



## STRUCTURAL DESIGN

# ENCLOSED BUILDING

**MAXIMUM 32'-0" WIDE X 16'- 0" EAVE HEIGHT-  
BOX EAVE FRAME AND BOW FRAME**

1 October 2021  
Revision 0  
M&A Project No. 21048S

Prepared for:

SteelCraft Structures  
1841 Amity Hill Rd.  
Statesville, NC 28677

Prepared by:

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

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



MOORE AND ASSOCIATES  
ENGINEERING AND CONSULTING

MAY 13 2022




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DRAWN BY: LT

CHECKED BY: PDH

PROJECT MGR: WSM

CLIENT: STEELCRAFT

STEELCRAFT STRUCTURES

1841 AMITY HILL RD.

STATESVILLE, NC 28677

32'-0"x16'-0" ENCLOSED STRUCTURE

DATE: 10-1-21

SCALE: NTS

JOB NO: 21048S

SHT. 1

DWG. NO: SK-3

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## INSTALLATION NOTES AND SPECIFICATIONS

1. DESIGN IS FOR MAXIMUM 32'-0" WIDE x 16'-0" EAVE HEIGHT ENCLOSED STRUCTURES.
2. DESIGN WAS DONE IN ACCORDANCE WITH ALL THE APPLICABLE BUILDING CODES LISTED ON SHEET 3A.
3. DESIGN LOADS ARE AS FOLLOWS:
  - A) DEAD LOAD = 1.5 PSF
  - B) LIVE LOAD = 12 PSF
  - C) GROUND SNOW LOAD = 20 PSF

NOTE: UNBALANCED LOADING DUE TO SNOW DRIFTING FROM AN ADJACENT TALLER STRUCTURE HAS NOT BEEN EVALUATED.
4. 3-SECOND GUST ULTIMATE WIND SPEED ( $V_{ULT}$ ) =  $\leq$  140 MPH (NOMINAL WIND SPEED =  $\leq$  108 MPH).
5. MAXIMUM RAFTER/COLUMN AND END COLUMN SPACING = 5.0 FEET (UNLESS NOTED OTHERWISE).
6. ENDWALL COLUMNS (POSTS) AND SIDE WALL COLUMNS ARE EQUIVALENT IN SIZE AND SPACING (UNLESS NOTED OTHERWISE).
7. RISK CATEGORY I.
8. WIND EXPOSURE CATEGORY B.
9. SPECIFICATIONS APPLICABLE TO 29 GAUGE METAL PANELS FASTENED DIRECTLY TO 2 1/2" x 2 1/2" - 14 GAUGE 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.
10. AVERAGE PANEL SPACING ON-CENTERS = 10 INCHES.
11. FASTENERS CONSIST OF #12-14x3/4" SELF-DRILLING FASTENER (SDF), USE CONTROL SEAL WASHER WITH EXTERIOR FASTENERS. SPECIFICATIONS APPLICABLE ONLY FOR MEAN ROOF HEIGHT OF 16 FEET OR LESS, AND ROOF SLOPES OF 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.
12. ANCHORS SHALL BE INSTALLED THROUGH BASE RAIL AT OR WITHIN 6' OF EVERY COLUMN.
13. STANDARD GROUND ANCHORS (SOIL NAILS) CONSIST OF #4 REBAR W/ WELDED NUT x 30" LONG AND MAY ONLY BE USED IN SUITABLE SOILS. OPTIONAL ANCHORAGE MAY BE USED IN SUITABLE SOILS AND MUST BE USED IN UNSUITABLE SOILS AS NOTED. COORDINATE WITH LOCAL CODES/ORDINANCES REGARDING MINIMUM LENGTH FOR FROST DEPTH PROTECTION.
14. WIND FORCES GOVERN OVER SEISMIC FORCES. SEISMIC PARAMETERS ANALYZED ARE:
  - SOIL SITE CLASS = D
  - RISK CATEGORY I
  - R = 3.25                       $I_E = 1.0$
  - $S_{DS} = 2.039 g$                $V = C_S W$
  - $S_{D1} = 1.258 g$
15. 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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## LIST OF APPLICABLE BUILDING CODES

2018 INTERNATIONAL BUILDING CODE (IBC 2018)

2015 INTERNATIONAL BUILDING CODE (IBC 2015)

2012 INTERNATIONAL BUILDING CODE (IBC 2012)

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

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

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

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

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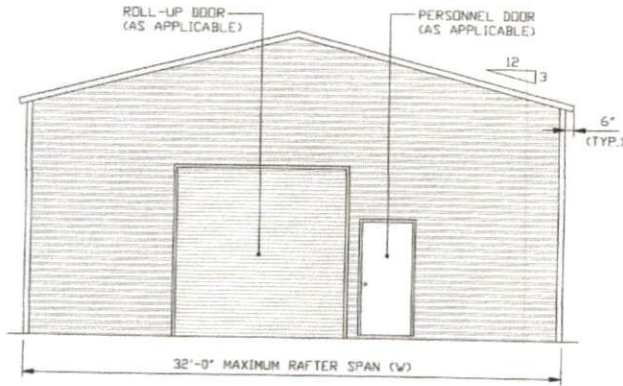
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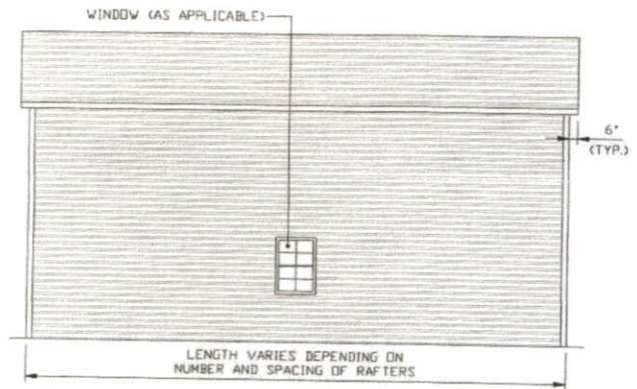
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### BOX EAVE FRAME RAFTER STRUCTURE



**TYPICAL END ELEVATION**

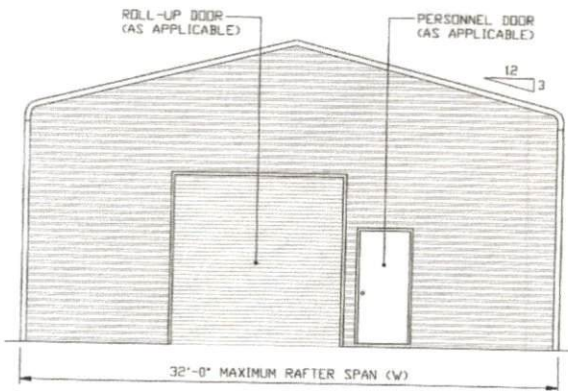
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**TYPICAL SIDE ELEVATION**

