

**STRUCTURAL GENERAL NOTES**

DESIGN CRITERIA

A. SPECIFICATIONS

1. FOR MATERIAL SPECIFICATIONS, SEE CONTRACT SPECIFICATIONS AND SPECIAL PROVISIONS.

B. DESIGN CODES

1. FREDERICK COUNTY BUILDING CODE, 2020
2. MARYLAND STATE BUILDING CODE, 2018
3. INTERNATIONAL BUILDING CODE, 2018
4. ACI 318-14 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE"
5. ASCE 7-16 "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES"
6. ADM1-2015 "ALUMINUM DESIGN MANUAL: PART 1 - A SPECIFICATION FOR ALUMINUM STRUCTURES"
7. TMS 402-2016 "BUILDING CODE FOR MASONRY STRUCTURES"
8. BUILDING DESIGN IS BASED ON THE SHORED CONSTRUCTION METHOD

DESIGN LOADING

A. DEAD LOADS

- REINFORCED CONCRETE 150 PCF
- CONCRETE MASONRY 135 PCF
- BUILDING MATERIALS ACTUAL WEIGHT OF MATERIALS

B. FLOOR LIVE LOADS

- STAIRS 100 PSF
- EQUIPMENT PLATFORMS 250 PSF (UNO)
- STORAGE AREAS 250 PSF (UNO)
- FLUID 65 PCF
- HANDRAIL 200 LBS IN ANY DIRECTION OR 50 PLF

C. ROOF LIVE LOAD 30 PSF

D. SNOW LOAD DATA

- GROUND SNOW LOADS, Pg 30 PSF
- FLAT ROOF SNOW LOAD, Pf XX PSF
- SNOW EXPOSURE FACTOR, Ce 1.0
- SNOW LOAD IMPORTANCE FACTOR, Is 1.00
- THERMAL FACTOR, Ct 1.2
- SLOPE FACTOR(S), Cs 1.0
- DRIFT SURCHARGE LOAD(S), Pd XX PSF
- WIDTH OF SNOW DRIFT(S), w XX FT

E. WIND DESIGN DATA

- BASIC DESIGN WIND SPEED, V 120 MPH
- ALLOWABLE STRESS DESIGN WIND SPEED, V<sub>asd</sub> 93 MPH
- RISK CATEGORY III
- WIND EXPOSURE OPEN-
- INTERNAL PRESSURE COEFFICIENT, C<sub>pi</sub> N/A
- DESIGN WIND PRESSURE, C&C 31.2 PSF

F. EARTHQUAKE DESIGN DATA

- RISK CATEGORY III
- SEISMIC IMPORTANCE FACTOR, I<sub>e</sub> 1.50
- MAPPED SPECTRAL RESPONSE ACCELERATION PARAMETERS
  - S<sub>s</sub> 0.334g
  - S<sub>1</sub> 0.110g
- SITE CLASS E
- DESIGN SPECTRAL RESPONSE ACCELERATION PARAMETERS
  - SDS 0.497g
  - SD1 0.255g
- SEISMIC DESIGN CATEGORY D
- BASIC SEISMIC FORCE RESISTING SYSTEM XX
- DESIGN BASE SHEAR XX
- SEISMIC RESPONSE COEFFICIENT
  - C<sub>i</sub> XX
  - C<sub>c</sub> XX

- RESPONSE MODIFICATION COEFFICIENT

R <sub>i</sub>	XX
R <sub>c</sub>	XX

- ANALYSIS PROCEDURE USED

ELF

G. GEOTECHNICAL INFORMATION

- SOIL DESIGN LOAD-BEARING CAPACITY XXXX PSF

H. FLOOD DESIGN DATA

- FLOOD DESIGN CLASS X

- ELEVATION OF XXXXX XXX.XX'

I. ROOF RAIN LOAD DATA

- RAIN INTENSITY, I XX IN/HR

CONCRETE

A. ALL CONCRETE CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH ACI 318 AND ACI 301, EXCEPT AS MODIFIED BY THE CONTRACT DOCUMENTS.

B. ALL CONCRETE SHALL BE NORMAL-WEIGHT WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF F'<sub>c</sub> = 4,500 PSI.

C. ALLOW 48 HOURS MINIMUM CURING TIME BETWEEN PLACEMENT OF ADJACENT CONCRETE POURS.

D. CHAMFER ALL EXPOSED EDGES 3/4" X 3/4". CHAMFER REQUIRED UNLESS NOTED OTHERWISE IN DRAWINGS.

E. JOINTS

1. UNLESS OTHERWISE NOTED ON THE DRAWINGS, JOINTS SHOWN SHALL BE CONSTRUCTION JOINTS.
2. CONSTRUCTION JOINTS SHALL BE AS DETAILED, AND NO ADDITIONAL JOINTS SHALL BE USED NOR ANY OMITTED EXCEPT BY WRITTEN AUTHORIZATION OF THE ENGINEER.
3. CONTRACTOR SHALL SUBMIT THE LOCATION OF PROPOSED CONSTRUCTION JOINTS THAT ARE NOT SHOWN ON THE DRAWINGS FOR APPROVAL. ENGINEER APPROVED ADDITIONAL CONSTRUCTION JOINTS SHALL NOT RESULT IN ADDITIONAL EXPENSE TO THE OWNER.
4. CONTRACTOR SHALL COORDINATE LOCATION OF JOINTS SHOWN WITH PIPE OPENINGS, EQUIPMENT, AND REINFORCING STEEL LAP REQUIREMENTS. NUMBER OF JOINTS SHOWN IS A MINIMUM.
5. INTENTIONALLY ROUGHEN SURFACE OF HORIZONTAL CONSTRUCTION JOINTS IN WALLS AND AT BASE OF WALL TO 1/4" AMPLITUDE.
6. PROVIDE A ROUGHENED CONSTRUCTION JOINT WHERE INDICATED IN THESE DRAWINGS AND FOR SURFACES WHERE NEW CONCRETE WILL BE PLACED AGAINST EXISTING CONCRETE.
  - i) CONCRETE SURFACES SHALL BE ROUGHENED TO A FULL 1/4" AMPLITUDE AND AN EPOXY BONDING COMPOUND APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.

F. EMBEDDED ITEMS

1. SEE ARCHITECTURAL, CIVIL, MECHANICAL, PROCESS MECHANICAL, AND ELECTRICAL DRAWINGS FOR ALL EMBEDDED ITEMS SUCH AS SCREWS, ANCHORS, ELECTRICAL CONDUITS, OPENINGS, ETC. WHICH MAY INTERFERE WITH CONCRETE CONSTRUCTION.
2. CONDUITS AND EMBEDDED PIPES SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 318 AND ACI 350.

G. SLABS-ON-GRADE

1. ALL CONCRETE SLABS-ON-GRADE SHALL HAVE THICKENINGS, DEPRESSIONS, OPENINGS, ETC. AS SHOWN OR AS REQUIRED BY VARIOUS TRADES.
2. INTERIOR SLABS-ON-GRADE SHALL CONTAIN AN UNDERSLAB VAPOR RETARDER AS SPECIFIED IN SECTION 03 30 00, UNLESS NOTED OTHERWISE.

H. FINISHES

1. BROOM FINISH EXTERIOR CONCRETE PLATFORMS, STAIRS AND LOADING DOCKS UNLESS OTHERWISE INDICATED OR SPECIFIED.

I. THE EXTERIOR OF ALL BURIED WALLS SHALL BE WATERPROOFED AND DAMPROOFED IN ACCORDANCE WITH SPECIFICATION SECTION 07100.

REINFORCING STEEL

A. MATERIALS SHALL CONFORM TO THE FOLLOWING AND AS SPECIFIED:

1. REINFORCING STEEL BARS SHALL CONFORM TO ASTM A615, GRADE 60.
2. WELDED WIRE REINFORCEMENT SHALL CONFORM TO ASTM A1064 AND BE FURNISHED IN FLAT SHEETS.

B. CONCRETE COVER FOR REINFORCING STEEL SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE ON THE DRAWINGS:

1. UNFORMED CONCRETE BOTTOM BARS IN FOOTINGS AND SLABS ON EARTH, GRAVEL OR CRUSHED STONE.....3"
2. SLABS AND WALLS EXPOSED TO GROUND, WEATHER OR PROCESS LIQUID AFTER REMOVAL OF FORMS.....2"

C. LAP SPLICES

1. ALL SPLICES SHALL BE CLASS B, TENSION LAPS UNLESS OTHERWISE NOTED ON THE PLANS.
2. LAP SPlice LENGTHS SHALL BE AS SHOWN IN THESE PLANS.
3. FOUNDATION MATS AND BASE SLABS: LAP CONTINUOUS BOTTOM REINFORCEMENT AT THE CENTER OF A SPAN AND CONTINUOUS TOP REINFORCEMENT AT SUPPORTS
4. ALL WELDED WIRE REINFORCEMENT SHALL BE SPLICED SO THAT THE OVERLAP OF THE OUTERMOST CROSS WIRES OF EACH ADJOINING SHEET IS NOT LESS THAN THE SPACING OF THE CROSS WIRES PLUS TWO INCHES, UNLESS NOTED OTHERWISE.

D. DO NOT WELD OR TACK REINFORCING STEEL.

E. REINFORCING STEEL, BAR SUPPORTS, AND SPACERS SHALL BE DETAILED IN ACCORDANCE WITH ACI 315-LATEST EDITION, "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT", EXCEPT WHERE SHOWN OTHERWISE.

F. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF REINFORCING STEEL PRIOR TO PROCEEDING WITH FABRICATION.

UNIT MASONRY

A. ALL MASONRY CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH TMS 402-2016 AND TMS 602-2016.

B. MASONRY COMPRESSIVE STRENGTH, f'<sub>m</sub>, SHALL BE 2,000 PSI UNO. THE MINIMUM 28-DAY COMPRESSIVE STRENGTHS OF INDIVIDUAL MASONRY COMPONENTS SHALL BE AS NOTED BELOW:

f'm	MORTAR	BLOCK	GROUT
2,000 PSI	TYPE S - 1,800 PSI	2,000 PSI	2,000 PSI
2,000 PSI	TYPE M - 2,500 PSI	2,000 PSI	2,000 PSI

C. MATERIALS SHALL CONFORM TO THE FOLLOWING AND AS SPECIFIED:

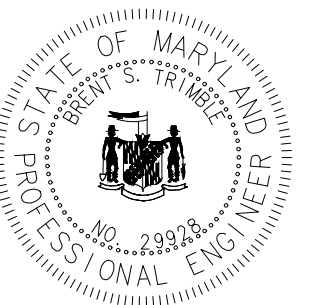
1. HOLLOW UNITS: ASTM C90, NORMAL WEIGHT
2. MORTAR: ASTM C270, TYPE M OR S, 3/8" FULL BEDDING
  - i) REMOVE MORTAR PROTRUDING INTO CELL CAVITIES TO BE REINFORCED AND GROUTED.
  - ii) TYPE "M" MORTAR SHALL BE USED FOR ALL MASONRY CONSTRUCTION BELOW GRADE, TYPE "S" ABOVE GRADE.
3. GROUT: ASTM C476, MIN. 2,000 AT 28 DAYS, 3/8" AGGREGATE MAX., 8" - 10" SLUMP.
  - i) CELLS TO BE GROUTED SHALL BE GROUTED FOR FULL WALL HEIGHT.

D. REINFORCEMENT:

1. HORIZONTAL JOINTS: PROVIDE TRUSS-TYPE OR LADDER-TYPE JOINT REINFORCEMENT AT 16" OC.
  - i) USE PREFABRICATED CORNERS AND TEES AT WALL INTERSECTIONS, OVERLAP DISCONTINUED ENDS, AND EXTEND INTO COLUMNS 6" MIN.
2. VERTICAL AND HORIZONTAL REINFORCEMENT: ASTM A615, GRADE 60.
  - i) PROVIDE MINIMUM #4 BARS TYP AT WALL INTERSECTIONS, EACH SIDE OF OPENINGS, AND AT WALL ENDS.
  - ii) HOOK TOP OF ALL DISCONTINUED BARS, LAP CONTINUOUS REINFORCEMENT 48 BAR DIAMETERS UNLESS NOTED OTHERWISE.
  - iii) USE BAR SPACERS IN EVERY 4TH COURSE WHERE CELLS ARE TO BE GROUTED.

