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(33)

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904

**USA STEEL BUILDINGS**

## STRUCTURAL DESIGN

### **STANDARD PACKAGE ENCLOSED BUILDING**

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

21 April 2021

Revision 3

M&A Project No. 16220S/17311S/18104S/21015S

Prepared for:

USA Steel Buildings, Inc.  
210 Airport Road  
Mount Airy, NC 27030



Prepared by:

Moore and Associates Engineering  
and Consulting, Inc.

1009 East Avenue  
North Augusta, SC 29841

401 South Main Street, Suite 200  
Mount Airy, NC 27030



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**DRAWN BY: AT**

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**PROJECT MGR: VSM**

**CLIENT: USA STEEL**

**USA STEEL BUILDINGS  
210 AIRPORT ROAD  
MOUNT AIRY, NC 27030  
30'-0"x16'-0" SP ENCLOSED STRUCTURE**

**DATE: 4-21-21**

**SCALE: NTS**

**JOB NO: 16220S/  
18104S/P1015S**

**SHT. 1**

**DWG. NO: SK-3**

**REV: 3**

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<b>MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.</b>	DRAWN BY: AT	<b>USA STEEL BUILDINGS</b> 210 AIRPORT ROAD MOUNT AIRY, NC 27030 30'-0"x16'-0" SP ENCLOSED STRUCTURE		
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	CLIENT: USA STEEL	SHT. 2A	DWG. NO: SK-3	REV: 3

## INSTALLATION NOTES AND SPECIFICATIONS

1. DESIGN IS FOR MAXIMUM 30'-0" WIDE x 16'-0" EAVE HEIGHT ENCLOSED STRUCTURES.
2. DESIGN WAS DONE IN ACCORDANCE WITH THE 2020 FLORIDA BUILDING CODE (FBC) 7TH EDITION.
3. DESIGN LOADS ARE AS FOLLOWS:
  - A) DEAD LOAD = 1.5 PSF
  - B) LIVE LOAD = 12 PSF
  - C) GROUND SNOW LOAD = 0 PSF
4. 3-SECOND GUST ULTIMATE WIND SPEED  $V_{ULT}$  (LW) 105 TO 140 MPH (NOMINAL WIND SPEED 81 TO 108 MPH); MAXIMUM RAFTER/POST AND END POST SPACING = 5.0 FEET.
5. 3-SECOND GUST ULTIMATE WIND SPEED  $V_{ULT}$  (HW) 141 TO 170 MPH (NOMINAL WIND SPEED 109 TO 132 MPH); MAXIMUM RAFTER/POST AND END POST SPACING = 4.0 FEET.
6. END WALL COLUMNS (POSTS) AND SIDE WALL COLUMNS ARE EQUIVALENT IN SIZE AND SPACING (UNLESS NOTED OTHERWISE).
7. RISK CATEGORY I.
8. WIND EXPOSURE CATEGORY B/C.
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 FOR LOW WIND. 2 1/4" x 2 1/4" - 12 GAUGE TS MAY BE USED AS AN OPTION FOR LOW WIND. USE 2 1/4" x 2 1/4" - 12 GAUGE TS FOR HIGH WIND.
10. AVERAGE FASTENER SPACING ON-CENTERS ALONG RAFTERS OR HAT CHANNELS, AND COLUMNS (INTERIOR DISTANCE OR EDGE DISTANCE) = 10" O.C. (MAX.) FOR LOW WIND AND 6" O.C. (MAX.) FOR HIGH WIND.
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. ROOF SLOPES LESS THAN 3:12 REQUIRE USE OF LAP JOINT SEALANT.
12. ANCHORS SHALL BE INSTALLED THROUGH BASE RAIL AT OR WITHIN 6" OF EACH RAFTER COLUMN ALONG SIDES. STRUCTURE MUST HAVE AN ANCHOR AT EVERY COLUMN.
13. 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 FOR WIND SPEEDS  $\leq$  145 MPH. OPTIONAL ANCHORAGE MAY BE USED IN SUITABLE SOILS AND MUST BE USED IN UNSUITABLE SOILS FOR WIND SPEEDS  $>$  145 MPH AS NOTED.
14. WIND FORCES GOVERN OVER SEISMIC FORCES. SEISMIC PARAMETERS ANALYZED ARE:
 

SOIL SITE CLASS = D  
RISK CATEGORY I

$R = 3.25$        $I_E = 1.0$   
 $S_{DS} = 2.039$        $V = C_S W$   
 $S_{DI} = 1.258$



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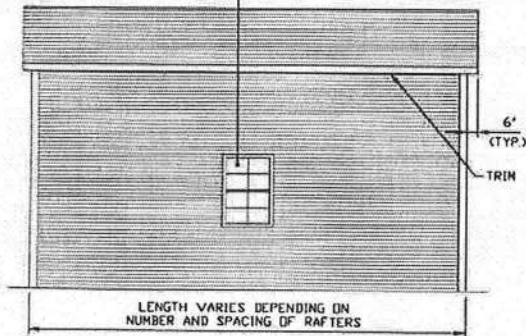
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## BOX EAVE FRAME RAFTER STRUCTURE

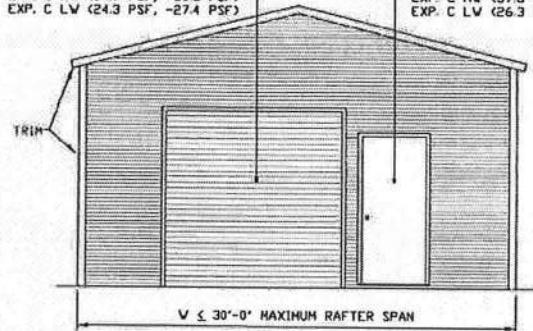
WINDOW (AS APPLICABLE)  
DESIGN PRESSURE  
EXP. B HW (27.0 PSF, -28.1 PSF)  
EXP. B LW (18.1 PSF, -19.6 PSF)  
EXP. C HW (39.4 PSF, -41.0 PSF)  
EXP. C LW (27.5 PSF, -29.8 PSF)



**TYPICAL SIDE ELEVATION**  
SCALE: NTS

ROLL-UP DOOR  
(AS APPLICABLE)  
DESIGN PRESSURE  
EXP. B HW (27.6 PSF, -31.2 PSF)  
EXP. B LW (18.5 PSF, -20.9 PSF)  
EXP. C HW (34.7 PSF, -39.2 PSF)  
EXP. C LW (24.3 PSF, -27.4 PSF)

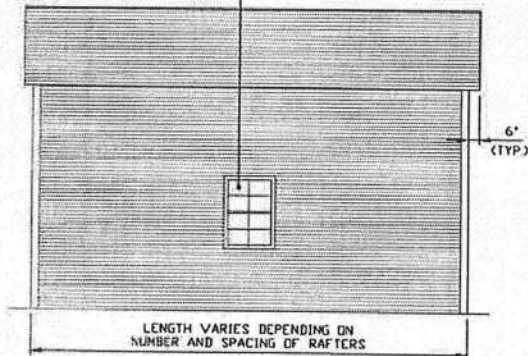
PERSONNEL DOOR  
(AS APPLICABLE)  
DESIGN PRESSURE  
EXP. B HW (25.7 PSF, -28.0 PSF)  
EXP. B LW (17.2 PSF, -18.8 PSF)  
EXP. C HW (37.6 PSF, -41.0 PSF)  
EXP. C LW (26.3 PSF, -28.6 PSF)



**TYPICAL END ELEVATION**  
SCALE: NTS

## BOX FRAME RAFTER STRUCTURE

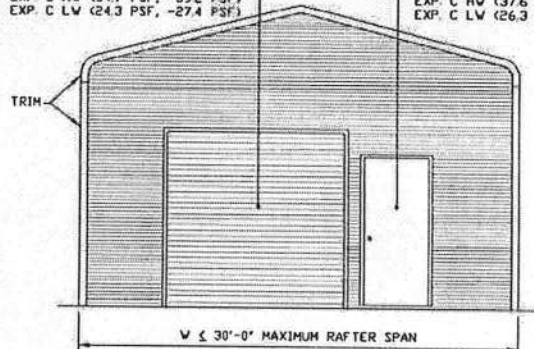
WINDOW (AS APPLICABLE)  
DESIGN PRESSURE  
EXP. B HW (27.0 PSF, -28.1 PSF)  
EXP. B LW (18.1 PSF, -19.6 PSF)  
EXP. C HW (39.4 PSF, -41.0 PSF)  
EXP. C LW (27.5 PSF, -29.8 PSF)



**TYPICAL SIDE ELEVATION**  
SCALE: NTS

ROLL-UP DOOR  
(AS APPLICABLE)  
DESIGN PRESSURE  
EXP. B HW (27.6 PSF, -31.2 PSF)  
EXP. B LW (18.5 PSF, -20.9 PSF)  
EXP. C HW (34.7 PSF, -39.2 PSF)  
EXP. C LW (24.3 PSF, -27.4 PSF)

PERSONNEL DOOR  
(AS APPLICABLE)  
DESIGN PRESSURE  
EXP. B HW (25.7 PSF, -28.0 PSF)  
EXP. B LW (17.2 PSF, -18.8 PSF)  
EXP. C HW (37.6 PSF, -41.0 PSF)  
EXP. C LW (26.3 PSF, -28.6 PSF)



**TYPICAL END ELEVATION**  
SCALE: NTS



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

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SHT. 3A

SCALE: NTS

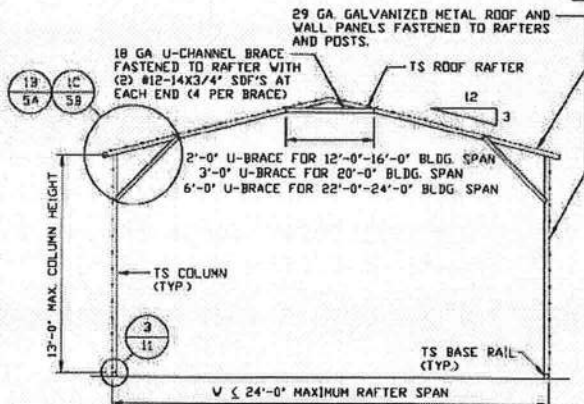
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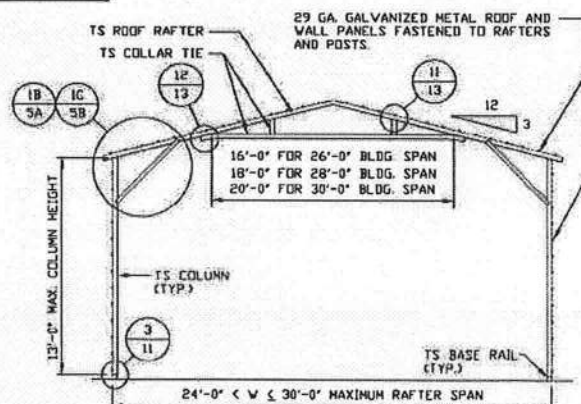
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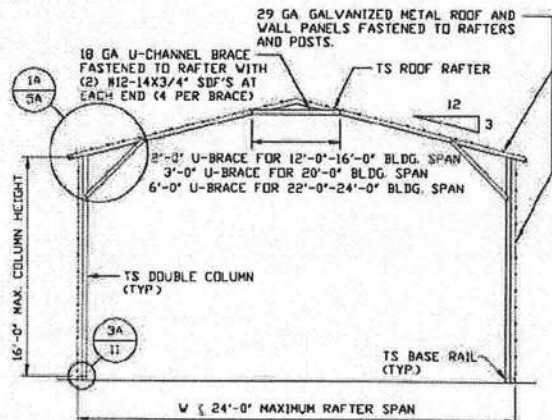
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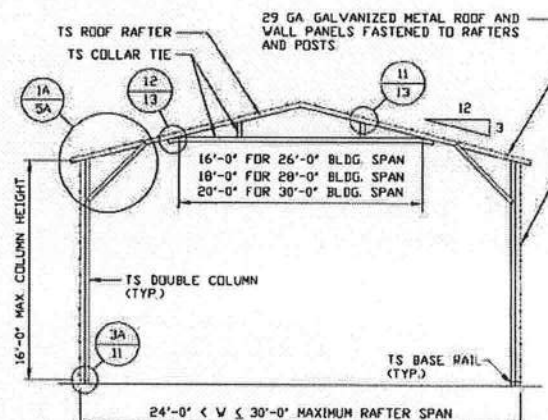
**TYPICAL RAFTER/COLUMN END FRAME SECTION**  
SCALE: NTS



