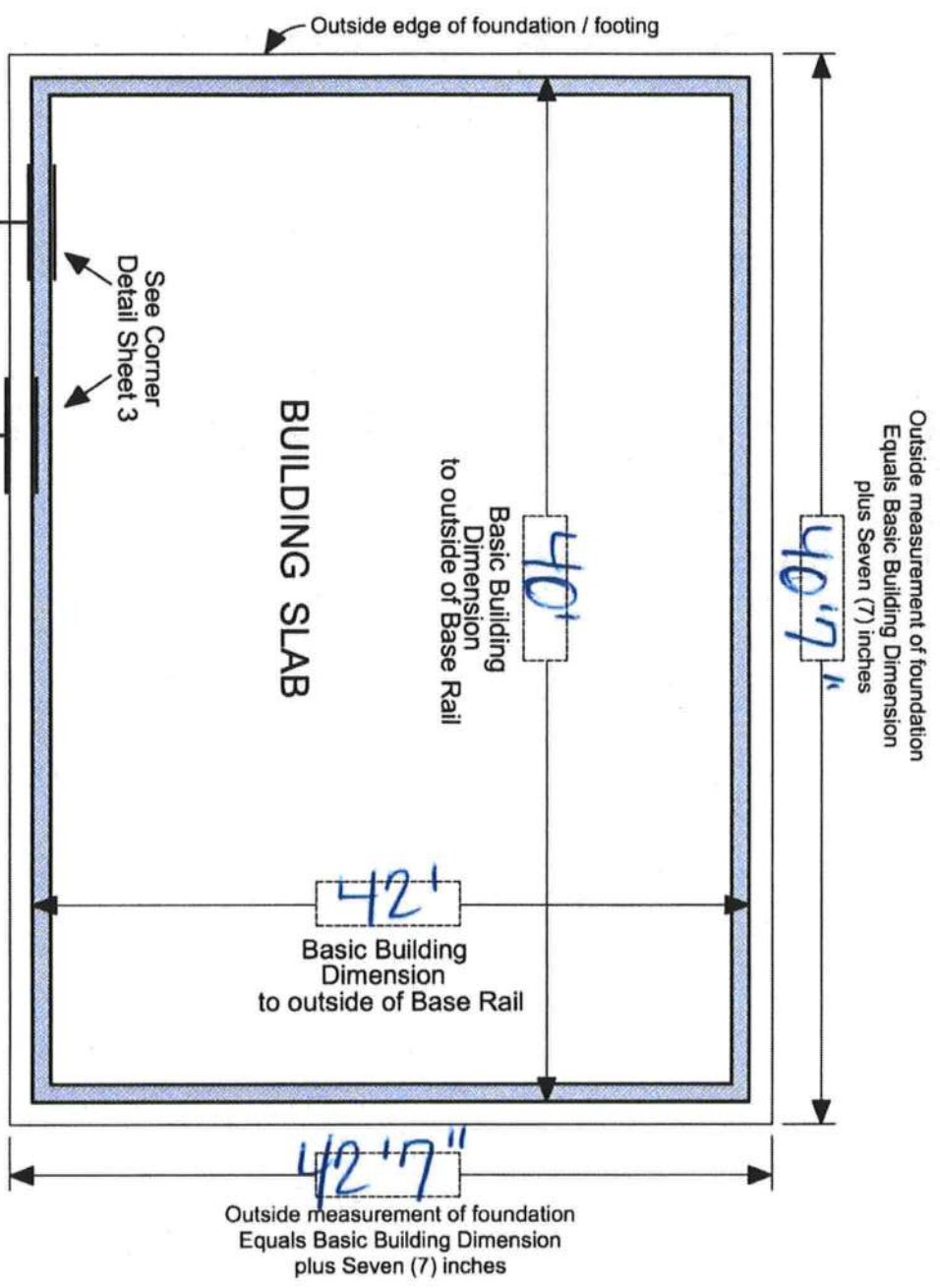


TYPICAL BUILDING

CORNER DETAIL



TYPICAL BUILDING FOUNDATION MEASUREMENTS

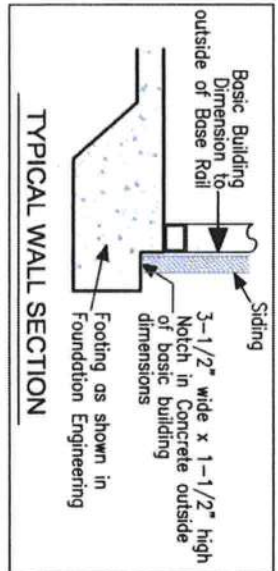


IMPORTANT - NOTES

Record Measurements
in these spaces provided

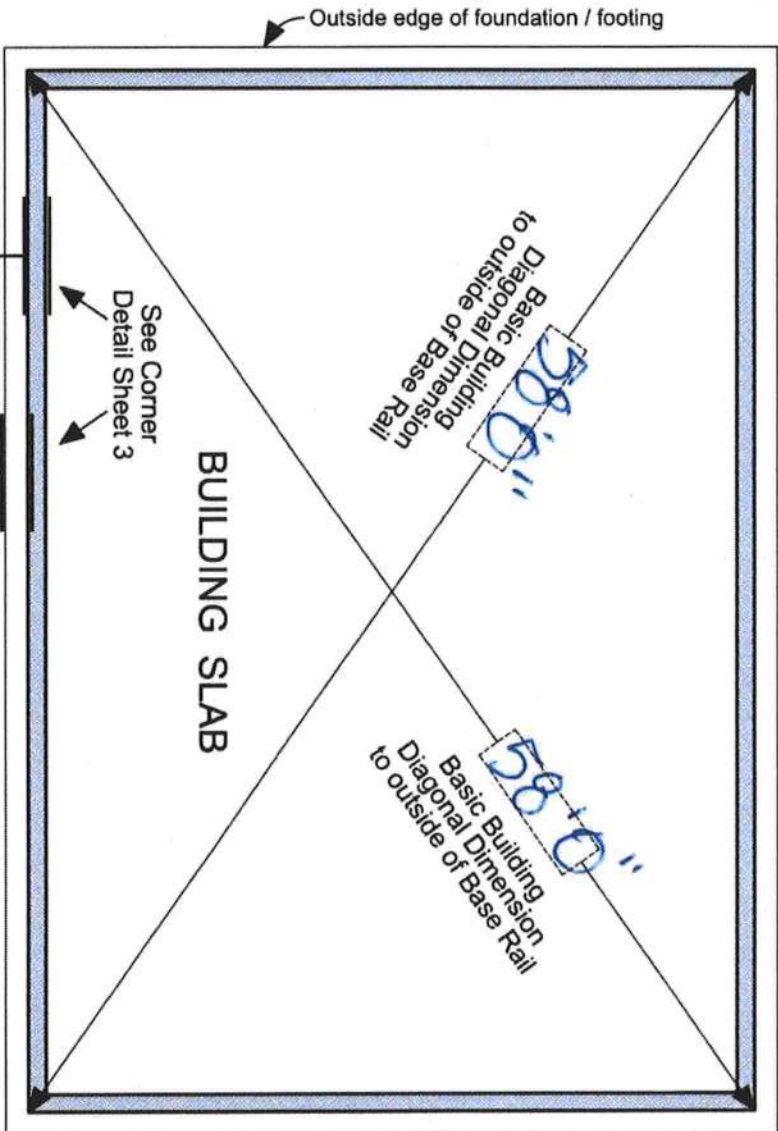
All basic building dimensions
are to the outside of the
frame Base Rail and DO NOT
INCLUDE the 3-1/2" x 1-1/2"
notch in the concrete footing

