

MOUNT HEBRON AND PATAPSCO PARK PUMPING STATIONS

2019 UPGRADES

HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS

CAPITAL PROJECT NO. S6600

CONTRACT NO. 745-S

GENERAL NOTES:

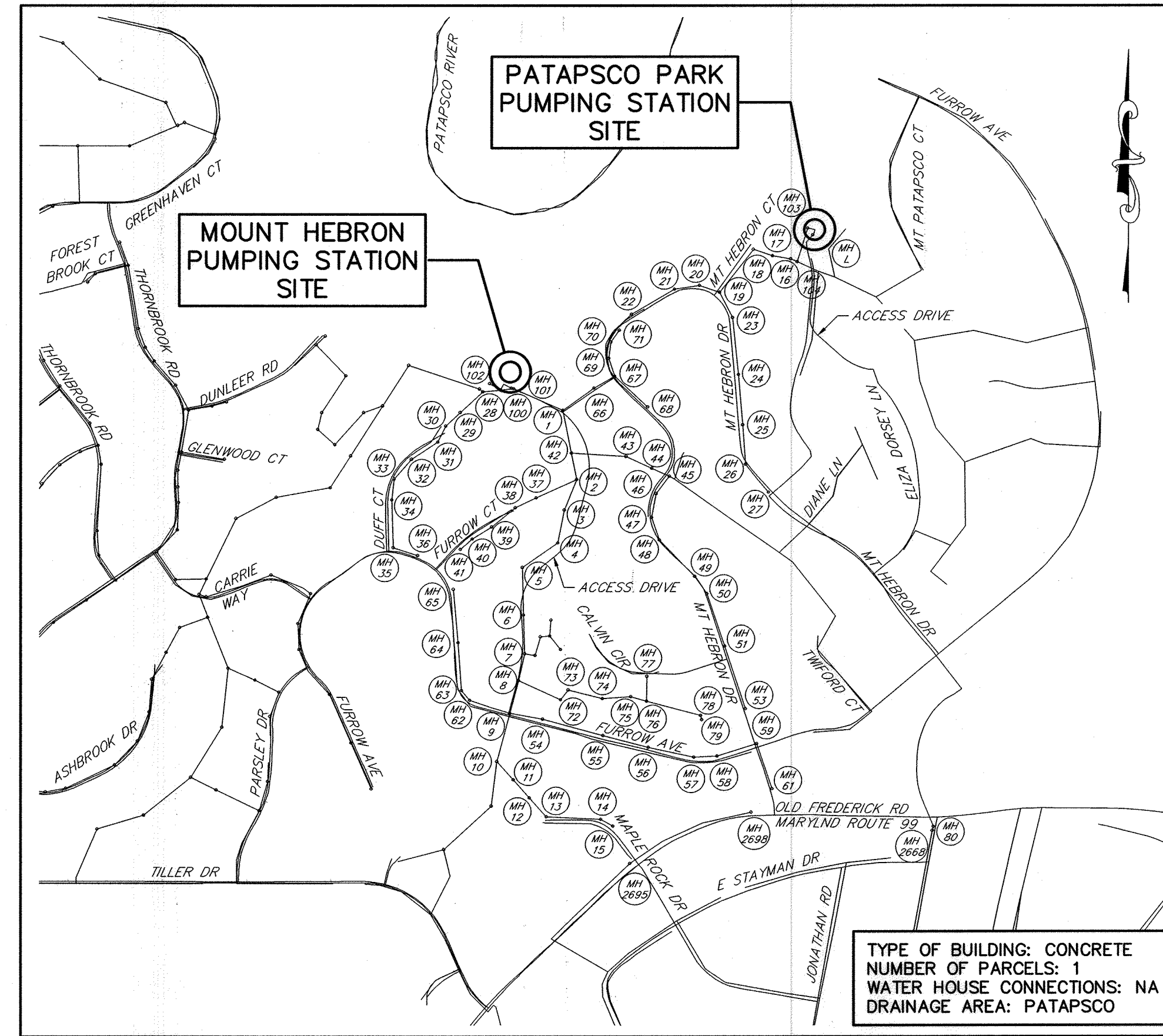
1. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL BE LIABLE FOR ALL SEWAGE OVERFLOW AND/OR SPILL CLEAN UP COSTS INCURRED BY THE OWNER AND/OR STATE OF MARYLAND AND ALSO SHALL BE LIABLE FOR ANY CIVIL AND/OR CRIMINAL PENALTIES ASSOCIATED WITH SUCH OVERFLOWS AND/OR SPILLS.
2. ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
3. FOR DETAILS NOT SHOWN ON THE DRAWINGS, AND FOR MATERIALS AND CONSTRUCTION METHODS NOT SPECIFIED, USE HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (LATEST EDITION). THE CONTRACTOR SHALL HAVE A COPY OF VOLUME IV ON THE JOB SITE.
4. THE CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS:

AT&T	800-252-1133
BGE (CONSTRUCTION SERVICES)	410-637-8713
BGE (EMERGENCY)	410-685-0123
BUREAU OF UTILITIES	410-313-4900
COLONIAL PIPELINE CO.	410-795-1390
MISS UTILITY	800-257-7777
STATE HIGHWAY ADMINISTRATION	410-531-5533
VERIZON	800-743-0033
5. TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR ACQUIRING ALL PERMITS NECESSARY FOR CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER OF ANY CHANGES OR CONDITIONS REQUIRED BY ANY PERMIT.
7. THESE DRAWINGS WERE PREPARED BASED ON AS-BUILT AND OTHER CONSTRUCTION DOCUMENTS, WHICH MAY OR MAY NOT BE COMPLETELY ACCURATE. SCALING OF THESE DRAWINGS SHALL BE FOR ESTIMATING PURPOSES ONLY AND ALL DIMENSIONS SCALED SHALL BE CONSIDERED APPROXIMATE AND SHALL BE FIELD VERIFIED.
8. CONSTRUCTION SHALL CONFORM TO ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES, REGULATIONS, STANDARDS, SPECIFICATIONS AND REQUIREMENTS.
9. THE EXISTING BUILDING ELEVATIONS SHOWN ON THE STRUCTURAL AND MECHANICAL DRAWINGS ARE BASED ON ORIGINAL CONSTRUCTION PLANS ENTITLED "MOUNT HEBRON PUMPING STATIONS" DATED 2/4/81, AS PROVIDED BY HOWARD COUNTY AND ARE BASED ON THE U.S.G.S. DATUM.
10. CONTRACTOR SHALL ASSUME THAT ALL CAULK, FLANGE GASKETS, ETC. ARE ASBESTOS-CONTAINING MATERIALS (ACM). ANY DISTURBANCE OR REMOVAL OF THESE MATERIALS SHALL BE DONE IN ACCORDANCE WITH OSHA 29CFR1926.1101 FOR CLASS II WORK. CONTRACTOR SHALL REMOVE AND DISPOSE OF ACM PRIOR TO RENOVATION ACTIVITIES THAT MAY MAKE THEM EPA REGULATED.
11. CONTRACTOR SHALL ASSUME THAT ALL EXISTING PAINT IS LEAD-BASED PAINT (LBP). THIS PAINT MUST BE HANDLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE EPA AND THE OSHA LEAD IN CONSTRUCTION STANDARD WITH MARYLAND AMENDMENTS (29CFR1926.62). IF COMPONENTS ARE TO BE REMOVED AND DISPOSED OF, CONTRACTOR SHALL FOLLOW THE REQUIREMENTS OF THE RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) 40CFR261 AND ANY OTHER APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS. PROHIBITED METHODS OF LEAD PAINT REMOVAL INCLUDE: SANDING (EXCEPT WITH EQUIPMENT FITTED WITH HEPA FILTERS), BURNING WITH AN OPEN FLAME TORCH, OR ANY METHODS WHICH PRODUCE UNCONTROLLED DUST OR FUMES. WHENEVER RENOVATION OR DEMOLITION IS PERFORMED ON PAINTED COMPONENTS, CONTRACTOR SHALL CONTROL DUST. NON-REGULATED PAINT HAS THE ABILITY TO PRODUCE LEAD DUST WHEN IT IS DISTURBED.
12. A FULL PUMPING STATION DEMONSTRATION TEST SHALL BE COMPLETED BEFORE THE CONTRACTOR CAN START THE THIRTY DAY DEMONSTRATION PERIOD. THE ABOVE SHALL BE WITNESSED AND ACCEPTED BY THE COUNTY. THE CONTRACTOR SHALL NOTIFY THE COUNTY AT LEAST SEVEN DAYS PRIOR TO CONDUCTING ANY TESTING SO THE PROPER PERSONNEL CAN BE SCHEDULED TO WITNESS THE TESTING.
13. EXISTING FEATURES DENOTED BY SLANTED TEXT.
14. CONTRACTOR SHALL SUBMIT A PROPOSED SEQUENCE OF CONSTRUCTION FOR REVIEW PRIOR TO COMMENCEMENT OF ANY WORK. SEQUENCE OF CONSTRUCTION SHALL INCLUDE TEMPORARY BYPASS PUMPING AND ALL PROPOSED WORK, INCLUDING HOW THE WORK BETWEEN THE MOUNT HEBRON AND PATAPSCO PARK PUMPING STATIONS WILL BE SEQUENCED.
15. THE EXISTING PUMPING STATION CAPACITY OF 470 GPM FOR THE MOUNT HEBRON PUMPING STATION AND 600 GPM FOR THE PATAPSCO PARK PUMPING STATION MUST REMAIN AVAILABLE FOR THE DURATION OF THE PROJECT, WITH THE EXCEPTION OF THE TEMPORARY STATION SHUTDOWN PERIOD AS DESCRIBED IN SPECIFICATION 02750. PROVIDE TEMPORARY BYPASS PUMPING, AS NECESSARY, TO ENSURE THAT THE PUMPING STATIONS HAVE PRIMARY AND BACKUP PUMPS OPERATIONAL AT ALL TIMES. IT IS NOTED THAT THE PATAPSCO PARK PUMPING STATION RECEIVES FLOW DIRECTLY FROM THE MT. HEBRON PUMPING STATION.
16. PUMPING STATION ADDRESS:

MOUNT HEBRON PUMPING STATION
9260 FURROW AVE.
ELLCOTT CITY, MD 21042
PATAPSCO PARK PUMPING STATION
2041 ELIZA DORSEY LANE
ELLCOTT CITY, MD 21042

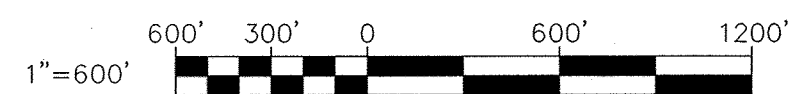
PURPOSE STATEMENT:

A PROJECT TO UPGRADE VARIOUS COMPONENTS OF THE EXISTING MOUNT HEBRON AND PATAPSCO PARK SEWAGE PUMPING STATIONS, INCLUDING BUT NOT LIMITED TO; PUMPS, VALVES, FLOWMETERS, PIPING, HVAC, PLUMBING, ELECTRICAL DISTRIBUTION, GENERATORS, INSTRUMENTATION AND CONTROLS, AND MISCELLANEOUS APPURTENANCES.



LOCATION MAP
SCALE: 1"=600'

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DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND	<p style="text-align: center;">PROFESSIONAL CERTIFICATION</p> <p style="font-size: small;">I HEREBY CERTIFY THAT REDLINE REVISIONS INCLUDED IN 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.</p> <p>LICENSE NO. 28472 EXPIRATION DATE 9/16/2019</p>		<p>DES: DAO</p> <p>DRN: NAF</p> <p>CHK: RAL</p> <p>DATE: 4/02/19</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>BY</th> <th>NO.</th> <th>REVISIONS</th> <th>DATE</th> </tr> <tr> <td>RK&K</td> <td>1</td> <td>2019 UPGRADES - ADD SHEET 1A</td> <td>4/19</td> </tr> </table>	BY	NO.	REVISIONS	DATE	RK&K	1	2019 UPGRADES - ADD SHEET 1A	4/19	<p>TITLE SHEET - 2019 UPGRADES</p>	<p>MOUNT HEBRON SEWER MAINS 2019 UPGRADES</p> <p>CAPITAL PROJECT NO. S6600 CONTRACT NO. 745-S</p>	<p>SCALE AS SHOWN</p> <p>SHEET 1A OF 25</p>
BY	NO.	REVISIONS	DATE												
RK&K	1	2019 UPGRADES - ADD SHEET 1A	4/19												
<p style="font-size: small;">4/5/19</p> <p style="font-size: small;">4/5/19</p> <p style="font-size: small;">4/5/19</p>	<p style="font-size: small;">4/5/19</p> <p style="font-size: small;">4/5/19</p> <p style="font-size: small;">4/5/19</p>				<p>MAP NO. 17 BLOCK NO. 8</p>	<p>ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND</p>									

ABBREVIATIONS

ATS	AUTOMATIC TRANSFER SWITCH	LR	LONG RADIUS
ALUM	ALUMINUM	MAX	MAXIMUM
CFM	CUBIC FEET PER MINUTE	MCC	MOTOR CONTROL CENTER
CI	CAST IRON	MIN	MINIMUM
CIP	CAST IRON PIPE	MJ	MECHANICAL JOINT
CISP	CAST IRON SOIL PIPE	MOD	MOTOR OPERATED DAMPER
CLR	CLEAR	MTS	MANUAL TRANSFER SWITCH
CMU	CONCRETE MASONRY UNIT	NO.	NUMBER
CONC	CONCRETE	OC	ON CENTER
CV	CHECK VALVE		
D	DOOR, DEPTH	P	PUMP
DA	DAMPER	PCP	PUMP CONTROL PANEL
DIP	DUCTILE IRON PIPE	PE	PLAIN END
DP	DEEP	PV	PLUG VALVE
		PVC	POLYVINYL CHLORIDE
ECC	ECCENTRIC	Q	FLOW
EF	EXHAUST FAN		
EL	ELEVATION	RED	REDUCER
ELL	ELBOW	RET	RETAINER
EXT	EXTENSION	RPM	REVOLUTIONS PER MINUTE
		RTU	REMOTE TELEMETRY UNIT
FF	FINISHED FLOOR	S	SEAT SIDE (PLUG VALVE)
FLG	FLANGE	SCH	SCHEDULE
FM	FORCE MAIN	SF	SUPPLY FAN
FRP	FIBERGLASS REINFORCED PLASTIC	S.P.	STATIC PRESSURE
		SQ.	SQUARE
GALV	GALVANIZED	SS	STAINLESS STEEL
GPM	GALLONS PER MINUTE		
GV	GATE VALVE		
H	HEIGHT	TDH	TOTAL DYNAMIC HEAD
HM	HOLLOW METAL	TYP	TYPICAL
HP	HORSE POWER	UH	UNIT HEATER
		W	WIDTH
KW	KILOWATT	W/	WITH
		W.G.	WATER GAUGE

GENERAL LEGEND

EXISTING

ITEMS TO BE DEMOLISHED AND REMOVED



PROPOSED

NEW CONCRETE PATCH



BACK-UP FLOAT



PUMP E-STOP



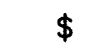
MOTOR



FREEZESTAT



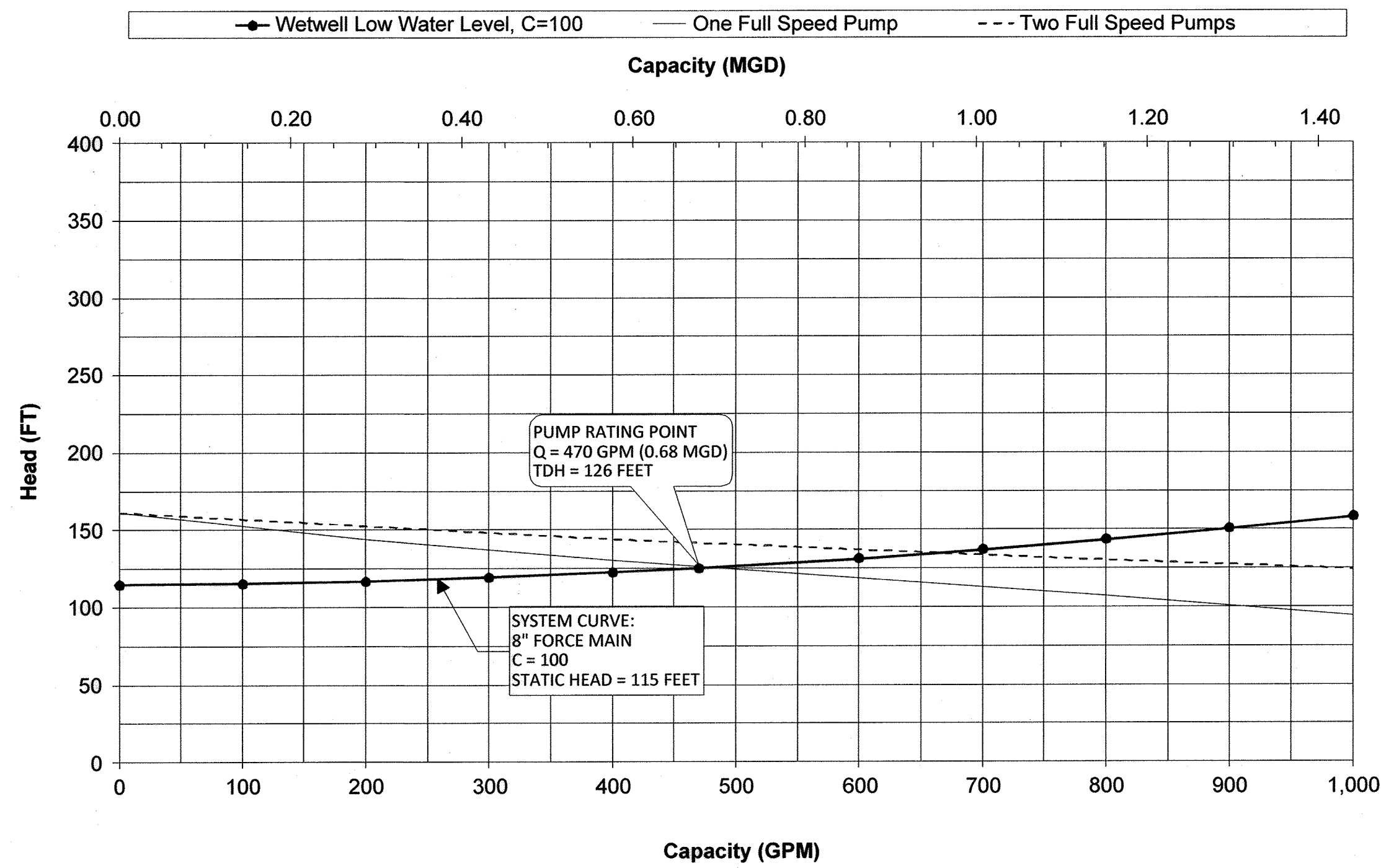
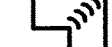
WALL SWITCH



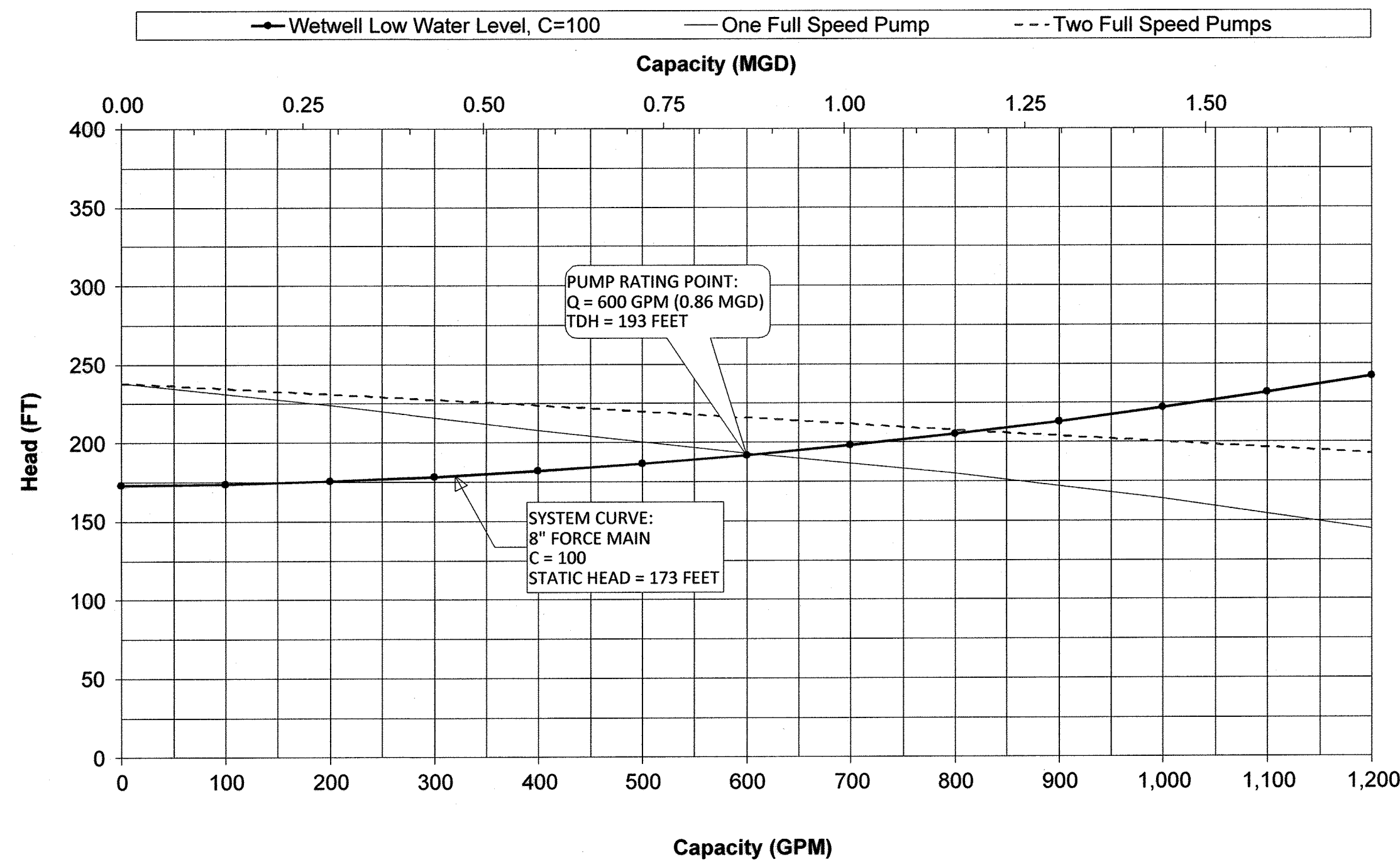
HATCH SWITCH



DUCTWORK TURNING VANES



MOUNT HEBRON PUMPING STATION SYSTEM CURVE



PATAPSCO PARK PUMPING STATION SYSTEM CURVE

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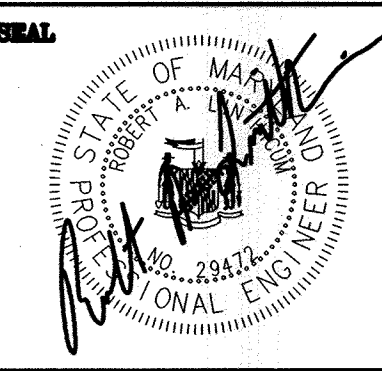
DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

<i>[Signature]</i> DIRECTOR OF PUBLIC WORKS	4/6/19 DATE	<i>[Signature]</i> CHIEF, BUREAU OF ENGINEERING	4/5/19 DATE
<i>[Signature]</i> CHIEF, BUREAU OF UTILITIES	4-5-19 DATE	<i>[Signature]</i> CHIEF, UTILITY DIVISION	4/5/19 DATE

PROFESSIONAL CERTIFICATION

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LICENSE NO. 28472. EXPIRATION DATE 9/15/2019

RK&K 700 EAST PRATT STREET
SUITE 500
BALTIMORE, MARYLAND 21202



DES: DAO				
DRN: NAF				
CHK: RAL				
DATE: 4/02/19	RK&K	1	2019 UPGRADES - ADD SHEET 1B	4/19
BY	NO.		REVISIONS	DATE

ABBREVIATIONS, LEGEND AND SYSTEM CURVES - 2019 UPGRADES

MAP NO. 17 BLOCK NO. 8

MOUNT HEBRON SEWER MAINS
2019 UPGRADES

CAPITAL PROJECT NO. S6600
CONTRACT NO. 745-S

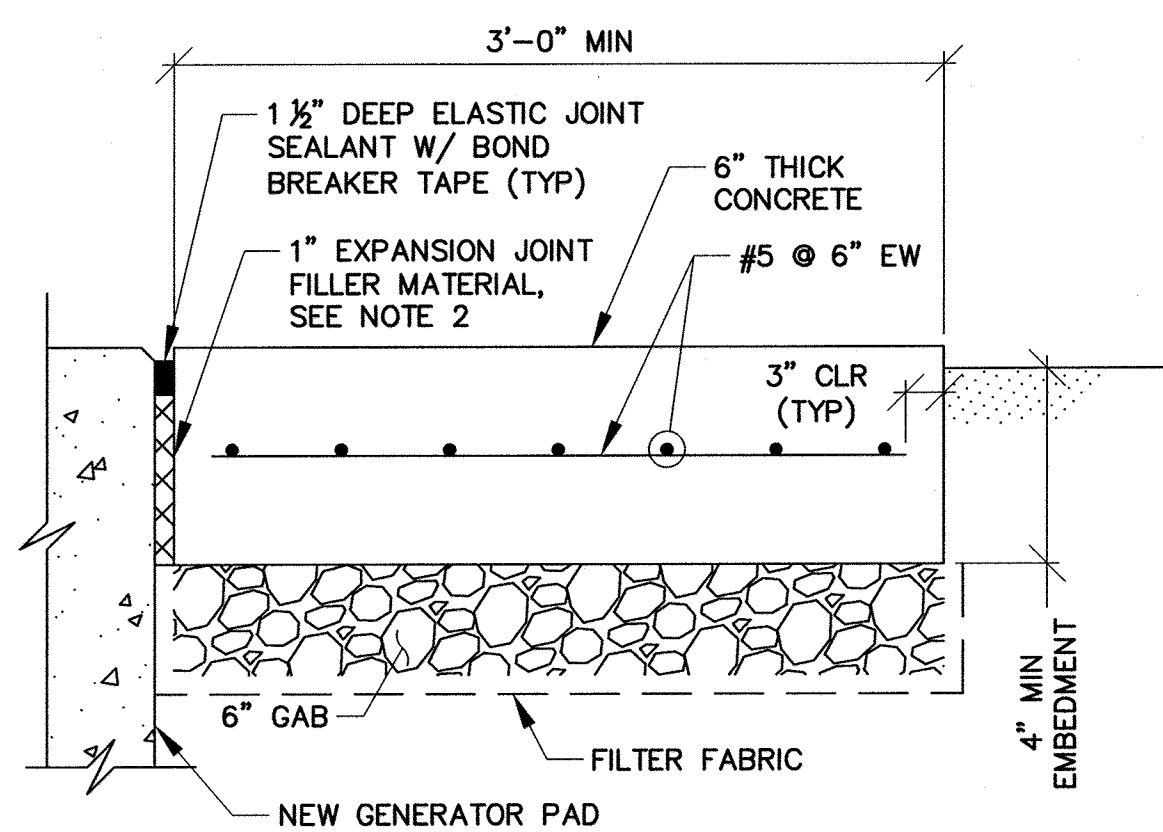
ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

SCALE
NTS

SHEET
1B OF 25

NOTES:

1. ALL EXISTING FEATURES DENOTED BY SLANTED TEXT.
2. THE LOCATIONS OF ALL UNDERGROUND UTILITIES AS SHOWN HEREON ARE BASED ON ABOVE GROUND FIELD OBSERVATIONS AND RECORD DRAWINGS. ADDITIONAL BURIED UTILITIES OR STRUCTURES MAY BE ENCOUNTERED. NO EXCAVATIONS WERE MADE TO LOCATE BURIED UTILITIES/STRUCTURES. ALL SUBSURFACE UTILITIES/STRUCTURES SHOWN ARE TO BE CONSIDERED APPROXIMATE LOCATION ONLY. UNDERGROUND UTILITIES MUST BE VERIFIED BY TEST PITS.
3. ALL DISTURBED AREAS SHALL BE GRADED, SEEDED AND LANDSCAPED TO RESTORE ALL PROPERTY TO ITS ORIGINAL UNDISTURBED CONDITION.
4. GENERATOR ENCLOSURE SHALL BE SUFFICIENTLY WEATHER-PROTECTIVE TO ENSURE THE GENERATOR WILL OPERATE AS INTENDED DURING INCLEMENT WEATHER, AND SHALL PROVIDE THE STRICTEST POSSIBLE SOUND-ATTENUATION LEVEL POSSIBLE FOR THE PARTICULAR GENERATOR MODEL FURNISHED IN ACCORDANCE WITH SPECIFICATION SECTION 16700.

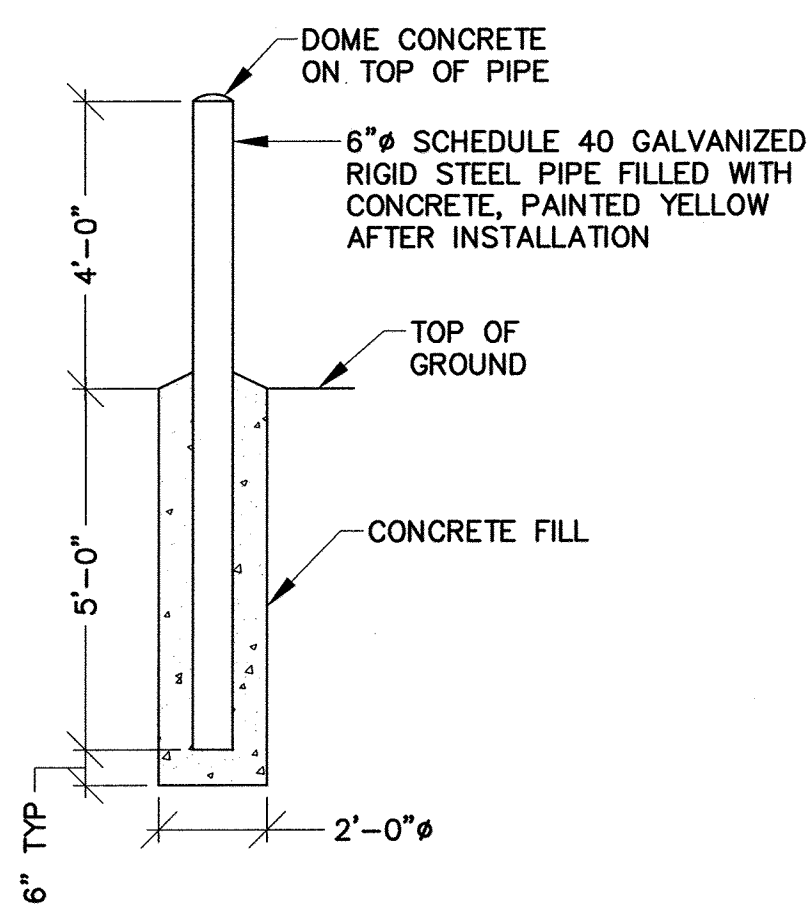


NOTES:

1. CONCRETE PAD TO CONTAIN #5 @ 6" EACH WAY, CENTERED VERTICALLY.
2. EXPANSION JOINTS TO BE A MINIMUM DEPTH OF 1/4" THE WALKWAY THICKNESS.

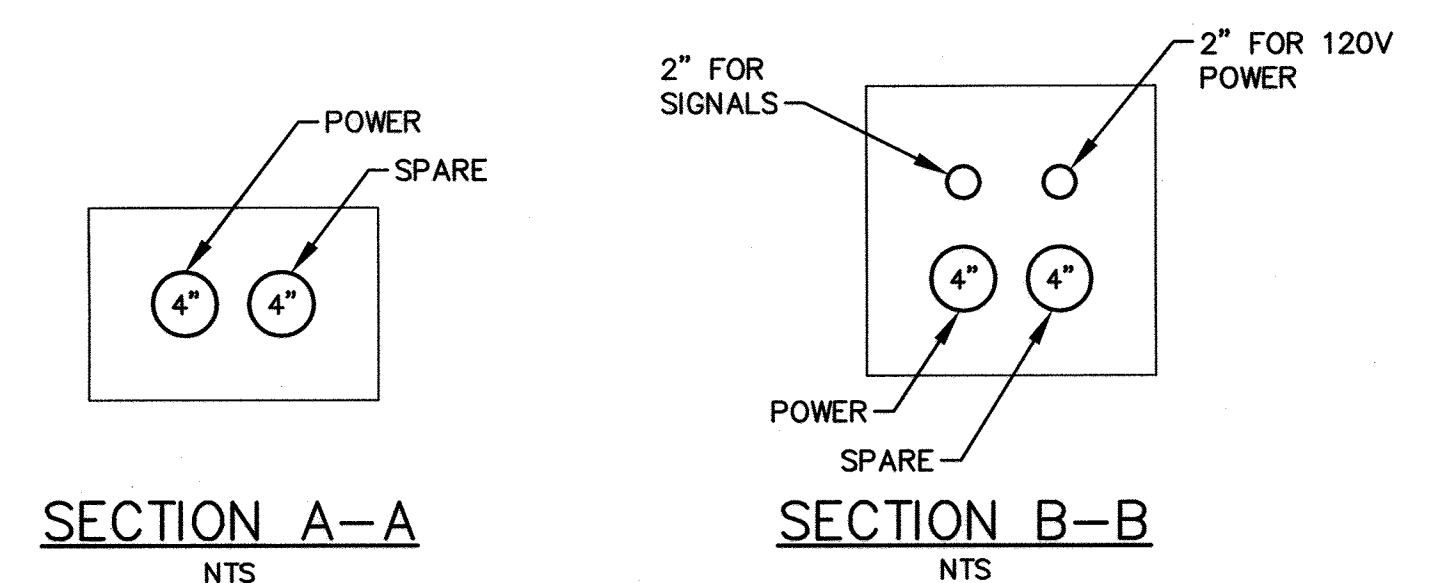
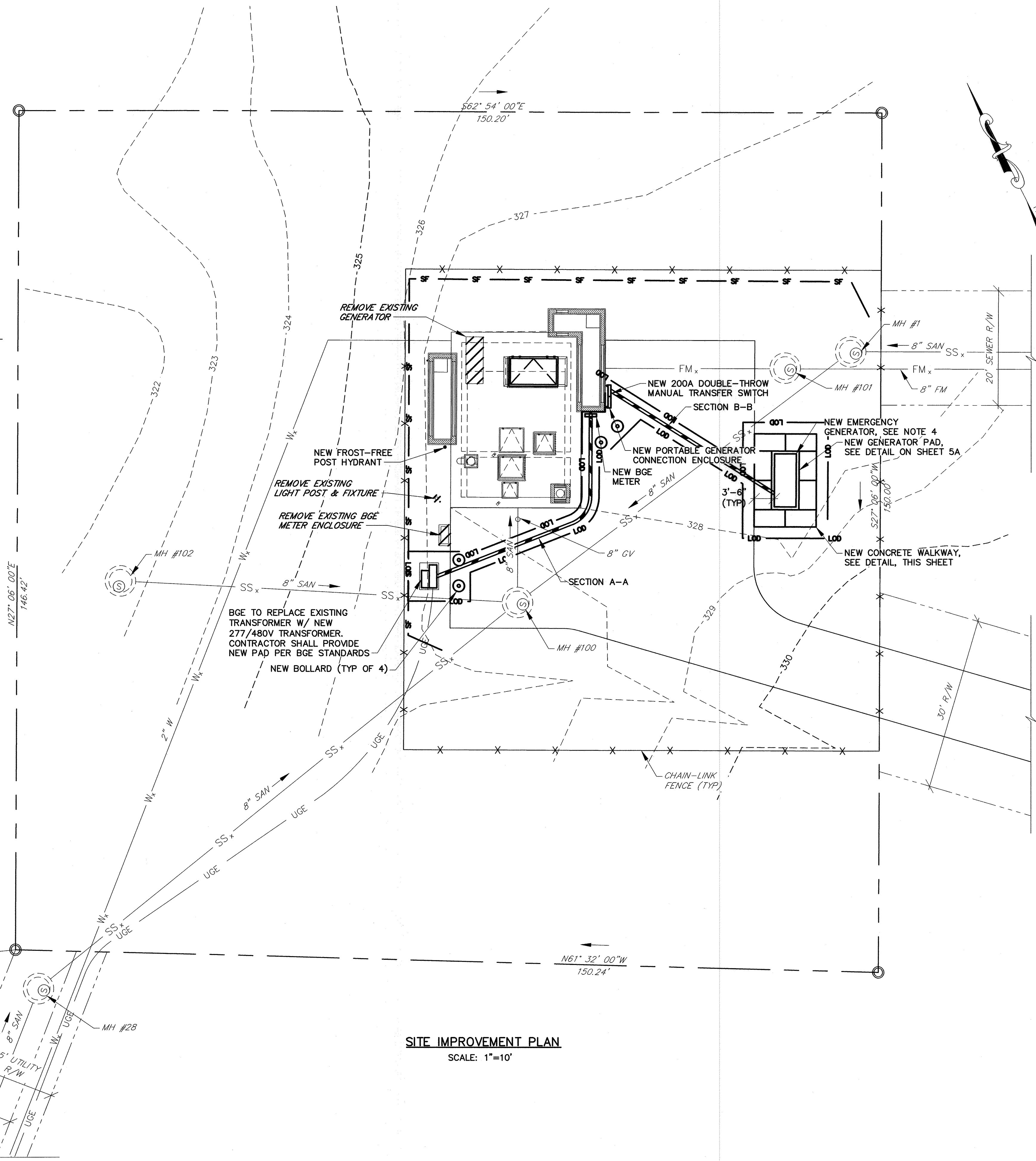
CONCRETE WALKWAY DETAIL

NTS



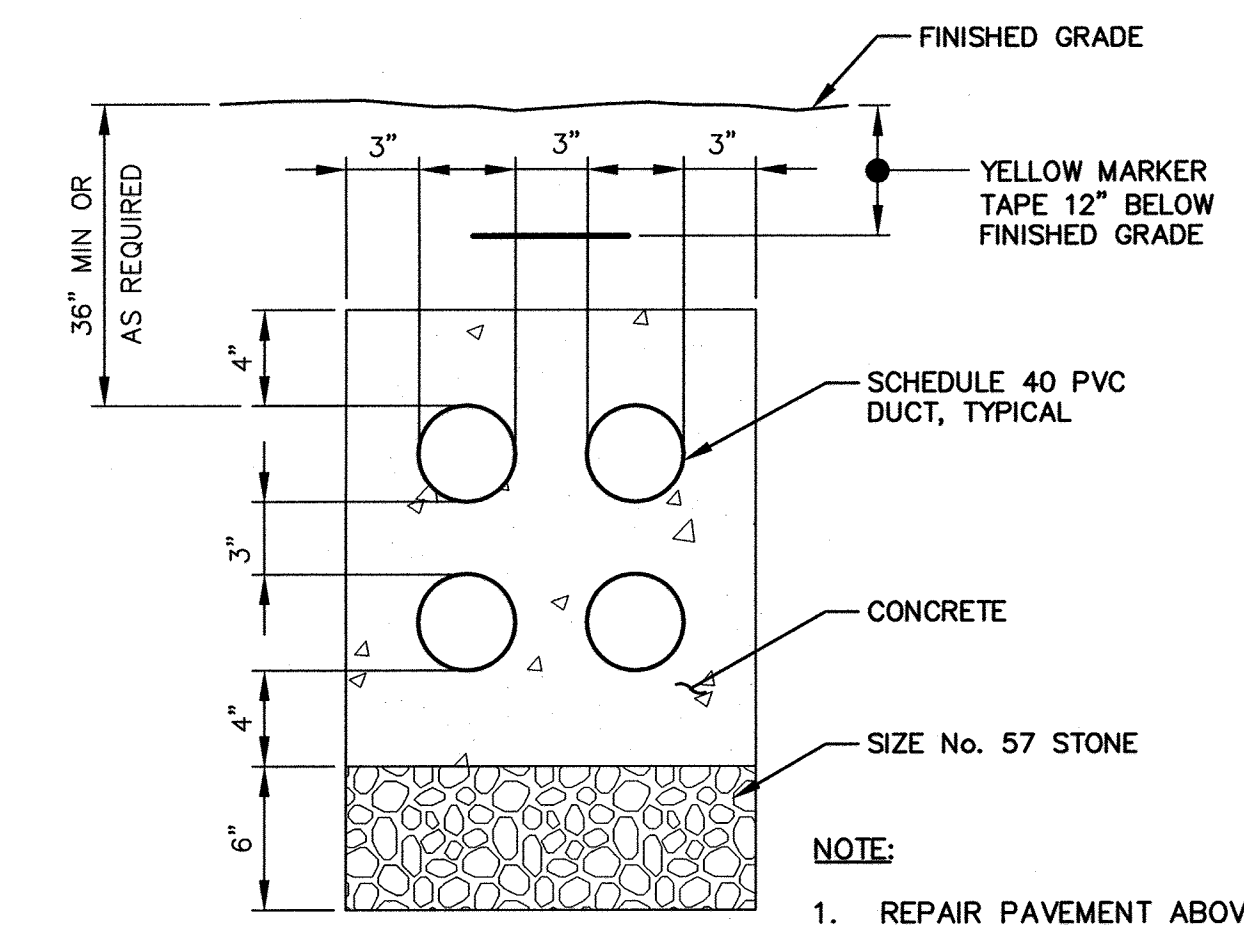
BOLLARD DETAIL

NTS



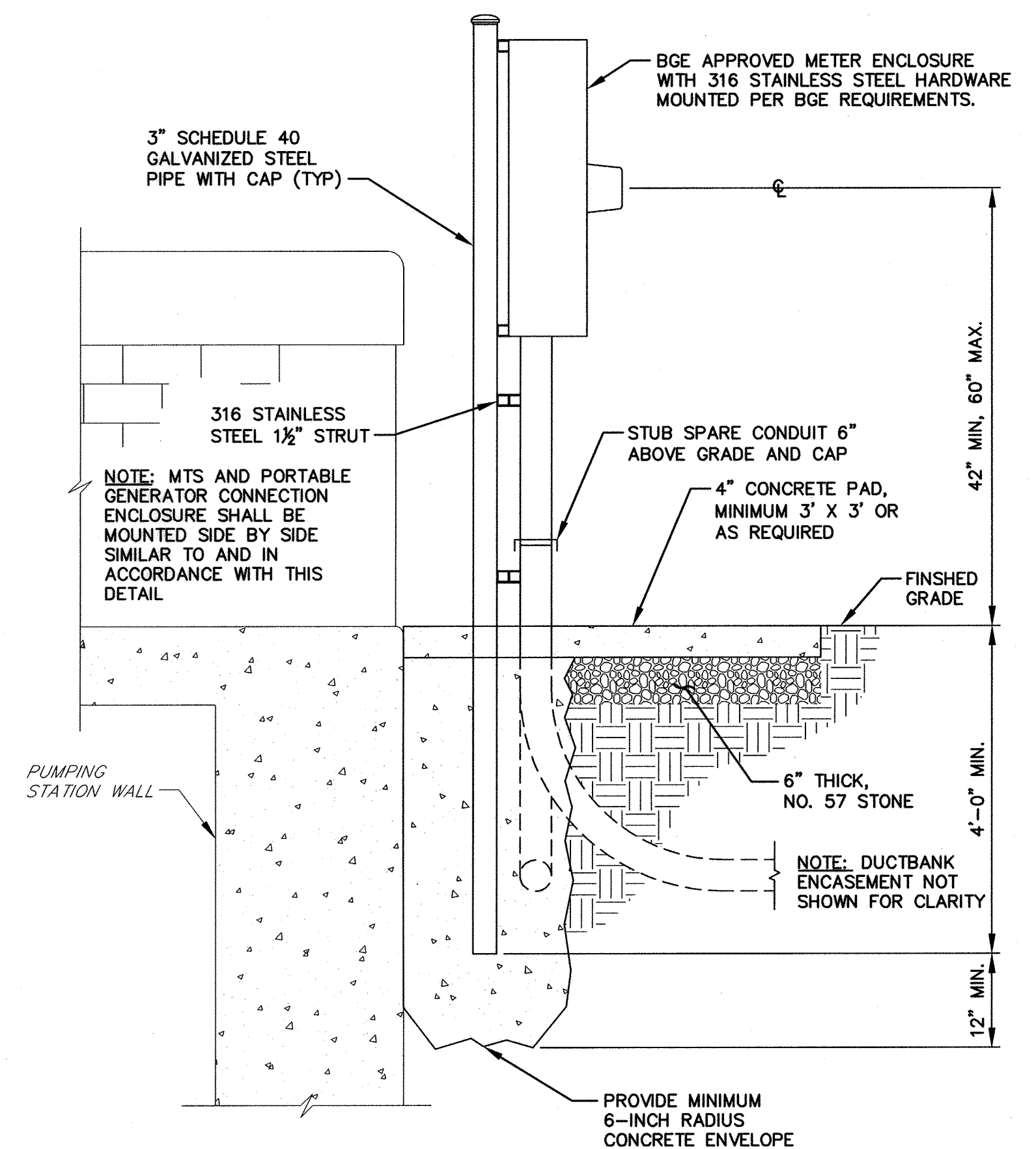
SECTION A-A NTS

SECTION B-B NTS



TYPICAL CONCRETE ENCASED DUCTBANK DETAIL

- NOTE:
1. REPAIR PAVEMENT ABOVE DUCTBANK IN ACCORDANCE WITH DETAIL G-4.01-UTILITY TRENCH ROADWAY REPAIRING, HOWARD COUNTY DESIGN MANUAL, VOLUME IV.



METER BOX/ENCLOSURE/SWITCH MOUNTING DETAIL

NTS



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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 4/16/19
 DIRECTOR OF PUBLIC WORKS DATE

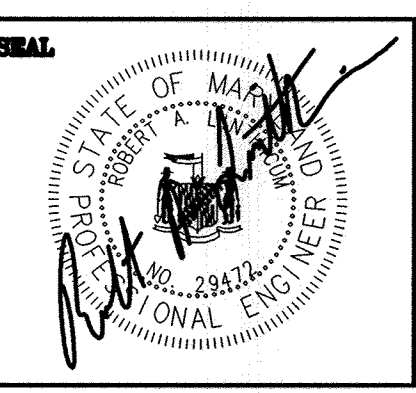
[Signature] 4/15/19
 CHEF, BUREAU OF ENGINEERING DATE

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DES:	DAO			
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CHK:	RAL			
DATE:	4/02/19			
BY:	NO.	REVISIONS	DATE	
		RK&K 1 2019 UPGRADES - ADD SHEET 2A	4/19	

MOUNT HEBRON SPS
SITE DEVELOPMENT PLAN -
2019 UPGRADES

MAP NO. 17 BLOCK NO. 8

MOUNT HEBRON SEWER MAINS
2019 UPGRADES

CAPITAL PROJECT NO. S6600
CONTRACT NO. 745-S

ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 2A OF 25

B-4 STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

Definition: Using vegetation to cover to protect exposed soil from erosion.

Purpose: To promote the establishment of vegetation on exposed soil.

Conditions Where Practice Applies: On all disturbed areas not stabilized by other methods. This specification is divided into sections on incremental stabilization; soil preparation, soil amendments and topsoiling; seeding and mulching; temporary stabilization; and permanent stabilization.

Effects on Water Quality and Quantity: Stabilization practices are used to promote the establishment of vegetation on exposed soil. When soil is stabilized with vegetation, the soil is less likely to erode and more likely to allow infiltration of rainfall, thereby reducing sediment loads and runoff to downstream areas.

Planting vegetation in disturbed areas will have an effect on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, percolation, and groundwater recharge. Over time, vegetation will increase organic matter content and improve the water holding capacity of the soil and subsequent plant growth.

Vegetation will help reduce the movement of sediment, nutrients, and other chemicals carried by runoff to receiving waters. Plants will also help protect groundwater supplies by assimilating those substances present within the root zone.

Sediment control practices must remain in place during grading, seedbed preparation, seeding, mulching, and vegetative establishment.

Adequate Vegetative Establishment: Inspect seeded areas for vegetative establishment and make necessary repairs, replacements, and reseedings within the planting season.

1. Adequate vegetative stabilization requires 95 percent groundcover.
2. If an area has less than 40 percent groundcover, restabilize following the original recommendations for lime, fertilizer, seedbed preparation, and seeding.
3. If an area has between 40 and 94 percent groundcover, over-seed and fertilize using half of the rates originally specified.
4. Maintenance fertilizer rates for permanent seeding are shown in Table B.6.

B-4-1 STANDARDS AND SPECIFICATIONS FOR INCREMENTAL STABILIZATION

Definition: Establishment of vegetative cover on cut and fill slopes.

Purpose: To provide timely vegetative cover on cut and fill slopes as work progresses.

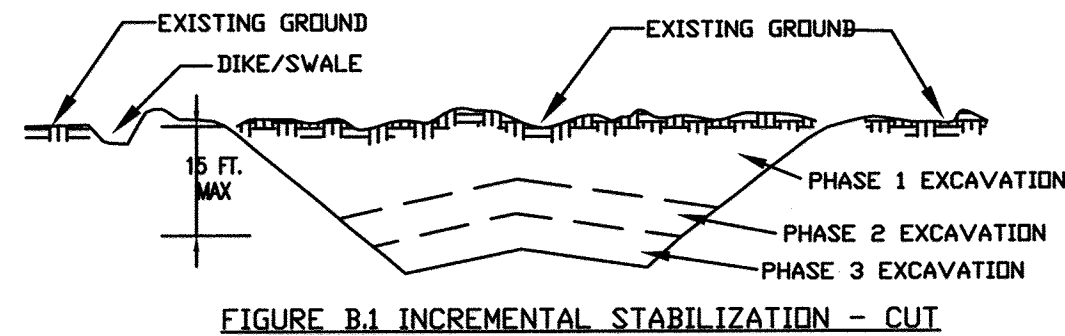
Conditions Where Practice Applies: Any cut or fill slope greater than 15 feet in height. This practice also applies to stockpiles.

Criteria:

A. Incremental Stabilization - Cut Slopes

1. Excavate and stabilize cut slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all cut slopes as the work progresses.
2. Construction sequence example (Refer to Figure B.1):
 - a. Construct and stabilize all temporary swales or dikes that will be used to convey runoff around the excavation.
 - b. Perform Phase 1 excavation, prepare seedbed, and stabilize.
 - c. Perform Phase 2 excavation, prepare seedbed, and stabilize. Overseed Phase 1 areas as necessary.
 - d. Perform final phase excavation, prepare seedbed, and stabilize. Overseed previously seeded areas as necessary.

Note: Once excavation has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.



B. Incremental Stabilization - Fill Slopes

1. Construct and stabilize fill slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all slopes as the work progresses.
2. Stabilize slopes immediately when the vertical height of a lift reaches 15 feet, or when the grading operation ceases as prescribed in the plans.
3. At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
4. Construction sequence example (Refer to Figure B.2):
 - a. Construct and stabilize all temporary swales or dikes that will be used to divert runoff around the fill. Construct silt fence on low side of fill unless other methods shown on the plans address this area.
 - b. At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
 - c. Place Phase 1 fill, prepare seedbed, and stabilize.
 - d. Place Phase 2 fill, prepare seedbed, and stabilize.
 - e. Place final phase fill, prepare seedbed, and stabilize. Overseed previously seeded areas as necessary.

Note: Once the placement of fill has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.

B-4-2 STANDARDS AND SPECIFICATIONS FOR SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

Definition: The process of preparing the soils to sustain adequate vegetative stabilization.

Purpose: To provide a suitable soil medium for vegetative growth.

Conditions Where Practice Applies: Where vegetative stabilization is to be established.

Criteria:

A. Soil Preparation

1. Temporary Stabilization
 - a. Seedbed preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened, it must not be rolled or dragged smooth but left in the roughened condition. Slopes 3:1 or flatter are to be tracked with ridges running parallel to the contour of the slope.
 - b. Apply fertilizer and lime as prescribed on the plans.
 - c. Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.
2. Permanent Stabilization
 - a. A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
 - i. Soil pH between 6.0 and 7.0.
 - ii. Soluble salts less than 500 parts per million (ppm).
 - iii. Soil contains less than 40 percent clay but enough fine grained material (greater than 30 percent silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception: if lowgrass will be planted, then a sandy soil (less than 30 percent silt plus clay) would be acceptable.
 - iv. Soil contains 1.5 percent minimum organic matter by weight.
 - v. Soil contains sufficient pore space to permit adequate root penetration.
 - b. Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
 - c. Graded areas must be maintained in a true and even grade, as specified on the approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.
 - d. Apply soil amendments as specified on the approved plan or as indicated by the results of a soil test.
 - e. Mix soil amendments into the top 3 to 5 inches of soil by disking or other suitable means. Rake lawn areas to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface where site conditions will not permit normal seedbed preparation. Track slopes 3:1 or flatter with tracked equipment leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. Leave the top 1 to 3 inches of soil loose and friable. Seedbed loosening may be unnecessary on newly disturbed areas.

B. Topsoiling

1. Topsoiling is placed over prepared subsoil prior to establishment of permanent vegetation. The purpose is to provide a suitable soil medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.
2. Topsoil salvaged from an existing site may be used provided it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-NRCS.
3. Topsoiling is limited to areas having 2:1 or flatter slopes where:
 - a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
 - b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
 - c. The original soil to be vegetated contains material toxic to plant growth.
 - d. The soil is so acidic that treatment with limestone is not feasible.
4. Areas having slopes steeper than 2:1 require special consideration and design.
5. Topsoil Specifications: Soil to be used as topsoil must meet the following criteria:
 - a. Topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Topsoil must not be a mixture of contrasting textured subsoils and must contain less than 5 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1 1/2 inches in diameter.
 - b. Topsoil must be free of noxious plants or plant parts such as Bermuda grass, nut grass, Johnson grass, nut sedge, poison ivy, thistle, or others as specified.
 - c. Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.

6. Topsoil Application

- a. Erosion and sediment control practices must be maintained when applying topsoil.
- b. Uniformly distribute topsoil in a 5 to 8 inch layer and lightly compact to a minimum thickness of 4 inches. Spreading is to be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations must be corrected in order to prevent the formation of depressions or water pockets.
- c. Topsoil must not be placed if the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

C. Soil Amendments (Fertilizer and Lime Specifications)

1. Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas of 5 acres or more. Soil analysis may be performed by a recognized private or commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analyses.
2. Fertilizers must be uniform in composition, free flowing and suitable for accurate application by appropriate equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers must all be delivered to the site fully labeled according to the applicable laws and must bear the name, trade name or trademark and warranty of the producer.
3. Lime materials must be ground limestone (hydrated or burnt lime may be substituted except when hydroseeding) which contains at least 50 percent total oxides (calcium oxide plus magnesium oxide). Limestone must be ground to such fineness that at least 50 percent will pass through a #100 mesh sieve and 98 to 100 percent will pass through a #20 mesh sieve.
4. Lime and fertilizer are to be evenly distributed and incorporated into the top 3 to 5 inches of soil by disking or other suitable means.
5. Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestone at the rate of 4 to 8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil.

B-4-3 STANDARDS AND SPECIFICATIONS FOR SEEDING AND MULCHING

Definition: The application of seed and mulch to establish vegetative cover.

Purpose: To protect disturbed soils from erosion during and at the end of construction.

Conditions Where Practice Applies: To the surface of all perimeter controls, slopes, and any disturbed area not under active grading.

Criteria:

A. Seeding

1. Specifications
 - a. All seed must meet the requirements of the Maryland State Seed Law. All seed must be subject to re-testing by a recognized seed laboratory. All seed used must have been tested within the 6 months immediately preceding the date of sowing such material on any project. Refer to Table B.4 regarding the quality of seed. Seed tags must be available upon request to the inspector to verify type of seed and seeding rate.
 - b. Mulch alone may be applied between the fall and spring seeding dates only if the ground is frozen. The appropriate seeding mixture must be applied when the ground thaws.
 - c. Inoculants: The inoculant for treating legume seed in the seed mixtures must be a pure culture of nitrogen fixing bacteria prepared specifically for the species. Inoculants must not be used later than the date indicated on the container. Add fresh inoculants as directed on the package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until use. Temperatures above 75 to 80 degrees Fahrenheit can weaken bacteria and make the inoculant less effective.
 - d. Sod or seed must not be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phytotoxic materials.
2. Application
 - a. Dry Seeding: This includes use of conventional drag or broadcast spreaders
 - i. Incorporate seed into the subsoil at the rates prescribed on Temporary Seeding Table B.1, Permanent Seeding Table B.3, or site-specific seeding summaries.
 - ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction. Roll the seeded area with a weighted roller to provide good seed to soil contact.
 - b. Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil.
 - i. Cultipacker seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seedbed must be firm after planting.
 - ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction.
 - c. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer)
 - i. If fertilizer is being applied at the time of seeding, the application rates should not exceed the following: nitrogen, 100 pounds per acre total of soluble nitrogen; P205 (phosphorus), 200 pounds per acre; K20 (potassium), 200 pounds per acre.
 - ii. Lime: Use only ground agricultural limestone (up to 3 tons per acre may be applied by hydroseeding). Normally, not more than 2 tons are applied by hydroseeding at any one time. Do not use burnt or hydrated lime when hydroseeding.
 - iii. Mix seed and fertilizer on site and seed immediately and without interruption.
 - iv. When hydroseeding do not incorporate seed into the soil.

