



STRUCTURAL DESIGN

FULLY OPEN BUILDING EXPOSURE B

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

8 January 2021

Revision 6

M&A Project No. 16022S/17300S/18028S/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
by Wayne S
Moore
Date: 2021.01.12
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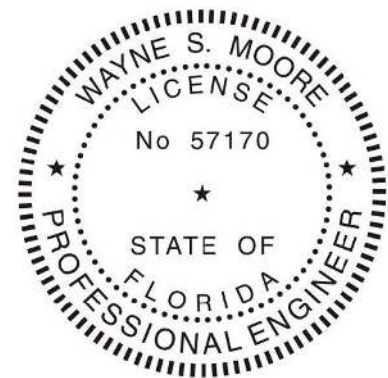
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	CHECKED BY: PDH			
	PROJECT MGR: WSM	DATE: 1-8-21	SCALE: NTS	JDB NO: 16022S/ 17300S/18028S/20352S
	CLIENT: TBS	SHT: 1	DWG. NO: SK-1	REV: 6

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TUBULAR BUILDING SYSTEMS

631 SE INDUSTRIAL CIRCLE

LAKE CITY, FLORIDA 32025

30'-0"x20'-0" FULLY OPEN STRUCTURE EXP. B

DATE: 1-8-21

SCALE: NTS

DWG. NO: SK-1

**JOB NO: 16022S/
17300S/18028S/20352S**

REV: 6

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INSTALLATION NOTES AND SPECIFICATIONS

1. DESIGN IS FOR A MAXIMUM 30'-0" WIDE x 20'-0" EAVE HEIGHT FULLY OPEN STRUCTURES.
2. DESIGN WAS DONE IN ACCORDANCE WITH THE 2020 FLORIDA BUILDING CODE (FBC) 7TH EDITION, 2012 INTERNATIONAL BUILDING CODE (IBC), 2015 IBC, 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. ANCHORS SHALL BE INSTALLED THROUGH BASE RAIL WITHIN 6" OF EACH RAFTER COLUMN ALONG SIDES.
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
 $R = 3.25$ $I_e = 1.0$
 $S_{DS} = 1.522 g$ $V = C_{sW}$
 $S_{DI} = 0.839 g$



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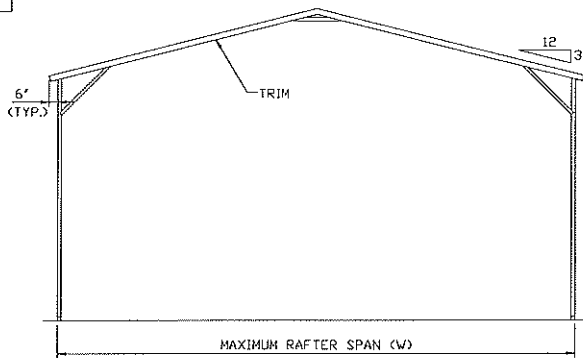
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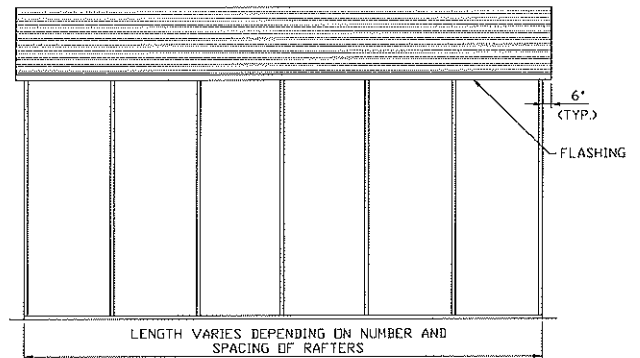
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☐ BOX EAVE FRAME RAFTER ENCLOSED BUILDING

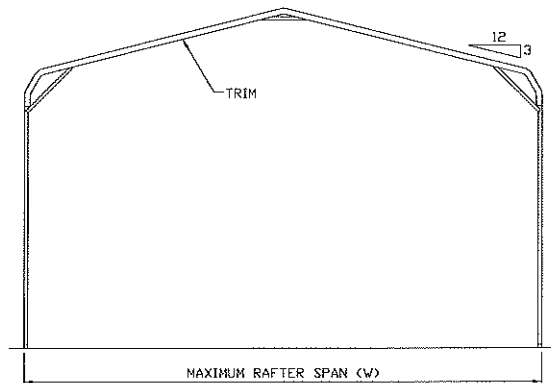


TYPICAL END ELEVATION-HORIZONTAL ROOF
SCALE: NTS

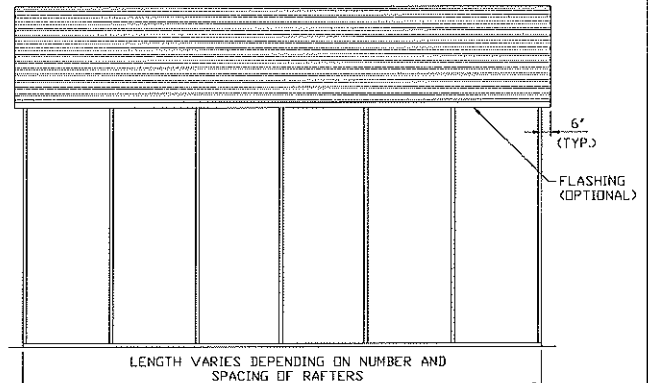


TYPICAL SIDE ELEVATION-HORIZONTAL ROOF
SCALE: NTS

☐ BOW FRAME RAFTER ENCLOSED BUILDING



TYPICAL END ELEVATION
SCALE: NTS



TYPICAL SIDE ELEVATION
SCALE: NTS



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SHT. 4

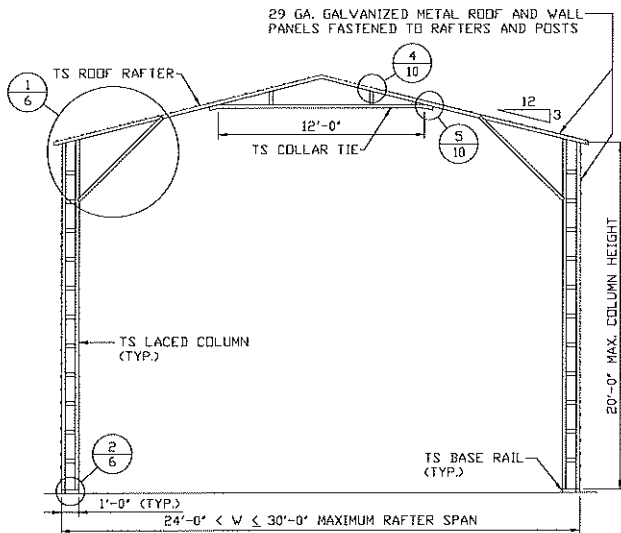
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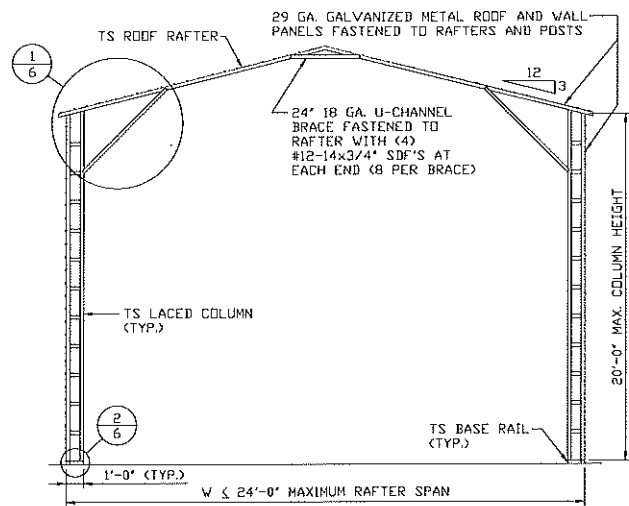
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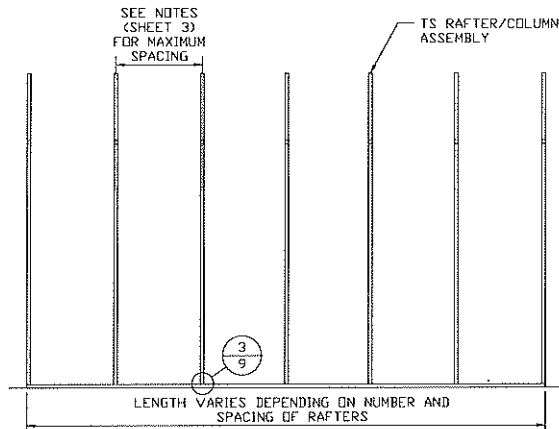
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TYPICAL RAFTER/COLUMN END FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN END FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION
SCALE: NTS



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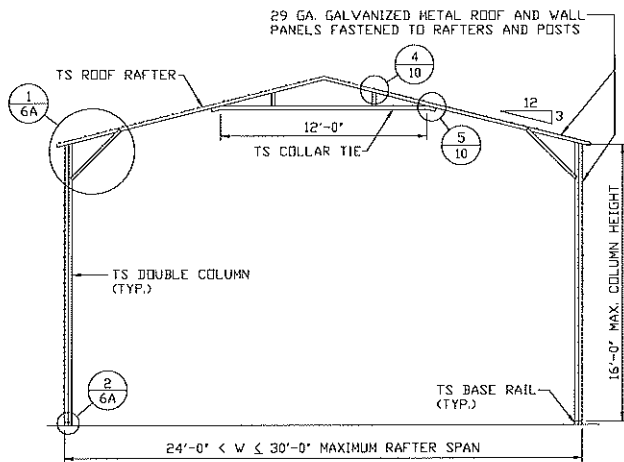
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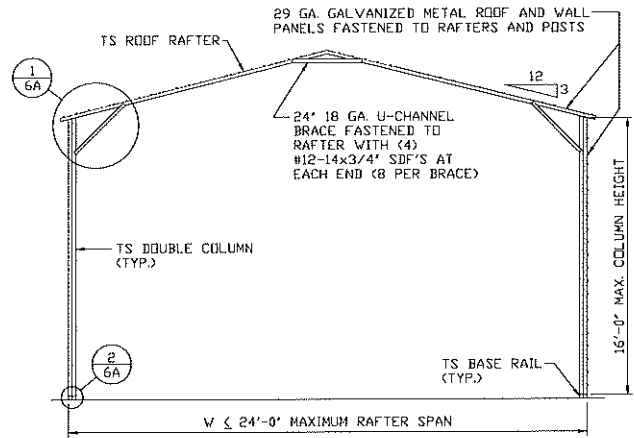
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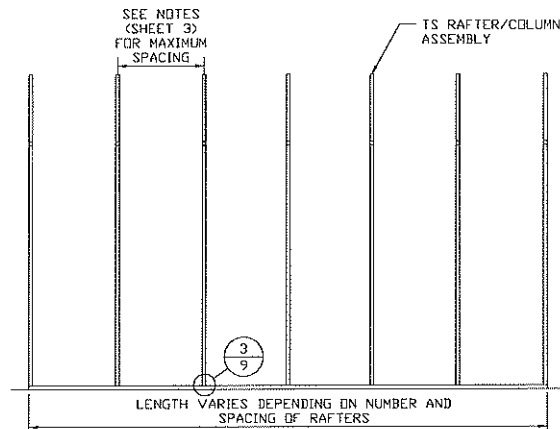
TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE: NTS



