

**1. COORDINATION:**

CONTRACTOR TO COORDINATE ALL PIPE AND CONDUIT LOCATIONS WITH MECHANICAL AND ELECTRICAL DRAWINGS PRIOR TO PLACING CONCRETE. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS FOR EQUIPMENT AND ANCHOR BOLT LOCATIONS.

STRUCTURAL DRAWINGS SHALL BE COORDINATED WITH MECHANICAL AND ELECTRICAL DRAWINGS TO PROPERLY LOCATE WALL PIPES, PIPE SLEEVES, ANCHOR BOLTS, BLOCKOUTS, ETC. DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE COUNTY ENGINEER BEFORE PROCEEDING WITH THE WORK.

**2. PRECAUTIONS:**

CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT FLOTATION OF STRUCTURES UNTIL FULLY CONSTRUCTED AND BACKFILL IS IN PLACE AND COMPACTED.

**3. DESIGN CRITERIA AND LOADS:**

ACI 350	CONCRETE SANITARY ENGINEERING STRUCTURES
ACI 318	BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE
ASTM C 478	STANDARD SPECIFICATION FOR CIRCULAR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS
ASTM C 433	STANDARD SPECIFICATION FOR JOINTS FOR CONCRETE PIPE AND MANHOLES, USING RUBBER GASKETS

**DESIGN LIVE LOADS:**

WET WELL TOP SLAB	AASHTO HS20-44.
SITE PAD - VEHICULAR AREA BEARING	AASHTO HS20-44.
SITE PAD - NON-VEHICULAR AREA BEARING	300 PSF.
NET ALLOWABLE SOIL BEARING CAPACITY:	1500 PSF. (MINIMUM)
DESIGN ENGINEER TO CONFIRM	

**4. CAST-IN-PLACE CONCRETE:**

CAST-IN-PLACE CONCRETE SHALL HAVE THE FOLLOWING MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS:

SLABS ON GRADE	4,000 PSI
PIPE SUPPORTS, PUMPS PADS, ENCASEMENTS	4,000 PSI

**5. PRECAST CONCRETE:**

PRECAST WET WELL CONCRETE SHALL HAVE MINIMUM 4,000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.

**6. REINFORCING STEEL:**

REINFORCING STEEL FOR ALL BARS SHALL CONFORM TO ASTM 615, GRADE 60 OF UNITED STATES MANUFACTURE.

WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.

**7. REINFORCEMENT CLEARANCE:**

CLEARANCE OF REINFORCING STEEL FROM THE FACE OF CONCRETE TO THE OUTERMOST TIE OR BAR SHALL BE 2", UNLESS OTHERWISE NOTED ON THE DRAWINGS.

**8. PIPE OPENINGS:**

OPENINGS SHALL BE LOCATED BASED ON THE REQUIREMENTS SPECIFIED IN THE MECHANICAL DRAWINGS. MANUFACTURER RESPONSIBLE FOR COORDINATING SIZE AND LOCATION WITH ENGINEER.

**9. ALUMINUM ACCESS HATCH:**

ACCESS HATCH COVER SHALL BE ALUMINUM, MEET HILLSBOROUGH COUNTY SPECIFICATIONS AND BE SIZED AND DETAILED TO MEET THE REQUIREMENTS OF THE SELECTED PUMPS.

**10. WATERSTOPS:**

WATERSTOPS SHALL BE DUMBELL STYLE, MADE OF FLEXIBLE PVC AND MEASURING 6" x 3/8".

**11. COATINGS:**

THE WET WELL INTERIOR SHALL RECEIVE A FIELD APPLIED CORROSION RESISTANT COATING AS PER HILLSBOROUGH COUNTY SPECIFICATIONS.

**12. SHOP DRAWINGS:**

THE FOLLOWING SHOP DRAWINGS SHALL BE SUBMITTED FOR REVIEW. FABRICATION SHALL NOT COMMENCE UNTIL ALL REVIEWS ARE COMPLETED.

- REINFORCING STEEL
- PRECAST CONCRETE
- GROUTS
- WATERPROOF JOINTS
- LINKSEAL STYLE CONNECTION
- GASKETS
- ANCHOR BOLTS FOR PUMPS
- CONCRETE MIX DESIGNS
- ACCESS HATCHES AND FRAMES
- EXPANSION JOINT MATERIAL
- FLEXIBLE 'BOOT' CONNECTIONS
- WATERSTOPS

**13. FOUNDATIONS:**

REMOVE ALL ORGANIC SOIL, CLAYS AND OTHER COMPRESSIBLE MATERIALS.

A MINIMUM OF 6 INCHES OF COMPACTED CRUSHED STONE (SEE HILLSBOROUGH COUNTY STANDARDS) SHALL BE PLACED UNDER THE WET WELL BASE SLAB AND DROP CONNECTION.

DEWATER EXCAVATION DURING WET WELL INSTALLATION. ALL WORK SHALL BE DONE IN THE "DRY".

**14. DESIGN CONDITIONS VS SITE CONDITIONS:**

THE WET WELL DESIGN WALL THICKNESS, BOTTOM SLAB THICKNESS AND DIMENSIONS, BOTTOM SLAB EXTENSION, AND FOUNDATION BASE COURSE ARE MINIMUM DIMENSIONS. THE STRUCTURAL DESIGN IS BASED ON THE LOADS AND CONDITIONS LISTED HERE. TO USE THESE PLANS AS-IS, THE ENGINEER SHALL VERIFY THAT THE SITE CONDITIONS MEET THE DESIGN CONDITIONS, INCLUDING THE GEOTECHNICAL CONDITIONS AND FLOTATION CALCULATIONS. IF THE SITE CONDITIONS VARY FROM THE DESIGN CONDITIONS, THE ENGINEER SHALL MODIFY THE DESIGN AS NEEDED AND PROVIDE SIGNED AND SEALED DRAWINGS TO THE COUNTY FOR APPROVAL.

**15. WET WELL CONSTRUCTION NOTES:**

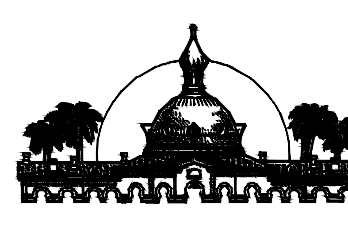

- A. GRAVITY PIPE, DISCHARGE PIPING, AUXILIARY SUCTION AND PROCESS PIPING SIZES TO BE DETERMINED BY THE ENGINEER. REFER TO MECHANICAL DRAWINGS.
- B. OPENING REQUIREMENTS:
  - GRAVITY PIPE: CAST-IN-PLACE OR CORED OPENING FOR FLEXIBLE 'BOOT' CONNECTION.
  - DISCHARGE PIPING: LINK SEAL TYPE PIPE SEAL.
  - AUXILIARY PIPING: LINK SEAL TYPE PIPE SEAL.
  - OTHER PIPING: NON-SHRINK GROUT.
- C. DROP CONNECTION SHALL BE USED WHEN THE ELEVATION DIFFERENCE BETWEEN THE INVERT OF THE INFLUENT PIPE AND THE PUMP LOW WATER LEVEL IS GREATER THAN 2 FEET.
- D. WET WELL BARREL JOINTS SHALL BE SEALED WITH A SINGLE OFFSET OR O-RING STYLE GASKET PER ASTM C433.
- E. TOP SLAB, BOTTOM SLAB AND WET WELL BARREL SHALL BE PRECAST.

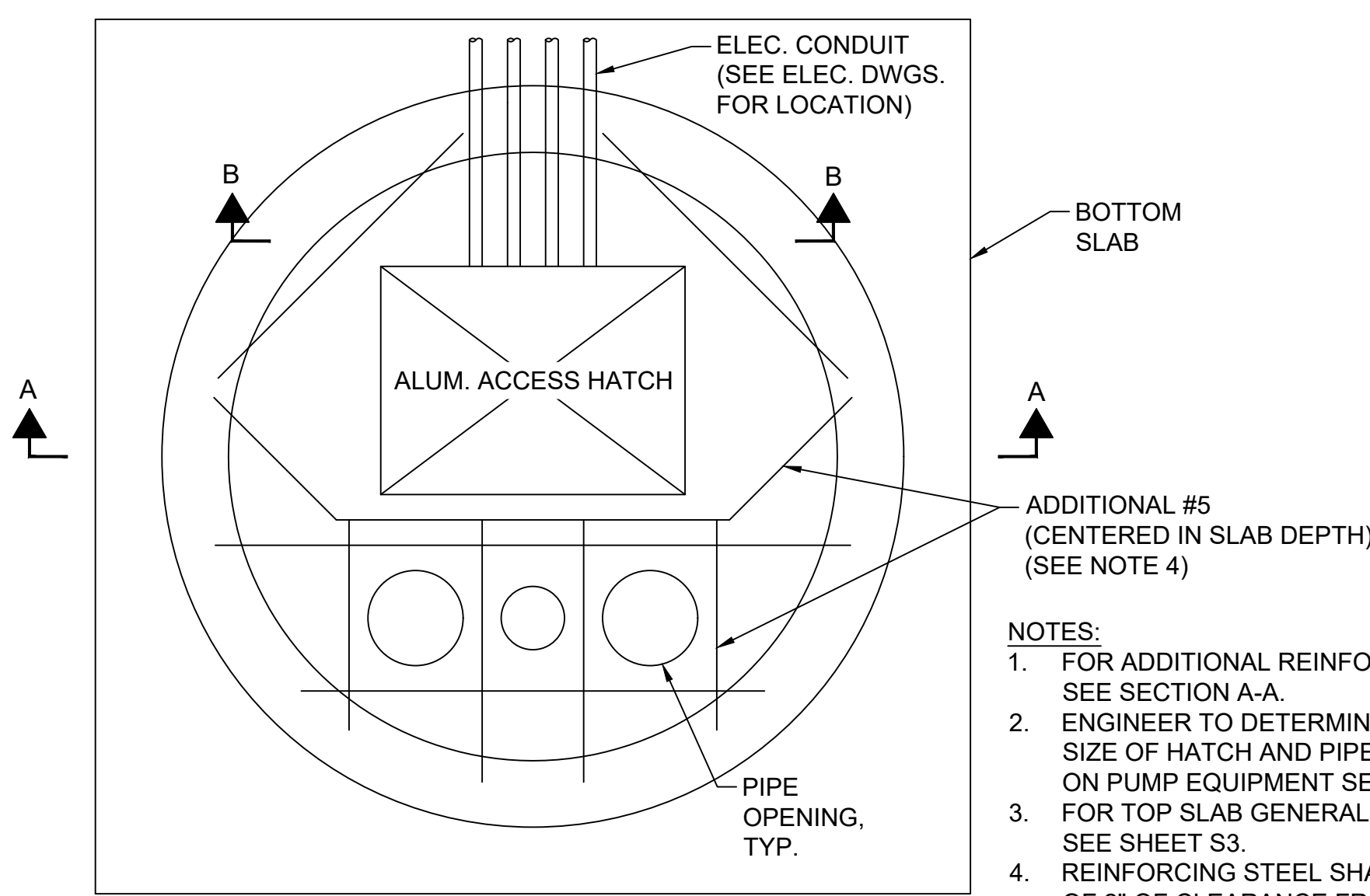
**USE OF DRAWINGS:**

SUCCESSOR PROFESSIONAL ENGINEER UTILIZING THESE DRAWINGS MUST ABIDE BY THE RULES AND REGULATIONS CONTAINED IN 61G15-27.001 OF THE FLORIDA ADMINISTRATIVE CODE.

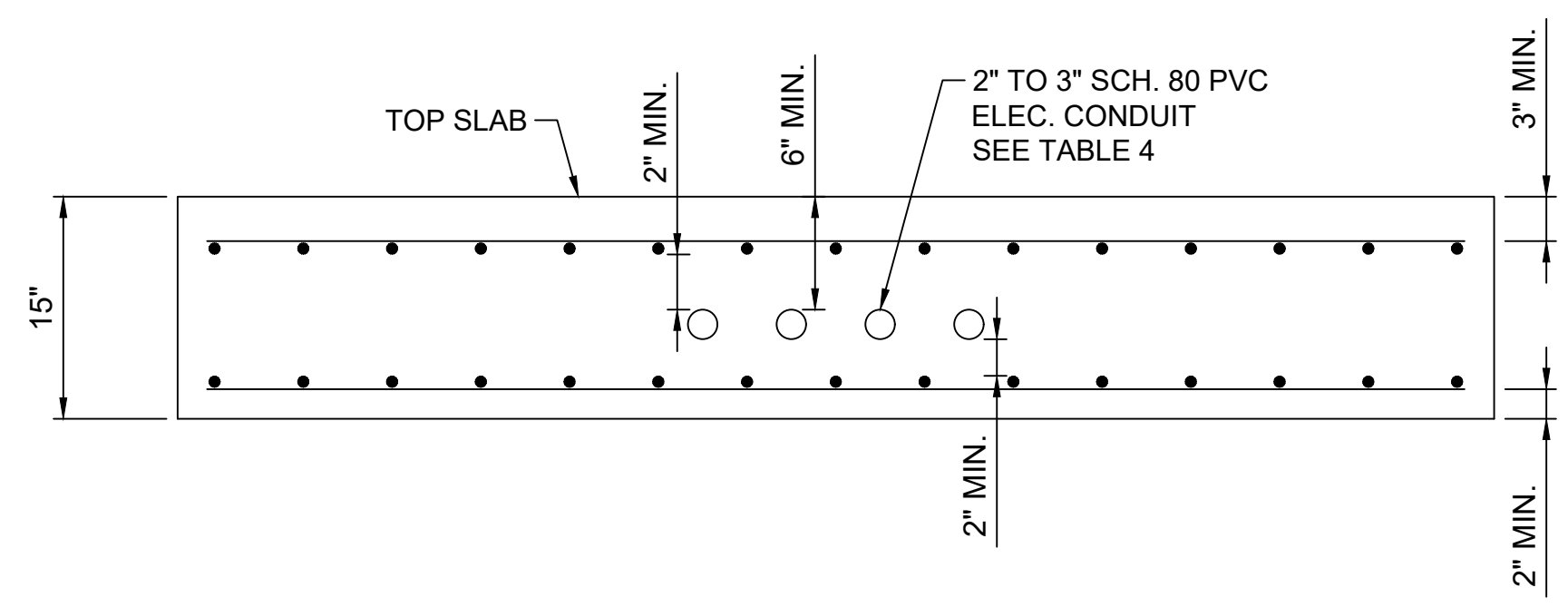
DAVID A. WILCOX  
FLORIDA PE 34942  
PROJECT MANAGER

WILLIAM N. HAUSHEER  
FLORIDA PE 31715  
STRUCTURAL ENGINEER

<b>SCALE</b>		<b>REVISIONS</b>		 <p><b>HILLSBOROUGH COUNTY PUBLIC UTILITIES DEPARTMENT</b> 925 E. TWIGGS STREET / TAMPA, FLORIDA 33602</p>	<table border="1" style="font-size: 8px;"> <tr><td>PROJECT No.:</td><td></td></tr> <tr><td>FILE No.:</td><td></td></tr> <tr><td>DESIGNED BY:</td><td>RMA</td></tr> <tr><td>DRAWN BY:</td><td>TRS</td></tr> <tr><td>CHECKED BY:</td><td>DAW &amp; WNH</td></tr> <tr><td>ISSUE DATE:</td><td>OCTOBER 2025</td></tr> <tr><td>SCALE:</td><td>AS SHOWN</td></tr> </table>	PROJECT No.:		FILE No.:		DESIGNED BY:	RMA	DRAWN BY:	TRS	CHECKED BY:	DAW & WNH	ISSUE DATE:	OCTOBER 2025	SCALE:	AS SHOWN	<p><b>NOTES STRUCTURAL</b></p>	 <p>7650 West Courtney Campbell Causeway Suite 700 Tampa, Florida 33607 Ph: (813) 286-1711 Fax: (813) 286-6587 Florida Engineering Number: 000002</p>	<p><b>SHEET</b></p> <p style="font-size: 24px;">S1</p> <p>1 OF 6</p>
PROJECT No.:																						
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**TYPICAL TOP SLAB REINFORCING PLAN**  
N.T.S.



