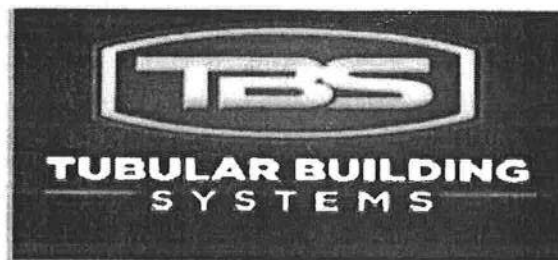


33



**STRUCTURAL DESIGN**  
**ENCLOSED BUILDING**  
**EXPOSURE B**

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

29 July 2021

Revision 6

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**



**Wayne  
S Moore**

Digitally signed  
by Wayne S  
Moore  
Date: 2021.10.21  
08:30:02 -04'00'



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ENGINEERING AND CONSULTING



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CHECKED BY: PDH

PROJECT MGR: WSM

CLIENT: TBS

**TUBULAR BUILDING SYSTEMS  
30'-0"x20'-0" ENCLOSED BUILDING EXP. B  
PE SEAL COVER SHEET**

DATE: 7-29-21

SCALE: NTS

JOB NO: 16022S/  
17300S/20352S

SHT. 1

DWG. NO: SK-3

REV: 6

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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: 7-29-21

SCALE: NTS

JOB NO: 16022S/  
17300S/20352S

SHT. 2

DWG. NO: SK-3

REV: 6

## 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 = 15 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 = 50 FEET
- 5 HIGH ULTIMATE WIND SPEED 141 TO 170 MPH (NOMINAL WIND SPEED 109 TO 132 MPH); MAXIMUM RAFTER/POST AND END POST SPACING = 40 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" x 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 5' 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 (< 100 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 = 325      I<sub>E</sub> = 10  
 S<sub>DS</sub> = 1.522 g      V = 0.5W  
 S<sub>DI</sub> = 0.839 g



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

DATE: 7-29-21

SHT. 3

SCALE: NTS

DWG. NO: SK-3

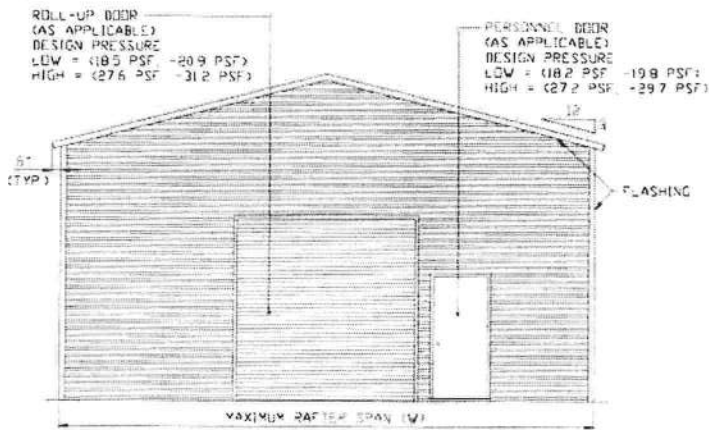
JOB NO: 16022S/  
17300S/20352S

REV: 6

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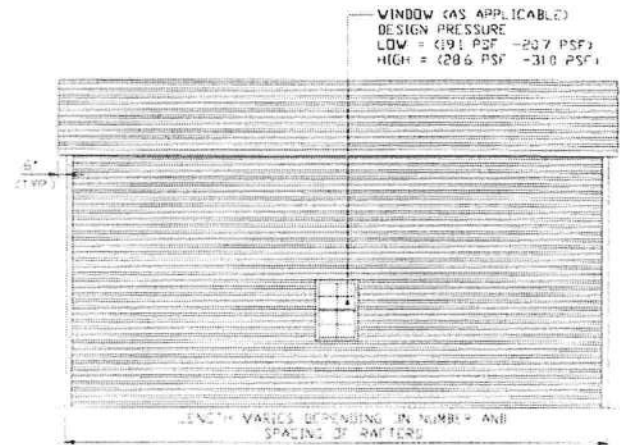


## BOX EAVE FRAME RAFTER ENCLOSED BUILDING



**TYPICAL END ELEVATION**

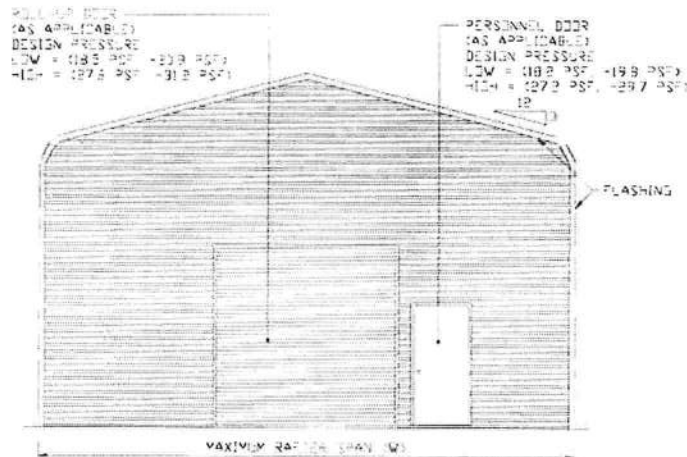
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**TYPICAL SIDE ELEVATION**

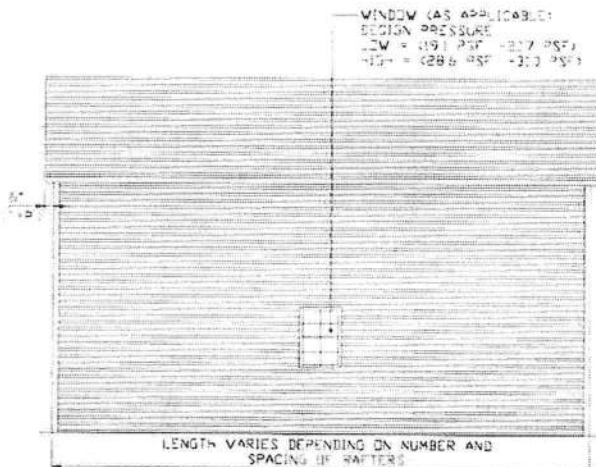
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## BOX FRAME RAFTER ENCLOSED BUILDING



**TYPICAL END ELEVATION**

SCALE: NTS



**TYPICAL SIDE ELEVATION**

SCALE: NTS



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631 SE INDUSTRIAL CIRCLE  
LAKE CITY, FLORIDA 32025  
30'-0"X20'-0" ENCLOSED BUILDING EXP. B

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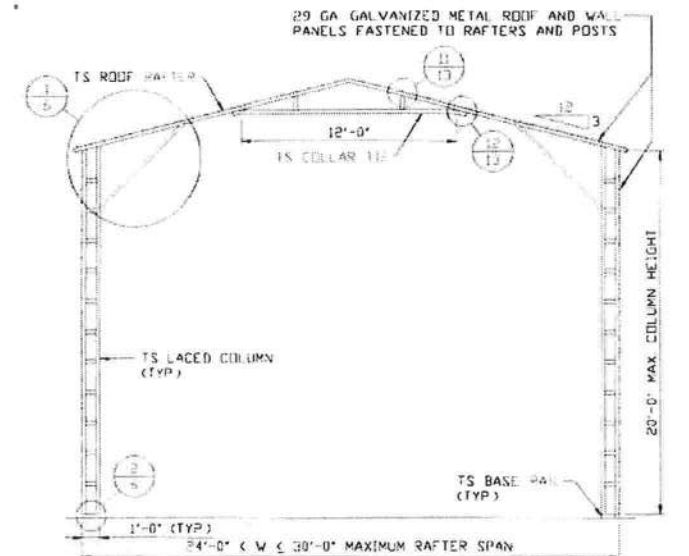
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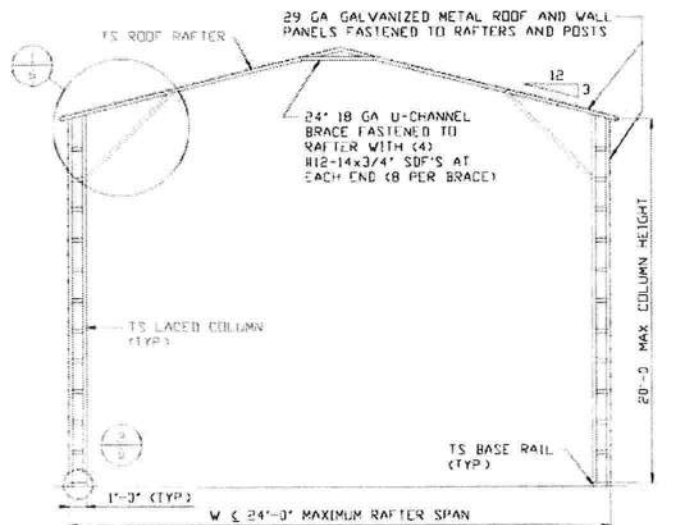
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17300S/20352S

REV: 6



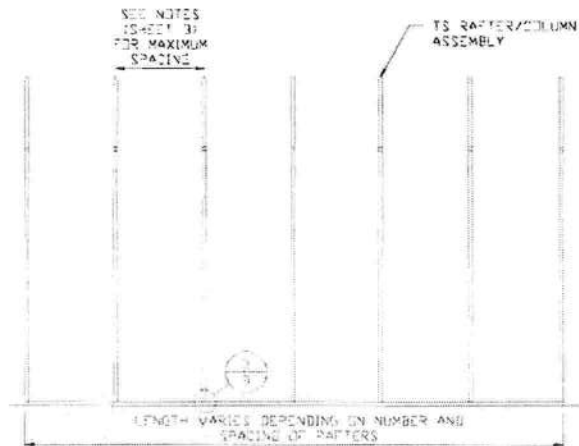
**TYPICAL RAFTER/COLUMN END FRAME SECTION**

SCALE: NTS



**TYPICAL RAFTER/COLUMN END FRAME SECTION**

SCALE: NTS



**TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION**

SCALE: NTS



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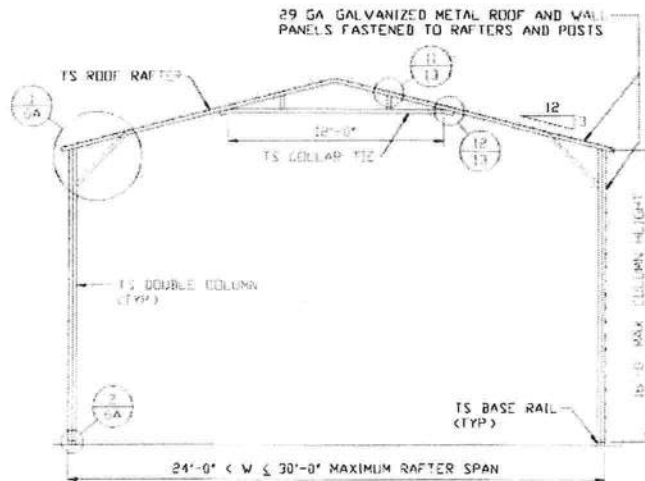
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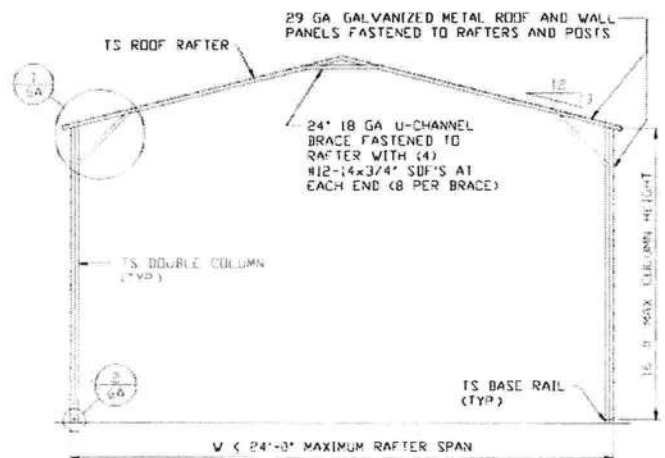
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JOB NO: 16022S/  
17300S/20352S