See Sheet 3 of 3
for Detail of Building
corner configuration

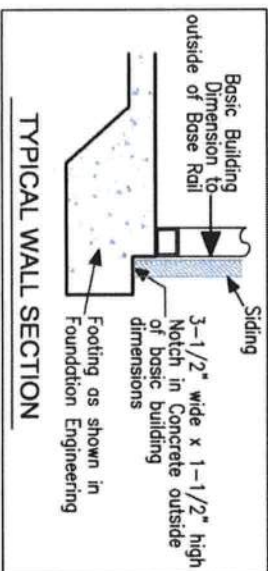




TYPICAL BUILDING FOUNDATION MEASUREMENTS DIAGONALS



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



STRUCTURAL DESIGN

PARTIALLY ENCLOSED (UTILITY) BUILDING **EXPOSURE B**

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

18 December 2017

Revision 1

M&A Project No. 16154S/17300S

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: 2017.12.19
13:16:08 -05'00'



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PROJECT MGR: WSH

CLIENT: TBS

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

DATE: 12-18-17

SCALE: NTS

**JOB NO:
16154S/17300S**

SHT. 1

DWG. NO: SK-2

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**TUBULAR BUILDING SYSTEMS
30'-0"x20'-0" PARTIALLY ENCLOSED (UTILITY)
BUILDING EXP. B**

DATE: 12-18-17

SCALE: NTS

DWG. NO: SK-2

**JOB NO:
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INSTALLATION NOTES AND SPECIFICATIONS

1. DESIGN IS FOR A MAXIMUM 30'-0" WIDE x 20'-0" EAVE HEIGHT PARTIALLY ENCLOSED STRUCTURES.
2. DESIGN WAS DONE IN ACCORDANCE WITH THE 2017 FLORIDA BUILDING CODE (FBC) 6TH EDITION, 2012 INTERNATIONAL BUILDING CODE (IBC), AND 2015 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. LOW HAZARD RISK CATEGORY I (WIND)
7. WIND EXPOSURE CATEGORY B
8. 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)
9. AVERAGE FASTENER SPACING ON-CENTERS ALONG RAFTERS OR PURLINS, AND POSTS, INTERIOR = 9" OR END = 6", (MAX)
10. 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.
11. GROUND ANCHORS SHALL BE INSTALLED THROUGH BASE RAIL WITHIN 6' OF EACH RAFTER COLUMN ALONG SIDES
12. 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 USE IN UNSUITABLE SOILS AS NOTED.
13. OPTIONAL BASE RAIL ANCHORAGE MAY BE USED FOR LOW AND MUST BE USED FOR HIGH WIND SPEEDS
14. WIND FORCES GOVERN OVER SEISMIC FORCES. SEISMIC PARAMETERS ANALYZED ARE:
 SOIL SITE CLASS = D
 RISK CATEGORY I/II/III
 R = 3.25 I_e = 1.0
 S_{DS} = 1.522 V = C_sW
 S_{D1} = 0.839



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**TUBULAR BUILDING SYSTEMS
30'-0"x20'-0" PARTIALLY ENCLOSED (UTILITY)
BUILDING EXP. B**

DATE: 12-18-17

SCALE: NTS

JOB NO:
16154S/17300S

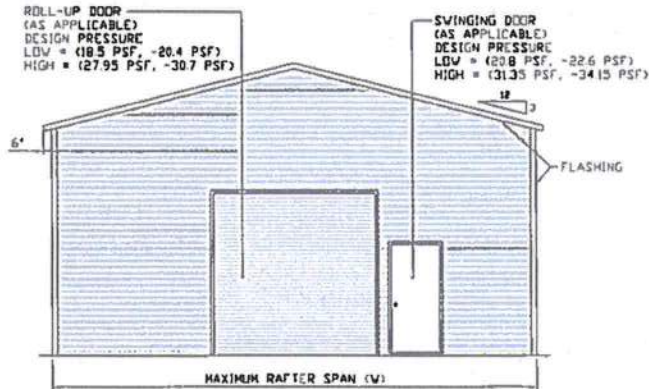
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DWG. NO: SK-2

REV: 1

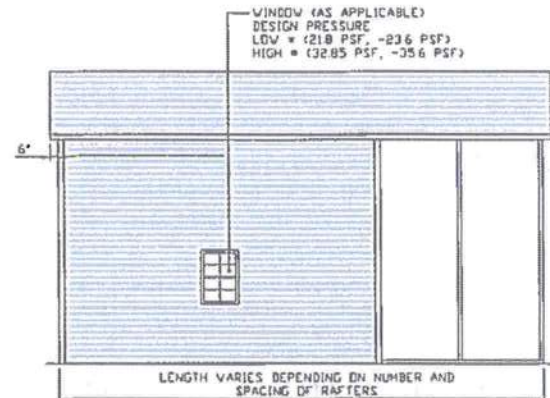
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BOX EAVE FRAME RAFTER ENCLOSED BUILDING



TYPICAL END ELEVATION-HORIZONTAL ROOF

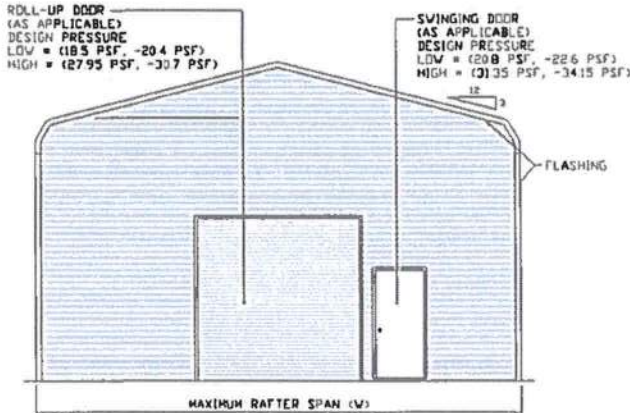
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TYPICAL SIDE ELEVATION-HORIZONTAL ROOF

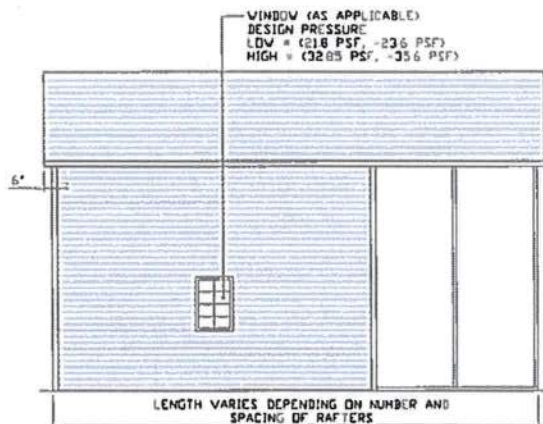
SCALE: NTS

BOW FRAME RAFTER ENCLOSED BUILDING



TYPICAL END ELEVATION

SCALE: NTS



TYPICAL SIDE ELEVATION

SCALE: NTS



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**TUBULAR BUILDING SYSTEMS
30'-0"x20'-0" PARTIALLY ENCLOSED (UTILITY)
BUILDING EXP. B**