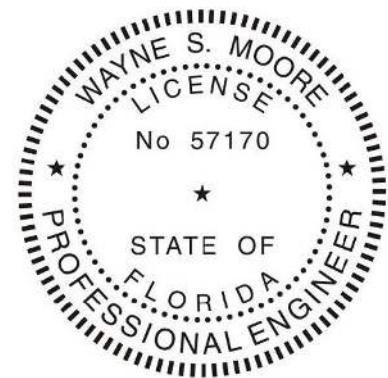
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TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

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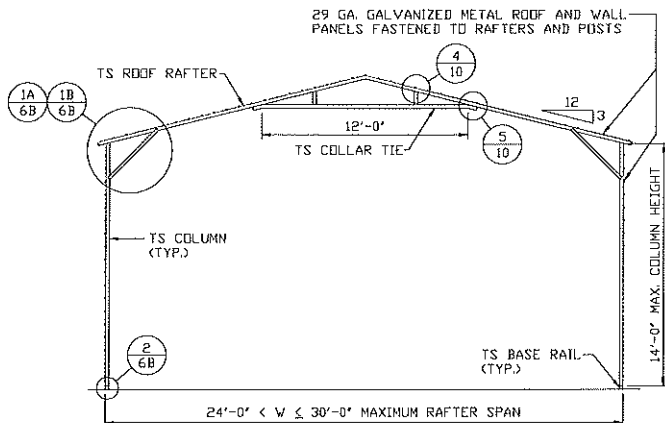
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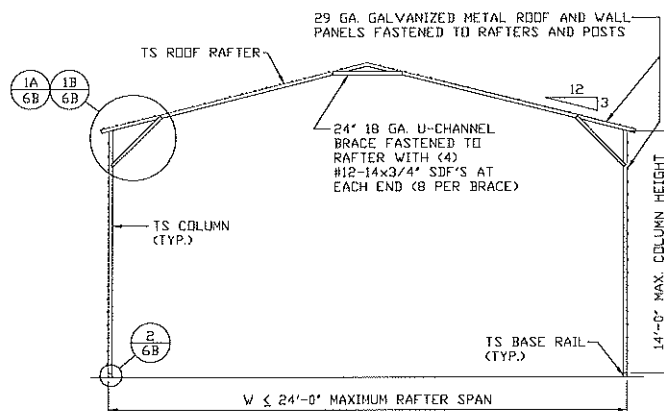
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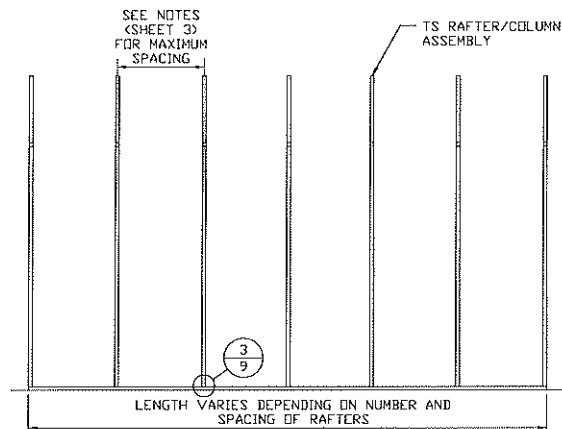
TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE: NTS



TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE: NTS



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

SCALE: NTS



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SHT. 5B

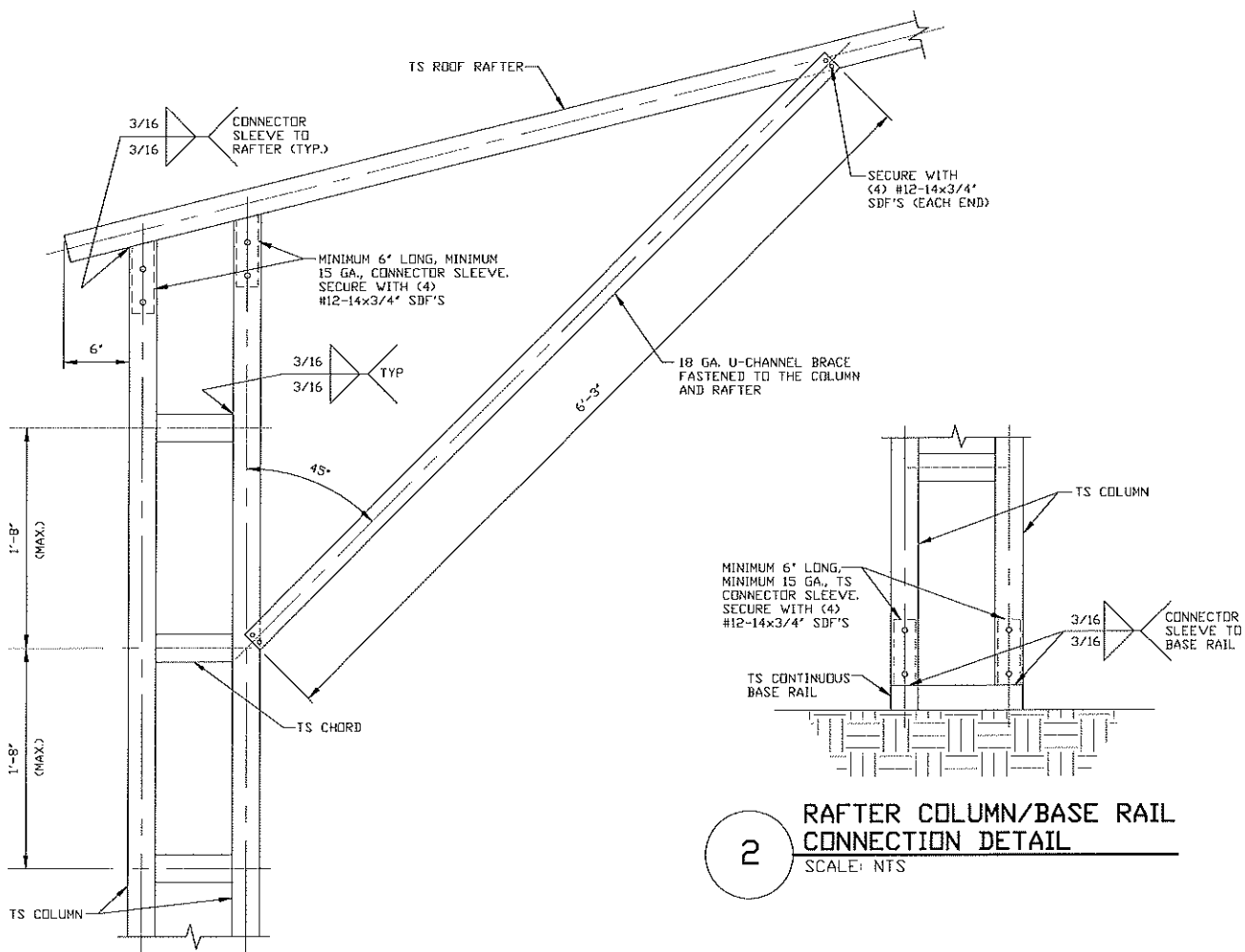
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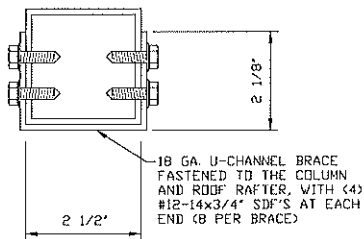
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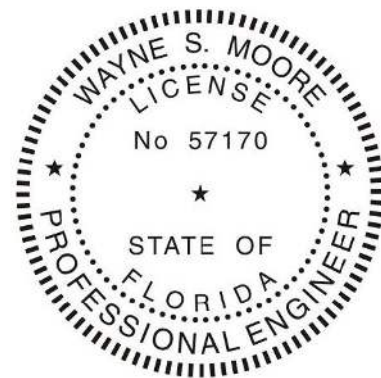


2 RAFTER COLUMN/BASE RAIL
CONNECTION DETAIL
SCALE: NTS

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



BRACE SECTION
SCALE: NTS



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SHT. 6

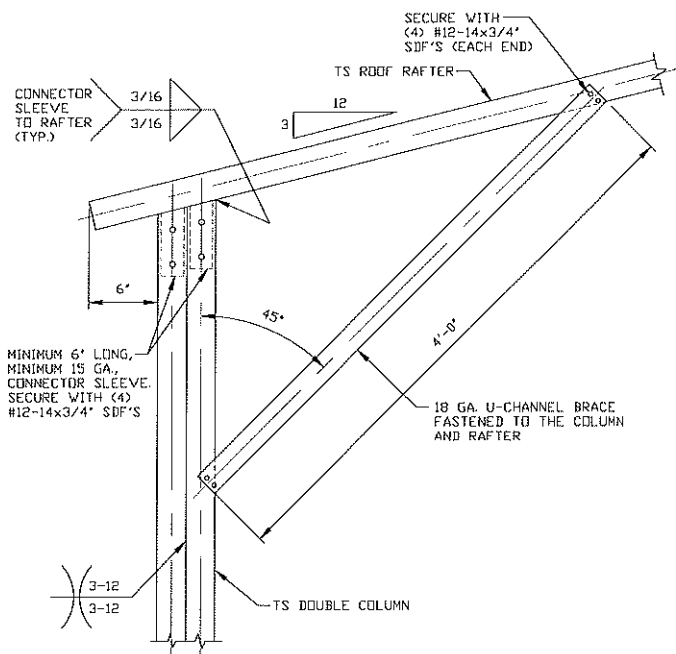
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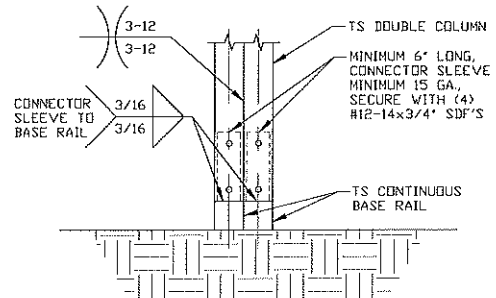
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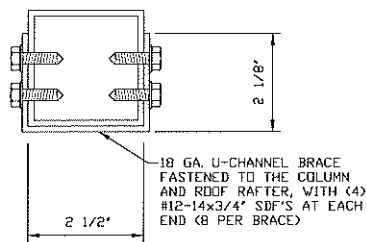
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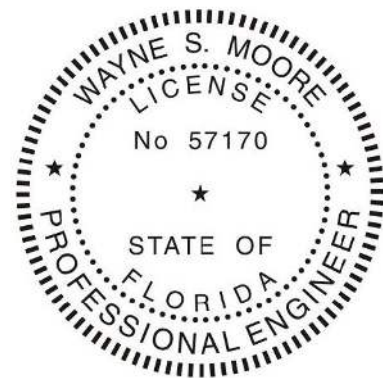
**BOX EAVE RAFTER COLUMN
CONNECTION DETAIL**
FOR HEIGHTS 14'-0" < TO ≤ 16'-0"
SCALE: NTS