B. Mulching

1. Mulch Materials (in order of preference)
 - a. Straw consisting of dry, shelled wheat, rye, oat, or barley and reasonably bright in color. Straw is to be free of noxious weed seeds as specified in the Maryland Seed Law and not musty, moldy, caked, decayed, or excessively dusty. Note: Use only sterile straw mulch in areas where one species of grass is desired.
 - b. Wood Cellulose Fiber Mulch (WCFM) consisting of specially prepared wood cellulose processed into a uniform fibrous physical state.
 - i. WCFM is to be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.
 - ii. WCFM, including dye, must contain no germination or growth inhibiting factors.
 - iii. WCFM materials are to be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material must form a blotter-like ground cover, on application, having moisture absorption and permeation properties and must cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
 - iv. WCFM material must not contain elements or compounds at concentration levels that will be phytotoxic.
 - v. WCFM must conform to the following physical requirements: fiber length of approximately 10 millimeters, diameter approximately 1 millimeter, pH range of 4.0 to 8.5, ash content of 1.6 percent maximum and water holding capacity of 90 percent minimum.
2. Application
 - a. Apply mulch to all seeded areas immediately after seeding.
 - b. When straw mulch is used, spread it over all seeded areas at the rate of 2 tons per acre to a uniform loose depth of 1 to 2 inches. Apply mulch to achieve a uniform distribution and depth so that the soil surface is not exposed. When using a mulch anchoring tool, increase the application rate to 2.5 tons per acre.
 - c. Wood cellulose fiber used as mulch must be applied at a net dry weight of 1500 pounds per acre. Mix the wood cellulose fiber with water to attain a mixture with a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
3. Anchoring
 - a. Perform mulch anchoring immediately following application of mulch to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon the size of the area and erosion hazard:
 - i. A mulch anchoring tool is a tractor draw implement designed to punch and anchor mulch into the soil surface a minimum of 2 inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should follow the contour.
 - ii. Wood cellulose fiber may be used for anchoring straw. Apply the fiber binder at a net dry weight of 750 pounds per acre. Mix the wood cellulose fiber with water at a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.

- a. Synthetic binders such as Acrylic DLR (Agro-Tack), DCA-70, Petroset, Terra Tack II, Terra Tack AR or other approved equal may be used. Follow application rates as specified by the manufacturer. Application of liquid binders needs to be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. Use of asphalt binders is strictly prohibited.
- b. Lightweight plastic netting may be stapled over the mulch according to manufacturer recommendations. Netting is usually available in rolls 4 to 15 feet wide and 300 to 3,000 feet long.

B-4-4 STANDARDS AND SPECIFICATIONS FOR TEMPORARY STABILIZATION

Definition: To stabilize disturbed soils with vegetation for up to 6 months

Purpose: To use fast growing vegetation that provides cover on disturbed soils.

Conditions Where Practice Applies: Exposed soils where ground cover is needed for a period of 6 months or less. For longer duration of time, permanent stabilization practices are required.

Criteria:

1. Select one or more of the species or seed mixtures listed in Table B.1 for the appropriate Plant Hardiness Zone (from Figure B.3), and enter them in the Temporary Seeding Summary below along with application rates, seeding dates and seeding depths. If this Summary is not put on the plan and completed, then Table B.1 plus fertilizer and lime rates must be put on the plan.
2. For sites having soil tests performed, use and show the recommended rates by the testing agency. Soil tests are not required for Temporary Seeding.
3. When stabilization is required outside of a seeding season, apply seed and mulch or straw mulch alone as prescribed in Section B-4-3A.1.b and maintain until the next seeding season.

TEMPORARY SEEDING SUMMARY

NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS	HARDINESS ZONE: 7A SEED MIXTURE:	
					FERTILIZER RATE (10-20-20)	LIME RATE
-	ANNUAL RYE	40	2/1- 4/30	0.5"	436 LB/AC (10 LB/1000SF)	2 TONS/AC (90 LB/1000SF)
-	FOXTAIL MILLET	30	5/1- 8/14	0.5"	436 LB/AC (10 LB/1000SF)	2 TONS/AC (90 LB/1000SF)
-	ANNUAL RYE	40	8/15- 11/30	0.5"	436 LB/AC (10 LB/1000SF)	2 TONS/AC (90 LB/1000SF)

TABLE B.1: TEMPORARY SEEDING FOR SITE STABILIZATION

PLANT SPECIES	SEEDING RATES ^{1/}		SEEDING DEPTH (INCHES)	RECOMMENDED SEEDING DATES BY PLANT HARDINESS ZONE ^{3/}		
	LB/AC	LBS/1000 FT ²		5b AND 6a	6b	(7a) AND 7b
COOL-SEASON GRASSES						
ANNUAL RYEGRASS (LOLIUM PERENNE SSP. MULTIFLORUM)	40	1.0	0.5	MAR 15 TO MAY 31; AUG 1 TO SEP 30	MAR 1 TO MAY 15; AUG 1 TO OCT 15	FEB 15 TO APR 30; AUG 15 TO NOV 30
BARLEY (HORDEUM VULGARE)	96	2.2	1.0	MAR 15 TO MAY 31; AUG 1 TO SEP 30	MAR 1 TO MAY 15; AUG 1 TO OCT 15	FEB 15 TO APR 30; AUG 15 TO NOV 30
OATS (Avena SATIVA)	72	1.7	1.0	MAR 15 TO MAY 31; AUG 1 TO SEP 30	MAR 1 TO MAY 15; AUG 1 TO OCT 15	FEB 15 TO APR 30; AUG 15 TO NOV 30
WHEAT (TRITICUM AESTIVUM)	120	2.8	1.0	MAR 15 TO MAY 31; AUG 1 TO SEP 30	MAR 1 TO MAY 15; AUG 1 TO OCT 15	FEB 15 TO APR 30; AUG 15 TO NOV 30
CEREAL RYE (SECALE CEREALE)	112	2.8	1.0	MAR 15 TO MAY 31; AUG 1 TO OCT 31	MAR 1 TO MAY 15; AUG 1 TO NOV 15	FEB 15 TO APR 30; AUG 15 TO DEC 15
WARM-SEASON GRASSES						
FOXTAIL MILLET (SETARIA ITALICA)	30	0.7	0.5	JUN 1 TO JUL 31	MAY 16 TO JUL 31	MAY 1 TO AUG 14
PEARL MILLET (PENNISETUM GLAUCUM)	20	0.5	0.5	JUN 1 TO JUL 31	MAY 16 TO JUL 31	MAY 1 TO AUG 14

^{1/} Seeding rates for the warm-season grasses are in pounds of Pure Live Seed (PLS). Actual planting rates shall be adjusted to reflect percent seed germination and purity, as tested. Adjustments are usually not needed for the cool-season grasses.

Seeding rates listed above are for temporary seedings, when planted alone. When planted as a nurse crop with permanent seed mixes, use 1/3 of the seeding rate listed above for barley, oats, and wheat. For smaller-seeded grasses (annual ryegrass, pearl millet, foxtail millet), do not exceed more than 5X (by weight) of the overall permanent seeding mix. Cereal rye generally should not be used as a nurse crop, unless planting will occur in very little till beyond the seeding dates for other temporary seedings. Cereal rye has allelopathic properties that inhibit the germination and growth of other plants. If it must be used as a nurse crop, seed at 1/3 of the rate listed above.

Oats are the recommended nurse crop for warm-season grasses.

^{2/} For sandy soils, plant seeds at twice the depth listed above.

^{3/} The planting dates listed are averages for each Zone and may require adjustment to reflect local conditions, especially near the boundaries of the zone.

B-4-5 STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION

Definition: To stabilize disturbed soils with permanent vegetation

Purpose: To use long-lived perennial grasses and legumes to establish permanent ground cover on disturbed soils.

Conditions Where Practice Applies: Exposed soils where ground cover is needed for 6 months or more.

Criteria:

A. Seed Mixtures

1. General Use
 - a. Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The Summary is to be placed on the plan.
 - b. Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical Field Office Guide, Section 342 - Critical Area Planting.
 - c. For sites having disturbed areas over 5 acres, use and show the rates recommended by the soil testing agency.
 - d. For areas receiving low maintenance, apply urea form fertilizer (46-0-0) at 3 1/2 pounds per 1000 square feet (150 pounds per acre) at the time of seeding in addition to the soil amendments shown in the Permanent Seeding Summary.
2. Turfgrass Mixtures
 - a. Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
 - b. Select one or more of the species or mixtures listed below based on the site conditions or purpose. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.

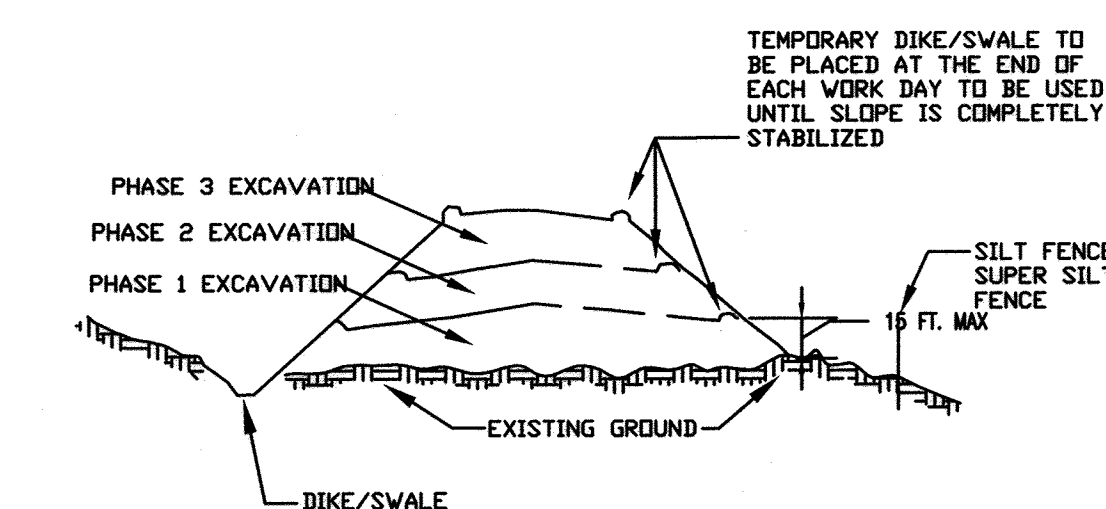
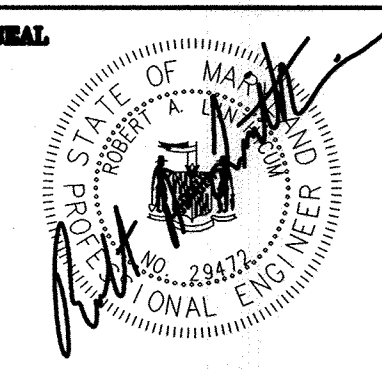


FIGURE B.2 INCREMENTAL STABILIZATION - FILL

**DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND**

Director of Public Works: [Signature] DATE: 4/15/19
 Chief Bureau of Engineering: [Signature] DATE: 4/15/19
 Chief, Bureau of Utilities: [Signature] DATE: 4/15/19
 Chief, Utility Division: [Signature] DATE: 4/15/19

PROFESSIONAL CERTIFICATION
 I HEREBY CERTIFY THAT REDLINE REVISIONS INCLUDED IN 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. 28472 EXPIRATION DATE 9/15/2019
RK&K 700 EAST PRATT STREET SUITE 500 BALTIMORE, MARYLAND 21202



DES:	DAO				
DRN:	NAF				
CHK:	RAL				
DATE:	4/02/19				
BY:	NO.				
RK&K	1	2019 UPGRADES - ADD SHEET 2B	4/19		
REVISIONS					
MAP NO.	17	BLOCK NO.	8	ELECTION DISTRICT NO.	2

**MOUNT HEBRON SPS
SITE DEVELOPMENT PLAN -
2019 UPGRADES**

**MOUNT HEBRON SEWER MAINS
2019 UPGRADES
CAPITAL PROJECT NO. S6600
CONTRACT NO. 745-S**

SCALE AS SHOWN
SHEET 2B OF 25

PERMANENT SEEDING SUMMARY

NO.	SPECIES	HARDINESS ZONE: 7A SEED MIXTURE: ROADSIDES		FERTILIZER RATE (10-20-20)			LIME RATE	
		APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS	N	P ₂ O ₅		K ₂ O
3	REDDOP	10	2/15-5/31	1/4- 1/2 INCH	45 LB/AC (1.0 LB/1000SF)	90 LB/AC (2 LB/1000SF)	90 LB/AC (2 LB/1000SF)	2 TONS/AC (90 LB/1000SF)
	COMMON LESPEDEZA	10	2/15-5/31	1/4- 1/2 INCH				
	CANADIAN WILD RYE	1	2/15-5/31	1/4- 1/2 INCH				
	DEERTONGUE	20	2/15-5/31	1/4- 1/2 INCH				
6	TALL FESCUE	40	2/15-4/30 8/15-10/31	1/4- 1/2 INCH	45 LB/AC (1.0 LB/1000SF)	90 LB/AC (2 LB/1000SF)	90 LB/AC (2 LB/1000SF)	2 TONS/AC (90 LB/1000SF)
	WHITE CLOVER	5	2/15-4/30 8/15-10/31	1/4- 1/2 INCH				
	PERENNIAL RYEGRASS	25	2/15-4/30 8/15-10/31	1/4- 1/2 INCH				

*FOR DATES 5/1-8/14 ADD 3.5 LBS/AC OF FOXTAIL MILLET OR PEARL MILLET TO PERMANENT SEEDING MIX #6 ABOVE.

TABLE B.2: RECOMMENDED PERMANENT SEEDING MIXTURES BY SITE CONDITION OR PURPOSE

SITE CONDITION OR PURPOSE OF THE PLANTING	RECOMMENDED MIX (SEE TABLE B.3)												
	1	2	3	4	5	6	7	8	9	10	11	12	13
STEEP SLOPES, ROADSIDES	R	R	R	R	R	R	R	R	R	R	R	R	R
SAND AND GRAVEL PITS, SANITARY LANDFILLS	R	R	R	R	R	R	R	R	R	R	R	R	R
SALT-DAMAGED AREAS	A												
MINE SPOIL, DREDGED MATERIAL, AND SPOIL BANKS	A	R	A	A									R
UTILITY RIGHTS-OF-WAY	R	R	R	R	R	R	R	R	R	R	R	R	R
DIKES AND DAMS	A	A	R	A	R	A	R	R	R	R	R	R	A
BERMS AND LOW EMBANKMENTS (NOT ON PONDS)	R	R	R	R	R	R	R	R	R	R	R	R	A
PONDS AND CHANNEL BANKS, STREAMBANKS	R	R	R	R	A	A	A	A	A	A	A	A	A
GRASSED WATERWAYS, DIVERSIONS, TERRACES, SPILLWAYS	A				A	R	A	R	A	R	A	R	A
BOTTOM OF DRAINAGE CHANNELS, SWALES, DETENTION BASINS					A	R	A	R	A	R	A	R	A
FIELD BORDERS, FILTER STRIPS, CONTOUR BUFFER STRIPS	R	R	R	A	R	A	R	A	R	R	A	R	A
WASTEWATER TREATMENT STRIPS AND AREAS										R	A	R	A
HEAVY USE AREAS (GRASS LOAFING PADDOCKS FOR LIVESTOCK)												R	A
ATHLETIC FIELDS, RESIDENTIAL AND COMMERCIAL LAWNS										A	R	R	A
RECREATION AREAS										R	R	R	A

R= RECOMMENDED MIX FOR THIS SITE CONDITION OR PURPOSE
A=ALTERNATIVE MIX, DEPENDING ON SITE CONDITIONS

NOTES:

1/ Seeding Rates: Seeding rates for the warm-season grasses are in pounds of Pure Live Seed (PLS). Actual planting rates must be adjusted to reflect percent seed germination and purity, as tested. Adjustments are usually not needed for the cool-season grasses, legumes, or wildflowers. All legume seeds must be inoculated before planting with the appropriate Rhizobium bacteria. When feasible, hard-seeded legumes should be scarified to improve germination.

2/ Soil Drainage Class (refer to the county soil survey for further information):
E - Excessively Drained; W - Well Drained; MW - Moderately Well Drained; SP - Somewhat Poorly Drained; P - Poorly Drained.

3/ Maintenance Level:

A - Intensive mowing (every 2-4 days), fertilization, lime, insect and weed control, and watering (examples: high maintenance lawns and athletic fields).
B - Frequent mowing (every 4-7 days), occasional fertilization, lime, pest control, and watering (examples: residential, school, and commercial lawns).
C - Periodic mowing (every 7-14 days), occasional fertilization and lime (examples: residential lawns, parks).
D - Infrequent or no mowing, fertilization, or lime after the first year of establishment (examples: wildlife areas, roadsides, steep banks).

4/ Turf-type cultivars of tall fescue and Kentucky bluegrass must be selected based on recommendations of the University of Maryland Cooperative Extension Service, Agronomy Memo 77. Recommendations are as follows:

A. Kentucky Bluegrass -

1. The following Kentucky bluegrass cultivars are suitable for general use, and are also noted for shade tolerance:

America	Covestry	Quantum Leap
Ascot	Liberator	Showcase
Brilliant	Moonlight	SR 2000
Champagne	Nuglade	Unique
Compact	Princeton 105	

2. The following Kentucky bluegrass cultivars are suitable for general use, and are also noted for tolerance of low maintenance condition:

Barirus	Haga	Monopoly
Caliber	Livingston	Washington
Eagleton	Merit Freedom	Midnight

B. Tall Fescue - The following turf-type cultivars are suitable for general use:

Alamo E	Bulldawg	Debutante	Good-En	Micro DD	Rebel 3D*	Scorpio	Titan 2
Apache II	Chapel Hill	Domination	Grande	Millennium	Rebel III*	Shenandoah	Tomahawk*
Avanti*	Chieftain II*	Duke	Guardian	Olympic Gold	Rebel Jr.	Shenandoah II	Trailblazer II*
Axiom	Chinook	Duster*	Heritage	Oncue	Rebel Sentry	Southern Choice*	Twilight II
Bandana	Cochise II	Eldorado*	Houndog 5	Pisite	Red Coat	SR 8200	Virtue*
Barlexus	Comstock	Empress	Jaguar III	Pisite E*	Regiment*	SR 8300	Watchdog
Barrington	Coyote	Falcon II*	Lancer	Plantation	Rembrandt	Stinson	Wolfpack
Bonanza*	Crossfire*	Finlawn Petite*	Laprechaun	Pyramid	Renegade	Tarheel	WPEZE
Bonanza II	Crossfire II	Genesis	Masterpiece	Rebel 2000	Reserve	TF6	Wyatt

Tall fescue cultivar names that are followed by an asterisk (*) have low endophyte levels (20% or lower, based on seed analysis). To avoid livestock health problems due to endophyte toxicity, use low-endophyte cultivars for critical area plantings where livestock may be allowed to graze (e.g., heavy use grass loafing paddocks). Please note that endophyte levels in plantings can vary between varieties, between fields of the same variety, and with the time of year. For areas where livestock will not have access, cultivars with higher endophyte levels are desirable because they tend to be more drought tolerant and more resistant to disease and insect damage.

TABLE B.3: SELECTED LIST OF PERMANENT HERBACEOUS SEEDING MIXTURE

MIX	RECOMMENDED CULTIVAR	SEEDING RATE ^{1/}		SOIL DRAINAGE CLASS ^{2/}	MAX HEIGHT (INCH) ^{2/}	MAINT. LEVEL ^{3/}	REMARKS
		LB/AC	LB/1000 FT ²				
WARM-SEASON/COOL SEASON GRASS MIXES							
1. SELECT ONE WARM-SEASON GRASS: Switch Grass (<i>Panicum virgatum</i>) OR Coastal Panic Grass (<i>Panicum amarum var. amarulum</i>) AND ADD: Creeping Red Fescue (<i>Festuca rubra var. rubra</i>) PLUS ONE OF THE FOLLOWING LEGUMES: Partridge Pea (<i>Chamaecrista fasciculata</i>) Bush Clover (<i>Lespedeza capitata</i>) Wild Indigo (<i>Baptisia tinctoria</i>)							
	Blackwell, Carthage, Cave-in-Rock, or Shelter	10	0.23				All species are native to Maryland. Plant this mix with a regular grass drill.
	Atlantic	10	0.23				Coastal panicgrass is best adapted to Zones 7a and 7b.
	Dawson, Pennlawn, Flyer, Fortress, Ruby, or Salem	15	0.34	E-P	4-7	C-D	Creeping red fescue is a cool-season grass that will provide erosion protection while the warm-season grass (switchgrass or coastal panicgrass) is becoming established.
	Common	4	0.09				Switchgrass, coastal panicgrass, the "Dawson" variety of creeping red fescue, and partridge pea are moderately salt-tolerant. Do not use bush clover or wild indigo on wet sites.
	Common	2	0.05				
	Common	2	0.05				
2. Big Bluestem (<i>Andropogon gerardii</i>) Indiangrass (<i>Sorghastrum nutans</i>) Little Bluestem (<i>Schizachyrium scoparium</i>) Creeping Red Fescue (<i>Festuca rubra var. rubra</i>) PLUS ONE OF THE FOLLOWING LEGUMES: Partridge Pea (<i>Chamaecrista fasciculata</i>) Bush Clover (<i>Lespedeza capitata</i>) Wild Indigo (<i>Baptisia tinctoria</i>) Showy Tick-Trefoil (<i>Desmodium canadense</i>)							
	Niagara or Rountree	6	0.14				All species are native to Maryland.
	Rumsey	6	0.14				The indiangrass and bluestems have fluffy seeds. Plant with a specialized native seed drill.
	Aldous or Blaze	4	0.09				Creeping red fescue is a cool-season grass that will provide erosion protection while the warm-season grasses are becoming established.
	Dawson, Pennlawn, Flyer, Fortress, Ruby, or Salem	15	0.34	E-MW	6-8	C-D	
	Common	4	0.09				
	Common	2	0.05				
	Common	2	0.05				
	Common	1	0.02				
3. SELECT THREE GRASSES: Deertongue (<i>Dichanthelium clandestinum</i>) Sheep Fescue (<i>Festuca ovina</i>) OR Canada Wild Rye (<i>Elymus canadensis</i>) Redtop (<i>Agrostis gigantea</i>) PLUS ONE OF THE FOLLOWING LEGUMES: Common Lespedeza (<i>Lespedeza striata</i>) Korean Lespedeza (<i>Lespedeza stipularica</i>)							
	Tioga	20	0.46				Excellent for excessively droughty, low pH (acidic) soils.
	Common or Bighorn	20	0.46				Sheep fescue, Canada wild rye, and redtop are cool-season grasses that will provide erosion protection while the warm-season grass (deertongue) is becoming established.
	Common	3	0.07	E-MW	4-6	C-D	
	Streaker	1	0.02				
	Common	10	0.23				Common lespedeza (Kobe' variety) is more tolerant of low acidity and high manganese concentrations than Korean lespedeza. These lespedeza are reseeding annuals.
	Climax or Rowan	10	0.23				
4. Deertongue (<i>Dichanthelium clandestinum</i>) Creeping Red Fescue (<i>Festuca rubra var. rubra</i>) Virginia Wild Rye (<i>Elymus virginicus</i>) OR Canada Wild Rye (<i>Elymus canadensis</i>)							
	Tioga	15	0.34				
	Dawson, Pennlawn, Flyer, Fortress, Ruby, or Salem Common	20	0.46	W-P	2-3	C-D	Use Virginia wild rye on moist, shady sites.
	Common	5	0.11				
	Common	5	0.11				Use Canada wild rye on droughty sites
COOL SEASON GRASS MIXES							
5. SELECT TWO GRASSES: Creeping Red Fescue (<i>Festuca rubra var. rubra</i>) OR Hard Fescue (<i>Festuca trachyphylla</i>) Perennial Ryegrass (<i>Lolium perenne</i>) OR Redtop (<i>Agrostis gigantea</i>) AND ADD THE FOLLOWING LEGUME: Flatpea (<i>Lathyrus sylvestris</i>)							
	Dawson, Pennlawn, Flyer, Fortress, Ruby, or Salem	20	0.46				Use creeping red fescue in heavy shade and on moist sites.
	Attila or Aurora	20	0.46				Perennial ryegrass and redtop will establish more rapidly than either fescue. Redtop tolerates wet sites better than ryegrass.
	Blazer (II), Pennfine	10	0.23	E-SP	2-3	B-D	
	Streaker	1	0.02				Flatpea will suppress woolly vegetation. It should be planted in the spring, or as a dormant seeding in late fall or winter. It must be incorporated into the soil or covered with mulch. It may not be winter-hardy if planted late summer-fall. Caution: Flatpea can spread aggressively, and can be toxic to livestock.
	Lathco	15	0.34				
6. Tall Fescue (<i>Lolium arundinaceum</i>) formerly <i>Festuca arundinacea</i>) Perennial Ryegrass (<i>Lolium perenne</i>) PLUS ONE OF THE FOLLOWING LEGUMES: Birdsfoot Trefoil (<i>Lotus corniculatus</i>) White Clover (<i>Trifolium repens</i>)							
	Recommended MD turf-types	40	0.93				
	Blazer (II), Pennfine	25	0.57	W-SP	2-3	C-D	Birdsfoot trefoil is suitable for use only in Zones 5b and 6a
	Empire, Viking, Norcen, Leo	8	0.18				
	Common	5	0.11				
7. Creeping Red Fescue (<i>Festuca rubra var. rubra</i>) Kentucky Bluegrass (<i>Poa pratensis</i>)							
	Dawson, Pennlawn, Flyer, Fortress, Ruby, or Salem Recommended MD turf-types	60	1.38	W-MD	2-3	C-D	This mix has good shade tolerance
	Common	15	0.34				
8. Tall Fescue (<i>Lolium arundinaceum</i>) (formerly <i>Festuca arundinacea</i>)							
	Recommended MD turf-types	100	2.3	E-SP	2-3	A-D	Tall fescue produces a dense turf if frequently mowed, but tends to be clumpy if mowed only occasionally. For best results, recommended using a blend of 3 cultivars.
	Common						Use low-endophyte cultivars in areas where livestock may graze.
9. SELECT ONE SPECIES OF FESCUE: Tall Fescue (<i>Lolium arundinaceum</i>) (formerly <i>Festuca arundinacea</i>) OR Hard Fescue (<i>Festuca trachyphylla</i>) AND ADD: Kentucky Bluegrass (<i>Poa pratensis</i>) Perennial Ryegrass (<i>Lolium perenne</i>)							
	Recommended MD turf-types	60	1.38				Good for highly managed athletic fields.
	Any	25	0.57				Tall fescue is more suitable for compacted, high use areas and on moist sites.
	Dawson, Pennlawn, Flyer, Fortress, Ruby, or Salem Streaker	10	0.23				
	Common	1	0.02	W-SP	2-3	A-B	Hard fescue produces finer-textured turf with more shade tolerance.
	Common	3	0.07				Use tall fescue instead of hard fescue for wastewater treatment strips and areas.
	Common	3	0.07				For best results, recommend using a blend of 3 cultivars each for tall fescue and Kentucky bluegrass.
	Common	20	0.46				
10. Orchardgrass (<i>Dactylis glomerata</i>) Creeping Red Fescue (<i>Festuca rubra var. rubra</i>) Redtop (<i>Agrostis gigantea</i>) Alsike Clover (<i>Trifolium hybridum</i>) White Clover (<i>Trifolium repens</i>)							
	Any	25	0.57				Low maintenance mix that is easy to establish.
	Dawson, Pennlawn, Flyer, Fortress, Ruby, or Salem Streaker	10	0.23				
	Common	1	0.02	W-SP	2-3	C-D	Alsike clover can be toxic to horses.
	Common	3	0.07				Omit the clovers if using this mix for wastewater treatment strips and areas.
	Common	3	0.07				
11. Creeping Red Fescue (<i>Festuca rubra var. rubra</i>) Chewings Fescue (<i>Festuca rubra ssp. commutata</i>) Kentucky Bluegrass (<i>Poa pratensis</i>) OPTIONAL ADDITION Rough Bluegrass (<i>Poa trivialis</i>)							
	Dawson, Pennlawn, Flyer, Fortress, Ruby, or Salem Common	30	0.69				
	Recommended MD turf-types	30	0.69				
	Common	20	0.46	E-MW	2-3	B-D	
	Common	15	0.34				Add rough bluegrass in moist, shady conditions
12. Creeping Red Fescue (<i>Festuca rubra var. rubra</i>) Hard Fescue (<i>Festuca trachyphylla</i>) Sheep Fescue (<i>Festuca ovina</i>) PLUS WILDFLOWER MIX: Black-eyed Susan (<i>Rudbeckia hirta</i>) Lance-leaved Coreopsis (<i>Coreopsis lanceolata</i>) Purple Coneflower (<i>Echinacea purpurea</i>) Partridge Pea (<i>Chamaecrista fasciculata</i>) OR ADD CLOVER MIX: White Clover (<i>Trifolium repens</i>) Red Clover (<i>Trifolium pratense</i>)							
	Dawson, Pennlawn, Flyer, Fortress, Ruby, or Salem Attila or Aurora	25	0.57				Attractive mix of fine fescues and wildflowers for low maintenance conditions. Once well-established, the grasses may tend to outcompete the wildflowers.
	Common or Bighorn	25	0.57				
	Common	2	0.05				Wildflowers are best established by broadcasting and cultipacking on a prepared seedbed. Drilling can be used, but care must be taken so that seeds are not drilled too deep.
	Common	2	0.05				Hydroseeding is not recommended for this mix if wildflowers are used. (They have very small seeds.)
	Common	2	0.05	E-MW	2-3	C-D	
	Common	2	0.05				
	Common	5	0.11				
	Common	3	0.07				
	Any	3	0.07				
	Any	3	0.07				
13. Alkali Saltgrass (<i>Puccinellia distans</i>) Creeping Red Fescue (<i>Festuca rubra var. rubra</i>) Fowl Meadowgrass (<i>Poa palustris</i>) OPTIONAL ADDITION Creeping Bentgrass (<i>Agrostis stolonifera</i>)							
	Fuls or Salty	20	0.46				This is the recommended mix for saline sites. Saltgrass will persist only under saline conditions.
	Dawson	15	0.34				For best results, only use the "Dawson" variety of creeping red fescue. It is a salt-tolerant variety.
	Common	2	0.05	W-P	2-3	B-D	Add bentgrass for wetter conditions.
	Common	2	0.05				

SITE DATA

MT HEBRON	
AREA OF SITE	22,260 SF/ 0.51 AC
LIMIT OF DISTURBANCE	640 SF/ 0.015 AC
FILL	.23 CY.
CUT	.23 CY.
AREA VEGETATIVELY STABILIZED	150 SF/ 0.003 AC.
IMPERVIOUS AREA	490 SF/ 0.011 AC.

PATAPSCO PARK

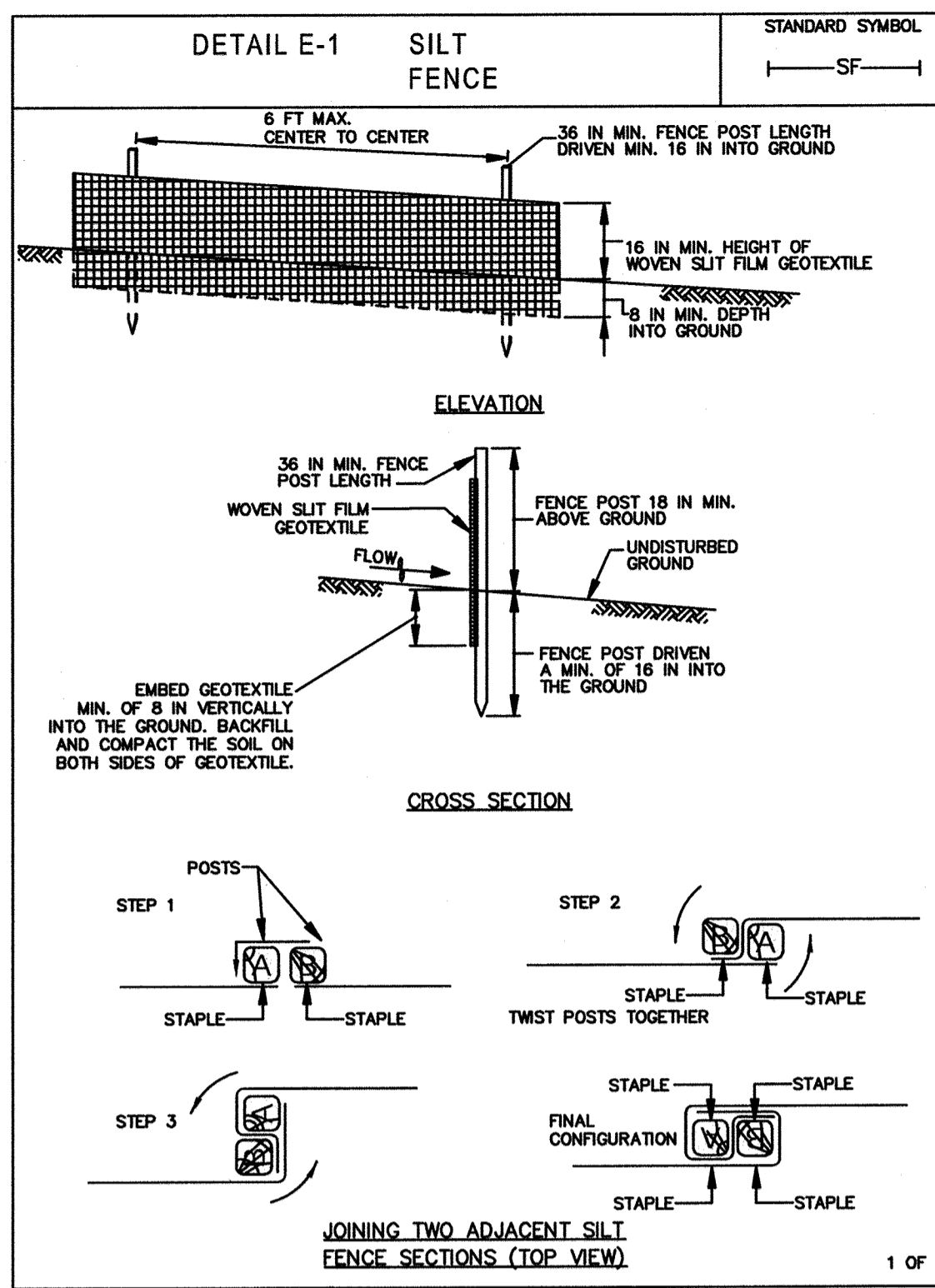
AREA OF SITE	10,055 SF/ 0.23 AC
LIMIT OF DISTURBANCE	480 SF/ 0.011 AC
FILL	.10 CY.
CUT	.10 CY.
AREA VEGETATIVELY STABILIZED	75 SF/ 0.002 AC.
IMPERVIOUS AREA	405 SF/ 0.009 AC.

PLANT HARDINESS ZONE: 7A

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

	4/5/19		4/5/19
DIRECTOR OF PUBLIC WORKS	DATE	CHIEF, BUREAU OF ENGINEERING	DATE
	4-5-19		4/5/19
CHIEF, BUREAU OF UTILITIES	DATE	CHIEF, UTILITY DIVISION	DATE

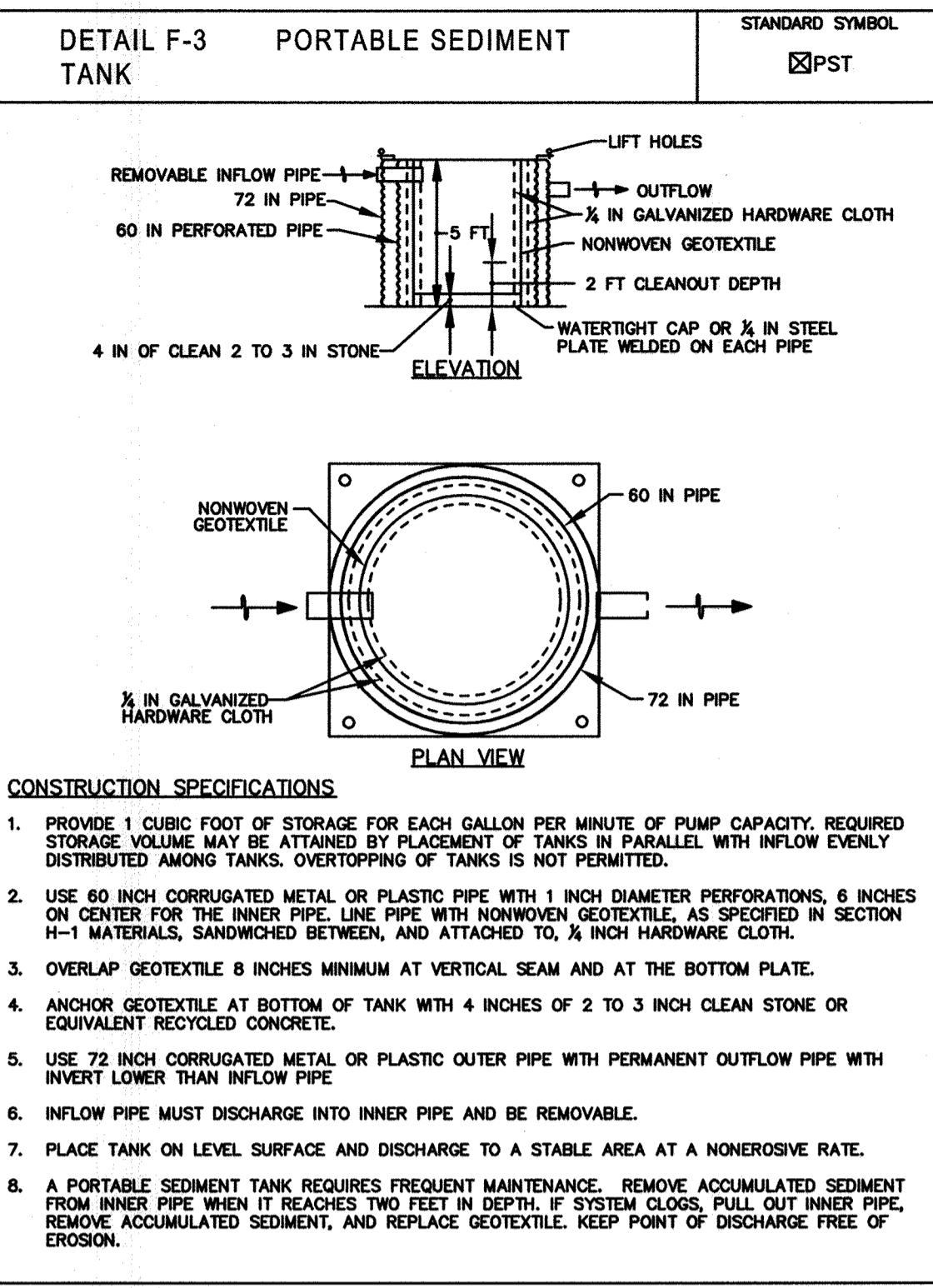
PROFESSIONAL CERTIFICATION</



DETAIL E-1 SILT FENCE

CONSTRUCTION SPECIFICATIONS

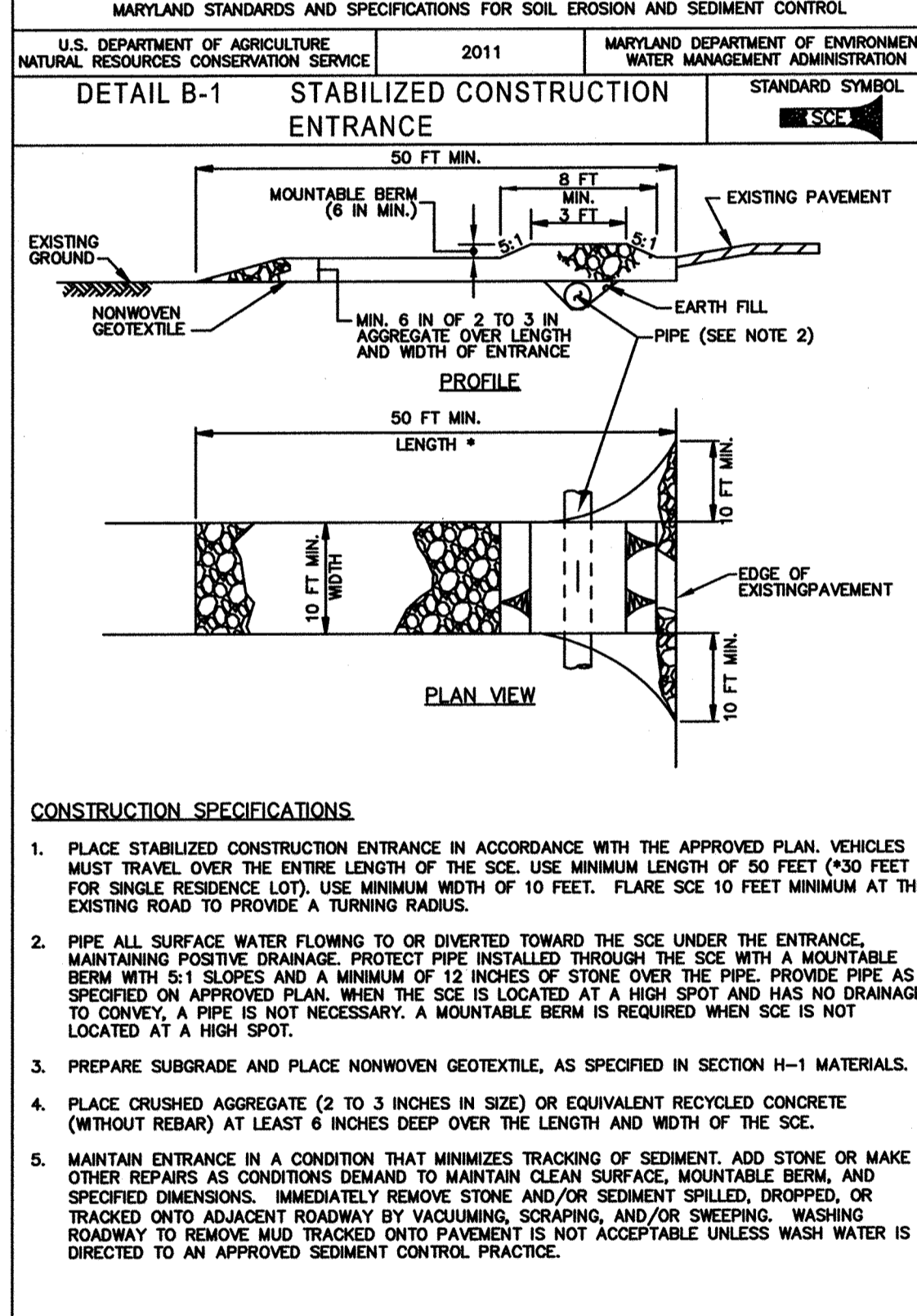
- USE WOOD POSTS 1 1/2 X 1 1/2 X 3/8 INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD, AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
- USE 36 INCH MINIMUM POSTS DRIVEN 18 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
- USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
- PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
- EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND, BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
- WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
- EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
- REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.



DETAIL F-3 PORTABLE SEDIMENT TANK

CONSTRUCTION SPECIFICATIONS

- PROVIDE 1 CUBIC FOOT OF STORAGE FOR EACH GALLON PER MINUTE OF PUMP CAPACITY, REQUIRED STORAGE VOLUME MAY BE ATTAINED BY PLACEMENT OF TANKS IN PARALLEL WITH INFLOW EVENLY DISTRIBUTED AMONG TANKS. OVERTOPPING OF TANKS IS NOT PERMITTED.
- USE 60 INCH CORRUGATED METAL OR PLASTIC PIPE WITH 1 INCH DIAMETER PERFORATIONS, 6 INCHES ON CENTER FOR THE INNER PIPE. LINE PIPE WITH NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, SANDWICHED BETWEEN, AND ATTACHED TO, 1/2 INCH HARDWARE CLOTH.
- OVERLAP GEOTEXTILE 8 INCHES MINIMUM AT VERTICAL SEAM AND AT THE BOTTOM PLATE.
- ANCHOR GEOTEXTILE AT BOTTOM OF TANK WITH 4 INCHES OF 2 TO 3 INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE.
- USE 72 INCH CORRUGATED METAL OR PLASTIC OUTER PIPE WITH PERMANENT OUTFLOW PIPE WITH INVERT LOWER THAN INFLOW PIPE.
- INFLOW PIPE MUST DISCHARGE INTO INNER PIPE AND BE REMOVABLE.
- PLACE TANK ON LEVEL SURFACE AND DISCHARGE TO A STABLE AREA AT A NONEROSIVE RATE.
- A PORTABLE SEDIMENT TANK REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT FROM INNER PIPE WHEN IT REACHES TWO FEET IN DEPTH. IF SYSTEM CLOGS, PULL OUT INNER PIPE, REMOVE ACCUMULATED SEDIMENT, AND REPLACE GEOTEXTILE. KEEP POINT OF DISCHARGE FREE OF EROSION.



DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

CONSTRUCTION SPECIFICATIONS

- PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
- PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
- PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
- PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
- MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.



DETAIL C-8 MOUNTABLE BERM

CONSTRUCTION SPECIFICATIONS

- USE MINIMUM WIDTH OF 10 FEET TO ALLOW FOR VEHICULAR PASSAGE.
- PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, OVER THE EARTH MOUND PRIOR TO PLACING STONE.
- PLACE 2 TO 3 INCH STONE OR EQUIVALENT RECYCLED CONCRETE AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE MOUNTABLE BERM.
- MAINTAIN LINE, GRADE, AND CROSS SECTION. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN SPECIFIED DIMENSIONS. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. MAINTAIN POSITIVE DRAINAGE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE 2011

MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE 2011

MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Raymond J. ... 4/5/19
DIRECTOR OF PUBLIC WORKS DATE

Thomas B. ... 4/5/19
CHIEF, BUREAU OF ENGINEERING DATE

... 4-5-19
CHIEF, BUREAU OF UTILITIES DATE

... 4/5/19
CHIEF, UTILITY DIVISION DATE

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT REDLINE REVISIONS INCLUDED IN 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. 28472 EXPIRATION DATE 9/15/2019

RK&K 700 EAST PRATT STREET SUITE 500 BALTIMORE, MARYLAND 21202

DES: DAO				
DRN: NAF				
CHK: RAL				
DATE: 4/02/19	RK&K	1	2019 UPGRADES - ADD SHEET 2D	4/19
BY	NO.		REVISIONS	DATE

H-1 STANDARDS AND SPECIFICATIONS FOR MATERIALS

TABLE H.1: GEOTEXTILE FABRICS

PROPERTY	TEST METHOD	MINIMUM AVERAGE ROLL VALUE			
		MD	CD	MD	CD
GRAB TENSILE STRENGTH	ASTM D-4632	200 LB	200 LB	370 LB	250 LB
GRAB TENSILE ELONGATION	ASTM D-4632	15%	10%	15%	50%
TRAPEZOIDAL TEAR STRENGTH	ASTM D-4533	75 LB	75 LB	100 LB	60 LB
PUNCTURE STRENGTH	ASTM D-6241	450 LB	900 LB	450 LB	450 LB
APPARENT OPENING SIZE	ASTM D-4751	U.S. SIEVE 30 (0.59MM)	U.S. SIEVE 70 (0.21MM)	U.S. SIEVE 70 (0.21MM)	U.S. SIEVE 70 (0.21MM)
PERMITTIVITY	ASTM D-4491	0.05 SEC -1	0.28 SEC -1	1.0 SEC -1	1.0 SEC -1
ULTRAVIOLET RESISTANCE RETAINED AT 500 HOURS	ASTM D-4355	70% STRENGTH	70% STRENGTH	70% STRENGTH	70% STRENGTH

1. ALL NUMERIC VALUES EXCEPT APPARENT OPENING SIZE (AOS) REPRESENT MINIMUM AVERAGE ROLL VALUES (MARV). MARV IS CALCULATED AS THE TYPICAL MINIMUM TWO STANDARD DEVIATIONS. MD IS MACHINE DIRECTION; CD IS CROSS DIRECTION.

2. VALUES FOR AOS REPRESENT THE AVERAGE MAXIMUM OPENING.

GEOTEXTILES MUST BE EVALUATED BY THE NATIONAL TRANSPORTATION PRODUCT EVALUATION PROGRAM (NITEP) AND CONFORM TO THE VALUES IN TABLE H.1.

THE GEOTEXTILE MUST BE INERT TO COMMONLY ENCOUNTERED CHEMICALS AND HYDROCARBONS AND MUST BE ROT AND MILDEW RESISTANT. THE GEOTEXTILE MUST BE MANUFACTURED FROM FIBERS CONSISTING OF LONG CHAIN SYNTHETIC POLYMERS AND COMPOSED OF A MINIMUM OF 95 PERCENT BY WEIGHT OF POLYOLEFINS OR POLYESTERS, AND FORMED INTO A STABLE NETWORK SO THE FILAMENTS OR YAMS RETAIN THEIR DIMENSIONAL STABILITY RELATIVE TO EACH OTHER, INCLUDING SELVAGES.

WHEN MORE THAN ONE SECTION OF GEOTEXTILE IS NECESSARY, OVERLAP THE SECTIONS BY AT LEAST ONE FOOT. THE GEOTEXTILE MUST BE PULLED TAUT OVER THE APPLIED SURFACE. EQUIPMENT MUST NOT RUN OVER EXPOSED FABRIC. WHEN PLACING RIPRAP ON GEOTEXTILE, DO NOT EXCEED A ONE FOOT DROP IN HEIGHT.

SEQUENCE OF CONSTRUCTION

- NOTIFY HOWARD COUNTY DEPARTMENT OF PERMITS, APPROVALS AND INSPECTIONS, SEDIMENT CONTROL, (410) 313-2455 AT LEAST 48 HOURS PRIOR TO BEGINNING WORK.
- ORANGE HIGH VISIBILITY FENCE SHALL BE MANUALLY INSTALLED ALONG THE LIMIT OF DISTURBANCE, WHERE THE LIMIT IS WITHIN 50 FEET OF THE FOREST BUFFER/CONSERVATION EASEMENT. THIS SHALL BE COMPLETED BY AND INSPECTED AT, THE PRE-CONSTRUCTION MEETING.
- CLEAR AND GRUB FOR AND INSTALL ALL SEDIMENT AND EROSION CONTROL MEASURES AND DEVICES.
- NOTIFY HOWARD COUNTY DEPARTMENT OF PERMITS, APPROVALS AND INSPECTIONS, SEDIMENT CONTROL, UPON COMPLETION OF SAID INSTALLATION.
- CONSTRUCT ALL PUMPING STATION IMPROVEMENTS AS REQUIRED. THE CONTRACTOR SHALL ONLY DISTURB THAT AREA WHICH CAN BE STABILIZED BY THE END OF EACH WORKING DAY. STABILIZATION SHALL BE 6 MIN. PERMANENT SEED AND MULCH FOR VEGETATED AREAS.
- REPLACE/REPAIR ALL EXISTING PAVING THAT IS DAMAGED.
- STABILIZE ALL DISTURBED AREAS. PAVED AREAS TO BE REPAVED. TURF AREAS TO BE PERMANENTLY SEEDED.
- UPON STABILIZATION OF SITE WITH ESTABLISHED VEGETATION AND WITH PERMISSION OF THE SEDIMENT CONTROL INSPECTOR, REMOVE SEDIMENT CONTROL MEASURES AND STABILIZE THOSE AREAS DISTURBED BY THIS PROCESS.

MOUNT HEBRON SPS SITE DEVELOPMENT PLAN - 2019 UPGRADES

CAPITAL PROJECT NO. S660 CONTRACT NO. 745-S

SCALE AS SHOWN SHEET 2D OF 25

ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

RK21315 - K:\Projects\2019\13154_HJC6080A\Task 9 - Miscellaneous Pumping Stations\Mount Hebron_P5\Cadd\Plan\Proposed\13154-MountHebr-S-0020-00-20.dwg Apr 02, 2019 - 1:00pm Plot Scale: 1:1

DESIGN CRITERIA

- A. STRUCTURAL DESIGN SHALL BE IN ACCORDANCE WITH THE GOVERNING PROVISIONS OF THE FOLLOWING CODE, STANDARDS AND SPECIFICATIONS:
 1. INTERNATIONAL BUILDING CODE (IBC) 2015
 2. ASCE 7-10 MIN. DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.
 3. ACI 318-14 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE.
 4. ACI 350-06 CODE REQUIREMENTS FOR ENVIRONMENTAL CONCRETE STRUCTURES.
 5. ACI 530-13 BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.
 6. AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, A.S.D., 14TH EDITION
 7. AWS D1.1 "STRUCTURAL WELDING CODE - STEEL"
 8. AWS D1.6 "STRUCTURAL WELDING CODE - STAINLESS STEEL"

EXISTING CONSTRUCTION

- A. ALL MEMBER SIZES AND DIMENSIONS AND ELEVATIONS OF EXISTING STRUCTURES SHOWN ON THE DRAWINGS ARE OBTAINED FROM AVAILABLE SOURCES, AND ARE NOT GUARANTEED TO BE TRUE AND EXACT. THE CONTRACTOR SHALL VERIFY THESE DIMENSIONS AND ELEVATIONS BY ACTUAL FIELD MEASUREMENTS PRIOR TO FABRICATION OF ANY MATERIALS AND START OF WORK, AND REPORT ANY DISCREPANCIES TO THE ENGINEER.
- B. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY SHORING, SUPPORT, NEEDLING AND BRACING AS REQUIRED TO SUPPORT THE EXISTING STRUCTURE. THE CONTRACTOR SHALL EXAMINE THE EXISTING STRUCTURE TO DETERMINE THE EXTENT OF THE NECESSARY SHORING/NEEDLING. THE CAPACITY AND METHOD FOR SHORING AND NEEDLING SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

DEMOLITION

- A. REMOVE EXISTING CONSTRUCTION AS SHOWN ON 2018 UPGRADE PLANS. SEE PLANS, SECTIONS, AND DETAILS FOR EXTENT OF STRUCTURE TO BE REMOVED.
- B. EXISTING STRUCTURAL FRAMING SHALL REMAIN UNLESS SPECIFICALLY NOTED ON PLAN TO BE REMOVED.
- C. IF FIELD CONDITIONS DIFFER FROM THOSE SHOWN ON DRAWINGS, NOTIFY ENGINEER BEFORE PROCEEDING.
- D. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO EXAMINE THE EXISTING BUILDING DURING THE COURSE OF CONSTRUCTION AND IMMEDIATELY NOTIFY THE ENGINEER OF ANY AREAS WHERE THE STRUCTURE EXHIBITS DISTRESS OR FAILURE.
- E. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SATISFY HIMSELF AS TO THE LOCATION OF ANY UTILITIES IN THE IMMEDIATE VICINITY OF CONSTRUCTION SO AS TO PREVENT DAMAGE TO THEM. SHOULD ANY DAMAGE TO SUCH UTILITIES OCCUR, THE CONTRACTOR SHALL BE REQUIRED TO REPAIR SUCH DAMAGE AT HIS OWN EXPENSE AND TO THE SATISFACTION OF THE OWNER.

MASONRY

- A. DESIGN CRITERIA: ACI 530-13/ASCE 5-13
- B. CONCRETE MASONRY UNITS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 1900 PSI ON THE NET AREA AND SHALL CONFORM TO THE LATEST EDITION OF ASTM C90.
- C. TYPE "M" MORTAR SHALL BE USED FOR ALL BELOW GRADE MASONRY CONSTRUCTION. TYPE "S" ABOVE GRADE.
- D. GROUT: ASTM C476, MIN. 3,000 PSI @ 28 DAYS, 3/8" AGGREGATE MAX., 8"-10" SLUMP.
- E. REINFORCEMENT:
 1. HORIZONTAL JOINTS: STD. DUR-O-WALL @ 16" OC, USE PREFABRICATED CORNERS AND TEES @ WALL INTERSECTIONS, OVERLAP DISCONTINUED ENDS AND EXTEND INTO COLUMNS 6" MIN.
 2. VERTICAL AND HORIZONTAL REINFORCEMENT: ASTM 615, GRADE 60, EPOXY COATED, PROVIDE MIN. #4 BARS TYP @ WALL INTERSECTIONS, EACH SIDE OF OPENINGS, AND @ WALL ENDS, HOOK TOP OF ALL DISCONTINUED BARS, LAP CONT. REINF 48 BAR DIA. UNO.
 3. USE BAR SPACERS IN EVERY 4TH COURSE WHERE CELLS ARE TO BE GROUTED.
- F. PROVIDE CLEANOUT OPENINGS FOR EACH GROUTED CELL.
- G. ALL BRICK SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2,500 PSI ON THE NET AREA AND CONFORM TO ASTM C62.

CAST-IN-PLACE REINFORCED CONCRETE

- A. ALL CONCRETE WORK SHALL CONFORM TO ACI-350-06 CODE REQUIREMENTS FOR ENVIRONMENTAL CONCRETE STRUCTURES.
- B. MINIMUM 28 DAY COMPRESSIVE STRENGTH, MAX WATER TO CEMENTITIOUS MATERIAL RATIOS & AGGREGATE SIZE: PADS & SLABS: 4,500 PSI, NORMAL WEIGHT, W/C=0.42, #57 AGGREGATE, UNLESS OTHERWISE NOTED.
- C. SLUMP 3" MAX FOR CONCRETE PADS, UNLESS OTHERWISE NOTED.
- D. REINFORCING STEEL SHALL CONFORM TO ASTM A-615, GRADE 60, EPOXY COATED EXCEPT TIES MAY BE GRADE 40. ALL HOOKS SHALL BE STANDARD HOOKS, UNLESS OTHERWISE NOTED.
- E. CHAMFER ALL EDGES OF BEAMS, COLUMNS, HAUNCHES, WALLS EQUIPMENT PADS AND SLABS EXPOSED TO VIEW 3/4" UNLESS OTHERWISE NOTED.
- F. ALL GROUT SHALL BE NON-SHRINK GROUT WITH A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI.