**SECTION B-B**  
N.T.S.

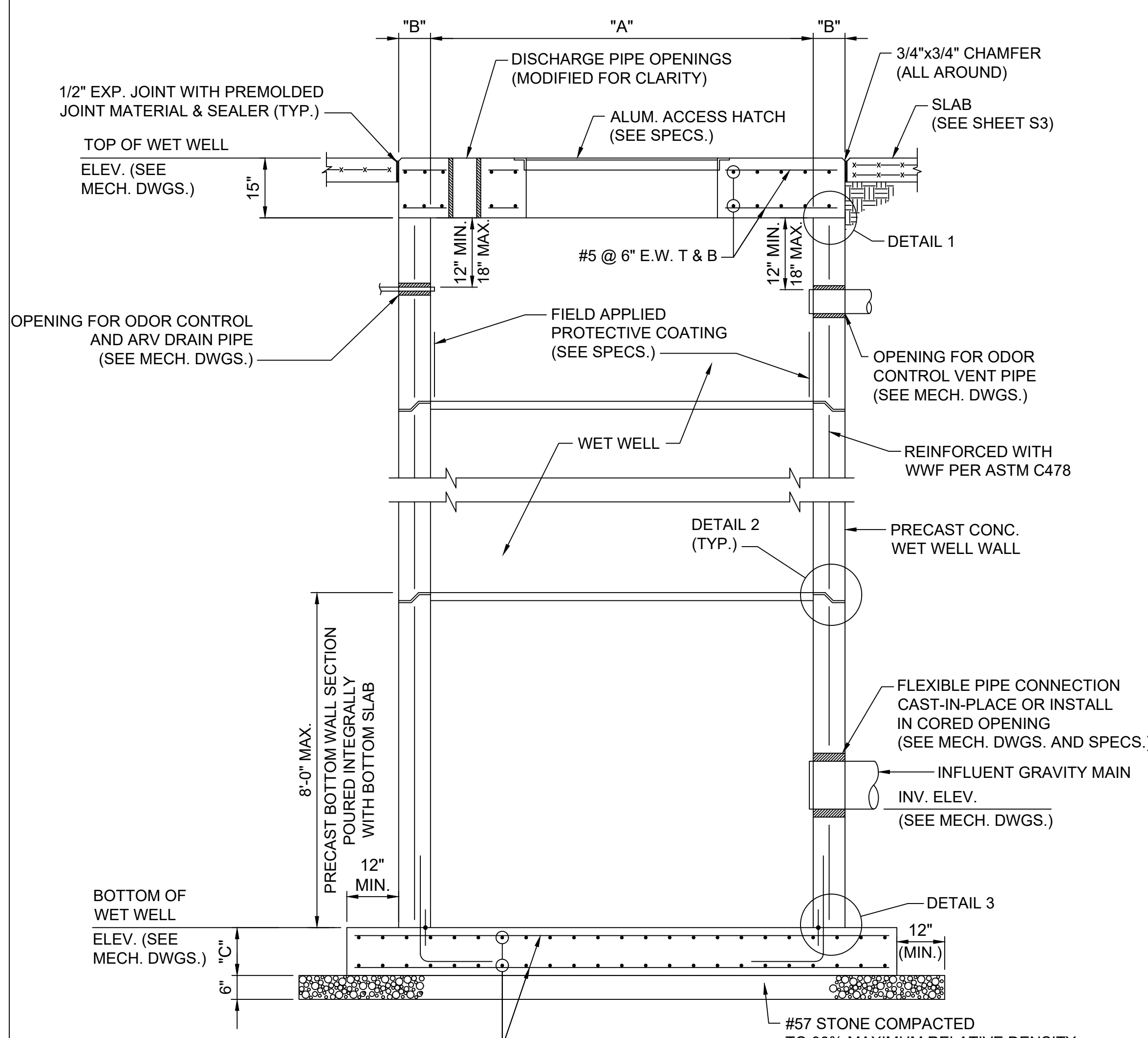
A	B	C
6'	8"	12"
8'	9"	18"
10'	10"	18"

GRAVITY INLET		PUMP DISCHARGE		AUX SUCTION	
DIA	OPENING	DIA	OPENING	DIA	OPENING
8"	12"	4"	10"	4"	6"
10"	14" OR 16"	6"	12"	6"	10"
12"	16"	8"	16"	N/A	N/A
16"	20" OR 22"	10"	18"	N/A	N/A

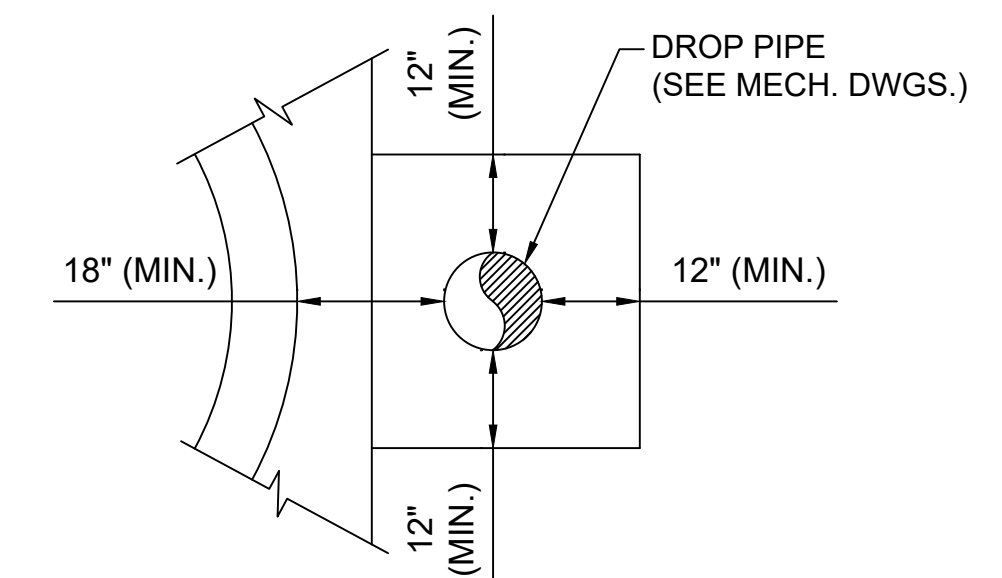
- NOTES:**
- FOR ADDITIONAL REINFORCING NOT SHOWN, SEE SECTION A-A.
  - ENGINEER TO DETERMINE LOCATION AND SIZE OF HATCH AND PIPE OPENINGS BASED ON PUMP EQUIPMENT SELECTED.
  - FOR TOP SLAB GENERAL ARRANGEMENTS, SEE SHEET S3.
  - REINFORCING STEEL SHALL HAVE A MINIMUM OF 2" OF CLEARANCE FROM PIPE OPENINGS.

WET WELL	SLAB	REINFORCING
6'	9' - 4" SQ.	#5 @ 6" T & B EACH WAY
8'	11' - 6" SQ.	#5 @ 6" T & B EACH WAY
10'	13' - 8" SQ.	#5 @ 6" T & B EACH WAY

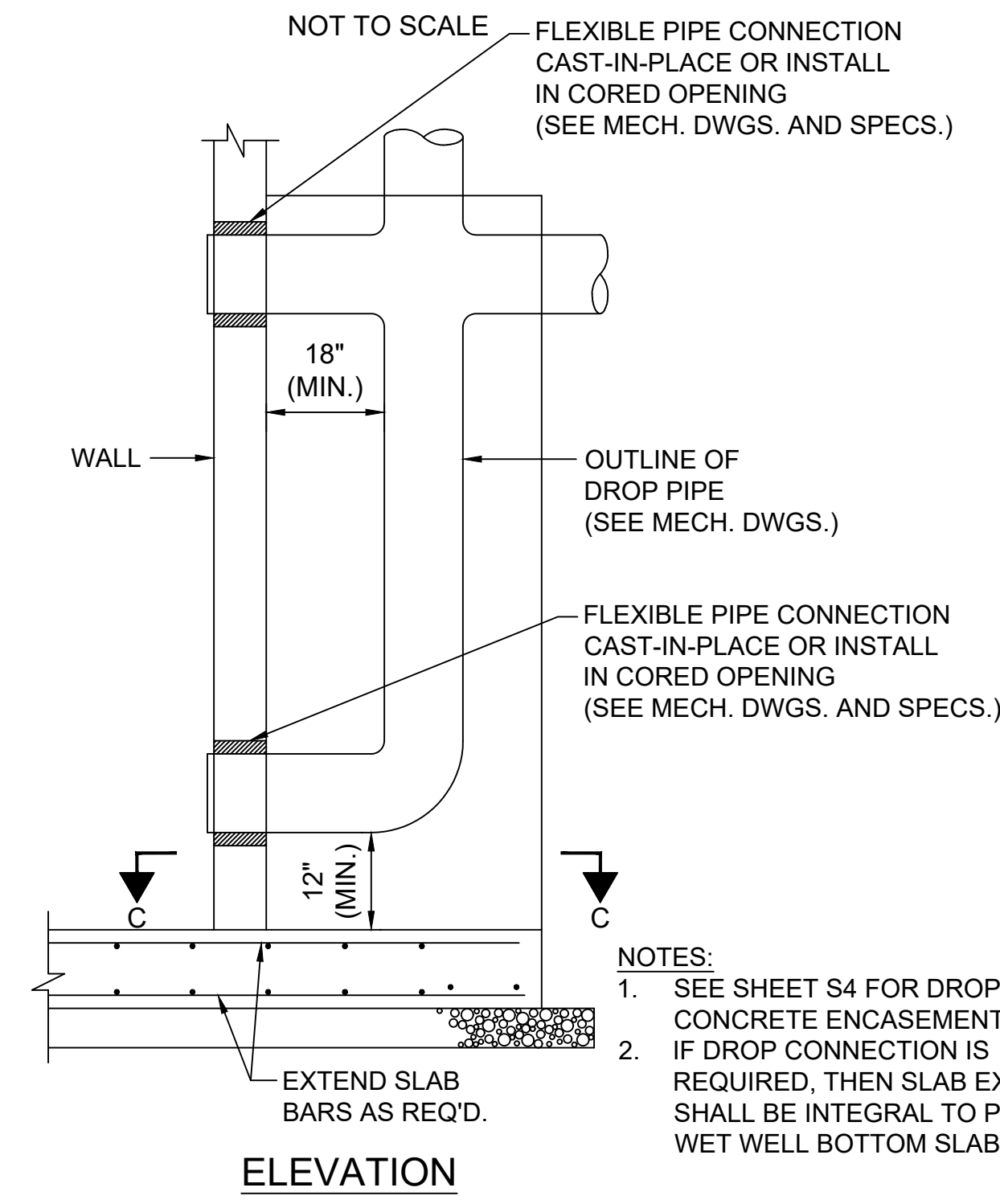
DIMENSIONS ARE MINIMUMS. ENGINEER TO DETERMINE BASED ON FLOTATION CALCULATIONS.



**SECTION A-A**  
NOT TO SCALE



**SECTION C-C**  
NOT TO SCALE

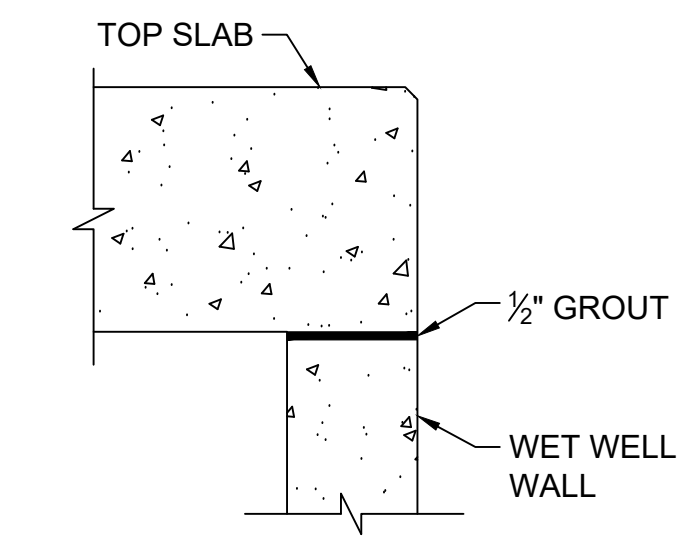


**DROP CONNECTION  
BOTTOM SLAB EXTENSION DETAIL**  
NOT TO SCALE

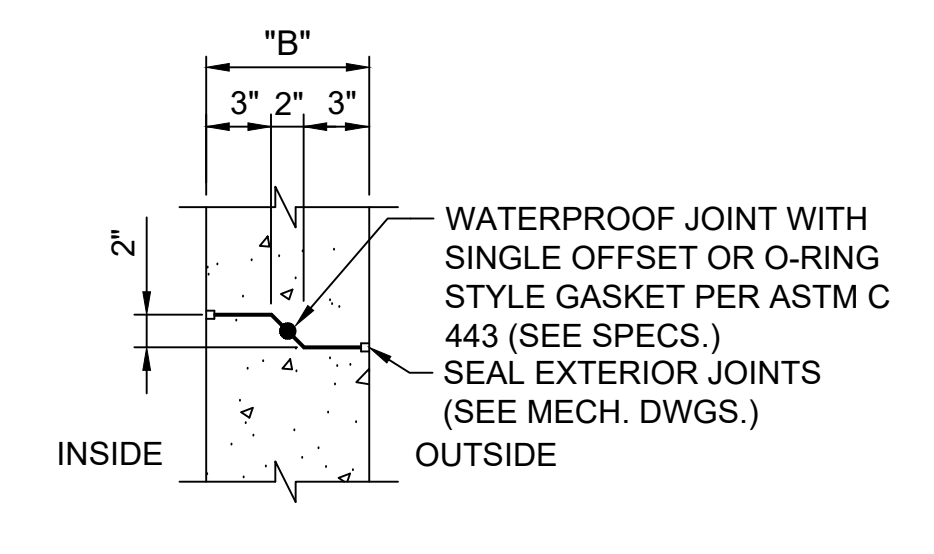
- NOTES:**
- SEE SHEET S4 FOR DROP PIPE CONCRETE ENCASEMENT.
  - IF DROP CONNECTION IS REQUIRED, THEN SLAB EXTENSION SHALL BE INTEGRAL TO PRECAST WET WELL BOTTOM SLAB.

PUMP HP	CONDUIT *
3 - 20	2"
25 - 50	2 1/2"
> 50 - 100	3"

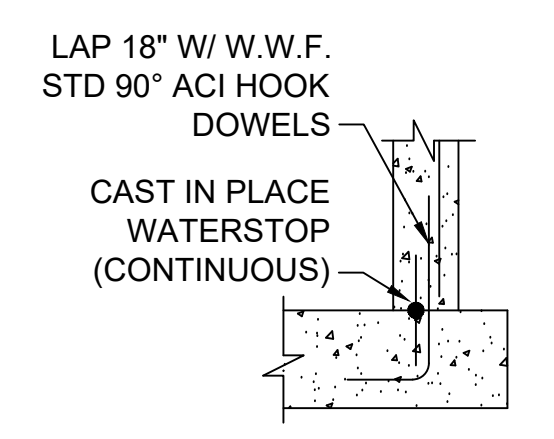
\* 4 CONDUIT FOR DUPLEX L.S.  
5 CONDUIT FOR TRIPLEX L.S.  
CONFIRM CONDUIT SIZES WITH ELECTRICAL ENGINEER.



**DETAIL 1**  
NOT TO SCALE



**DETAIL 2**  
NOT TO SCALE



**DETAIL 3**  
NOT TO SCALE

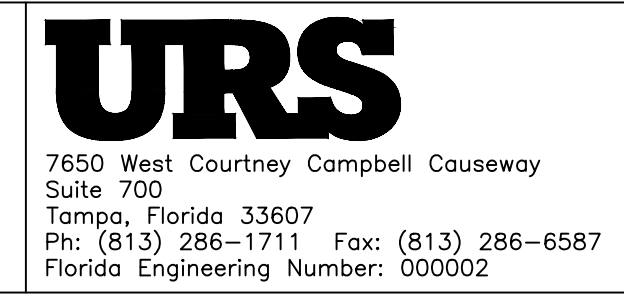
- NOTES:**
- FOR DIMENSIONS AND PIPE PENETRATION OPENING SIZES REFER TO TABLES ON THIS SHEET.
  - SEE SHEET S1 FOR WET WELL CONSTRUCTION NOTES.

