

GENERAL NOTES

1. DESIGN IS FOR MAXIMUM 30'-0" WIDE X 20'-0" EAVE HEIGHT UTILITY STRUCTURES.
2. APPLICABLE CODES, REGULATIONS, & STANDARDS:

A. 2023 FLORIDA BUILDING CODE (8TH EDITION)

B. 2024 INTERNATIONAL BUILDING CODE

C. ASCE 7-22: MINIMUM DESIGN LOADS ON BUILDINGS AND OTHER STRUCTURES

D. AISC STEEL CONSTRUCTION MANUAL (15TH EDITION)

E. ACI 318-19: BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE

F. TMS 402-16: BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES

G. AWS D1.1: STRUCTURAL WELDING
3. RISK CATEGORY: I
4. EXPOSURE CATEGORY: C
5. LOW ULTIMATE WIND SPEED 105 TO 150 MPH (NOMINAL WIND SPEED 81 TO 116 MPH): MAXIMUM RAFTER/POST AND END POST SPACING = 5.0 FEET.

HIGH ULTIMATE WIND SPEED 151 TO 180 MPH (NOMINAL WIND SPEED 117 TO 139 MPH): MAXIMUM RAFTER/POST AND END POST SPACING = 4.0 FEET.
6. DEAD LOAD = 5 PSF
7. ROOF LIVE LOAD = 12 PSF
8. SPECIFICATIONS APPLICABLE TO 29/26 GAUGE METAL PANELS FASTENED DIRECTLY TO 2 1/2" x 2 1/2" - 14 GAUGE TUBE STEEL (TS) FRAMING MEMBERS FOR VERTICAL PANELS, 29/26 GAUGE METAL PANELS SHALL BE FASTENED TO 18 GAUGE HAT CHANNELS (UNLESS OTHERWISE NOTED).
9. OPTIONAL BASE RAIL ANCHORAGE MAY BE USED FOR LOW AND MUST BE USED FOR HIGH WIND SPEEDS.
10. FASTENERS CONSIST OF #12-14 x 3/4" 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. AVERAGE FASTENER SPACING ON-CENTERS ALONG RAFTERS OR PURLINS, AND POSTS, INTERIOR = 9" OR END = 6", (MAX.). THIS CONNECTION PATTERN SHALL BE SUPERCEDED BY THE PANEL MANUFACTURER'S INSTALLATION INSTRUCTIONS.
12. WIND FORCES GOVERN OVER SEISMIC FORCES. SEISMIC PARAMETERS ANALYZED ARE:

SOIL SITE CLASS = D

R = 3.5 Ie = 1.0

Sds = 0.087 g V = CsW

Sdi = 0.084 g
13. GROUND ANCHORS SHALL BE INSTALLED THROUGH BASE RAIL WITHIN 6" OF EACH RAFTER COLUMN ALONG SIDES.
14. GROUND ANCHOR (SOIL NAILS) CONSIST OF #5 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.
15. MIN. LAP REQUIREMENT FOR REBAR IN FOOTER IS 25".
16. SOIL TO BE COMPACTED TO 95% OF ITS MAXIMUM DRY DENSITY, AT OPTIMUM MOISTURE CONTENT, IN ACCORDANCE WITH ASTM D1557-93
17. PRIOR TO PLACING CONCRETE, TREAT THE ENTIRE SUBSURFACE AREA FOR TERMITES IN COMPLIANCE WITH THE FBC.
18. A LANDING OF MIN. 36" WIDTH IN THE DIRECTION OF TRAVEL SHALL BE PROVIDED AT THE EXTERIOR DOORS. SLOPE OF LANDING NOT TO EXCEED 1/4"-1'. LANDING LEVEL NOT TO BE LOWER THAN 1-1/2" (FOR EGRESS DOORS) & 7-3/4" (FOR OTHER EXTERIOR DOORS) BELOW THE TOP OF THRESHOLD.
19. CONTRACTOR TO PROVIDE APPROVED PRODUCTS THAT MEET OR EXCEED WIND DESIGN PRESSURES.
20. CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS:

CONTRACTOR TO VERIFY THAT THE FINISHED FLOOR ELEVATION FOR THE PROPOSED STRUCTURE IS AT OR ABOVE THE GREATER OF THE FOLLOWING ELEVATIONS:

I) BFE (BASE FLOOD ELEVATION) + 2'-0"

II) DFE (DESIGN FLOOD ELEVATION)

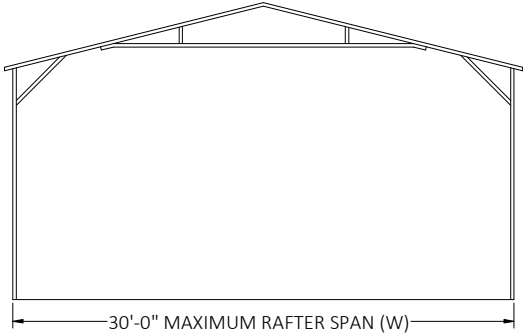
III) THE MINIMUM ELEVATION MANDATED BY THE BUILDING CODES ADOPTED BY THE AUTHORITY HAVING JURISDICTION.

DRAWING INDEX

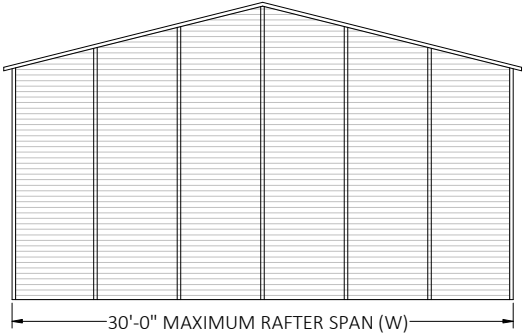
PAGE NO.	DESCRIPTION
1	NOTES AND SPECIFICATIONS
2	BOX EAVE FRAME RAFTER ENCLOSED BUILDING
3	BOW EAVE FRAME RAFTER ENCLOSED BUILDING
4	BASE RAIL AND FOUNDATION ANCHORAGE
5	BOX/BOW EAVE VERTICAL ROOF/SIDING OPTION
6	BOX/BOW EAVE RAFTER LEAN-TO OPTIONS
7	BOX EAVE RAFTER END WALL, SIDE WALL AND OPENING FRAMING
8	VENT AND CMU STEM WALL DETAIL
9	OPTIONAL CONCRETE STRIP FOOTING

UTILITY METAL BUILDING DESIGN
MAXIMUM 30'-0" WIDE X 20'-0" EAVE HEIGHT
BOX/BOW EAVE FRAME

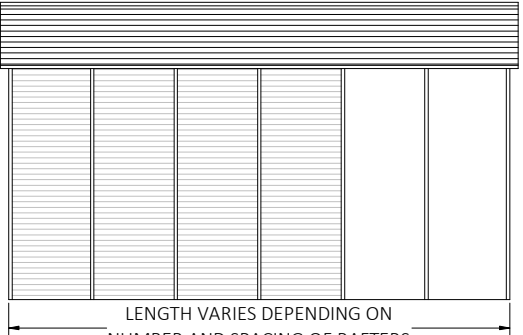
BOX EAVE FRAME RAFTER UTILITY BUILDING



TYPICAL END ELEVATION

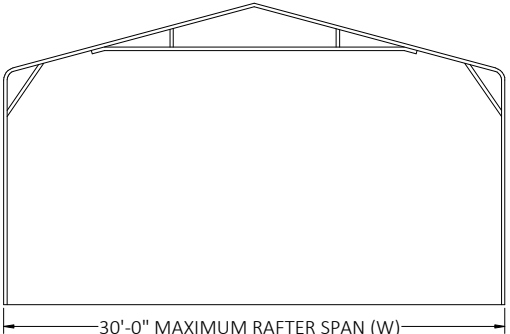


TYPICAL END ELEVATION - HORIZONTAL ROOF

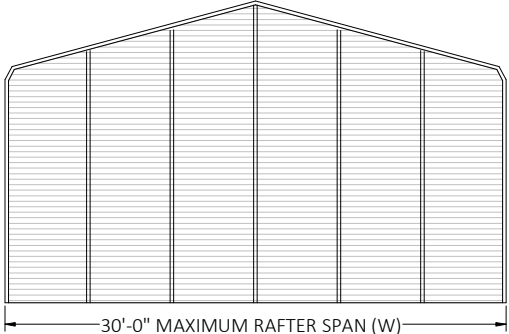


TYPICAL SIDE ELEVATION - HORIZONTAL ROOF

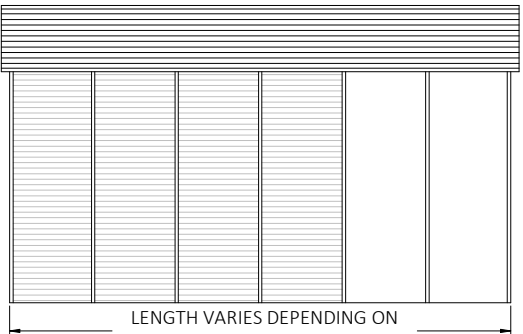
BOW FRAME RAFTER UTILITY BUILDING



TYPICAL END ELEVATION



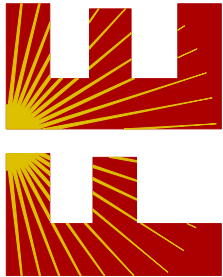
TYPICAL END ELEVATION - HORIZONTAL ROOF



TYPICAL SIDE ELEVATION - HORIZONTAL ROOF

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CA CERT. #30782

PROJECT NO. 2504211-30-U

FLORIDA ENGINEERING LLC PROJECT NO. 2504211-30-U
SIGNED AND SEALED DATED 03/27/2025 REVISES AND
SUPERSEDES FLORIDA ENGINEERING LLC PROJECT NO.
2322771-30-U SIGNED AND SEALED DATED 01/16/2024.

