TUBULAR BUILDING SYSTEMS

STRUCTURAL DESIGN

ENCLOSED BUILDING
EXPOSURE B

MAXIMUM 50'-0" WIDE X 20'-0" EAVE HEIGHT- BOX EAVE FRAME

18 December 2017
Revision 0
M&A Project No. 17250S

Prepared for:

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

Columbia County Building Department
Plans Reviewed for Code Compliance
State of Florida

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: 2017.12.21 08:25:20 -05'00'

MOORE AND ASSOCIATES
ENGINEERING AND CONSULTING

WAYNE S. MOORE
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No 57170
STATE OF FLORIDA
PROFESSIONAL ENGINEER

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DRAWN BY: JRS
CHECKED BY: PDH
PROJECT MGR: WSM
CLIENT: TBS

TUBULAR BUILDING SYSTEMS
PE COVER SHEET
50'-0"x20'-0" ENCLOSED BUILDING EXPOSURE B

DATE: 12-18-17 | SCALE: NTS | JOB NO: 172505
SHT. 1 | DWG. NO: SK-3 | REV: 0

DRAWING INDEX

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CHECKED BY: PDH				
PROJECT MGR: WSM	DATE: 12-18-17	SCALE: NTS	JOB NO: 172505	
CLIENT: TBS	SHT. 2	DWG. NO: SK-3	REV: 0	

INSTALLATION NOTES AND SPECIFICATIONS

1. DESIGN IS FOR A MAXIMUM 50'-0" WIDE x 20'-0" EAVE HEIGHT STRUCTURES
2. DESIGN WAS DONE IN ACCORDANCE WITH THE 2014 FLORIDA BUILDING CODE (FBC) 5TH EDITION, 2017 FBC 6TH EDITION, 2012 INTERNATIONAL BUILDING CODE (IBC), AND 2015 IBC.
3. DESIGN LOADS ARE AS FOLLOWS:
   A) DEAD LOAD = 1.5 PSF
   B) LIVE LOAD = 12 PSF
   C) GROUND SNOW LOAD = 35 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. 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.
9. AVERAGE FASTENER SPACING ON-CENTERS ALONG RAFTERS OR PURLINS, AND POSTS, INTERIOR = 9" AND 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 CONSISTING OF #4 REBAR W/ WELDED NUT x 30" LONG MAY BE USED FOR LOW WIND SPEEDS ONLY.
12. GROUND ANCHORS (SOIL NAILS) CONSIST OF #4 REBAR W/ WELDED NUT x 30" LONG IN SUITABLE SOIL CONDITIONS. OPTIONAL ANCHORAGE MAY BE USED IN SUITABLE SOILS AND MUST BE USED IN UNSUITABLE SOILS AS NOTED. SOIL NAILS ARE NOT ALLOWED FOR HIGH WIND APPLICATION.
13. OPTIONAL BASE RAIL ANCHORAGE MAY BE USED FOR LOW AND 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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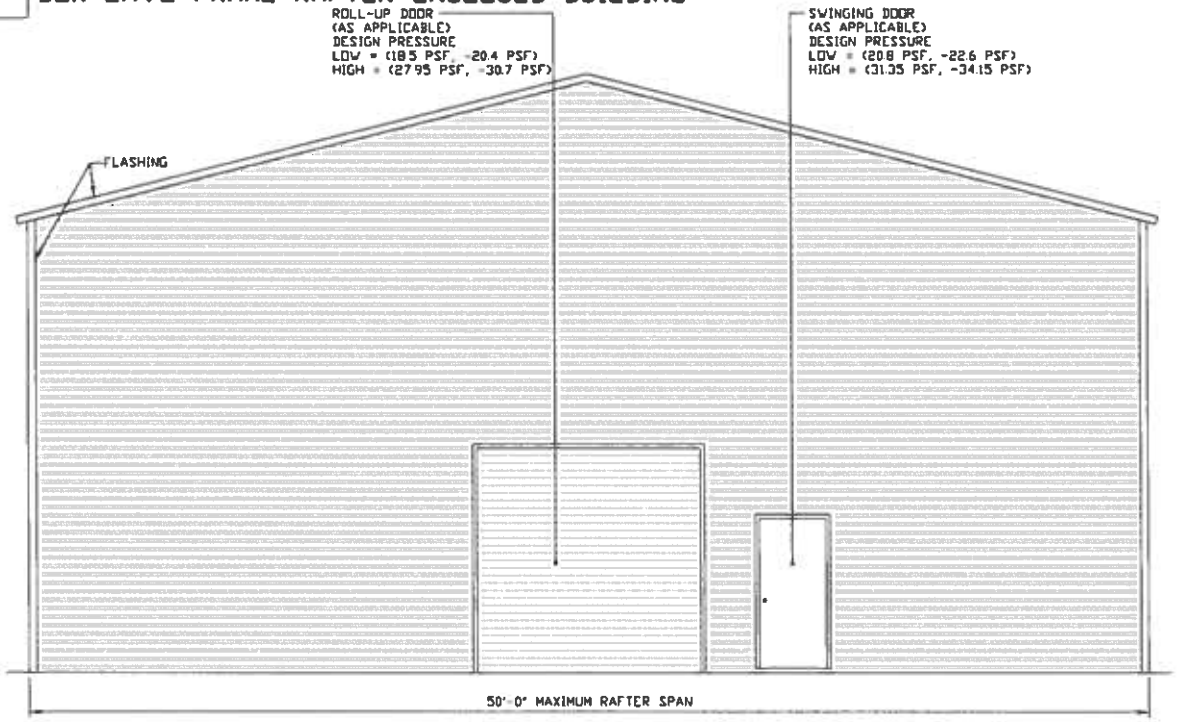
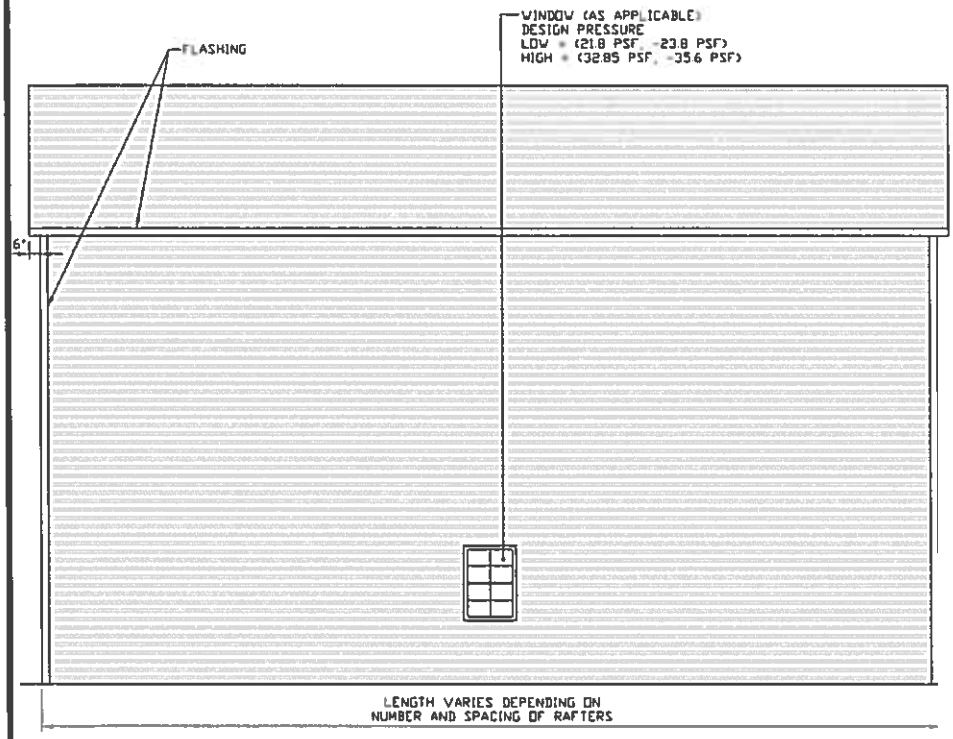
	CLIENT: TBS	SHT. 3	DWG. NO: SK-3	REV: 0

