

## **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**



**MOORE AND ASSOCIATES  
ENGINEERING AND CONSULTING**



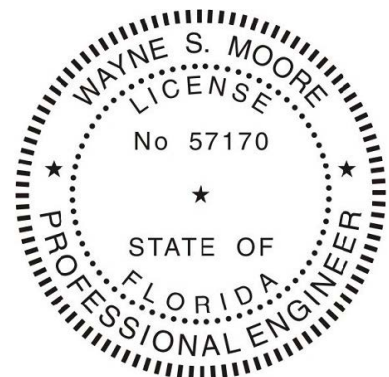
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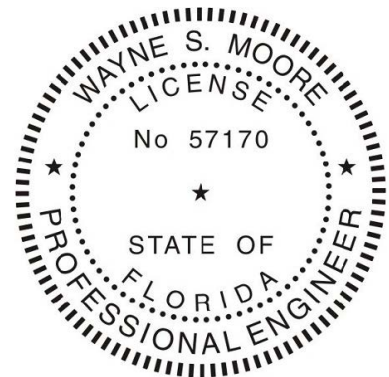
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<b>MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.</b>	DRAWN BY: AT	<b>USA STEEL BUILDINGS</b> 210 AIRPORT ROAD MOUNT AIRY, NC 27030 30'-0"x16'-0" SP ENCLOSED STRUCTURE			
	CHECKED BY: PDH				
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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

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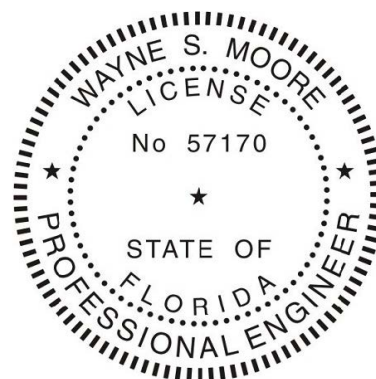
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	CLIENT: USA STEEL	SHT. 2A	DWG. NO: SK-3	REV: 3	

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## 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 ≤ 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       $I_E = 1.0$   
 $S_{DS} = 2.039$        $V = C_{SW}$   
 $S_{DI} = 1.258$



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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/21015S**

**SHT. 3**

**DWG. NO: SK-3**

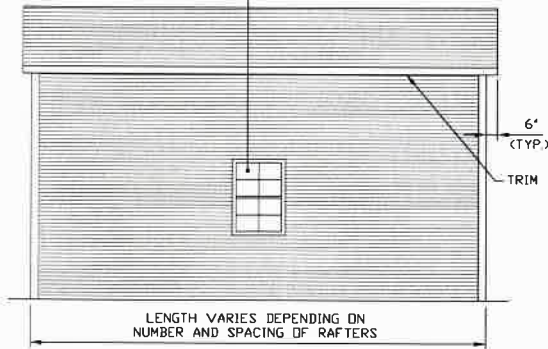
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## BOX EAVE FRAME RAFTER STRUCTURE

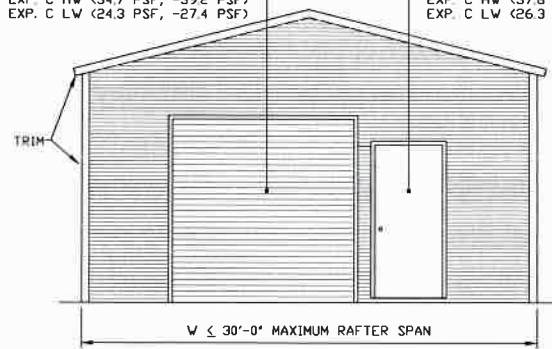
WINDOW (AS APPLICABLE)  
DESIGN PRESSURE  
EXP. B HW (27.0 PSF, -28.1 PSF)  
EXP. B LW (18.1 PSF, -19.6 PSF)  
EXP. C HW (39.4 PSF, -41.0 PSF)  
EXP. C LW (27.5 PSF, -29.8 PSF)



**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)

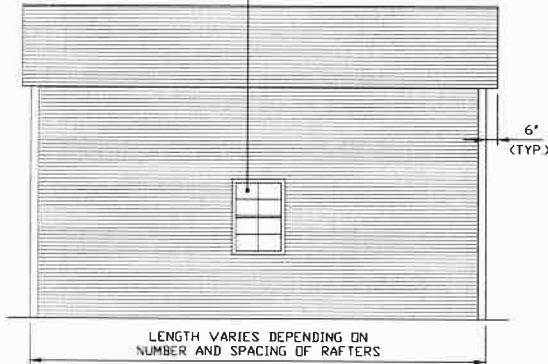


**TYPICAL END ELEVATION**

SCALE: NTS

## BOW FRAME RAFTER STRUCTURE

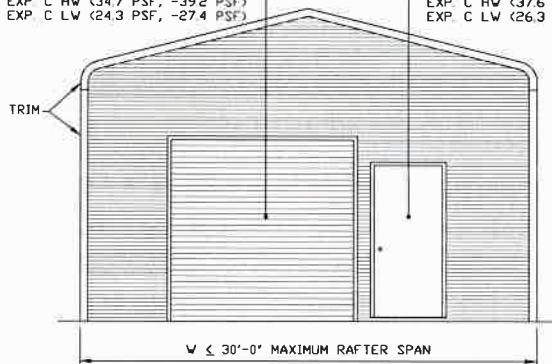
WINDOW (AS APPLICABLE)  
DESIGN PRESSURE  
EXP. B HW (27.0 PSF, -28.1 PSF)  
EXP. B LW (18.1 PSF, -19.6 PSF)  
EXP. C HW (39.4 PSF, -41.0 PSF)  
EXP. C LW (27.5 PSF, -29.8 PSF)



**TYPICAL SIDE ELEVATION**

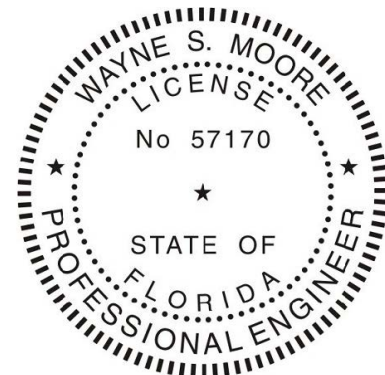
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ROLL-UP DOOR  
(AS APPLICABLE)  
DESIGN PRESSURE  
EXP. B HW (27.6 PSF, -31.2 PSF)  
EXP. B LW (18.5 PSF, -20.9 PSF)  
EXP. C HW (34.7 PSF, -39.2 PSF)  
EXP. C LW (24.3 PSF, -27.4 PSF)



**TYPICAL END ELEVATION**

SCALE: NTS



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**PROJECT MGR: WSH**

**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. 3A**

**SCALE: NTS**

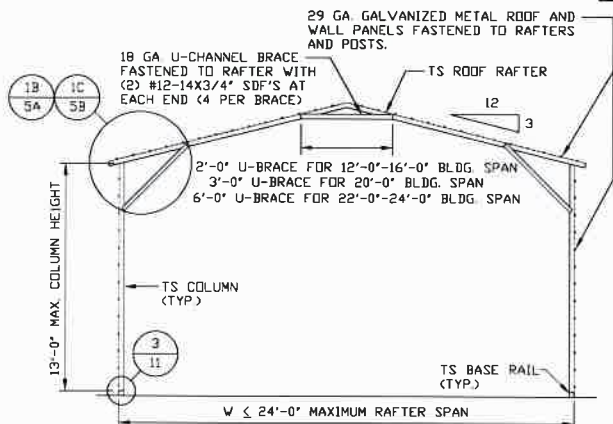
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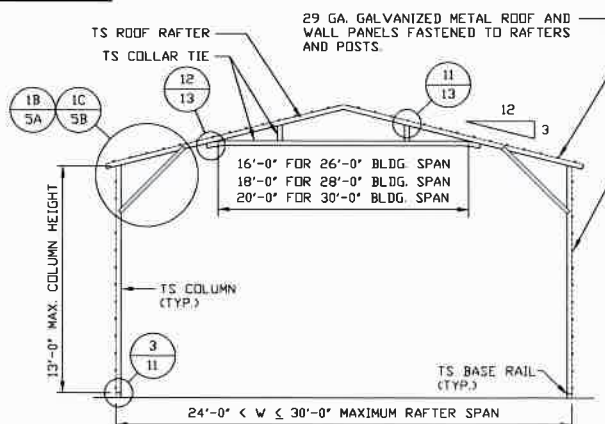
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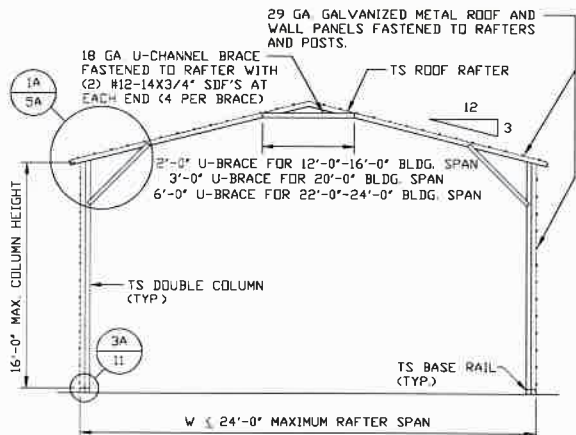
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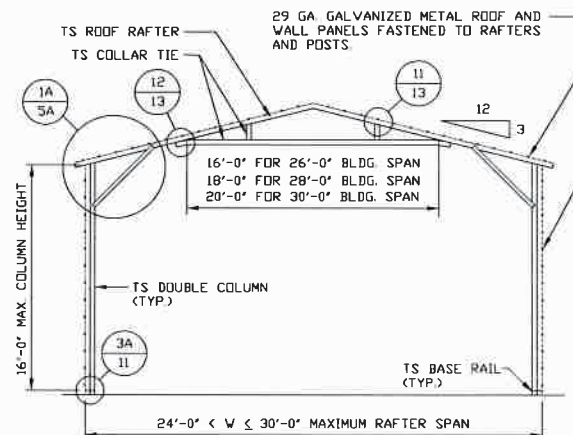
**TYPICAL RAFTER/COLUMN END FRAME SECTION**  
SCALE: NTS



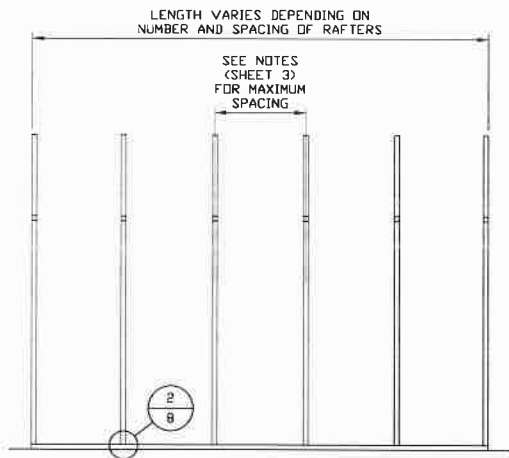
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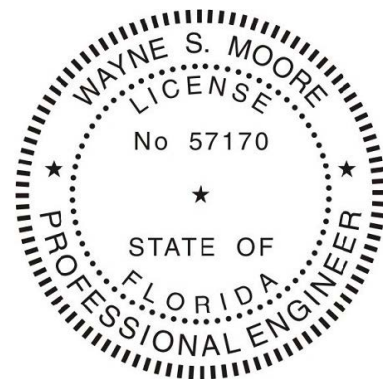
**TYPICAL RAFTER/COLUMN END FRAME SECTION**  
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**TYPICAL RAFTER/COLUMN END FRAME SECTION**  
SCALE: NTS