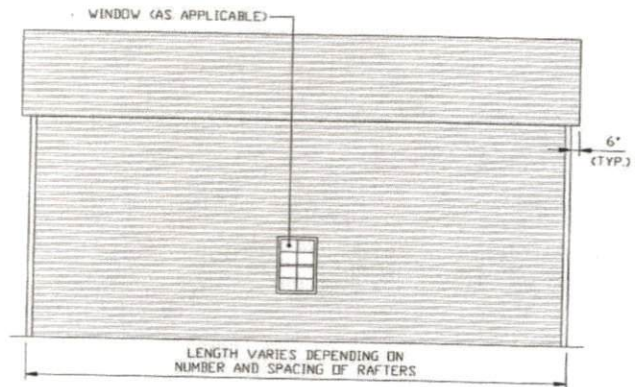
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### BOW EAVE FRAME RAFTER STRUCTURE



**TYPICAL END ELEVATION**

SCALE: NTS



**TYPICAL SIDE ELEVATION**

SCALE: NTS

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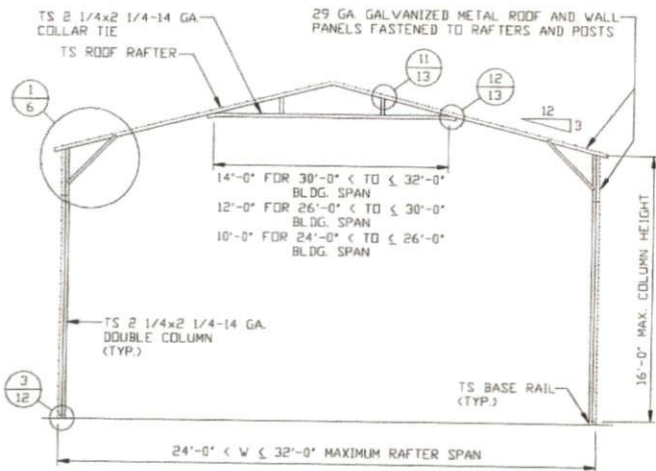
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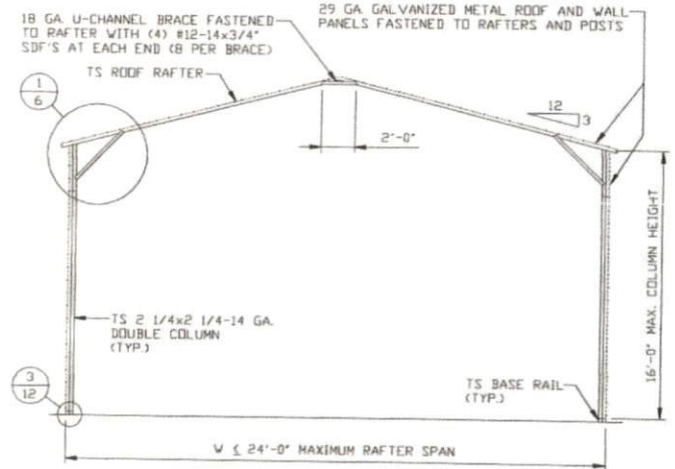
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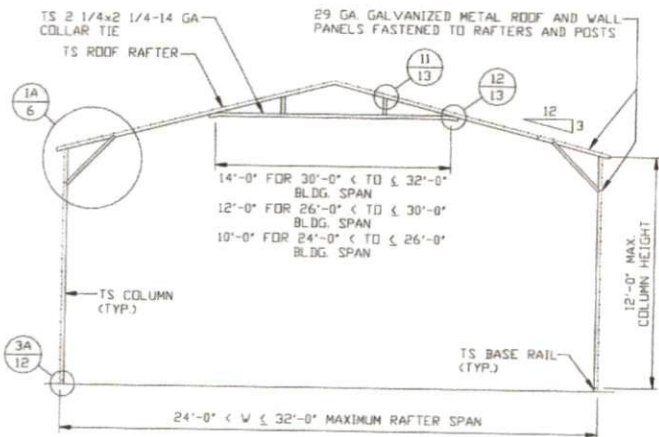
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SCALE: NTS



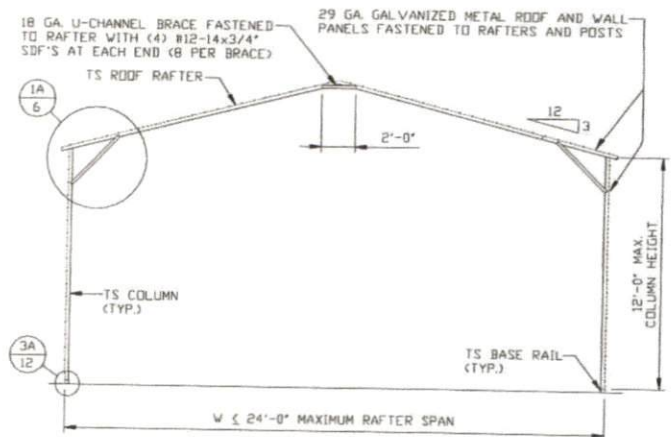
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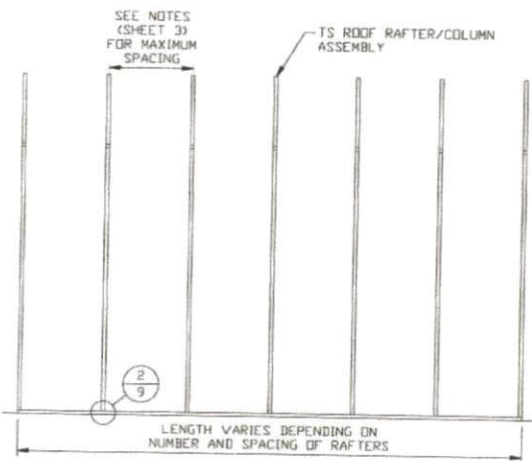
**TYPICAL RAFTER/COLUMN FRAME SECTION**