REINFORCEMENT

- A. ALL DEVELOPMENT AND SPLICES OF REINFORCEMENT SHALL CONFORM TO THE PROVISIONS OF ACI BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318-LATEST EDITION).
- B. REINFORCING STEEL SHALL BE DEFORMED BARS OF INTERMEDIATE GRADE NEW BILLET STEEL CONFORMING TO CURRENT REQUIREMENTS OF ASTM A615 GRADE 60, EPOXY COATED EXCEPT TIES MAY BE GRADE 40. ALL HOOKS SHALL BE STANDARD HOOKS, UNLESS OTHERWISE NOTED.
- C. REINFORCING BAR SUPPORTS AND SPACERS SHALL CONFORM TO ACI 315-(LATEST EDITION) DETAILING MANUAL.
- D. SHOP DRAWINGS SHOWING ALL NECESSARY SECTIONS AND DETAILS FOR THE PROPER POSITIONING OF ALL REINFORCING STEEL SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW BEFORE FABRICATION OR PLACEMENT OF THE STEEL.
- E. ALL REINFORCEMENT SHALL HAVE 3" COVER UNLESS OTHERWISE NOTED.

BRICK/CMU WALL REPAIR

- A. REMOVE AND REPLACE BRICK/CMU WHICH IS CHIPPED, BROKEN, OR OTHERWISE DAMAGED TO MATCH EXISTING SIZE AND COLOR. RE-POINT LOOSE BRICK/CMU.
- B. WET THE BRICK UNITS AS NECESSARY TO PROVIDE A BETTER BONDING BETWEEN BRICK AND MORTAR PRIOR TO INSTALLATION. DO NOT WET CONCRETE MASONRY UNITS.
- C. FOR BRICK/CMU INSTALLATION, ALL JOINTS BETWEEN BRICK/CMU SHALL BE COMPLETELY FILLED WITH MORTAR. BED JOINT SHALL BE FORMED OF A THICK LAYER OF SMOOTH OR SLIGHTLY FURROWED MORTAR, APPLIED TO THE UNITS PREVIOUSLY LAID WITH BRICK/CMU, THEN SHOVE IN PLACE. CROSS JOINTS SHALL BE FORMED BY APPLYING TO THE BRICK/CMU TO BE LAID. A FULL COAT OF MORTAR ON THE ENTIRE END OR THE ENTIRE SIDE AND THEN SHOVING COVERED END AND/OR SIDE OF THE BRICK/CMU TIGHTLY AGAINST THE BRICK/CMU PREVIOUSLY LAID.
- D. AT THE AREAS WITH DEFECTIVE JOINTS AND/OR LOOSE MORTAR FROM THE JOINTS BETWEEN BRICK/CMU, COURSES MAY BE REPAIRED BY RE-POINTING OR TUCK POINTING WITH FILLING IN WITH FRESH MORTAR.
- E. CLEANING OF BRICK/CMU UNITS SHALL BE PER MANUFACTURER AND/OR ENGINEER'S RECOMMENDATIONS AND SHALL COMPLY WITH NCMMA REQUIREMENTS.
- F. USE MORTAR AS PER ASTM C270 REQUIREMENTS.

STRUCTURAL STEEL

- A. ALL STRUCTURAL STEEL SHALL CONFORM TO THE AISC SPECIFICATIONS FOR THE DESIGN FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS.
- B. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS:
 - STRUCTURAL STEEL W-SHAPES: A992 HAVING A MINIMUM YIELD STRENGTH OF 50 KSI.
 - STRUCTURAL STEEL ANGLES: A36 HAVING A MINIMUM YIELD STRENGTH OF 36 KSI.
 - SQUARE AND RECTANGULAR TUBING: A500, GRADE B HAVING MINIMUM YIELD STRENGTH OF 46 KSI.
 - ROUND PIPE: A53, GRADE B HAVING A MINIMUM YIELD STRENGTH OF 35 KSI.
- C. APPROVAL OF THE ENGINEER SHALL BE MANDATORY FOR THE USE OF CUTTING TORCH IN THE FIELD.
- D. ALL GROUT UNDER STEEL PLATES (LINTELS) SHALL BE NON-SHRINK "PRE-MIX" TYPE AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI, UNLESS OTHERWISE NOTED.
- E. STRUCTURAL STEEL SHALL BE INSPECTED IN THE FIELD BY AN INDEPENDENT TESTING AGENCY APPROVED BY THE ENGINEER AND PAID FOR BY THE CONTRACTOR.

ALUMINUM STRUCTURAL SHAPES

- A. ALUMINUM STRUCTURAL SHAPES SHALL BE ASTM B-308, 6061.T6.
- B. ALLOWABLE TOLERANCES FOR MILLED ALUMINUM STANDARD STRUCTURAL SHAPES SHALL BE IN ACCORDANCE WITH ANSI H35.2. COMPLY WITH THE ALUMINUM DESIGN MANUAL (ADM-1) LATEST EDITION.
- C. ALUMINUM SURFACES IN CONTACT WITH CONCRETE AND ANY OTHER MATERIAL SHALL BE GIVEN A HEAVY COAT OF ALKALI RESISTANT BITUMINOUS PAINT OR OTHER COATING PROVIDING EQUIVALENT PROTECTION BEFORE INSTALLATION.

MISCELLANEOUS

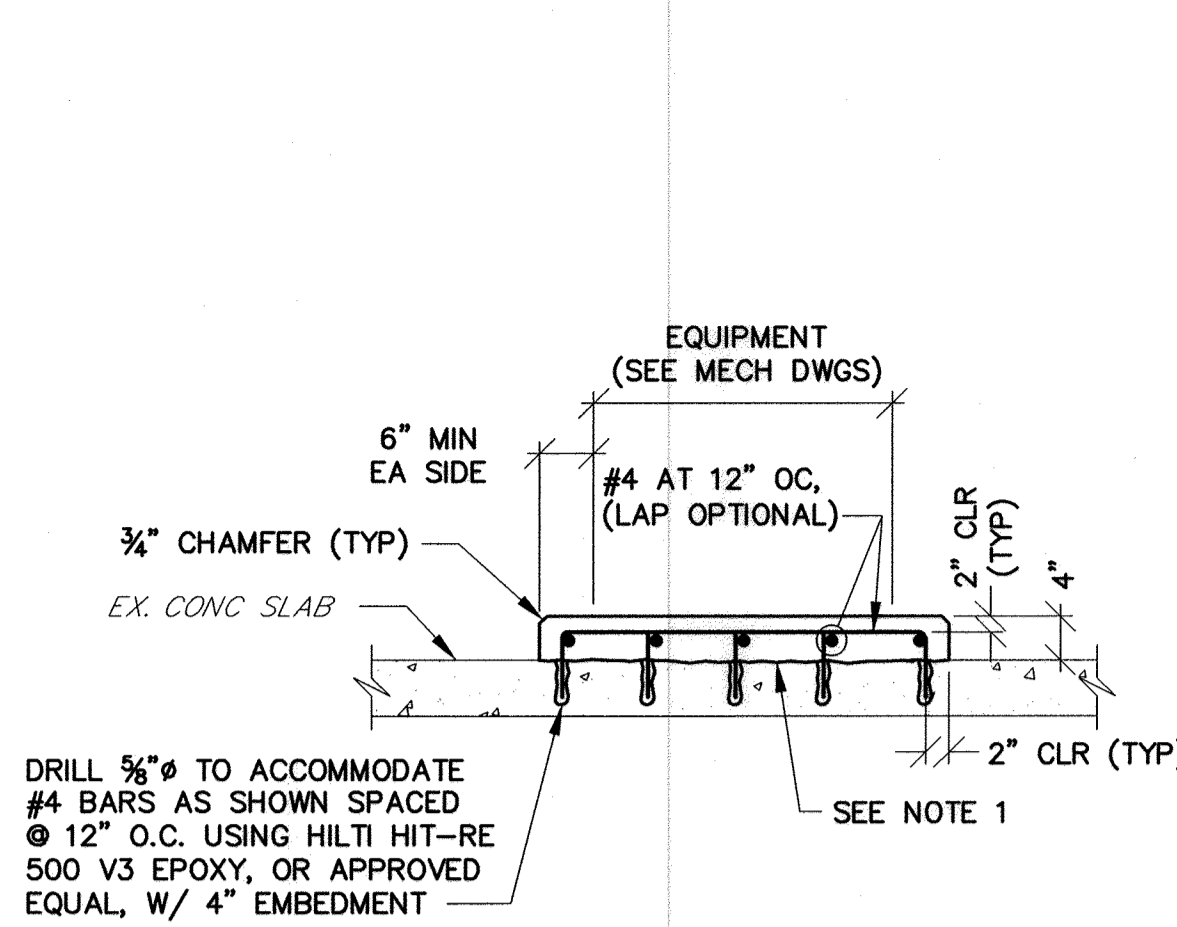
- A. ALL EXISTING FEATURES DENOTED BY SLANTED TEXT.
- B. ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE.
- C. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND TRANSPORTATION INTACT OF ALL DEMOLISHED EQUIPMENT.
- D. ALL OPENINGS THRU CONCRETE SHALL BE WATERTIGHT.
- E. CONTRACTOR SHALL COORDINATE ALL REQUIRED OPENINGS WITH IMPROVEMENT DRAWINGS.
- F. CONTRACTOR SHALL COORDINATE FINAL SIZES AND LOCATIONS OF ALL OPENINGS WITH THE ACTUAL FIELD.

SPECIAL INSPECTION

- A. SPECIAL INSPECTIONS IBC 1704.2
- B. STEEL CONSTRUCTION IBC 1705.2
- C. CONCRETE CONSTRUCTION IBC 1705.3
- D. MASONRY CONSTRUCTION IBC 1705.4

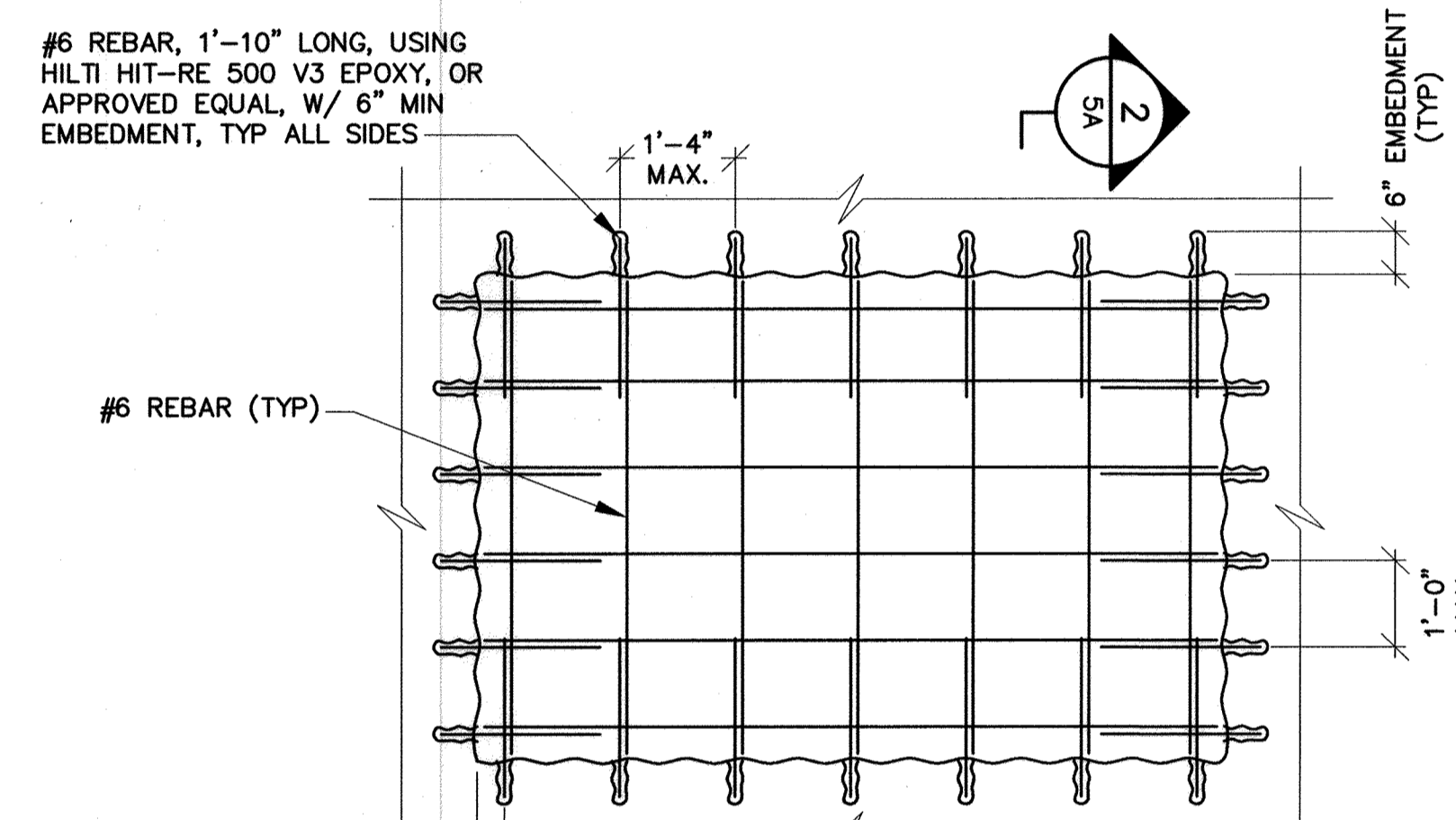
STAINLESS STEEL SPECIFICATIONS

- A. ALL STRUCTURAL STEEL SHALL BE AS FOLLOWS:
 1. STRUCTURAL STEEL SHAPES SHALL BE ASTM 276, TYPE 316L WITH A MINIMUM YIELD OF 42 KSI.
 2. STAINLESS STEEL PLATES SHALL BE ASTM A666, TYPE 316L.
 3. ALL BOLTS SHALL BE ASTM F593 STAINLESS STEEL TYPE 316, GRADE B8, ALL NUTS SHALL BE ASTM F594 STAINLESS STEEL GRADE B8, AND ALL WASHERS SHALL BE ASTM F352 STAINLESS STEEL.
- B. ALL STAINLESS STEEL SHALL BE #4 INDUSTRIAL FINISH.
- C. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING:
 1. "AMERICAN WELDING SOCIETY" (AWS) D1.1 "STRUCTURAL" WELDING CODE - STEEL, LATEST EDITION.
 2. AWS D1.6 "STRUCTURAL WELDING CODE - STAINLESS STEEL", LATEST EDITION



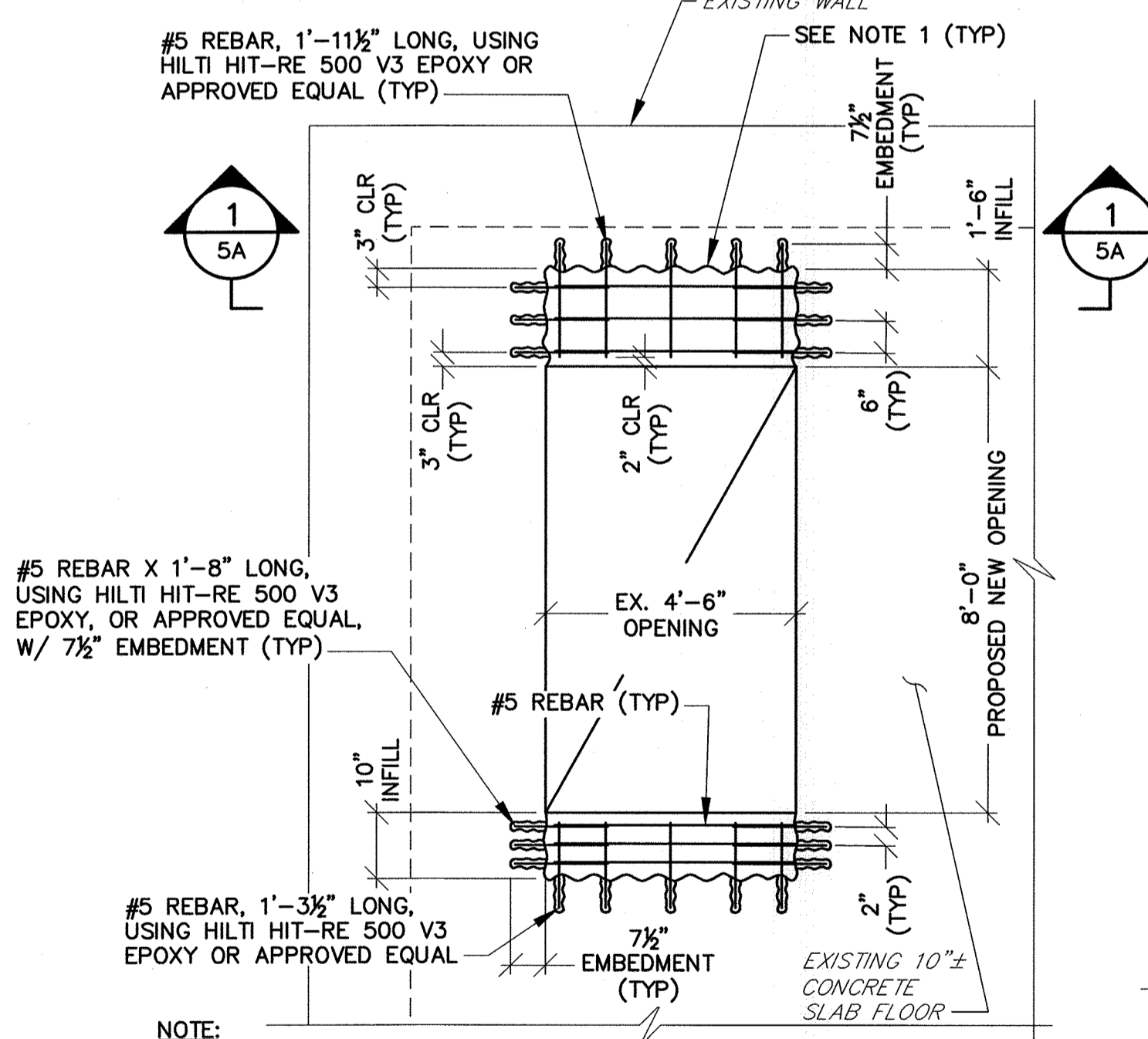
- NOTES:**
1. SURFACE OF EXISTING CONCRETE AT THE PAD LOCATION SHALL BE ROUGHENED TO A FULL AMPLITUDE OF 1/4" AND SCRUBBED WITH A COARSE WIRE BRUSH TO REMOVE ALL LAITANCE. APPLY SIMPSON STRONG-TIE FX-752 EPOXY BONDING AGENT, OR APPROVED EQUAL, BETWEEN EXISTING AND NEW CONCRETE, IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
 2. COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 4,500 psi AT 28 DAYS.

TYPICAL EQUIPMENT PAD DETAIL
NTS



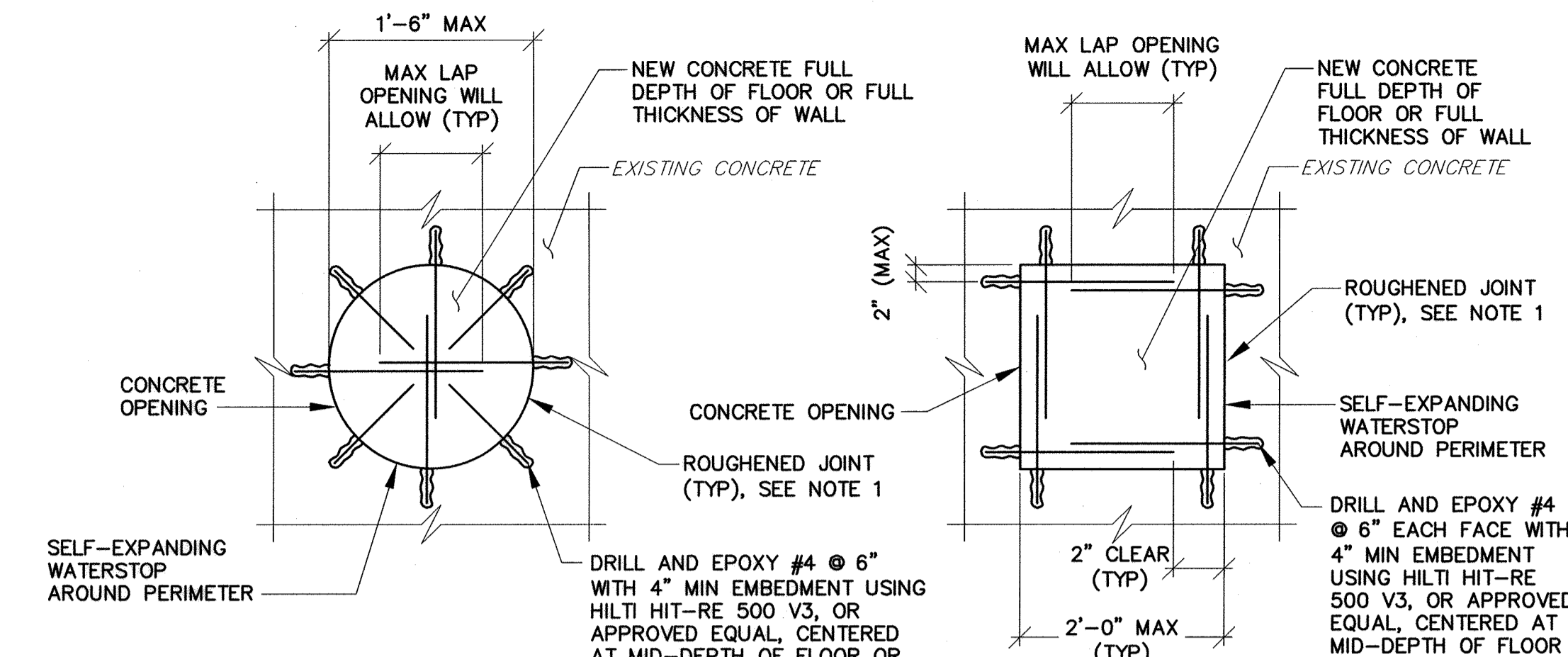
- NOTE:**
1. USE $f_c = 4,500$ psi

CONCRETE WALL INFILL DETAIL
NTS



- NOTE:**
1. SURFACE OF EXISTING CONCRETE TO RECEIVE NEW 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 SIMPSON STRONG-TIE FX-752 EPOXY BONDING AGENT, OR APPROVED EQUAL, IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

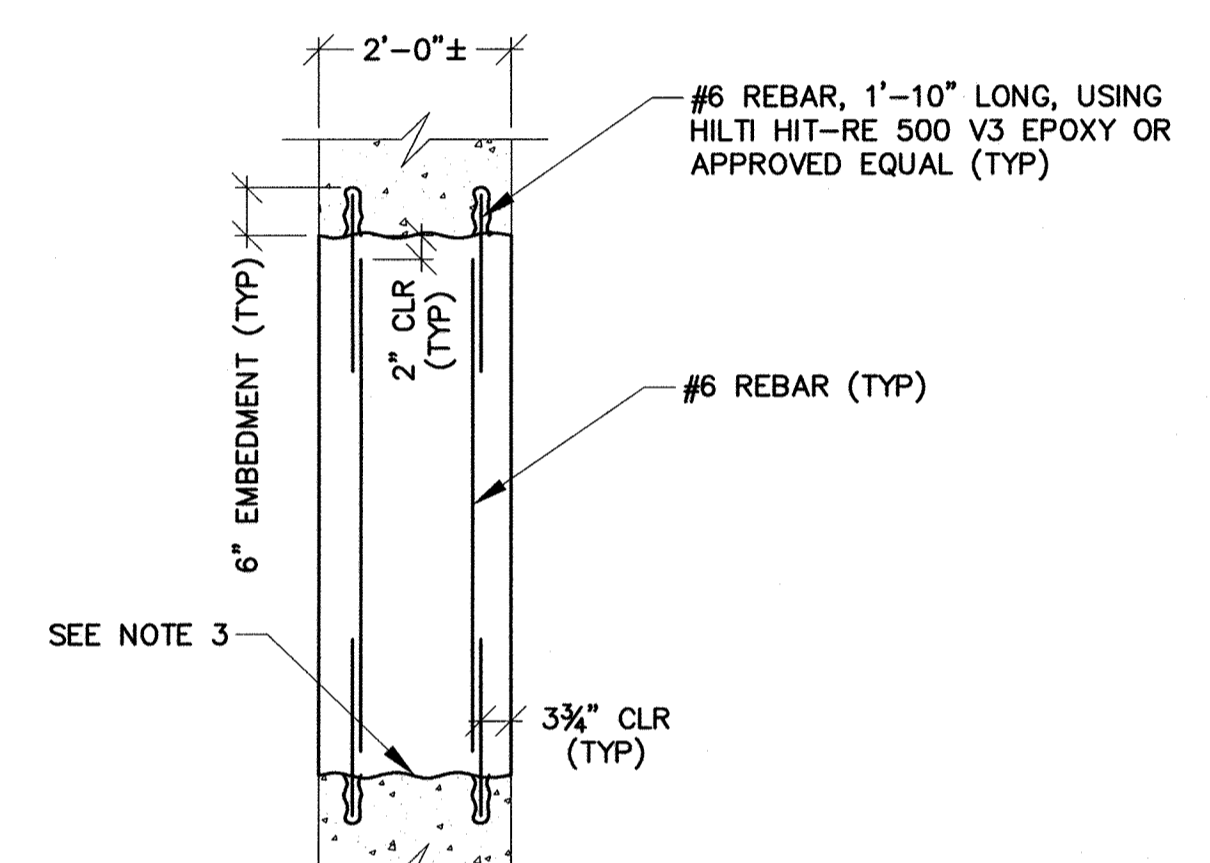
TOP SLAB OPENING MODIFICATION DETAIL
NTS



- NOTES:**
1. SURFACE OF EXISTING 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 COMPOUND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. EPOXY BONDING AGENT SHALL BE "SIKADUR 32, HI MOD" OR APPROVED EQUAL.
 2. COMPRESSIVE STRENGTH OF THE CONCRETE SHALL BE 4,500 PSI AT 28 DAYS.

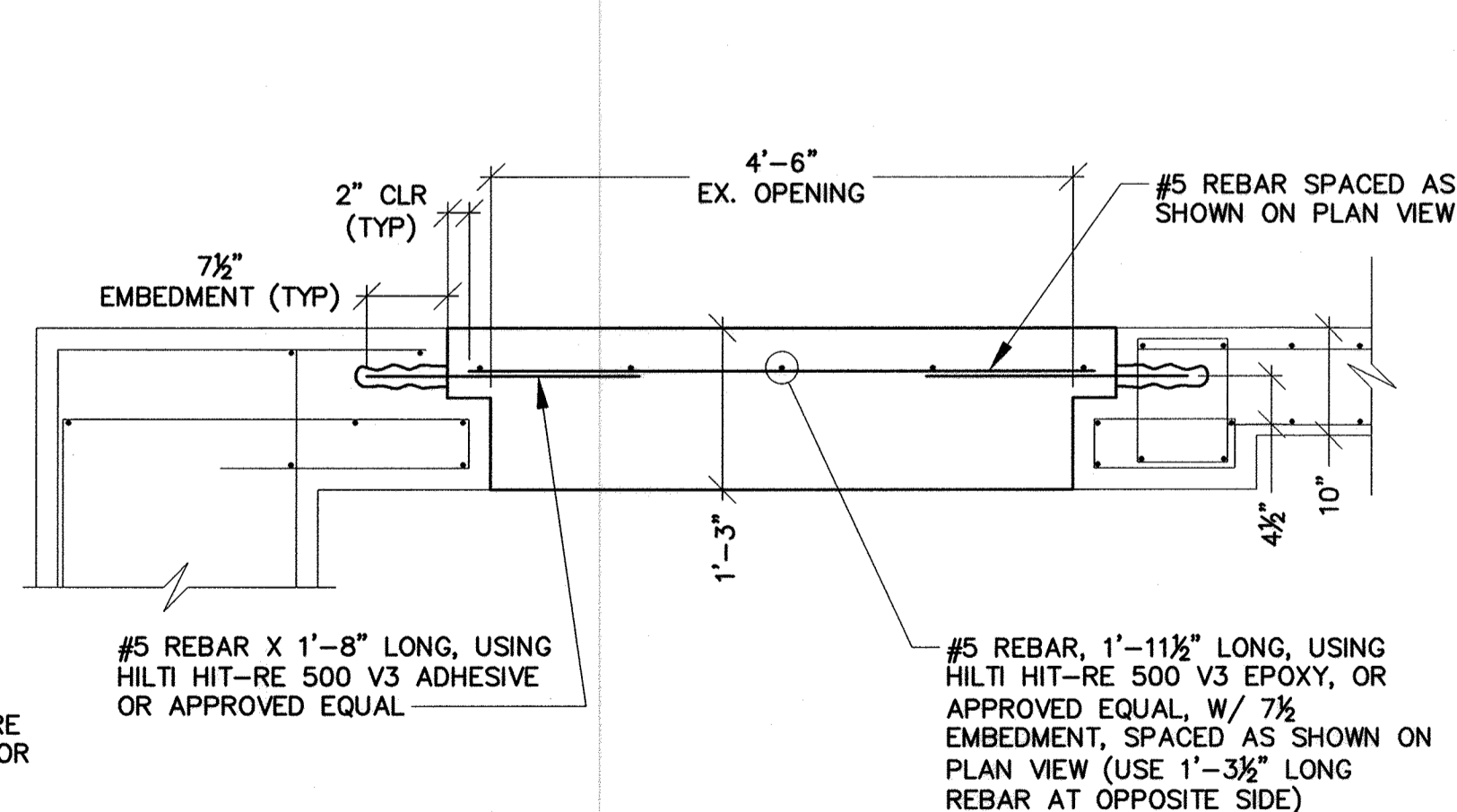
CIRCULAR PATCH and **SQUARE/RECTANGULAR PATCH**

TYPICAL CONCRETE PATCH DETAIL
NTS

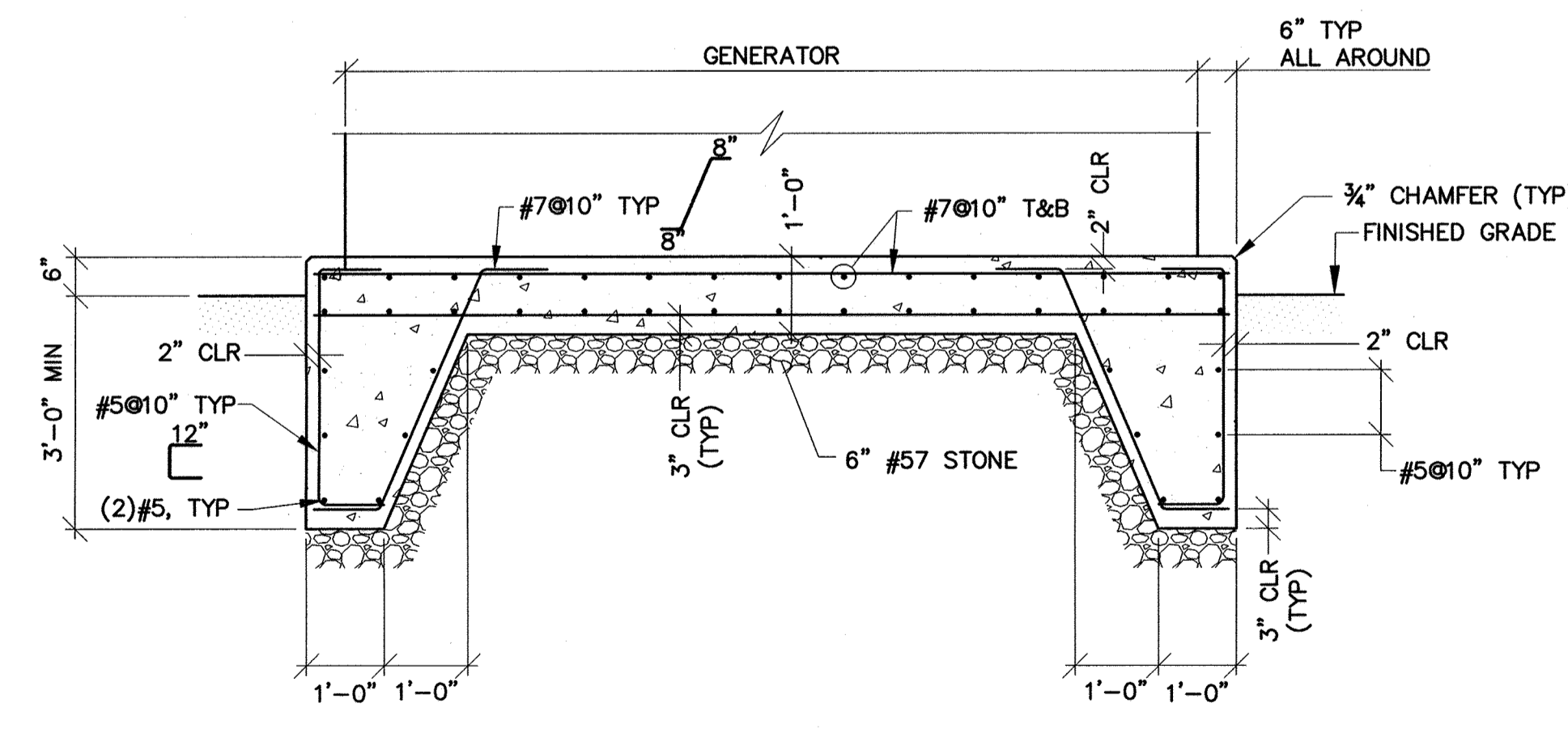


- NOTES:**
1. SEE IMPROVEMENT DRAWINGS FOR MORE INFORMATION.
 2. THIS SECTION WILL APPLY TO ENTIRE PERIMETER OF THE WALL OPENING TO BE INFILLED.
 3. SURFACE OF EXISTING CONCRETE SHALL BE ROUGHENED TO A FULL AMPLITUDE OF 1/4" AND SCRUBBED WITH A COARSE WIRE BRUSH TO REMOVE ALL LAITANCE AND TO PROVIDE A ROUGHENED SURFACE FOR BONDING NEW CONCRETE TO EXISTING CONCRETE. APPLY SIMPSON STRONG-TIE FX-752 EPOXY BONDING AGENT, OR APPROVED EQUAL, IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

SECTION 2
NTS



SECTION 1
NTS

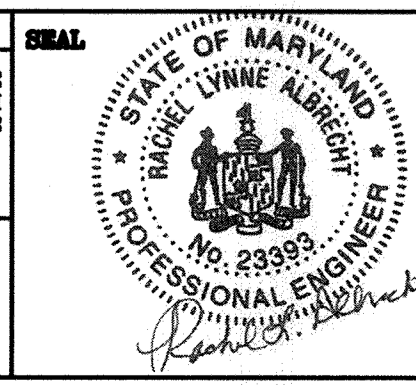


GENERATOR PAD DETAIL
NTS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signatures]
DIRECTOR, PUBLIC WORKS DATE 4/5/19
CHIEF, BUREAU OF ENGINEERING DATE 4/5/19
CHIEF, BUREAU OF UTILITIES DATE 4/5/19
CHIEF, UTILITY DIVISION DATE 4/5/19

PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT REVISIONS INCLUDED IN 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. 29399. EXPIRATION DATE 8/26/20
ALBRECHT ENGINEERING INC



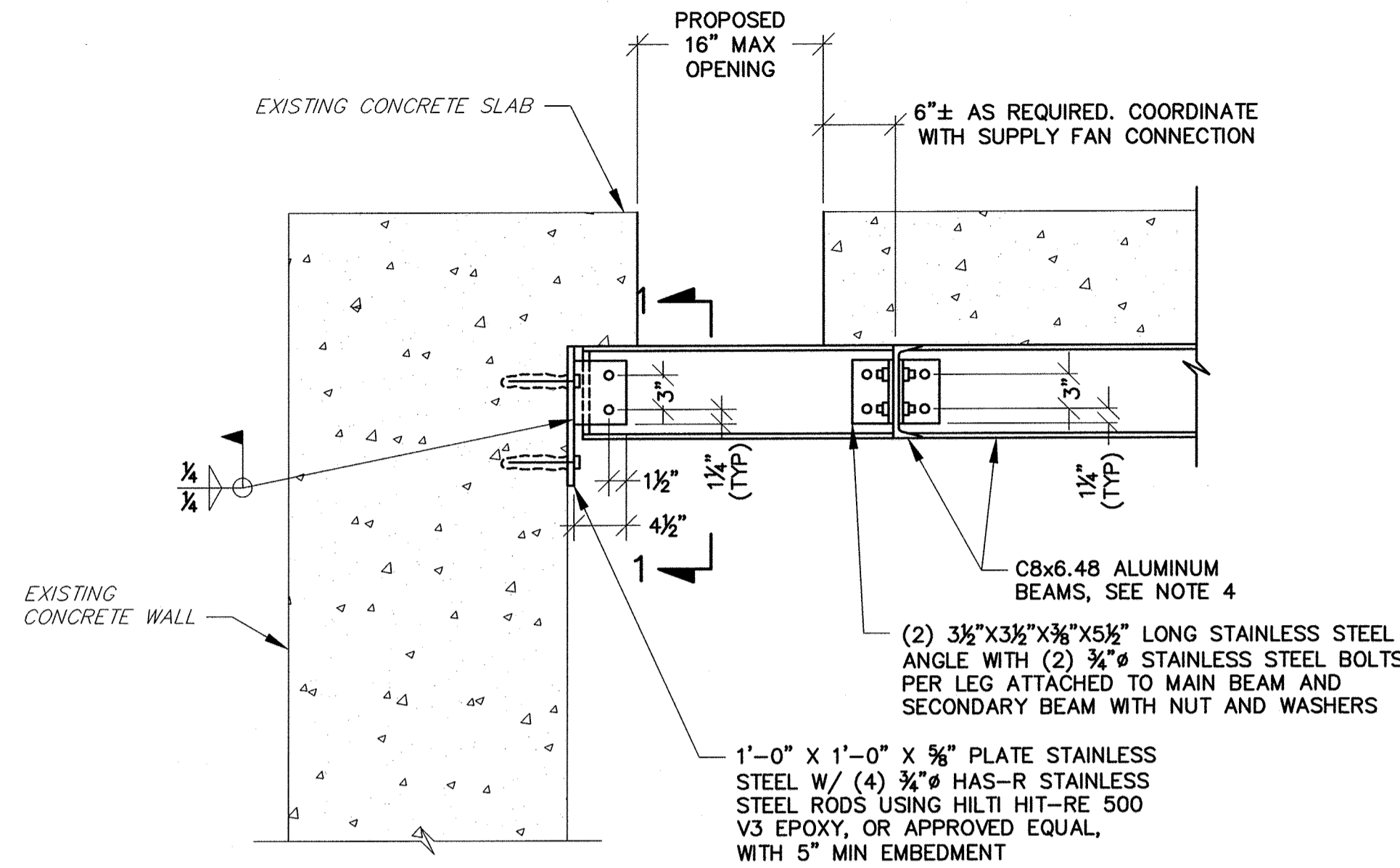
DES: RCC			
DRN: NAF			
CHK: RLA			
DATE: 4/02/19			
RK&K 1	2019 UPGRADES - ADD SHEET 5A	4/19	
BY NO.	REVISIONS	DATE	

STRUCTURAL DETAILS &
GENERAL NOTES
MOUNT HEBRON SPS -
2019 UPGRADES
MAP NO. 17 BLOCK NO. 8

MOUNT HEBRON SEWER MAINS
2019 UPGRADES
CAPITAL PROJECT NO. S6600
CONTRACT NO. 745-S
ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND
SCALE NTS
SHEET 5A OF 25

NOTE:

1. ALL EXISTING FEATURES DENOTED BY SLANTED TEXT.
2. ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE.

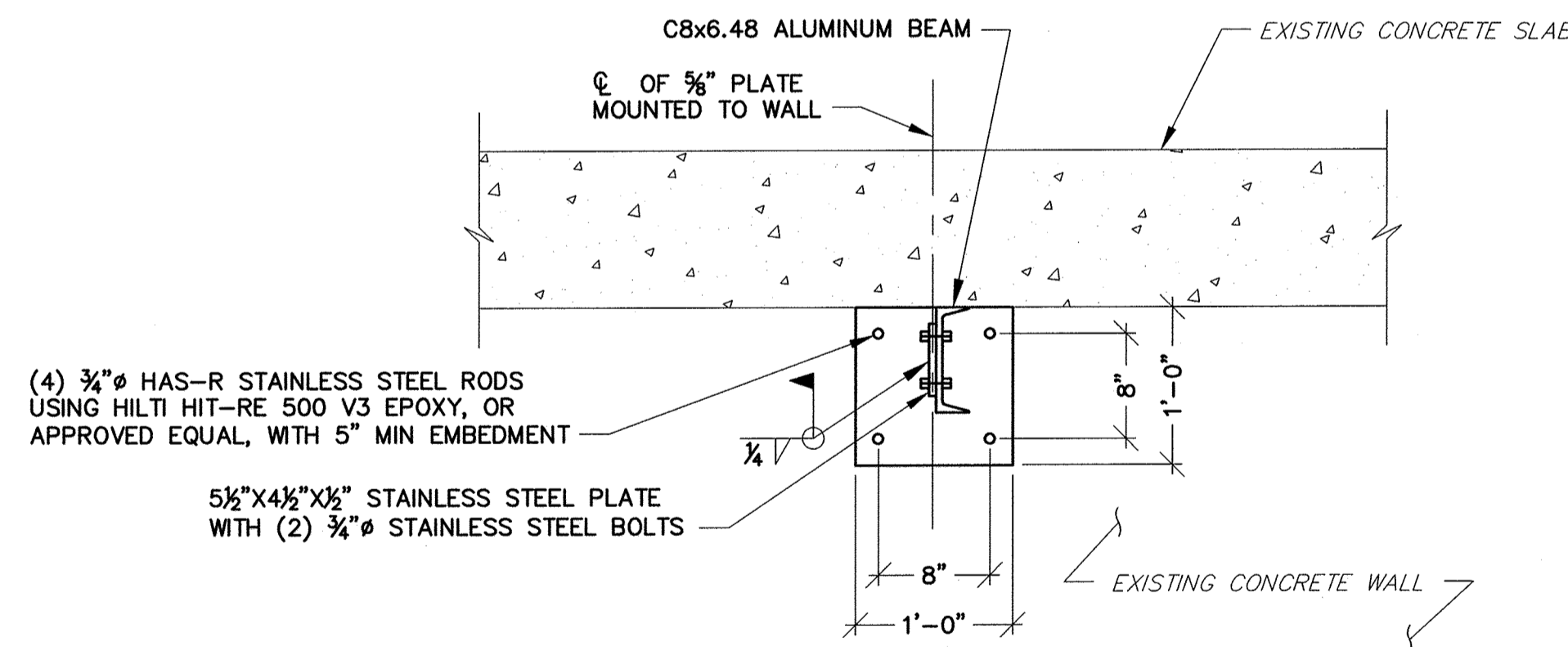


NOTES:

1. SEE TOP SLAB PLAN, SHEET 7D, FOR INSTALLATION LOCATION.
2. USE PLASTIC OR RUBBER WASHERS, SLEEVES, NEOPRENE PADS AND/OR BITUMINOUS PAINT, AS NECESSARY, TO CREATE A BARRIER BETWEEN DISSIMILAR METALS.
3. CONTRACTOR SHALL SHIM C8X6.48 ALUMINUM BEAMS TIGHT TO BOTTOM OF CONCRETE SLAB WITH ALUMINUM SHIMS (AS REQUIRED). WELD SHIMS TO TOP FLANGE OF BEAM.
4. COPE FLANGES OF C8X6.48 ALUMINUM BEAM THAT RUNS IN THE NORTHWEST/SOUTHEAST DIRECTION AS REQUIRED TO MAKE CONNECTION TO C8X6.48 BEAM IN NORTHEAST/SOUTHWEST DIRECTION.

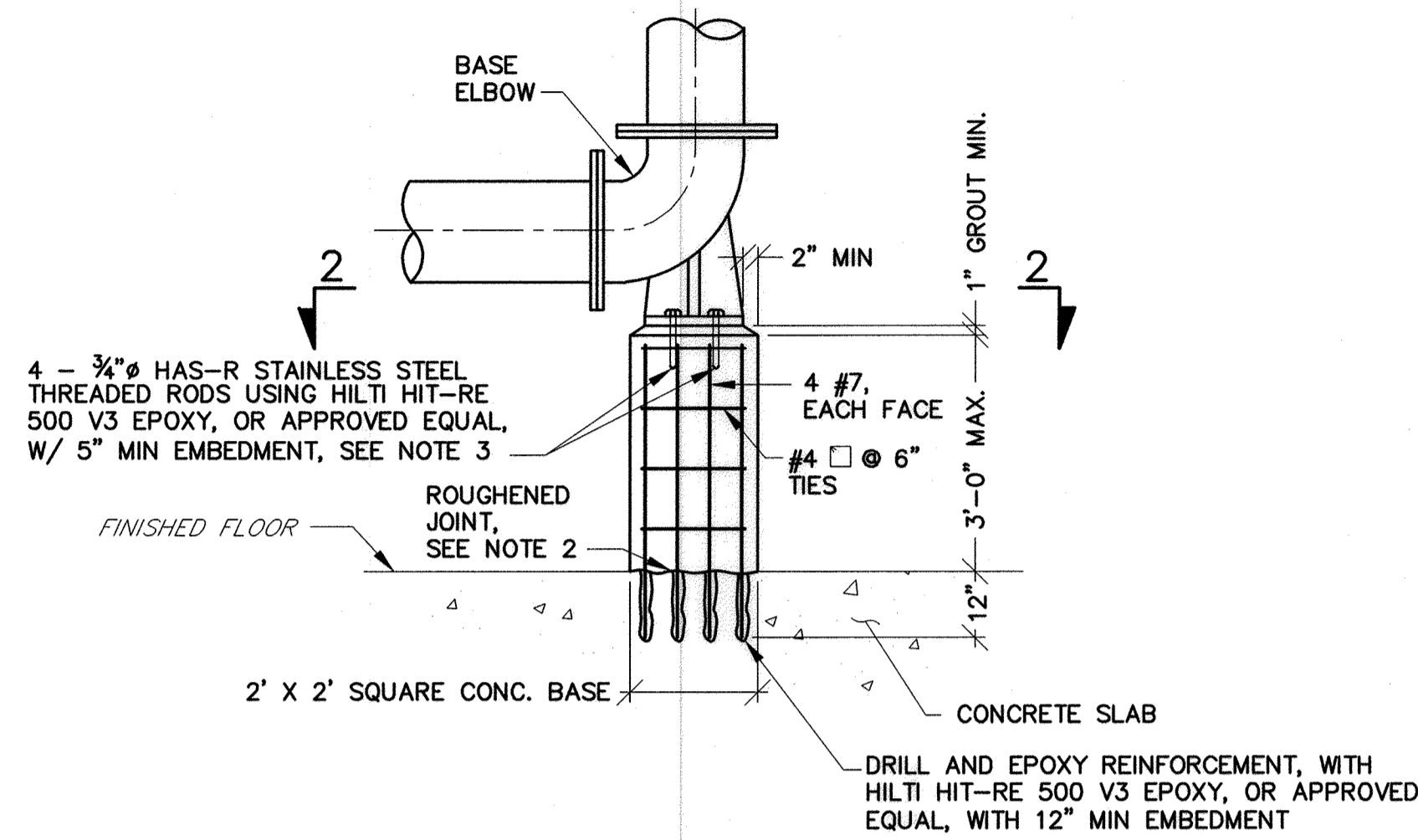
WETWELL TOP SLAB OPENING SUPPORT BEAM DETAIL

SCALE: 1" = 1'-0"



SECTION 1

SCALE: 1" = 1'-0"



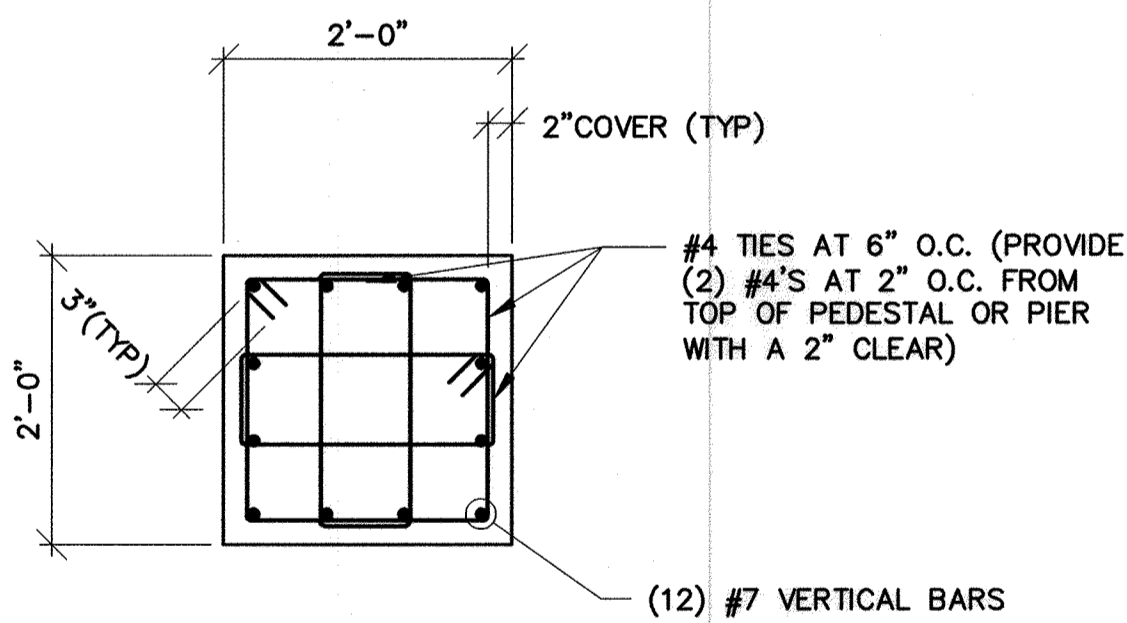
ELEVATION

NOTES:

1. SEE SHEETS 7B & 8B FOR INSTALLATION LOCATIONS.
2. SURFACE OF EXISTING 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 COMPOUND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. EPOXY BONDING AGENT SHALL BE "SIKADUR 32, HI-MOD", OR APPROVED EQUAL.
3. USE A NON-CONDUCTIVE PLASTIC WASHER AND SLEEVE TO FIT ON THE SHAFT OF THE ANCHOR, OR BITUMINOUS PAINT TO CREATE A BARRIER BETWEEN DISSIMILAR METALS.

BASE ELBOW SUPPORT DETAIL

NTS

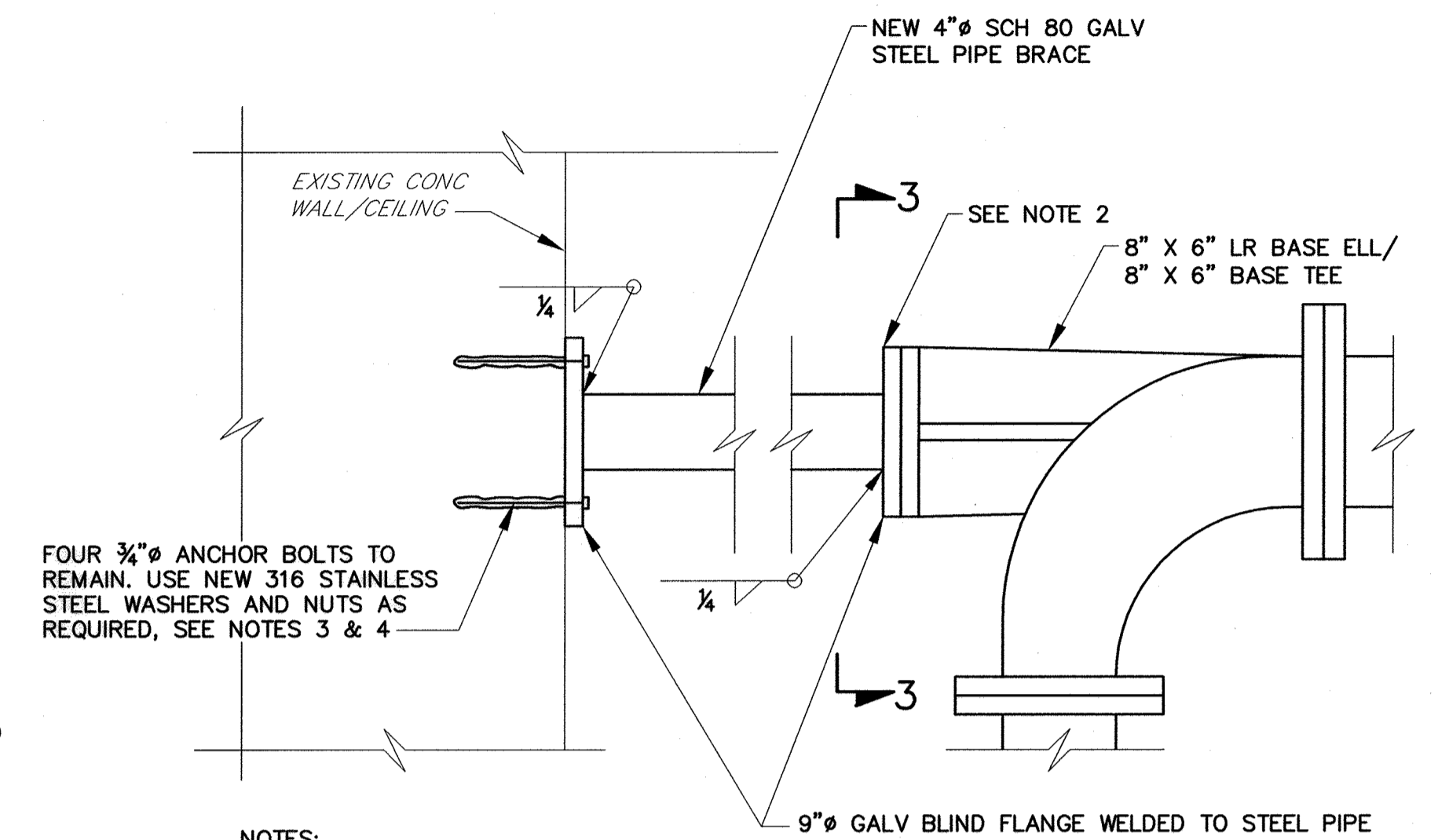


NOTE:

1. COMPRESSIVE STRENGTH OF CONCRETE SHALL BE f'c=4,500 psi.

SECTION 2

NTS

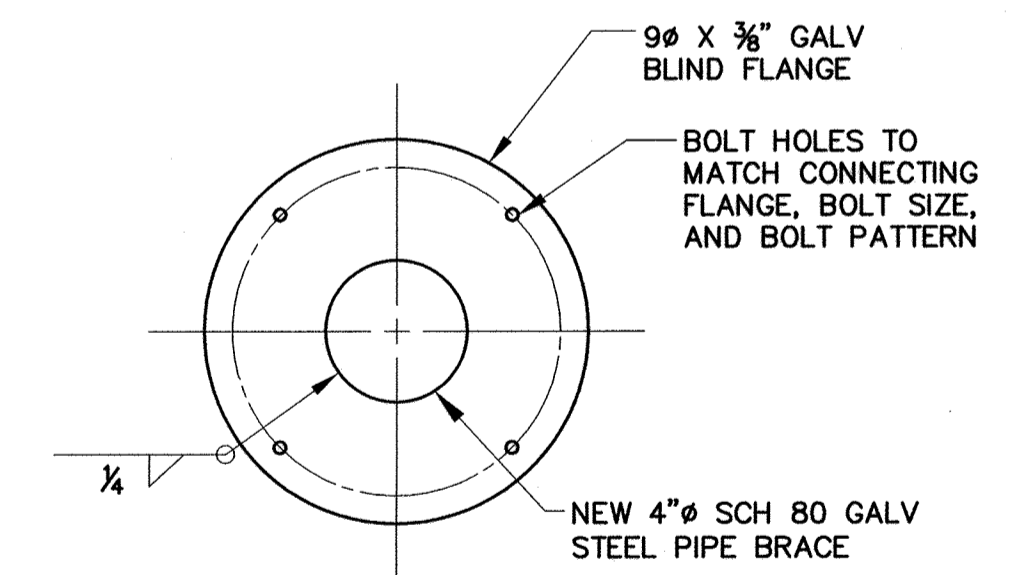


NOTES:

1. SEE SHEETS 7B & 8B FOR INSTALLATION LOCATIONS.
2. COORDINATE BOLT HOLE LOCATIONS WITH THE BASE FITTING PROVIDED.
3. USE PLASTIC OR RUBBER WASHERS, SLEEVES, NEOPRENE PADS AND/OR BITUMINOUS PAINT AS REQUIRED TO CREATE A BARRIER BETWEEN DISSIMILAR METALS.
4. REUSE EXISTING ANCHORS TO EXTENT POSSIBLE. IF EXISTING ANCHORS ARE IN POOR CONDITION OR DO NOT LINEUP WITH THE NEW PIPING, REFER TO SHEET 18B, SECTION 3 FOR NEW WALL/CEILING CONNECTION.