BOX EAVE FRAME RAFTER ENCLOSED BUILDING



TYPICAL SIDE ELEVATION-HORIZONTAL ROOF

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



TYPICAL END ELEVATION-HORIZONTAL ROOF

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

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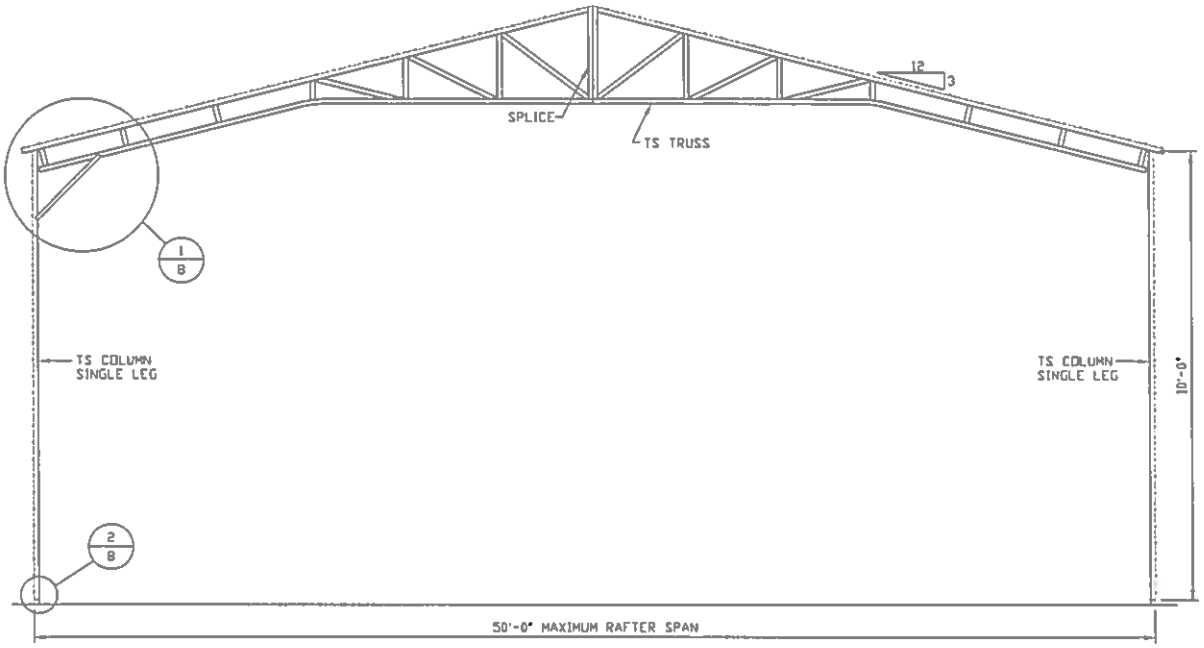
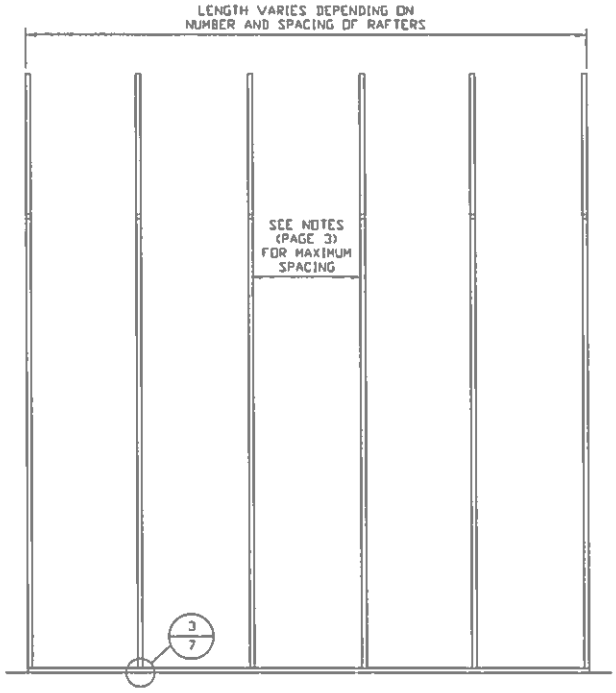


TYPICAL RAFTER/POST FRAME SECTION

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



TYPICAL RAFTER/POST SIDE FRAMING SECTION

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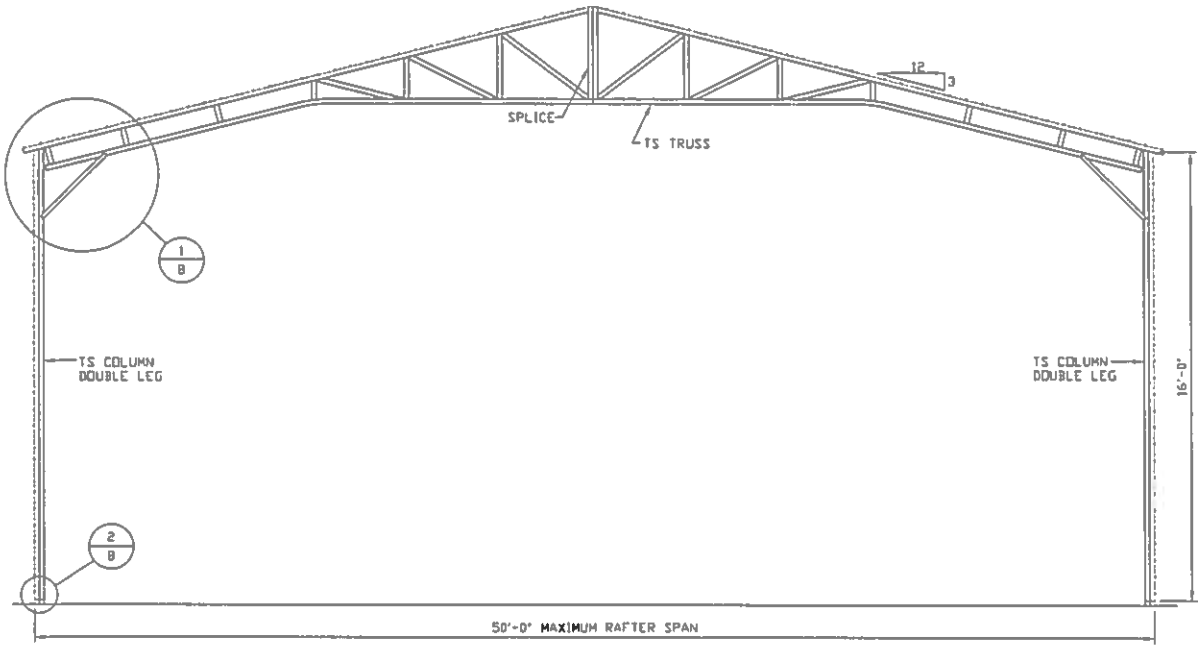

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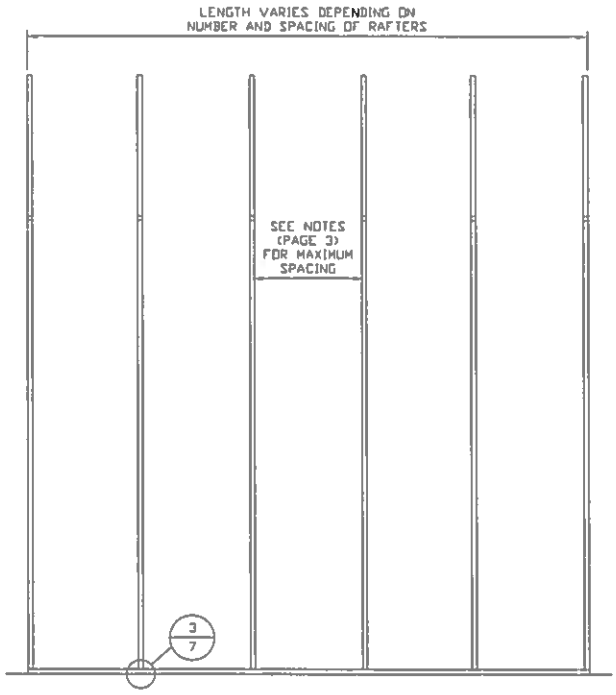

