

APPLICABLE CODES AND STANDARDS

1. 2023 FLORIDA BUILDING CODE, BUILDING
2. 2023 FLORIDA BUILDING CODE, RESIDENTIAL
3. ASCE 7-22, MINIMUM DESIGN LOADS ON BUILDINGS AND OTHER STRUCTURES
4. AISC STEEL CONSTRUCTION MANUAL (15TH EDITION)
5. ACI 318-19, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
6. TMS 402-16, BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES
7. AWS D1.1: STRUCTURAL WELDING

DESIGN LOADS

1. DEAD LOAD = 1.5 PSF
  2. ROOF LIVE LOAD = 12 PSF
  3. WIND LOAD
  - A. RISK CATEGORY = I
  - B. WIND EXPOSURE CATEGORY = C
  - C. ULTIMATE WIND SPEED = 110 MPH TO 140 MPH
- NOMINAL WIND SPEED = 86 MPH TO 108 MPH

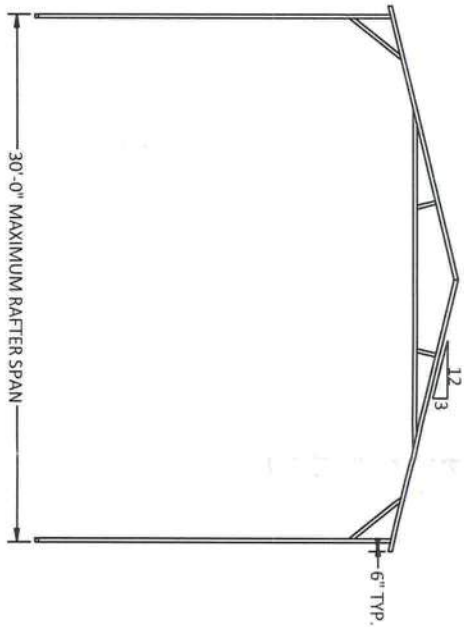
INSTALLATION NOTES AND SPECIFICATIONS

1. THESE PLANS BELONG EXCLUSIVELY TO THE STRUCTURE, INCLUDING MAIN WIND FORCE RESISTING SYSTEM (MWFRS), COMPONENTS AND CLADDING (C&C), AND BASE RAIL ANCHORAGE. OTHER DESIGN ISSUES, INCLUDING BUT NOT LIMITED TO PROPERTY SET-BACKS, ELECTRICAL, PLUMBING, INGRESS/EGRESS, FINISH FLOOR SLOPES AND ELEVATIONS, OR OTHER LOCAL ZONING REQUIREMENTS ARE THE LIABILITY OF OTHERS.
2. THESE STRUCTURES ARE ENGINEERED AS CAPABLE OF SUPPORTING DEAD LOAD OF THE STRUCTURE AND LIVE AND WIND LOADS. UPGRADES NOT SPECIFICALLY ADDRESSED HEREIN, SUCH AS WINDOWS, DOORS, OR ANOTHER COMPONENT NOT LISTED IN THE BUILDING CODE APPROVED PRODUCT LIST, AND NOT PROVIDED AND INSTALLED BY THE CONTRACTOR, WHICH CAUSE ADDITIONAL LOADS ON THE STRUCTURE SHALL BE AT THE OWNER'S RISK. THE ENGINEER SHALL NOT BE RESPONSIBLE FOR FAILURE OR STRUCTURAL DAMAGE DUE TO THE EXTRA LOAD.
3. ALL STEEL TUBING SHALL BE 50 KSI GALVANIZED STEEL. ALL FASTENERS SHALL BE ZINC COATED HARDWARE.
4. END WALL COLUMNS (POST) AND SIDE WALL COLUMNS ARE EQUIVALENT IN SIZE AND SPACING U.N.O.
5. SPECIFICATIONS APPLICABLE TO 29 GA METAL PANELS FASTENED DIRECTLY TO 2.5"x2.5"x14 GA TUBE STEEL (TS) FRAMING MEMBERS FOR VERTICAL PANELS. 29 GA METAL PANELS SHALL BE FASTENED DIRECTLY TO 18 GA HAT CHANNELS U.N.O.
6. AVERAGE FASTENER SPACING ON-CENTERS ALONG RAFTERS OR PURLINS, AND POSTS, INTERIOR = 9" AND END = 6" MAX.
7. FASTENERS CONSIST OF #12-14X3/4" SELF-DRILLING SCREWS (SDS), USE CONTROL SEAL WASHER WITH EXTERIOR FASTENERS. SPECIFICATIONS APPLICABLE ONLY FOR MEAN ROOF HEIGHT OF 20'-0" OR LESS, AND ROOF SLOPES OF 14° (3:12 PITCH) OR LESS. SPACING REQUIREMENTS FOR OTHER ROOF HEIGHTS AND/OR SLOPES MAY VARY.
8. ANCHORS SHALL BE INSTALLED THROUGH THE BASE RAIL WITHIN 6" OF EACH RAFTER COLUMN ALONG SIDES AND ENDS.
9. STANDARD GROUND ANCHORS (SOIL NAILS) CONSIST OF #4 REBARS WITH WELDED NUT X 36" LONG AND MAY BE USED IN SUITABLE SOILS. OPTIONAL ANCHORAGE MAY BE USED IN SUITABLE SOILS AND MUST BE USED IN UNSUITABLE SOILS AS NOTED. SOIL NAILS MAY BE USED FOR WIND SPEEDS LESS THAN OR EQUAL TO 145 MPH.
10. RAFTER SPACING IS 5'-0" MAX.
11. PURLIN SPACING IS 4'-0" MAX.
12. WIND FORCES GOVERN OVER SEISMIC FORCES. SEISMIC PARAMETERS ANALYZED ARE:  
SOIL SITE CLASS = D  
RISK CATEGORY I  
R = 3.25     $I_e = 1.0$      $S_{ds} = 0.087 g$      $V = CSW$      $S_{d1} = 0.084 g$

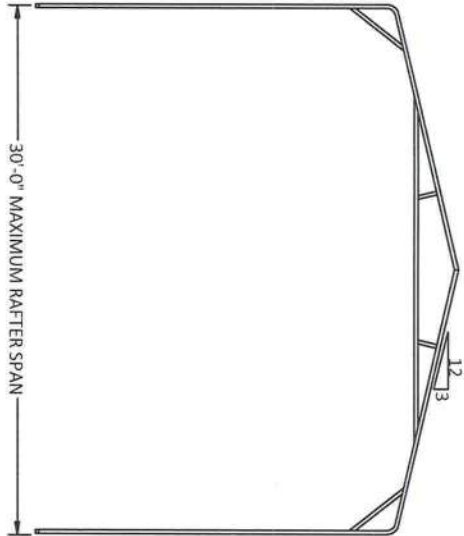
DRAWING INDEX

PAGE NO.	DESCRIPTION
1	TITLE PAGE WITH INDEX
2	TRUSS DESIGN FOR RAFTER SPAN
3	CONNECTION DETAILS (1-2)
4	BASE RAIL AND FOUNDATION ANCHORAGE
5	RAFTER END WALL, SIDE WALL AND OPENING FRAMING
6	CONNECTION DETAILS (4-14)
7	BOX EAVE RAFTER LEAN-TO OPTIONS
8	CONNECTION DETAILS (16-18)
9	BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION
10	OPTIONAL HELICAL ANCHORING ON GRADE DETAIL
11	OPTIONAL CONCRETE STRIP FOOTING
12	OPTIONAL HELICAL ANCHORING ON TIMBER BEAM DETAIL
13	FLOOD VENT REQUIREMENT/DETAIL

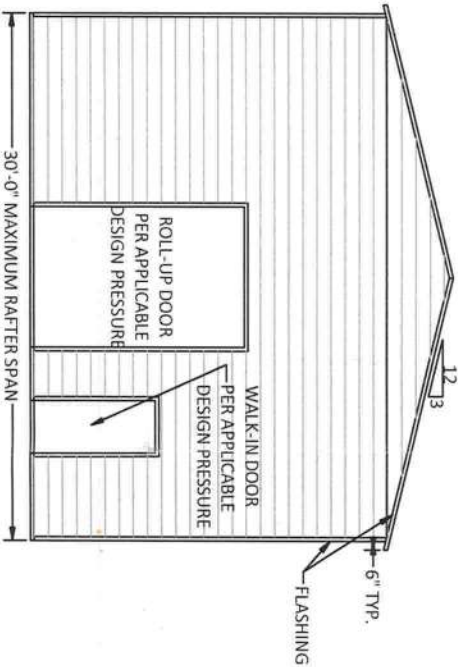
PARTIALLY ENCLOSED (UTILITY) METAL BUILDING DESIGN  
MAXIMUM 30'-0" WIDE X 100'-0" LONG X 20'-0" HIGH (EAVE)  
BOX EAVE FRAME / BOW EAVE FRAME



