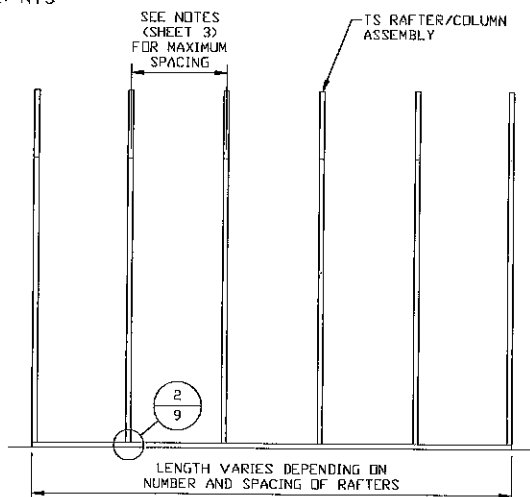
**TYPICAL RAFTER/COLUMN FRAME SECTION**  
SCALE: NTS



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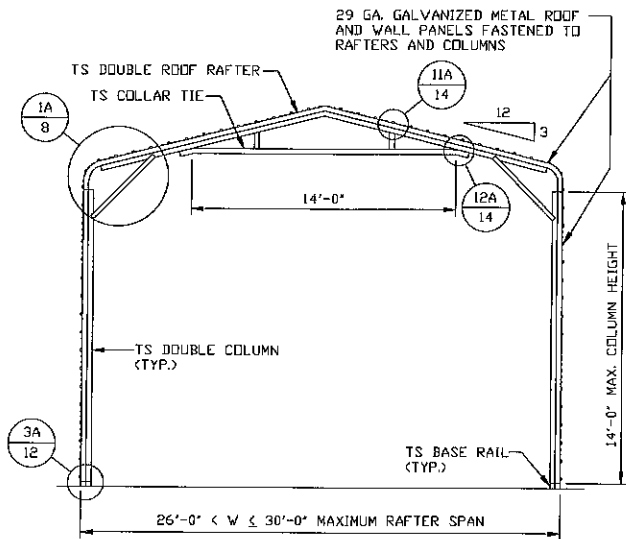
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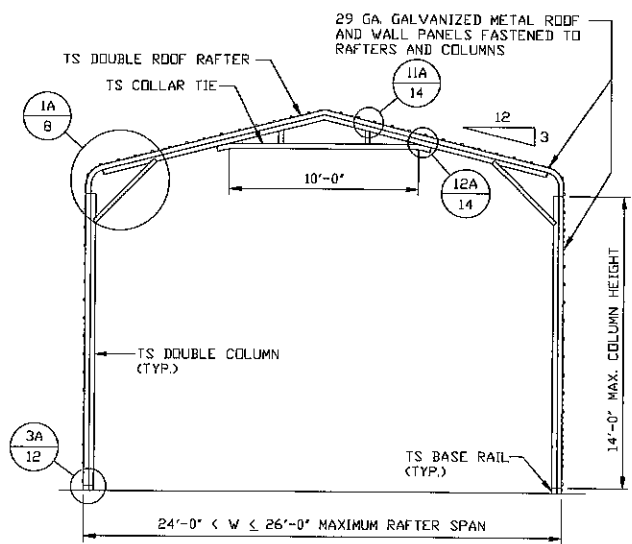
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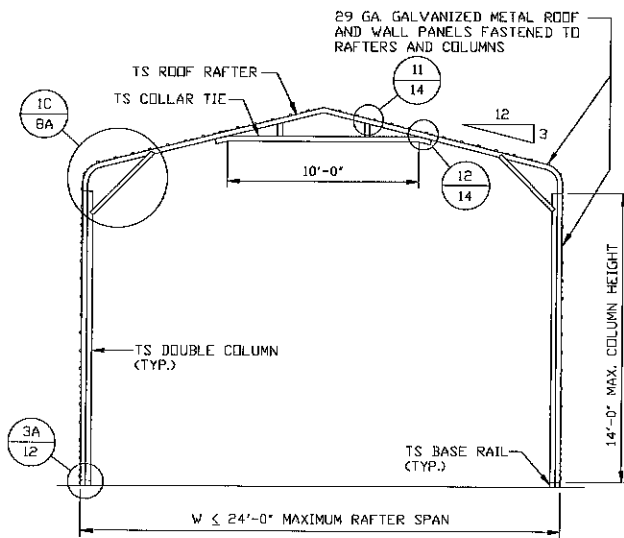
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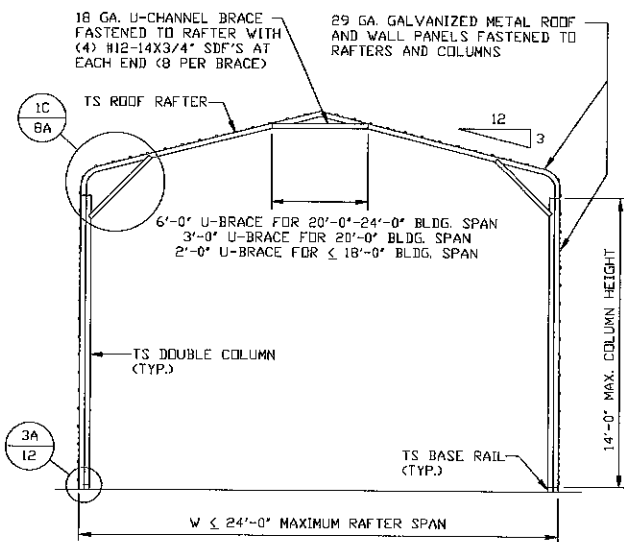
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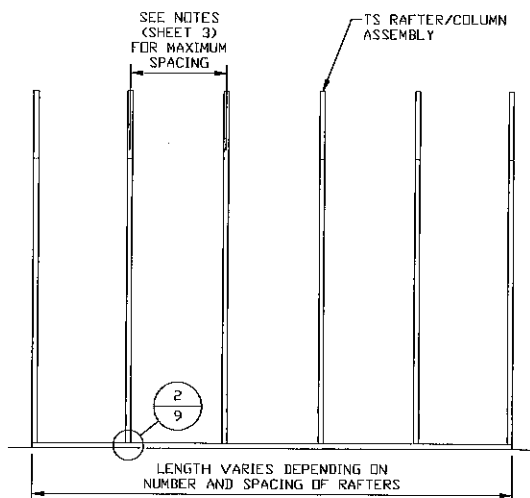
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**TYPICAL RAFTER/COLUMN FRAME SECTION**  
SCALE: NTS



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



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

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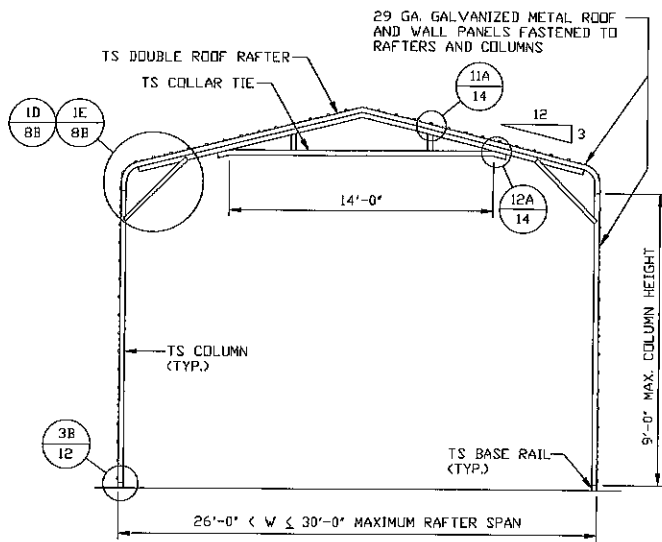
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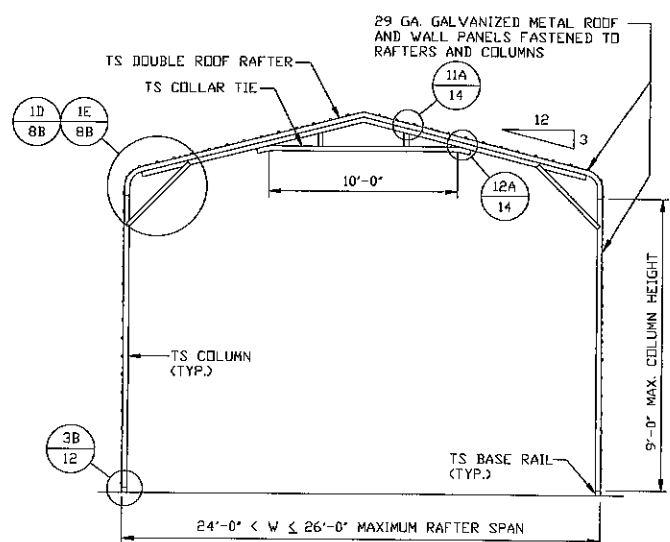
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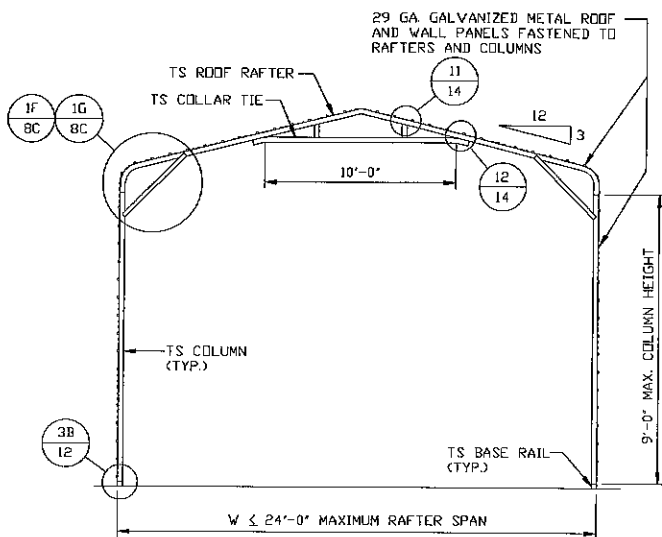
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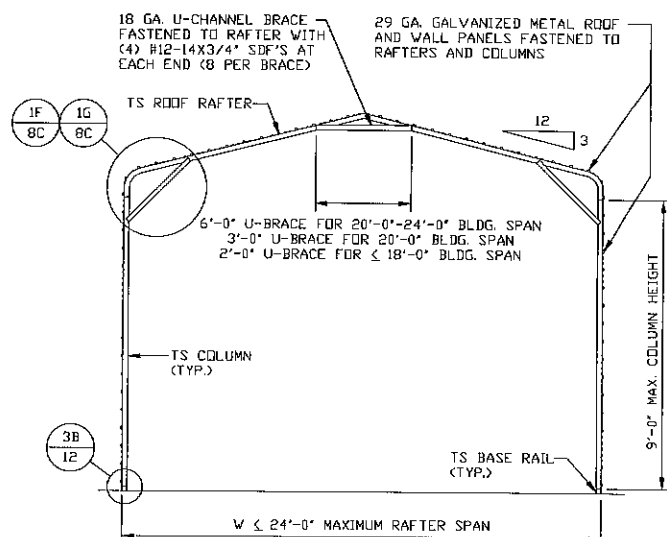
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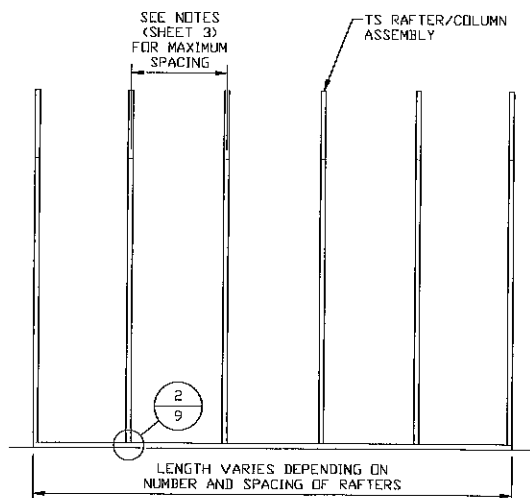
**TYPICAL RAFTER/COLUMN FRAME SECTION**  
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**TYPICAL RAFTER/COLUMN FRAME SECTION**  
SCALE: NTS