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



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SHT. 6A

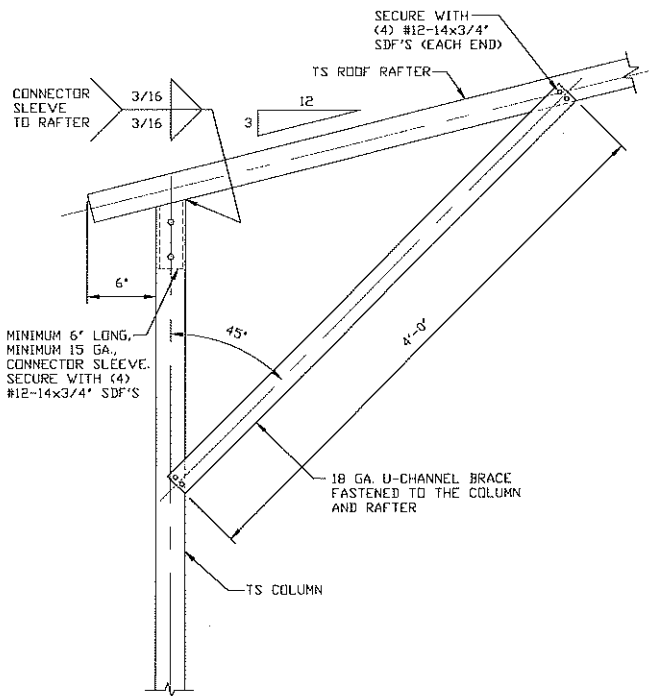
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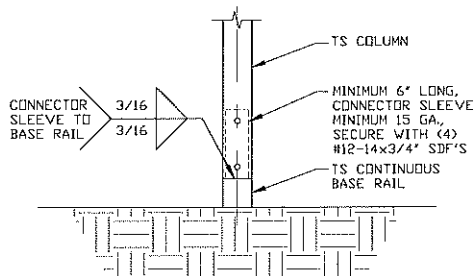
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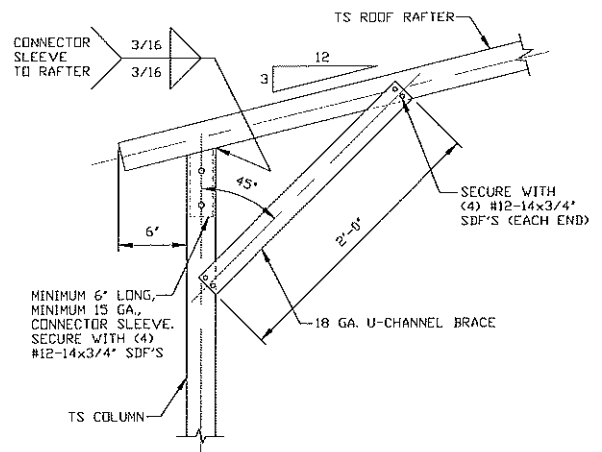
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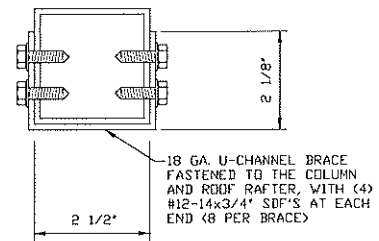
**BOX EAVE RAFTER COLUMN
CONNECTION DETAIL
FOR HEIGHTS 12'-0" < TO ≤ 14'-0"**
SCALE: NTS



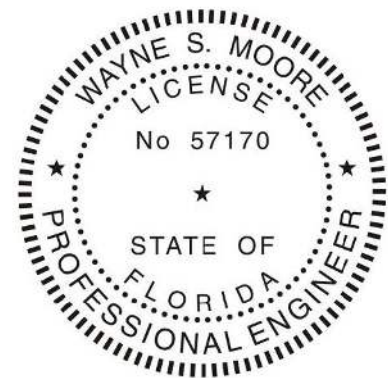
**2 RAFTER COLUMN/BASE RAIL
CONNECTION DETAIL**
SCALE: NTS



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



BRACE SECTION
SCALE: NTS



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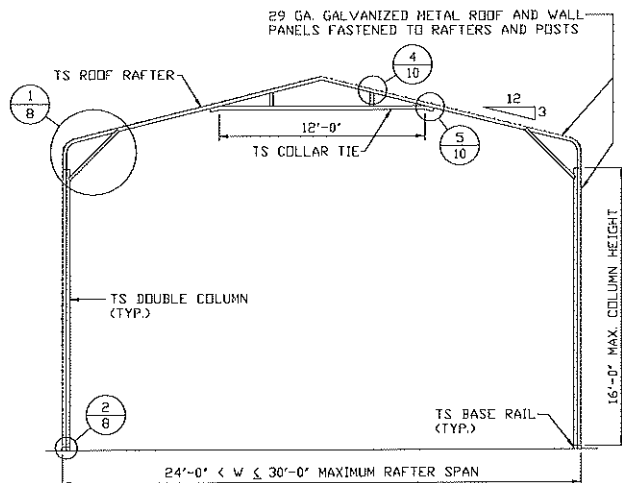
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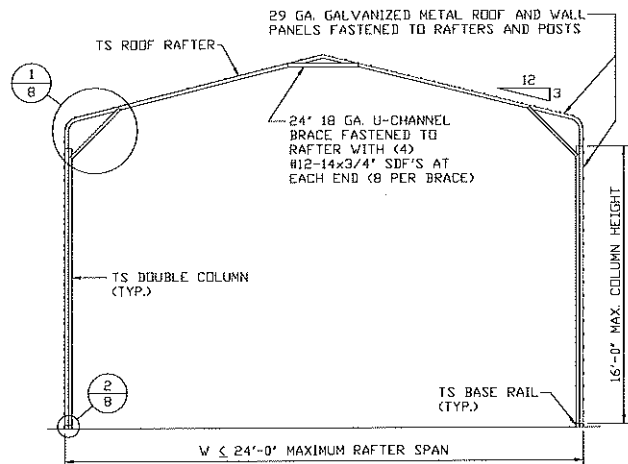
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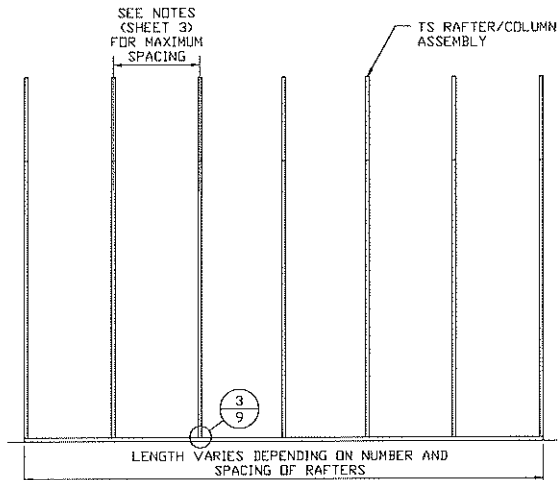
TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE: NTS



TYPICAL RAFTER/COLUMN END FRAME SECTION

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TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

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DATE: 1-8-21

SCALE: NTS

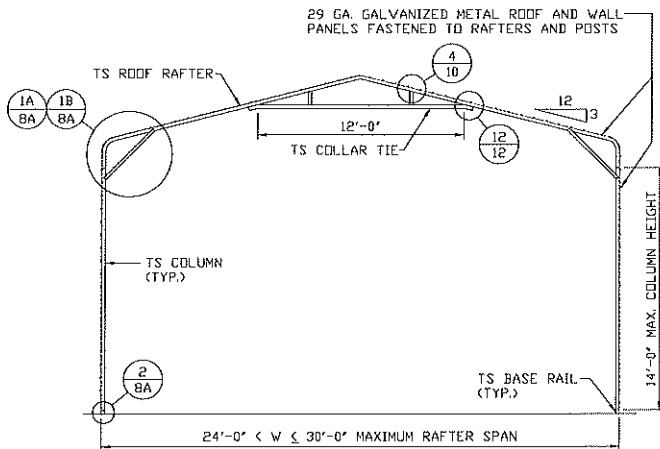
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**JOB NO: 16022S/
17300S/18028S/20352S**

SHT. 7

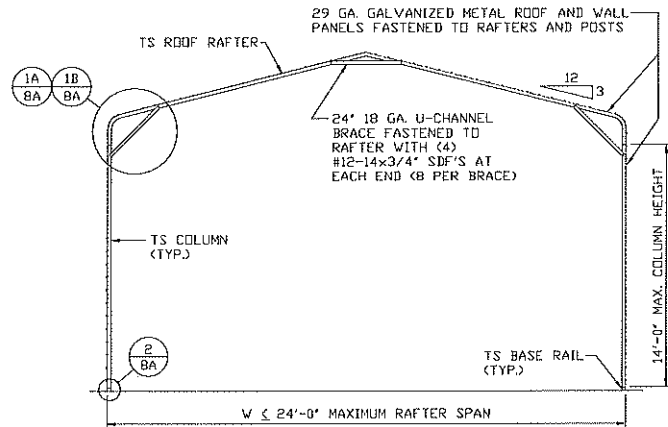
REV: 6

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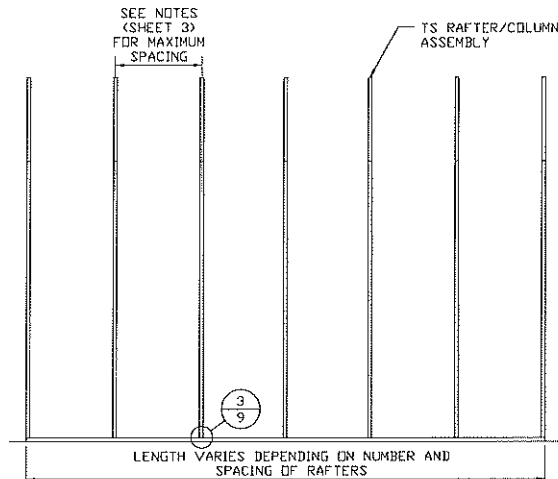
TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE: NTS



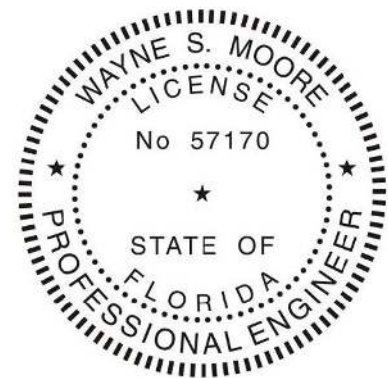
TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE: NTS



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

SCALE: NTS



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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" FULLY OPEN STRUCTURE EXP. B