DIGITAL CERTIFICATION NOTES:
1. THIS DOCUMENT HAS BEEN DIGITALLY SIGNED AND SHALL REMAIN IN DIGITAL FORMAT, SHALL BE VERIFIED BY ELECTRONIC MEANS & PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED.
2. THIS DOCUMENT HAS BEEN CREATED BY FLORIDA ENGINEERING LLC FOR TUBULAR BUILDING SYSTEMS ONLY. IT SHALL NOT BE REPRODUCED IN WHOLE OR PART WITHOUT THE WRITTEN CONSENT OF FLORIDA ENGINEERING LLC AND TUBULAR BUILDING SYSTEMS.
3. ALTERATIONS, ADDITIONS OR OTHER MARKINGS TO THIS DOCUMENT ARE NOT PERMITTED AND INVALIDATE FLORIDA ENGINEERING LLC'S CERTIFICATION.
4. THESE PLANS ARE GENERIC AND DO NOT PROVIDE INFORMATION FOR A SITE-SPECIFIC PROJECT WHERE THE SITE CONDITIONS DEVIATE FROM WHAT HAS BEEN CALLED OUT ON THESE PLANS.
5. CONTRACTOR MUST NOT DEVIATE FROM THE CONDITIONS DETAILED ON THESE PLANS.
6. CONSTRUCTION SAFETY AT THE SITE IS THE CONTRACTOR'S RESPONSIBILITY.

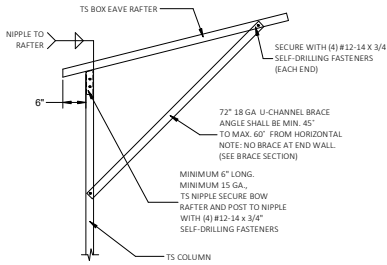
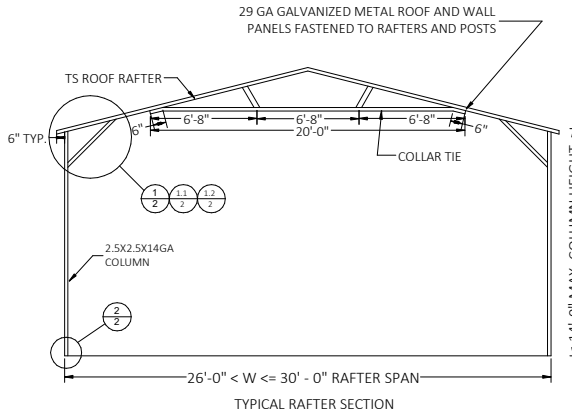
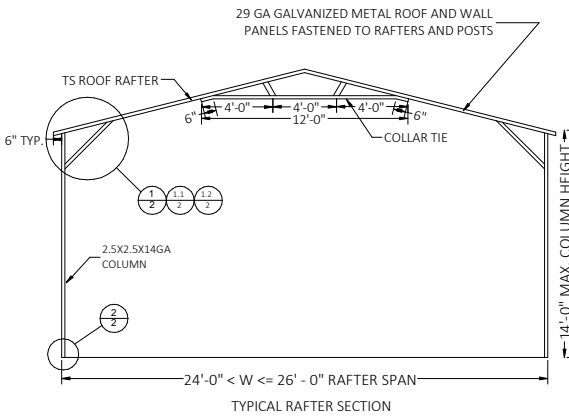
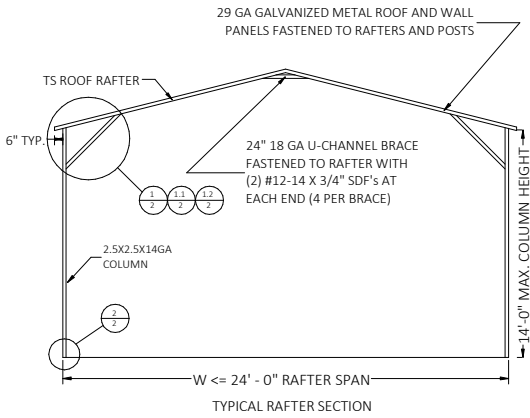
CONTRACTOR:

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

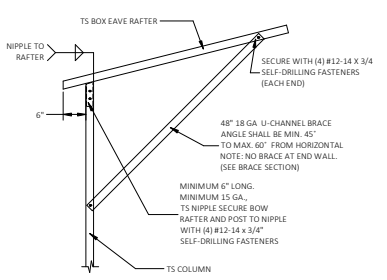
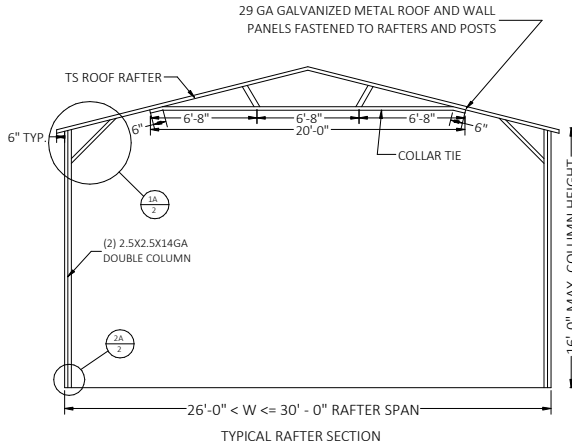
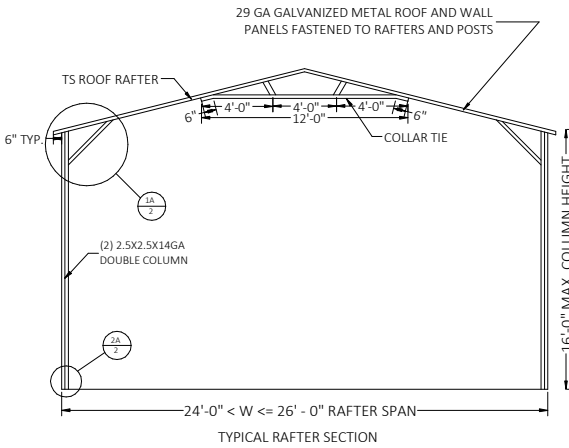
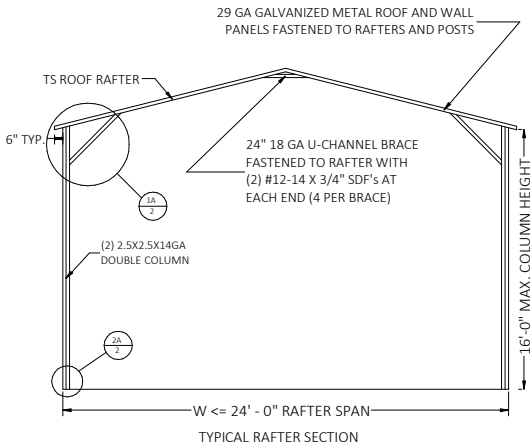
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30' WIDE X 20' HIGH
UTILITY STRUCTURE