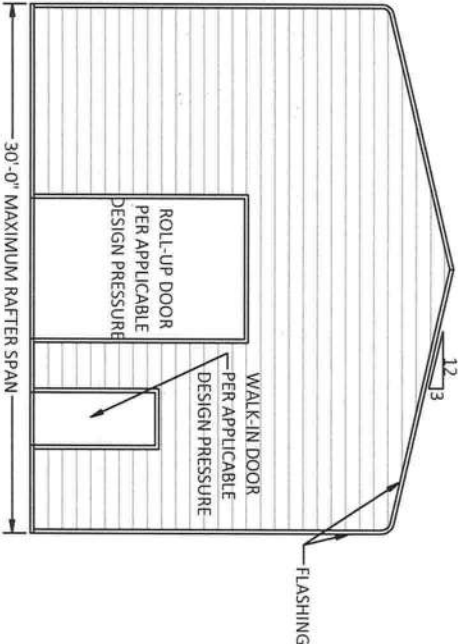
TYPICAL END ELEVATION - BOX EAVE



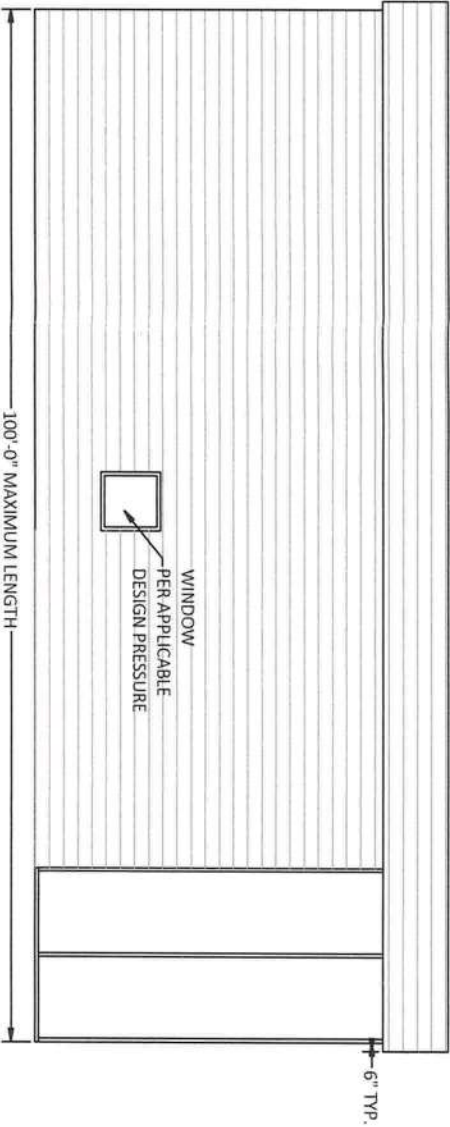
TYPICAL END ELEVATION - BOW EAVE



TYPICAL END ELEVATION - BOX EAVE



TYPICAL END ELEVATION - BOW EAVE



TYPICAL SIDE ELEVATION - HORIZONTAL ROOF

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CA CERT. #30782

Richard E. Walker, P.E. #61240  
DATE: 01/15/2024

CONTRACTOR:  
STEEL BUILDINGS AND  
STRUCTURES INC.  
800PIEDMONT TRIAD WEST DR.,  
MOUNT AIRY, NC 27030

PROJECT ADDRESS:  
12'-30' WIDE ENCLOSED

DESIGN DATE: 01/15/2024

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DRAWN BY: SK

SCALE: NTS

SHEET: 1 OF 13

PROJECT NO. 2401113



MEMBER LEGEND:	
1. SIDEWALL TS COLUMN = 2.5X2.5X14 GA U.N.O.	
2. SIDEWALL TS DOUBLE COLUMN = (2)2.5X2.5X14 GA U.N.O.	
3. TRUSS MEMBERS = 2.5X2.5X14 GA U.N.O.	
4. KNEE-BRACE = 2.5"X2"X18GA CHANNEL	
5. PURLIN = 1.125"X18GA HAT CHANNEL	
6. U-BRACE = 2.5"X2"X16GA CHANNEL	
7. ENDWALL COLUMN:	
MAX. EAVE HEIGHT	END WALL COLUMN DIMENSIONS
20'	(2) 2.5X2.5X14 GA
14'	2.5X2.5X14 GA

TRUSS LAYOUT- BOX EAVE

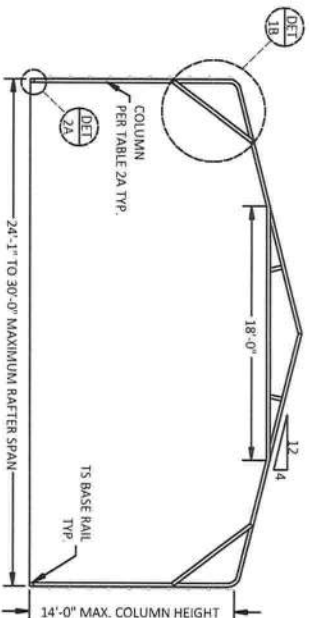
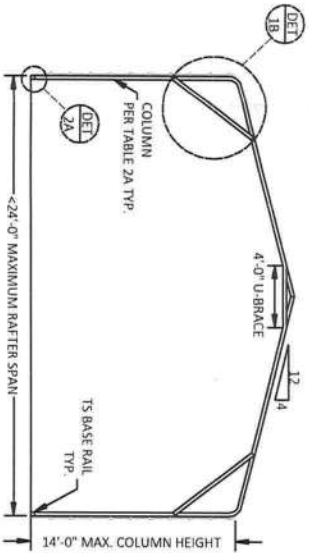
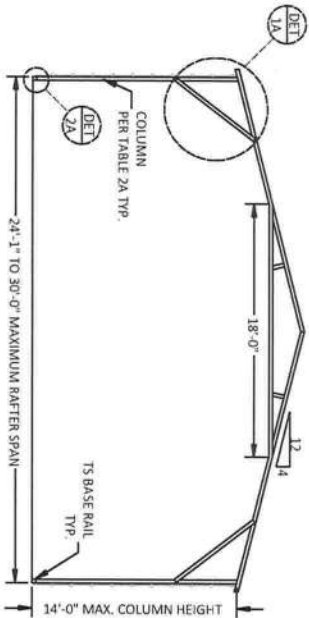
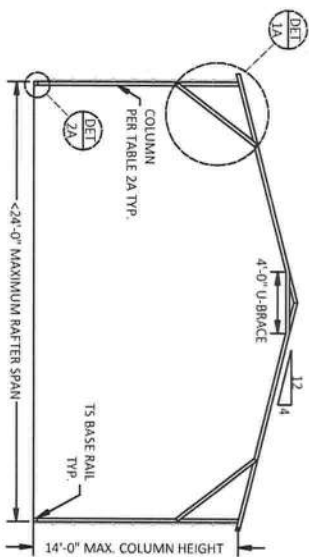
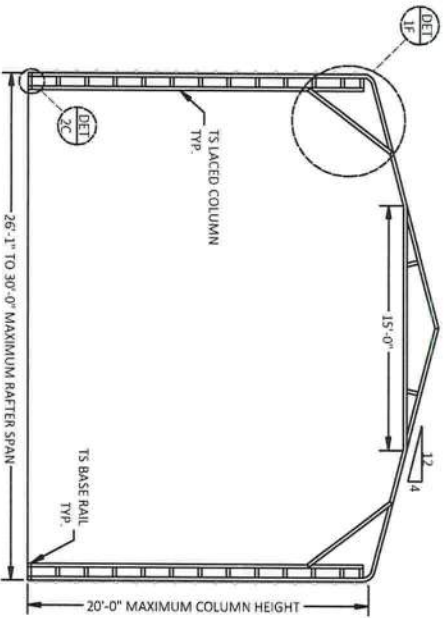
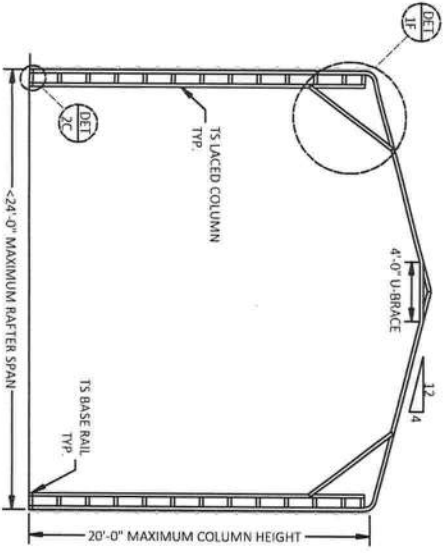
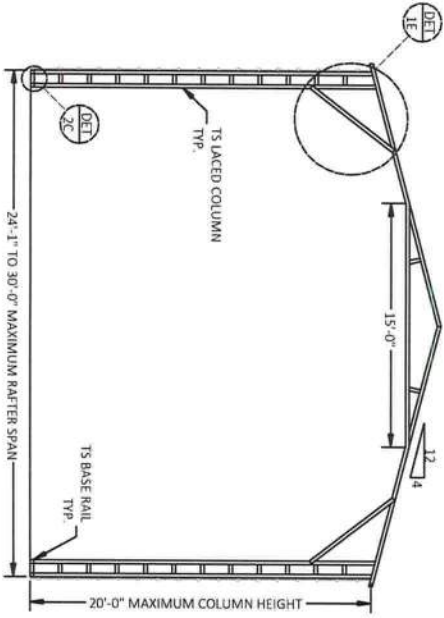
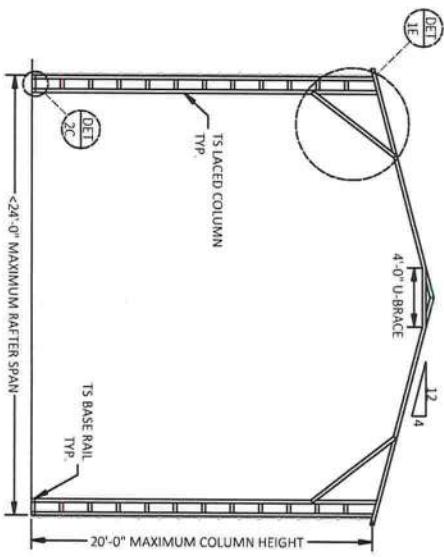
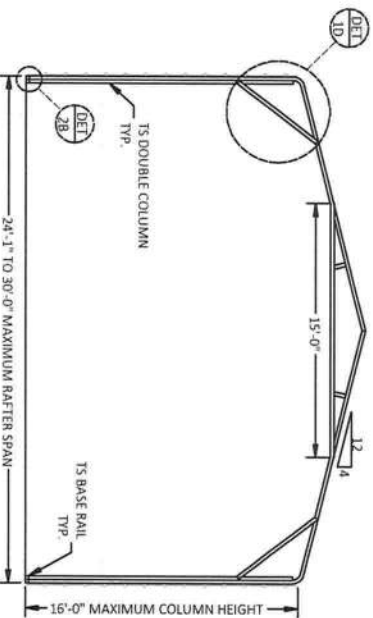
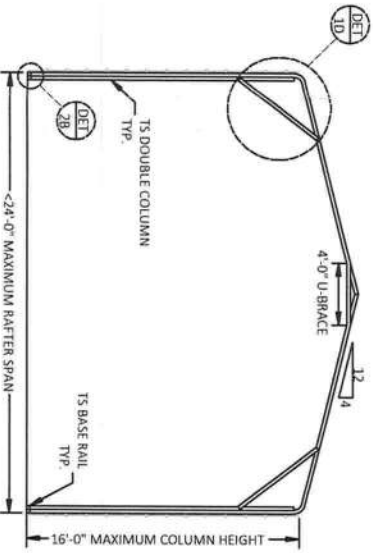
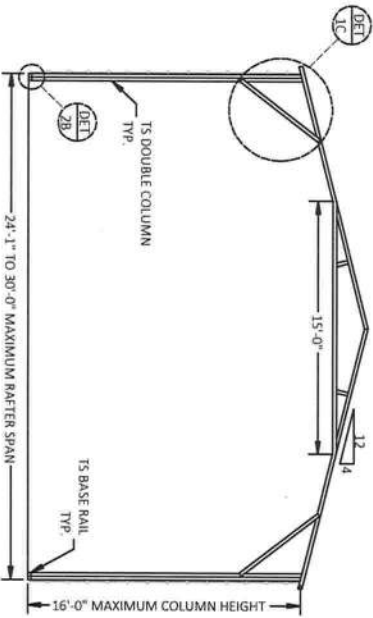
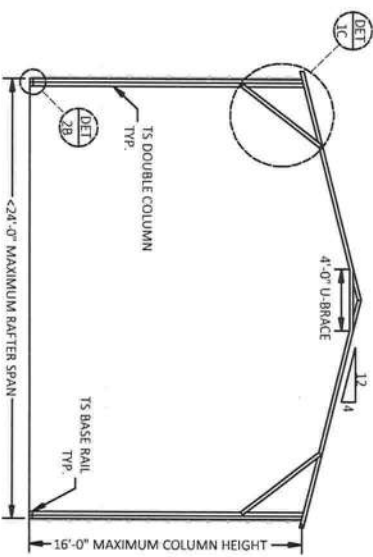