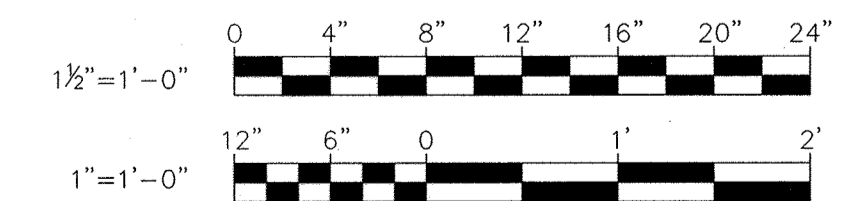
4" PIPE BRACE DETAIL

SCALE: 1 1/2" = 1'-0"



SECTION 3

NTS

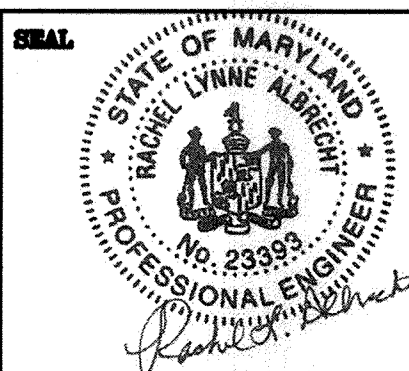


R:\Projects\2019\12154_H6C80A\Task 6 - Miscellaneous Pumping Stations\Mount Hebron PS\Cadd\Drawn\Proposed\12154MHP5-005B-SB.dwg Apr 02, 2019 - 1:11pm Plot Scale: 1:1

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James P. Butler 4/5/19
DIRECTOR, PUBLIC WORKS DATE
James P. Butler 4/5/19
CHIEF, BUREAU OF ENGINEERING DATE
James P. Butler 4/5/19
CHIEF, BUREAU OF UTILITIES DATE
James P. Butler 4/5/19
CHIEF, UTILITY DIVISION DATE

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LICENSE NO. 23393 EXPIRATION DATE 8/25/20
ALBRECHT ENGINEERING INC



DES: RCC				
DRN: NAP				
CHK: RLA				
DATE: 4/02/19	RK&K	1	2019 UPGRADES - ADD SHEET 5B	4/19
	BY	NO.	REVISIONS	DATE

STRUCTURAL DETAILS
MOUNT HEBRON SPS -
2019 UPGRADES

MOUNT HEBRON SEWER MAINS
2019 UPGRADES
CAPITAL PROJECT NO. S6600
CONTRACT NO. 745-S
ELECTION DISTRICT NO. 2
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 5B OF 25

NOTES:

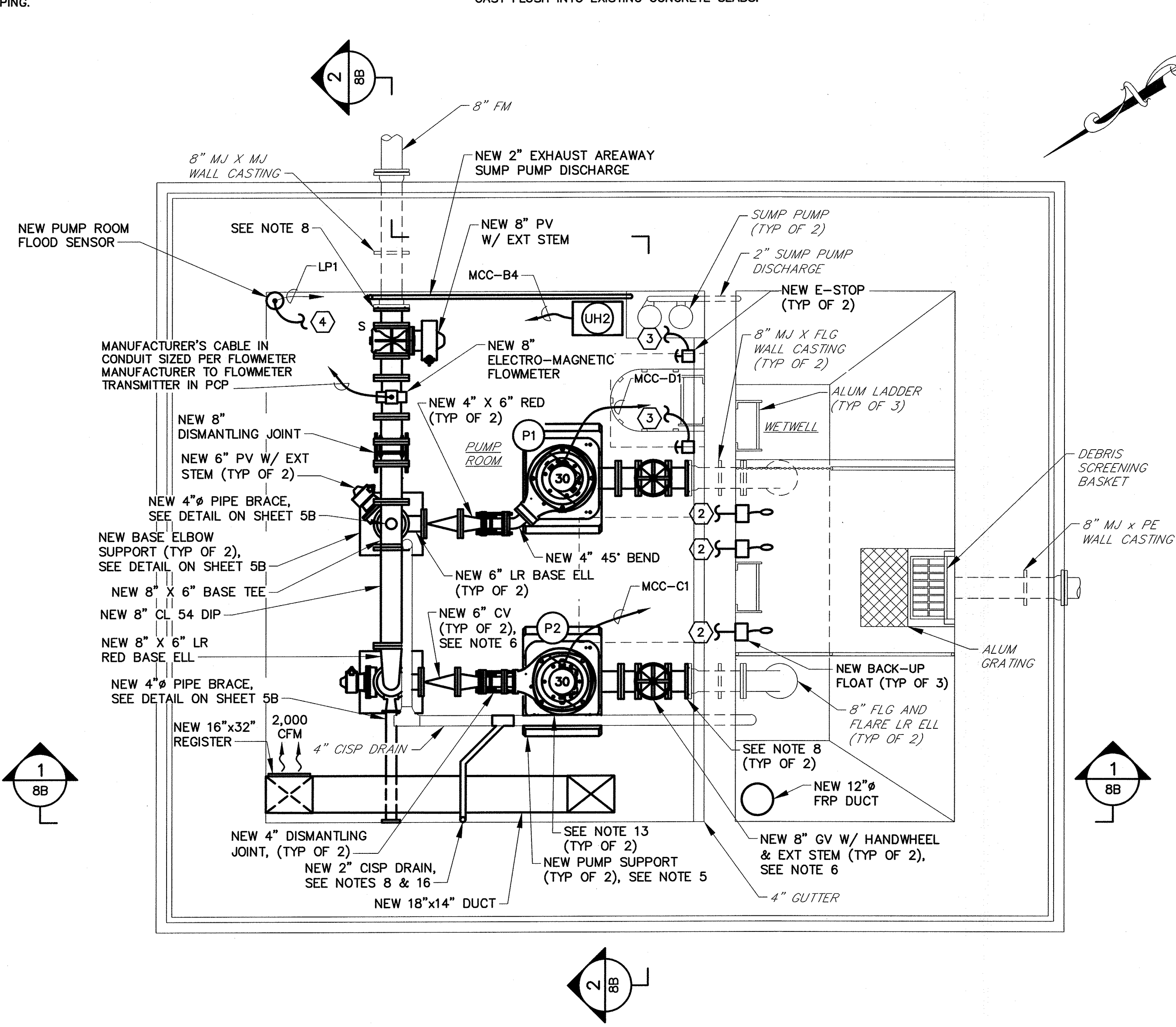
- ALL EXISTING FEATURES DENOTED BY SLANTED TEXT.
- ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE.
- INSTALL CONCRETE EQUIPMENT PADS FOR ALL FLOOR MOUNTED EQUIPMENT.
- CLEAN AND PAINT ALL EXPOSED FERROUS METALS (EXCEPT PIPE FLANGES AND FASTENERS), ALL CMU AND NEW CONCRETE IN ACCORDANCE WITH SPECIFICATION SECTION 0900.
- PUMP SUPPORTS SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY. CONTRACTOR SHALL HAVE PUMP SUPPORTS DESIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF MARYLAND FOR PUMPS FURNISHED.
- SUPPORT CHECK VALVES AND PUMP SUCTION GATE VALVES WITH ADJUSTABLE FLOOR MOUNTED PIPE SUPPORTS, INSTALLED SO AS NOT TO INTERFERE WITH THE OPERATION OF THE VALVES.
- NO ATTEMPT HAS BEEN MADE TO SHOW ALL REQUIRED PIPE SUPPORTS. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A COMPLETE PIPING SUPPORT SYSTEM COMPLYING WITH MSS SP-58, ANSI/MSS SP-69, FEDERAL SPECIFICATION WW-H171, AND SPECIFICATION SECTION 15060.
- FURNISH AND INSTALL ALL GLANDS, RETAINERS, GASKETS, BOLTS AND OTHER MISCELLANEOUS MATERIALS AS NECESSARY TO CONNECT NEW PIPING TO EXISTING PIPING.

- NEW PUMP SUCTION AND DISCHARGE PIPING, VALVE AND FITTING ARRANGEMENT IS DEPENDENT ON ACTUAL PUMP EQUIPMENT FURNISHED. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER OF PUMP EQUIPMENT FURNISHED, TAKE ACCURATE FIELD MEASUREMENTS, AND PREPARE AND SUBMIT LAYOUT DRAWINGS FOR APPROVAL PRIOR TO PURCHASING ANY EQUIPMENT OR FABRICATING ANY PIPING.
- PUMP CABLES SHALL BE SUPPORTED BY THE DRYWELL WALLS OR CEILING USING STAINLESS STEEL KELLUM GRIPS AT INTERVALS AS NECESSARY TO SUPPORT THE ENTIRE WEIGHT OF THE CABLES, IN ACCESSIBLE LOCATIONS WHICH SHALL BE APPROVED BY THE COUNTY. SLACK IN CABLES SHALL NOT BE COILED. CONTRACTOR SHALL SUBMIT PUMP CABLE ROUTING PLANS TO THE ENGINEER FOR REVIEW PRIOR TO ORDERING PUMPS.
- SEE POTABLE WATER RISER DIAGRAM ON SHEET 11A.
- CONTRACTOR SHALL COORDINATE W/ MANUFACTURER OF VENTILATION FANS FURNISHED, TAKE ACCURATE FIELD MEASUREMENTS AND SUBMIT DRAWINGS SHOWING DUCT LAYOUTS AND METHOD OF FAN SUPPORT TO THE ENGINEER FOR REVIEW. FANS SHALL NOT BE SUPPORTED BY DUCTWORK.
- PUMPS SHALL BE LOCATED DIRECTLY BELOW THE EXISTING LIFTING EYES.
- COORDINATE LOCATION OF VALVE BOXES WITH EXT STEMS FOR VALVES FURNISHED. ENSURE THAT VALVE BOXES PERMIT FULL ACCESS AND OPERATION OF THE VALVE. USE UNIVERSAL JOINTS, RIGHT ANGLE BEARS AND ADAPTERS ON EXT STEMS, AS NECESSARY. NEW VALVE BOXES SHALL BE CAST FLUSH INTO EXISTING CONCRETE SLABS.

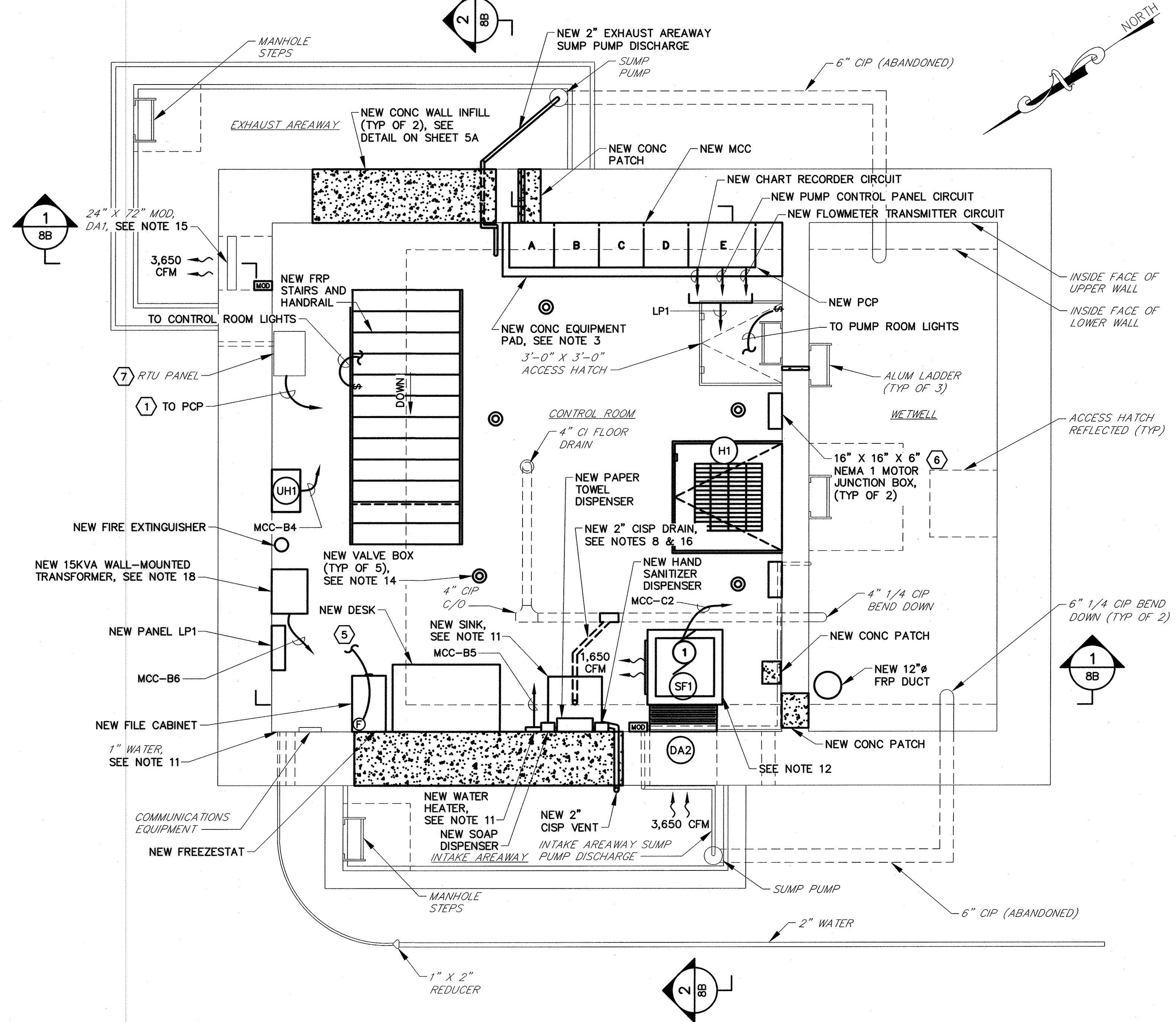
- PROVIDE NEW ACTUATOR AND ACCESSORIES SIZED TO OPERATE EXISTING DAMPER.
- CONNECT NEW 2" CISP TO EXISTING 4" CIP.
- REPLACE ALL EXISTING RECEPTACLES WITH NEW GFI RECEPTACLES AT EXISTING LOCATIONS. PROVIDE NEW BOX, WHILE-IN-USE COVER, CONDUIT AND WIRE. ONE BRANCH CIRCUIT PER LEVEL.
- TRANSFORMER SHALL BE 480V PRIMARY AND 208/120V 3-PHASE SECONDARY. SUBMIT MOUNTING HEIGHT FOR APPROVAL (MINIMUM 6'-0" TO BOTTOM OF WALL BRACKET).
- REPLACE LIGHTING ON BOTH LEVELS. SEE LIGHTING FIXTURE SCHEDULE, SHEET 23B. SUBMIT PROPOSED LAYOUT FOR APPROVAL AND PROVIDE NEW CONDUIT AND WIRE TO LPI AND SWITCHING. PROVIDE ONE BRANCH CIRCUIT PER LEVEL.
- SEE DWG. 11A FOR ALL MECHANICAL SCHEDULES.

ELECTRICAL NOTES:

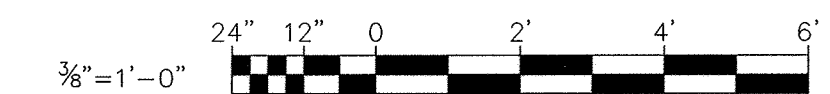
- PROVIDE 1" CONDUIT TO PCP FOR CONTROL AND MONITORING I/O SIGNALS. SEE ELECTRICAL DETAILS SHEET FOR WIRING REQUIREMENTS.
- FLOAT SWITCH CABLE TO PUMP CONTROL PANEL IN 3/4" CONDUIT OR AS REQUIRED BY FLOAT MANUFACTURER.
- 2-#14 FROM THE E-STOP TO THE RVSS IN 3/4" CONDUIT.
- 2-#14 TO PUMP CONTROL PANEL IN 3/4" CONDUIT.
- 2-#14 IN 3/4" CONDUIT TO VENTILATION CONTROLS IN MCC.
- PROVIDE APPROPRIATELY SIZED LUGS FOR TERMINATION OF ALL MANUFACTURER SUPPLIED POWER AND ALARM CONDUCTORS FROM PUMP MOTOR. CONTINUATION OF CONDUCTORS SHALL BE WITH STANDARD BUILDING WIRE FROM JUNCTION BOXES TO MCC.
- EXISTING RTU PANEL TO REMAIN IN SERVICE. PANEL CONTAINS THE EXISTING LC150 PRIMARY PUMP CONTROLLER, WHICH IS ALSO TO REMAIN IN SERVICE. TO GENERATE THE PRIMARY PUMP CONTROLS BY THE SYSTEM INTEGRATOR IN THE PROPOSED PCP. REFER TO WIRING SCHEMATICS PROVIDED.



PUMP ROOM PLAN
SCALE: 3/8"=1'-0"



CONTROL ROOM PLAN
SCALE: 3/8"=1'-0"



R:\Projects\2019\12154-MC680A\Task 9 - Miscellaneous Pumping Stations\Mount Hebron PS\Cadd\Plan\Proposed\12154MPPS-007B-WP-7B.dwg Apr 02, 2019 - 1:11pm Plot Scale 1:1

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND	
Director of Public Works <i>[Signature]</i> 4/5/19 DATE	Chief, Bureau of Engineering <i>[Signature]</i> 4/5/19 DATE
Chief, Bureau of Utilities <i>[Signature]</i> 4/5/19 DATE	Chief, Utility Division <i>[Signature]</i> 4/5/19 DATE

PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT REDLINE REVISIONS INCLUDED IN THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 28472. EXPIRATION DATE 9/18/2019	
	700 EAST PRATT STREET SUITE 500 BALTIMORE, MARYLAND 21202

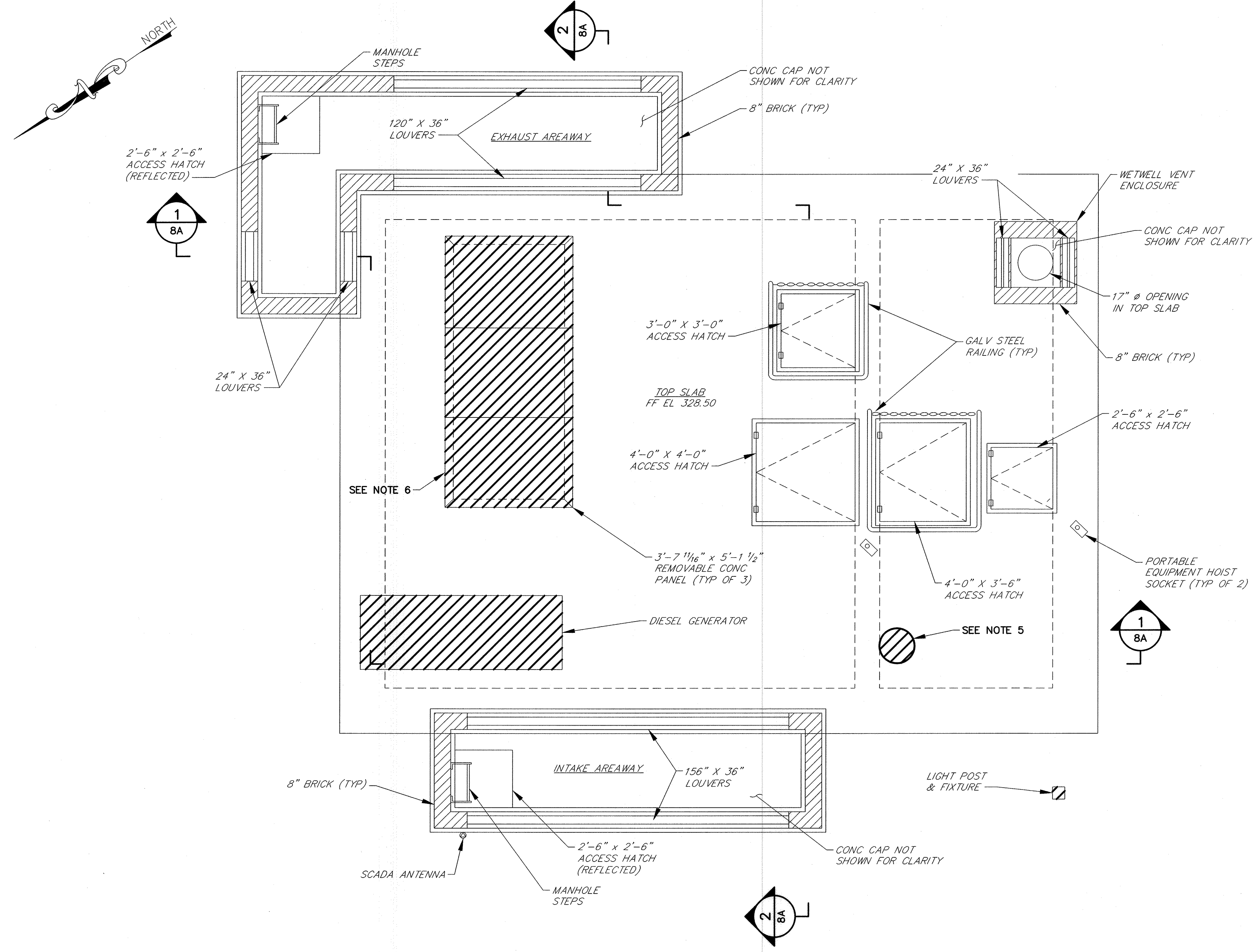
DES: DAO			
DRN: NAF			
CHK: RAL			
DATE: 4/02/19	RK&K 1	2019 UPGRADES - ADD SHEET 7B	4/19
BY NO.		REVISIONS	DATE

IMPROVEMENT PLANS MOUNT HEBRON SPS - 2019 UPGRADES	
MAP NO. 17	BLOCK NO. 8

MOUNT HEBRON SEWER MAINS 2019 UPGRADES CAPITAL PROJECT NO. S6600 CONTRACT NO. 745-S	
ELECTION DISTRICT NO. 2	HOWARD COUNTY, MARYLAND
SCALE 3/8"=1'-0"	SHEET 7B OF 25

NOTES:

1. ALL EXISTING FEATURES DENOTED BY SLANTED TEXT.
2. ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE.
3. PATCH ALL EXISTING HOLES IN CONCRETE FLOOR SLABS THAT ARE NOT USED IN THE NEW WORK WITH MIN. 9000 PSI COMPRESSIVE STRENGTH NON-SHRINKING GROUT. THE GROUT SHALL BE MIXED AND PLACED IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS FOR THIS APPLICATION. GROUT SHALL BE KAUFMAN PRODUCTS SURE GROUT, OR APPROVED EQUAL. HOLES THAT CONTAIN EXISTING WALL SLEEVES SHALL BE PATCHED BY FIRST INSTALLING A CAST IRON OR DUCTILE IRON PLUG AND FILLING THE REMAINING OPENING WITH NON-SHRINK GROUT.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND TRANSPORTATION, INTACT OF ALL DEMOLISHED EQUIPMENT DESIGNATED BY THE COUNTY TO BE SALVAGED, TO THE COUNTY'S LITTLE PATUXENT WATER RECLAMATION PLANT (LPWRP) MAINTENANCE SHOP, LOCATED AT 8900 GREENWOOD PLACE, 410-313-1200. CONTRACTOR SHALL PROVIDE THE COUNTY WITH FIVE (5) DAYS ADVANCE NOTICE PRIOR TO DELIVERY OF EQUIPMENT. CONTRACTOR SHALL DISPOSE OF ALL NON-SALVAGED EQUIPMENT AND MATERIAL DEMOLISHED.
5. CORE DRILL HOLE IN CONCRETE SLAB TO ACCOMMODATE NEW WETWELL SUPPLY FAN. INSTALL FRAMING AROUND HOLE IN WETWELL TOP SLAB AS SHOWN ON SHEET 7D.
6. REMOVE STEEL ANGLES AND PREPARE OPENING FOR NEW CONCRETE FILL AND ACCESS HATCH.



TOP SLAB PLAN
SCALE: 3/8"=1'-0"



R:\Projects\2019\154-JHG\G00A\Task 9 - Miscellaneous Pumping Stations\Mount Hebron PS\County Plans\Proposed\2154MPPS-007C-0P-7C.dwg Apr 02, 2019 - 1:11pm Plot Scale 1:1

**DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND**

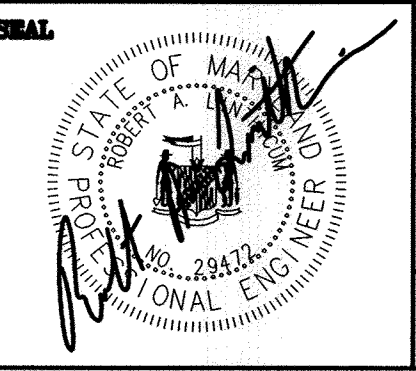
<i>[Signature]</i> DIRECTOR, PUBLIC WORKS 4/5/19	<i>[Signature]</i> CHIEF, BUREAU OF ENGINEERING 4/5/19
<i>[Signature]</i> CHIEF, BUREAU OF UTILITIES 4/5/19	<i>[Signature]</i> CHIEF, UTILITY DIVISION 4/5/19

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT REDLINE REVISIONS INCLUDED IN 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. 22472. EXPIRATION DATE 9/15/2019

RK&K 700 EAST PRATT STREET
SUITE 500
BALTIMORE, MARYLAND 21202



DES: DAO			
DRN: NAF			
CHK: RAL			
DATE: 4/02/19	RK&K 1	2019 UPGRADES - ADD SHEET 7C	4/19
BY NO.		REVISIONS	DATE

**DEMOLITION PLAN
MOUNT HEBRON SPS -
2019 UPGRADES**

MAP NO. 17 BLOCK NO. 8

**MOUNT HEBRON SEWER MAINS
2019 UPGRADES**

CAPITAL PROJECT NO. S6600
CONTRACT NO. 745-S

ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

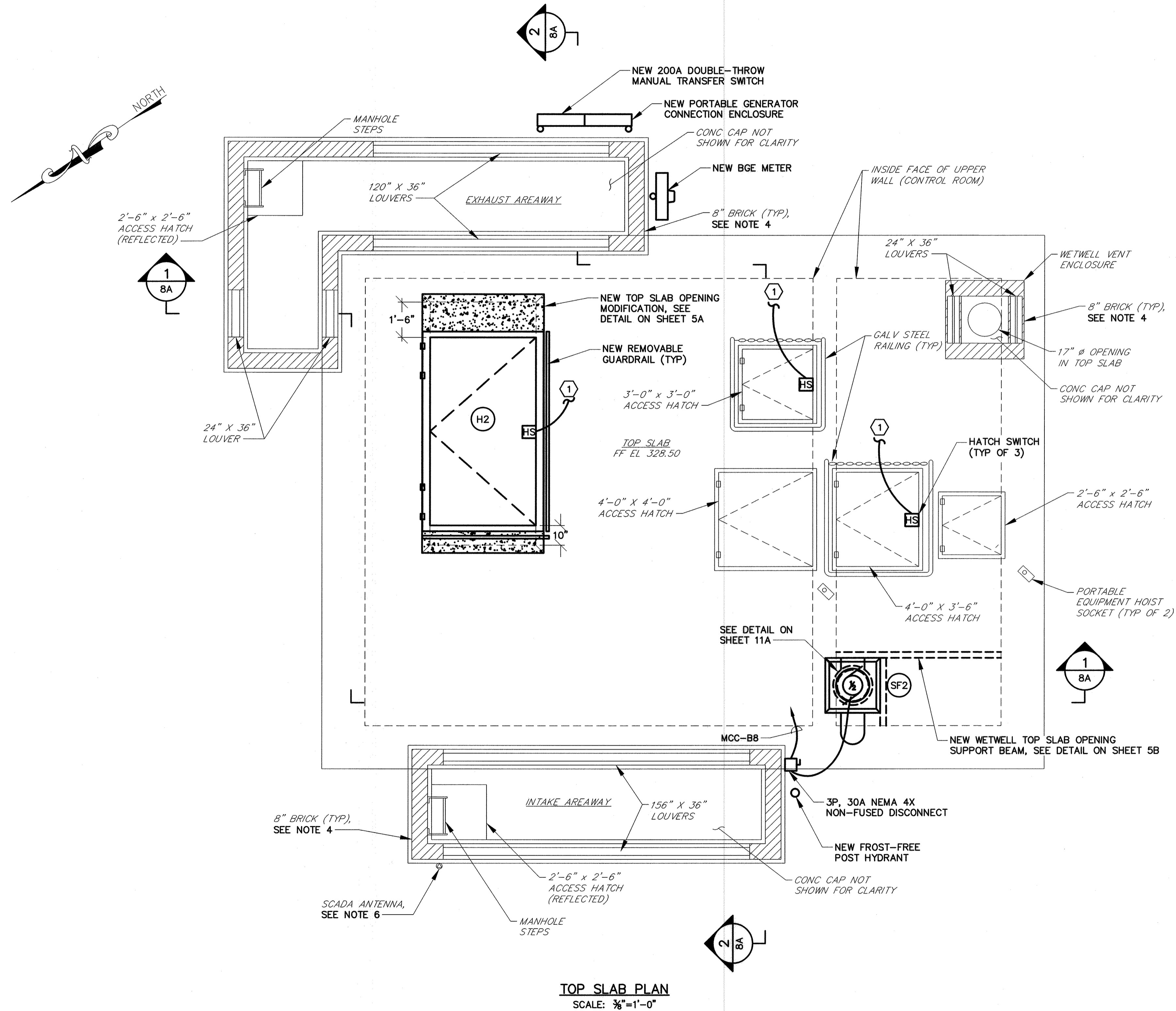
SCALE 3/8"=1'-0"
SHEET 7C OF 25

NOTES:

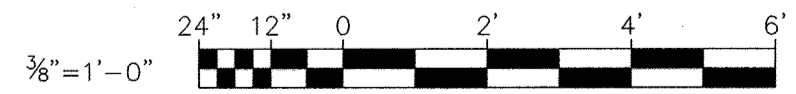
1. ALL EXISTING FEATURES DENOTED BY SLANTED TEXT.
2. ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE.
3. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER OF VENTILATION FAN FURNISHED. TAKE ACCURATE FIELD MEASUREMENTS AND SUBMIT DRAWINGS SHOWING DUCT LAYOUT AND METHOD OF FAN SUPPORT TO ENGINEER FOR REVIEW. FAN SHALL NOT BE SUPPORTED BY DUCTWORK.
4. REPAIR ALL DAMAGED MASONRY AND REPOINT ALL DETERIORATED OR CRACKED MASONRY JOINTS IN ACCORDANCE WITH SPECIFICATION SECTION 04900. ALL MASONRY SHALL RECEIVE A FINAL CLEANING IN ACCORDANCE WITH SPECIFICATION 04900.
5. CLEAN AND PAINT ALL EXPOSED FERROUS METALS AND NEW CONCRETE IN ACCORDANCE WITH SPECIFICATION SECTION 09900.
6. PROVIDE PVC WATERPROOF SLEEVE THROUGH INTAKE AREAWAY WHERE WALLS WILL BE CLOSED AND REROUTE/RECONNECT ANTENNA CABLE TO REMAIN.

ELECTRICAL NOTES:

- ① 2-#14 IN 3/4" CONDUIT TO VENTILATION CONTROLS IN MCC.



TOP SLAB PLAN
SCALE: 3/8"=1'-0"



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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

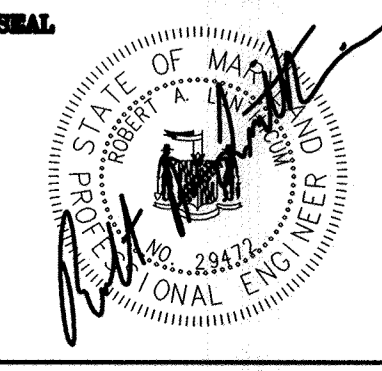
<i>[Signature]</i> DIRECTOR OF PUBLIC WORKS 4/5/19	<i>[Signature]</i> CHIEF, BUREAU OF ENGINEERING 4/5/19
<i>[Signature]</i> CHIEF, BUREAU OF UTILITIES 4/5/19	<i>[Signature]</i> CHIEF, UTILITY DIVISION 4/5/19

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THE REVISIONS INCLUDED IN 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. 28472 EXPIRATION DATE 9/15/2019

RK&K 700 EAST PRATT STREET
SUITE 500
BALTIMORE, MARYLAND 21202



DES: DAO				
DRN: NAF				
CHK: RAL				
DATE: 4/02/19	RK&K	1	2019 UPGRADES - ADD SHEET 7D	4/19
BY NO.			REVISIONS	DATE

IMPROVEMENT PLAN
MOUNT HEBRON SPS -
2019 UPGRADES

MAP NO. 17 BLOCK NO. 8

MOUNT HEBRON SEWER MAINS
2019 UPGRADES

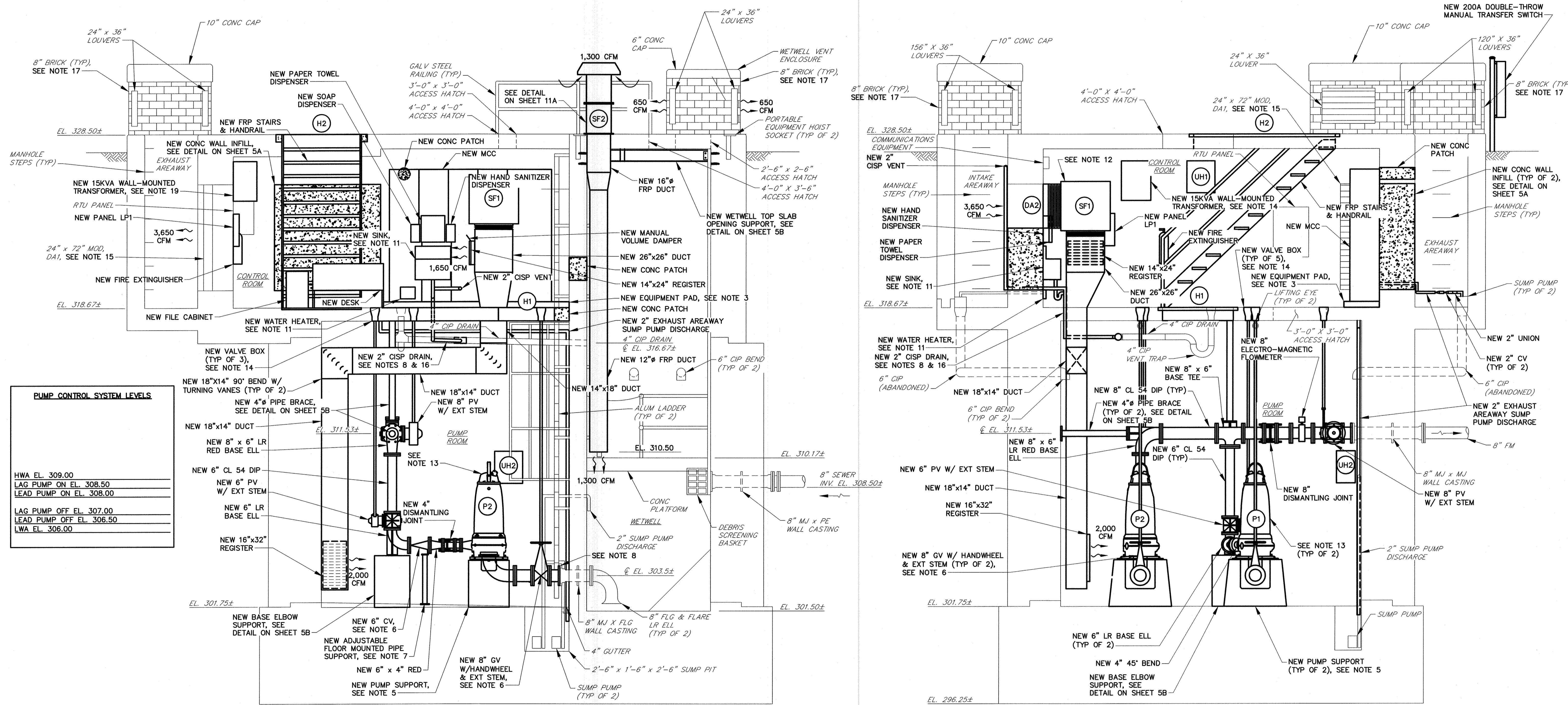
CAPITAL PROJECT NO. S6600
CONTRACT NO. 745-S

ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

SCALE 3/8"=1'-0"
SHEET 7D OF 25

NOTES:

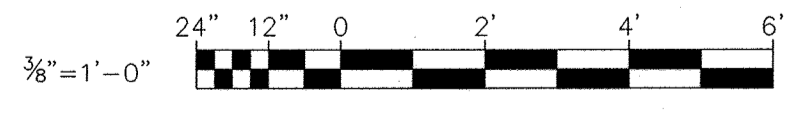
- ALL EXISTING FEATURES DENOTED BY SLANTED TEXT.
- ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE.
- INSTALL CONCRETE EQUIPMENT PADS FOR ALL FLOOR MOUNTED EQUIPMENT.
- CLEAN AND PAINT ALL EXPOSED FERROUS METALS (EXCEPT PIPE FLANGES AND FASTENERS), AND NEW CONCRETE IN ACCORDANCE WITH SPECIFICATION SECTION 0900.
- PUMP SUPPORTS SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY. CONTRACTOR SHALL HAVE PUMP SUPPORTS DESIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF MARYLAND FOR PUMPS FURNISHED.
- SUPPORT CHECK VALVES AND PUMP SUCTION GATE VALVES WITH ADJUSTABLE FLOOR MOUNTED PIPE SUPPORTS, INSTALLED SO AS NOT TO INTERFERE WITH THE OPERATION OF THE VALVES.
- NO ATTEMPT HAS BEEN MADE TO SHOW ALL REQUIRED PIPE SUPPORTS. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A COMPLETE PIPING SUPPORT SYSTEM COMPLYING WITH MSS SP-58, ANSI/MSS SP-69, FEDERAL SPECIFICATION WW-H171, AND SPECIFICATION SECTION 15060.
- FURNISH AND INSTALL ALL GLANDS, RETAINERS, GASKETS, BOLTS AND OTHER MISCELLANEOUS MATERIALS AS NECESSARY TO CONNECT NEW PIPING TO EXISTING PIPING.
- NEW PUMP SUCTION AND DISCHARGE PIPING, VALVE AND FITTING ARRANGEMENT IS DEPENDENT ON ACTUAL PUMP EQUIPMENT FURNISHED. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER OF PUMP EQUIPMENT FURNISHED, TAKE ACCURATE FIELD MEASUREMENTS, AND PREPARE AND SUBMIT LAYOUT DRAWINGS FOR APPROVAL PRIOR TO PURCHASING ANY EQUIPMENT OR FABRICATING ANY PIPING.
- PUMP CABLES SHALL BE SUPPORTED BY THE DRYWELL WALLS OR CEILING USING STAINLESS STEEL KELLUM GRIPS, AT INTERVALS AS NECESSARY TO SUPPORT THE ENTIRE WEIGHT OF THE CABLES, IN ACCESSIBLE LOCATIONS WHICH SHALL BE APPROVED BY THE COUNTY. SLACK IN CABLES SHALL NOT BE COILED. CONTRACTOR SHALL SUBMIT PUMP CABLE ROUTING PLANS TO THE ENGINEER FOR REVIEW PRIOR TO ORDERING PUMPS.
- SEE POTABLE WATER RISER DIAGRAM ON SHEET 11A.
- CONTRACTOR SHALL COORDINATE W/ MANUFACTURER OF VENTILATION FANS FURNISHED, TAKE ACCURATE FIELD MEASUREMENTS AND SUBMIT DRAWINGS SHOWING DUCT LAYOUTS AND METHOD OF FAN SUPPORT TO THE ENGINEER FOR REVIEW. FANS SHALL NOT BE SUPPORTED BY DUCTWORK.
- PUMPS SHALL BE LOCATED DIRECTLY BELOW THE EXISTING LIFTING EYES.
- COORDINATE LOCATION OF VALVE BOXES WITH EXT STEMS FOR VALVES FURNISHED. ENSURE THAT VALVE BOXES PERMIT FULL ACCESS AND OPERATION OF THE VALVE. USE UNIVERSAL JOINTS, RIGHT ANGLE GEARS AND ADAPTERS ON EXT STEMS, AS NECESSARY. NEW VALVE BOXES SHALL BE CAST FLUSH INTO EXISTING CONCRETE SLABS.
- PROVIDE NEW ACTUATOR AND ACCESSORIES SIZED TO OPERATE EXISTING DAMPER.
- CONNECT NEW 2" CISP TO EXISTING 4" CIP.
- REPAIR ALL DAMAGED MASONRY AND REPOINT ALL DETERIORATED OR CRACKED MASONRY JOINTS IN ACCORDANCE WITH SPECIFICATION SECTION 04900. ALL MASONRY SHALL RECEIVE A FINAL CLEANING IN ACCORDANCE WITH SPECIFICATION 04900.
- REPLACE ALL EXISTING RECEPTACLES WITH NEW GFI RECEPTACLES AT EXISTING LOCATIONS. PROVIDE NEW BOX, WHILE-IN-USE COVER, CONDUIT AND WIRE. ONE BRANCH CIRCUIT PER LEVEL.
- TRANSFORMER SHALL BE 480V PRIMARY AND 208/120V 3-PHASE SECONDARY. SUBMIT MOUNTING HEIGHT FOR APPROVAL (MINIMUM 6'-0" TO BOTTOM OF WALL BRACKET).
- REPLACE LIGHTING ON BOTH LEVELS. SEE LIGHTING FIXTURE SCHEDULE, SHEET 23B. SUBMIT PROPOSED LAYOUT FOR APPROVAL AND PROVIDE NEW CONDUIT AND WIRE TO LP1 AND SWITCHING. PROVIDE ONE BRANCH CIRCUIT PER LEVEL.
- SEE DWG. 11A FOR ALL MECHANICAL SCHEDULES.



PUMP CONTROL SYSTEM LEVELS	
HWA	EL. 309.00
LAG PUMP ON	EL. 308.50
LEAD PUMP ON	EL. 308.00
LAG PUMP OFF	EL. 307.00
LEAD PUMP OFF	EL. 306.50
LWA	EL. 306.00

SECTION 1
SCALE: 3/8"=1'-0"

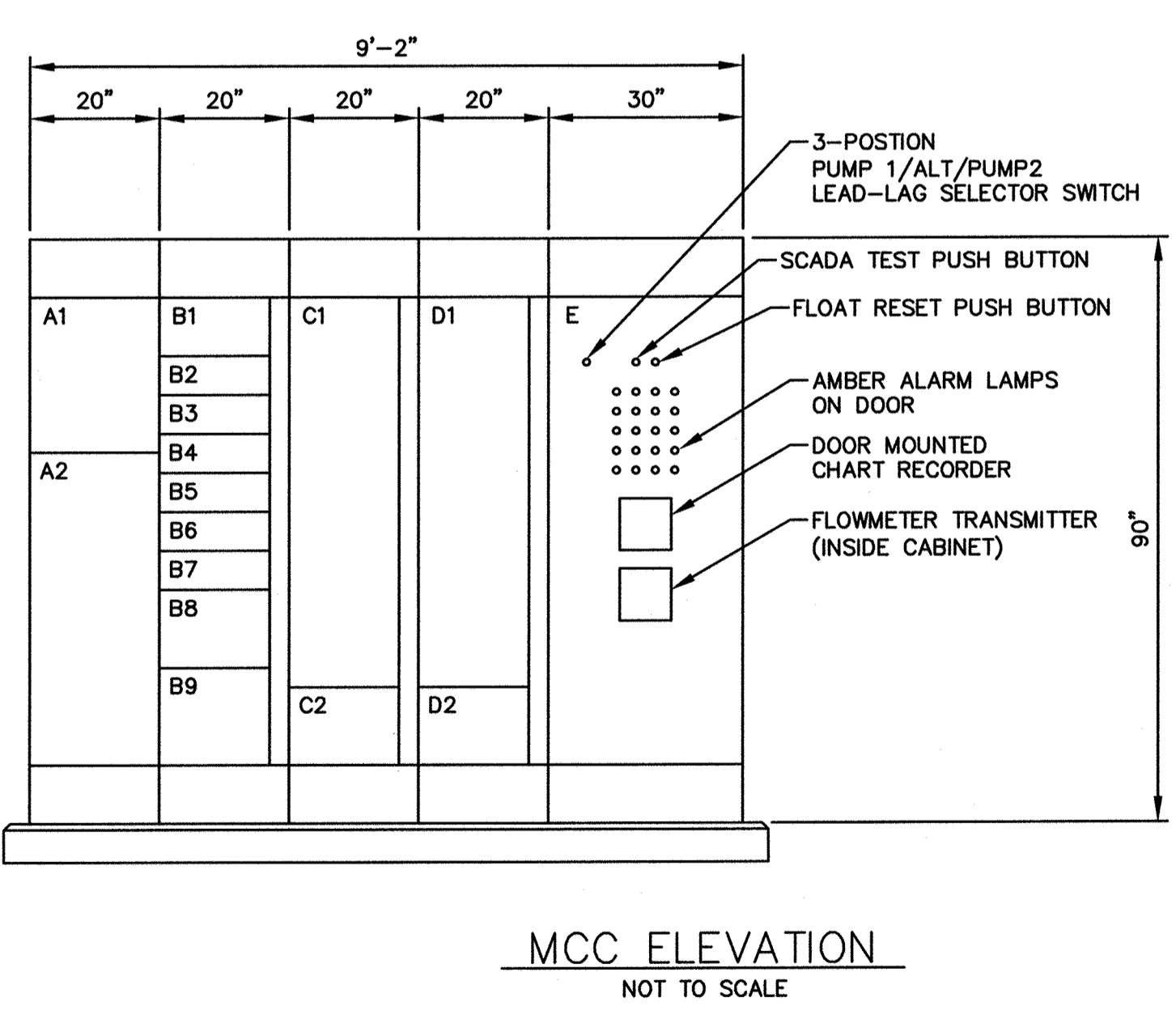
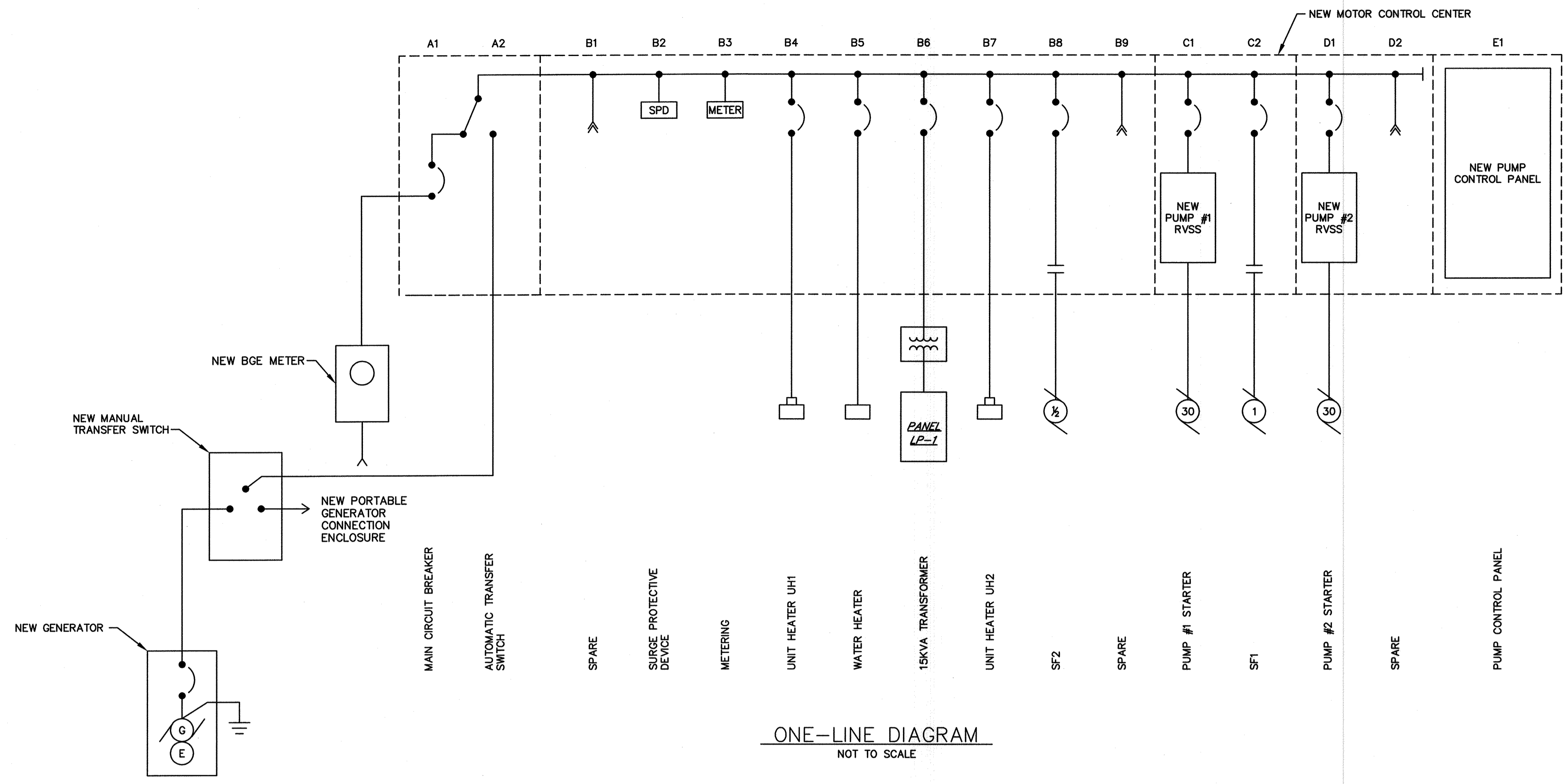
SECTION 2
SCALE: 3/8"=1'-0"



DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND		PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT THE REVISIONS INCLUDED IN 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. 28472 EXPIRATION DATE 9/16/2019		DES: DAO DRN: NAP CHK: RAL DATE: 4/02/19		IMPROVEMENT SECTIONS MOUNT HEBRON SPS - 2019 UPGRADES		MOUNT HEBRON SEWER MAINS 2019 UPGRADES CAPITAL PROJECT NO. S660 CONTRACT NO. 745-S		SCALE 3/8"=1'-0"
Director of Public Works <i>[Signature]</i> 4/5/19		Chief, Bureau of Engineering <i>[Signature]</i> 4/5/19		700 EAST PRATT STREET SUITE 500 BALTIMORE, MARYLAND 21202 RK&K		2019 UPGRADES - ADD SHEET 8B		MAP NO. 17 BLOCK NO. 8 ELECTION DISTRICT NO. 2		SHEET 8B OF 25
Chief, Bureau of Utilities <i>[Signature]</i> 4/3/19		Chief, Utility Division <i>[Signature]</i> 4/3/19		4/19		17 8		HOWARD COUNTY, MARYLAND		

RK&K\SYS - K:\projects\2019\12154_Heb080A\Task 9 - Miscellaneous Pumping Stations\Mount Hebron_PSP\Coord\Plans\Proposed\12154MPPS-0808-UP-8B.dwg Apr 02, 2019 - 1:12pm Plot Scale 1:1

RK21315 - K:\projects\2019\1514_HcCoBDA\Task 9 - Miscellaneous Pumping Stations\Mount Hebron PS\Cad\Drawings\Proposed\1514MPPS-09A-EP-9A.dwg Apr 02, 2019 - 1:12pm Plot Scale 1:1



- ALARM LAMP LEGEND**
- HIGH LEVEL WETWELL
 - LOW LEVEL WETWELL
 - PUMP ROOM FLOODED
 - STATION LOSS OF POWER
 - ATS IN EMERGENCY
 - GENERATOR RUNNING
 - GENERATOR FAILURE
 - UPS ON BATTERY
 - UPS BATTERY LOW
 - PUMP 1 NOT IN AUTO
 - PUMP 2 NOT IN AUTO
 - PUMP 1 FAIL
 - PUMP 2 FAIL
 - PUMP 1 RVSS FAULT
 - PUMP 2 RVSS FAULT
 - PUMP 1 OVERTEMP
 - PUMP 2 OVERTEMP
 - COMMON ALARM
 - SPARE
 - SPARE

MCC SCHEDULE													
480/277 VOLTS, 3 PHASE, 4 WIRE, 600 AMP BUS													
ITEM	DESCRIPTION	BRKR SIZE		FEEDER			STARTER				AUX. DES.	REMARKS	
		AMP	POLE	WIRE	QUAN	GRD	COND	TYPE	SIZE	HP			COIL
A1	MAIN BREAKER	200	3	3/0	4	4	4"	-	-	-	-	ONE 4" SPARE	
A2	AUTOMATIC TRANSFER SWITCH	-	-	-	-	-	-	-	-	-	-	200 AMPERE	
B1	SPARE	-	-	-	-	-	-	-	-	-	-	---	
B2	SPD	-	-	-	-	-	-	-	-	-	-	---	
B3	METERING	-	-	-	-	-	-	-	-	-	-	---	
B4	UNIT HEATER UH1	30	3	10	3	10	3/4"	-	-	-	-	---	
B5	WATER HEATER	30	3	10	3	10	3/4"	-	-	-	-	---	
B6	15KVA TRANSFORMER	25	3	10	3	10	3/4"	-	-	-	-	---	
B7	UNIT HEATER UH2	30	3	10	3	10	3/4"	-	-	-	-	---	
B8	SF2	30	3	10	3	10	3/4"	FVNR	1/2	1/2	120	1,2,3,5	---
B9	SPARE	-	-	-	-	-	-	-	-	-	-	SEE SCHEMATIC	
C1	PUMP MOTOR #1	75	3	6	3	8	1 1/4"	RVSS	-	30	-	1,2,3,4,5	SEE NOTES 2 & 3
C2	SF1	20	3	12	3	12	3/4"	FVNR	1	1	120	1,2,3,5	SEE SCHEMATIC

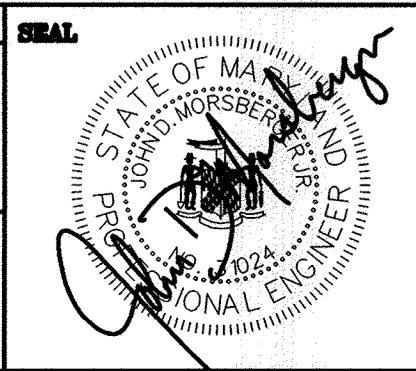
- AUXILIARIES FOR MOTOR CONTROL CENTER**
- HAND-OFF-AUTOMATIC SWITCH
 - INDICATING LIGHTS
 - 120 VOLTS CONTROL POWER TRANSFORMER
 - RUNNING TIME METERS AND START COUNTERS
 - AUXILIARY RELAYS/CONTACTS

MCC SCHEDULE (CONTINUED)													
480/277 VOLTS, 3 PHASE, 4 WIRE, 600 AMP BUS													
ITEM	DESCRIPTION	BRKR SIZE		FEEDER			STARTER				AUX. DES.	REMARKS	
		AMP	POLE	WIRE	QUAN	GRD	COND	TYPE	SIZE	HP			COIL
D1	PUMP MOTOR #2	75	3	6	3	8	1 1/4"	RVSS	-	30	-	1,2,3,4,5	SEE NOTES 2 & 3
D2	SPARE	-	-	-	-	-	-	-	-	-	-	-	-
E	PUMP CONTROL PANEL	-	-	-	-	-	-	-	-	-	-	-	SEE NOTE 1

- NOTES:**
- PROVIDE EMPTY MOTOR CONTROL CENTER SECTION FOR FABRICATION BY SYSTEM INTEGRATOR.
 - CONDUIT SHOWN IS MINIMUM SIZE. MOTORS ARE CONNECTED WITH CABLES PROVIDED BY THE PUMP MANUFACTURER. PROVIDE QUANTITY AND SIZE OF CONDUITS PER MANUFACTURER'S RECOMMENDATIONS. TERMINATE CONDUITS WITH BUSHING, IN LOCATION AS DIRECTED IN THE FIELD AND SUSPEND CABLES USING 3/16" STAINLESS STEEL HOOKS AND CABLE GRIPS.
 - EQUIPMENT SHALL BE RATED FOR A MINIMUM OF 38 FULL LOAD AMPERES, BUT NOT LESS THAN STANDARD HORSEPOWER SHOWN.

