



**STRUCTURAL DESIGN**

**ENCLOSED BUILDING**

**EXPOSURE B**

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

**8 January 2021**

**Revision 5**

**M&A Project No. 16022S/17300S/20352S**

**Prepared for:**

**Tubular Building Systems, LLC  
631 SE Industrial Circle  
Lake City, Florida 32025**

**Prepared by:**

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

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

**Digitally signed  
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**PROJECT MGR: WSM**

**CLIENT: TBS**

**TUBULAR BUILDING SYSTEMS  
631 SE INDUSTRIAL CIRCLE  
LAKE CITY, FLORIDA 32025  
30'-0"x20'-0" ENCLOSED BUILDING EXP. B**

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**DATE: 1-8-21**

**SHT. 2**

**SCALE: NTS**

**DWG. NO: SK-3**

**JOB NO: 16022S/  
17300S/20352S**

**REV: 5**

## INSTALLATION NOTES AND SPECIFICATIONS

1. DESIGN IS FOR A MAXIMUM 30'-0" WIDE x 20'-0" EAVE HEIGHT ENCLOSED STRUCTURES.
2. DESIGN WAS DONE IN ACCORDANCE WITH THE 2020 FLORIDA BUILDING CODE (FBC) 7TH EDITION, 2012 INTERNATIONAL BUILDING CODE (IBC), 2015 IBC, AND 2018 IBC.
3. DESIGN LOADS ARE AS FOLLOWS:
  - A) DEAD LOAD = 1.5 PSF
  - B) LIVE LOAD = 12 PSF
  - C) GROUND SNOW LOAD = 10 PSF
4. LOW ULTIMATE WIND SPEED 105 TO 140 MPH (NOMINAL WIND SPEED 81 TO 108 MPH); MAXIMUM RAFTER/POST AND END POST SPACING = 5.0 FEET.
5. HIGH ULTIMATE WIND SPEED 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.
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 VERTICAL PANELS, 29 GAUGE METAL PANELS SHALL BE FASTENED TO 18 GAUGE HAT CHANNELS (UNLESS OTHERWISE NOTED).
10. AVERAGE FASTENER SPACING ON-CENTERS ALONG RAFTERS OR PURLINS, AND POSTS, INTERIOR = 9" OR END = 6", (MAX.)
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 JOINT SEALANT.
12. STANDARD ANCHORS SHALL BE INSTALLED THROUGH BASE RAIL WITHIN 6" OF EACH COLUMN.
13. STANDARD GROUND ANCHORS (SOIL NAILS) CONSIST OF #4 REBAR W/WELDED NUT x 30" LONG IN SUITABLE SOIL. CONDITIONS MAY BE USED FOR LOW (< 108 MPH NOMINAL) WIND SPEEDS ONLY. OPTIONAL ANCHORAGE MAY BE USED IN SUITABLE SOILS AND MUST BE USED IN UNSUITABLE SOILS AS NOTED. COORDINATE WITH LOCAL CODES/ORDINANCES REGARDING MINIMUM LENGTH FOR FROST DEPTH PROTECTION.
14. WIND FORCES GOVERN OVER SEISMIC FORCES. SEISMIC PARAMETERS ANALYZED ARE:  
SOIL SITE CLASS = D  
RISK CATEGORY I  
 $R = 3.25$   $I_E = 1.0$   
 $S_{DS} = 1.522 g$   $V = C_S W$   
 $S_{DI} = 0.839 g$



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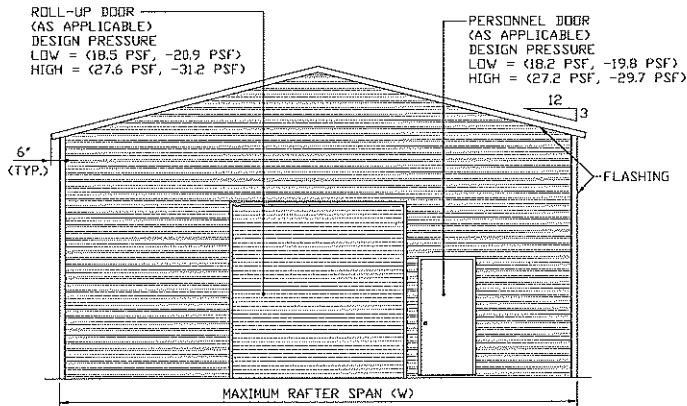
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DWG. NO: SK-3

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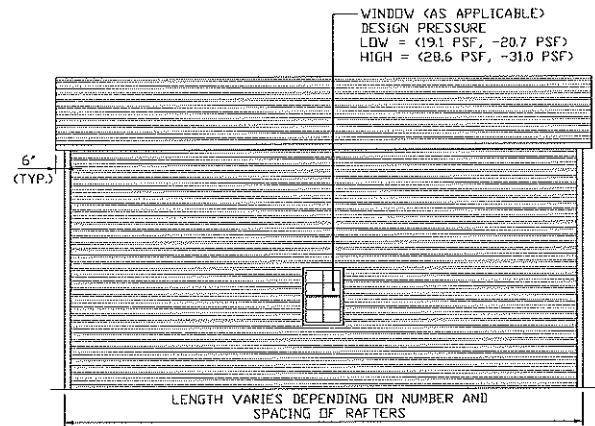
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## BOX EAVE FRAME RAFTER ENCLOSED BUILDING



**TYPICAL END ELEVATION**

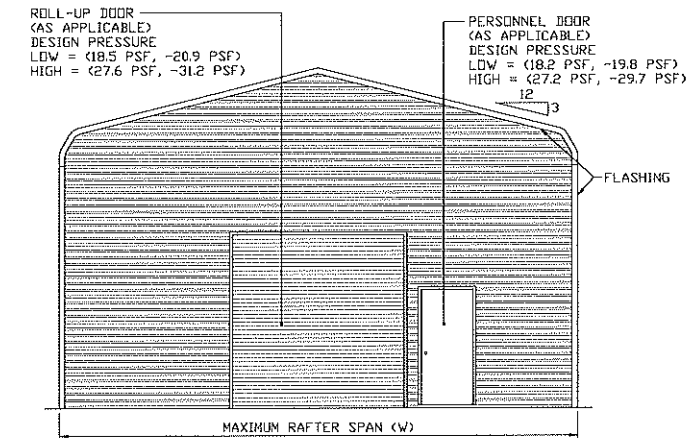
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**TYPICAL SIDE ELEVATION**

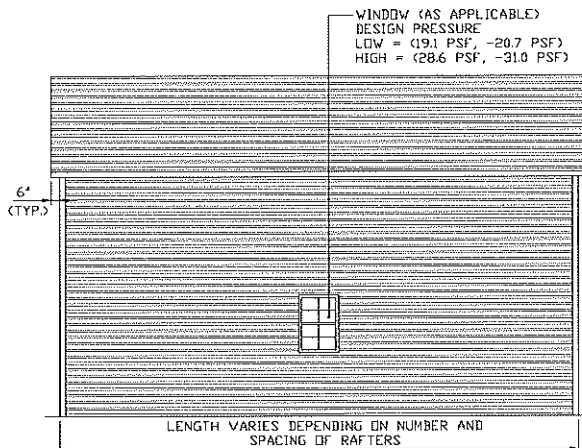
SCALE: NTS

## BOW FRAME RAFTER ENCLOSED BUILDING



**TYPICAL END ELEVATION**

SCALE: NTS



**TYPICAL SIDE ELEVATION**

SCALE: NTS



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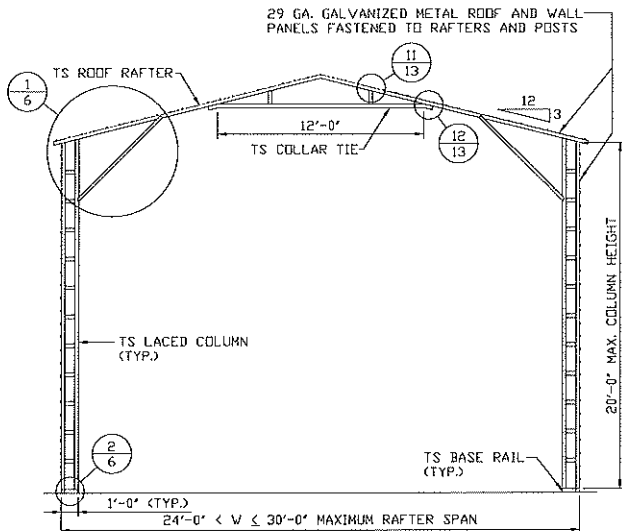
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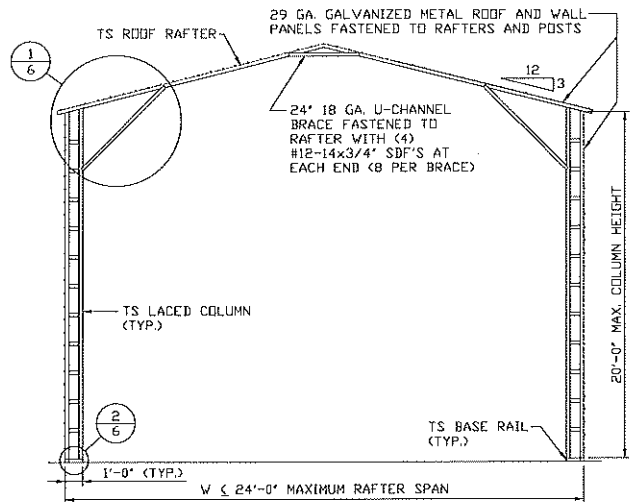
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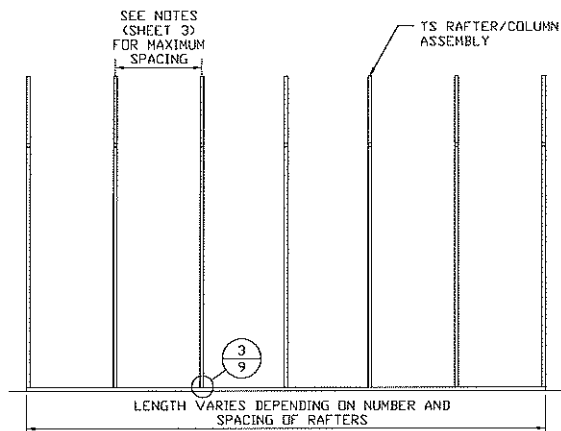




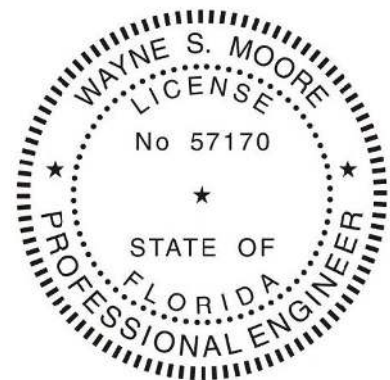
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SCALE: NTS



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



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



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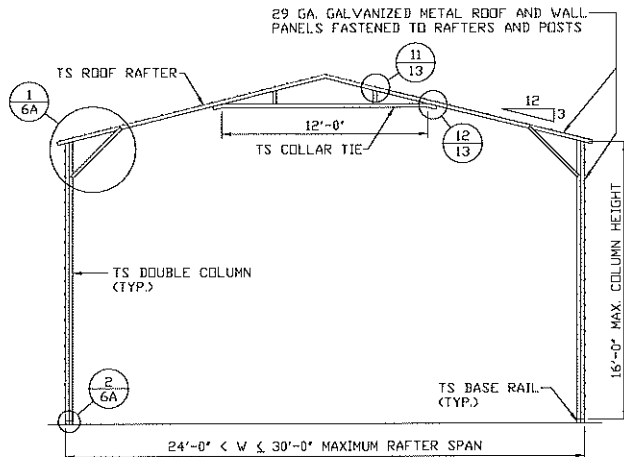
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17300S/20352S**

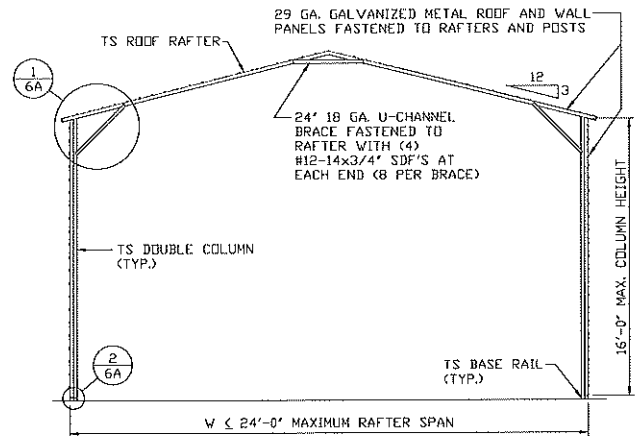
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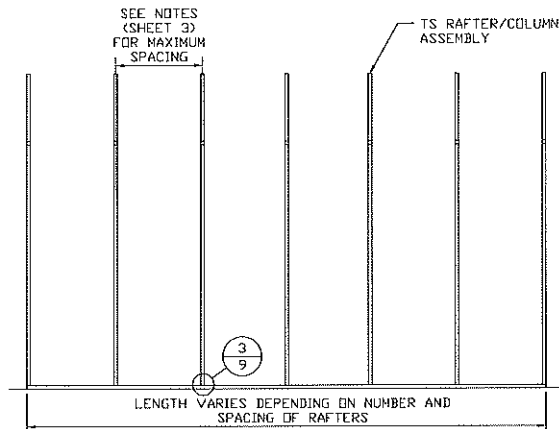
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**TYPICAL RAFTER/COLUMN END FRAME SECTION**  
SCALE: NTS