SCALE	REVISIONS
AS SHOWN	
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FILE No.:	
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DRAWN BY:	TRS
CHECKED BY:	DAW & WNH
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**WET WELL PLAN, SECTIONS, and DETAILS**  
STRUCTURAL

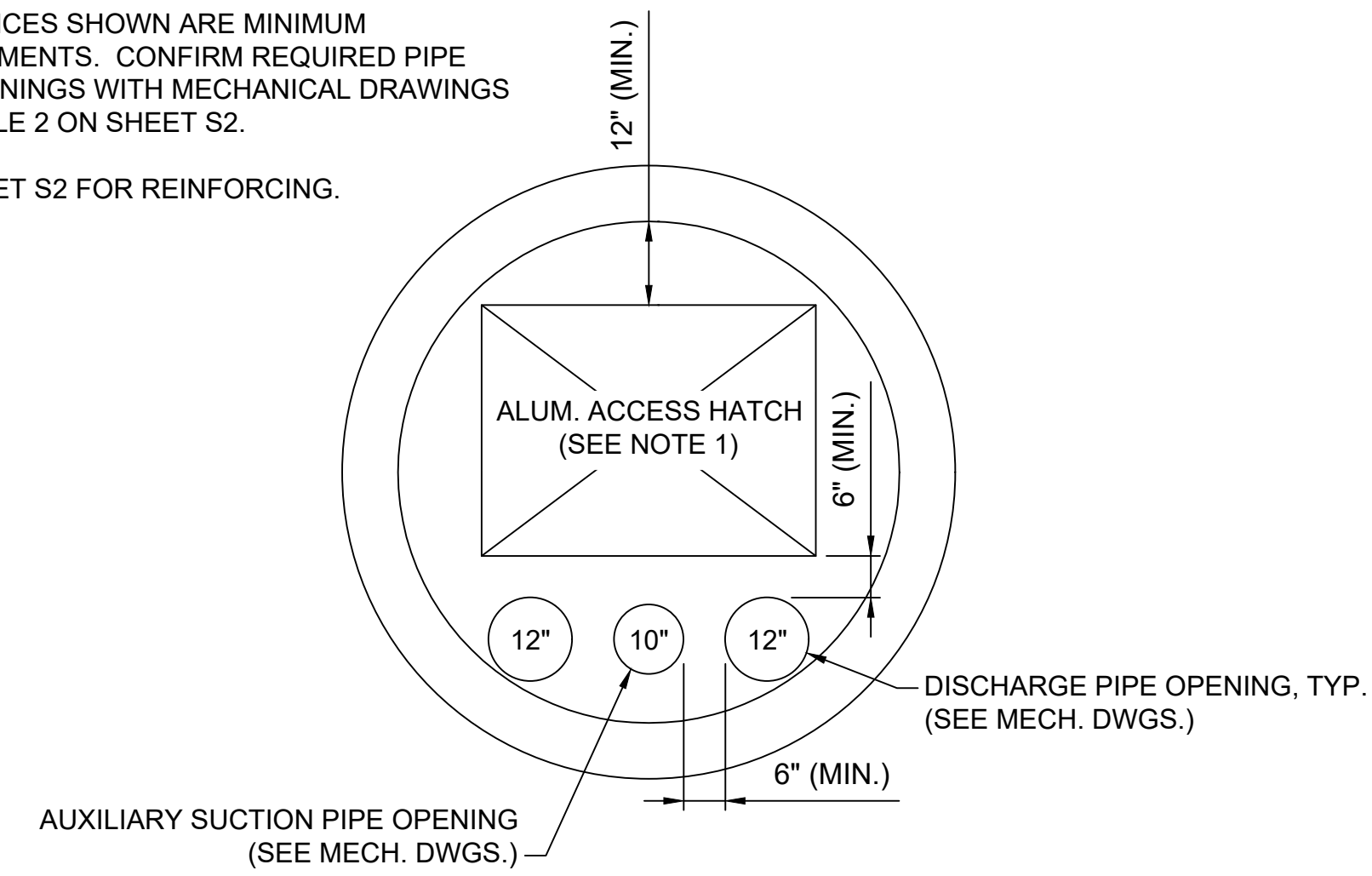


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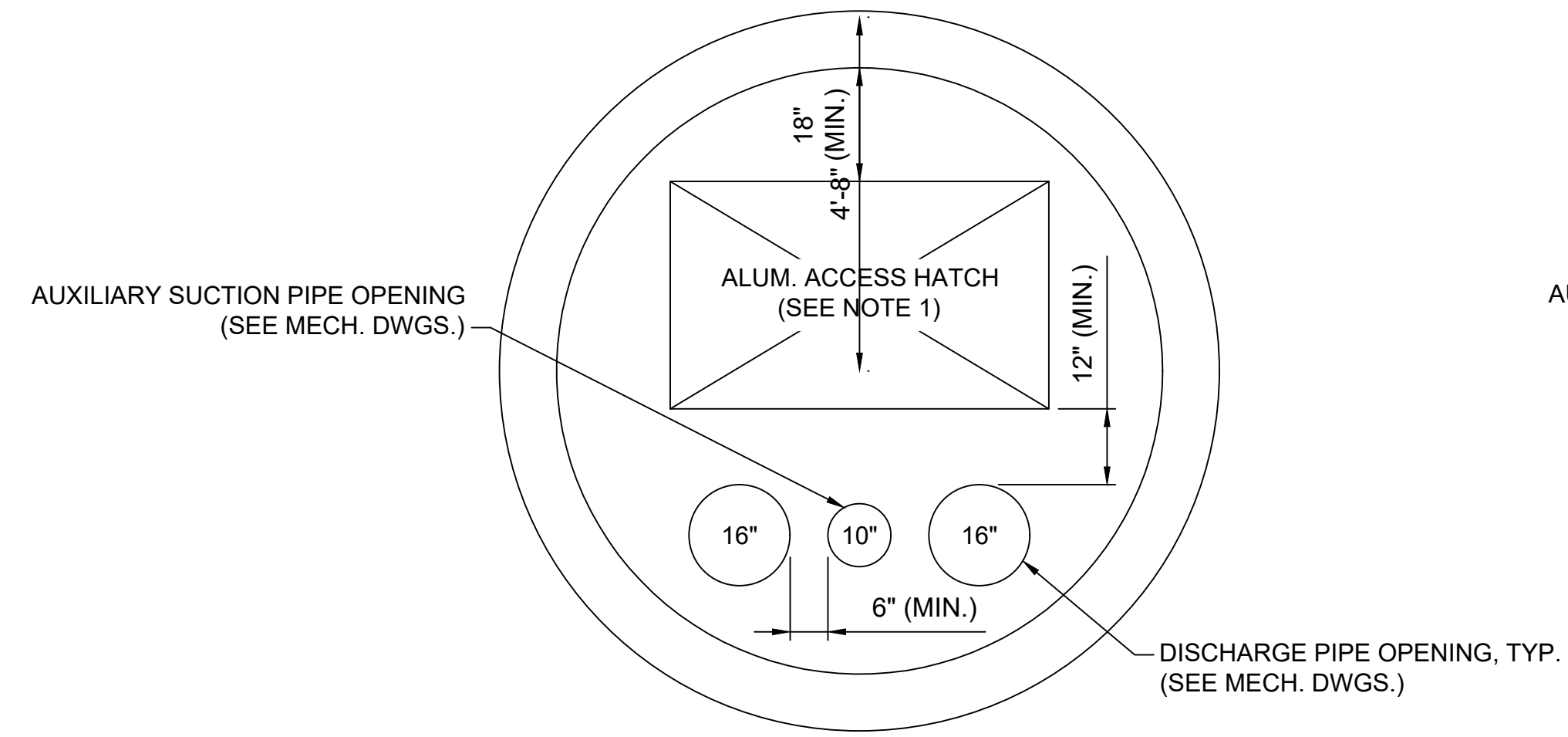
**NOTES:**

- ACCESS HATCHES SHOWN ARE FOR GENERAL ARRANGEMENT REQUIREMENTS ONLY. ENGINEER TO SELECT ACCESS HATCH SIZE AND LOCATION. REFER TO SPECIFICATIONS FOR MINIMUM REQUIRED HATCH SIZES.
- CLEARANCES SHOWN ARE MINIMUM REQUIREMENTS. CONFIRM REQUIRED PIPE SIZE OPENINGS WITH MECHANICAL DRAWINGS AND TABLE 2 ON SHEET S2.
- SEE SHEET S2 FOR REINFORCING.



**6' DUPLEX WET WELL TOP PLAN**

SCALE: 1/4" = 1'-0"



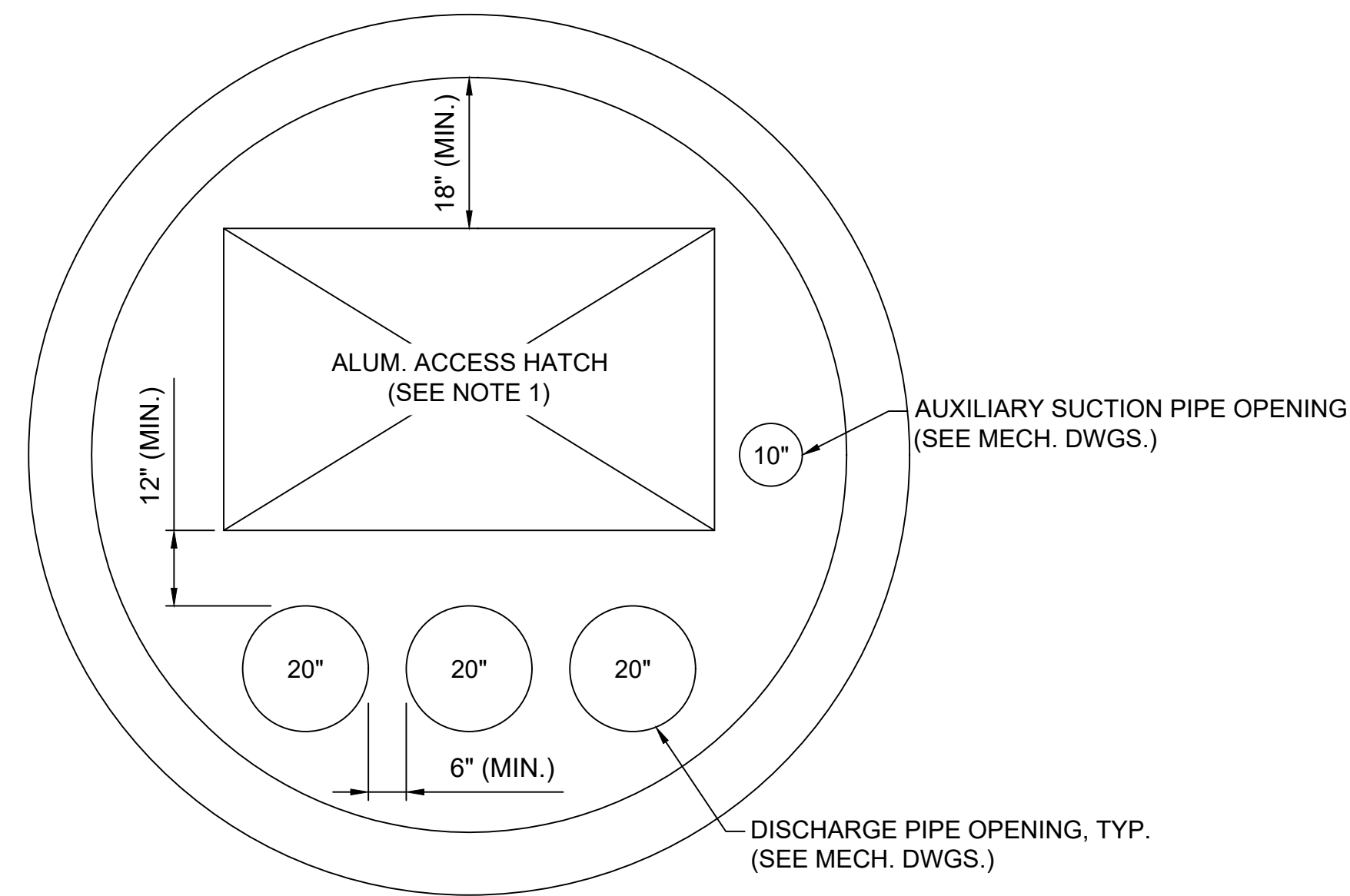
**8' DUPLEX WET WELL TOP PLAN**

SCALE: 1/4" = 1'-0"



**10' DUPLEX WET WELL TOP PLAN**

SCALE: 1/4" = 1'-0"

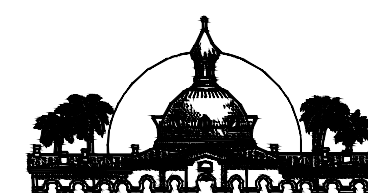


**10' TRIPLEX WET WELL TOP PLAN**

SCALE: 1/4" = 1'-0"

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SCALE		REVISIONS	
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1		ADDED 2 BLACK & VEATCH FALL HAZARD PROTECTION SHTS	8/31/2023



HILLSBOROUGH COUNTY  
PUBLIC UTILITIES DEPARTMENT  
925 E. TWIGGS STREET / TAMPA, FLORIDA 33602

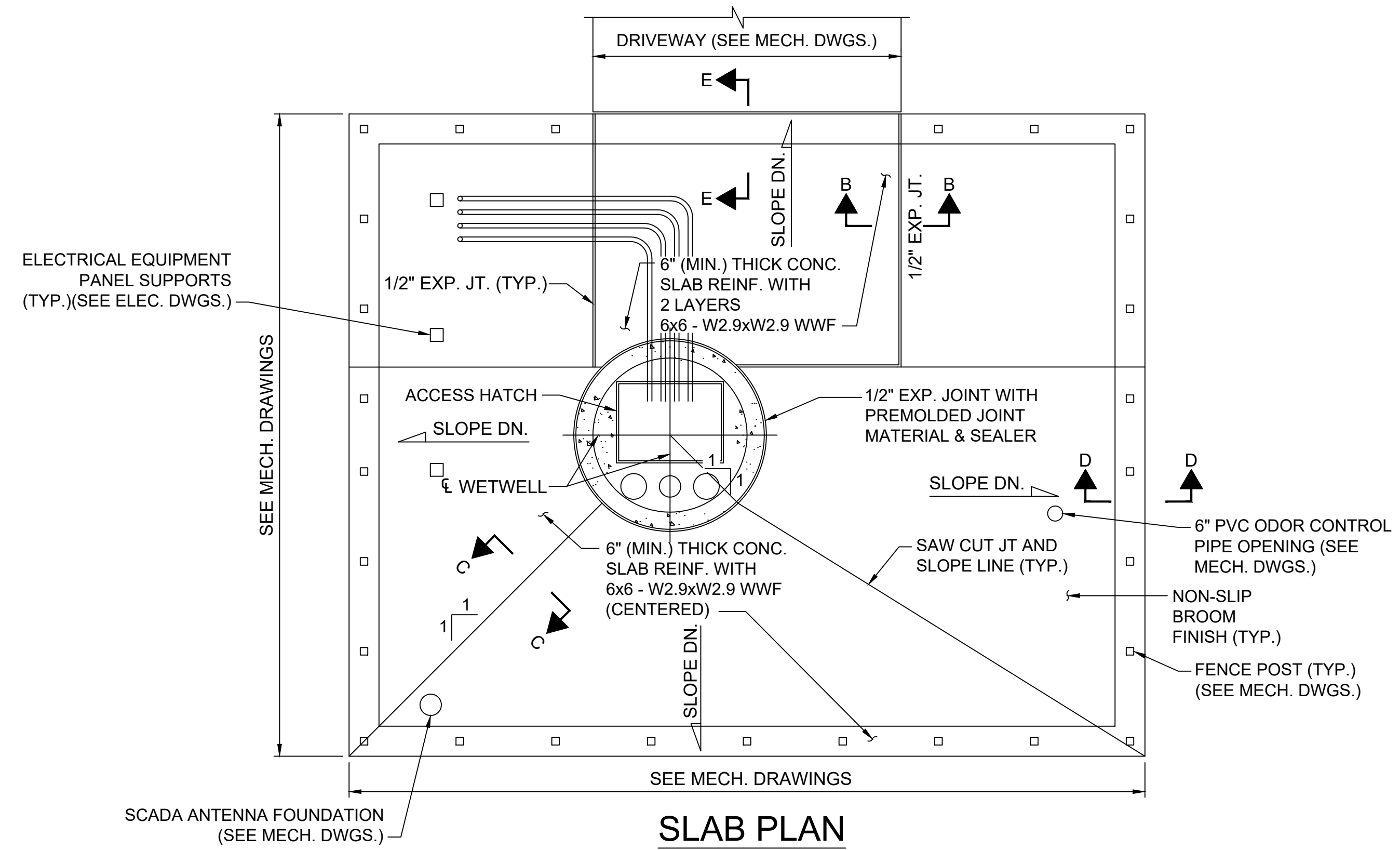
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DESIGNED BY:	RMA
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**WET WELL TOP SLAB GENERAL ARRANGEMENT  
STRUCTURAL**