TABLE 2A:	
FOR COLUMN HEIGHT OF MAX. 14'-0"	
BUILDING LENGTH	COLUMN DIMENSIONS
<= 60'-0"	ALL COLUMNS TO BE 2.5X2.5X14 GA
60'-1" TO 100'-0"	(N-10) CENTRAL COLUMNS TO BE (2)2.5X2.5X14 GA
	REST 2.5X2.5X14 GA

\*N = NO. OF COLUMNS PER SIDE ELEVATION



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2 OF 13	



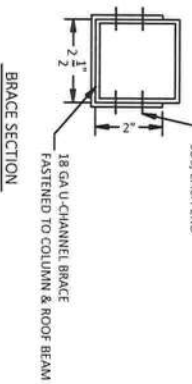
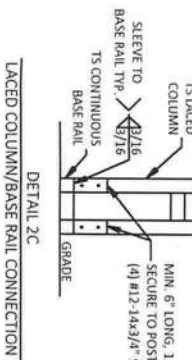
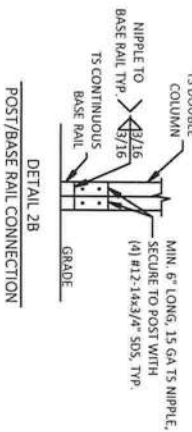
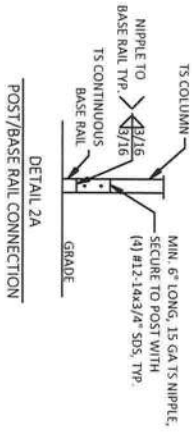
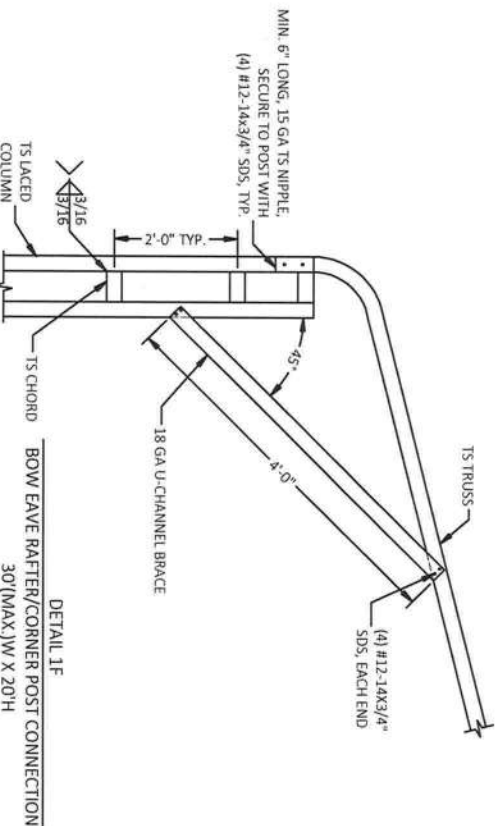
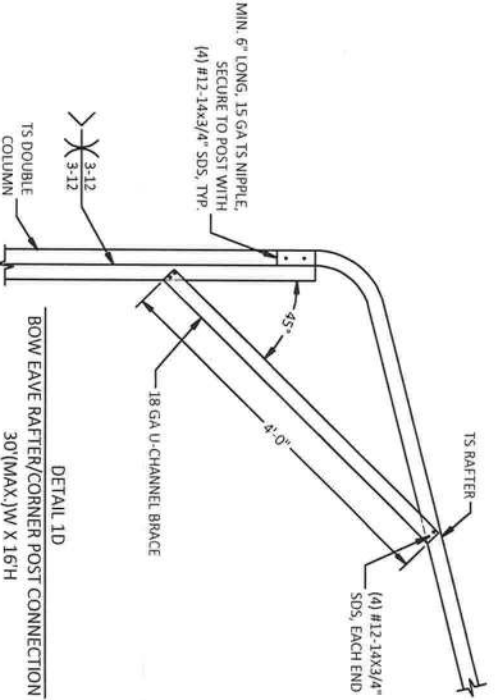
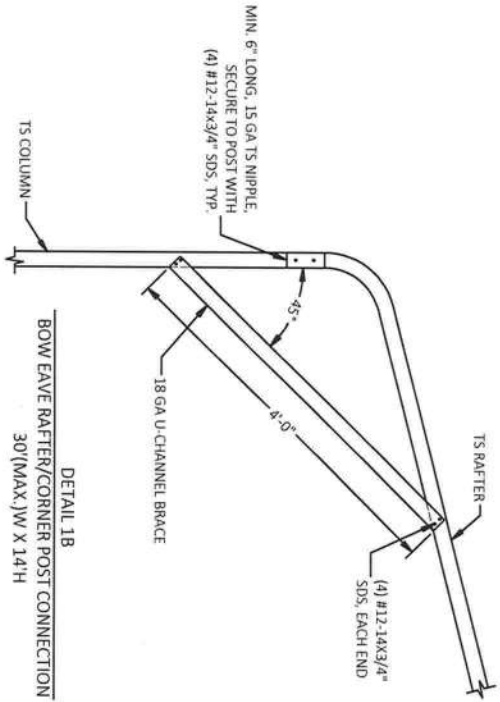
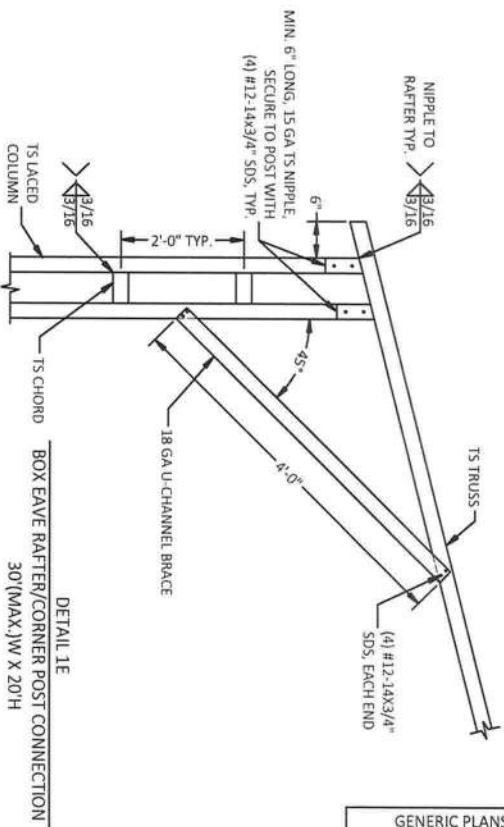
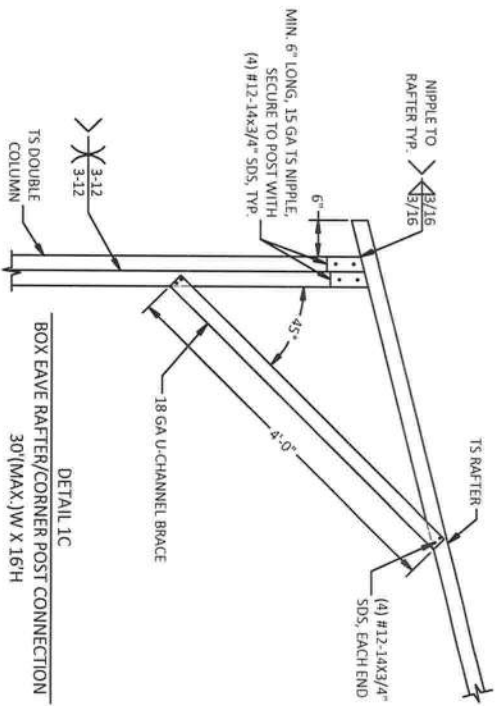
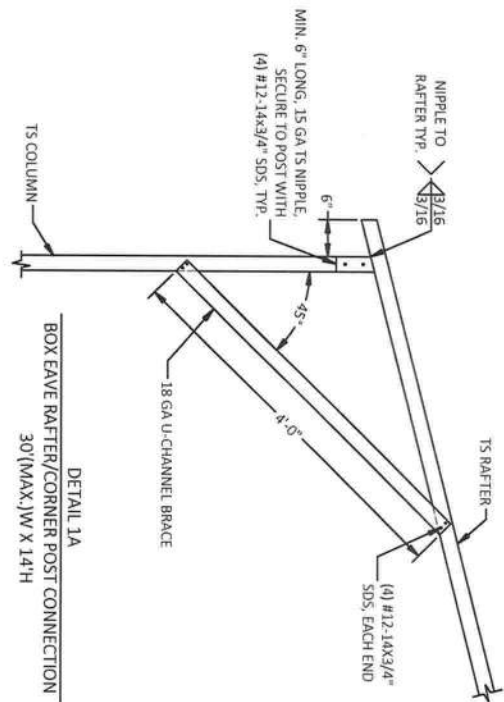
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Richard E. Walker, P.E. #61240

DATE: 01/15/2024



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3 OF 13



GENERAL NOTES:  
CONCRETE MONOLITHIC SLAB DESIGN IS BASED ON A MINIMUM SOIL BEARING CAPACITY OF 2500 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 PERMANENTLY 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.