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



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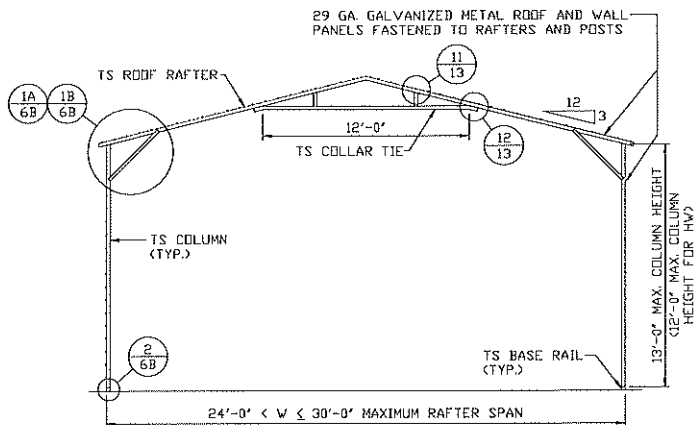
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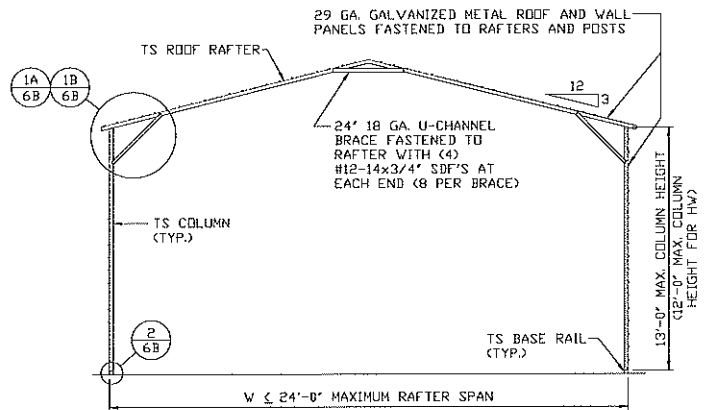
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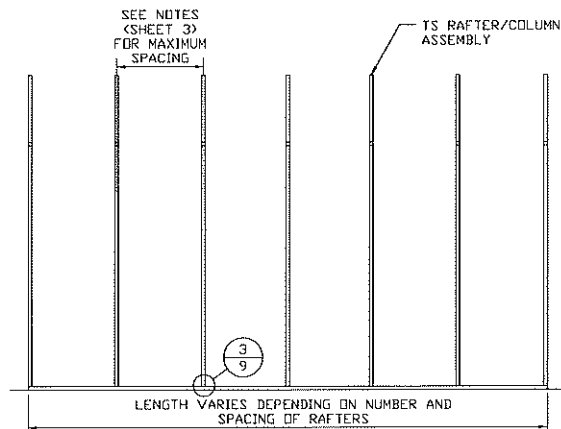
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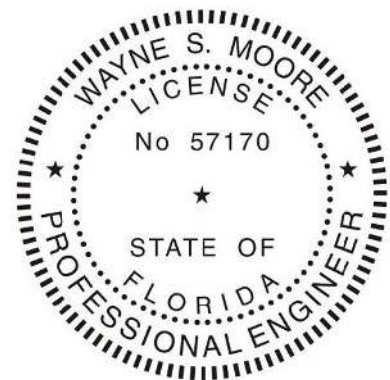
**TYPICAL RAFTER/COLUMN END FRAME SECTION**  
SCALE: NTS



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



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



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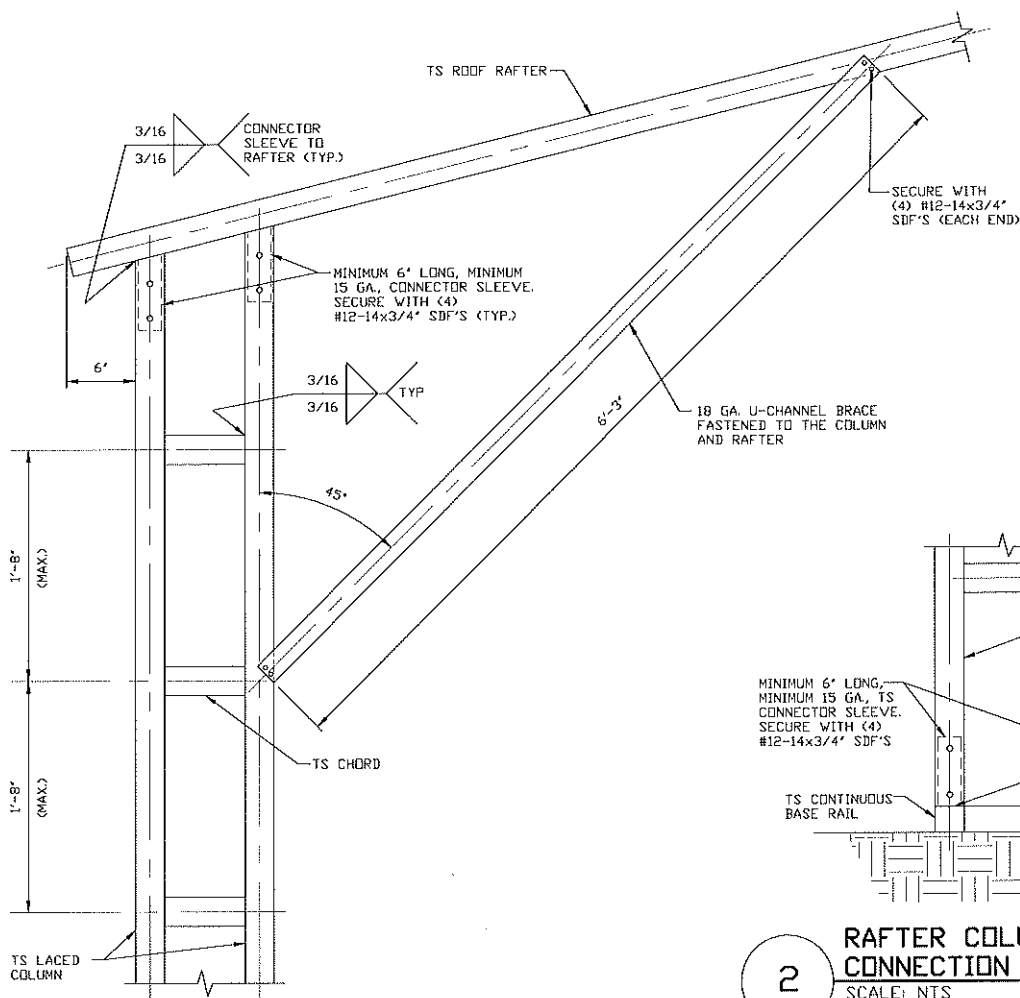
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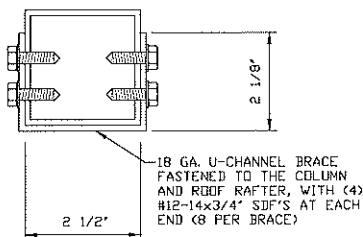
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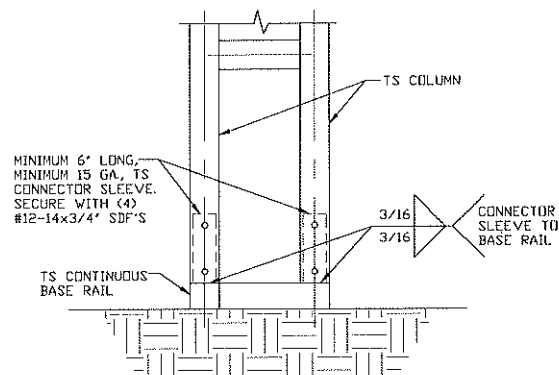




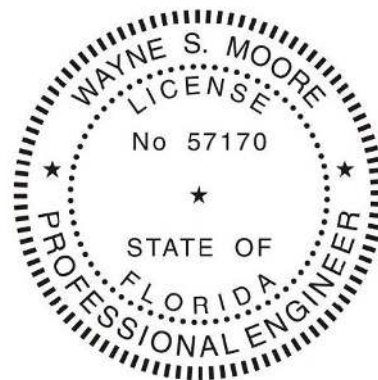
**1** BOX EAVE RAFTER COLUMN  
CONNECTION DETAIL  
FOR HEIGHTS 16'-0" < TO ≤ 20'-0"  
SCALE: NTS



**BRACE SECTION**  
SCALE: NTS



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



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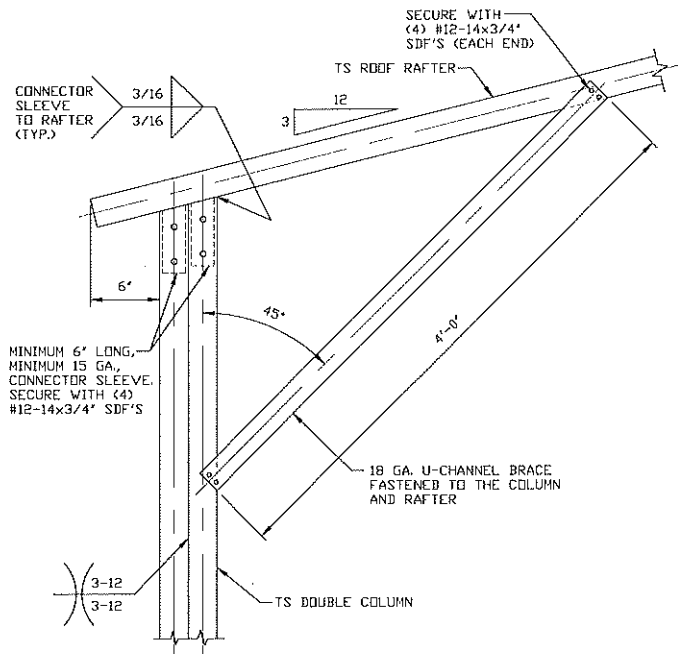
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**SHT. 6**

**REV: 5**

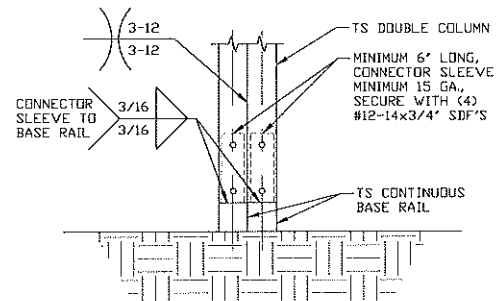
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# **BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 13'-0" < TO ≤ 16'-0"**

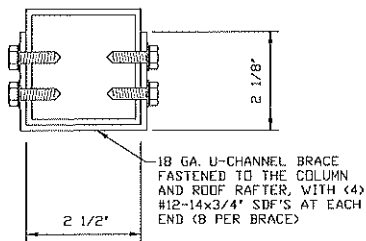
SCALE: NTS

NOTE: COLUMN HEIGHTS 12'-0" < TO ≤ 16'-0" FOR HIGH WIND.