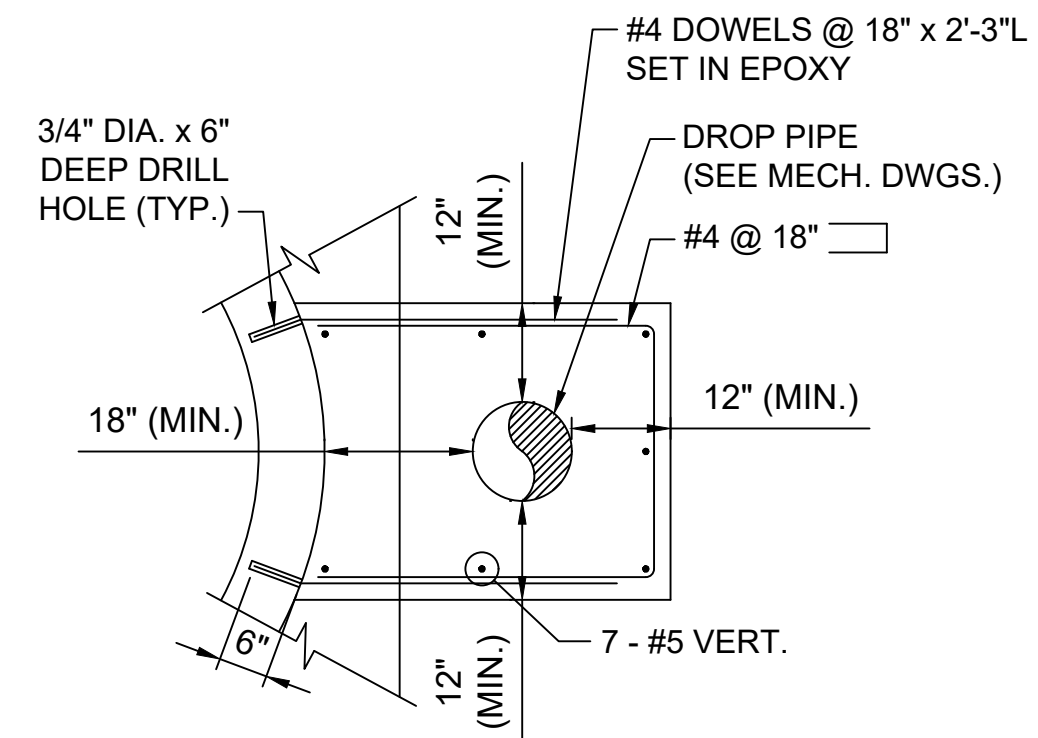
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Florida Engineering Number: 000002

**SHEET**  
**S3**  
3 OF 6

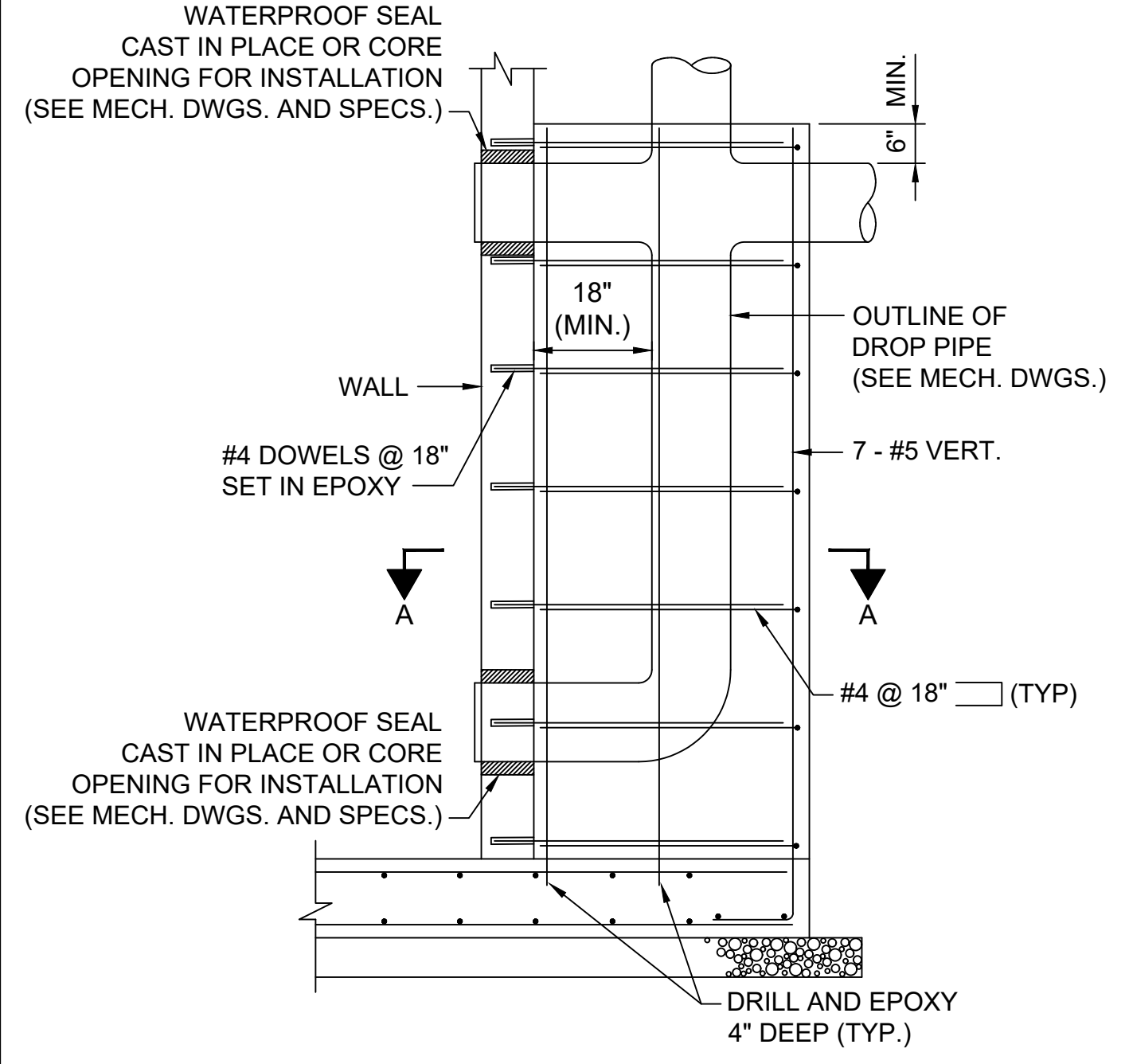


**SLAB PLAN**

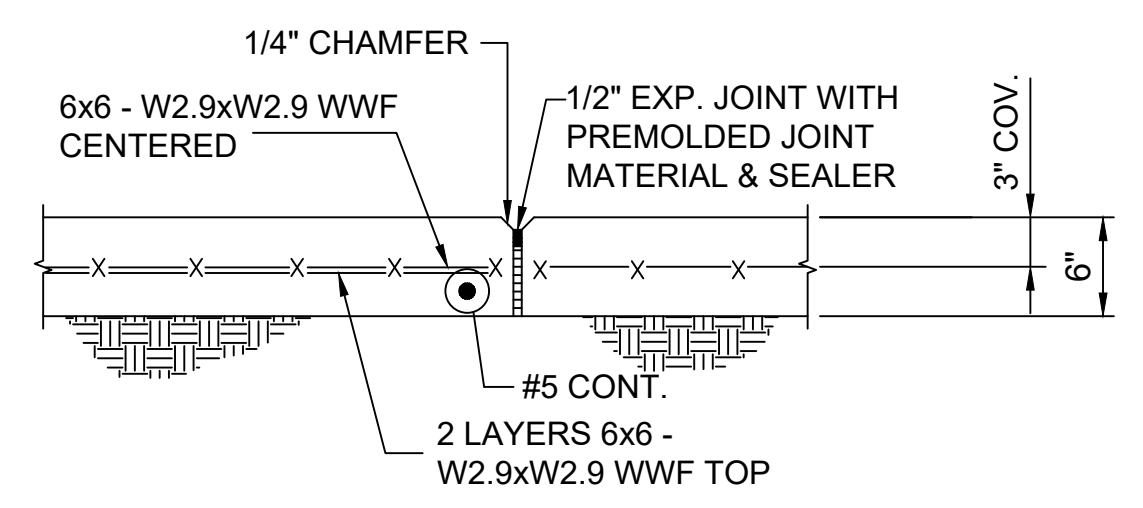
- NOTES:**
- SEE MECHANICAL DRAWINGS FOR LOCATION, SIZE AND ORIENTATION OF ALL PIPE OPENINGS AND SLAB DIMENSIONS.
  - DUPLEX LS IS SHOWN. SLAB IS THE SAME FOR TRIPLEX LS.



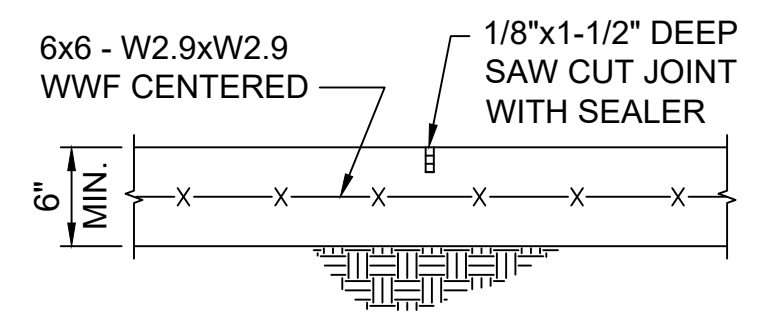
**SECTION A-A**  
NOT TO SCALE



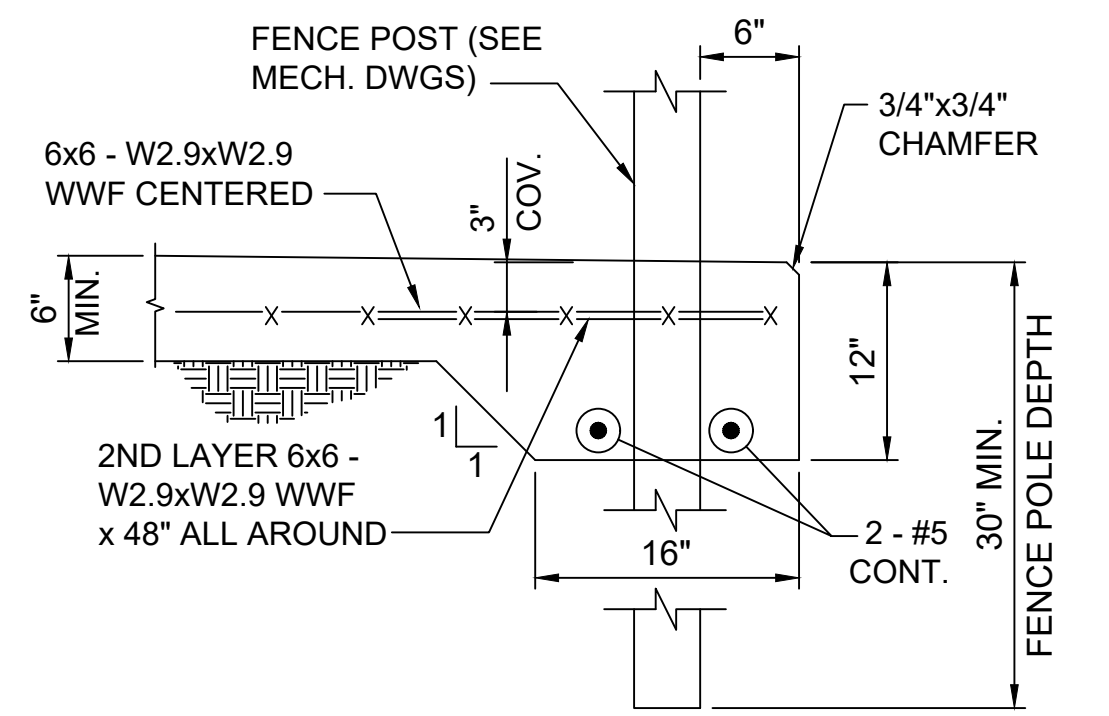
**ELEVATION  
DROP CONNECTION  
ENCASUREMENT DETAIL**  
NOT TO SCALE



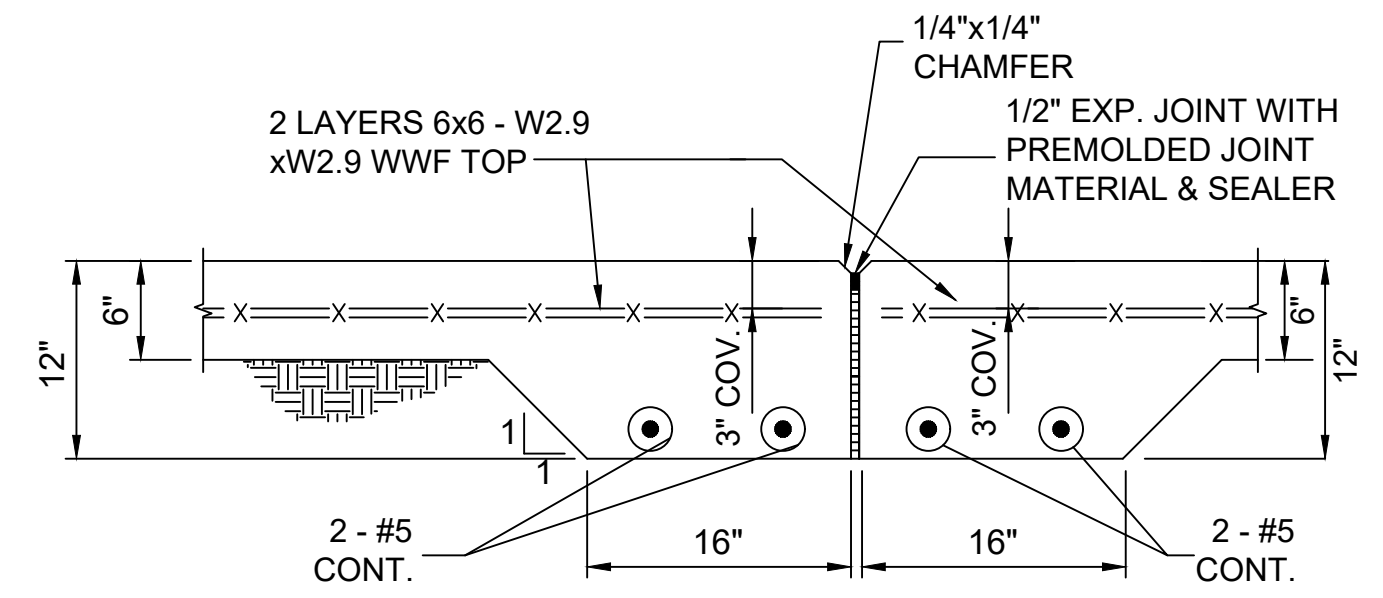
**SECTION B-B**  
SCALE: 1" = 1'-0"