DATE: 12-18-17

SHT. 4

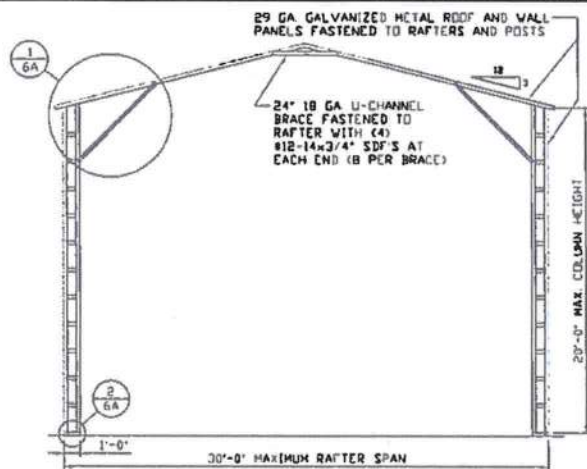
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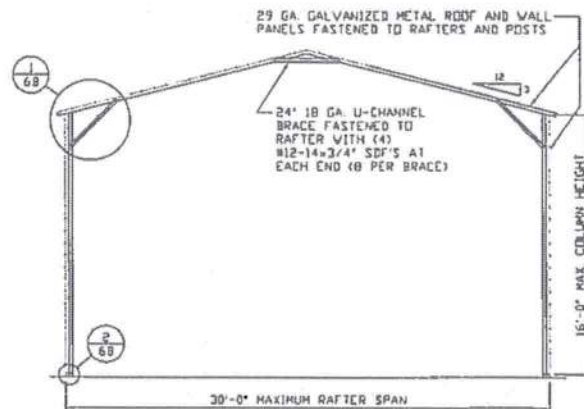
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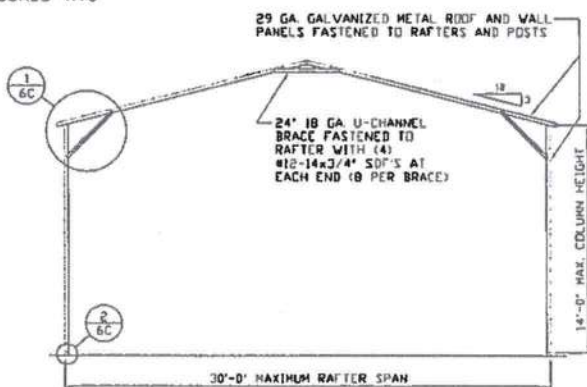
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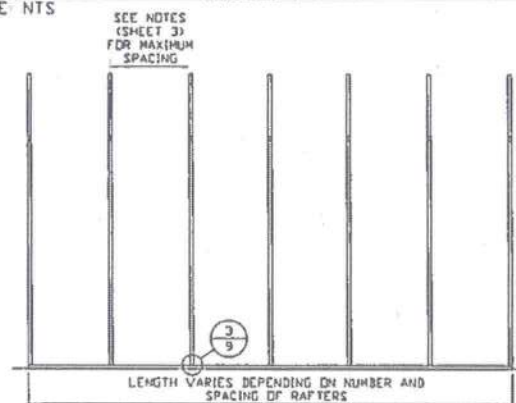
TYPICAL RAFTER/COLUMN END FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN END FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN END FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION
SCALE: NTS



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**TUBULAR BUILDING SYSTEMS
30'-0"x20'-0" PARTIALLY ENCLOSED (UTILITY)
BUILDING EXP. B**

DATE: 12-18-17

SHT. 5

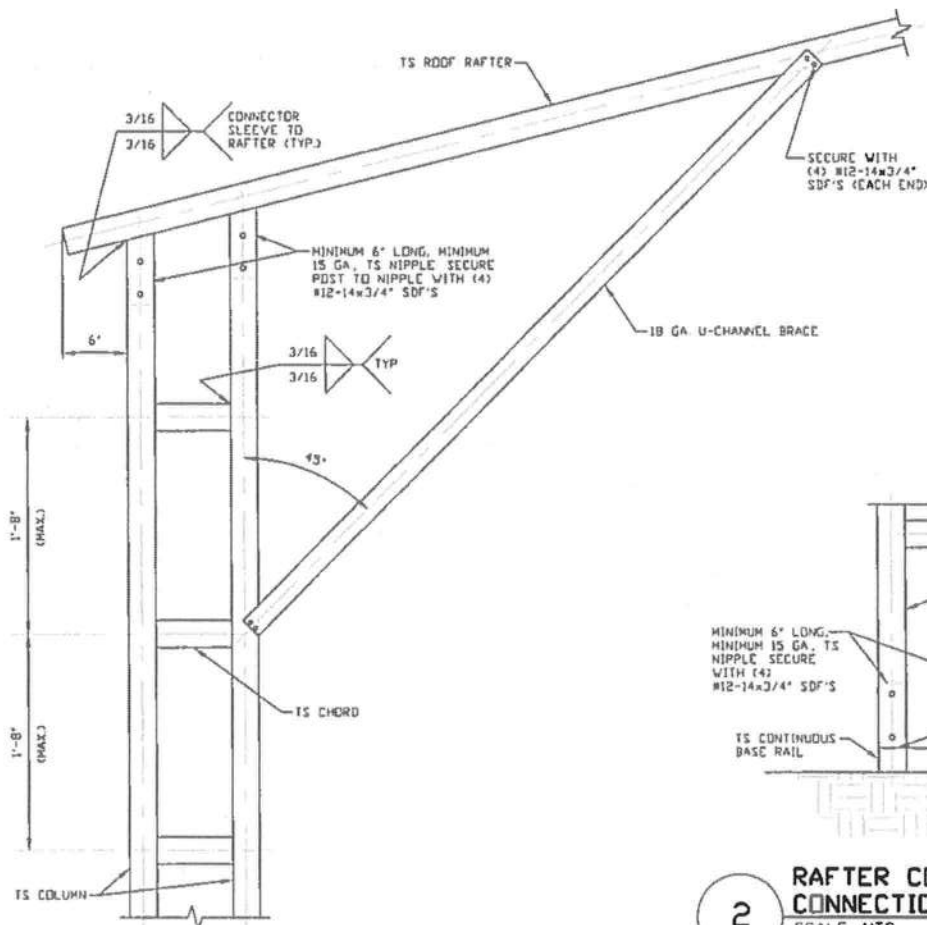
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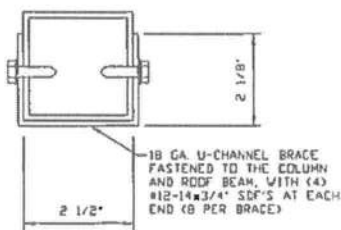
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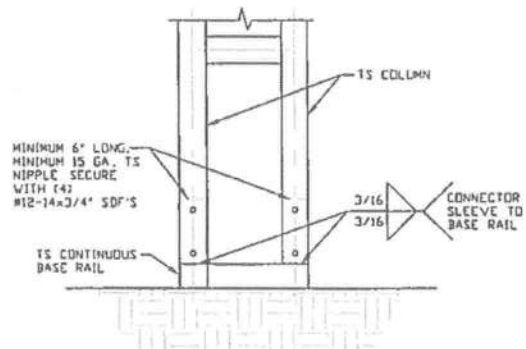


1 BOX EAVE RAFTER COLUMN
CONNECTION DETAIL
FOR HEIGHTS 16'-0" < TO ≤ 20'-0"
SCALE: NTS



BRACE SECTION
SCALE: NTS

2 RAFTER COLUMN/BASE RAIL
CONNECTION DETAIL
SCALE: NTS



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30'-0"x20'-0" PARTIALLY ENCLOSED (UTILITY)
BUILDING EXP. B**

DATE: 12-18-17

SHT. 6A

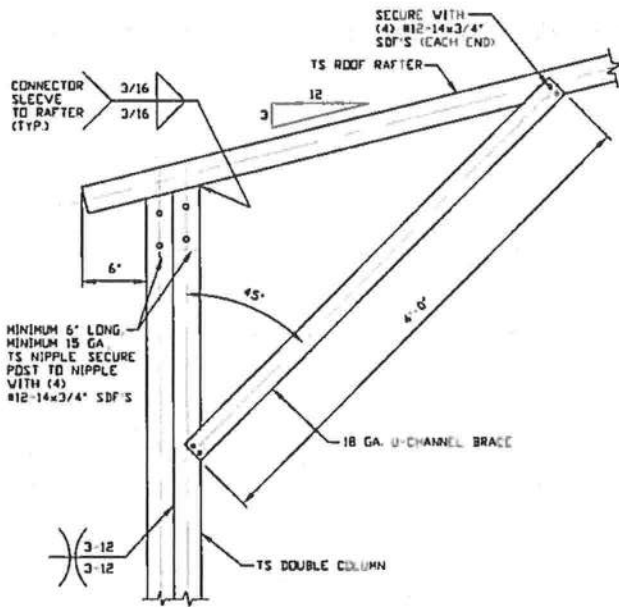
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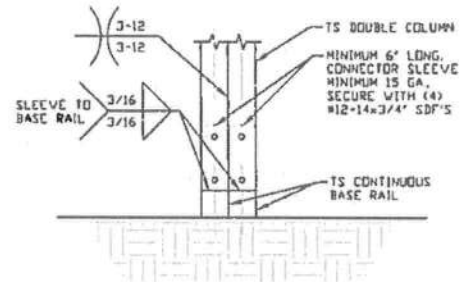
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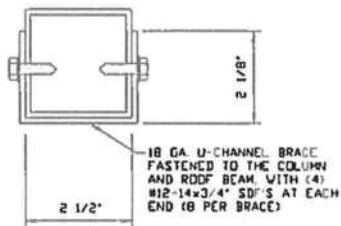
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1 BOX EAVE RAFTER COLUMN
CONNECTION DETAIL
FOR HEIGHTS 14'-0" < TO ≤ 16'-0"
SCALE: NTS