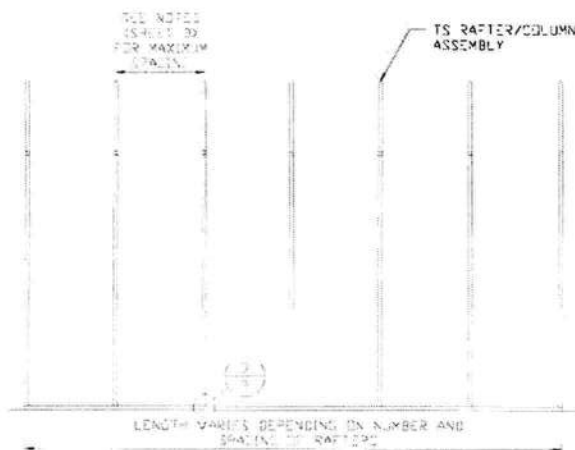
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**TYPICAL RAFTER/COLUMN END FRAME SECTION**  
SCALE: NTS



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



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



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

**DATE: 7-29-21**

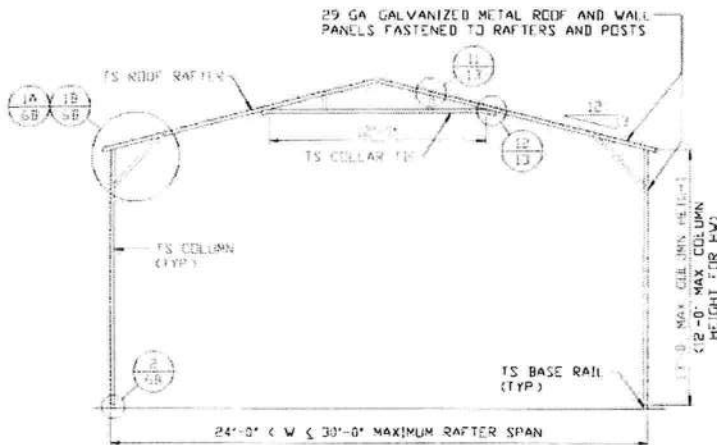
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**SCALE: NTS**

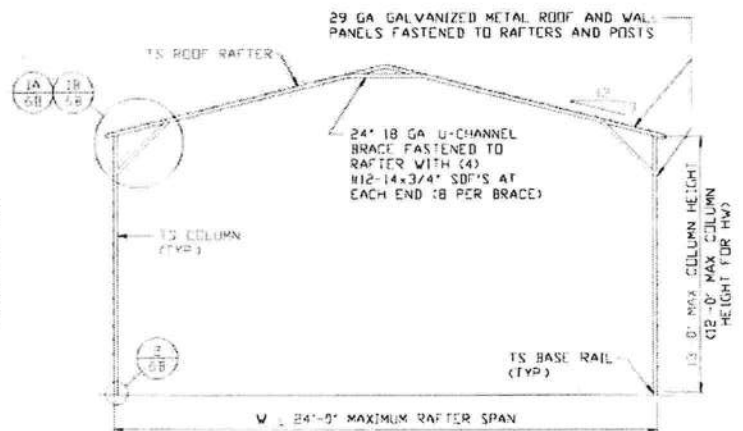
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**JOB NO: 16022S/  
17300S/20352S**

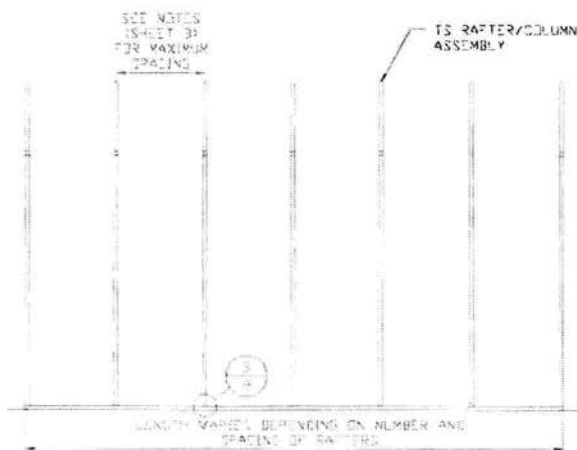
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**TYPICAL RAFTER/COLUMN END FRAME SECTION**  
SCALE: NTS



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



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



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

DATE: 7-29-21

SHT. 5B

SCALE: NTS

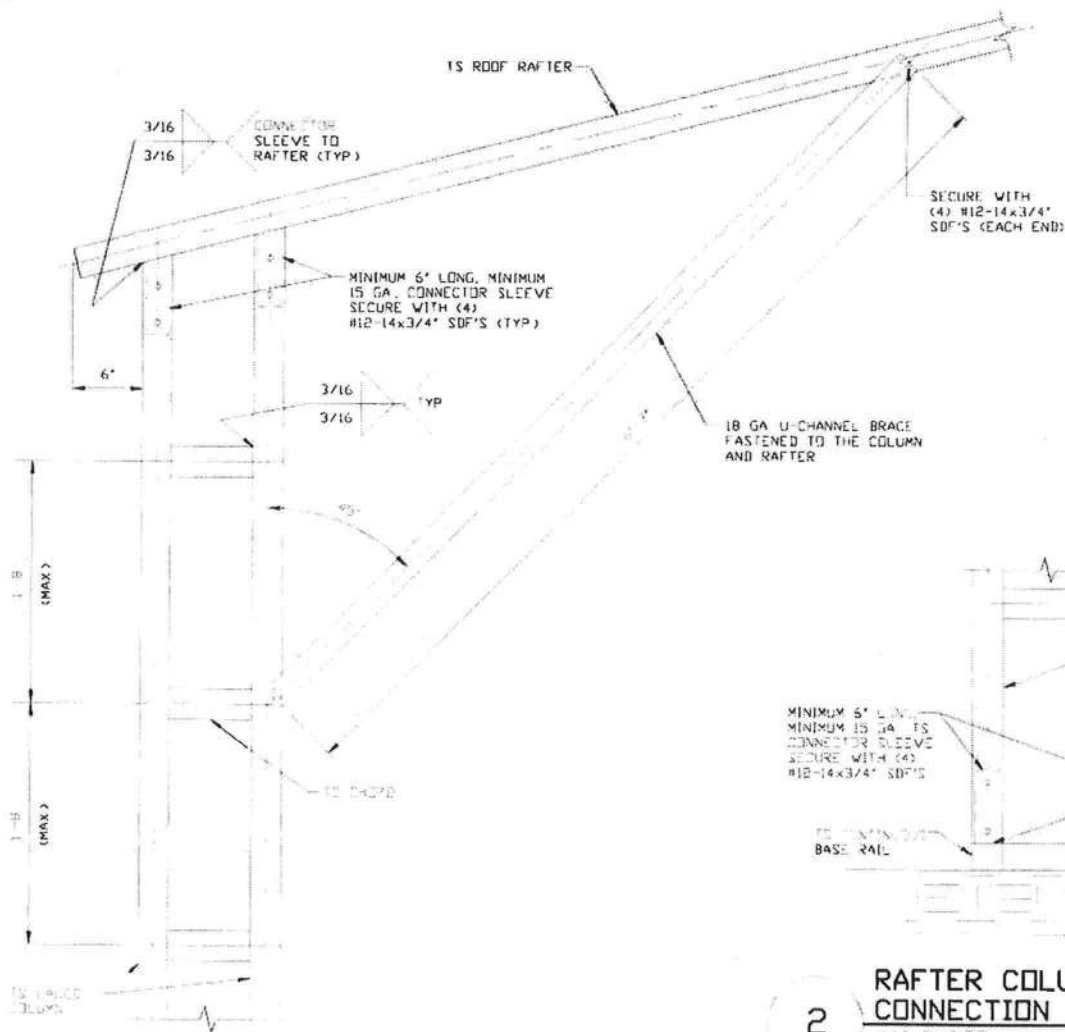
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17300S/20352S

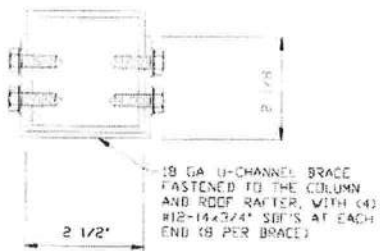
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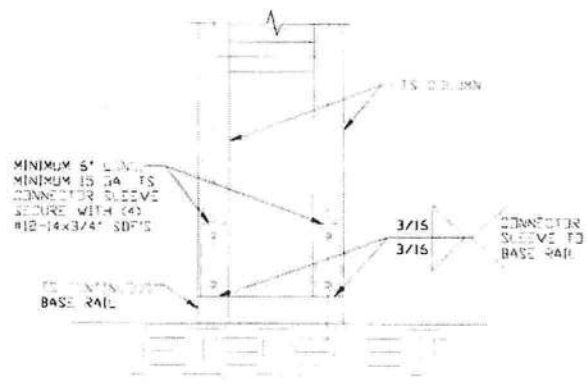
**BOX EAVE RAFTER COLUMN  
CONNECTION DETAIL  
FOR HEIGHTS 16'-0\"**

SCALE: NTS



**BRACE SECTION**

SCALE: NTS



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

SCALE: NTS



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

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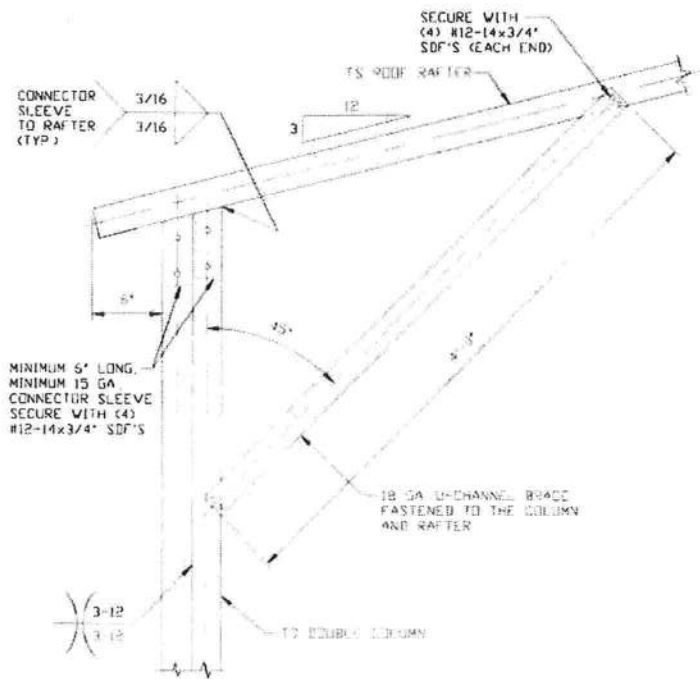
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SCALE: NTS

DWG. NO: SK-3

JOB NO: 16022S/  
17300S/20352S

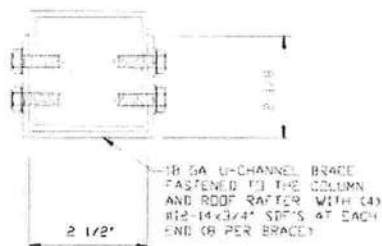
REV: 6



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

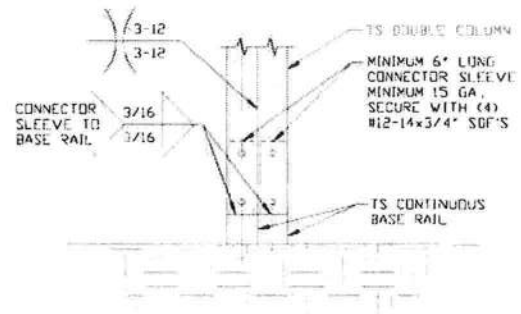
SCALE: NTS

NOTE: COLUMN HEIGHTS 12'-0" < TO ≤ 15'-0" FOR HIGH WIND



**BRACE SECTION**

SCALE: NTS



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

SCALE: NTS



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LAKE CITY, FLORIDA 32025  
30'-0"x20'-0" ENCLOSED BUILDING EXP. B