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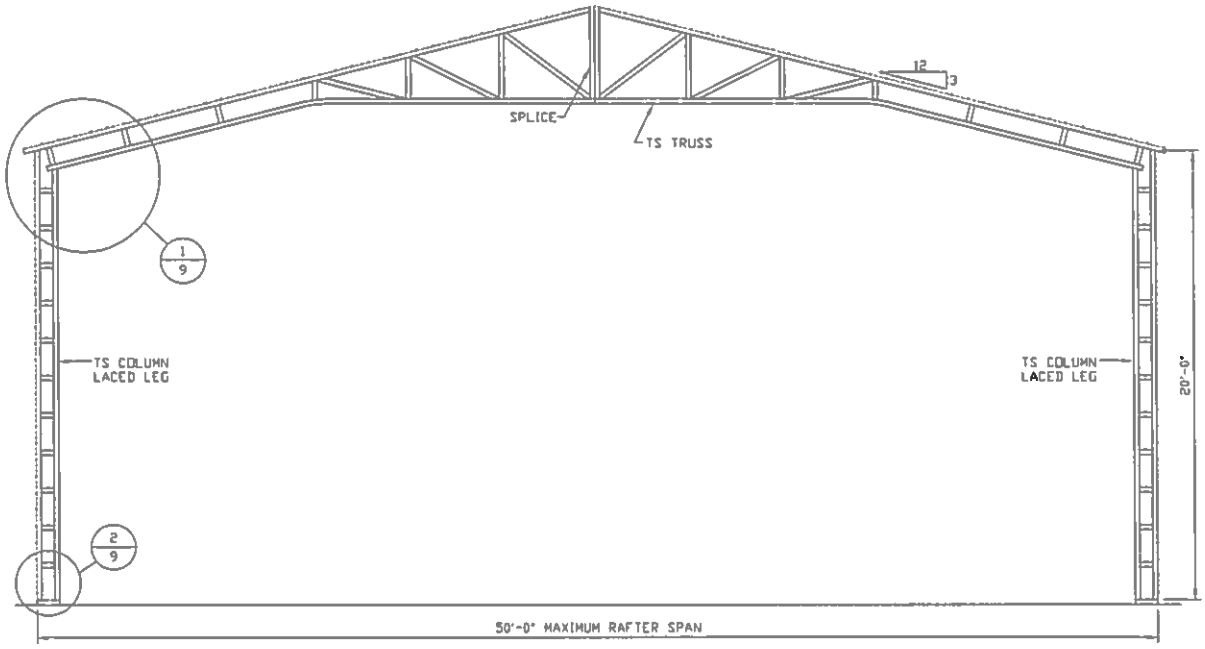
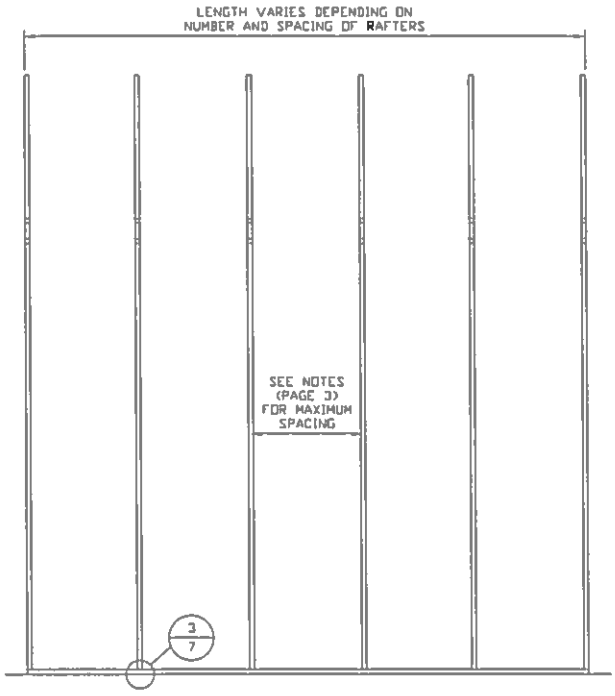


TYPICAL RAFTER/POST FRAME SECTION

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



TYPICAL RAFTER/POST SIDE FRAMING SECTION

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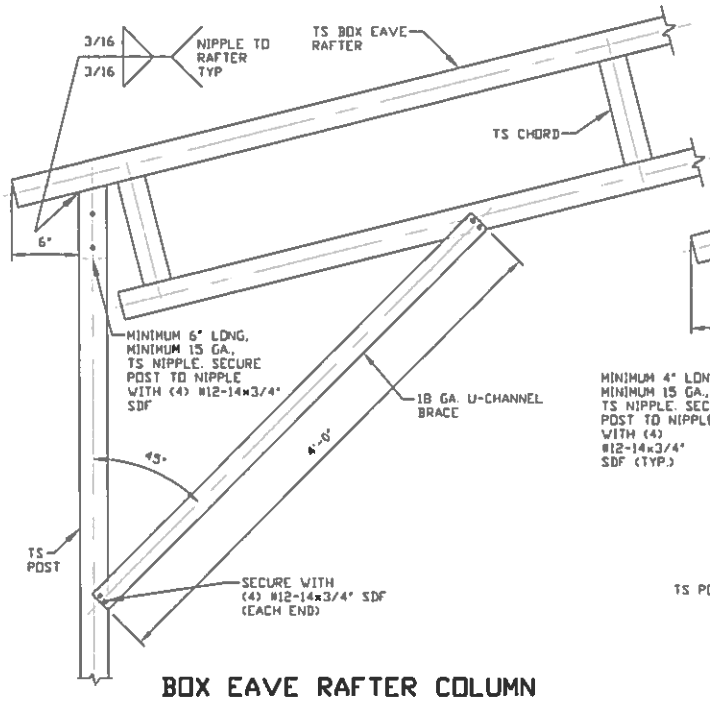
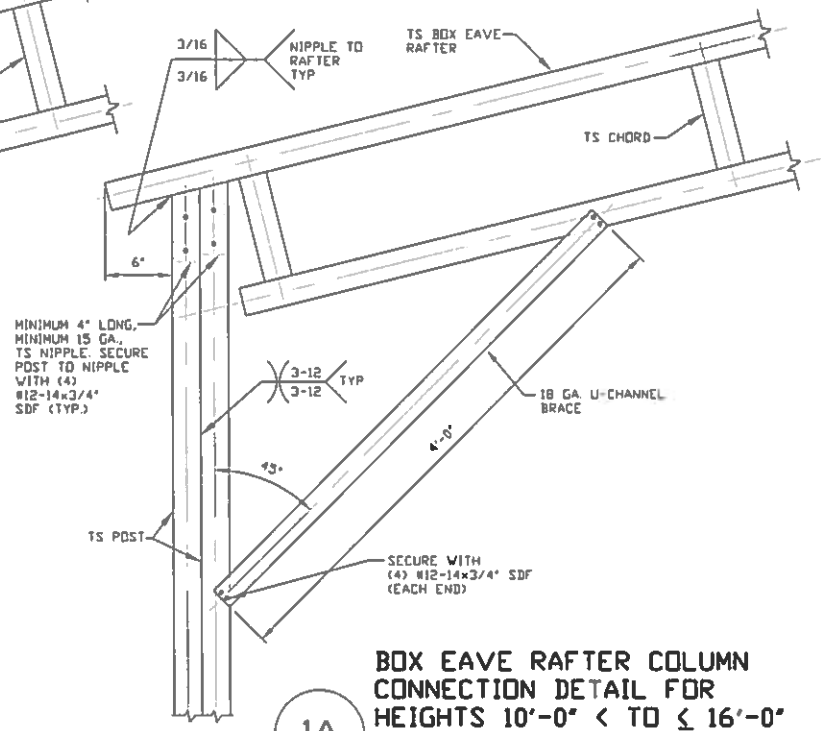


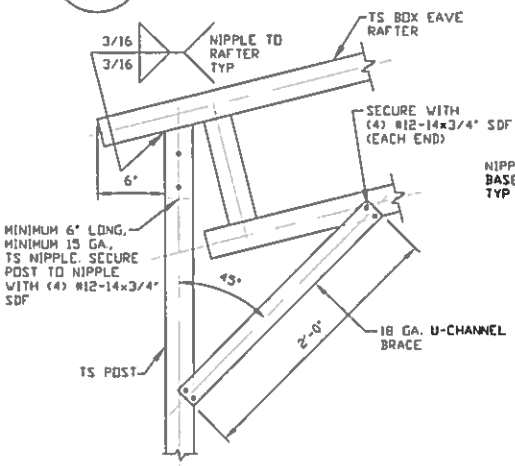
1 BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 8'-0" < TO ≤ 10'-0"

