



STRUCTURAL DESIGN

ENCLOSED BUILDING

EXPOSURE C

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

25 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
by Wayne S
Moore
Date:
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	CHECKED BY: PDH			
	PROJECT MGR: WSM	DATE: 1-25-21	SCALE: NTS	JOB NO: 16022S/ 17300S/20352S
	CLIENT: TBS	SHT. 1	DWG. NO: SK-3	REV: 5

DRAWING INDEX

SHEET 1	PE SEAL COVER SHEET
SHEET 2	DRAWING INDEX
SHEET 3	INSTALLATION NOTES AND SPECIFICATIONS
SHEET 4	TYPICAL SIDE AND END ELEVATIONS
SHEET 5	TYPICAL RAFTER COLUMN END AND SIDE FRAMING SECTIONS (BOX EAVE RAFTER)
SHEET 5A	TYPICAL RAFTER COLUMN END AND SIDE FRAMING SECTIONS (BOX EAVE RAFTER)
SHEET 5B	TYPICAL RAFTER COLUMN END AND SIDE FRAMING SECTIONS (BOX EAVE RAFTER)
SHEET 6	TYPICAL RAFTER COLUMN CONNECTION DETAILS (LACED COLUMN)
SHEET 6A	TYPICAL RAFTER COLUMN CONNECTION DETAILS (DOUBLE COLUMN)
SHEET 6B	TYPICAL RAFTER COLUMN CONNECTION DETAILS (SINGLE COLUMN)
SHEET 7	TYPICAL RAFTER COLUMN END AND SIDE FRAMING SECTIONS (BOW RAFTER)
SHEET 7A	TYPICAL RAFTER COLUMN END AND SIDE FRAMING SECTIONS (BOW RAFTER)
SHEET 8	TYPICAL RAFTER COLUMN CONNECTION DETAILS (DOUBLE COLUMN)
SHEET 8A	TYPICAL RAFTER COLUMN CONNECTION DETAILS (SINGLE COLUMN)
SHEET 9	BASE RAIL ANCHORAGE OPTIONS FOR LOW AND HIGH WIND SPEED
SHEET 9A	OPTIONAL FOUNDATION ANCHORAGE FOR LOW AND HIGH WIND SPEED
SHEET 9B	BASE RAIL ANCHORAGE OPTION
SHEET 9C	BASE RAIL ANCHORAGE OPTIONS
SHEET 10	BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS
SHEET 11	BOW RAFTER END WALL AND SIDE WALL OPENINGS
SHEET 12	CONNECTION DETAILS
SHEET 13	CONNECTION DETAILS
SHEET 14	BOX EAVE RAFTER LEAN-TO OPTIONS
SHEET 14A	BOX EAVE RAFTER LEAN-TO OPTIONS
SHEET 15	BOW RAFTER LEAN-TO OPTIONS
SHEET 15A	BOW RAFTER LEAN-TO OPTIONS
SHEET 16	VERTICAL ROOF/SIDING OPTION
SHEET 17	OPTIONAL DOOR HEADER
SHEET 18	FLOOD VENT DETAIL
SHEET 19	STAND-ALONE STEM WALL DETAIL
SHEET 20	VERTICAL SLIDING WINDOW DETAIL
SHEET 21	STRIP FOOTING OPTION



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

DATE: 1-25-21

SCALE: NTS

SHT. 2

DWG. NO: SK-3

**JOB NO: 16022S/
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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 C.
9. SPECIFICATIONS APPLICABLE TO 29 GAUGE METAL PANELS FASTENED DIRECTLY TO 2 1/2" x 2 1/2" - 14 GAUGE TUBE STEEL (TS) FRAMING MEMBERS. FOR 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= 10
S_{DS}= 2.039 g V= C_SW
S_{DI}= 1.258 g



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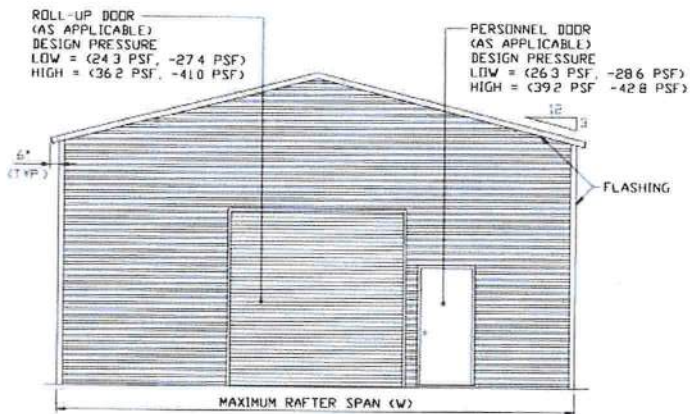
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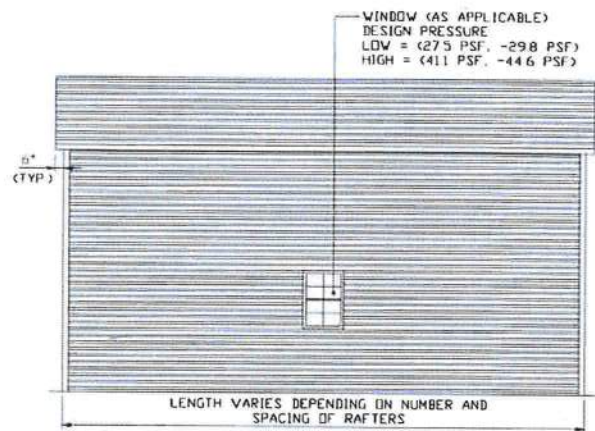
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BOX EAVE FRAME RAFTER ENCLOSED BUILDING



TYPICAL END ELEVATION

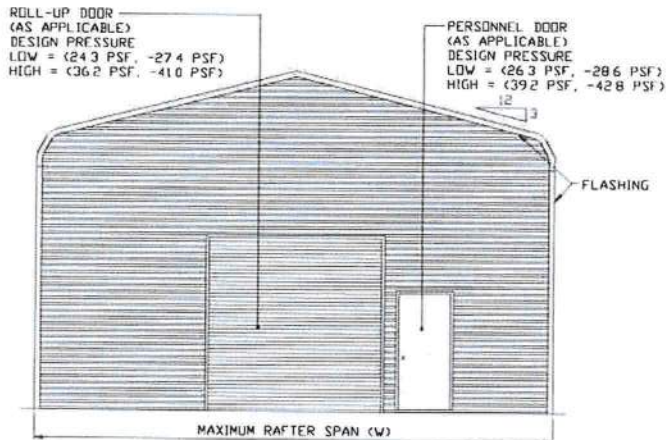
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TYPICAL SIDE ELEVATION

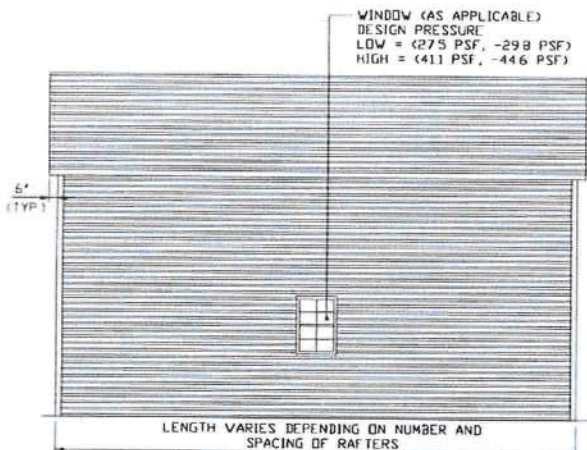
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BOW FRAME RAFTER ENCLOSED BUILDING



TYPICAL END ELEVATION

SCALE: NTS



TYPICAL SIDE ELEVATION

SCALE: NTS



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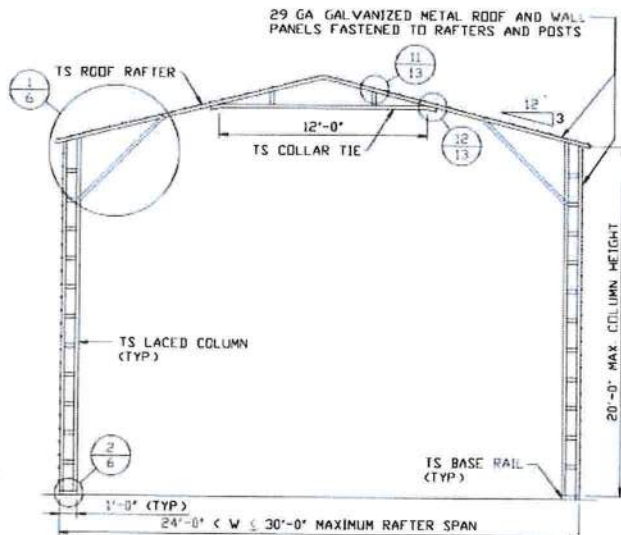
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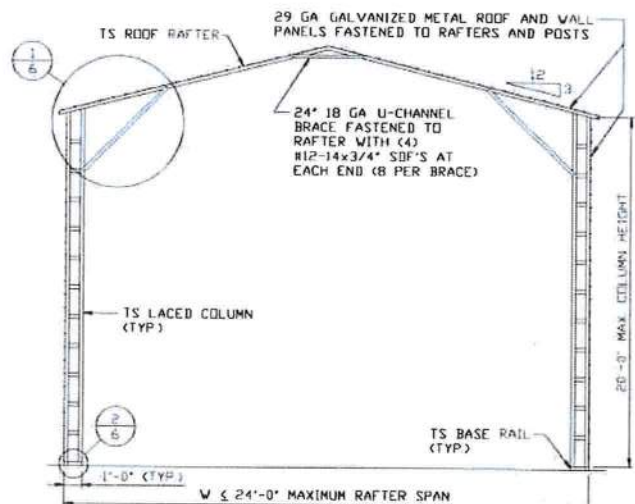
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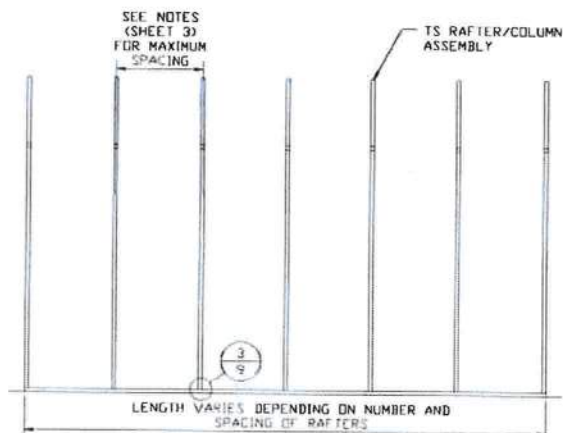
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TYPICAL RAFTER/COLUMN END FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN END FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION
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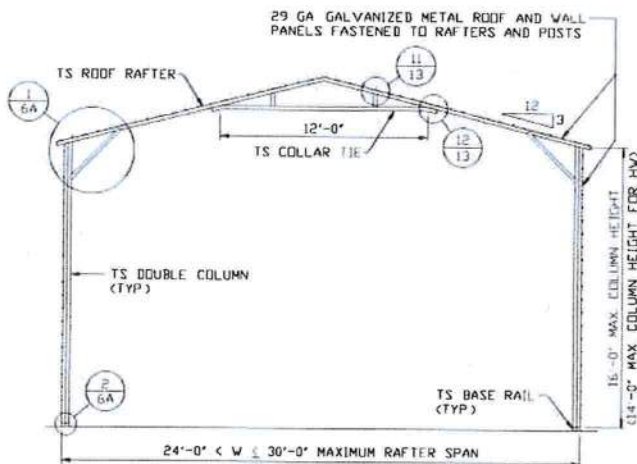
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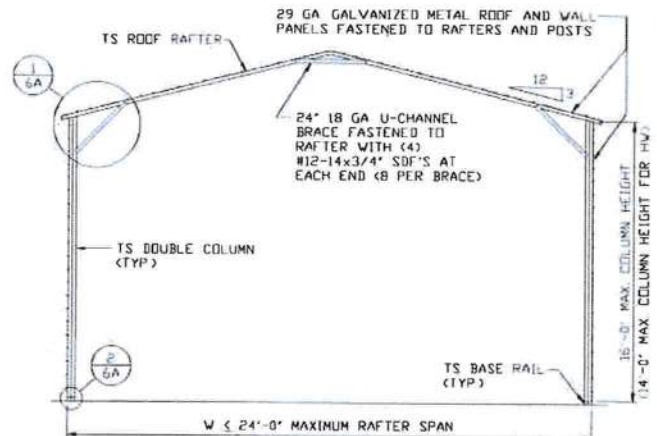
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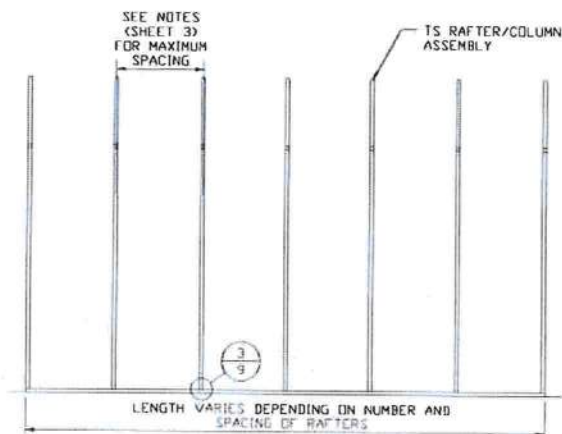
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TYPICAL RAFTER/COLUMN END FRAME SECTION
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TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION
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SHT. 5A