2 RAFTER COLUMN/BASE RAIL
CONNECTION DETAIL
SCALE: NTS



BRACE SECTION
SCALE: NTS



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30'-0"x20'-0" PARTIALLY ENCLOSED (UTILITY)
BUILDING EXP. B**

DATE: 12-18-17

SHT. 6B

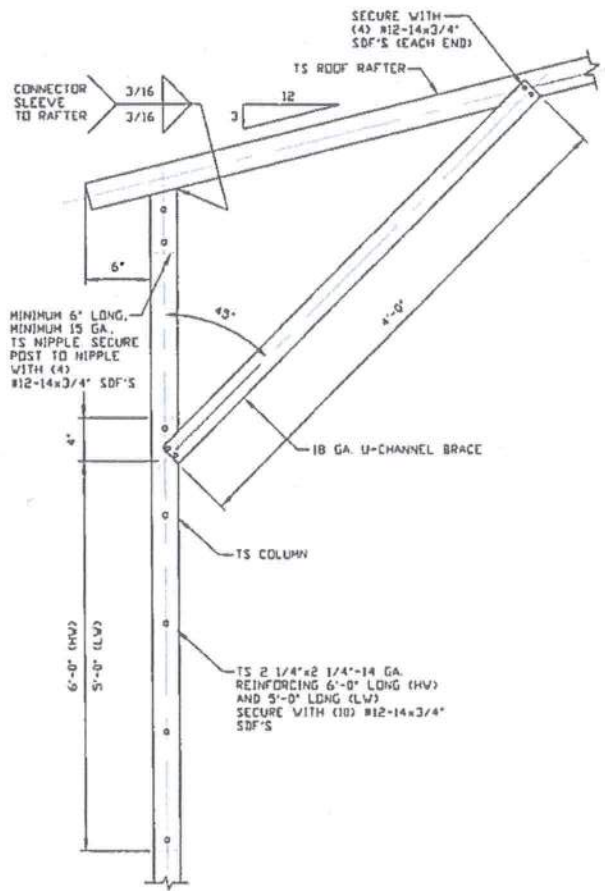
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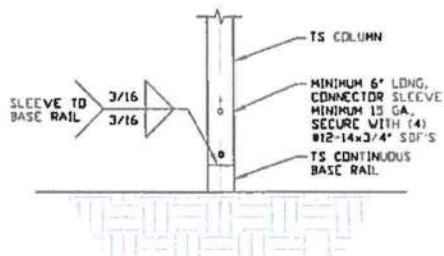
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161545/17300S

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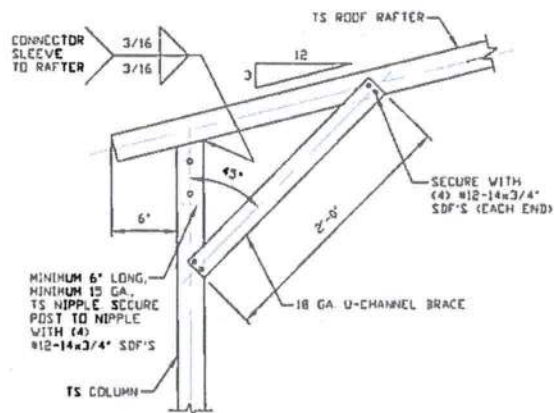
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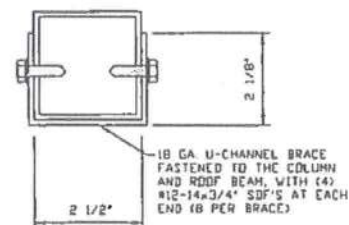
1A BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 10'-0" < TO ≤ 14'-0" SCALE: NTS



2 RAFTER COLUMN/BASE RAIL CONNECTION DETAIL SCALE: NTS



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



BRACE SECTION SCALE: NTS



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PROJECT MGR: WSH

CLIENT: TBS

**TUBULAR BUILDING SYSTEMS
30'-0"x20'-0" PARTIALLY ENCLOSED (UTILITY)
BUILDING EXP. B**

DATE: 12-18-17

SHT. 6C

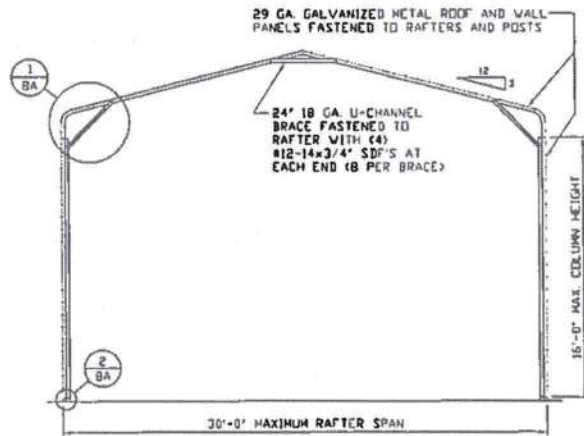
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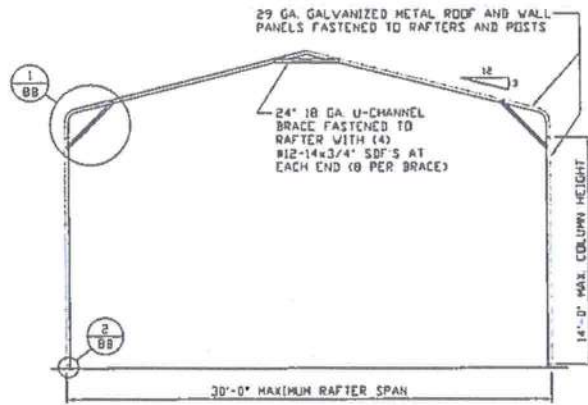
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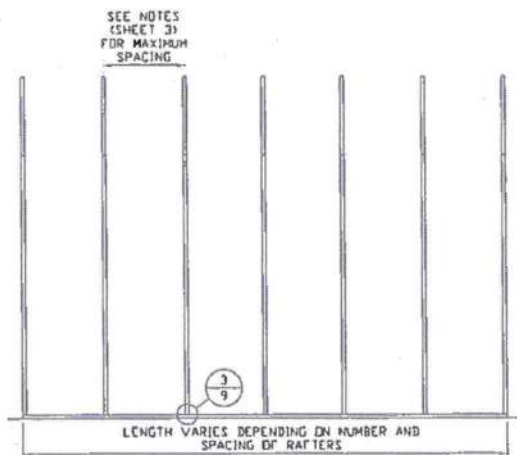
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TYPICAL RAFTER/COLUMN END FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN END FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION
SCALE: NTS



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PROJECT MGR: WSH

CLIENT: TBS

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30'-0"x20'-0" PARTIALLY ENCLOSED (UTILITY)
BUILDING EXP. B**