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



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

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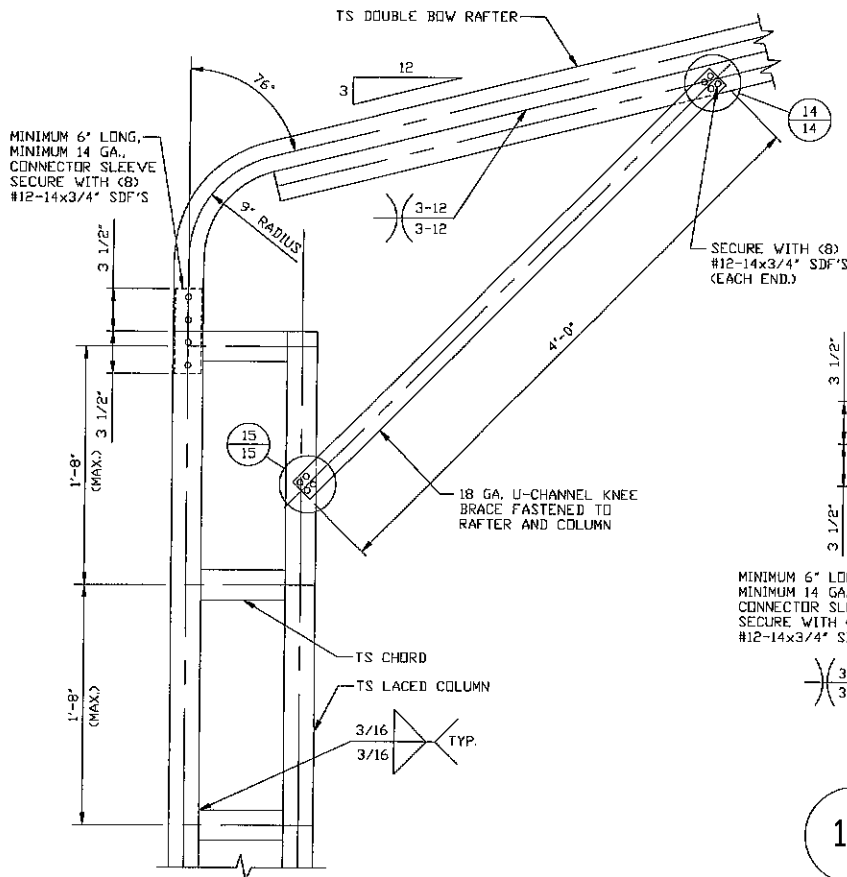
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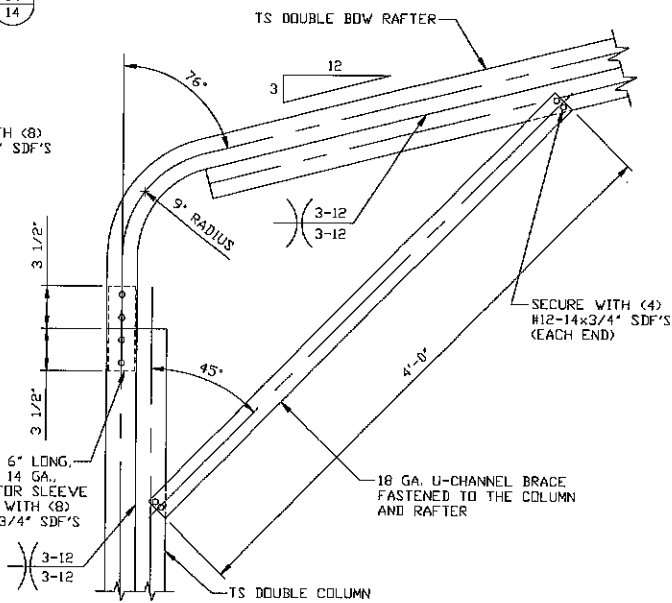
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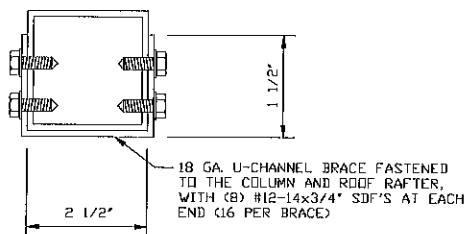




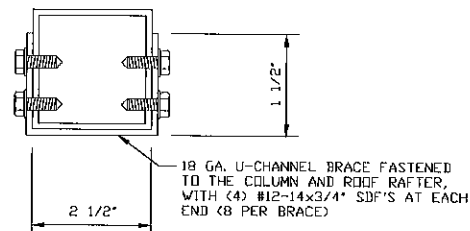
**1** BOW EAVE RAFTER/CORNER COLUMN CONNECTION DETAIL FOR HEIGHTS 14'-0" < TO <= 20'-0" SCALE: NTS



**1A** BOW EAVE RAFTER/CORNER COLUMN CONNECTION DETAIL FOR HEIGHTS 9'-0" < TO <= 14'-0" SCALE: NTS



**BRACE SECTION** SCALE: NTS



**BRACE SECTION** SCALE: NTS

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SCALE: NTS

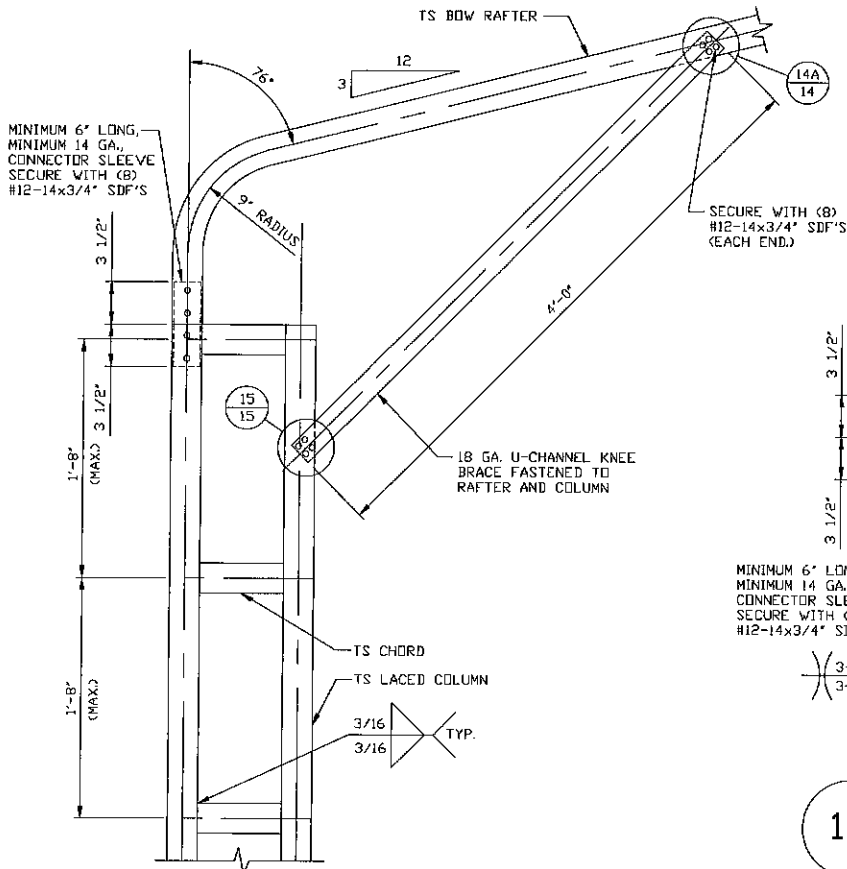
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DWG. NO: SK-3

REV: 0

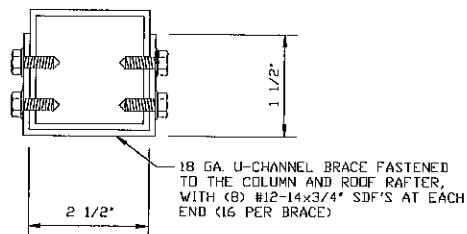
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**BOW EAVE RAFTER/CORNER COLUMN CONNECTION DETAIL FOR HEIGHTS 14'-0" < TO <= 20'-0"**

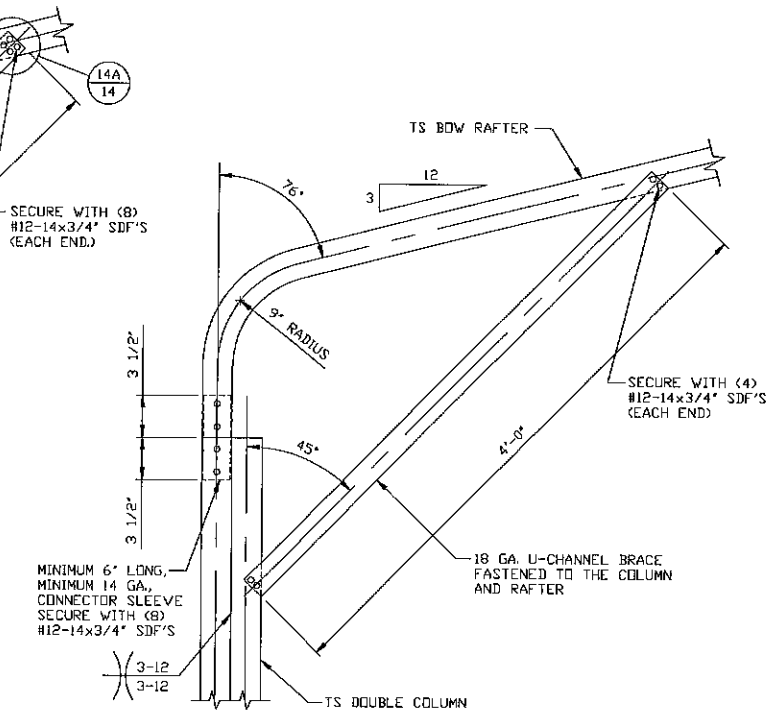
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SCALE: NTS