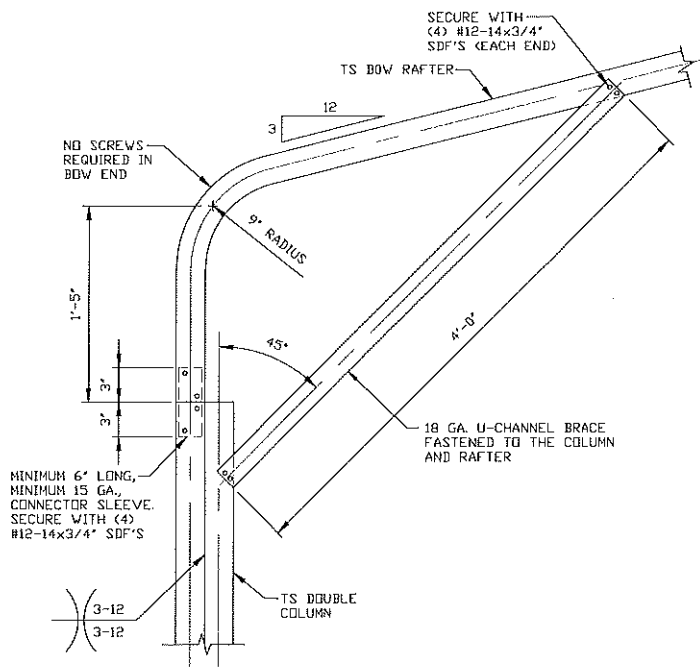
DATE: 1-8-21

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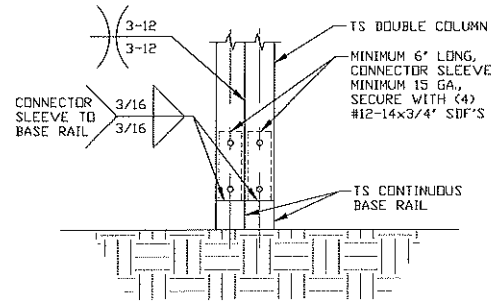
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JDB NO: 16022S/
17300S/18028S/20352S

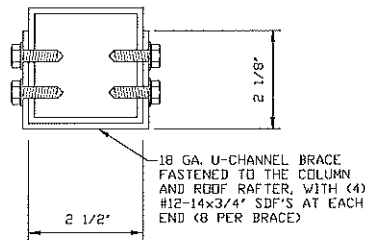
REV: 6



**BOX EAVE RAFTER COLUMN
CONNECTION DETAIL**
FOR HEIGHTS 14'-0" < TO ≤ 16'-0"
SCALE: NTS



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



BRACE SECTION
SCALE: NTS



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CLIENT: TBS

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

DATE: 1-8-21

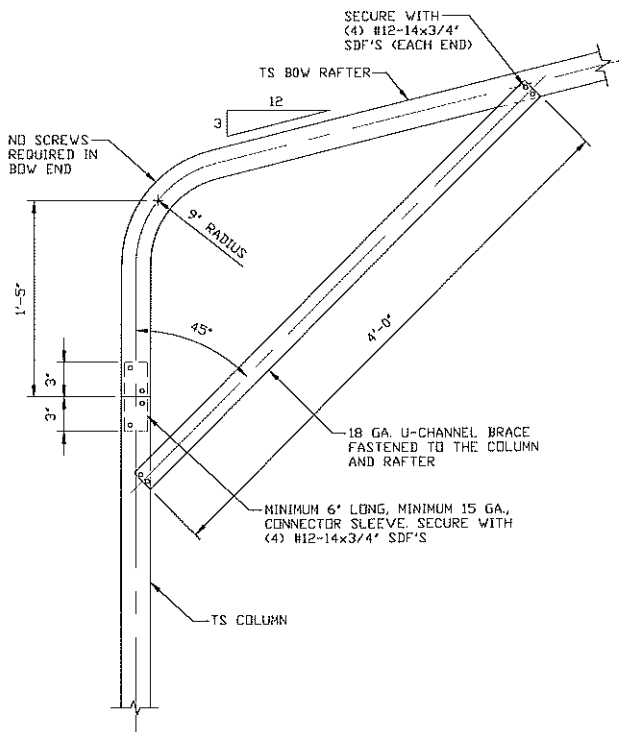
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DWG. NO: SK-1

**JOB NO: 16022S/
17300S/18028S/20352S**

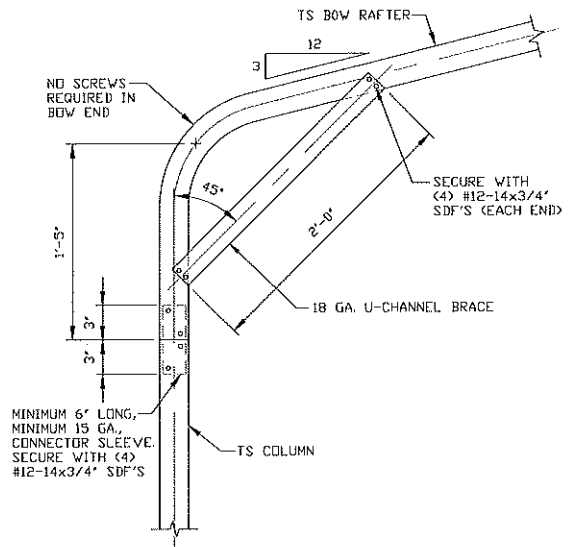
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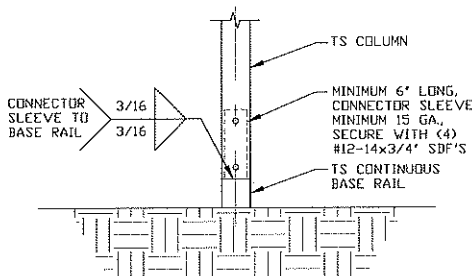
1A

**BOX EAVE RAFTER COLUMN
CONNECTION DETAIL
FOR HEIGHTS 12'-0" < TO ≤ 14'-0"**
SCALE: NTS



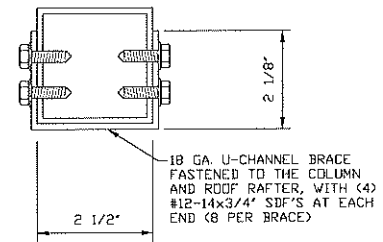
1B

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



2

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



BRACE SECTION
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" FULLY OPEN STRUCUTRE EXP. B**

DATE: 1-8-21

SCALE: NTS

SHT. 8A

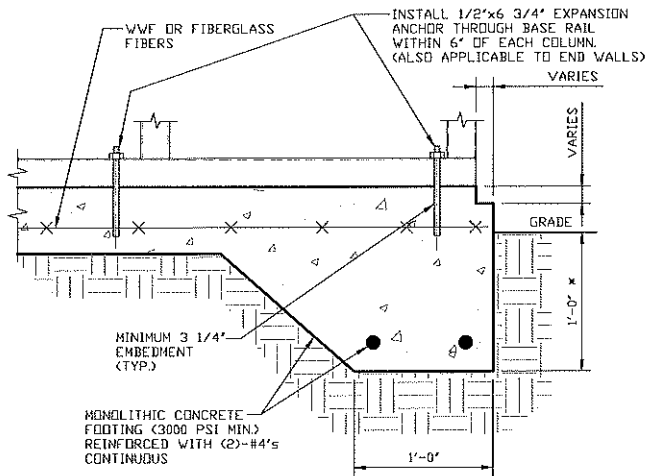
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**JOB NO: 16022S/
17300S/18028S/20352S**

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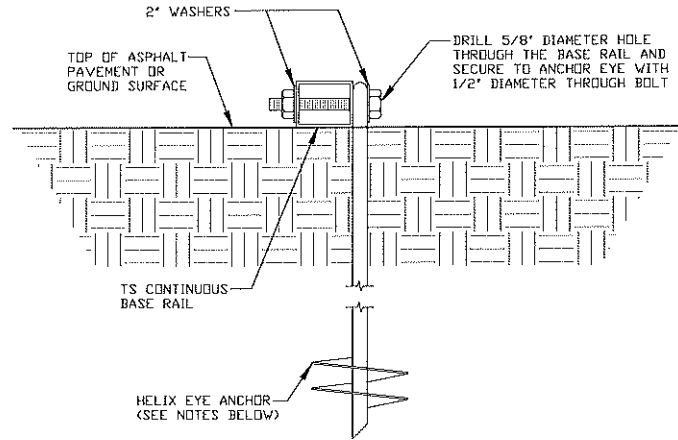
BASE RAIL ANCHORAGE OPTIONS FOR LOW AND HIGH WIND SPEED



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 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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CHECKED BY: PDH

PROJECT MGR: WSM

CLIENT: TBS

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

DATE: 1-8-21

SCALE: NTS

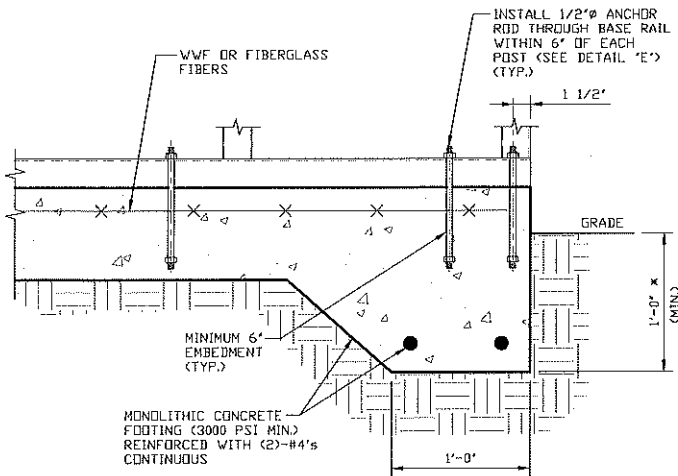
DWG. NO: SK-1

JOB NO: 16022S/
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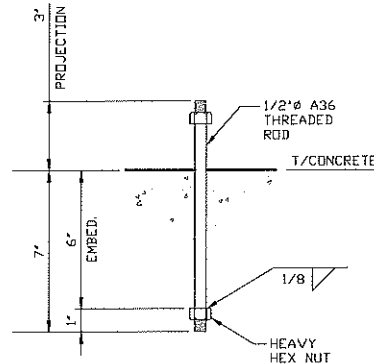
OPTIONAL FOUNDATION ANCHORAGE FOR LOW & HIGH WIND SPEED



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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PROJECT MGR: WSM