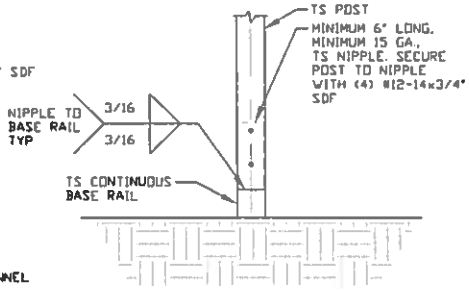
SCALE: NTS



1A BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 10'-0" < TO ≤ 16'-0"

SCALE: NTS



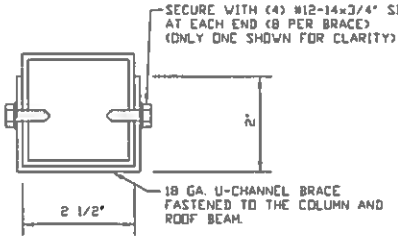


2 POST/BASE RAIL CONNECTION DETAIL

SCALE: NTS

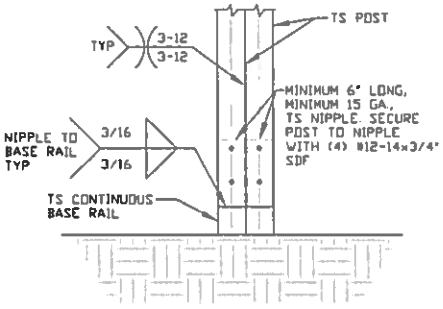
1B BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS ≤ 8'-0"

SCALE: NTS



BRACE SECTION

SCALE: NTS



2A POST/BASE RAIL CONNECTION DETAIL

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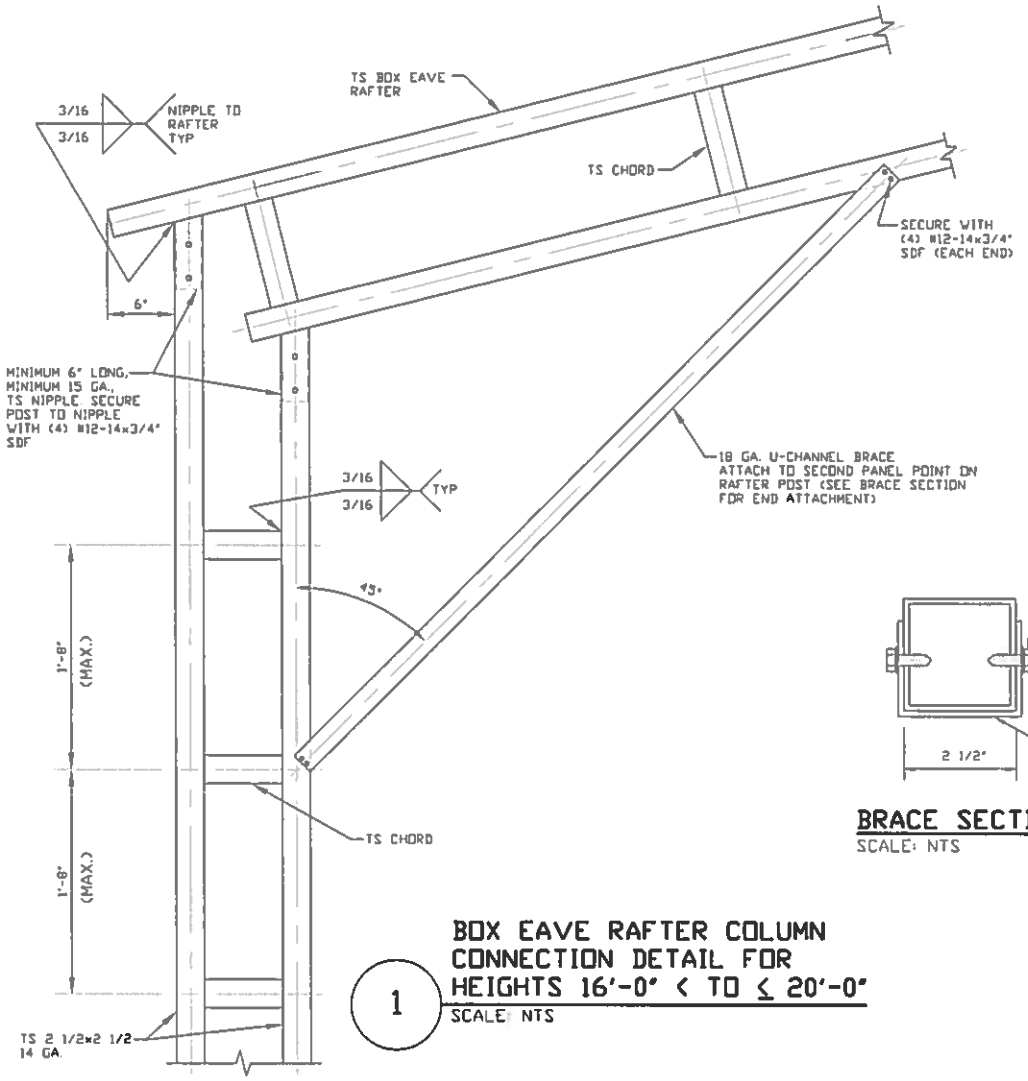
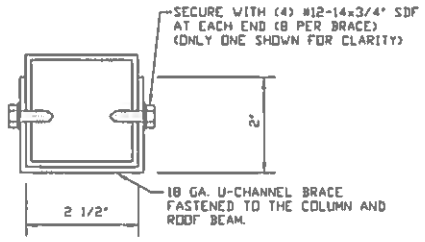


BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 16'-0" < TO ≤ 20'-0"

1

SCALE: NTS



BRACE SECTION

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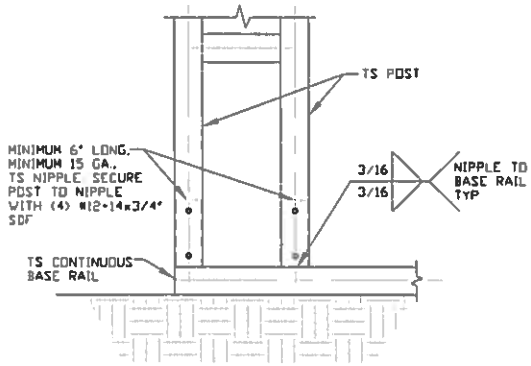

POST/BASE RAIL CONNECTION DETAIL

2

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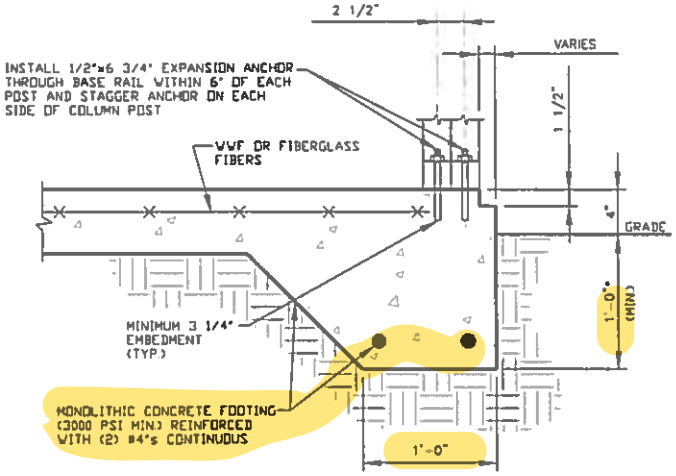
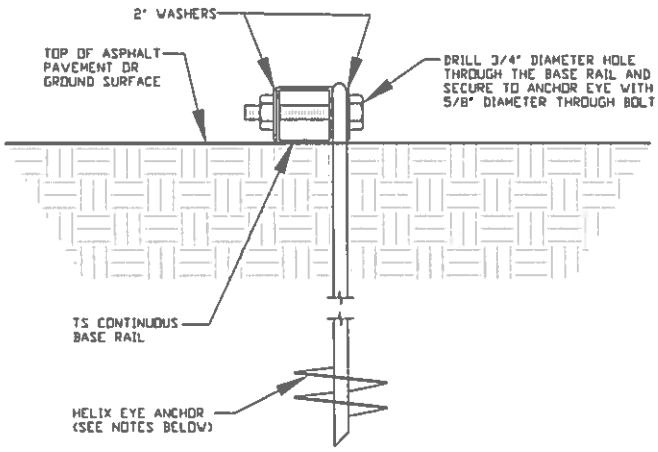
BASE RAIL ANCHORAGE OPTIONS FOR LOW AND HIGH WIND SPEED