**TYPICAL RAFTER/COLUMN SIDE FRAMING 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. 4**

**SCALE: NTS**

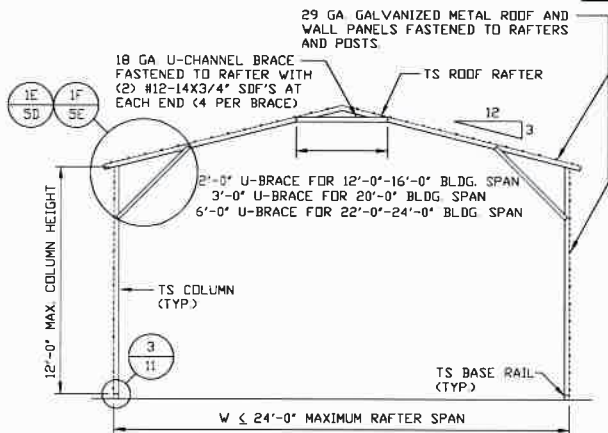
**DWG. NO: SK-3**

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

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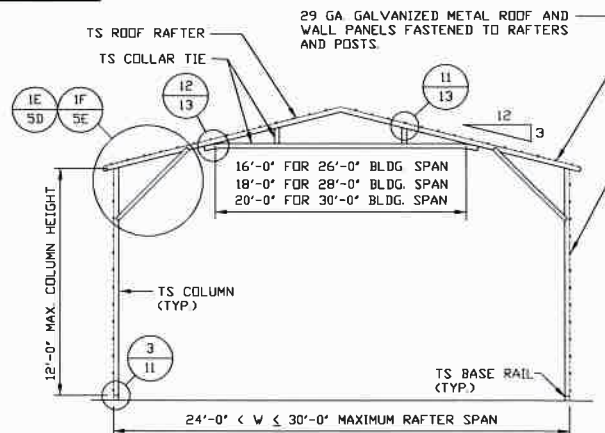
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## EXPOSURE C



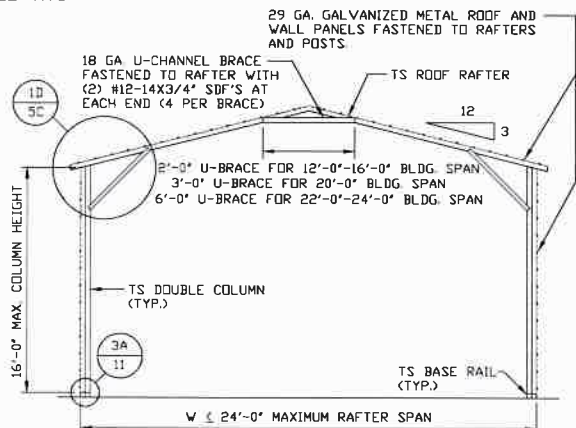
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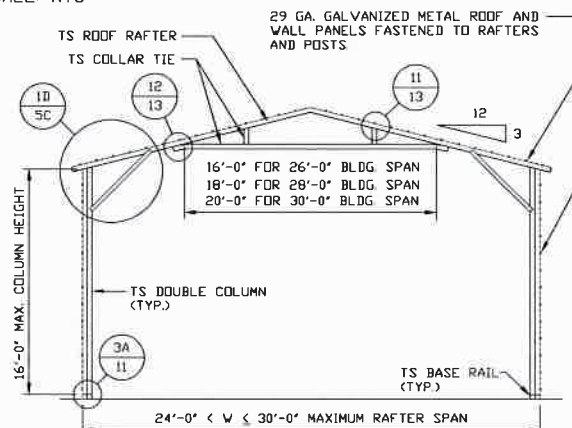
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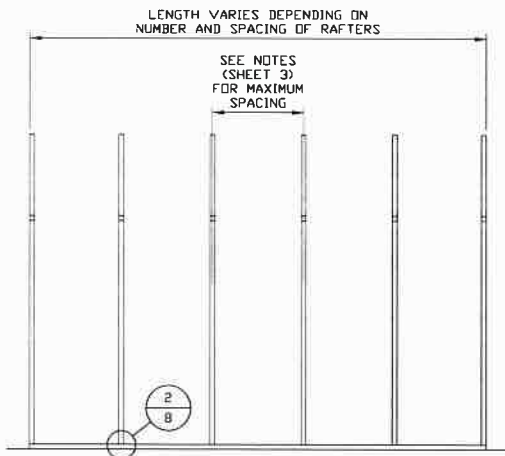
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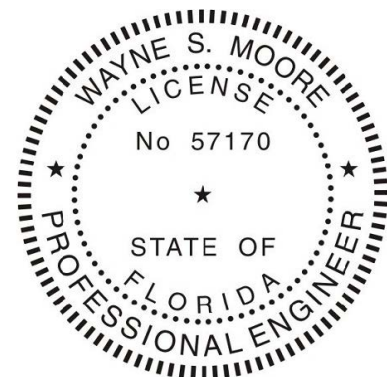
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**TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION**

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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. 4A**

**SCALE: NTS**

**DWG. NO: SK-3**

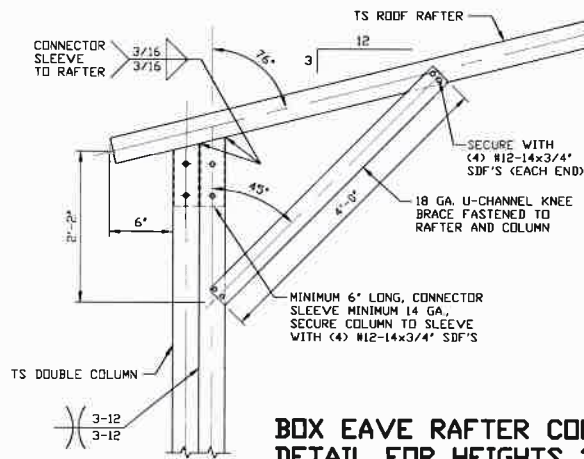
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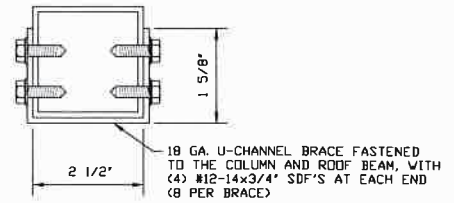


## EXPOSURE B



1A

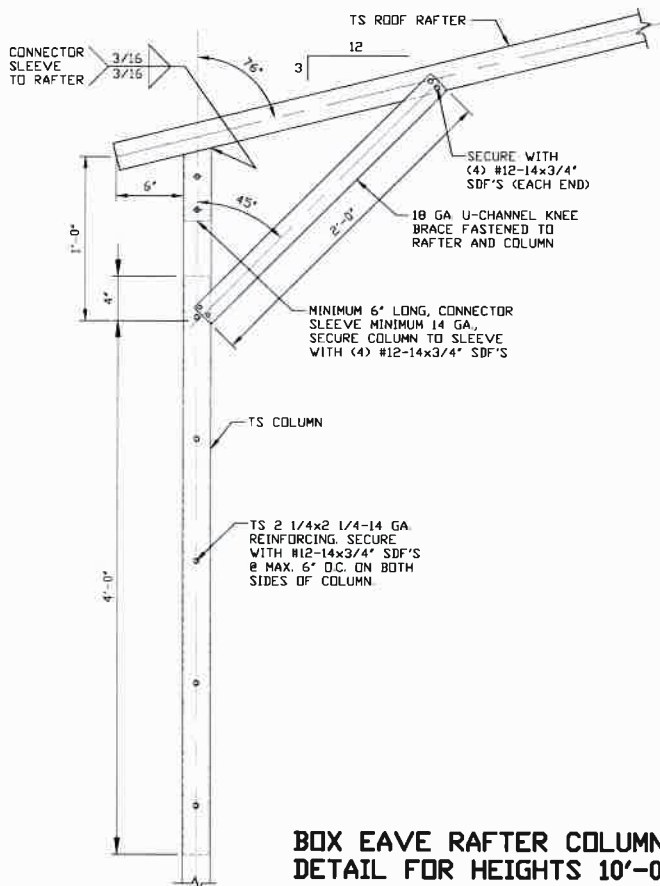
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### BRACE SECTION

SCALE: NTS

**BOX 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**



1B

SCALE: NTS

**BOX 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**



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**SHT. 5A**

**SCALE: NTS**

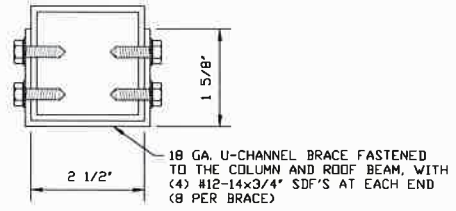
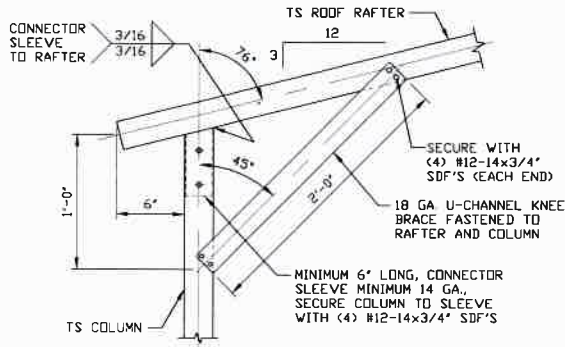
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**JOB NO. 16220S/  
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## EXPOSURE B



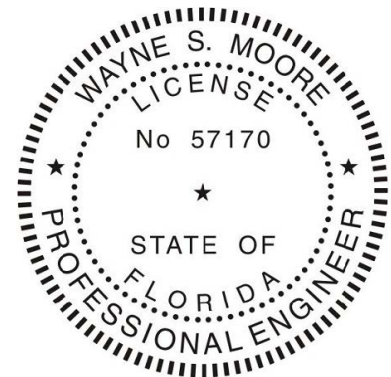
**BRACE SECTION**

SCALE: NTS

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

1C

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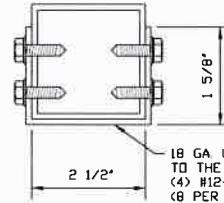
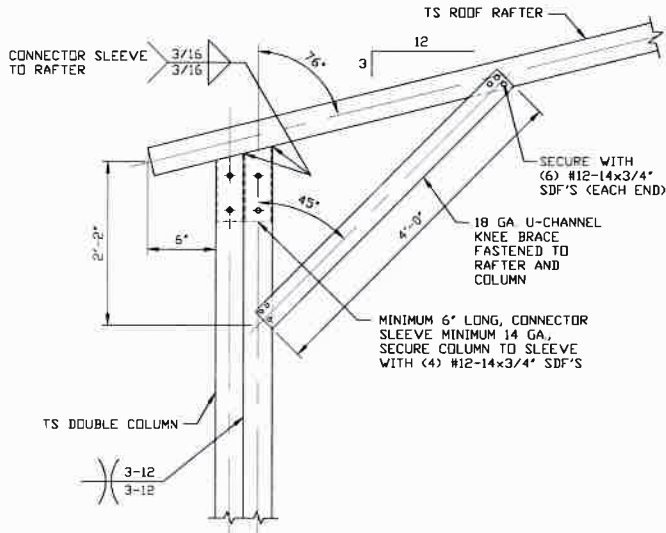
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## EXPOSURE C