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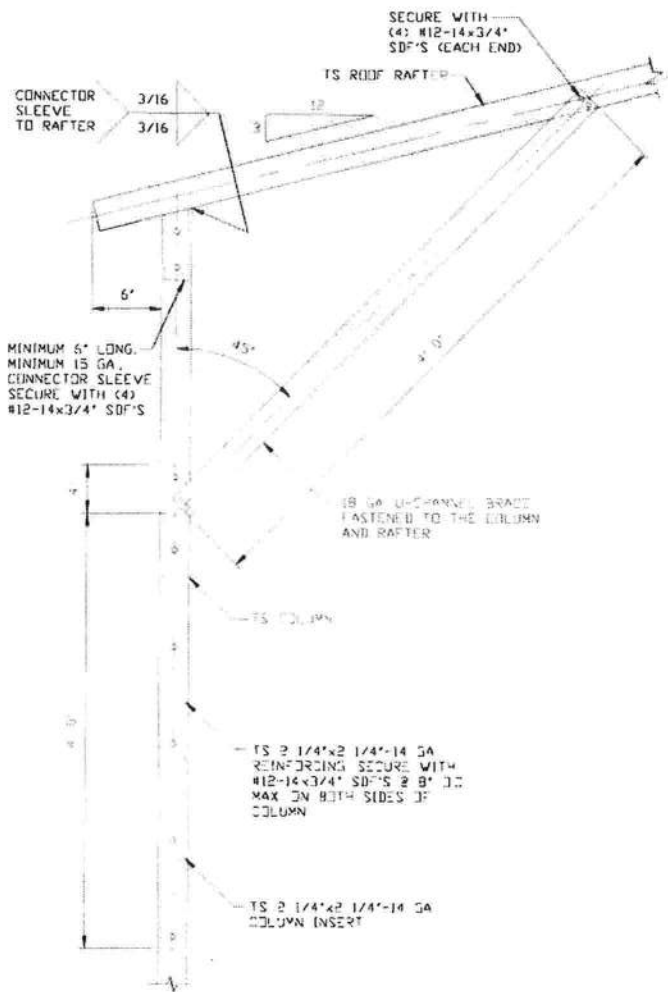
SHT. 6A

SCALE: NTS

DWG. NO: SK-3

JOB NO: 16022S/  
17300S/20352S

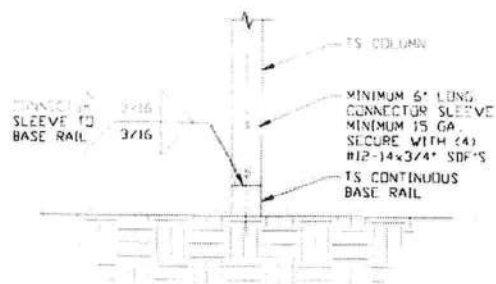
REV: 6



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

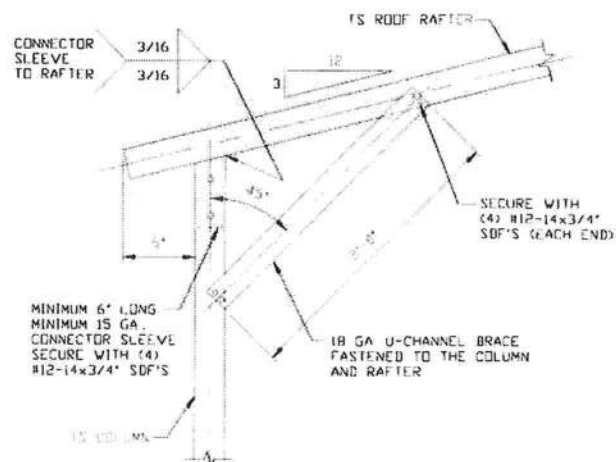
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NOTE: MAXIMUM COLUMN HEIGHT IS 12'-0" FOR HIGH WIND



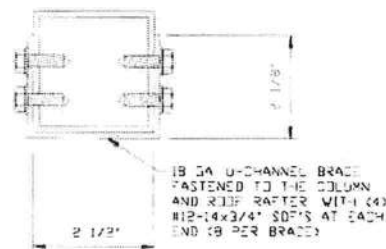
**RAFTER COLUMN/BASE RAIL  
CONNECTION DETAIL**

SCALE: NTS



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

SCALE: NTS



**BRACE SECTION**

SCALE: NTS



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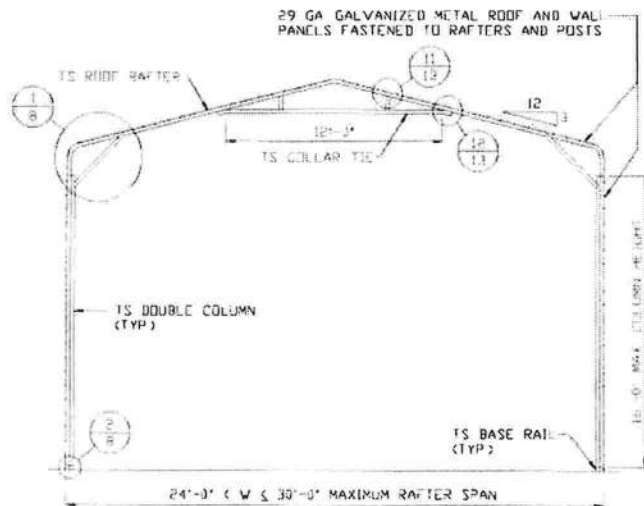
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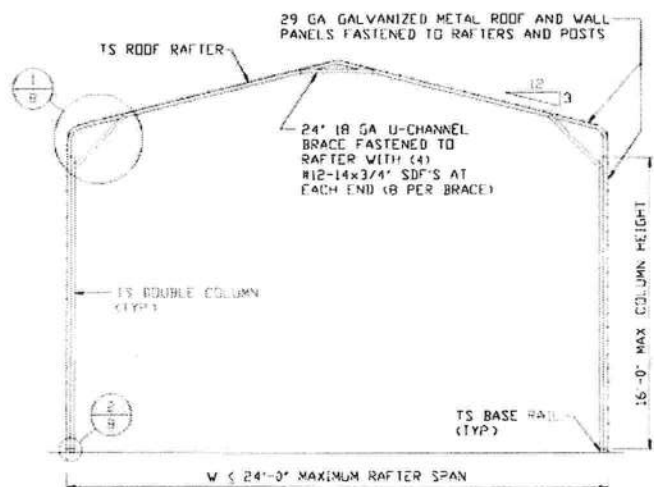
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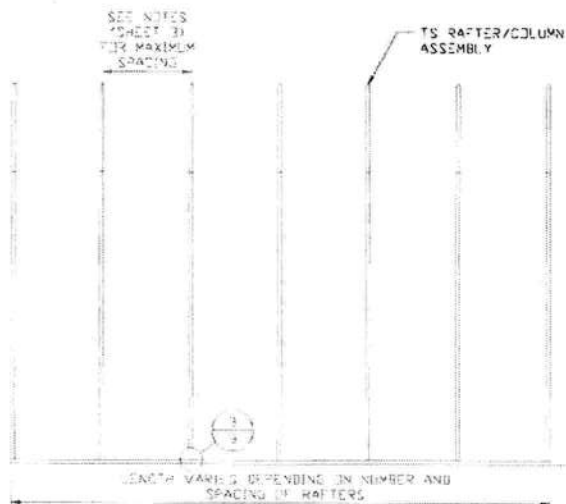
REV: 6



**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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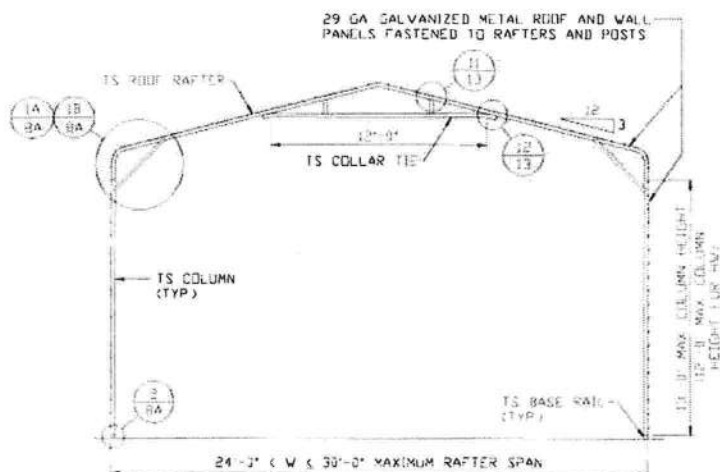
SHT. 7

SCALE: NTS

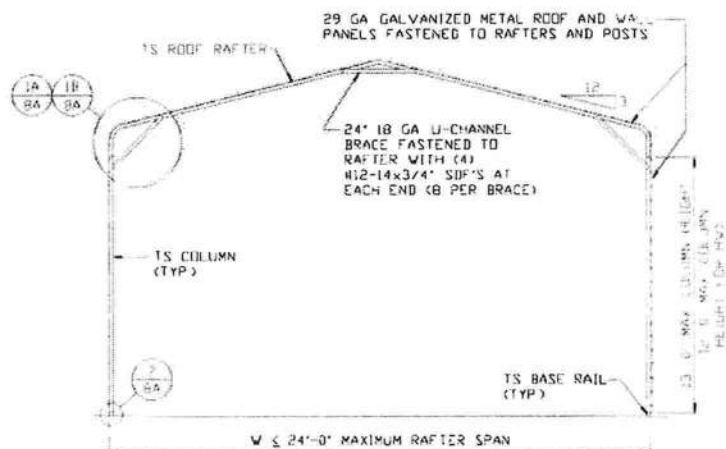
DWG. NO: SK-3

JOB NO: 16022S/  
17300S/20352S

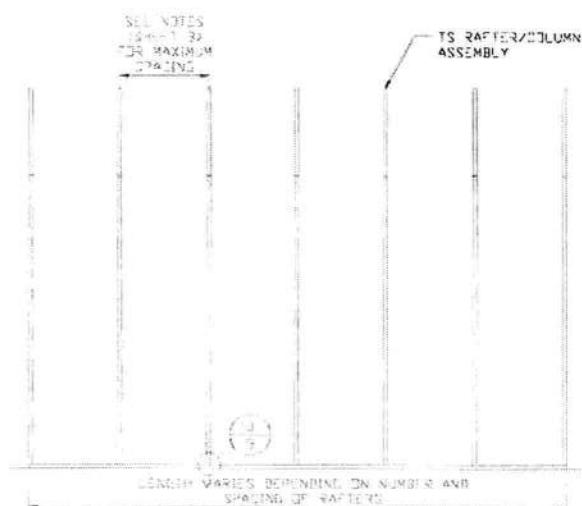
REV: 6



**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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CHECKED BY: PDH

PROJECT MGR: WSH

CLIENT: TBS

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

DATE: 7-29-21

SHT. 7A

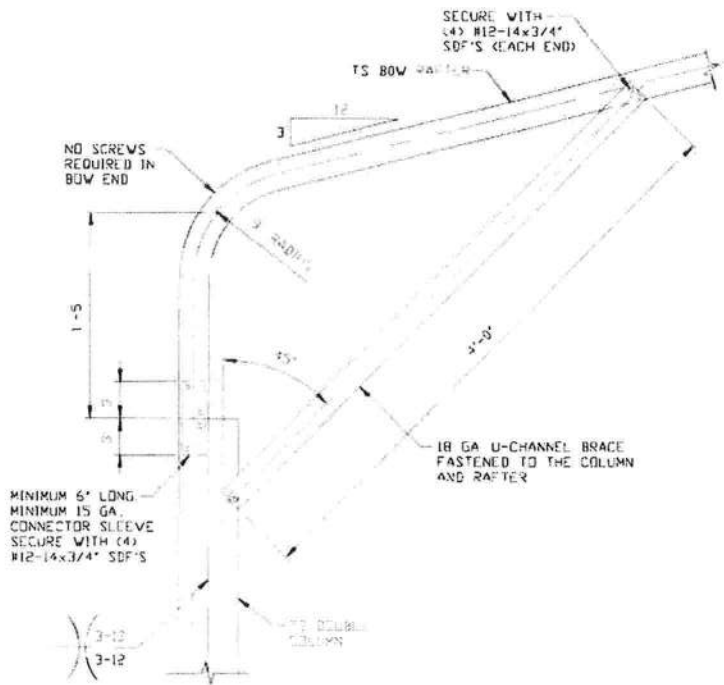
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DWG. NO: SK-3