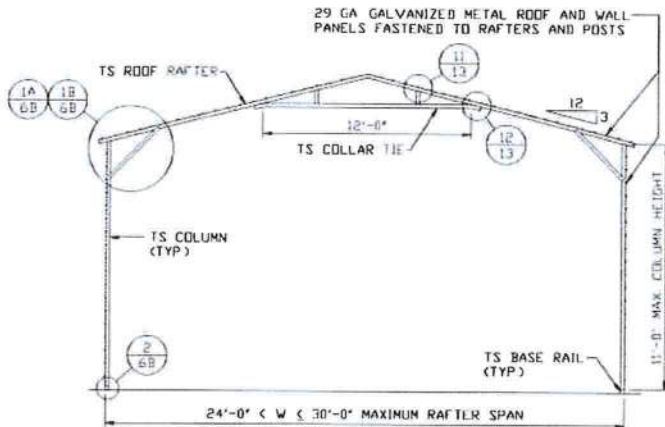
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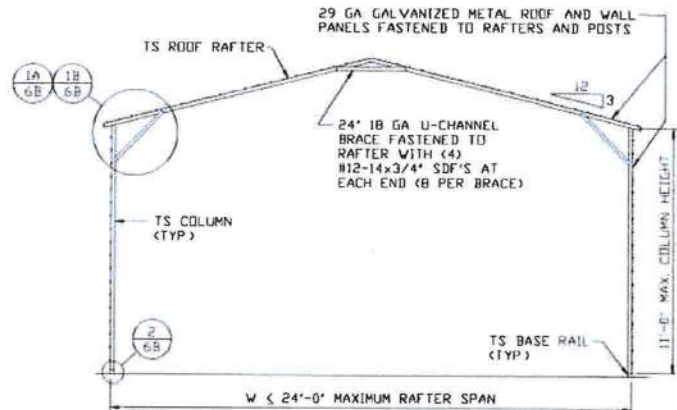
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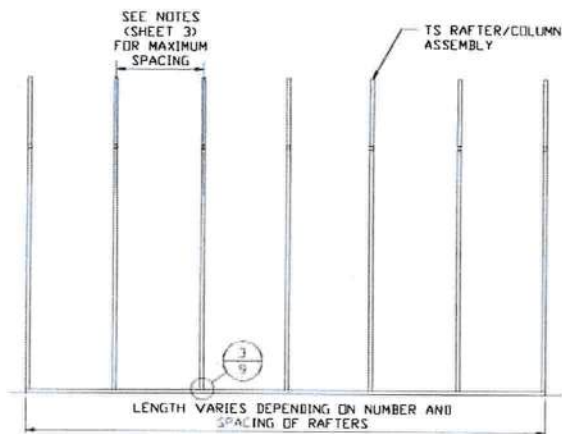
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TYPICAL RAFTER/COLUMN END FRAME SECTION
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TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION
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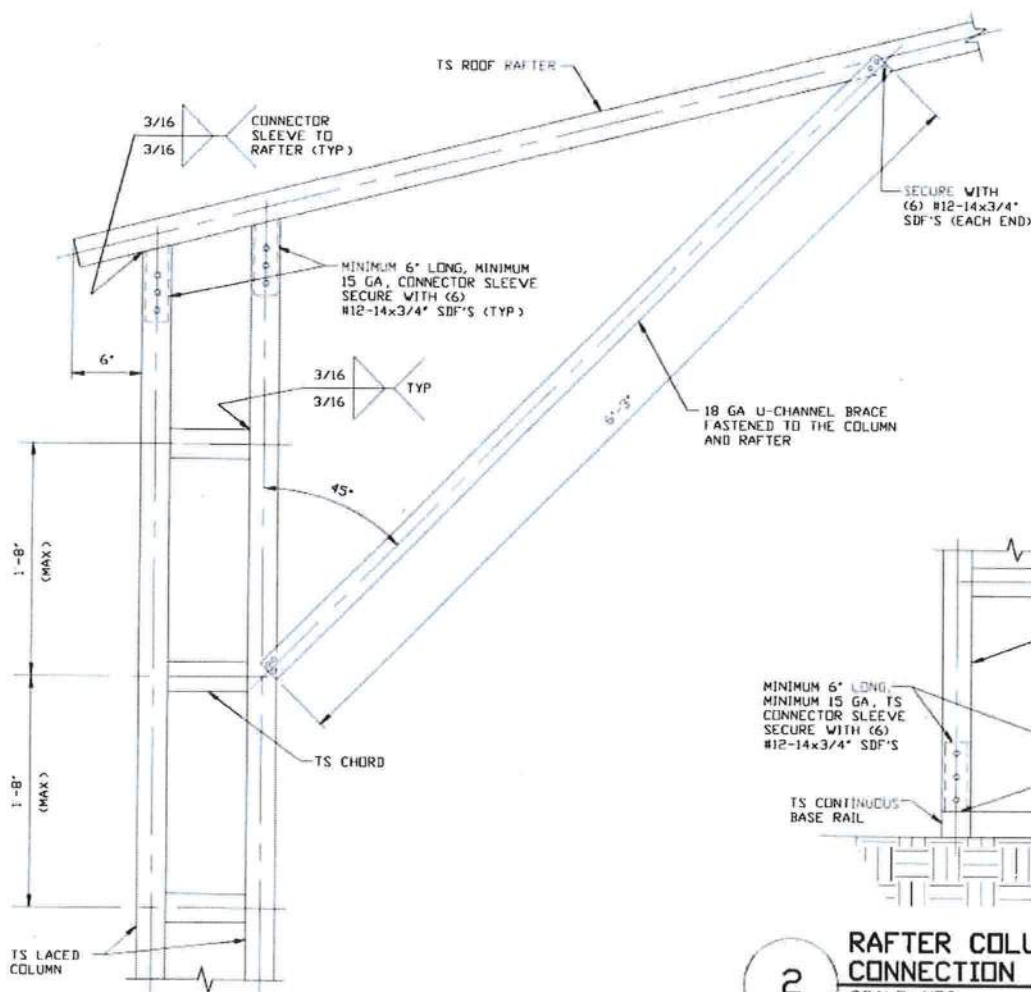
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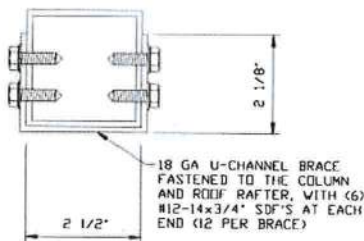
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BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 16'-0" < TO ≤ 20'-0"

SCALE: NTS

NOTE: USE (4) TEK SCREWS AT EACH END FOR LOW WIND



BRACE SECTION

SCALE: NTS

2

RAFTER COLUMN/BASE RAIL CONNECTION DETAIL

SCALE: NTS



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SHT. 6

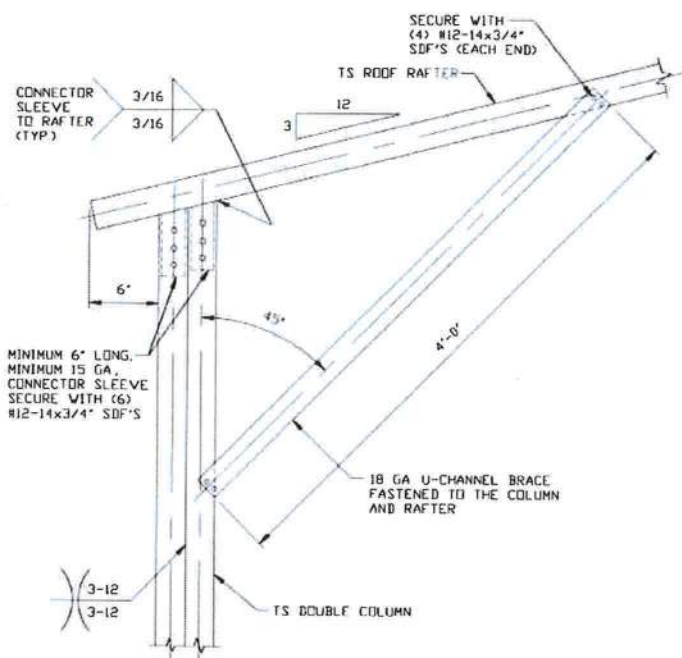
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DWG. NO: SK-3

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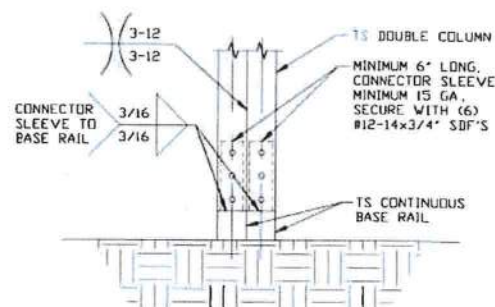
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1 BOX EAVE RAFTER COLUMN
CONNECTION DETAIL
FOR HEIGHTS 11'-0" < TO ≤ 16'-0"

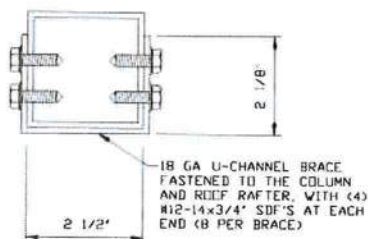
SCALE: NTS

NOTE: COLUMN HEIGHTS 11'-0" < TO ≤ 14'-0" FOR HIGH WIND



2 RAFTER COLUMN/BASE RAIL
CONNECTION DETAIL

SCALE: NTS



BRACE SECTION

SCALE: NTS



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SHT. 6A

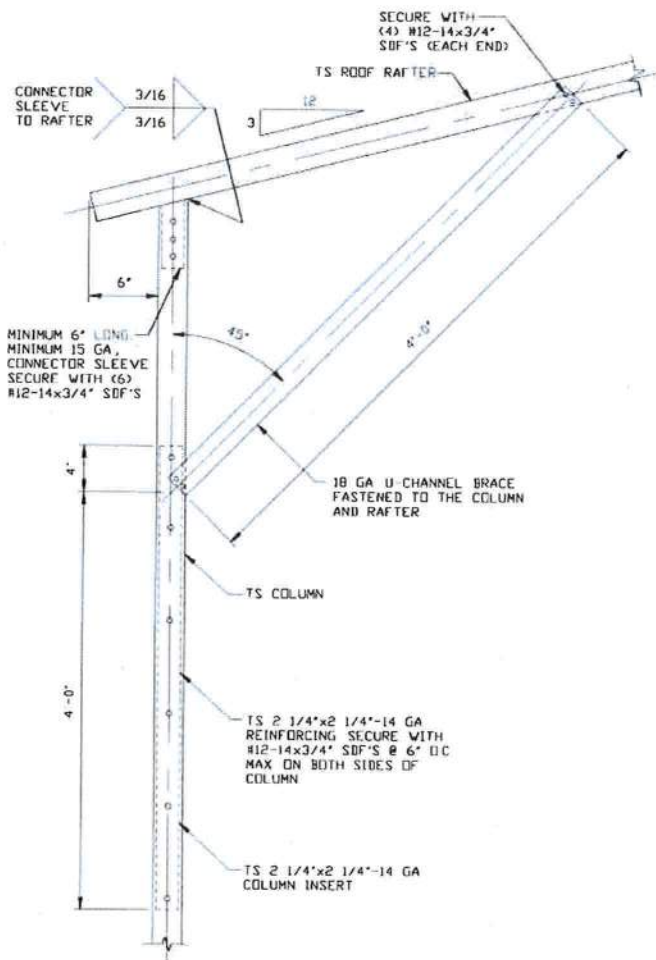
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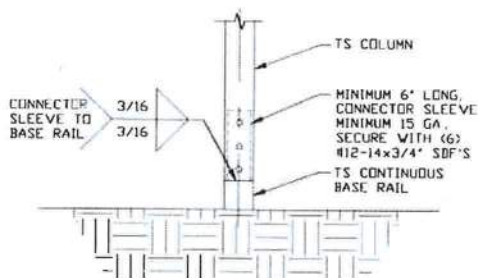
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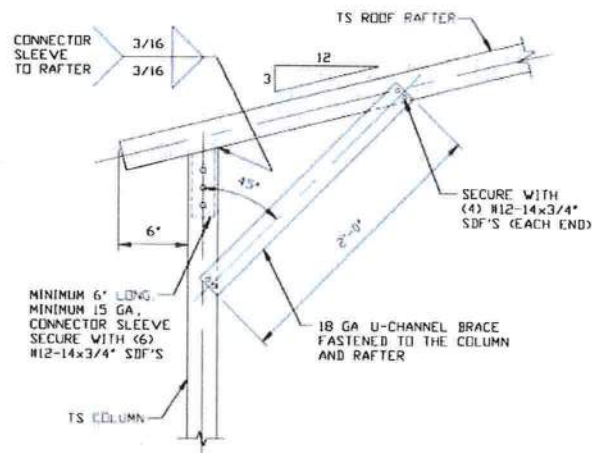
1A