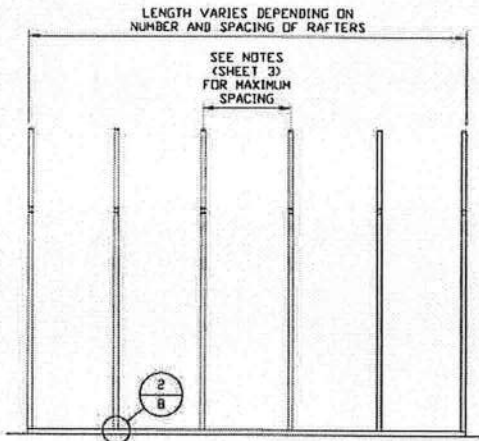
**TYPICAL RAFTER/COLUMN END FRAME SECTION**  
SCALE: NTS



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



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



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



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SHT. 4

SCALE: NTS

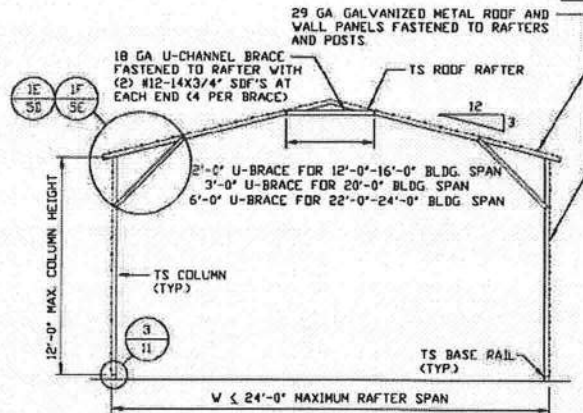
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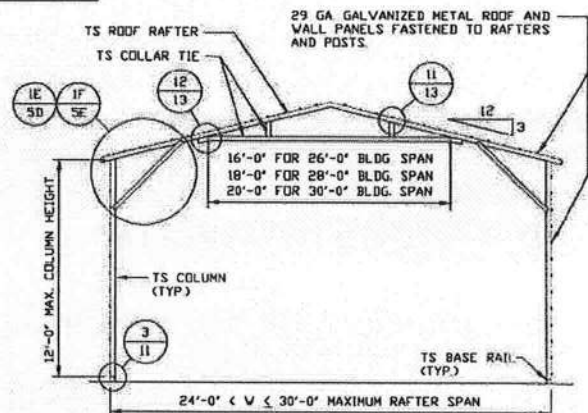
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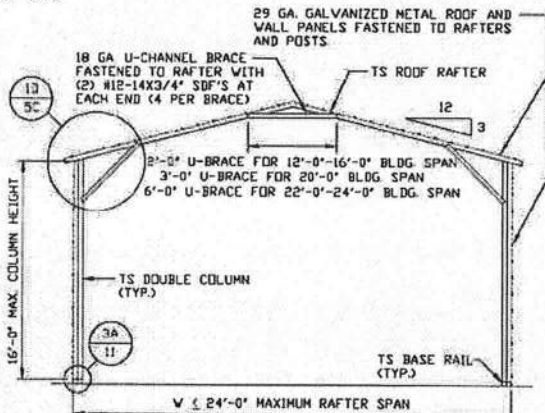
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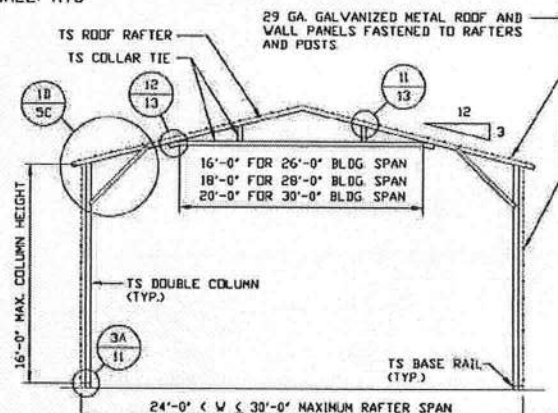
**TYPICAL RAFTER/COLUMN END FRAME SECTION**  
SCALE: NTS



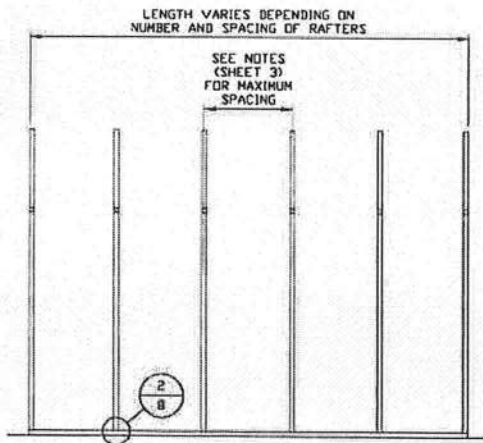
**TYPICAL RAFTER/COLUMN END FRAME SECTION**  
SCALE: NTS



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



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



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



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**SHT. 4A**

**SCALE: NTS**

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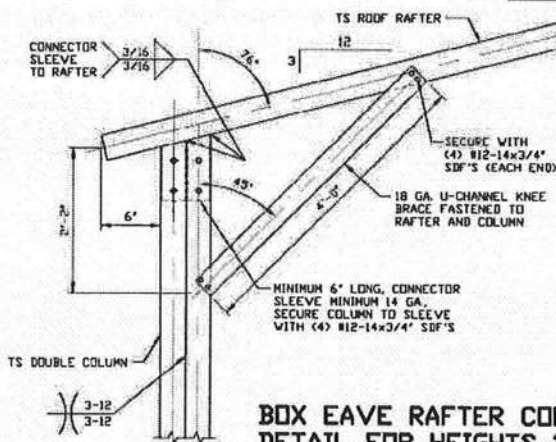
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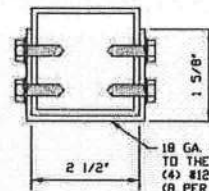
## EXPOSURE B



**BOX EAVE RAFTER COLUMN CONNECTION  
DETAIL FOR HEIGHTS 12'-0\"**

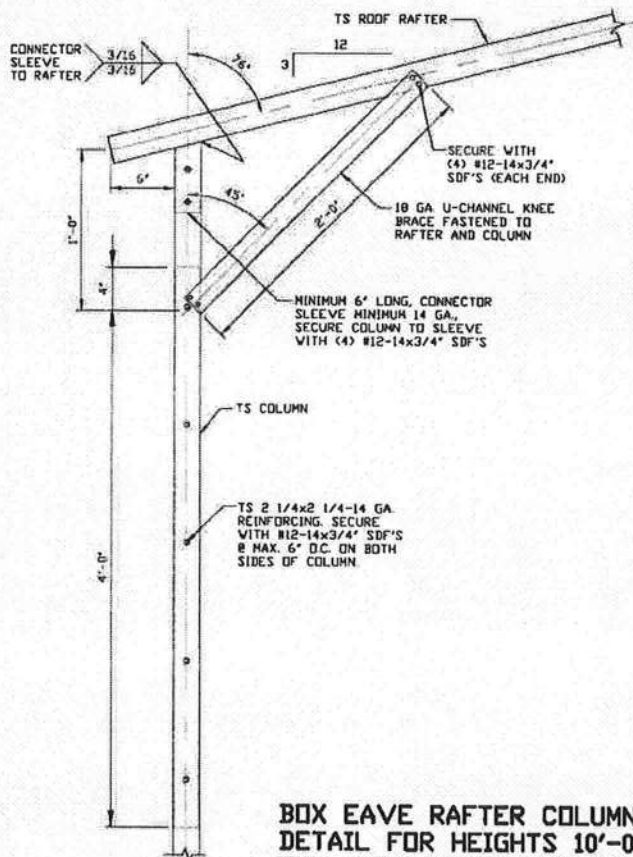
**1A**

SCALE: NTS



**BRACE SECTION**

SCALE: NTS



**BOX EAVE RAFTER COLUMN CONNECTION  
DETAIL FOR HEIGHTS 10'-0\"**

**1B**

SCALE: NTS



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**USA STEEL BUILDINGS  
210 AIRPORT ROAD  
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30'-0\"**

**DATE: 4-21-21**

**SHT. 5A**

**SCALE: NTS**

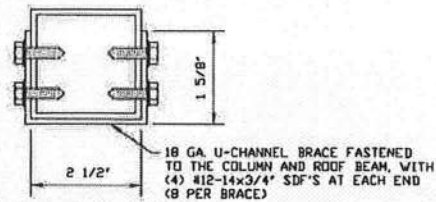
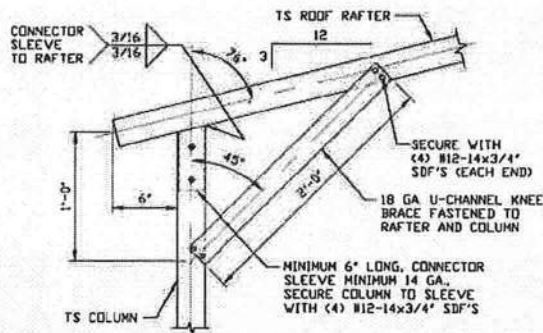
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## EXPOSURE B



**BRACE SECTION**  
SCALE: NTS

**BOX EAVE RAFTER COLUMN CONNECTION  
DETAIL FOR HEIGHTS  $\leq 10'-0"$  FOR  
WIND SPEEDS 141 MPH  $< TO \leq 170$  MPH  
AND HEIGHTS  $\leq 11'-0"$  FOR  
WIND SPEEDS  $\leq 140$  MPH**

**1C**

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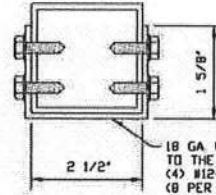
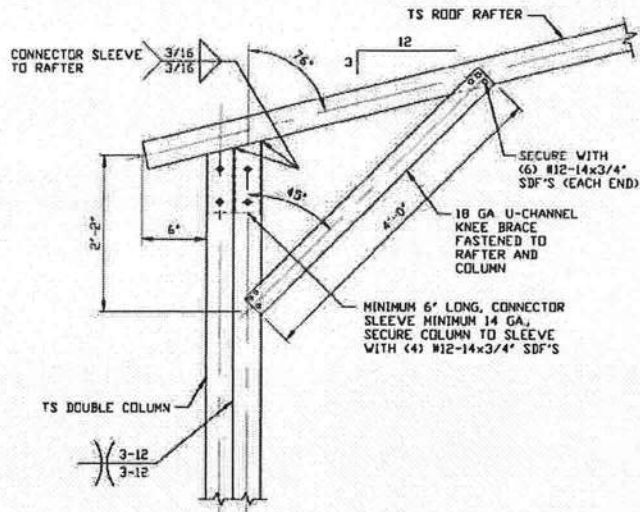
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## EXPOSURE C



**BRACE SECTION**  
SCALE: NTS

**BOX EAVE RAFTER COLUMN CONNECTION  
DETAIL FOR HEIGHTS 11'-0" < TO ≤ 16'-0"  
FOR WIND SPEEDS 141 MPH < TO ≤ 170 MPH  
AND FOR HEIGHTS 12'-0" < TO ≤ 16'-0"  
FOR WIND SPEEDS ≤ 140 MPH**