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 Director of Public Works: [Signature] 4/5/19
 Chief, Bureau of Engineering: [Signature] 4/5/19
 Chief, Bureau of Utilities: [Signature] 4-5-19
 Chief, Utility Division: [Signature] 4/5/19

PROFESSIONAL CERTIFICATION
 I HEREBY CERTIFY THAT REDLINE REVISIONS INCLUDED IN 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. 31024 EXPIRATION DATE 10/17/2020
RK&K 700 EAST PRATT STREET SUITE 600 BALTIMORE, MARYLAND 21202



DES: JDM			
DRN: NAF			
CHK: JDM			
DATE: 4/02/19	RK&K 1	2019 UPGRADES - ADD SHEET 9A	4/19
BY NO.		REVISIONS	DATE

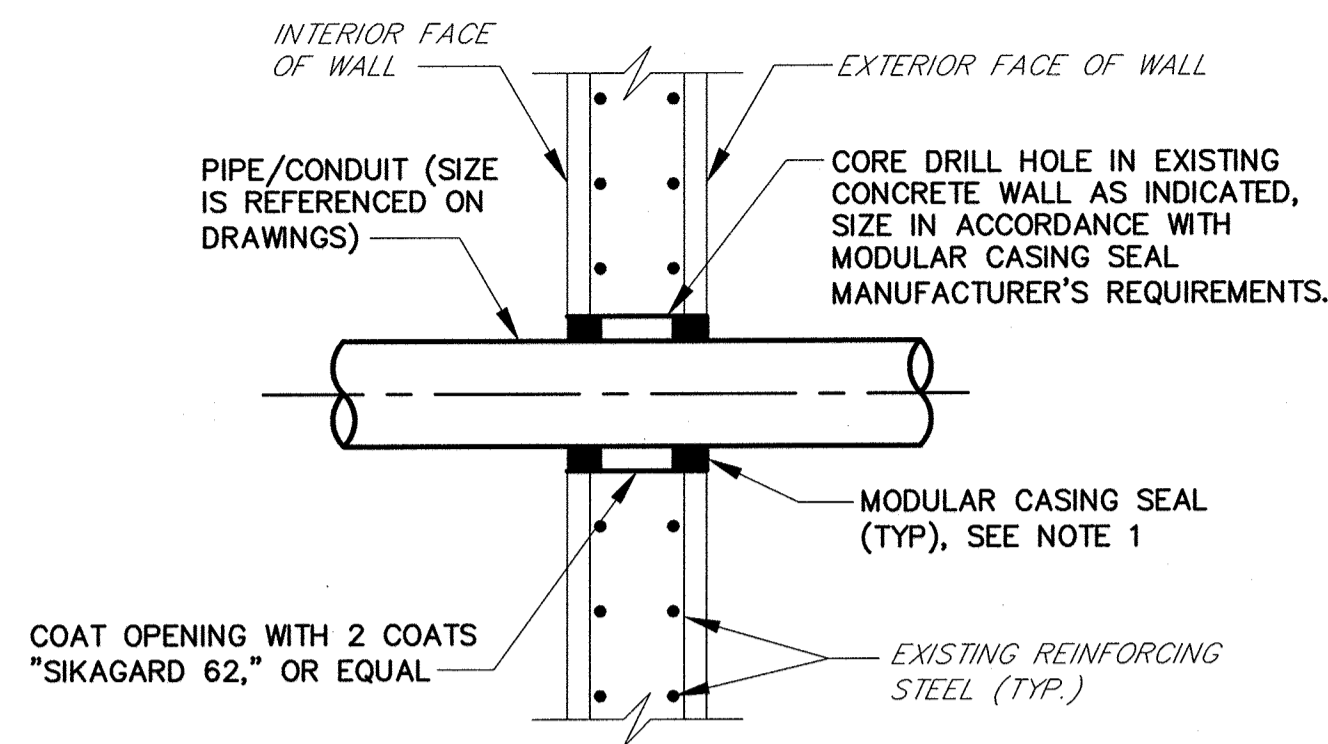
MCC SCHEDULE, ELEVATION &
 ONE-LINE DIAGRAM
 MOUNT HEBRON SPS -
 2019 UPGRADES

MOUNT HEBRON SEWER MAINS
 2019 UPGRADES
 CAPITAL PROJECT NO. S6600
 CONTRACT NO. 745-S
 ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

SCALE
 NTS
 SHEET
 9A OF 25

NOTES:

1. ALL EXISTING FEATURES DENOTED BY SLANTED TEXT.
2. ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE.



NOTES:

1. MODULAR CASING SEAL SHALL BE LINKSEAL, OR APPROVED EQUAL.
2. PIPE AT MODULAR CASING SEAL LOCATION SHALL BE LEVEL.
3. ON EXTERIOR WALLS WHERE PIPING IS BURIED, ONLY ONE MODULAR CASING SEAL IS REQUIRED, ON INTERIOR SIDE.

TYPICAL CONCRETE WALL PENETRATION DETAIL

NTS

UNIT HEATER SCHEDULE					
ID	SIZE (H X W X D)	KW	MOUNTING HEIGHT	NOTES	MANUFACTURER & MODEL NO.
UH1	21 3/4" X 19" X 12 3/4"	15	6'-6" AFF	1,2,3,4	QMARK MODEL MUH-15
UH2	21 3/4" X 19" X 12 3/4"	15	7'-0" AFF	1,2,3,4	QMARK MODEL MUH-15

NOTES:

1. PROVIDE INTEGRAL THERMOSTAT
2. MOUNTING HEIGHT IS TO BOTTOM OF UNIT
3. PROVIDE INTEGRAL DISCONNECT
4. SEE ELECTRICAL DRAWINGS FOR CONNECTION REQUIREMENTS

PUMP SCHEDULE						
ID	DESCRIPTION	LOCATION	Q (GPM)	TDH (FT)	RPM (MAX)	REMARKS
P1	PUMP #1	PUMP ROOM	470	126	1800	NEW DRY-PIT SUBMERSIBLE
P2	PUMP #2	PUMP ROOM	470	126	1800	NEW DRY-PIT SUBMERSIBLE

DAMPER SCHEDULE						
ID	SIZE (INCHES)	DEPTH (INCHES)	MATERIAL	NOTES	TYPE	REMARKS
DA1	24" x 72"	NA	NA	3,4	EXISTING	OPEN WHEN SUPPLY FAN SF1 IS OPERATING, OTHERWISE CLOSED (NEW ACTUATOR ONLY)
DA2	30" x 30"	4	ALUMINUM	1,3,4,6,7,9	THIN LINE CONTROL DAMPER	OPEN WHEN SUPPLY FAN SF1 IS OPERATING, OTHERWISE CLOSED

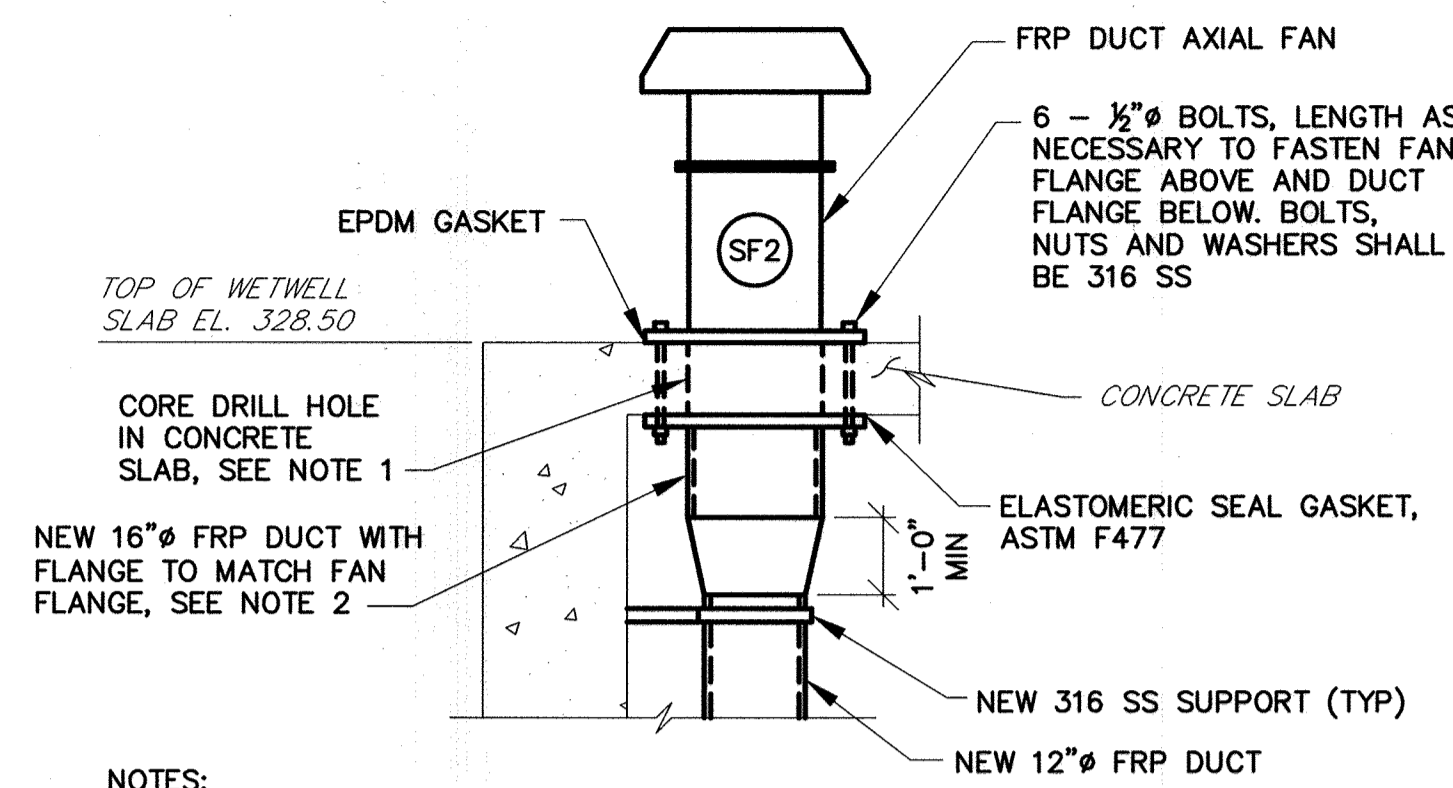
NOTES:

1. CLEAR ANODIZED FINISH
2. PNEUMATIC ACTUATOR
3. ELECTRIC ACTUATOR
4. ACTUATOR MOUNTING BRACKET
5. SWITCH PACKAGE
6. FRONT FLANGE FRAME
7. REAR FLANGE FRAME
8. SPRING LOADED OPEN
9. SPRING LOADED CLOSED

CENTRIFUGAL SQUARE INLINE FAN SCHEDULE											
ID	SERVICE	LOCATION	DRIVE	CFM	S.P. (IN W.G.)	FAN RPM	MOTOR HP	VOLTAGE/PHASE	SOUND (MAX AT 5')	NOTES	MANUFACTURER & MODEL NO.
SF1	SUPPLY	CONTROL ROOM	BELT	3,650	0.67	746	1.0	480/3	60 dBA	4,7,11,12,13,14,17,19,21,25,26,27,28	LOREN COOK MODEL NO. 225SQN-B, OR APPROVED EQUAL

NOTES:

1. NEMA 4 DISCONNECT
2. GRAVITY BACKDRAFT DAMPER
3. MOTORIZED BACKDRAFT DAMPER
4. SIDE DISCHARGE PACKAGE
5. DUEL SIDE DISCHARGE PACKAGE
6. BELT GUARD
7. OSHA GUARD/MOTOR COVER
8. INSULATED HOUSING
9. INLET GUARD
10. OUTLET GUARD
11. INLET FLEXIBLE CONNECTOR
12. OUTLET FLEXIBLE CONNECTOR
13. FLANGED INLET CONNECTION WITH COMPANION FLANGE
14. FLANGED OUTLET CONNECTION WITH COMPANION FLANGE
15. CEILING MOUNTED RUBBER-IN-SHEAR INSULATORS
16. FLOOR MOUNTED RUBBER-IN-SHEAR INSULATORS
17. CEILING MOUNTED SPRING ISOLATORS
18. FLOOR MOUNTED SPRING ISOLATORS
19. LORENTZ COATING
20. EPOXY POWDER COATING
21. REINFORCED WHEEL
22. EXTERNAL INLET VANE DAMPER - ALUMINUM
23. FILTER BOX WITH ALUMINUM FILTER
24. FILTER BOX WITH 30% ALUMINUM FILTER
25. EXTENDED LUBE LINES
26. SPARE BELT KIT
27. BELT TENSIONER-ROTARY
28. THERMOSTATICALLY CONTROLLED

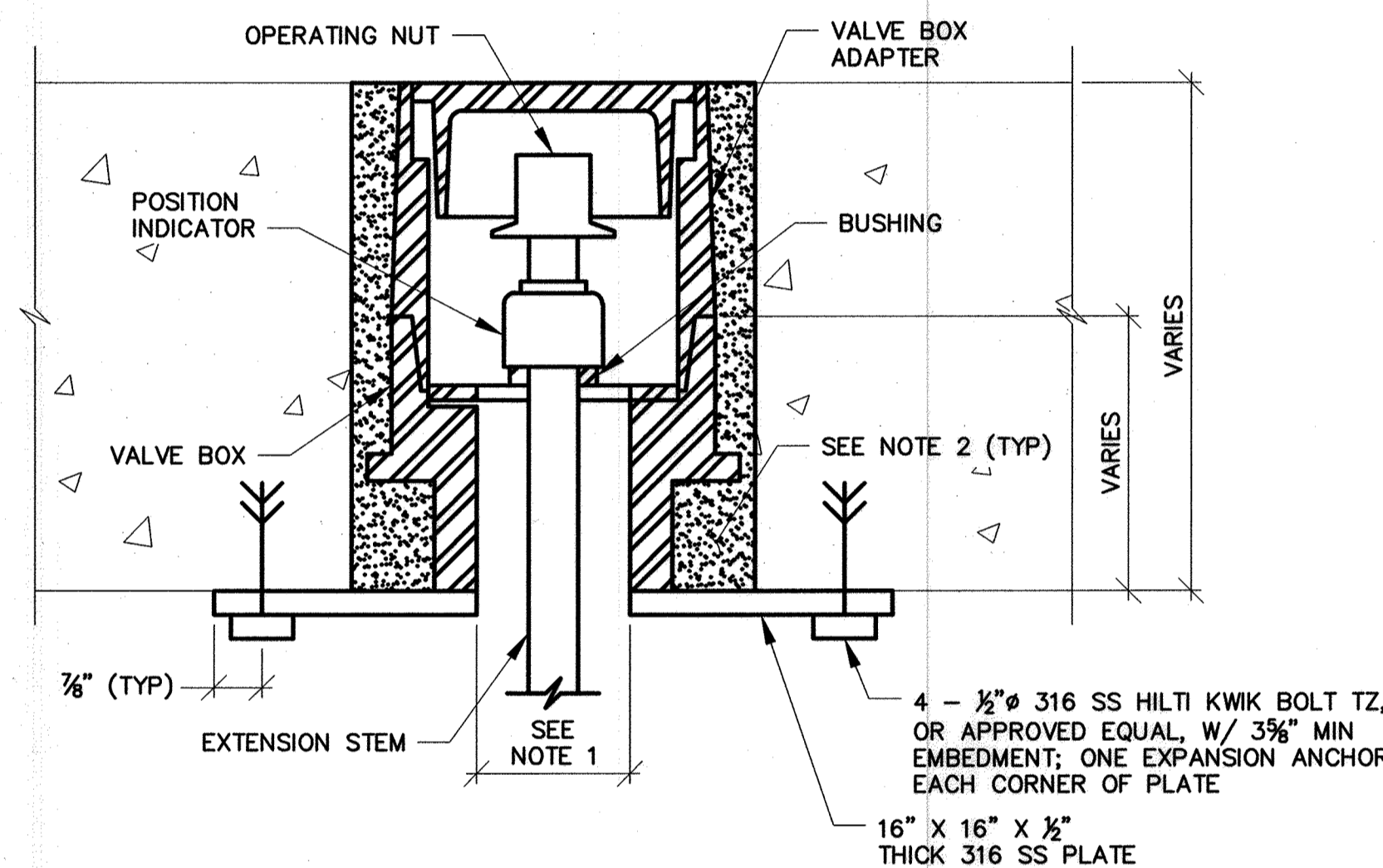


NOTES:

1. COORDINATE SIZE OF HOLE IN CONCRETE SLAB WITH MANUFACTURER OF FAN FURNISHED.
2. PROVIDE OVERSIZED FLANGES SO THAT THE BOLT HOLES ARE A MINIMUM OF 3" FROM THE DUCT OPENING IN THE CONCRETE SLAB

16\"/>

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NOTES:

1. HOLE IN SS PLATE SHALL MATCH THE INSIDE DIAMETER OF VALVE BOX.
2. FILL ANNULAR SPACE AROUND VALVE BOX WITH NON-SHRINK, NON-METALLIC CEMENTITIOUS GROUT.

TYPICAL VALVE BOX INSTALLATION DETAIL

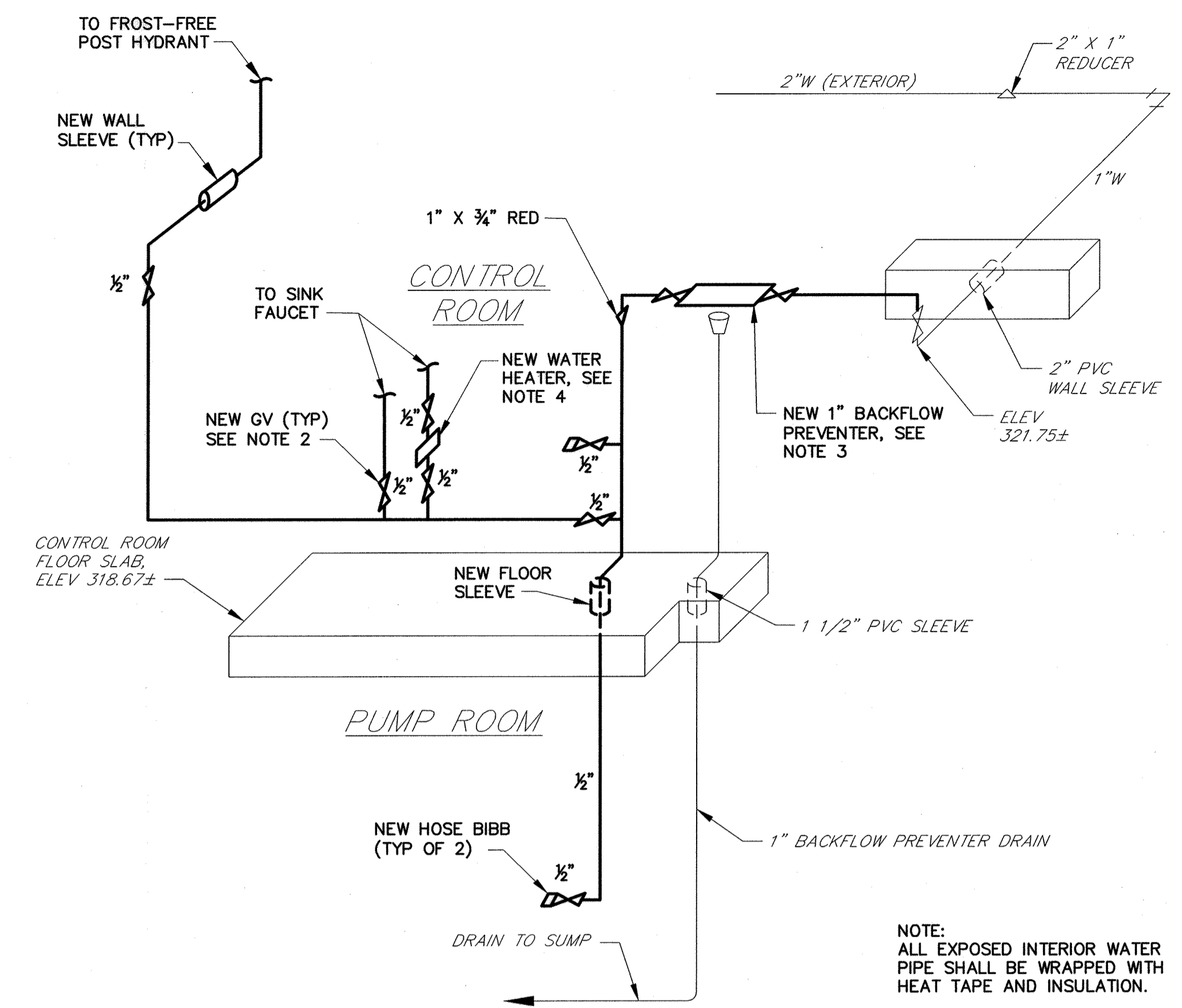
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ACCESS HATCH SCHEDULE				
ID	SLAB OPENING	CLEAR OPENING	DESCRIPTION	REMARKS
H1	48" x 48"	45 1/2" x 42 1/8"	CONTROL ROOM	NEW GENERAL PURPOSE RETROFIT ACCESS HATCH W/GRATING
H2	54" x 96"	51" x 96"	TOP SLAB	NEW GENERAL PURPOSE RETROFIT ACCESS HATCH

FIBERGLASS DUCT AXIAL FAN SCHEDULE											
ID	SERVICE	LOCATION	DRIVE	CFM	S.P. (IN W.G.)	FAN RPM	MOTOR HP	VOLTAGE/PHASE	SOUND (MAX AT 5 FEET)	NOTES	MANUFACTURER & MODEL NO.
SF2	SUPPLY	WETWELL TOP SLAB	BELT	1,300	0.50	1555	1/2	480/3	67 dBA	3,4,5,6,7,11,18,19,20	HARTZELL FAN INC. FRP DUCT AXIAL MODEL NO. A35-166E, OR APPROVED EQUAL

NOTES:

1. DISCONNECT SWITCH
2. VANE SECTION
3. 316 SS HARDWARE AND SHAFT
4. ACCESS DOOR
5. STATIC GROUNDING - CARBON/GRAPHITE IMPREGNATION
6. ALL VINYL ESTER CONSTRUCTION
7. SURFACE VEIL
8. FRP ROOF CURB
9. ROOF MOUNT
10. DUCT MOUNT
11. FIBERGLASS MOTOR COVER
12. HORIZONTAL MOUNTING ANGLES FOR SUSPENDED MOUNTING
13. VERTICAL MOUNTING FEET/ANGLES (FLOOR/CEILING MOUNTING)
14. HORIZONTAL BASE FOR FLOOR MOUNTING
15. VIBRATION ISOLATOR
16. INLET BELL
17. 316 SS INLET GUARD
18. FRP EXPLOSION PROOF
19. INVERTER DUTY MOTOR
20. WEATHER HOOD



POTABLE WATER NOTES:

1. CONTRACTOR SHALL PROVIDE ALL FITTINGS NECESSARY TO CONNECT NEW PIPING TO EXISTING PIPING.
2. GATE VALVES SHALL BE INSTALLED IN CLOSE PROXIMITY TO ALL NEW PLUMBING FIXTURES.
3. INSTALL BACKFLOW PREVENTER SO THAT THE EXISTING DRAIN PIPING CAN BE REUSED. MANUFACTURER SUPPLIED AIR GAP FITTING SHALL BE INSTALLED BETWEEN THE BACKFLOW PREVENTER AND THE DRAIN PIPING.
4. MOUNT WATER HEATER SUCH THAT THE ELEVATION OF THE TOP OF THE WATER HEATER IS BELOW THE SINK ELEVATION AND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

MOUNT HEBRON PUMPING STATION WATER SUPPLY DIAGRAM

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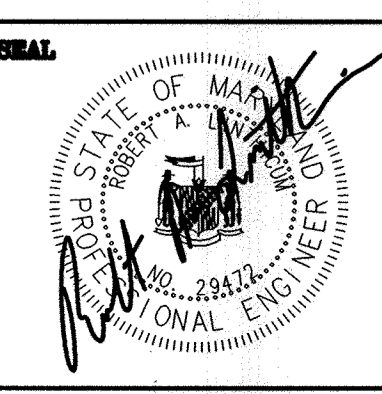
**DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND**

Director of Public Works: [Signature] 4/5/19
 Chief, Bureau of Engineering: [Signature] 4/5/19
 Chief, Bureau of Utilities: [Signature] 4/5/19
 Chief, Utility Division: [Signature] 4/5/19

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT REVISIONS INCLUDED IN 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. 22472. EXPIRATION DATE 9/15/2019

RK&K
 700 EAST PRATT STREET
 SUITE 500
 BALTIMORE, MARYLAND 21202



DES: DAO	DRN: NAF	CHK: RAL	DATE: 4/02/19
RK&K 1	2019 UPGRADES - ADD SHEET 11A	4/19	
BY NO.	REVISIONS	DATE	

MISCELLANEOUS DETAILS AND SCHEDULES
 MOUNT HEBRON SPS - 2019 UPGRADES
 MAP NO. 17 BLOCK NO. 8

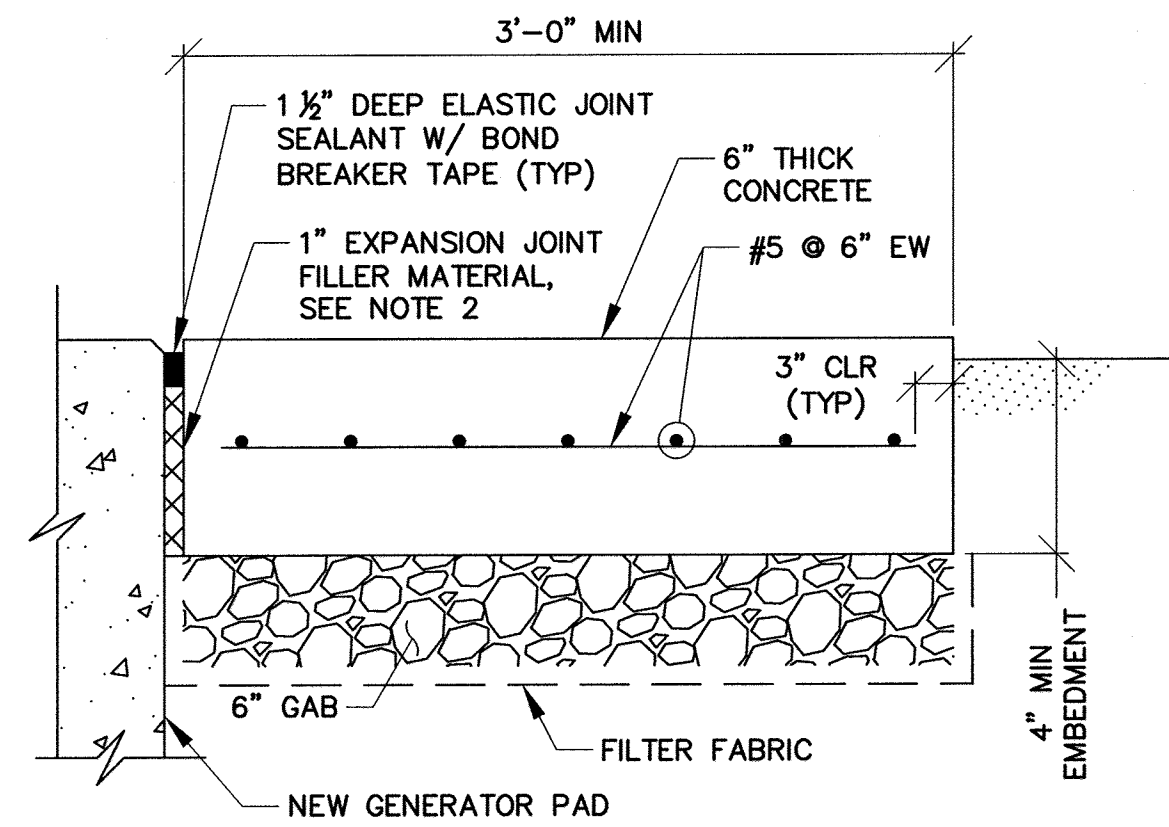
**MOUNT HEBRON SEWER MAINS
2019 UPGRADES**
 CAPITAL PROJECT NO. S6600
 CONTRACT NO. 745-S
 ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

SCALE NTS
 SHEET 11A OF 25

RK21315 - K:\Projects\2019\19154_HoCoSMA\Task 9 - Miscellaneous Pumping Stations\Mount Hebron SPS\Cadd\Plan\Proposed\19154SMA-PS-011A-UP-11A.dwg Apr 02, 2019 - 1:12pm Plot Scale 1:1

NOTES:

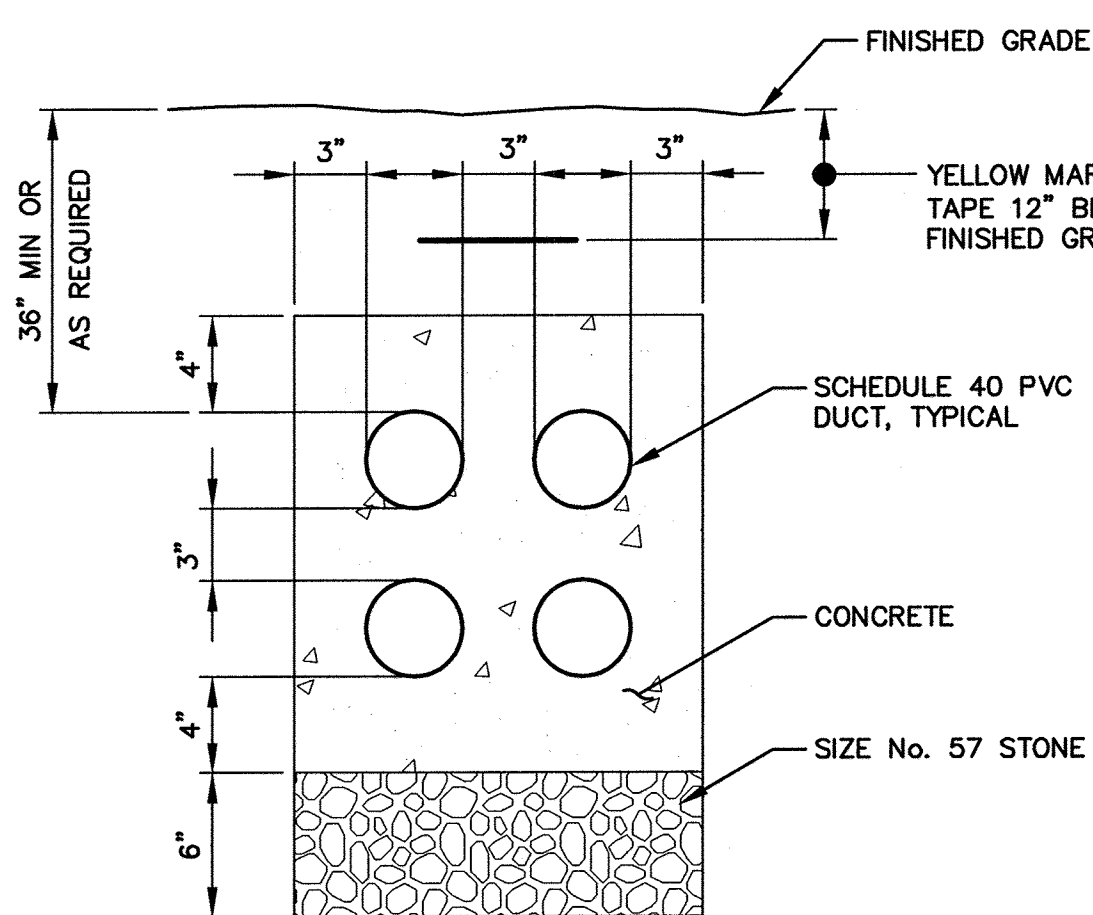
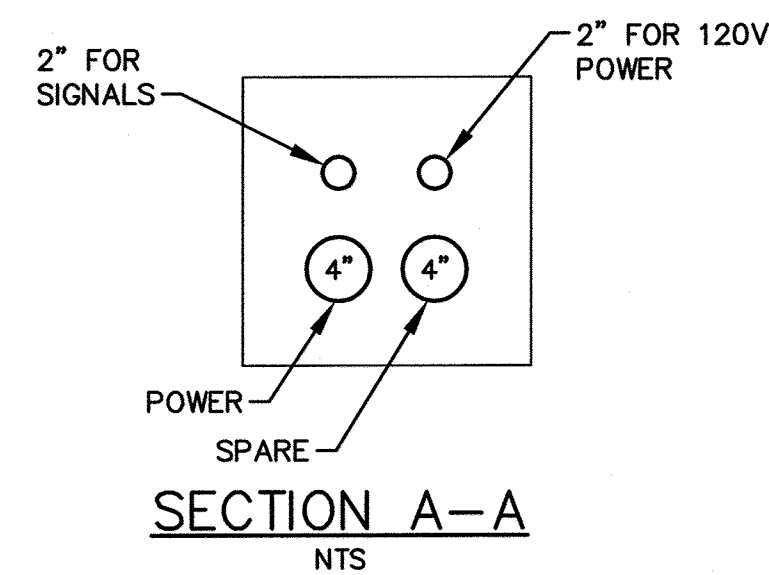
1. ALL EXISTING FEATURES DENOTED BY SLANTED TEXT.
2. THE LOCATIONS OF ALL UNDERGROUND UTILITIES AS SHOWN HEREON ARE BASED ON ABOVE GROUND FIELD OBSERVATIONS AND RECORD DRAWINGS. ADDITIONAL BURIED UTILITIES OR STRUCTURES MAY BE ENCOUNTERED. NO EXCAVATIONS WERE MADE TO LOCATE BURIED UTILITIES/STRUCTURES. ALL SUBSURFACE UTILITIES/STRUCTURES SHOWN ARE TO BE CONSIDERED APPROXIMATE LOCATION ONLY. UNDERGROUND UTILITIES MUST BE VERIFIED BY TEST PITS.
3. ALL DISTURBED AREAS SHALL BE GRADED, SEEDED AND LANDSCAPED TO RESTORE ALL PROPERTY TO ITS ORIGINAL, UNDISTURBED CONDITION.
4. GENERATOR ENCLOSURE SHALL BE SUFFICIENTLY WEATHER-PROTECTIVE TO ENSURE THE GENERATOR WILL OPERATE AS INTENDED DURING INCLEMENT WEATHER, AND SHALL PROVIDE THE STRICTEST POSSIBLE SOUND-ATTENUATION LEVEL POSSIBLE FOR THE PARTICULAR GENERATOR MODEL FURNISHED IN ACCORDANCE WITH SPECIFICATION SECTION 16700.



- NOTES:
1. CONCRETE PAD TO CONTAIN #5 @ 6" EACH WAY, CENTERED VERTICALLY.
 2. EXPANSION JOINTS TO BE A MINIMUM DEPTH OF 1/4" THE WALKWAY THICKNESS.

CONCRETE WALKWAY DETAIL

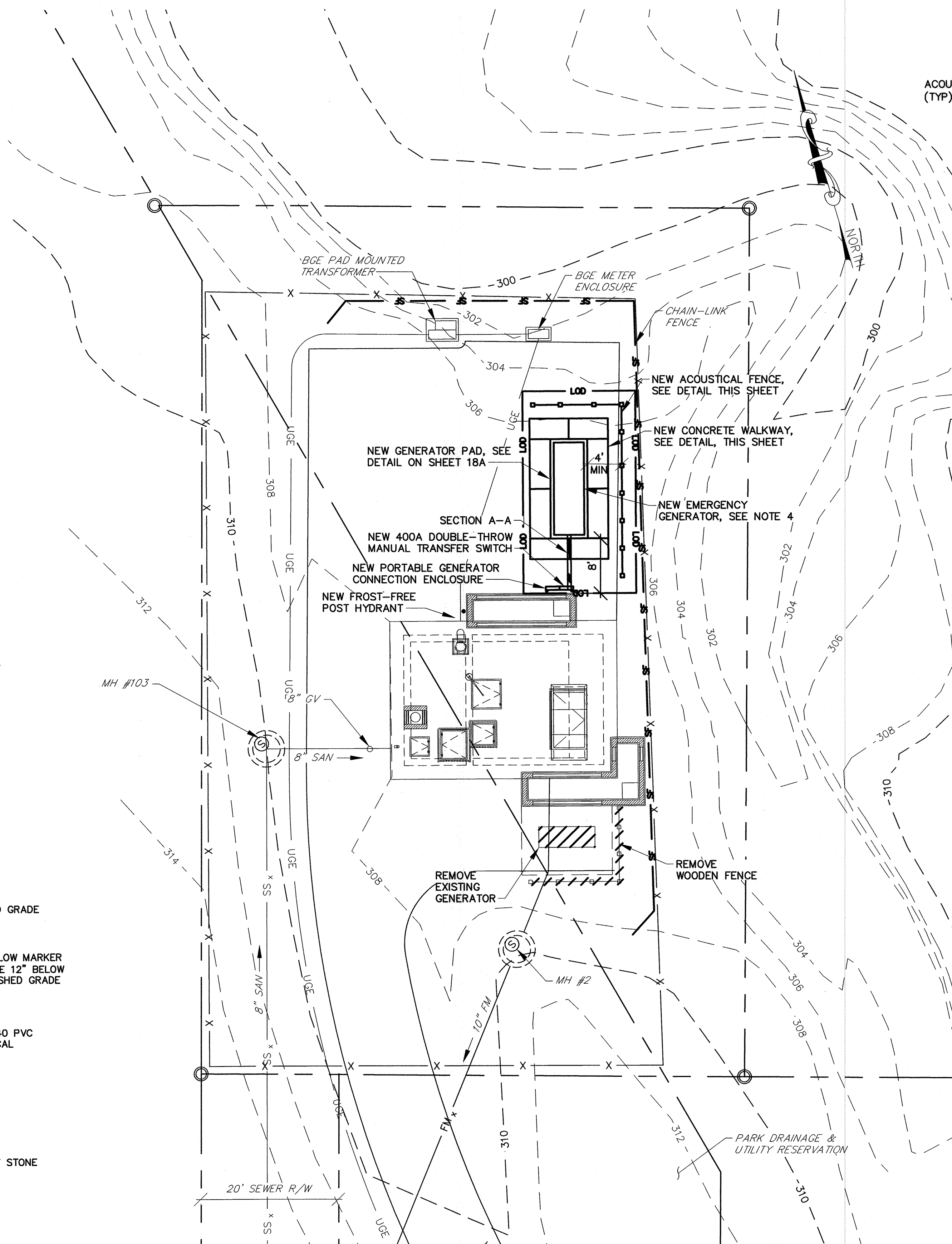
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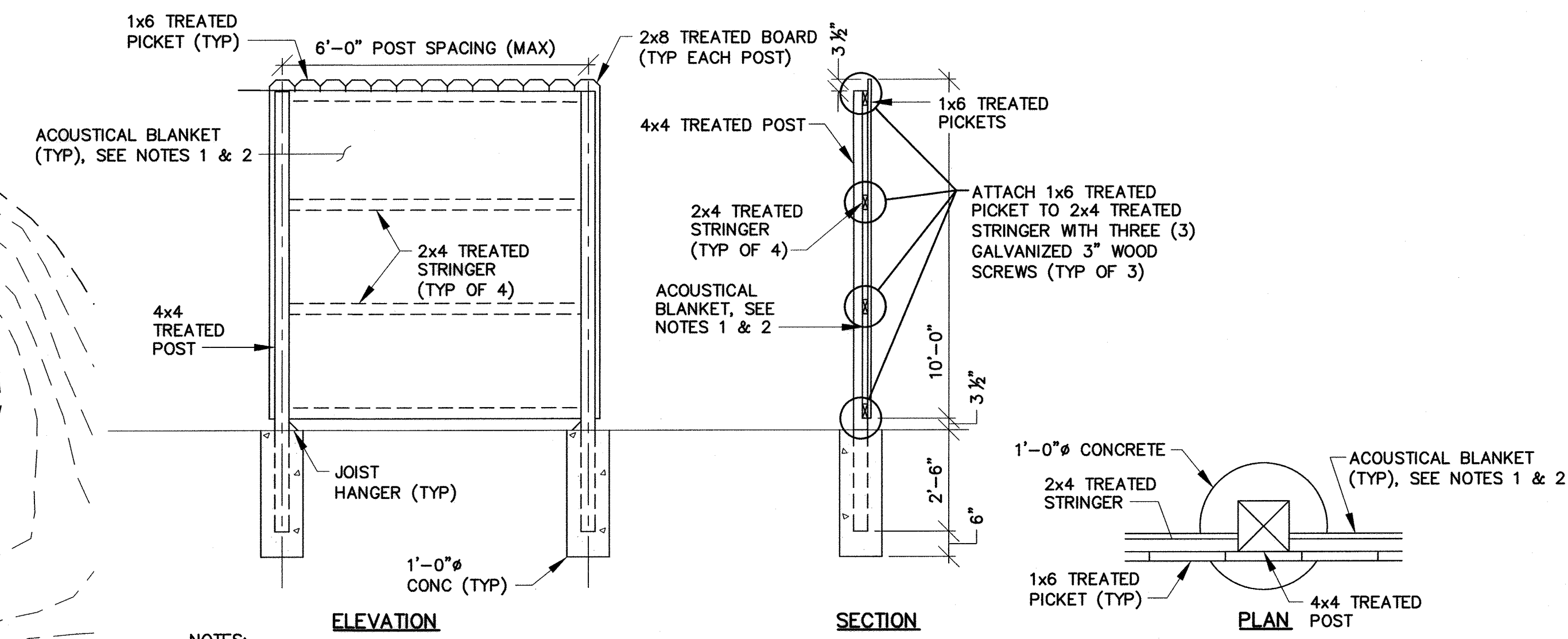
- NOTE:
1. REPAIR PAVEMENT ABOVE DUCTBANK IN ACCORDANCE WITH DETAIL G-4.01-UTILITY TRENCH ROADWAY REPAVING, HOWARD COUNTY DESIGN MANUAL, VOLUME IV.

TYPICAL CONCRETE ENCASED DUCTBANK DETAIL

NTS



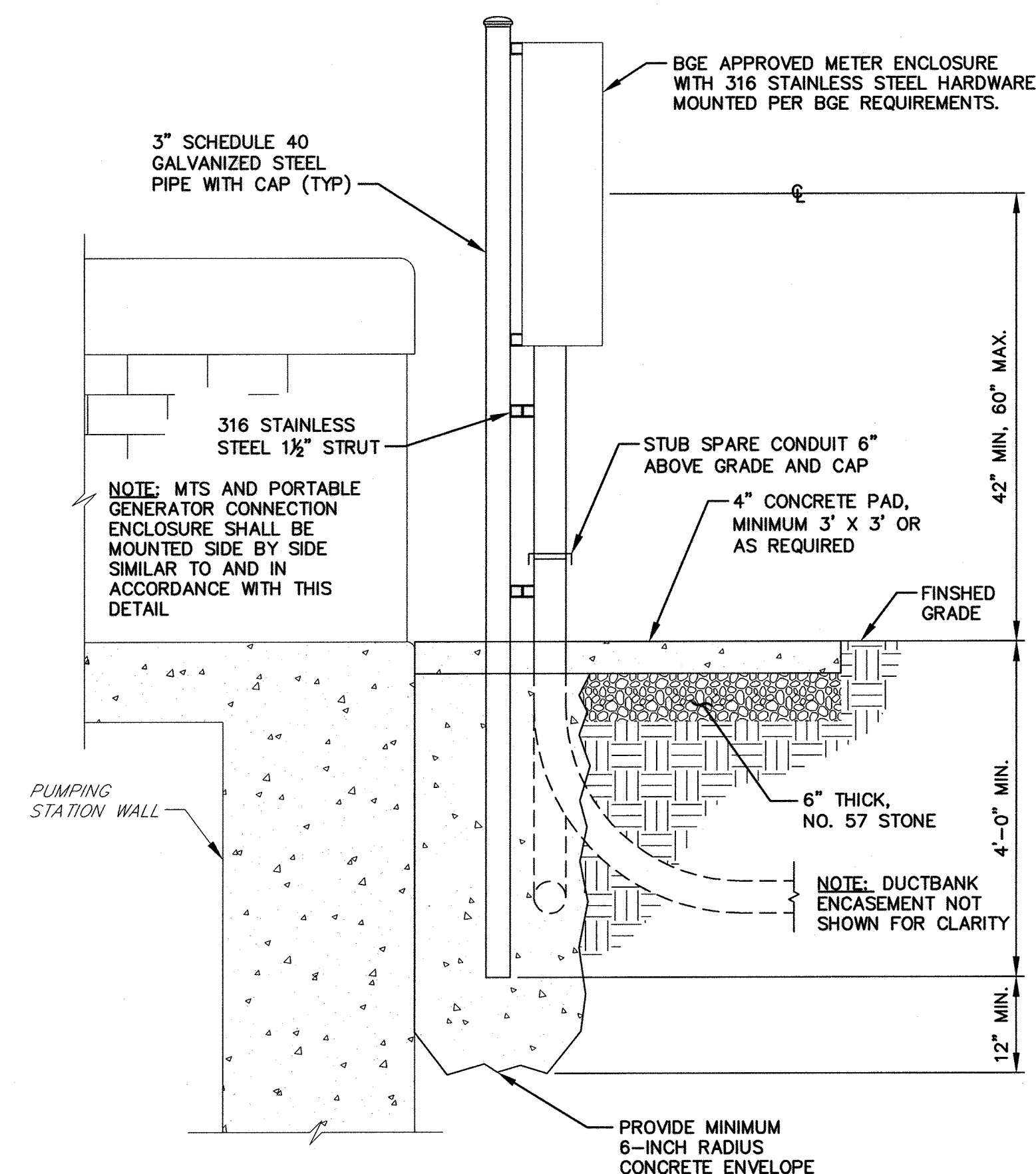
SITE IMPROVEMENT PLAN
SCALE: 1"=10'



- NOTES:
1. ACOUSTICAL BLANKETS SHALL BE ABC-13EXT AUDIOSEAL EXTERIOR SOUND BLANKET, AS MANUFACTURED BY ACOUSTICAL SOLUTIONS, INC., OR APPROVED EQUAL.
 2. ACOUSTICAL BLANKETS SHALL BE ATTACHED TO THE FENCE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

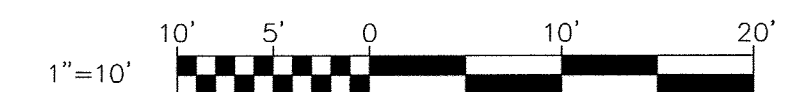
ACOUSTICAL WOODEN FENCE DETAIL

NTS



ENCLOSURE/SWITCH MOUNTING DETAIL

NTS



RK21315 - K:\Projects\2012\12154_H66080A\Task 9 - Miscellaneous Pumping Stations\Patapsco Park PS\Cadd\Plans\Proposed\12154MPS-012A-02-12A.dwg Apr 02, 2019 - 1:09pm Plot Scale: 1:1

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

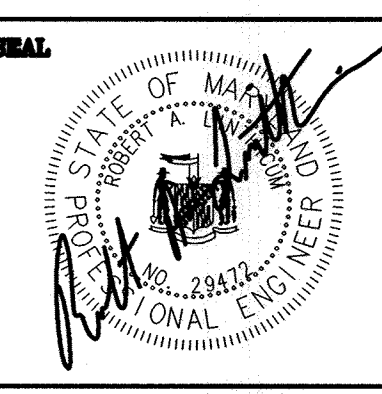
Randy De... 4/19
 DIRECTOR OF PUBLIC WORKS DATE
... 4-5-19
 CHIEF, BUREAU OF UTILITIES DATE

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT REVISIONS INCLUDED IN 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. 29472 EXPIRATION DATE 9/15/2019

RK&K 700 EAST PRATT STREET SUITE 500 BALTIMORE, MARYLAND 21202



DES:	DAO			
DRN:	NAP			
CHK:	RAL			
DATE:	4/02/19	RK&K 1	2019 UPGRADES - ADD SHEET 12A	4/19
BY:	NO.		REVISIONS	DATE

PATAPSCO PARK SPS
SITE DEVELOPMENT PLAN -
2019 UPGRADES

MOUNT HEBRON SEWER MAINS
2019 UPGRADES
CAPITAL PROJECT NO. S6600
CONTRACT NO. 745-S

SCALE
AS SHOWN
SHEET
12A OF 25

MAP NO. 17 BLOCK NO. 8 ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

DESIGN CRITERIA

- A. STRUCTURAL DESIGN SHALL BE IN ACCORDANCE WITH THE GOVERNING PROVISIONS OF THE FOLLOWING CODE, STANDARDS AND SPECIFICATIONS:
 1. INTERNATIONAL BUILDING CODE (IBC) 2015
 2. ASCE 7-10 MIN. DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.
 3. ACI 318-14 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE.
 4. ACI 350-06 CODE REQUIREMENTS FOR ENVIRONMENTAL CONCRETE STRUCTURES.
 5. ACI 530-13 BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.
 6. AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, A.S.D., 14TH EDITION
 7. AWS D1.1 "STRUCTURAL WELDING CODE - STEEL"
 8. AWS D1.6 "STRUCTURAL WELDING CODE - STAINLESS STEEL"

EXISTING CONSTRUCTION

- A. ALL MEMBER SIZES AND DIMENSIONS AND ELEVATIONS OF EXISTING STRUCTURES SHOWN ON THE DRAWINGS ARE OBTAINED FROM AVAILABLE SOURCES, AND ARE NOT GUARANTEED TO BE TRUE AND EXACT. THE CONTRACTOR SHALL VERIFY THESE DIMENSIONS AND ELEVATIONS BY ACTUAL FIELD MEASUREMENTS PRIOR TO FABRICATION OF ANY MATERIALS AND START OF WORK, AND REPORT ANY DISCREPANCIES TO THE ENGINEER.
- B. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY SHORING, SUPPORT, NEEDLING AND BRACING AS REQUIRED TO SUPPORT THE EXISTING STRUCTURE. THE CONTRACTOR SHALL EXAMINE THE EXISTING STRUCTURE TO DETERMINE THE EXTENT OF THE NECESSARY SHORING/NEEDLING. THE CAPACITY AND METHOD FOR SHORING AND NEEDLING SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

DEMOLITION

- A. REMOVE EXISTING CONSTRUCTION AS SHOWN ON 2018 UPGRADE PLANS. SEE PLANS, SECTIONS, AND DETAILS FOR EXTENT OF STRUCTURE TO BE REMOVED.
- B. EXISTING STRUCTURAL FRAMING SHALL REMAIN UNLESS SPECIFICALLY NOTED ON PLAN TO BE REMOVED.
- C. IF FIELD CONDITIONS DIFFER FROM THOSE SHOWN ON DRAWINGS, NOTIFY ENGINEER BEFORE PROCEEDING.
- D. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO EXAMINE THE EXISTING BUILDING DURING THE COURSE OF CONSTRUCTION AND IMMEDIATELY NOTIFY THE ENGINEER OF ANY AREAS WHERE THE STRUCTURE EXHIBITS DISTRESS OR FAILURE.
- E. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SATISFY HIMSELF AS TO THE LOCATION OF ANY UTILITIES IN THE IMMEDIATE VICINITY OF CONSTRUCTION SO AS TO PREVENT DAMAGE TO THEM. SHOULD ANY DAMAGE TO SUCH UTILITIES OCCUR, THE CONTRACTOR SHALL BE REQUIRED TO REPAIR SUCH DAMAGE AT HIS OWN EXPENSE AND TO THE SATISFACTION OF THE OWNER.

MASONRY

- A. DESIGN CRITERIA: ACI 530-13/ASCE 5-13
- B. CONCRETE MASONRY UNITS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 1900 PSI ON THE NET AREA AND SHALL CONFORM TO THE LATEST EDITION OF ASTM C90.
- C. TYPE "M" MORTAR SHALL BE USED FOR ALL BELOW GRADE MASONRY CONSTRUCTION. TYPE "S" ABOVE GRADE.
- D. GROUT: ASTM C476, MIN. 3,000 PSI @ 28 DAYS, 3/8" AGGREGATE MAX., 8"-10" SLUMP.
- E. REINFORCEMENT:
 1. HORIZONTAL JOINTS: STD. DUR-O-WALL @ 16" O.C. USE PREFABRICATED CORNERS AND TEES @ WALL INTERSECTIONS, OVERLAP DISCONTINUED ENDS AND EXTEND INTO COLUMNS 6" MIN.
 2. VERTICAL AND HORIZONTAL REINFORCEMENT: ASTM 615, GRADE 60, EPOXY COATED, PROVIDE MIN. #4 BARS TYP @ WALL INTERSECTIONS, EACH SIDE OF OPENINGS, AND @ WALL ENDS, HOOK TOP OF ALL DISCONTINUED BARS, LAP CONT. REINF 48 BAR DIA. UNO.
 3. USE BAR SPACERS IN EVERY 4TH COURSE WHERE CELLS ARE TO BE GROUTED.
- F. PROVIDE CLEANOUT OPENINGS FOR EACH GROUTED CELL.
- G. ALL BRICK SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2,500 PSI ON THE NET AREA AND CONFORM TO ASTM C62.

CAST-IN-PLACE REINFORCED CONCRETE

- A. ALL CONCRETE WORK SHALL CONFORM TO ACI-350-06 CODE REQUIREMENTS FOR ENVIRONMENTAL CONCRETE STRUCTURES.
- B. MINIMUM 28 DAY COMPRESSIVE STRENGTH, MAX WATER TO CEMENTITIOUS MATERIAL RATIOS & AGGREGATE SIZE:
 - PADS & SLABS: 4,500 PSI, NORMAL WEIGHT, W/C=0.42, #57 AGGREGATE, UNLESS OTHERWISE NOTED.
 - SLUMP 3" MAX FOR CONCRETE PADS, UNLESS OTHERWISE NOTED.
- C. REINFORCING STEEL SHALL CONFORM TO ASTM A-615, GRADE 60, EPOXY COATED.
- D. CHAMFER ALL EDGES OF BEAMS, COLUMNS, HAUNCHES, WALLS EQUIPMENT PADS AND SLABS EXPOSED TO VIEW 3/4" UNLESS OTHERWISE NOTED.
- E. ALL GROUT SHALL BE NON-SHRINK GROUT WITH A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI.

REINFORCEMENT

- A. ALL DEVELOPMENT AND SPLICES OF REINFORCEMENT SHALL CONFORM TO THE PROVISIONS OF ACI BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318-LATEST EDITION).
- B. REINFORCING STEEL SHALL BE DEFORMED BARS OF INTERMEDIATE GRADE NEW BILLET STEEL CONFORMING TO CURRENT REQUIREMENTS OF ASTM A615 GRADE 60, EPOXY COATED EXCEPT TIES MAY BE GRADE 40. ALL HOOKS SHALL BE STANDARD HOOKS, UNLESS OTHERWISE NOTED.
- C. REINFORCING BAR SUPPORTS AND SPACERS SHALL CONFORM TO ACI 315-(LATEST EDITION) DETAILING MANUAL.
- D. SHOP DRAWINGS SHOWING ALL NECESSARY SECTIONS AND DETAILS FOR THE PROPER POSITIONING OF ALL REINFORCING STEEL SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW BEFORE FABRICATION OR PLACEMENT OF THE STEEL.
- E. ALL REINFORCEMENT SHALL HAVE 3" COVER UNLESS OTHERWISE NOTED.

BRICK/CMU WALL REPAIR

- A. REMOVE AND REPLACE BRICK/CMU WHICH IS CHIPPED, BROKEN, OR OTHERWISE DAMAGED TO MATCH EXISTING SIZE AND COLOR. RE-POINT LOOSE BRICK/CMU.
- B. WET THE BRICK UNITS AS NECESSARY TO PROVIDE A BETTER BONDING BETWEEN BRICK AND MORTAR PRIOR TO INSTALLATION. DO NOT WET CONCRETE MASONRY UNITS.
- C. FOR BRICK/CMU INSTALLATION, ALL JOINTS BETWEEN BRICK/CMU SHALL BE COMPLETELY FILLED WITH MORTAR. BED JOINT SHALL BE FORMED OF A THICK LAYER OF SMOOTH OR SLIGHTLY FURROWED MORTAR, APPLIED TO THE UNITS PREVIOUSLY LAID WITH BRICK/CMU, THEN SHOVE IN PLACE. CROSS JOINTS SHALL BE FORMED BY APPLYING TO THE BRICK/CMU TO BE LAID. A FULL COAT OF MORTAR ON THE ENTIRE END OR THE ENTIRE SIDE AND THEN SHOVING COVERED END AND/OR SIDE OF THE BRICK/CMU TIGHTLY AGAINST THE BRICK/CMU PREVIOUSLY LAID.
- D. AT THE AREAS WITH DEFECTIVE JOINTS AND/OR LOOSE MORTAR FROM THE JOINTS BETWEEN BRICK/CMU, COURSES MAY BE REPAIRED BY RE-POINTING OR TUCK POINTING WITH FILLING IN WITH FRESH MORTAR.
- E. CLEANING OF BRICK/CMU UNITS SHALL BE PER MANUFACTURER AND/OR ENGINEER'S RECOMMENDATIONS AND SHALL COMPLY WITH NOMA REQUIREMENTS.
- F. USE MORTAR AS PER ASTM C270 REQUIREMENTS.

STRUCTURAL STEEL

- A. ALL STRUCTURAL STEEL SHALL CONFORM TO THE AISC SPECIFICATIONS FOR THE DESIGN FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS.
- B. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS:
 - STRUCTURAL STEEL W-SHAPES: A992 HAVING A MINIMUM YIELD STRENGTH OF 50 KSI.
 - STRUCTURAL STEEL ANGLES: A36 HAVING A MINIMUM YIELD STRENGTH OF 36 KSI.
 - SQUARE AND RECTANGULAR TUBING: A500, GRADE B HAVING MINIMUM YIELD STRENGTH OF 46 KSI.
 - ROUND PIPE: A53, GRADE B HAVING A MINIMUM YIELD STRENGTH OF 35 KSI.
- C. APPROVAL OF THE ENGINEER SHALL BE MANDATORY FOR THE USE OF CUTTING TORCH IN THE FIELD.
- D. ALL GROUT UNDER STEEL PLATES (INTELS) SHALL BE NON-SHRINK "PRE-MIX" TYPE AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI, UNLESS OTHERWISE NOTED.
- E. STRUCTURAL STEEL SHALL BE INSPECTED IN THE FIELD BY AN INDEPENDENT TESTING AGENCY APPROVED BY THE ENGINEER AND PAID FOR BY THE CONTRACTOR.

ALUMINUM STRUCTURAL SHAPES

- A. ALUMINUM STRUCTURAL SHAPES SHALL BE ASTM B-308, 6061T6.
- B. ALLOWABLE TOLERANCES FOR MILLED ALUMINUM STANDARD STRUCTURAL SHAPES SHALL BE IN ACCORDANCE WITH ANSI H35.2. COMPLY WITH THE ALUMINUM DESIGN MANUAL (ADM-1) LATEST EDITION.
- C. ALUMINUM SURFACES IN CONTACT WITH CONCRETE AND ANY OTHER MATERIAL SHALL BE GIVEN A HEAVY COAT OF ALKALI RESISTANT BITUMINOUS PAINT OR OTHER COATING PROVIDING EQUIVALENT PROTECTION BEFORE INSTALLATION.