E. CONTRACTOR IS RESPONSIBLE FOR LATERAL BRACING OF MASONRY WALLS DURING CONSTRUCTION.

F. WHERE EXPANSION ANCHOR BOLTS ARE SET IN MASONRY WALLS, FILL BLOCK CELLS WITH GROUT FOR BOLTED COURSE AND TWO COURSES ABOVE AND BELOW ANCHOR ELEVATION.



PROFESSIONAL CERTIFICATION  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
 LICENSE NO. 28928      EXPIRATION DATE 01/11/2028  
**RK&K**  
 700 EAST PRATT STREET, SUITE 500  
 BALTIMORE, MARYLAND 21202  
 800.787.3755

NO.	DESCRIPTION	DATE	BY
1	REISSUED FOR BID - ADDENDUM NO. 3	02/06/2024	

TOWN OF EMMITSBURG, MARYLAND  
 WATER PLANT CLARIFIER  
 CIP NO. 4-1600-40-160-1  
 HAMPTON VALLEY ROAD, EMMITSBURG ELECTION DISTRICT NO. 5, FREDERICK COUNTY, MARYLAND  
**STRUCTURAL GENERAL NOTES**

ENGINEER GG	CHECKED BY BST
DRAWN BY MBP	DATE 2023
RK&K PROJECT NUMBER 20119	

DRAWING NUMBER  
**S-01**  
 SHEET NO. 18 OF 42

ALUMINUM

A. MATERIALS SHALL CONFORM TO THE FOLLOWING:

- 1. SHAPES AND PLATES: ALLOY TYPE 6061-T6.
2. BOLTED CONNECTIONS: ASTM F593, TYPE 304, CONDITION SH1 OR SH2 STAINLESS STEEL
3. WELDED CONNECTIONS: PER AWS D1.2 "STRUCTURAL WELDING CODE - ALUMINUM".
4. GRATING: ALLOY TYPE 6063-T6.

B. CONNECTIONS SHALL BE BOLTED UNLESS WELDING IS INDICATED. FIELD WELDING OF STRUCTURAL MEMBERS IS NOT PERMITTED UNLESS SPECIFICALLY INDICATED.

C. BAND ALL EDGES AND OPENINGS IN GRATINGS.

D. DISSIMILAR MATERIALS

- 1. PROVIDE GALVANIC SEPARATION WHERE ALUMINUM IS IN CONTACT WITH CONCRETE OR STEEL.
2. PROVIDE DISSIMILAR METAL PROTECTION AT LOCATIONS WHERE DISSIMILAR METALS ARE IN CONTACT. PROTECT WITH A MINIMUM 4-MIL DRY THICKNESS COAT OF ZINC CHROMATE PRIMER ON THE ALUMINUM SURFACES AND A MINIMUM 2-MIL DRY THICKNESS COAT OF ALL-METAL PRIMER FOLLOWED BY ONE COAT OF MINIMUM 3-MIL DRY THICKNESS ALUMINUM PAINT TO THE DISSIMILAR METAL.

E. ALL ALUMINUM SHALL BE ANODIZED, INCLUDING ALUMINUM LADDERS AND LADDER COMPONENTS.

POST-INSTALLED ANCHORS AND POST-INSTALLED REINFORCING STEEL

A. EXCEPT WHERE INDICATED ON THE DRAWINGS, POST-INSTALLED ANCHORS SHALL CONSIST OF THE FOLLOWING ANCHOR TYPES AS PROVIDED BY HILTI, INC. CONTACT HILTI AT (800) 879-8000 FOR PRODUCT RELATED QUESTIONS.

1. FOR ANCHORING INTO CRACKED AND UNCRACKED CONCRETE:

- i) ADHESIVE ANCHORS SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ACI 308.4 AND/OR ICC-ES AC308 FOR CRACKED CONCRETE AND SEISMIC APPLICATIONS. ADHESIVE ANCHORS SHALL BE INSTALLED BY A CERTIFIED ADHESIVE ANCHOR INSTALLER WHERE DESIGNATED ON THE CONTRACT DOCUMENTS. PREAPPROVED PRODUCTS INCLUDE:

(1) ADHESIVES FOR USE:

- (a) HILTI HIT-HY 200 SAFE SET SYSTEM WITH HILTI HOLLOW DRILL BIT AND VACUUM WITH HAS THREADED ROD (ICC-ES ESR-3187)
(b) HILTI HIT-RE 500v3 SAFE SET SYSTEM WITH HILTI HOLLOW DRILL BIT AND VACUUM WITH HAS THREADED ROD (ICC-ES ESR-3814)
(c) HILTI HIT-RE 500v3 SAFE SET SYSTEM WITH HILTI ROUGHENING TOOL (HIT RT) WITH HAS THREADED ROD (ICC-ES ESR-3814) FOR DIAMOND CORED HOLES

(2) STEEL ELEMENTS FOR USE WITH ADHESIVE:

- (a) HILTI HAS-R-316 STAINLESS STEEL ROD

- ii) MECHANICAL ANCHORS SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ACI 308.2 AND/OR ICC-ES AC193 FOR CRACKED CONCRETE AND SEISMIC APPLICATIONS. PREAPPROVED PRODUCTS INCLUDE:

- (1) HILTI KWIK BOLT-TZ EXPANSION ANCHOR SAFE SET SYSTEM WITH HOLLOW DRILL BIT AND VACUUM AND SI-AT-A22 TOOL WITH ADAPTIVE TORQUE FOR APPLICABLE SIZES (ICC-ES ESR-1917)

2. FOR REBAR DOWELING INTO CRACKED AND UNCRACKED CONCRETE:

- i) PREAPPROVED ADHESIVE SYSTEMS INCLUDE:

- (1) HILTI HIT-HY 200 SAFE SET SYSTEM WITH HILTI HOLLOW DRILL BIT AND VACUUM WITH CONTINUOUSLY DEFORMED REBAR (ICC-ES ESR-3187)
(2) HILTI HIT-HY 500v3 SAFE SET SYSTEM WITH HILTI HOLLOW DRILL BIT AND VACUUM WITH CONTINUOUSLY DEFORMED REBAR (ICC-ES ESR-3814)
(3) HILTI HIT-RE 500v3 SAFE SET SYSTEM WITH HILTI ROUGHENING TOOL (HIT RT) WITH CONTINUOUSLY DEFORMED REBAR IN DIAMOND CORED HOLES (ICC-ES ESR-3814)

3. FOR ANCHORAGE TO SOLID GROUTED CONCRETE MASONRY UNITS:

- i) ADHESIVE ANCHORS SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ICC-ES AC58. PREAPPROVED PRODUCTS INCLUDE:

(1) ADHESIVE(S) FOR USE:

- (a) HILTI HIT-HY 270 SAFE SET SYSTEM WITH HILTI HOLLOW DRILL BIT AND VACUUM (ICC-ES ESR-4143)
(2) STEEL ELEMENT(S) FOR USE WITH ADHESIVE:
(a) HILTI HAS CONTINUOUSLY THREADED ROD OR CONTINUOUSLY DEFORMED STEEL REBAR

- ii) MECHANICAL ANCHORS SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ICC-ES AC01 OR ICC-ES AC106. PREAPPROVED PRODUCTS INCLUDE:

- (1) HILTI KWIK BOLT-3 EXPANSION ANCHOR (ICC-ES ESR-1385)

B. POST-INSTALLED REINFORCING STEEL BAR CONNECTIONS SHALL CONSIST OF THE FOLLOWING EPOXY SYSTEMS AS PROVIDED BY HILTI, INC. CONTACT HILTI AT (800) 879-8000 FOR PRODUCT RELATED QUESTIONS.

- 1. THE EPOXY SYSTEM SHALL BE TESTED IN ACCORDANCE WITH THE ICC-ES ACCEPTANCE CRITERIA FOR POST-INSTALLED EPOXY ANCHORS IN CONCRETE ELEMENTS (AC308), TABLE 3.8. TECHNICAL DATA SHALL BE PUBLISHED IN AN ICC-ES EVALUATION SERVICE REPORT SHOWING COMPLIANCE WITH THE IBC. PREAPPROVED PRODUCTS INCLUDE:

- i. HILTI HIT-HY 200 SAFE SET SYSTEM WITH HILTI HOLLOW DRILL BIT (TE-CD OR TE-YD) AND VC 20/40 VACUUM (VC 20-U OR VC 40-U) SYSTEM WITH CONTINUOUSLY DEFORMED REINFORCING STEEL (ICC-ES ESR-3187)

- ii. HILTI HIT-HY 500 V3 SAFE SET SYSTEM WITH HILTI HOLLOW DRILL BIT (TE-CD OR TE-YD) AND VC 20/40 VACUUM (VC 20-U OR VC 40-U) SYSTEM WITH CONTINUOUSLY DEFORMED REINFORCING STEEL (ICC-ES ESR-3814)

- iii. HILTI HIT-RE 500 V3 SAFE SET SYSTEM WITH HILTI ROUGHENING TOOL (YE-YRT) WITH CONTINUOUSLY DEFORMED REINFORCING STEEL IN DIAMOND CORED HOLES (ICC-ES ESR-3814)

C. THE ABOVE LISTED PRODUCTS ARE THE DESIGN BASIS FOR THIS PROJECT. SUBSTITUTION REQUESTS FOR PRODUCTS OR DRILLING METHODS OTHER THAN THOSE LISTED ABOVE MUST BE APPROVED IN WRITING BY THE STRUCTURAL ENGINEER OF RECORD PRIOR TO USE. SUBSTITUTION REQUESTS SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER OF RECORD AND SHALL MEET THE REQUIREMENTS OF THE PROJECT SPECIFICATIONS.

D. USE OF DIAMOND CORE BIT WITH ROUGHENING TOOL FOR ANCHOR HOLES REQUIRES APPROVAL FROM ENGINEER OF RECORD PRIOR TO DRILLING. UNLESS OTHERWISE SHOWN IN THE DRAWINGS, ALL HOLES SHALL BE DRILLED PERPENDICULAR TO THE CONCRETE SURFACE.

E. INSTALL ANCHORS PER THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS, AS INCLUDED IN THE ANCHOR PACKAGING.

F. OVERHEAD ADHESIVE ANCHORS MUST BE INSTALLED USING THE HILTI PROFI PISTON PLUG SYSTEM.

G. POST-INSTALLED ANCHORS AND REINFORCING STEEL BAR INSTALLATIONS SHALL BE PERFORMED BY PERSONNEL TRAINED TO INSTALL THE SYSTEM PER THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS (MPII).

- 1. THE CONTRACTOR SHALL ARRANGE FOR A MANUFACTURER'S REPRESENTATIVE TO PROVIDE ONSITE INSTALLATION TRAINING FOR ALL OF THEIR ANCHORING PRODUCTS THAT ARE TO BE USED AS PART OF THIS PROJECT. THE STRUCTURAL ENGINEER OF RECORD MUST RECEIVE DOCUMENTED CONFIRMATION PRIOR TO THE COMMENCEMENT OF INSTALLING THE POST-INSTALLED PRODUCTS THAT ALL OF THE CONTRACTOR'S PERSONNEL WHO WILL INSTALL POST-INSTALLED ANCHORS AND REINFORCING STEEL BARS HAVE BEEN TRAINED TO INSTALL THE SYSTEM PER THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS (MPII).

I. POST-INSTALLED ANCHOR AND REINFORCING STEEL CAPACITY IS DEPENDENT UPON SPACING BETWEEN ADJACENT ANCHORS/REINFORCING STEEL AND PROXIMITY OF ANCHORS/REINFORCING STEEL TO EDGE OF CONCRETE. INSTALL ANCHORS/REINFORCING STEEL IN ACCORDANCE WITH SPACING AND EDGE CLEARANCES INDICATED ON THE DRAWINGS.

J. EXISTING REINFORCING STEEL IN THE CONCRETE STRUCTURE MAY CONFLICT WITH SPECIFIED POST-INSTALLED ANCHOR/REINFORCING STEEL LOCATIONS. UNLESS NOTED ON THE CONTRACT DRAWINGS THAT THE EXISTING REINFORCING STEEL BARS CAN BE CUT, THE CONTRACTOR SHALL PREVIEW THE EXISTING STRUCTURAL DRAWINGS AND SHALL LOCATE THE POSITION OF THE EXISTING REINFORCING STEEL BARS IN THE VICINITY OF THE PROPOSED CONCRETE ANCHORS/REINFORCING STEEL, BY HILTI FERROSCAN, GPR, X-RAY, OR OTHER MEANS.