**1D**

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**SHT. 5C**

**SCALE: NTS**

**DWG NO SK-3**

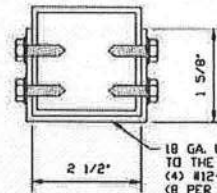
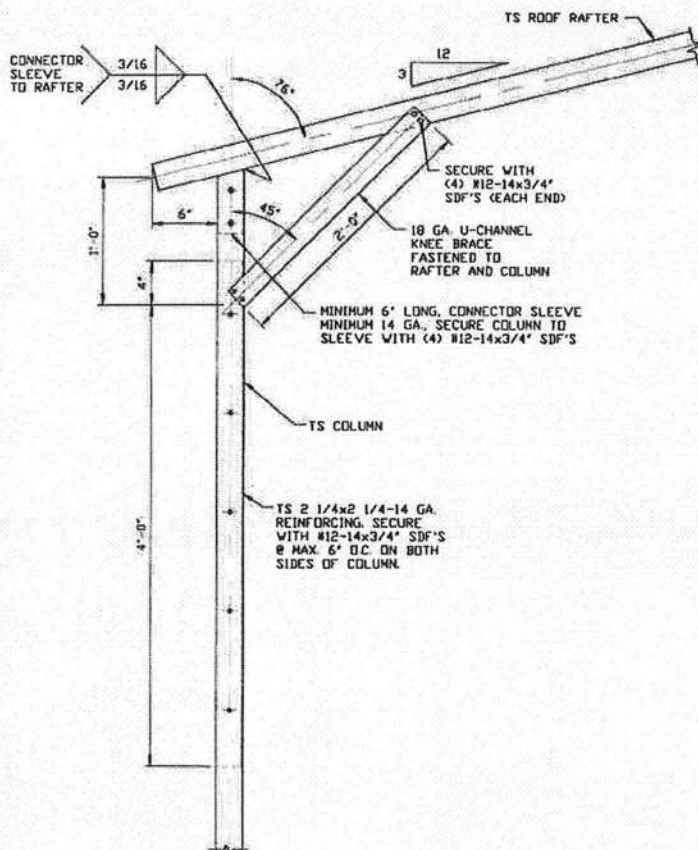
**JOB NO: 16220S/  
16104S/21015S**

**REV: 3**

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## EXPOSURE C



**BRACE SECTION**

SCALE: NTS

**BOX EAVE RAFTER COLUMN CONNECTION  
DETAIL FOR HEIGHTS 9'-0" < TO ≤ 11'-0"  
FOR WIND SPEEDS 141 MPH < TO ≤ 170 MPH  
AND FOR HEIGHTS 10'-0" < TO ≤ 12'-0"  
FOR WIND SPEEDS ≤ 140 MPH**

**1E**

SCALE: NTS



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**DRAWN BY: AT**

**CHECKED BY: PDH**

**PROJECT MGR: WSM**

**CLIENT: USA STEEL**

**USA STEEL BUILDINGS  
210 AIRPORT ROAD  
MOUNT AIRY, NC 27030  
30'-0" x 16'-0" SP ENCLOSED STRUCTURE**

**DATE: 4-21-21**

**SCALE: NTS**

**SHT. 5D**

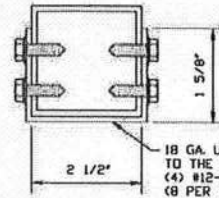
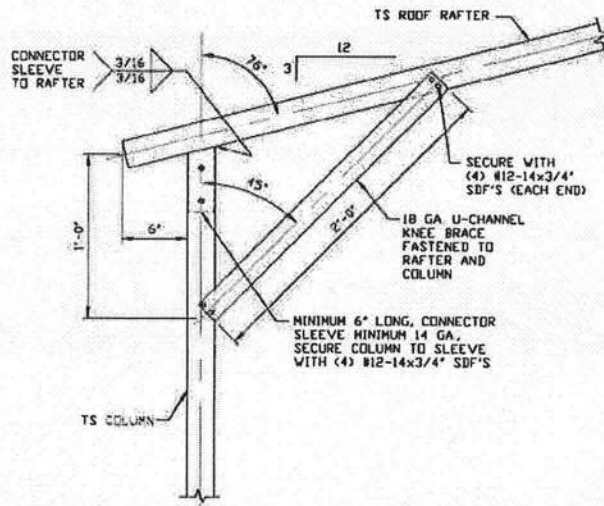
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**JOB NO: 16220S/  
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## EXPOSURE C



**BRACE SECTION**  
SCALE: NTS

**BOX EAVE RAFTER COLUMN CONNECTION  
DETAIL FOR HEIGHTS  $\leq 9'-0''$  FOR  
WIND SPEEDS 141 MPH  $< TO \leq 170$  MPH  
AND HEIGHTS  $\leq 10'-0''$  FOR  
WIND SPEEDS  $\leq 140$  MPH**

**1F**

SCALE: NTS



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**PROJECT MGR: VSM**

**CLIENT: USA STEEL**

**USA STEEL BUILDINGS  
210 AIRPORT ROAD  
MOUNT AIRY, NC 27030  
30'-0" x 16'-0" SP ENCLOSED STRUCTURE**

**DATE: 4-21-21**

**SCALE: NTS**

**SHT. 5E**

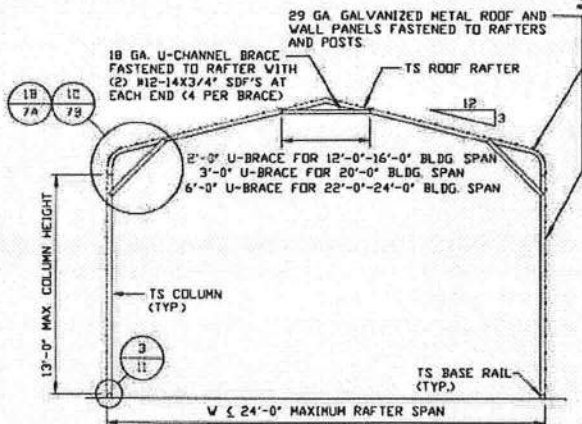
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**JOB NO: 16220S/  
18104S/21015S**

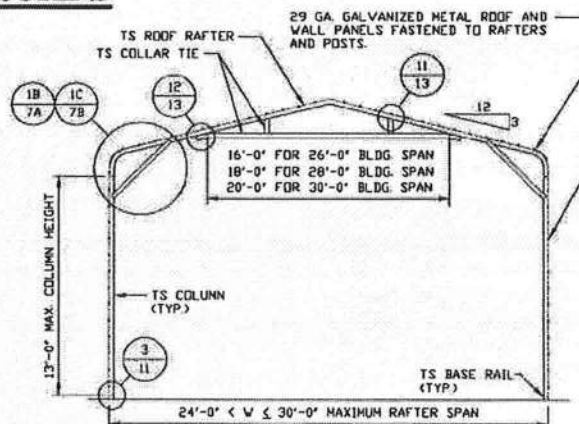
**REV: 3**

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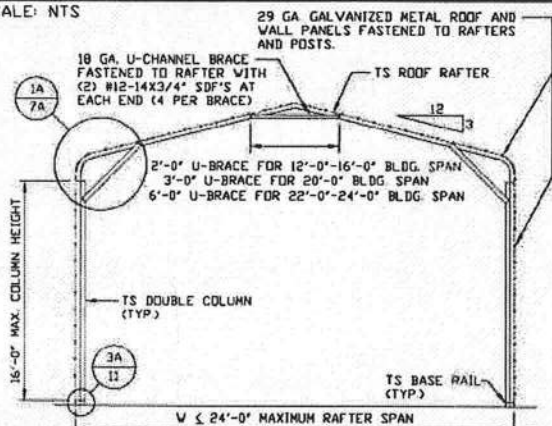
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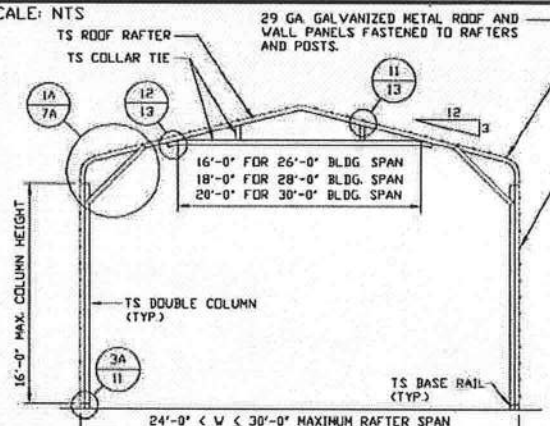
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SCALE: NTS



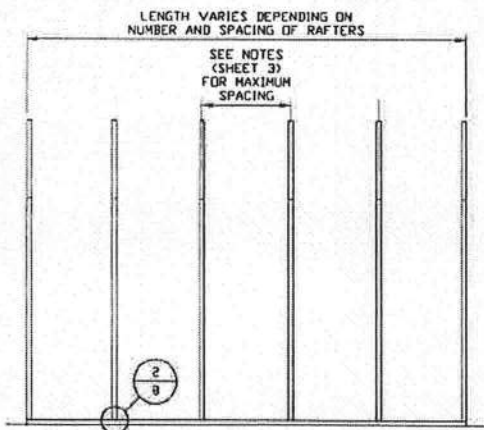
**TYPICAL RAFTER/COLUMN END FRAME SECTION**  
SCALE: NTS



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



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



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



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**PROJECT MGR: WSH**

**CLIENT: USA STEEL**

**USA STEEL BUILDINGS  
210 AIRPORT ROAD  
MOUNT AIRY, NC 27030  
30'-0" x 16'-0" SP ENCLOSED STRUCTURE**

**DATE: 4-21-21**

**SHT. 6**

**SCALE: NTS**

**DWG. NO SK-3**

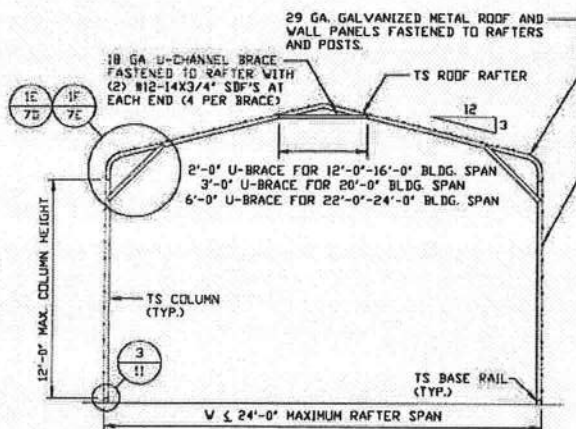
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18104S/21015S**

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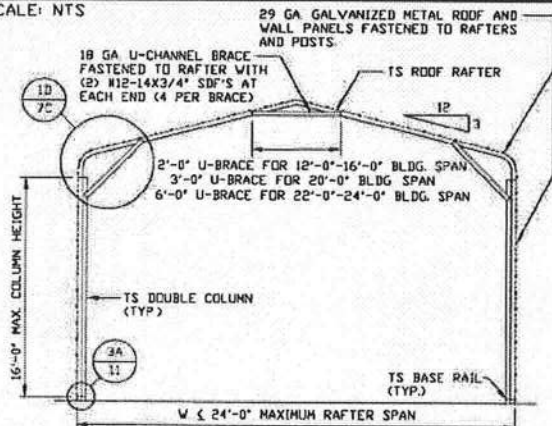