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 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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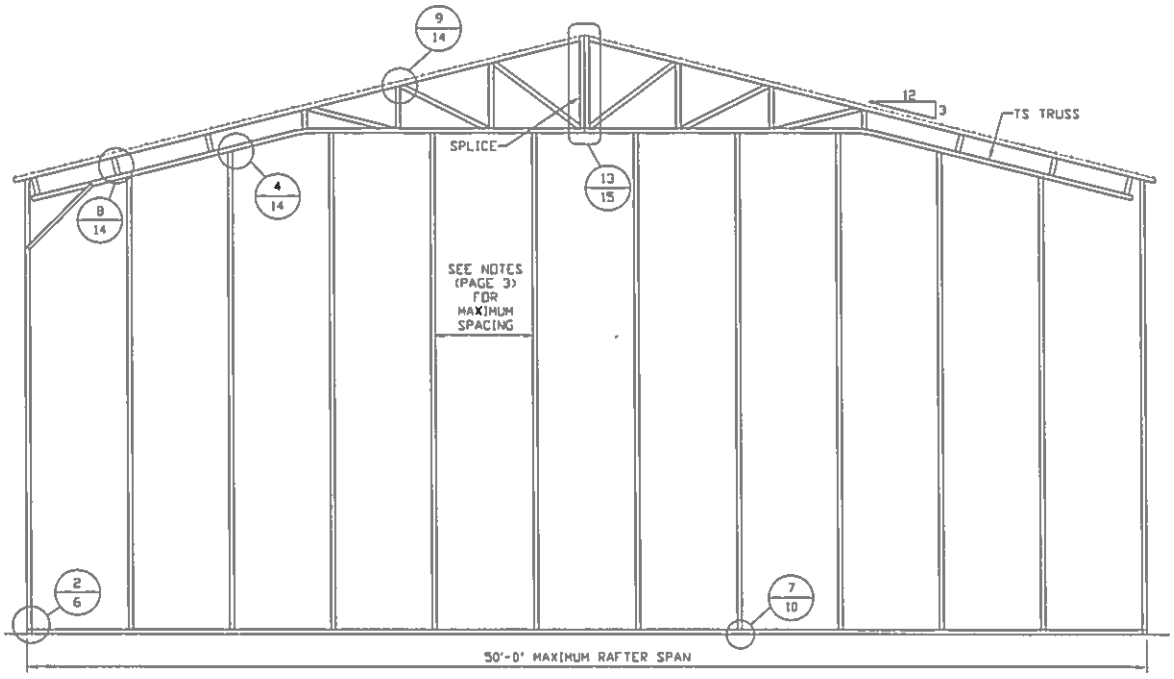
BOX EAVE RAFTER END WALL AND WALL OPENINGS



TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION

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

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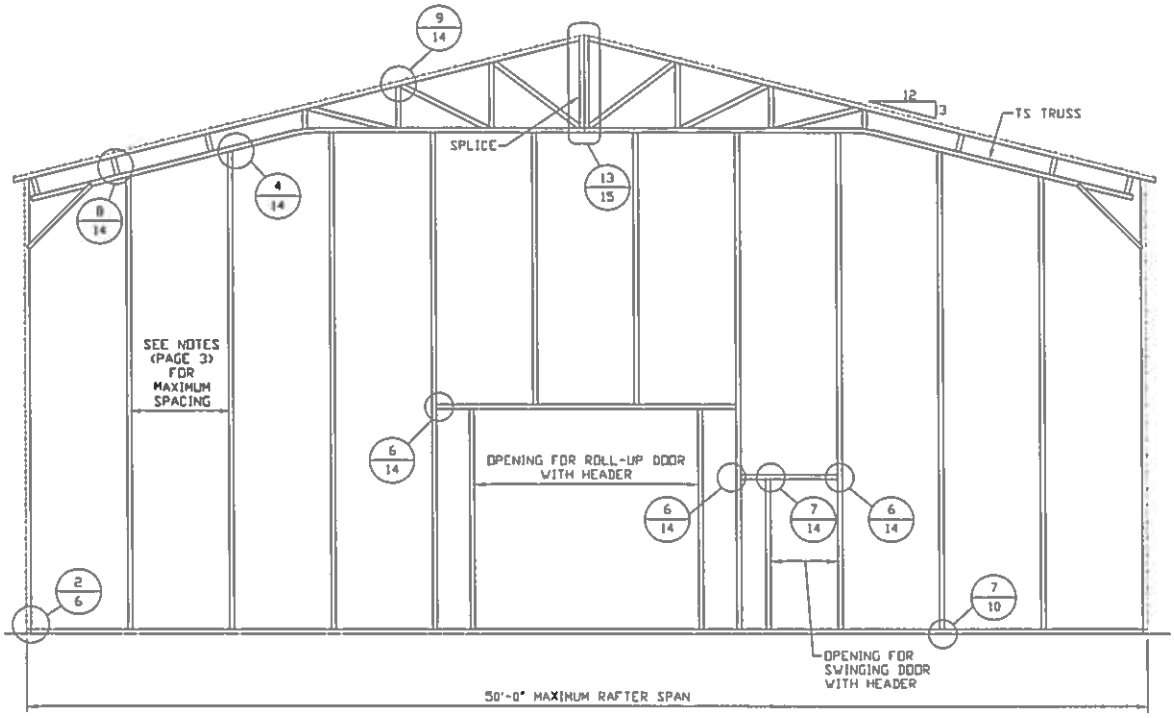

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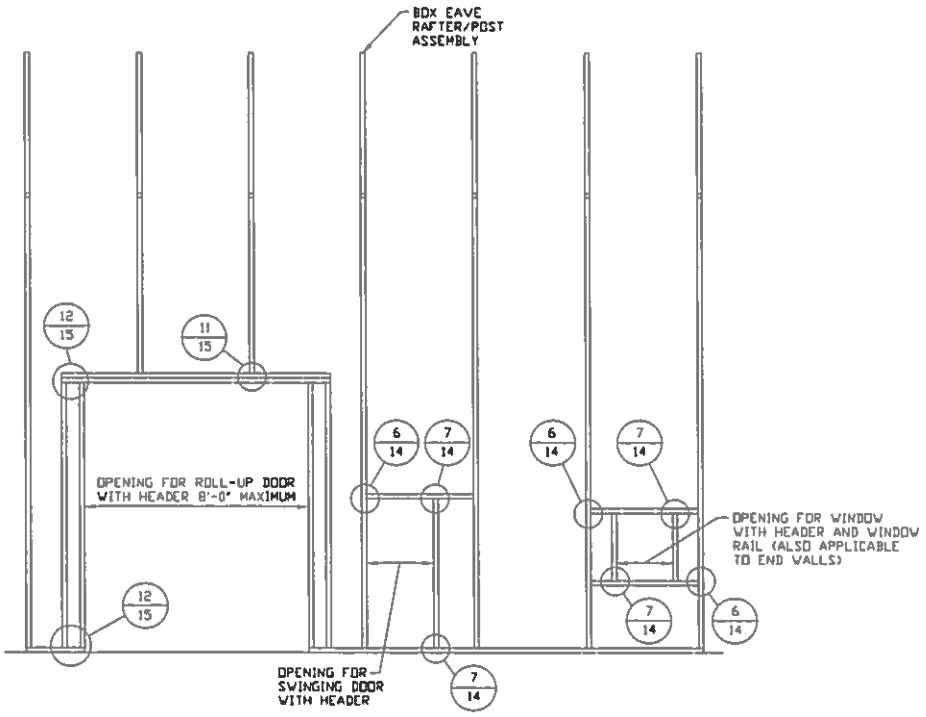
BOX EAVE RAFTER SIDE WALL AND WALL OPENINGS