GENERAL REQUIREMENTS

A. ELEVATIONS ARE TO BE ACTUAL FINISH ELEVATION. SEE CIVIL DRAWINGS FOR GRADE ELEVATIONS.

B. FOR STAKE OUT DATA, SEE CIVIL DRAWINGS.

C. SHORING REQUIRED FOR THE STABILITY OF THE UNCOMPLETED STRUCTURE OR FOR INSTALLATION OR MODIFICATION OF STRUCTURAL MEMBERS, SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

D. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS, DIMENSIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES OR CONFLICTS FOUND IN CONTRACT DOCUMENTS AND/OR FIELD CONDITIONS.

E. EQUIPMENT PADS, PEDESTALS, AND OPENINGS

1. CONTRACTOR SHALL COORDINATE ALL REQUIRED OPENINGS WITH ARCHITECTURAL, MECHANICAL, PROCESS MECHANICAL, AND ELECTRICAL DRAWINGS.

2. CONTRACTOR SHALL COORDINATE FINAL SIZE AND LOCATION OF ALL OPENINGS WITH THE ACTUAL EQUIPMENT SUPPLIED, PROJECT REQUIREMENTS, AND WITH FIELD CONDITIONS.

3. THE ENGINEER PERMITS NO OPENINGS OR ALTERATIONS THROUGH BEAMS OR COLUMNS, UNLESS DETAILED ON STRUCTURAL DRAWINGS.

4. THE SIZES AND LOCATIONS OF EQUIPMENT PADS AND PEDESTALS, AS WELL AS EQUIPMENT RELATED FLOORS AND SLAB OPENINGS ARE DEPENDENT ON THE ACTUAL EQUIPMENT FURNISHED. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE AND VERIFY ALL SUCH ITEMS. NO DIMENSIONS INDICATED ON THESE DRAWINGS SHALL BE ALTERED WITHOUT THE ENGINEER'S APPROVAL.

F. DELEGATED DESIGN

1. CONTRACTOR SHALL DESIGN ALL PIPE SADDLES AND CONNECTIONS TO SUPPORTING MEMBERS AS SHOWN IN THE PLANS AND IN ACCORDANCE WITH THE SPECIFICATIONS. THE CONTRACTOR SHALL COORDINATE ALL DIMENSIONS AND ELEVATIONS WITH SADDLE DESIGNS.

2. ANY ADDITIONAL PIPE SUPPORTS THAT ARE REQUIRED AND NOT SHOWN OR DETAILED SHALL BE DESIGNED BY THE CONTRACTOR. CALCULATIONS AND DETAILS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. ALL CALCULATIONS SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF MARYLAND.

3. ALL FRP GRATINGS, STAIRS, HANDRAILS, AND STRUCTURAL COMPONENTS SHALL BE DESIGNED BY THE CONTRACTOR IN ACCORDANCE WITH SPECIFICATION SECTION 06500.

4. IN ADDITION TO SUBMISSIONS AS REQUIRED BY THE SPECIFICATIONS, CONTRACTOR SHALL SUBMIT PLANS, DETAILS AND CALCULATIONS, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF MARYLAND FOR THE FOLLOWING: RAILING, GRATING, METAL STAIRS, PRE-ENGINEERED BUILDINGS, PRE-FABRICATED BUILDINGS, PRECAST BUILDINGS, AND PRECAST CONCRETE STRUCTURES.

G. ALL HANDRAIL SHALL BE ALUMINUM WITH SIZES AS SHOWN AND DETAILED IN THE PLANS AND SPECIFICATIONS.

H. PROJECT DOCUMENTS ARE INTENDED TO BE COMPLEMENTARY. ITEMS INDICATED IN ONE PLACE OR ANOTHER AMONG THE DOCUMENTS SHALL BE INTENDED AS THOUGH SHOWN IN ALL PLACES.

EXCAVATION AND EARTHWORK

A. FOR SITE, EXCAVATION, FILL, AND BACKFILL REQUIREMENTS, SEE PROJECT SPECIFICATIONS AND CONTRACT DRAWINGS.

B. REFER TO SPECIFICATIONS FOR ADDITIONAL SITE PREPARATION AND FOUNDATION SUPPORT REQUIREMENTS.

C. LOCATE ANY EXISTING UTILITY LINES OR APPURTENANCES AND ADVISE ENGINEER OF ANY CONFLICTS WITH NEW STRUCTURES PRIOR TO THEIR CONSTRUCTION.

D. DO NOT DEMOLISH ANY EXISTING STRUCTURE WITHOUT WRITTEN AUTHORIZATION.

E. ALL EXCAVATIONS SHALL BE KEPT DRY. STANDING WATER SHALL NOT BE ALLOWED IN EXCAVATIONS.

F. CONTRACTOR SHALL DESIGN AND PROVIDE SUPPORT OF EXCAVATION SYSTEM AS REQUIRED TO SUPPORT SOIL AND CONSTRUCTION LOADS.

G. CONTRACTOR SHALL DESIGN AND PROVIDE UNDERPINNING SYSTEM TO SUPPORT EXISTING ADJACENT STRUCTURES AS REQUIRED TO COMPLETE THE WORK.

FOUNDATIONS

A. FOUNDATION PREPARATION

- 1. BUILDING AREAS SHALL BE COMPLETELY STRIPPED OF VEGETATION, PAVEMENTS, WALLS AND SOFT OR MUDDY AREAS.
2. EXPOSED SUBGRADE SHALL BE COMPACTED TO A MINIMUM OF 95% OF MODIFIED PROCTOR DENSITY.
3. FILL ALL VOIDS AND REPLACE DISTURBED SOIL WITH LEAN CONCRETE.

B. BEFORE PLACING ANY CRUSHED STONE OR CONCRETE ON SUBGRADE, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

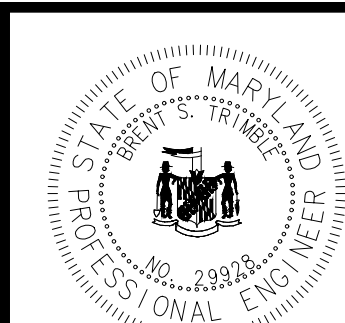
C. ALL FOUNDATIONS SHALL BEAR ON A MINIMUM OF 12" OF #57 STONE OVER UNDISTURBED SOIL WITH AN ALLOWABLE BEARING CAPACITY AS NOTED ON THE CONTRACT DRAWINGS.

D. FOR MECHANICAL OR ELECTRICAL WORK TO BE INCORPORATED IN FOUNDATION WORK, SEE MECHANICAL OR ELECTRICAL DRAWINGS.

E. CONCRETE SHALL NOT BE POURED ON FROZEN GROUND.

F. BACKFILL MATERIAL MAY NOT BE PLACED AGAINST FOUNDATION WALLS UNTIL THE UPPER BRACING FLOORS ARE IN PLACE FOR AT LEAST 7 DAYS, AND THE WALLS AND BRACING FLOORS HAVE REACHED THE MINIMUM 28-DAY COMPRESSIVE STRENGTH. WHERE BACKFILL IS REQUIRED ON BOTH SIDES OF WALL, BACKFILL BOTH SIDES SIMULTANEOUSLY.

G. REFER TO GEOTECHNICAL INVESTIGATION REPORT DATED DECEMBER 1, 2021 BY FINDLING, INC.



PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. 28928 EXPIRATION DATE 01/01/2028
700 EAST PRATT STREET, SUITE 500 BALTIMORE, MARYLAND 21202 800.787.3795

Table with columns: NO., DESCRIPTION, REVISIONS, BY, DATE. Row 1: 1, REISSUED FOR BID - ADDENDUM NO. 3, 02/06/2024

TOWN OF EMMITSBURG, MARYLAND
WATER PLANT CLARIFIER
CIP NO. 4-1600-40-160-1
HAMPTON VALLEY ROAD, EMMITSBURG ELECTION DISTRICT NO. 5, FREDERICK COUNTY, MARYLAND
STRUCTURAL GENERAL NOTES

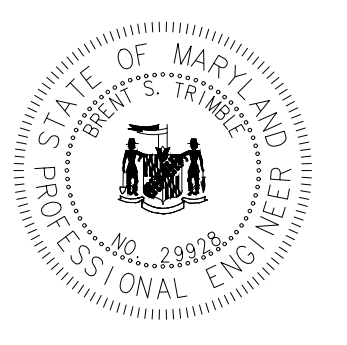
Table with columns: ENGINEER, CHECKED BY, DRAWN BY, DATE, PROJECT NUMBER. Values: GG, BST, MBP, 2023, 20119

DRAWING NUMBER
S-02
SHEET NO. 19 OF 42

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# ABBREVIATIONS

∠	ANGLE	GALV	GALVANIZED	VERT	VERTICAL
@	AT	HD GALV	HOT-DIPPED GALVANIZED	VIF	VERIFY IN FIELD
⊕	CENTERLINE	HORIZ	HORIZONTAL	W/	WITH
∅	DIAMETER	HSS	HOLLOW STRUCTURAL SECTION	W/C	WATER TO CEMENT RATIO
⌞	PLATE	INV	INVERT	W/O	WITHOUT
ADD'L	ADDITIONAL	JT	JOINT	WWF	WELDED WIRE FABRIC
AFF	ABOVE FINISHED FLOOR	KSI	KIPS/SQUARE INCH	WWR	WELED WIRE REINFORCEMENT
ALUM	ALUMINUM	LLH	LONG LEG HORIZONTAL		
ARCH	ARCHITECTURAL	LLV	LONG LEG VERTICAL		
BOT	BOTTOM	LONG	LONGITUDINAL		
BRG	BEARING	MANUF	MANUFACTURER		
COL	COLUMN	MO	MASONRY OPENING		
CIP	CAST-IN-PLACE	MAX	MAXIMUM		
CJ	CONTRACTION JOINT	MECH	MECHANICAL		
CJT	CONTROL JOINT	MIN	MINIMUM		
CMU	CONCRETE MASONRY UNIT	MISC	MISCELLANEOUS		
CONC	CONCRETE	MRWR	MID RANGE WATER REDUCER		
CONT	CONTINUOUS	NO	NUMBER		
COORD	COORDINATE	OC	ON CENTER		
DEG	DEGREE	PCF	POUNDS/CUBIC FOOT		
DIA	DIAMETER	PLWD	PLYWOOD		
DIM	DIMENSION	PSF	POUNDS/SQUARE FOOT		
DTL	DETAIL	PSI	POUNDS/SQUARE INCH		
DWG(S)	DRAWING(S)	REIN	REINFORCEMENT		
EA	EACH	RTU	ROOF TOP UNIT		
EE	EACH END	SCH	SCHEDULE		
EF	EACH FACE	SECT	SECTION		
EJ	EXPANSION JOINT	SF	SQUARE FT		
ENG	ENGINEER	SIM	SIMILAR		
ELEC	ELECTRICAL	SQ	SQUARE		
ELEV	ELEVATION	SS	STAINLESS STEEL		
EMBED	EMBED(MENT)	STD	STANDARD		
EQ	EQUAL	T&B	TOP & BOTTOM		
EX	EXISTING	T&G	TONGUE& GROOVE		
EW	EACH WAY	TOF	TOP OF FOOTING		
EWEF	EACH WAY EACH FACE	TOS	TOP OF SLAB		
EXP	EXPANSION	TS	TUBE STEEL		
FF	FINISHED FLOOR	TRANSV	TRANSVERSE		
FNDN	FOUNDATION	TYP	TYPICAL		
FTG	FOOTING	T/RET WALL	TOP OF RETAINING WALL		
FV	FIELD VERIFY	T/WALL	TOP OF WALL		
FRP	FIBER REINFORCED PLASTIC	UNO	UNLESS NOTED OTHERWISE		



PROFESSIONAL CERTIFICATION  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
 LICENSE NO. 28928      EXPIRATION DATE 07/17/2028  
**RK&K** 700 EAST PRATT STREET, SUITE 500  
 BALTIMORE, MARYLAND 21202  
 800.787.3755