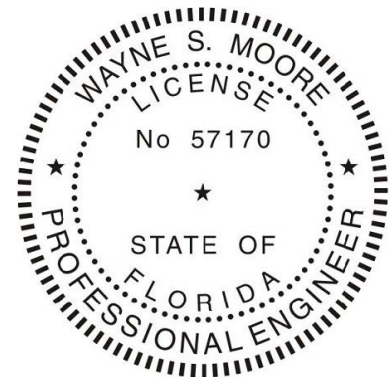
**BRACE SECTION**

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**

SCALE: NTS



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**CHECKED BY: PDH**

**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**

**SCALE: NTS**

**SHT. 5C**

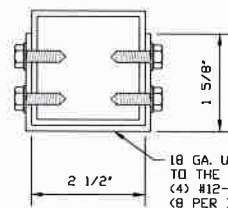
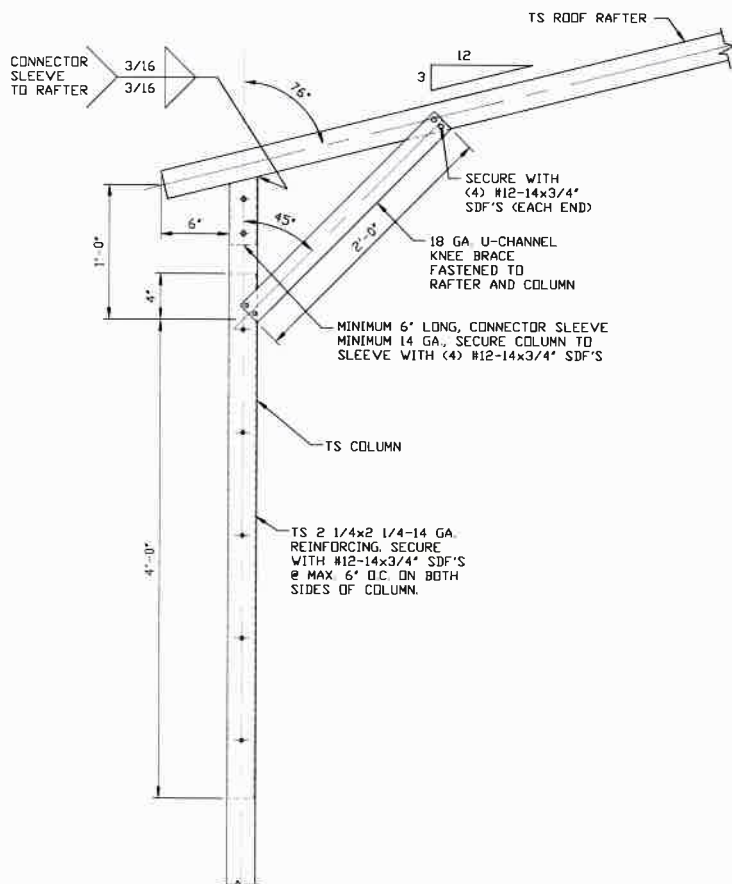
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**JOB NO: 16220S/  
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## EXPOSURE C



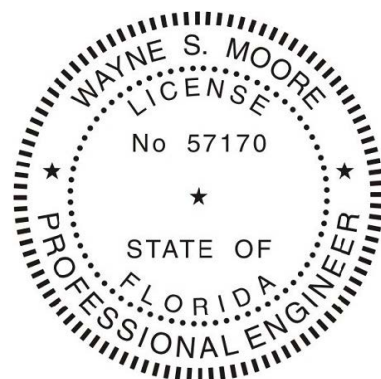
### BRACE SECTION

SCALE: NTS

**BOX EAVE RAFTER COLUMN CONNECTION  
DETAIL FOR HEIGHTS 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**

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**SHT. 5D**

**SCALE: NTS**

**DWG. NO: SK-3**

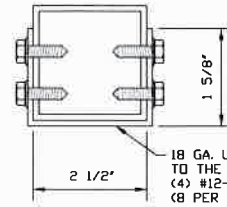
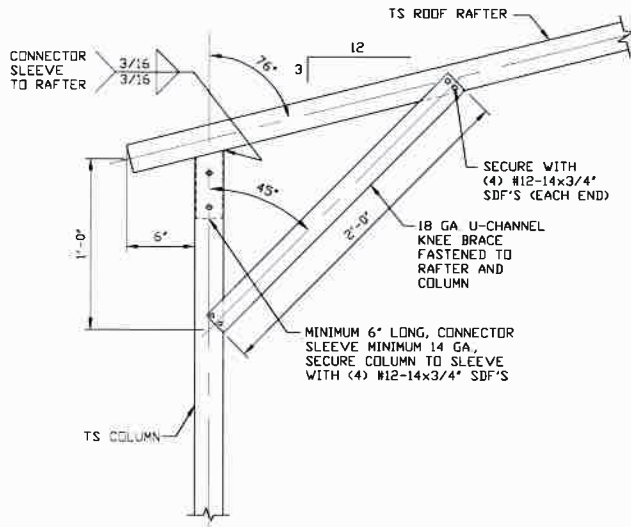
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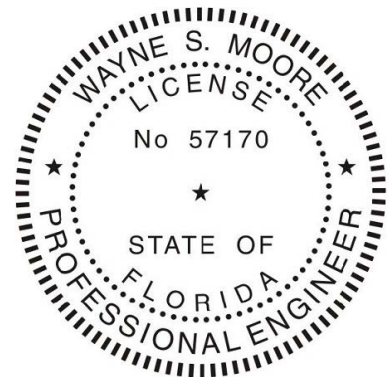


**BRACE SECTION**  
SCALE: NTS

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WIND SPEEDS  $\leq 140$  MPH**

**1F**

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**SHT. 5E**

**SCALE: NTS**

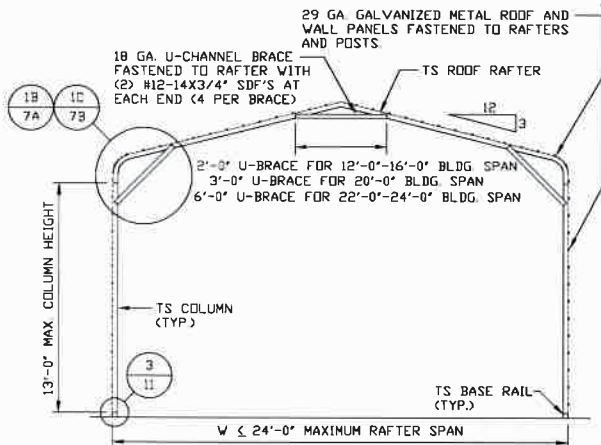
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**REV: 3**

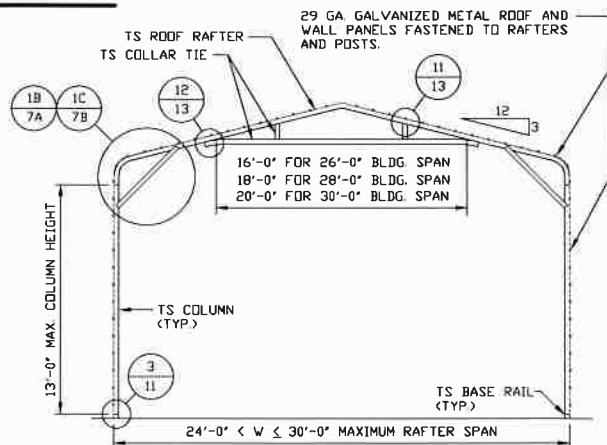
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## EXPOSURE B



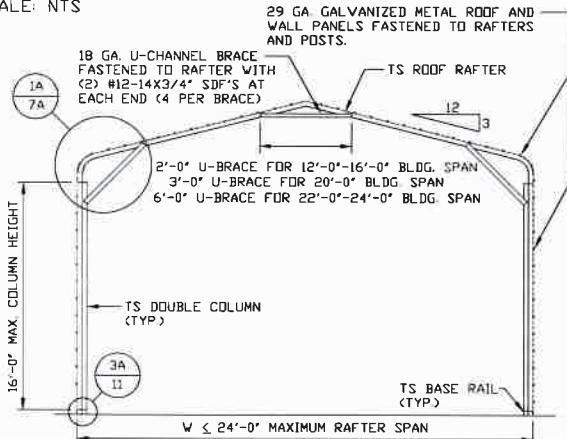
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SCALE: NTS



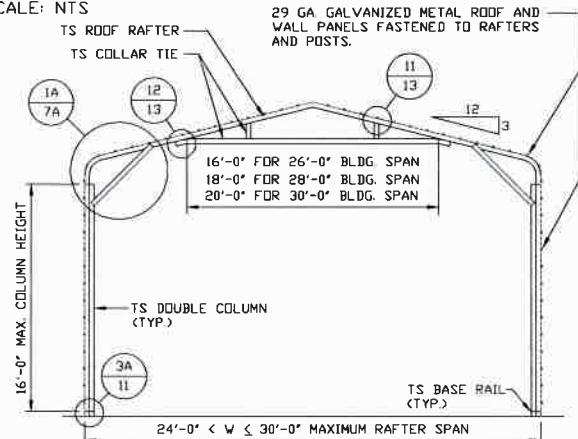
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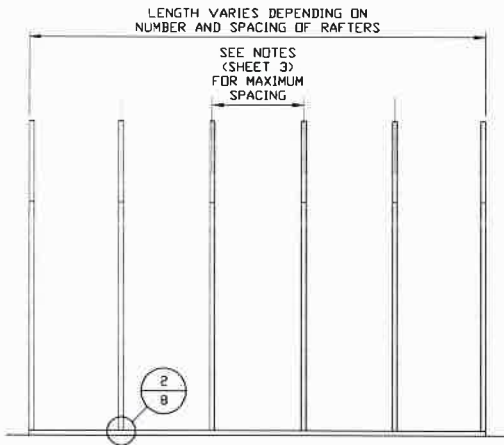
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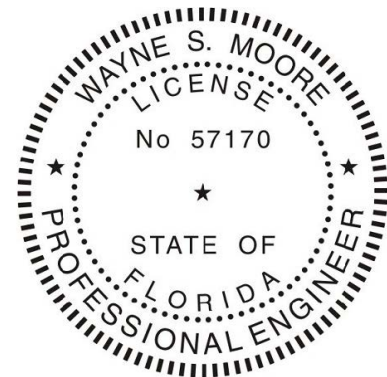
**TYPICAL RAFTER/COLUMN END FRAME SECTION**

SCALE: NTS



**TYPICAL RAFTER/COLUMN FRAMING SIDE SECTION**

SCALE: NTS



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**PROJECT MGR: WSH**

**CLIENT: USA STEEL**

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**DATE: 4-21-21**

**SHT. 6**

**SCALE: NTS**

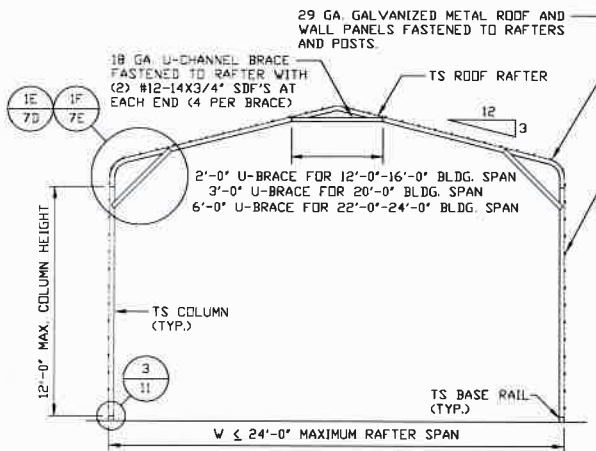
**DWG. NO: SK-3**

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

**REV: 3**

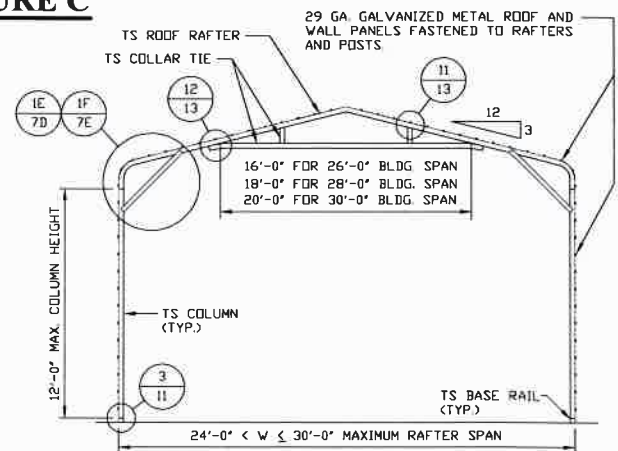
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## EXPOSURE C