DATE: 12-18-17

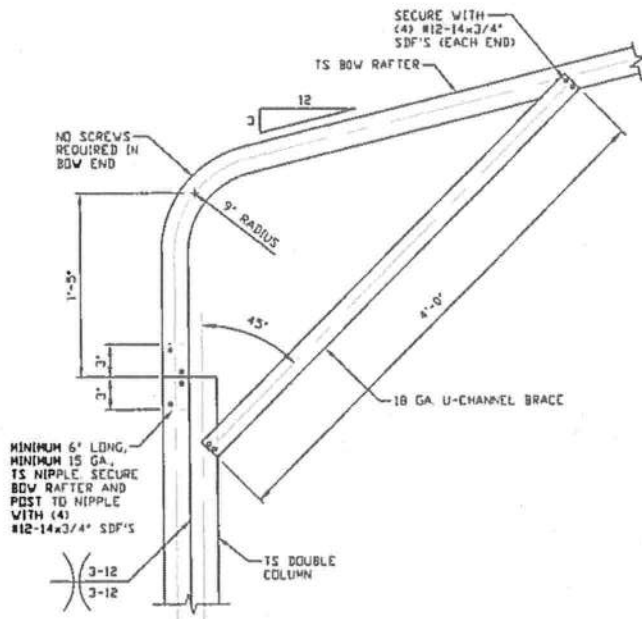
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SCALE: NTS

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JOB NO:
161545/173005

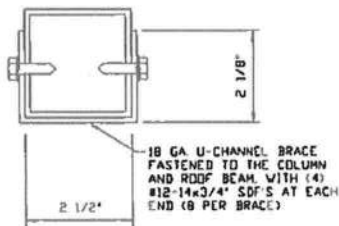
REV: 1



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

1

SCALE: NTS



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

2

SCALE: NTS

BRACE SECTION

SCALE: NTS



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**TUBULAR BUILDING SYSTEMS
30'-0"x20'-0" PARTIALLY ENCLOSED (UTILITY)
BUILDING EXP. B**

DATE: 12-18-17

SHT. BA

SCALE: NTS

DWG. NO: SK-2

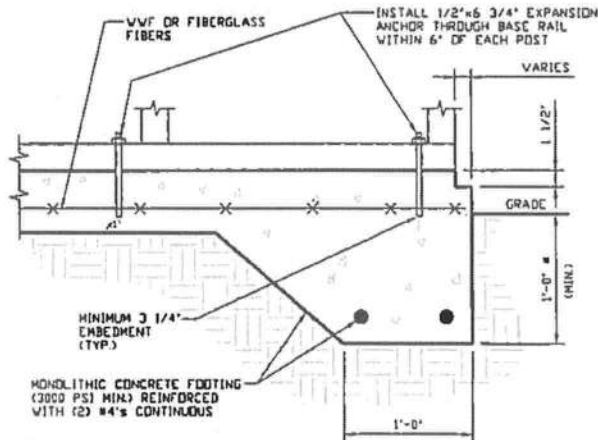
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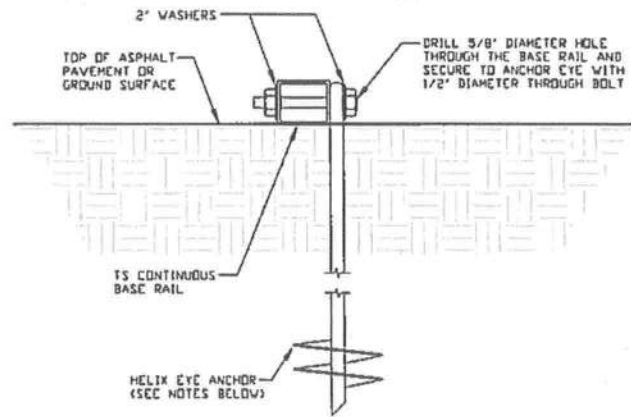
BASE RAIL ANCHORAGE OPTIONS FOR LOW AND HIGH WIND SPEED



3A

CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE

SCALE: NTS
(MINIMUM ANCHOR EDGE DISTANCE IS 4")
* COORDINATE WITH LOCAL CODES/ORD.



3B

GROUND BASE HELIX ANCHORAGE

SCALE: NTS (CAN BE USED FOR ASPHALT)

GENERAL NOTES

CONCRETE:

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

COVER OVER REINFORCING STEEL:

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

REINFORCING STEEL:

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

REINFORCEMENT MAY BE BENT IN THE SHOP OR THE FIELD PROVIDED:

- 1 REINFORCEMENT IS BENT COLD.
- 2 THE DIAMETER OF THE BEND, MEASURED ON THE INSIDE OF THE BAR, IS NOT LESS THAN SIX-BAR DIAMETERS.
- 3 REINFORCEMENT PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE FIELD BENT.

HELIX ANCHOR NOTES:

- 1 FOR VERY DENSE AND/OR CEMENTED SANDS, COARSE GRAVEL AND COBBLES, CALICHE, PRELOADED SILTS AND CLAYS USE MINIMUM (2) 4" HELICES WITH MINIMUM 30 INCH EMBEDMENT.
- 2 FOR CORAL USE MINIMUM (2) 4" HELICES WITH MINIMUM 30 INCH EMBEDMENT.
- 3 FOR MEDIUM DENSE COARSE SANDS, SANDY GRAVELS, VERY STIFF SILTS, AND CLAYS USE MINIMUM (2) 4" HELICES WITH MINIMUM 30 INCH EMBEDMENT.
- 4 FOR LOOSE TO MEDIUM DENSE SANDS, FIRM TO STIFF CLAYS AND SILTS ALLUVIAL FILL USE MINIMUM (2) 6" HELICES WITH MINIMUM 50 INCH EMBEDMENT.
- 5 FOR VERY LOSE TO MEDIUM DENSE SANDS, FIRM TO STIFFER CLAYS AND SILTS, ALLUVIAL FILL USE MINIMUM (2) 8" HELICES WITH MINIMUM 60 INCH EMBEDMENT.



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**MOORE AND ASSOCIATES
ENGINEERING AND CONSULTING, INC.**

DRAWN BY: LT

CHECKED BY: PDH

PROJECT MGR: VSM

CLIENT: TBS

**TUBULAR BUILDING SYSTEMS
30'-0"X20'-0" PARTIALLY ENCLOSED (UTILITY)
BUILDING EXP. B**

DATE: 12-18-17

SHT. 9A

SCALE: NTS

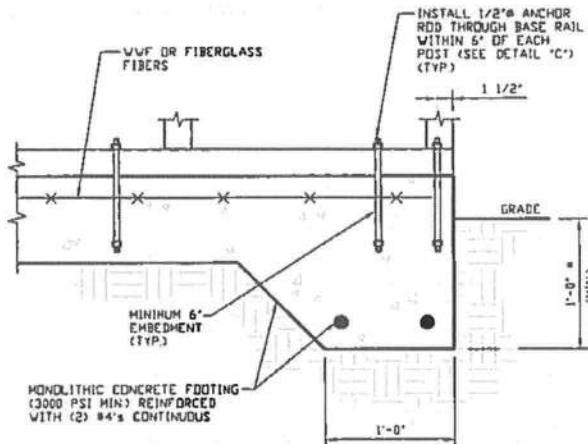
DWG. NO: SK-2

**JOB NO:
161545/173005**

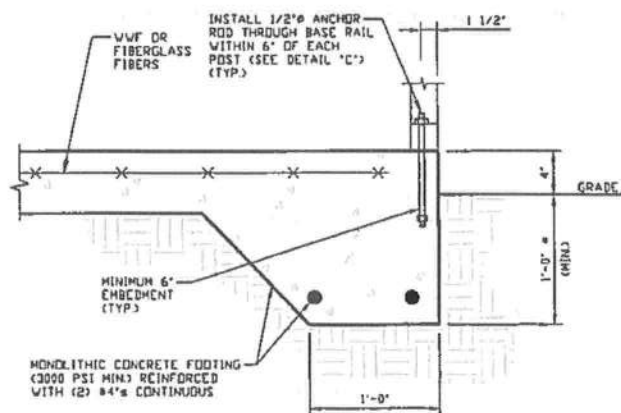
REV: 1

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OPTIONAL FOUNDATION ANCHORAGE FOR LOW & HIGH WIND SPEED



3A CONCRETE MONOLITHIC SLAB
BASE RAIL ANCHORAGE
SCALE: NTS
(MINIMUM ANCHOR EDGE DISTANCE IS 1 1/2")
■ COORDINATE WITH LOCAL CODES/ORD.