JOB NO: 16022S/  
17300S/20352S

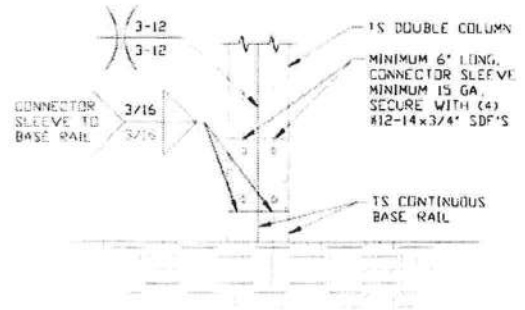
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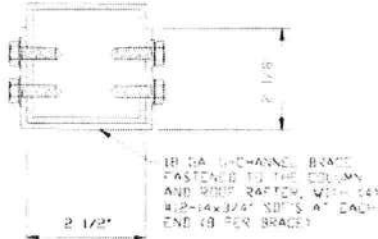
**BOX EAVE RAFTER COLUMN  
CONNECTION DETAIL**  
FOR HEIGHTS 13'-0" < TO ≤ 16'-0"

SCALE: NTS  
NOTE: COLUMN HEIGHTS 12'-0" < TO ≤ 15'-0" FOR HIGH WIND



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

SCALE: NTS



**BRACE SECTION**

SCALE: NTS



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

DATE: 7-29-21

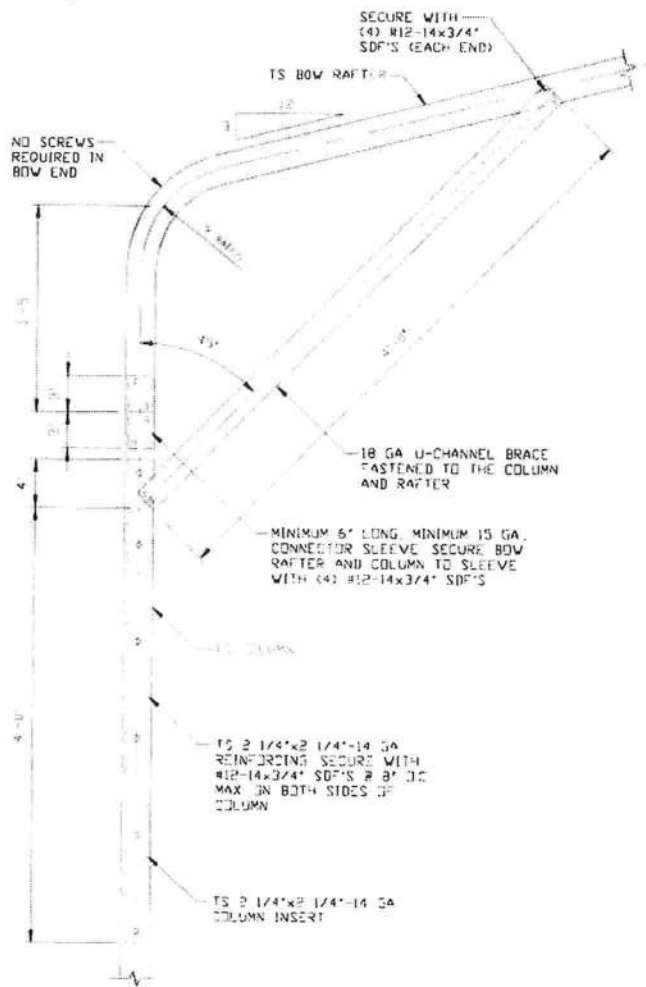
SHT. 8

SCALE: NTS

DWG. NO: SK-3

JOB NO: 16022S/  
17300S/20352S

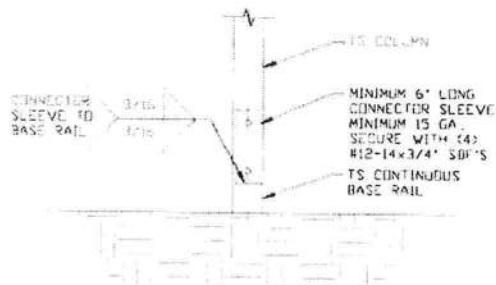
REV: 6



1A

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

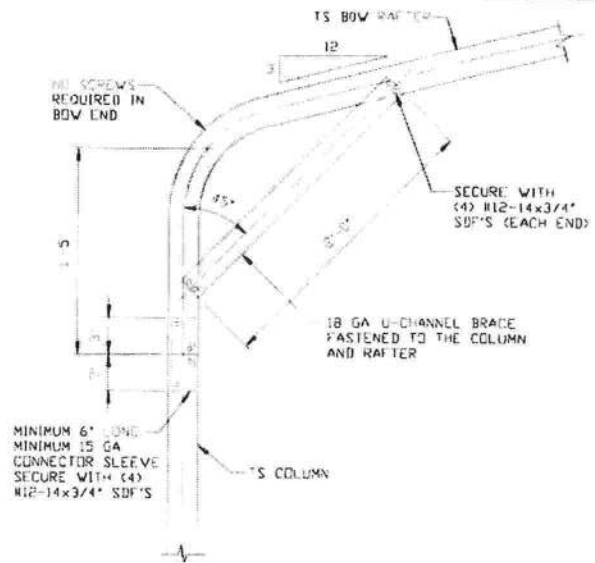
SCALE: NTS  
NOTE: MAXIMUM COLUMN HEIGHT IS 12'-0" FOR HIGH WIND



2

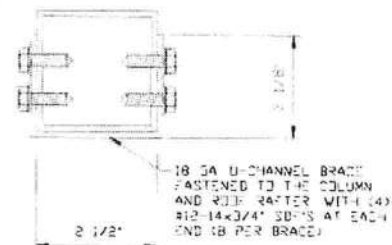
### RAFTER COLUMN/BASE RAIL CONNECTION DETAIL

SCALE: NTS



1B

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



### BRACE SECTION

SCALE: NTS



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

DATE: 7-29-21

ISHT: 8A

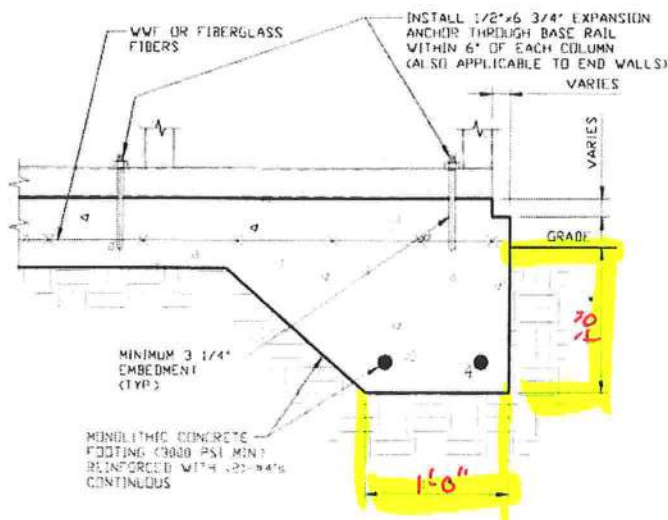
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JOB NO: 16022S/  
17300S/20352S

REV: 6

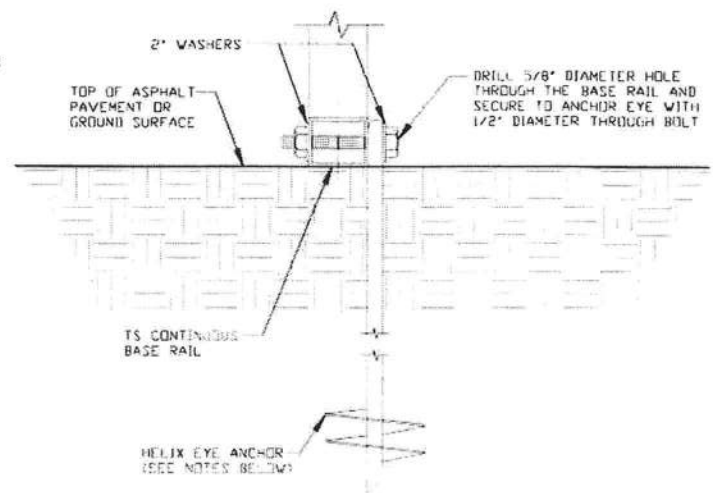
## BASE RAIL ANCHORAGE OPTIONS FOR LOW AND HIGH WIND SPEED



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 1500 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 LOOSE 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: WSH

CLIENT: TBS

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30'-0"x20'-0" ENCLOSED BUILDING EXP. B

DATE: 7-29-21

SHT. 9

SCALE: NTS

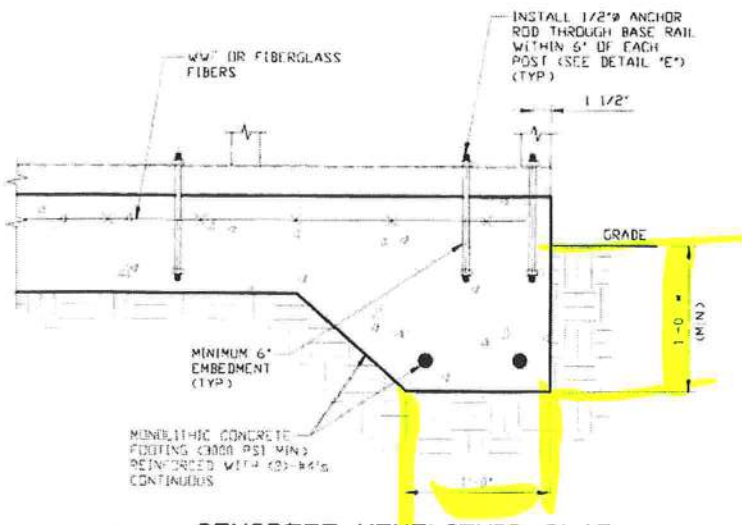
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JOB NO: 16022S/  
17300S/20352S

REV: 6

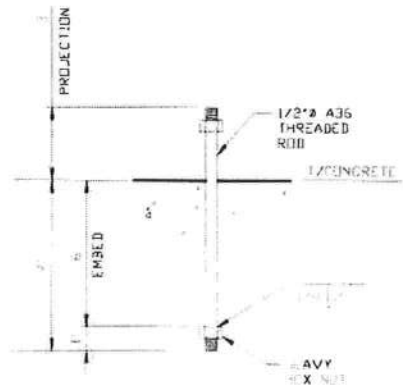


### OPTIONAL FOUNDATION ANCHORAGE FOR LOW AND HIGH WIND SPEED



CONCRETE MONOLITHIC SLAB  
BASE RAIL ANCHORAGE

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



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 A195 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  
0"x20'-0" ENCLOSED BUILDING EXP. B

DATE: 7-29-21

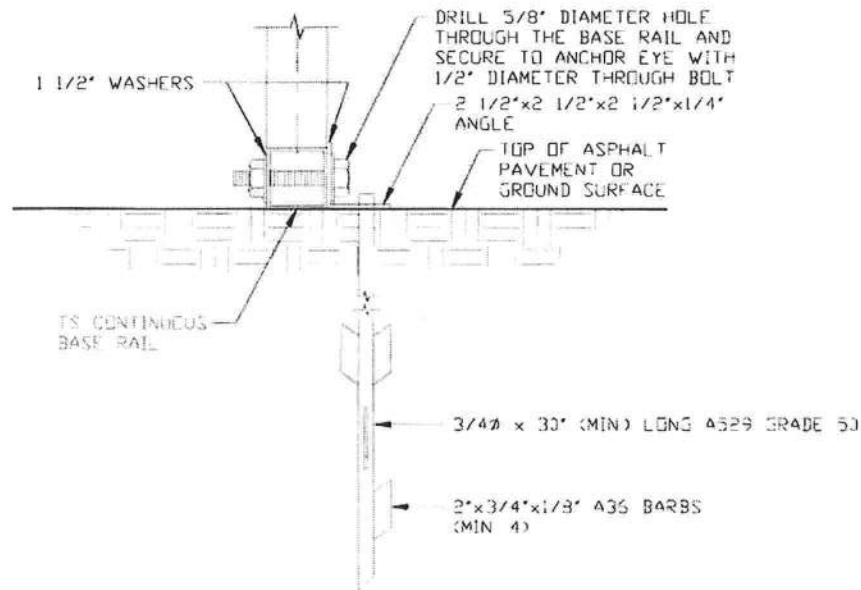
SCALE POINTS

DWG. NO: SK-3

JOB NO: 16022S/  
17300S/20352S

REV. 6

## 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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TUBULAR BUILDING SYSTEMS  
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LAKE CITY, FLORIDA 32025  
30'-0"x20'-0" ENCLOSED BUILDING EXP. B