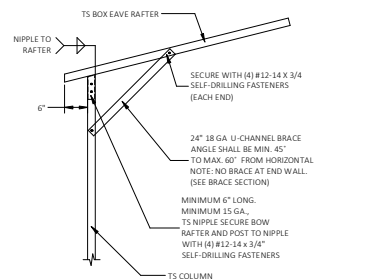
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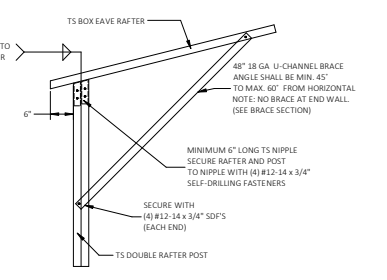
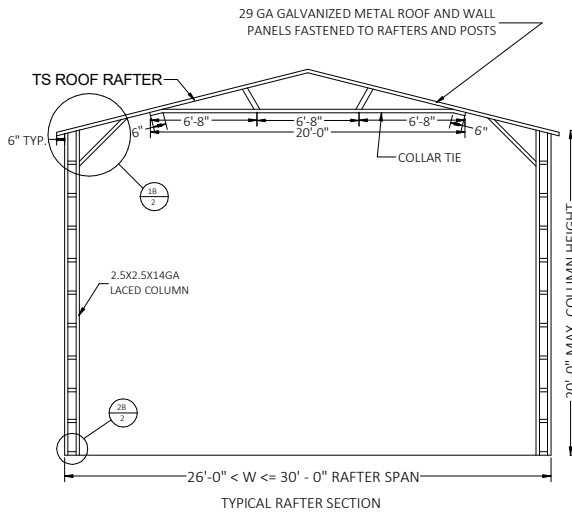
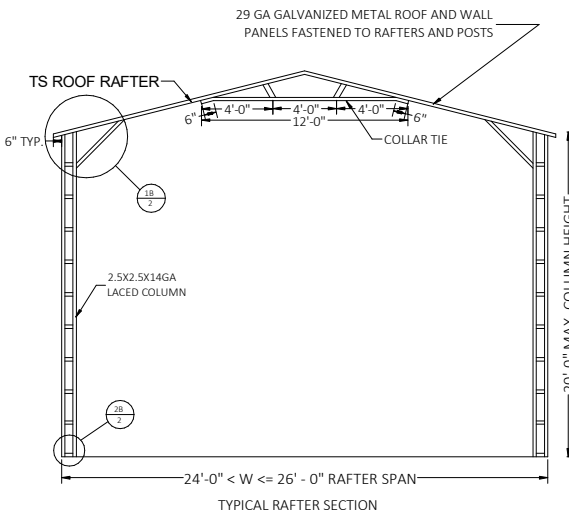
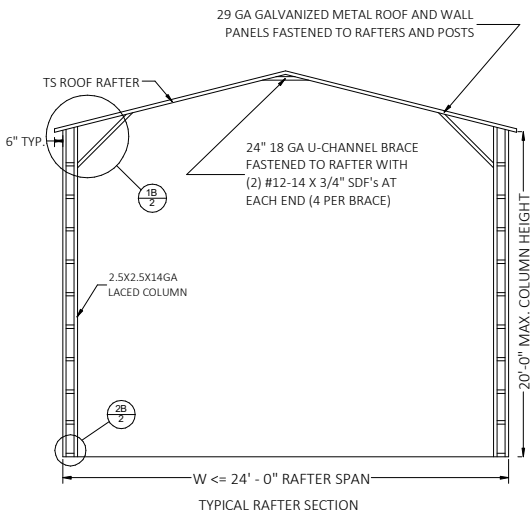
1 BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 13'-0" < TO <= 14'-0" SCALE: NTS



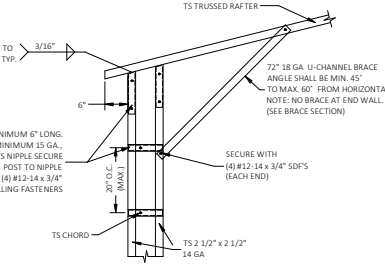
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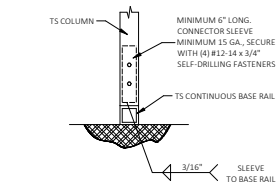
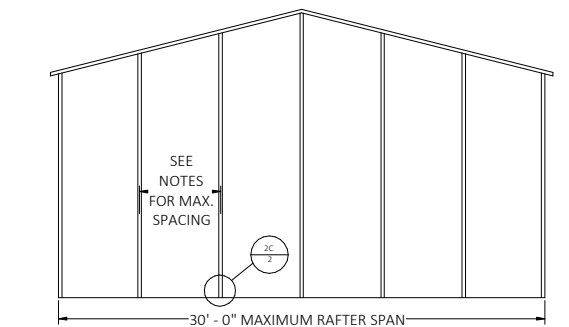
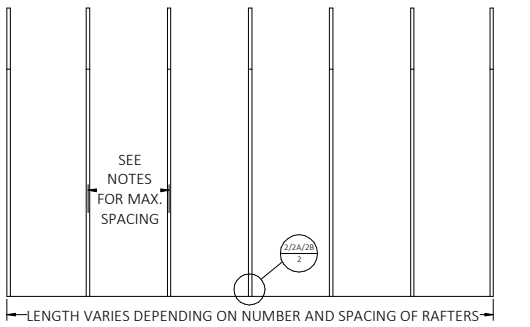
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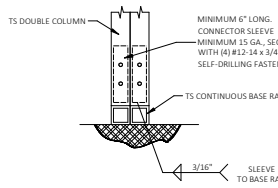
1A BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 14'-0" < TO <= 16'-0" SCALE: NTS



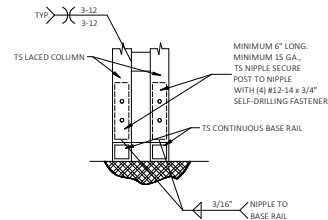
1B BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 16'-0" < TO <= 20'-0" SCALE: NTS