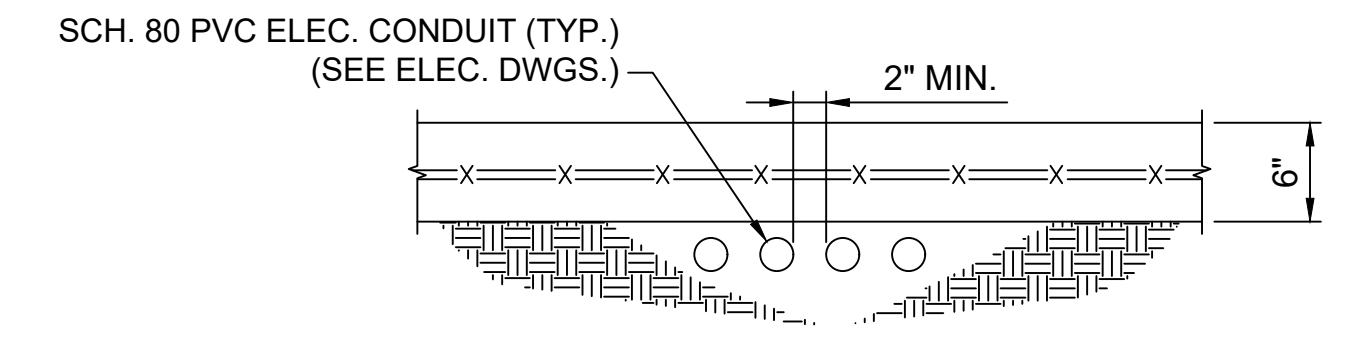
**SECTION C-C**  
SCALE: 1" = 1'-0"



**SECTION D-D**  
SCALE: 1" = 1'-0"



**SECTION E-E**  
SCALE: 1" = 1'-0"



**DRIVEWAY SLAB DETAIL WITH CONDUIT**  
SCALE: 1" = 1'-0"

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**SITE PLAN, SECTIONS AND DETAILS  
STRUCTURAL**

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Florida Engineering Number: 000002

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**SHEET**  
S4  
4 OF 6

**STRUCTURAL NOTES**

GENERAL

1. THE APPLICABLE BUILDING CODE IS THE 2015 INTERNATIONAL BUILDING CODE (IBC) AND THE 2017 FLORIDA BUILDING CODE, SIXTH EDITION.
2. THE REQUIREMENTS INDICATED ON THIS SHEET ARE INTENDED AS A BASIC SUMMARY OF THE MATERIAL AND CONSTRUCTION REQUIREMENTS FOR THE PROJECT. ADDITIONAL REQUIREMENTS ARE PROVIDED IN THE DRAWINGS AND ALL WORK MUST BE IN ACCORDANCE WITH HILLSBOROUGH COUNTY STANDARDS AND SPECIFICATIONS.
3. ALL STRUCTURAL RELATED SHOP DRAWINGS SHALL BE REVIEWED BY THE COUNTY PRIOR TO CONSTRUCTION.
4. CONTRACTOR SHALL INSTALL AND COMPACT CRUSHED STONE AS INDICATED ON THE DRAWINGS. AFTER COMPACTION BUT PRIOR TO INSTALLATION OF REINFORCING STEEL AND CONCRETE THE COUNTY WILL VERIFY COMPACTION REQUIREMENTS HAVE BEEN SATISFIED. PROVIDE 48 HOURS NOTICE PRIOR TO SUBGRADE BEING READY FOR COMPACTION VERIFICATION.

CONCRETE

1. SEE BELOW FOR CAST-IN-PLACE AND PRECAST CONCRETE STRENGTH REQUIREMENTS.
2. CONCRETE SHALL BE CONTROLLED WITHIN THE FOLLOWING LIMITING REQUIREMENTS:
  - MAXIMUM WATER-CEMENT RATIO - 0.42 ON A WEIGHT BASIS
  - CONCRETE STRENGTH - 4,000 PSI MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS.
  - COARSE AGGREGATE - MAXIMUM NOMINAL COARSE AGGREGATE SIZE, 1 INCH.
  - CONSISTENCY - WORKABLE, WITHOUT SEGREGATION, WITH SLUMP NOT MORE THAN 5 INCHES WHEN CONCRETE IS PLACED.
3. THE FOLLOWING ITEMS SHALL BE SUBMITTED TO THE COUNTY FOR REVIEW:
  - MANUFACTURER DATA FOR CONCRETE MIX
  - PROPOSED MIXTURE PROPORTIONS
  - CONCRETE COMPRESSIVE STRENGTH AT 28 DAYS
4. THE LOCATION OF ALL CONSTRUCTION JOINTS AND OTHER TYPES OF JOINTS, OTHER THAN THOSE SPECIFIED OR SHOWN ON THE PLANS, SHALL BE ACCEPTABLE TO THE COUNTY PRIOR TO PLACING CONCRETE.

REINFORCING STEEL

1. ALL REINFORCING BARS SHALL BE GRADE 60, DEFORMED, ASTM A615, UNLESS NOTED OTHERWISE.
2. DIMENSIONS TO REINFORCING BARS ARE TO BAR CENTERLINES UNLESS NOTED OTHERWISE. BAR COVER IS THE CLEAR DISTANCE BETWEEN THE BAR AND THE CONCRETE SURFACE.
3. CONCRETE COVER SHALL BE 2" WITH EXCEPTION OF LOCATIONS WHERE CONCRETE IS PLACED AGAINST SOIL. WHERE CONCRETE IS PLACED AGAINST SOIL, PROVIDE 3" OF CONCRETE COVER.
4. NO WELDING OF REINFORCING BARS SHALL BE PERMITTED UNLESS APPROVAL IS OBTAINED FROM THE COUNTY PRIOR TO CONSTRUCTION.

POST-INSTALLED ANCHORS

1. POST-INSTALLED ANCHORS SHALL INCLUDE ADHESIVE ANCHORS (THREADED RODS, BOLTS OR REINFORCING BARS), EXPANSION ANCHORS, AND UNDERCUT ANCHORS INSTALLED INTO HARDENED CONCRETE. SEE DETAILS FOR SIZE AND DIAMETER OF ANCHORS.
2. CARE SHALL BE TAKEN TO AVOID CONFLICTS WITH EXISTING REINFORCING STEEL AND OTHER EMBEDDED ITEMS WHEN DRILLING HOLES. REINFORCING BARS SHALL NOT BE DAMAGED DURING DRILLING OR ANCHOR INSTALLATION. HOLES SHALL BE DRILLED AND CLEANED PER THE PRODUCT MANUFACTURER'S INSTRUCTIONS. ANCHORS SHALL BE INSTALLED PER THE PRODUCT MANUFACTURER'S INSTRUCTIONS AT NOT LESS THAN MINIMUM EDGE DISTANCES AND/OR SPACING INDICATED IN THE MANUFACTURER'S LITERATURE.
3. DATA, CATALOG CUTS, AND MANUFACTURER'S RESEARCH REPORTS (FROM INDEPENDENT ORGANIZATIONS SUCH AS ICC-ES OR IAPMO UES) INDICATING THE MANUFACTURER AND TYPES OF ADHESIVE ANCHORS, EXPANSION ANCHORS, AND UNDERCUT ANCHORS TO BE SUPPLIED SHALL BE SUBMITTED. PRODUCTS SHALL BE SINGLE COMPONENT ANCHORS TESTED IN ACCORDANCE WITH ICC AC1193 (EXPANSION ANCHORS) AND ACI 308, AND SHALL HAVE MANUFACTURER'S RESEARCH REPORT IN COMPLIANCE WITH THE APPLICABLE BUILDING CODE. THE ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS AND ALL APPLICABLE REQUIREMENTS OF THE MANUFACTURER'S RESEARCH REPORT, AND SHALL BE APPROVED FOR USE IN CRACKED CONCRETE. ANCHORS SHALL BE INSTALLED IN DRY CONDITIONS, AFTER CONCRETE HAS REACHED ITS 21 DAY STRENGTH, HAMMER DRILLED HOLE ONLY, AND UNDER THE CONCRETE TEMPERATURE MAXIMUMS OF 162 F (SHORT-TERM) AND 110 F (LONG-TERM).
4. SUBSTITUTION REQUESTS FOR PRODUCTS OTHER THAN THOSE LISTED HEREIN OR INDICATED ON THE DRAWINGS SHALL BE SUBMITTED TO COUNTY FOR REVIEW AND APPROVAL. PRODUCT ICC-ESR EVALUATION REPORTS SHALL BE INCLUDED WITH THE SUBMITTAL PACKAGE. IF REQUESTED, CALCULATIONS PREPARED BY A REGISTERED PROFESSIONAL ENGINEER, LICENSED IN THE STATE OF FLORIDA, USING METHODS AND PROCEDURES REQUIRED BY THE BUILDING CODE MAY BE REQUIRED AS PART OF THE SUBMITTAL PACKAGE.
5. INSPECTION WILL BE PROVIDED BY THE COUNTY FOR ALL POST-INSTALLED ANCHORS.

EXISTING STRUCTURES

1. DRAWING S-02 DEPICTS WORK AT EXISTING STRUCTURES. ALL DIMENSIONS AND ALL DEPICTIONS SHALL BE FIELD-VERIFIED BY THE CONTRACTOR PRIOR TO ORDERING MATERIALS, STARTING FABRICATION, OR STARTING CONSTRUCTION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE, REPAIRS OR STRUCTURAL MODIFICATIONS THAT ARE REQUIRED DUE TO DEMOLITION BEYOND THE LIMITS IDENTIFIED ON THE DRAWINGS.
3. REINFORCEMENT FOR ANY EXISTING CONCRETE ELEMENT SHALL NOT BE DAMAGED UNLESS THE ELEMENT IS TO BE DEMOLISHED AS NOTED ON THE DRAWINGS. WHEN LOCATING EXISTING REINFORCEMENT IS REQUIRED, IT SHALL BE LOCATED USING NON-DESTRUCTIVE METHODS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE, REPAIRS OR STRUCTURAL MODIFICATIONS THAT ARE REQUIRED DUE TO DAMAGE OF CONCRETE, MASONRY OR REINFORCEMENT THAT HAS BEEN IDENTIFIED ON THE DRAWINGS TO REQUIRE FIELD VERIFICATION.
4. CORE DRILLING AND SAW CUTTING SHALL NOT BE PERFORMED UNLESS INDICATED ON THE DRAWINGS OR APPROVED BY THE ENGINEER.
5. EXPOSED CONCRETE SURFACES THAT REMAIN AFTER DEMOLITION SHALL BE REPAIRED TO MATCH ADJACENT CONCRETE SURFACES.
6. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, EXPOSED CONCRETE SURFACES WITH REINFORCEMENT, ANCHOR BOLTS, HANGER RODS, OR OTHER EXPOSED METAL EMBEDMENTS SHALL BE REPAIRED BY CUTTING OFF THE METAL AT THE FACE OF THE CONCRETE, GRINDING SMOOTH, AND COATING WITH A CORROSION INHIBITOR, SIKA ARMATEC 110 EpoCem 111 OR EQUAL. COATING SHALL EXTEND A MINIMUM OF 1" BEYOND THE EDGE OF ANY EXPOSED METAL.

NEW STRUCTURES

1. WHERE ANCHOR SYSTEMS ARE TO BE INSTALLED WITH NEW CONSTRUCTION, PEDESTAL MOUNTED ANCHOR POINTS SHALL BE THE PRIMARY OPTION UNLESS INGRESS/EGRESS AT A SITE OR ACCESS TO EQUIPMENT IS OF CONCERN. FLUSH MOUNTED ANCHOR POINTS MAY BE USED WITH SPECIFIC APPROVAL FROM THE COUNTY. CONTRACTOR MAY USE PRECAST OR CAST IN-PLACE PEDESTAL OPTION. SEE DETAILS FOR DOWEL ARRANGEMENT FOR EACH OPTION.
2. SITE LAYOUT SHALL ACCOUNT FOR HOIST CONNECTION LOCATION(S) TO ALLOW FOR FULL ACCESS TO ALL ELECTRICAL EQUIPMENT, WETWELL HATCH OPENING, AND THE STAGING OF PORTABLE DIESEL PUMPS OR OTHER PERTINENT APPURTENANCES REQUIRED BY MAINTENANCE STAFF. IT IS EXPECTED THAT A MINIMUM OF TWO HOIST CONNECTION LOCATIONS WILL BE REQUIRED PER SITE.

FALL PROTECTION SYSTEM

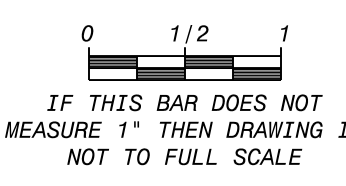
1. THE SCOPE OF THESE CONSTRUCTION DOCUMENTS IS LIMITED TO THE CONSTRUCTION OF THE FALL PROTECTION SYSTEM ANCHOR POINTS AND SLEEVE ANCHORAGE. ALL OTHER COMPONENTS OF THE FALL PROTECTION SYSTEM SHALL BE USED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDED SPECIFICATIONS.
2. THE DESIGN PROVIDED IN THESE CONSTRUCTION DOCUMENTS SHALL BE USED AS A GENERAL GUIDELINE FOR THE PLACEMENT AND CONSTRUCTION OF THE ANCHOR POINTS AND SLEEVE ANCHORAGE OF THE FALL PROTECTION SYSTEM. CONFIGURATIONS AND ORIENTATION MAY VARY FOR SPECIFIC SITES. IN ALL CASES, CONTRACTOR SHALL FOLLOW THE MINIMUM REQUIREMENTS ESTABLISHED IN THE DRAWINGS.
3. THE FALL PROTECTION ANCHOR DESIGN ASSUMES EXISTING CONCRETE WITH THE MINIMUM REQUIREMENTS LISTED BELOW.

MIN CONCRETE STRENGTH	MIN THICKNESS	MIN AREA OF EXISTING UNINTERRUPTED CONCRETE
4000 PSI	6"	36 SQ FT
4000 PSI	4"	50 SQ FT
3000 PSI	6"	50 SQ FT
3000 PSI	4"	75 SQ FT

UNINTERRUPTED CONCRETE IS DEFINED AS A SINGLE POUR OF CONCRETE WITHIN EXPANSION OR CONSTRUCTION JOINTS. SAWED JOINTS ARE PERMITTED WITH THE LIMITS OF UNINTERRUPTED CONCRETE.

IF CONDITIONS DIFFER THAN THESE MINIMUMS, THE CONTRACTOR IS TO CONTACT THE COUNTY AND A SITE SPECIFIC DESIGN WILL NEED TO BE DONE TO ENSURE SAFE INSTALLATION OF THE FALL PROTECTION ANCHOR.