SCALE: NTS



**TYPICAL RAFTER/COLUMN FRAME SECTION**

SCALE: NTS



**TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION**

SCALE: NTS

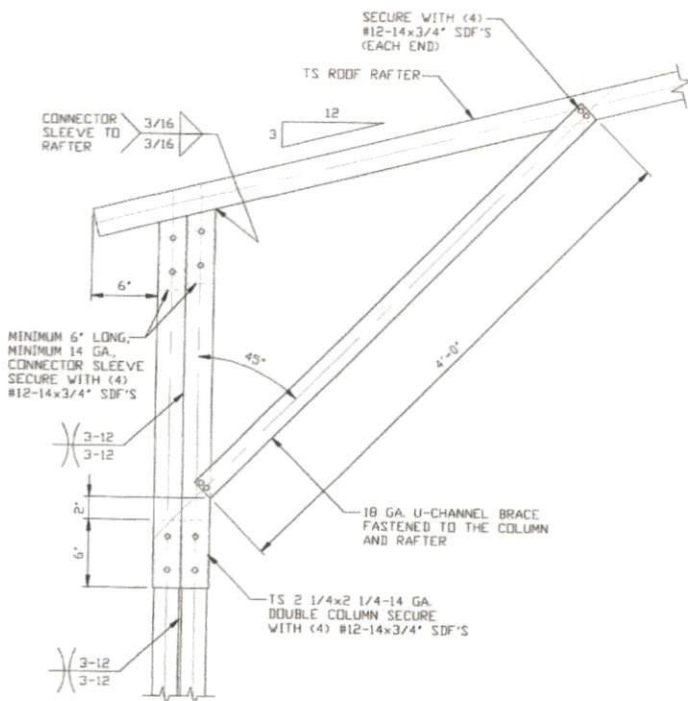
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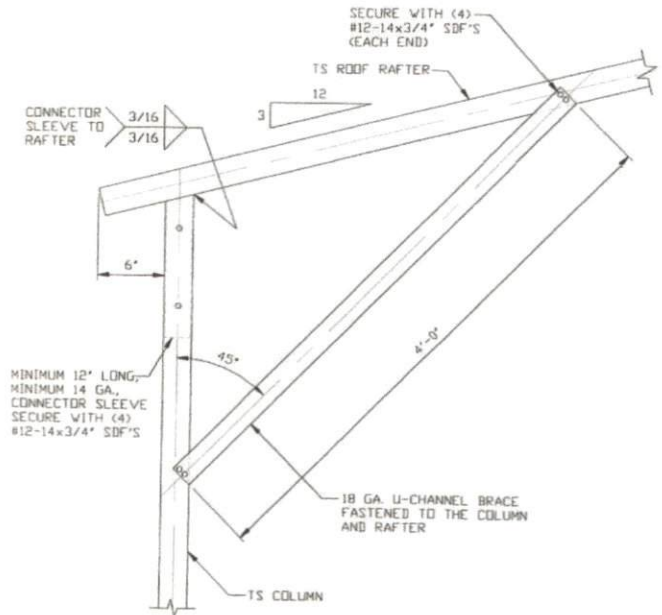
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<b>PROJECT MGR:</b> WSM	<b>DATE:</b> 10-1-21	<b>SCALE:</b> NTS	<b>JOB NO:</b> 21048S
<b>CLIENT:</b> STEELCRAFT	<b>SHT.</b> 5	<b>DWG. NO:</b> SK-3	<b>REV:</b> 0

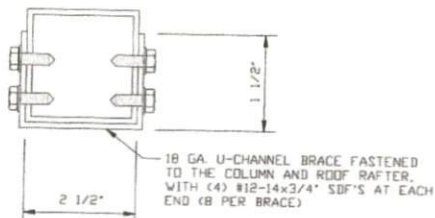
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**1** BOX EAVE RAFTER/CORNER COLUMN CONNECTION DETAIL FOR HEIGHTS 12'-0" < TO ≤ 16'-0" SCALE: NTS



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



**BRACE SECTION** SCALE: NTS

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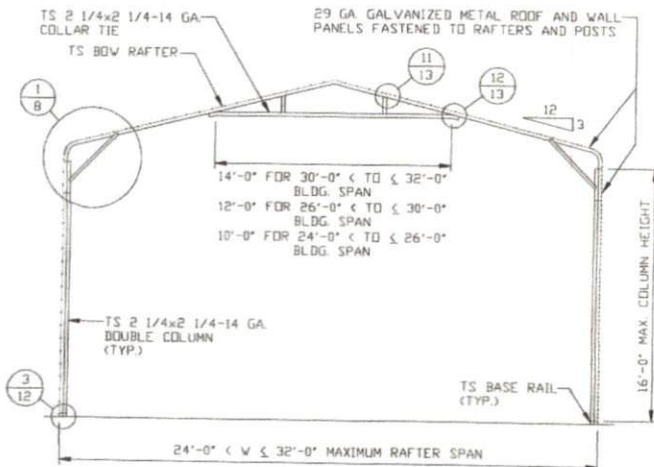


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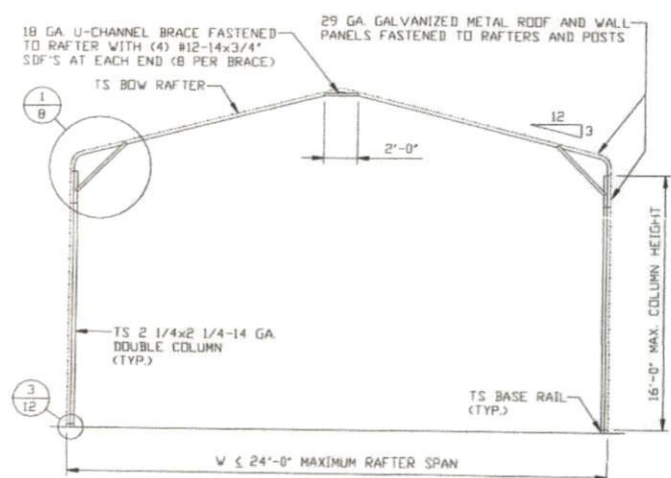
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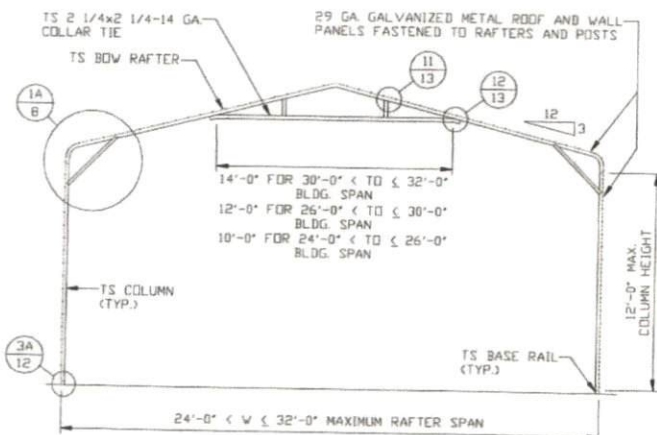




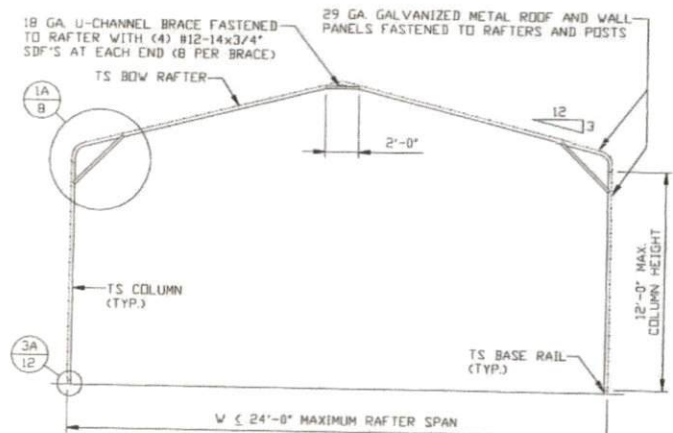
**TYPICAL RAFTER/COLUMN FRAME SECTION**  
SCALE: NTS



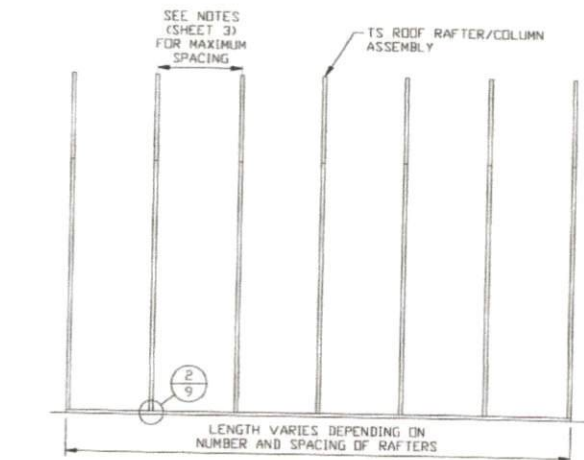
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**TYPICAL RAFTER/COLUMN FRAME SECTION**  
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**TYPICAL RAFTER/COLUMN FRAME SECTION**  
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**TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION**  
SCALE: NTS