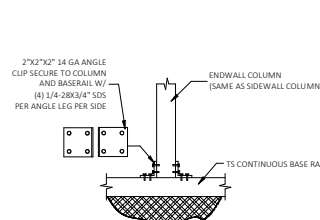
2 SIDEWALL SINGLE COLUMN/BASE RAIL CONNECTION DETAIL SCALE: NTS



2A SIDEWALL DOUBLE COLUMN/BASE RAIL CONNECTION DETAIL SCALE: NTS



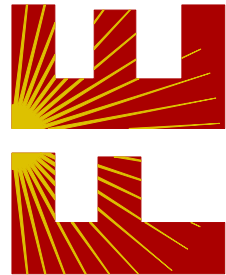
2B SIDEWALL LACED COLUMN/BASE RAIL CONNECTION DETAIL SCALE: NTS



2C ENDWALL COLUMN/BASE RAIL CONNECTION DETAIL SCALE: NTS

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

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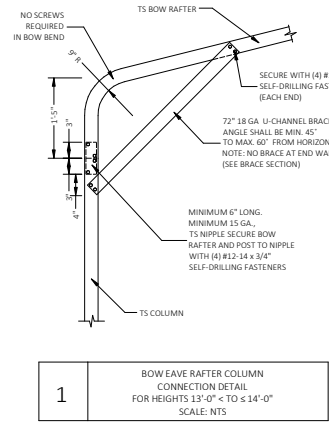
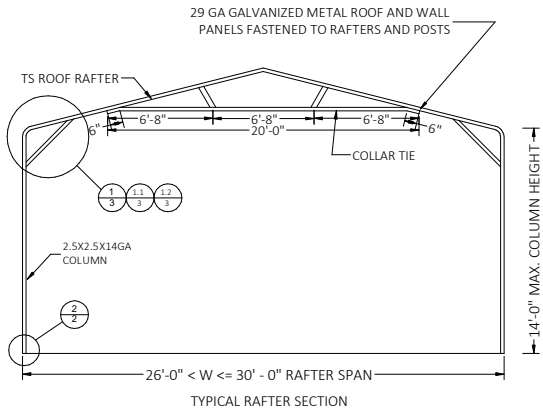
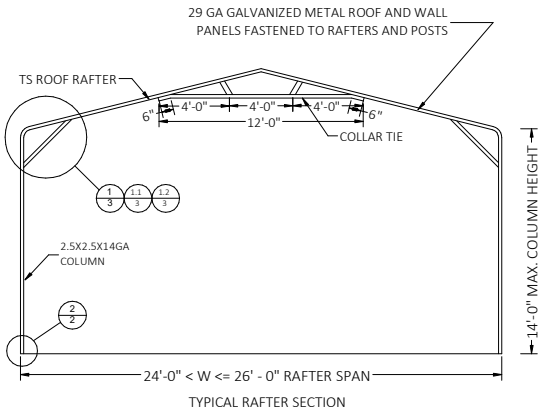
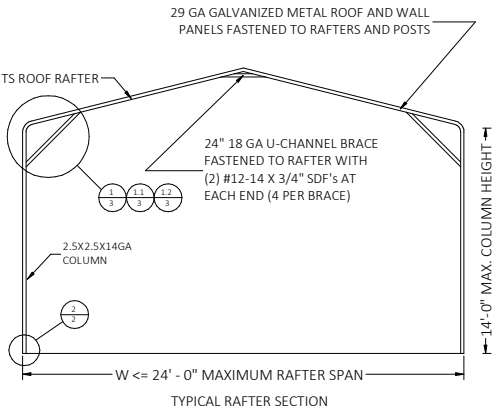
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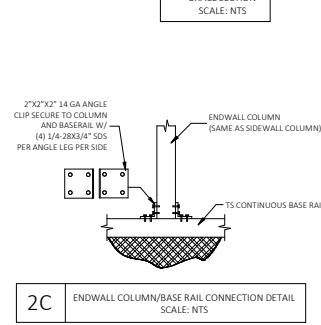
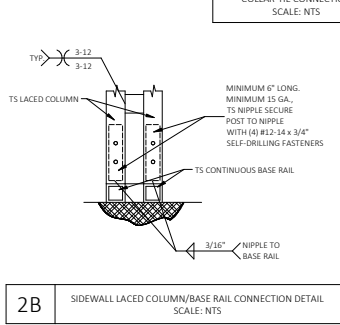
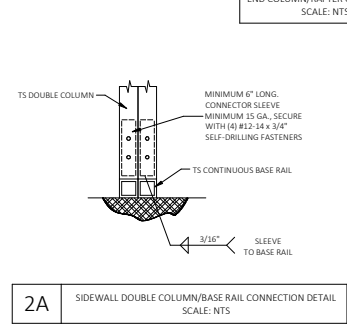
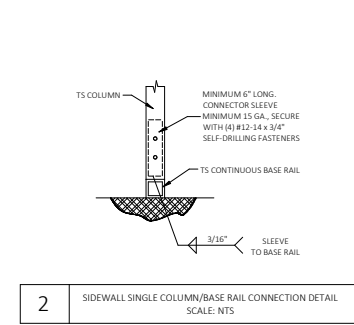
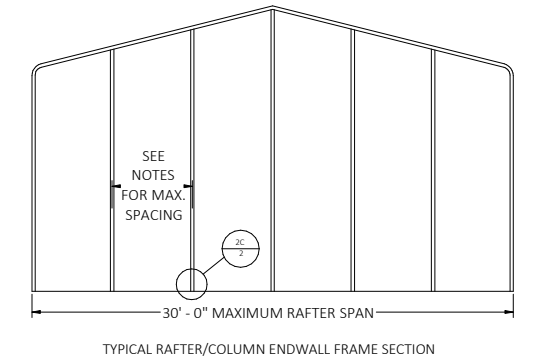
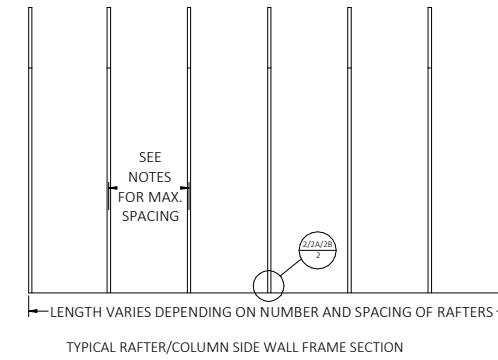
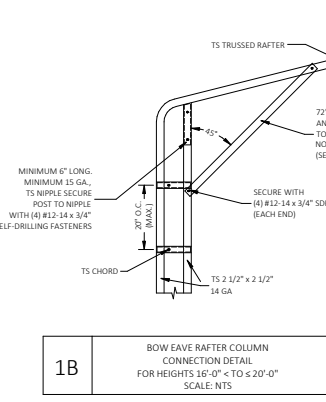
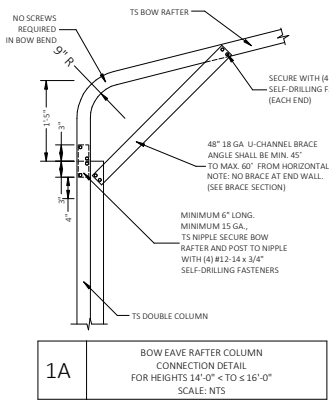
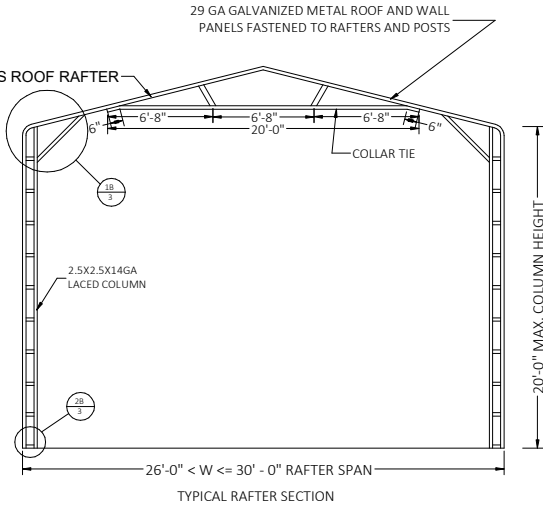
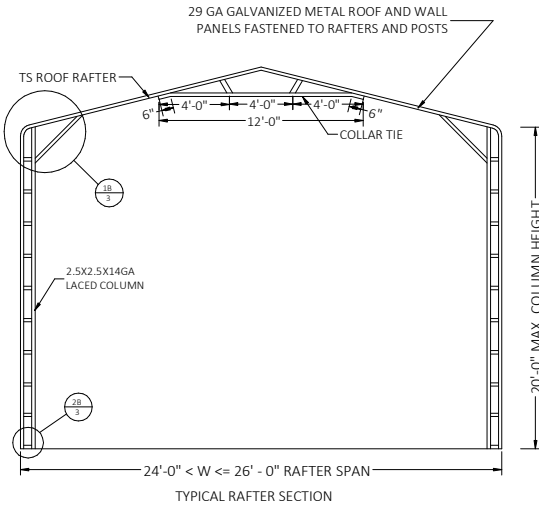
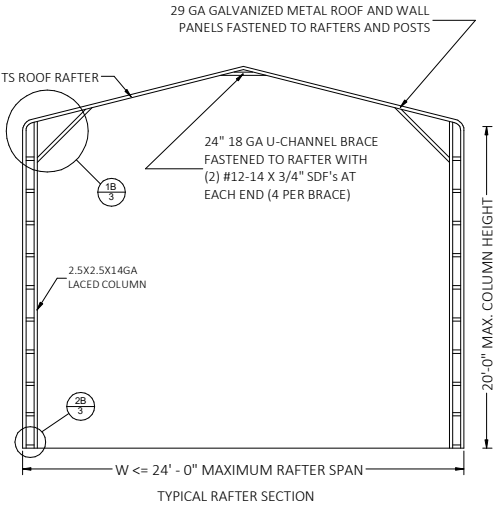
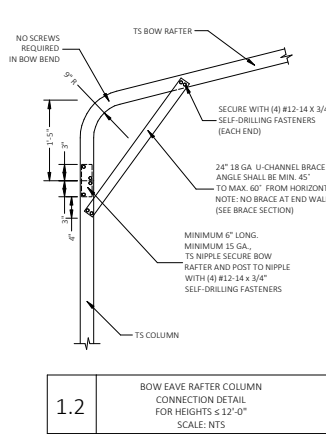
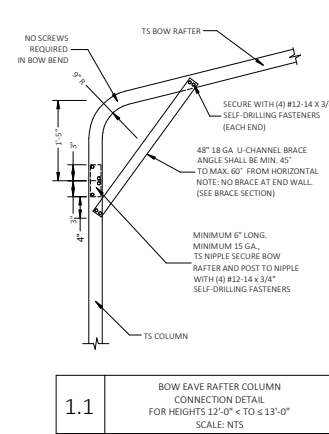
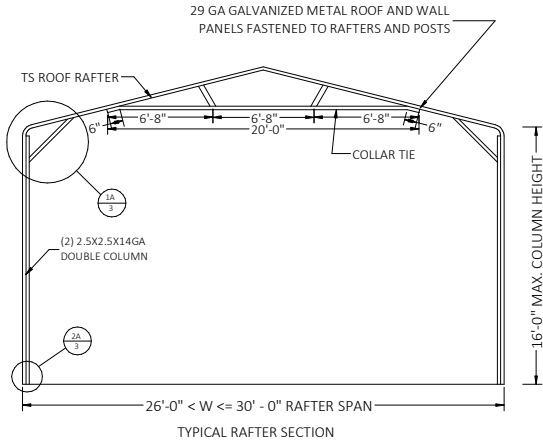
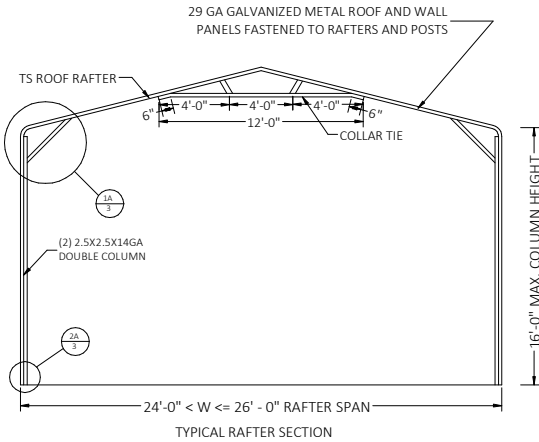
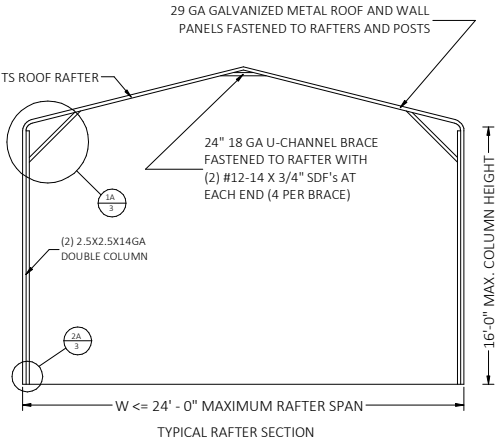
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CA CERT. #30782

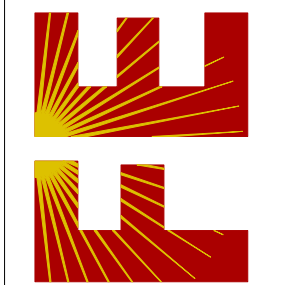
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CA CERT. #30782

PROJECT NO. 2504211-30-U

BASE RAIL ANCHORAGE OPTIONS FOR LOW AND HIGH WIND SPEED

GENERAL NOTES

CONCRETE:

1. CONCRETE SHALL HAVE A MINIMUM SPECIFIED COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
2. PRIOR TO PLACING CONCRETE, TREAT THE ENTIRE SUBSURFACE AREA FOR TERMITES IN COMPLIANCE WITH THE FBC.
3. MINIMUM SOIL BEARING CAPACITY OF COMPACTED GRADE= 2000 PSF

COVERAGE OF THE REINFORCED STEEL:

FOR FOUNDATIONS, MINIMUM CONCRETE COVER OVER REINFORCING BARS SHALL BE PER ACI-318: 3 INCHES WHERE THE CONCRETE IS POURED AGAINST AND TEMPORARY IN CONTACT WITH THE EARTH OR UNPROTECTED FROM THE EARTH OR WEATHER, OTHERWISE 1-1/2 INCHES.