MISCELLANEOUS

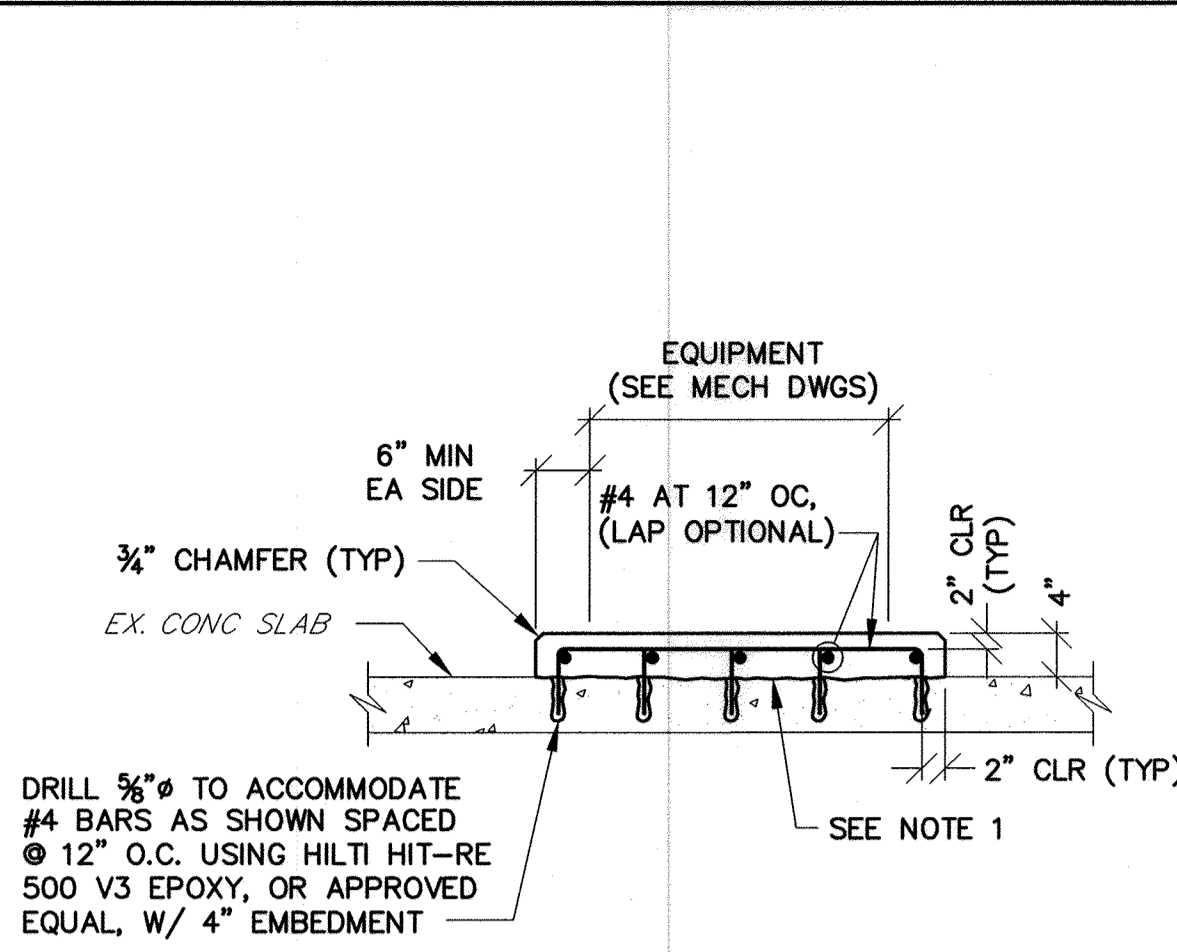
- A. ALL EXISTING FEATURES DENOTED BY SLANTED TEXT.
- B. ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE.
- C. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND TRANSPORTATION INTACT OF ALL DEMOLISHED EQUIPMENT.
- D. ALL OPENINGS THRU CONCRETE SHALL BE WATERTIGHT.
- E. CONTRACTOR SHALL COORDINATE ALL REQUIRED OPENINGS WITH IMPROVEMENT DRAWINGS.
- F. CONTRACTOR SHALL COORDINATE FINAL SIZES AND LOCATIONS OF ALL OPENINGS WITH THE ACTUAL FIELD.

SPECIAL INSPECTION

- A. SPECIAL INSPECTIONS IBC 1704.2
- B. STEEL CONSTRUCTION IBC 1705.2
- C. CONCRETE CONSTRUCTION IBC 1705.3
- D. MASONRY CONSTRUCTION IBC 1705.4

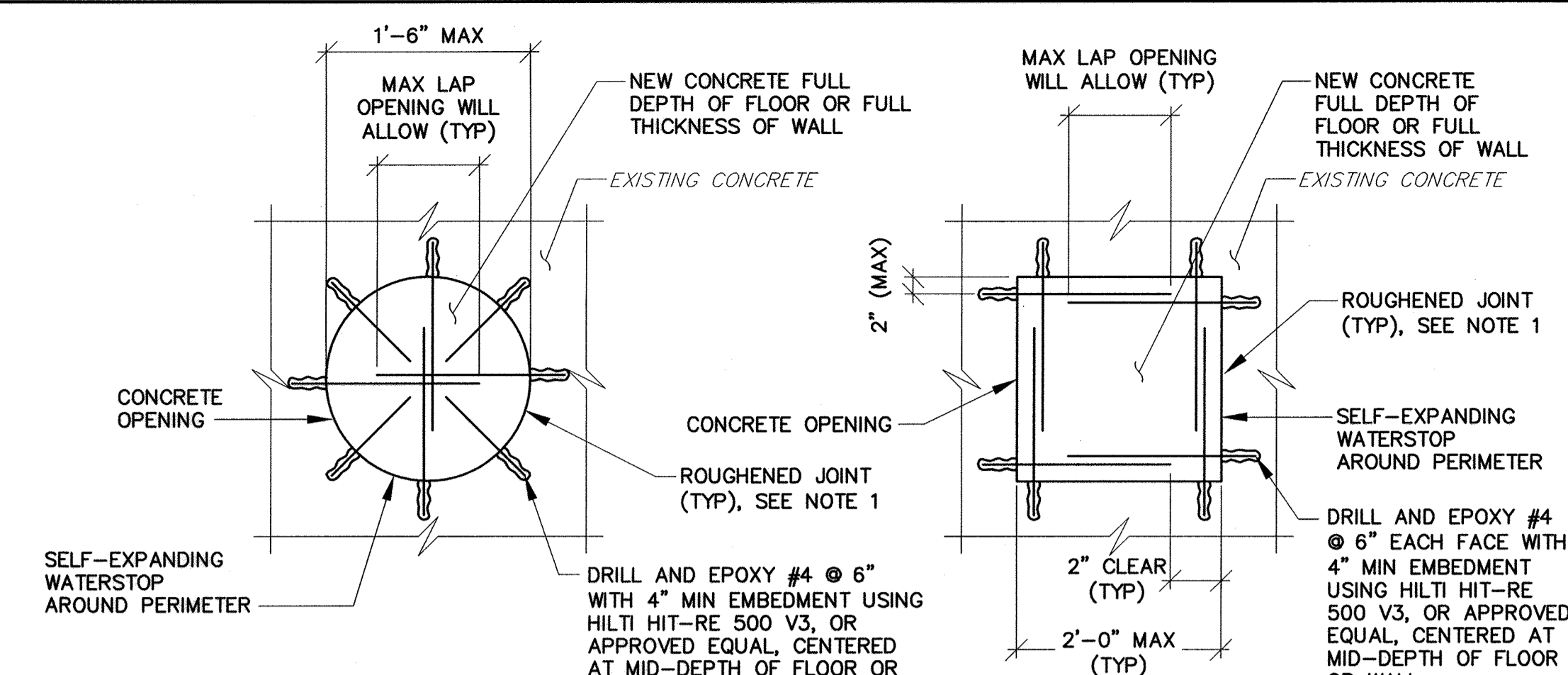
STAINLESS STEEL SPECIFICATIONS

- A. ALL STRUCTURAL STEEL SHALL BE AS FOLLOWS:
 1. STRUCTURAL STEEL SHAPES SHALL BE ASTM 276, TYPE 316L WITH A MINIMUM YIELD OF 42 KSI.
 2. STAINLESS STEEL PLATES SHALL BE ASTM A666, TYPE 316L.
 3. ALL BOLTS SHALL BE ASTM F593 STAINLESS STEEL TYPE 316, GRADE B8, ALL NUTS SHALL BE ASTM F594 STAINLESS STEEL GRADE B8, AND ALL WASHERS SHALL BE ASTM F352 STAINLESS STEEL.
- B. ALL STAINLESS STEEL SHALL BE #4 INDUSTRIAL FINISH.
- C. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING:
 1. "AMERICAN WELDING SOCIETY" (AWS) D1.1 "STRUCTURAL" WELDING CODE - STEEL, LATEST EDITION.
 2. AWS D1.6 "STRUCTURAL WELDING CODE - STAINLESS STEEL", LATEST EDITION

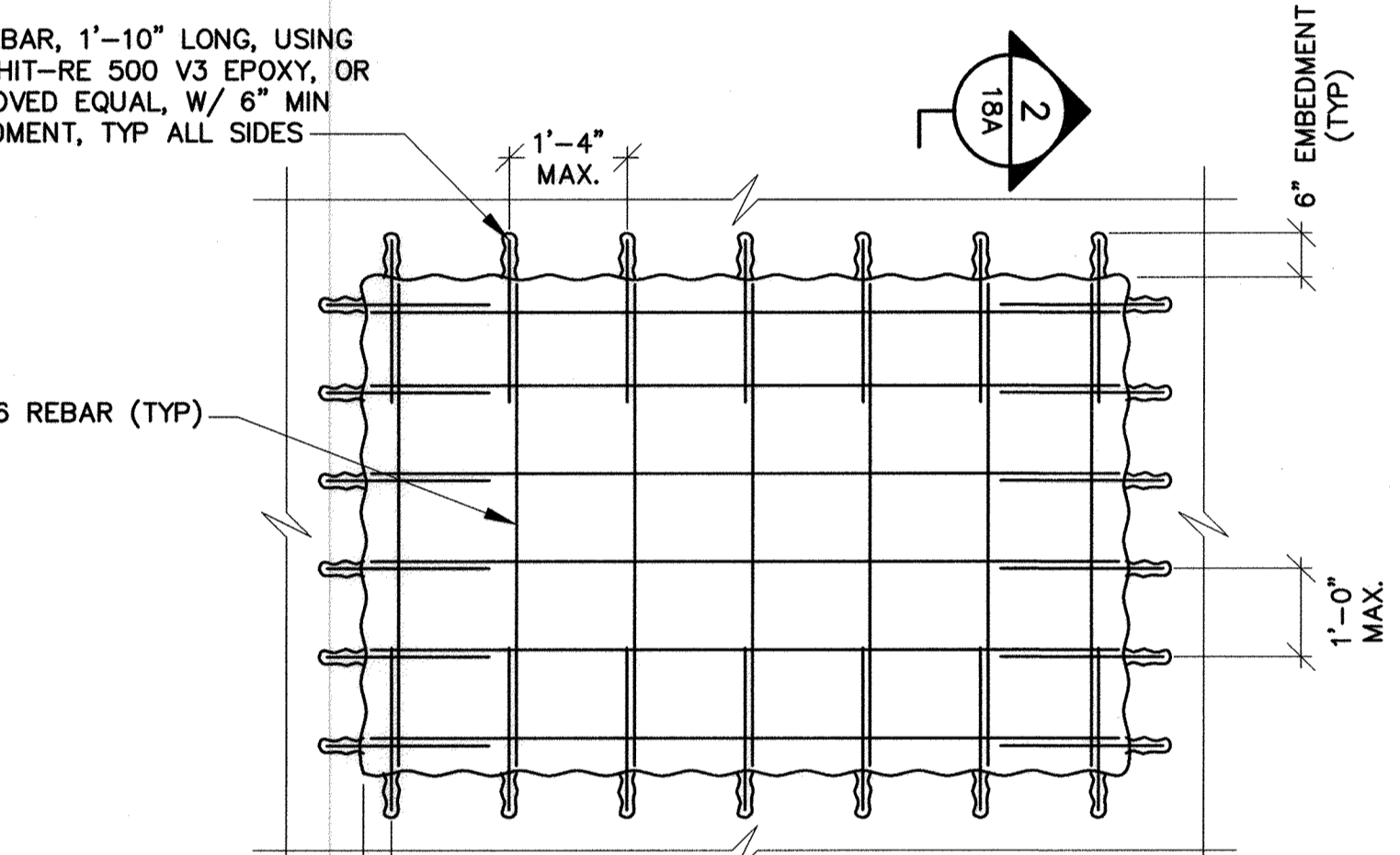


- NOTES:**
1. SURFACE OF EXISTING CONCRETE AT THE PAD LOCATION SHALL BE ROUGHENED TO A FULL AMPLITUDE OF 1/4" AND SCRUBBED WITH A COARSE WIRE BRUSH TO REMOVE ALL LAITANCE. APPLY SIMPSON STRONG-TIE FX-752 EPOXY BONDING AGENT, OR APPROVED EQUAL, BETWEEN EXISTING AND NEW CONCRETE, IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
 2. COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 4,500 psi AT 28 DAYS.

TYPICAL CONCRETE PATCH DETAIL NTS

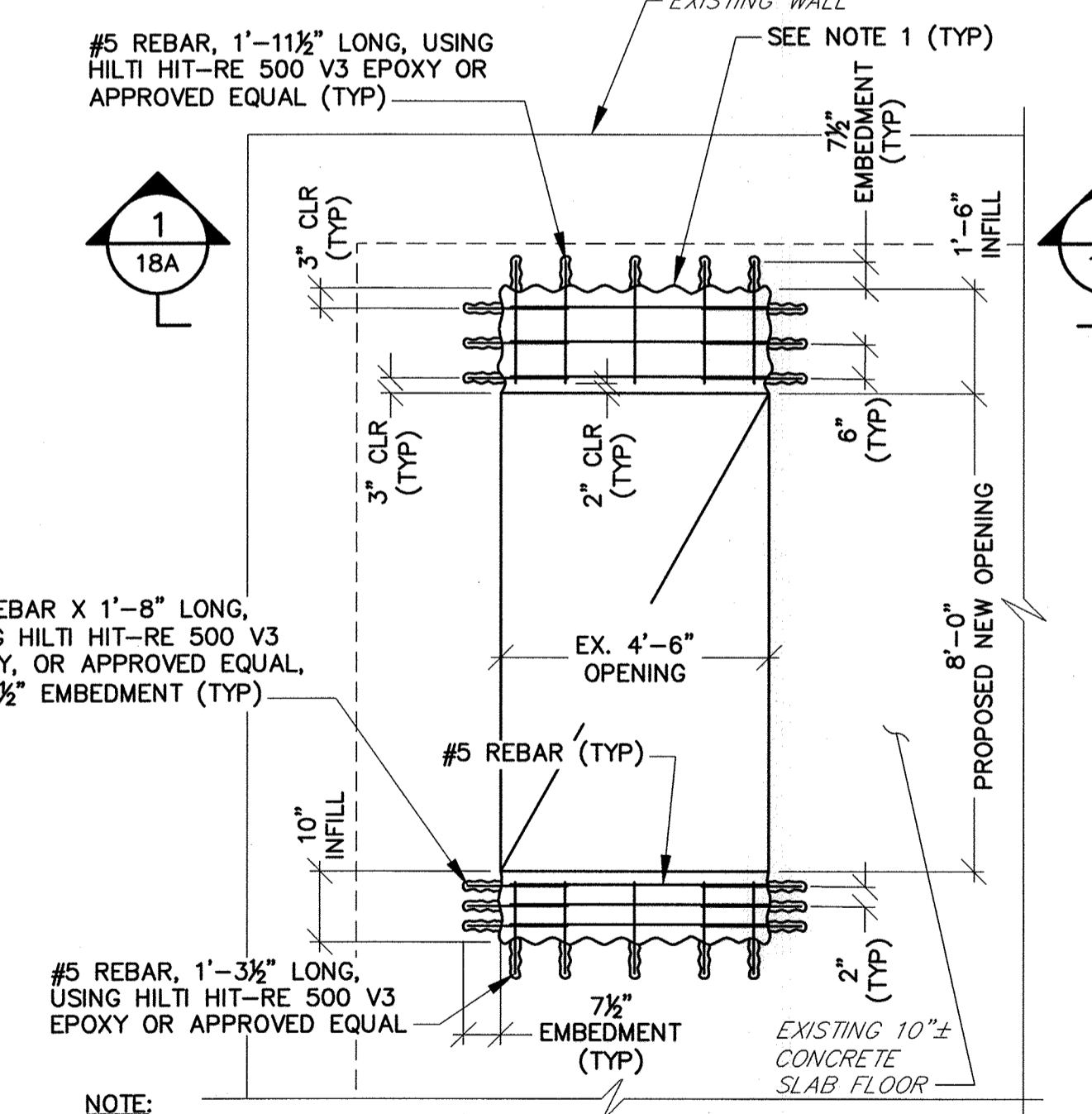


- NOTES:**
1. SURFACE OF EXISTING CONCRETE SHALL BE ROUGHENED TO A FULL AMPLITUDE OF 1/4" AND SCRUBBED WITH A COARSE WIRE BRUSH TO REMOVE ALL LAITANCE AND TO PROVIDE A ROUGHENED SURFACE FOR BONDING NEW CONCRETE TO EXISTING CONCRETE. APPLY SIMPSON STRONG-TIE FX-752 EPOXY BONDING AGENT, OR APPROVED EQUAL, IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. EPOXY BONDING AGENT SHALL BE "SIKADUR 32, HI MOD" OR APPROVED EQUAL.
 2. COMPRESSIVE STRENGTH OF THE CONCRETE SHALL BE 4,500 PSI AT 28 DAYS.

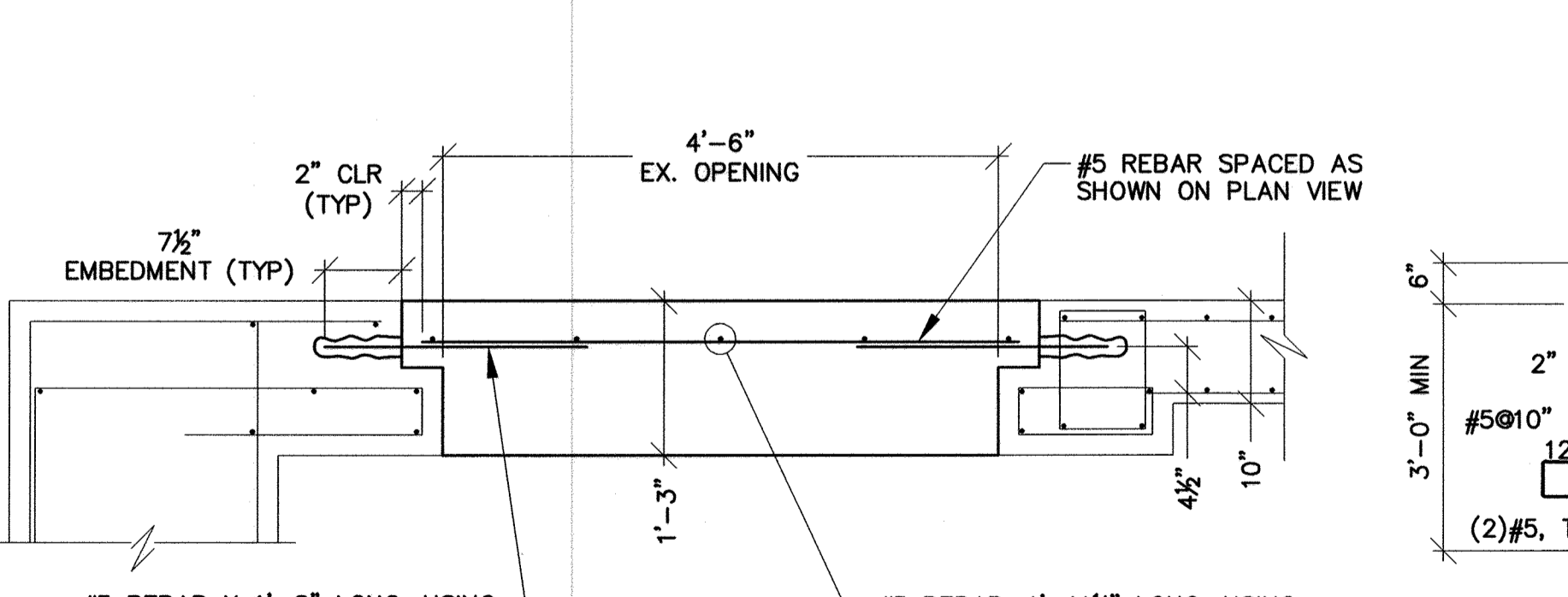


- NOTE:**
1. USE fc = 4,500 psi

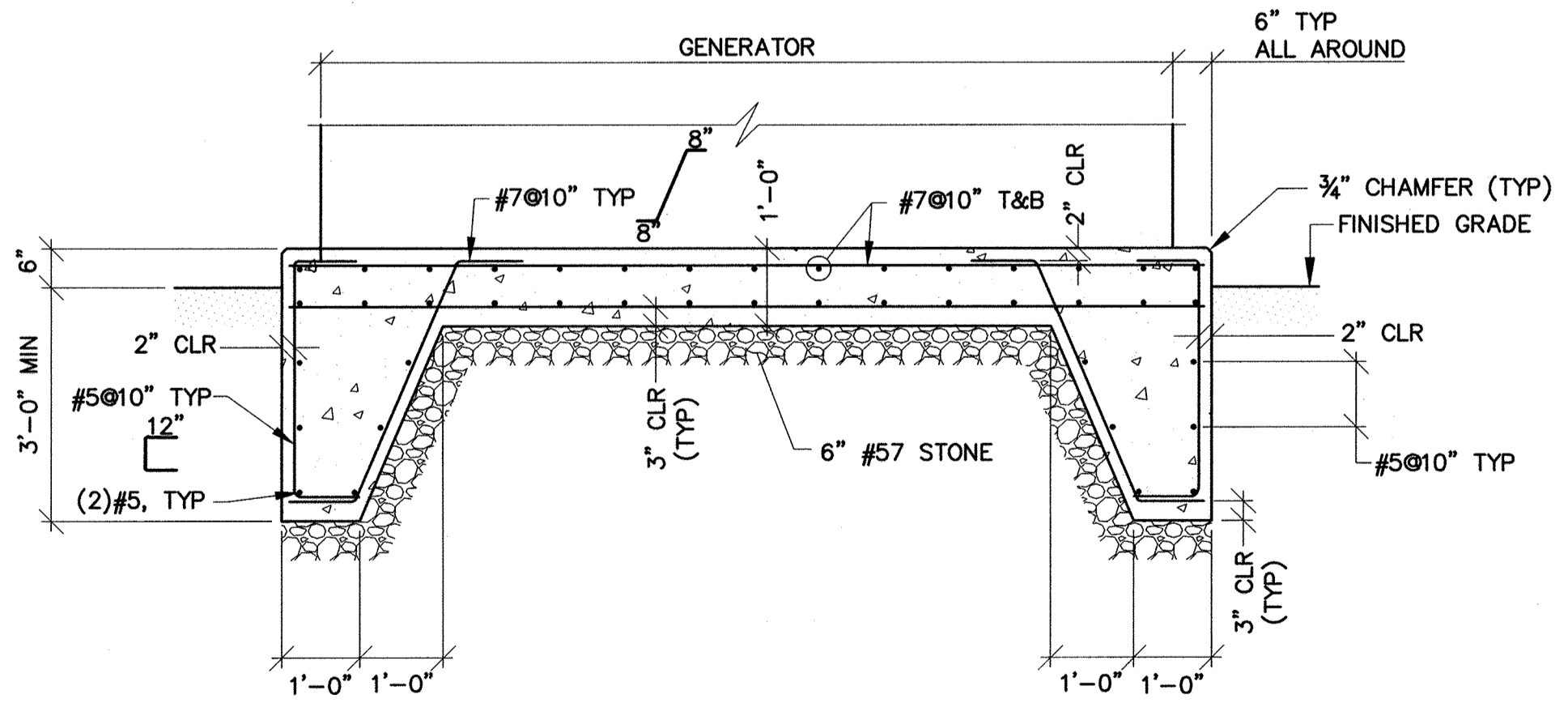
TOP SLAB OPENING MODIFICATION DETAIL NTS



- NOTE:**
1. SURFACE OF EXISTING CONCRETE TO RECEIVE NEW 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 SIMPSON STRONG-TIE FX-752 EPOXY BONDING AGENT, OR APPROVED EQUAL, IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.



- NOTE:**
1. USE fc = 4,500 psi



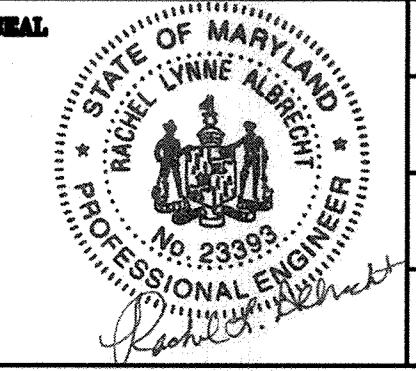
- NOTE:**
1. SEE MECH DWGS. FOR MORE INFORMATION.
 2. THIS SECTION WILL APPLY TO ENTIRE PERIMETER OF THE WALL OPENING TO BE INFILLED.
 3. SURFACE OF EXISTING CONCRETE SHALL BE ROUGHENED TO A FULL AMPLITUDE OF 1/4" AND SCRUBBED WITH A COARSE WIRE BRUSH TO REMOVE ALL LAITANCE AND TO PROVIDE A ROUGHENED SURFACE FOR BONDING NEW CONCRETE TO EXISTING CONCRETE. APPLY SIMPSON STRONG-TIE FX-752 EPOXY BONDING AGENT, OR APPROVED EQUAL, IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

R0221315 - K:\projects\2012\2154_Hc6080AA\Task 9 - Miscellaneous Pumping Stations\Patapoco Park_PSD\Cadd\Plans\Proposed\13154MHPS-018A-S-18A.dwg Apr 02, 2019 - 1:09pm Plot Scale: 1:1

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* 4/5/19
 Chief, Bureau of Engineering: *[Signature]* 4/5/19
 Chief, Bureau of Utilities: *[Signature]* 4/5/19
 Chief, Utility Division: *[Signature]* 4/5/19

PROFESSIONAL CERTIFICATION
 I HEREBY CERTIFY THAT REVISIONS INCLUDED IN 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. 23393 EXPIRATION DATE 8/26/20
ALBRECHT ENGINEERING INC



DES: RCC	DRN: NAF	CHK: RLA	DATE: 4/02/19
RK&K 1	2019 UPGRADES - ADD SHEET 18A	4/19	
BY NO.	REVISIONS	DATE	MAP NO. 17 BLOCK NO. 8

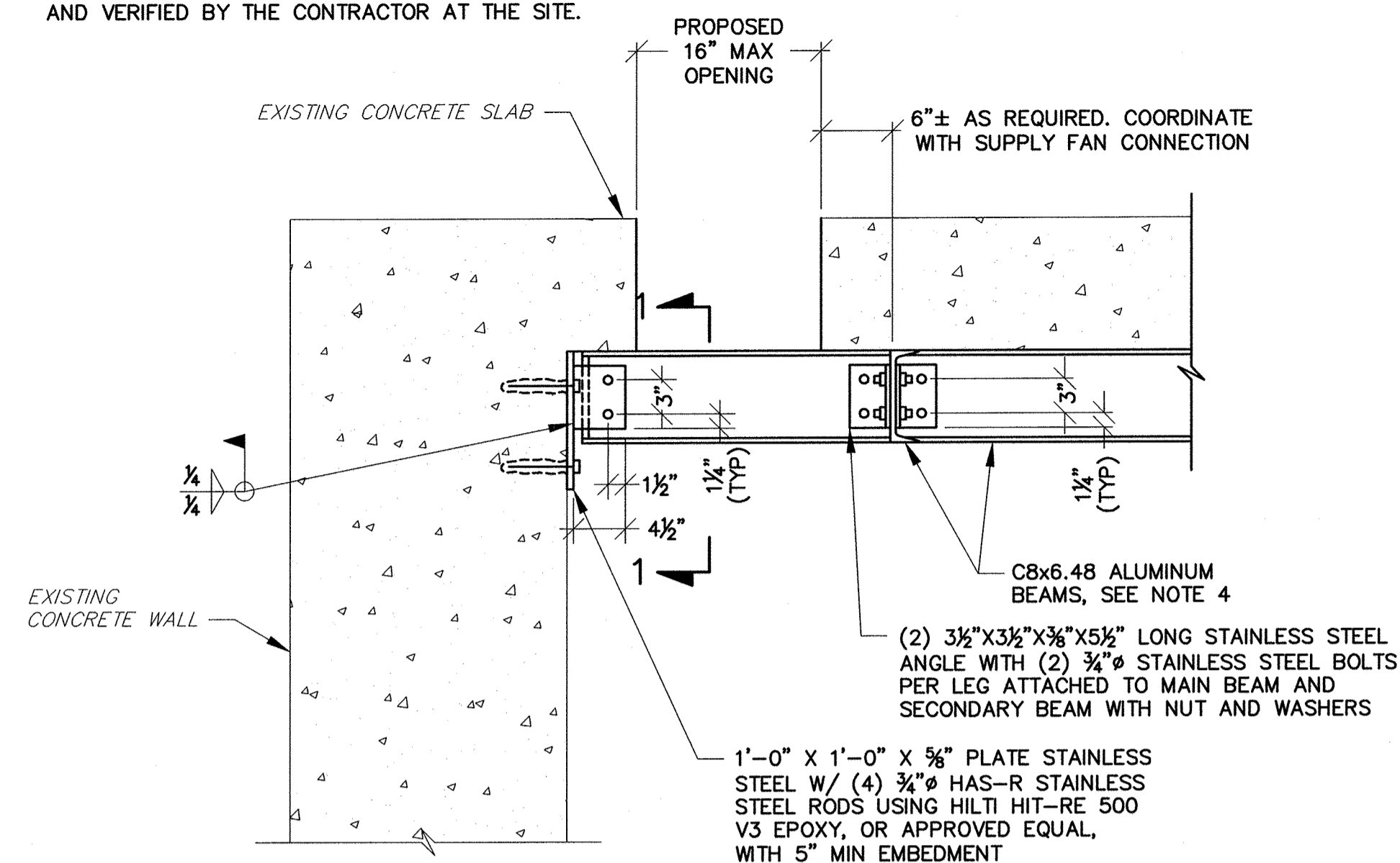
STRUCTURAL DETAILS & GENERAL NOTES
 PATAPSCO PARK SPS - 2019 UPGRADES

MOUNT HEBRON SEWER MAINS
 2019 UPGRADES
 CAPITAL PROJECT NO. S600
 CONTRACT NO. 745-S
 ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

SCALE NTS
 SHEET 18A OF 25

NOTES:

1. ALL EXISTING FEATURES DENOTED BY SLANTED TEXT.
2. ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE.

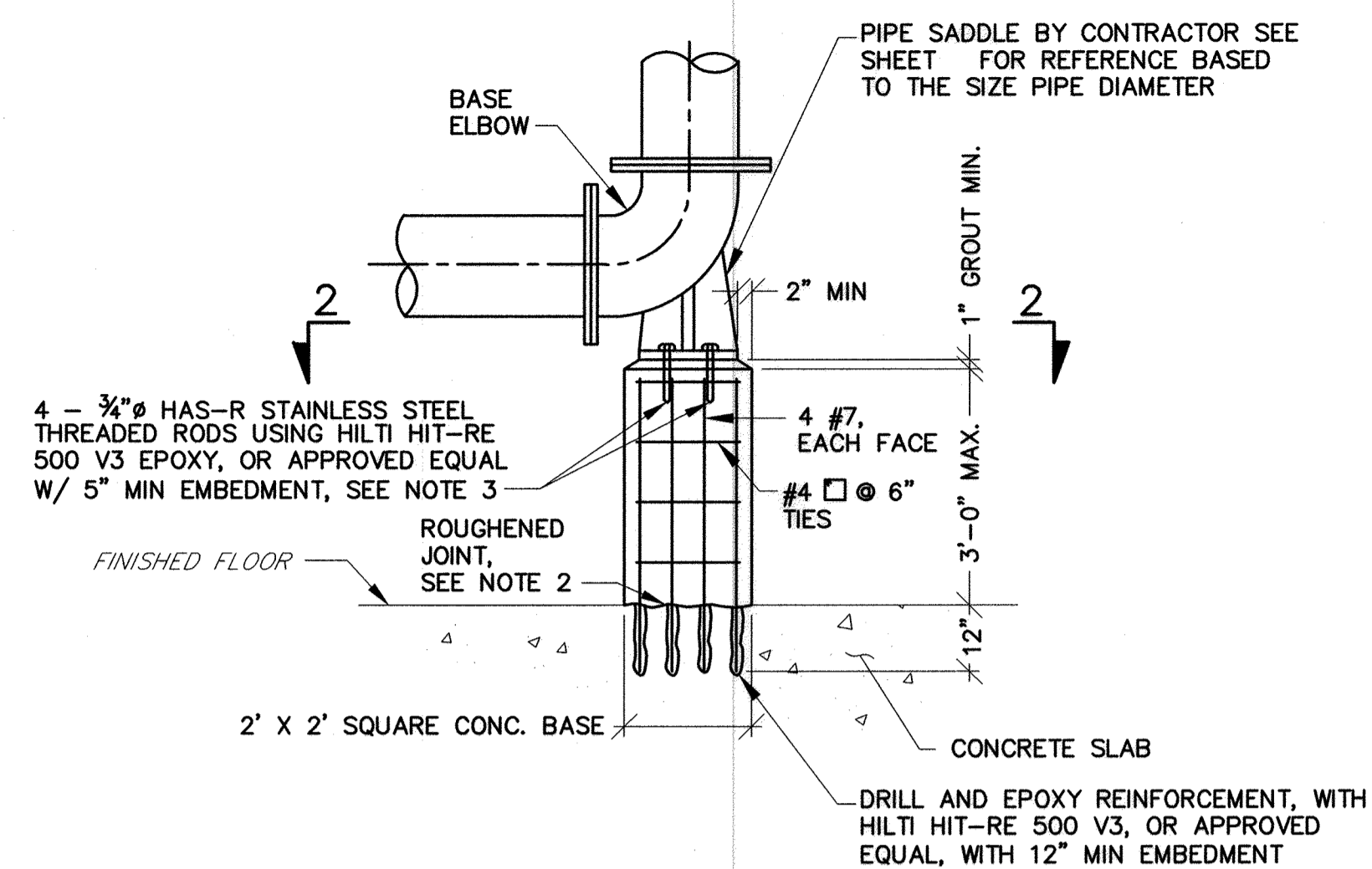


NOTES:

1. SEE TOP SLAB PLAN, SHEET 20D, FOR INSTALLATION LOCATION.
2. USE PLASTIC OR RUBBER WASHERS, SLEEVES, NEOPRENE PADS AND/OR BITUMINOUS PAINT, AS NECESSARY, TO CREATE A BARRIER BETWEEN DISSIMILAR METALS.
3. CONTRACTOR SHALL SHIM C8X6.48 ALUMINUM BEAM TIGHT TO BOTTOM OF CONCRETE SLAB WITH ALUMINUM SHIMS (AS REQUIRED). WELD SHIMS TO TOP FLANGE OF BEAM.
4. COPE FLANGES OF C8X6.48 ALUMINUM BEAM THAT RUNS IN THE NORTH/SOUTH DIRECTION AS REQUIRED TO MAKE CONNECTION TO C8X6.48 BEAM IN EAST/WEST DIRECTION.

WETWELL TOP SLAB OPENING SUPPORT BEAM DETAIL

SCALE: 1" = 1'-0"



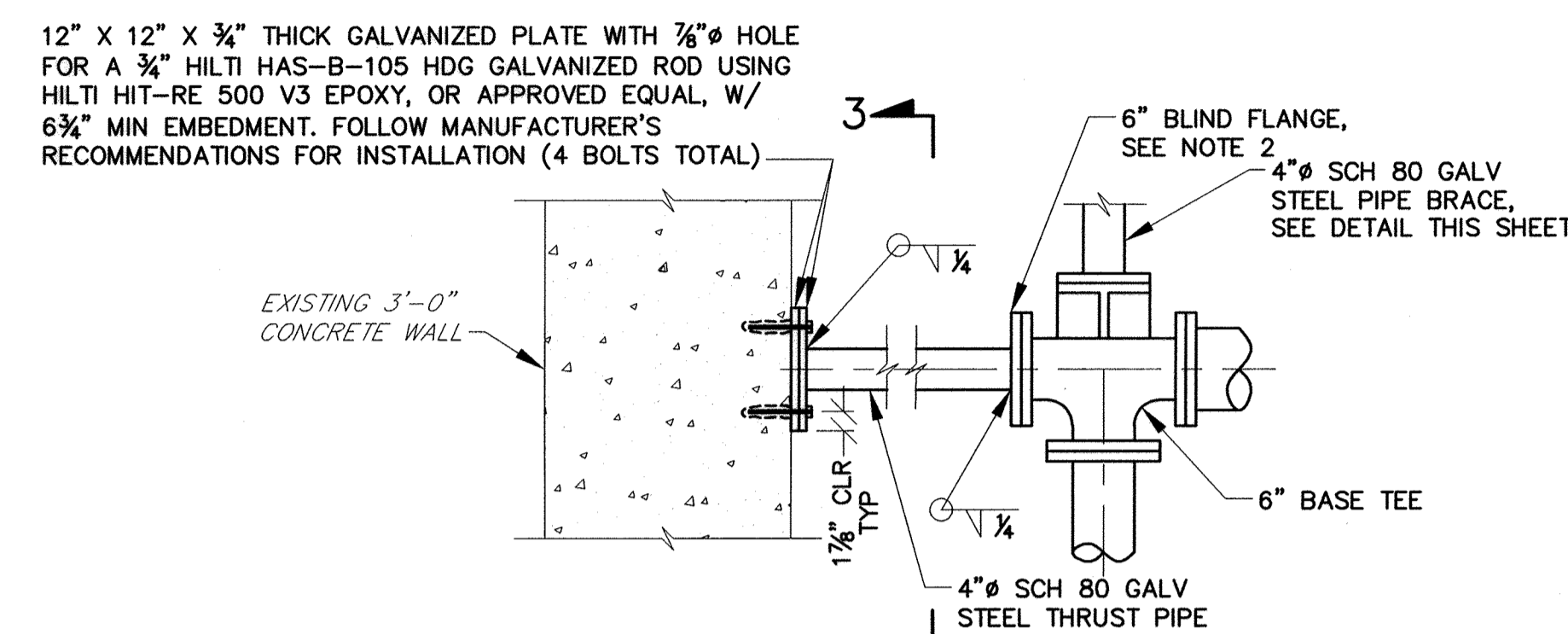
ELEVATION

NOTES:

1. SEE SECTIONS ON SHEET 21B, FOR INSTALLATION LOCATIONS.
2. SURFACE OF EXISTING 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 COMPOUND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. EPOXY BONDING AGENT SHALL BE "SIKADUR 32, HI-MOD", OR APPROVED EQUAL.
3. USE A NON-CONDUCTIVE PLASTIC WASHER AND SLEEVE TO FIT ON THE SHAFT OF THE ANCHOR, OR BITUMINOUS PAINT TO CREATE A BARRIER BETWEEN DISSIMILAR METALS

BASE ELBOW SUPPORT DETAIL

NTS

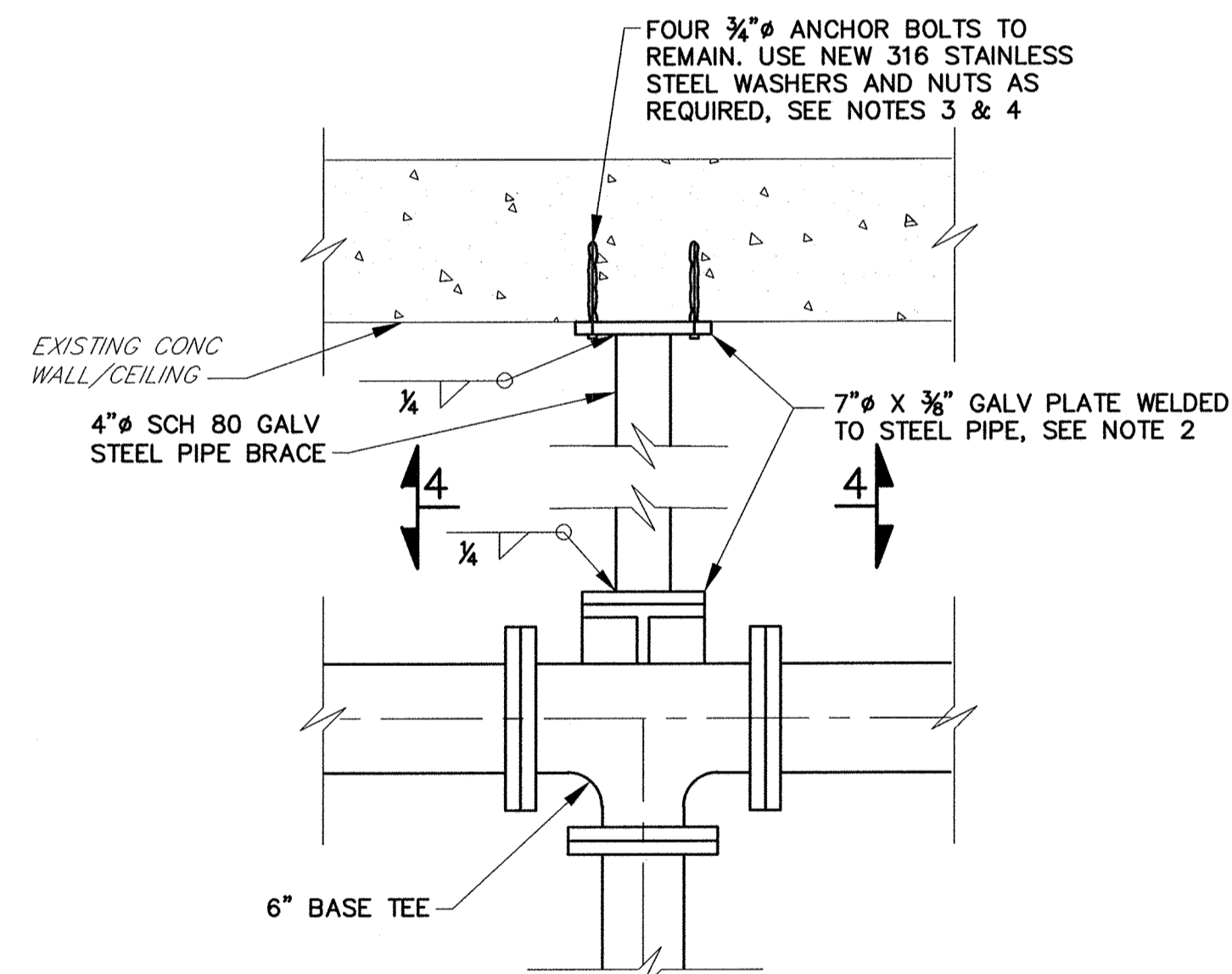


NOTES:

1. SEE SHEETS 20B & 21B FOR INSTALLATION LOCATIONS.
2. COORDINATE BOLT HOLE LOCATIONS WITH THE BASE FITTING PROVIDED.

4" PIPE THRUST PIPE SUPPORT DETAIL

NTS

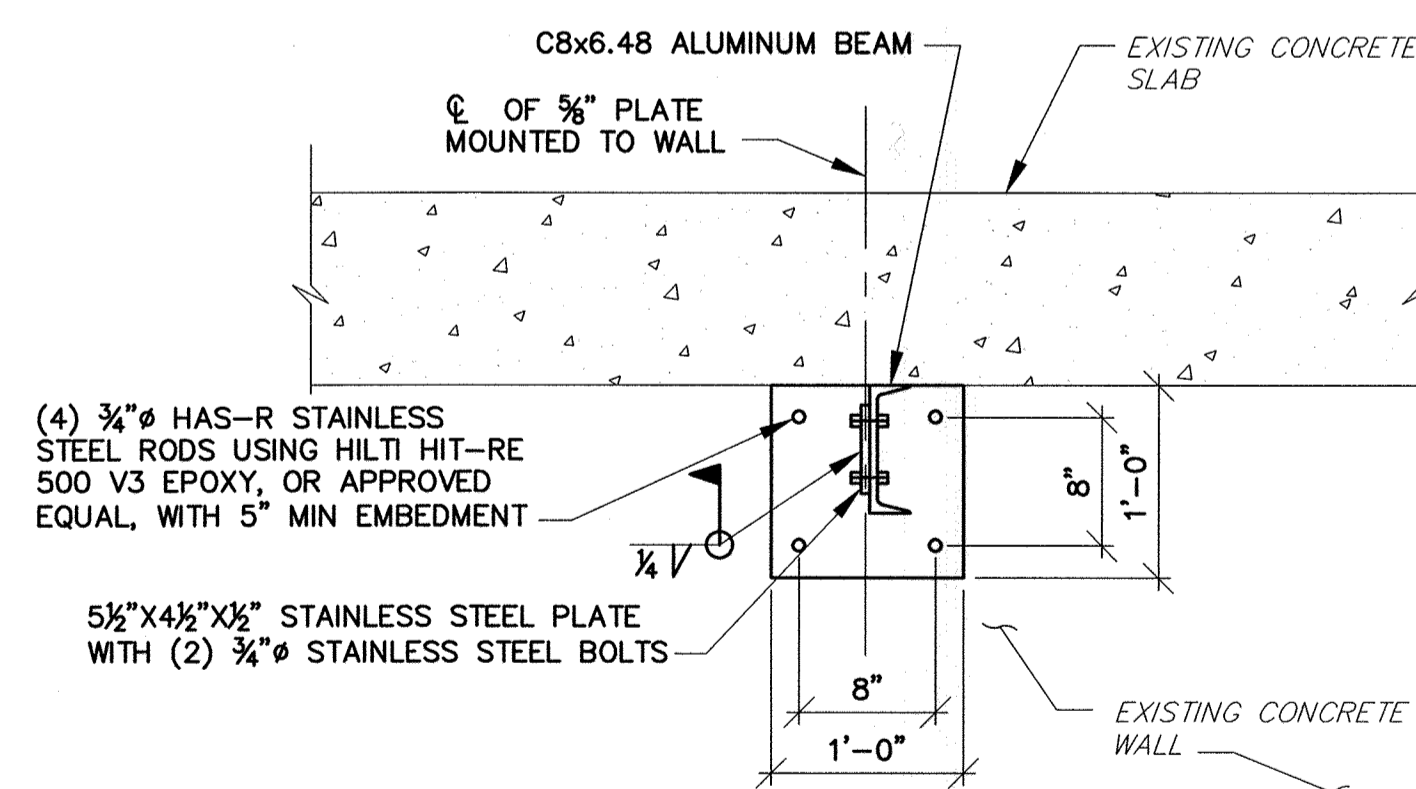


NOTES:

1. SEE SHEETS 20B & 21B FOR INSTALLATION LOCATIONS.
2. COORDINATE BOLT HOLE LOCATIONS WITH THE BASE FITTING PROVIDED.
3. USE PLASTIC OR RUBBER WASHERS, SLEEVES, NEOPRENE PADS AND/OR BITUMINOUS PAINT AS REQUIRED TO CREATE A BARRIER BETWEEN DISSIMILAR METALS.
4. REUSE EXISTING ANCHORS TO EXTENT POSSIBLE. IF EXISTING ANCHORS ARE IN POOR CONDITION OR DO NOT LINEUP WITH THE NEW PIPING, REFER TO SHEET 18B, SECTION 3 FOR NEW WALL/CEILING CONNECTION.

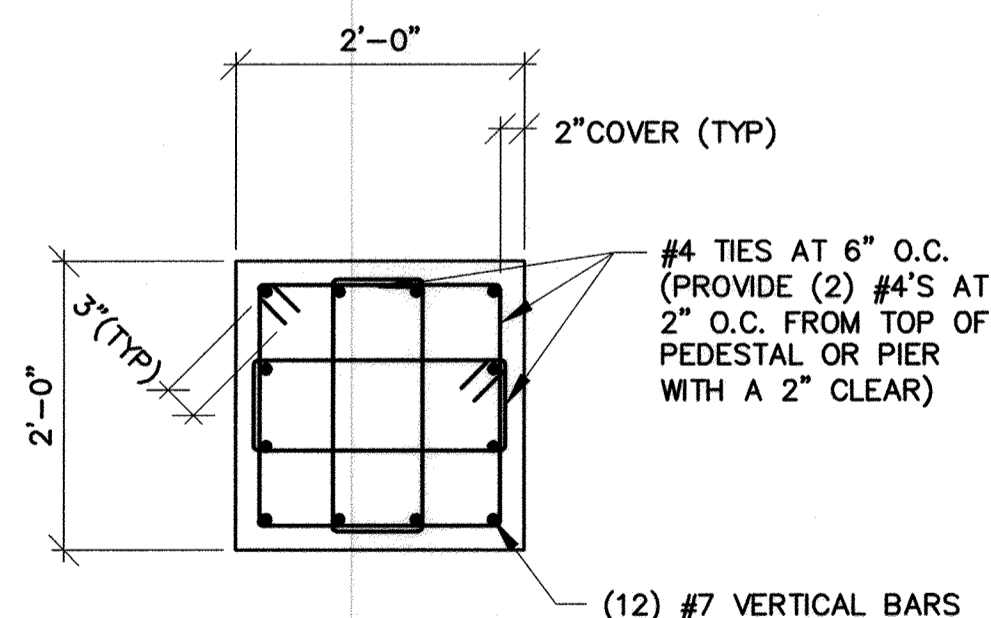
4" PIPE BRACE DETAIL

SCALE: 1" = 1'-0"



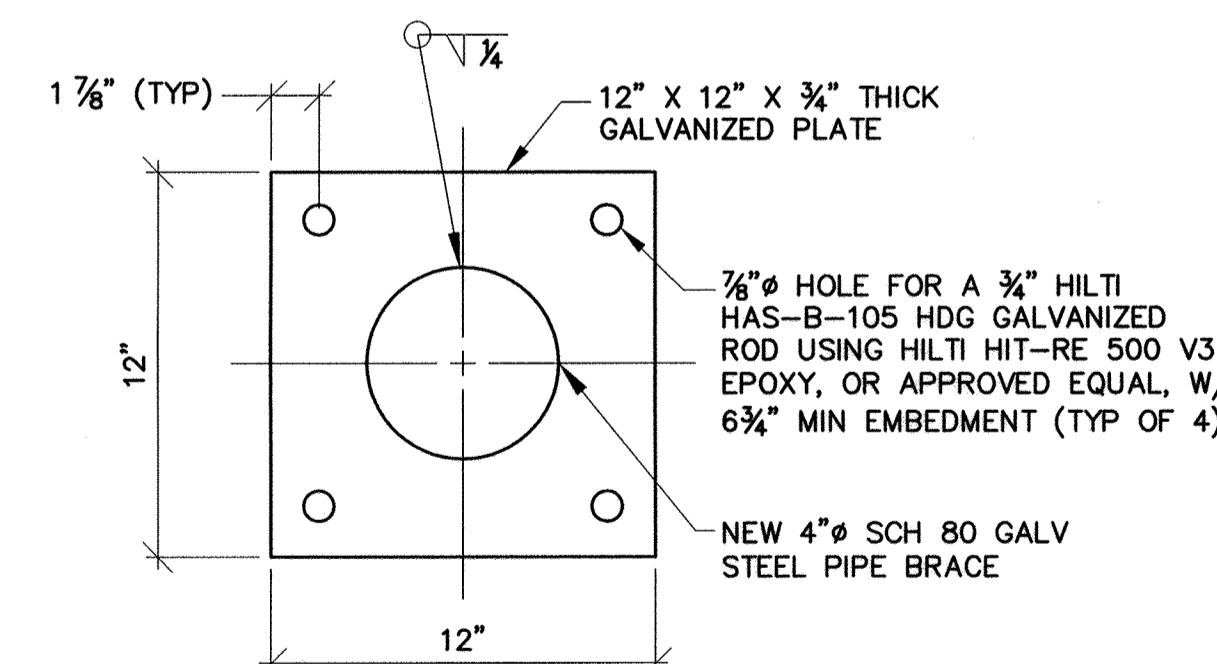
SECTION 1

SCALE: 1" = 1'-0"



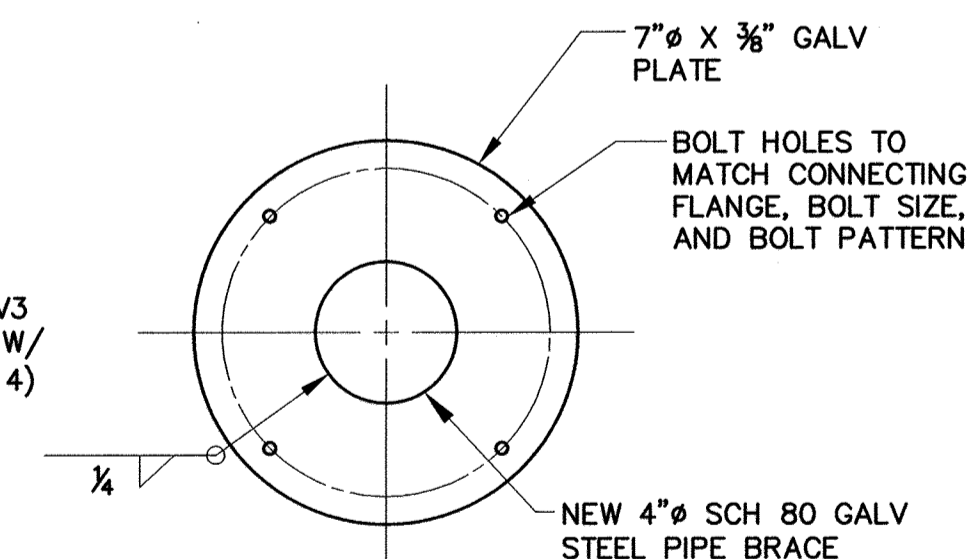
SECTION 2

NTS



SECTION 3

NTS



SECTION 4

NTS



R0421315 - K:\projects\2019\12154_H6680A\Task 9 - Miscellaneous Pumping Stations\Patapsco Park_P5\Cadd\Plan\Proposed\12154H6680S-018B-05-18B.dwg, Apr 12, 2019 - 1:09pm, Plot Scale: 1:1

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

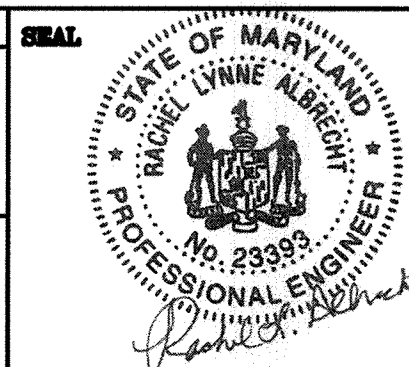
[Signature] 4/5/19
DIRECTOR, PUBLIC WORKS
[Signature] 4/5/19
CHIEF, BUREAU OF UTILITIES

[Signature] 4/5/19
CHIEF, BUREAU OF ENGINEERING
[Signature] 4/5/19
CHIEF, UTILITY DIVISION

PROFESSIONAL CERTIFICATION

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LICENSE NO. 23393, EXPIRATION DATE 9/25/20