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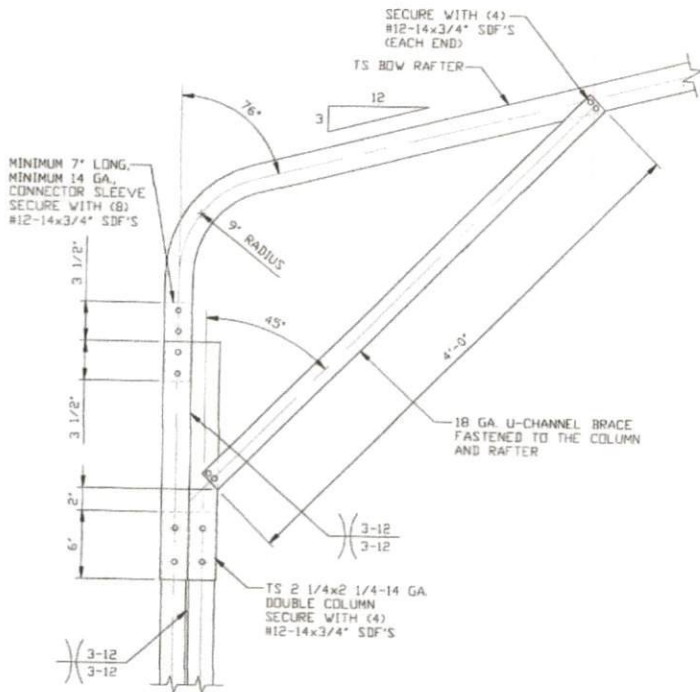
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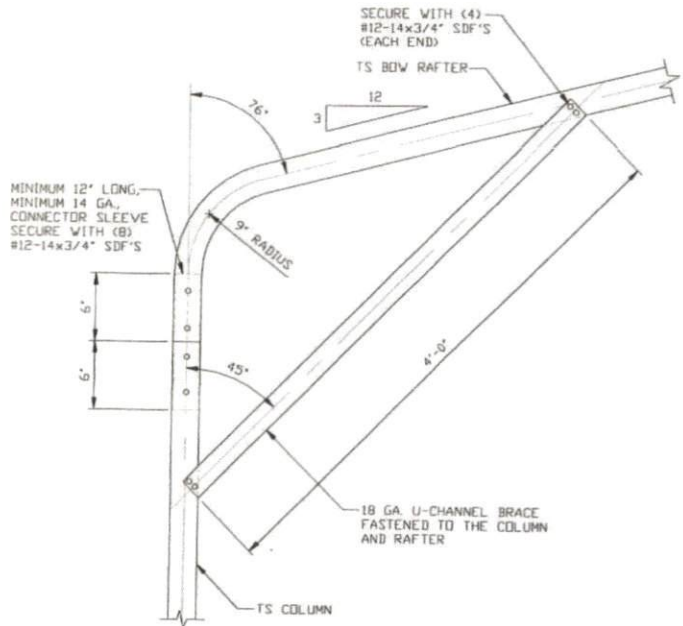
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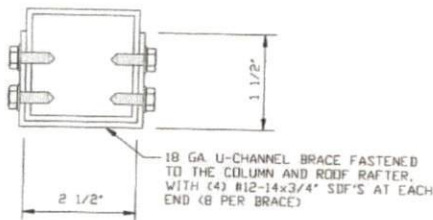
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**1** BOW EAVE RAFTER/CORNER COLUMN CONNECTION DETAIL FOR HEIGHTS 12'-0" < TO <= 16'-0" SCALE: NTS



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



**BRACE SECTION** SCALE: NTS

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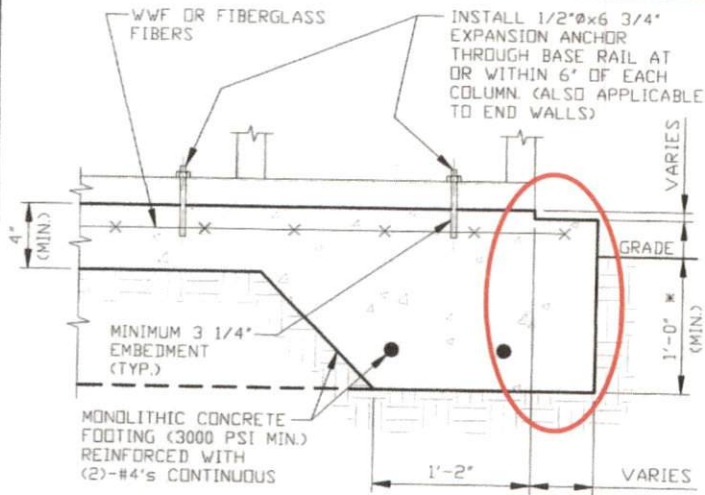
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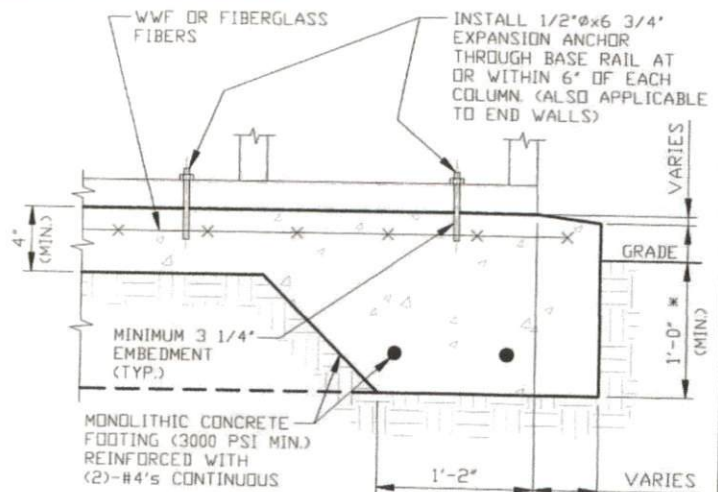
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## BASE RAIL ANCHORAGE OPTIONS



**2 CONCRETE MONOLITHIC SLAB  
BASE RAIL ANCHORAGE**

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



**2A CONCRETE SLAB BASE  
RAIL ANCHORAGE**

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

### GENERAL NOTES

NOTE: CONCRETE MONOLITHIC SLAB DESIGN BASED ON MINIMUM SOIL BEARING CAPACITY OF 1,500 PSF.

#### CONCRETE:

CONCRETE SHALL HAVE A MINIMUM SPECIFIED COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS.