3B CONCRETE MONOLITHIC SLAB
BASE RAIL ANCHORAGE
SCALE: NTS
(MINIMUM ANCHOR EDGE DISTANCE IS 1 1/2")
■ COORDINATE WITH LOCAL CODES/ORD.

GENERAL NOTES

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

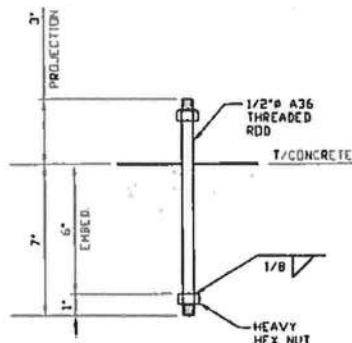
3 INCHES IN FOUNDATIONS WHERE THE CONCRETE IS CAST AGAINST AND PERMANENTLY IN CONTACT WITH THE EARTH OR EXPOSED TO THE EARTH OR WEATHER, AND 1 1/2 INCHES ELSEWHERE

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.



3C ANCHOR ROD THROUGH BASE
RAIL DETAIL
SCALE: NTS



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CHECKED BY: PDH

PROJECT MGR: VSM

CLIENT: TBS

TUBULAR BUILDING SYSTEMS
30'-0"x20'-0" PARTIALLY ENCLOSED (UTILITY)
BUILDING EXP. B

DATE: 12-18-17

SHT. 9B

SCALE: NTS

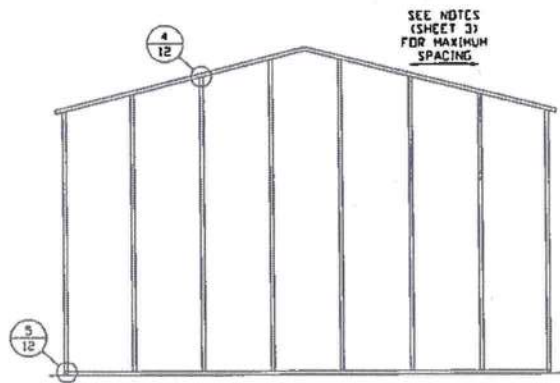
DWG. NO: SK-2

JOB NO:
161545/173005

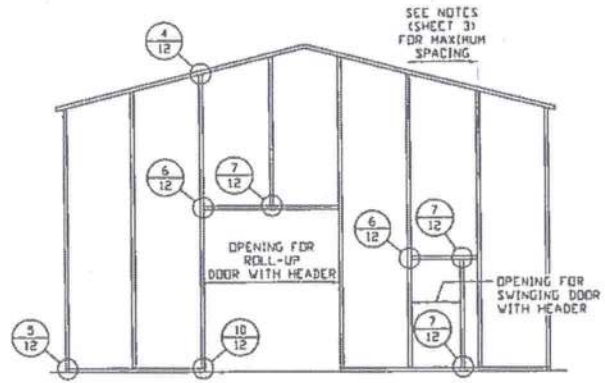
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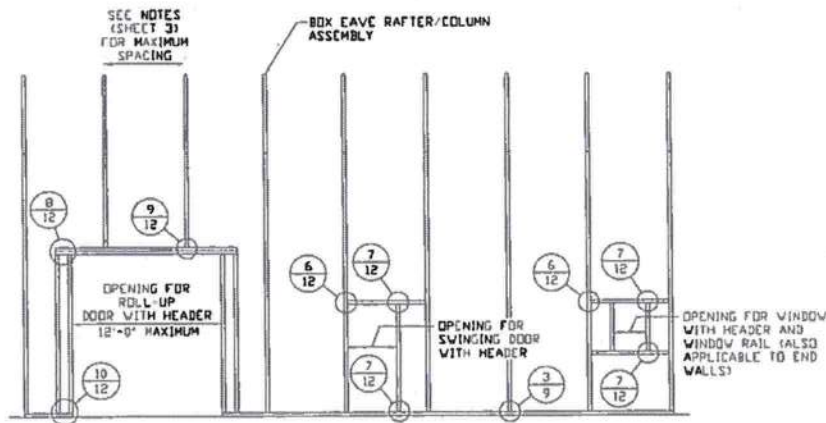
BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS



**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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PROJECT MGR: VSM

CLIENT: TBS

**TUBULAR BUILDING SYSTEMS
30'-0"x20'-0" PARTIALLY ENCLOSED (UTILITY)
BUILDING EXP. B**

DATE: 12-18-17

SHT. 10

SCALE: NTS

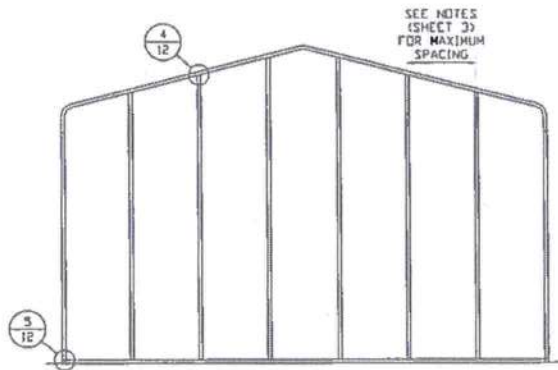
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**JOB NO:
161543/173005**

REV: 1

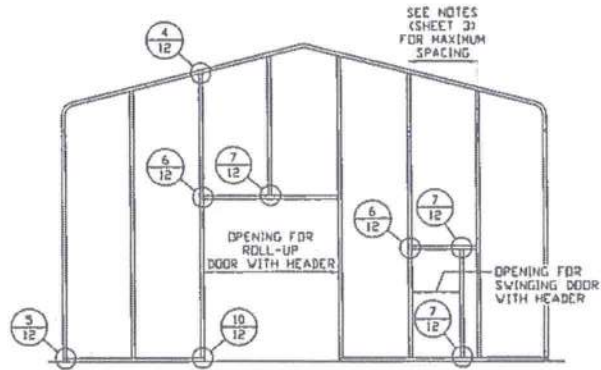
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BOW RAFTER END WALL AND SIDE WALL OPENINGS



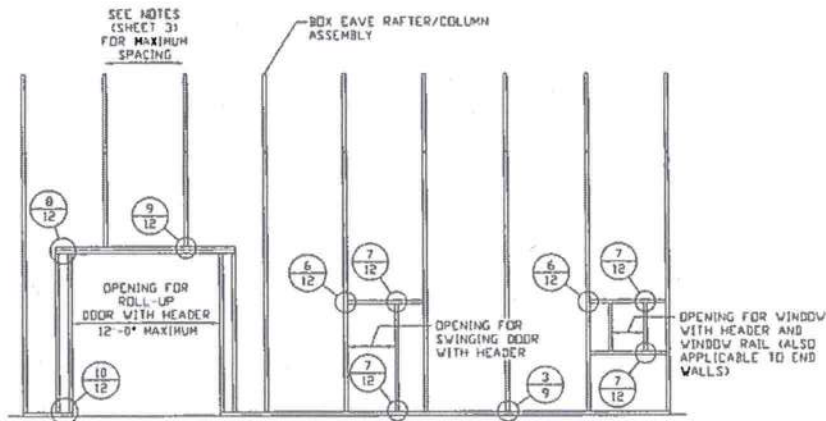
**TYPICAL BOX EAVE RAFTER
END WALL FRAMING SECTION**

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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PROJECT MGR: WSM