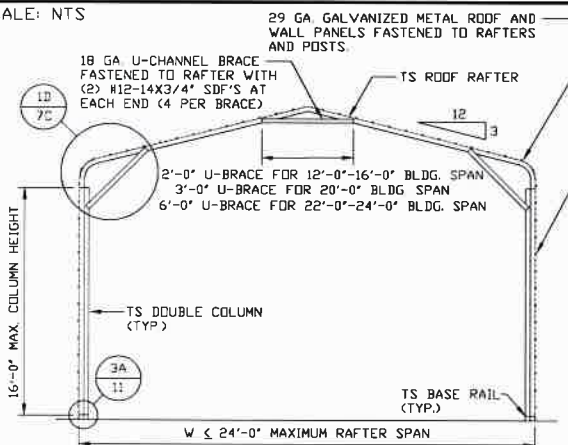
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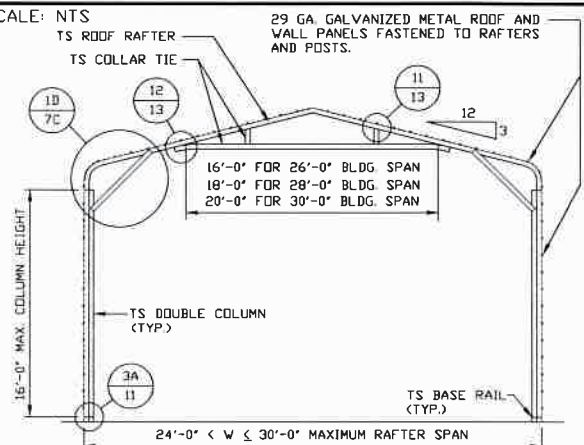
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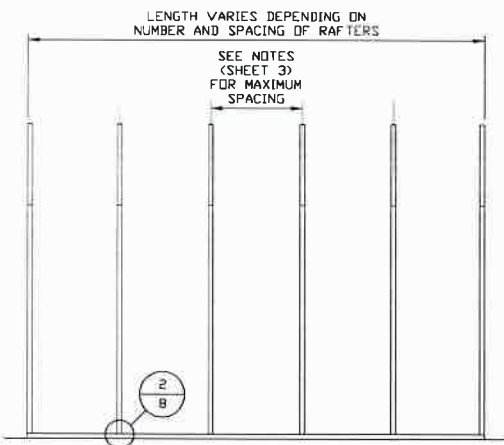
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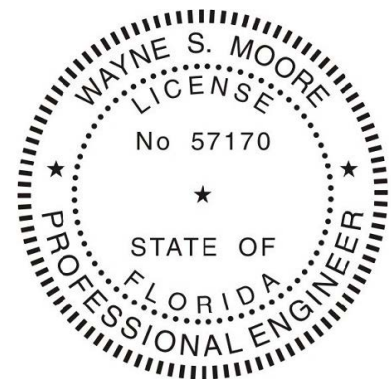
**TYPICAL RAFTER/COLUMN END FRAME SECTION**

SCALE: NTS



**TYPICAL RAFTER/COLUMN FRAMING SIDE SECTION**

SCALE: NTS



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**PROJECT MGR: WSM**

**CLIENT: USA STEEL**

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**DATE: 4-21-21**

**SHT. 6A**

**SCALE: NTS**

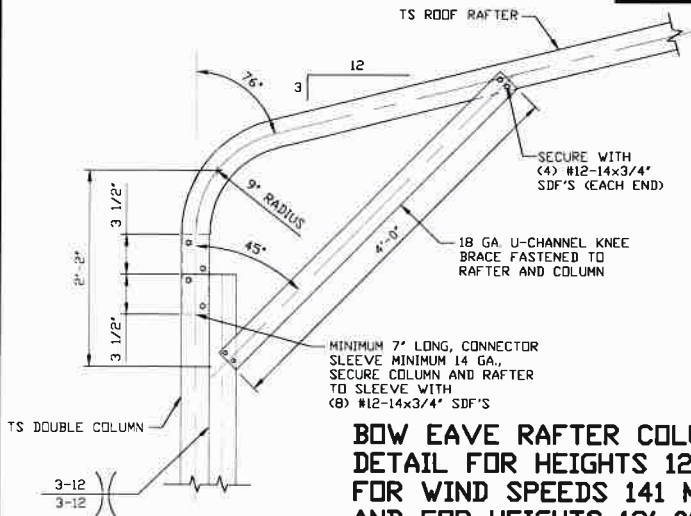
**DWG. NO: SK-3**

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

**REV: 3**

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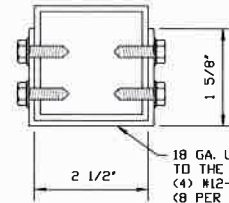
## EXPOSURE B



**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**

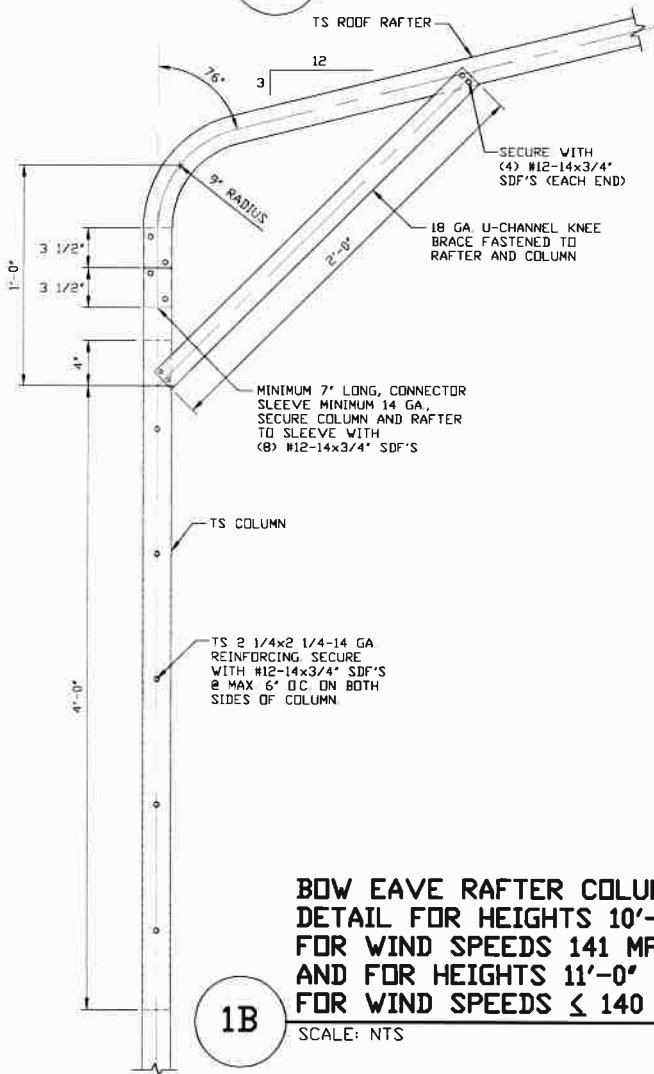
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SCALE: NTS



**BRACE SECTION**

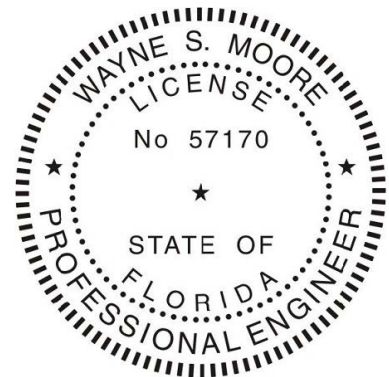
SCALE: NTS



**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

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**SHT. 7A**

**SCALE: NTS**

**DWG. NO: SK-3**

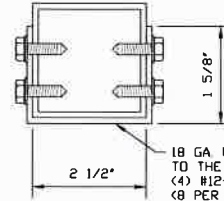
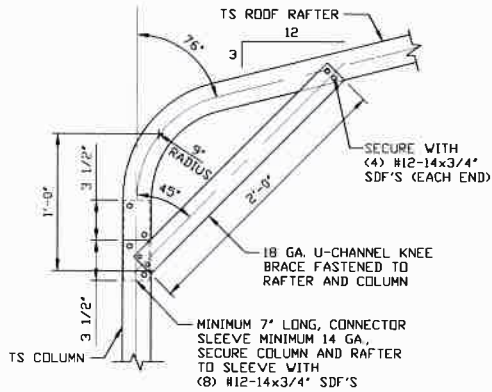
**JOB NO: 16220S/  
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## EXPOSURE B



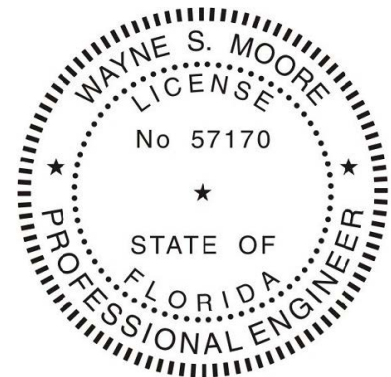
### BRACE SECTION

SCALE: NTS

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

1C

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**CLIENT: USA STEEL**

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**SHT. 7B**

**SCALE: NTS**

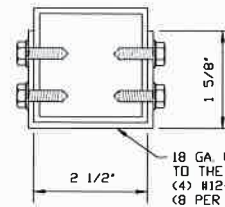
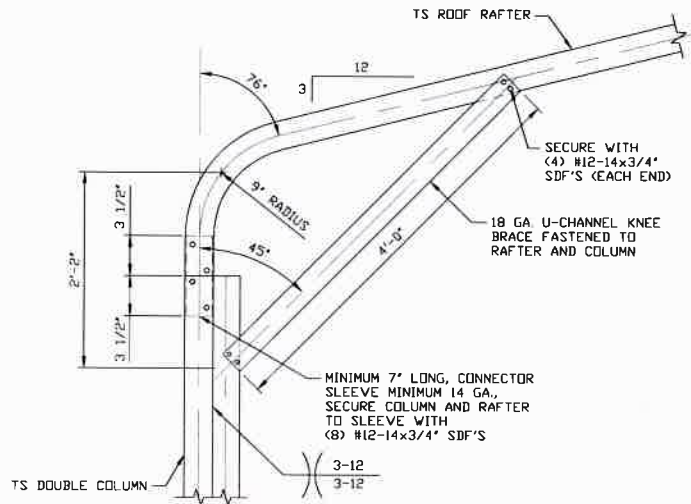
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## EXPOSURE C