#### COVER OVER REINFORCING STEEL:

FOR FOUNDATIONS, MINIMUM CONCRETE COVER OVER REINFORCING BARS SHALL BE PER ACI-318.  
3" IN FOUNDATIONS WHERE THE CONCRETE IS CAST AGAINST AND PERMANENTLY IN CONTACT WITH THE EARTH OR EXPOSED TO THE EARTH OR WEATHER, AND 1 1/2" ELSEWHERE.

#### REINFORCING STEEL:

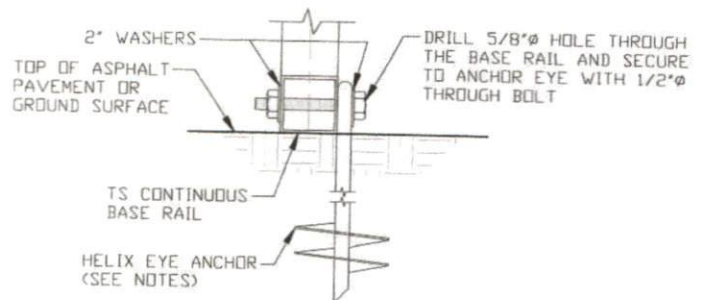
THE TURNDOWN REINFORCING STEEL SHALL BE ASTM A615 GRADE 60. THE SLAB REINFORCEMENT SHALL BE WELDED WIRE FABRIC MEETING ASTM A185 OR FIBERGLASS FIBER REINFORCEMENT.

#### REINFORCEMENT MAY BE BENT IN THE SHOP OR THE FIELD PROVIDED:

1. REINFORCEMENT IS BENT COLD.
2. THE DIAMETER OF THE BEND, MEASURED ON THE INSIDE OF THE BAR, IS NOT LESS THAN SIX-BAR 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.



**2B GROUND BASE  
HELIX ANCHORAGE**

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

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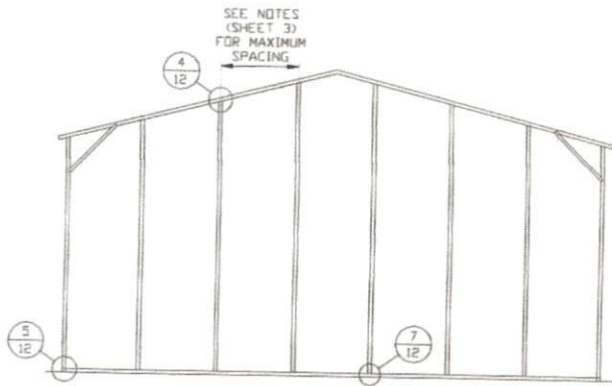
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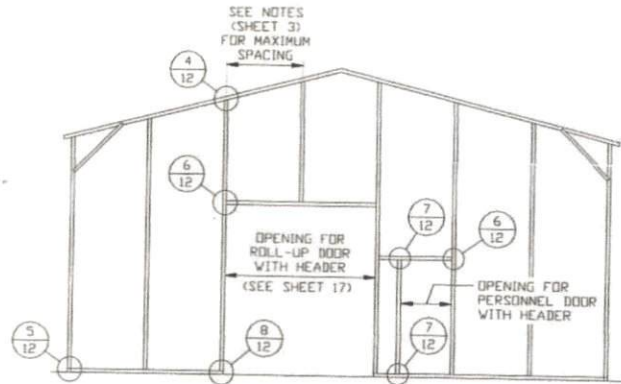
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# BOX EAVE RAFTER END WALL AND SIDE WALL FRAMING SECTIONS



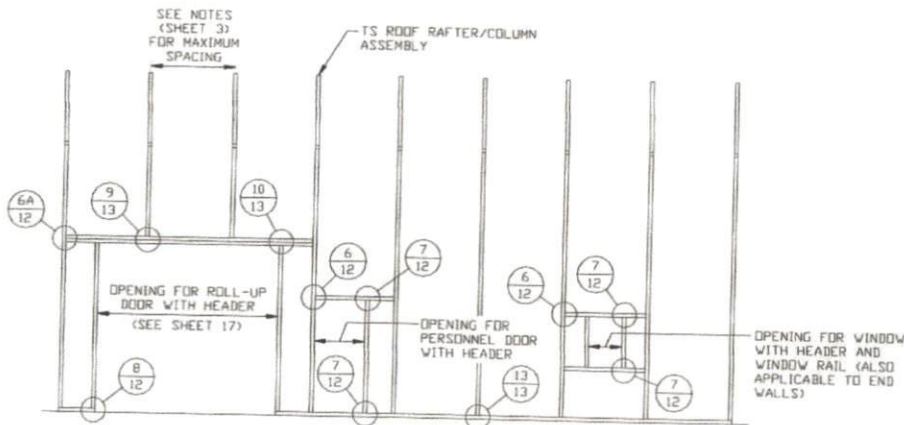
**TYPICAL BOX EAVE RAFTER  
END WALL FRAMING SECTION**

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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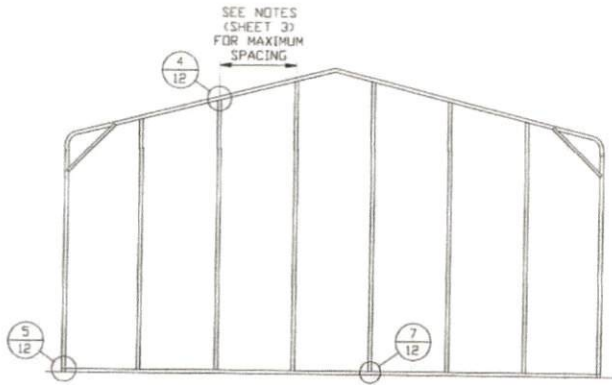
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DWG. NO: SK-3

REV: 0

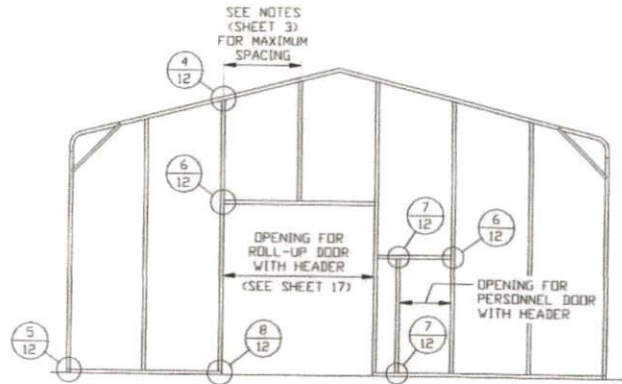
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# BOW EAVE RAFTER END WALL AND SIDE WALL FRAMING SECTIONS