△ N/A



DESIGNED	EAP
DETAILED	JPS
CHECKED	EB
APPROVED	RAZ
ISSUE DATE	OCTOBER 2025

ENGINEER OF RECORD:  
NICHOLAS W. ECKHARDT, P.E.  
FLORIDA LICENSE NO.:  
69144



HILLSBOROUGH COUNTY  
PUBLIC UTILITIES DEPARTMENT  
WATER RESOURCE DIVISION  
925 East Twigg Street  
Tampa, Florida 33602

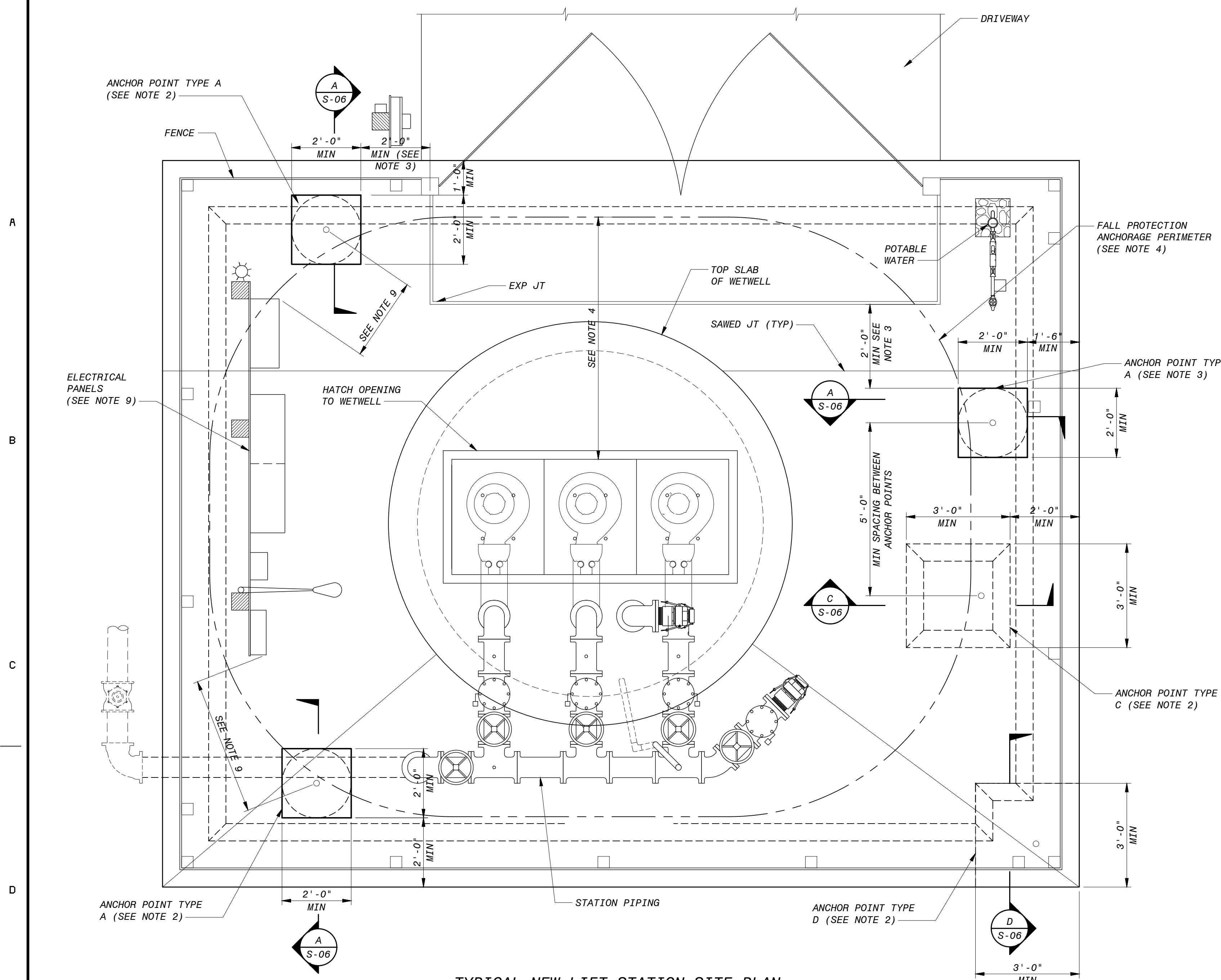
B&V PROJECT NO.  
198544  
C.I.P. NO.  
10138

HILLSBOROUGH COUNTY, FLORIDA

FALL PROTECTION STRUCTURAL  
GENERAL NOTES

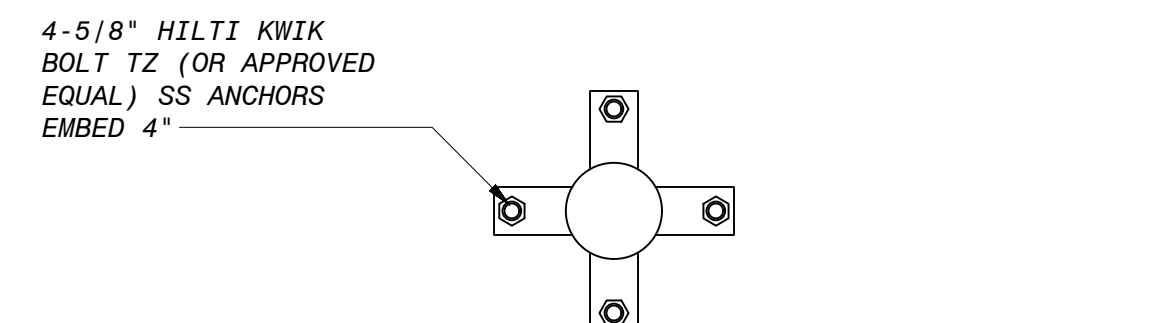
S-05  
SHEET  
5 OF 6

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
8/31/23	REVISED FOR COUNTY STANDARDS				

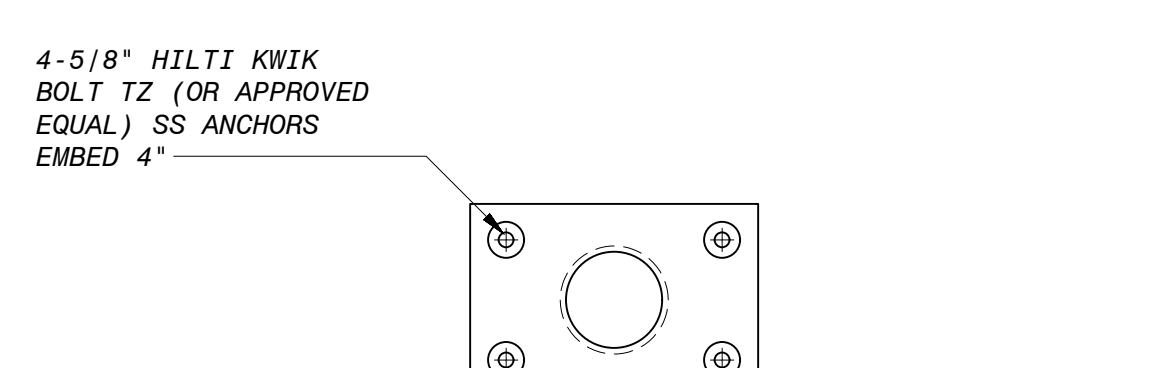


**TYPICAL NEW LIFT STATION SITE PLAN**  
1/2" = 1'-0"

- FALL PROTECTION LOCATION AND INSTALLATION NOTES:**
1. TYPICAL SITE PLAN IS BASED ON COUNTY STANDARDS AND INTENDED TO BE USED AS A GUIDELINE FOR THE LOCATION AND ORIENTATION OF THE FALL PROTECTION ANCHOR POINTS FOR NEW LIFT STATIONS. REFERENCE STRUCTURAL NOTES ON SHEET S-05 FOR REQUIREMENTS AND ASSUMPTIONS.
  2. ANCHOR POINT TYPE AND FLOOR MOUNT SLEEVE TYPE SELECTION SHALL BE BASED ON A SITE-BY-SITE BASIS AND PER THE COUNTY'S WRITTEN DIRECTION. PEDESTAL MOUNTED ANCHOR POINTS ARE THE PREFERRED OPTION, HOWEVER; FLUSH MOUNTED ANCHOR POINTS MAY BE USED IF ANCHOR POINT LOCATION, EGRESS/INGRESS, ACCESS TO PORTABLE DIESEL PUMPS, OR OTHER EQUIPMENT IS AN ISSUE; BUT ONLY WITH A CASE BY CASE APPROVAL FROM THE COUNTY.
  3. ALL ANCHOR POINTS MUST BE INSTALLED THE MINIMUM DISTANCE NOTED FROM AN EXISTING EXPANSION JOINT OR FREE EDGE OF CONCRETE. ANCHOR POINTS MAY BE INSTALLED AMONG SAWED JOINTS. TOTAL AREA OF UNINTERRUPTED EXISTING CONCRETE SURROUNDING ANCHOR POINT SHALL BE GREATER THAN OR EQUAL TO THE MINIMUM AREAS STATED IN FALL PROTECTION NOTE 3 ON DRAWING S-05. UNINTERRUPTED CONCRETE IS DEFINED AS A SINGLE POUR OF CONCRETE WITHIN EXPANSION OR CONSTRUCTION JOINTS. SAWED JOINTS ARE PERMITTED WITHIN THE LIMITS OF UNINTERRUPTED CONCRETE.
  4. FALL PROTECTION ANCHORAGE PERIMETER IS THE BOUNDARY AT A MINIMUM DISTANCE FROM THE ANCHORAGE POINT TO THE EDGE OF THE OPENING OF THE WETWELL AND IS ALSO DEPENDENT ON THE LENGTH OF THE FALL PROTECTION LANYARD PROVIDED. FALL PROTECTION ANCHORAGE POINTS SHALL ONLY BE INSTALLED BEYOND THIS PERIMETER. CONTRACTOR TO SET ANCHOR POINT BASED ON FINAL INSTALLATION LOCATION OF LANYARD CONNECTION POINT ON THE HOIST TO ENSURE DISTANCE FROM OPENING TO CONNECTION POINT IS NOT LESS THAN 6 FT. COUNTY STANDARD LANYARD IS 9 FT UNLESS OTHERWISE NOTED.
  5. FALL PROTECTION ANCHOR POINT DESIGN LOADING IS BASED ON THE FALL PROTECTION SLEEVE DESIGN LOADS OF:  
5,000 LBS DOWNWARD FORCE  
90,000 IN-LBS OVERTURNING MOMENT  
LOADS ABOVE ARE APPLIED AT THE SLEEVE CONNECTION POINT.
  6. LIFT STATION AND SLAB SHALL BE DESIGNED BY OTHERS.
  7. CONTRACTOR SHALL PAINT ENTIRE PEDESTAL MOUNTED ANCHOR POINT AND A 6" STRIP SURROUNDING THE PERIMETER OF FLUSH MOUNTED ANCHOR POINT SAFETY YELLOW AFTER INSTALLATION.
  8. FOR CAST-IN-PLACE CONCRETE, CONTRACTOR SHALL ROUGHEN EXISTING SURFACE TO 1/4" AMPLITUDE WITH HANDHELD BUSH HAMMER AND PREPARE SURFACE IN ACCORDANCE WITH THE ADHESIVE ANCHOR MANUFACTURER'S RECOMMENDATIONS. EXISTING SURFACE SHALL BE CLEAN AND SOUND CONCRETE. FOR PRECAST PEDESTAL, CONTRACTOR SHALL CLEAN EXISTING CONCRETE SURFACE AND CAREFULLY MARK LOCATIONS OF DOWEL EMBEDMENTS AND SET PRECAST PEDESTAL WITHOUT DAMAGE TO DOWELS.
  9. CONTRACTOR TO INSTALL ANCHOR POINT AT REQUIRED DISTANCE TO MAINTAIN CLEARANCE BETWEEN THE BOOM ARM OF THE HOISTS AND THE ELECTRICAL EQUIPMENT PER LATEST NEC REQUIREMENTS.