REINFORCING STEEL:

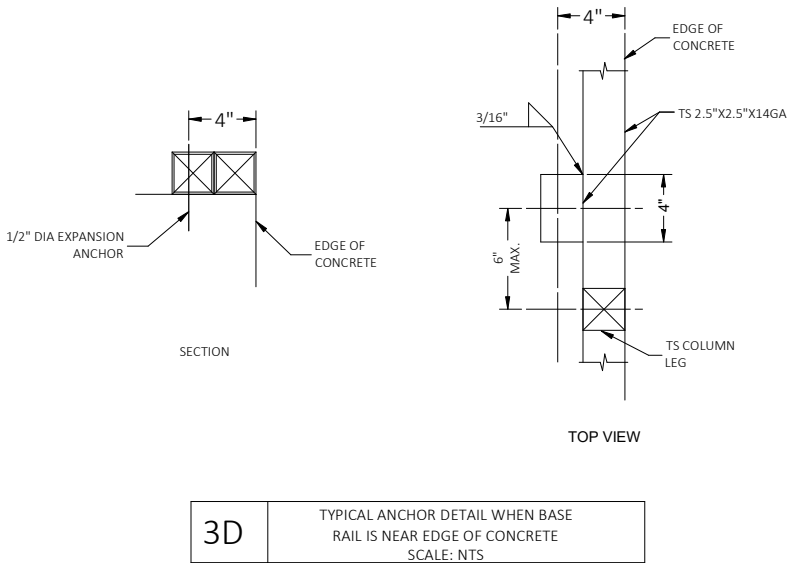
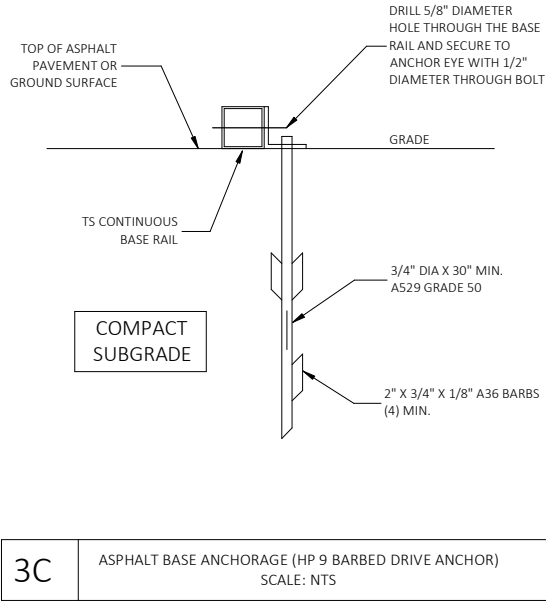
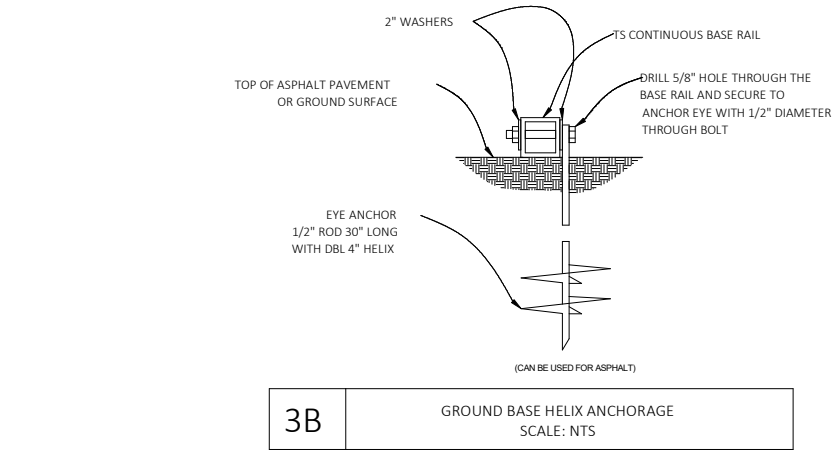
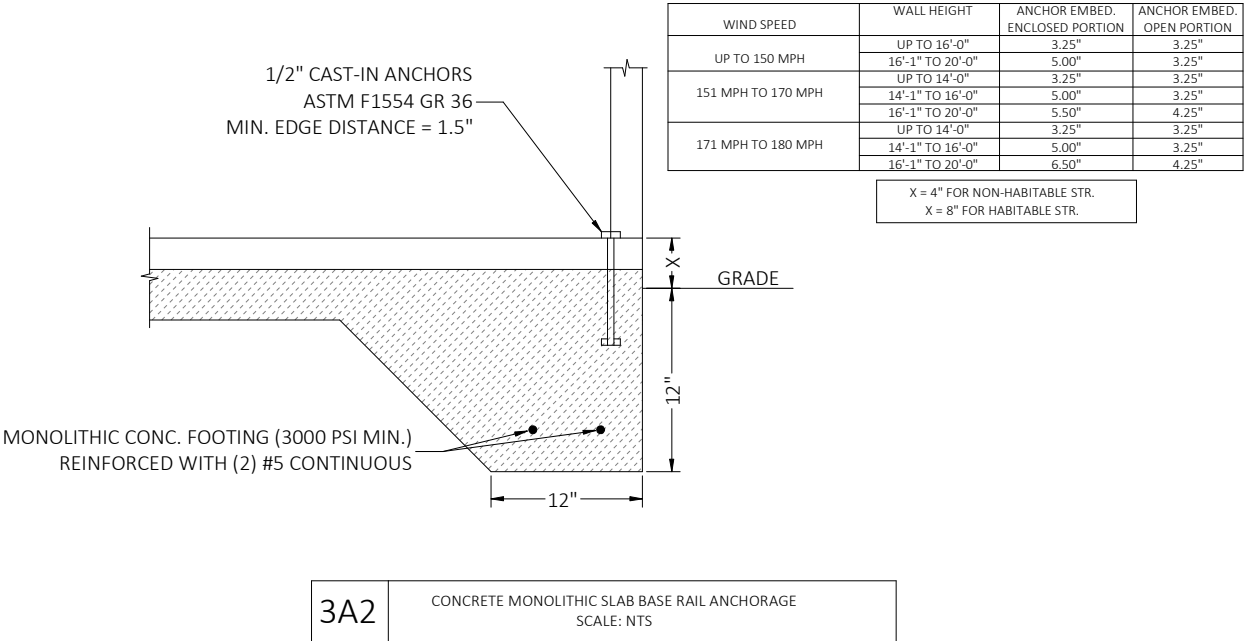
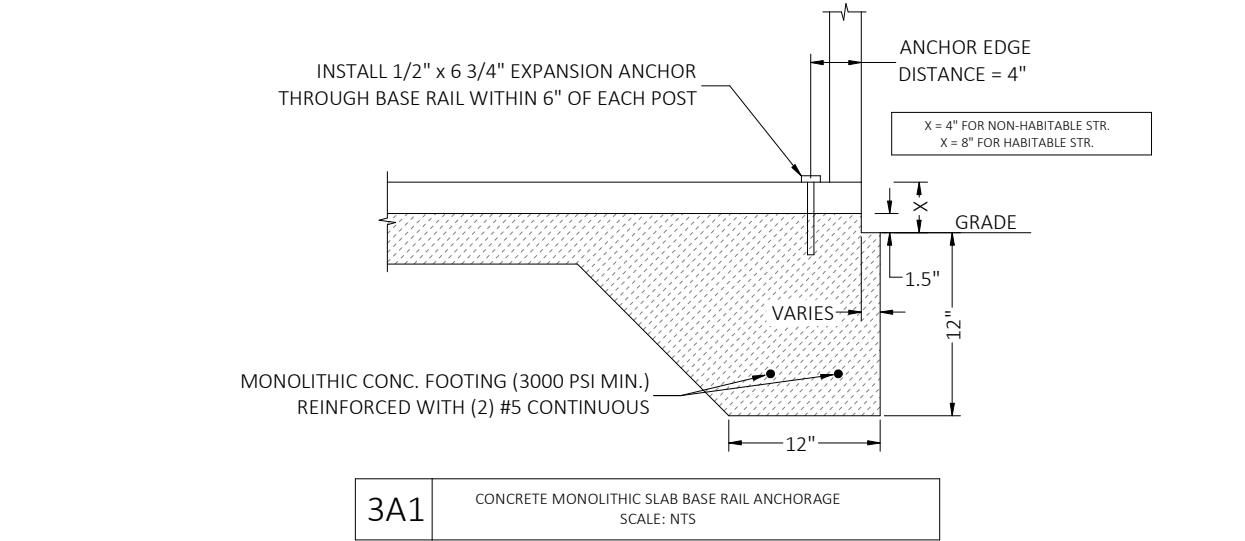
THE TURNDOWN REINFORCING STEEL SHALL BE ASTM A615 GRADE 60. THE SLAB REINFORCEMENT SHALL BE WELDED WIRE FABRIC MEETING ASTM A185 OR FIBERGLASS FIBER REINFORCEMENT.