TYPICAL BOX EAVE RAFTER SIDE WALL OPENINGS FRAMING SECTION

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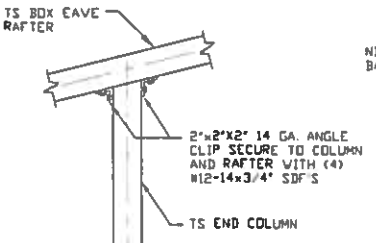
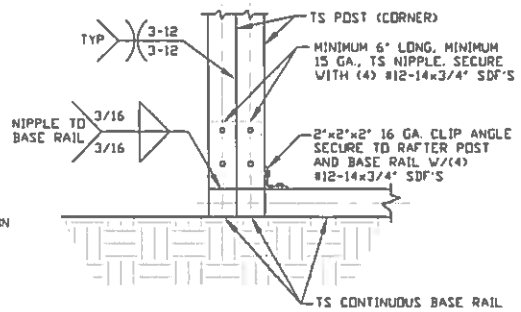
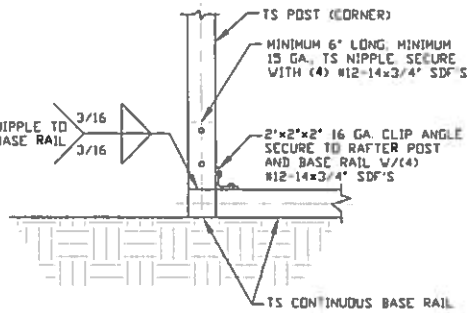
BOX EAVE RAFTER WALL OPENING DETAILS



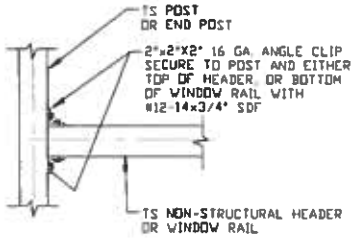
4 END POST/RAFTER CONNECTION DETAIL
SCALE: NTS



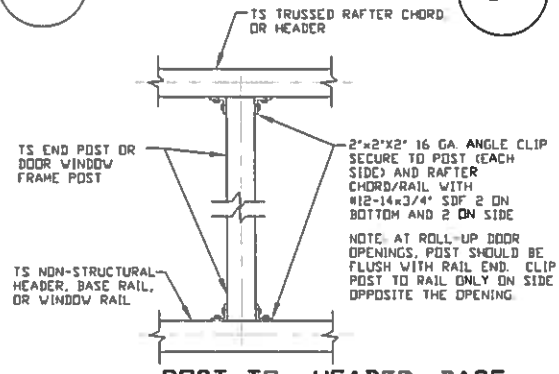
5 END POST/BASE RAIL CONNECTION DETAIL
SCALE: NTS



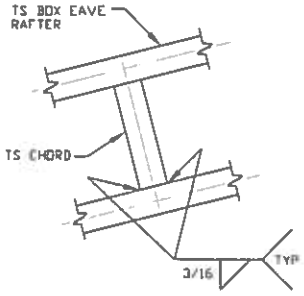
5A END POST/BASE RAIL CONNECTION DETAIL
SCALE: NTS



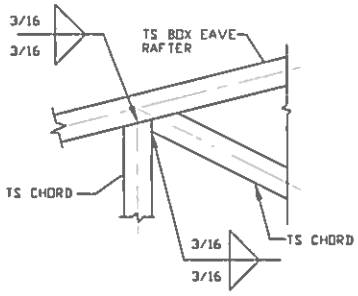
6 HEADER OR WINDOW RAIL TO POST CONNECTION DETAIL
SCALE: NTS



7 POST TO HEADER, BASE RAIL, OR WINDOW RAIL CONNECTION DETAIL
SCALE: NTS



8 CHORD/RAFTER CONNECTION DETAIL
SCALE: NTS



9 TRUSS POST AND CORD TO RAFTER CONNECTION DETAIL
SCALE: NTS

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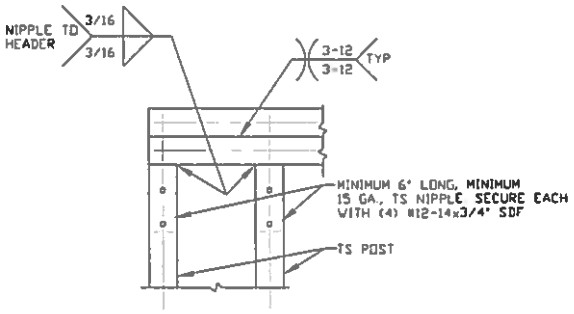
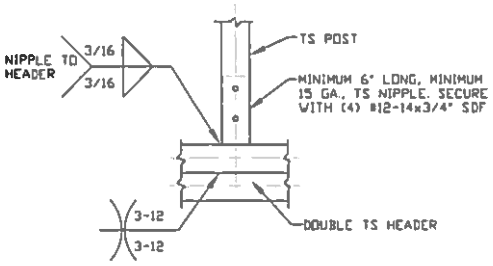
	CHECKED BY: PDH			
	PROJECT MGR: WSH	DATE: 12-18-17	SCALE: NTS	JOB NO: 172505
	CLIENT: TBS	SHT. 14	DWG. NO: SK-3	REV: 0