CLIENT: TBS

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

DATE: 1-8-21

SCALE: NTS

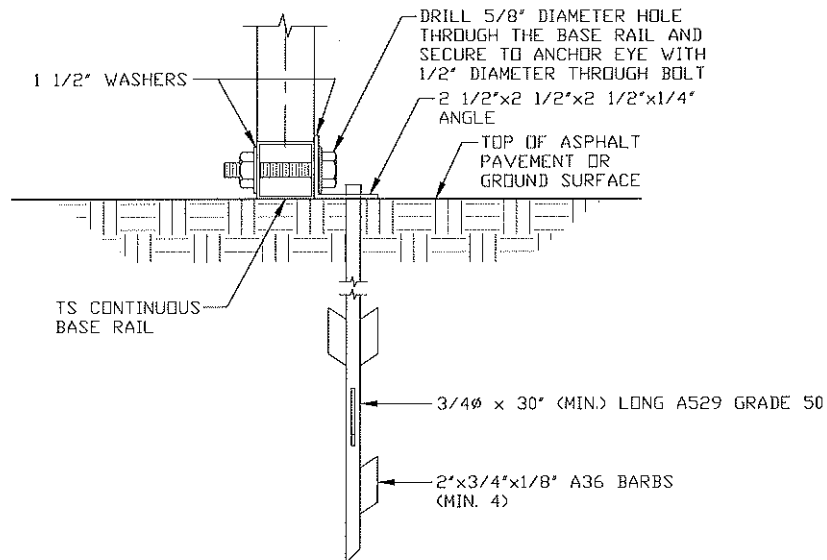
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JOB NO: 16022S/
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BASE RAIL ANCHORAGE OPTION



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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**TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025**

30'-0"x20'-0" FULLY OPEN STRUCTURE EXP. B

DATE: 1-8-21

SCALE: NTS

DWG. NO: SK-1

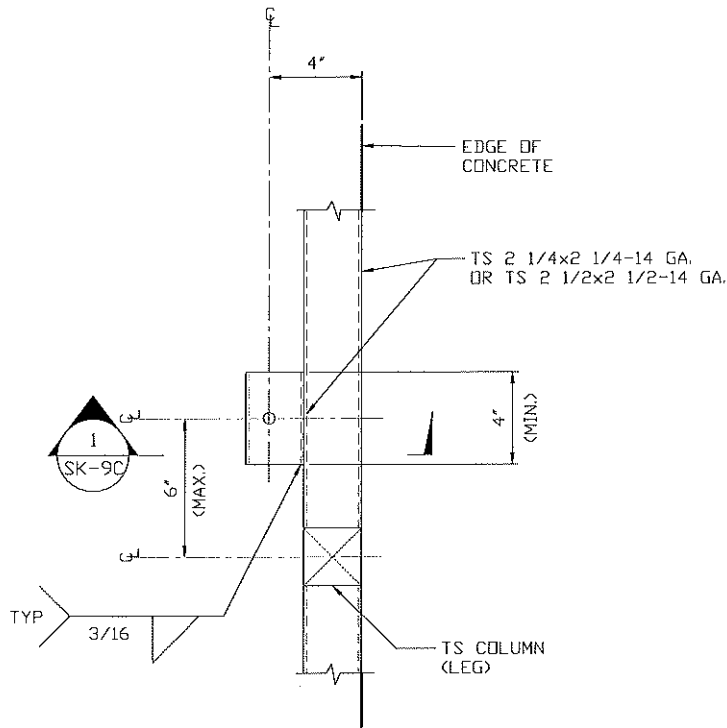
**JOB NO: 16022S/
17300S/18028S/20352S**

SHT. 9B

REV. 6

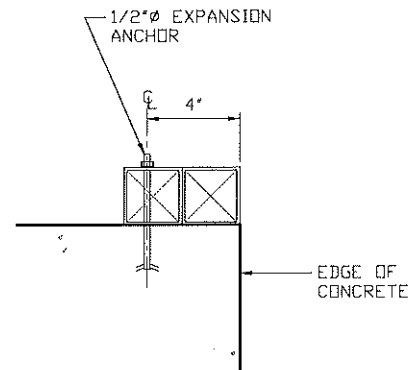
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BASE RAIL ANCHORAGE OPTIONS



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

SCALE: NTS



SECTION 1
SCALE: NTS



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PROJECT MGR: WSM

CLIENT: TBS

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

DATE: 1-8-21

SCALE: NTS

DWG. NO: SK-1

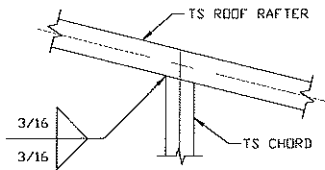
**JOB NO: 16022S/
17300S/18028S/20352S**

SHT. 9C

REV: 6

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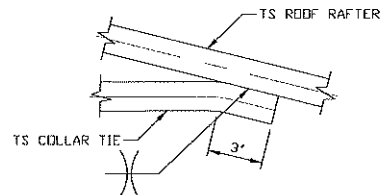
CONNECTION DETAILS



4

RAFTER TO CHORD CONNECTION DETAIL

SCALE: NTS



5

COLLAR TIE CONNECTION DETAIL

SCALE: NTS



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TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025

30'-0"x20'-0" FULLY OPEN STRUCTURE EXP. B

DATE: 1-8-21

SHT. 10

SCALE: NTS

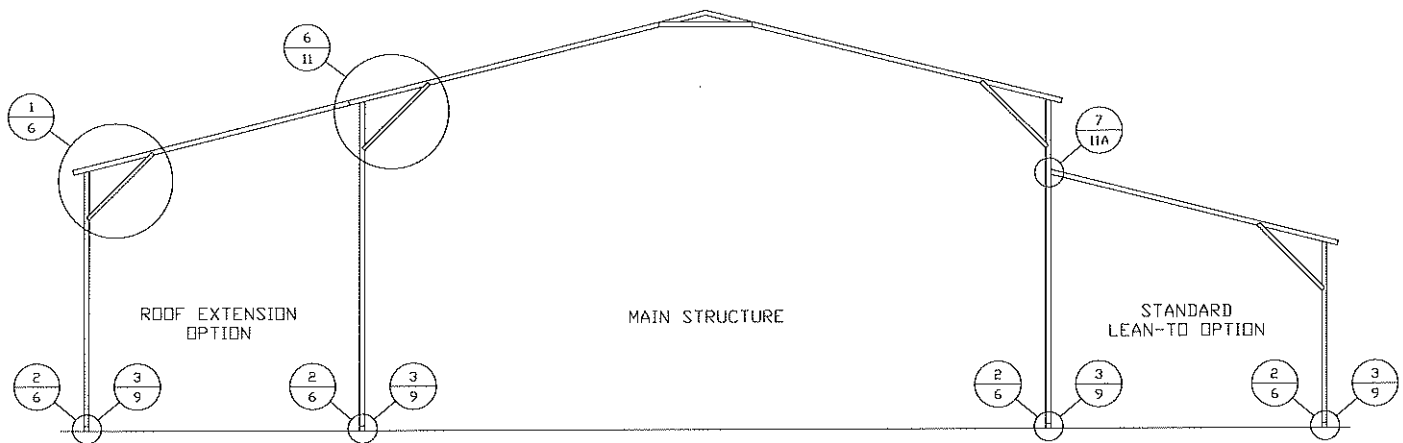
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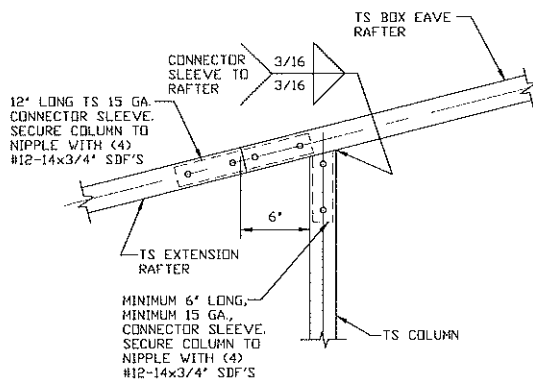
BOX EAVE RAFTER LEAN-TO OPTIONS



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

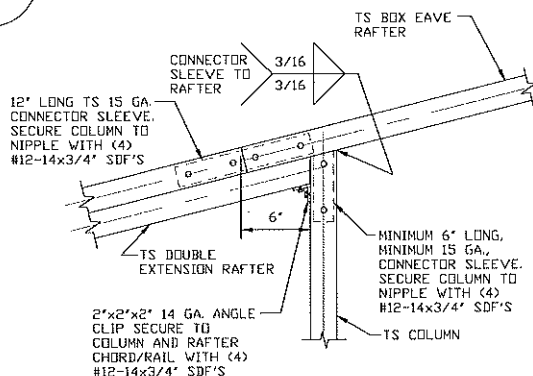
SCALE: NTS

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" < 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".
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR EAVE HEIGHTS ≤ 10'-0".
 KNEE BRACE MUST BE 4'-0" (5'-0" FOR HIGH WIND).



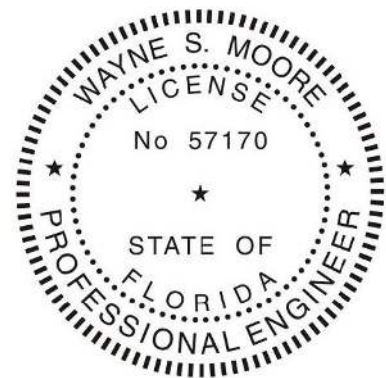
6 SIDE EXTENSION RAFTER/COLUMN DETAIL FOR RAFTER SPANS < 15'-0"

SCALE: NTS



6A SIDE EXTENSION RAFTER/COLUMN 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" FULLY OPEN STRUCTURE EXP. B

DATE: 1-8-21

SCALE: NTS

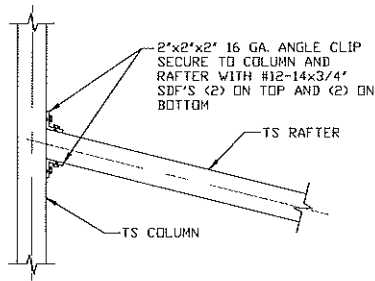
DWG. NO: SK-1

**JOB NO: 16022S/
17300S/18028S/20352S**

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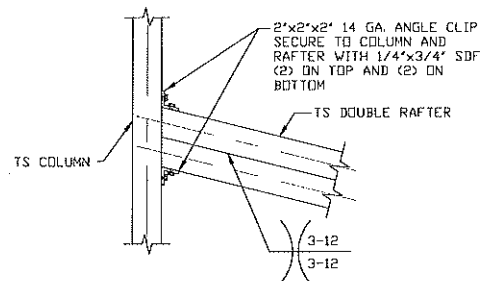
BOX EAVE RAFTER LEAN-TO OPTIONS



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

7

SCALE: NTS



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

7A

SCALE: NTS



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TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
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30'-0"x20'-0" FULLY OPEN STRUCTURE EXP. B

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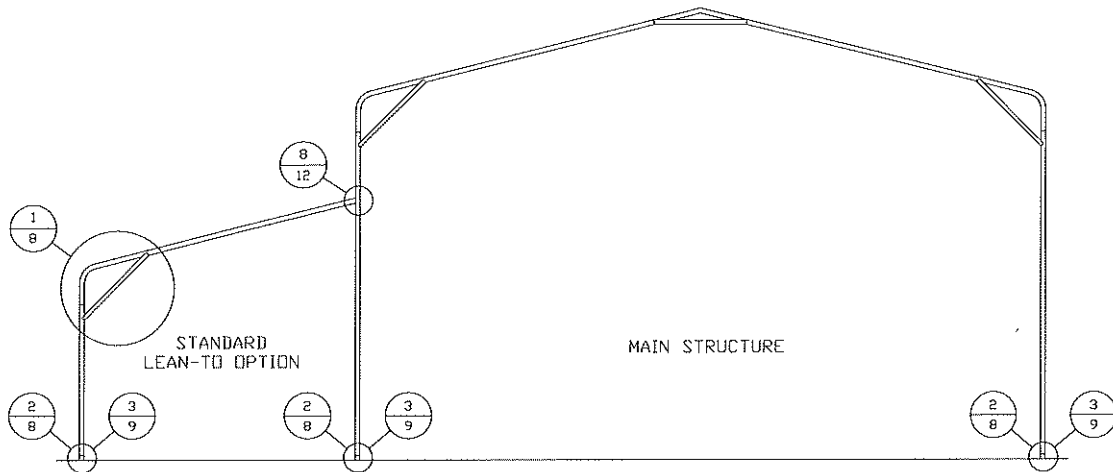
DWG. NO: SK-1

JDB NO: 16022S/
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BOW RAFTER LEAN-TO OPTIONS



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

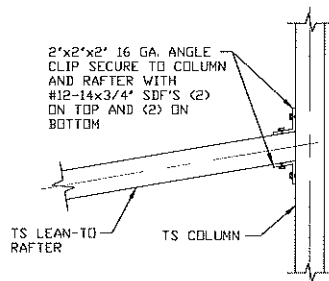
SCALE: NTS

MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE DOUBLE COLUMNS FOR EAVE HEIGHTS 13'-0" < 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".

MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR EAVE HEIGHTS ≤ 10'-0".

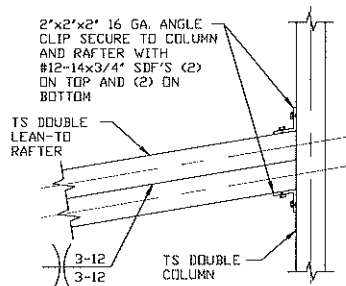
KNEE BRACE MUST BE 4'-0" < 5'-0" FOR HIGH WIND.



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

8

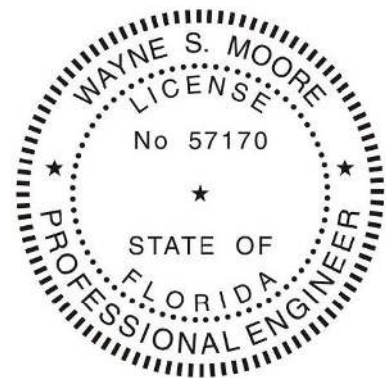
SCALE: NTS



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

8A

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" FULLY OPEN STRUCTURE EXP. B

DATE: 1-8-21

SHT. 12

SCALE: NTS

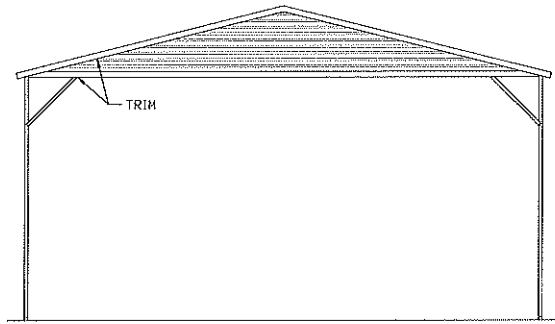
DWG. NO: SK-1

**JOB NO: 16022S/
17300S/18028S/20352S**

REV: 6

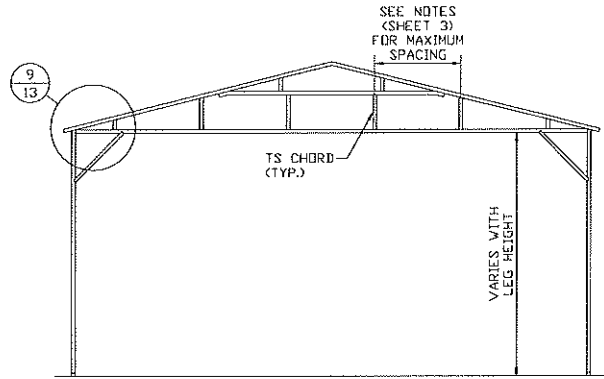
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BOX EAVE RAFTER GABLE END OPTION



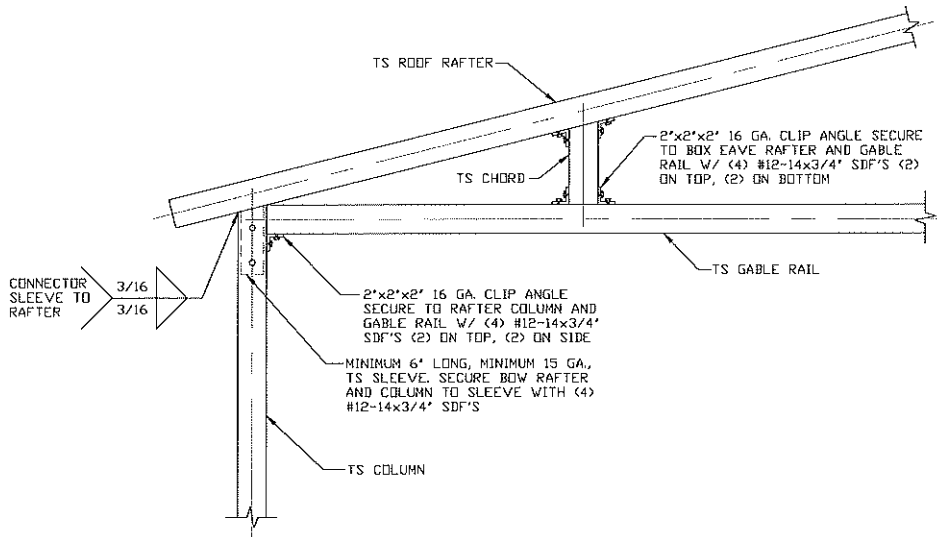
**TYPICAL BOX EAVE RAFTER
GABLE END ELEVATION**

SCALE: NTS



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

SCALE: NTS



9

**BOX EAVE RAFTER GABLE RAIL TO
RAFTER COLUMN CONNECTION DETAIL**

SCALE: NTS

NOTE: KNEE BRACE NOT SHOWN FOR CLARITY.



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

DATE: 1-8-21

SHT. 13

SCALE: NTS

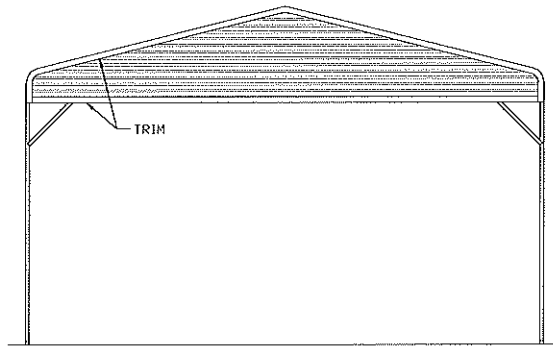
DWG. NO: SK-1

**JDB NO: 16022S/
17300S/18028S/20352S**

REV: 6

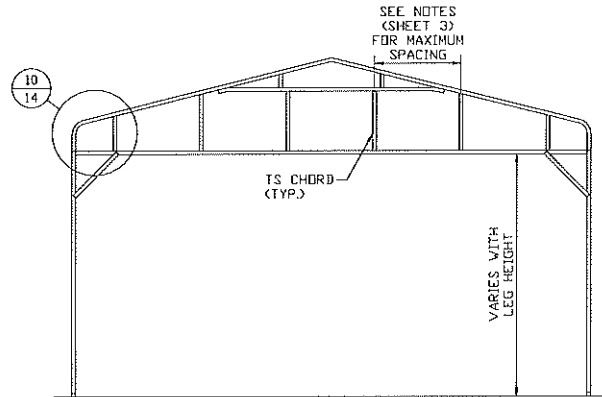
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BOW RAFTER GABLE END OPTION



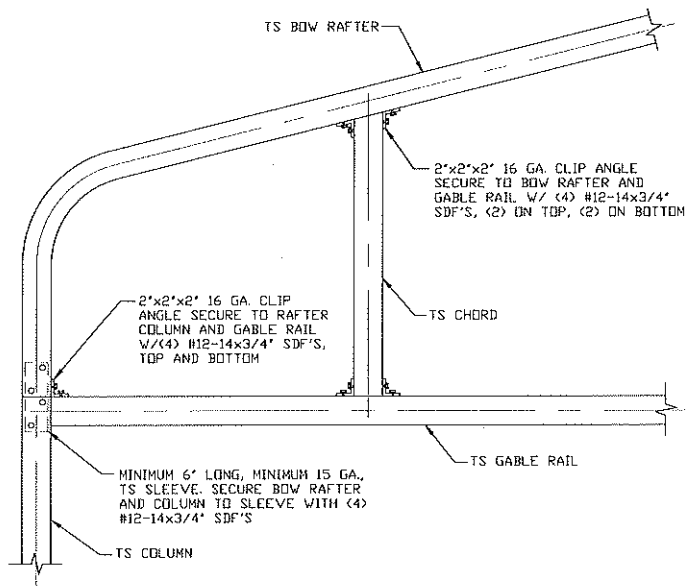
**TYPICAL BOW EAVE RAFTER
END WALL FRAMING SECTION**

SCALE: NTS



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

SCALE: NTS



10

**BOW RAFTER GABLE RAIL
TO GABLE END ELEVATION**

SCALE: NTS

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

DATE: 1-8-21

SCALE: NTS

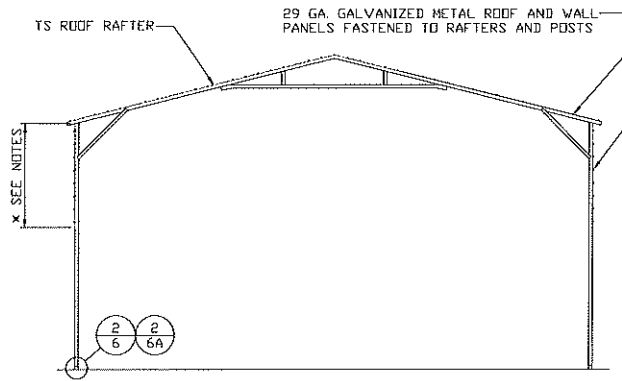
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**JOB NO: 16022S/
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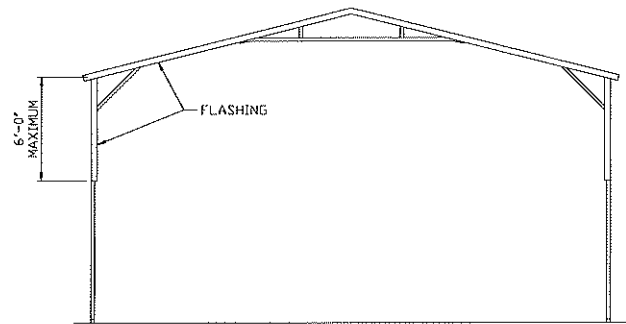
REV: 6