**BOX EAVE RAFTER COLUMN
CONNECTION DETAIL
FOR HEIGHTS 8'-0" < TO ≤ 11'-0"**
SCALE: NTS



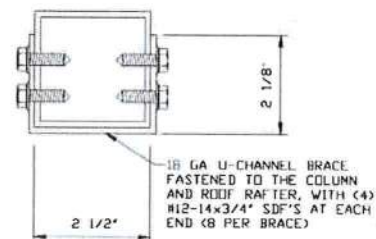
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**RAFTER COLUMN/BASE RAIL
CONNECTION DETAIL**
SCALE: NTS



1B

**BOX EAVE RAFTER COLUMN
CONNECTION DETAIL
FOR HEIGHTS ≤ 8'-0"**
SCALE: NTS



BRACE SECTION
SCALE: NTS



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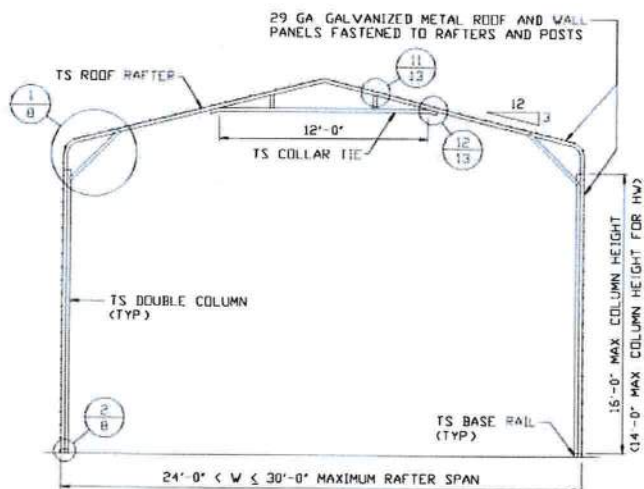
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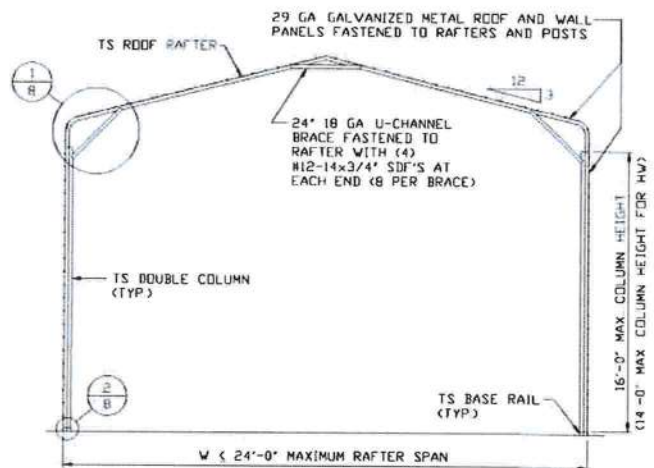
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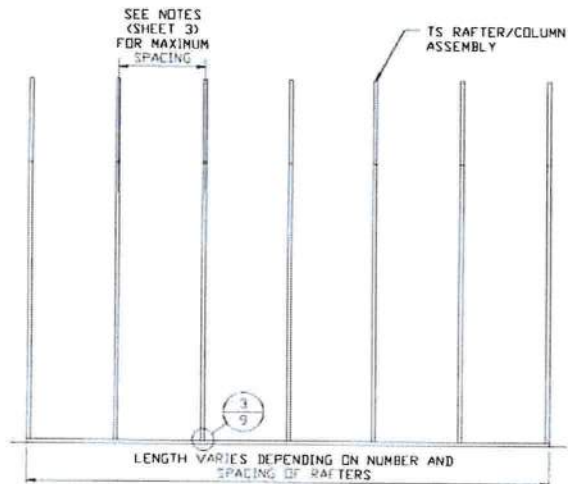
TYPICAL RAFTER/COLUMN END FRAME SECTION

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TYPICAL RAFTER/COLUMN END FRAME SECTION

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TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

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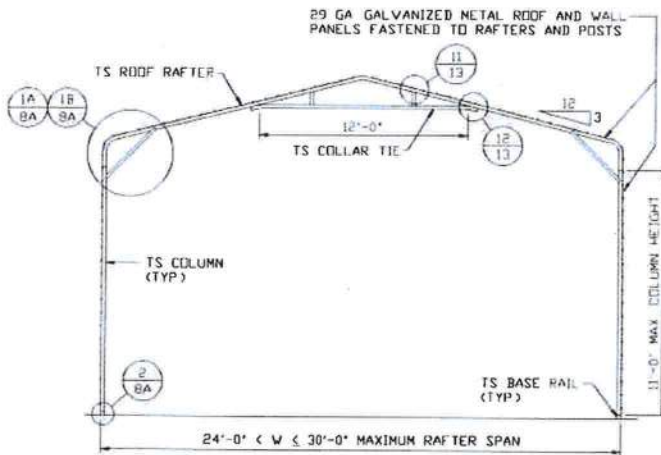
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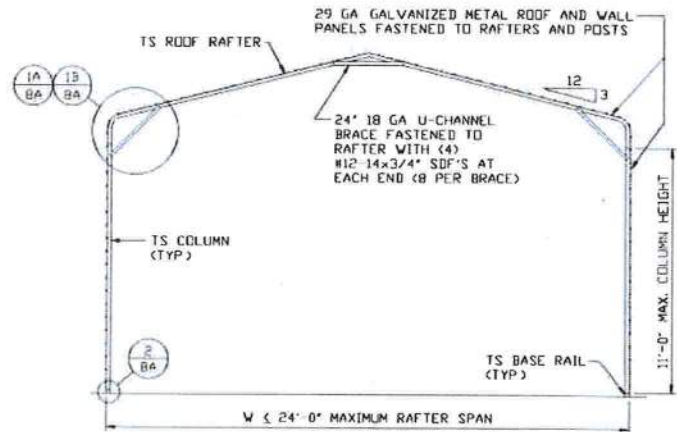
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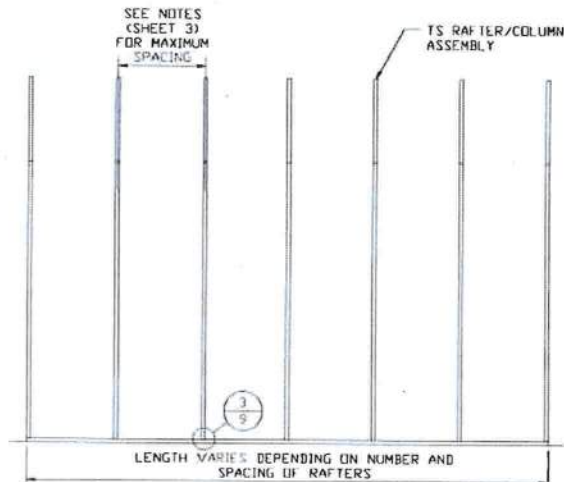
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CLIENT: TBS

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

DATE: 1-25-21

SHT. 7A

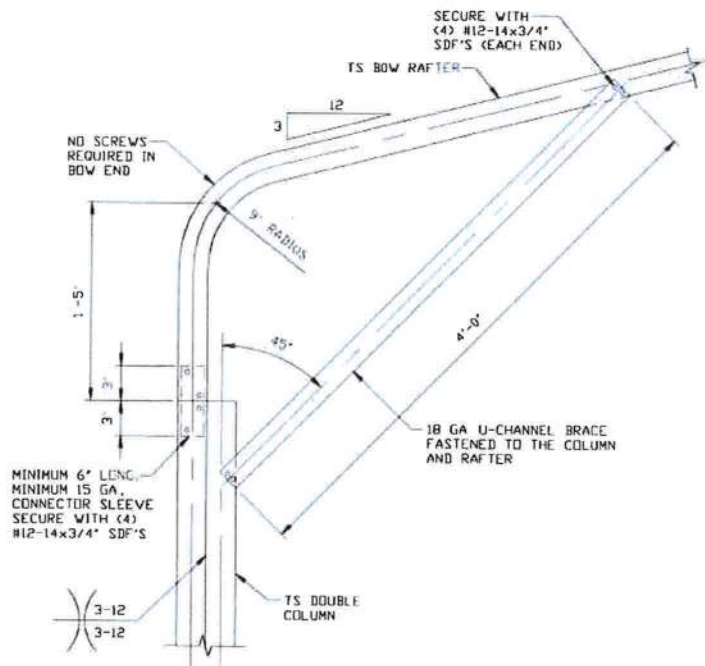
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DWG. NO: SK-3

JOB NO: 16022S/
17300S/20352S

REV: 5

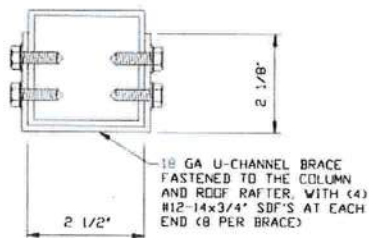
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1 BOX EAVE RAFTER COLUMN
CONNECTION DETAIL
FOR HEIGHTS 11'-0" < TO ≤ 16'-0"

SCALE: NTS

NOTE: COLUMN HEIGHTS 11'-0" < TO ≤ 14'-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. C

DATE: 1-25-21

SHT. 8

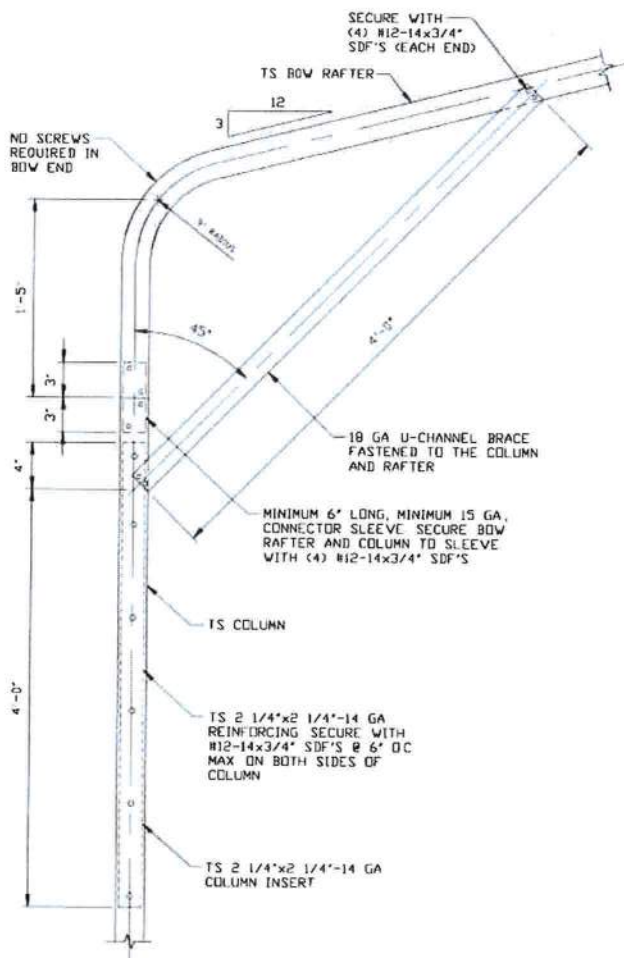
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DWG. NO: SK-3

JOB NO: 16022S/
17300S/20352S

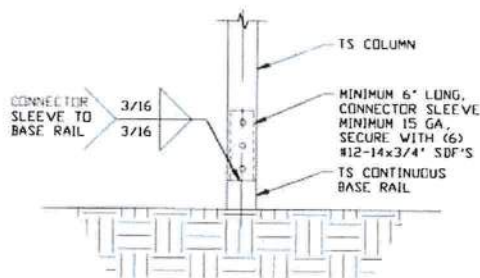
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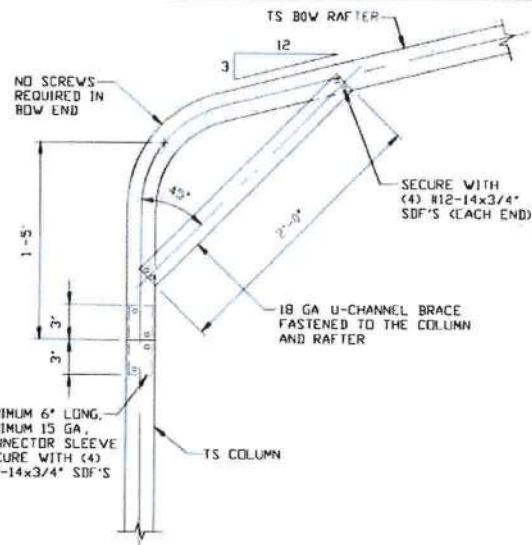
1A

**BOX EAVE RAFTER COLUMN
CONNECTION DETAIL
FOR HEIGHTS 8'-0" < TO ≤ 11'-0"**
SCALE: NTS



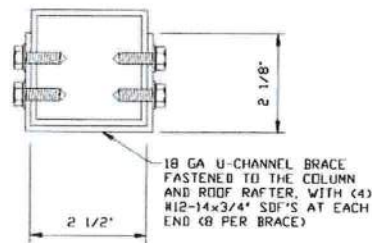
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**RAFTER COLUMN/BASE RAIL
CONNECTION DETAIL**
SCALE: NTS