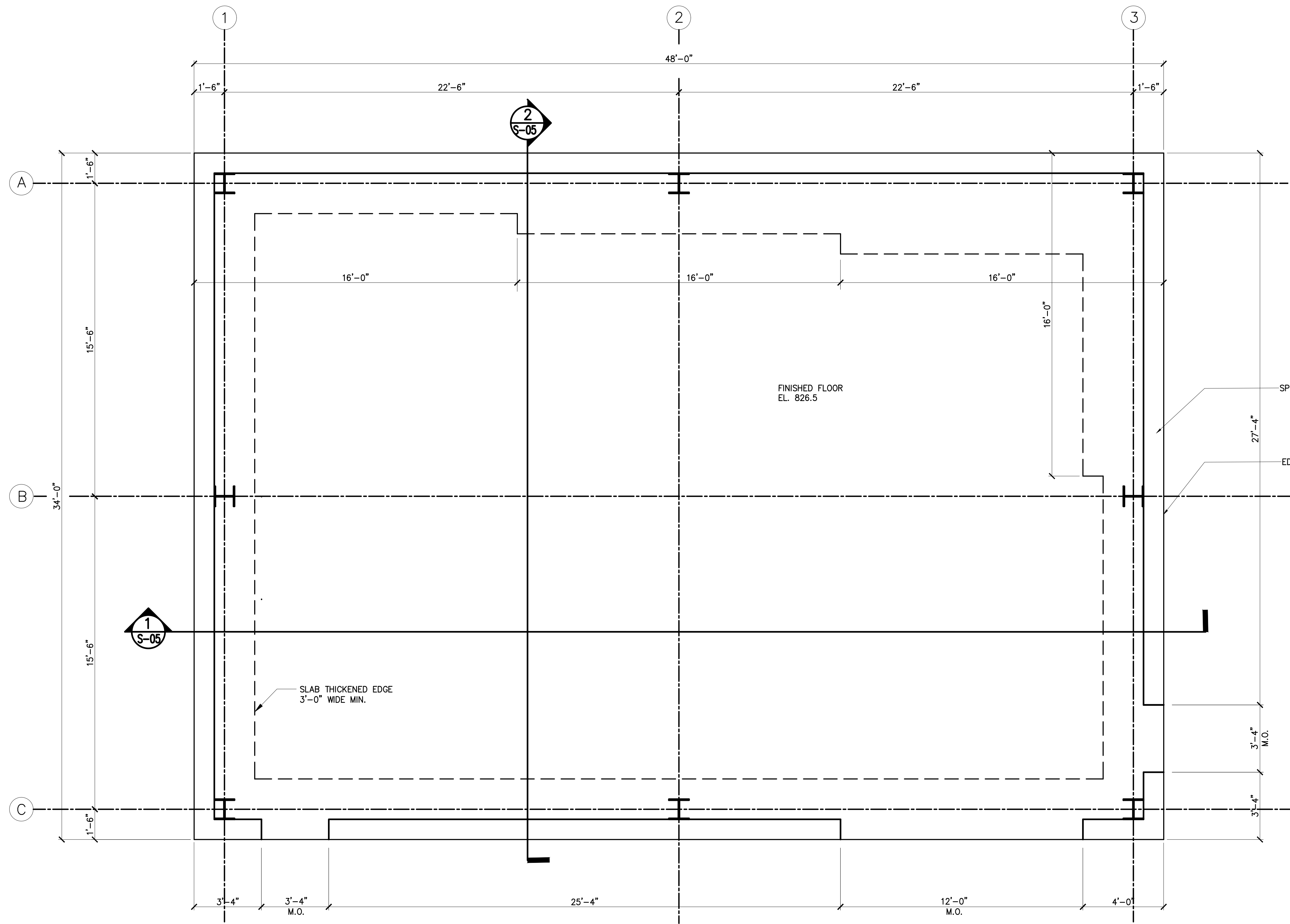
NO.	DESCRIPTION	BY	DATE
1	REISSUED FOR BID - ADDENDUM NO. 3		02/06/2024

TOWN OF EMMITSBURG, MARYLAND  
 WATER PLANT CLARIFIER  
 CIP NO. 4-1600-40-160-1  
 HAMPTON VALLEY ROAD, EMMITSBURG ELECTION DISTRICT No. 5, FREDERICK COUNTY, MARYLAND  
 STRUCTURAL GENERAL NOTES

ENGINEER	CHECKED BY
GG	BST
DRAWN BY	DATE
MBP	2023
RK&K PROJECT NUMBER	
20119	

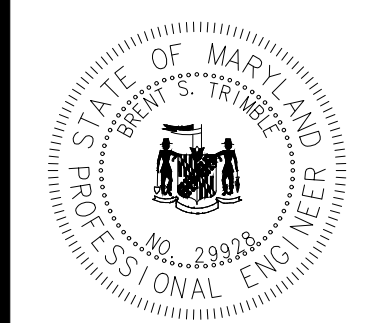
DRAWING NUMBER  
**S-03**  
 SHEET NO. 20 OF 42

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**1 FOUNDATION PLAN**  
SCALE: 3/8"=1'-0"

- NOTES:**
1. FOR STRUCTURE LOCATION, SEE DWG. XX-XX.
  2. FOR STRUCTURAL GENERAL NOTES, SEE DWGS. S-01 TO S-02.
  3. FOR STRUCTURAL STANDARD DETAILS, SEE DWGS. S-05 TO S-06.
  4. CONTRACTOR SHALL COORDINATE WITH PRE-ENGINEERED BUILDING MANUFACTURER. REFER TO ARCHITECTURAL DRAWINGS.
  5. FOR FINISHED ELEVATIONS, REFER TO ARCHITECTURAL DRAWINGS.
  6. FOR EQUIPMENT PAD DETAILS, SEE DWG. M-XX.



**PROFESSIONAL CERTIFICATION**  
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LICENSE NO. 29828 EXPIRATION DATE 07/17/2028

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1	REISSUED FOR BID - ADDENDUM NO. 3		02/06/2024

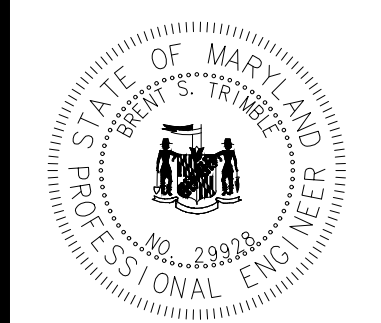
TOWN OF EMMITSBURG, MARYLAND  
WATER PLANT CLARIFIER  
CIP NO. 4-1600-40-160-1  
HAMPTON VALLEY ROAD, EMMITSBURG ELECTION DISTRICT No. 5, FREDERICK COUNTY, MARYLAND

**FOUNDATION PLAN**

ENGINEER GG	CHECKED BY BST
DRAWN BY MBP	DATE 2023
RK&K PROJECT NUMBER 20119	

DRAWING NUMBER  
**S-04**  
SHEET NO. 21 OF 42





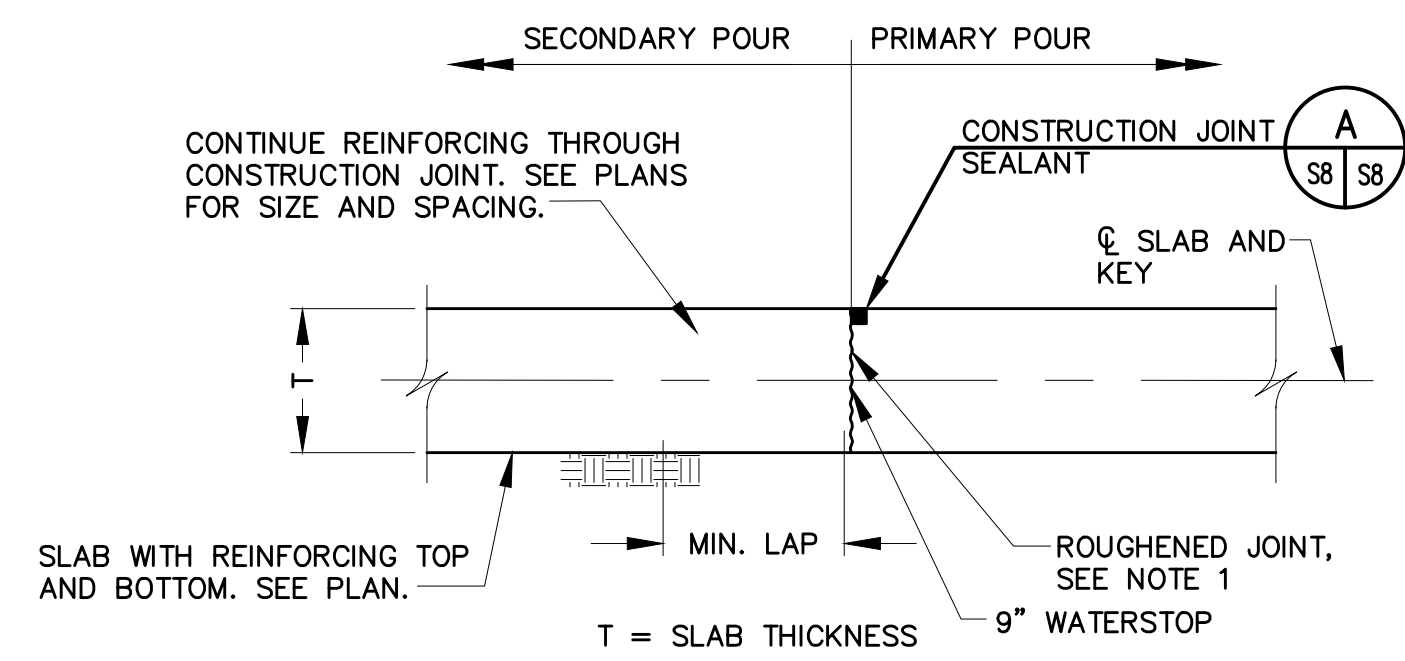
PROFESSIONAL CERTIFICATION  
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 LICENSE NO. 29828  
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NO.	DESCRIPTION	BY	DATE
1	REISSUED FOR BID - ADDENDUM NO. 3	MX	02/06/2024
		MX	
		MX	

TOWN OF EMMITSBURG, MARYLAND  
 WATER PLANT CLARIFIER  
 CIP NO. 4-1600-40-160-1  
 HAMPTON VALLEY ROAD, EMMITSBURG ELECTION DISTRICT No. 5, FREDERICK COUNTY, MARYLAND  
 STRUCTURAL DETAILS

ENGINEER	CHECKED BY
GG	BST
DRAWN BY	DATE
MBP	2023
RK&K PROJECT NUMBER	
20119	

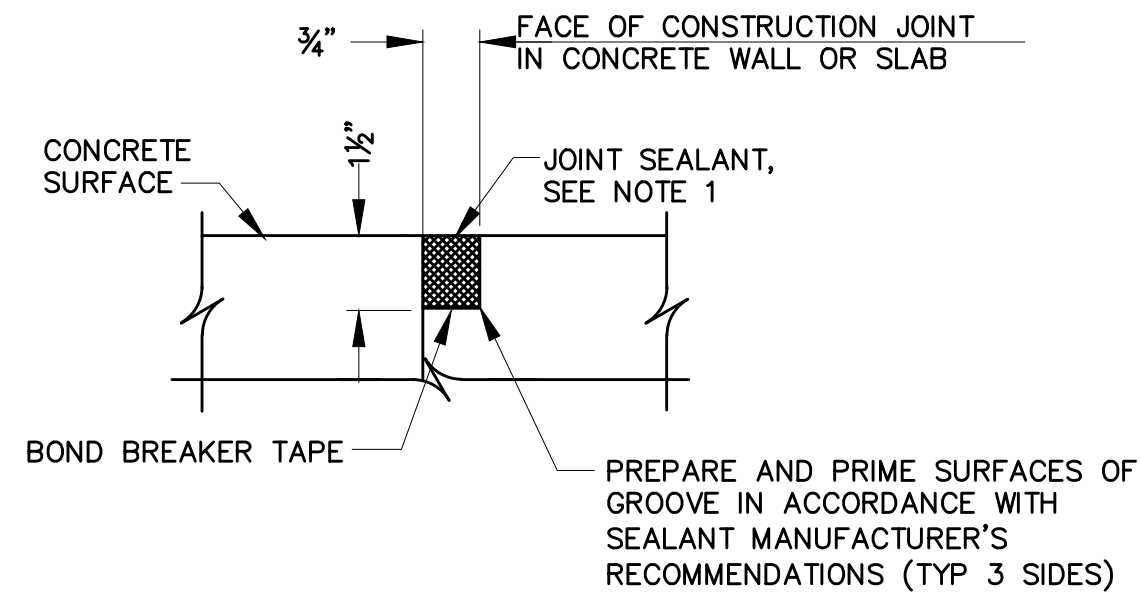
DRAWING NUMBER  
**S-06**  
 SHEET NO. 23 OF 42



**NOTE:**

1. SURFACE OF CONCRETE PLACED IN THE PRIMARY POUR SHALL BE ROUGHENED TO A FULL AMPLITUDE OF 1/4" AND CLEANED WITH A COARSE WIRE BRUSH AND COMPRESSED AIR TO REMOVE ALL LAITANCE AND TO PROVIDE A ROUGHENED SURFACE FOR BONDING NEW CONCRETE TO HARDENED CONCRETE. APPLY BONDING ADHESIVE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. EPOXY BONDING ADHESIVE SHALL BE SIKADUR 32, HI-MOD, OR APPROVED EQUAL.