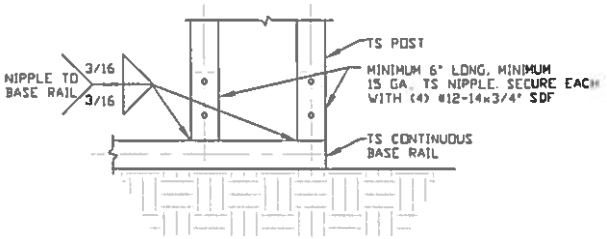
BOX EAVE RAFTER WALL OPENING DETAILS



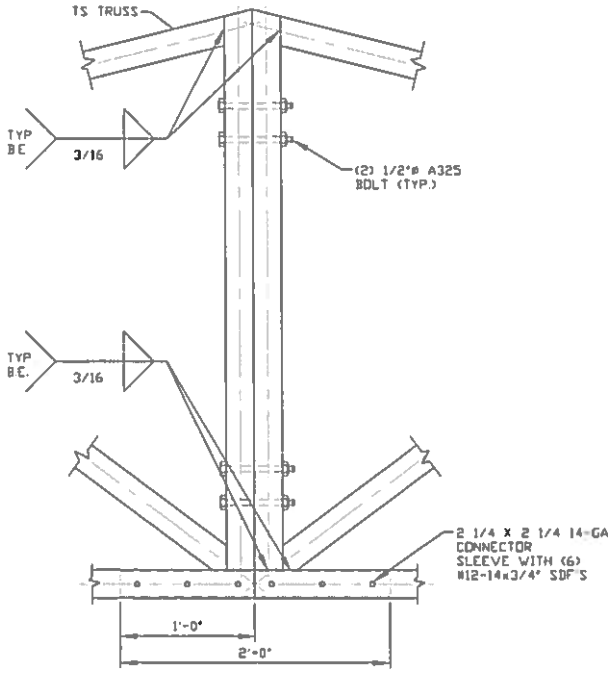
10 DOUBLE HEADER/POST CONNECTION DETAIL
SCALE: NTS



11 POST/DOUBLE HEADER CONNECTION DETAIL
SCALE: NTS



12 POST/BASE RAIL CONNECTION DETAIL
SCALE: NTS



13 SPLICE CONNECTION DETAIL
SCALE: NTS

WAYNE S. MOORE
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No 57170
STATE OF FLORIDA
PROFESSIONAL ENGINEER

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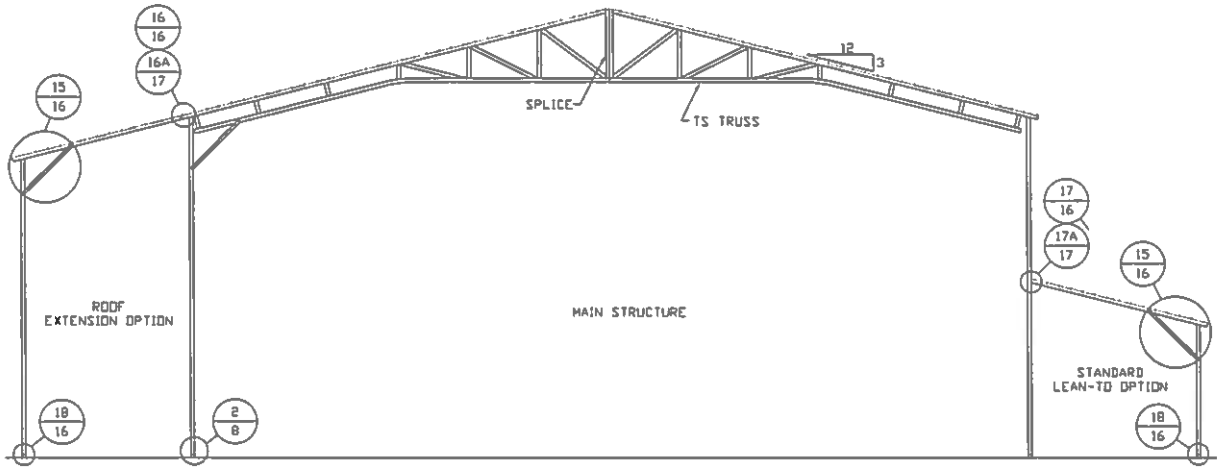
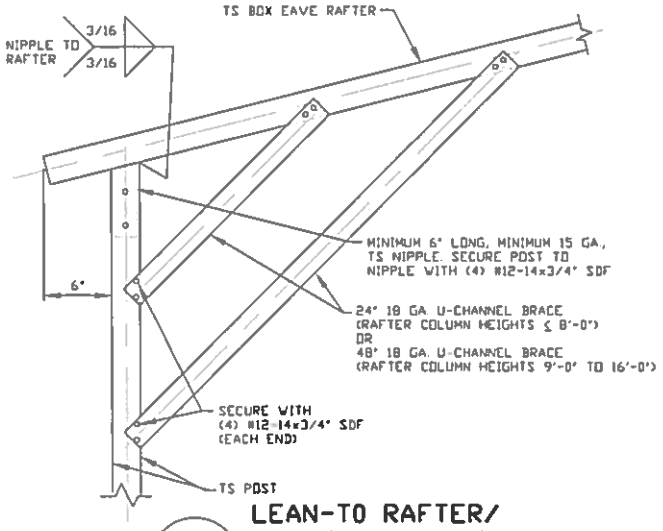
CHECKED BY: PDH			
PROJECT MGR: WSM	DATE: 12-18-17	SCALE: NTS	JOB NO: 172505
CLIENT: TBS	SHT. 15	DWG. NO: SK-3	REV: 0

BOX EAVE RAFTER LEAN-TO OPTIONS

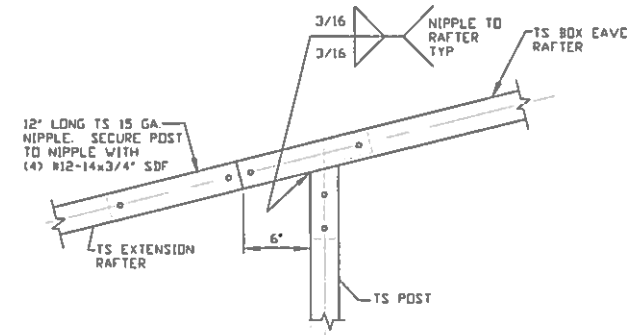


TYPICAL BOX EAVE RAFTER LEAN-TO OPTIONS FRAMING SECTION (BOTH OPTIONS SHOWN)

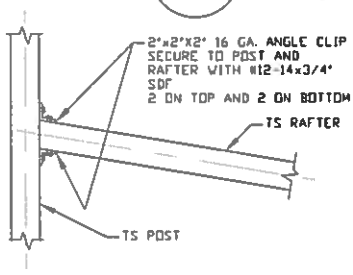
SCALE: NTS
(MAXIMUM WIDTH OF SINGLE MEMBER RAFTER LEAN-TO IS 12'-0".)
(MAXIMUM WIDTH OF DOUBLE MEMBER RAFTER LEAN-TO IS 16'-0".)

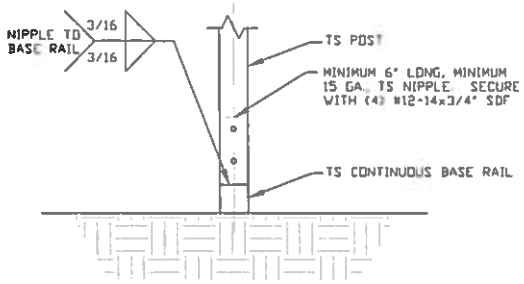


15 LEAN-TO RAFTER/ CORNER POST DETAIL
SCALE: NTS



16 SIDE EXTENSION RAFTER/COLUMN DETAIL FOR RAFTER SPANS ≤ 12'-0"
SCALE: NTS





17 LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR RAFTER SPANS 12'-0"
SCALE: NTS

18 LEAN-TO POST CONNECTION DETAIL
SCALE: NTS

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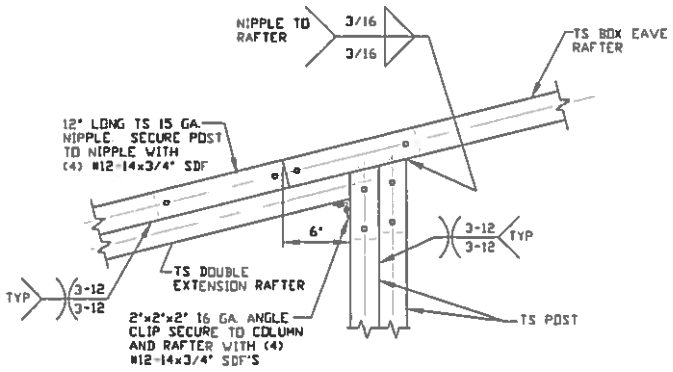
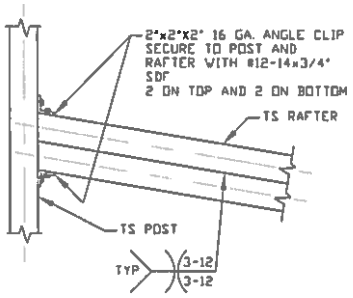
	CHECKED BY: PDH			
	PROJECT MGR: WSM	DATE: 12-18-17	SCALE: NTS	JOB NO: 172505
	CLIENT: TBS	SHT. 16	DWG. NO: SK-3	REV: 0



16A SIDE EXTENSION RAFTER/COLUMN DETAIL FOR RAFTER SPANS 12'-0" < L ≤ 16'-0"

SCALE: NTS



17A LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR RAFTER SPANS 12'-0" < L ≤ 16'-0"

SCALE: NTS

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	CHECKED BY: PDH			
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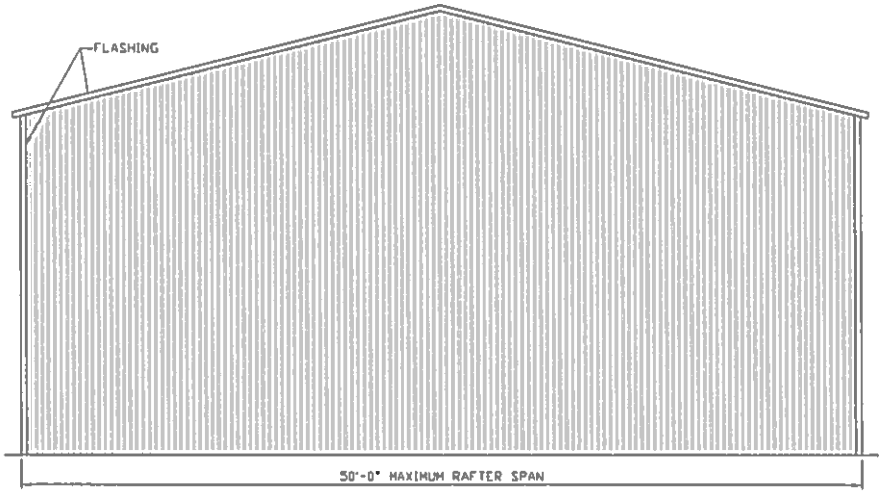
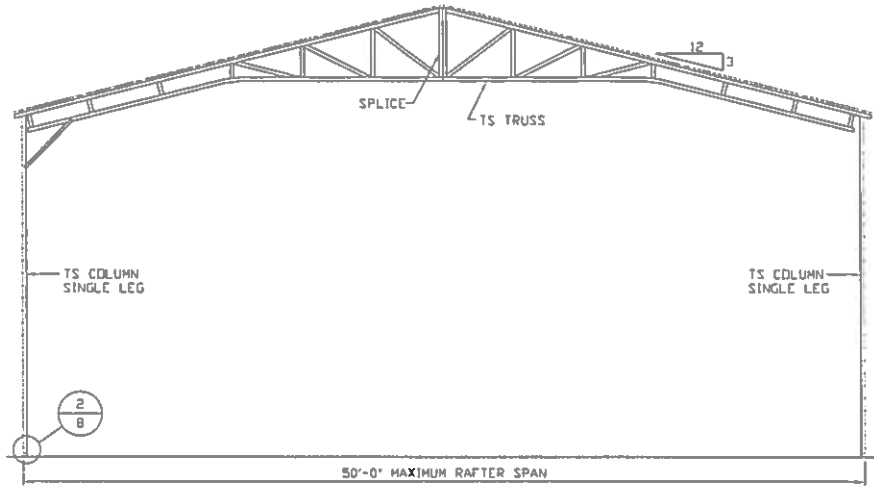
	CLIENT: TBS	SHT. 17	DWG. NO: SK-3	REV: 0

BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



TYPICAL END ELEVATION VERTICAL ROOF/SIDING
SCALE: NTS



TYPICAL SECTION VERTICAL ROOF/SIDING OPTION
SCALE: NTS

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STATE OF
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PROFESSIONAL ENGINEER

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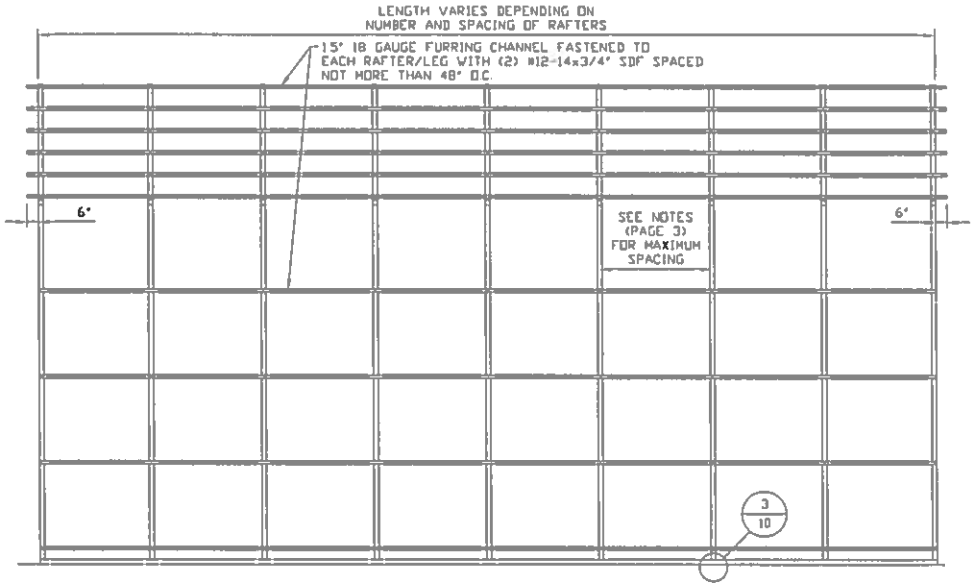
	CHECKED BY: PDH			
	PROJECT MGR: WSM	DATE: 12-18-17	SCALE: NTS	JOB NO: 17250S
	CLIENT: TBS	SHT. 18	DWG. NO: SK-3	REV: 0

BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION

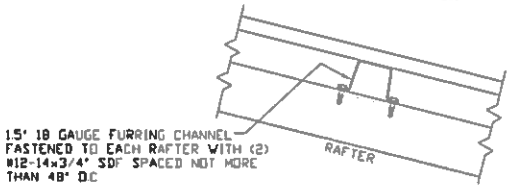
TYPICAL SIDE ELEVATION VERTICAL ROOF/SIDING

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



TYPICAL FRAMING SECTION VERTICAL ROOF OPTION

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



PANEL ATTACHMENT

(ALTERNATE FOR VERTICAL ROOF PANELS)

WAYNE S. MOORE
LICENSE
No 57170
STATE OF FLORIDA
PROFESSIONAL ENGINEER

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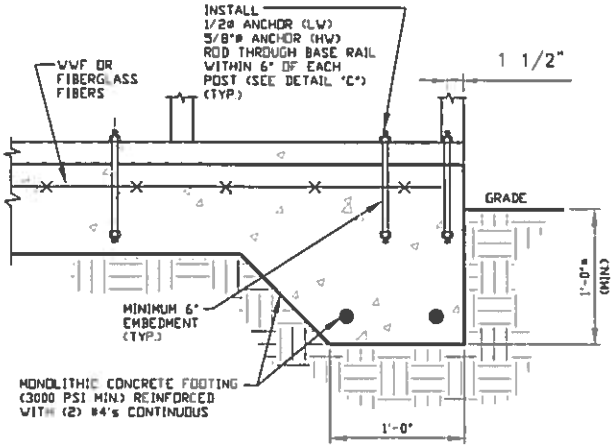
	CLIENT: TBS	SHT. 19	DWG. NO: SK-3	REV: 0

OPTIONAL FOUNDATION ANCHORAGE FOR LOW AND HIGH WIND SPEED

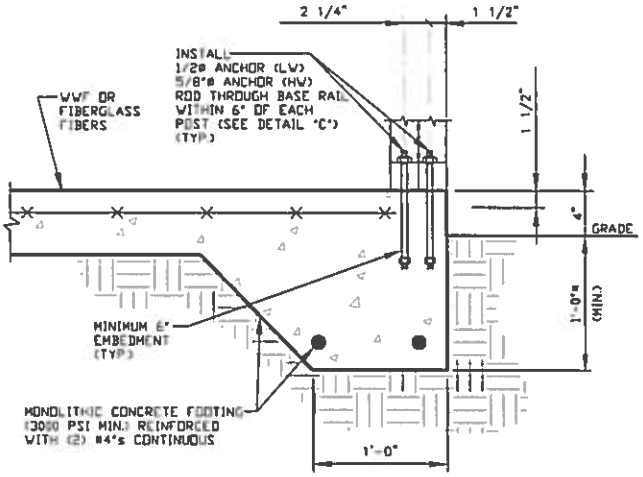


1A **CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE**

SCALE: NTS

(MINIMUM ANCHOR EDGE DISTANCE IS 1 1/2")

* COORDINATE WITH LOCAL CODES/ORD.

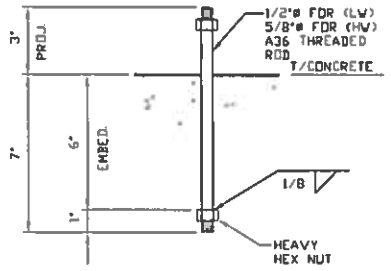


1B **CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE**

SCALE: NTS

(MINIMUM ANCHOR EDGE DISTANCE IS 1 1/2")

* COORDINATE WITH LOCAL CODES/ORD.



1C **ANCHOR ROD THROUGH BASE RAIL DETAIL**

SCALE: NTS

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.

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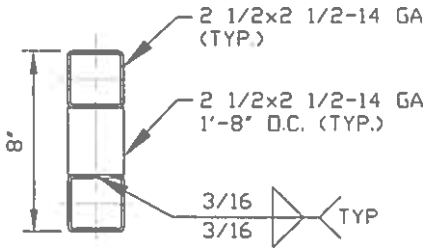
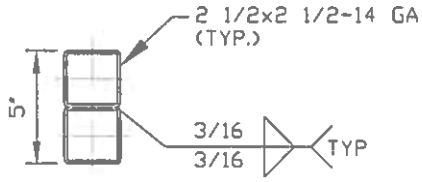
	PROJECT MGR: WSM	DATE: 12-18-17	SCALE: NTS	JOB NO: 17250S
	CLIENT: TBS	SHT. 20	DWG. NO: SK-3	REV: 0

OPTIONAL HEADER



HEADER DETAIL FOR
OPENINGS 8'-0" < LENGTH ≤15'-0"
SCALE: NTS



HEADER DETAIL FOR
OPENINGS LENGTH ≤8'-0"
SCALE: NTS

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	PROJECT MGR: WSM	DATE: 12-18-17	SCALE: NTS	JOB NO: 172505
	CLIENT: TBS	SHT. 21	DWG. NO: SK-3	REV.: 0