1B

**BOX EAVE RAFTER COLUMN
CONNECTION DETAIL
FOR HEIGHTS ≤ 8'-0"**
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. C

DATE: 1-25-21

SHT. 8A

SCALE: NTS

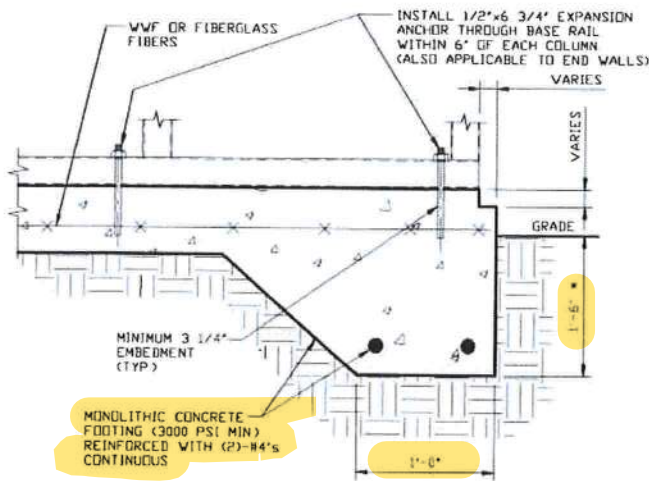
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REV: 5

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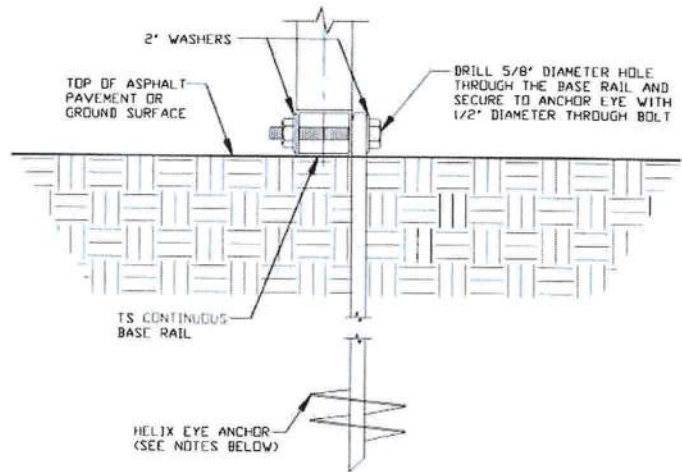
BASE RAIL ANCHORAGE OPTIONS FOR LOW AND HIGH WIND SPEED



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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CLIENT: TBS

TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
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DATE: 1-25-21

SHT. 9

SCALE: NTS

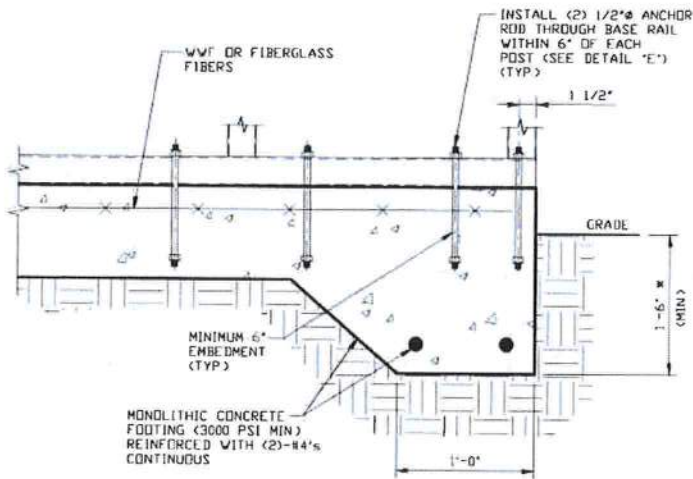
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JOB NO: 16022S/
17300S/20352S

REV: 5

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OPTIONAL FOUNDATION ANCHORAGE FOR LOW AND HIGH WIND SPEED



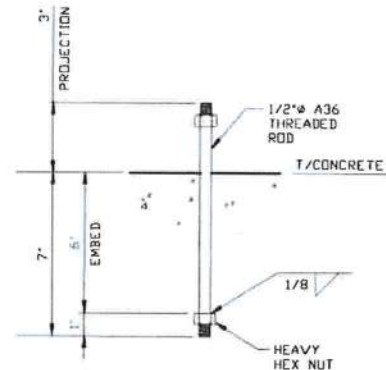
3C

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

DATE: 1-25-21

SHT. 9A

SCALE: NTS

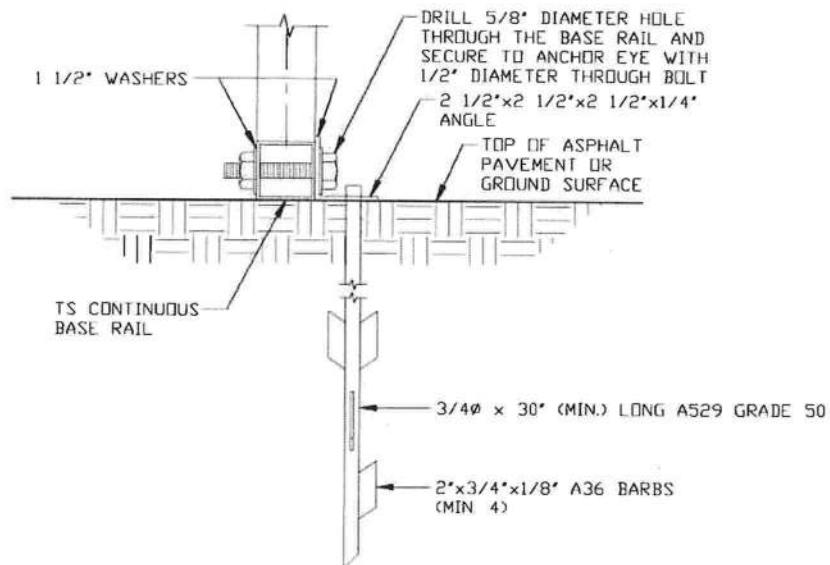
DWG. NO: SK-3

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

DATE: 1-25-21

SHT. 9B

SCALE: NTS

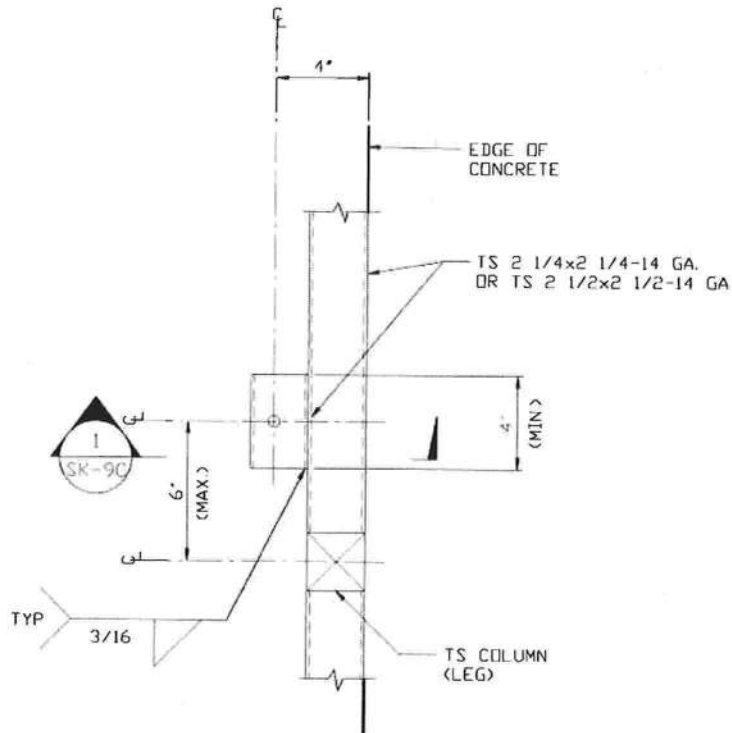
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JOB NO: 16022S/
17300S/20352S

REV: 5

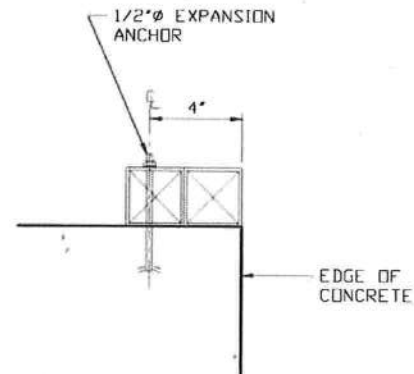
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BASE RAIL ANCHORAGE OPTIONS



**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
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DATE: 1-25-21

SHT. 9C

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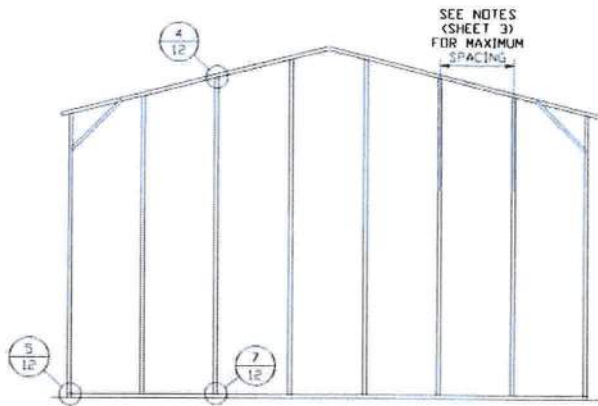
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**JOB NO: 16022S/
17300S/20352S**

REV: 5

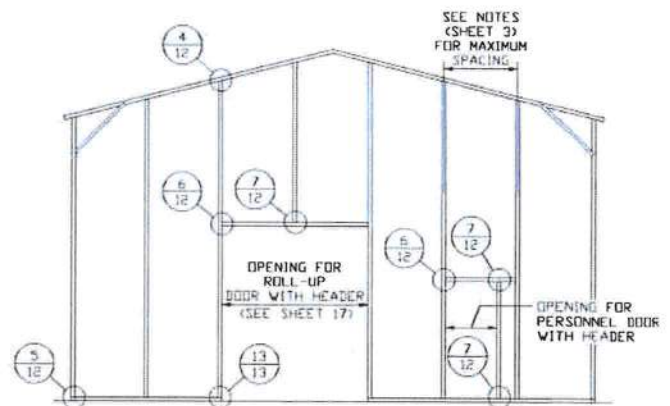
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BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS



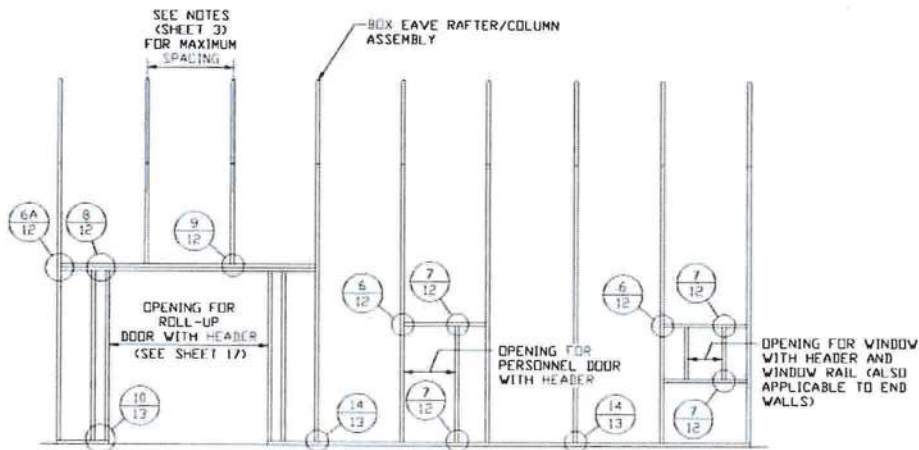
**TYPICAL BOX EAVE RAFTER
END WALL FRAMING SECTION**

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

DATE: 1-25-21

SHT. 10

SCALE: NTS

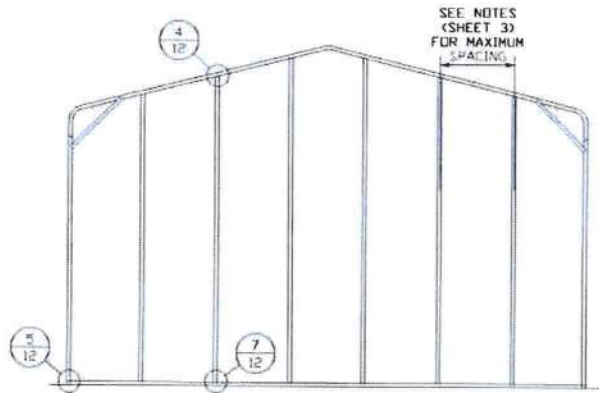
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**JOB NO: 16022S/
17300S/20352S**