**BRACE SECTION**

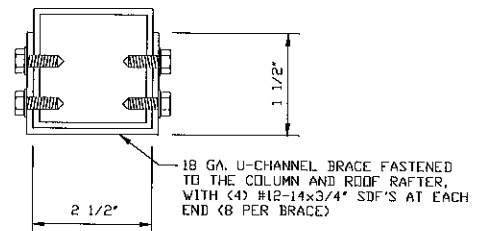
SCALE: NTS



**BOW EAVE RAFTER/CORNER COLUMN CONNECTION DETAIL FOR HEIGHTS 9'-0" < TO <= 14'-0"**

1C

SCALE: NTS



**BRACE SECTION**

SCALE: NTS

**MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.**

DRAWN BY: JG

CHECKED BY: PDH

PROJECT MGR: WSM

CLIENT: FIVE STAR

FIVE STAR METAL STRUCTURES, LLC  
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30'-0"x20'-0" ENCLOSED STRUCTURE

DATE: 1-20-22

SCALE: NTS

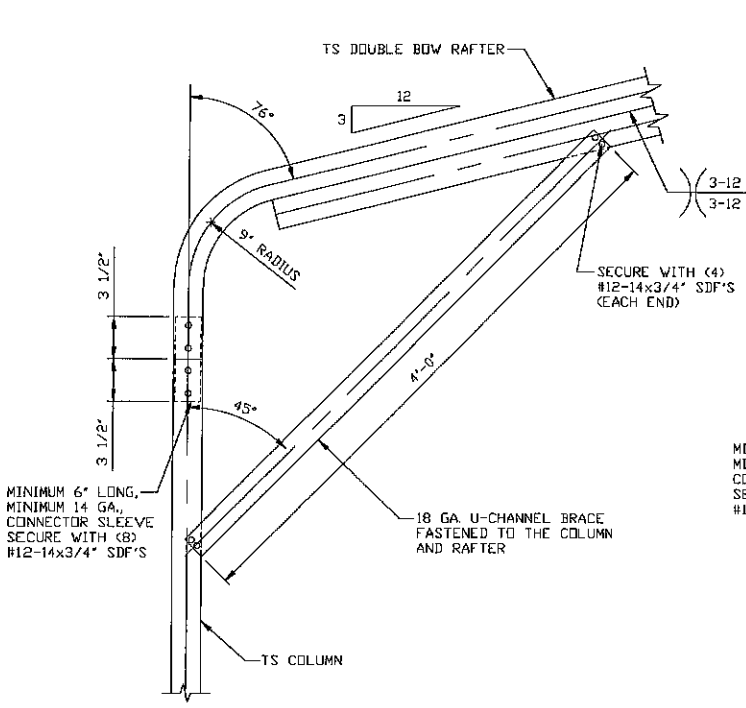
JOB NO: 21263S

SHT. 8A

DWG. NO: SK-3

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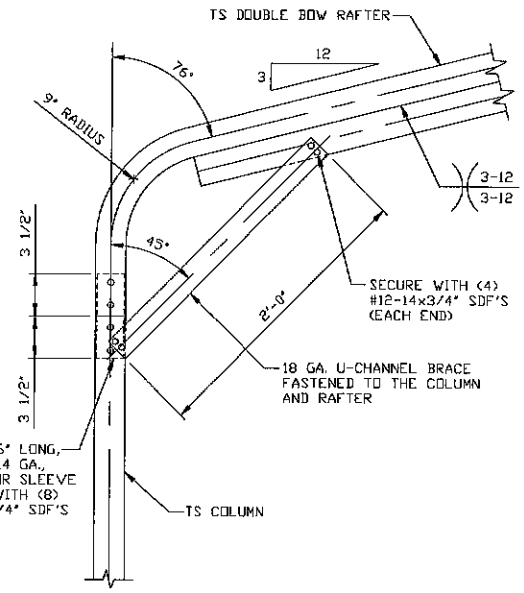


**1D** BOW EAVE RAFTER/CORNER COLUMN CONNECTION DETAIL FOR HEIGHTS 8'-0" < TO <= 9'-0" SCALE: NTS

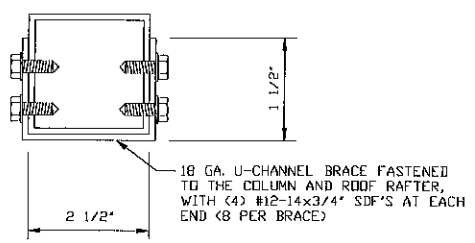
NOTE: MAXIMUM SINGLE TUBE COLUMN HEIGHT IS 8'-0" WHEN A LEAN-TO IS ATTACHED FOR GROUND SNOW > 10 PSF. A 2'-0" LONG KNEE BRACE IS REQUIRED FOR THIS SCENARIO.

NOTE: MAXIMUM SINGLE TUBE COLUMN HEIGHT IS 12'-0" FOR RISK CATEGORY I, WIND EXPOSURE CATEGORY B STRUCTURES WITH WIND SPEEDS < 138 MPH AND GROUND SNOW < 10 PSF.

MAXIMUM SINGLE TUBE COLUMN HEIGHT IS 14'-0" FOR RISK CATEGORY I, WIND EXPOSURE CATEGORY B STRUCTURES WITH WIND SPEEDS < 107 MPH AND GROUND SNOW < 10 PSF.



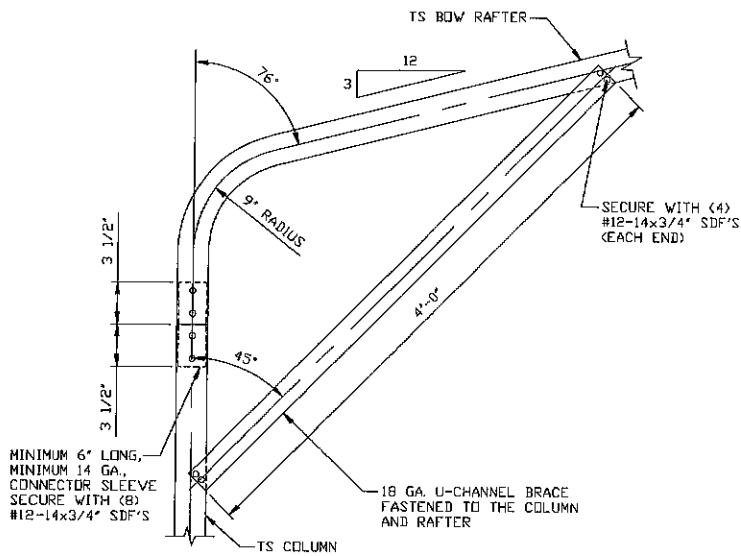
**1E** BOW EAVE RAFTER/CORNER COLUMN CONNECTION DETAIL FOR HEIGHTS <= 8'-0" SCALE: NTS



**BRACE SECTION** SCALE: NTS

<b>MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.</b>	DRAWN BY: JG	<b>FIVE STAR METAL STRUCTURES, LLC</b> P.O. BOX 1186 TOAST, NC 27049 30'-0"x20'-0" ENCLOSED STRUCTURE		
	CHECKED BY: PDH			
PROJECT MGR: WSM	DATE: 1-20-22	SCALE: NTS	JOB NO: 21263S	
CLIENT: FIVE STAR	SHT. 08	DWG. NO: SK-3	REV: 0	

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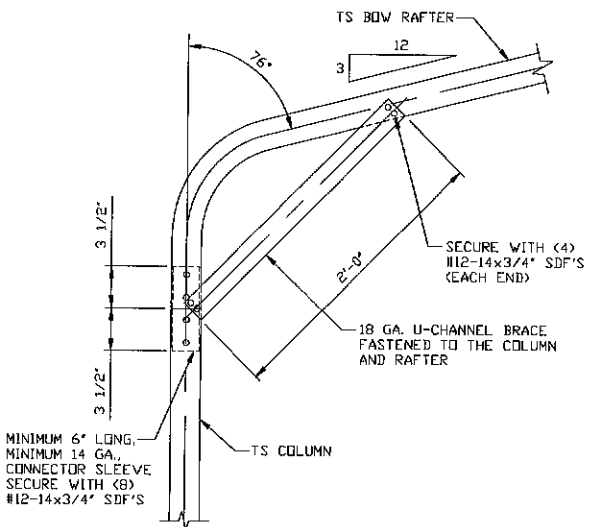
**1F** BOW EAVE RAFTER/CORNER COLUMN CONNECTION DETAIL FOR HEIGHTS 8'-0" < TO < 9'-0"

SCALE: NTS

NOTE: MAXIMUM SINGLE TUBE COLUMN HEIGHT IS 8'-0" WHEN A LEAN-TO IS ATTACHED FOR GROUND SNOW > 10 PSF. A 2'-0" LONG KNEE BRACE IS REQUIRED FOR THIS SCENARIO.

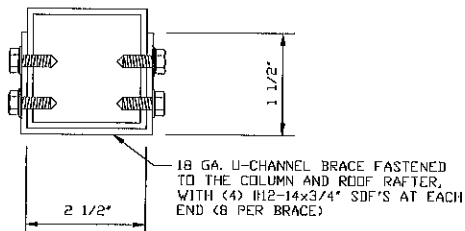
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MAXIMUM SINGLE TUBE COLUMN HEIGHT IS 14'-0" FOR RISK CATEGORY I, WIND EXPOSURE CATEGORY B STRUCTURES WITH WIND SPEEDS < 107 MPH AND GROUND SNOW < 10 PSF.



**1G** BOW EAVE RAFTER/CORNER COLUMN CONNECTION DETAIL FOR HEIGHTS < 8'-0"

SCALE: NTS



**BRACE SECTION**

SCALE: NTS

MOORE AND ASSOCIATES  
ENGINEERING AND CONSULTING, INC.