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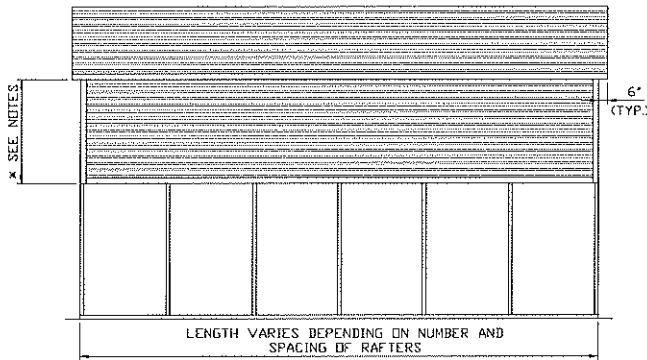
BOX EAVE RAFTER EXTRA SIDE PANEL OPTION



**TYPICAL RAFTER/POST FRAME
SECTION EXTRA SIDE PANELS**
SCALE: NTS



**TYPICAL END ELEVATION
EXTRA SIDE PANELS**
SCALE: NTS



**TYPICAL SIDE ELEVATION
EXTRA SIDE PANELS**
SCALE: NTS

NOTES:

- * 20'-0" PANEL FOR EAVE HEIGHT 14'-0" < TO < 20'-0"
- * 0'-0" PANEL FOR EAVE HEIGHT ≤ 14'-0"



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

DATE: 1-8-21

SCALE: NTS

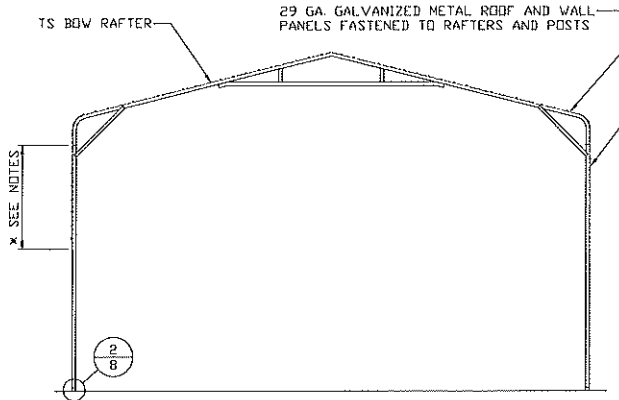
DWG. NO: SK-1

**JOB NO: 16022S/
17300S/18028S/20352S**

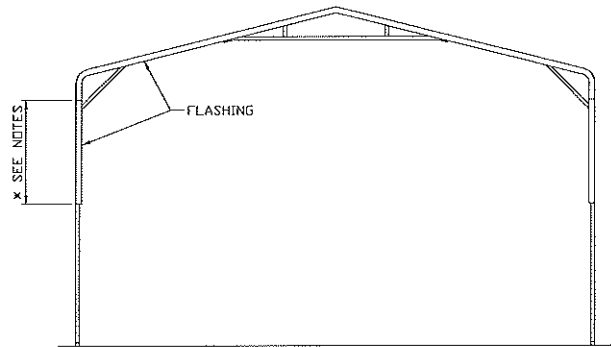
REV: 6

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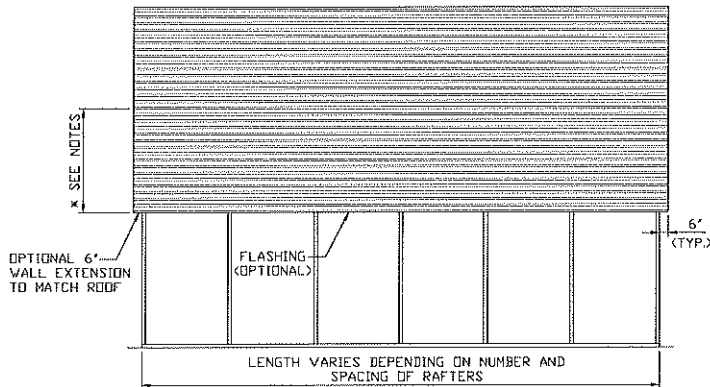
BOW RAFTER EXTRA SIDE PANEL OPTION



**TYPICAL RAFTER/POST FRAME
SECTION EXTRA SIDE PANELS**
SCALE: NTS



**TYPICAL END ELEVATION
EXTRA SIDE PANELS**
SCALE: NTS



**TYPICAL SIDE ELEVATION
EXTRA SIDE PANELS**
SCALE: NTS

NOTES:

- * 20'-0" PANEL FOR EAVE HEIGHT 14'-0" < TO < 20'-0"
- * 0'-0" PANEL FOR EAVE HEIGHT ≤ 14'-0"



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

DATE: 1-8-21

SCALE: NTS

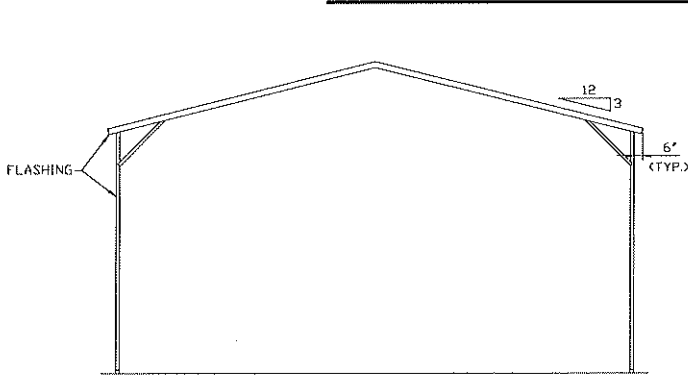
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**JDB NO: 16022S/
17300S/18028S/20352S**

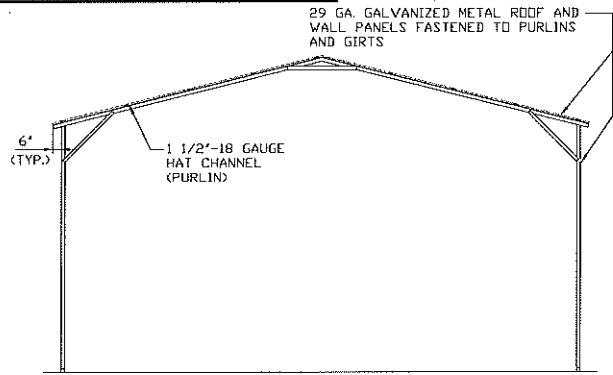
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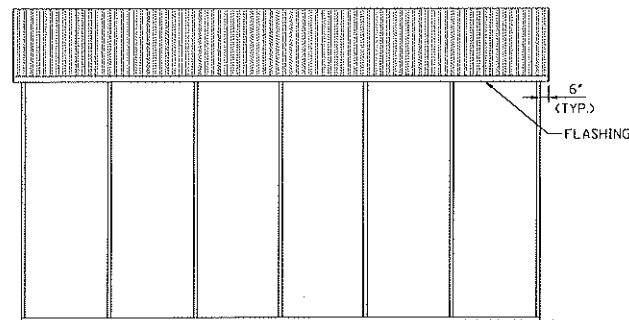
BOX EAVE RAFTER VERTICAL ROOF OPTION



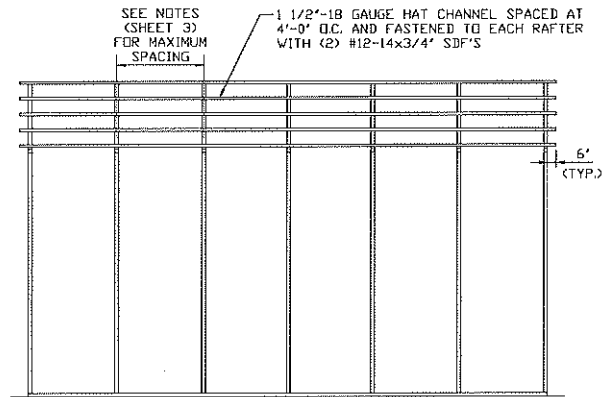
**TYPICAL END ELEVATION
VERTICAL ROOF/SIDING OPTION**
SCALE: NTS



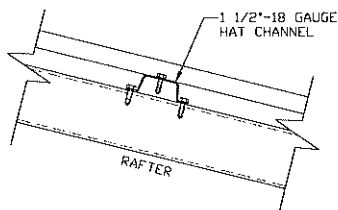
**TYPICAL SECTION VERTICAL
ROOF/SIDING OPTION**
SCALE: NTS



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



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



ROOF PANEL ATTACHMENT

(ALTERNATE FOR VERTICAL ROOF PANELS)
SCALE: NTS



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TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
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30'-0"x20'-0" FULLY OPEN STRUCTURE EXP. B

DATE: 1-8-21

SHT. 17

SCALE: NTS

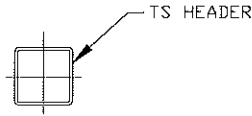
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**JOB NO: 16022S/
17300S/18028S/20352S**

REV: 6

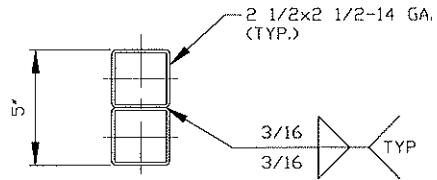
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SIDE WALL HEADER OPTIONS