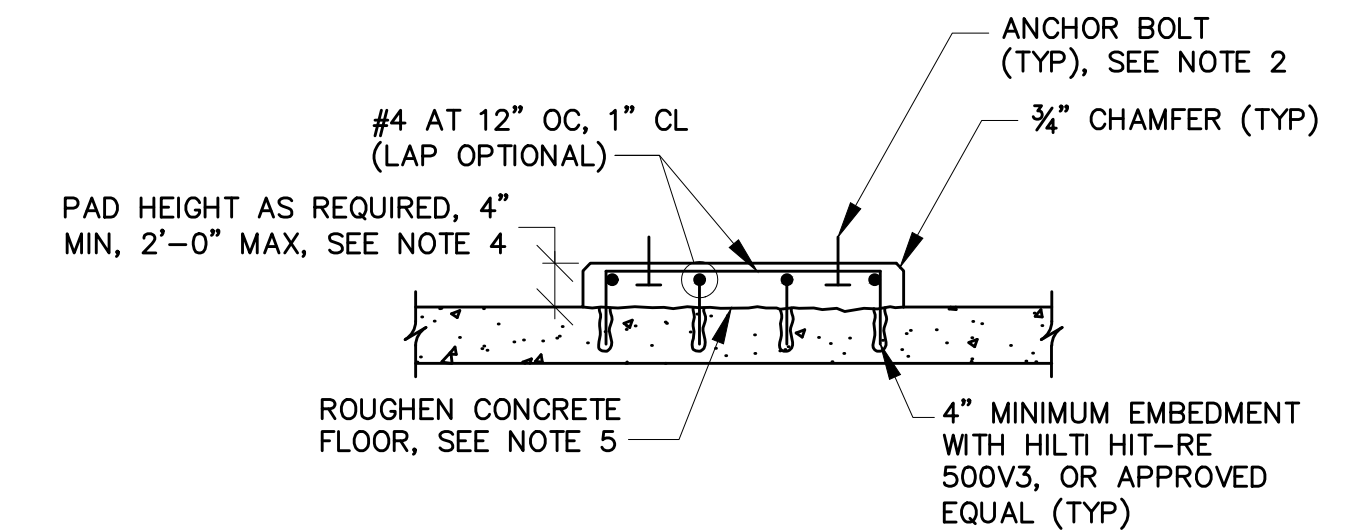
**OPTIONAL FOUNDATION CONSTRUCTION JOINT DETAIL**  
 NTS



**NOTE:**

1. SEALANT TO BE LOCATED ON FLUID SIDE(S) OF WALL OR WEATHER SIDE, IF NO FLUID.

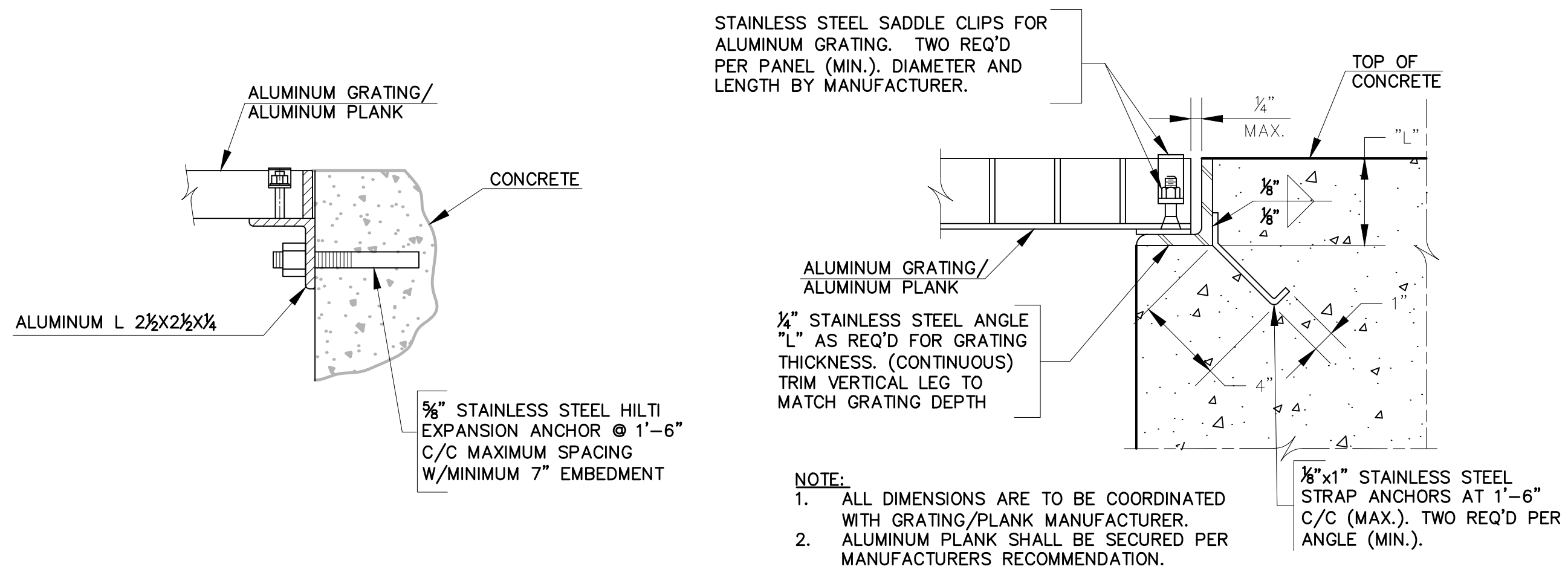
**CONSTRUCTION JOINT SEALANT DETAIL**  
 NTS



**NOTES:**

1. THE MINIMUM PAD SIZE SHALL BE AS INDICATED OR AS DETERMINED BY THE EQUIPMENT MANUFACTURER.
2. WHEN ANCHOR BOLTS ARE REQUIRED, THE SIZE, NUMBER, TYPE, LOCATION AND THE THREAD PROJECTION OF THE ANCHOR BOLTS SHALL BE DETERMINED BY THE EQUIPMENT MANUFACTURER. HOLD CONCRETE ANCHOR BOLTS IN POSITION WITH A TEMPLATE WHILE PAD IS BEING PLACED.
3. EQUIPMENT BASES SHALL BE INSTALLED LEVEL UNLESS NOTED OTHERWISE ON THE PLANS.
4. FOR EQUIPMENT PADS WITH HEIGHT GREATER THAN 2'-0", THE CONTRACTOR SHALL DESIGN AND SUBMIT A DETAIL TO THE ENGINEER FOR APPROVAL.
5. SURFACE OF CONCRETE SHALL BE ROUGHENED TO A FULL AMPLITUDE OF 1/4" AND SCRUBBED WITH A COARSE WIRE BRUSH TO REMOVE ALL LAITANCE AND TO PROVIDE A ROUGHENED SURFACE FOR BONDING NEW CONCRETE TO EXISTING CONCRETE. APPLY BONDING ADHESIVE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. EPOXY BONDING ADHESIVE SHALL BE "SIKADUR 32, HI-MOD", OR APPROVED EQUAL.