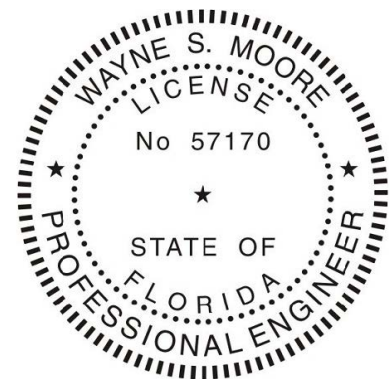
### BRACE SECTION

SCALE: NTS

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

**1D**

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**SHT. 7C**

**SCALE: NTS**

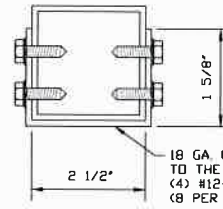
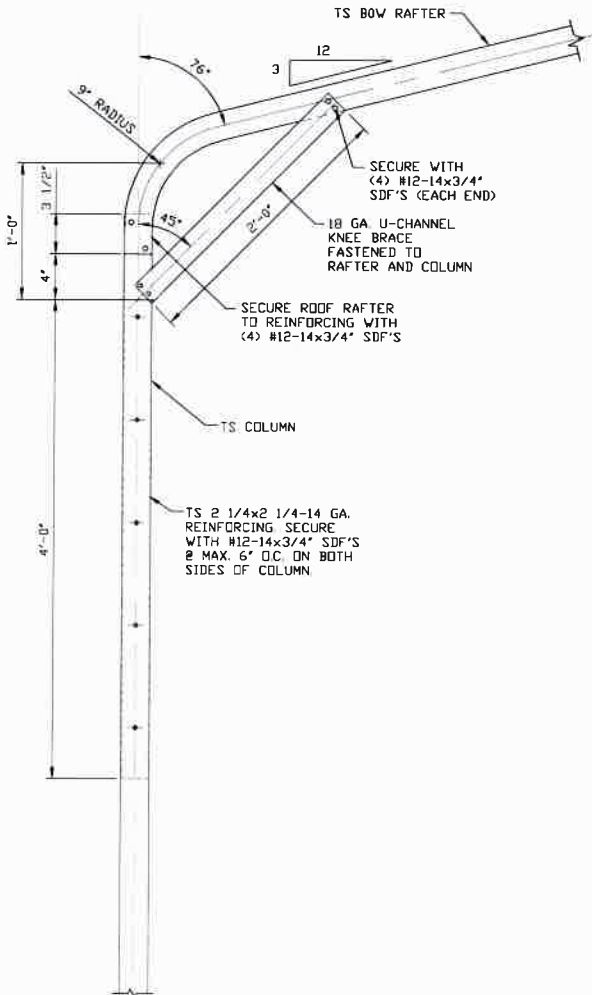
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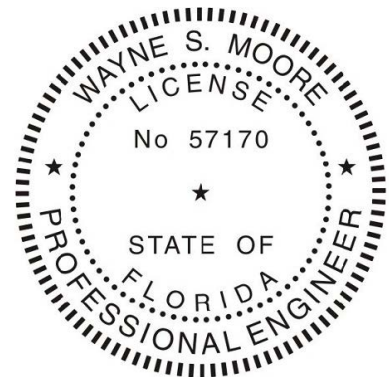


**BRACE SECTION**  
SCALE: NTS

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1E

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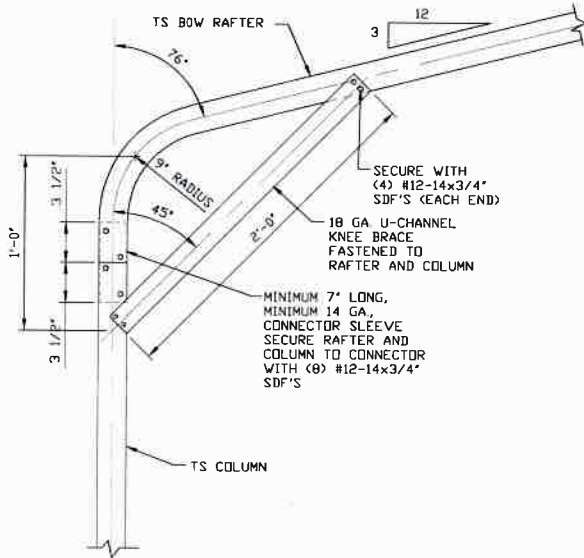
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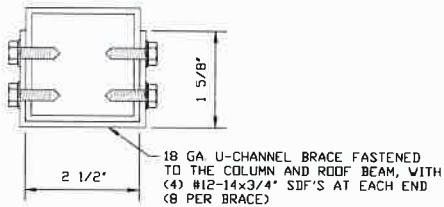
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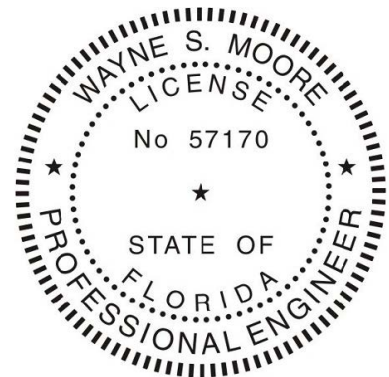
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**BRACE SECTION**

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**SCALE: NTS**

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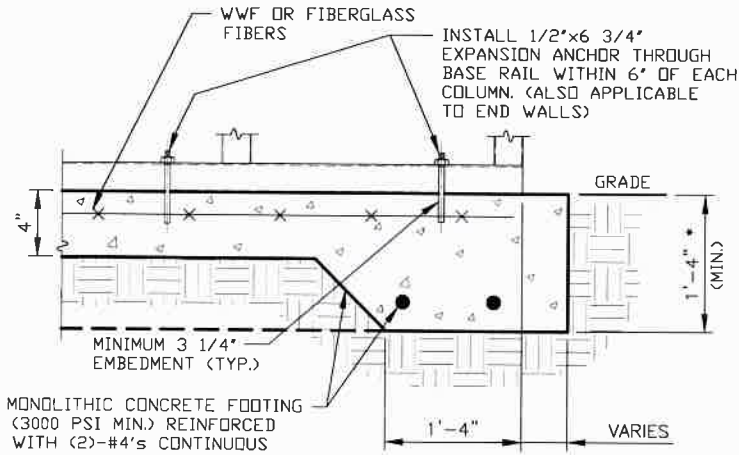
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# BASE RAIL ANCHORAGE OPTIONS FOR WIND SPEEDS 141 MPH < TO ≤ 170 MPH



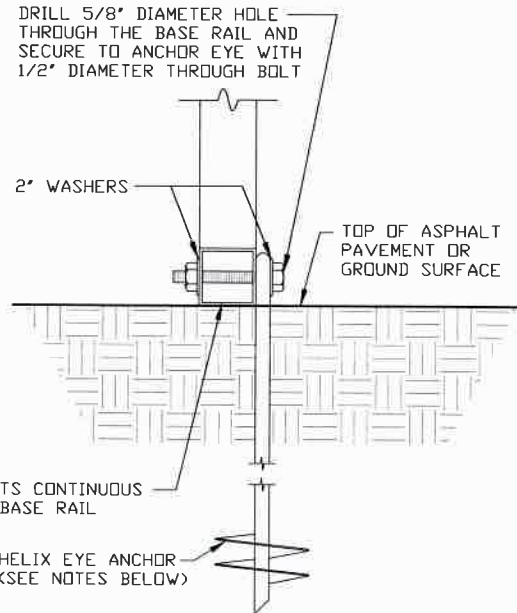
2A

## 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:

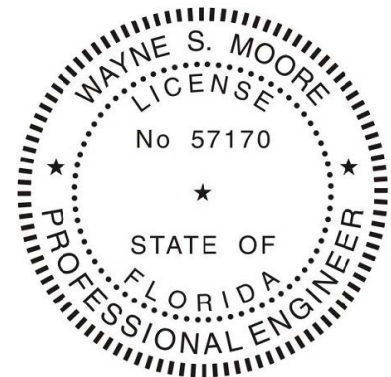
THE TURNDOWN REINFORCING STEEL SHALL BE ASTM A615 GRADE  
60 THE SLAB REINFORCEMENT SHALL BE WELDED WIRE FABRIC  
MEETING ASTM A185 OR FIBERGLASS FIBER REINFORCEMENT.

### 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: 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. 8**

**SCALE: NTS**

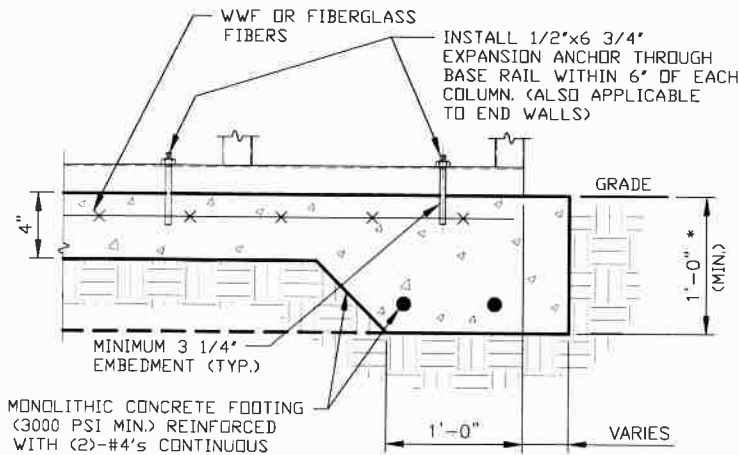
**DWG. NO: SK-3**

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

**REV: 3**

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



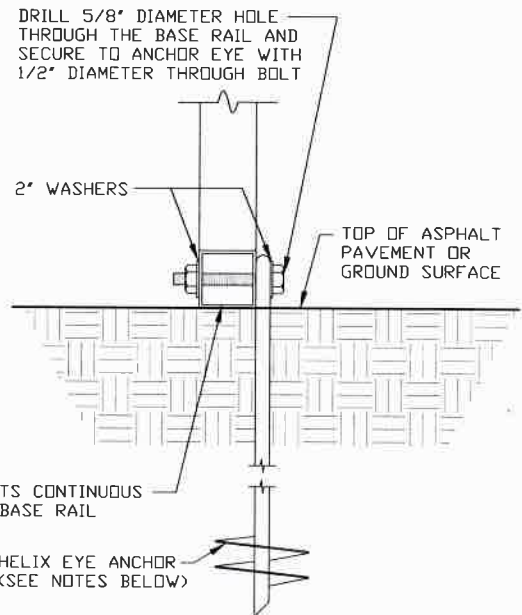
2A

### 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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**PROJECT MGR: WSH**

**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. 8A**

**SCALE: NTS**

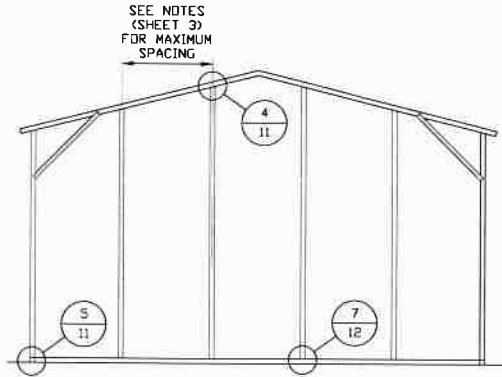
**DWG. NO. SK-3**

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

**REV. 3**

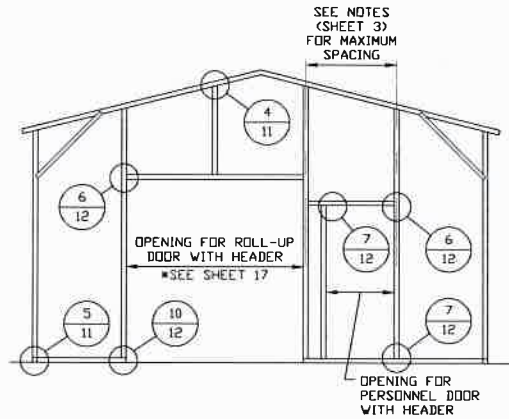
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## BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS



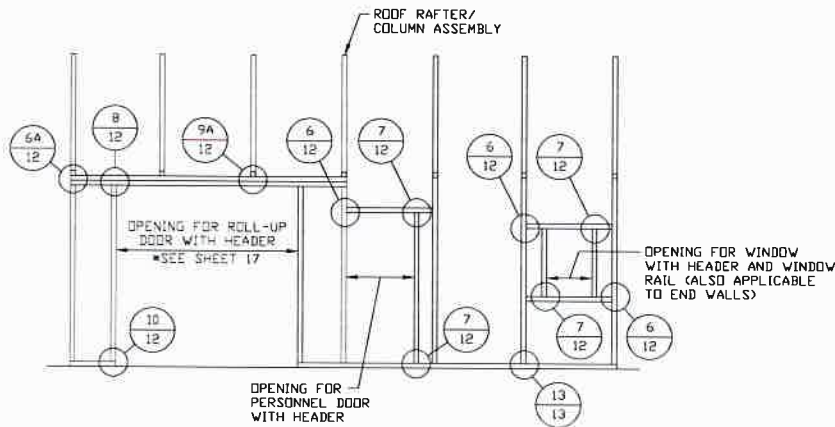
**TYPICAL BOX EAVE RAFTER  
END WALL FRAMING SECTION**

SCALE: NTS



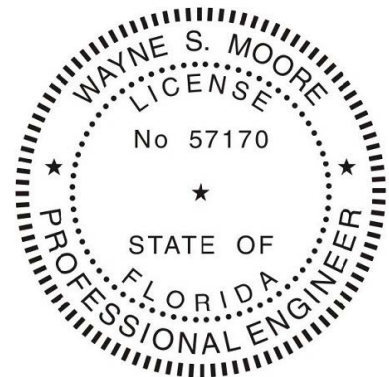
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WALL OPENINGS FRAMING SECTION**