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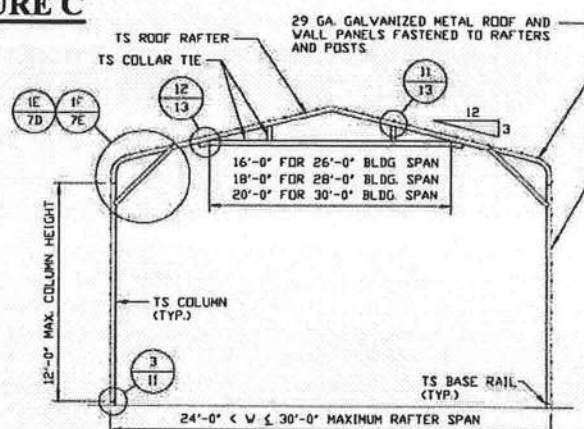
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SCALE: NTS



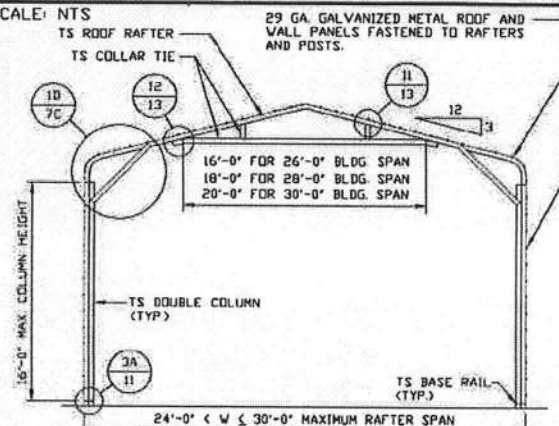
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SCALE: NTS



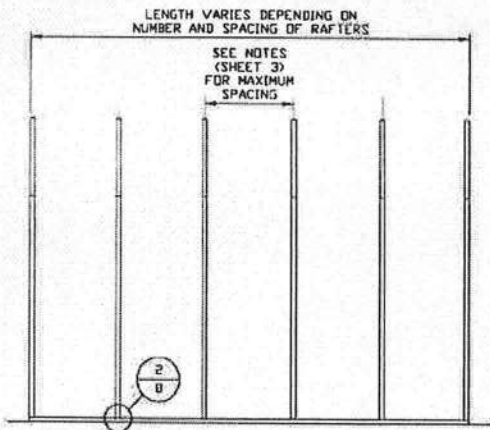
**TYPICAL RAFTER/COLUMN END FRAME SECTION**

SCALE: NTS



**TYPICAL RAFTER/COLUMN END FRAME SECTION**

SCALE: NTS



**TYPICAL RAFTER/COLUMN FRAMING SIDE SECTION**

SCALE: NTS



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**PROJECT MGR: VSM**

**CLIENT: USA STEEL**

**USA STEEL BUILDINGS  
210 AIRPORT ROAD  
MOUNT AIRY, NC 27030  
30'-0" x 16'-0" SP ENCLOSED STRUCTURE**

**DATE: 4-21-21**

**SHT. 6A**

**SCALE: NTS**

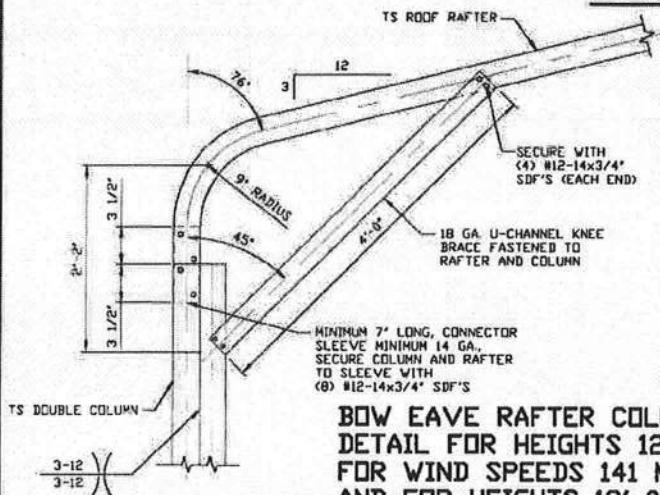
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**JOB NO: 16220S/  
18104S/21015S**

**REV: 3**

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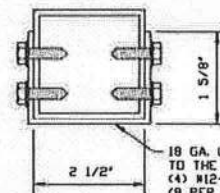
## EXPOSURE B



**BOW EAVE RAFTER COLUMN CONNECTION**  
**DETAIL FOR HEIGHTS 12'-0" < TO ≤ 16'-0"**  
**FOR WIND SPEEDS 141 MPH < TO ≤ 170 MPH**  
**AND FOR HEIGHTS 13'-0" < TO ≤ 16'-0"**  
**FOR WIND SPEEDS ≤ 140 MPH**

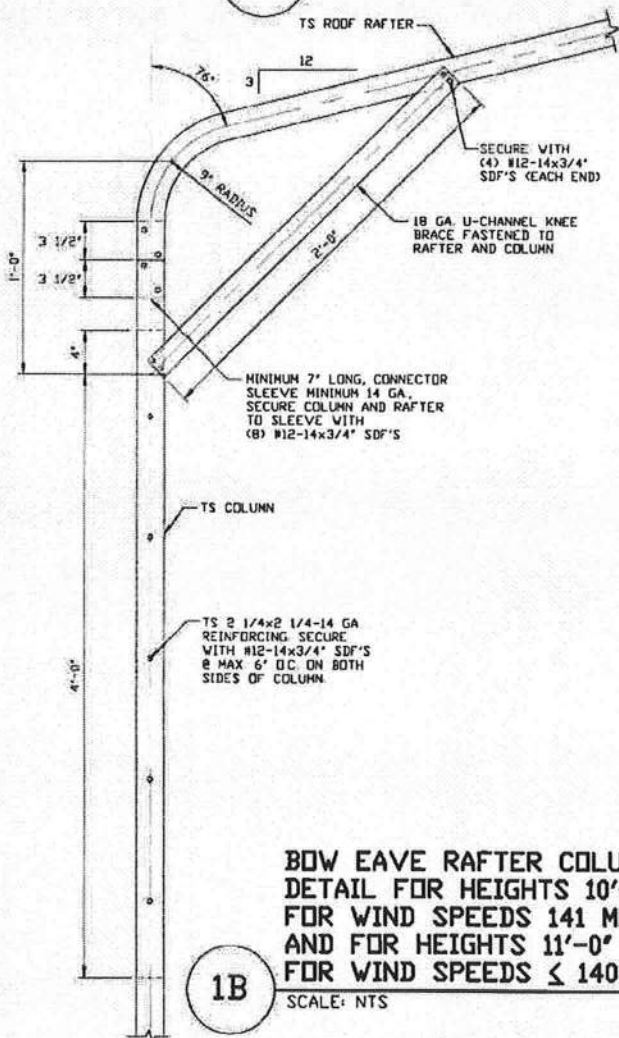
1A

SCALE: NTS



## BRACE SECTION

SCALE: NTS



**BOW EAVE RAFTER COLUMN CONNECTION**  
**DETAIL FOR HEIGHTS 10'-0" < TO ≤ 12'-0"**  
**FOR WIND SPEEDS 141 MPH < TO ≤ 170 MPH**  
**AND FOR HEIGHTS 11'-0" < TO ≤ 13'-0"**  
**FOR WIND SPEEDS ≤ 140 MPH**

1B

SCALE: NTS



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CHECKED BY: PDH

PROJECT NO: VSM

CLIENT: USA STEEL

USA STEEL BUILDINGS  
 210 AIRPORT ROAD  
 MOUNT AIRY, NC 27030  
 30'-0"x16'-0" SP ENCLOSED STRUCTURE

DATE: 4-21-21

SHT. 7A

SCALE: NTS

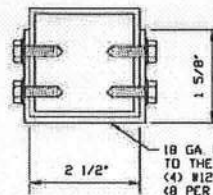
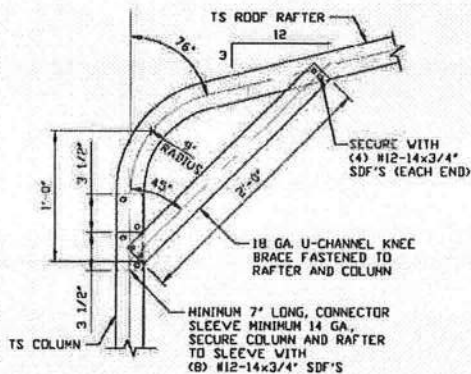
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JTB NO: 16220S/  
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REV: 3

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## EXPOSURE B



### BRACE SECTION

SCALE: NTS

**BOW EAVE RAFTER COLUMN CONNECTION  
DETAIL FOR HEIGHTS  $\leq 10'-0"$  FOR  
WIND SPEEDS 141 MPH  $<$  TO  $\leq 170$  MPH  
AND HEIGHTS  $\leq 11'-0"$  FOR  
WIND SPEEDS  $\leq 140$  MPH**

**1C**

SCALE: NTS



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**PROJECT MGR: WSM**

**CLIENT: USA STEEL**

**USA STEEL BUILDINGS  
210 AIRPORT ROAD  
MOUNT AIRY, NC 27030**

**30'-0"x16'-0" SP ENCLOSED STRUCTURE**

**DATE: 4-21-21**

**SHT. 7B**

**SCALE: NTS**

**DWG. NO: SK-3**

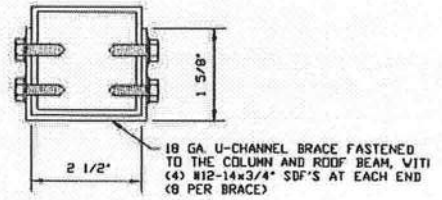
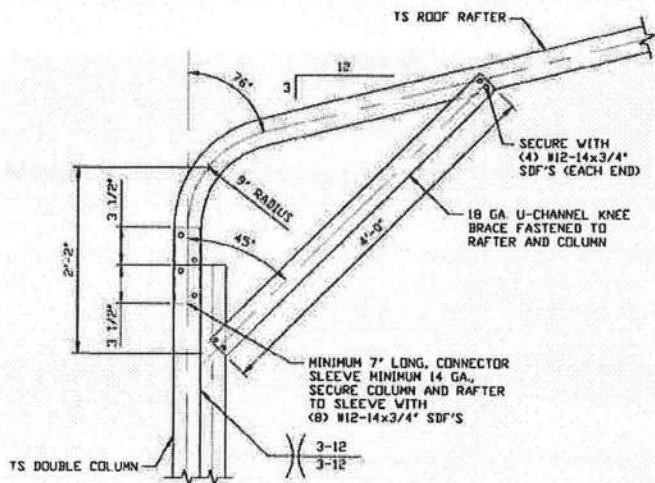
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## EXPOSURE C



### BRACE SECTION

SCALE: NTS

**BOW EAVE RAFTER COLUMN CONNECTION  
DETAIL FOR HEIGHTS 11'-0" < TO ≤ 16'-0"  
FOR WIND SPEEDS 141 MPH < TO ≤ 170 MPH  
AND FOR HEIGHTS 12'-0" < TO ≤ 16'-0"  
FOR WIND SPEEDS ≤ 140 MPH**