REINFORCEMENT MAY BE BENT IN THE FIELD OR SHOP AS LONG AS:

1. IT IS BENT COLD;
2. REINFORCEMENT PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE FIELD BENT;
3. THE DIAMETER OF THE BEND, MEASURED ON THE INSIDE OF THE BAR, IS NOT LESS THAN SIX-BAR DIAMETERS.
4. MINIMUM REQUIRED LAP LENGTH SHALL NOT BE LESS THAN 57-BAR DIAMETERS.

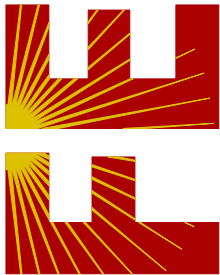
HELIX ANCHOR NOTES

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 COARSE 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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CONTRACTOR:
TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE,
LAKE CITY, FL 32025

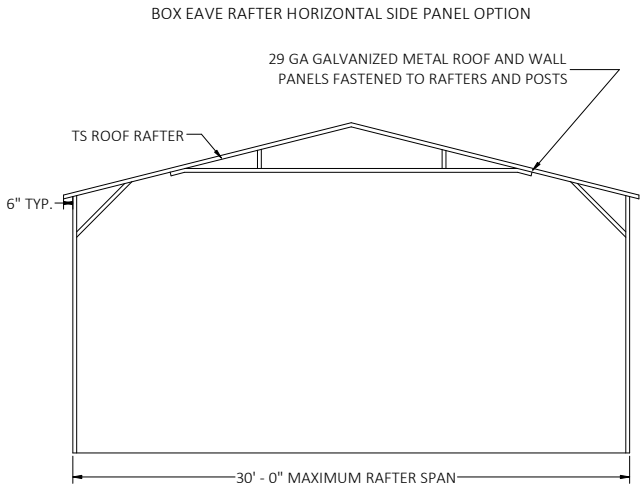
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30' WIDE X 20' HIGH
UTILITY STRUCTURE

DESIGN DATE: 03/27/2025
REVISION 1: DATE
REVISION 2: DATE
SCALE: NTS

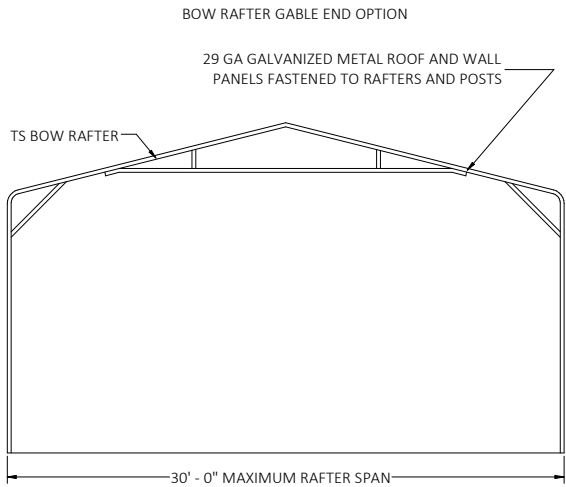
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CA CERT. #30782

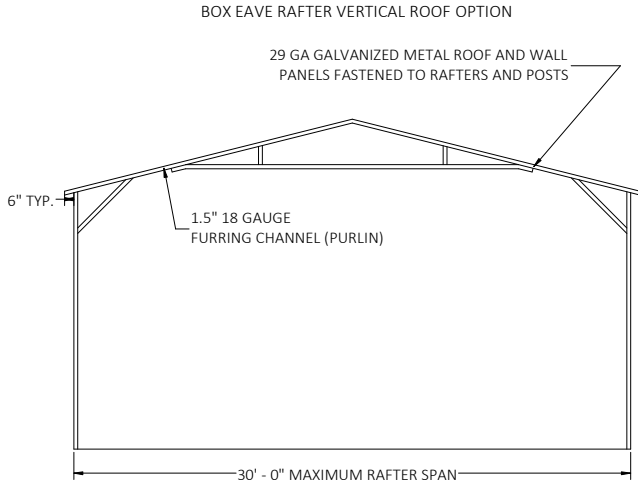
PROJECT NO. 2504211-30-U



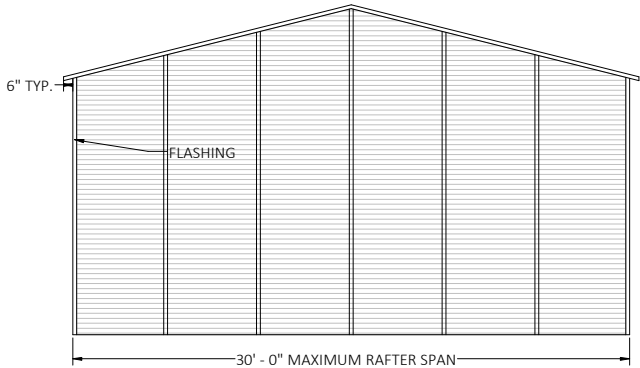
TYPICAL RAFTER/POST FRAME
SECTION EXTRA SIDE PANELS



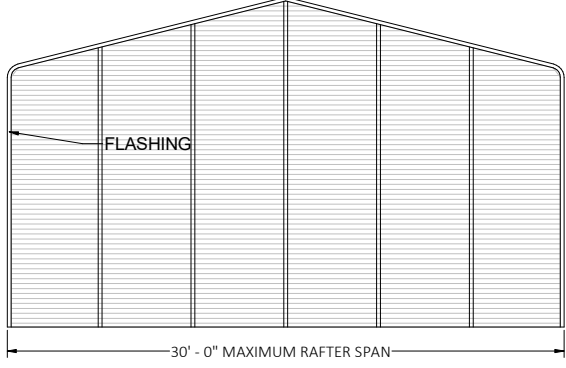
TYPICAL RAFTER/POST FRAME
SECTION EXTRA SIDE PANELS



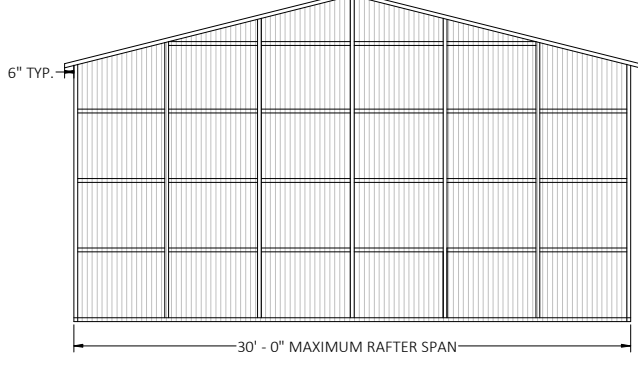
TYPICAL SECTION VERTICAL
ROOF/SIDING OPTION



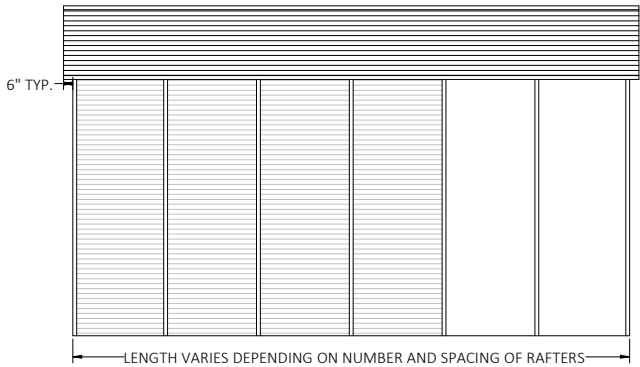
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EXTRA SIDE PANELS



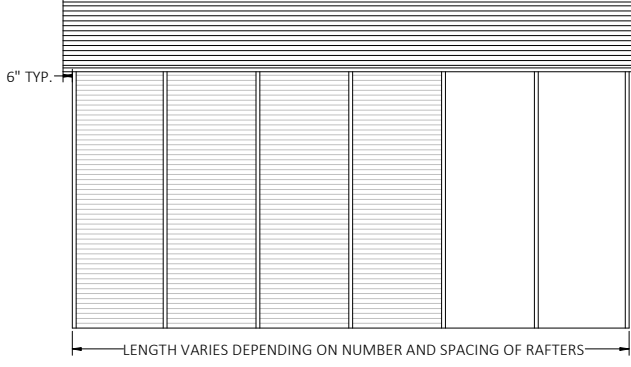
TYPICAL END ELEVATION
EXTRA SIDE PANELS



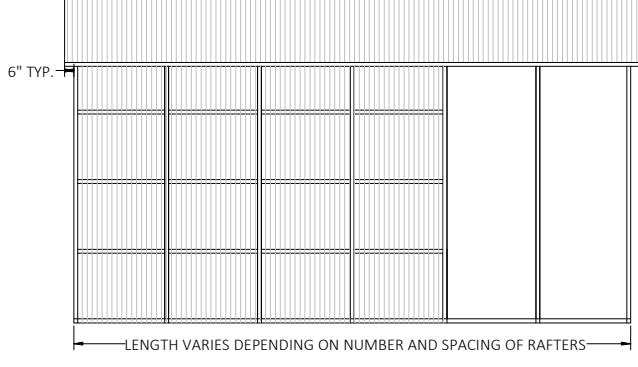
TYPICAL END ELEVATION
VERTICAL ROOF/SIDING OPTION



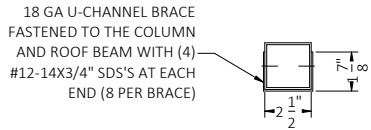
TYPICAL SIDE ELEVATION - EXTRA SIDE PANELS