CLIENT: TBS

**TUBULAR BUILDING SYSTEMS
30'-0"x20'-0" PARTIALLY ENCLOSED (UTILITY)
BUILDING EXP. B**

DATE: 12-18-17

SHT. 11

SCALE: NTS

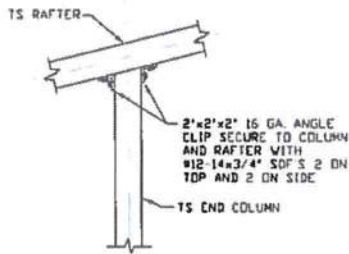
DWG. NO: SK-2

**JOB NO:
161545/173005**

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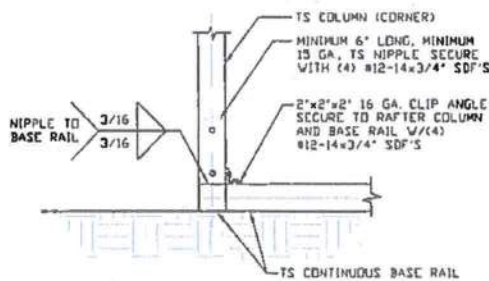
BOW AND BOX EAVE RAFTER WALL OPENING DETAILS



4

END COLUMN/RAFTER CONNECTION DETAIL

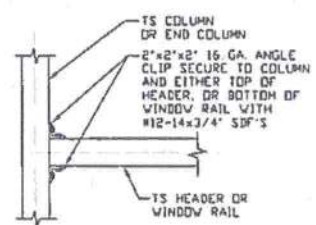
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5

END COLUMN/BASE RAIL CONNECTION DETAIL

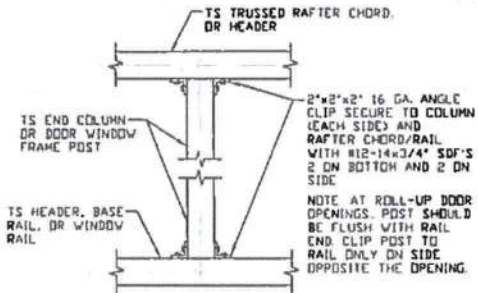
SCALE: NTS



6

HEADER OR WINDOW RAIL TO COLUMN CONNECTION DETAIL

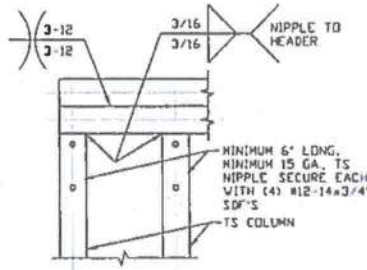
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7

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

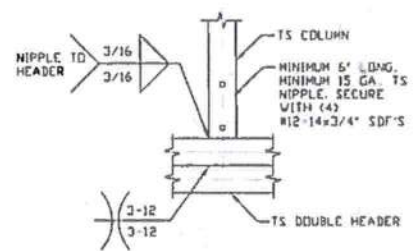
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8

DOUBLE HEADER/COLUMN CONNECTION DETAIL

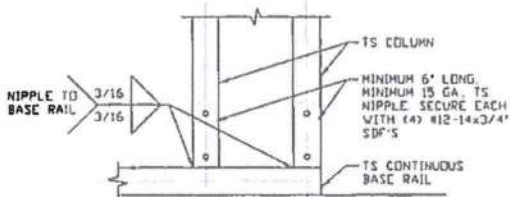
SCALE: NTS



9

COLUMN/DOUBLE HEADER CONNECTION DETAIL

SCALE: NTS



10

COLUMN/BASE RAIL CONNECTION DETAIL

SCALE: NTS



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PROJECT MGR: VSM

CLIENT: TBS

**TUBULAR BUILDING SYSTEMS
30'-0"x20'-0" PARTIALLY ENCLOSED (UTILITY)
BUILDING EXP. B**

DATE: 12-18-17

SHT. 12

SCALE: NTS

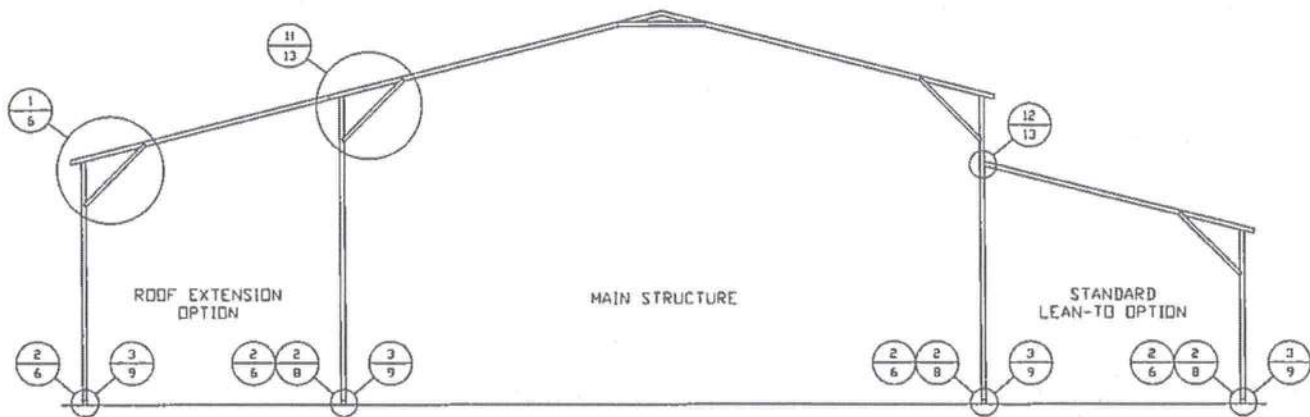
DWG. NO: SK-2

JOB NO:
161545/173005

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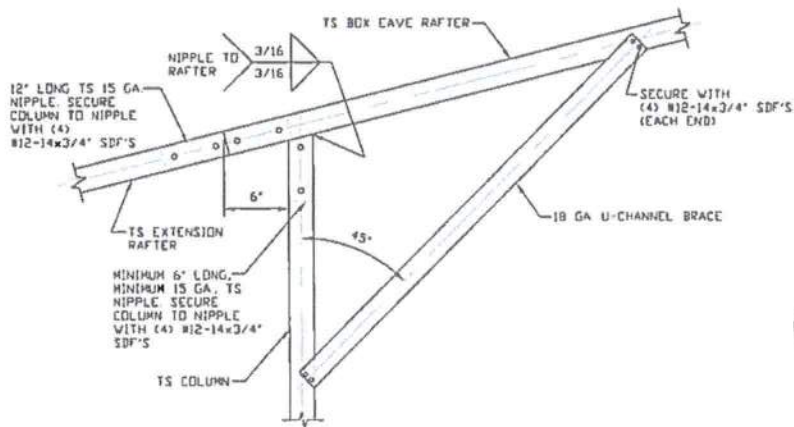
BOX EAVE RAFTER LEAN-TO OPTIONS



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

SCALE: NTS

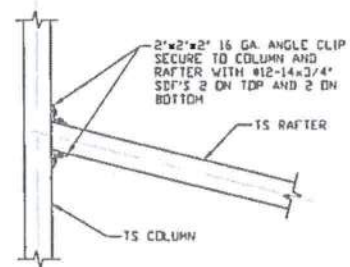
MAXIMUM WIDTH OF SINGLE MEMBER RAFTER LEAN-TO IS 16'-0".