# **RAFTER COLUMN/BASE RAIL CONNECTION DETAIL**

SCALE: NTS



# **BRACE SECTION**

SCALE: NTS



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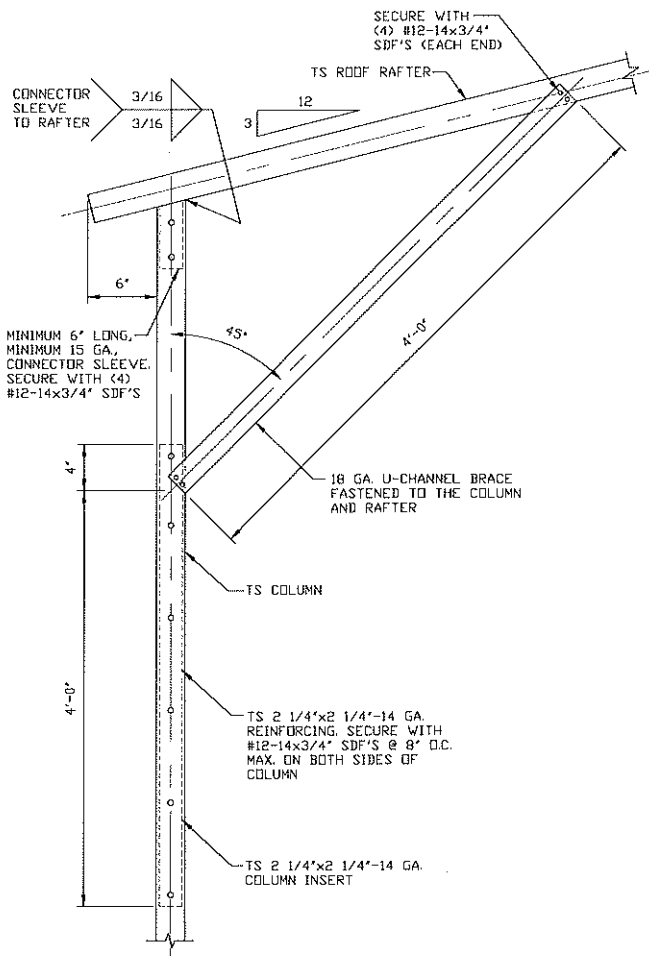
DWG. NO: SK-3

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SHT. 6A

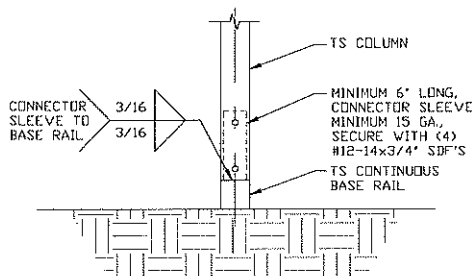
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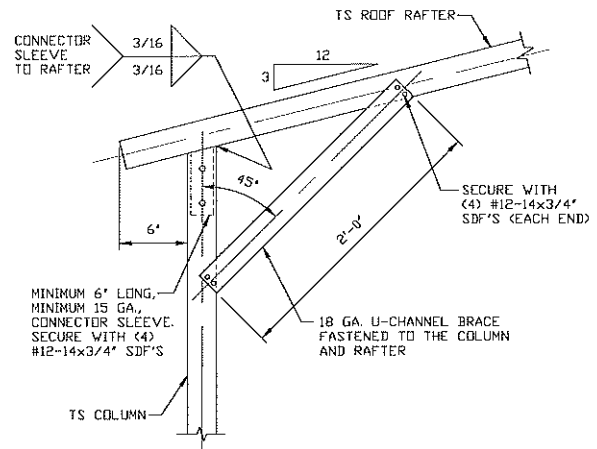
**1A** BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 10'-0" < TO ≤ 13'-0"

SCALE: NTS  
NOTE: MAXIMUM COLUMN HEIGHT IS 12'-0" FOR HIGH WIND.



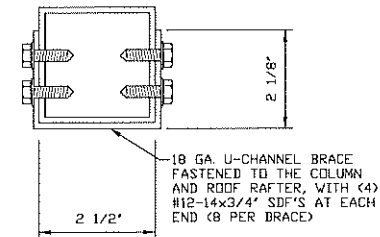
**2** RAFTER COLUMN/BASE RAIL CONNECTION DETAIL

SCALE: NTS



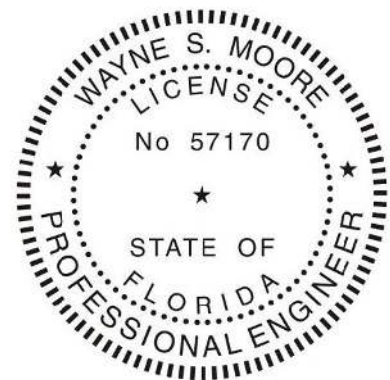
**1B** BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS ≤ 10'-0"

SCALE: NTS



**BRACE SECTION**

SCALE: NTS



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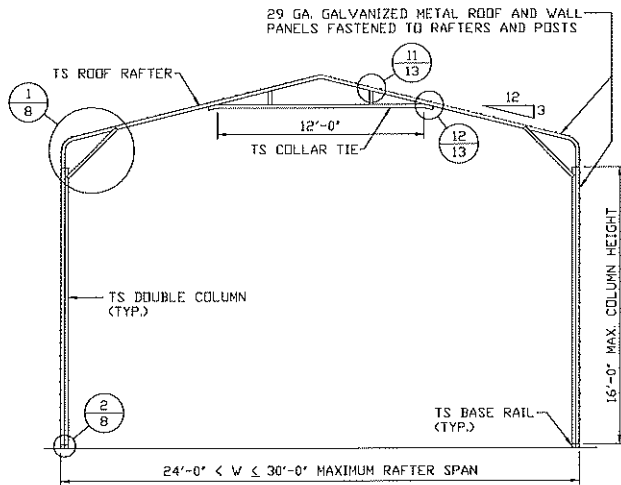
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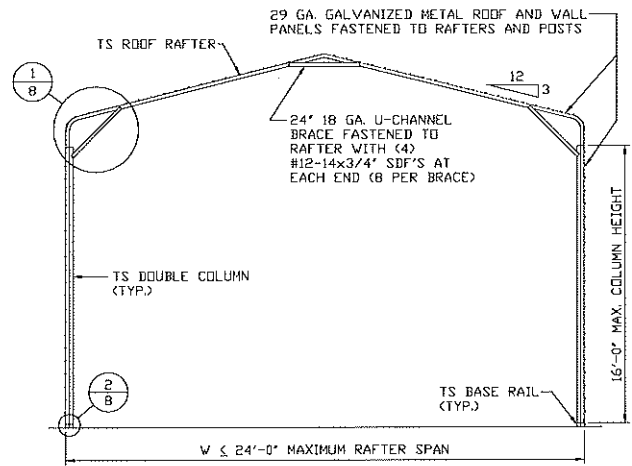
**SHT. 6B**

**REV: 5**

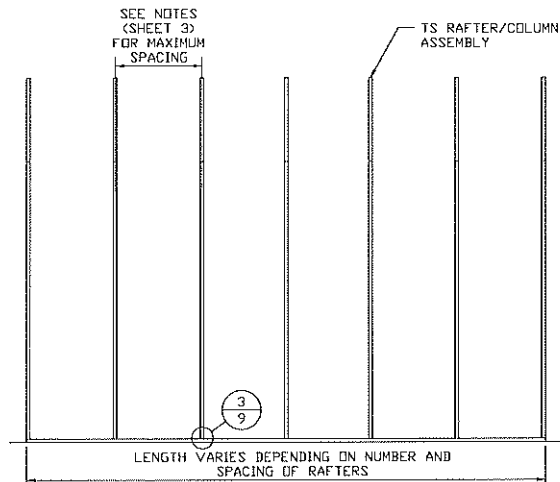
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**TYPICAL RAFTER/COLUMN END FRAME SECTION**  
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**TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION**  
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CHECKED BY: PDH

PROJECT MGR: WSM

CLIENT: TBS

TUBULAR BUILDING SYSTEMS  
631 SE INDUSTRIAL CIRCLE  
LAKE CITY, FLORIDA 32025  
30'-0"x20'-0" ENCLOSED BUILDING EXP. B

DATE: 1-8-21

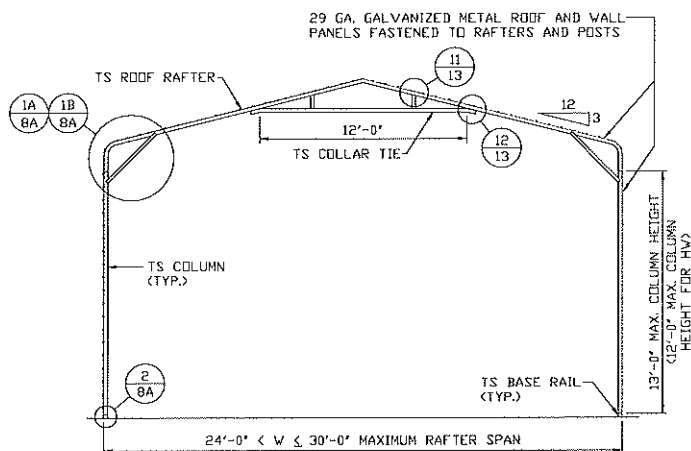
SHT. 7

SCALE: NTS

DWG. NO: SK-3

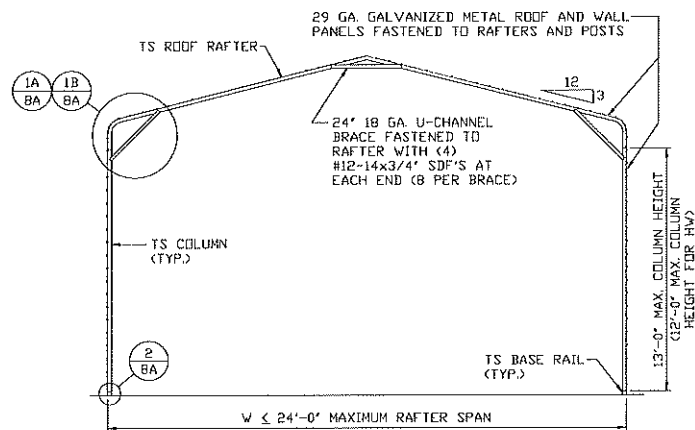
JOB NO: 16022S/  
17300S/20352S

REV: 5



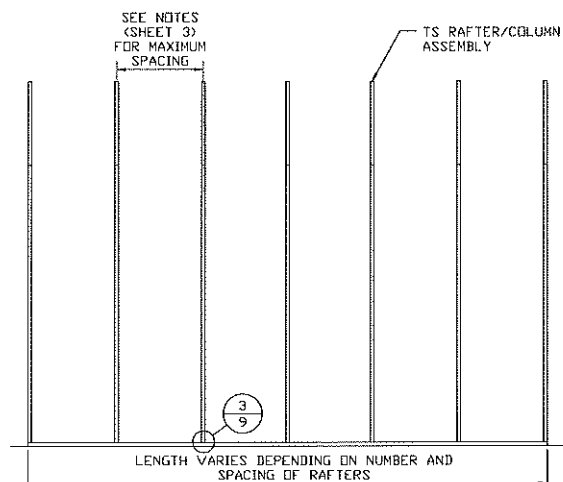
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SCALE: NTS



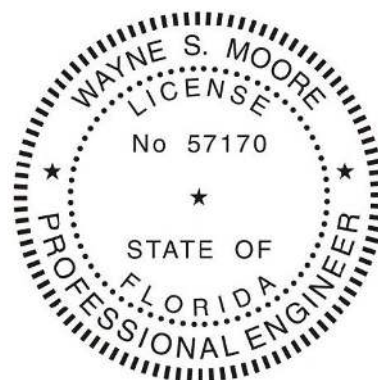
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SCALE: NTS



**TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION**

SCALE: NTS



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LAKE CITY, FLORIDA 32025  
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**DATE: 1-8-21**

**SCALE: NTS**

**SHT. 7A**

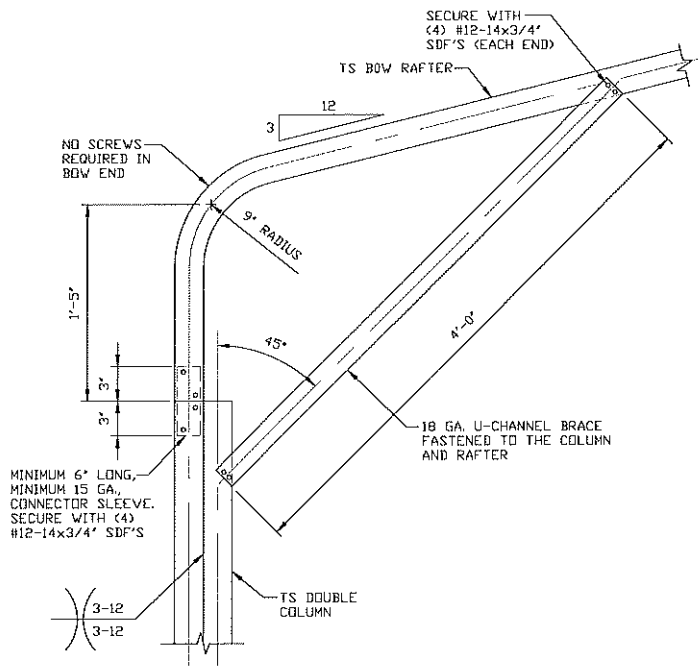
**DWG. NO: SK-3**

**JOB NO: 16022S/  
17300S/20352S**

**REV: 5**

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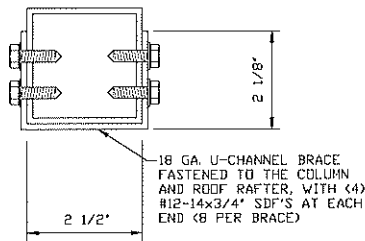


1

### BOX EAVE RAFTER COLUMN CONNECTION DETAIL

SCALE: NTS

NOTE: COLUMN HEIGHTS 12'-0" < TO ≤ 16'-0" FOR HIGH WIND.