REV: 5

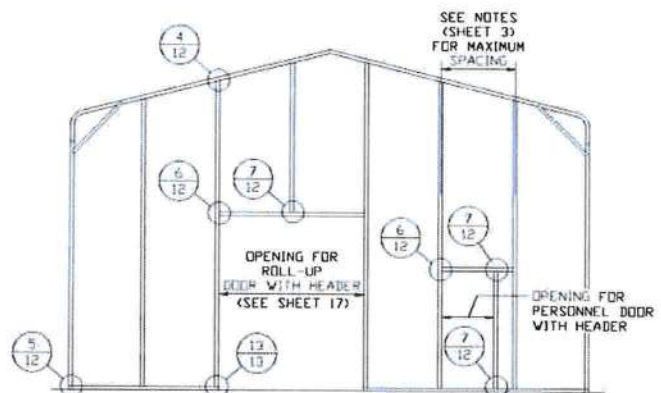
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BOW RAFTER END WALL AND SIDE WALL OPENINGS



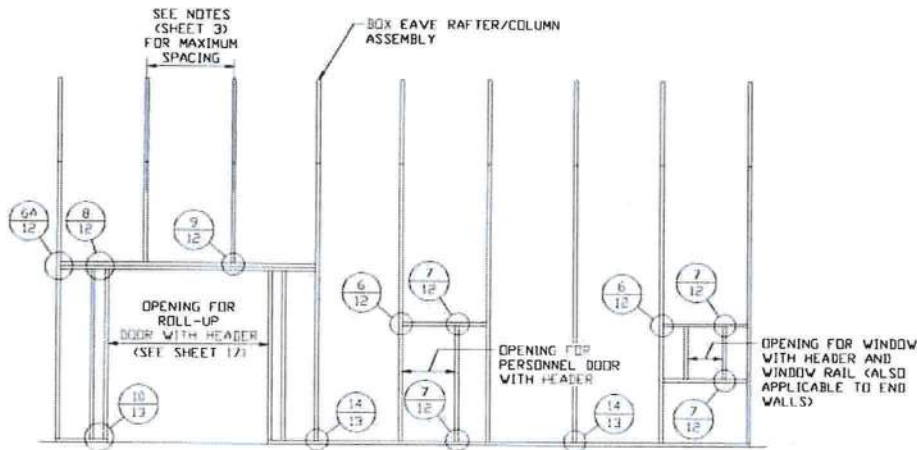
**TYPICAL BOX EAVE RAFTER
END WALL FRAMING SECTION**

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

DATE: 1-25-21

SHT. 11

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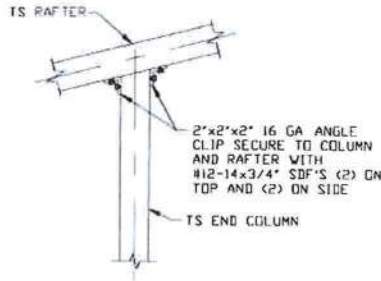
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**JOB NO: 16022S/
17300S/20352S**

REV: 5

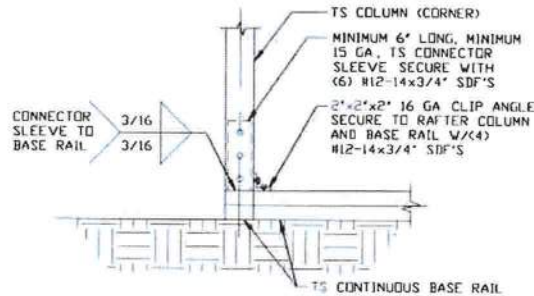
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CONNECTION DETAILS



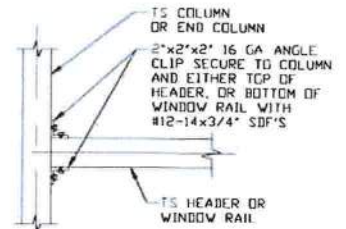
4 END COLUMN/RAFTER
CONNECTION DETAIL

SCALE: NTS



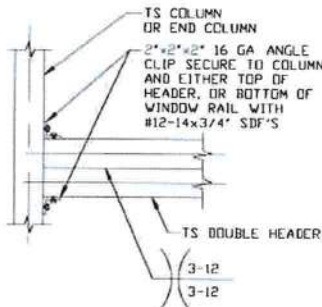
5 END COLUMN/BASE RAIL
CONNECTION DETAIL

SCALE: NTS



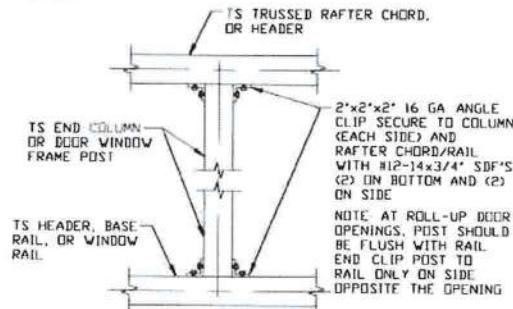
6 HEADER OR WINDOW
RAIL TO COLUMN
CONNECTION DETAIL

SCALE: NTS



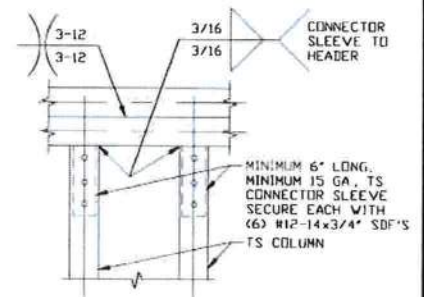
6A DOUBLE HEADER
TO COLUMN
CONNECTION DETAIL

SCALE: NTS



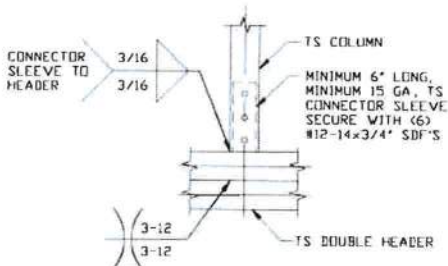
7 COLUMN TO HEADER,
BASE RAIL, OR
WINDOW RAIL
CONNECTION DETAIL

SCALE: NTS



8 DOUBLE HEADER/COLUMN
CONNECTION DETAIL

SCALE: NTS



9 COLUMN/DOUBLE HEADER
CONNECTION DETAIL

SCALE: NTS



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SHT. 12

SCALE: NTS

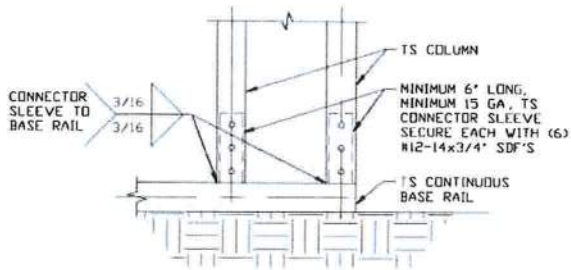
DWG. NO: SK-3

JOB NO: 16022S/
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REV: 5

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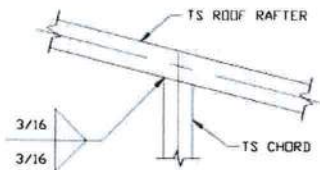
CONNECTION DETAILS



**COLUMN/BASE RAIL
CONNECTION DETAIL**

10

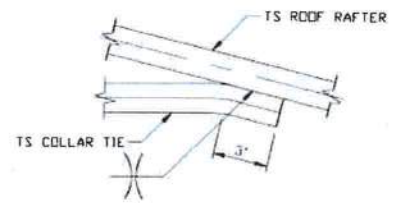
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**RAFTER TO CHORD
CONNECTION DETAIL**

11

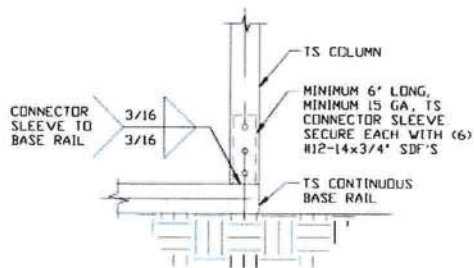
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**COLLAR TIE
CONNECTION DETAIL**

12

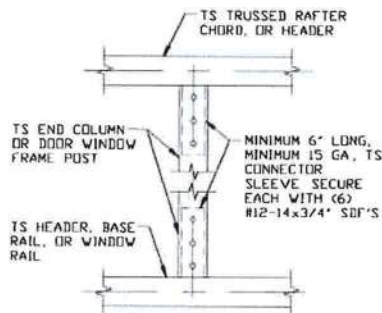
SCALE: NTS



**COLUMN/BASE RAIL
CONNECTION DETAIL**

13

SCALE: NTS



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

14

SCALE: NTS



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SHT. 13

SCALE: NTS

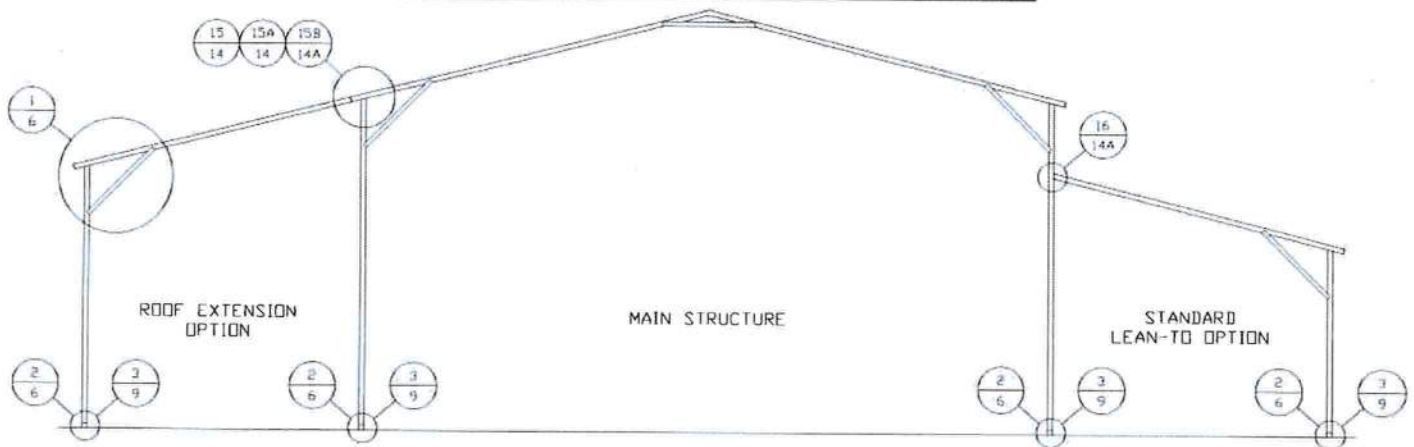
DWG. NO: SK-3

JOB NO: 16022S/
17300S/20352S

REV: 5

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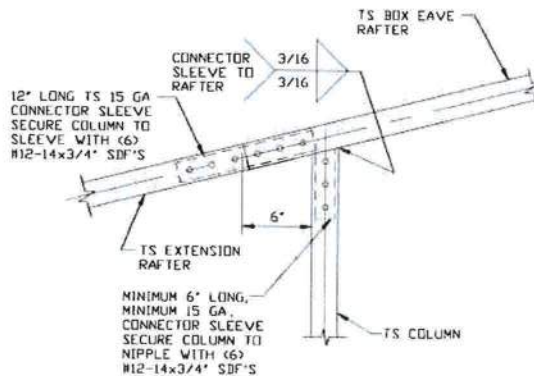
BOX EAVE RAFTER LEAN-TO OPTIONS



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

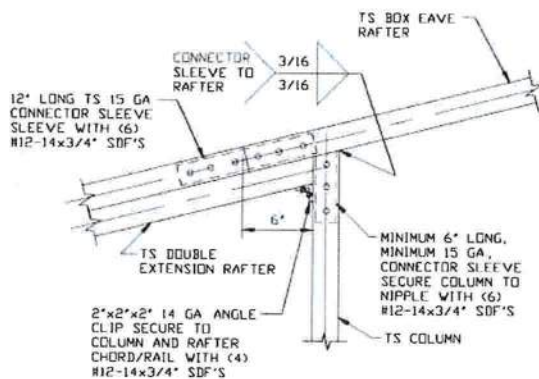
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MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE LACED COLUMNS FOR EAVE HEIGHTS 16'-0" (14'-0" FOR HIGH WIND) < TO ≤ 20'-0"
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE DOUBLE COLUMNS FOR EAVE HEIGHTS 11'-0" < TO ≤ 16'-0" (14'-0" FOR HIGH WIND)
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR EAVE HEIGHTS 8'-0" < TO ≤ 11'-0" (WITH 4'-4" INSERT)
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR EAVE HEIGHTS < 8'-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 ≤ 14'-0"

SCALE: NTS



15A SIDE EXTENSION RAFTER/COLUMN DETAIL FOR RAFTER SPANS 14'-0" < TO ≤ 22'-0"

SCALE: NTS

NOTE: MAX LEAN-TO SPAN IS 21'-0" FOR HIGH WIND



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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. C