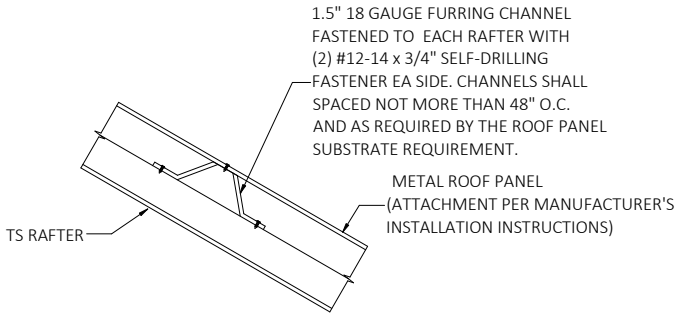
TYPICAL SIDE ELEVATION - EXTRA SIDE PANELS



TYPICAL SIDE ELEVATION - VERTICAL ROOF/SIDING OPTION

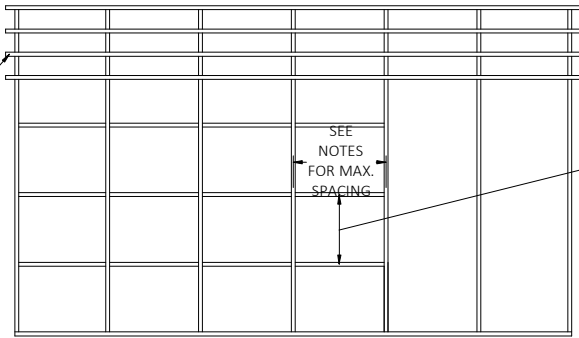


BRACE SECTION
SCALE: NTS



ROOF PANEL ATTACHMENT
SCALE: NTS

1.5" 18 GAUGE FURRING CHANNEL
FASTENED TO EACH RAFTER WITH
(2) #12-14 x 3/4" SELF-DRILLING
FASTENER EA SIDE. CHANNELS SHALL
SPACED NOT MORE THAN 48" O.C.
AND AS REQUIRED BY THE ROOF PANEL
SUBSTRATE REQUIREMENT.

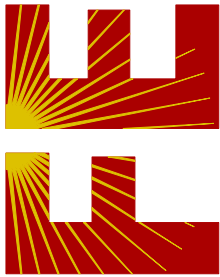


TYPICAL FRAMING SECTION - VERTICAL ROOF/SIDING OPTION

1.5" 18 GAUGE FURRING CHANNEL
FASTENED TO EACH POST WITH
(2) #12-14 x 3/4" SELF-DRILLING
FASTENER EA SIDE. CHANNELS SHALL
SPACED NOT MORE THAN 48" O.C.
AND AS REQUIRED BY THE WALL PANEL
SUBSTRATE REQUIREMENT.

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CA CERT. #30782

PROJECT NO. 2504211-30-U

CONTRACTOR: TUBULAR BUILDING SYSTEMS 631 SE INDUSTRIAL CIRCLE, LAKE CITY, FL 32025		PROJECT DESCRIPTION: 30' WIDE X 20' HIGH UTILITY STRUCTURE	
DESIGN DATE:	03/27/2025		
REVISION 1:	DATE	PAGE : 5	
REVISION 2:	DATE		
SCALE:	NTS		

BOX EAVE RAFTER LEAN-TO OPTIONS TYPICAL BOX EAVE RAFTER LEAN-TO OPTIONS FRAMING SECTION (BOTH OPTIONS SHOWN)			BOW RAFTER LEAN-TO OPTIONS TYPICAL BOW RAFTER LEAN-TO OPTIONS FRAMING SECTION			This item has been digitally signed and sealed by Richard E. Walker, P.E. on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.
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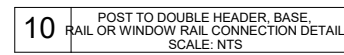
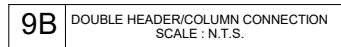
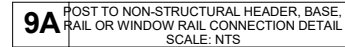
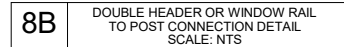
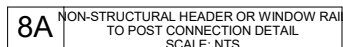
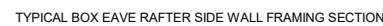
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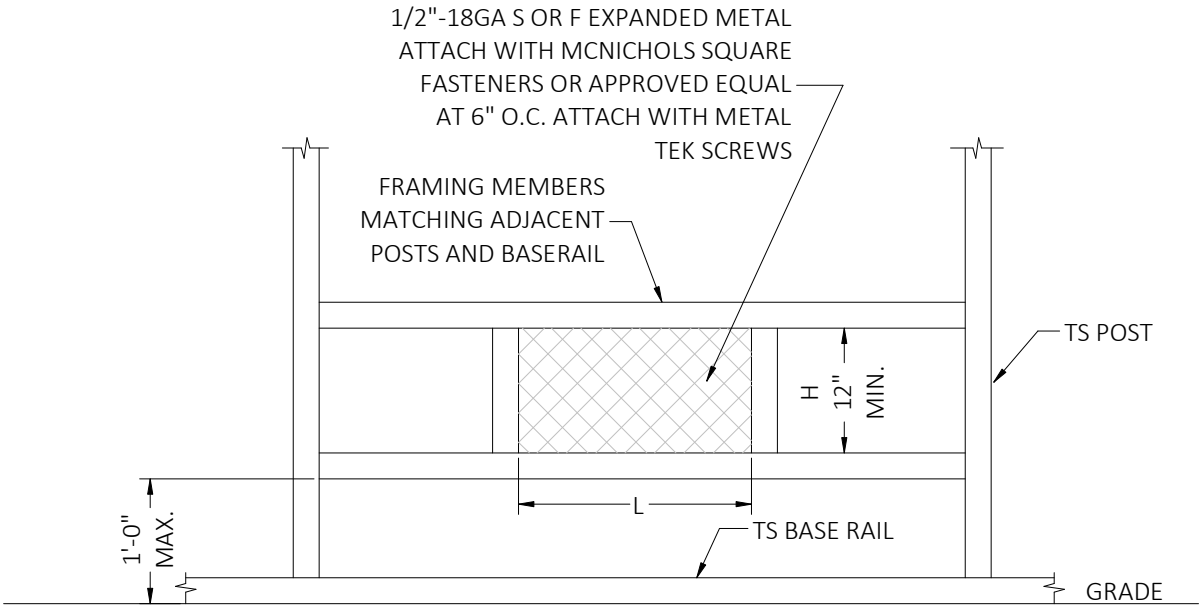
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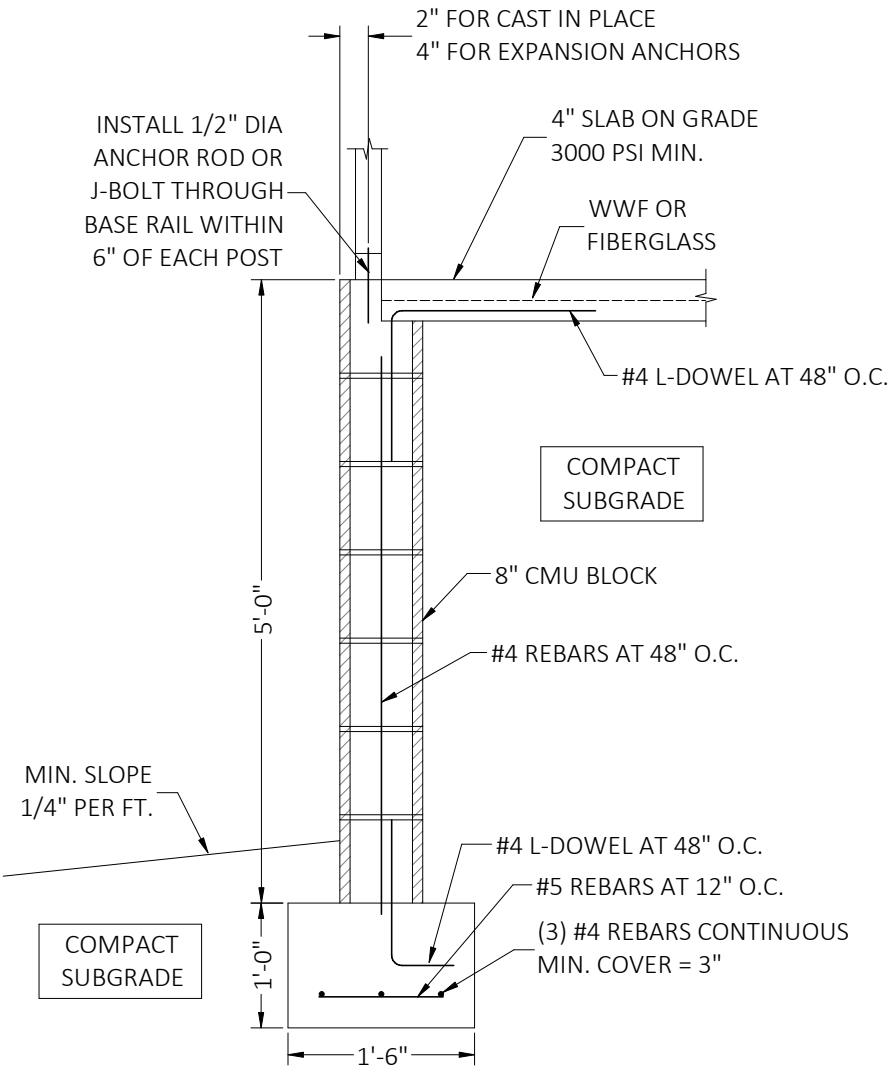


TYPICAL FLOOD VENT DETAIL

CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS:
CONTRACTOR TO VERIFY THAT THE FINISHED FLOOR ELEVATION FOR THE PROPOSED STRUCTURE IS AT OR ABOVE THE GREATER OF THE FOLLOWING ELEVATIONS:
I) BFE (BASE FLOOD ELEVATION) + 2’-0”
II) DFE (DESIGN FLOOD ELEVATION)
III) THE MINIMUM ELEVATION MANDATED BY THE BUILDING CODES ADOPTED BY THE AUTHORITY HAVING JURISDICTION.