DRAWN BY: JG

CHECKED BY: PDH

PROJECT MGR: WSM

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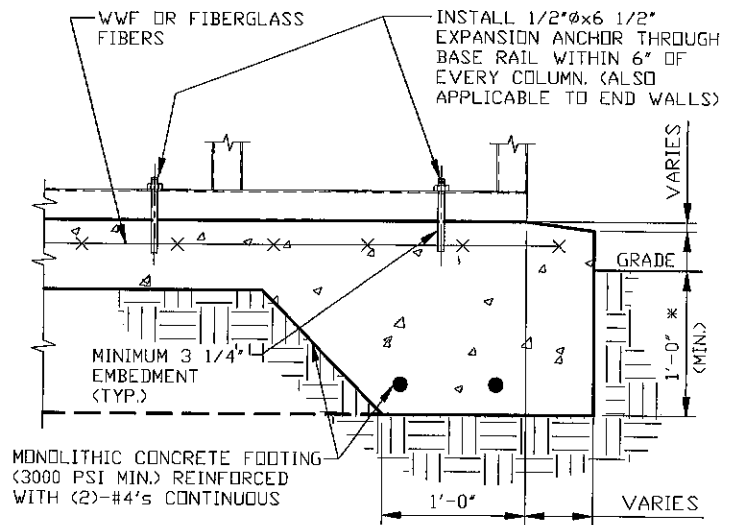
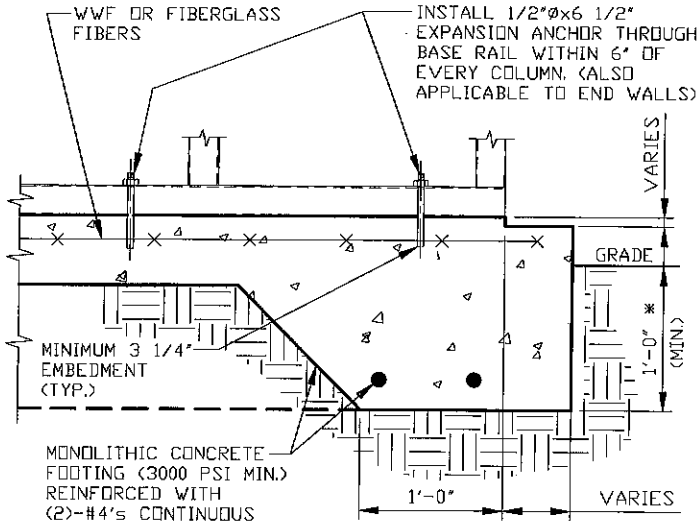
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## BASE RAIL ANCHORAGE OPTIONS



2

### CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE

SCALE: NTS  
 MINIMUM ANCHOR EDGE DISTANCE IS 4".  
 \* COORDINATE WITH LOCAL BUILDING CODE AND/OR D REGARDING MINIMUM FROST DEPTH (LENGTH).

2A

### CONCRETE SLAB BASE RAIL ANCHORAGE

SCALE: NTS  
 MINIMUM ANCHOR EDGE DISTANCE IS 4".  
 \* COORDINATE WITH LOCAL BUILDING CODE AND/OR D REGARDING MINIMUM FROST DEPTH (LENGTH).

## 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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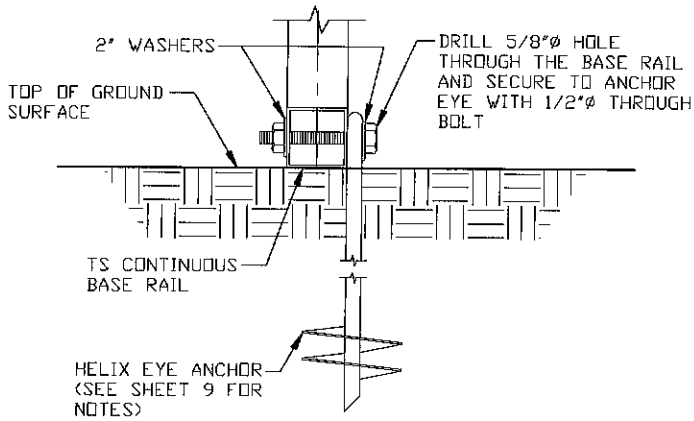
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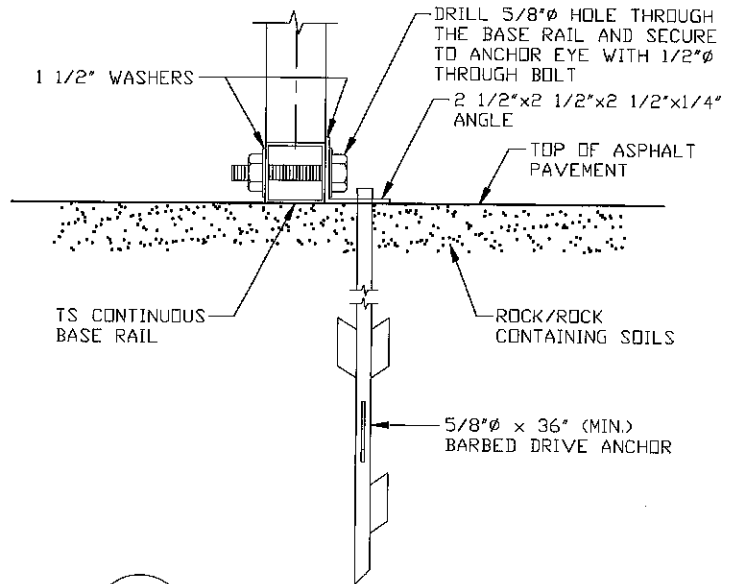
# BASE RAIL ANCHORAGE OPTIONS



**2B**

## GROUND BASE HELIX ANCHORAGE

SCALE: NTS  
 \* COORDINATE WITH LOCAL BUILDING CODE AND/OR D REGARDING MINIMUM FROST DEPTH (LENGTH).



**2C**

## ASPHALT BASE ANCHORAGE

SCALE: NTS  
 \* COORDINATE WITH LOCAL BUILDING CODE AND/OR D REGARDING MINIMUM FROST DEPTH (LENGTH).

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DRAWN BY: JG

CHECKED BY: PDH

PROJECT MGR: WSM

CLIENT: FIVE STAR

FIVE STAR METAL STRUCTURES, LLC  
 P.O. BOX 1186  
 TOAST, NC 27049  
 30'-0" x 20'-0" ENCLOSED STRUCTURE

DATE: 1-20-22

SCALE: NTS

JOB NO: 21263S

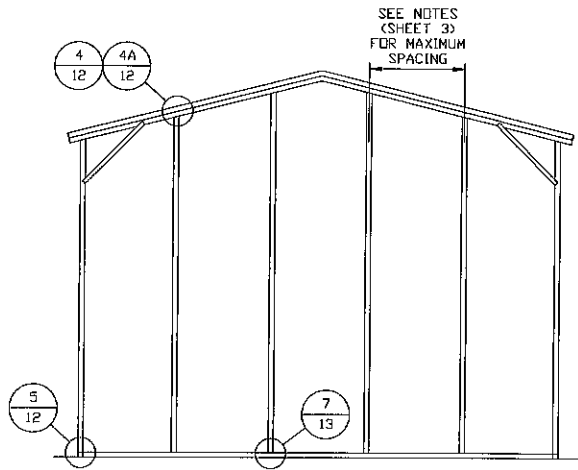
SHT. 9A

DWG. NO: SK-3

REV: 0

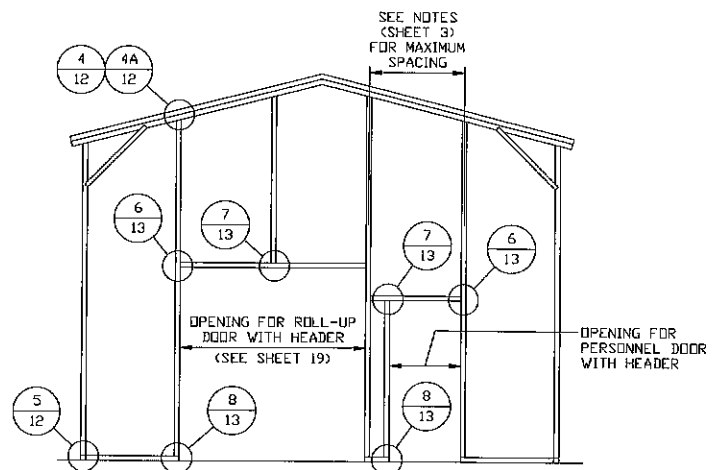
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# BOX EAVE RAFTER END WALL AND SIDE WALL FRAMING SECTIONS



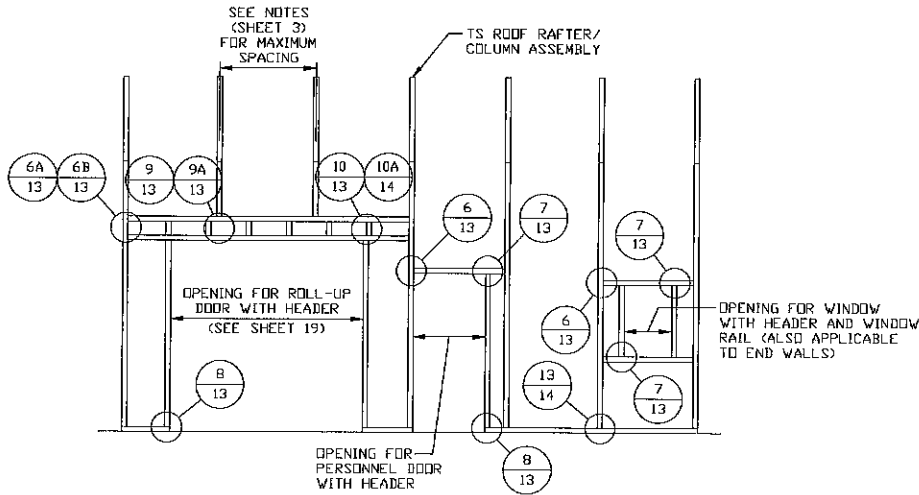
**TYPICAL BOX EAVE RAFTER  
END WALL FRAMING SECTION**

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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**CHECKED BY: PDH**

**PROJECT MGR: WSM**

**CLIENT: FIVE STAR**

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TOAST, NC 27049  
30'-0" x 20'-0" ENCLOSED STRUCTURE