2

### RAFTER COLUMN/BASE RAIL CONNECTION DETAIL

SCALE: NTS

### BRACE SECTION

SCALE: NTS



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SCALE: NTS

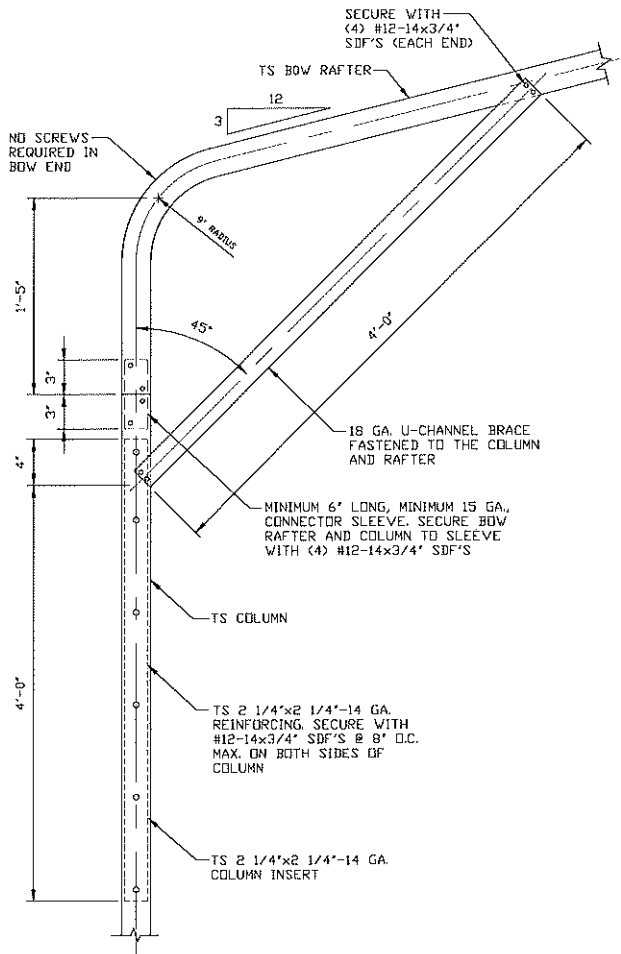
DWG. NO: SK-3

JOB NO: 16022S/  
17300S/20352S

SHT. 8

REV: 5

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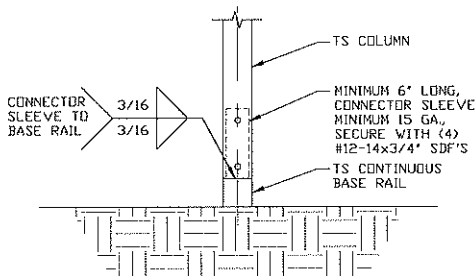


1A

**BOX EAVE RAFTER COLUMN  
CONNECTION DETAIL  
FOR HEIGHTS 10'-0" < TO ≤ 13'-0"**

SCALE: NTS

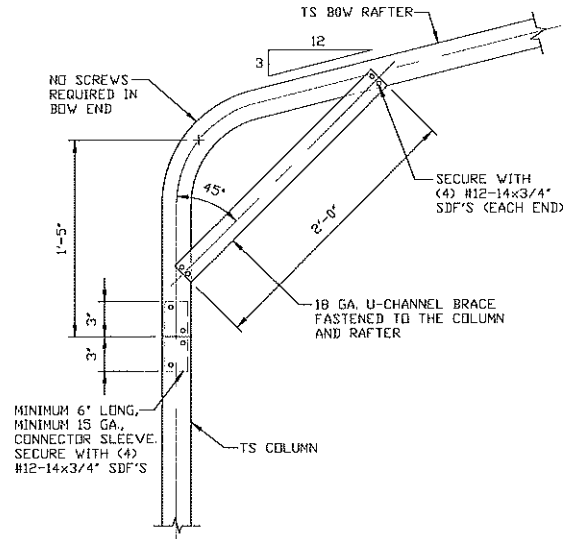
NOTE: MAXIMUM COLUMN HEIGHT IS 12'-0" FOR HIGH WIND.



2

**RAFTER COLUMN/BASE RAIL  
CONNECTION DETAIL**

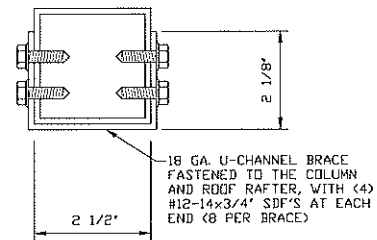
SCALE: NTS



1B

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

SCALE: NTS



**BRACE SECTION**

SCALE: NTS



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**SCALE: NTS**

**SHT. 0A**

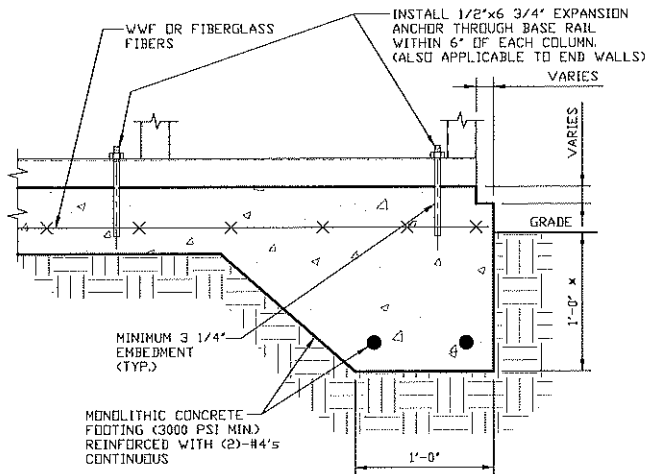
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**JOB NO: 16022S/  
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## BASE RAIL ANCHORAGE OPTIONS FOR LOW AND HIGH WIND SPEED



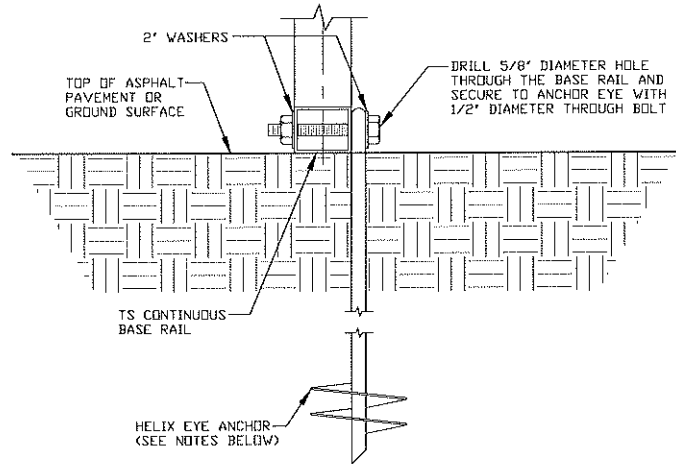
3A

### CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE

SCALE: NTS

MINIMUM ANCHOR EDGE DISTANCE IS 4"

\* COORDINATE WITH LOCAL CODES/ORD.  
REGARDING MINIMUM FROST DEPTH REQ.



3B

### GROUND BASE HELIX ANCHORAGE

SCALE: NTS

(CAN BE USED FOR ASPHALT)

\* COORDINATE WITH LOCAL CODES/ORD.  
REGARDING MINIMUM FROST DEPTH REQ.

## GENERAL NOTES

NOTE: CONCRETE MONOLITHIC SLAB DESIGN 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 INCHES 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 INCHES 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 INCH EMBEDMENT.
2. FOR CORAL USE MINIMUM (2) 4" HELICES WITH MINIMUM 30 INCH EMBEDMENT.
3. FOR MEDIUM DENSE COARSE SANDS, SANDY GRAVELS, VERY STIFF SILTS, AND CLAYS USE MINIMUM (2) 4" HELICES WITH MINIMUM 30 INCH EMBEDMENT.
4. FOR LOOSE TO MEDIUM DENSE SANDS, FIRM TO STIFF CLAYS AND SILTS ALLUVIAL FILL USE MINIMUM (2) 6" HELICES WITH MINIMUM 50 INCH 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 INCH EMBEDMENT.



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**PROJECT MGR:** WSM

**CLIENT:** TBS

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30'-0" x 20'-0" ENCLOSED BUILDING EXP. B

**DATE:** 1-8-21

**SHT.** 9

**SCALE:** NTS

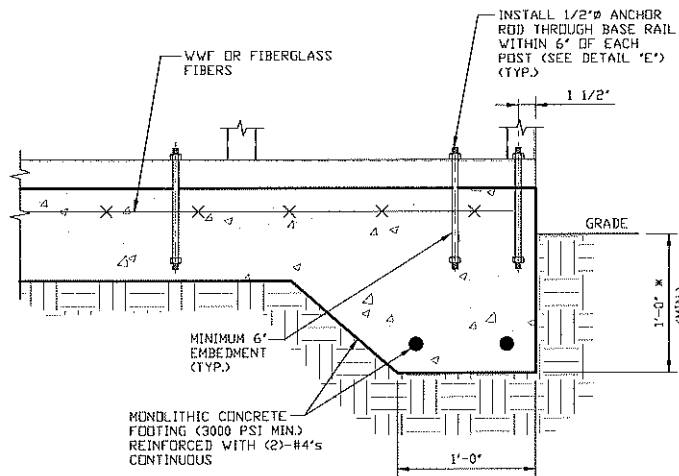
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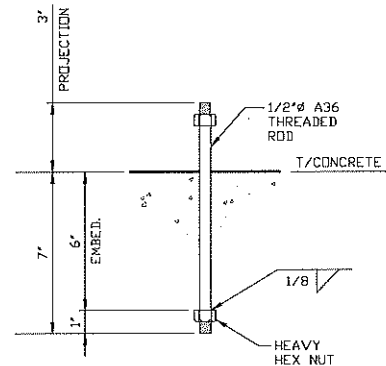
## OPTIONAL FOUNDATION ANCHORAGE FOR LOW AND HIGH WIND SPEED



3C

### CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE

SCALE: NTS  
MINIMUM ANCHOR EDGE DISTANCE IS 1 1/2"  
\* COORDINATE WITH LOCAL CODES/ORD.  
REGARDING MINIMUM FROST DEPTH REQ.



3D

### ANCHOR ROD THROUGH BASE RAIL DETAIL

SCALE: NTS

## GENERAL NOTES

NOTE: CONCRETE MONOLITHIC SLAB DESIGN 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:

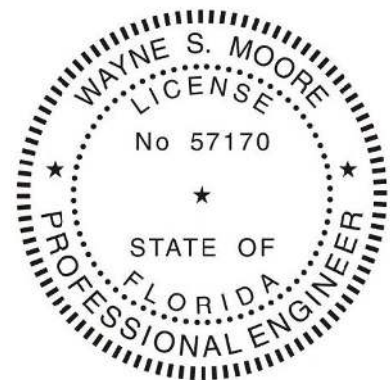
FOR FOUNDATIONS, MINIMUM CONCRETE COVER OVER REINFORCING BARS SHALL BE PER ACI-318:  
3 INCHES IN FOUNDATIONS WHERE THE CONCRETE IS CAST AGAINST AND PERMANENTLY IN CONTACT WITH THE EARTH OR EXPOSED TO THE EARTH OR WEATHER, AND 1 1/2 INCHES ELSEWHERE.

### 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.



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CLIENT: TBS

TUBULAR BUILDING SYSTEMS  
631 SE INDUSTRIAL CIRCLE  
LAKE CITY, FLORIDA 32025  
30'-0" x 20'-0" ENCLOSED BUILDING EXP. B

DATE: 1-8-21

SCALE: NTS

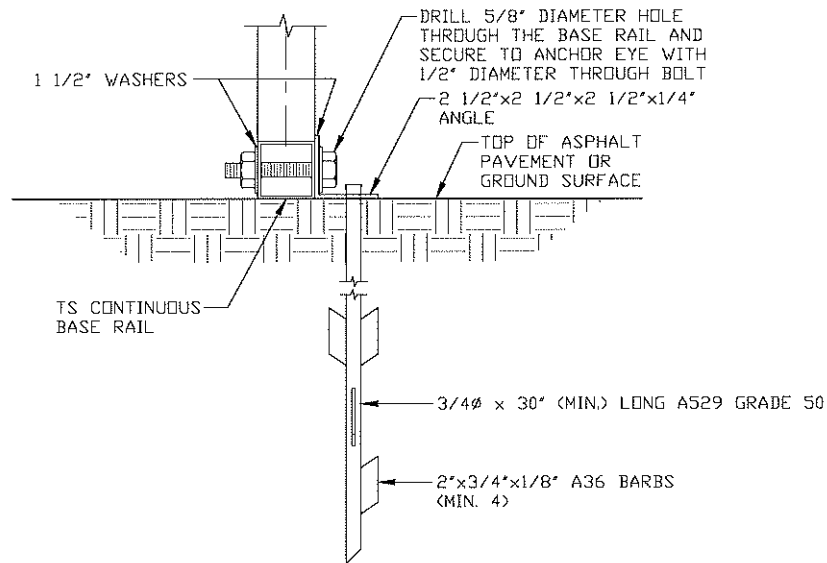
DWG. NO: SK-3

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## BASE RAIL ANCHORAGE OPTION



3E

### ASPHALT BASE ANCHORAGE (HP 9 BARBED DRIVE ANCHOR)

SCALE: NTS

(CAN BE USED FOR ASPHALT)

\* COORDINATE WITH LOCAL CODES/ORD.  
REGARDING MINIMUM FROST DEPTH REQ.