FLOOD VENT INSTALLATION NOTES:
1. MINIMUM VENT SPACE REQUIRED = 1 SQ. IN. OF OPEN VENT AREA PER SQ. FT. OF ENCLOSED AREA.
2. PROVIDE A MINIMUM OF TWO OPENINGS ON DIFFERENT SIDES OF EACH ENCLOSED AREA.
3. APPLY A 1.3 FACTOR WHEN CALCULATING TOTAL OPEN AREA WHEN USING 1/2\"/>

FLOOD SOLUTIONS STATIC FLOOD VENTS FL #17588.1-R4				
VENT MODEL	VENT SIZE (WIDHT x HEIGHT) (in.)	ROUGH OPENING SIZE (Width x Height) (in.)	ENCLSOED AREA COVERAGE (sq. ft.)	NET FREE AREA (sq. in.)
FS-1608	18 ¹ / ₂ " X 10 ¹ / ₂ "	16 X 8	97	80.7
FS-1616	18 ¹ / ₂ " X 18 ¹ / ₂ "	16 X 16	191	158.2
FS-1412	17 ¹ / ₂ " X 14 ¹ / ₂ "	14 ¹ / ₂ " X 12"	129	106.7
FS-1608-HEX	18 ¹ / ₂ " X 10 ¹ / ₂ "	16 X 8	110	91.4



STAND-ALONE CONCRETE MASONRY UNIT (CMU)
FOUNDATION STEM WALL DETAIL

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CA CERT. #30782

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LAKE CITY, FL 32025

PROJECT DESCRIPTION:

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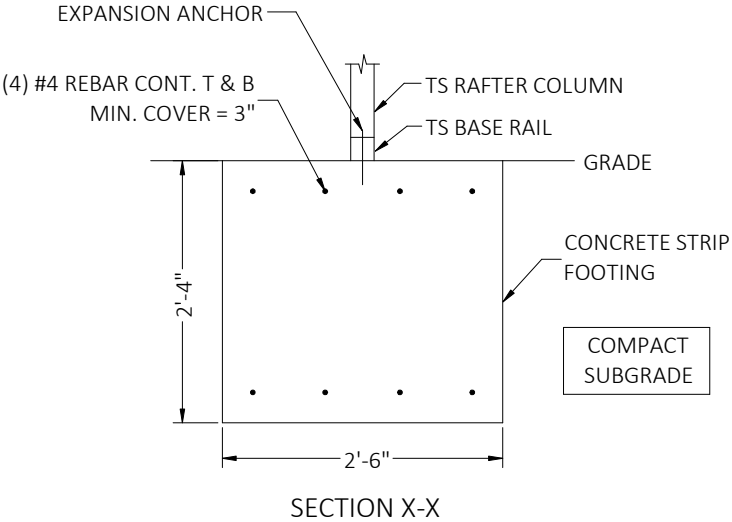
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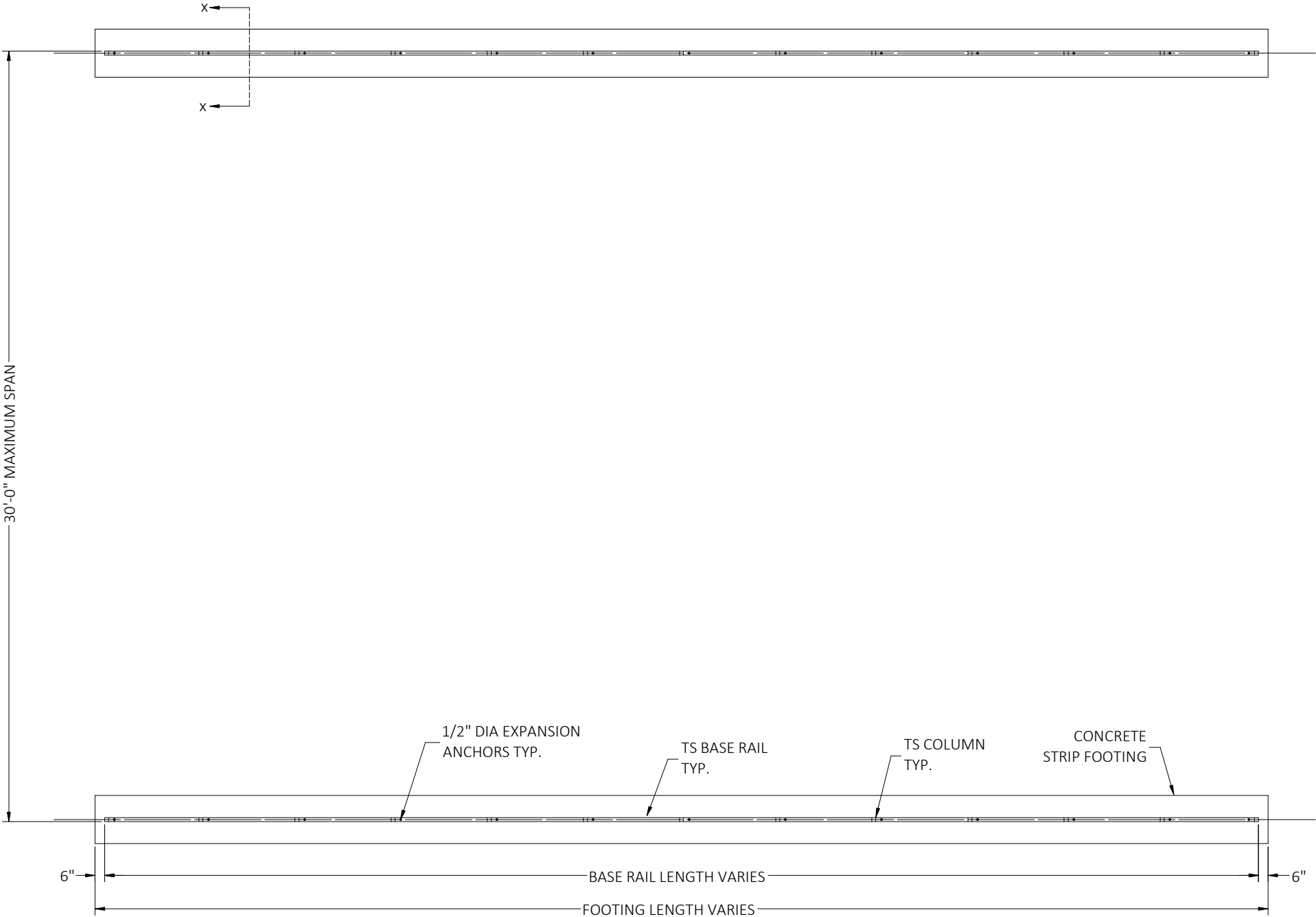
GENERAL NOTES
CONCRETE MONOLITHIC SLAB DESIGN IS BASED ON A MINIMUM SOIL BEARING CAPACITY OF 1500 PSF.

CONCRETE
MINIMUM 28-DAY SPECIFIED COMPRESSIVE STRENGTH = 3000 PSI

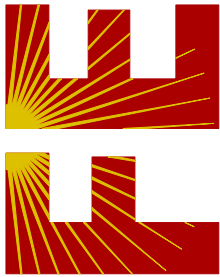
- REINFORCING STEEL
1. TURNDOWN REINFORCING STEEL = ASTM A615 GRADE 60
 2. SLAB REINFORCEMENT = WELDED WIRE FABRIC PER ASTM A185 OR FIBERGLASS FIBER REINFORCEMENT
 3. REINFORCING STEEL COVER = 3" WHERE CASE AGAINST AND PERMENENTLY EXPOSED TO SOIL OR WATER, 1.5" EVERYWHERE ELSE.
 4. REINFORCEMENT IS BENT COLD.
 5. MINIMUM INSIDE DIAMETER OF BEND = (6) BAR DIAMETERS
 6. REINFORCEMENT PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE FIELD BENT.



OPTIONAL CONCRETE STRIP FOOTING



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