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

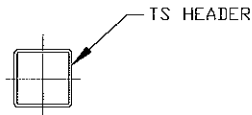
SCALE: NTS



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

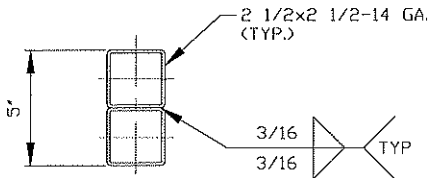
SCALE: NTS

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

DATE: 1-8-21

SCALE: NTS

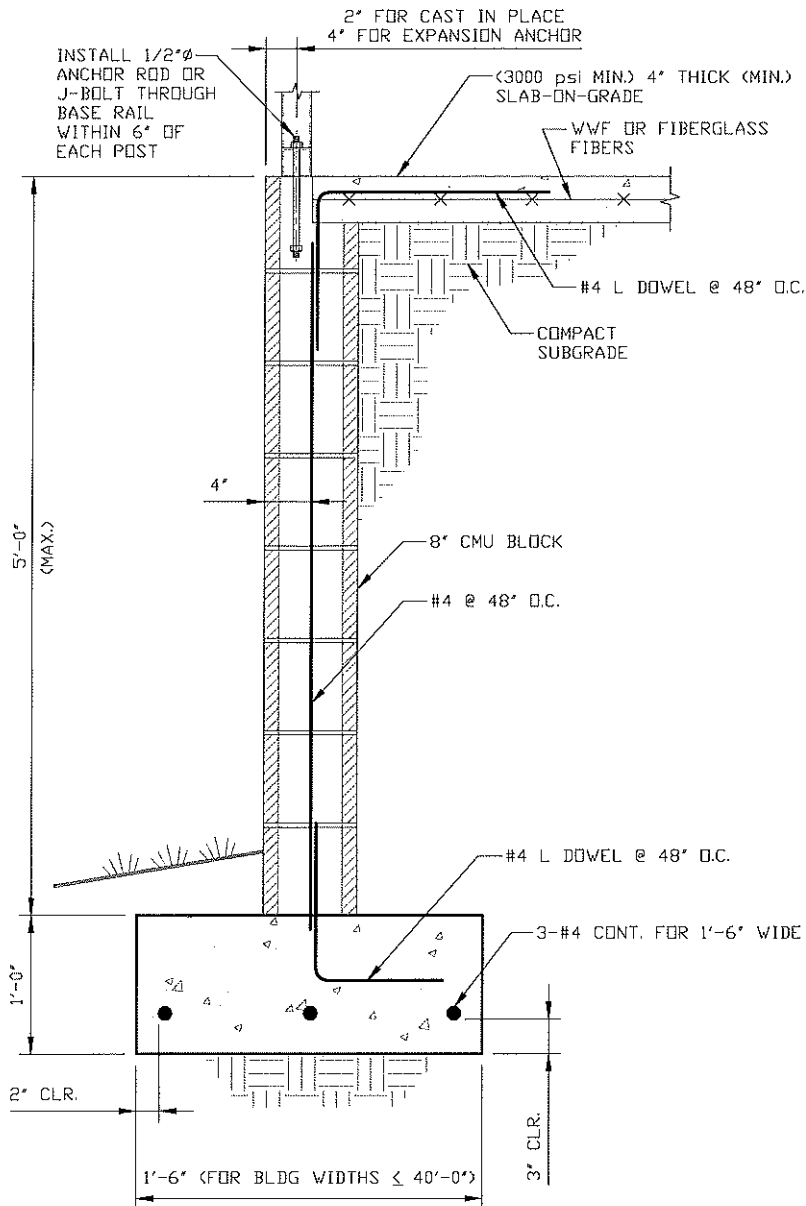
DWG. NO: SK-1

JOB NO: 16022S/
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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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**TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30'-0"x20'-0" FULLY OPEN STRUCTURE EXP. B**

DATE: 1-8-21

SHT. 19

SCALE: NTS

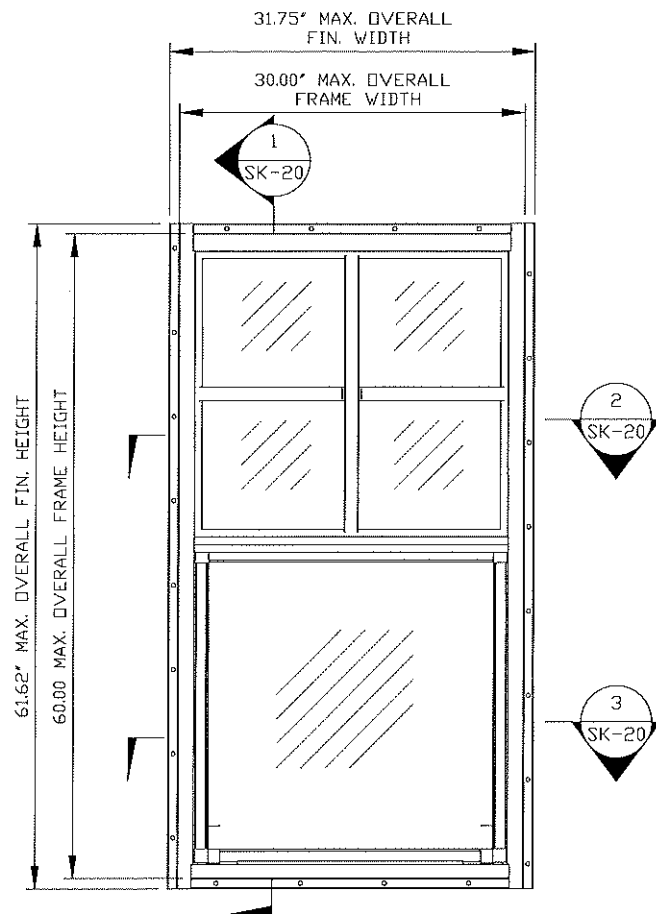
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**JOB NO: 16022S/
17300S/18028S/20352S**

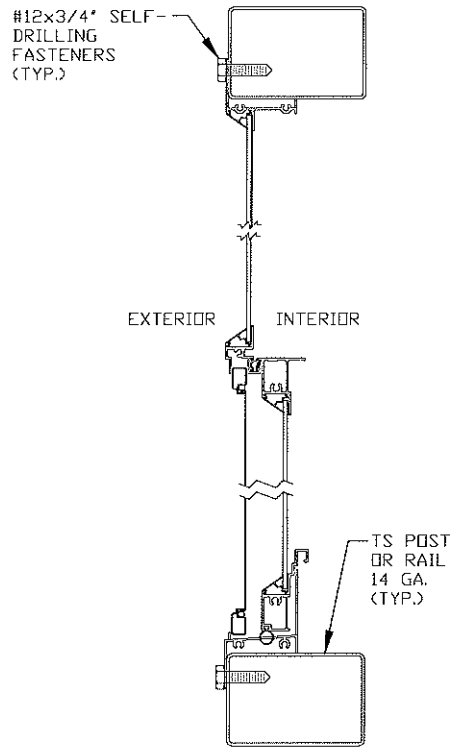
REV: 6

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VERTICAL SLIDING WINDOW DETAIL



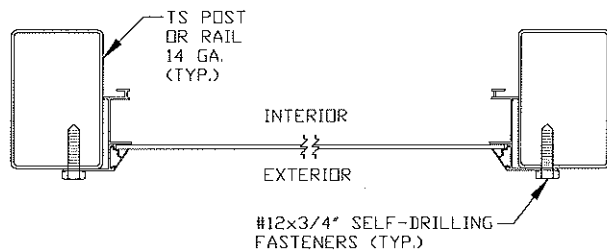
ELEVATION VIEW
SCALE: NTS



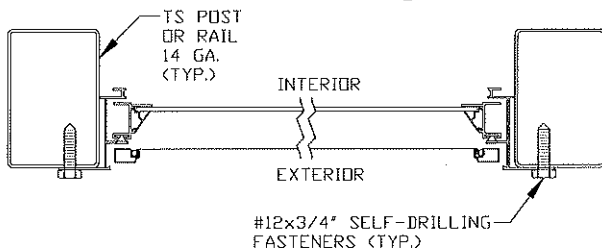
SECTION 1
SCALE: 3"=1'-0"

NOTE: KINRD 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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TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30'-0"x20'-0" FULLY OPEN STRUCUTRE EXP. B

DATE: 1-8-21

SCALE: NTS

DWG. NO: SK-1

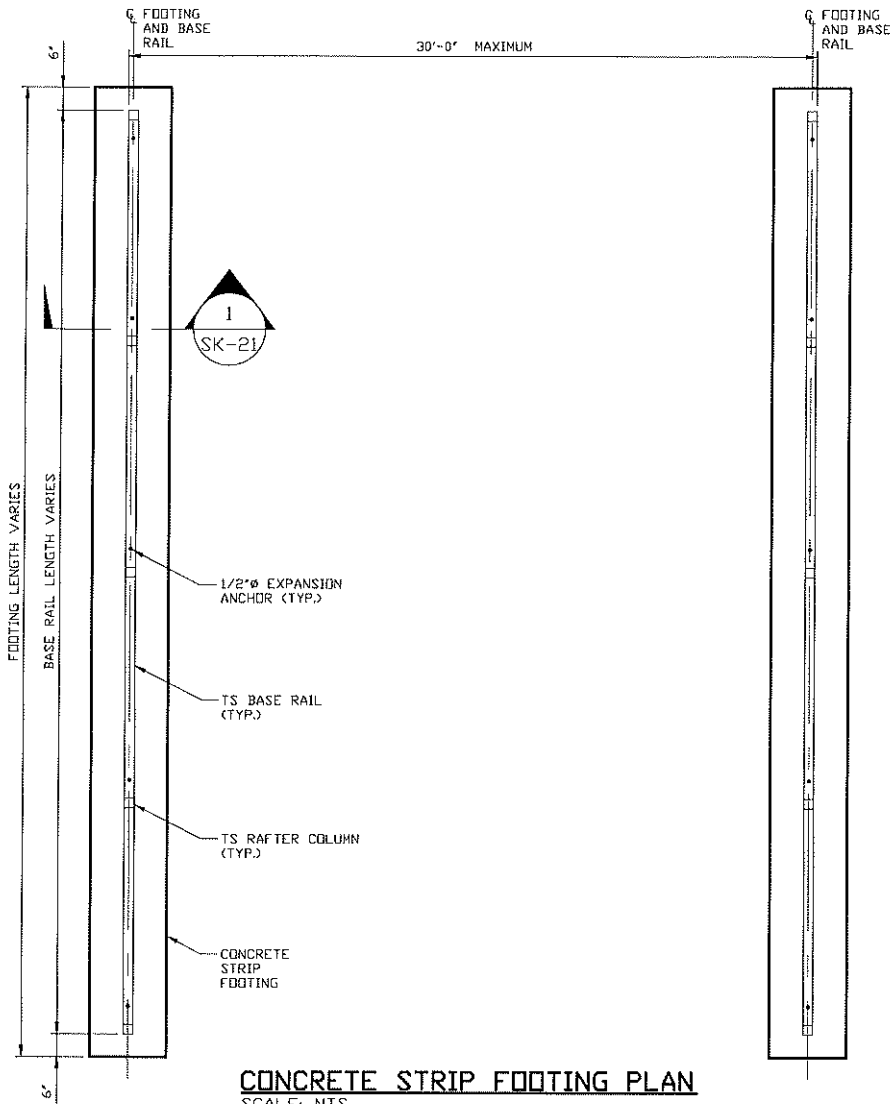
**JDB NO: 16022S/
17300S/18028S/20352S**

SHT. 20

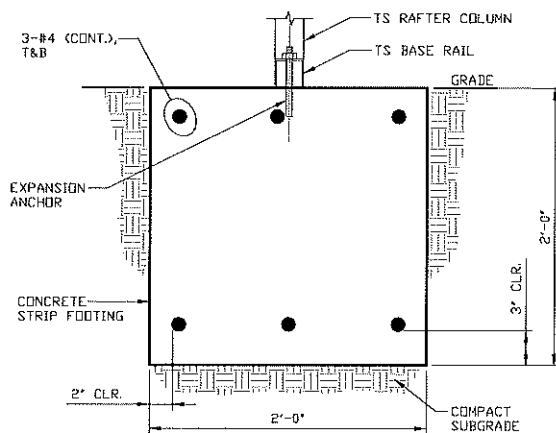
REV: 6

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OPTIONAL CONCRETE STRIP FOOTING



CONCRETE STRIP FOOTING PLAN
SCALE: NTS



SECTION 1 SK-21
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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**TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30'-0"x20'-0" FULLY OPEN STRUCUTRE EXP. B**

DATE: 1-8-21

SCALE: NTS

DWG. NO: SK-1

**JOB NO: 16022S/
17300S/18028S/20352S**

REV: 6

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