**1D**

SCALE: NTS



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**PROJECT MGR: VSM**

**CLIENT: USA STEEL**

**USA STEEL BUILDINGS  
210 AIRPORT ROAD  
MOUNT AIRY, NC 27030  
30'-0" x 16'-0" SP ENCLOSED STRUCTURE**

**DATE: 4-21-21**

**SCALE: NTS**

**SHT. 7C**

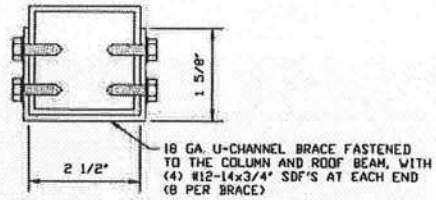
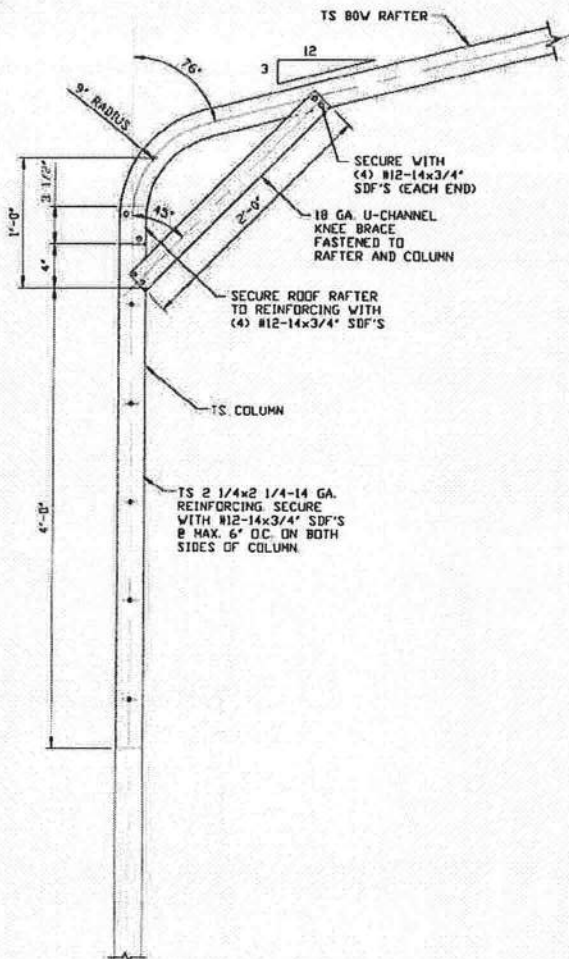
**DWG. NO: SK-3**

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## EXPOSURE C



### BRACE SECTION

SCALE: NTS

BOW EAVE RAFTER COLUMN CONNECTION  
DETAIL FOR HEIGHTS 9'-0" < TO ≤ 11'-0"  
FOR WIND SPEEDS 141 MPH < TO ≤ 170 MPH  
AND FOR HEIGHTS 10'-0" < TO ≤ 12'-0"  
FOR WIND SPEEDS ≤ 140 MPH

1E

SCALE: NTS



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CLIENT: USA STEEL

USA STEEL BUILDINGS  
210 AIRPORT ROAD  
MOUNT AIRY, NC 27030  
30'-0"x16'-0" SP ENCLOSED STRUCTURE

DATE: 4-21-21

SHT. 7D

SCALE: NTS

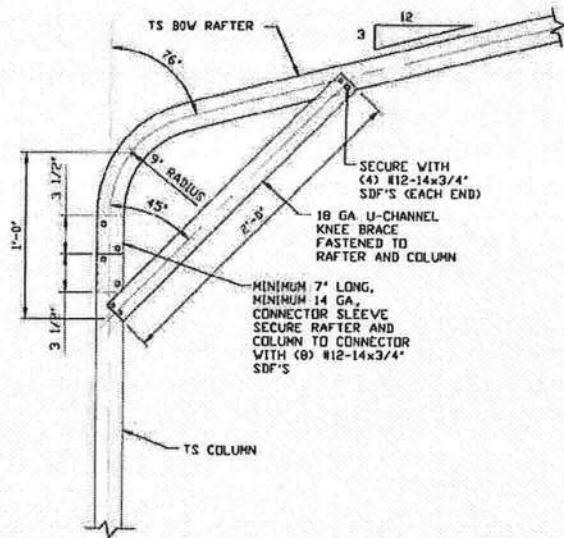
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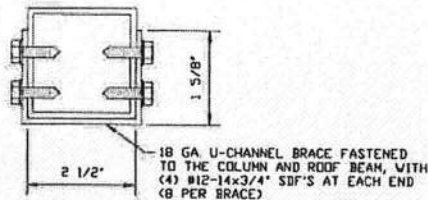
# EXPOSURE C



**BOW EAVE RAFTER COLUMN CONNECTION  
DETAIL FOR HEIGHTS  $\leq 9'-0''$  FOR  
WIND SPEEDS 141 MPH  $<$  TO  $\leq 170$  MPH  
AND HEIGHTS  $\leq 10'-0''$  FOR  
WIND SPEEDS  $\leq 140$  MPH**

1F

SCALE: NTS



**BRACE SECTION**

SCALE: NTS



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PROJECT MGR: VSM

CLIENT: USA STEEL

USA STEEL BUILDINGS  
210 AIRPORT ROAD  
MOUNT AIRY, NC 27030  
30'-0"x16'-0" SP ENCLOSED STRUCTURE

DATE: 4-21-21

SHT. 7E

SCALE: NTS

DWG. NO SK-3

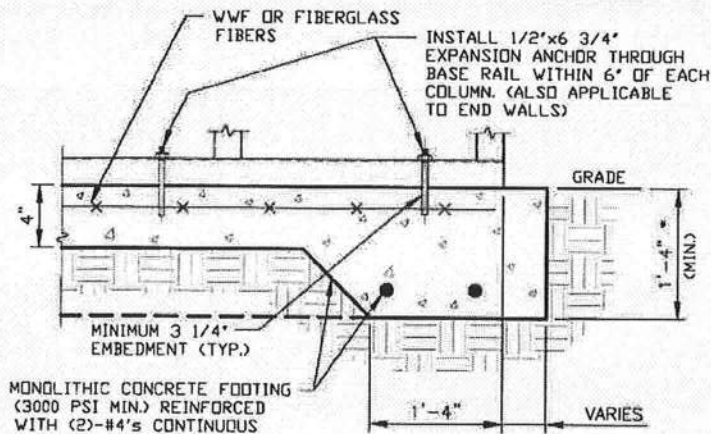
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# **BASE RAIL ANCHORAGE OPTIONS FOR WIND SPEEDS 141 MPH < TO ≤ 170 MPH**

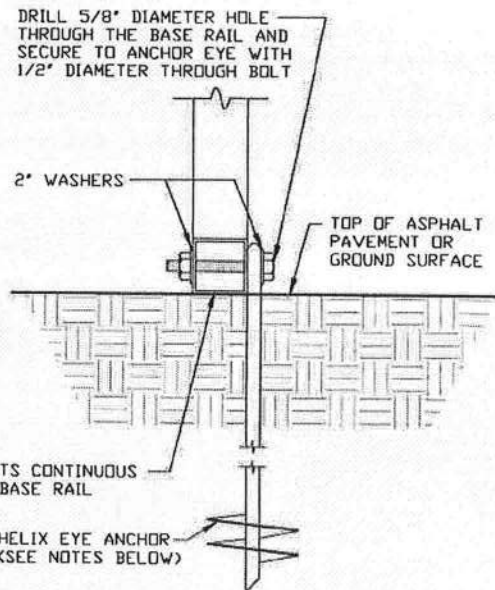


2A

## **CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE**

SCALE: NTS  
MINIMUM ANCHOR EDGE DISTANCE IS 4".

\* COORDINATE WITH LOCAL BUILDING CODE/ORD.  
REGARDING REQUIRED FOOTING DEPTH.



2B

## **GROUND BASE HELIX ANCHORAGE**

SCALE: NTS (CAN BE USED FOR ASPHALT)

\* COORDINATE WITH LOCAL BUILDING CODE/ORD.  
REGARDING REQUIRED ANCHOR 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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**DRAWN BY: AT**

**CHECKED BY: PDH**

**PROJECT MGR: VSM**

**CLIENT: USA STEEL**

**USA STEEL BUILDINGS  
210 AIRPORT ROAD  
MOUNT AIRY, NC 27030  
30'-0"x16'-0" SP ENCLOSED STRUCTURE**

**DATE: 4-21-21**

**SHT. 8**

**SCALE: NTS**

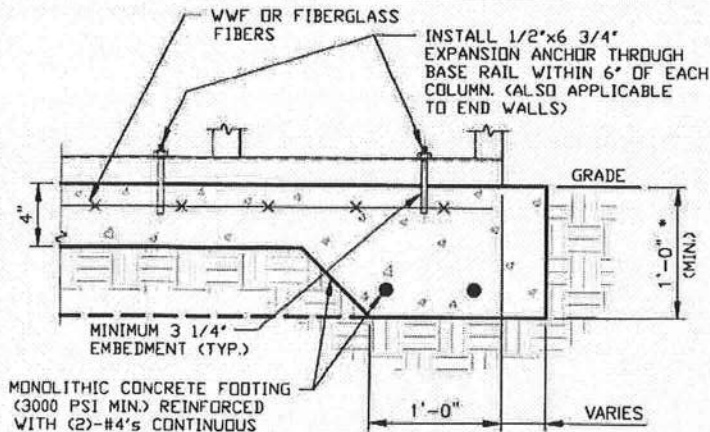
**DWG. NO: SK-3**

**JOB NO: 16220S/  
18104S/21015S**

**REV: 3**

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## BASE RAIL ANCHORAGE OPTIONS FOR WIND SPEEDS $\leq 140$ MPH

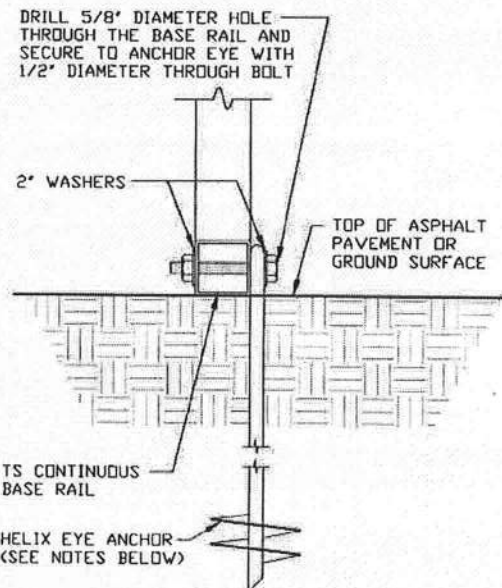


2A

### CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE

SCALE: NTS  
MINIMUM ANCHOR EDGE DISTANCE IS 4".

\* COORDINATE WITH LOCAL BUILDING CODE/ORD.  
REGARDING REQUIRED FOOTING DEPTH.



2B

### GROUND BASE HELIX ANCHORAGE

SCALE: NTS (CAN BE USED FOR ASPHALT)

\* COORDINATE WITH LOCAL BUILDING CODE/ORD.  
REGARDING REQUIRED ANCHOR 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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**CHECKED BY: PDH**

**PROJECT MGR: VSH**

**CLIENT: USA STEEL**

USA STEEL BUILDINGS  
210 AIRPORT ROAD  
MOUNT AIRY, NC 27030  
30'-0" x 16'-0" SP ENCLOSED STRUCTURE

**DATE: 4-21-21**

**SHT. 8A**

**SCALE: NTS**

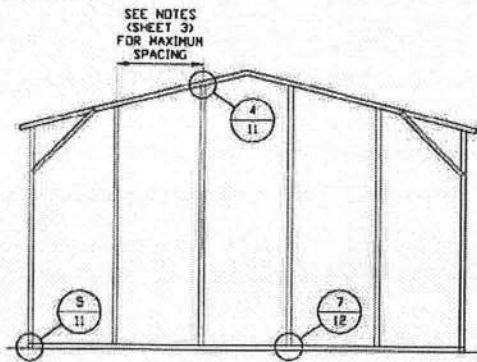
**DWG. NO. SK-3**

**JOB NO. 16220S/  
18104S/21015S**

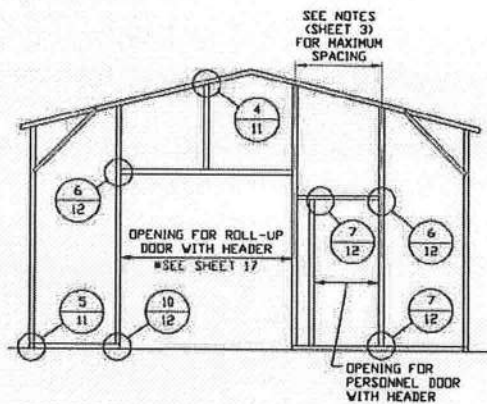
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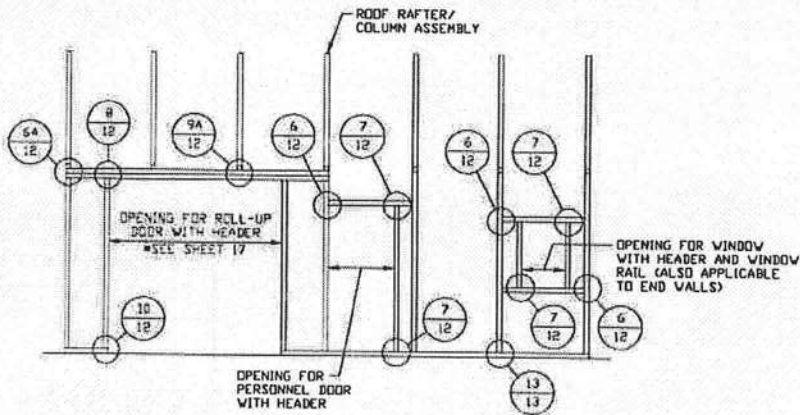
## BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS



**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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**CLIENT: USA STEEL**

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210 AIRPORT ROAD  
MOUNT AIRY, NC 27030  
30'-0" x 16'-0" SP ENCLOSED STRUCTURE**

**DATE: 4-21-21**

**SHT. 9**

**SCALE: NTS**

**DWG. NO: SK-3**

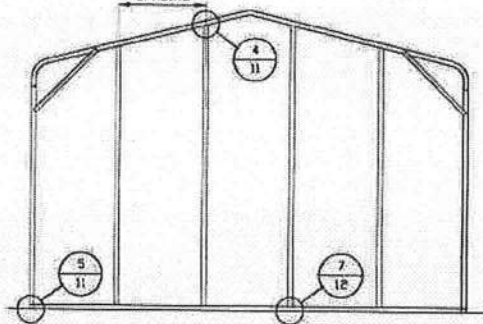
**JOB NO: 16220S/  
18104S/21015S**

**REV: 3**

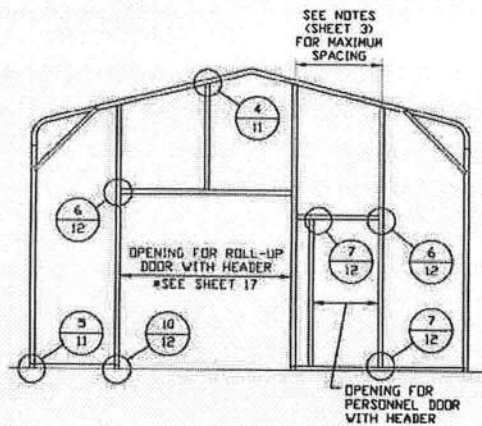
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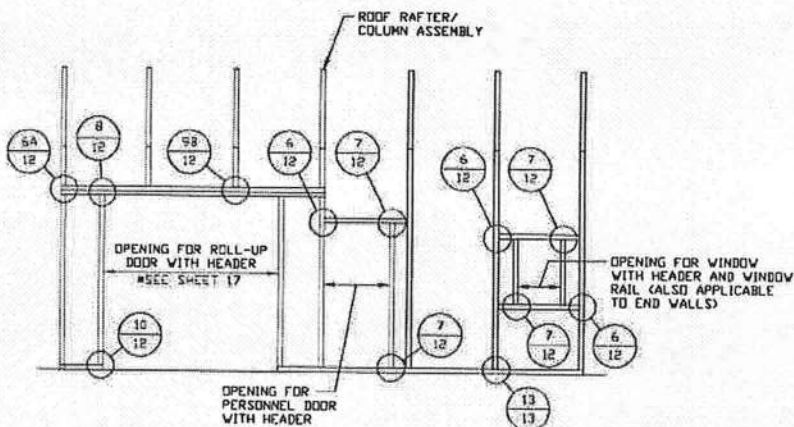
SEE NOTES  
(SHEET 3)  
FOR MAXIMUM  
SPACING



SCALE: NTS



SCALE: NTS



SCALE: NTS

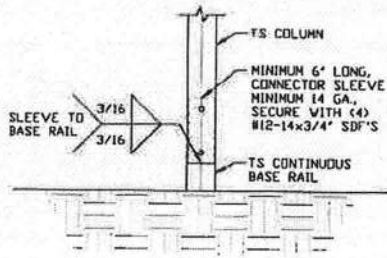


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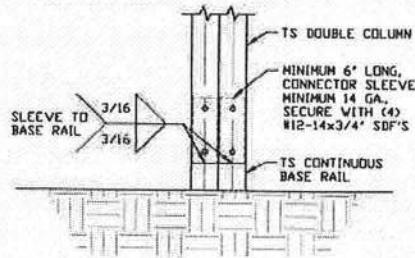
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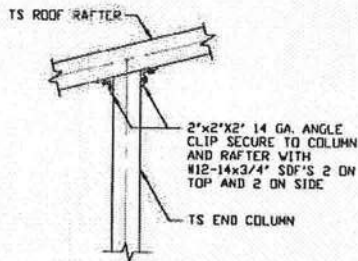
## CONNECTION DETAILS



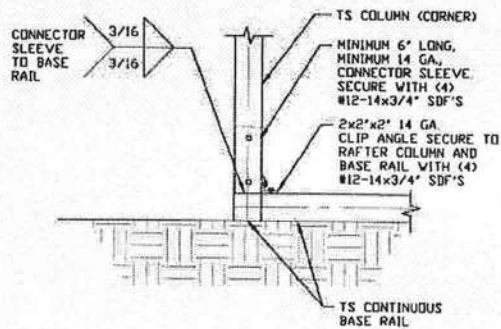
**3** **RAFTER COLUMN/BASE  
RAIL CONNECTION DETAIL**  
SCALE: NTS



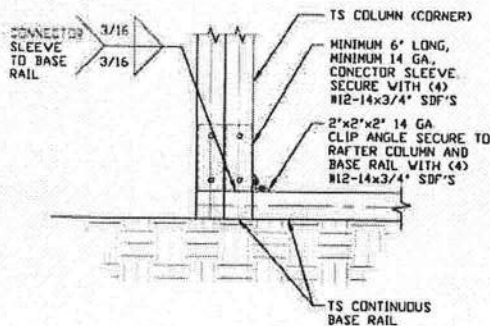
**3A** **RAFTER COLUMN/BASE  
RAIL CONNECTION DETAIL**  
SCALE: NTS



**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



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**CLIENT: USA STEEL**

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210 AIRPORT ROAD  
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30'-0" x 16'-0" SP ENCLOSED STRUCTURE**

**DATE: 4-21-21**

**SHT. 11**

**SCALE: NTS**

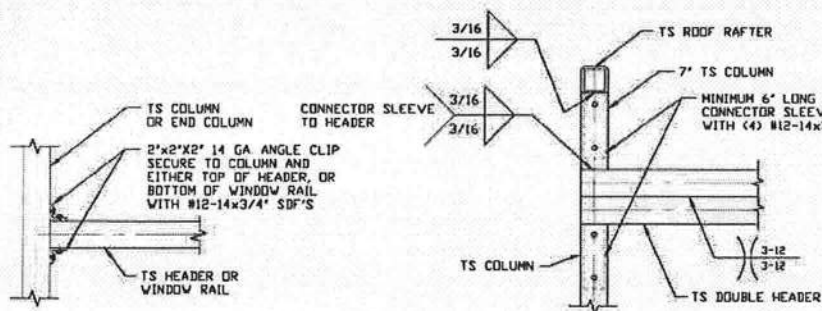
**DWG. NO: SK-3**

**JOB NO: 16220S/  
18104S/21013S**

**REV: 3**

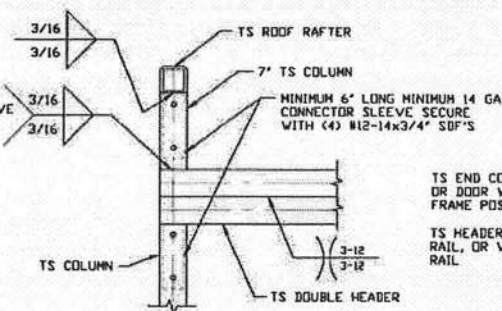
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## CONNECTION DETAILS



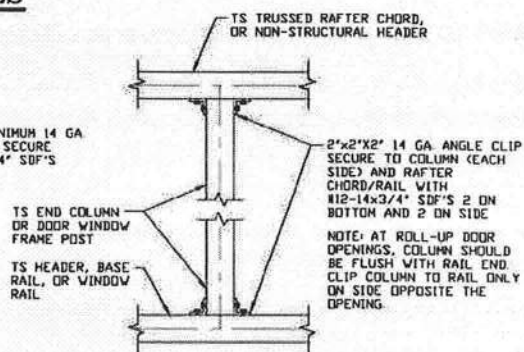
**6** COLUMN TO WINDOW RAIL OR TS GIRT CONNECTION DETAIL

SCALE: NTS



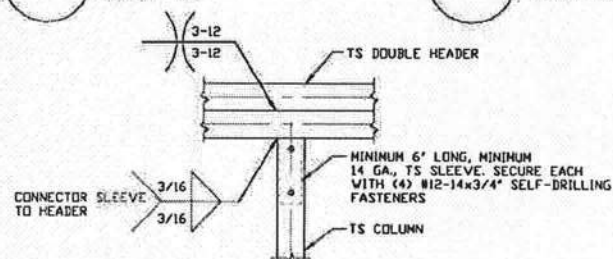
**6A** DOUBLE HEADER TO COLUMN CONNECTION DETAIL

SCALE: NTS



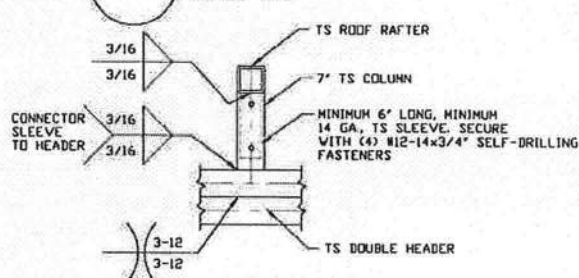
**7** COLUMN TO WINDOW RAIL CONNECTION DETAIL

SCALE: NTS



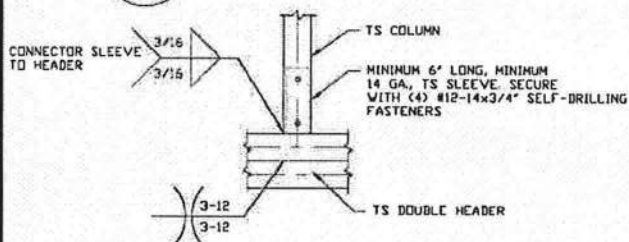
**8** DOUBLE HEADER/COLUMN CONNECTION DETAIL

SCALE: NTS



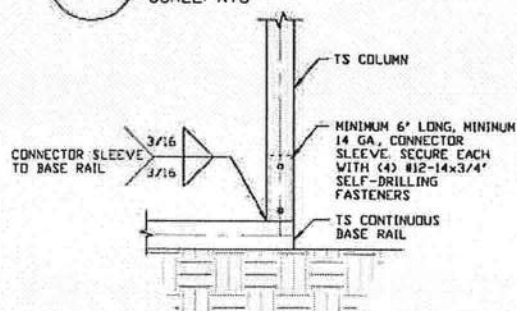
**9A** COLUMN/DOUBLE HEADER CONNECTION DETAIL