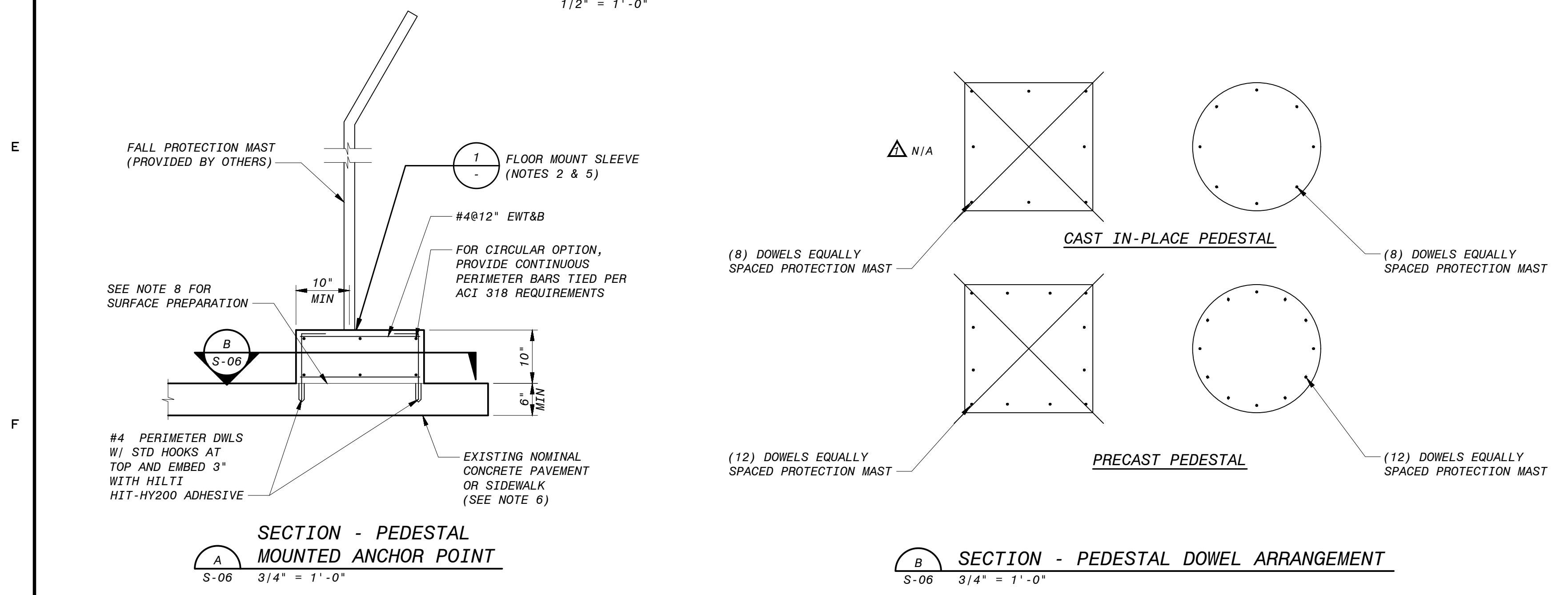


**POST-INSTALLED FLOOR MOUNT SLEEVE**

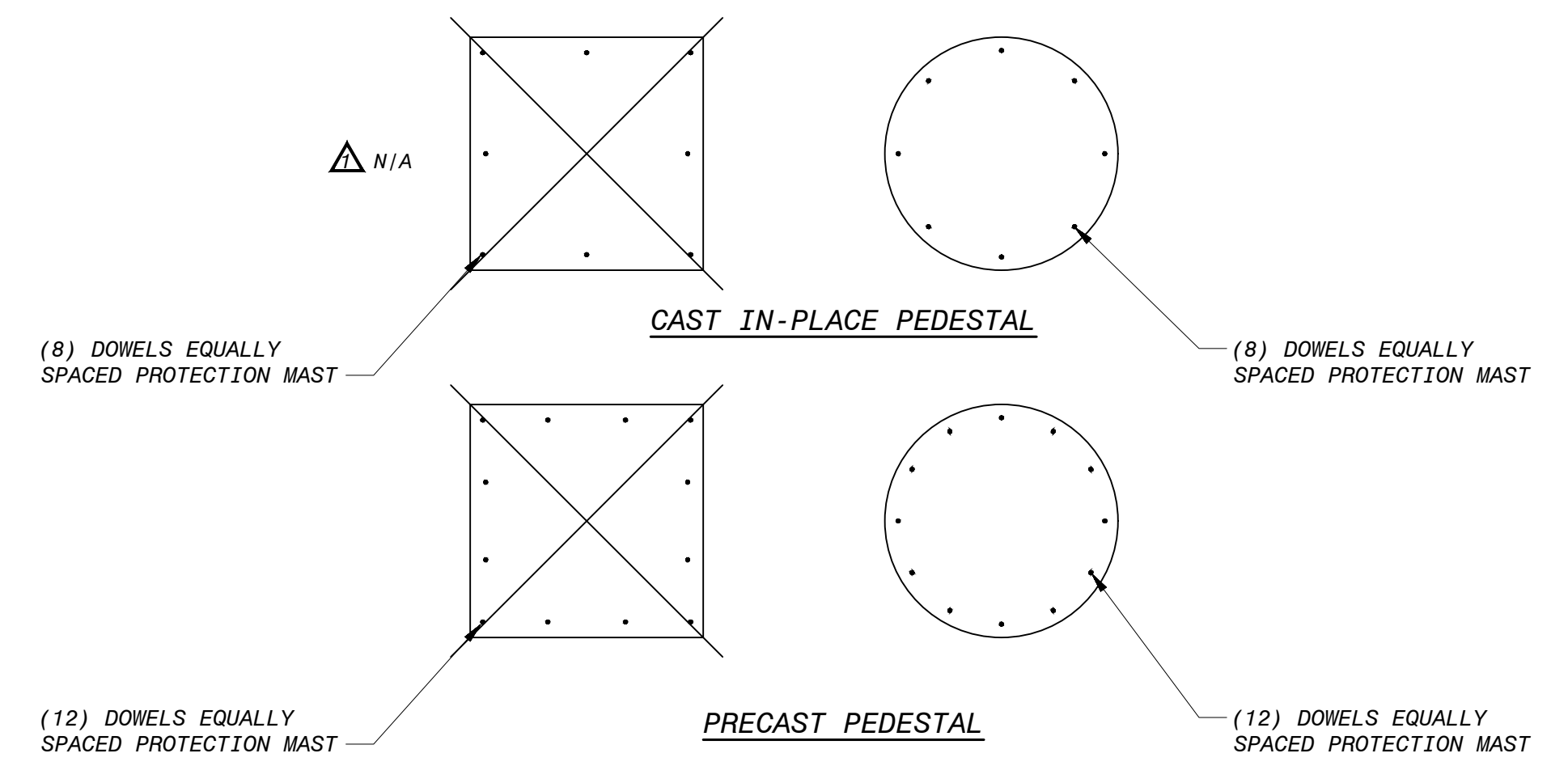


**CAST-IN-PLACE FLUSH FLOOR MOUNT SLEEVE**

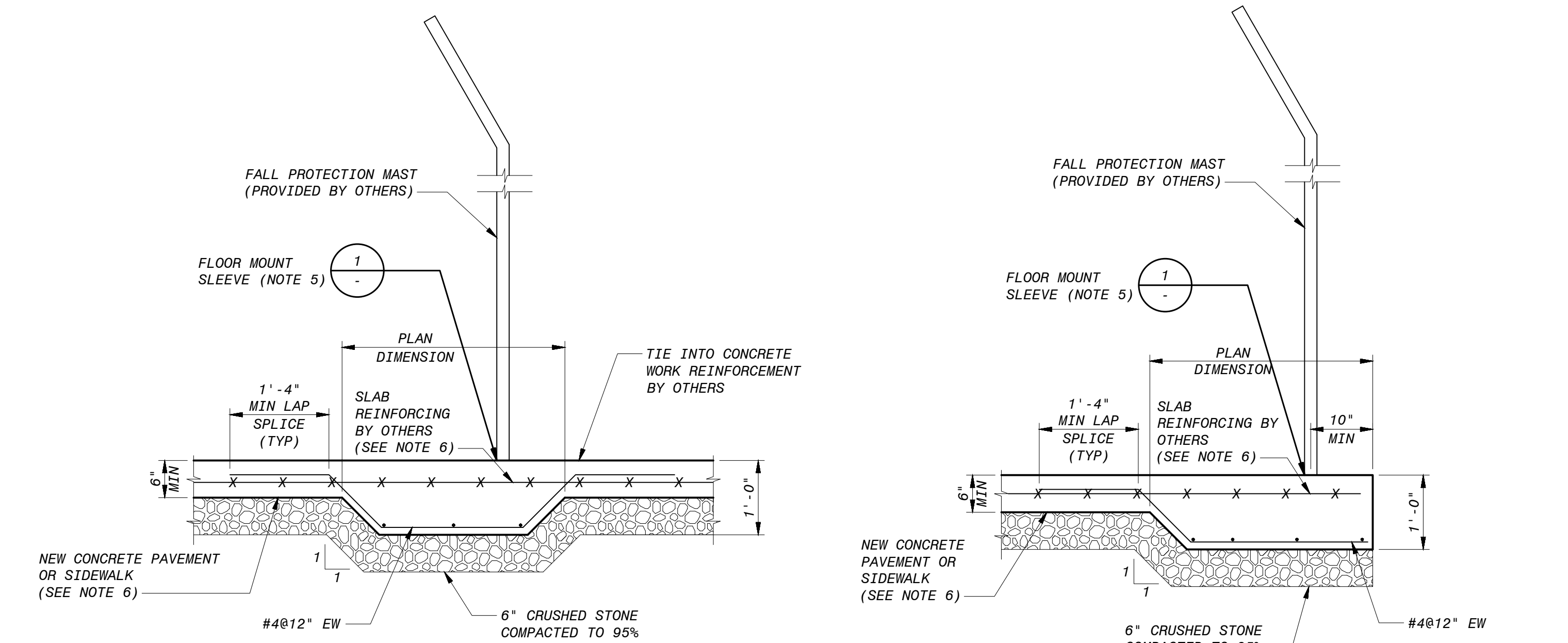
**DETAIL - FLOOR MOUNT SLEEVE**  
S-06 1 1/2" = 1'-0"



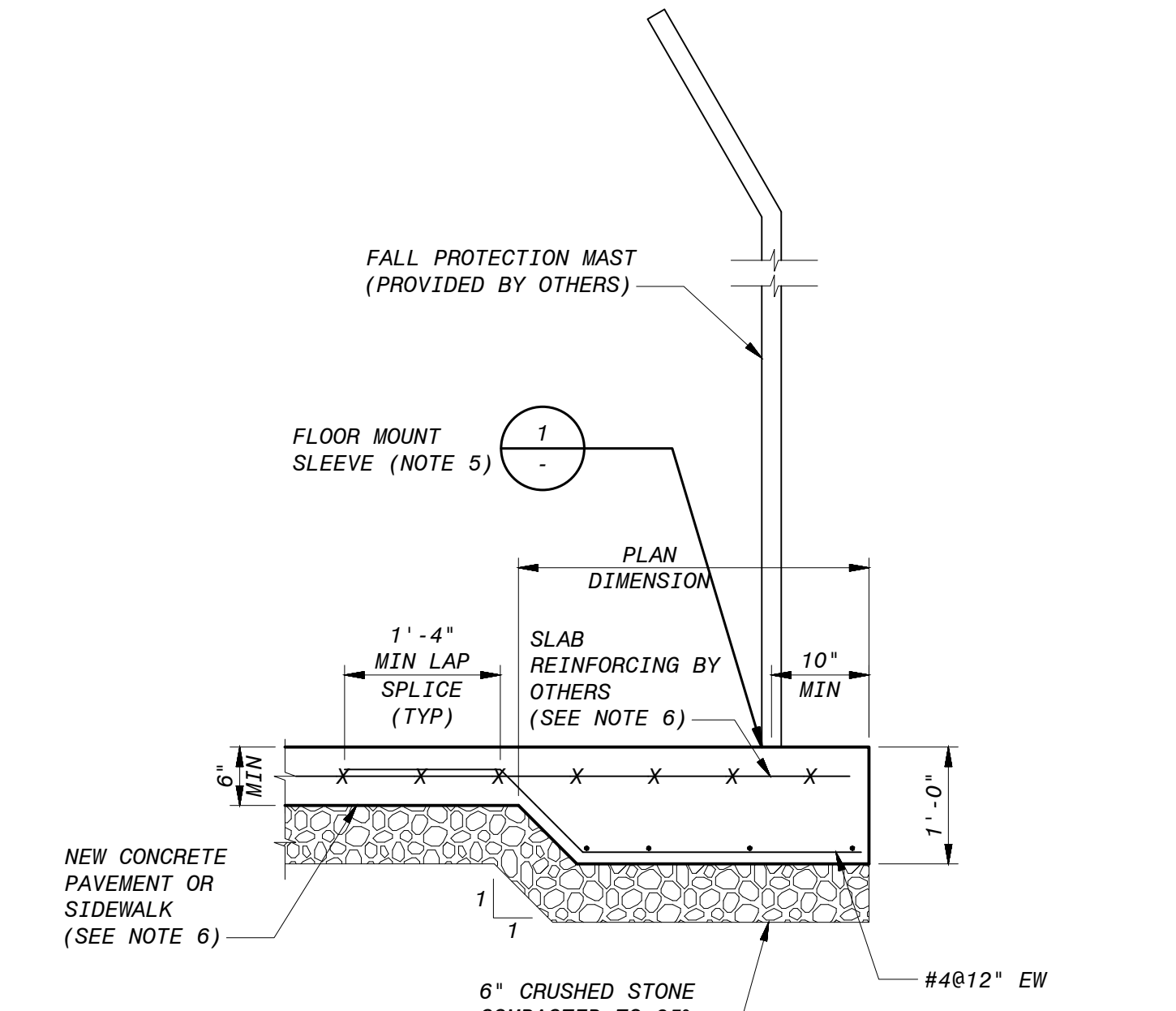
**SECTION - PEDESTAL MOUNTED ANCHOR POINT**  
S-06 3/4" = 1'-0"



**SECTION - PEDESTAL DOWEL ARRANGEMENT**  
S-06 3/4" = 1'-0"



**SECTION - THICKENED SLAB MOUNTED ANCHOR POINT AT MID-SLAB**  
S-06 3/4" = 1'-0"



**SECTION - THICKENED SLAB MOUNTED ANCHOR POINT AT EDGE**  
S-06 3/4" = 1'-0"

DESIGNED: EAP	ENGINEER OF RECORD: NICHOLAS W. ECKHARDT, P.E.	BLACK & VEATCH Building a world of difference	HILLSBOROUGH COUNTY PUBLIC UTILITIES DEPARTMENT WATER RESOURCE DIVISION 925 East Twiggs Street Tampa, Florida 33602	B&V PROJECT NO. 198544 C.I.P. NO. 10138	HILLSBOROUGH COUNTY, FLORIDA FALL PROTECTION STRUCTURAL PLANS SECTIONS AND DETAILS, NEW LIFT STATION	S-06 SHEET 6 OF 6
DATE: 8/31/23	REVISIONS AND RECORD OF ISSUE	FLORIDA LICENSE NO.: 69144	3405 W. Dr. M.L. King Jr. Blvd, Suite 125 Tampa, Florida 33607 Certificate No. 8132			
NO. BY CK APP		APPROVED: NWE ISSUE DATE: OCTOBER 2025				

## WASTEWATER LIFT STATION DESIGN PARAMETERS (FOR COUNTY-OWNED STATIONS)

WASTEWATER LIFT STATION: \_\_\_\_\_ (FACILITY NAME)  
 LOCATION: \_\_\_\_\_ SECTION: \_\_\_\_\_ TOWNSHIP: \_\_\_\_\_ RANGE: \_\_\_\_\_  
 (NEAREST CROSS STREET)

### I. SERVICE AREA

- NORTHWEST  
 CENTRAL  
 SOUTH

NAME OF WWTP SERVING THIS DEVELOPMENT: \_\_\_\_\_

### II. DESIGN CAPACITY

#### A. AVERAGE DAILY FLOW (A.D.F.):

\_\_\_\_\_ x 200 GPD/UNIT (single-family units) = \_\_\_\_\_ G.P.D.  
 \_\_\_\_\_ x 140 GPD/UNIT (multi-family units) = \_\_\_\_\_ G.P.D.  
 \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_ G.P.D.  
 \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_ G.P.D.  
 A.D.F. TOTAL = \_\_\_\_\_ G.P.D.

#### B. PEAK INFLUENT RATE (PEAK FACTOR = PER UTILITY TECHNICAL MANUAL, APPENDIX 5)

PEAK FACTOR = (PER UTILITY TECHNICAL MANUAL, APPENDIX 5)  
 $\frac{ADF \times PEAK FACTOR}{1440} = \frac{(\ ) \times (\ )}{1440} = \text{_____ G.P.M.}$

#### C. DESIGN MINIMUM FLOW:

$\frac{ADF \times 0.20}{1440} = \frac{(\ ) \times 0.20}{1440} = \text{_____ G.P.M.}$

#### D. DESIGN PUMP CAPACITY (MINIMUM REQUIRED) = \_\_\_\_\_ G.P.M.

#### E. VELOCITY IN FORCE MAIN AT MAX. PUMPING RATE = \_\_\_\_\_ FEET/SECOND

### III. WETWELL DESIGN (DUPLIX SYSTEM)

#### A. DESIGN CRITERIA:

- MAXIMUM PUMP MOTOR CYCLE RATE = 6 STARTS PER HOUR
- MAXIMUM DETENTION TIME AT MINIMUM FLOW = 30 MINUTES

#### B. PUMP CONTROL LEVEL SETTINGS:

- PUMP CYCLING RATES ARE AT A MAXIMUM WHEN INFLOW EQUALS ONE-HALF THE DESIGN PUMPING RATE OF \_\_\_\_\_ G.P.M.

- WETWELL VOLUME REQUIRED BETWEEN LEAD PUMP START AND PUMP SHUT OFF LEVEL = \_\_\_\_\_

$$V = \frac{CYCLE PERIOD \times (1/2) PUMP RATE}{2}$$

$$V = \frac{10 \text{ MIN.} \times (1/2) (\ ) \text{ G.P.M.}}{2} = \text{_____ GALLONS}$$

- WETWELL DIAMETER (D) = \_\_\_\_\_ FEET

$$WETWELL VOLUME = \frac{\pi(D)^2 \times 7.48 \text{ GAL./C.F.}}{4} = \frac{7.48(\pi)(D)^2}{4} = \frac{7.48(\pi)(\ )^2}{4} = \text{_____ GALS./FT.DEPTH}$$

- WETWELL LEVEL CHANGE BETWEEN PUMP STOP AND LEAD PUMP START = \_\_\_\_\_

$$\frac{(\text{III B.2. GAL.})}{(\text{III B.3. GAL./FT.DEPTH})} = \text{_____ FEET DESIGN FOR: _____ INCHES}$$

#### C. CONTROL ELEVATIONS:

TOP OF SLAB ELEV. \_\_\_\_\_  
 INFLUENT INVERT ELEV. \_\_\_\_\_  
 HIGH WATER ALARM ELEV. \_\_\_\_\_  
 LAG PUMP ON ELEV. \_\_\_\_\_  
 LEAD PUMP ON ELEV. \_\_\_\_\_  
 ALL PUMPS OFF ELEV. \_\_\_\_\_  
 BOTTOM ELEV. \_\_\_\_\_

### IV. SYSTEM CURVE CALCULATIONS

#### A. FRICTION LOSS:

##### 1. LIFT STATION PIPING

ITEM	SIZE (INCHES)	QUANTITY	FRICTION LOSS (ea.)	TOTAL
a. TEE		x		
b. 90° ELBOW		x		
c. CHECK VALVE		x		
d. GATE VALVE		x		
e. SIDE OUTLET CROSS		x		
f. WYE		x		
g. OTHER:		x		
TOTAL =				
PIPE LENGTH =				
TOTAL EQUIVALENT LENGTH =				

##### 2. FORCE MAIN PIPING:

ITEM	SIZE (INCHES)	QUANTITY	FRICTION LOSS (ea.)	TOTAL
a. TEE		x		
b. 90° ELBOW		x		
c. CHECK VALVE		x		
d. GATE VALVE		x		
e. SIDE OUTLET CROSS		x		
f. WYE		x		
g. OTHER:		x		
TOTAL =				
PIPE LENGTH =				
TOTAL EQUIVALENT LENGTH =				

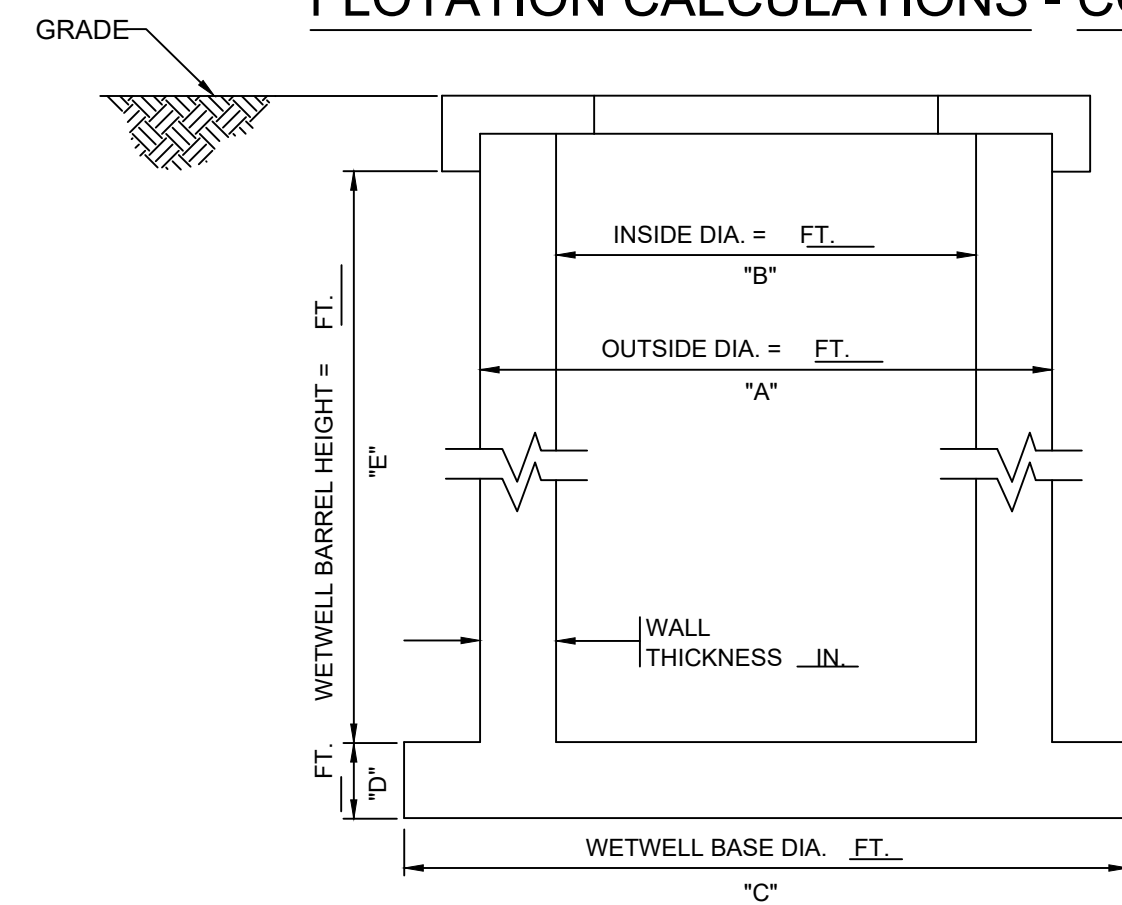
#### B. STATIC HEAD:

- PIPE CENTER LINE AT DISCHARGE POINT = ELEV. \_\_\_\_\_ FT.
- LOW WATER LEVEL (ALL PUMPS OFF) = ELEV. \_\_\_\_\_ FT.
- TOTAL STATIC HEAD (B.1.- B.2.) = \_\_\_\_\_ FT.