**DATE: 1-20-22**

**SCALE: NTS**

**JOB NO: 21263S**

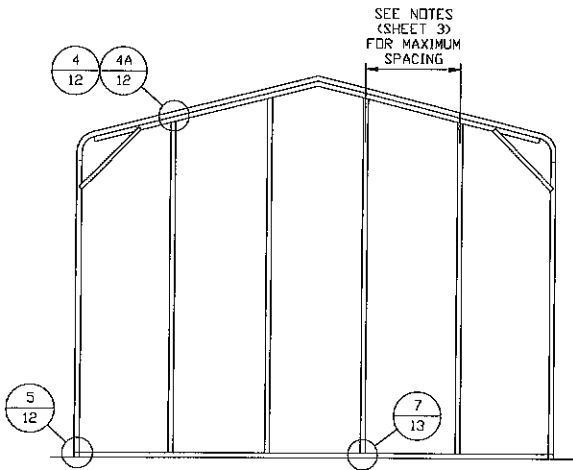
**SHT. 10**

**DWG. NO: SK-3**

**REV: 0**

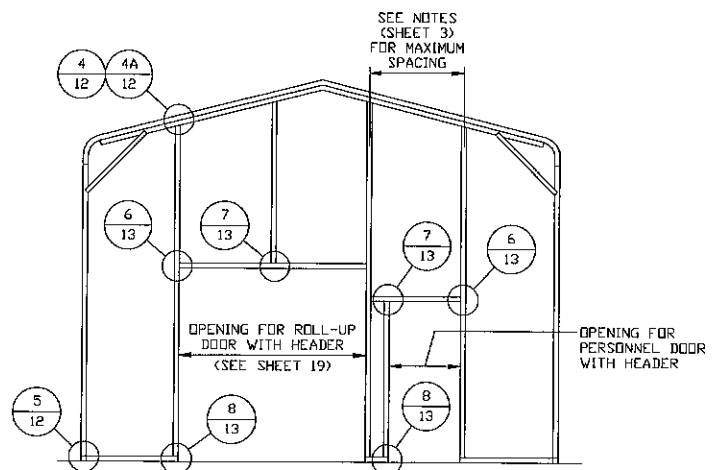
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# BOW EAVE RAFTER END WALL AND SIDE WALL FRAMING SECTIONS



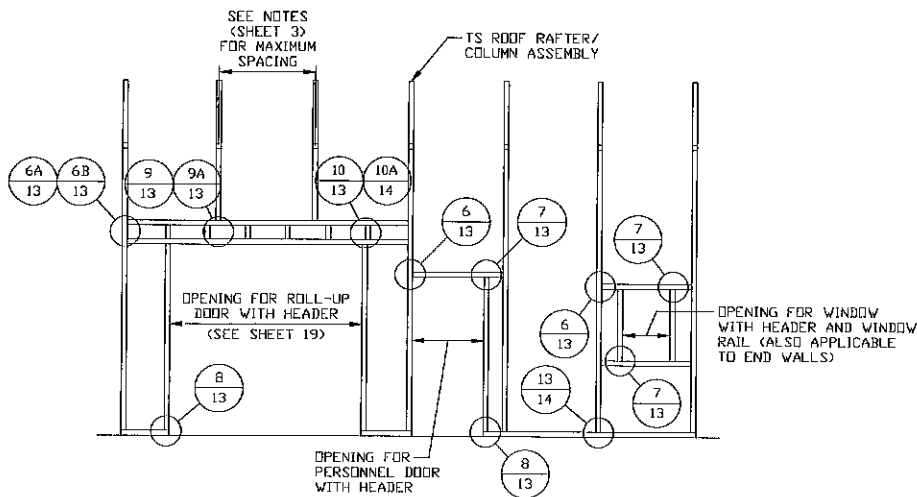
**TYPICAL BOW EAVE RAFTER  
END WALL FRAMING SECTION**

SCALE: NTS



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

SCALE: NTS



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

SCALE: NTS

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**PROJECT MGR: WSM**

**CLIENT: FIVE STAR**

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P.O. BOX 1186  
TOAST, NC 27049  
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**DATE: 1-20-22**

**SCALE: NTS**

**JOB NO: 21263S**

**SHT. 11**

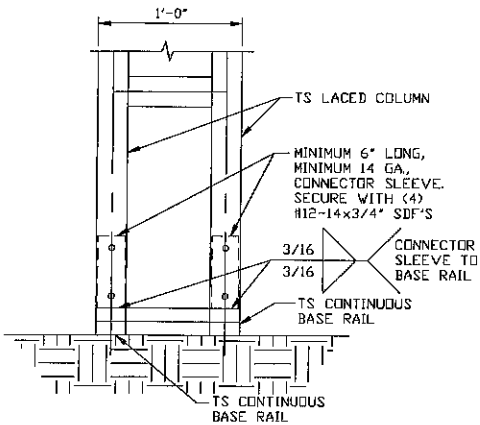
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**REV: 0**

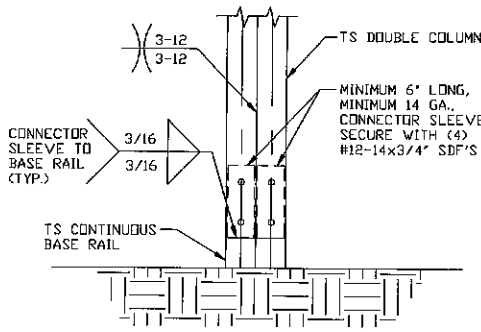
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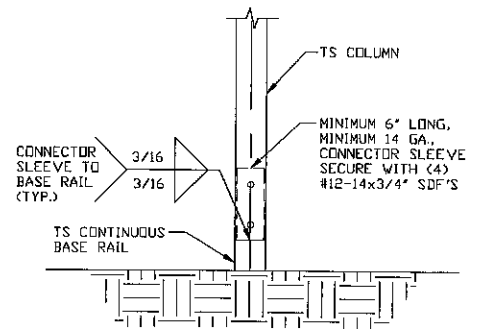
# CONNECTION DETAILS



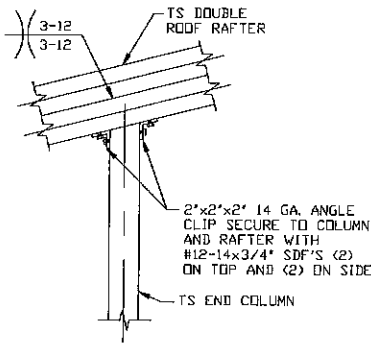
**3** COLUMN/BASE RAIL CONNECTION DETAIL  
SCALE: NTS



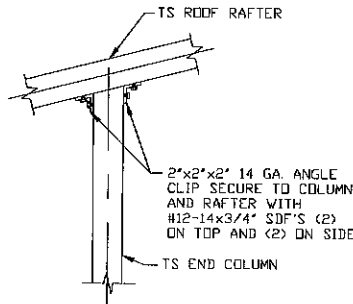
**3A** COLUMN/BASE RAIL CONNECTION DETAIL  
SCALE: NTS



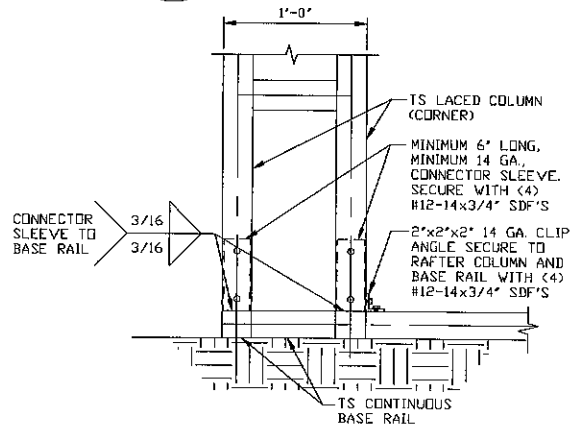
**3B** COLUMN/BASE RAIL CONNECTION DETAIL  
SCALE: NTS



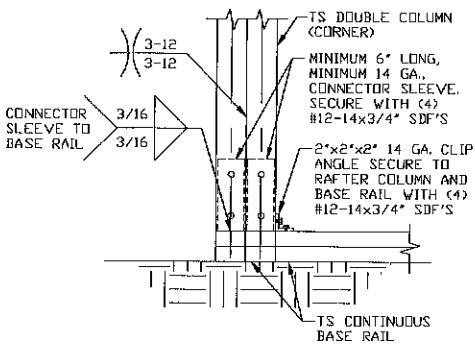
**4** END COLUMN/RAFTER CONNECTION DETAIL  
SCALE: NTS



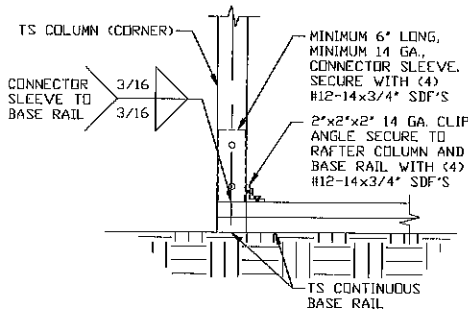
**4A** END COLUMN/RAFTER CONNECTION DETAIL  
SCALE: NTS



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



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



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

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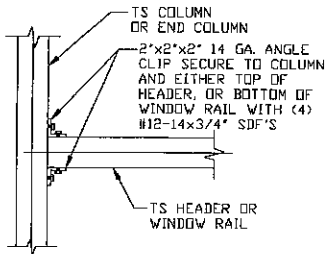
SHT. 12

DWG. NO: SK-3

REV: 0

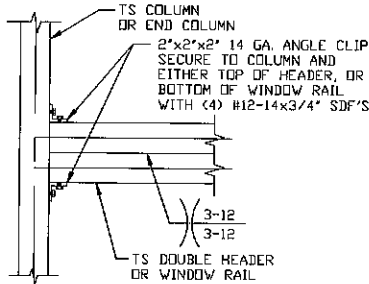
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# CONNECTION DETAILS