DATE: 1-25-21

SHT. 14

SCALE: NTS

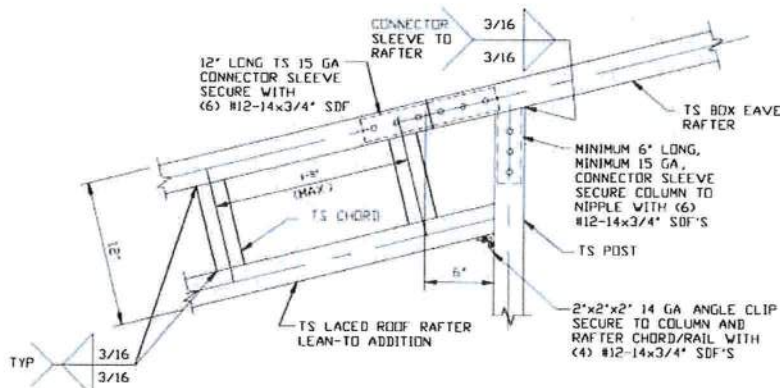
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JOB NO: 16022S/
17300S/20352S

REV: 5

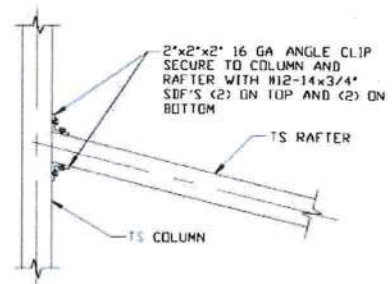
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BOX EAVE RAFTER LEAN-TO OPTIONS



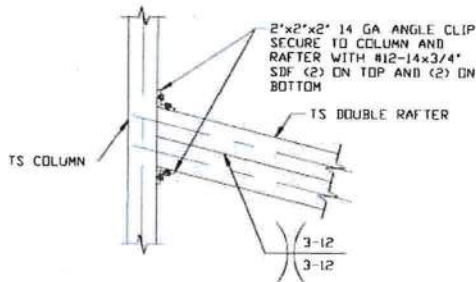
15B

**SIDE EXTENSION RAFTER/COLUMN DETAIL
FOR RAFTER SPANS 22'-0" < TO ≤ 24'-0"**
SCALE: NTS



16

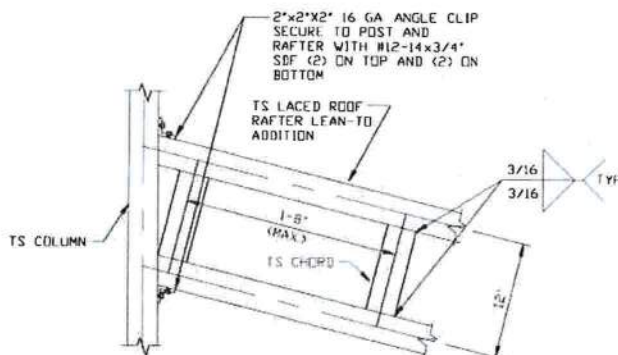
**LEAN-TO RAFTER TO RAFTER
COLUMN CONNECTION DETAIL
FOR RAFTER SPANS ≤ 14'-0"**
SCALE: NTS



16A

**LEAN-TO RAFTER TO RAFTER
COLUMN CONNECTION DETAIL
FOR RAFTER SPANS
14'-0" < TO ≤ 22'-0"**
SCALE: NTS

NOTE: MAX LEAN-TO SPAN IS 21'-0" FOR HIGH WIND



16B

**LEAN-TO RAFTER TO RAFTER
COLUMN CONNECTION DETAIL
FOR RAFTER SPANS
22'-0" < TO ≤ 24'-0"**
SCALE: NTS



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

DATE: 1-25-21

SHT. 14A

SCALE: NTS

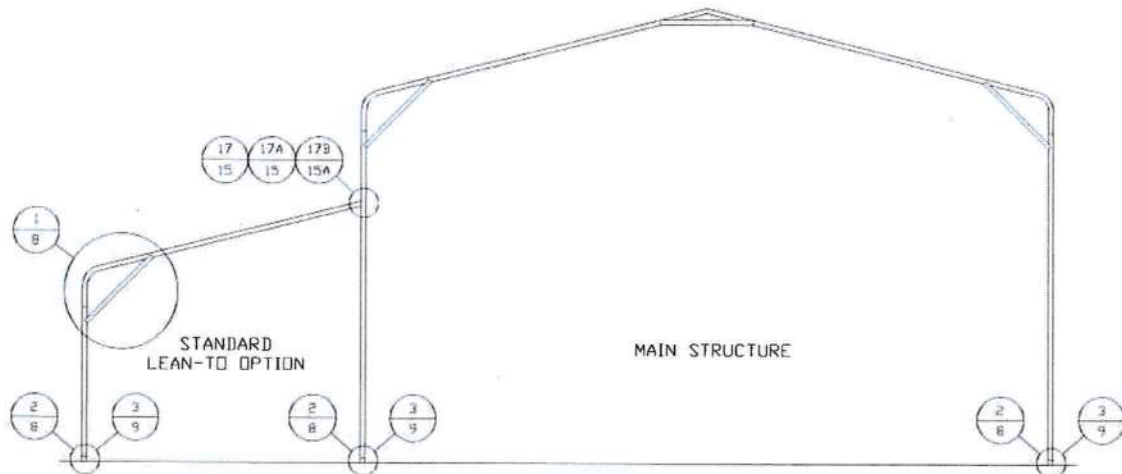
DWG. NO: SK-3

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



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

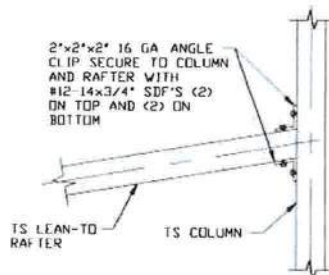
SCALE: NTS

MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE DOUBLE COLUMNS FOR EAVE HEIGHTS 11'-0" (11'-0" < TO ≤ 16'-0" < 14'-0" FOR HIGH WIND)

MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR EAVE HEIGHTS 8'-0" < TO ≤ 11'-0" (WITH 4'-4" INSERT)

MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR EAVE HEIGHTS ≤ 8'-0".

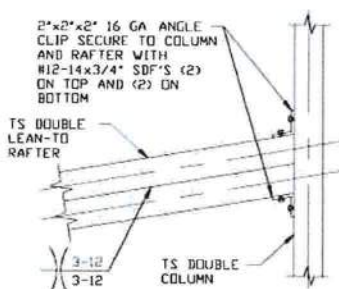
KNEE BRACES MUST BE 4'-0" (5'-0" FOR HIGH WIND) WHEN LEAN-TO'S ARE ADDED.



LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR RAFTER SPANS ≤ 14'-0"

17

SCALE: NTS



LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR RAFTER SPANS 14'-0" < TO ≤ 22'-0"

17A

SCALE: NTS

NOTE: MAX LEAN-TO SPAN IS 21'-0" FOR HIGH WIND



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PROJECT MGR: VSM

CLIENT: TBS

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

DATE: 1-25-21

SHT. 15

SCALE: NTS

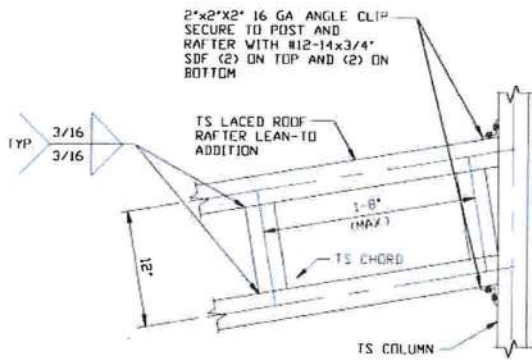
DWG. NO: SK-3

JOB NO: 16022S/
17300S/20352S

REV: 5

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BOW RAFTER LEAN-TO OPTIONS



**LEAN-TO RAFTER TO RAFTER
COLUMN CONNECTION DETAIL
FOR RAFTER SPANS
22'-0" < TO ≤ 24'-0"**

17B

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. C**

DATE: 1-25-21

SHT. 15A

SCALE: NTS

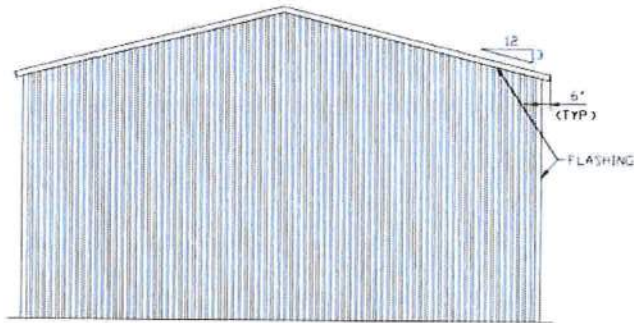
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**JOB NO: 16022S/
17300S/20352S**

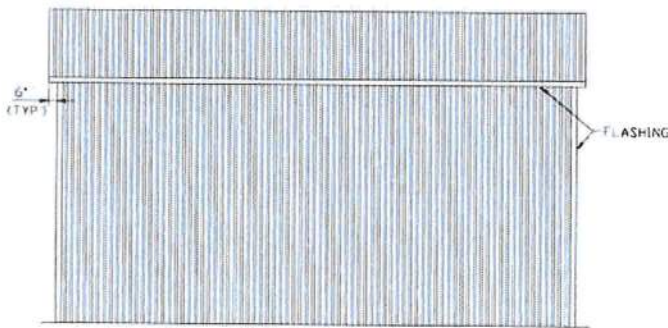
REV: 5

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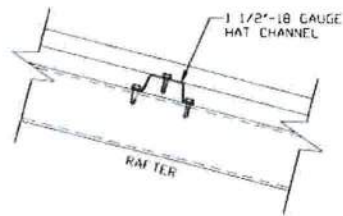
BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



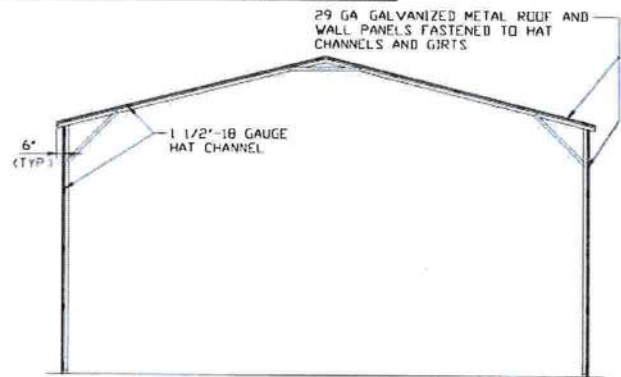
**TYPICAL END ELEVATION
VERTICAL ROOF/SIDING OPTION**
SCALE: NTS



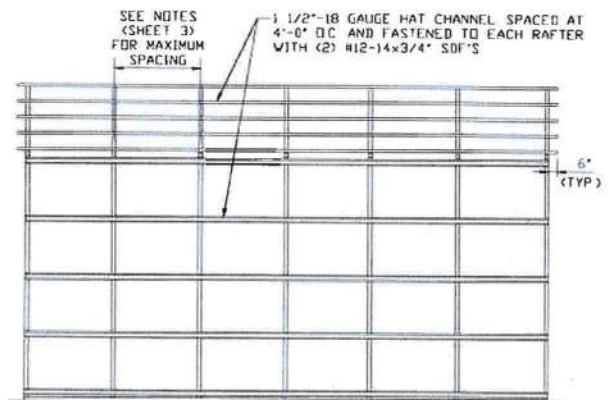
**TYPICAL SIDE ELEVATION
VERTICAL ROOF/SIDING OPTION**
SCALE: NTS



ROOF PANEL ATTACHMENT
(ALTERNATE FOR VERTICAL ROOF PANELS)
SCALE: NTS



**TYPICAL SECTION 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 SPACED AT 4'-0" (MAX) O.C.



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CLIENT: TBS

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

DATE: 1-25-21

SHT. 16

SCALE: NTS

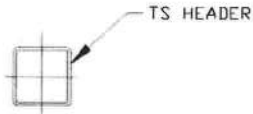
DWG. NO: SK-3

JOB NO: 16022S/
17300S/20352S

REV: 5

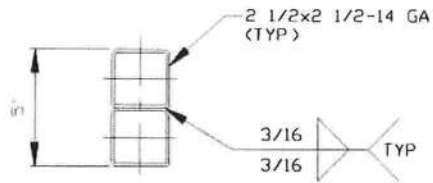
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SIDE WALL HEADER OPTIONS