SCALE: NTS



**9B** COLUMN/DOUBLE HEADER CONNECTION DETAIL

SCALE: NTS



**10** COLUMN/BASE RAIL CONNECTION DETAIL

SCALE: NTS



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**PROJECT MGR: VSM**

**CLIENT: USA STEEL**

**USA STEEL BUILDINGS**  
210 AIRPORT ROAD  
MOUNT AIRY, NC 27030  
30'-0"x16'-0" SP ENCLOSED STRUCTURE

**DATE: 4-21-21**

**SHT. 12**

**SCALE: NTS**

**DWG. NO. SK-3**

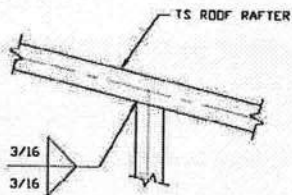
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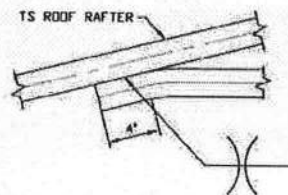
## CONNECTION DETAILS



11

### RAFTER TO CHORD CONNECTION DETAIL

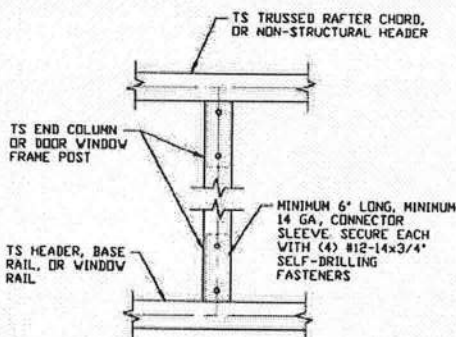
SCALE: NTS



12

### COLLAR TIE CONNECTION DETAIL

SCALE: NTS



13

### COLUMN TO HEADER OR BASE RAIL CONNECTION DETAIL

SCALE: NTS



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USA STEEL BUILDINGS  
210 AIRPORT ROAD  
MOUNT AIRY, NC 27030

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

DATE: 4-21-21

SCALE: NTS

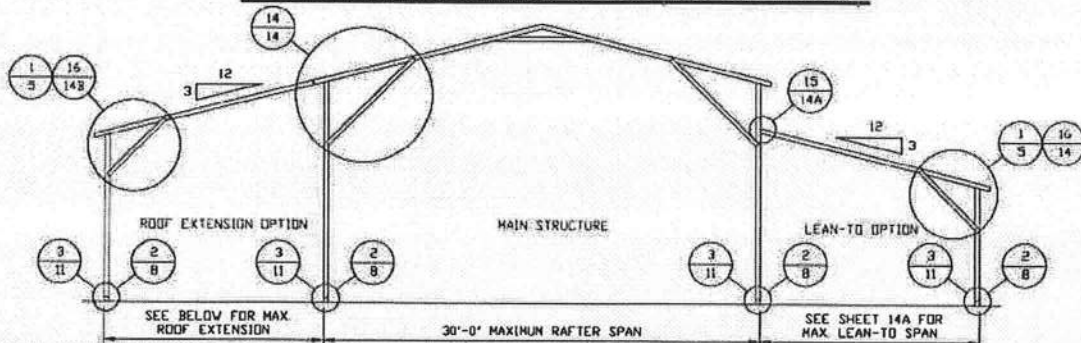
DWG. NO: SK-3

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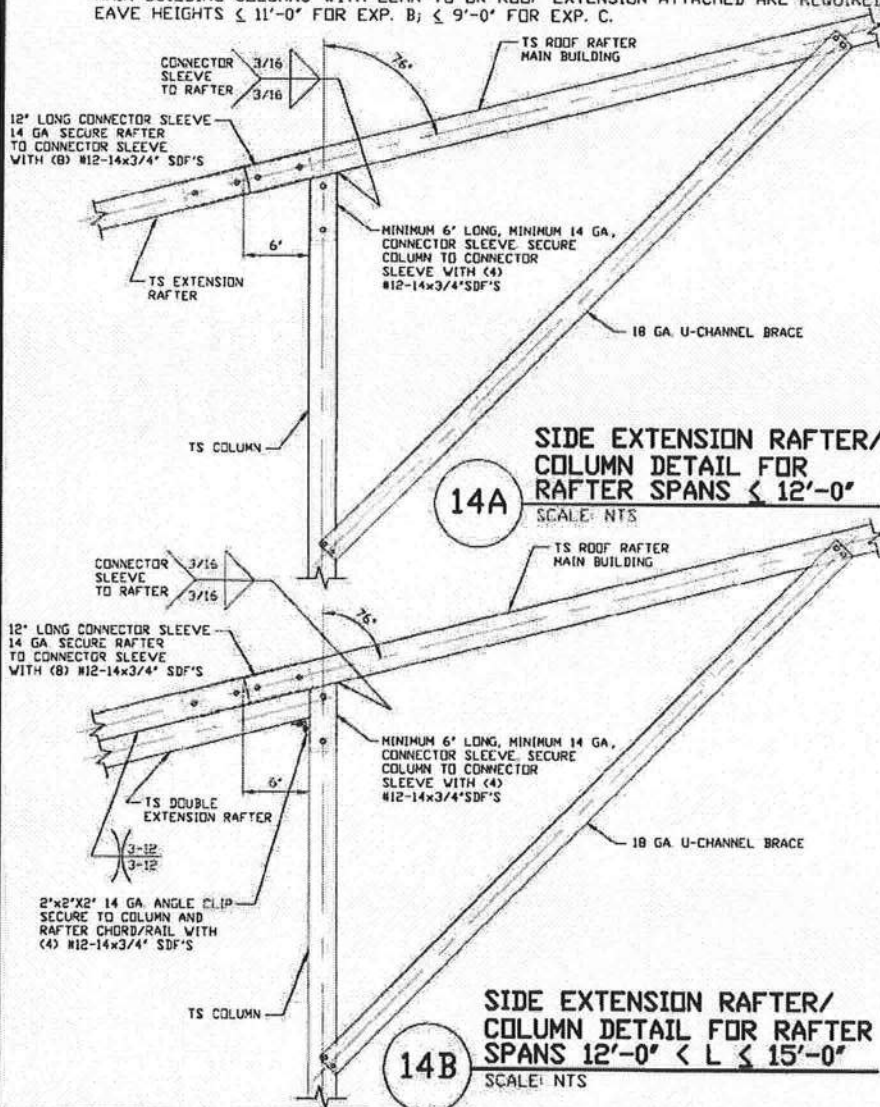
## BOX EAVE RAFTER LEAN-TO OPTIONS



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

SCALE: NTS

MAXIMUM WIDTH OF SINGLE MEMBER (RAFTER AND COLUMN) ROOF EXTENSION AND LEAN-TO IS 12'-0".  
 MAXIMUM WIDTH OF DOUBLE MEMBER (RAFTER AND COLUMN) ROOF EXTENSION AND LEAN-TO IS 15'-0".  
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE DOUBLE COLUMNS FOR  
 EAVE HEIGHTS 13'-0" < TO ≤ 16'-0" FOR EXP. B; 12'-0" < TO ≤ 16'-0" FOR EXP. C.  
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSIONS ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS WITH  
 INSERTS FOR EAVE HEIGHTS 11'-0" TO ≤ 13'-0" FOR EXP. B; 9'-0" < TO ≤ 12'-0" FOR EXP. C.  
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR  
 EAVE HEIGHTS ≤ 11'-0" FOR EXP. B; ≤ 9'-0" FOR EXP. C.



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CLIENT: USA STEEL

USA STEEL BUILDINGS  
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MOUNT AIRY, NC 27030  
30'-0"x16'-0" SP ENCLOSED STRUCTURE

DATE: 4-21-21

SHT. 14

SCALE: NTS

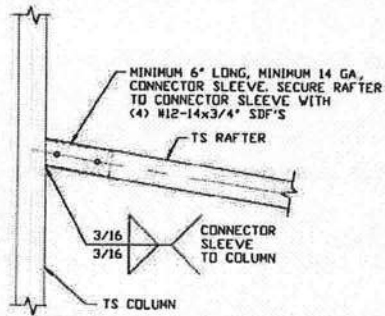
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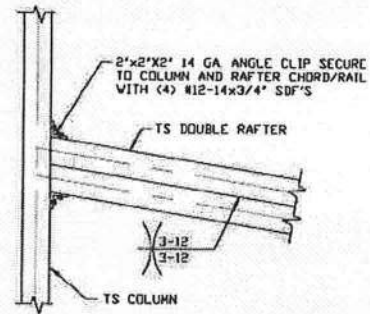
## BOX EAVE RAFTER LEAN-TO OPTIONS



15A

**LEAN-TO RAFTER TO RAFTER  
COLUMN CONNECTION DETAIL  
FOR RAFTER SPANS  $\leq 12'-0''$**   
SCALE: NTS

NOTE: ROOF PITCH OF 2:12 TO 1:12 ARE  
ADEQUATE FOR LEAN-TO RAFTER



15B

**LEAN-TO RAFTER TO RAFTER  
COLUMN CONNECTION DETAIL  
FOR RAFTER SPANS  $12'-0'' < L \leq 15'-0''$**   
SCALE: NTS

NOTE: ROOF PITCH OF 2:12 TO 1:12 ARE  
ADEQUATE FOR LEAN-TO RAFTER



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**CLIENT: USA STEEL**

**USA STEEL BUILDINGS  
210 AIRPORT ROAD  
MOUNT AIRY, NC 27030  
30'-0" x 16'-0" SP ENCLOSED STRUCTURE**

**DATE: 4-21-21**

**SHT. 14A**

**SCALE: NTS**

**DWG. NO: SK-3**

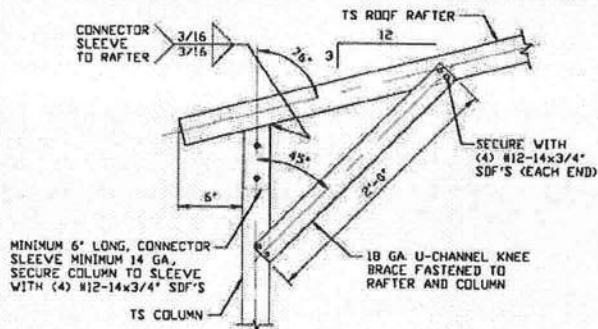
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## BOX EAVE RAFTER LEAN-TO OPTIONS

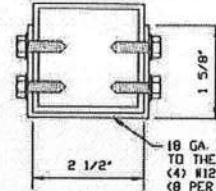


16

### **BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS $\leq 14'-0"$**

SCALE: NTS

HORSE BARN OPTION (REQUIRES A LEAN-TO ON BOTH  
SIDES OF THE MAIN BUILDING.)