11

SIDE EXTENSION RAFTER/COLUMN DETAIL

SCALE: NTS



12

LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL

SCALE: NTS



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**TUBULAR BUILDING SYSTEMS
30'-0"x20'-0" PARTIALLY ENCLOSED (UTILITY)
BUILDING EXP. B**

DATE: 12-18-17

SHT. 13

SCALE: NTS

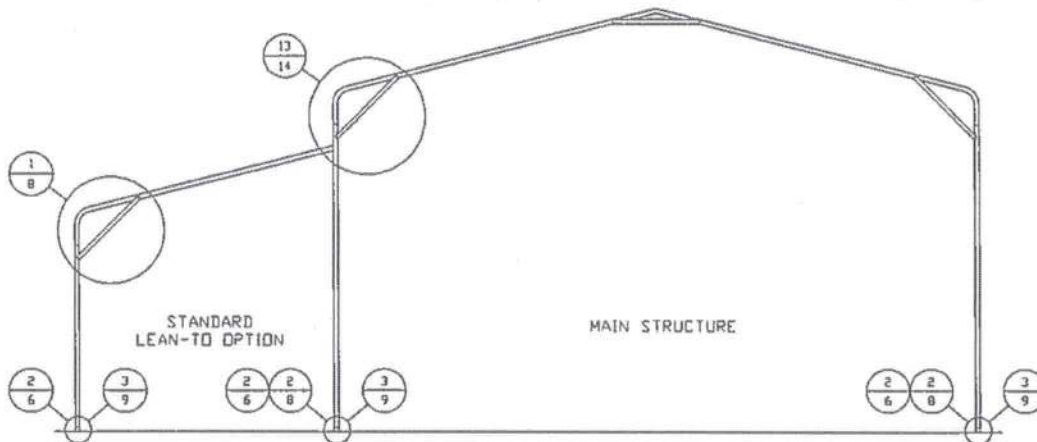
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JOB NO:
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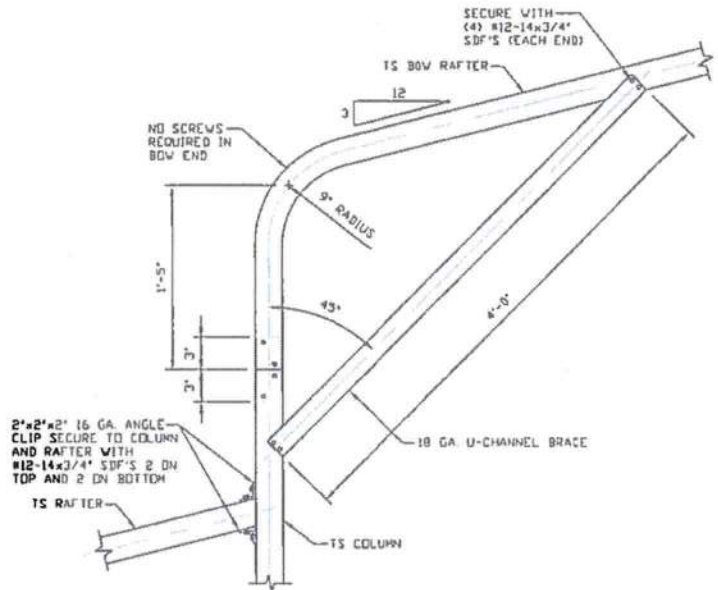
BOW RAFTER LEAN-TO OPTIONS



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

SCALE: NTS

MAXIMUM WIDTH OF SINGLE MEMBER RAFTER LEAN-TO IS 16'-0"



13

SIDE EXTENSION RAFTER/COLUMN DETAIL

SCALE: NTS



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**TUBULAR BUILDING SYSTEMS
30'-0"x20'-0" PARTIALLY ENCLOSED (UTILITY)
BUILDING EXP. B**

DATE: 12-18-17

SHT. 14

SCALE: NTS

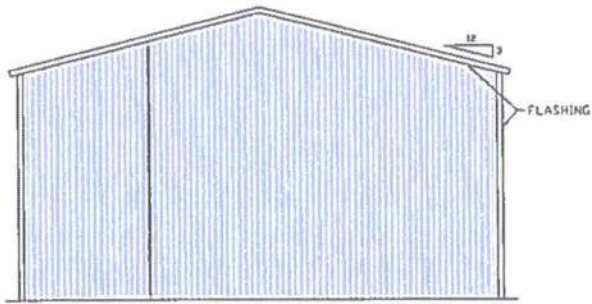
DWG. NO: SK-2

JOB NO:
161545/17300S

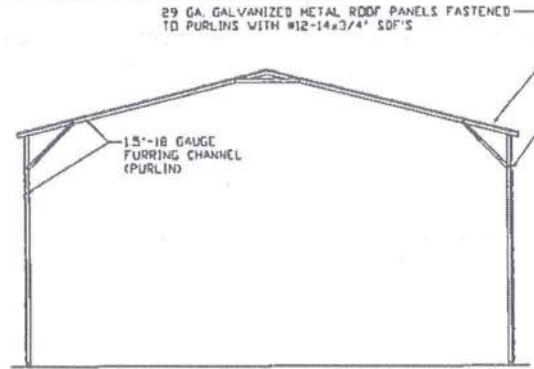
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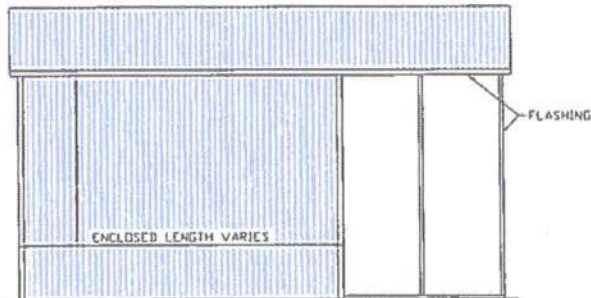
BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



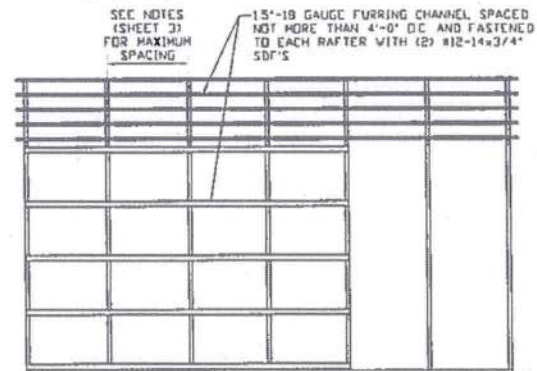
**TYPICAL END ELEVATION
VERTICAL ROOF/SIDING OPTION**
SCALE: NTS



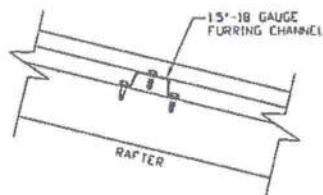
**TYPICAL SECTION VERTICAL
ROOF/SIDING OPTION**
SCALE: NTS



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



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



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



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CLIENT: TBS

TUBULAR BUILDING SYSTEMS
30'-0"x20'-0" PARTIALLY ENCLOSED (UTILITY)
BUILDING EXP. B

DATE: 12-18-17

SHT. 15

SCALE: NTS

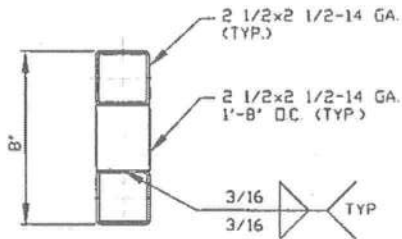
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JOB NO:
161545/17300S

REV: 1

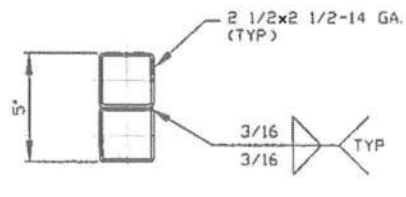
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OPTIONAL DOOR HEADER



**HEADER DETAIL FOR DOOR
OPENINGS 12'-0" < LENGTH ≤ 15'-0"**

SCALE: NTS



**HEADER DETAIL FOR DOOR
OPENINGS LENGTH ≤ 12'-0"**

SCALE: NTS



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CLIENT: TDS

**TUBULAR BUILDING SYSTEMS
30'-0"x20'-0" PARTIALLY ENCLOSED (UTILITY)
BUILDING EXP. B**

DATE: 12-18-17

SCALE: NTS

DWG. NO: SK-2

**JOB NO:
161545/17300S**

REV: 1

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