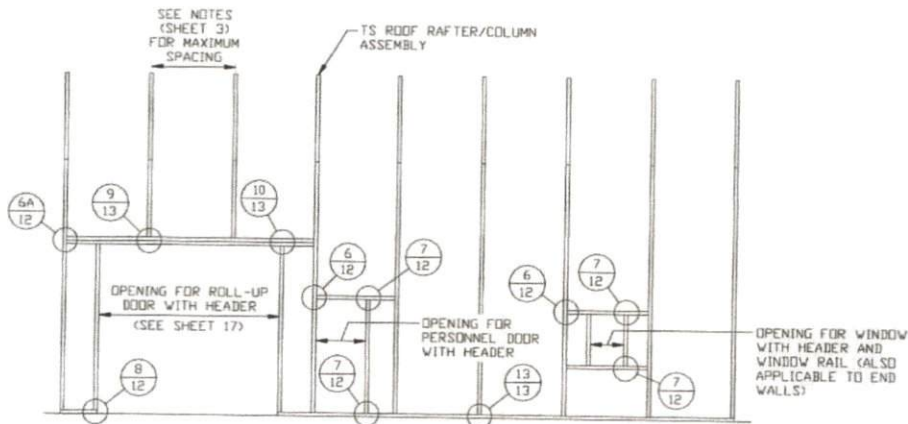
**TYPICAL BOW EAVE RAFTER  
END WALL FRAMING SECTION**

SCALE: NTS



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

SCALE: NTS



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

SCALE: NTS

MAY 13 2022



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

**DRAWN BY: LT**

**CHECKED BY: PDH**

**PROJECT MGR: WSM**

**CLIENT: STEELCRAFT**

**STEELCRAFT STRUCTURES**

1841 AMITY HILL RD.

STATESVILLE, NC 28677

32'-0" x 16'-0" ENCLOSED STRUCTURE

**DATE: 10-1-21**

**SCALE: NTS**

**JOB NO: 21048S**

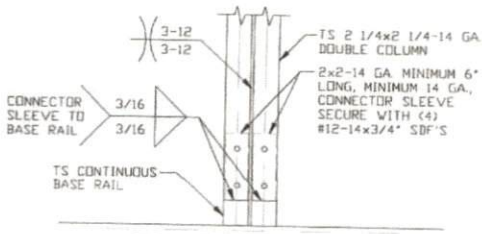
**SHT. 11**

**DWG. NO: SK-3**

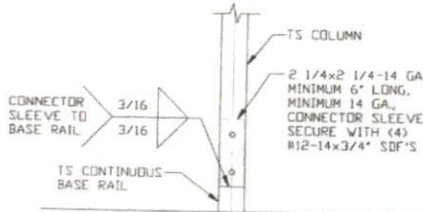
**REV: 0**

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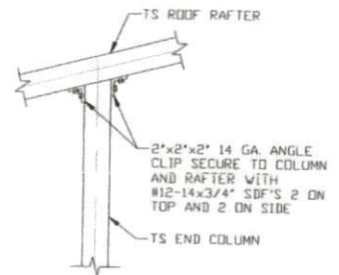
# CONNECTION DETAILS



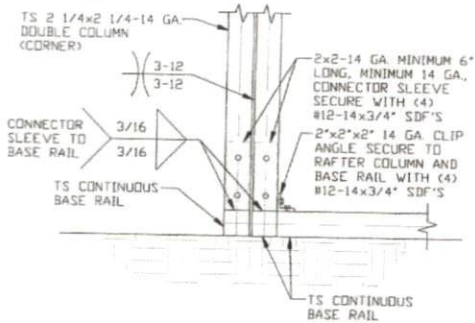
**3** COLUMN/BASE RAIL CONNECTION DETAIL  
SCALE: NTS



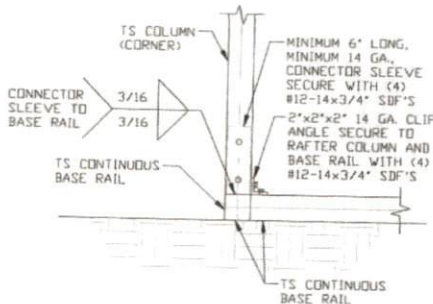
**3A** COLUMN/BASE RAIL CONNECTION DETAIL  
SCALE: NTS



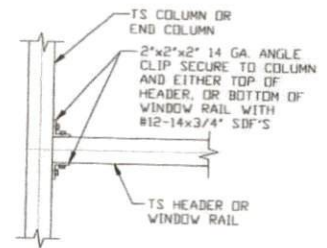
**4** END COLUMN/RAFTER CONNECTION DETAIL  
SCALE: NTS



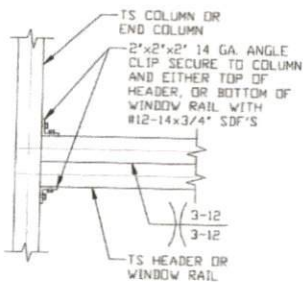
**5** END COLUMN/BASE RAIL CONNECTION DETAIL  
SCALE: NTS



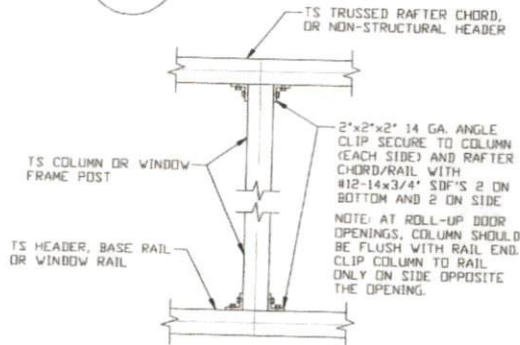
**5A** END COLUMN/BASE RAIL CONNECTION DETAIL  
SCALE: NTS



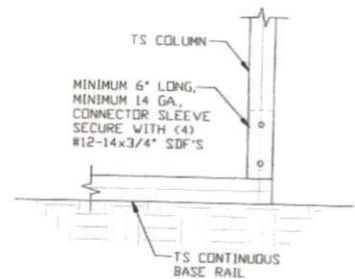
**6** COLUMN OR WINDOW RAIL/GIRT TO POST CONNECTION DETAIL  
SCALE: NTS



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



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



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

MAY 13 2022



MOORE AND ASSOCIATES  
ENGINEERING AND CONSULTING, INC.

DRAWN BY: LT

CHECKED BY: PDH

PROJECT MGR: WSM

CLIENT: STEELCRAFT

STEELCRAFT STRUCTURES  
1841 AMITY HILL RD.  
STATESVILLE, NC 28677  
32'-0" x 16'-0" ENCLOSED STRUCTURE

DATE: 10-1-21

SCALE: NTS

JOB NO: 21048S

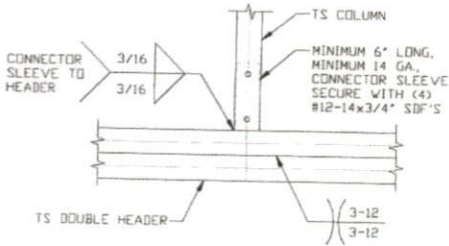
SHT. 12

DWG. NO: SK-3

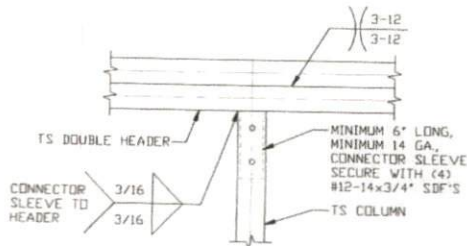
REV: 0

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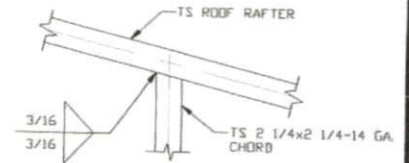
# CONNECTION DETAILS