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**SHT. 9B**

**SCALE: NTS**

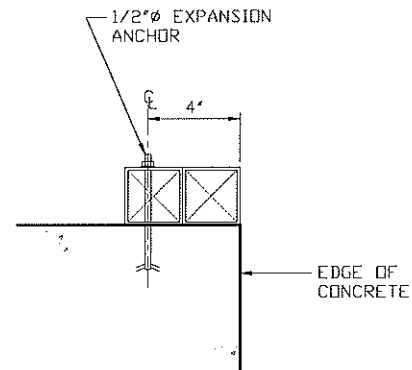
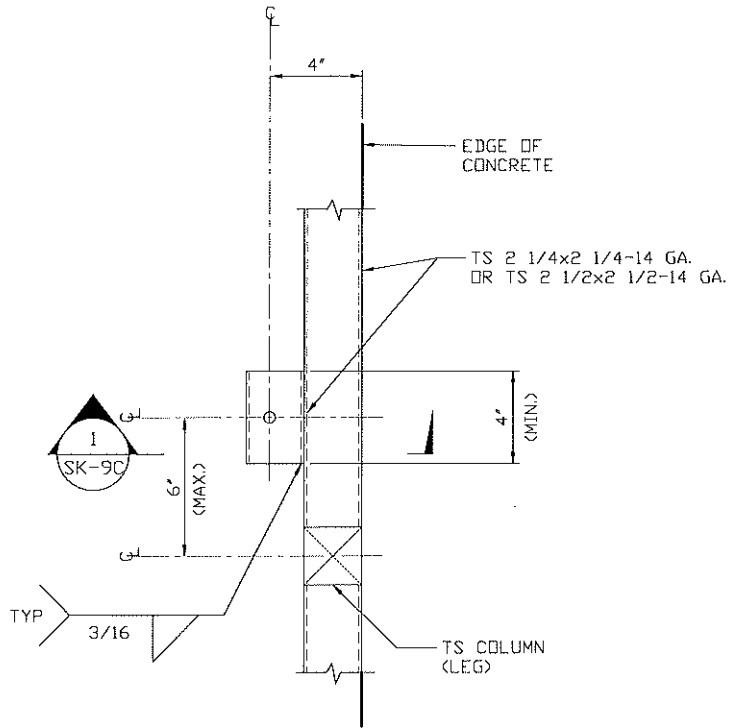
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**JOB NO: 16022S/  
17300S/20352S**

**REV: 5**



## BASE RAIL ANCHORAGE OPTIONS



SECTION 1  
SCALE: NTS SK-9C

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

SCALE: NTS



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**SCALE:** NTS

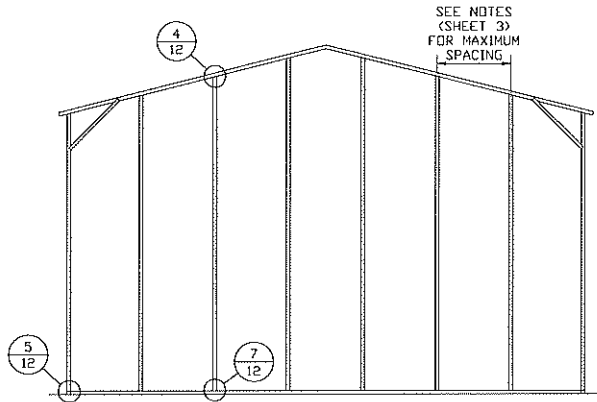
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17300S/20352S

**REV:** 5

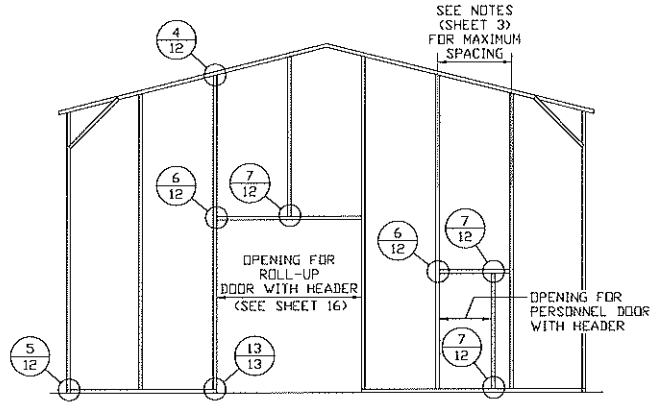
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## BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS



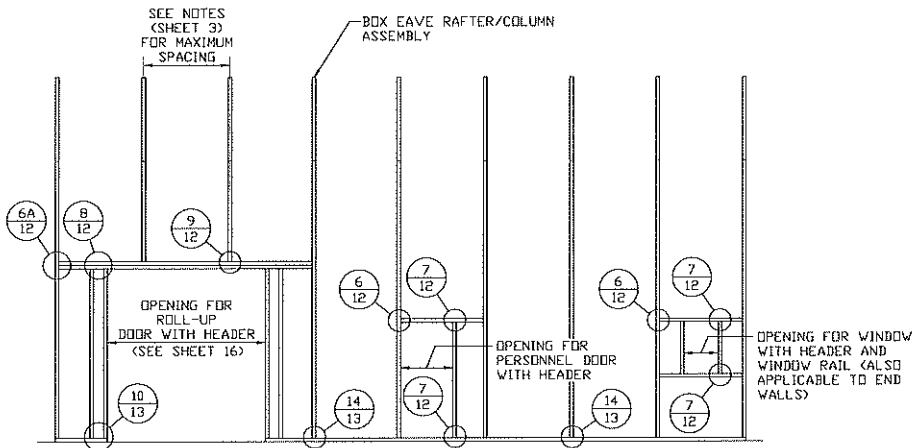
**TYPICAL BOX EAVE RAFTER  
END WALL FRAMING SECTION**

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:** TBS

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**SCALE:** NTS

**SHT.** 10

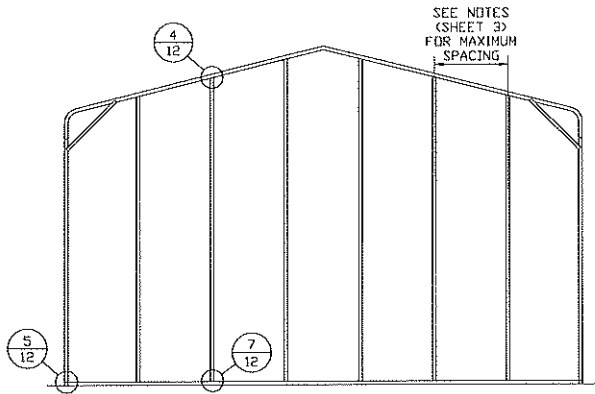
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**JOB NO:** 16022S/  
17300S/20352S

**REV:** 5

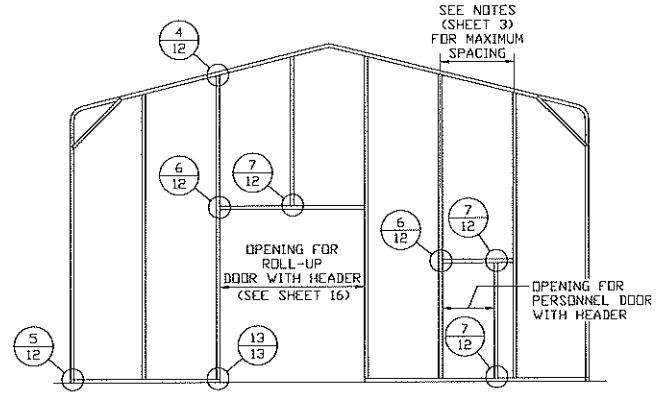
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## BOW RAFTER END WALL AND SIDE WALL OPENINGS



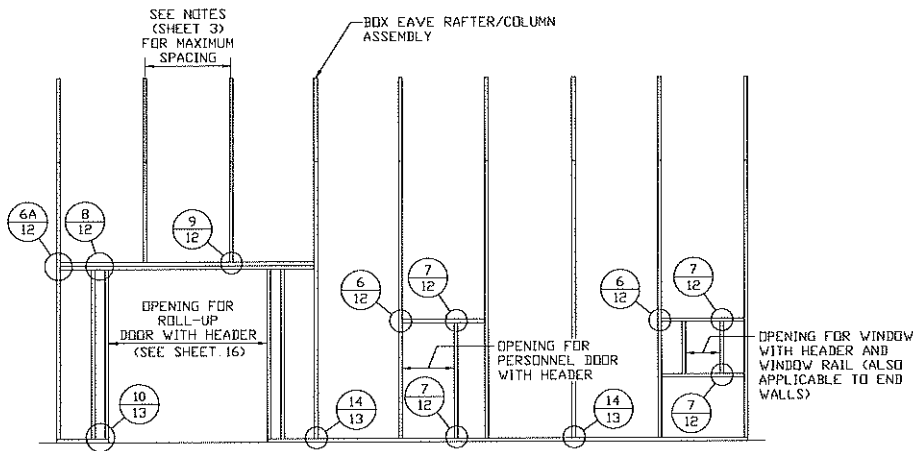
**TYPICAL BOX EAVE RAFTER  
END WALL FRAMING SECTION**

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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**SHT. 11**

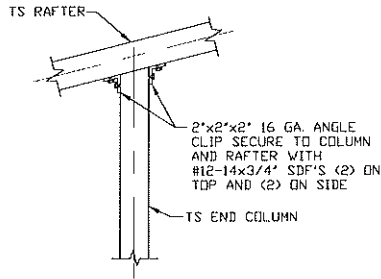
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**JOB NO: 16022S/  
17300S/20352S**

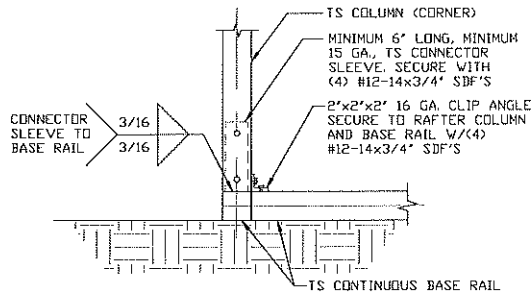
**REV: 5**

## CONNECTION DETAILS



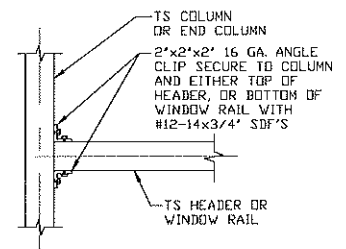
**4** **END COLUMN/RAFTER CONNECTION DETAIL**

SCALE: NTS



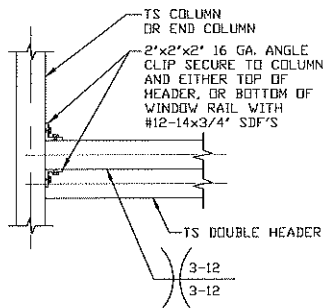
**5** **END COLUMN/BASE RAIL CONNECTION DETAIL**

SCALE: NTS



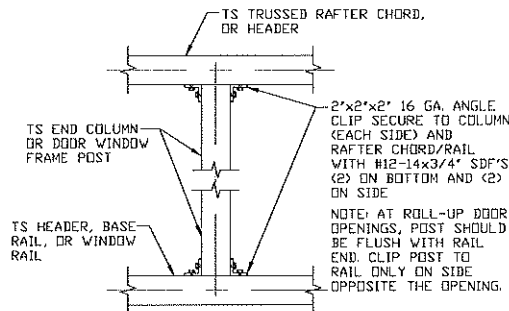
**6** **HEADER OR WINDOW RAIL TO COLUMN CONNECTION DETAIL**

SCALE: NTS



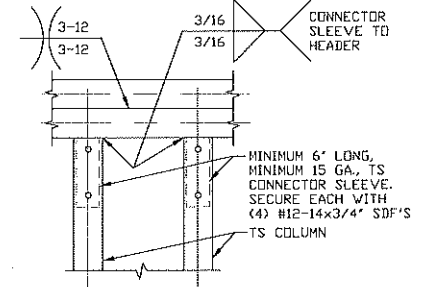
**6A** **DOUBLE HEADER TO COLUMN CONNECTION DETAIL**

SCALE: NTS



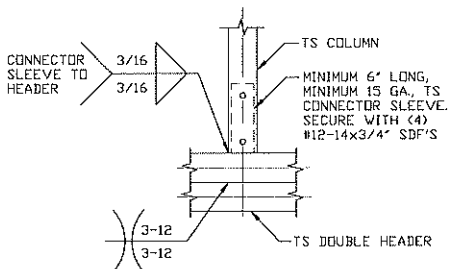
**7** **COLUMN TO HEADER, BASE RAIL, OR WINDOW RAIL CONNECTION DETAIL**

SCALE: NTS



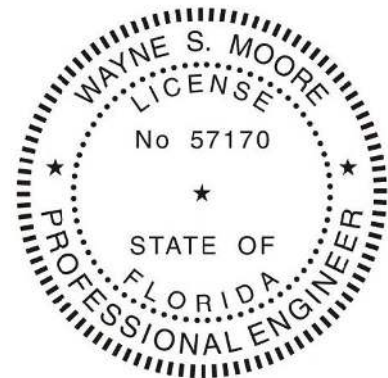
**8** **DOUBLE HEADER/COLUMN CONNECTION DETAIL**