HELIX ANCHOR NOTES

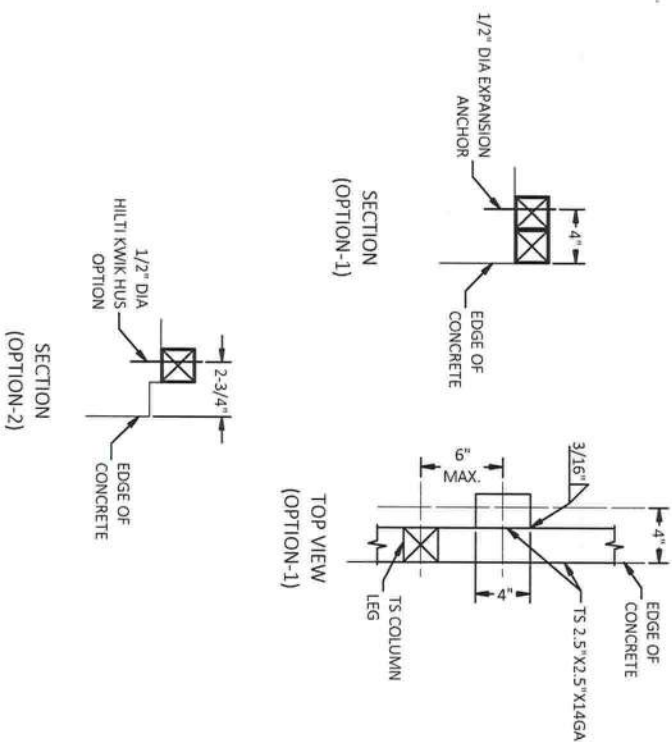
1. FOR VERY DENSE AND/OR CEMENTED SANDS, COARSE GRAVEL, AND COBBLES, CALICHE, PRELOADED SILTS AND CLAYS, CORALS, MEDIUM DENSE COARSE SANDS, SANDY GRAVELS, VERY STIFF SILTS AND CLAYS, USE MINIMUM (2) 4" HELICES WITH MINIMUM 30" EMBEDMENT EVERY 10'.
2. FOR MEDIUM TO VERY LOOSE DENSE SANDS, FIRM TO STIFF CLAYS AND SILTS, ALLUVIAL FILL, USE MINIMUM (2) 4" HELICES WITH MINIMUM 30" EMBEDMENT EVERY 5' OR EVERY POST (LEG).
3. THE UPLIFT/BEARING CAPACITY OF EACH ANCHOR MUST BE EQUAL TO OR GREATER THAN 8.5 KIPS.

HP 9 BARBED DRIVE ANCHOR NOTES

1. ANCHOR TO BE 3/4" DIA (A529 GRADE 50) WITH 30" MIN. EMBEDMENT & (4) MIN. BARBS AS SHOWN IN DETAIL 3C.
2. FOR VERY DENSE AND/OR CEMENTED SANDS, COARSE GRAVEL, AND COBBLES, CALICHE, PRELOADED SILTS AND CLAYS, CORALS, MEDIUM DENSE COARSE SANDS, SANDY GRAVELS, VERY STIFF SILTS AND CLAYS, MAXIMUM SPACING TO BE 10'.
2. FOR MEDIUM TO VERY LOOSE DENSE SANDS, FIRM TO STIFF CLAYS AND SILTS, ALLUVIAL FILL, MAX. SPACING TO BE 5' OR EVERY POST (LEG).
3. THE UPLIFT/BEARING CAPACITY OF EACH ANCHOR MUST BE EQUAL TO OR GREATER THAN 8.5 KIPS.

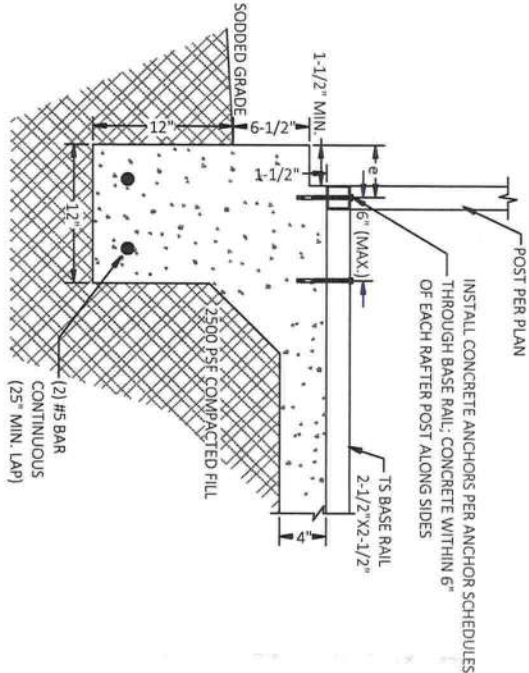
ANCHOR SCHEDULES:

ANCHOR TYPE #1	1/2" DIA WEDGE ANCHOR WITH 5" MIN. EMBEDMENT INTO 3KSI MIN. CONCRETE; 4" MIN. EDGE DISTANCE (e)
ANCHOR TYPE #2	1/2" DIA HILTI KWIK HUS ANCHOR WITH 4.5" MIN. EMBEDMENT INTO 3KSI MIN. CONCRETE; 2.75" MIN. EDGE DISTANCE (e)

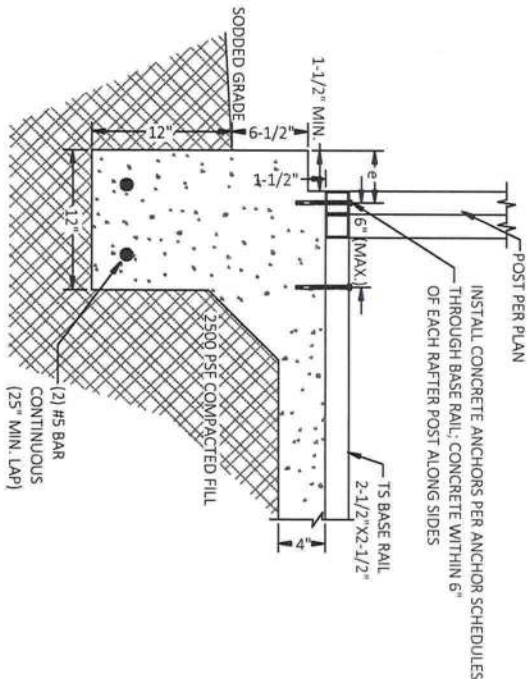


TYPICAL ANCHOR DETAIL WHEN BASE RAIL IS NEAR EDGE OF CONCRETE

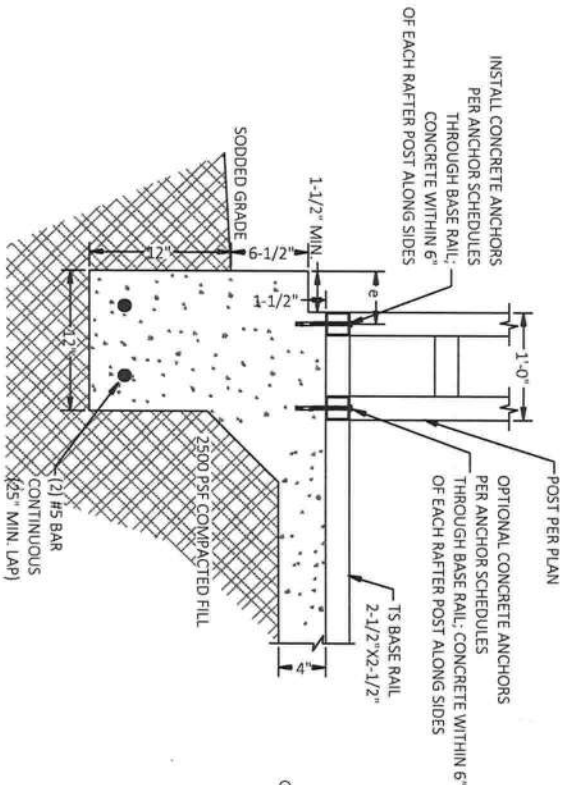
BASE RAIL ANCHORAGE OPTION



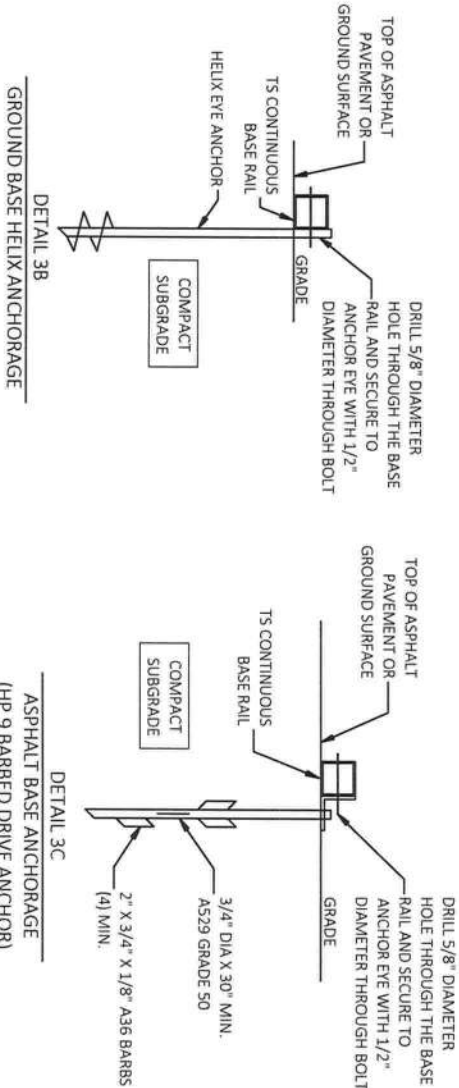
DETAIL 3A-I  
CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE



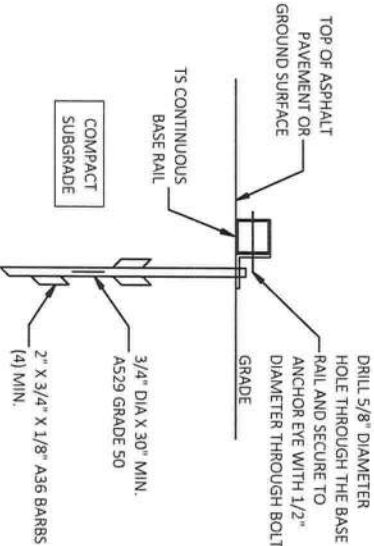
DETAIL 3A-II  
CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE



DETAIL 3A-III  
CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE



DETAIL 3B  
GROUND BASE HELIX ANCHORAGE



DETAIL 3C  
ASPHALT BASE ANCHORAGE  
(HP 9 BARBED DRIVE ANCHOR)

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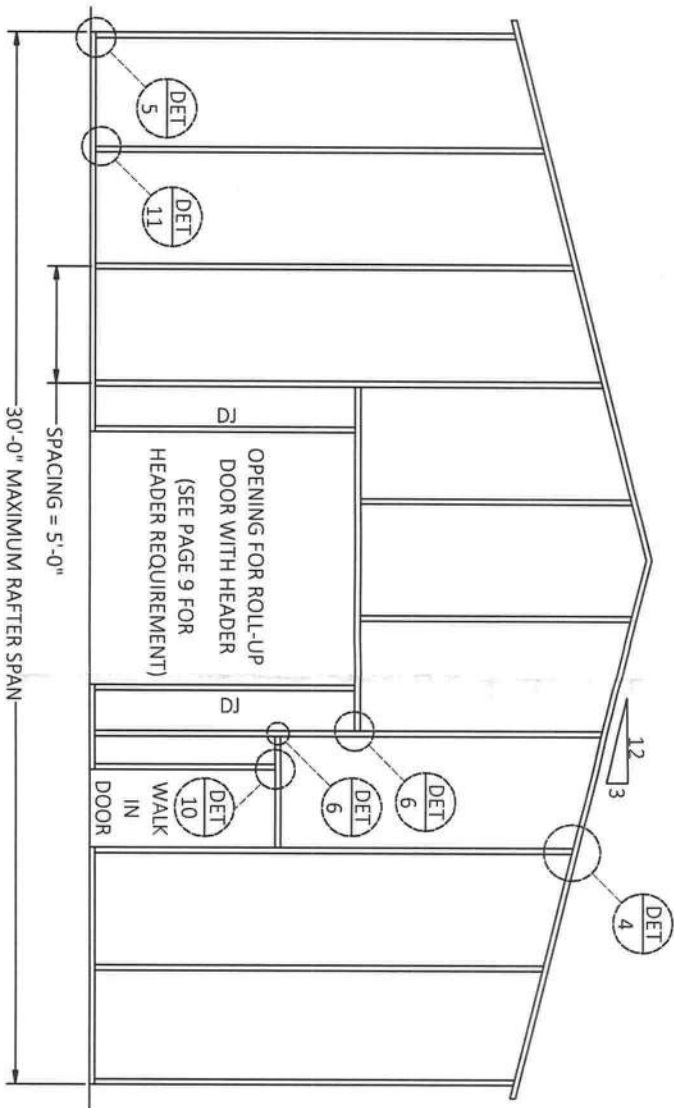
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REVISION 2: DATE SHEET: 4 OF 13

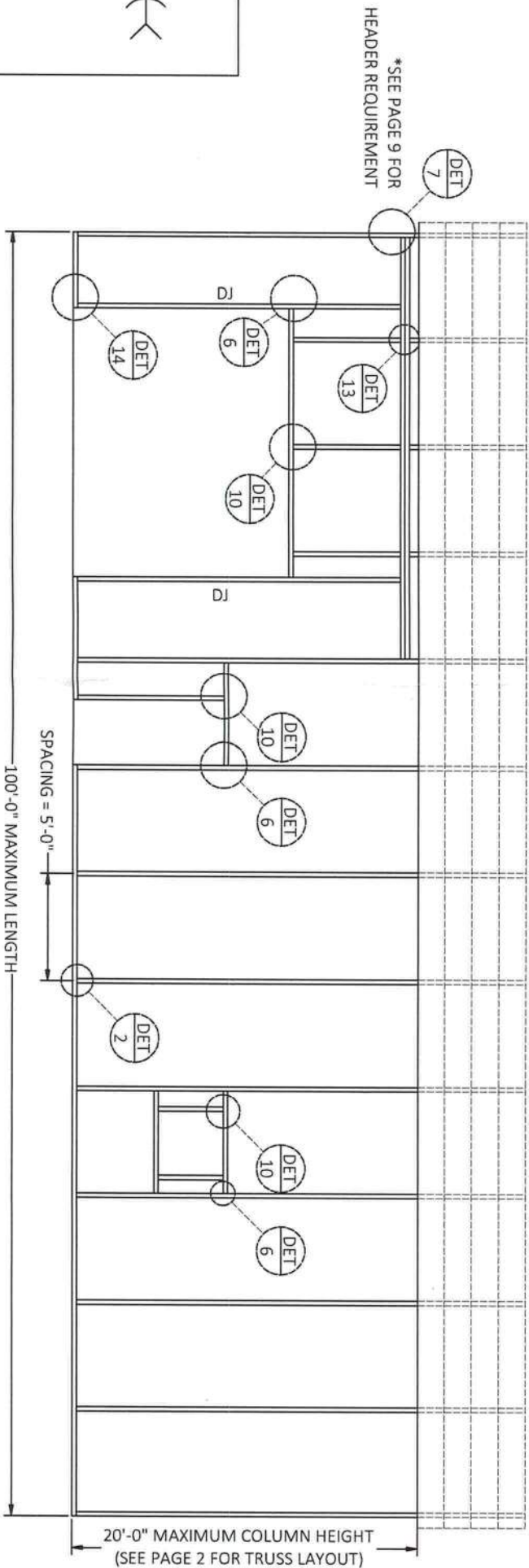
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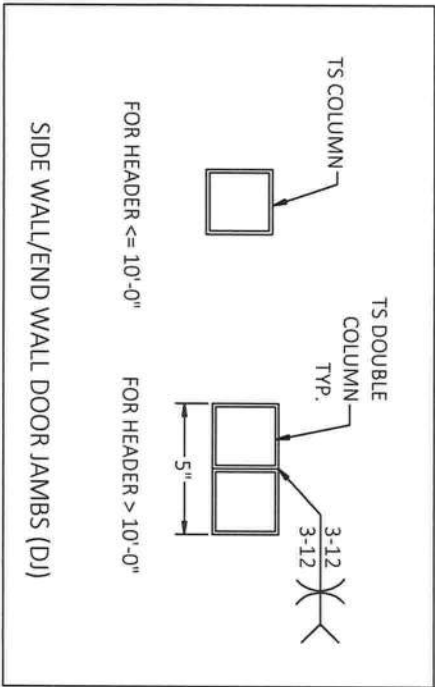




TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION



TYPICAL BOX EAVE RAFTER SIDE WALL FRAMING SECTION



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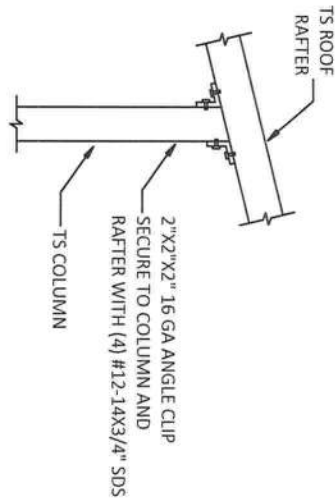
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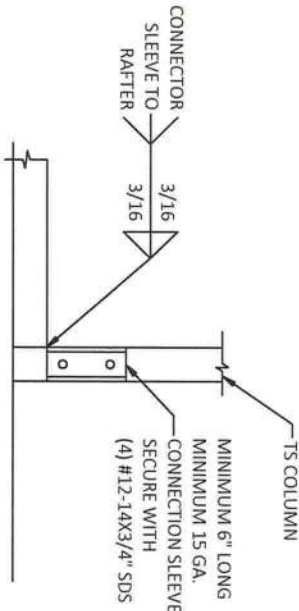
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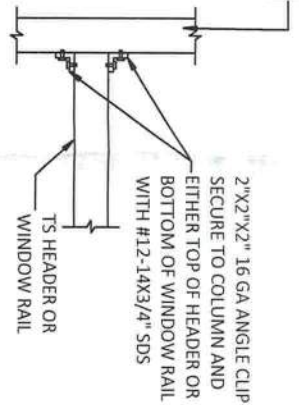
CONNECTION DETAILS



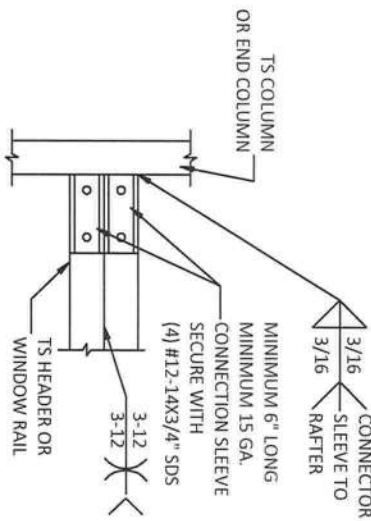
DETAIL 4  
END COLUMN/RAFTER CONNECTION



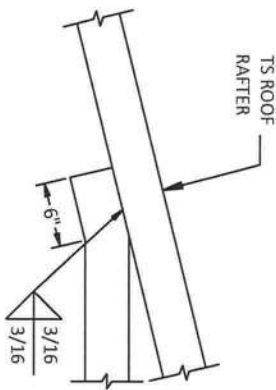
DETAIL 5  
END POST/BASE RAIL CONNECTION