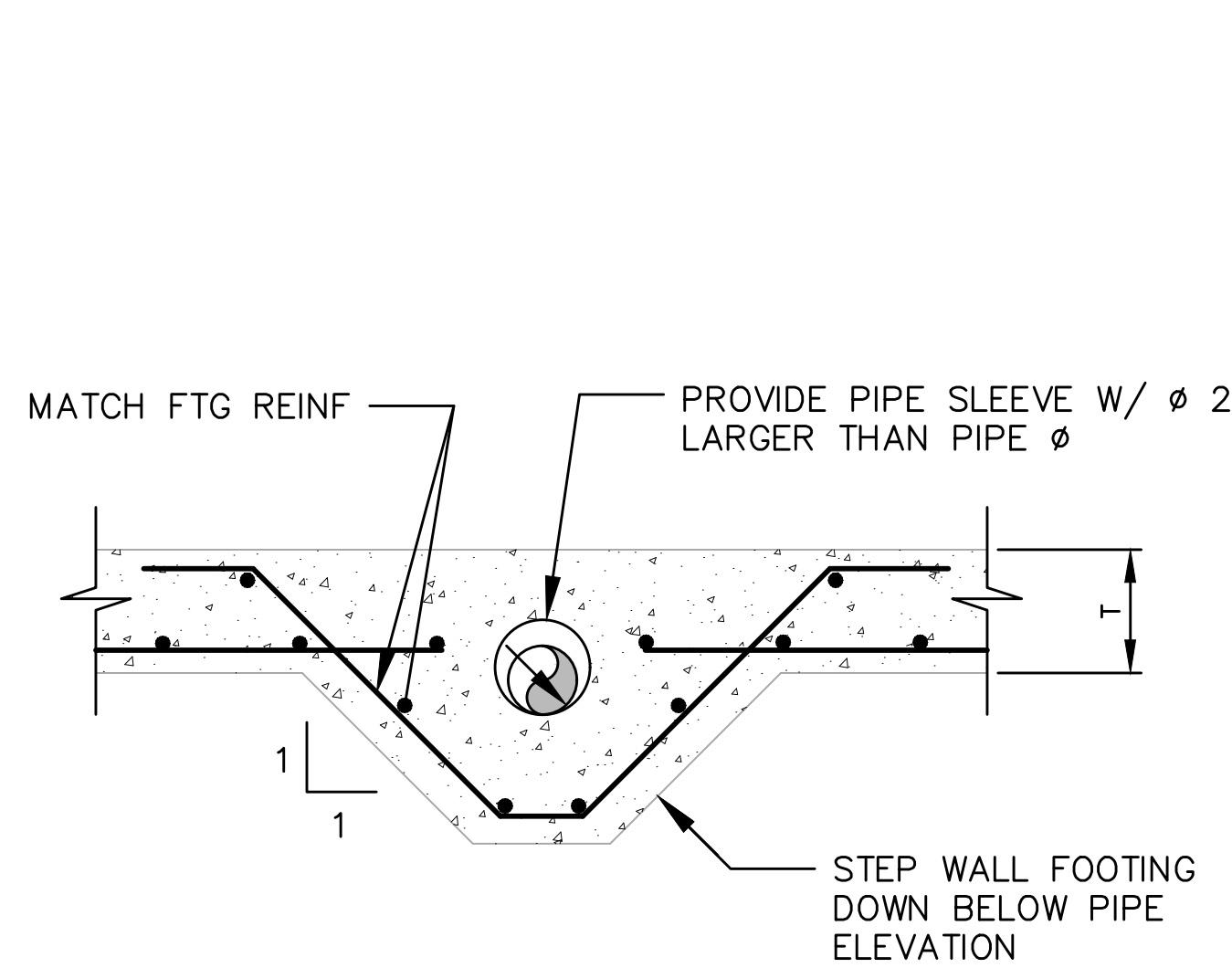
**EQUIPMENT PAD DETAIL**  
 NTS



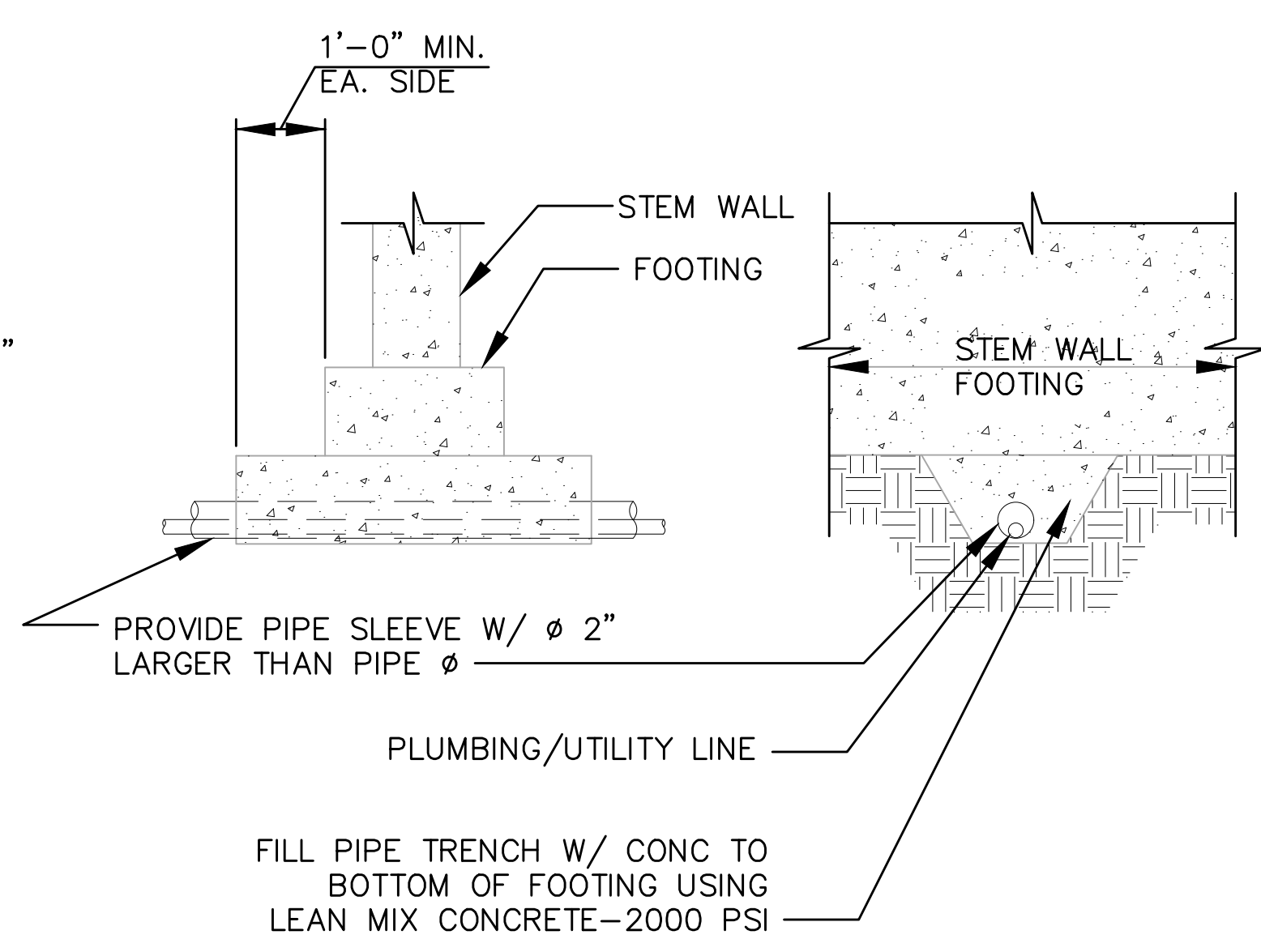
**NOTE:**

1. ALL DIMENSIONS ARE TO BE COORDINATED WITH GRATING/PLANK MANUFACTURER.
2. ALUMINUM PLANK SHALL BE SECURED PER MANUFACTURER'S RECOMMENDATION.

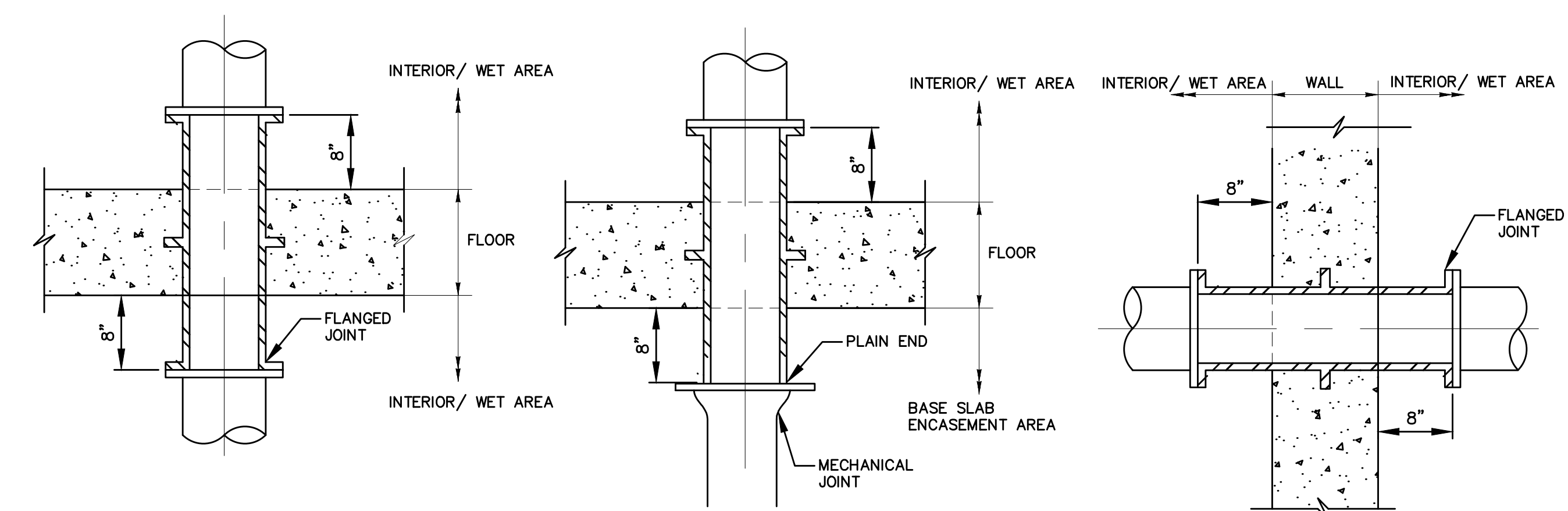
**GRATING/ALUMINUM PLANK SUPPORT DETAIL**  
 NO SCALE



**TYPICAL UTILITY PIPE THROUGH FOOTING**  
 SCALE: NONE



**TYPICAL UTILITY PIPE UNDER FOOTING**  
 SCALE: NONE



**NOTE:**

TYPICAL AT ALL DUCTILE IRON PIPE FLOOR PENETRATIONS IN AN ELEVATED SLAB.

**NOTE:**

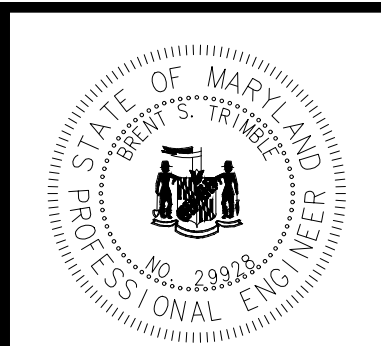
TYPICAL AT ALL DUCTILE IRON PIPE FLOOR PENETRATIONS THROUGH A BASE SLAB.

**NOTE:**

TYPICAL AT ALL DUCTILE IRON PIPE NON-BURIED WALL PENETRATIONS.

**PIPE WALL AND SLAB PENETRATION DETAILS**  
 NTS

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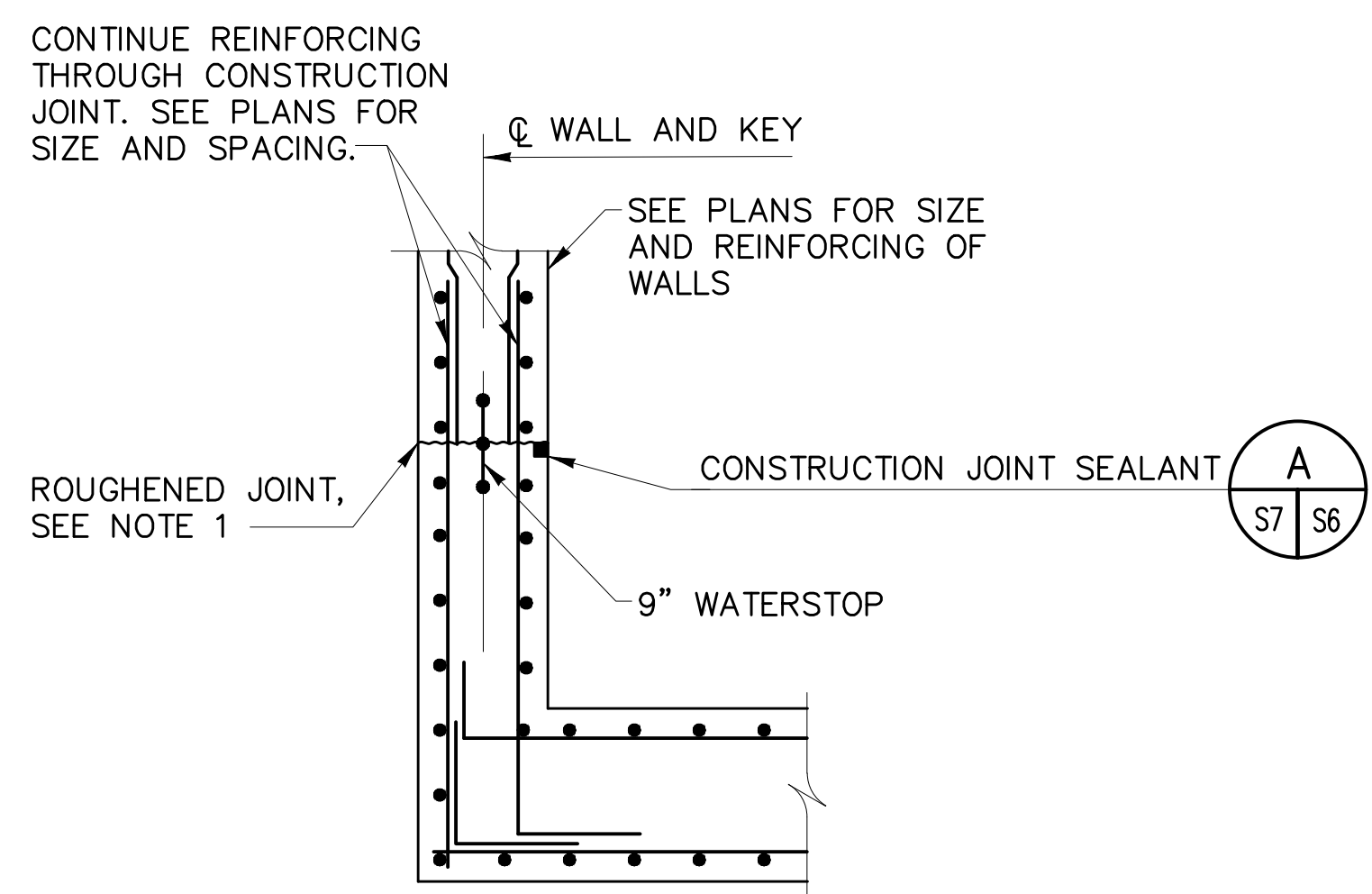
PROFESSIONAL CERTIFICATION  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.  
 LICENSE NO. 23828 EXPIRATION DATE 01/11/2028  
**RK&K**  
 700 EAST PRATT STREET, SUITE 500  
 BALTIMORE, MARYLAND 21202  
 800.787.3755

NO.	DESCRIPTION	BY	DATE
1	REISSUED FOR BID - ADDENDUM NO. 3		02/06/2024

TOWN OF EMMITSBURG, MARYLAND  
 WATER PLANT CLARIFIER  
 CIP NO. 4-1600-40-160-1  
 HAMPTON VALLEY ROAD, EMMITSBURG ELECTION DISTRICT No. 5, FREDERICK COUNTY, MARYLAND  
 STRUCTURAL DETAILS