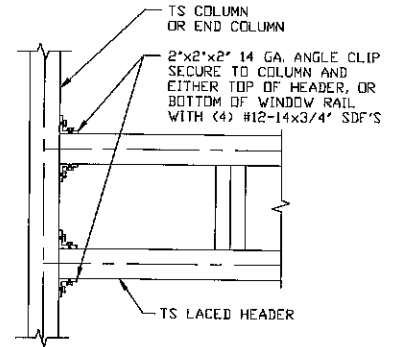
**6** COLUMN OR WINDOW RAIL/WALL GIRT TO COLUMN CONNECTION DETAIL

SCALE: NTS



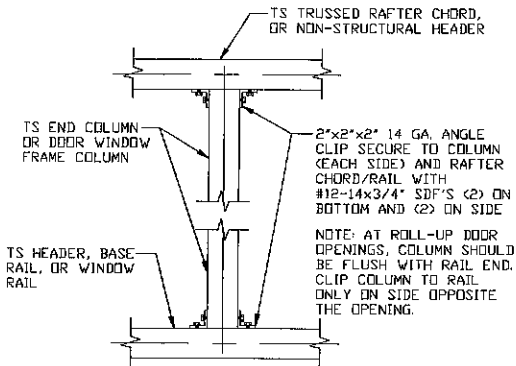
**6A** DOUBLE HEADER TO COLUMN CONNECTION DETAIL

SCALE: NTS



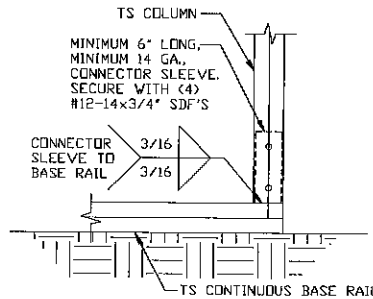
**6B** LACED HEADER TO COLUMN CONNECTION DETAIL

SCALE: NTS



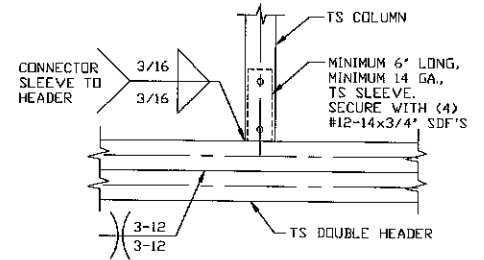
**7** COLUMN TO HEADER, BASE RAIL, OR WINDOW RAIL CONNECTION DETAIL

SCALE: NTS



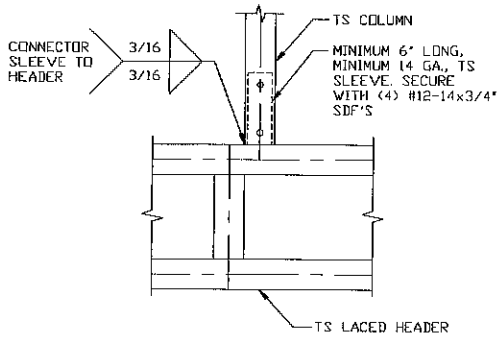
**8** COLUMN/BASE RAIL CONNECTION DETAIL

SCALE: NTS



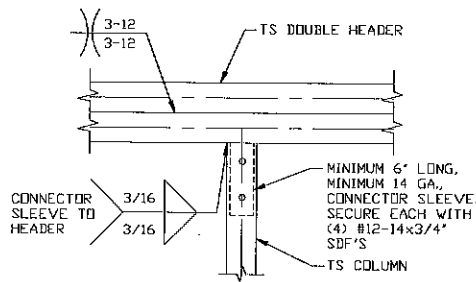
**9** COLUMN/DOUBLE HEADER CONNECTION DETAIL

SCALE: NTS



**9A** COLUMN/LACED HEADER CONNECTION DETAIL

SCALE: NTS



**10** DOUBLE HEADER/COLUMN CONNECTION DETAIL

SCALE: NTS

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CLIENT: FIVE STAR

FIVE STAR METAL STRUCTURES, LLC  
P.O. BOX 1186  
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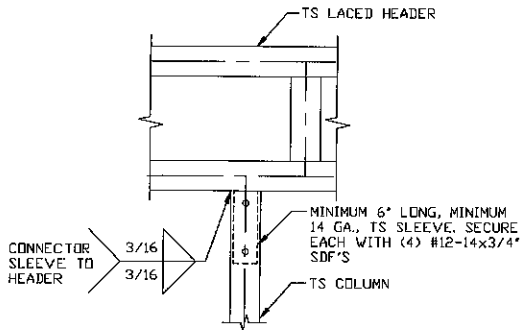
SHT. 13

DWG. NO: SK-3

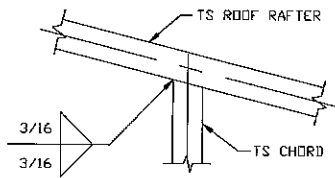
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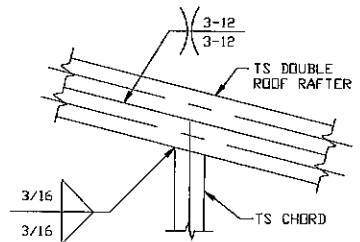
# CONNECTION DETAILS



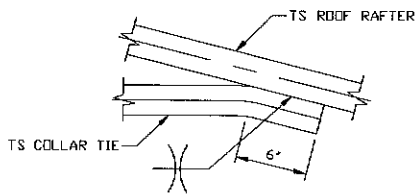
**10A** LACED HEADER/  
COLUMN  
CONNECTION DETAIL  
SCALE: NTS



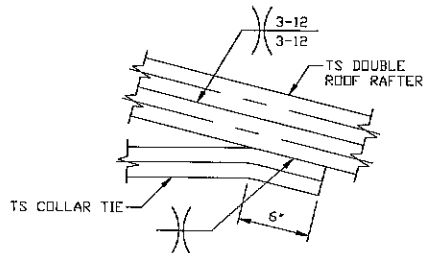
**11** RAFTER TO CHORD  
CONNECTION DETAIL  
SCALE: NTS



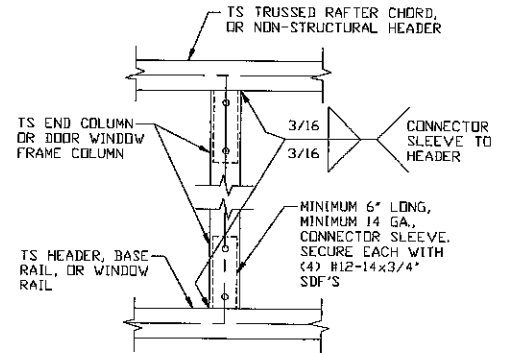
**11A** DOUBLE RAFTER  
TO CHORD  
CONNECTION DETAIL  
SCALE: NTS



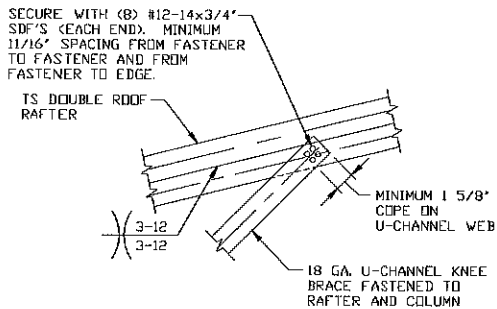
**12** COLLAR TIE  
CONNECTION DETAIL  
SCALE: NTS



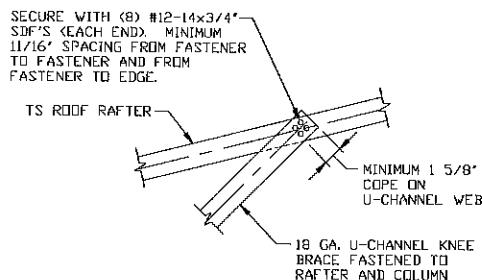
**12A** COLLAR TIE  
CONNECTION DETAIL  
SCALE: NTS



**13** COLUMN TO HEADER  
OR BASE RAIL  
CONNECTION DETAIL  
SCALE: NTS



**14** U-CHANNEL TO RAFTER  
CONNECTION DETAIL  
SCALE: NTS



**14A** U-CHANNEL TO RAFTER  
CONNECTION DETAIL  
SCALE: NTS

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30'-0" x 20'-0" ENCLOSED STRUCTURE

DATE: 1-20-22

SHT. 14

SCALE: NTS

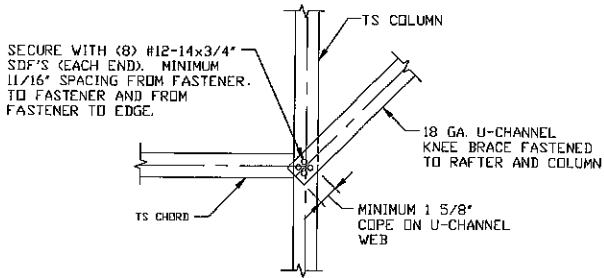
DWG. NO: SK-3

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# CONNECTION DETAILS



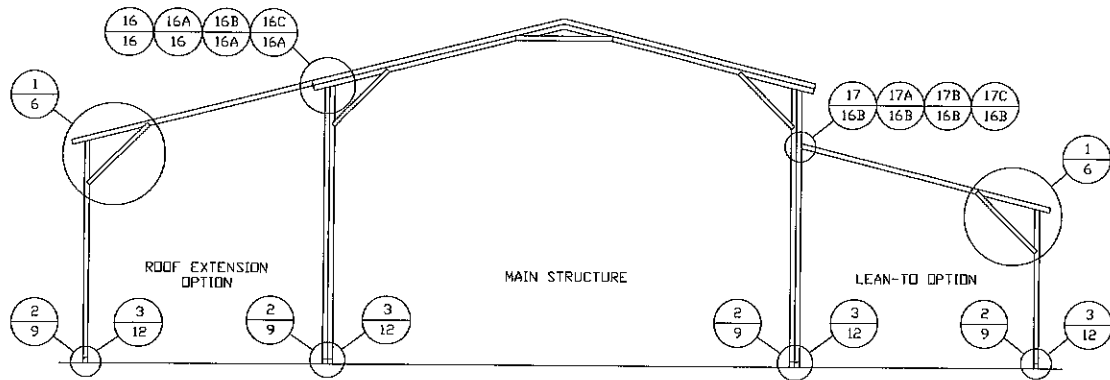
**U-CHANNEL TO COLUMN  
CONNECTION DETAIL**  
SCALE: NTS

15

<b>MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.</b>	DRAWN BY: JG	FIVE STAR METAL STRUCTURES, LLC P.O. BOX 1186 TOAST, NC 27049 30'-0"x20'-0" ENCLOSED STRUCTURE			
	CHECKED BY: PDH	PROJECT MGR: WSM	DATE: 1-20-22	SCALE: NTS	JOB NO: 21263S
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# BOX EAVE RAFTER LEAN-TO OPTIONS

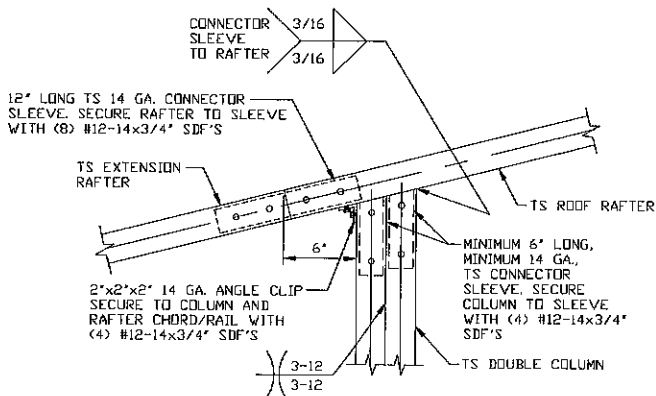
NOTE: DOUBLE TUBE RAFTER SHOWN.  
PLEASE REFER TO SHEETS 5, 5A AND 5B FOR ACTUAL RAFTER SIZE.