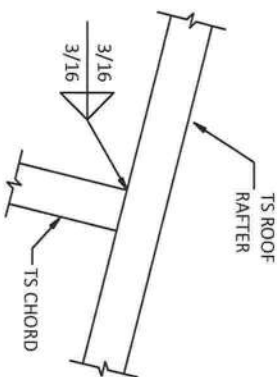
DETAIL 6  
HEADER TO COLUMN CONNECTION



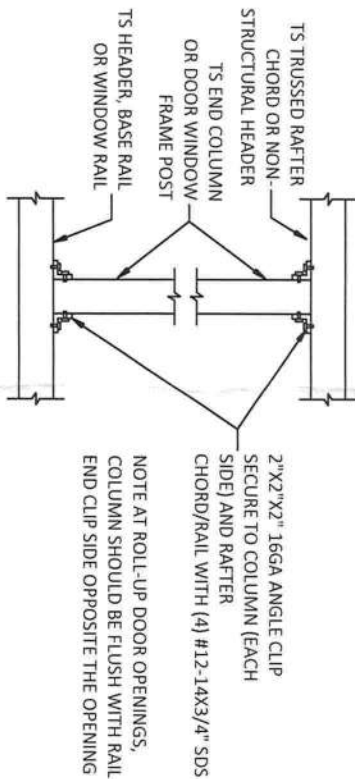
DETAIL 7  
DOUBLE HEADER TO COLUMN CONNECTION



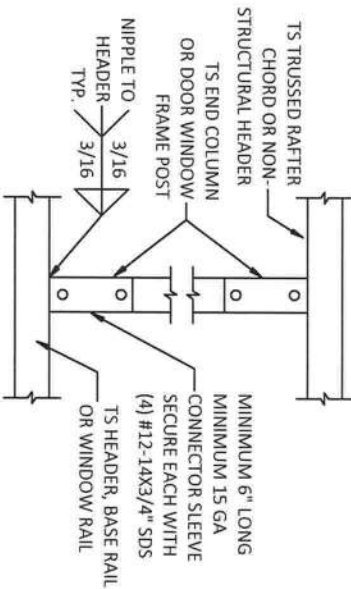
DETAIL 8  
COLLAR TIE CONNECTION



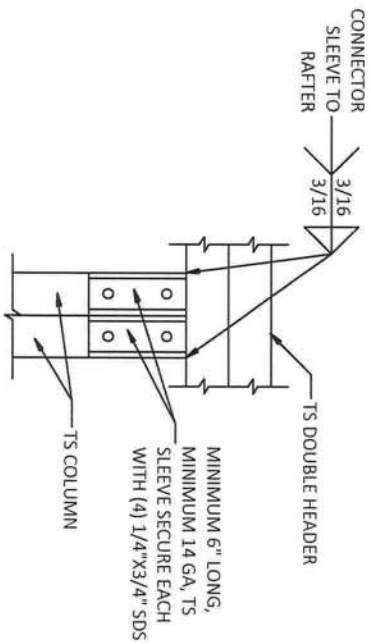
DETAIL 9  
RAFTER TO CHORD CONNECTION



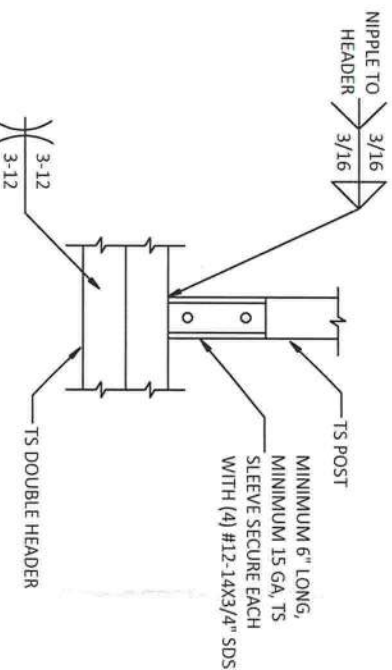
DETAIL 10  
POST TO HEADER, BASE RAIL OR WINDOW RAIL CONNECTION  
(OPTION-1)



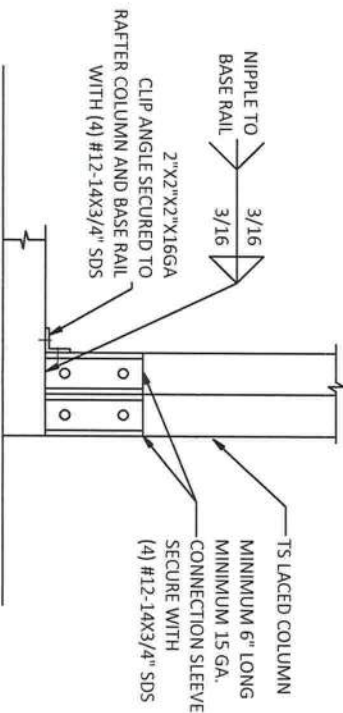
DETAIL 11  
POST TO HEADER, BASE RAIL CONNECTION  
(OPTION-2)



DETAIL 12  
DOUBLE HEADER TO COLUMN CONNECTION



DETAIL 13  
POST/DOUBLE HEADER CONNECTION



DETAIL 14  
POST/BASE RAIL CONNECTION

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PROJECT NO. 2401113

CA CERT. #30782

*Richard E. Walker*  
Richard E. Walker, P.E. #61240

DATE: 01/15/2024

CONTRACTOR:

STEEL BUILDINGS AND  
STRUCTURES INC.  
800PIEDMONT TRIAD WEST DR.,  
MOUNT AIRY, NC 27030

PROJECT ADDRESS:

12'-30' WIDE ENCLOSED

DESIGN DATE:

01/15/2024

REVISION 1:

DATE

REVISION 2:

DATE

DRAWN BY:

SK

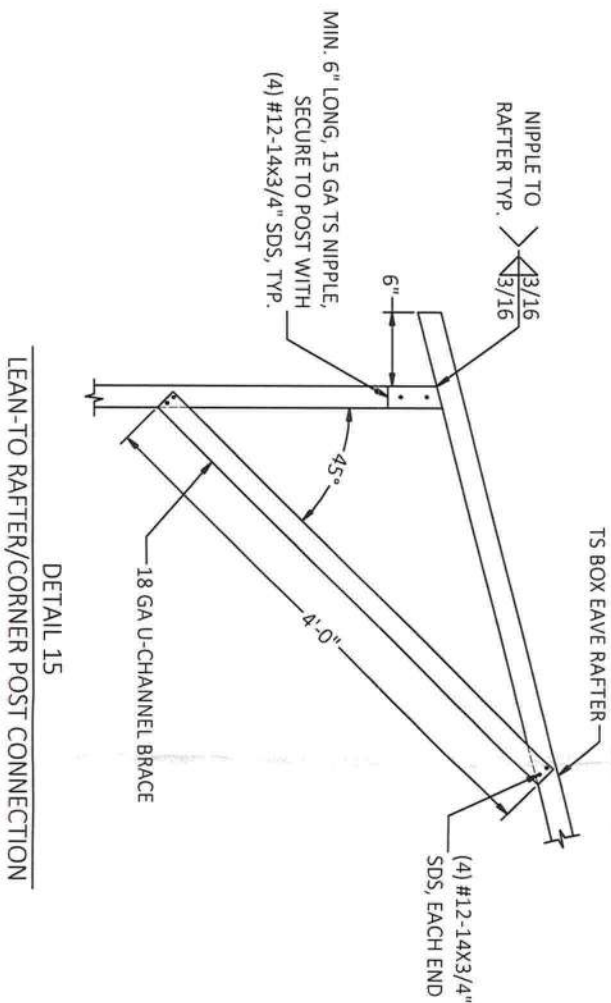
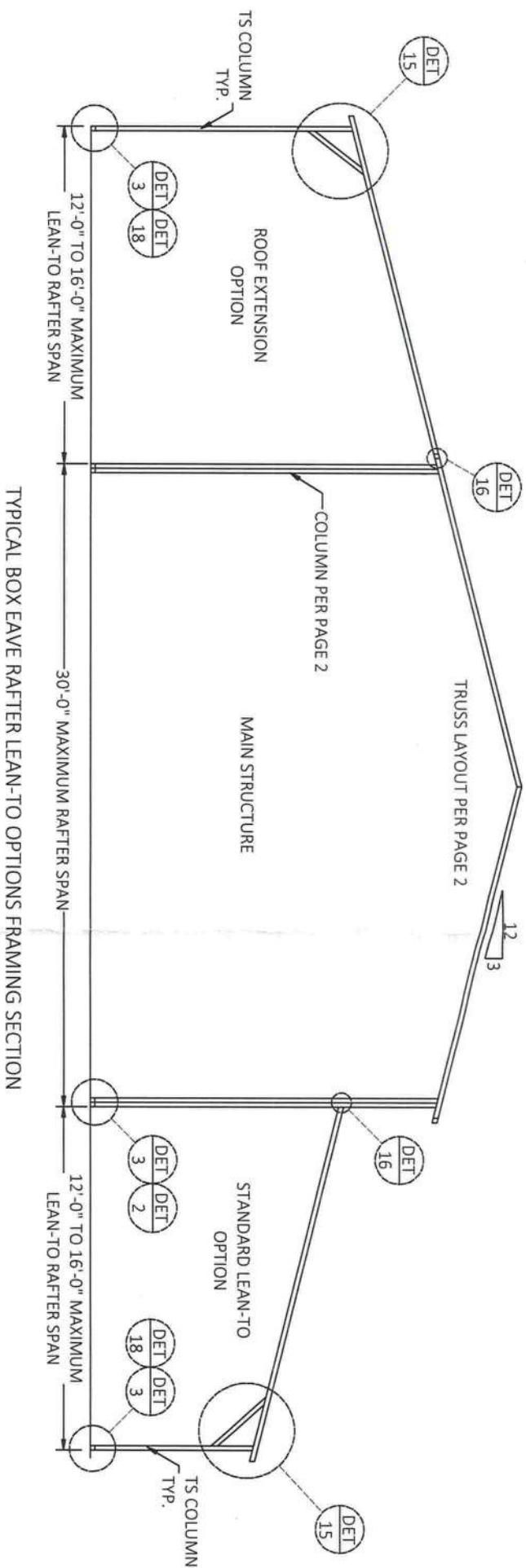
SCALE:

NTS

SHEET:

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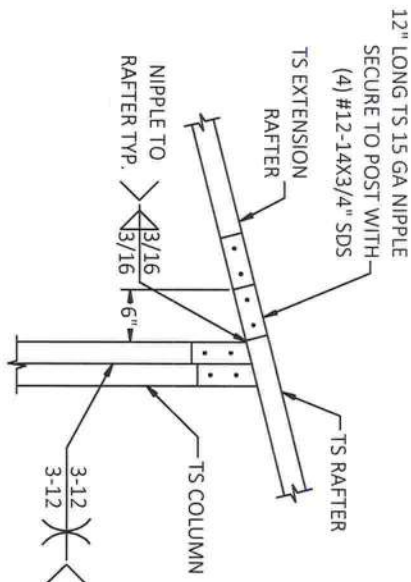
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SCALE: NTS

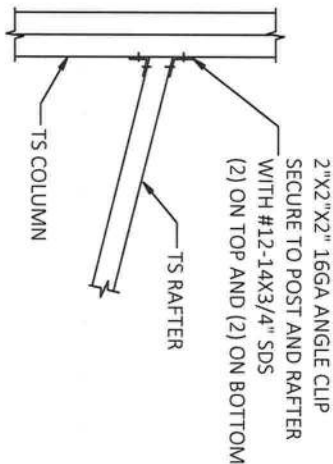
SHEET: 7 OF 13

CONNECTION DETAILS



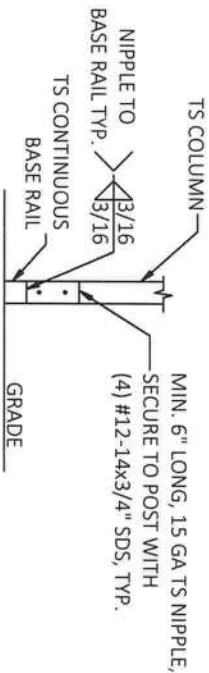
DETAIL 16A

SIDE EXTENSION RAFTER/COLUMN CONNECTION  
FOR RAFTER SPANS LESS THAN 12'-0"



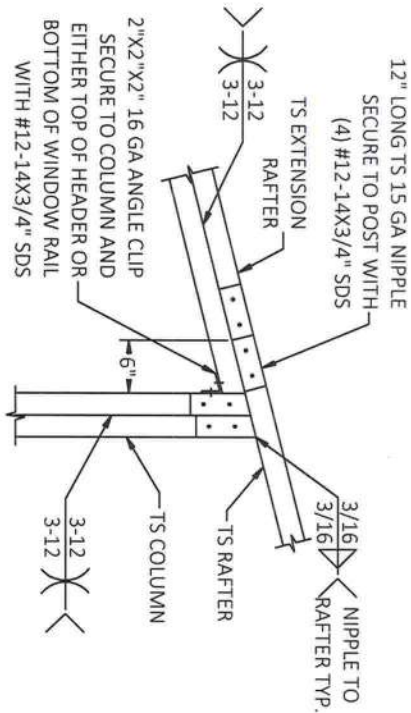
DETAIL 17A

LEAN TO RAFTER/COLUMN CONNECTION  
FOR RAFTER SPANS LESS THAN 12'-0"



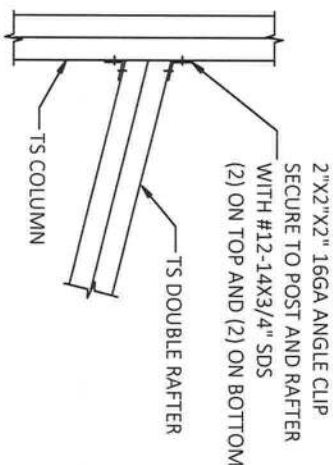
DETAIL 18A

LEAN-TO POST CONNECTION



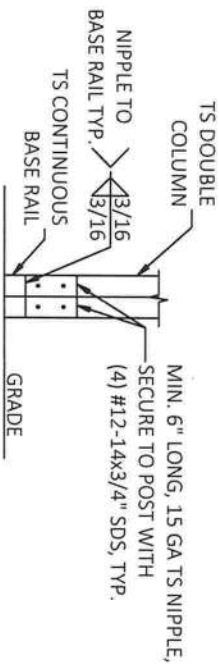
DETAIL 16B

SIDE EXTENSION RAFTER/COLUMN CONNECTION  
FOR RAFTER SPANS BETWEEN 12'-0" AND 16'-0"



DETAIL 17B

LEAN TO RAFTER/COLUMN CONNECTION  
FOR RAFTER SPANS BETWEEN 12'-0" AND 16'-0"



DETAIL 18B

LEAN-TO DOUBLE POST CONNECTION

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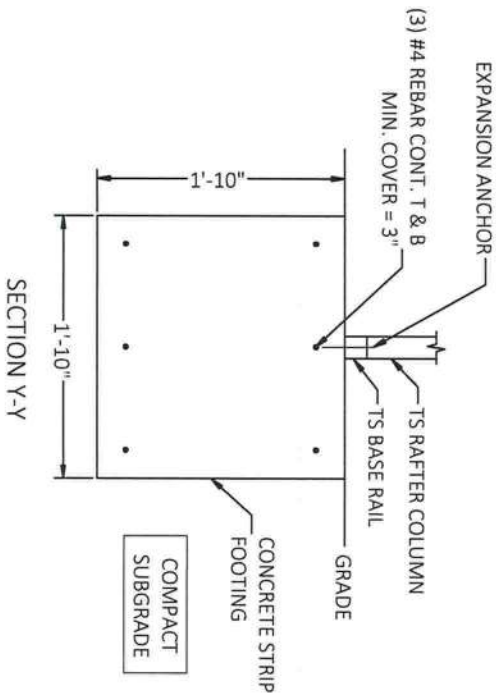


GENERAL NOTES  
CONCRETE MONOLITHIC SLAB DESIGN IS BASED ON A MINIMUM SOIL BEARING CAPACITY OF 2500 PSF.

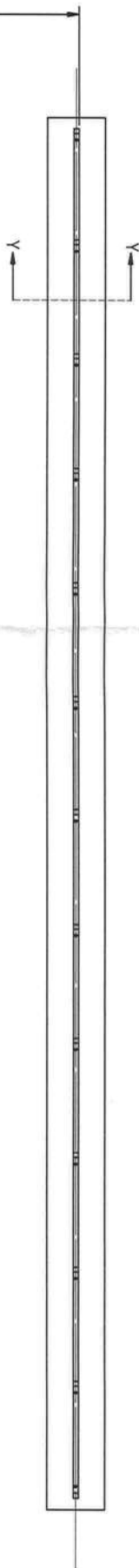
CONCRETE  
MINIMUM 28-DAY SPECIFIED COMPRESSIVE STRENGTH = 3000 PSI

REINFORCING STEEL

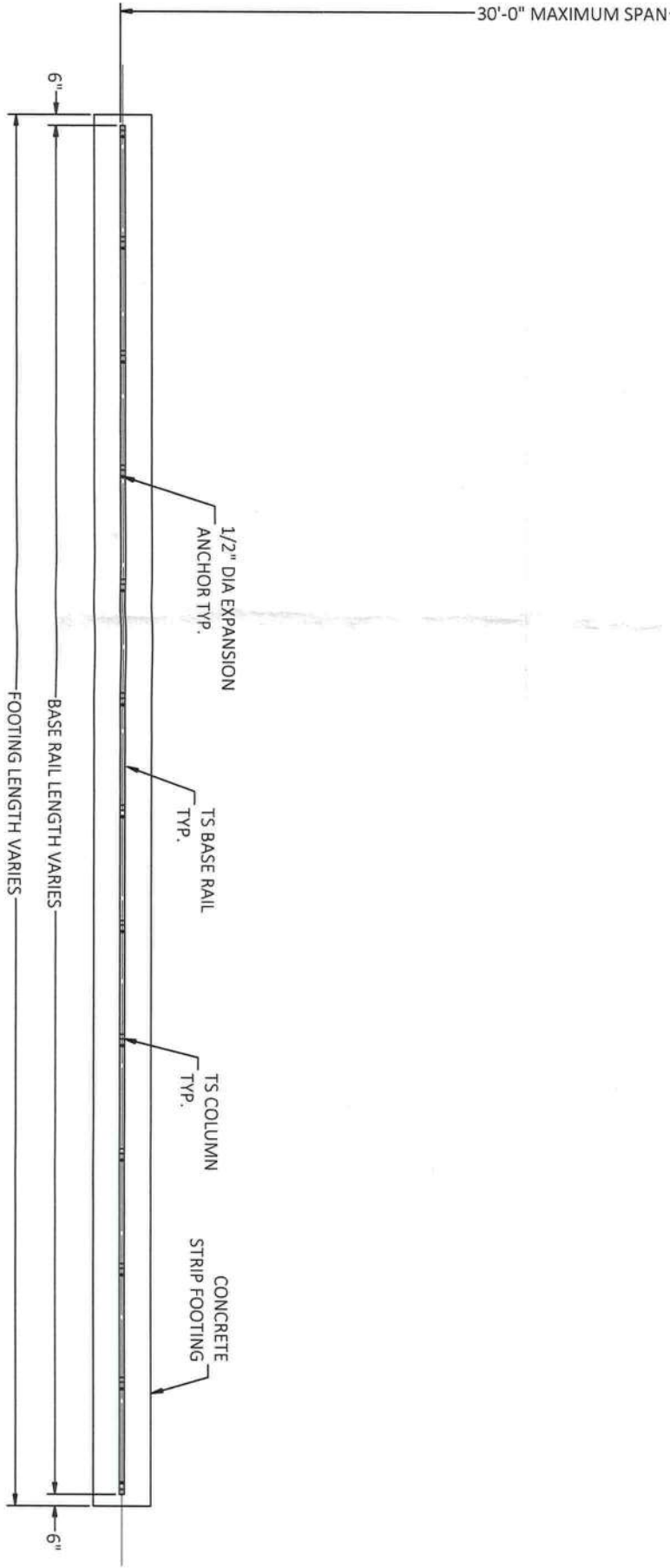
1. TURNDOWN REINFORCING STEEL = ASTM A615 GRADE 60
2. SLAB REINFORCEMENT = WELDED WIRE FABRIC PER ASTM A185 OR FIBERGLASS FIBER REINFORCEMENT
3. REINFORCING STEEL COVER = 3" WHERE CASE AGAINST AND PERMANENTLY EXPOSED TO SOIL OR WATER, 1.5" EVERYWHERE ELSE.
4. REINFORCEMENT IS BENT COLD.
5. MINIMUM INSIDE 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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CONCRETE STRIP FOOTING PLAN

CONTRACTOR: STEEL BUILDINGS AND STRUCTURES INC. 800PIEDMONT TRIAD WEST DR., MOUNT AIRY, NC 27030		PROJECT ADDRESS: 12'-30' WIDE ENCLOSED	
DESIGN DATE: 01/15/2024	REVISION 1: DATE	DATE	SHEET: 11 OF 13
REVISION 2: DATE	DATE	DATE	DATE
DRAWN BY: SK	SK	SK	SK
SCALE: NTS	NTS	NTS	NTS



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DATE: 01/15/2024

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TIMBER NOTES:  
1. TIMBER BASE TO BE NO. 2 SYP PT OR EQUIVALENT.