SCALE: NTS



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

SCALE: NTS



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MOUNT AIRY, NC 27030  
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**DATE: 4-21-21**

**SHT. 9**

**SCALE: NTS**

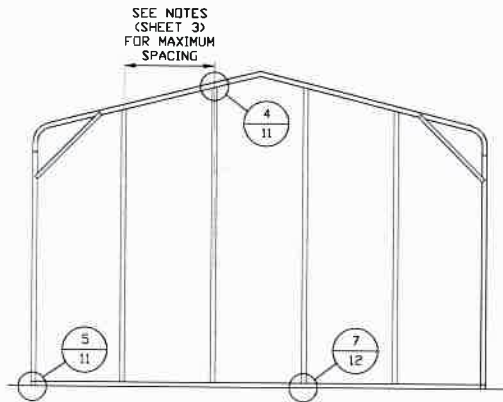
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**JOB NO: 16220S/  
18104S/21015S**

**REV: 3**

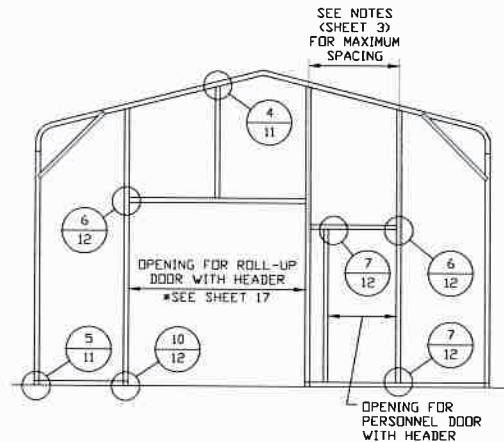
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## BOW EAVE RAFTER END WALL AND SIDE WALL OPENINGS



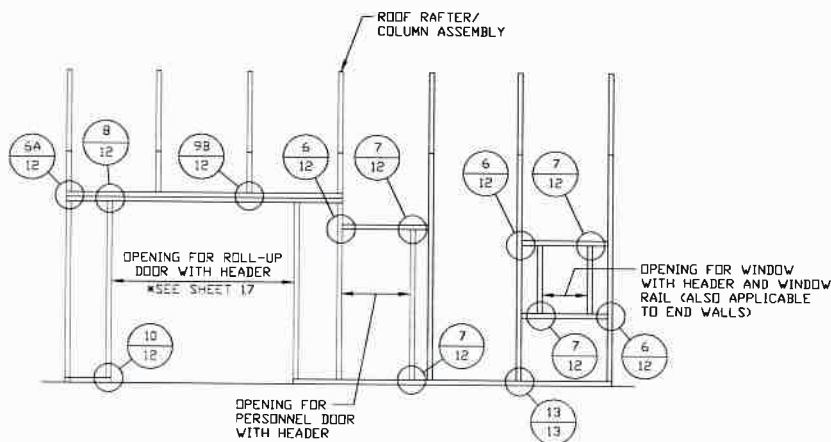
**TYPICAL BOW RAFTER  
END WALL FRAMING SECTION**

SCALE: NTS



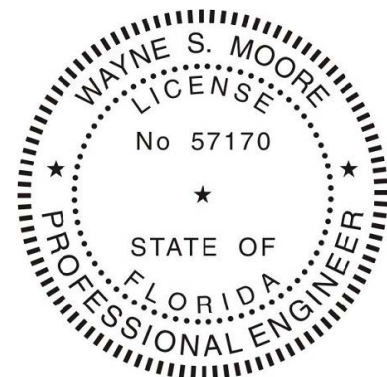
**TYPICAL BOW RAFTER END  
WALL OPENINGS FRAMING SECTION**

SCALE: NTS



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

SCALE: NTS



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**SHT. 10**

**SCALE: NTS**

**DWG. NO: SK-3**

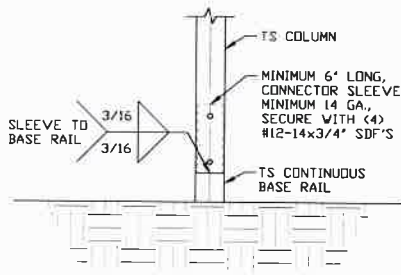
**JOB NO: 16220S/  
18104S/21015S**

**REV: 3**

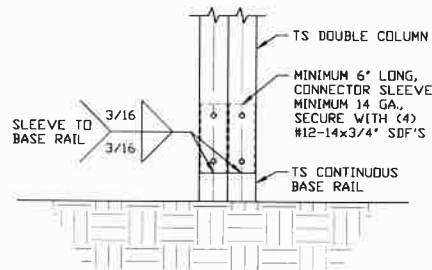
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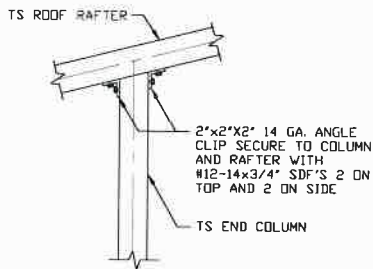
## CONNECTION DETAILS



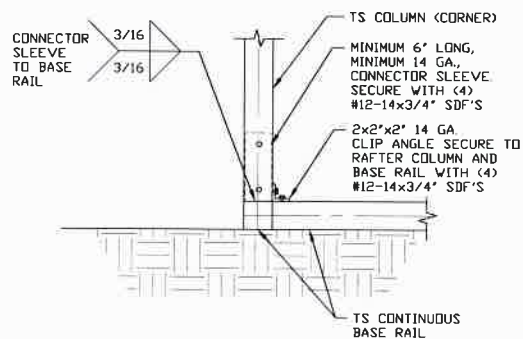
**3** **RAFTER COLUMN/BASE  
RAIL CONNECTION DETAIL**  
SCALE: NTS



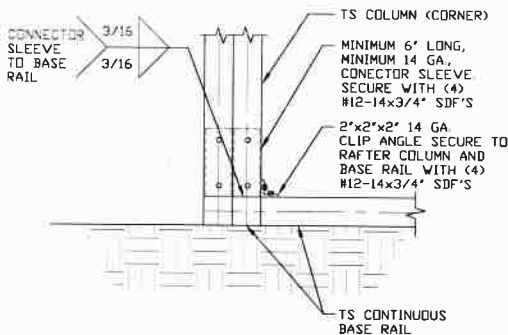
**3A** **RAFTER COLUMN/BASE  
RAIL CONNECTION DETAIL**  
SCALE: NTS



**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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**DATE: 4-21-21**

**SHT. 11**

**SCALE: NTS**

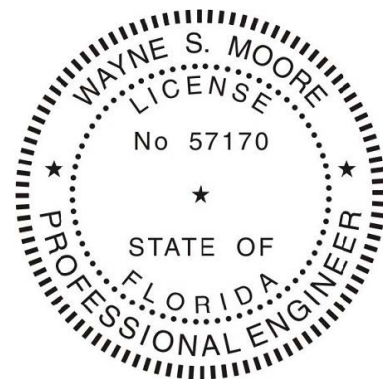
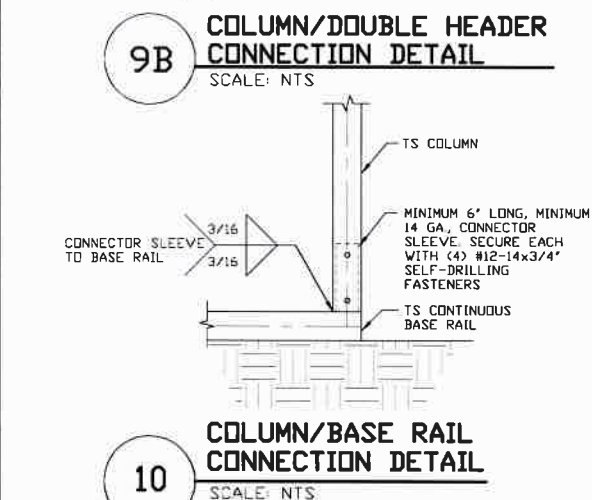
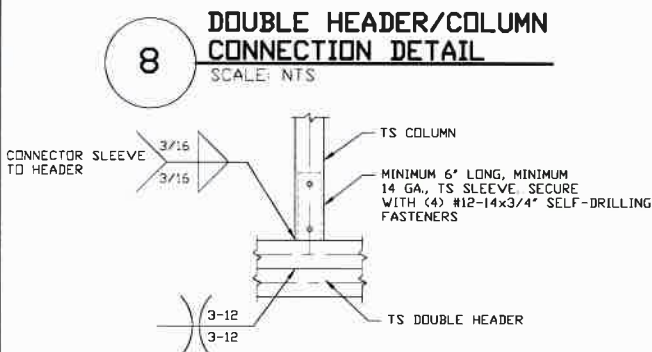
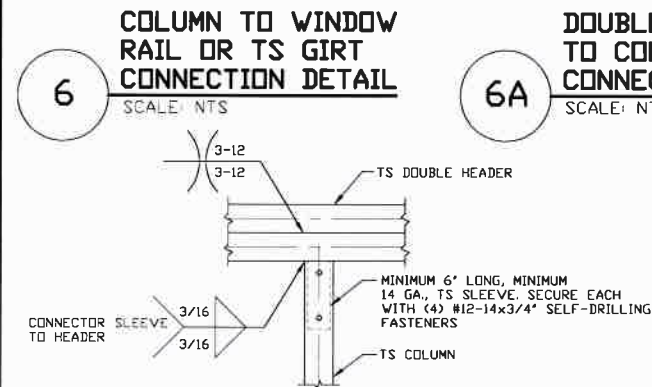
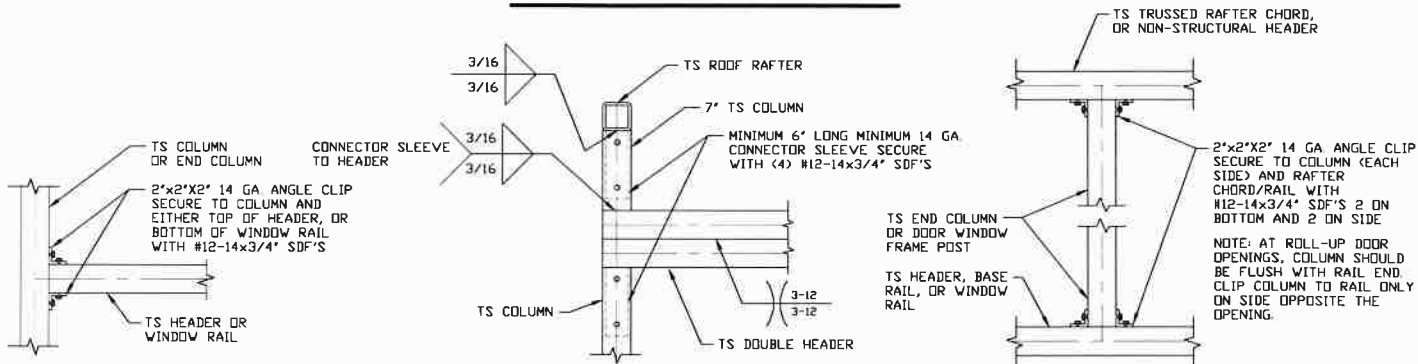
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**JOB NO: 16220S/  
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## CONNECTION DETAILS