ALBRECHT
ENGINEERING INC



DES: RCC			
DRN: NAP			
CHK: RLA			
DATE: 4/02/19	RK&K 1	2019 UPGRADES - ADD SHEET 18B	4/19
BY NO.		REVISIONS	DATE

STRUCTURAL DETAILS
PATAPSCO PARK SPS -
2019 UPGRADES

MAP NO. 17 BLOCK NO. 8

MOUNT HEBRON SEWER MAINS
2019 UPGRADES

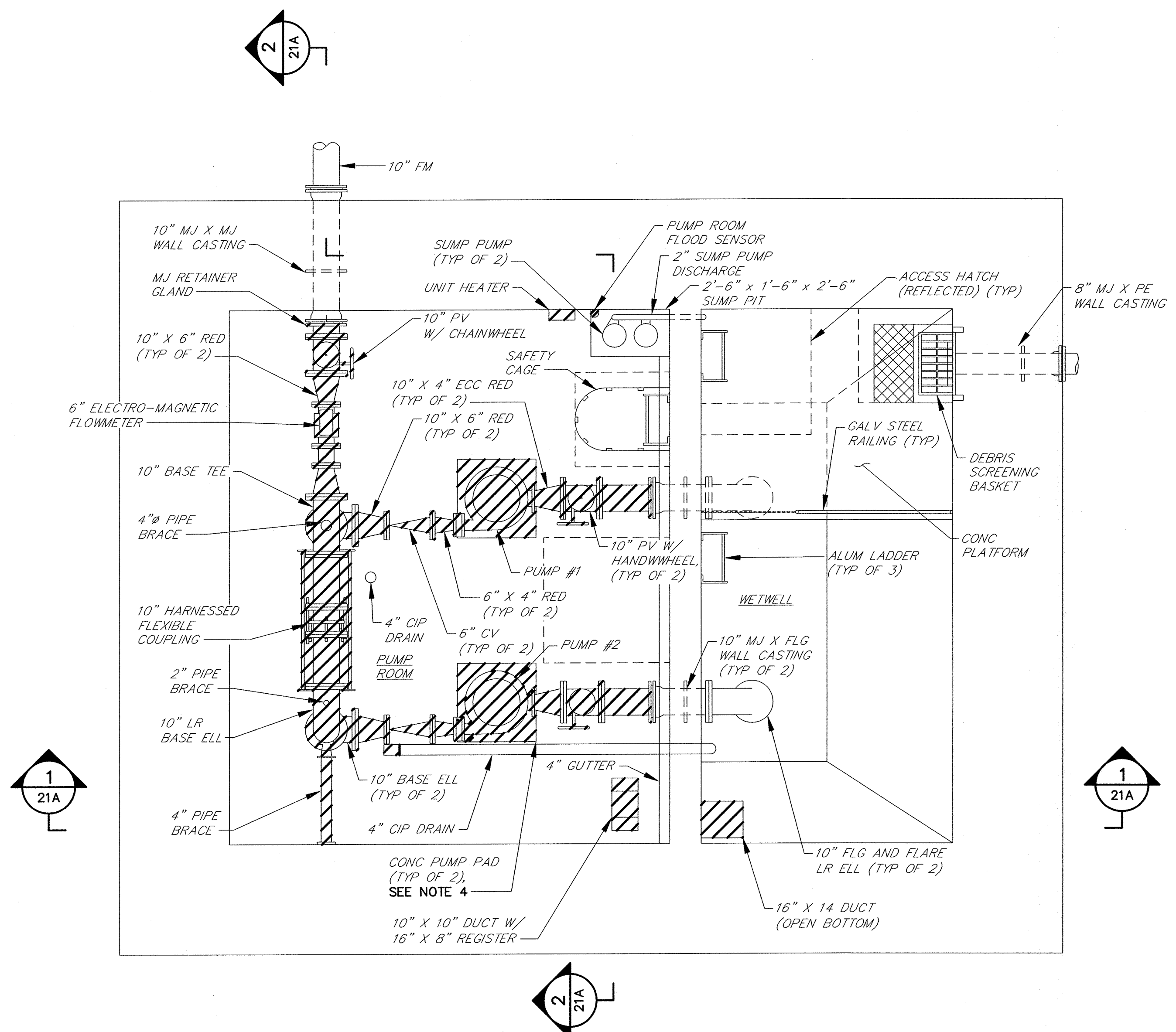
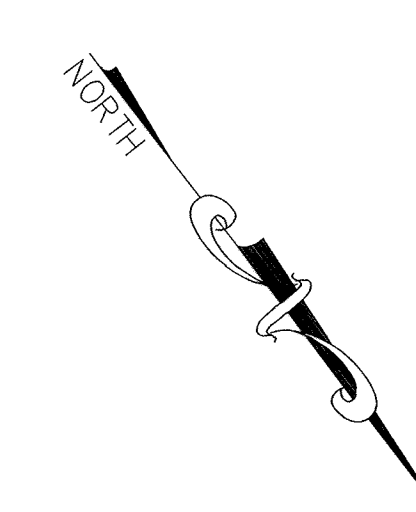
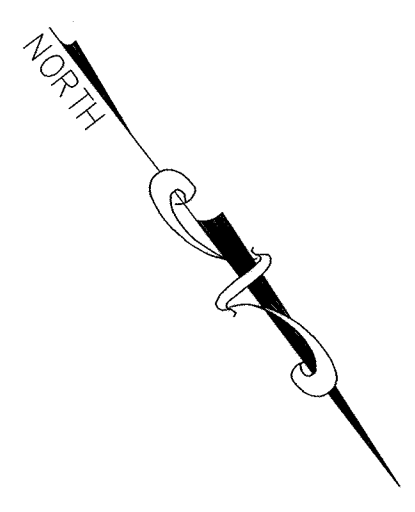
CAPITAL PROJECT NO. S6600
CONTRACT NO. 745-S

ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

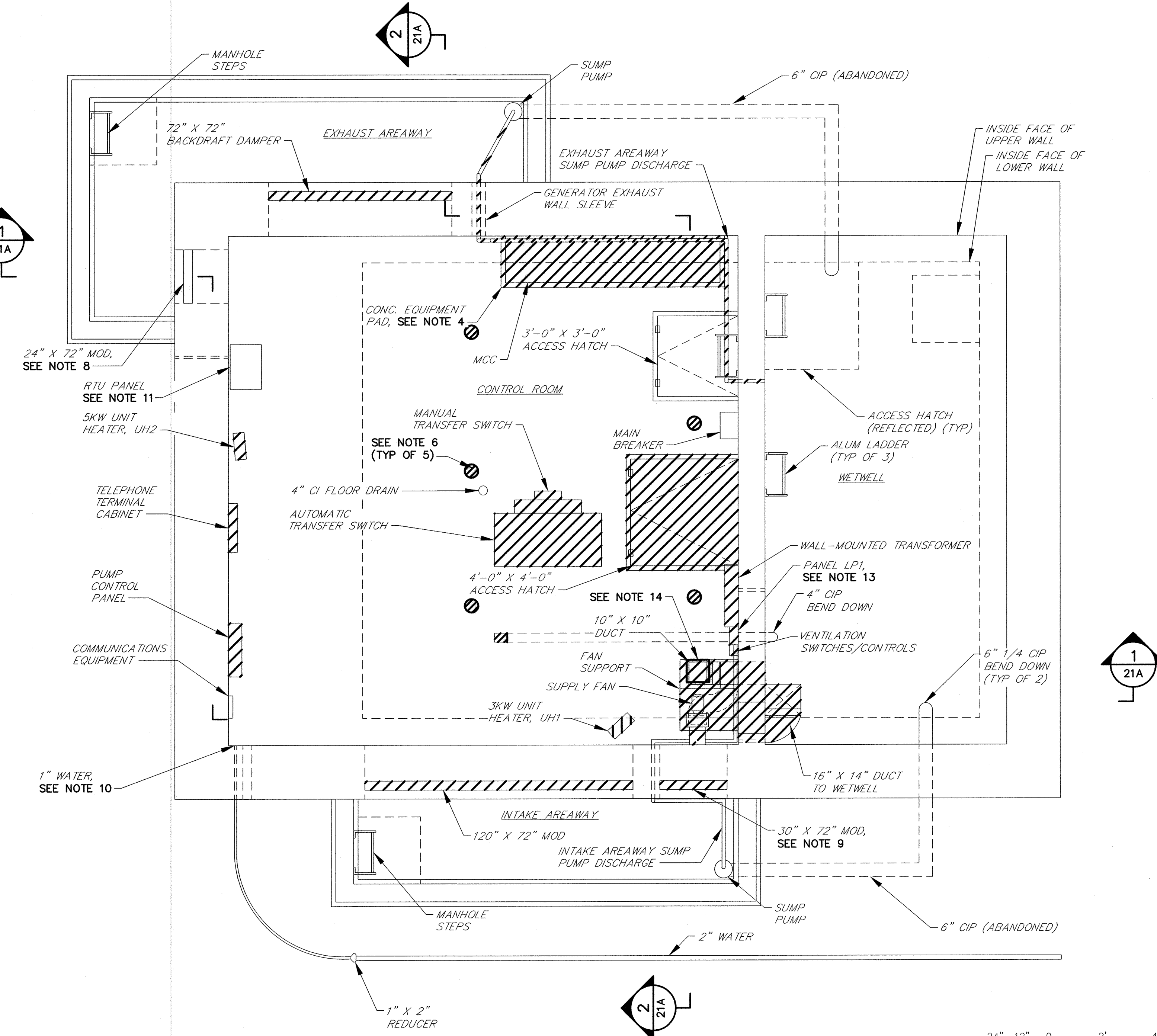
SCALE AS SHOWN
SHEET 18B OF 25

NOTES:

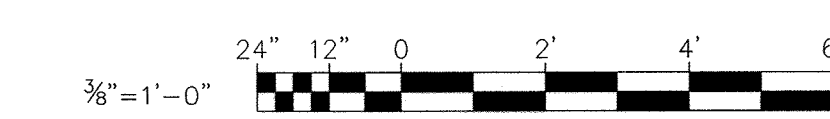
- ALL EXISTING FEATURES DENOTED BY SLANTED TEXT.
- ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE.
- PATCH ALL EXISTING HOLES IN CONCRETE FLOOR SLABS AND WALLS THAT ARE NOT USED IN THE NEW WORK WITH MIN. 9000 PSI COMPRESSIVE STRENGTH NON-SHRINKING GROUT. THE GROUT SHALL BE MIXED AND PLACED IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS FOR THIS APPLICATION. GROUT SHALL BE KAUFMAN PRODUCTS SURE GROUT, OR APPROVED EQUAL. HOLES THAT CONTAIN EXISTING WALL SLEEVES SHALL BE PATCHED BY FIRST INSTALLING A CAST IRON OR DUCTILE IRON PLUG AND FILLING THE REMAINING OPENING WITH NON-SHRINK GROUT.
- REMOVE EQUIPMENT PADS, PUMP PADS AND VALVE SUPPORTS FOR ALL REMOVED EQUIPMENT AND PIPING, AND RESTORE CONCRETE FLOOR TO MATCH EXISTING.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND TRANSPORTATION, INTACT OF ALL DEMOLISHED EQUIPMENT DESIGNATED BY THE COUNTY TO BE SALVAGED, TO THE COUNTY'S LITTLE PATUXENT WATER RECLAMATION PLANT (LPWRP) MAINTENANCE SHOP, LOCATED AT 8900 GREENWOOD PLACE, 410-313-1200. CONTRACTOR SHALL PROVIDE THE COUNTY WITH FIVE (5) DAYS ADVANCE NOTICE PRIOR TO DELIVERY OF EQUIPMENT. CONTRACTOR SHALL DISPOSE OF ALL NON-SALVAGED EQUIPMENT AND MATERIAL DEMOLISHED.
- CORE DRILL HOLES IN CONCRETE SLAB TO ACCOMMODATE NEW VALVE BOXES.
- REMOVAL OF EQUIPMENT SHALL INCLUDE ALL CONDUIT AND WIRING ASSOCIATED WITH EQUIPMENT TO BE REMOVED. EMBEDDED CONDUIT MAY BE REUSED. SURFACE CONDUIT SHALL BE REPLACED.
- REMOVE DAMPER ACTUATOR AND PREPARE DAMPER FOR INSTALLATION OF NEW ACTUATOR.
- REMOVE DAMPER AND PREPARE OPENING FOR INSTALLATION OF NEW DAMPER AND CONCRETE FILL.
- SEE POTABLE WATER SUPPLY DIAGRAM, SHEET 24.
- EXISTING RTU PANEL TO REMAIN IN SERVICE. PANEL CONTAINS THE EXISTING LC150 PRIMARY PUMP CONTROLLER, WHICH IS ALSO TO REMAIN IN SERVICE, TO GENERATE THE PRIMARY PUMP CONTROLS BY THE SYSTEM INTEGRATOR IN THE PROPOSED PCP. REFER TO WIRING SCHEMATICS ON DWG. 23B.
- REMOVE ALL LIGHTING, RECEPTACLES AND ASSOCIATED DEVICES. INDIVIDUAL UNITS NOT SHOWN FOR CLARITY.
- EXTEND ALL EXISTING LOADS TO REMAIN TO NEW PANEL AND PROVIDE NEW BRANCH CIRCUIT CONDUIT AND WIRE.
- SAWCUT OPENING IN FLOOR SLAB TO ACCOMMODATE NEW DUCTWORK.



PUMP ROOM PLAN
SCALE: 3/8"=1'-0"



CONTROL ROOM PLAN
SCALE: 3/8"=1'-0"



RK&K\SYS - K:\projects\2019\12154_H4680A\Task 9 - Miscellaneous Pumping Stations\Patapsco Park_PCP\Draw\Proposed\12154MHPS-020A-PP-20A.dwg Apr 02, 2019 - 1:09pm Plot Scale: 1:1

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND	
Director of Public Works <i>[Signature]</i> DATE: 4-5-19	Chief, Bureau of Engineering <i>[Signature]</i> DATE: 4/5/19
Chief, Bureau of Utilities <i>[Signature]</i> DATE: 4/5/19	Chief, Utility Division <i>[Signature]</i> DATE: 4/5/19

PROFESSIONAL CERTIFICATION I HEREBY CERTIFY THAT REDLINE REVISIONS INCLUDED IN 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. 29472, EXPIRATION DATE 9/15/2019	
	700 EAST PRATT STREET SUITE 500 BALTIMORE, MARYLAND 21202

DES:	DAO			
DRN:	NAF			
CHE:	RAL			
DATE:	4/02/19			
BY:	NO.	REVISIONS	DATE	
	1	2019 UPGRADES - ADD SHEET 20A	4/19	

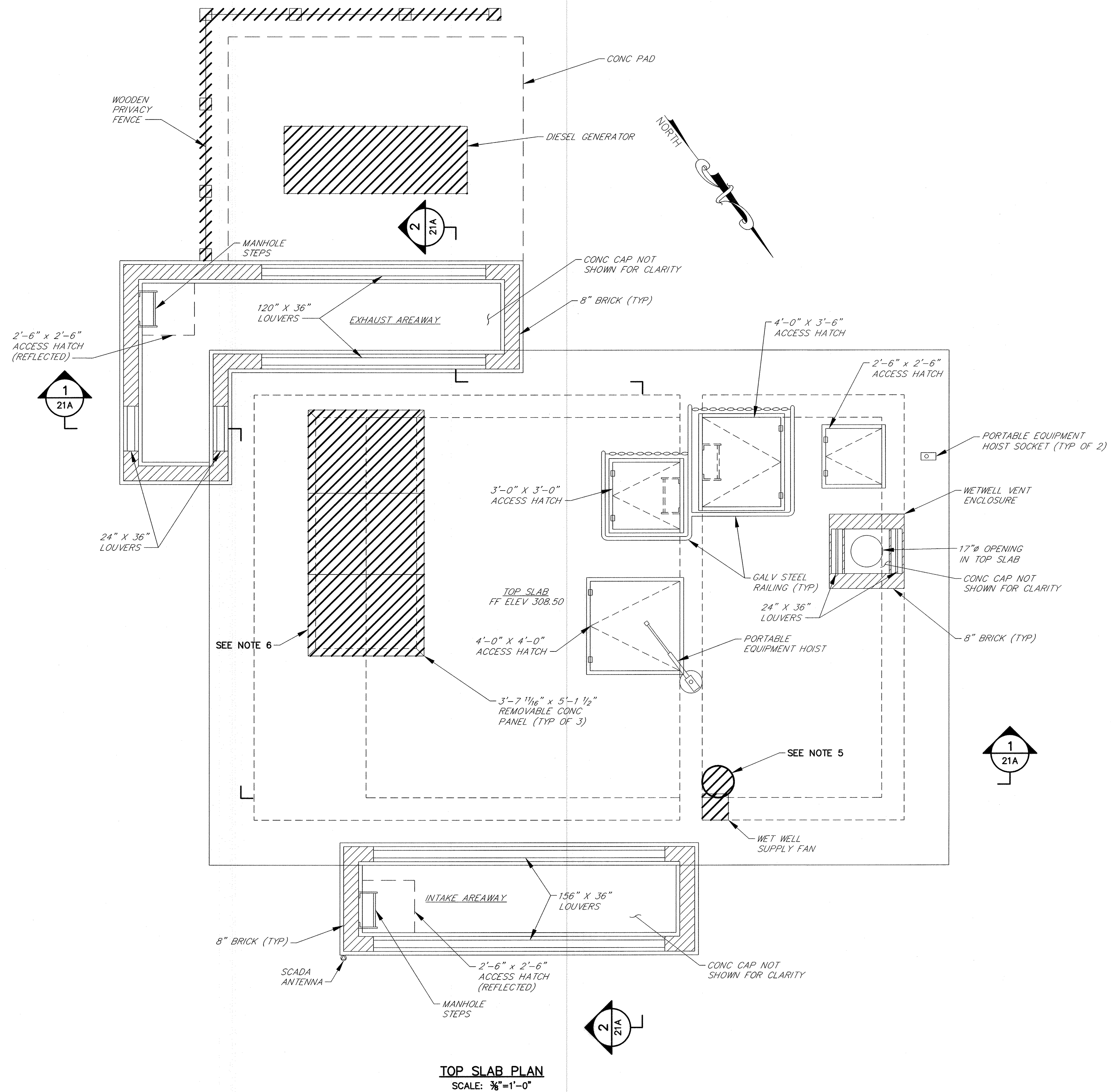
DEMOLITION PLANS PATAPSCO PARK SPS - 2019 UPGRADES	
MAP NO.	17
BLOCK NO.	8

MOUNT HEBRON SEWER MAINS 2019 UPGRADES CAPITAL PROJECT NO. S6600 CONTRACT NO. 745-S	
ELECTION DISTRICT NO.	2
HOWARD COUNTY, MARYLAND	20A OF 26

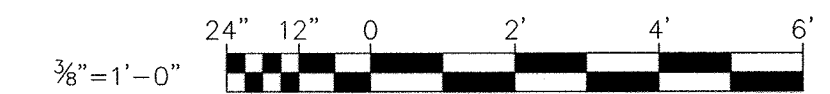
SCALE
3/8"=1'-0"
SHEET
20A OF 26

NOTES:

1. ALL EXISTING FEATURES DENOTED BY SLANTED TEXT.
2. ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE.
3. PATCH ALL EXISTING HOLES IN CONCRETE FLOOR SLABS AND WALLS THAT ARE NOT USED IN THE NEW WORK WITH MIN. 9000 PSI COMPRESSIVE STRENGTH NON-SHRINKING GROUT. THE GROUT SHALL BE MIXED AND PLACED IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS FOR THIS APPLICATION. GROUT SHALL BE KAUFMAN PRODUCTS SURE GROUT, OR APPROVED EQUAL. HOLES THAT CONTAIN EXISTING WALL SLEEVES SHALL BE PATCHED BY FIRST INSTALLING A CAST IRON OR DUCTILE IRON PLUG AND FILLING THE REMAINING OPENING WITH NON-SHRINK GROUT.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND TRANSPORTATION, INTACT OF ALL DEMOLISHED EQUIPMENT DESIGNATED BY THE COUNTY TO BE SALVAGED, TO THE COUNTY'S LITTLE PATUXENT WATER RECLAMATION PLANT (LPWRP) MAINTENANCE SHOP, LOCATED AT 8900 GREENWOOD PLACE, 410-313-1200. CONTRACTOR SHALL PROVIDE THE COUNTY WITH FIVE (5) DAYS ADVANCE NOTICE PRIOR TO DELIVERY OF EQUIPMENT. CONTRACTOR SHALL DISPOSE OF ALL NON-SALVAGED EQUIPMENT AND MATERIAL DEMOLISHED.
5. CORE DRILL HOLE IN CONCRETE SLAB TO ACCOMMODATE NEW SUPPLY FAN. INSTALL FRAMING AROUND HOLE IN WETWELL TOP SLAB AS SHOWN ON SHEET 20D.
6. REMOVE STEEL ANGLES AND PREPARE OPENING FOR NEW CONCRETE FILL AND ACCESS HATCH.



TOP SLAB PLAN
SCALE: 3/8"=1'-0"



R:\21515 - K:\projects\2019\21515_H6C60A\Task 9 - Miscellaneous Pumping Stations\Patapsco Park PS\Cad\Plans\Proposed\21515_H6C60A.dwg Apr 02, 2019 - 1:09pm Plot Scale 1:1

**DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND**

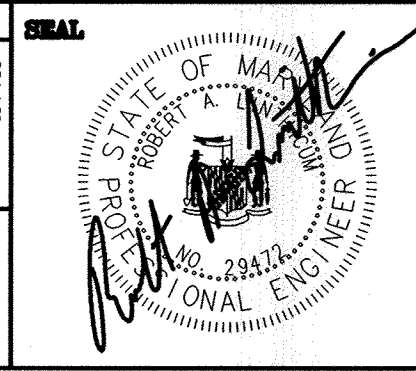
<i>[Signature]</i> DIRECTOR OF PUBLIC WORKS	4/5/19 DATE	<i>[Signature]</i> CHIEF, BUREAU OF ENGINEERING	4/5/19 DATE
<i>[Signature]</i> CHIEF, BUREAU OF UTILITIES	4-5-19 DATE	<i>[Signature]</i> CHIEF, UTILITY DIVISION	4/5/19 DATE

PROFESSIONAL CERTIFICATION

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LICENSE NO. 29472 EXPIRATION DATE 9/15/2019

RK&K 700 EAST PRATT STREET
SUITE 500
BALTIMORE, MARYLAND 21202



DES:	DAO			
DRN:	NAF			
CHK:	RAL			
DATE:	4/02/19	RK&K 1	2019 UPGRADES - ADD SHEET 20C	4/19
BY:	NO.		REVISIONS	DATE

**DEMOLITION PLAN
PATAPSCO PARK SPS -
2019 UPGRADES**

MAP NO. 17 BLOCK NO. 8

**MOUNT HEBRON SEWER MAINS
2019 UPGRADES**

CAPITAL PROJECT NO. S6600
CONTRACT NO. 745-S

ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

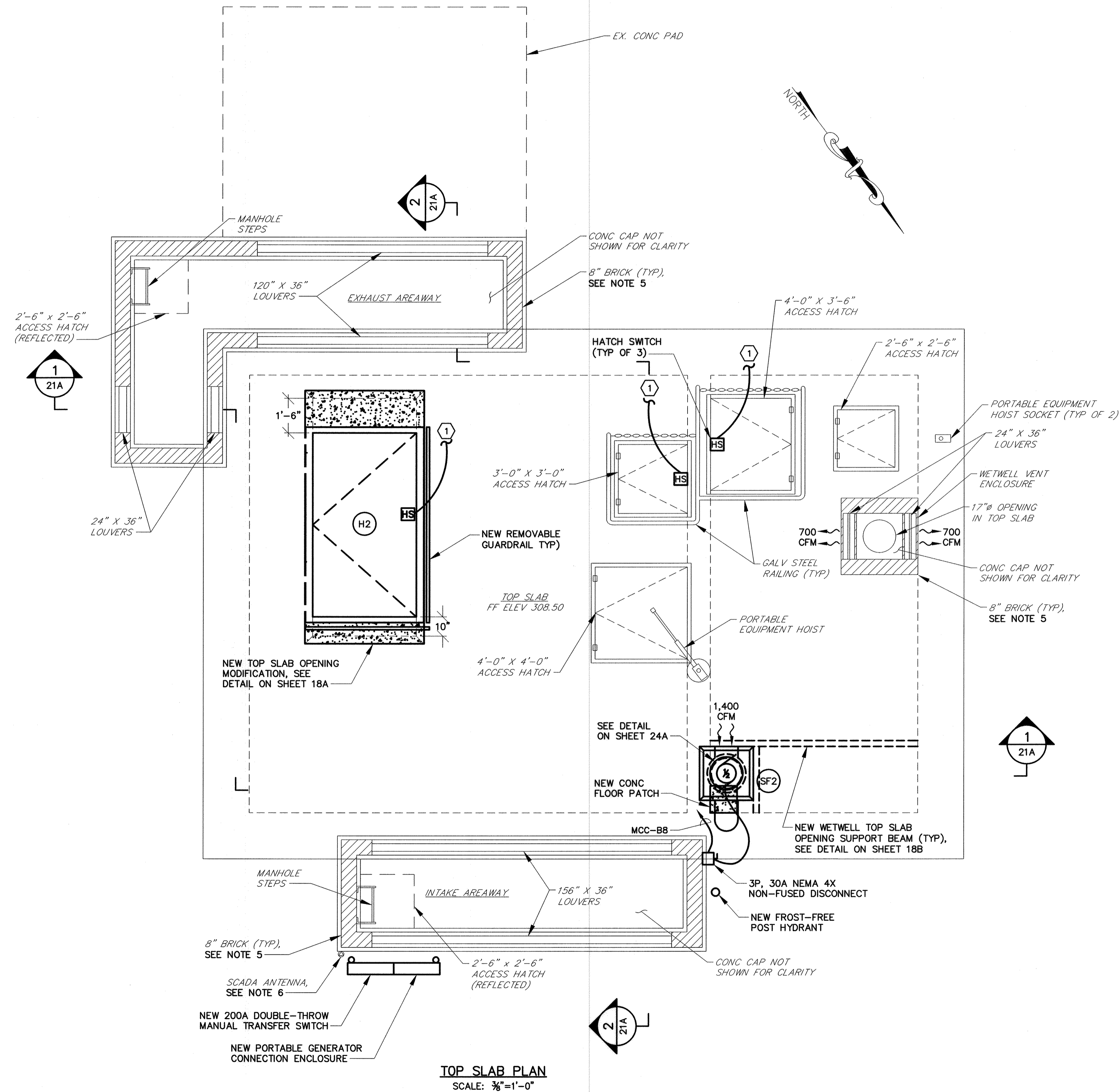
SCALE
3/8"=1'-0"
SHEET
20C OF 25

NOTES:

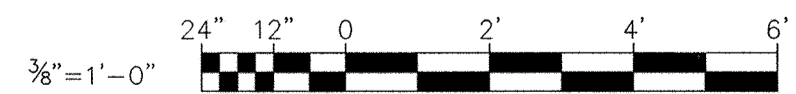
1. ALL EXISTING FEATURES DENOTED BY SLANTED TEXT.
2. ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE.
3. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER OF VENTILATION FAN FURNISHED, TAKE ACCURATE FIELD MEASUREMENTS AND SUBMIT DRAWINGS SHOWING DUCT LAYOUT AND METHOD OF FAN SUPPORT TO ENGINEER FOR REVIEW. FAN SHALL NOT BE SUPPORTED BY DUCTWORK.
4. CLEAN AND PAINT ALL EXPOSED FERROUS METALS AND NEW CONCRETE IN ACCORDANCE WITH SPECIFICATION SECTION 09900.
5. REPAIR ALL DAMAGED MASONRY AND REPOINT ALL DETERIORATED OR CRACKED MASONRY JOINTS IN ACCORDANCE WITH SPECIFICATION SECTION 04900. ALL MASONRY SHALL RECEIVE A FINAL CLEANING IN ACCORDANCE WITH SPECIFICATION 04900.
6. PROVIDE PVC WATERPROOF SLEEVE THROUGH INTAKE AREAWAY WHERE WALLS WILL BE CLOSED AND REROUTE/RECONNECT ANTENNA CABLE TO REMAIN.

ELECTRICAL NOTES:

- ① 2-#14 IN 3/4" CONDUIT TO VENTILATION CONTROLS IN MCC.



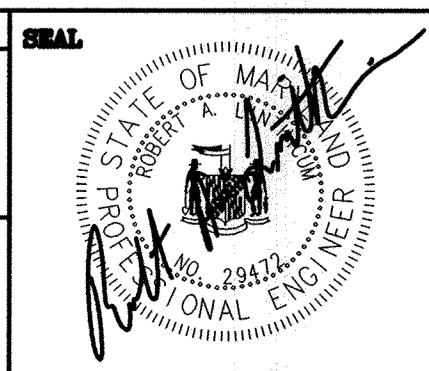
TOP SLAB PLAN
SCALE: 3/8"=1'-0"



R:\21\1515 - K:\projects\2019\1515_46680A\Task 9 - Miscellaneous Pumping Stations\Proposed\1515\SPMS-2020-UP-200.dwg Apr 02, 2019 - 1:09pm Plt Scale 1:1

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND	
Director of Public Works <i>[Signature]</i> 4/5/19 DATE	Chief, Bureau of Engineering <i>[Signature]</i> 4/5/19 DATE
Chief, Bureau of Utilities <i>[Signature]</i> 4-5-19 DATE	Chief, Utility Division <i>[Signature]</i> 4/5/19 DATE

PROFESSIONAL CERTIFICATION	
I HEREBY CERTIFY THAT REVISIONS INCLUDED IN 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. 23472 EXPIRATION DATE 9/15/2019	
RK&K	700 EAST PRATT STREET SUITE 500 BALTIMORE, MARYLAND 21202



DES: DAO			
DRN: NAF			
CHK: RAL			
DATE: 4/02/19	RK&K 1	2019 UPGRADES - ADD SHEET 20D	4/19
BY NO.		REVISIONS	DATE

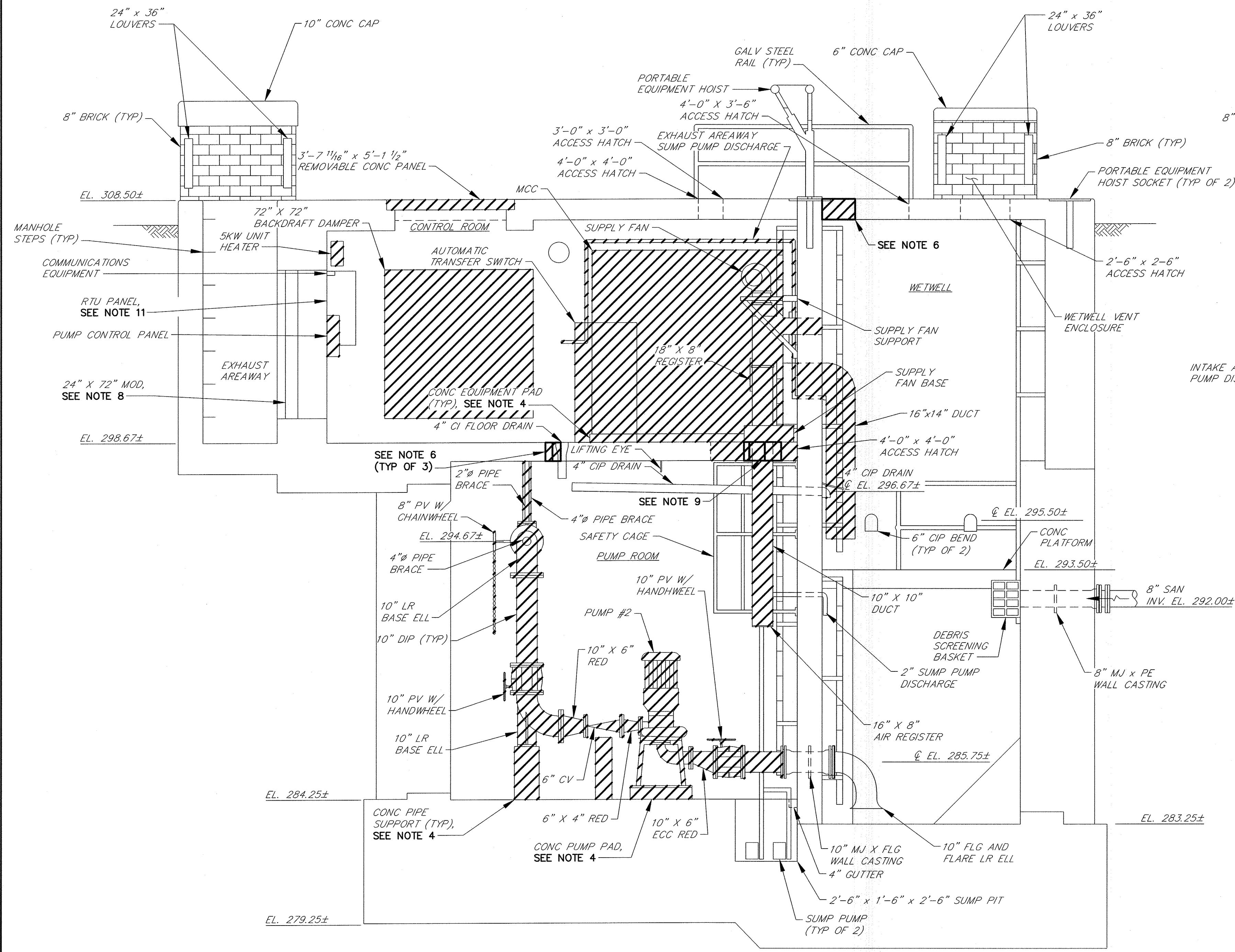
IMPROVEMENT PLAN PATAPSCO PARK SPS - 2019 UPGRADES	
MAP NO. 17	BLOCK NO. 8

MOUNT HEBRON SEWER MAINS 2019 UPGRADES	
CAPITAL PROJECT NO. S6600 CONTRACT NO. 745-S	
ELECTION DISTRICT NO. 2	HOWARD COUNTY, MARYLAND

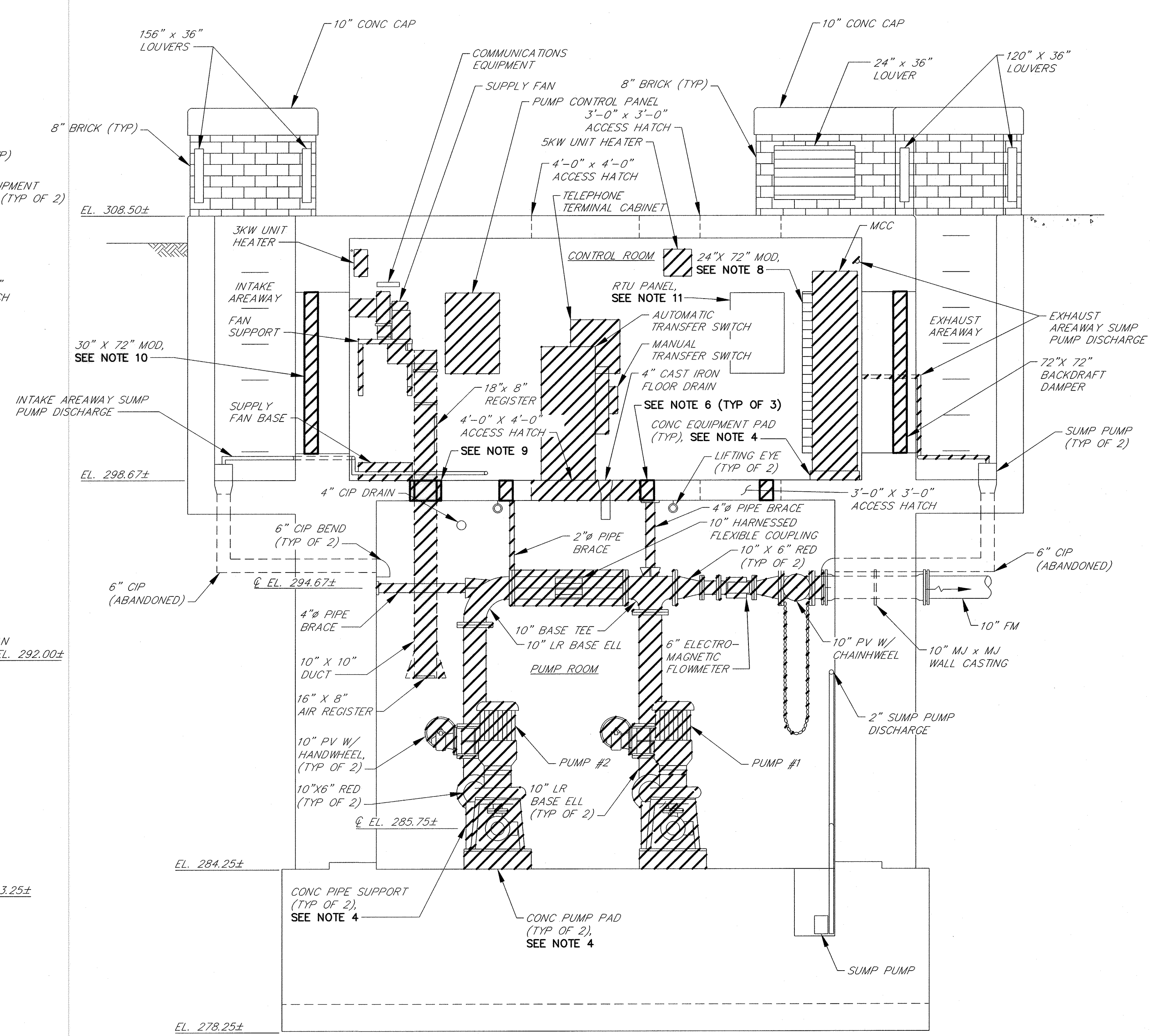
SCALE 3/8"=1'-0"
SHEET 20D OF 25

NOTES:

- ALL EXISTING FEATURES DENOTED BY SLANTED TEXT.
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- REMOVE EQUIPMENT PADS, PUMP PADS AND VALVE SUPPORTS FOR ALL REMOVED EQUIPMENT AND PIPING, AND RESTORE CONCRETE FLOOR TO MATCH EXISTING.
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- CORE DRILL HOLES IN CONCRETE SLAB TO ACCOMMODATE NEW VALVE BOXES AND WETWELL SUPPLY FAN.
- REMOVAL OF EQUIPMENT SHALL INCLUDE ALL CONDUIT AND WIRING ASSOCIATED WITH EQUIPMENT TO BE REMOVED. EMBEDDED CONDUIT MAY BE REUSED. SURFACE CONDUIT SHALL BE REPLACED.
- REMOVE DAMPER ACTUATOR AND PREPARE DAMPER FOR INSTALLATION OF NEW ACTUATOR.
- SAWCUT OPENING IN FLOOR SLAB TO ACCOMMODATE NEW DUCTWORK.
- REMOVE DAMPER AND PREPARE OPENING FOR INSTALLATION OF NEW DAMPER AND CONCRETE FILL.
- EXISTING RTU PANEL TO REMAIN IN SERVICE. PANEL CONTAINS THE EXISTING LC150 PRIMARY PUMP CONTROLLER, WHICH IS ALSO TO REMAIN IN SERVICE, TO GENERATE THE PRIMARY PUMP CONTROLS BY THE SYSTEM INTEGRATOR IN THE PROPOSED PCP. REFER TO WIRING SCHEMATICS ON DWG. 23B.
- REMOVE ALL LIGHTING, RECEPTACLES AND ASSOCIATED DEVICES. INDIVIDUAL UNITS NOT SHOWN FOR CLARITY.



SECTION 1
SCALE: 3/8"=1'-0"



SECTION 2
SCALE: 3/8"=1'-0"



RK&K\SYS - K:\projects\2019\154_H66060A\Task 9 - Miscellaneous Pumping Stations\Patapsco Park_P5\Cadd\Plan\Proposed\154H66060A.dwg Apr 02, 2019 - 11:09am Plot Scale: 1:1

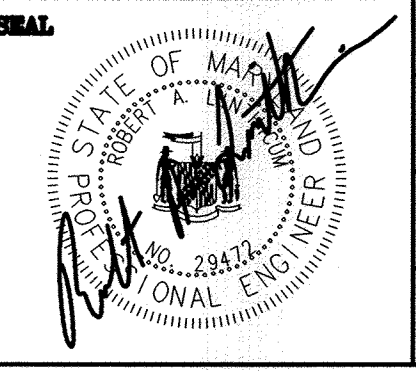
**DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND**

Director of Public Works: *[Signature]* 4/5/19
 Chief, Bureau of Engineering: *[Signature]* 4/5/19
 Chief, Bureau of Utilities: *[Signature]* 4/5/19
 Chief, Utility Division: *[Signature]* 4/5/19

PROFESSIONAL CERTIFICATION

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 LICENSE NO. 28472. EXPIRATION DATE 9/16/2019

RK&K
 700 EAST PRATT STREET
 SUITE 500
 BALTIMORE, MARYLAND 21202



DES:	DAO			
DRN:	NAP			
CHK:	RAL			
DATE:	4/02/19	RK&K 1	2019 UPGRADES - ADD SHEET 21A	4/19
BY:	NO.		REVISIONS	DATE

**DEMOLITION SECTIONS
PATAPSCO PARK SPS -
2019 UPGRADES**

MAP NO. 17 BLOCK NO. 8

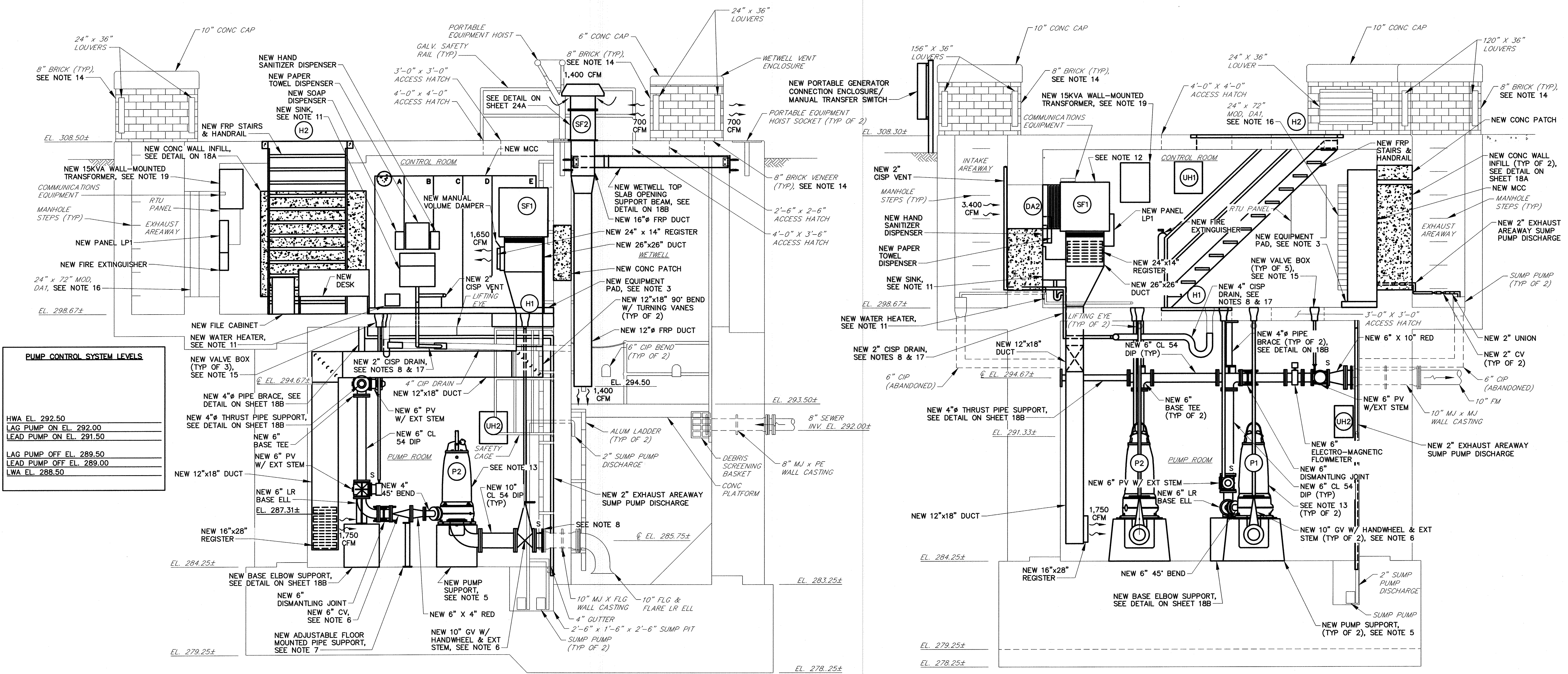
**MOUNT HEBRON SEWER MAINS
2019 UPGRADES**

CAPITAL PROJECT NO. S6600
 CONTRACT NO. 745-S
 ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

SCALE
 3/8"=1'-0"
 SHEET
 21A OF 25

NOTES:

- ALL EXISTING FEATURES DENOTED BY SLANTED TEXT.
- ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE.
- INSTALL CONCRETE EQUIPMENT PADS FOR ALL FLOOR MOUNTED EQUIPMENT.
- CLEAN AND PAINT ALL EXPOSED FERROUS METALS (EXCEPT PIPE FLANGES AND FASTENERS) AND NEW CONCRETE IN ACCORDANCE WITH SPECIFICATION SECTION 09900.
- PUMP SUPPORTS SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY. CONTRACTOR SHALL HAVE PUMP SUPPORTS DESIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF MARYLAND FOR PUMPS FURNISHED.
- SUPPORT CHECK VALVES AND PUMP SUCTION GATE VALVES WITH ADJUSTABLE FLOOR MOUNTED PIPE SUPPORTS, INSTALLED SO AS NOT TO INTERFERE WITH THE OPERATION OF THE VALVES.
- NO ATTEMPT HAS BEEN MADE TO SHOW ALL REQUIRED PIPE SUPPORTS. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A COMPLETE PIPING SUPPORT SYSTEM COMPLYING WITH MSS SP-58, ANSI/MSS SP-69, FEDERAL SPECIFICATION WW-H171, AND SPECIFICATION SECTION 15060.
- FURNISH AND INSTALL ALL GLANDS, RETAINERS, GASKETS, BOLTS AND OTHER MISCELLANEOUS MATERIALS AS NECESSARY TO CONNECT NEW PIPING TO EXISTING PIPING.
- NEW PUMP SUCTION AND DISCHARGE PIPING, VALVE AND FITTING ARRANGEMENT IS DEPENDENT ON ACTUAL PUMP EQUIPMENT FURNISHED. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER OF PUMP EQUIPMENT FURNISHED, TAKE ACCURATE FIELD MEASUREMENTS, AND PREPARE AND SUBMIT LAYOUT DRAWINGS FOR APPROVAL PRIOR TO PURCHASING ANY EQUIPMENT OR FABRICATING ANY PIPING.
- PUMP CABLES SHALL BE SUPPORTED BY THE PUMP ROOM WALLS OR CEILING USING STAINLESS STEEL KELLUM GRIPS, AT INTERVALS AS NECESSARY TO SUPPORT THE ENTIRE WEIGHT OF THE CABLES, IN ACCESSIBLE LOCATIONS WHICH SHALL BE APPROVED BY THE COUNTY. SLACK IN CABLES SHALL NOT BE COILED. CONTRACTOR SHALL SUBMIT PUMP CABLE ROUTING PLANS TO THE ENGINEER FOR REVIEW PRIOR TO ORDERING PUMPS.
- SEE POTABLE WATER RISER DIAGRAM ON SHEET 24A.
- CONTRACTOR SHALL COORDINATE W/ MANUFACTURER OF VENTILATION FANS FURNISHED, TAKE ACCURATE FIELD MEASUREMENTS AND SUBMIT DRAWINGS SHOWING DUCT LAYOUTS AND METHOD OF FAN SUPPORT TO THE ENGINEER FOR REVIEW. FANS SHALL NOT BE SUPPORTED BY DUCTWORK.
- PUMPS SHALL BE LOCATED DIRECTLY BELOW THE EXISTING LIFTING EYES.
- REPAIR ALL DAMAGED MASONRY AND REPOINT ALL DETERIORATED OR CRACKED MASONRY JOINTS IN ACCORDANCE WITH SPECIFICATION SECTION 04900. ALL MASONRY SHALL RECEIVE A FINAL CLEANING IN ACCORDANCE WITH SPECIFICATION 04900.
- COORDINATE LOCATION OF VALVE BOXES WITH EXT STEMS FOR VALVES FURNISHED. ENSURE THAT VALVE BOXES PERMIT FULL ACCESS AND OPERATION OF THE VALVE. USE UNIVERSAL JOINTS, RIGHT ANGLE GEARS AND ADAPTERS ON EXT STEMS, AS NECESSARY. NEW VALVE BOXES SHALL BE CAST FLUSH INTO EXISTING CONCRETE SLABS.
- PROVIDE NEW ACTUATOR AND ACCESSORIES SIZED TO OPERATE EXISTING DAMPER.
- CONNECT NEW 2" & 4" CISP TO EXISTING 4" CIP DRAIN.
- REPLACE ALL EXISTING RECEPTACLES WITH NEW GFI RECEPTACLES AT EXISTING LOCATIONS. PROVIDE NEW BOX, WHILE-IN-USE COVER, CONDUIT AND WIRE. ONE BRANCH CIRCUIT PER LEVEL.
- TRANSFORMER SHALL BE 480V PRIMARY AND 208/120V 3-PHASE SECONDARY. SUBMIT MOUNTING HEIGHT FOR APPROVAL (MINIMUM 6'-0" TO BOTTOM OF WALL BRACKET).
- REPLACE LIGHTING ON BOTH LEVELS. SEE LIGHTING FIXTURE SCHEDULE, SHEET 23B. SUBMIT PROPOSED LAYOUT FOR APPROVAL AND PROVIDE NEW CONDUIT AND WIRE TO LP1 AND SWITCHING. PROVIDE ONE BRANCH CIRCUIT PER LEVEL.
- SEE DWG. 24A FOR ALL MECHANICAL SCHEDULES.

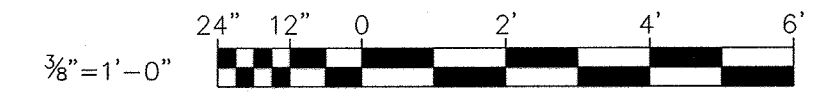


PUMP CONTROL SYSTEM LEVELS

HWA EL. 292.50
LAG PUMP ON EL. 292.00
LEAD PUMP ON EL. 291.50
LAG PUMP OFF EL. 289.50
LEAD PUMP OFF EL. 289.00
LWA EL. 288.50

SECTION 1
SCALE: 3/8"=1'-0"
208
200

SECTION 2
SCALE: 3/8"=1'-0"
208
200



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John J. De... 4/5/19
DIRECTOR OF PUBLIC WORKS DATE

Morgan B. Butler 4/5/19
CHIEF, BUREAU OF ENGINEERING DATE

... 4/5/19
CHIEF, BUREAU OF UTILITIES DATE

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT REVISIONS INCLUDED IN 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. 22412, EXPIRATION DATE 9/15/2019

RK&K 700 EAST PRATT STREET SUITE 600 BALTIMORE, MARYLAND 21202

DES: DAO			
DRN: NAF			
CHK: RAL			
DATE: 4/02/19	RK&K 1	2019 UPGRADES - ADD SHEET 21B	4/19
	BY NO.	REVISIONS	DATE

IMPROVEMENT SECTIONS
PATAPSCO PARK SPS -
2019 UPGRADES

MAP NO. 17 BLOCK NO. 8

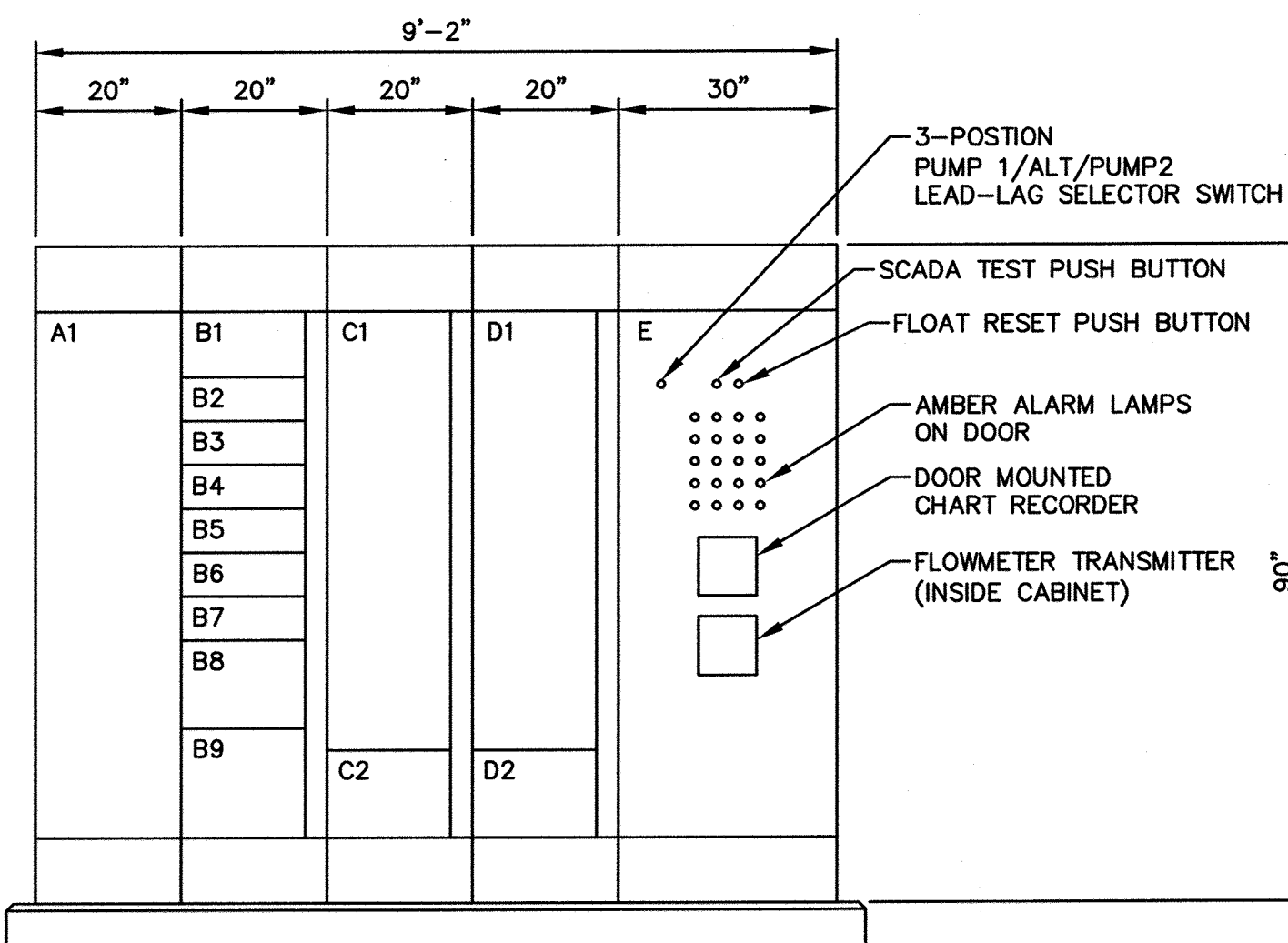
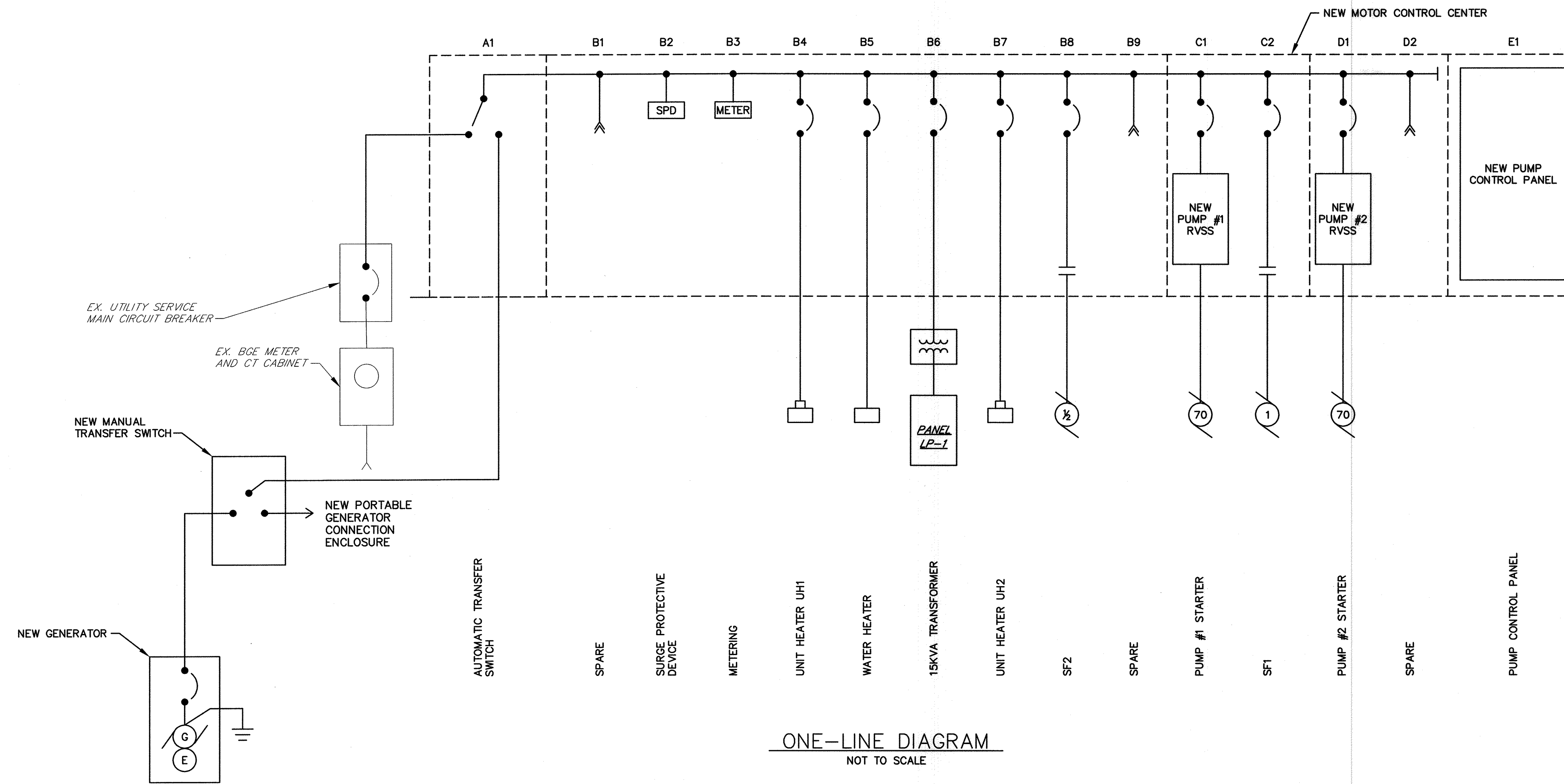
MOUNT HEBRON SEWER MAINS
2019 UPGRADES

CAPITAL PROJECT NO. S6600
CONTRACT NO. 745-S

ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

SCALE 3/8"=1'-0"
SHEET 21B OF 25

RK21315 - K:\projects\2019\2154_HC\Plans\Proposed\15154MHMS-021B-WP-21B.dwg Apr 02, 2019 - 1:56pm Plot Scale 1:1
 Miscellaneous Pumping Stations\Poloproc Park_PSA\Cadd\Plans\Proposed\15154MHMS-021B-WP-21B.dwg



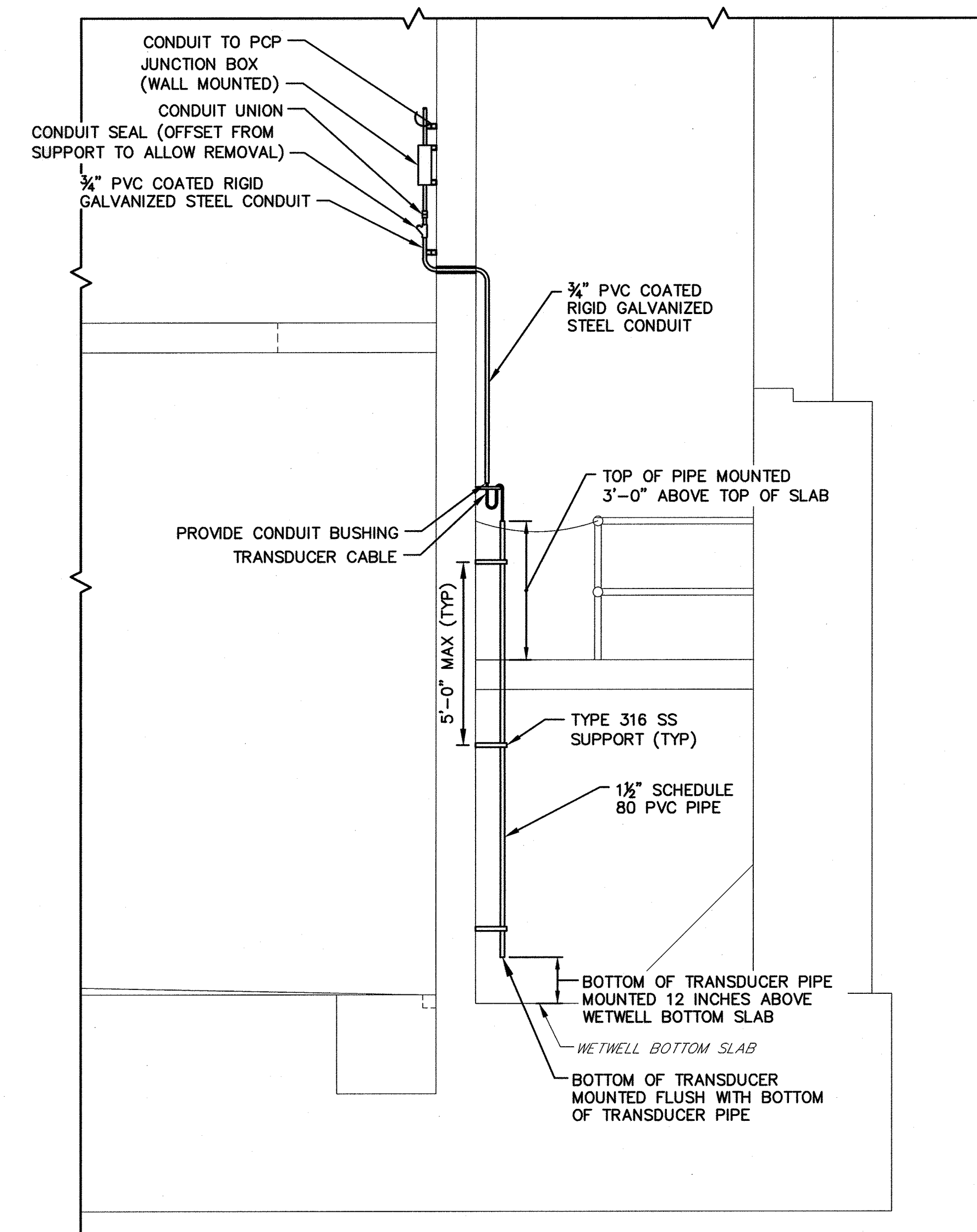
ALARM LAMP LEGEND

1. HIGH LEVEL WETWELL
2. LOW LEVEL WETWELL
3. PUMP ROOM FLOODED
4. STATION LOSS OF POWER
5. ATS IN EMERGENCY
6. GENERATOR RUNNING
7. GENERATOR FAILURE
8. UPS ON BATTERY
9. UPS BATTERY LOW
10. PUMP 1 NOT IN AUTO
11. PUMP 2 NOT IN AUTO
12. PUMP 1 FAIL
13. PUMP 2 FAIL
14. PUMP 1 RVSS FAULT
15. PUMP 2 RVSS FAULT
16. PUMP 1 OVERTEMP
17. PUMP 2 OVERTEMP
18. COMMON ALARM
19. SPARE
20. SPARE

MCC SCHEDULE												
480/277 VOLTS, 3 PHASE, 4 WIRE, 600 AMP BUS												
ITEM	DESCRIPTION	BRKR SIZE		FEEDER			STARTER			AUX. DES.	REMARKS	
		AMP	POLE	WIRE	QUAN	GRD	COND	TYPE	SIZE			HP
A1	AUTOMATIC TRANSFER SWITCH	-	-	350	4	3	4"	-	-	-	-	400 AMPERE
B1	SPARE	-	-	-	-	-	-	-	-	-	-	----
B2	SPD	-	-	-	-	-	-	-	-	-	-	----
B3	METERING	-	-	-	-	-	-	-	-	-	-	----
B4	UNIT HEATER UH1	30	3	10	3	10	¾"	-	-	-	-	----
B5	WATER HEATER	30	3	10	3	10	¾"	-	-	-	-	----
B6	15KVA TRANSFORMER	25	3	10	3	10	¾"	-	-	-	-	----
B7	UNIT HEATER UH2	30	3	10	3	10	¾"	-	-	-	-	----
B8	SF2	20	3	12	3	12	¾"	FVNR	1	½	120	1,2,3,5 SEE SCHEMATIC
B9	SPARE	-	-	-	-	-	-	-	-	-	-	----
C1	PUMP MOTOR #1	150	3	1	3	6	2"	RVSS	-	70	-	1,2,3,4,5 SEE NOTES 2 & 3
C2	SF1	20	3	12	3	12	¾"	FVNR	1	1	120	1,2,3,5 SEE SCHEMATIC

AUXILIARIES FOR MOTOR CONTROL CENTER

1. HAND-OFF-AUTOMATIC SWITCH
2. INDICATING LIGHTS
3. 120 VOLTS CONTROL POWER TRANSFORMER
4. RUNNING TIME METERS AND START COUNTERS
5. AUXILIARY RELAYS/CONTACTS



NOTE:

1. COORDINATE EXACT LOCATION OF TRANSDUCER AND ASSOCIATED COMPONENTS IN THE FIELD AND OBTAIN COUNTY APPROVAL PRIOR TO INSTALLATION.