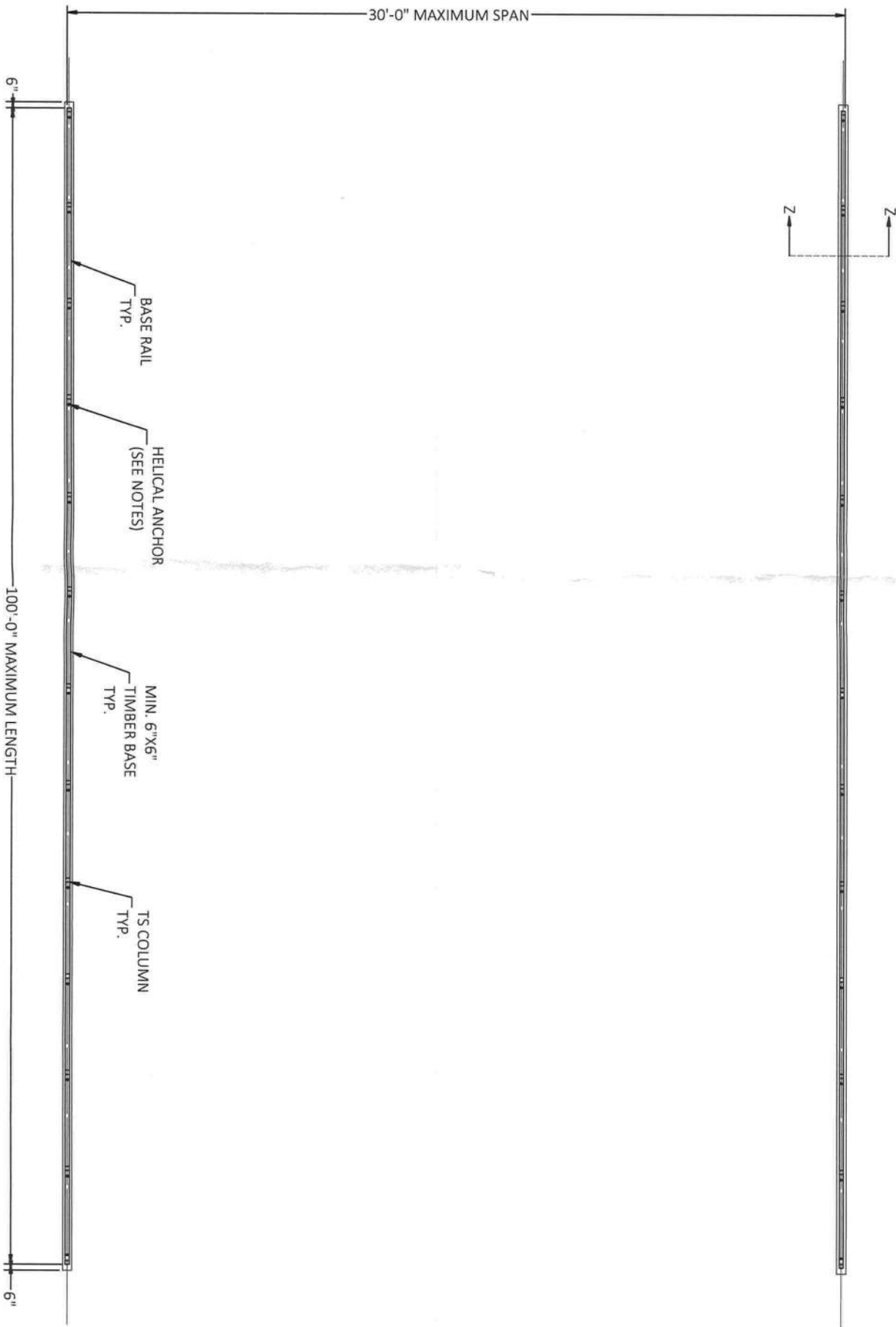
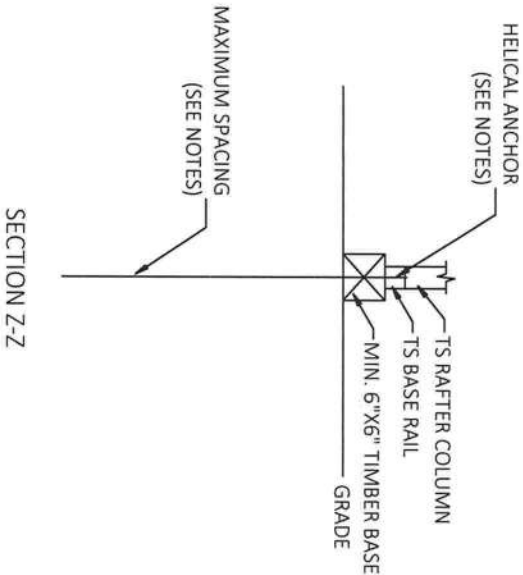
HELIX ANCHOR NOTES

1. FOR VERY DENSE AND/OR CEMENTED SANDS, COARSE GRAVEL AND COBBLES, CALICHE, PRELOADED SILTS AND CLAYS, CORALS, MEDIUM DENSE COARSE SANDS, SANDY GRAVELS, VERY STIFF SILTS AND CLAYS, USE MINIMUM (2) 4" HELICES WITH MINIMUM 30" EMBEDMENT EVERY 10'.
2. FOR MEDIUM TO VERY LOOSE DENSE SANDS, FIRM TO STIFF CLAYS AND SILTS, ALLUVIAL FIL, USE MINIMUM (2) 4" HELICES WITH MINIMUM 30" EMBEDMENT EVERY 5' OR EVERY POST (LEG).
3. THE UPLIFT/BEARING CAPACITY OF EACH ANCHOR MUST BE EQUAL TO OR GREATER THAN 8.5 KIPS.

OPTIONAL HELICAL ANCHORING ON TIMBER BEAM DETAIL

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BASE RAIL PLAN

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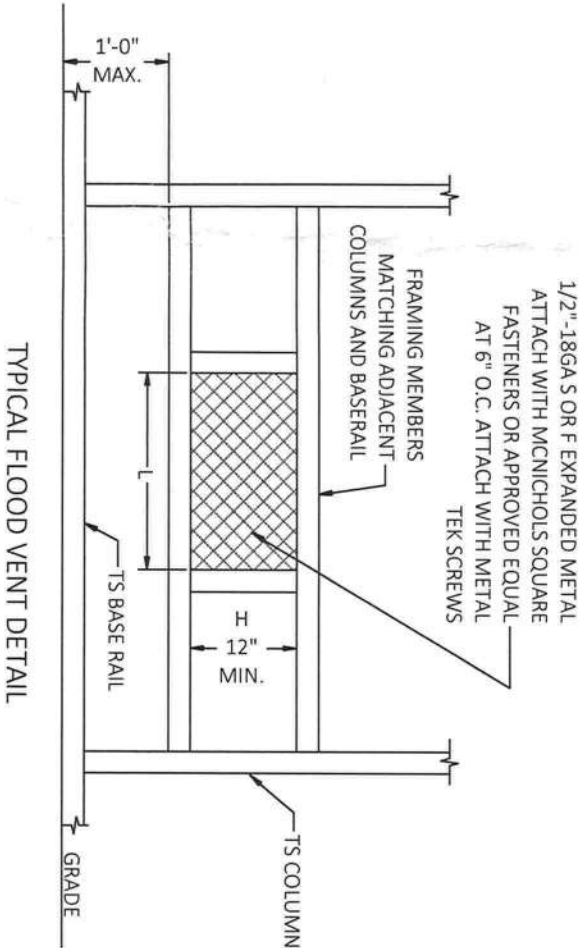


- FLOOD VENTS PROVISION IN FLOOD HAZARD AREAS (FLOOD ZONE AVI):
1. THE STRUCTURE SHALL BE CONSTRUCTED SUCH THAT THE FINISHED FLOOR IS ABOVE DESIGN FLOOD ELEVATION (DFE = BASE FLOOD ELEVATION + 1' FREEBOARD). IF THE CONSTRUCTION IS BELOW DFE, FLOOD VENTS SHALL BE INSTALLED PER 2023 FLORIDA BUILDING CODE, RESIDENTIAL (8TH EDITION), SECTION R322.2.2.
  2. CONTRACTOR TO VERIFY ELEVATIONS IN THE FIELD.

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"-18GA S OR F EXPANDED METAL.
4. TOTAL OPEN AREA OF VENT = L X H (MIN. 12").
5. FLOOD VENT DETAIL COMPLES WITH FEMA/NFIP.
6. PREFABRICATED FLOOD VENTS MEETING THE REQUIREMENTS OF FEMA/NFIP MAY BE INSTALLED.

FLOOD SOLUTIONS STATIC FLOOD VENTS FL #17588-R1				
VENT MODEL	VENT SIZE (WIDTH x HEIGHT) (in.)	ROUGH OPENING SIZE (Width x Height) (in.)	ENCLOSED 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



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