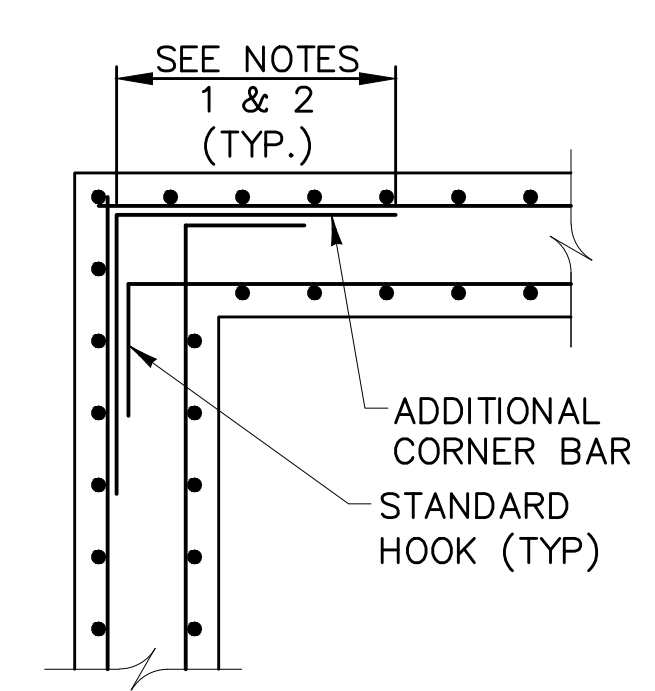
ENGINEER	CHECKED BY
GG	BST
DRAWN BY	DATE
MBP	2023
RK&K PROJECT NUMBER	
20119	

DRAWING NUMBER  
**S-07**  
 SHEET NO. 343 OF 42



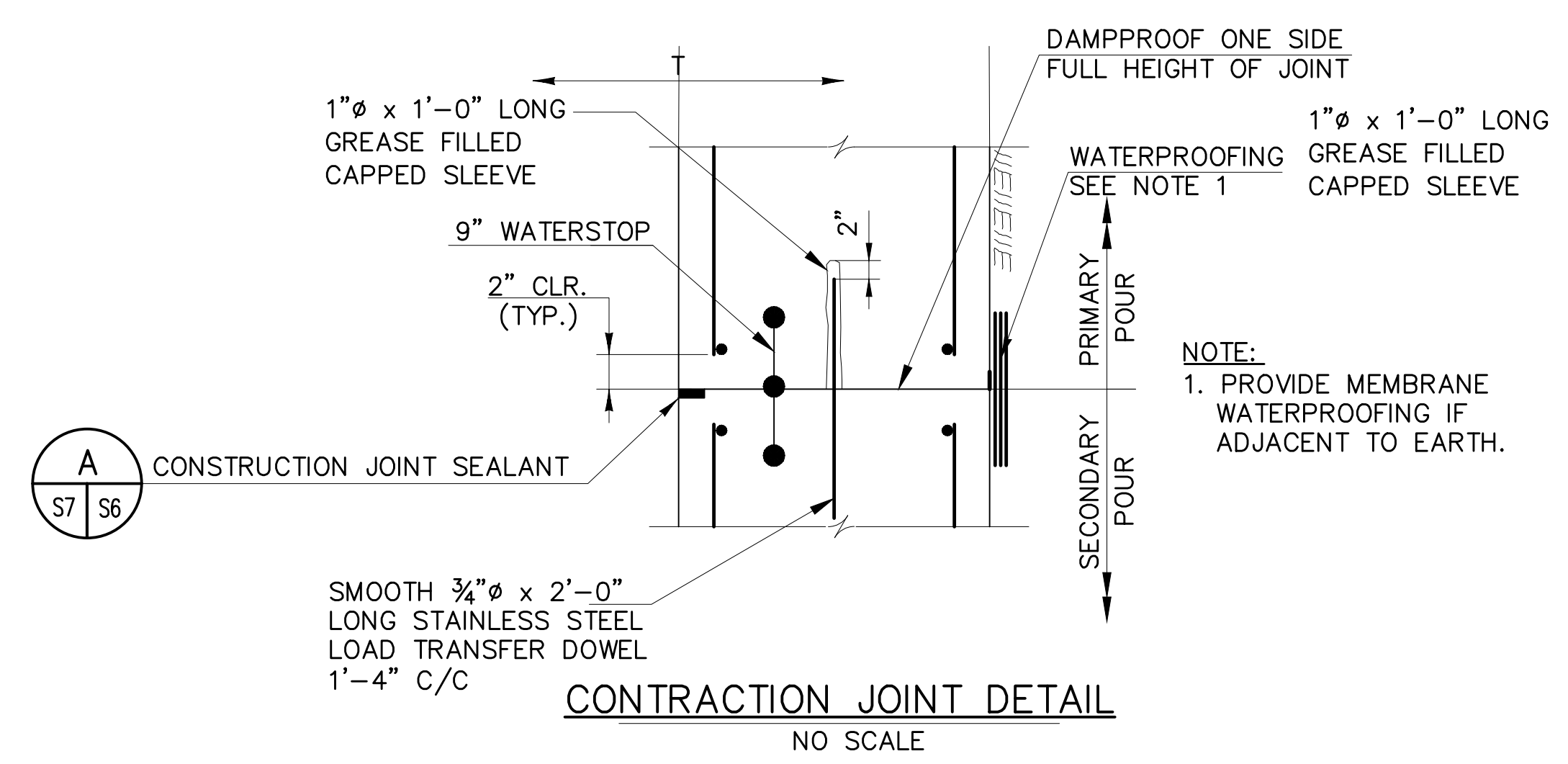
- NOTE:
1. SURFACE OF CONCRETE PLACED IN THE PRIMARY POUR SHALL BE ROUGHENED TO A FULL AMPLITUDE OF 1/4" AND CLEANED WITH A COARSE WIRE BRUSH AND COMPRESSED AIR TO REMOVE ALL LAITANCE AND TO PROVIDE A ROUGHENED SURFACE FOR BONDING NEW CONCRETE TO HARDENED CONCRETE. APPLY BONDING ADHESIVE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. EPOXY BONDING ADHESIVE SHALL BE SIKADUR 32, HI-MOD, OR APPROVED EQUAL.

TYPICAL WALL TO WALL CONSTRUCTION JOINT DETAIL  
 NTS



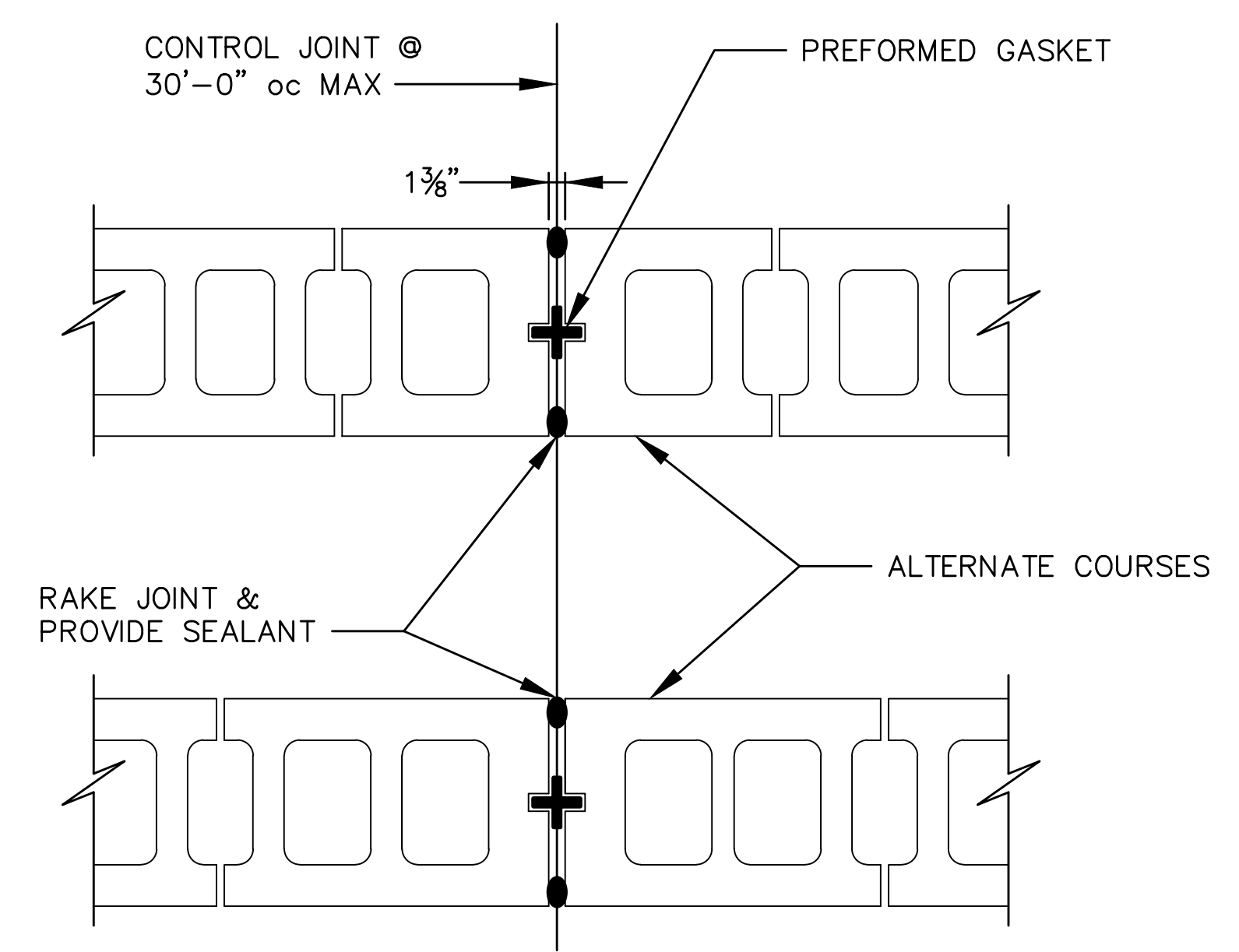
- NOTES:
1. UNLESS OTHERWISE NOTED ON THE DRAWINGS, PROVIDE MINIMUM LAP AS REQUIRED. IF BAR SIZES DIFFER, USE THE MIN. LAP LENGTH AS REQUIRED FOR THE SMALLER OF THE TWO BARS BEING SPLICED.
  2. UNLESS OTHERWISE NOTED ON THE DRAWINGS, THE ADDITIONAL BARS SHALL BE THE SAME SIZE AND AT THE SAME SPACING AS THE HORIZONTAL BARS.

CORNER REINFORCING DETAIL  
 NTS

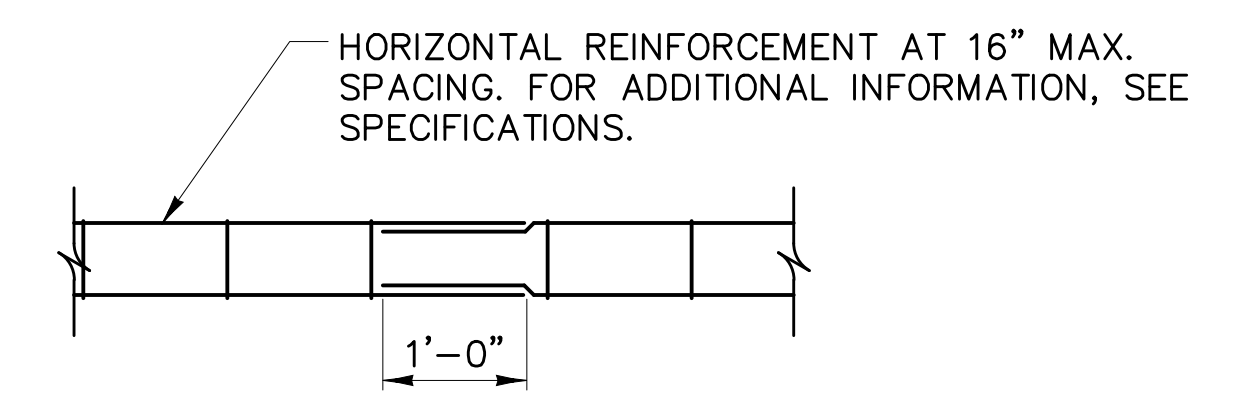


- NOTE:
1. PROVIDE MEMBRANE WATERPROOFING IF ADJACENT TO EARTH.