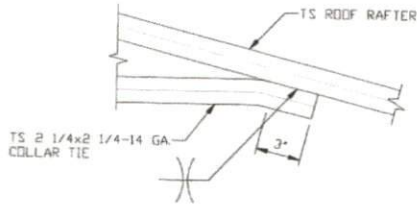
**9** COLUMN/DOUBLE HEADER CONNECTION DETAIL  
SCALE: NTS



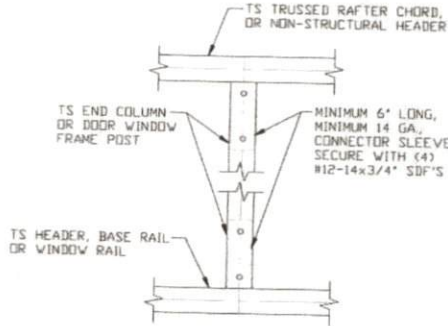
**10** DOUBLE HEADER/COLUMN CONNECTION DETAIL  
SCALE: NTS



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



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



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

MAY 13 2022

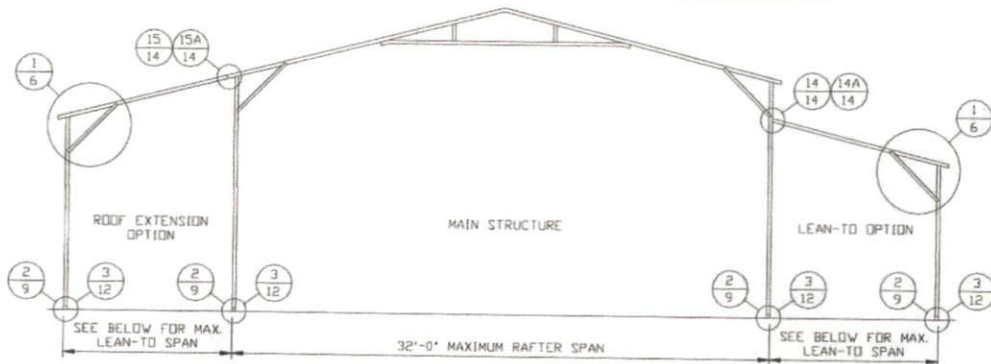


**MOORE AND ASSOCIATES  
ENGINEERING AND CONSULTING, INC.**

DRAWN BY: LT	STEELCRAFT STRUCTURES 1841 AMITY HILL RD. STATESVILLE, NC 28677 32'-0" x 16'-0" ENCLOSED STRUCTURE		
CHECKED BY: PDH	PROJECT MGR: WSM	DATE: 10-1-21	SCALE: NTS
CLIENT: STEELCRAFT	SHT. 13	DWG. NO: SK-3	JOB NO: 21048S REV: 0

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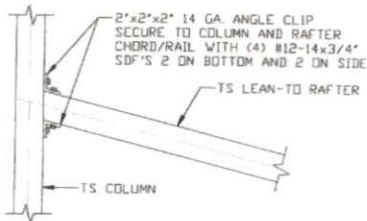
# BOX EAVE RAFTER LEAN-TO OPTIONS



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

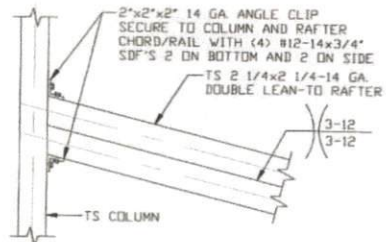
SCALE: NTS

MAXIMUM WIDTH OF SINGLE MEMBER RAFTER ROOF EXTENSION AND LEAN-TO IS 12'-0".  
 MAXIMUM WIDTH OF DOUBLE MEMBER RAFTER ROOF EXTENSION AND LEAN-TO IS 16'-0".  
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE DOUBLE COLUMNS FOR EAVE HEIGHTS 12'-0" < TO ≤ 16'-0".  
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMN FOR EAVE HEIGHTS ≤ 12'-0".



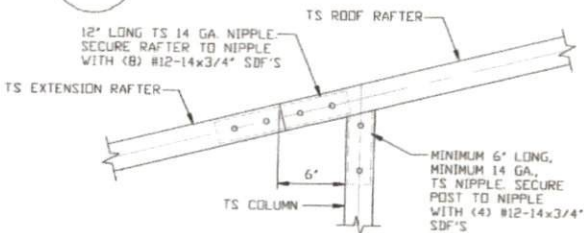
**14** LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR RAFTER SPANS ≤ 12'-0"

SCALE: NTS



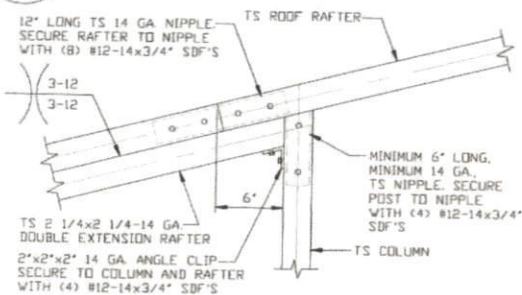
**14A** LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR RAFTER SPANS 12'-0" < TO ≤ 16'-0"

SCALE: NTS



**15** SIDE EXTENSION RAFTER COLUMN DETAIL FOR SPANS ≤ 12'-0"

SCALE: NTS



**15A** SIDE EXTENSION RAFTER COLUMN DETAIL FOR SPANS 12'-0" < TO ≤ 16'-0"

SCALE: NTS

MAY 13 2022



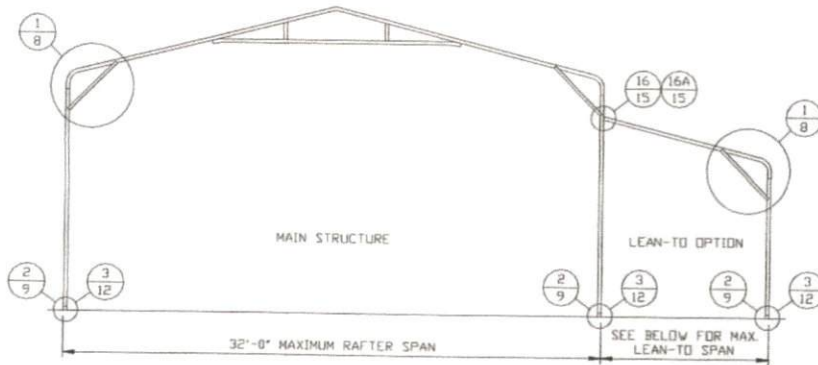
MOORE AND ASSOCIATES  
 ENGINEERING AND CONSULTING, INC.