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**DATE: 4-21-21**

**SHT. 12**

**SCALE: NTS**

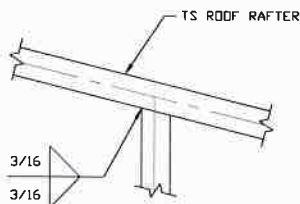
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**JOB NO: 16220S/  
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**REV: 3**

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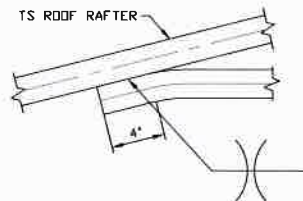
## CONNECTION DETAILS



11

### RAFTER TO CHORD CONNECTION DETAIL

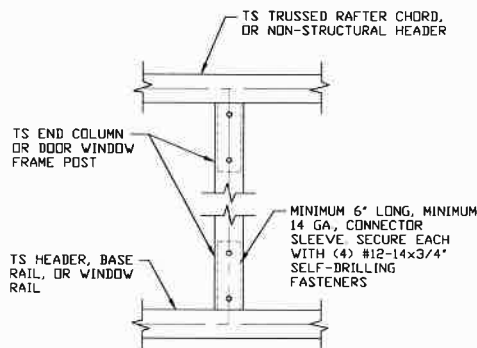
SCALE: NTS



12

### COLLAR TIE CONNECTION DETAIL

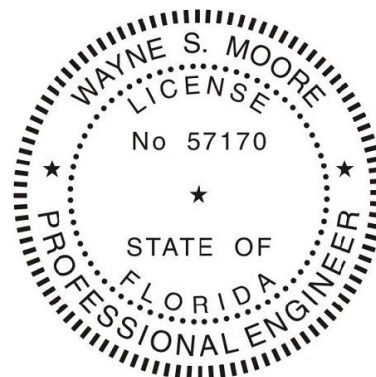
SCALE: NTS



13

### COLUMN TO HEADER OR BASE RAIL CONNECTION DETAIL

SCALE: NTS



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**DATE: 4-21-21**

**SHT. 13**

**SCALE: NTS**

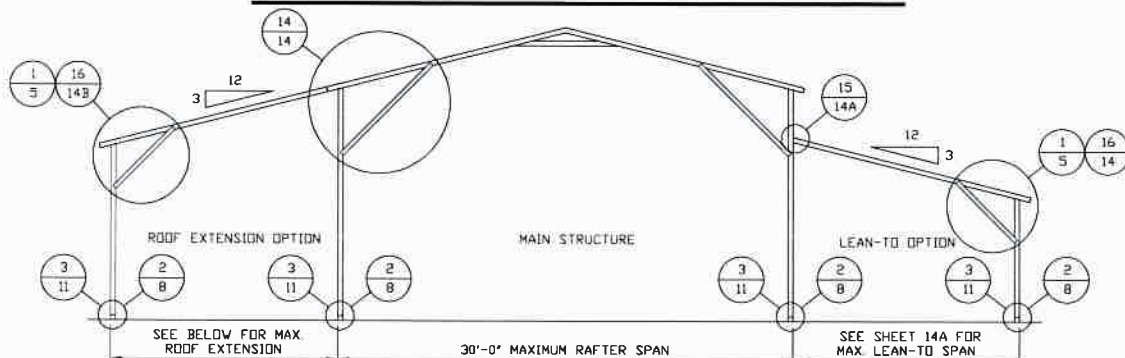
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## BOX EAVE RAFTER LEAN-TO OPTIONS



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

SCALE: NTS

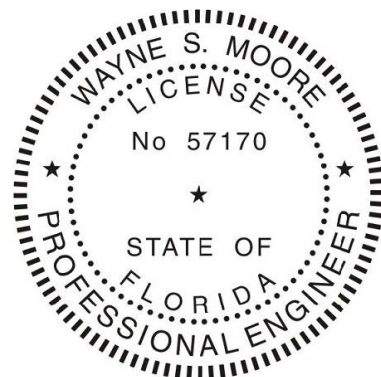
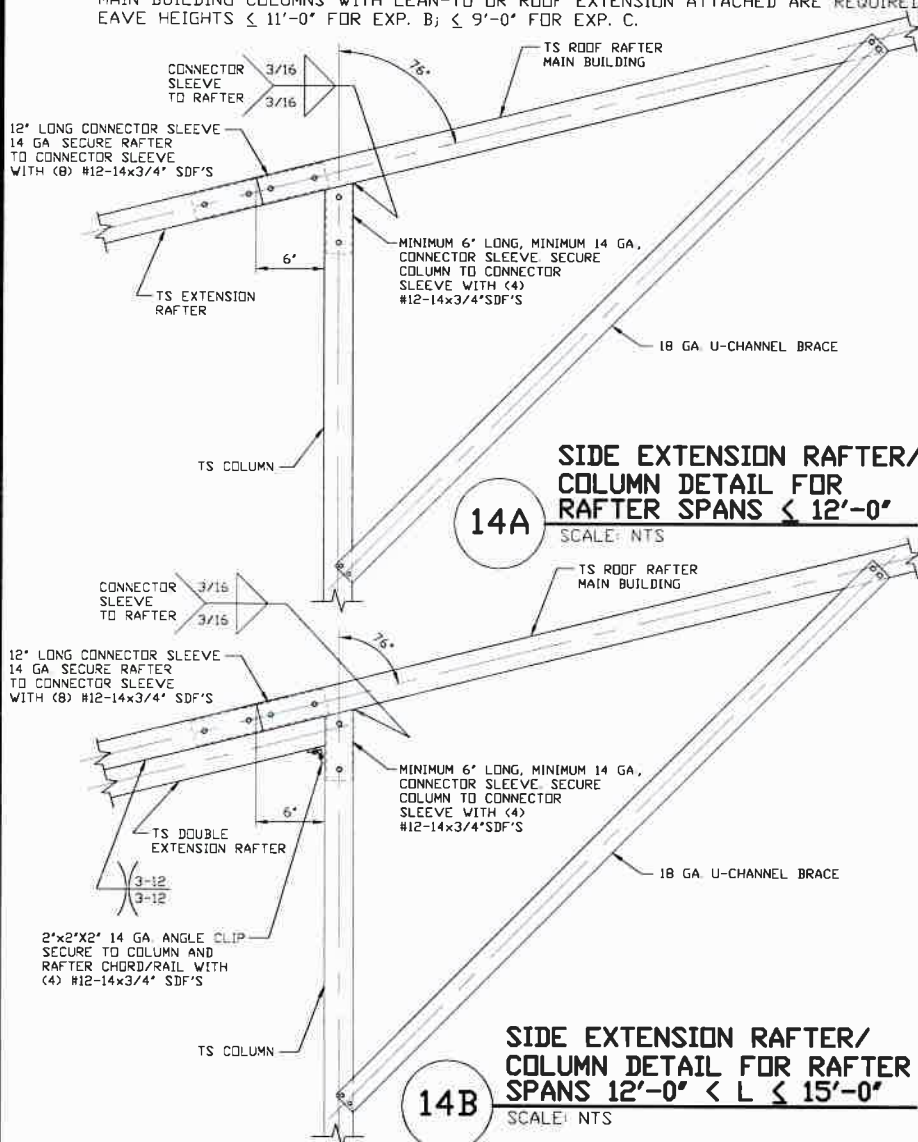
MAXIMUM WIDTH OF SINGLE MEMBER (RAFTER AND COLUMN) ROOF EXTENSION AND LEAN-TO IS 12'-0".

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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**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. 14**

**SCALE: NTS**

**DWG. NO: SK-3**

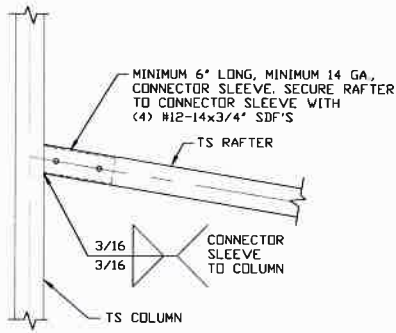
**JOB NO: 16220S/  
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## BOX EAVE RAFTER LEAN-TO OPTIONS

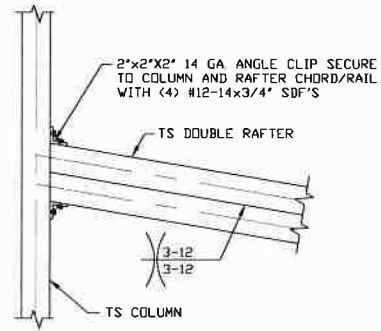


15A

**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

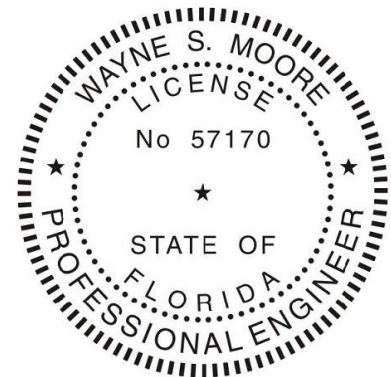


15B

**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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**SHT. 14A**

**SCALE: NTS**

**DWG. NO: SK-3**

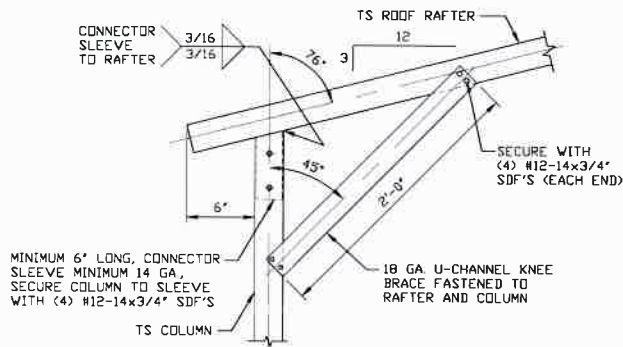
**JOB NO: 16220S/  
18104S/21015S**

**REV: 3**

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## BOX EAVE RAFTER LEAN-TO OPTIONS

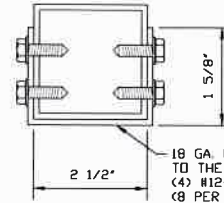


16

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

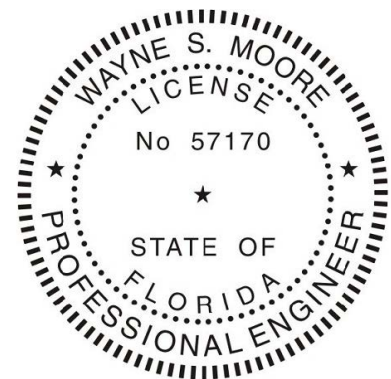
SCALE: NTS

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



### BRACE SECTION

SCALE: NTS



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

**DATE: 4-21-21**

**SHT. 14B**

**SCALE: NTS**

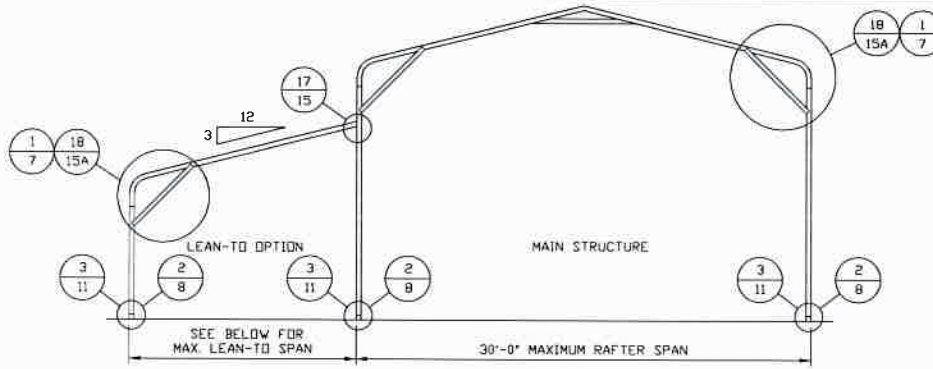
**DWG. NO: SK-3**

**JOB NO: 16220S/  
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## BOW EAVE RAFTER LEAN-TO OPTION



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

SCALE: NTS

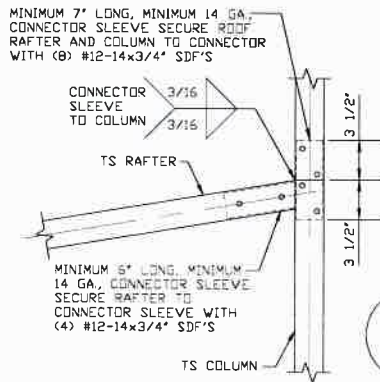
MAXIMUM WIDTH OF SINGLE MEMBER (RAFTER AND COLUMN) ROOF EXTENSION AND LEAN-TO IS 12'-0".