SCALE: NTS



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

SCALE: NTS



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**PROJECT MGR: WSM**

**CLIENT: TBS**

**TUBULAR BUILDING SYSTEMS  
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**DATE: 1-8-21**

**SCALE: NTS**

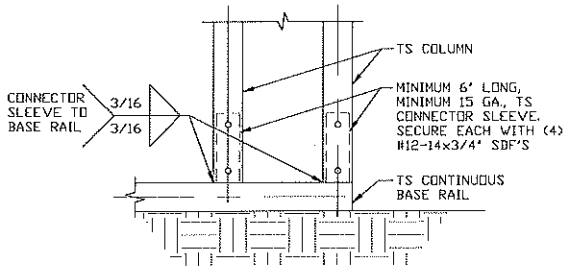
**DWG. NO: SK-3**

**JOB NO: 16022S/  
17300S/20352S**

**REV: 5**

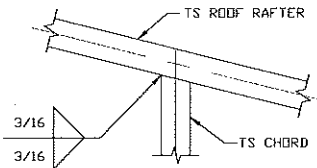
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## CONNECTION DETAILS



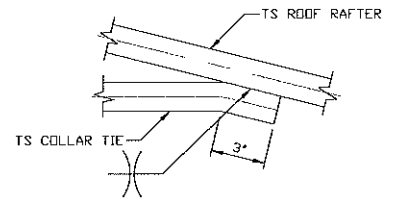
**10 COLUMN/BASE RAIL  
CONNECTION DETAIL**

SCALE: NTS



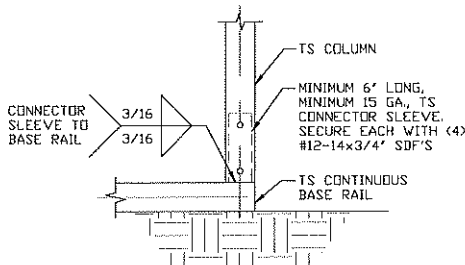
**11 RAFTER TO CHORD  
CONNECTION DETAIL**

SCALE: NTS



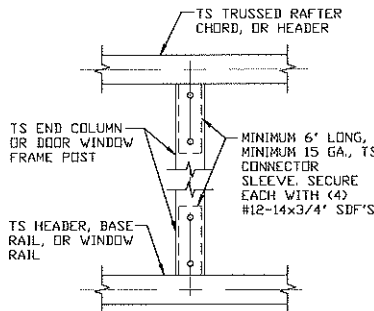
**12 COLLAR TIE  
CONNECTION DETAIL**

SCALE: NTS



**13 COLUMN/BASE RAIL  
CONNECTION DETAIL**

SCALE: NTS



**14 COLUMN TO HEADER,  
BASE RAIL  
CONNECTION DETAIL**

SCALE: NTS



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DRAWN BY: JG

CHECKED BY: PDH

PROJECT MGR: WSM

CLIENT: TBS

TUBULAR BUILDING SYSTEMS  
631 SE INDUSTRIAL CIRCLE  
LAKE CITY, FLORIDA 32025  
30'-0" x 20'-0" ENCLOSED BUILDING EXP. B

DATE: 1-8-21

SCALE: NTS

DWG. NO: SK-3

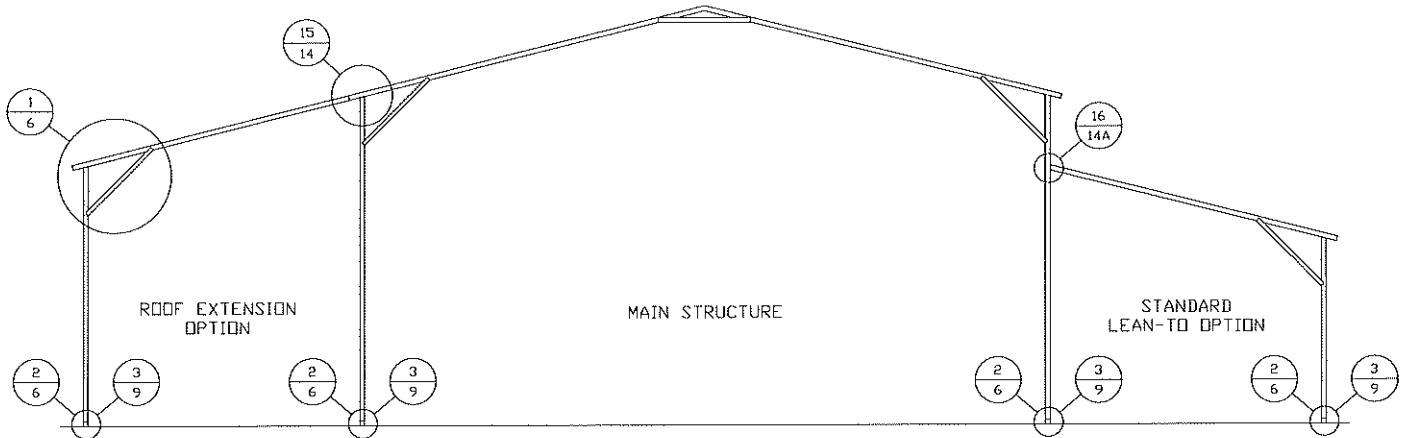
JOB NO: 16022S/  
17300S/20352S

SHT. 13

REV: 5



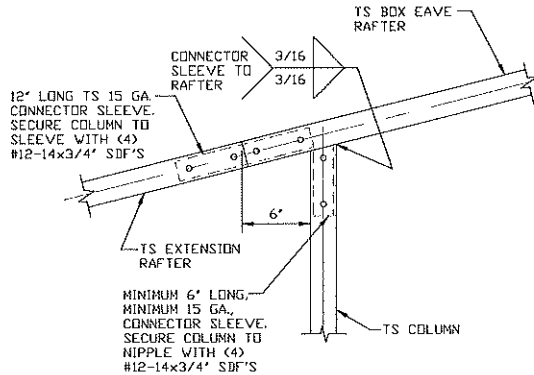
## BOX EAVE RAFTER LEAN-TO OPTIONS



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

SCALE: NTS

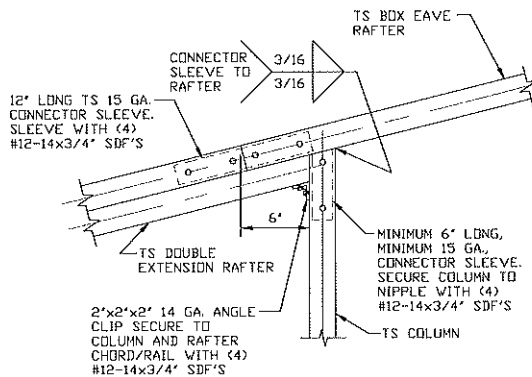
MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE LACED COLUMNS FOR EAVE HEIGHTS 16'-0" < TO ≤ 20'-0".  
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE DOUBLE COLUMNS FOR EAVE HEIGHTS 13'-0" (12'-0" FOR HIGH WIND) < TO ≤ 16'-0".  
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR EAVE HEIGHTS 10'-0" < TO ≤ 13'-0" (12'-0" FOR HIGH WIND) (WITH 4'-4" INSERT).  
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR EAVE HEIGHTS ≤ 10'-0".  
 KNEE BRACES MUST BE 4'-0" (5'-0" FOR HIGH WIND) WHEN LEAN-TO'S ARE ADDED.



15

### SIDE EXTENSION RAFTER/COLUMN DETAIL FOR RAFTER SPANS ≤ 15'-0"

SCALE: NTS



15A

### SIDE EXTENSION RAFTER/COLUMN DETAIL FOR RAFTER SPANS 15'-0" < TO ≤ 24'-0"

SCALE: NTS



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**CHECKED BY: PDH**

**PROJECT MGR: WSM**

**CLIENT: TBS**

TUBULAR BUILDING SYSTEMS  
631 SE INDUSTRIAL CIRCLE  
LAKE CITY, FLORIDA 32025  
30'-0"x20'-0" ENCLOSED BUILDING EXP. B

**DATE: 1-8-21**

**SHT. 14**

**SCALE: NTS**

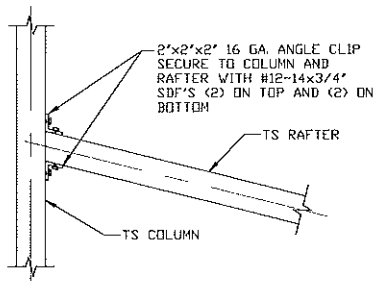
**DWG. NO: SK-3**

**JOB NO: 16022S/  
17300S/20352S**

**REV: 5**

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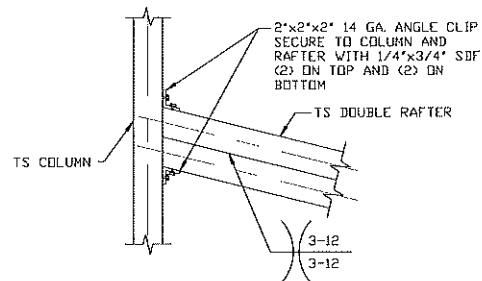
## BOX EAVE RAFTER LEAN-TO OPTIONS



**LEAN-TO RAFTER TO RAFTER  
COLUMN CONNECTION DETAIL  
FOR RAFTER SPANS  $\leq 15'-0''$**

16

SCALE: NTS



**LEAN-TO RAFTER TO RAFTER  
COLUMN CONNECTION DETAIL  
FOR RAFTER SPANS  
 $15'-0'' < TO \leq 24'-0''$**

16A

SCALE: NTS



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**PROJECT MGR: WSM**

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**TUBULAR BUILDING SYSTEMS  
631 SE INDUSTRIAL CIRCLE  
LAKE CITY, FLORIDA 32025  
30'-0"x20'-0" ENCLOSED BUILDING EXP. B**

**DATE: 1-8-21**

**SCALE: NTS**

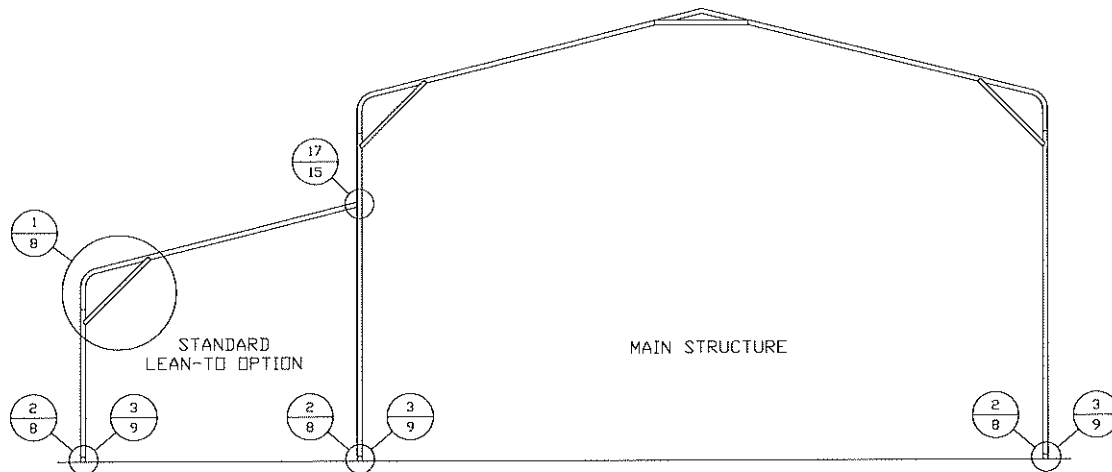
**DWG. NO: SK-3**

**JOB NO: 16022S/  
17300S/20352S**

**REV: 5**

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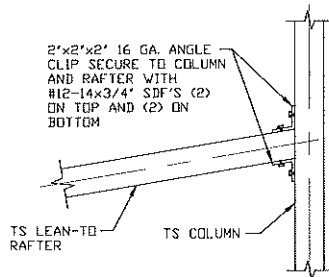
## BOW RAFTER LEAN-TO OPTIONS



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

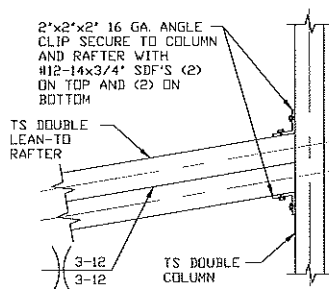
SCALE: NTS

MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE DOUBLE COLUMNS FOR EAVE HEIGHTS 13'-0" (12'-0" FOR HIGH WIND) < TO ≤ 16'-0".  
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR EAVE HEIGHTS 10'-0" < TO ≤ 13'-0" (12'-0" FOR HIGH WIND) (WITH 4'-4" INSERT).  
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR EAVE HEIGHTS ≤ 10'-0".  
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### LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR RAFTER SPANS ≤ 15'-0"