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

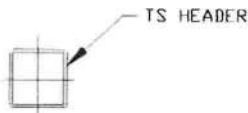
SCALE: NTS



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

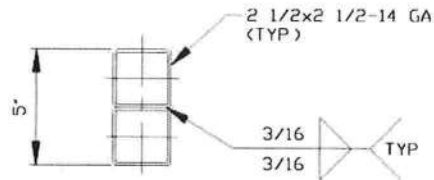
SCALE: NTS

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

DATE: 1-25-21

SHT. 17

SCALE: NTS

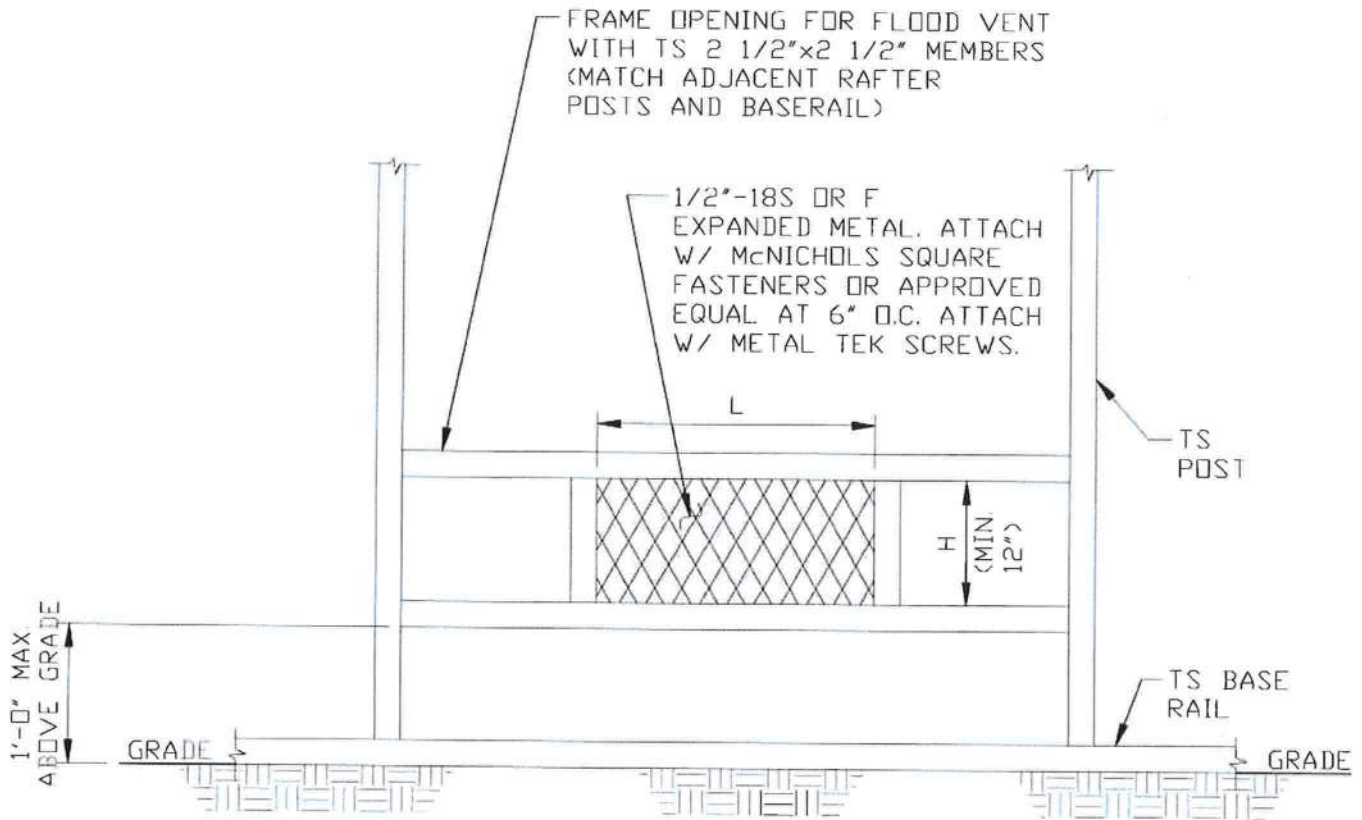
DWG. NO: SK-3

JOB NO: 16022S/
17300S/20352S

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. C**

DATE: 1-25-21

SHT. 18

SCALE: NTS

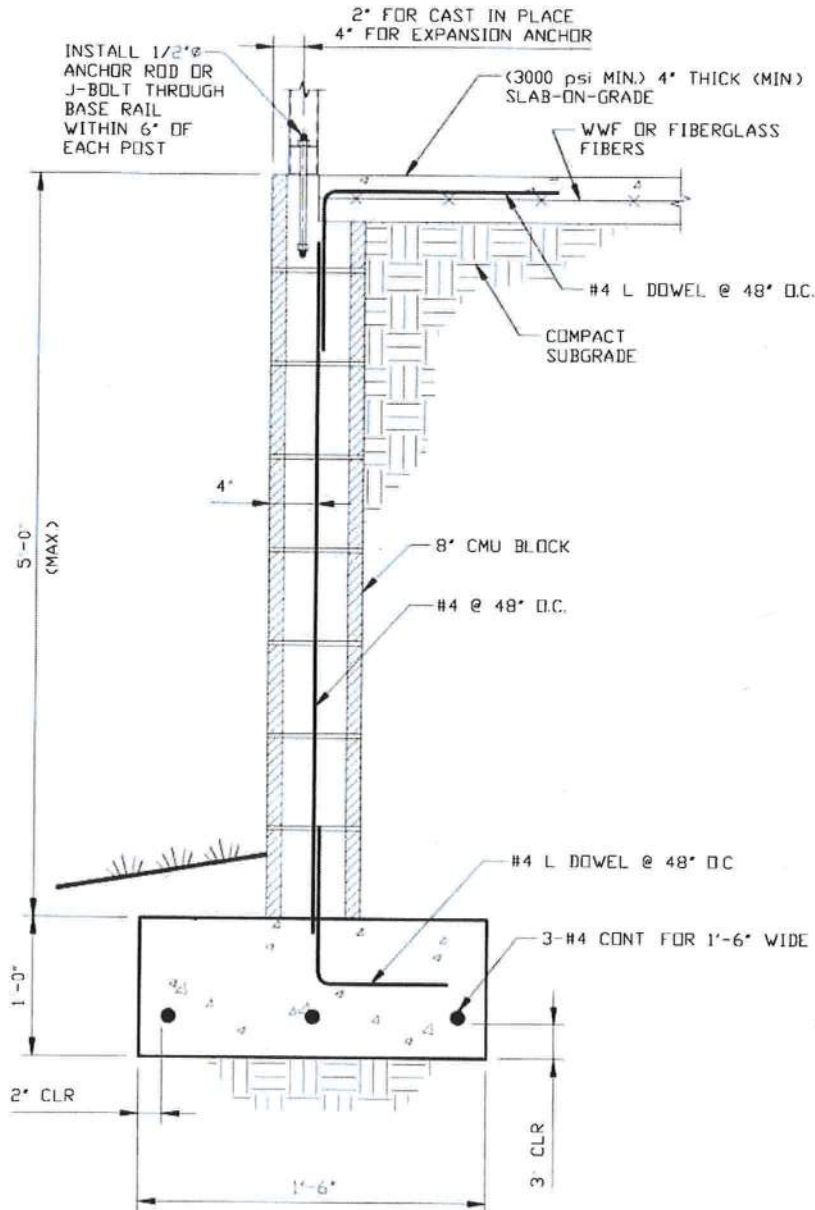
DWG. NO: SK-3

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

DATE: 1-25-21

SHT. 19

SCALE: NTS

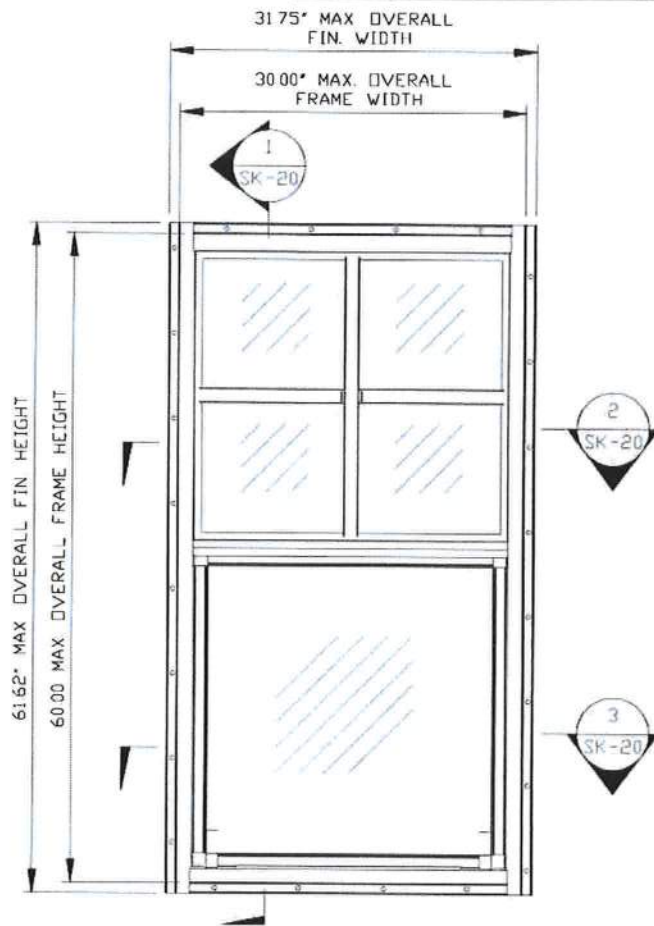
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JOB NO: 16022S/
17300S/20352S

REV: 5

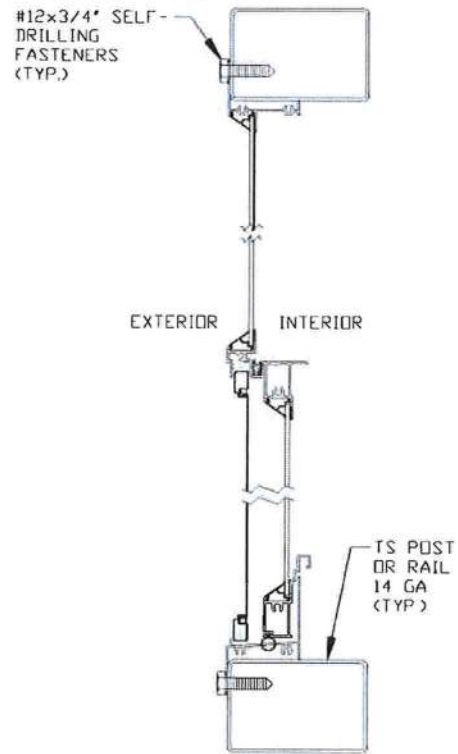
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VERTICAL SLIDING WINDOW DETAIL



ELEVATION VIEW

SCALE: NTS



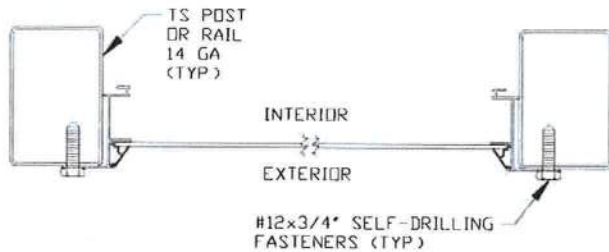
SECTION 1

SCALE: 3"=1'-0"

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

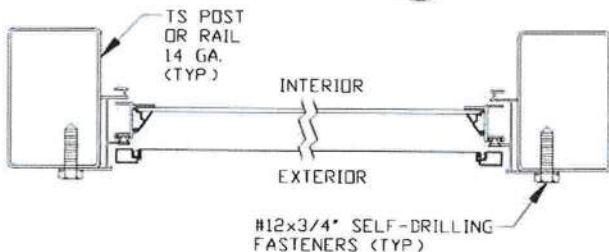
POSITIVE WALL PRESSURE: +40.0 PSF

NEGATIVE WALL PRESSURE: -40.0 PSF



SECTION 2

SCALE: 3"=1'-0"



SECTION 3

SCALE: 3"=1'-0"



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TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
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30'-0"x20'-0" ENCLOSED BUILDING EXP. C

DATE: 1-25-21

SHT. 20

SCALE: NTS

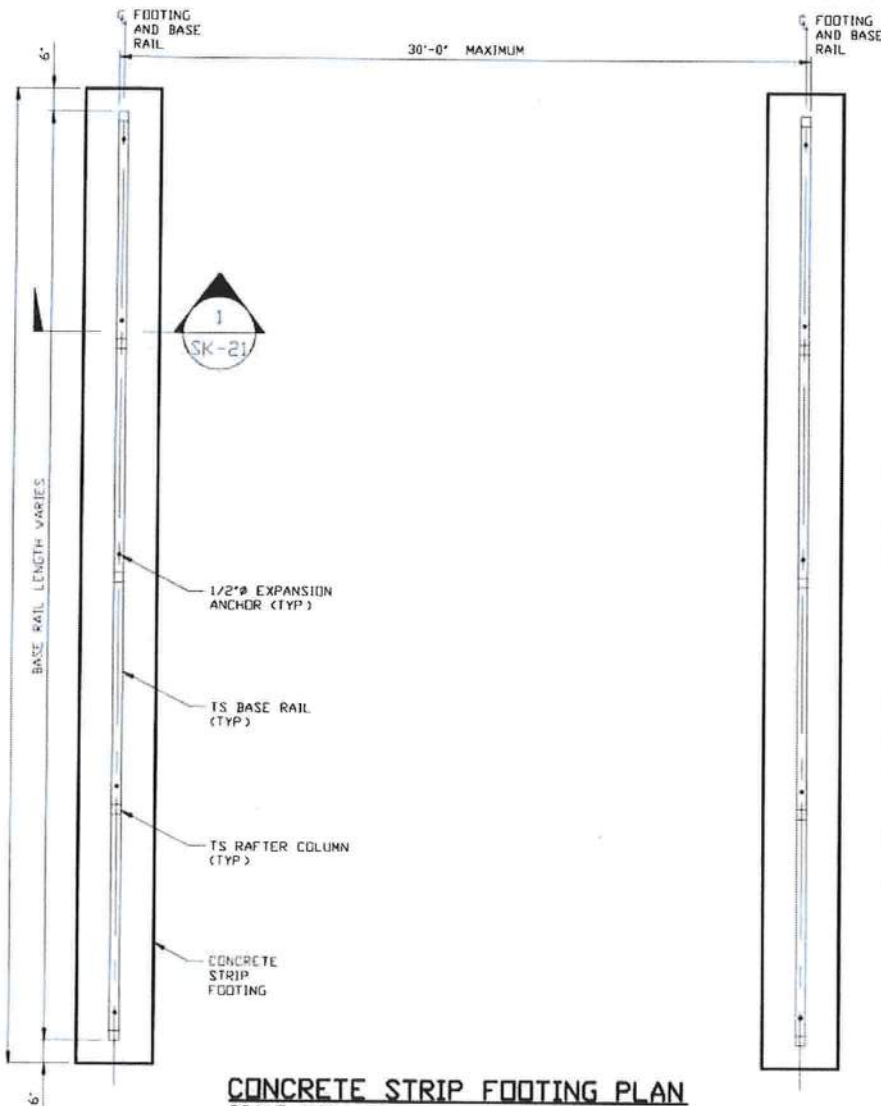
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JOB NO: 16022S/
17300S/20352S