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.

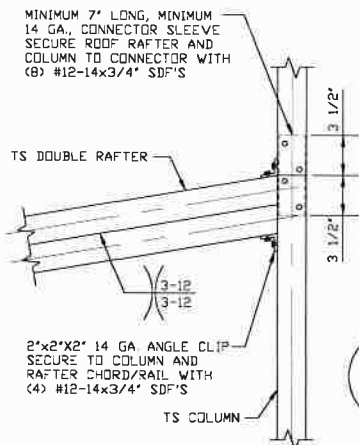


**17A**

### 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

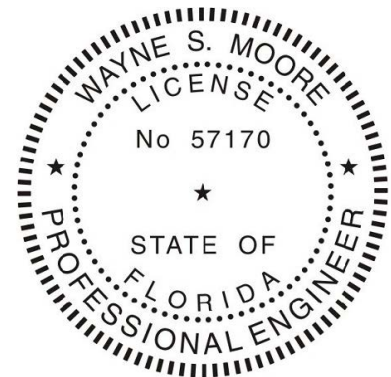


**17B**

### 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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**CHECKED BY: PDH**

**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. 15**

**SCALE: NTS**

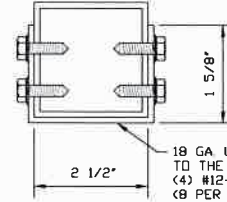
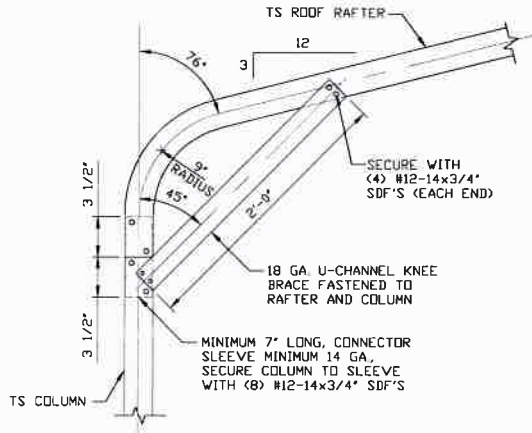
**DWG. NO: SK-3**

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

**REV: 3**

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## BOW EAVE RAFTER LEAN-TO OPTIONS



### BRACE SECTION

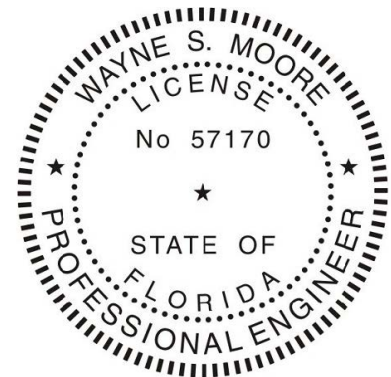
SCALE: NTS

18

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

SCALE: NTS

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



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**DATE: 4-21-21**

**SHT. 15A**

**SCALE: NTS**

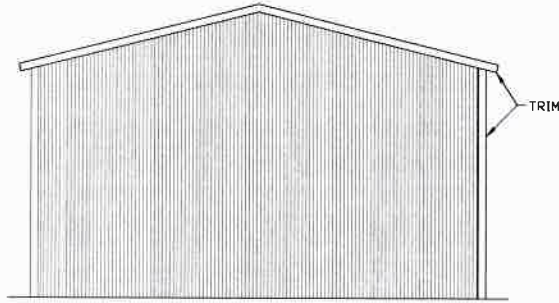
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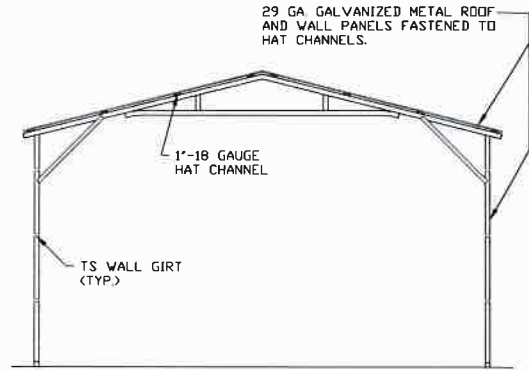
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## BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



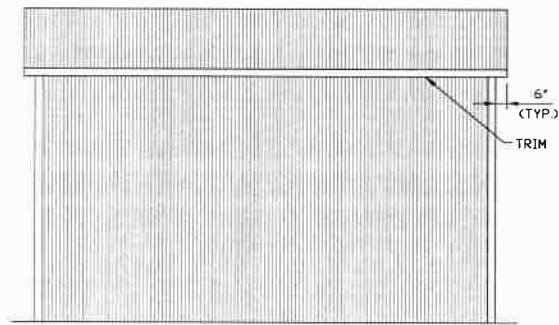
**TYPICAL END ELEVATION  
VERTICAL ROOF/SIDING**

SCALE: NTS



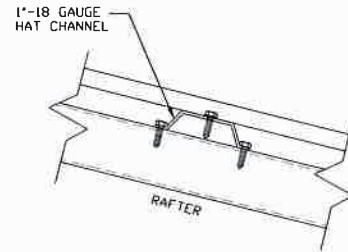
**TYPICAL SECTION VERTICAL  
ROOF/SIDING OPTION**

SCALE: NTS



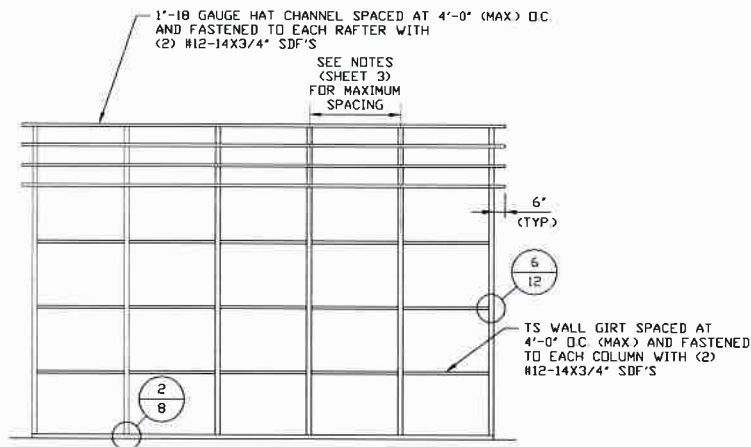
**TYPICAL SIDE ELEVATION  
VERTICAL ROOF/SIDING**

SCALE: NTS



**PANEL ATTACHMENT**

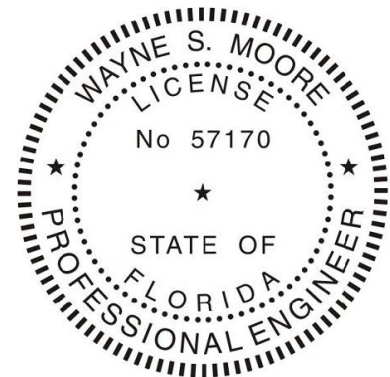
(ALTERNATE FOR VERTICAL ROOF PANELS)  
SCALE: NTS



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

SCALE: NTS

NOTE: 1\"/>



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**SHT. 16**

**SCALE: NTS**

**DWG. NO: SK-3**

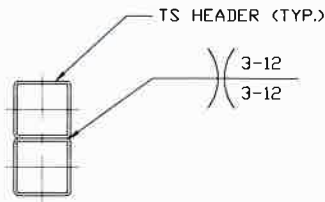
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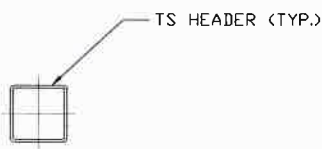
## HEADER OPTIONS FOR WIND SPEEDS 141 MPH < TO ≤ 170 MPH

### SIDEWALL HEADER OPTIONS



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

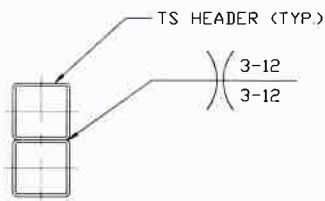
SCALE: NTS



#### HEADER DETAIL ≤ 10'-0"

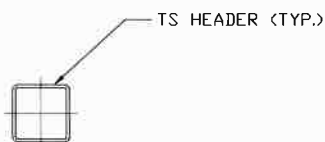
SCALE: NTS

### ENDWALL HEADER OPTIONS



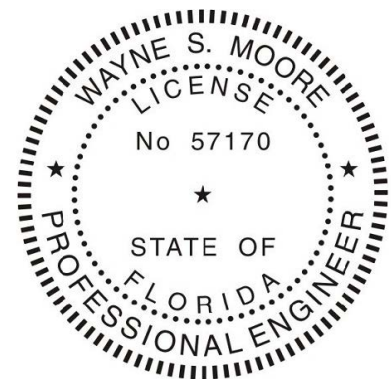
#### HEADER DETAIL FOR 13'-0" < LENGTHS ≤ 20'-0"

SCALE: NTS



#### HEADER DETAIL ≤ 13'-0"

SCALE: NTS



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**SHT. 17**

**SCALE: NTS**

**DWG. NO: SK-3**

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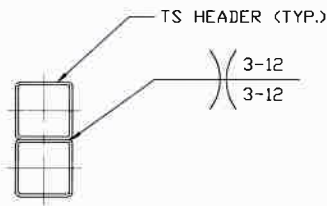
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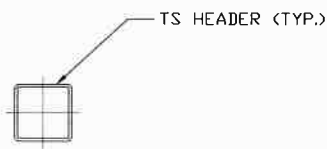
## HEADER OPTIONS FOR WIND SPEEDS $\leq 140$ MPH

### SIDEWALL HEADER OPTIONS



#### HEADER DETAIL FOR 10'-0" < LENGTHS $\leq$ 16'-0"

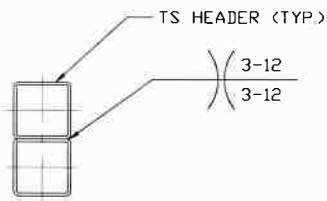
SCALE: NTS



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

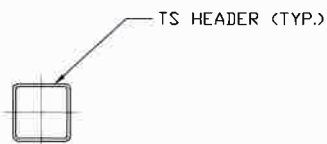
SCALE: NTS

### ENDWALL HEADER OPTIONS



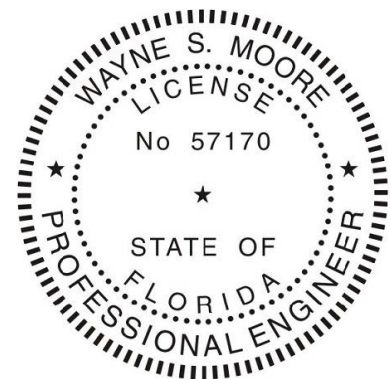
#### HEADER DETAIL FOR 13'-0" < LENGTHS $\leq$ 20'-0"

SCALE: NTS



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

SCALE: NTS



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