SCALE: NTS



### LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR RAFTER SPANS 15'-0" < TO ≤ 24'-0"

SCALE: NTS



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**PROJECT MGR: WSM**

**CLIENT: TBS**

TUBULAR BUILDING SYSTEMS  
631 SE INDUSTRIAL CIRCLE  
LAKE CITY, FLORIDA 32025  
30'-0"x20'-0" ENCLOSED BUILDING EXP. B

**DATE: 1-8-21**

**SHT. 15**

**SCALE: NTS**

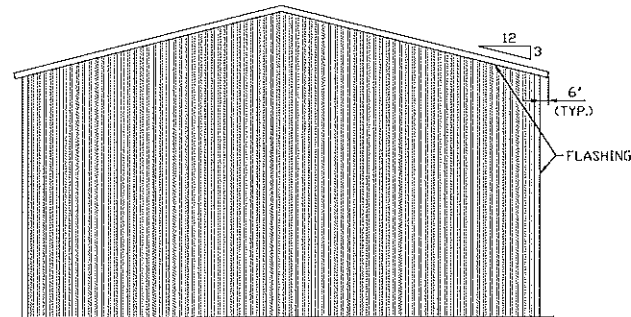
**DWG. NO: SK-3**

**JOB NO: 16022S/  
17300S/20352S**

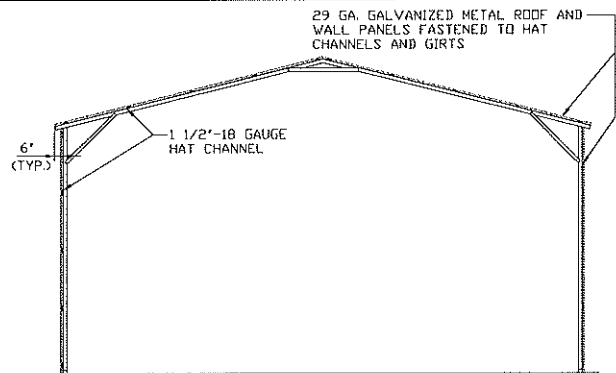
**REV: 5**

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## BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



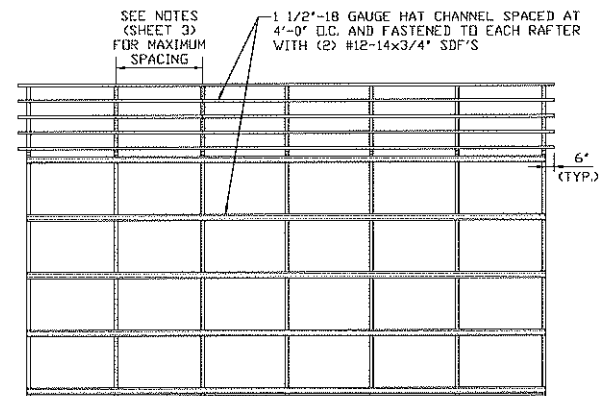
**TYPICAL END ELEVATION  
VERTICAL ROOF/SIDING OPTION**  
SCALE: NTS



**TYPICAL SECTION VERTICAL  
ROOF/SIDING OPTION**  
SCALE: NTS

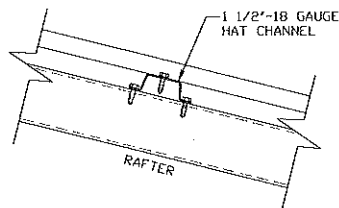


**TYPICAL SIDE ELEVATION  
VERTICAL ROOF/SIDING OPTION**  
SCALE: NTS



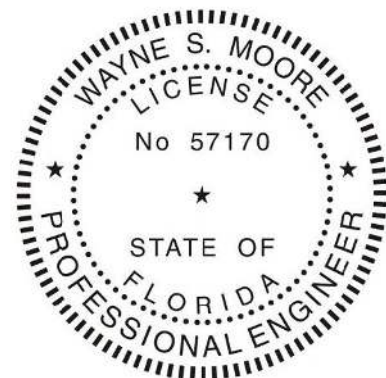
**TYPICAL FRAMING SECTION  
VERTICAL ROOF/SIDING OPTION**  
SCALE: NTS

NOTE: TS WALL GIRTS CAN BE USED AS AN OPTION IN PLACE OF HAT CHANNELS. TS GIRTS MUST BE SPACD AT 4'-0" (MAX.) O.C.



**ROOF PANEL ATTACHMENT**

(ALTERNATE FOR VERTICAL ROOF PANELS)  
SCALE: NTS



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**CHECKED BY: PDH**

**PROJECT MGR: WSM**

**CLIENT: TBS**

TUBULAR BUILDING SYSTEMS  
631 SE INDUSTRIAL CIRCLE  
LAKE CITY, FLORIDA 32025  
30'-0"x20'-0" ENCLOSED BUILDING EXP. B

**DATE: 1-8-21**

**SHT. 16**

**SCALE: NTS**

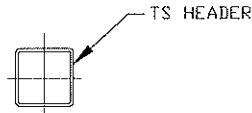
**DWG. NO: SK-3**

**JOB NO: 16022S/  
17300S/20352S**

**REV: 5**

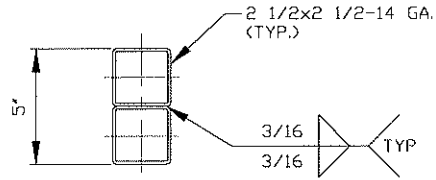
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## SIDE WALL HEADER OPTIONS



**HEADER DETAIL FOR DOOR  
OPENINGS  $\leq 10'-0"$**

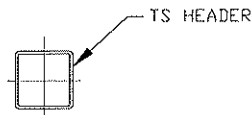
SCALE: NTS



**HEADER DETAIL FOR DOOR  
OPENINGS  $10'-0" < \text{LENGTH} \leq 15'-0"$**

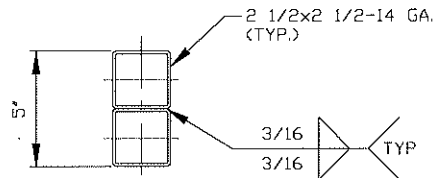
SCALE: NTS

## END WALL HEADER OPTIONS



**HEADER DETAIL FOR DOOR  
OPENINGS  $\leq 12'-0"$**

SCALE: NTS



**HEADER DETAIL FOR DOOR  
OPENINGS  $12'-0" < \text{LENGTH} \leq 15'-0"$**

SCALE: NTS



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**CLIENT: TBS**

**TUBULAR BUILDING SYSTEMS  
631 SE INDUSTRIAL CIRCLE  
LAKE CITY, FLORIDA 32025  
30'-0"x20'-0" ENCLOSED BUILDING EXP. B**

**DATE: 1-8-21**

**SCALE: NTS**

**DWG. NO: SK-3**

**JOB NO: 16022S/  
17300S/20352S**

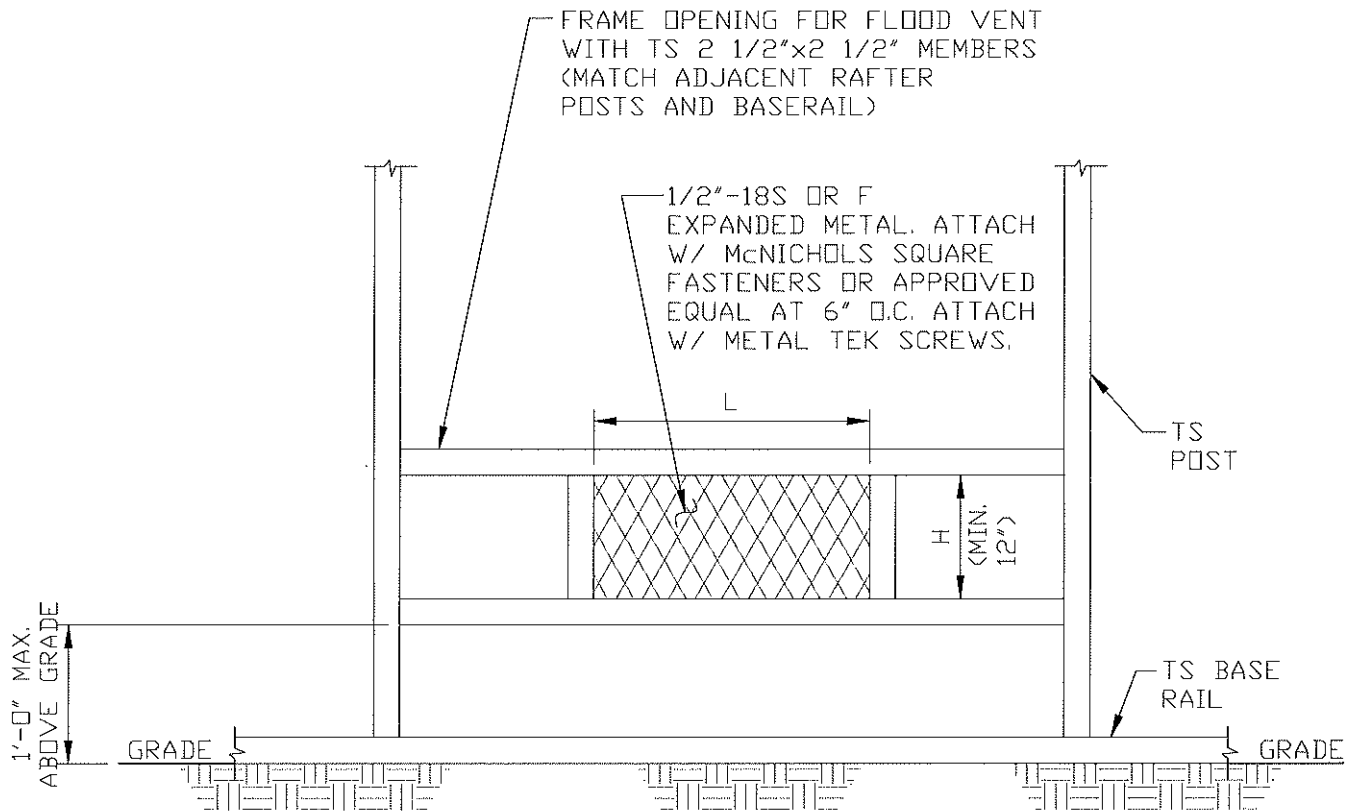
**SHT. 17**

**REV: 5**

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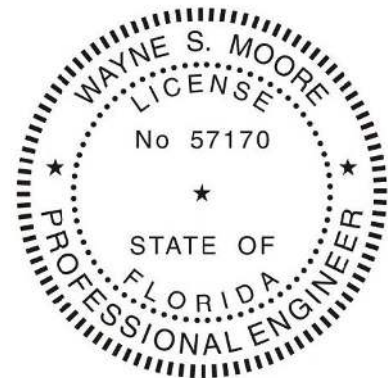
## FLOOD VENT DETAIL



### TYPICAL FLOOD VENT DETAIL

SCALE: NTS

1. MINIMUM VENT SPACE REQUIRED = 1 SQ. INCH OF OPEN VENT AREA PER SQ. FOOT OF BUILDING AREA.
2. THERE SHALL BE A MINIMUM OF TWO OPENINGS ON DIFFERENT SIDES FOR EACH ENCLOSED BUILDING.
3. APPLY 1.3 FACTOR WHEN CALCULATING TOTAL OPEN AREA WHEN USING 1/2"-18GA S OR F EXPANDED METAL.
4. TOTAL OPEN AREA OF VENT =  $L \times H(\text{MIN. } 12")$ .
5. FLOOD VENT DETAIL COMPLIES WITH FEMA/NFIP.
6. PREFABRICATED FLOOD VENTS MEETING THE REQUIREMENTS OF FEMA/NFIP MAY BE USED.