DRAWN BY: LT	STEELCRAFT STRUCTURES 1841 AMITY HILL RD. STATESVILLE, NC 28677		
CHECKED BY: PDH	32'-0" x 16'-0" ENCLOSED STRUCTURE		
PROJECT MGR: WSM	DATE: 10-1-21	SCALE: NTS	JOB NO: 21048S
CLIENT: STEELCRAFT	SHT. 14	DWG. NO: SK-3	REV: 0

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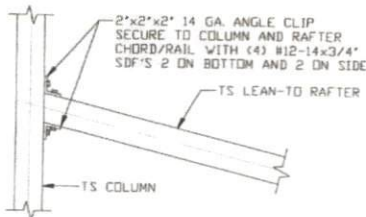


# BOW EAVE RAFTER LEAN-TO OPTIONS



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

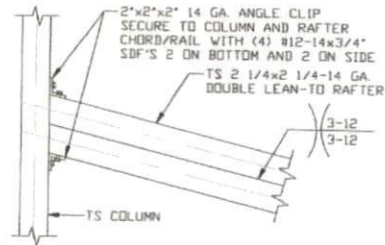
SCALE: NTS  
 MAXIMUM WIDTH OF SINGLE MEMBER RAFTER ROOF EXTENSION AND LEAN-TO IS 12'-0".  
 MAXIMUM WIDTH OF DOUBLE MEMBER RAFTER ROOF EXTENSION AND LEAN-TO IS 16'-0".  
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE DOUBLE COLUMNS FOR EAVE HEIGHTS 12'-0" < TO ≤ 16'-0".  
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMN FOR EAVE HEIGHTS ≤ 12'-0".



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

16

SCALE: NTS



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

16A

SCALE: NTS

MAY 13 2022



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 ENGINEERING AND CONSULTING, INC.**

DRAWN BY: LT

CHECKED BY: PDH

PROJECT MGR: WSM

CLIENT: STEELCRAFT

STEELCRAFT STRUCTURES  
 1841 AMITY HILL RD.  
 STATESVILLE, NC 28677  
 32'-0"x16'-0" ENCLOSED STRUCTURE

DATE: 10-1-21

SCALE: NTS

JOB NO: 21048S

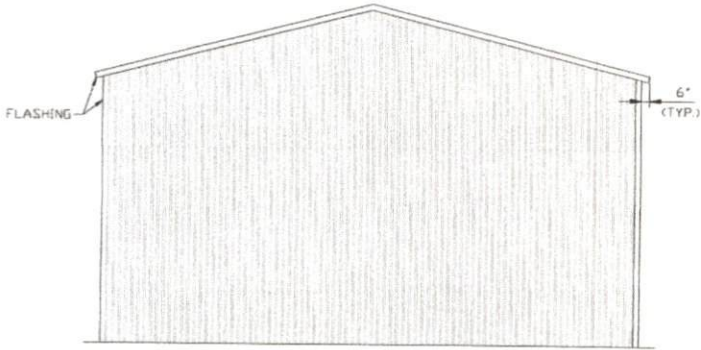
SHT. 15

DWG. NO: SK-3

REV: 0

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# BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



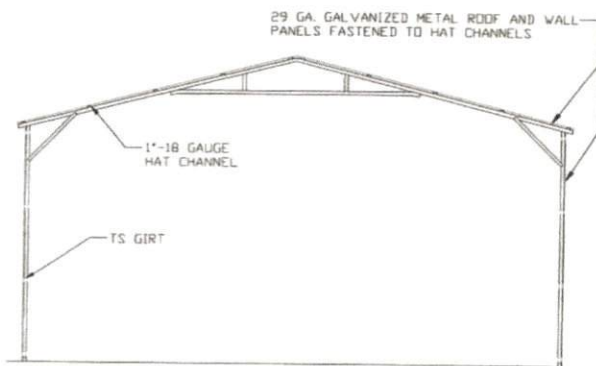
**TYPICAL END ELEVATION  
VERTICAL ROOF/SIDING**

SCALE: NTS



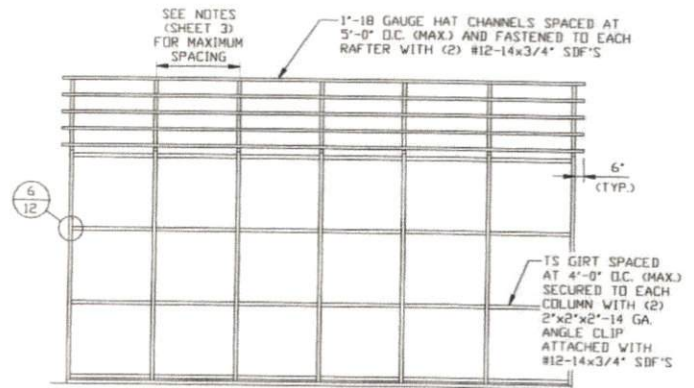
**TYPICAL SIDE ELEVATION  
VERTICAL ROOF/SIDING**

SCALE: NTS



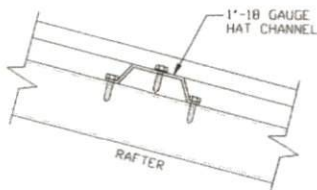
**TYPICAL SECTION VERTICAL  
ROOF/SIDING OPTION**

SCALE: NTS



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

SCALE: NTS



**PANEL ATTACHMENT**

(ALTERNATE FOR VERTICAL ROOF PANELS)  
SCALE: NTS

MAY 13 2022



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

DRAWN BY: LT

CHECKED BY: PDH

PROJECT MGR: WSH

CLIENT: STEELCRAFT

STEELCRAFT STRUCTURES

1841 AMITY HILL RD.

STATESVILLE, NC 28677

32'-0" x 16'-0" ENCLOSED STRUCTURE

DATE: 10-1-21

SCALE: NTS

JOB NO: 21048S

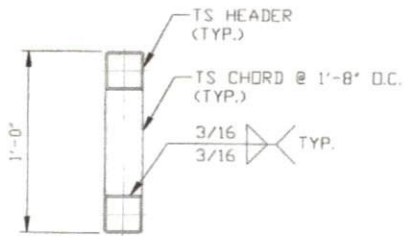
SHT. 16

DWG. NO: SK-3

REV: 0

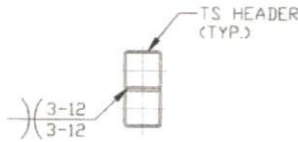
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## SIDE WALL HEADER OPTIONS



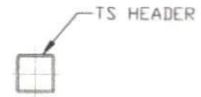
**HEADER DETAIL FOR  
SIDE WALL DOOR OPENINGS  
14'-0" < LENGTH ≤ 16'-0"**

SCALE: NTS



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

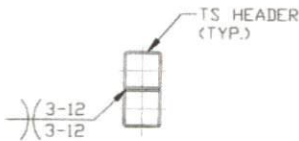
SCALE: NTS



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

SCALE: NTS

## END WALL HEADER OPTIONS



**HEADER DETAIL FOR SIDE WALL  
DOOR OPENINGS  
13'-0" < LENGTH ≤ 16'-0"**

SCALE: NTS



**HEADER DETAIL FOR END WALL  
DOOR OPENINGS ≤ 13'-0"**

SCALE: NTS

MAY 13 2022



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

DRAWN BY: LT

CHECKED BY: PDH

PROJECT MGR: VSM

CLIENT: STEELCRAFT

STEELCRAFT STRUCTURES

1841 AMITY HILL RD.

STATESVILLE, NC 28677

32'-0" x 16'-0" ENCLOSED STRUCTURE

DATE: 10-1-21

SCALE: NTS

JOB NO: 21048S

SHT. 17

DWG. NO: SK-3

REV: 0

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