DATE: 7-29-21

SHT. 9B

SCALE: NTS

DWG. NO: SK-3

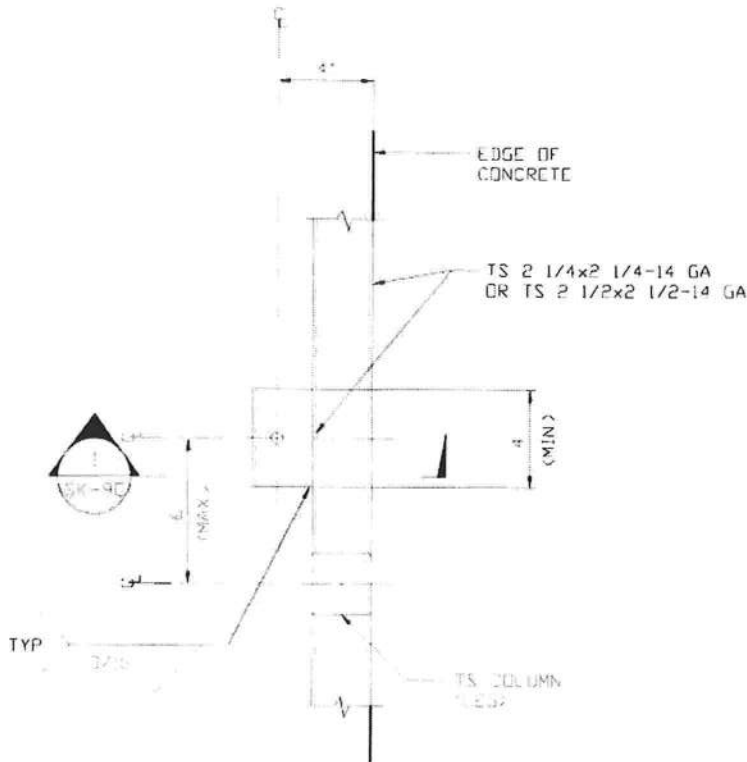
JOB NO: 16022S/  
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REV: 6

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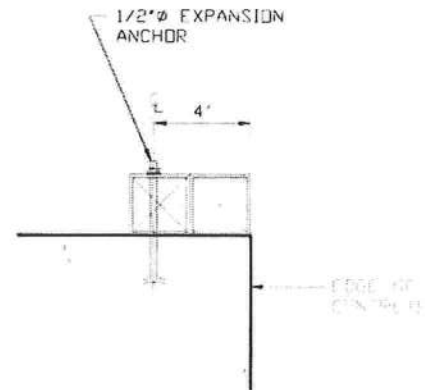


## BASE RAIL ANCHORAGE OPTIONS



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

SCALE: NTS



**SECTION 1**  
SCALE: NTS



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

**DATE: 7-29-21**

**SHT. 9C**

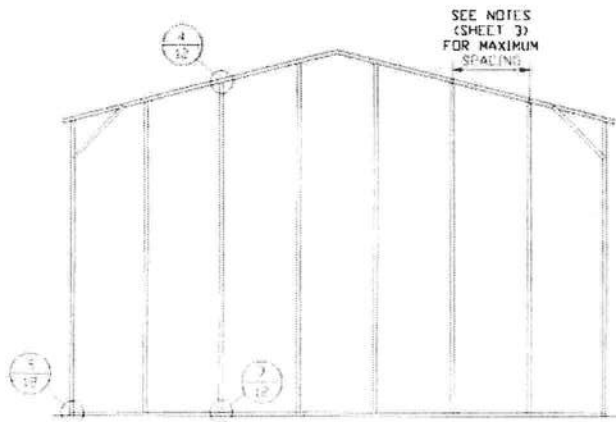
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**DWG. NO: SK-3**

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

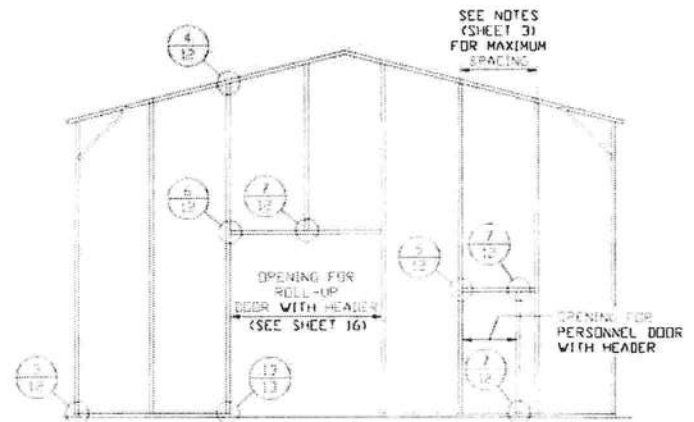
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## BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS



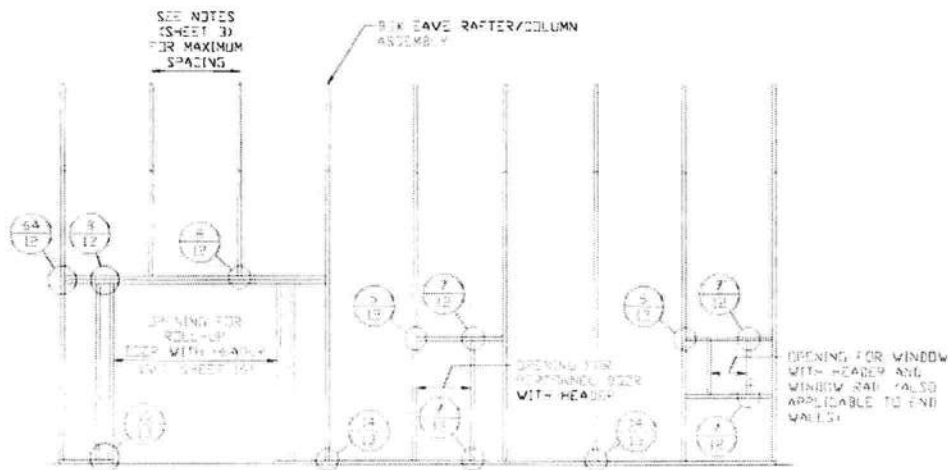
**TYPICAL BOX EAVE RAFTER  
END WALL FRAMING SECTION**

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

**DATE: 7-29-21**

**SHT. 10**

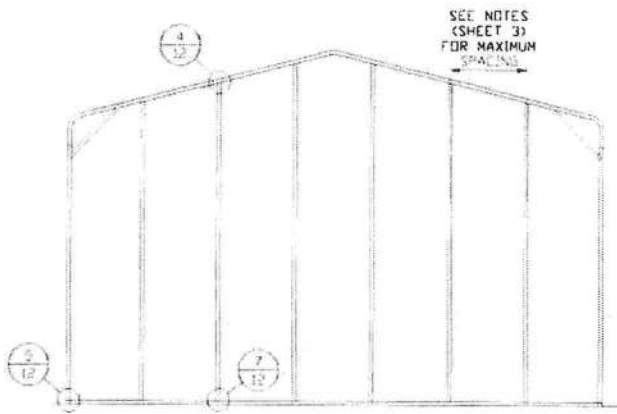
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**JOB NO: 16022S/  
17300S/20352S**

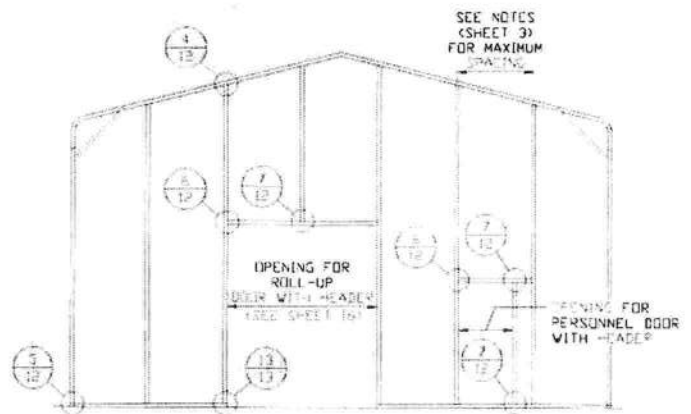
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## BOW RAFTER END WALL AND SIDE WALL OPENINGS



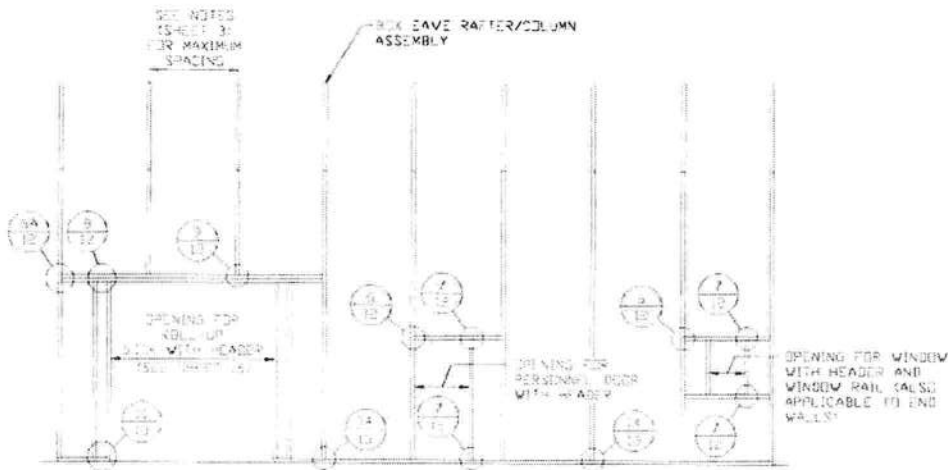
**TYPICAL BOX EAVE RAFTER  
END WALL FRAMING SECTION**

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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**CLIENT: TBS**

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

**DATE: 7-29-21**

**SHT. 11**

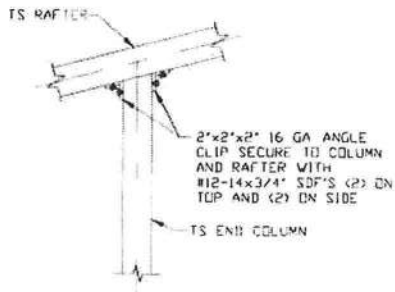
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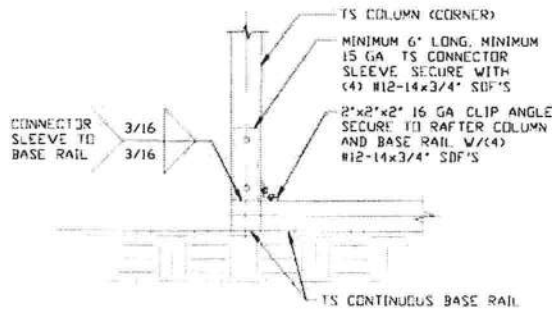
**JOB NO: 16022S/  
17300S/20352S**

**REV: 6**

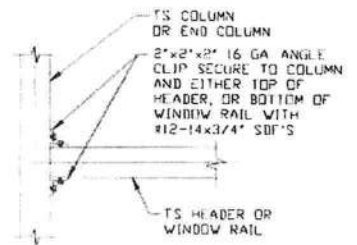
## CONNECTION DETAILS



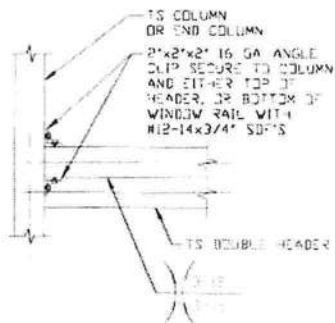
**4** END COLUMN/RAFTER CONNECTION DETAIL  
SCALE: NTS