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TUBULAR BUILDING SYSTEMS  
631 SE INDUSTRIAL CIRCLE  
LAKE CITY, FLORIDA 32025  
30'-0"x20'-0" ENCLOSED BUILDING EXP. B

**DATE: 1-8-21**

**SHT. 18**

**SCALE: NTS**

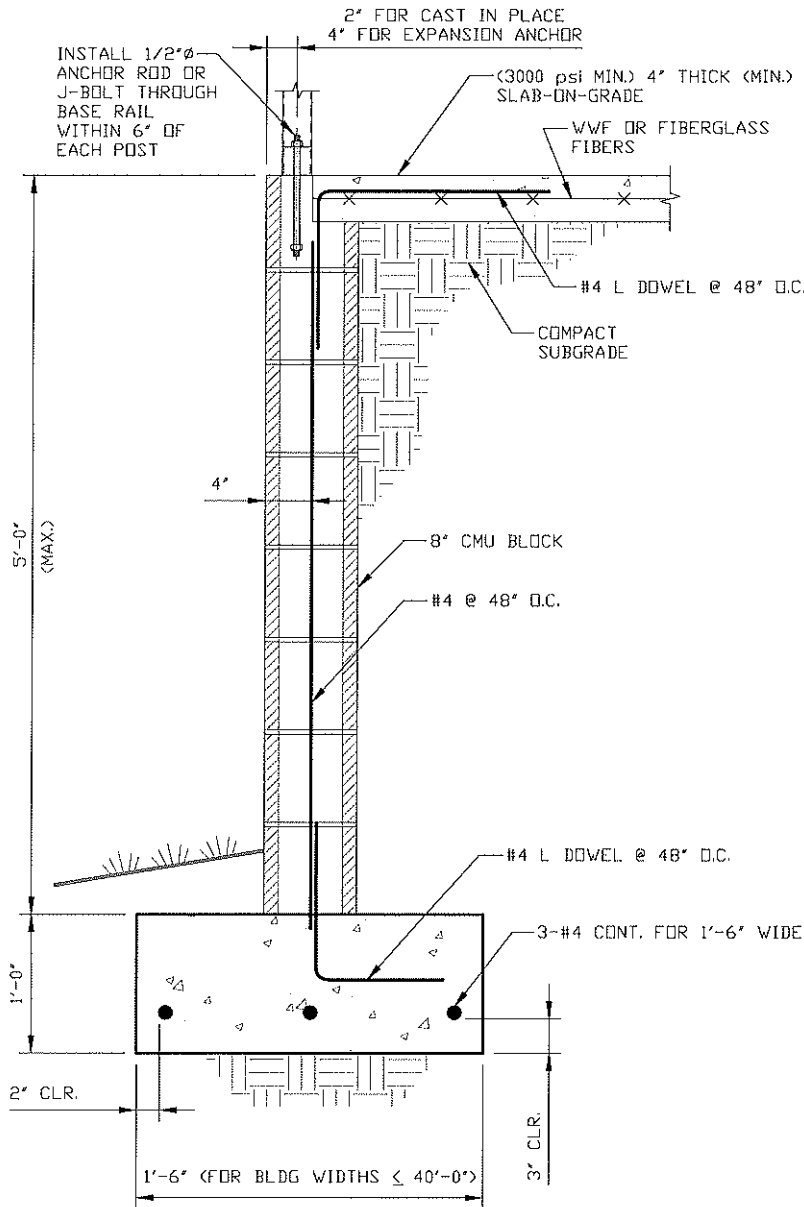
**DWG. NO: SK-3**

**JOB NO: 16022S/  
17300S/20352S**

**REV: 5**

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## STAND -ALONE STEM WALL DETAIL



**STAND-ALONE CONCRETE MASONRY UNIT (CMU)  
FOUNDATION STEM WALL DETAIL**

SCALE: NTS



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**PROJECT MGR: WSM**

**CLIENT: TBS**

**TUBULAR BUILDING SYSTEMS  
631 SE INDUSTRIAL CIRCLE  
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**DATE: 1-8-21**

**SHT. 19**

**SCALE: NTS**

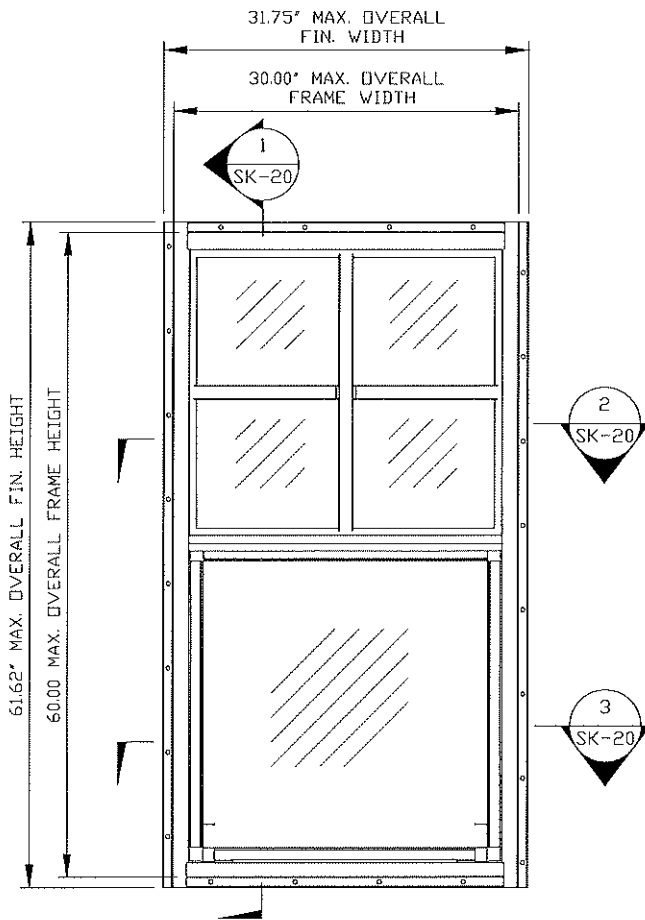
**DWG. NO: SK-3**

**JGB NO: 16022S/  
17300S/20352S**

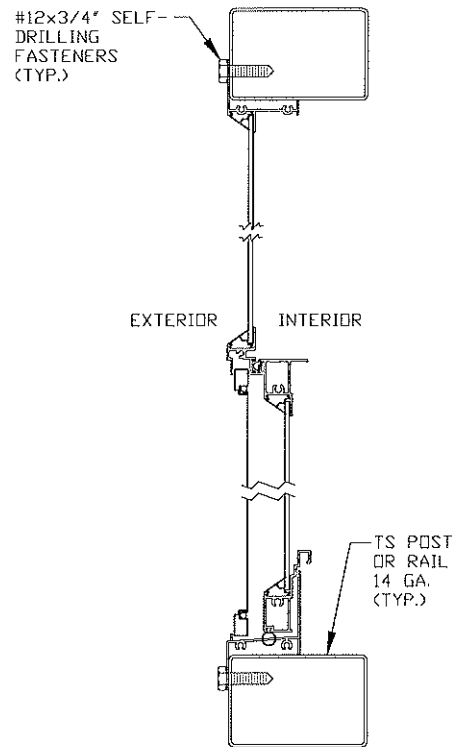
**REV: 5**

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# VERTICAL SLIDING WINDOW DETAIL



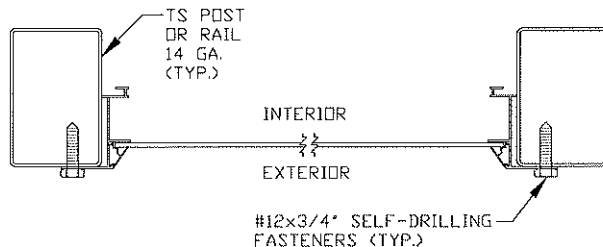
**ELEVATION VIEW**  
SCALE: NTS



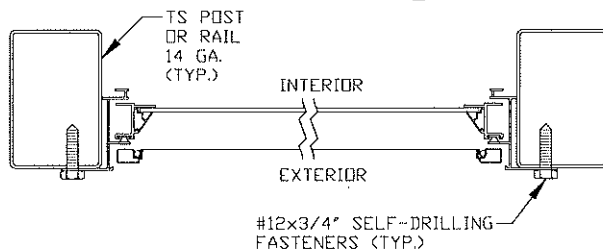
**SECTION 1**  
SCALE: 3"=1'-0"

NOTE: KINRO SERIES 18000-R VS OR EQUIVALENT WINDOW IS REQUIRED.

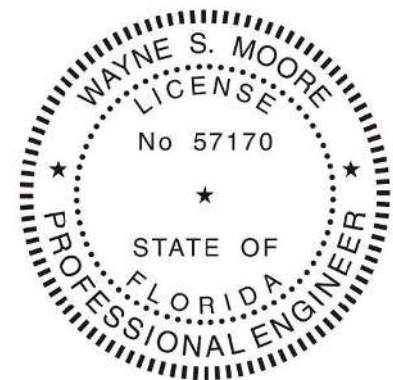
**POSITIVE WALL PRESSURE: +40.0 PSF**  
**NEGATIVE WALL PRESSURE: -40.0 PSF**



**SECTION 2**  
SCALE: 3"=1'-0"



**SECTION 3**  
SCALE: 3"=1'-0"



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**PROJECT MGR: WSM**

**CLIENT: TBS**

**TUBULAR BUILDING SYSTEMS**  
631 SE INDUSTRIAL CIRCLE  
LAKE CITY, FLORIDA 32025  
30'-0"x20'-0" ENCLOSED BUILDING EXP. B

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**SCALE: NTS**

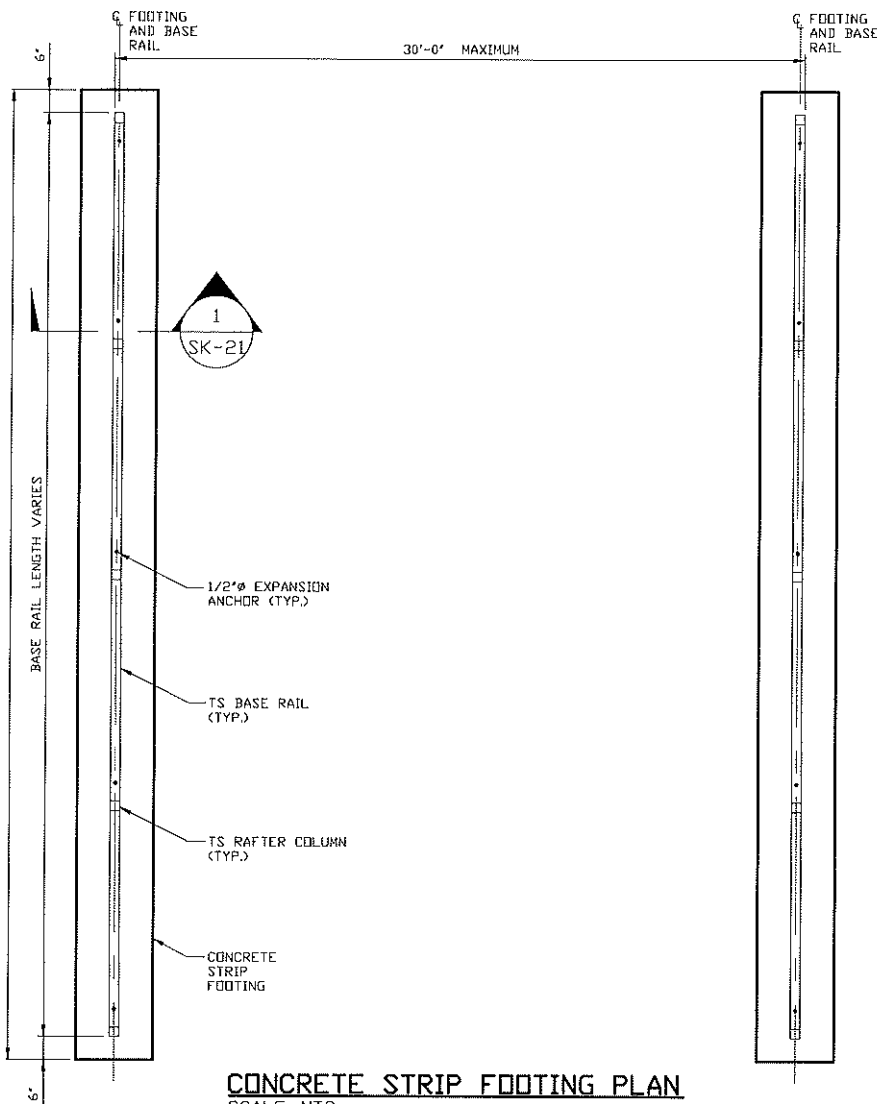
**DWG. NO: SK-3**

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17300S/20352S**

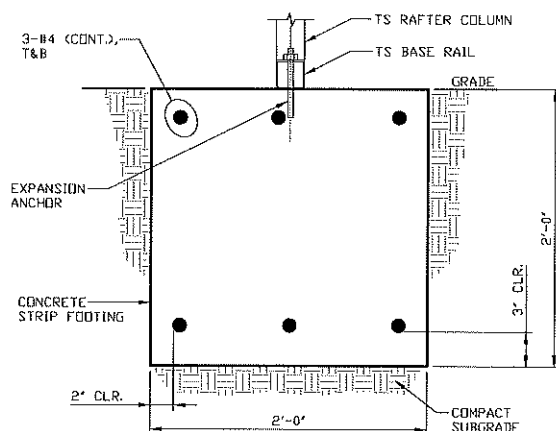
**REV: 5**

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## OPTIONAL CONCRETE STRIP FOOTING



**CONCRETE STRIP FOOTING PLAN**  
SCALE: NTS



**SECTION 1**  
SCALE: NTS

\* COORDINATE WITH LOCAL CODES/ORD.

1. STRIP FOOTING DESIGN BASED ON MINIMUM SOIL BEARING CAPACITY OF 1,500 PSF.
2. CONCRETE SHALL HAVE A MINIMUM SPECIFIED COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS.
3. 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.
4. THE STRIP FOOTING REINFORCING STEEL SHALL BE ASTM A615 GRADE 60.
5. REINFORCEMENT MAY BE BENT IN THE SHOP OR IN THE FIELD PROVIDED:
  - A) REINFORCEMENT IS BENT COLD.
  - B) THE DIAMETER OF THE BEND, MEASURED ON THE INSIDE OF THE BAR, IS NOT LESS THAN SIX-BAR DIAMETERS.
  - C) REINFORCEMENT PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE FIELD BENT.



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**SHT. 21**

**SCALE: NTS**

**DWG. NO: SK-3**

**JOB NO: 16022S/  
17300S/20352S**

**REV: 5**

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