REV: 5

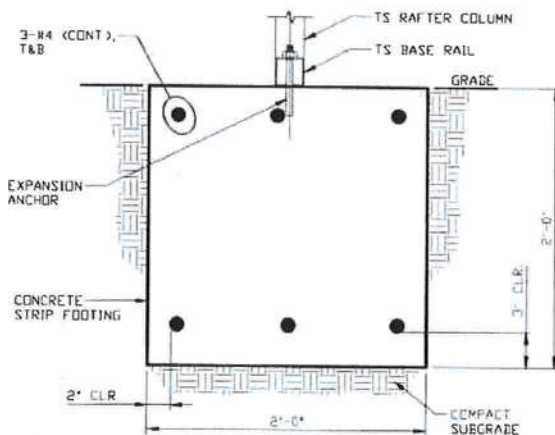
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OPTIONAL CONCRETE STRIP FOOTING



CONCRETE STRIP FOOTING PLAN

SCALE: NTS



SECTION 1
SCALE: NTS

* COORDINATE WITH LOCAL CODES/ORD

GENERAL NOTES

NOTE: CONCRETE MONOLITHIC SLAB DESIGN BASED ON MINIMUM SOIL BEARING CAPACITY OF 1,500 PSF

CONCRETE

CONCRETE SHALL HAVE A MINIMUM SPECIFIED COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS.

COVER OVER REINFORCING STEEL

FOR FOUNDATIONS, MINIMUM CONCRETE COVER OVER REINFORCING BARS SHALL BE PER ACI-318: 3 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"x20'-0" ENCLOSED BUILDING EXP. C**

DATE: 1-25-21

SHT. 21

SCALE: NTS

DWG. NO: SK-3

**JOB NO: 16022S/
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REV: 5

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Florida Product Approval Codes

Roll-Up Doors:

10Wide Janus International Corporation Model 750: 21450.10	12/31/21
--	----------

Walk-In Door:

Elixir Door & Metal Company blank (no window): 17996.5	8/26/25
--	---------

Window:

Kinro 993.7	10/19/21
-------------	----------

Roof Deck:

Capital Metal Supply Inc. Ag Panel: 20147.2	3/4/25
---	--------

Wall Panel:

Capital Metal Supply Inc. Ag Panel: 20148.2	3/4/25
---	--------

If you have any questions on concern, please contact Donald Little at 386-961-0006 or at tubularbuildingsystems@gmail.com.

Outside measurement of foundation
Equals Basic Building Dimension
plus Seven (7) inches

20' 7"

Basic Building
Dimension
to outside of Base Rail

20'

BUILDING SLAB

Basic Building
Dimension
to outside of Base Rail

20'

Outside measurement of foundation
Equals Basic Building Dimension
plus Seven (7) inches

20' 7"

All basic building dimensions
are to the outside of the
frame Base Rail and DO NOT
INCLUDE the 3-1/2" x 1-1/2"
notch in the concrete footing

See Sheet 3 of 3
for Detail of Building
corner configuration

IMPORTANT - NOTES

Record Measurements
in these spaces provided

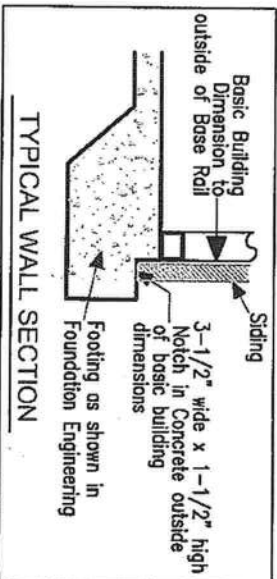
Building
Base Rail

3-1/2" wide x 1-1/2" high Notch
in Concrete outside
of basic building
dimensions

See Corner
Detail Sheet 3

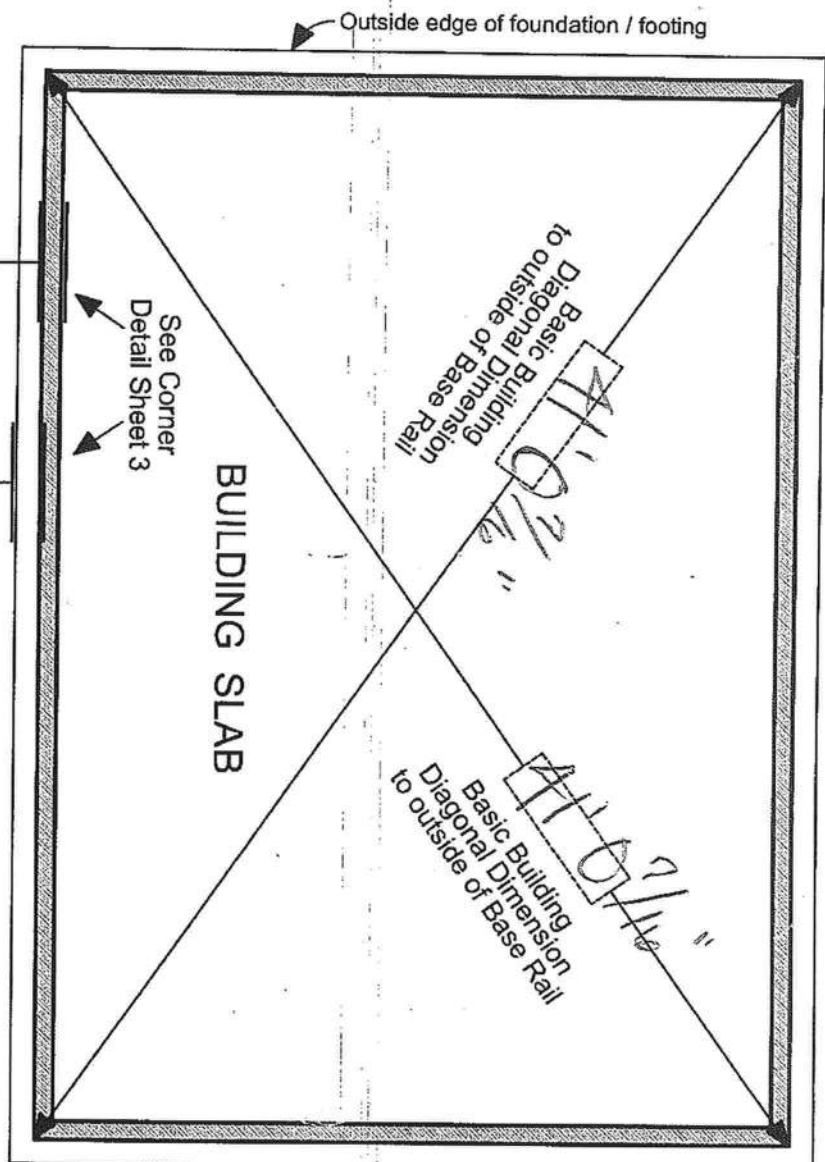


TYPICAL BUILDING FOUNDATION MEASUREMENTS



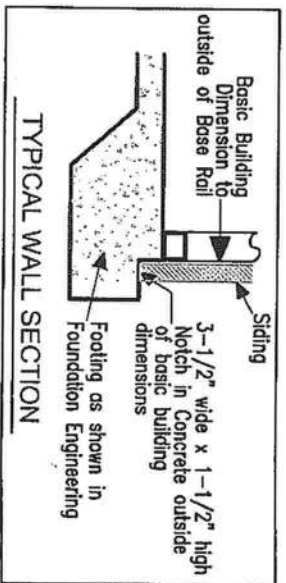


TYPICAL BUILDING FOUNDATION MEASUREMENTS DIAGONALS



Building
Base Rail

3-1/2" wide x 1-1/2" high Notch
in Concrete outside
of basic building
dimensions

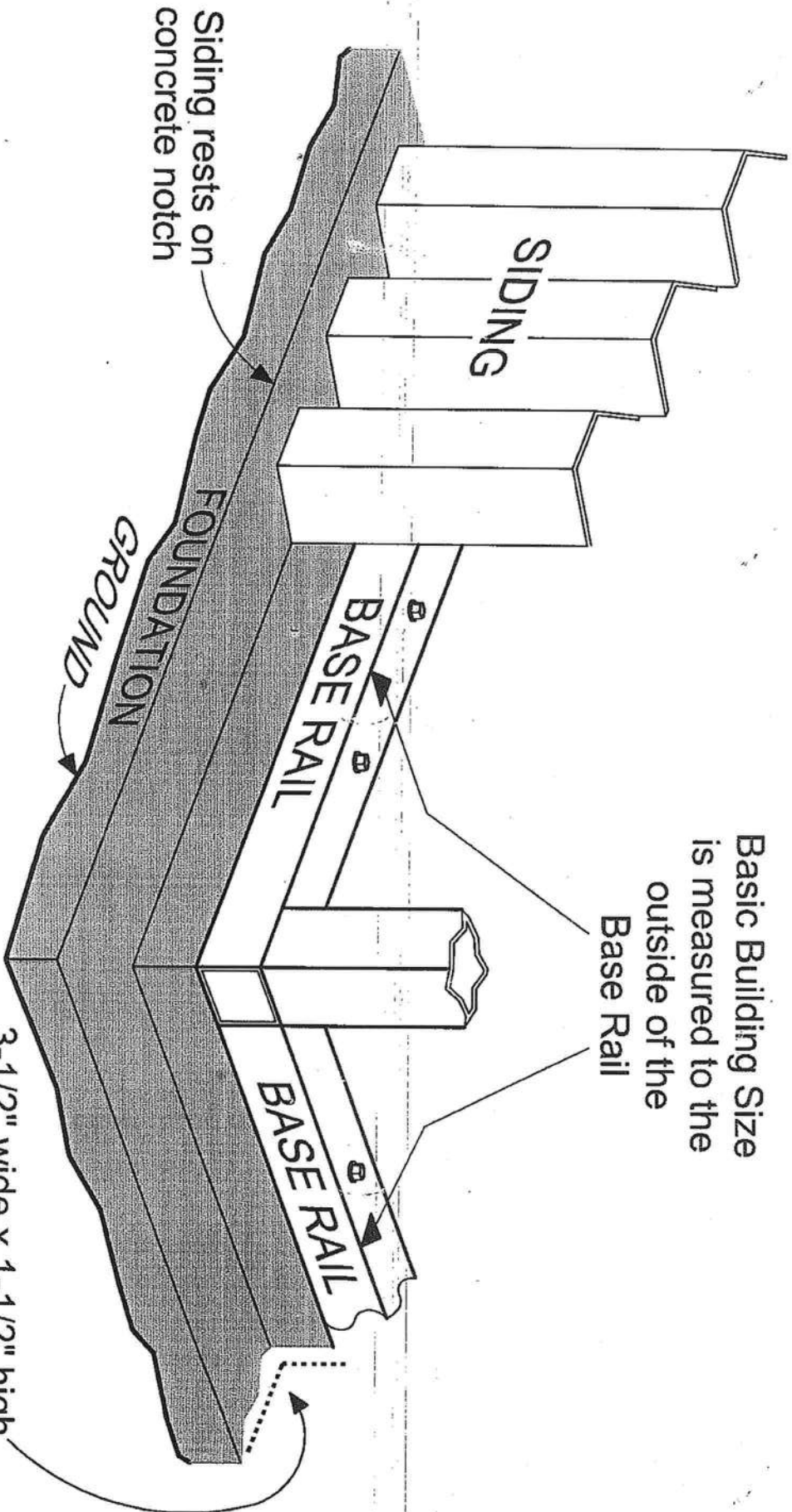


IMPORTANT - NOTES

Record Measurements
in these spaces provided

All basic building diagonal dimensions
are to the outside corner of the
frame Base Rail and DO NOT
INCLUDE the 3-1/2" x 1-1/2"
notch in the concrete footing

See Sheet 3 of 3
for Detail of Building
corner configuration



TYPICAL BUILDING

CORNER DETAIL