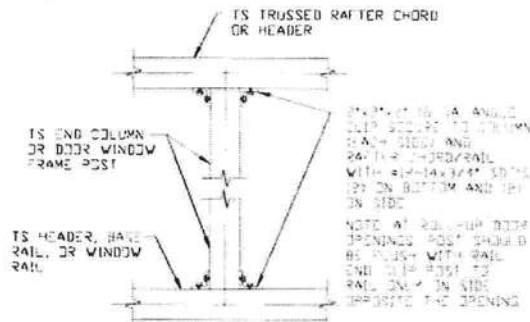
**5** END COLUMN/BASE RAIL CONNECTION DETAIL  
SCALE: NTS



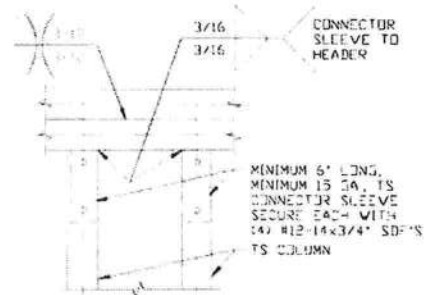
**6** HEADER OR WINDOW RAIL TO COLUMN CONNECTION DETAIL  
SCALE: NTS



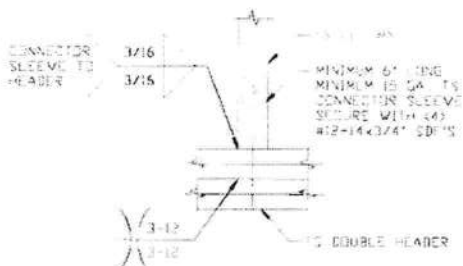
**6A** DOUBLE HEADER TO COLUMN CONNECTION DETAIL  
SCALE: NTS



**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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CLIENT: TBS

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LAKE CITY, FLORIDA 32025  
30'-0"x20'-0" ENCLOSED BUILDING EXP. B

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SHT. 12

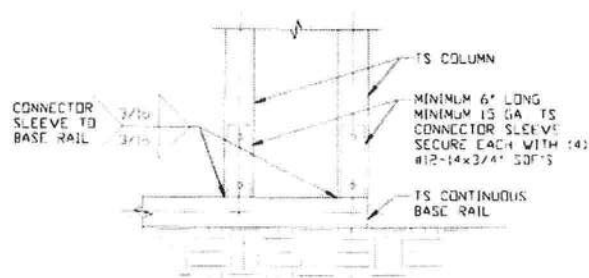
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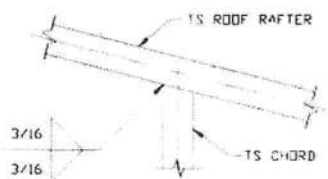
JOB NO: 16022S/  
17300S/20352S

REV: 6

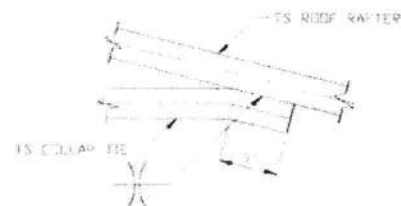
## CONNECTION DETAILS



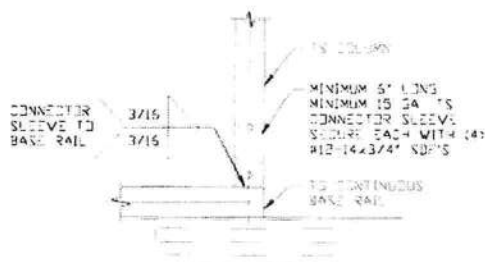
**10** COLUMN/BASE RAIL  
CONNECTION DETAIL  
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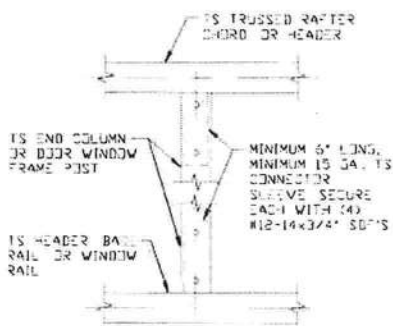
**11** RAFTER TO CHORD  
CONNECTION DETAIL  
SCALE: NTS



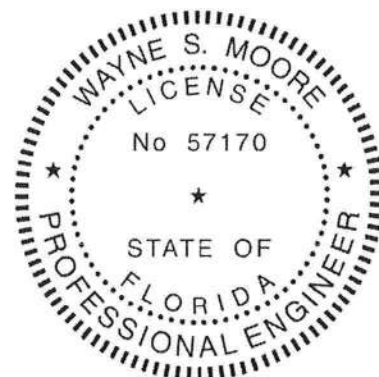
**12** COLLAR TIE  
CONNECTION DETAIL  
SCALE: NTS



**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"x20'-0" ENCLOSED BUILDING EXP. B

DATE: 7-29-21

SHT. 13

SCALE: NTS

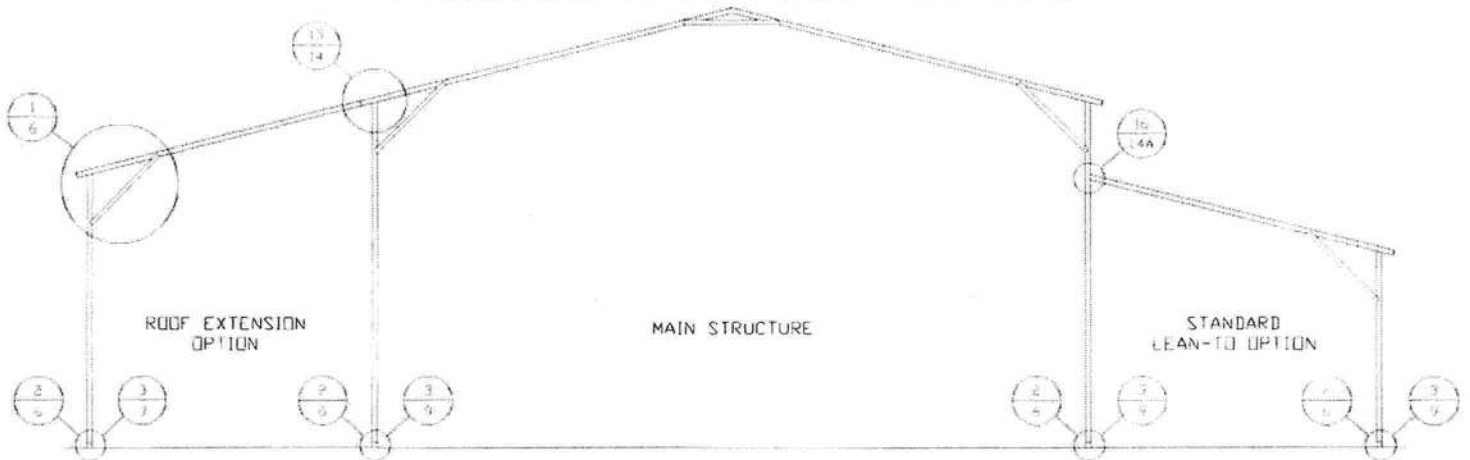
DWG. NO: SK-3

JOB NO: 16022S/  
17300S/20352S

REV: 6



# 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 ≤ 15'-0"

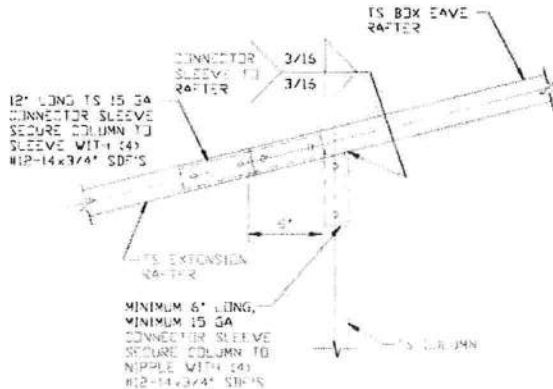
MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR

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 COLUMN FOR

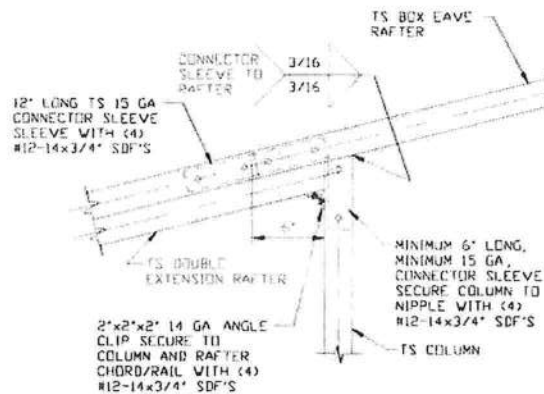
EAVE HEIGHTS < 10'-0"

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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DATE: 7-29-21

SHT. 14

SCALE: NTS

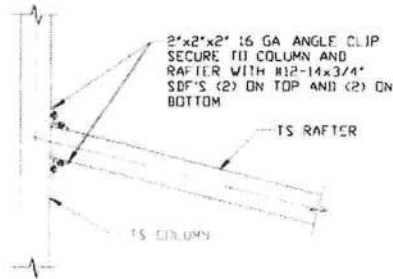
DWG. NO: SK-3

JOB NO: 16022S/  
17300S/20352S

REV: 6

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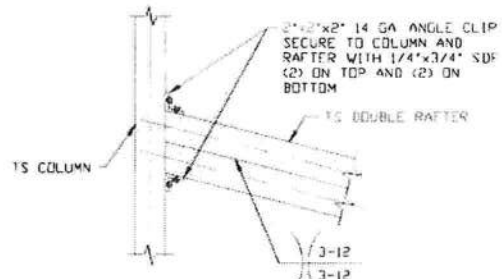
## BOX EAVE RAFTER LEAN-TO OPTIONS



**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  
 $15'-0'' < \text{TO} \leq 24'-0''$**

**16A**

SCALE: NTS



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

**DATE: 7-29-21**

**SHT. 14A**

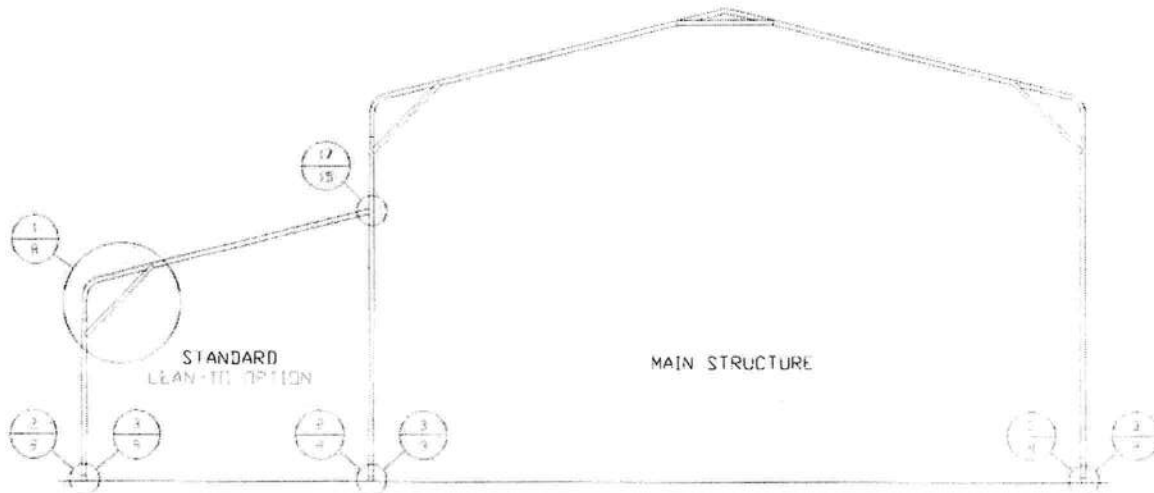
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**DWG. NO: SK-3**