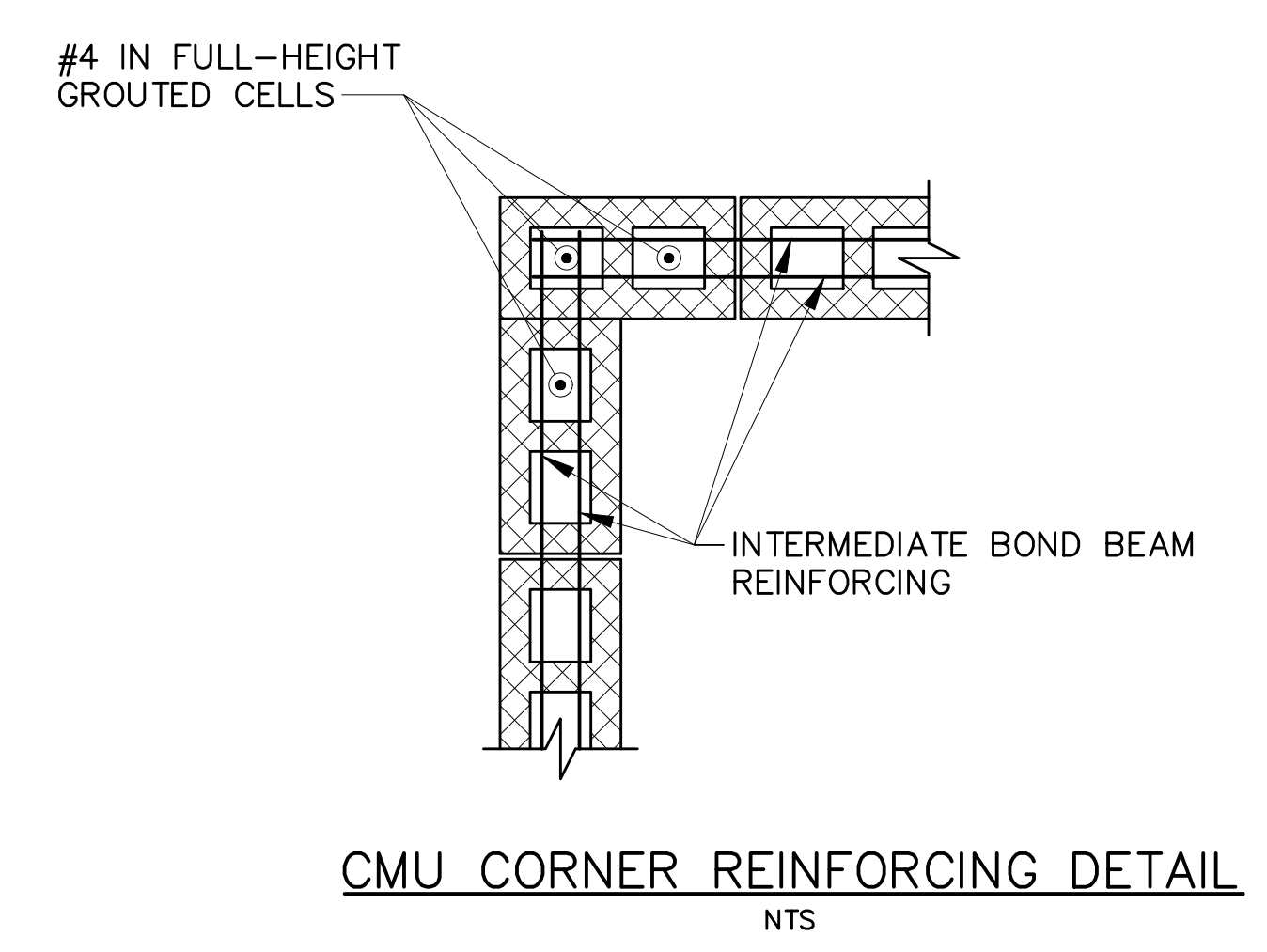
CONTRACTION JOINT DETAIL  
 NO SCALE



TYPICAL CONTROL JOINTS IN MASONRY WALLS  
 SCALE: NONE



- NOTE:
1. MASONRY NOT SHOWN FOR CLARITY.
- TYPICAL LADDER REINFORCING SPLICE DETAIL  
 NTS



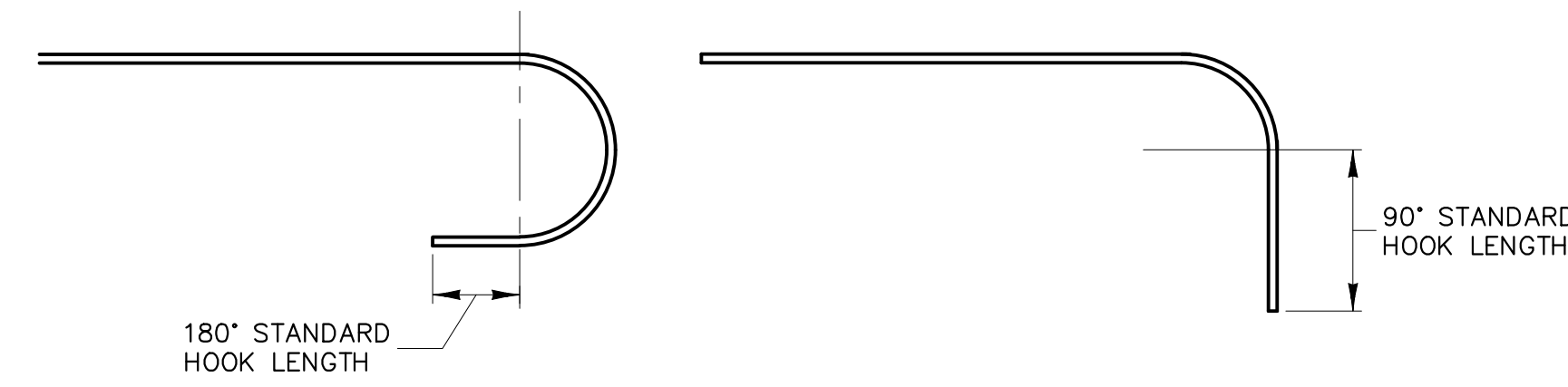
CMU CORNER REINFORCING DETAIL  
 NTS

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**NOTE:**

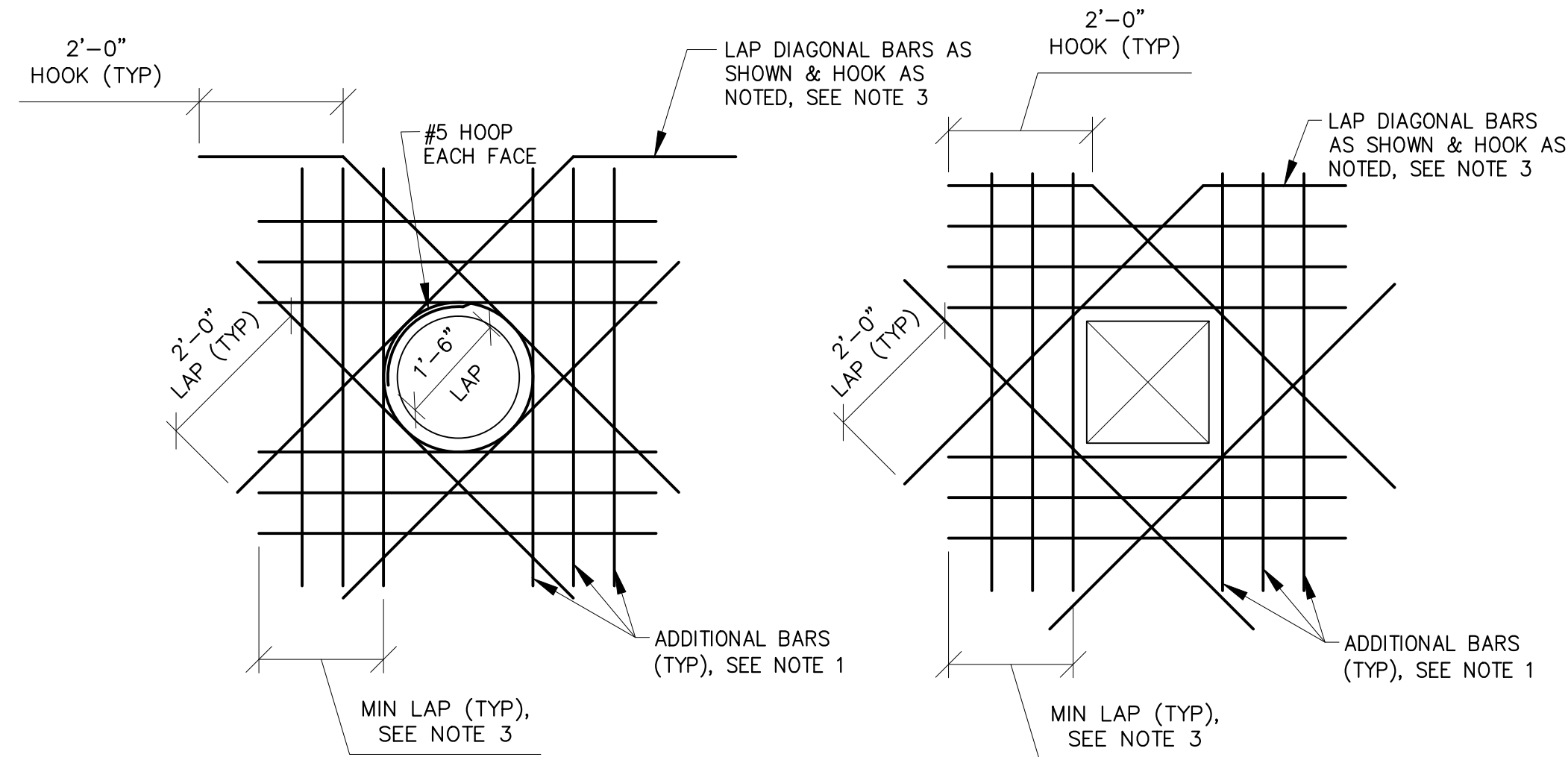
- TOP BARS ARE DEFINED AS BARS IN WALLS, SLABS AND BEAMS HAVING MORE THAN 12" OF FRESH CONCRETE CAST BELOW.

REINFORCEMENT SIZE	DEVELOPMENT LENGTH		LAP SPLICE LENGTH		HOOK DEVELOPMENT LENGTH	HOOK STRAIGHT EXTENSION	
	TOP BARS	BOTTOM BARS	TOP BARS	BOTTOM BARS		90 DEGREE	180 DEGREE
#3	1'-1"	1'-0"	1'-5"	1'-4"	9"	5"	3"
#4	1'-5"	1'-2"	1'-11"	1'-7"	11"	6"	3"
#5	1'-9"	1'-5"	2'-4"	1'-11"	1'-2"	8"	3"
#6	2'-8"	2'-1"	3'-6"	2'-9"	1'-5"	9"	3"
#7	3'-10"	3'-0"	5'-0"	3'-11"	1'-7"	11"	4"
#8	4'-5"	3'-5"	5'-9"	4'-6"	1'-10"	1'-0"	4"
#9	5'-5"	4'-2"	7'-1"	5'-4"	2'-1"	1'-2"	5"
#10	6'-9"	5'-2"	8'-10"	6'-9"	2'-4"	1'-4"	6"
#11	8'-1"	6'-2"	10'-7"	8'-1"	2'-7"	1'-5"	6"



REINFORCING DEVELOPMENT AND LAP LENGTH DETAIL

NTS

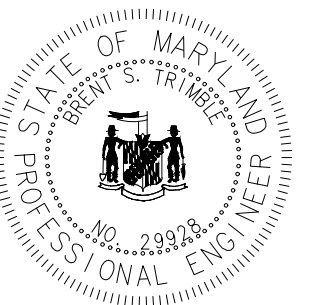


**NOTES:**

- NUMBER OF ADDITIONAL REINFORCING BARS AT EACH SIDE OF OPENING SHALL EQUAL HALF THE NUMBER OF INTERRUPTED BARS IN EACH LAYER OF REINFORCING.
- SIZE OF ADDITIONAL REINFORCING BARS TO EQUAL SIZE OF INTERRUPTED REINFORCING BARS.
- PROVIDE STANDARD HOOK BARS IF LAP LENGTH EXTENSION CANNOT BE OBTAINED AT JOINTS OR OTHER OBSTRUCTIONS. PLACE ADDITIONAL BARS IN SAME PLANES AS INTERRUPTED REINFORCING.
- SIZE OF DIAGONAL BARS SHALL BE THE SIZE OF THE LARGEST NORMAL REINFORCING BAR CUT, UNLESS OTHERWISE NOTED. LOCATE DIAGONALS IN EACH LAYER OF REINFORCING.
- PLACE DIAGONAL BARS INSIDE NORMAL REINFORCING.
- ALL REINFORCING TO CLEAR OPENING OR FLANGE COLLARS BY 2".
- ADDITIONAL REINFORCING BARS ARE REQUIRED AT ALL LOCATIONS WHERE THE REINFORCING IS INTERRUPTED BY AN OPENING.

TYPICAL ADDITIONAL REINFORCING BAR DETAILS

NTS



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ENGINEER	CHECKED BY
GG	BST
DRAWN BY	DATE
MBP	2023
RK&K PROJECT NUMBER	
20119	

DRAWING NUMBER  
**S-08**  
 SHEET NO. 345 OF 42