#### C. PRESSURES AT POINT OF CONNECTION:

BEST & WORST CASE SYSTEM CURVES PROVIDED BY WATER RESOURCE SERVICES, INFRASTRUCTURE PLANNING

## FLOTATION CALCULATIONS - CONCRETE WET WELL



#### ASSUMPTIONS:

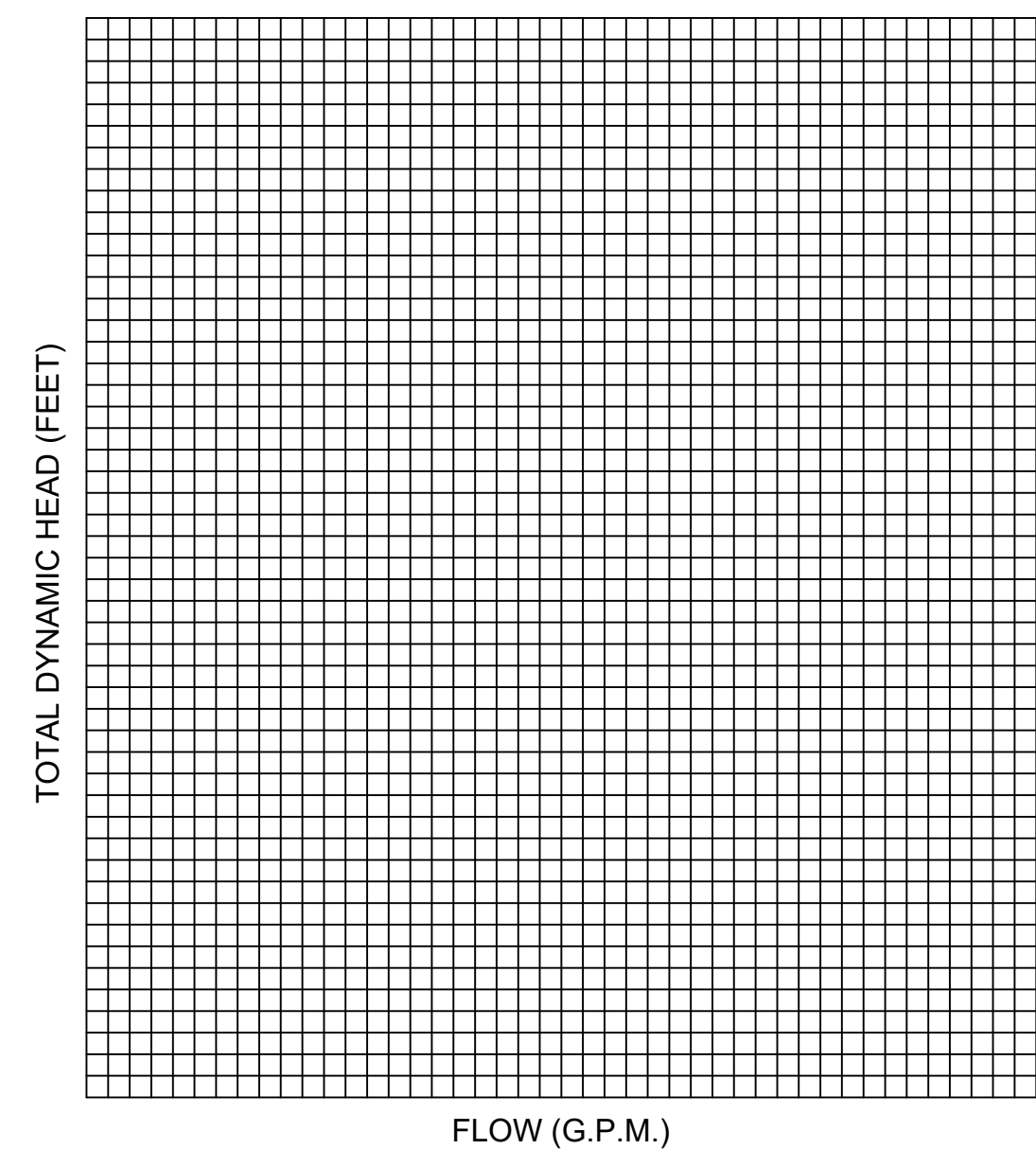
- CONCRETE (REINFORCED) = 150 lbs./ft.<sup>3</sup>
- SATURATED SOIL = 120 lbs./ft.<sup>3</sup>
- WATER = 62.4 lbs./ft.<sup>3</sup>
- DIMENSIONS IN FEET
- NO WATER IN WET WELL
- NEGLECT TOP SLAB WEIGHT
- NEGLECT SOIL FRICTION
- ROUND WETWELL BARREL
- CIRCULAR WETWELL BASE
- THE WATER TABLE IS AT GRADE

(1) BARREL WEIGHT =  $(A^2 - B^2)(\pi/4)(E)(150) = [(\ )^2 - (\ )^2](\pi/4)(\ )(\ ) = \text{_____ lb.}$   
 (2) BOTTOM SLAB WEIGHT =  $(C^2)(\pi/4)(D)(150) = (\ )^2(\pi/4)(\ )(\ ) = \text{_____ lb.}$   
 (3) SOIL WEIGHT =  $(C^2 - A^2)(\pi/4)(E)(120-62.4) = [(\ )^2 - (\ )^2](\pi/4)(\ )(\ ) = \text{_____ lb.}$   
 (4) TOTAL WEIGHT = (Barrel Weight) + (Bottom Slab Weight) + (Soil Weight) = \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ lb.  
 (5) WT. OF WATER DISPLACED =  $[(A^2)(\pi/4)(E) + (C^2)(\pi/4)(D)](62.4) = [(\ )^2(\pi/4)(\ ) + (\ )^2(\pi/4)(\ )](62.4) = \text{_____ lb.}$

SAFETY FACTOR =  $\frac{\text{TOTAL WEIGHT}}{\text{WT. OF WATER DISPLACED}} = \frac{(4)}{(5)} = \frac{(\ ) \text{ lb.}}{(\ ) \text{ lb.}} = \text{_____}$

## SYSTEM vs. PUMP PERFORMANCE CURVE

PUMP MANUFACTURER:		PUMP MODEL:		RPM:	HP:
GPM:	TDH:	IMPELLER DIA. NO.:	PHASE:	VOLTS:	AMPS:

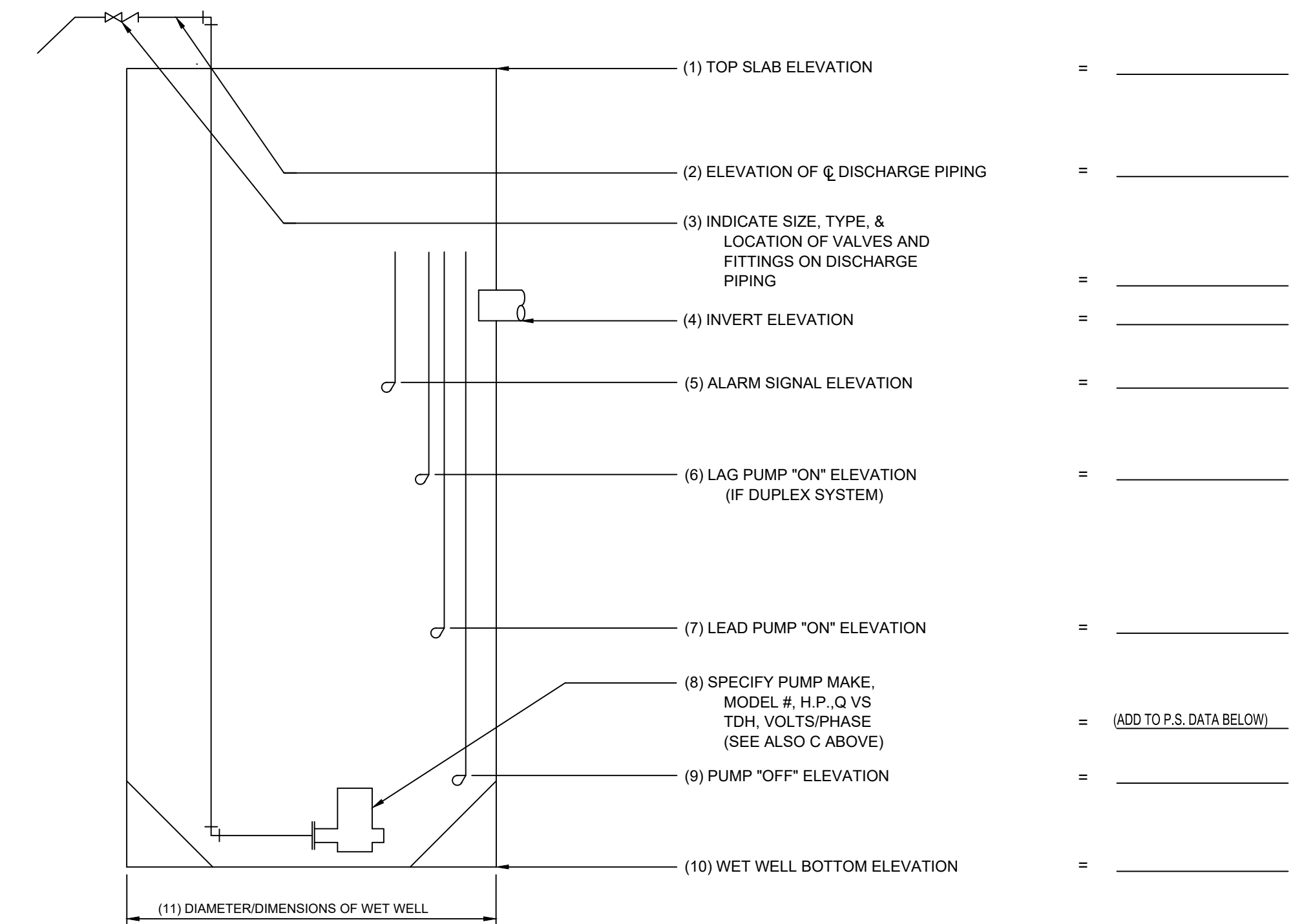


#### SYSTEM HEAD COMPUTATION - TOTAL LOSSES IN FEET

ITEM	FLOW RATE (G.P.M.)																			
	0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0	22.5	25.0	27.5	30.0	32.5	35.0	37.5	40.0	42.5	45.0	47.5
A. FRICTION LOSS:																				
1. EQUIVALENT LENGTH LIFT STATION PIPING:																				
L.F. OF _____ PIPE = _____																				
2. EQUIVALENT LENGTH FORCE MAIN PIPING:																				
L.F. OF _____ PIPE = _____																				
B. STATIC HEAD: _____ FEET																				
C. DESIGN PRESSURE AT POINT OF CONNECTION (BEST/WORST SYSTEM CURVES)																				
D. TOTAL LOSS (FEET): (BEST/WORST CASE)																				

## PLANS FOR PRIVATELY-OWNED LIFT STATIONS MUST PROVIDE THE FOLLOWING INFORMATION AS A MINIMUM REQUIREMENT

- SITE PLAN SHOWING LIFT STATION LOCATION AND POINT OF CONNECTION.
- PLAN AND PROFILE OF LIFT STATION.
- SYSTEM vs. PUMP PERFORMANCE CURVE (PLOT ON GRAPH PROVIDED)
- COPY OF MANUFACTURERS PUMP PERFORMANCE CURVES.
- PROVIDE DATA FOR ITEMS (1) THROUGH (11) AS SHOWN BELOW.
- LIFT STATION DATA.



## LIFT STATION DATA (FOR PRIVATELY-OWNED STATIONS)

DEVELOPMENT TO BE SERVED:		LOCATION (NEAREST CROSS STREET):	
SECTION:	TOWNSHIP:	RANGE:	POWER CO. POLE/PAD NO.:
DESIGN PRESSURE AT POINT OF CONNECTION: P.S.I. x 2.31 = FEET		AVERAGE DAILY FLOW (GPD):	PEAK FLOW (GPM):
WETWELL DIAMETER (FEET):	WETWELL VOLUME (GALS./FT. DEPTH):	WETWELL DEPTH (FEET):	

## NOTES:

SYSTEM HEAD VERSUS PUMP PERFORMANCE CURVES ARE TO BE SHOWN TO DETERMINE THE SYSTEM PERFORMANCE CAPABILITY AT THE FOLLOWING CONDITIONS:

#### A. CONVENTIONAL LIFT STATION - FORCE MAIN (NON-MANIFOLD)

- ONE PUMP RUNNING, IF DUPLEX STATION
- ONE PUMP AND TWO PUMPS RUNNING, IF TRIPLEX STATION, ETC.
- IF FORCE MAIN PROFILE RESULTS IN SIPHON, CURVES SHALL SHOW OPERATION AT START-UP (TO HIGH POINT OF PIPING) AS WELL AS FULL FLOW CONDITIONS

#### B. MANIFOLDED LIFT STATIONS

ALL CONDITIONS OUTLINED UNDER (A) ABOVE, AND THE FOLLOWING ADDITIONAL CONDITIONS

- SIMULTANEOUS OPERATION OF ALL LIFT STATIONS ON SYSTEM (WORST CASE)
- OPERATION WHILE ALL REMAINING STATIONS ARE OFF (BEST CASE)

#### C. VARIABLE SPEED LIFT STATIONS

ALL APPLICABLE CONDITIONS UNDER (A) AND (B) ABOVE AND IN ADDITION:

- OPERATING POINT, INCLUDING SPEED, AT PEAK, AVERAGE, AND MINIMUM FLOWS

SCALE	REVISIONS		
NONE	No.	DATE	DESCRIPTION
			APPVD.



**HILLSBOROUGH COUNTY**  
**WATER RESOURCE SERVICES**  
 925 E. TWIGGS STREET / TAMPA, FLORIDA 33602

PROJECT No.:	
FILE No.:	
DESIGNED BY:	
DRAWN BY:	
CHECKED BY:	
ISSUE DATE:	OCTOBER 2025
SCALE:	NONE

## LIFT STATION DESIGN PARAMETERS

NOT VALID UNLESS EMBOSSED WITH ENGINEER'S SEAL

## SHEET

I hereby certify that the work contained herein was prepared under my direct supervision and complies with the requirements of Chapter 471, Florida Statutes and Chapter 61G15, F.A.C.

Signature: \_\_\_\_\_  
 Print Name: \_\_\_\_\_  
 Florida Professional Engineer's Registration Number: \_\_\_\_\_  
 Date: \_\_\_\_\_

OF