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

**REV: 6**

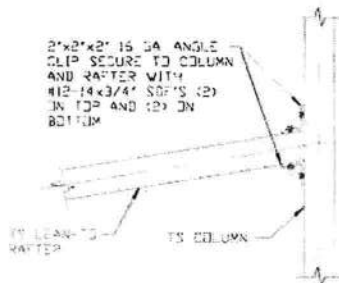
## BOW RAFTER LEAN-TO OPTIONS



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

SCALE: NTS

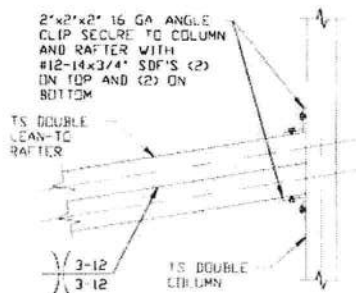
MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE DOUBLE COLUMNS FOR EAVE HEIGHTS 13'-0" (12'-0" FOR HIGH WIND) < TO < 15'-0"  
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR EAVE HEIGHTS 13'-0" < TO < 13'-0" (12'-0" 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 < 13'-0"  
 KNEE BRACES MUST BE 4'-0" (5'-0" FOR HIGH WIND) WHEN LEAN-TO'S ARE ADDED



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

17

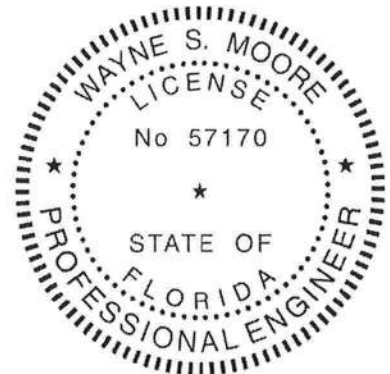
SCALE: NTS



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

17A

SCALE: NTS



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PROJECT MGR: WSM

CLIENT: TBS

TUBULAR BUILDING SYSTEMS  
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30'-0"x20'-0" ENCLOSED BUILDING EXP. B

DATE: 7-29-21

SHT. 15

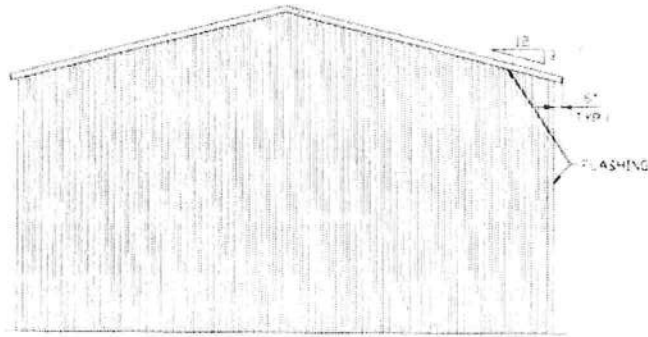
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DWG. NO: SK-3

JOB NO: 16022S/  
17300S/20352S

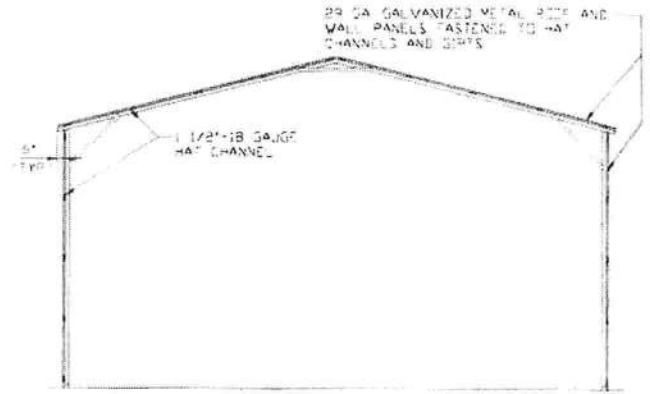
REV: 6

# BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



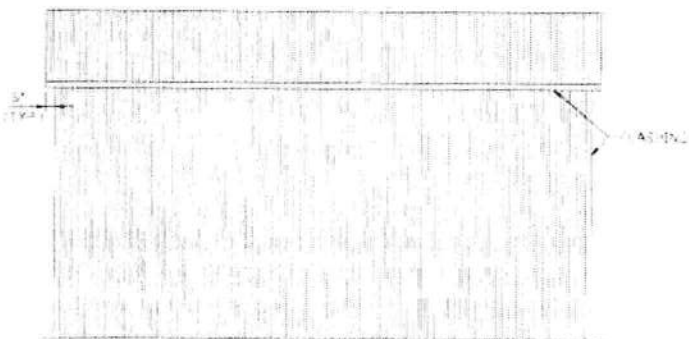
**TYPICAL END ELEVATION  
VERTICAL ROOF/SIDING OPTION**

SCALE: NTS



**TYPICAL SECTION VERTICAL  
ROOF/SIDING OPTION**

SCALE: NTS



**TYPICAL SIDE ELEVATION  
VERTICAL ROOF/SIDING OPTION**

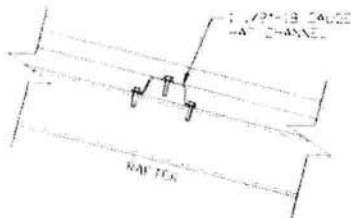
SCALE: NTS



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

SCALE: NTS

NOTE: 12 WALL GIRTS CAN BE USED AS AN OPTION IN PLACE OF HAT CHANNELS TO SUPPORT WALL. WALL BE SPACED AT 4' MAX.



**ROOF PANEL ATTACHMENT**

ALTERNATE FOR VERTICAL ROOF PANELS  
SCALE: NTS



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**TUBULAR BUILDING SYSTEMS**  
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SHT. 16

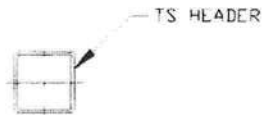
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JOB NO: 16022S/  
17300S/20352S

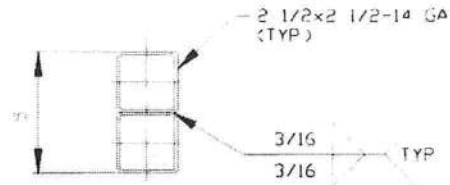
REV: 6

## SIDE WALL HEADER OPTIONS



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

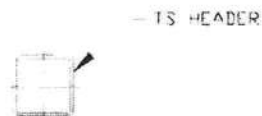
SCALE: NTS



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

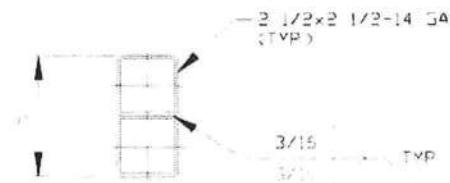
SCALE: NTS

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

**DATE: 7-29-21**

**SHT. 17**

**SCALE: NTS**

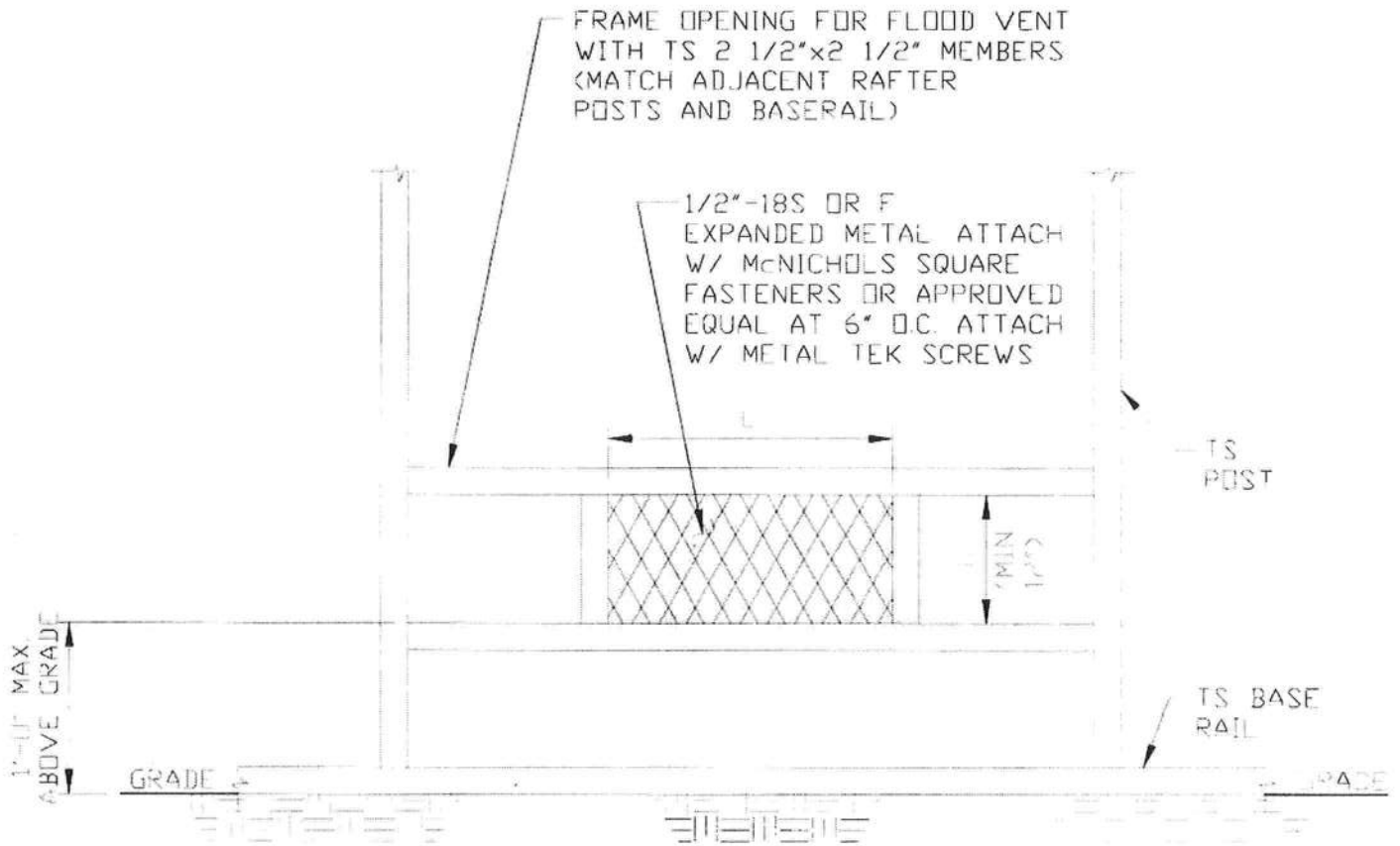
**DWG. NO: SK-3**

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

**REV: 6**



## FLOOD VENT DETAIL



### TYPICAL FLOOD VENT DETAIL

- 1 MINIMUM VENT SPACE REQUIRED = 1 SQ INCH OF OPEN VENT AREA PER 50 SQ FT OF BUILDING AREA
- 2 THERE SHALL BE A MINIMUM OF TWO OPENINGS ON DIFFERENT SIDES FOR EACH ENCLOSED BUILDING
- 3 APPLY 13 FACTOR WHEN CALCULATING TOTAL OPEN AREA WHEN USING 1/2"-18CA S OR F EXPANDED METAL
- 4 TOTAL OPEN AREA OF VENT =  $L \times H \times \text{MIN } 12"$
- 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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DATE: 7-29-21