### **BRACE SECTION**

SCALE: NTS



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210 AIRPORT ROAD  
MOUNT AIRY, NC 27030  
30'-0"x16'-0" SP ENCLOSED STRUCTURE**

**DATE: 4-21-21**

**SHT. 14B**

**SCALE: NTS**

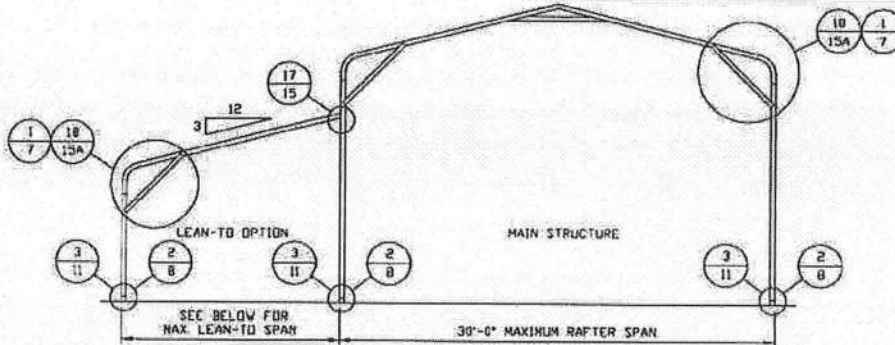
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## BOW EAVE RAFTER LEAN-TO OPTION

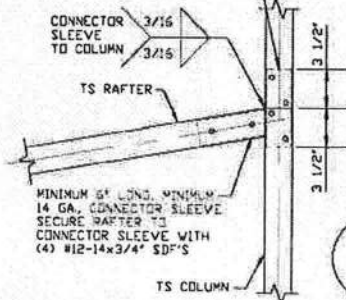


### TYPICAL BOW RAFTER LEAN-TO OPTION FRAMING SECTION

SCALE: NTS

MAXIMUM WIDTH OF SINGLE MEMBER (RAFTER AND COLUMN) ROOF EXTENSION AND LEAN-TO IS 12'-0".  
 MAXIMUM WIDTH OF DOUBLE MEMBER (RAFTER AND COLUMN) ROOF EXTENSION AND LEAN-TO IS 15'-0".  
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE DOUBLE COLUMNS FOR  
 EAVE HEIGHTS 13'-0" < TO ≤ 16'-0" FOR EXP. B; 12'-0" < TO ≤ 16'-0" FOR EXP. C.  
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSIONS ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS WITH  
 INSERTS FOR EAVE HEIGHTS 11'-0" TO ≤ 13'-0" FOR EXP. B; 9'-0" < TO ≤ 12'-0" FOR EXP. C.  
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR  
 EAVE HEIGHTS ≤ 11'-0" FOR EXP. B; ≤ 9'-0" FOR EXP. C.

MINIMUM 7' LONG, MINIMUM 14 GA. CONNECTOR SLEEVE SECURE ROOF RAFTER AND COLUMN TO CONNECTOR WITH (8) #12-14x3/4" SDF'S



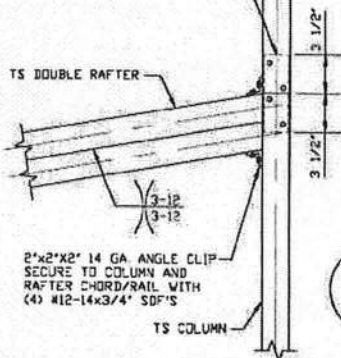
17A

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

SCALE: NTS

NOTE: ROOF PITCH OF 2:12 TO 1:12 ARE ADEQUATE FOR LEAN-TO RAFTER

MINIMUM 7' LONG, MINIMUM 14 GA. CONNECTOR SLEEVE SECURE ROOF RAFTER AND COLUMN TO CONNECTOR WITH (8) #12-14x3/4" SDF'S



17B

#### LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR RAFTER SPANS 12'-0" < L ≤ 15'-0"

SCALE: NTS

NOTE: ROOF PITCH OF 2:12 TO 1:12 ARE ADEQUATE FOR LEAN-TO RAFTER



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**PROJECT MGR: VSM**

**CLIENT: USA STEEL**

USA STEEL BUILDINGS  
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30'-0"x16'-0" SP ENCLOSED STRUCTURE

**DATE: 4-21-21**

**SHT. 15**

**SCALE: NTS**

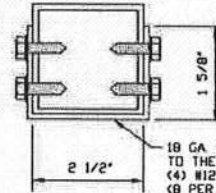
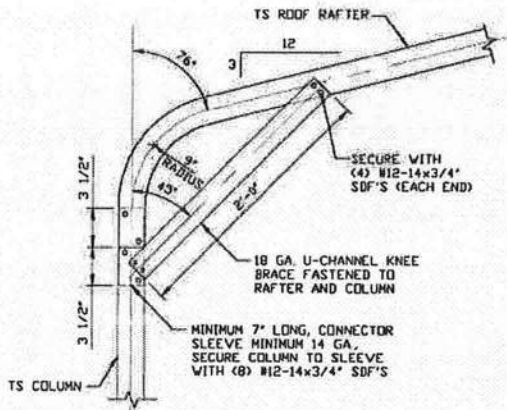
**DWG. NO: SK-3**

**JOB NO: 16220S/  
18104S/21015S**

**REV: 3**

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## BOW EAVE RAFTER LEAN-TO OPTIONS



### BRACE SECTION

SCALE: NTS

18

### BOW EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS ≤ 14'-0"

SCALE: NTS

HORSE BARN OPTION (REQUIRES A LEAN-TO ON BOTH SIDES OF THE MAIN BUILDING.)



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SHT. 15A

SCALE: NTS

DWG. NO. SK-3

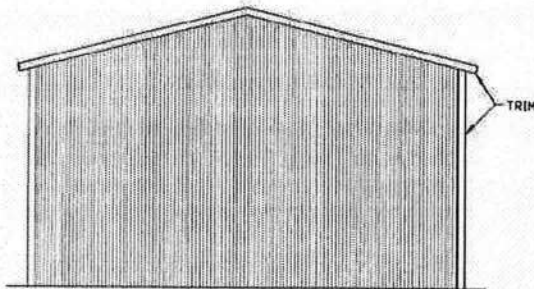
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18104S/E1015S

REV. 3

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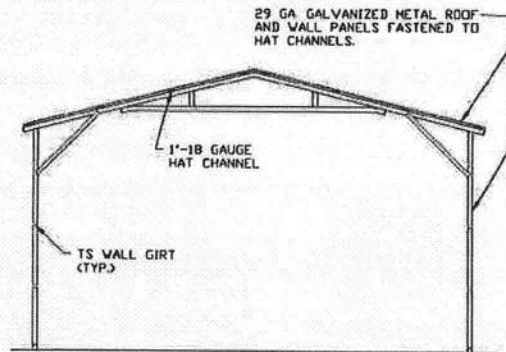


## BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



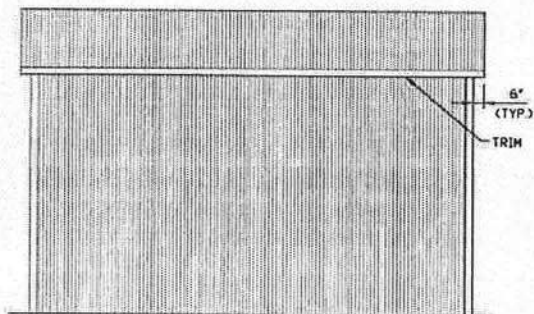
**TYPICAL END ELEVATION  
VERTICAL ROOF/SIDING**

SCALE: NTS



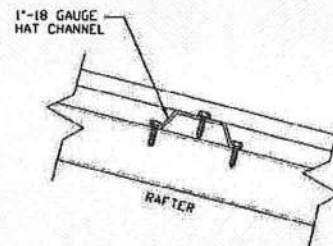
**TYPICAL SECTION VERTICAL  
ROOF/SIDING OPTION**

SCALE: NTS



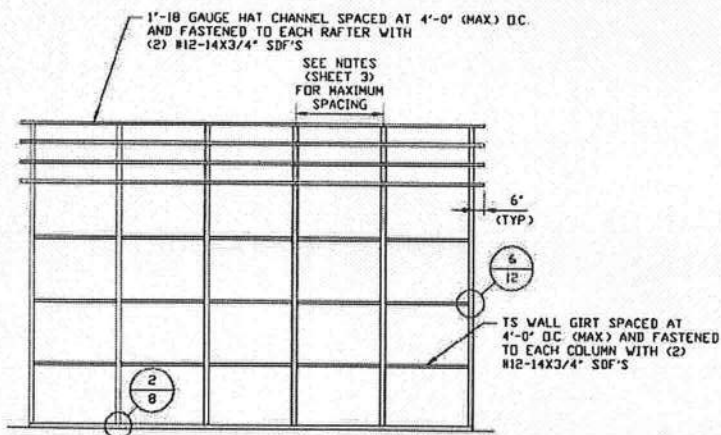
**TYPICAL SIDE ELEVATION  
VERTICAL ROOF/SIDING**

SCALE: NTS



**PANEL ATTACHMENT**

(ALTERNATE FOR VERTICAL ROOF PANELS)  
SCALE: NTS



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

SCALE: NTS

NOTE: 1\"/>



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**DRAWN BY: AT**

**CHECKED BY: PDH**

**PROJECT MGR: VSH**

**CLIENT: USA STEEL**

USA STEEL BUILDINGS  
210 AIRPORT ROAD  
MOUNT AIRY, NC 27030  
30'-0" x 16'-0" SP ENCLOSED STRUCTURE

**DATE: 4-21-21**

**SHT. 16**

**SCALE: NTS**

**DWG. NO: SK-3**

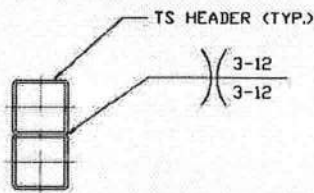
**JOB NO: 16220S/  
18104S/21015S**

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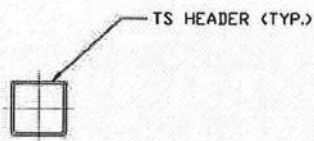
## HEADER OPTIONS FOR WIND SPEEDS 141 MPH < TO ≤ 170 MPH

### SIDEWALL HEADER OPTIONS



#### HEADER DETAIL FOR 10'-0" < LENGTHS ≤ 12'-0"

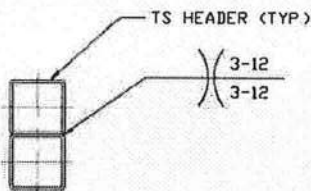
SCALE: NTS



#### HEADER DETAIL ≤ 10'-0"

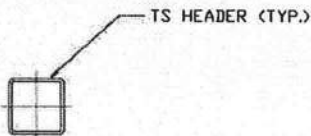
SCALE: NTS

### ENDWALL HEADER OPTIONS



#### HEADER DETAIL FOR 13'-0" < LENGTHS ≤ 20'-0"

SCALE: NTS



#### HEADER DETAIL ≤ 13'-0"

SCALE: NTS



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**PROJECT MGR: VSM**

**CLIENT: USA STEEL**

**USA STEEL BUILDINGS**

**210 AIRPORT ROAD**

**MOUNT AIRY, NC 27030**

**30'-0"x16'-0" SP ENCLOSED STRUCTURE**

**DATE: 4-21-21**

**SHT. 17**

**SCALE: NTS**

**DWG. NO. SK-3**

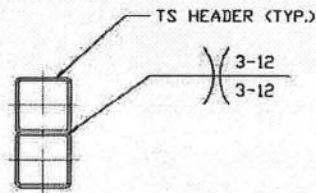
**JOB NO. 162203/  
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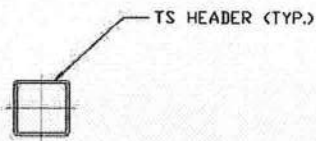
## HEADER OPTIONS FOR WIND SPEEDS $\leq 140$ MPH

### SIDEWALL HEADER OPTIONS



#### HEADER DETAIL FOR $10'-0'' < \text{LENGTHS} \leq 16'-0''$

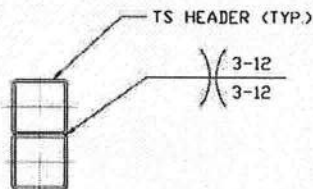
SCALE: NTS



#### HEADER DETAIL $\leq 10'-0''$

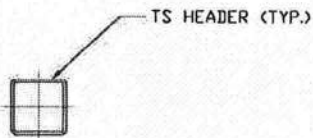
SCALE: NTS

### ENDWALL HEADER OPTIONS



#### HEADER DETAIL FOR $13'-0'' < \text{LENGTHS} \leq 20'-0''$

SCALE: NTS



#### HEADER DETAIL $\leq 13'-0''$

SCALE: NTS



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USA STEEL BUILDINGS  
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MOUNT AIRY, NC 27030  
30'-0" x 16'-0" SP ENCLOSED STRUCTURE

DATE: 4-21-21

SHT. 17A

SCALE: NTS

DWG. NO SK-3

JOB NO: 16220S/  
18104S/21015S

REV: 3

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