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

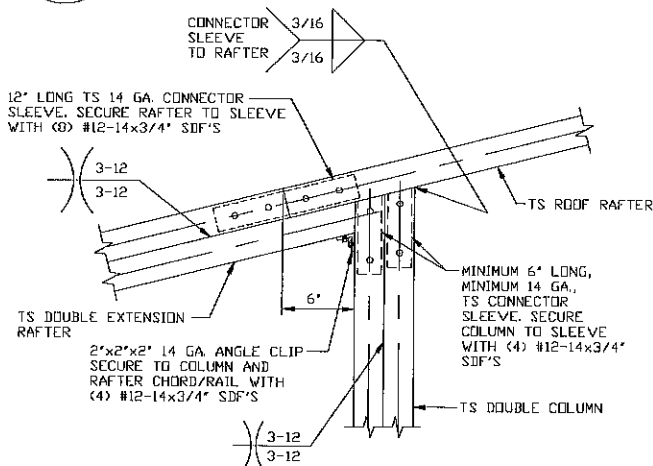
SCALE: NTS

NOTE: REFER TO SHEETS 6, 6A, 6B AND 6C FOR COLUMN HEIGHTS.



**16 SIDE EXTENSION RAFTER/COLUMN  
DETAIL FOR SPANS  $\leq 10'-0''$**

SCALE: NTS



**16A SIDE EXTENSION RAFTER/COLUMN  
DETAIL FOR SPANS  $10'-0'' < TO \leq 12'-0''$**

SCALE: NTS

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PROJECT MGR: WSM

CLIENT: FIVE STAR

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30'-0"x20'-0" ENCLOSED STRUCTURE

DATE: 1-20-22

SHT. 16

SCALE: NTS

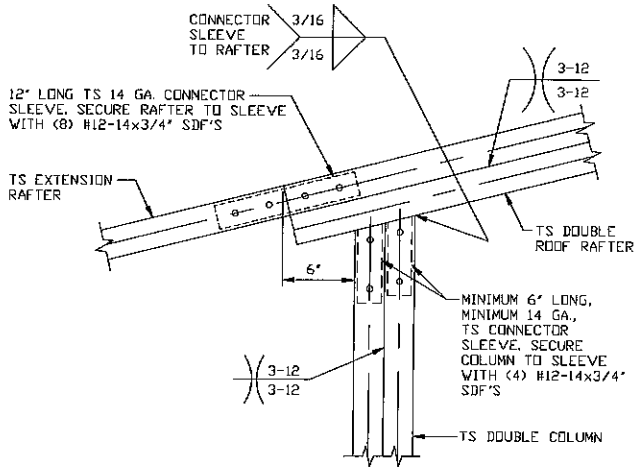
DWG. NO: SK-3

JOB NO: 21263S

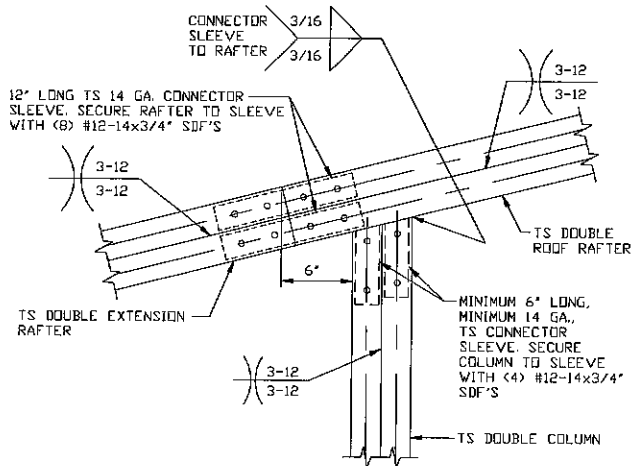
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# BOX EAVE RAFTER LEAN-TO OPTIONS



**16B** SIDE EXTENSION RAFTER/COLUMN  
DETAIL FOR SPANS  $\leq 10'-0"$   
SCALE: NTS



**16C** SIDE EXTENSION RAFTER/COLUMN  
DETAIL FOR SPANS  $10'-0" < TO \leq 12'-0"$   
SCALE: NTS

**MOORE AND ASSOCIATES  
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P.O. BOX 1186  
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30'-0" x 20'-0" ENCLOSED STRUCTURE

CHECKED BY: PDH

PROJECT MGR: WSM

DATE: 1-20-22

SCALE: NTS

JOB NO: 21263S

CLIENT: FIVE STAR

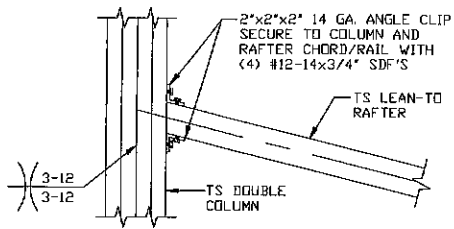
SHT. 16A

DWG. NO: SK-3

REV: 0

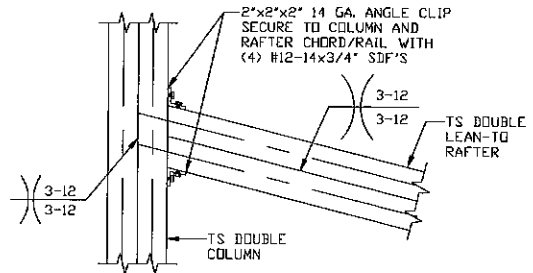
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# BOX EAVE RAFTER LEAN-TO OPTIONS



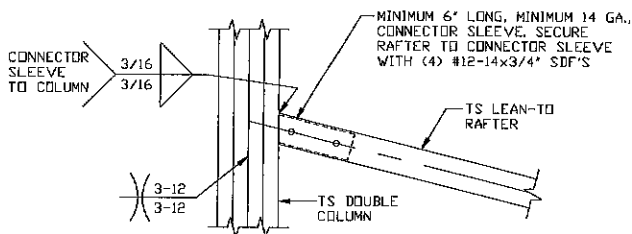
**17** LEAN-TO RAFTER TO RAFTER  
COLUMN CONNECTION DETAIL  
FOR RAFTER SPANS  $\leq 10'-0"$

SCALE: NTS



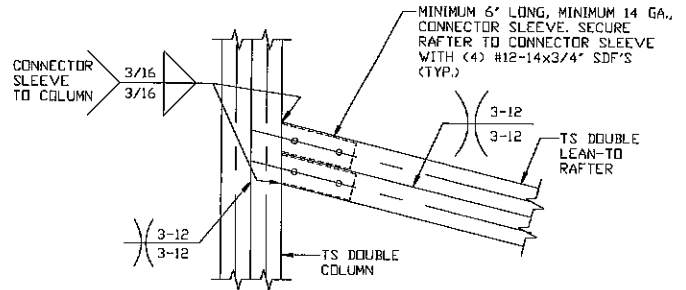
**17A** LEAN-TO RAFTER TO RAFTER  
COLUMN CONNECTION DETAIL FOR  
RAFTER SPANS  $10'-0" < TO \leq 12'-0"$

SCALE: NTS



**17B** LEAN-TO RAFTER TO RAFTER  
COLUMN CONNECTION DETAIL  
FOR RAFTER SPANS  $\leq 10'-0"$

SCALE: NTS



**17C** LEAN-TO RAFTER TO RAFTER  
COLUMN CONNECTION DETAIL FOR  
RAFTER SPANS  $10'-0" < TO \leq 12'-0"$

SCALE: NTS

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SCALE: NTS

JOB NO: 21263S

SHT. 16B

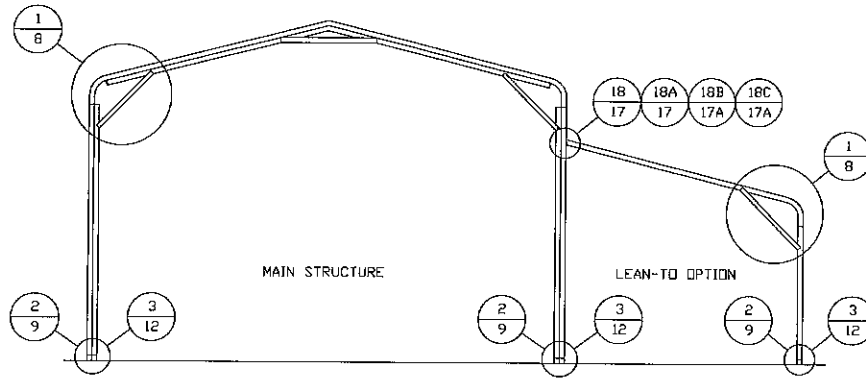
DWG. NO: SK-3

REV: 0

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# BOW EAVE RAFTER LEAN-TO OPTIONS

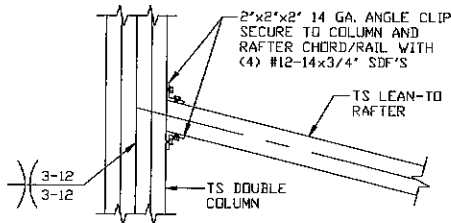
NOTE: DOUBLE TUBE RAFTER SHOWN.  
PLEASE REFER TO SHEETS 7, 7A AND 7B FOR ACTUAL RAFTER SIZE.



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

SCALE: NTS

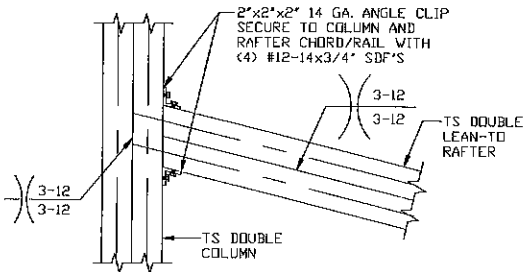
NOTE: REFER TO SHEETS 8, 8A, 8B AND 8C FOR COLUMN HEIGHTS.



### LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR RAFTER SPANS $\leq 10'-0"$

18

SCALE: NTS



### LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR RAFTER SPANS $10'-0" < TO \leq 12'-0"$

18A

SCALE: NTS

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JOB NO: 21263S

SHT. 17

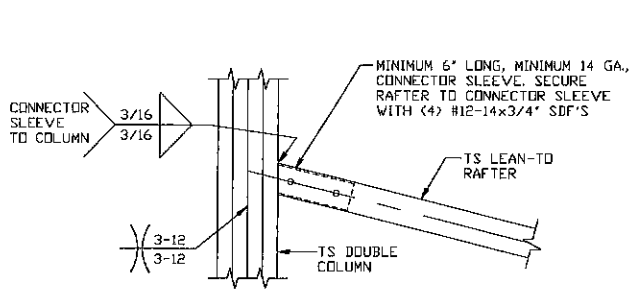
DWG. NO: SK-3

REV: 0

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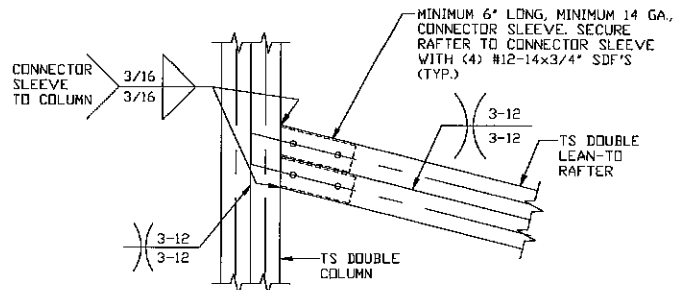
# BOW EAVE RAFTER LEAN-TO OPTIONS



**LEAN-TO RAFTER TO RAFTER  
COLUMN CONNECTION DETAIL  
FOR RAFTER SPANS ≤ 10'-0"**

**18B**

SCALE: NTS



**LEAN-TO RAFTER TO RAFTER  
COLUMN CONNECTION DETAIL FOR  
RAFTER SPANS 10'-0" < TO ≤ 12'-0"**

**18C**

SCALE: NTS

**MOORE AND ASSOCIATES  
ENGINEERING AND CONSULTING, INC.**

DRAWN BY: JG

CHECKED BY: PDH

PROJECT MGR: WSM

CLIENT: FIVE STAR

FIVE STAR METAL STRUCTURES, LLC  
P.O. BOX 1186  
TOAST, NC 27049  
30'-0"x20'-0" ENCLOSED STRUCTURE

DATE: 1-20-22

SHT. 17A

SCALE: NTS

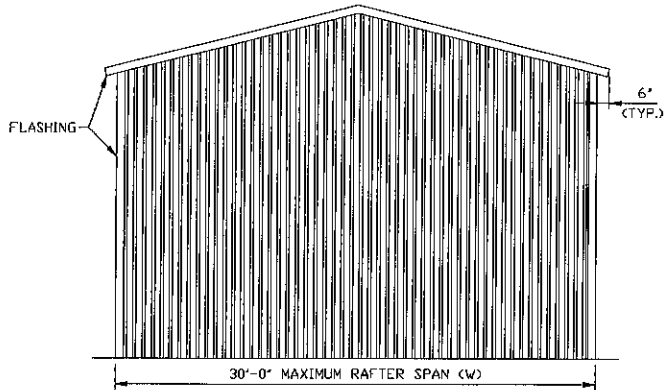
DWG. NO: SK-3

JOB NO: 21263S

REV: 0

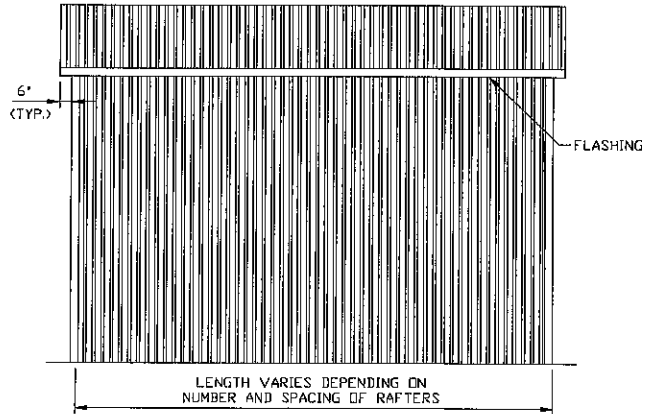
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# BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



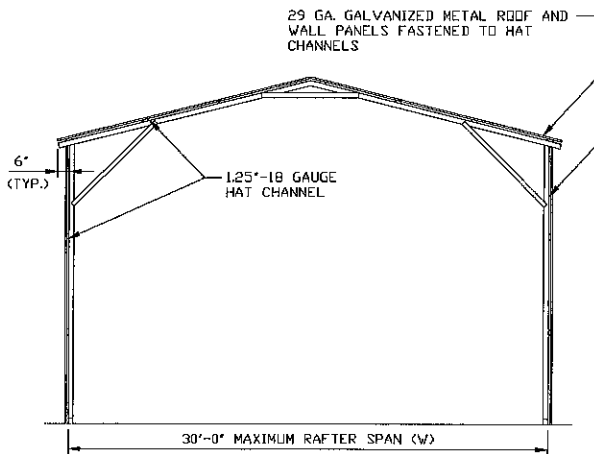
**TYPICAL END ELEVATION  
VERTICAL ROOF/SIDING**

SCALE: NTS



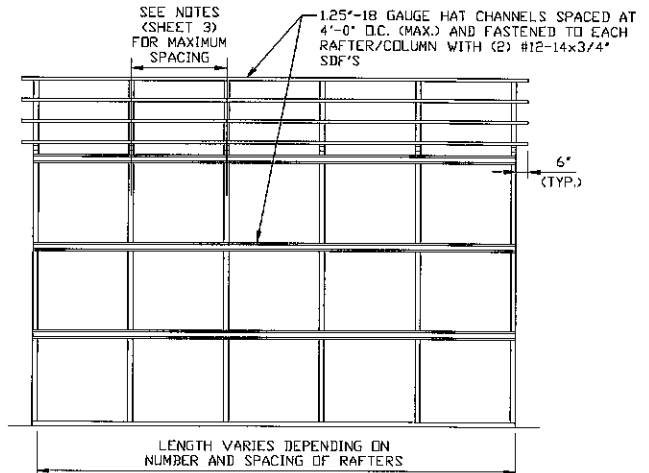
**TYPICAL SIDE ELEVATION  
VERTICAL ROOF/SIDING**

SCALE: NTS



**TYPICAL SECTION VERTICAL  
ROOF/SIDING OPTION**

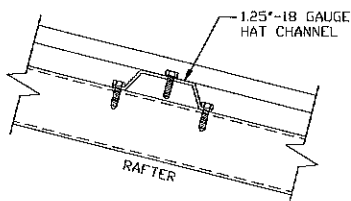
SCALE: NTS



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

SCALE: NTS

NOTE: TUBE STEEL (TS) IS ALLOWED TO BE USED IN LIEU OF HAT CHANNEL FOR ROOF PURLINS AND/OR WALL GIRTS.



**PANEL ATTACHMENT**

(ALTERNATE FOR VERTICAL ROOF PANELS)

SCALE: NTS

**MOORE AND ASSOCIATES  
ENGINEERING AND CONSULTING, INC.**

DRAWN BY: JG

CHECKED BY: PDH

PROJECT MGR: WSM

CLIENT: FIVE STAR

FIVE STAR METAL STRUCTURES, LLC  
P.O. BOX 1186  
TOAST, NC 27049  
30'-0"x20'-0" ENCLOSED STRUCTURE

DATE: 1-20-22

SHT. 18

SCALE: NTS

DWG. NO: SK-3

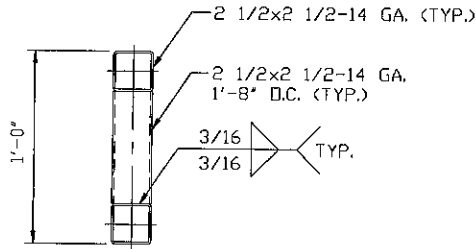
JOB NO: 21263S

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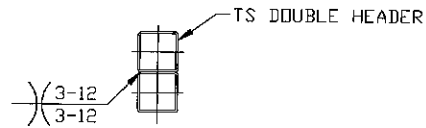
## SIDE WALL HEADER OPTIONS

NOTE: HEADER DESIGN DOES NOT TAKE IN TO ACCOUNT  
ADDITIONAL ROOF LOADING FROM ATTACHED LEAN-TO  
STRUCTURES.



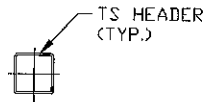
**HEADER DETAIL FOR SIDE  
WALL DOOR OPENINGS  
8'-0" < LENGTH ≤ 14'-0"**

SCALE: NTS



**HEADER DETAIL FOR SIDE  
WALL DOOR OPENINGS  
5'-0" < LENGTH ≤ 8'-0"**

SCALE: NTS

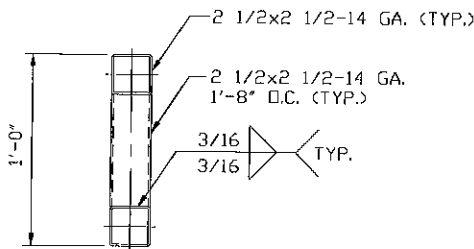


**HEADER DETAIL FOR SIDE  
WALL DOOR OPENINGS ≤ 5'-0"**

SCALE: NTS

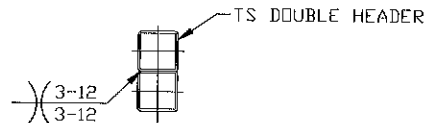
## END WALL HEADER OPTIONS

NOTE: HEADER DESIGN DOES NOT TAKE IN TO ACCOUNT  
ADDITIONAL ROOF LOADING FROM ATTACHED LEAN-TO  
STRUCTURES.



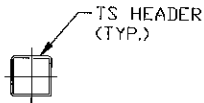
**HEADER DETAIL FOR SIDE  
WALL DOOR OPENINGS  
12'-0" < LENGTH ≤ 14'-0"**

SCALE: NTS



**HEADER DETAIL FOR SIDE  
WALL DOOR OPENINGS  
7'-0" < LENGTH ≤ 12'-0"**

SCALE: NTS



**HEADER DETAIL FOR END  
WALL DOOR OPENINGS ≤ 7'-0"**

SCALE: NTS

**MOORE AND ASSOCIATES  
ENGINEERING AND CONSULTING, INC.**

DRAWN BY: JG

CHECKED BY: PDH

PROJECT MGR: WSM

CLIENT: FIVE STAR

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P.O. BOX 1186  
TOAST, NC 27049  
30'-0"x20'-0" ENCLOSED STRUCTURE

DATE: 1-20-22

SHT. 19

SCALE: NTS

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