SHT. 18

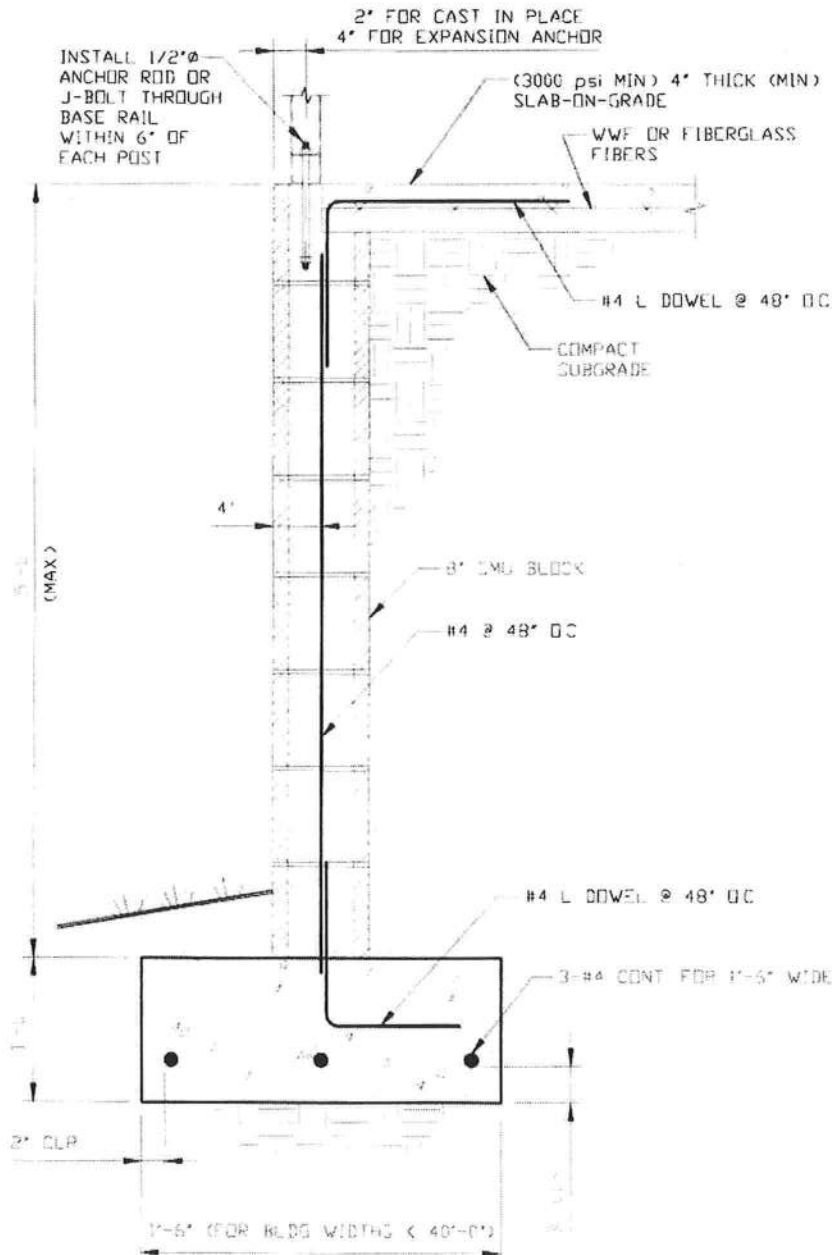
SCALE: NTS

DWG. NO: SK-3

JOB NO: 16022S/  
17300S/20352S

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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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SHT. 19

SCALE: NTS

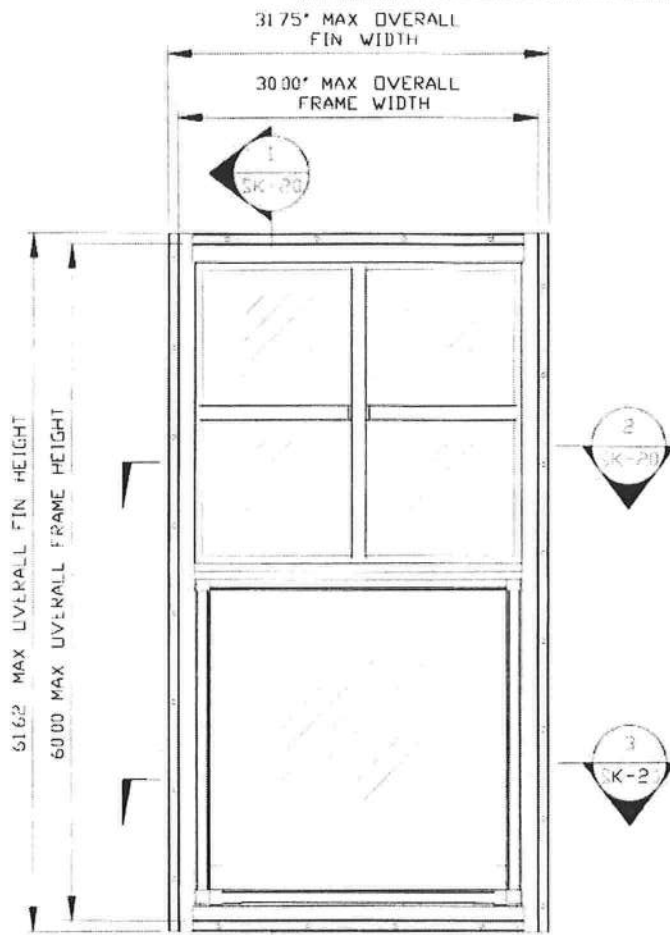
DWG. NO: SK-3

JOB NO: 16022S/  
17300S/20352S

REV: 6

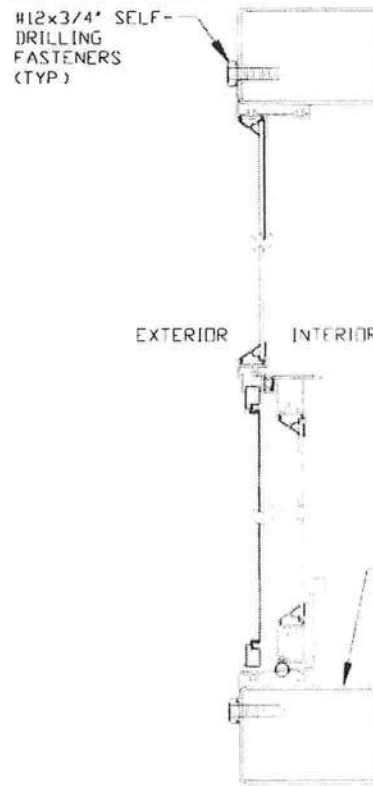
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# VERTICAL SLIDING WINDOW DETAIL



ELEVATION VIEW

SCALE: 3/8"=1'-0"



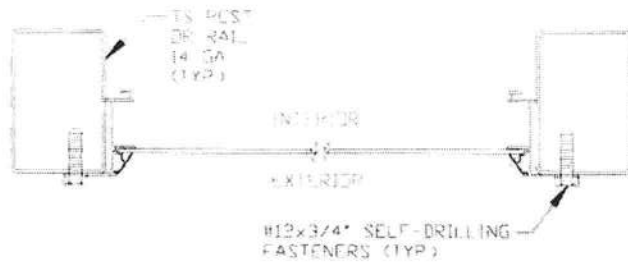
SECTION

SCALE: 3/8"=1'-0"

NOTE: MINOR SERIES BODY IF NO OR EQUIVALENT WINDOW IS REQUIRED

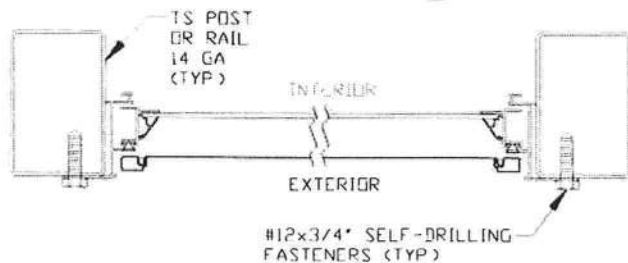
POSITIVE WALL PRESSURE: +40.0 PSF

NEGATIVE WALL PRESSURE: -40.0 PSF



SECTION

SCALE: 3/8"=1'-0"



SECTION

SCALE: 3/8"=1'-0"



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SHT. 20

SCALE: NTS

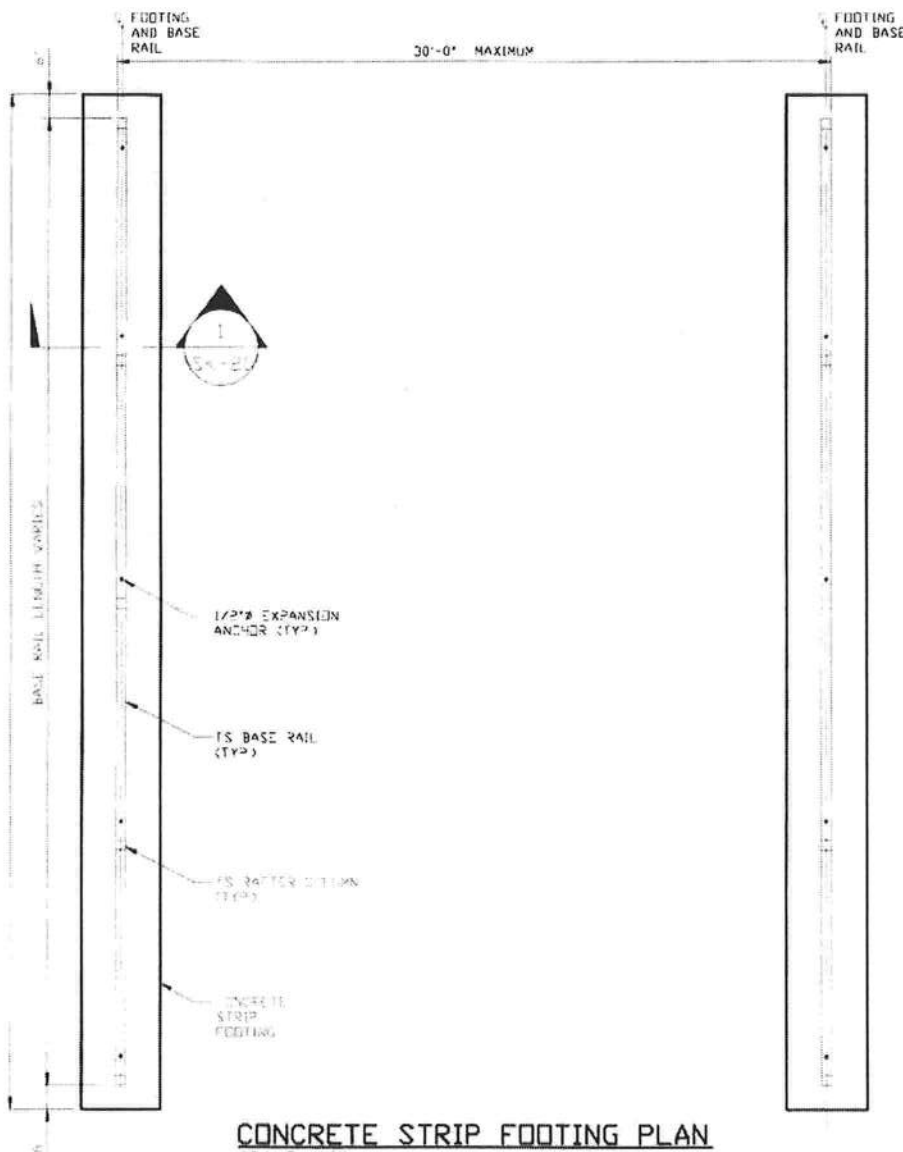
DWG. NO: SK-3

JOB NO: 16022S/  
17300S/20352S

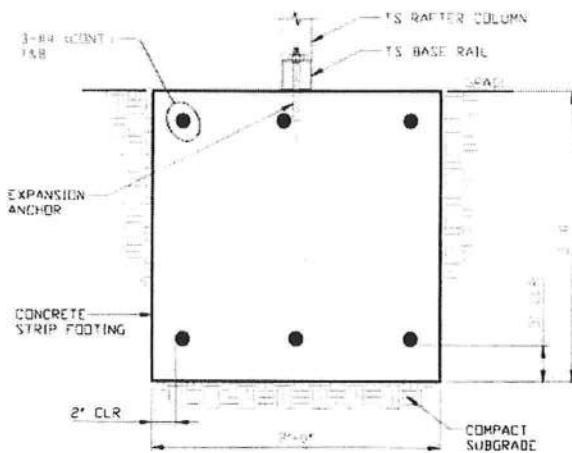
REV: 6

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# OPTIONAL CONCRETE STRIP FOOTING



CONCRETE STRIP FOOTING PLAN  
SCALE: NTS



SECTION 1  
SCALE: NTS  
SK-21

\* 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: 6