TRANSDUCER MOUNTING DETAIL
NTS

MCC SCHEDULE (CONTINUED)												
480/277 VOLTS, 3 PHASE, 4 WIRE, 600 AMP BUS												
ITEM	DESCRIPTION	BRKR SIZE		FEEDER			STARTER			AUX. DES.	REMARKS	
		AMP	POLE	WIRE	QUAN	GRD	COND	TYPE	SIZE			HP
D1	PUMP MOTOR #2	150	3	1	3	6	2"	RVSS	-	70	-	1,2,3,4,5 SEE NOTES 2 & 3
D2	SPARE	-	-	-	-	-	-	-	-	-	-	----
E	PUMP CONTROL PANEL	-	-	-	-	-	-	-	-	-	-	SEE NOTE 1

NOTES:

1. PROVIDE EMPTY MOTOR CONTROL CENTER SECTION FOR FABRICATION BY SYSTEM INTEGRATOR.
2. CONDUIT SHOWN IS MINIMUM SIZE. MOTORS ARE CONNECTED WITH CABLES PROVIDED BY THE PUMP MANUFACTURER. PROVIDE QUANTITY AND SIZE OF CONDUITS PER MANUFACTURER'S RECOMMENDATIONS. TERMINATE CONDUITS WITH BUSHING, IN LOCATION AS DIRECTED IN THE FIELD AND SUSPEND CABLES USING 316 STAINLESS STEEL HOOKS AND CABLE GRIPS.
3. EQUIPMENT SHALL BE RATED FOR A MINIMUM OF 79 FULL LOAD AMPERES, BUT NOT LESS THAN STANDARD HORSEPOWER SHOWN.

RK&K\SYS - K:\projects\2019\12154_MCC\B04\Task 9 - Miscellaneous Pumping Stations\Process\12154MPPS-022A-EP-22A.dwg Apr 02, 2019 - 1:10pm Plot Scale 1:1

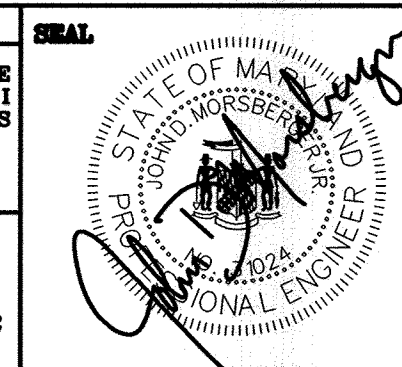
DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director: *[Signature]* 4/5/19
 Chief, Bureau of Public Works
 Date: 4-5-19

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT REVISIONS INCLUDED IN 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. 51024 EXPIRATION DATE 10/17/2020

RK&K
 700 EAST PRATT STREET
 SUITE 500
 BALTIMORE, MARYLAND 21202



DES: JDM

DRN: NAF

CHK: JDM

DATE: 4/02/19

BY NO.

RK&K 1

2019 UPGRADES - ADD SHEET 22A

DATE 4/19

MCC SCHEDULE, ELEVATION &
 ONE-LINE DIAGRAM
 PATAPSCO PARK SPS -
 2019 UPGRADES

MOUNT HEBRON SEWER MAINS
 2019 UPGRADES

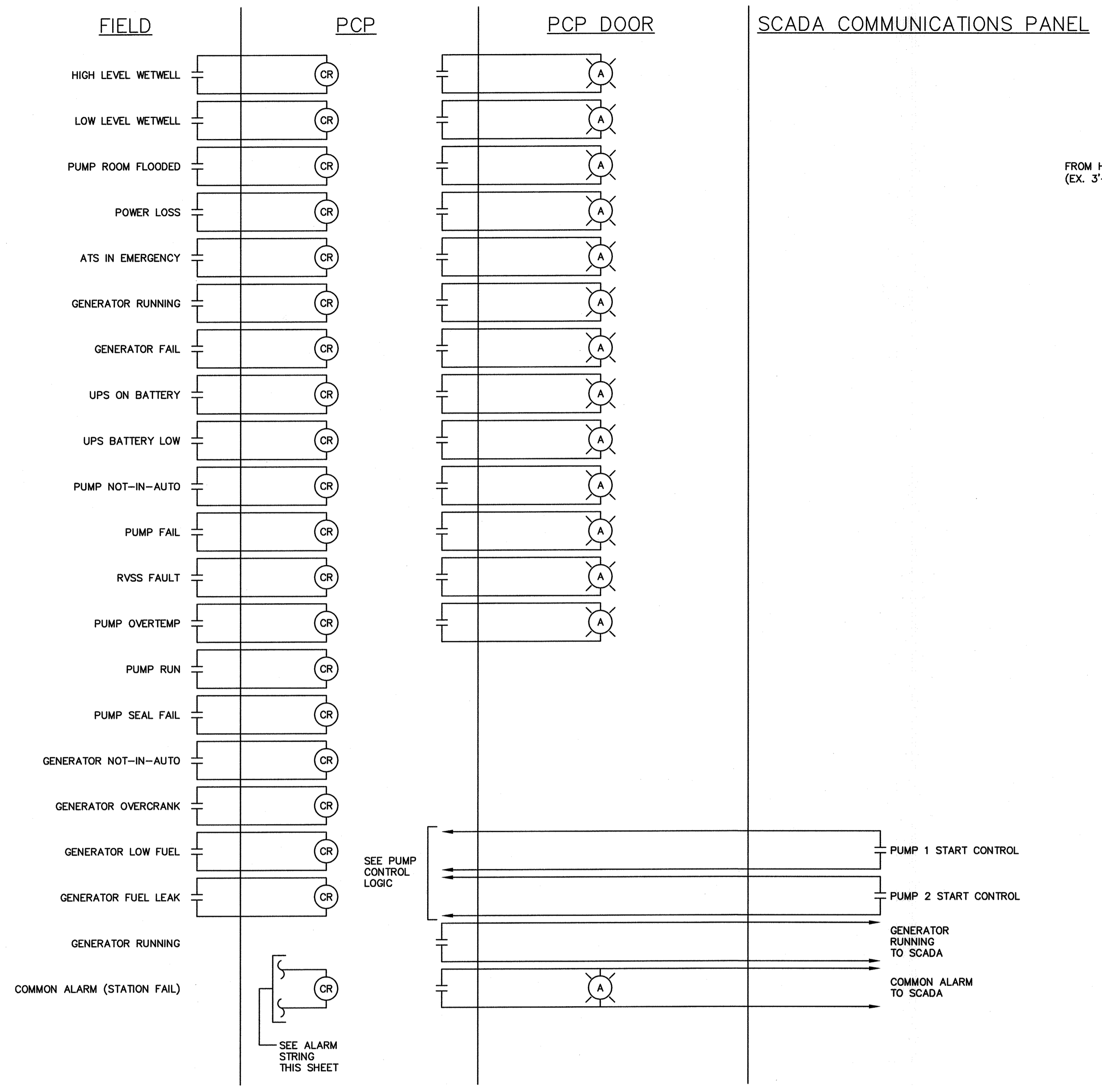
CAPITAL PROJECT NO. S6600
 CONTRACT NO. 745-S

MAP NO. 17 BLOCK NO. 8 ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

SCALE
NTS

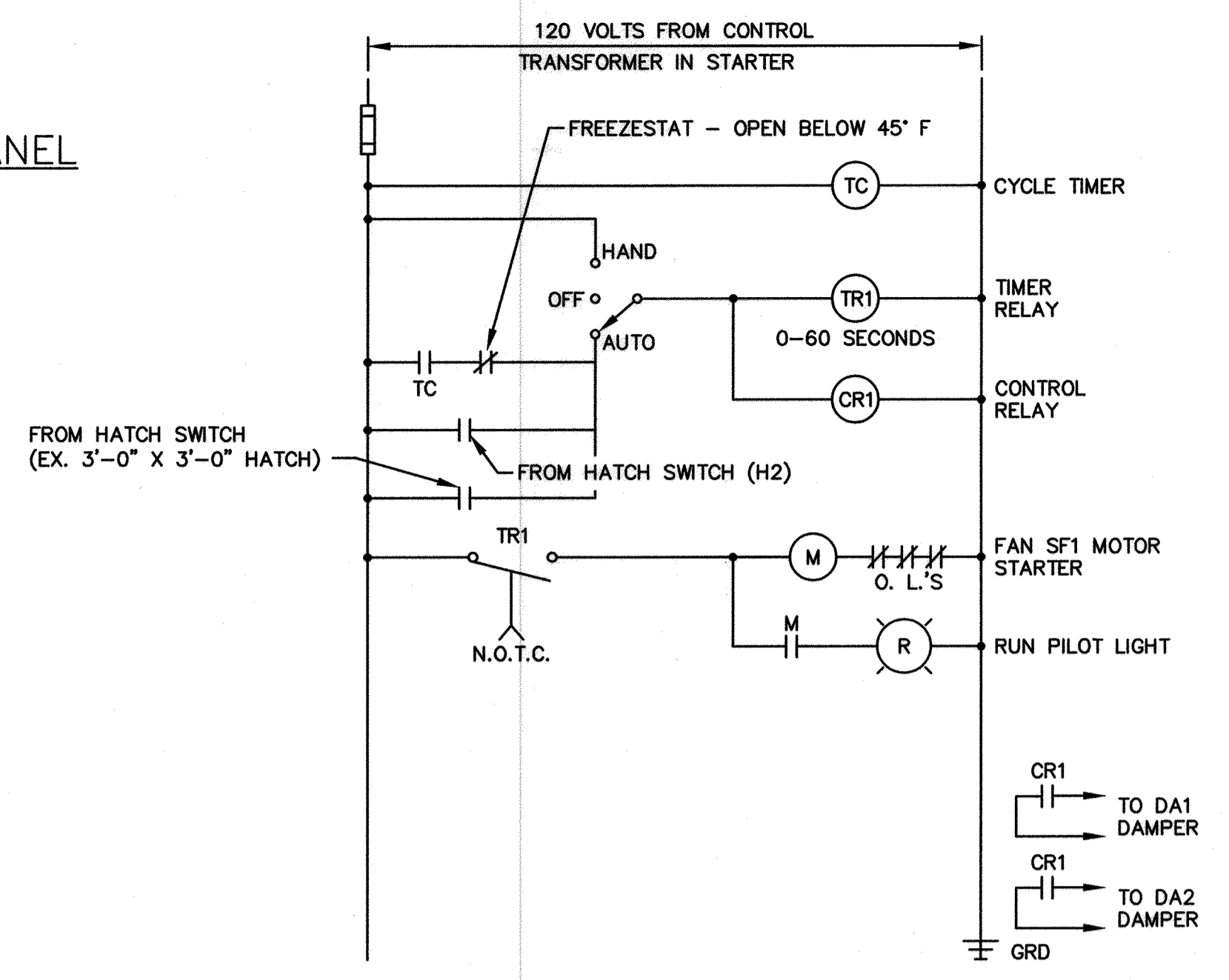
SHEET
22A OF 25

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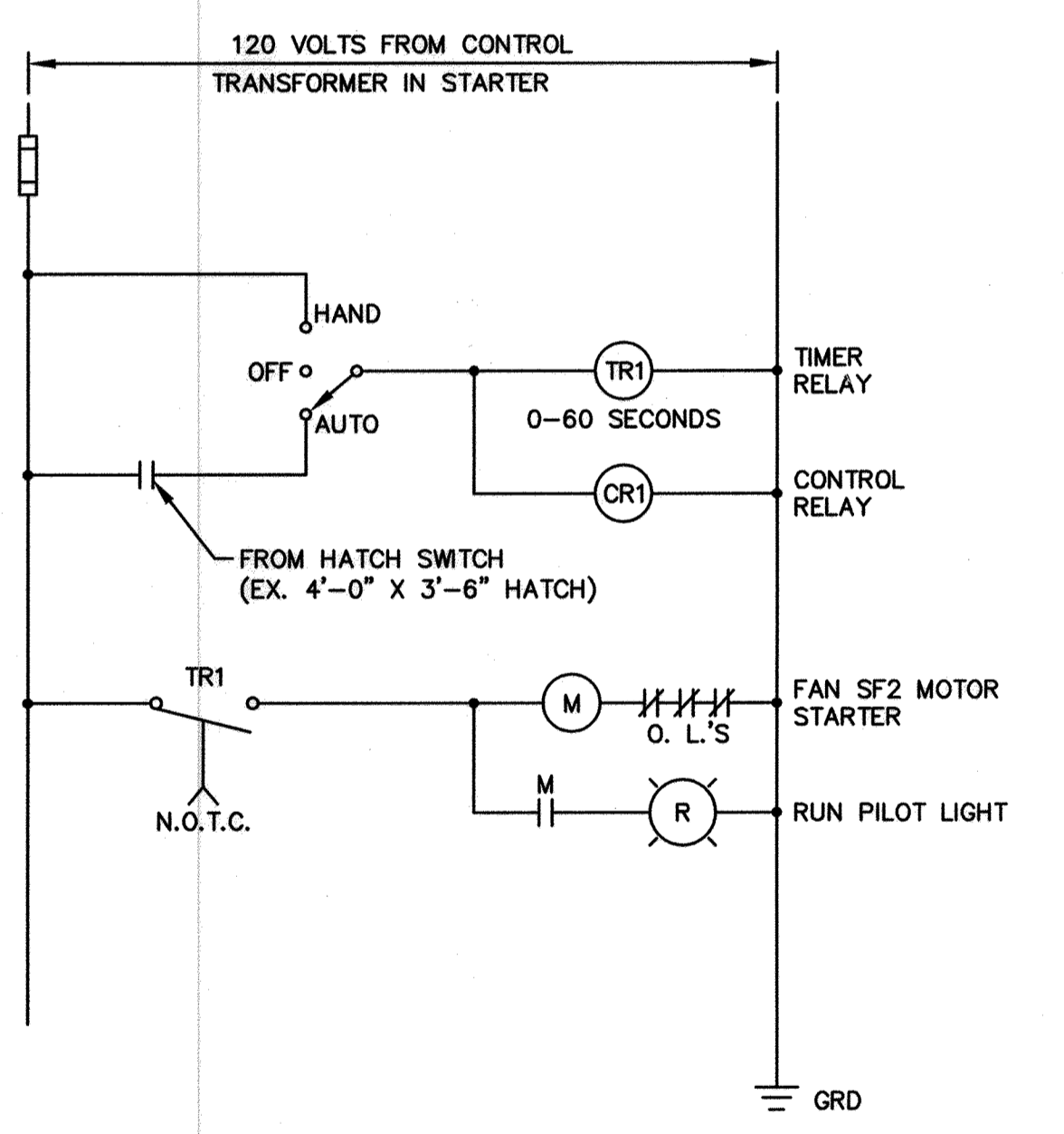


TYPICAL STATUS AND ALARM DIAGRAMS
NTS

- NOTES:
- PUMP RELATED SIGNALS ARE TYPICAL FOR BOTH PUMPS.
 - CONTRACTOR SHALL PROVIDE 2-#14 IN CONDUIT TO PCP FOR EACH SIGNAL (OR INTERNAL TO MCC) AND TERMINATE ON TERMINAL STRIP PRIOR TO EXTENDING TO RELAY.
 - ALL RELAYS SHALL BE 4-POLE.
 - DRY CONTACTS (NORMALLY OPEN) SHALL FEED ALARM SIGNALS TO SCADA COMMUNICATIONS PANEL.
 - PROVIDE A MINIMUM OF SIX 4-POLE RELAYS MOUNTED IN PCP AS SPARES.

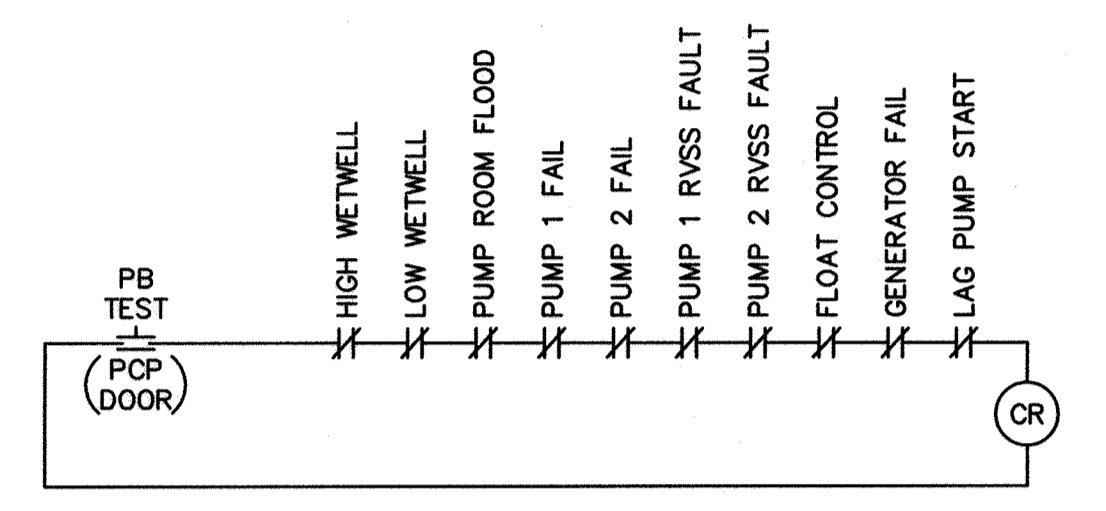


CONTROL SCHEMATIC - SUPPLY FAN SF1
NTS



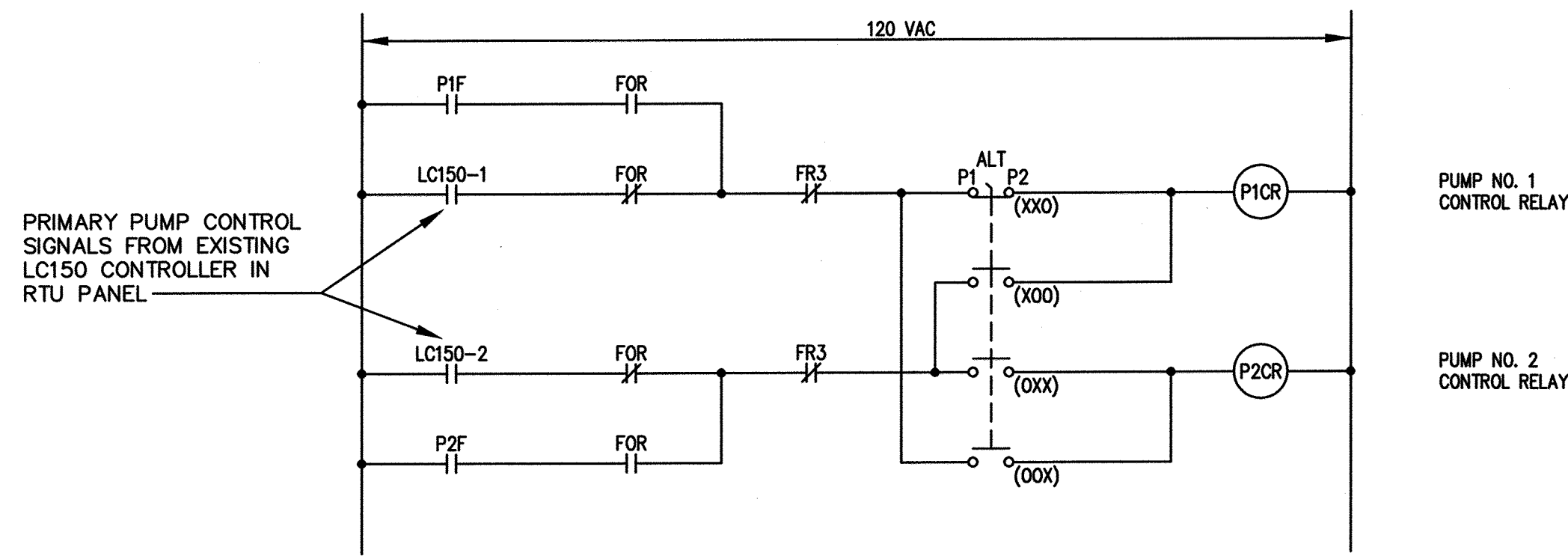
CONTROL SCHEMATIC - SUPPLY FAN SF2
NTS

- NOTES:
- CONTRACTOR TO PROVIDE ALL NECESSARY RELAYS TO ACCOMPLISH CONTROLS AS SHOWN, AND PROVIDE A MINIMUM OF TWO SPARE OUTPUTS PER FAN.
 - ALL MOTOR STARTERS SHALL HAVE PHASE MONITORS (NOT SHOWN) FOR SINGLE PHASE PROTECTION (SEE SPECIFICATION).
 - MOTOR OPERATED DAMPERS SHALL BE ENERGIZED PRIOR TO FAN MOTORS BASED ON PRESET TIME DELAY WHERE SHOWN.
 - REFER TO MECHANICAL SPECIFICATIONS FOR VENTILATION OPERATION DESCRIPTIONS.



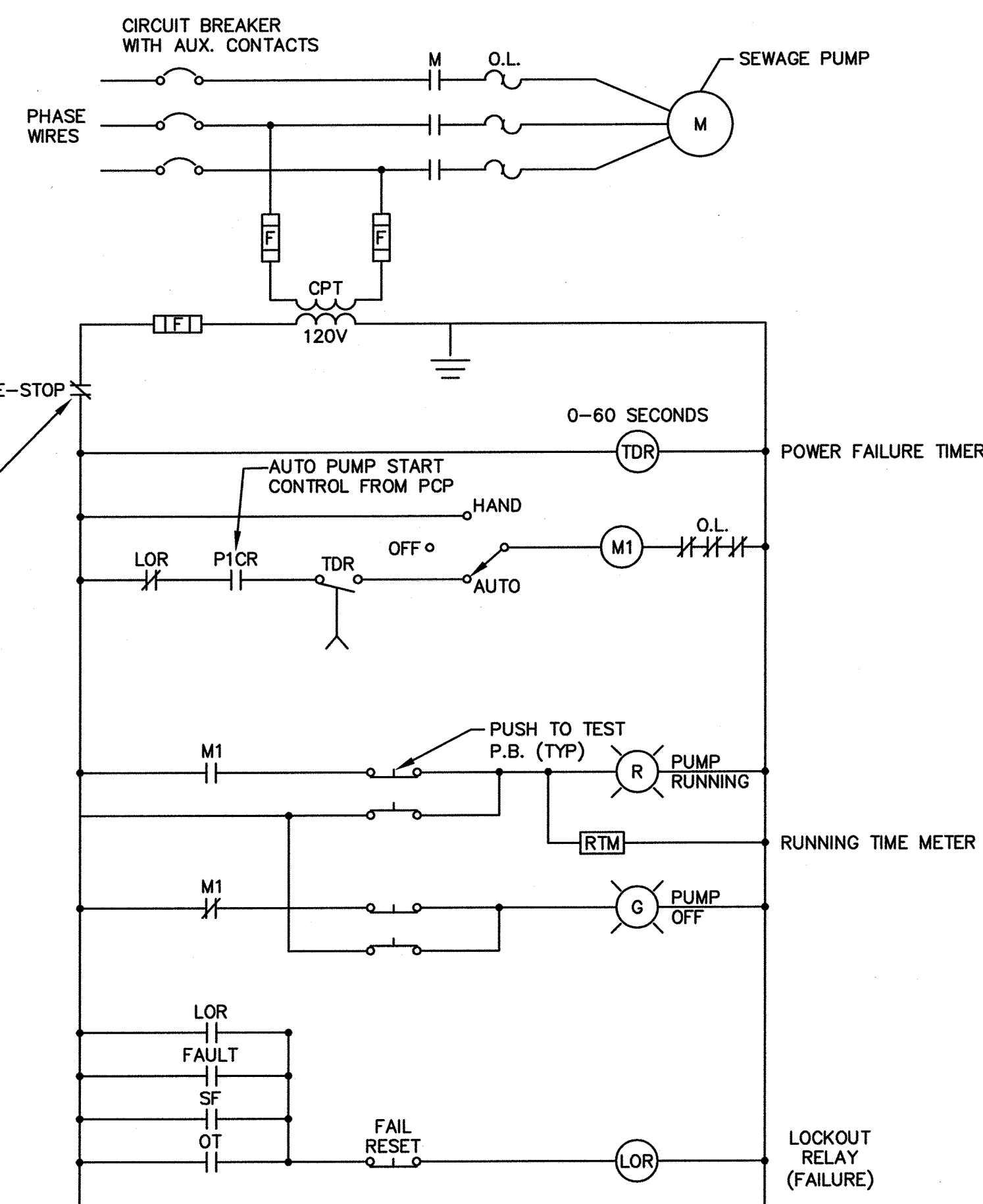
COMMON ALARM STRING (STATION FAILURE)
NTS

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND		PROFESSIONAL CERTIFICATION <small>I HEREBY CERTIFY THAT REDLINE REVISIONS INCLUDED IN 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.</small> LICENSE NO. 51024 EXPIRATION DATE 10/17/2020				DES: JDM DRN: NAF CHK: JDM DATE: 4/02/19		ELECTRICAL DETAILS MOUNT HEBRON & PATAPSCO PARK SPS - 2019 UPGRADES		MOUNT HEBRON SEWER MAINS 2019 UPGRADES CAPITAL PROJECT NO. S6600 CONTRACT NO. 745-S		SCALE NTS
<small>DIRECTOR OF PUBLIC WORKS</small> 		<small>DATE</small> 4/5/19		<small>CHIEF, BUREAU OF ENGINEERING</small> 		<small>DATE</small> 4/19		<small>REVISIONS</small> 1 2019 UPGRADES - ADD SHEET 23A		<small>MAP NO.</small> 17 <small>BLOCK NO.</small> 8		SHEET 23A OF 25
<small>CHIEF, BUREAU OF UTILITIES</small> 		<small>DATE</small> 1-5-19		<small>CHIEF, UTILITY DIVISION</small> 		<small>DATE</small> 4/19		<small>REVISIONS</small> 1 2019 UPGRADES - ADD SHEET 23A		<small>ELECTION DISTRICT NO. 2</small> <small>HOWARD COUNTY, MARYLAND</small>		



PRIMARY AND SECONDARY PUMP CONTROL AND ALTERNATION SELECTION

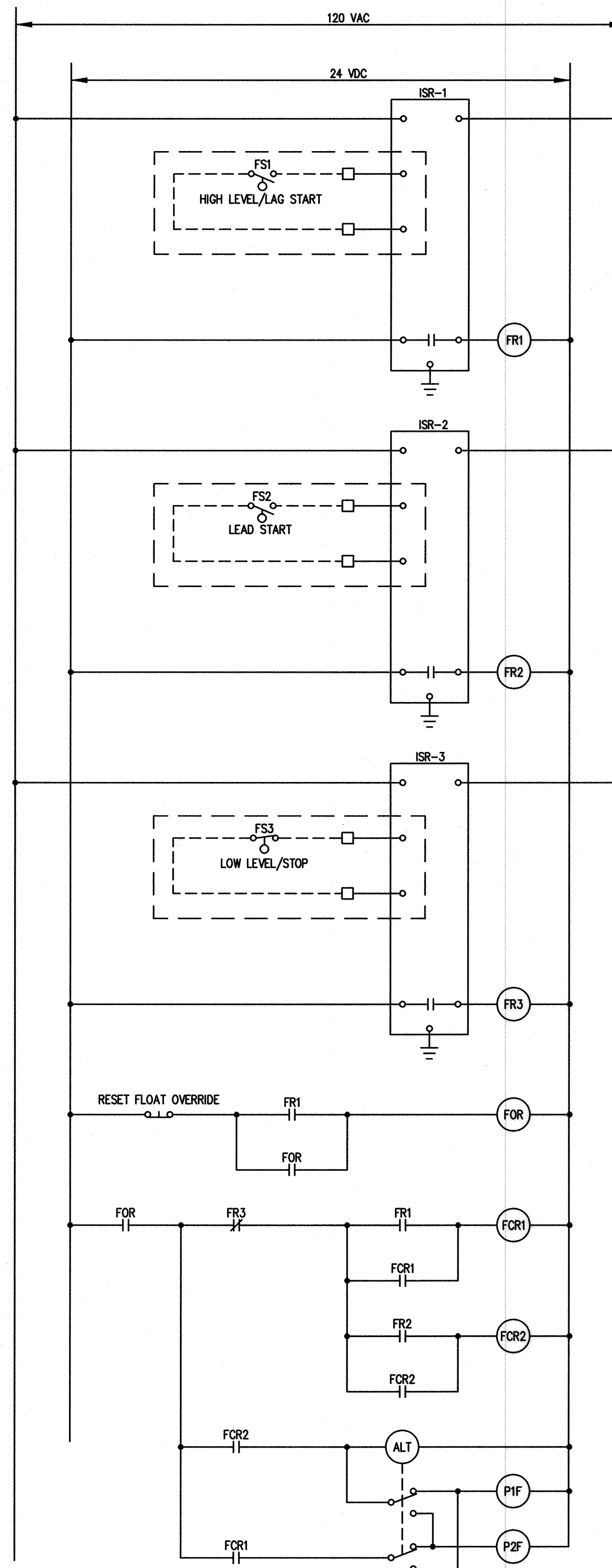
NTS



SEWAGE PUMP #1

NTS
(SEWAGE PUMP #2 SIMILAR EXCEPT P1CR WILL BE P2CR, AND M1 WILL BE M2)

NOTE:
1. PROVIDE ADDITIONAL ALARM PILOT LIGHTS ON RVSS DOOR FOR FAILURE, NOT-IN-AUTO, OVERTEMP AND SEAL FAIL. TRANSMIT THOSE SIGNALS TO PCP AS WELL, EXCEPT SEAL FAIL SHALL ONLY BE ANNUNCIATED ON RVSS DOOR.



BACKUP FLOAT CONTROLS

NTS

WETWELL HIGH LEVEL/LAG START FLOAT SWITCH I.S. RELAY

HIGH LEVEL/LAG PUMP START FLOAT RELAY

WETWELL LEAD START FLOAT SWITCH I.S. RELAY

LEAD PUMP START FLOAT RELAY

WET WELL LOW LEVEL/STOP SWITCH I.S. RELAY

LOW LEVEL/PUMP(S) STOP FLOAT RELAY

FLOAT OVERRIDE RELAY

BACKUP FLOAT LAG PUMP CONTROL RELAY

BACKUP FLOAT LEAD PUMP CONTROL RELAY

BACKUP FLOAT ALTERNATOR

BACKUP FLOAT PUMP 1 REQUIRED CONTROL RELAY

BACKUP FLOAT PUMP 2 REQUIRED CONTROL RELAY

LIGHT FIXTURE SCHEDULE						
TYPE	DESCRIPTION	VOLTAGE	LAMPS	MOUNTING HEIGHT	MANUFACTURER OR EQUAL	QTY
A	4 FOOT, ENCLOSED AND GASKETED LED FIXTURE, U.L. LISTED FOR WET LOCATION.	120/277	8000 LUMEN LED	STEM SUSPENDED OR SURFACE	LITHONIA FEM L48 8000LM (MAFL WD MVOLT GZ10 40K 80CRI)	10
B	WET LOCATION EXIT SIGN WITH BLACK HOUSING AND BRUSHED ALUMINUM STENCIL AND GREEN FIBERGLASS PANEL. CONNECT AHEAD OF SWITCH	120/277	LED	WALL MOUNTED 8'-0" ABOVE FINISHED FLOOR OR AS NOTED	McPHILBEN ER60MLD1GBA	2
C	9.6 VOLT LIGHTING UNIT WITH EMERGENCY BATTERY PACK, U.L. LISTED FOR WET LOCATION. OPERATION SHALL BE FULLY AUTOMATIC AND THE EMERGENCY POWER UNIT SHALL BE CAPABLE OF PROVIDING POWER FOR TWO LED LAMPS FOR A MINIMUM OF 90 MINUTES. FEATURES SHALL INCLUDE A SEALED NICKEL CADMIUM LONG LIFE BATTERY, SOLID STATE CHARGER, AN AUTOMATIC TURN ON CIRCUIT AND TEST SWITCH TO SIMULATE EMERGENCY OPERATION. CONNECT AHEAD OF SWITCH.	120/277	LED	WALL MOUNTED 8'-0" ABOVE FINISHED FLOOR	LITHONIA WLTV LED ELA T QWP L0309	4

NOTE: CONTRACTOR TO VERIFY AND SUBMIT LAYOUT AND MOUNTING HEIGHTS TO ENGINEER FOR APPROVAL PRIOR TO INSTALLATION. QUANTITY TO BE SPLIT BETWEEN PUMP ROOM AND CONTROL ROOM

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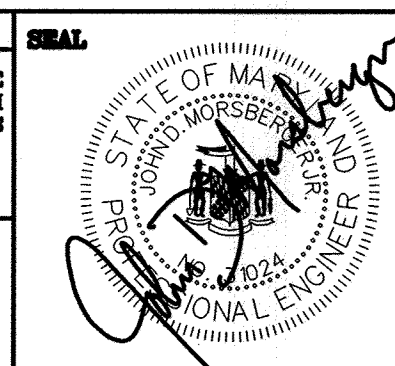
DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* 4/15/19
 Chief, Bureau of Engineering: *[Signature]* 4/15/19
 Chief, Bureau of Utilities: *[Signature]* 4-5-19
 Chief, Utility Division: *[Signature]* 4/15/19

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 LICENSE NO. 51024 EXPIRATION DATE 10/17/2020

RK&K
 700 EAST PRATT STREET
 SUITE 500
 BALTIMORE, MARYLAND 21202



DES:	JDM				
DRN:	NAP				
CHK:	JDM				
DATE:	4/02/19	RK&K	1	2019 UPGRADES - ADD SHEET 23B	4/19
BY:	NO.			REVISIONS	DATE

ELECTRICAL DETAILS MOUNT
HEBRON & PATAPSCO PARK SPS -
2019 UPGRADES

MAP NO. 17 BLOCK NO. 8

MOUNT HEBRON SEWER MAINS
2019 UPGRADES

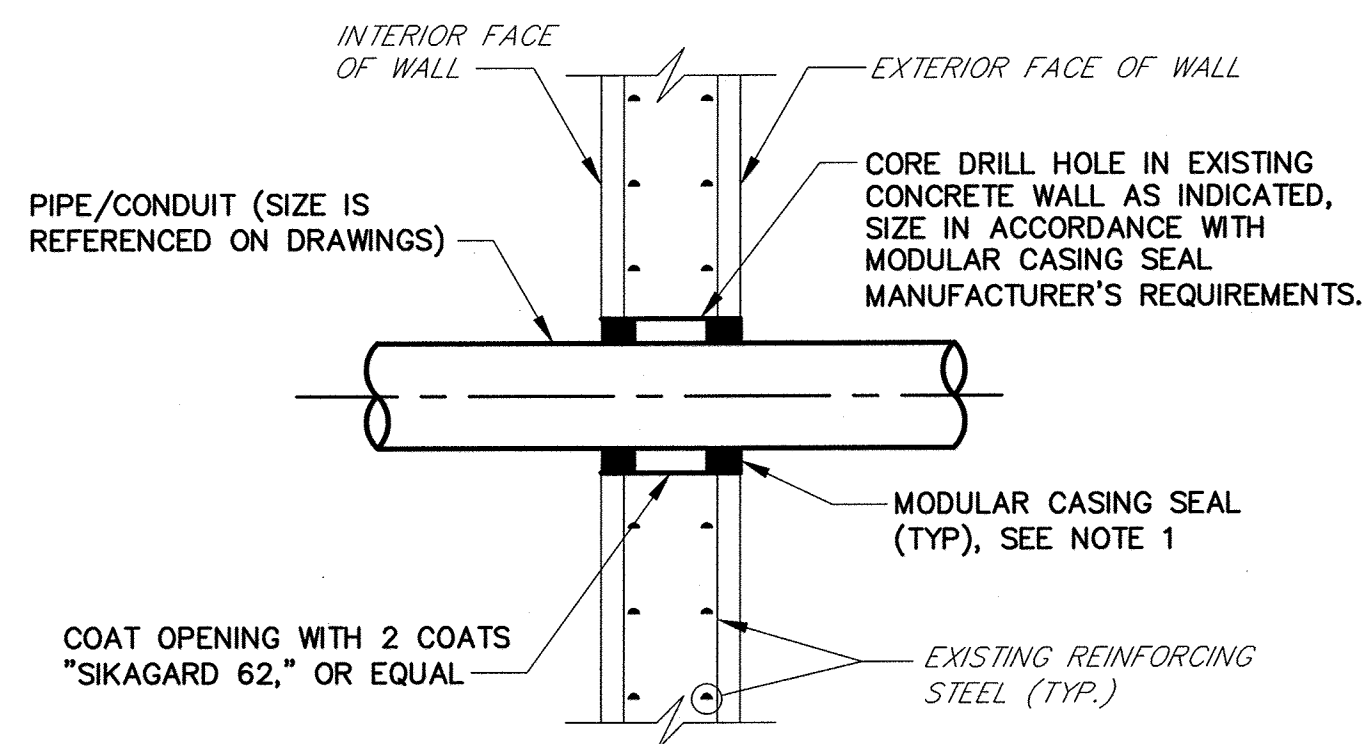
CAPITAL PROJECT NO. S6600
CONTRACT NO. 745-S

ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

SCALE
NTS
SHEET
23B OF 25

NOTES:

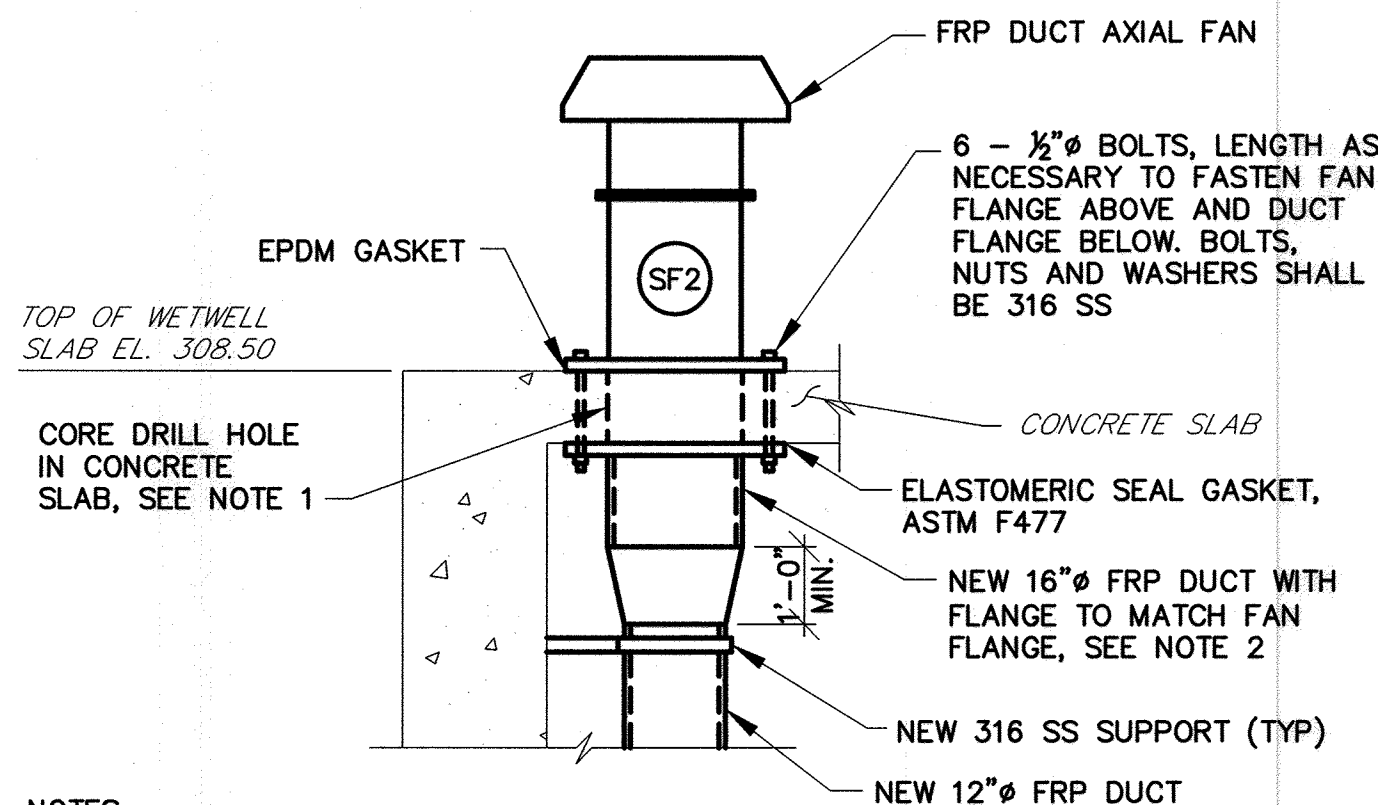
1. ALL EXISTING FEATURES DENOTED BY SLANTED TEXT.
2. ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE.



NOTES:

1. MODULAR CASING SEAL SHALL BE LINKSEAL, OR APPROVED EQUAL.
2. PIPE AT MODULAR CASING SEAL LOCATION SHALL BE LEVEL.
3. ON EXTERIOR WALLS WHERE PIPING IS BURIED, ONLY ONE MODULAR CASING SEAL IS REQUIRED, ON INTERIOR SIDE.

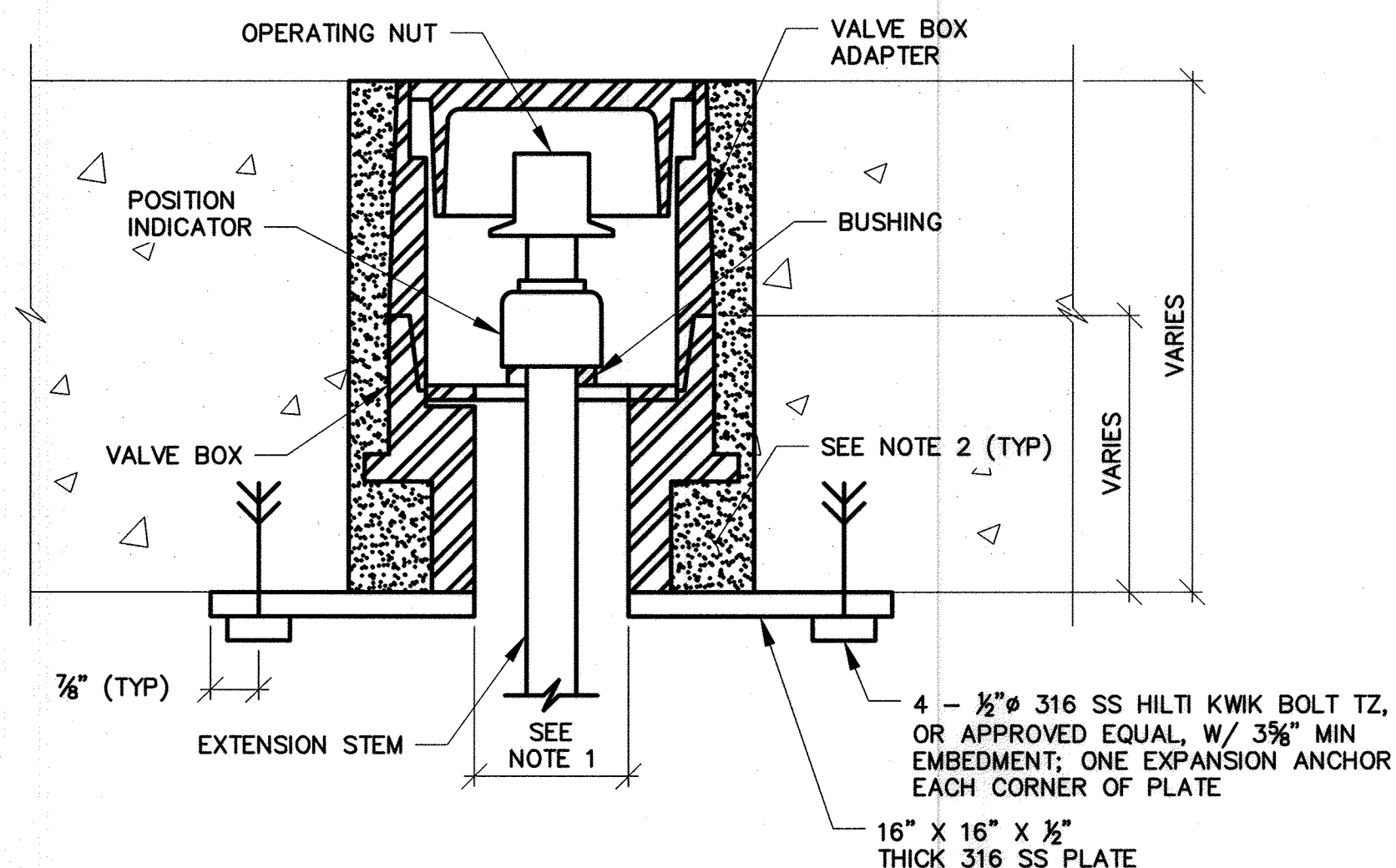
TYPICAL CONCRETE WALL PENETRATION DETAIL
NTS



NOTES:

1. COORDINATE SIZE OF HOLE IN CONCRETE SLAB WITH MANUFACTURER OF FAN FURNISHED.
2. PROVIDE OVERSIZED FLANGES SO THAT THE BOLT HOLES ARE A MINIMUM OF 3" FROM THE DUCT OPENING IN THE CONCRETE SLAB

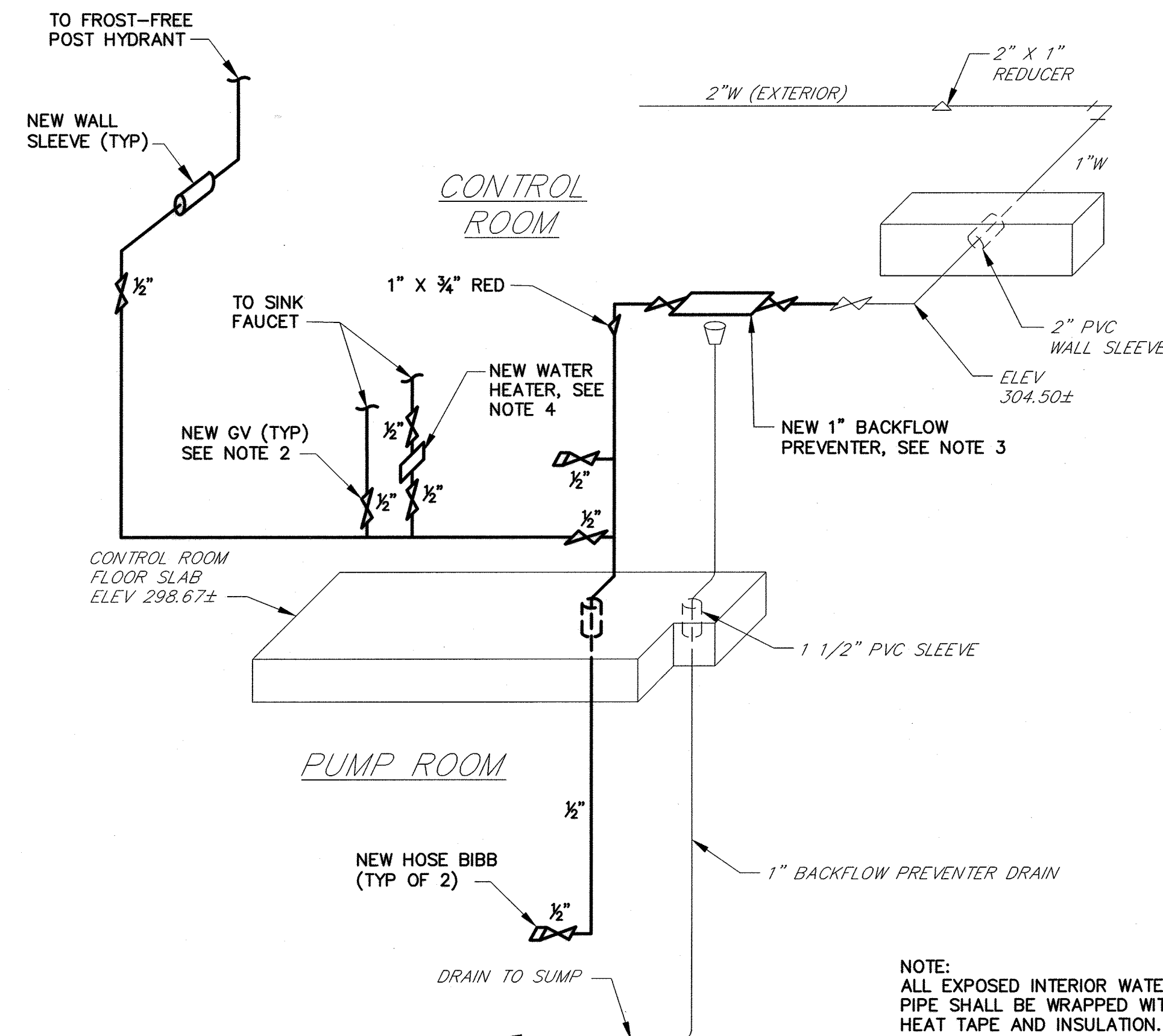
16" FRP SUPPLY FAN DETAIL
NTS



NOTES:

1. HOLE IN SS PLATE SHALL MATCH THE INSIDE DIAMETER OF VALVE BOX.
2. FILL ANNULAR SPACE AROUND VALVE BOX WITH NON-SHRINK, NON-METALLIC CEMENTITIOUS GROUT.

TYPICAL VALVE BOX INSTALLATION DETAIL
NTS



POTABLE WATER NOTES:

1. CONTRACTOR SHALL PROVIDE ALL FITTINGS NECESSARY TO CONNECT NEW PIPING TO EXISTING PIPING.
2. GATE VALVES SHALL BE INSTALLED IN CLOSE PROXIMITY TO ALL NEW PLUMBING FIXTURES.
3. INSTALL BACKFLOW PREVENTER SO THAT THE EXISTING DRAIN PIPING CAN BE REUSED. MANUFACTURER SUPPLIED AIR GAP FITTING SHALL BE INSTALLED BETWEEN THE BACKFLOW PREVENTER AND THE DRAIN PIPING.
4. MOUNT WATER HEATER SUCH THAT THE ELEVATION OF THE TOP OF THE WATER HEATER IS BELOW THE SINK ELEVATION AND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

PATAPSCO PARK PUMPING STATION
WATER SUPPLY DIAGRAM
NTS

UNIT HEATER SCHEDULE					
ID	SIZE (H X W X D)	KW	MOUNTING HEIGHT	NOTES	MANUFACTURER & MODEL NO.
UH1	21 3/4" X 19" X 12 3/4"	15	6'-6" AFF	1,2,3,4	QMARK MODEL MUH-15
UH2	21 3/4" X 19" X 12 3/4"	15	7'-0" AFF	1,2,3,4	QMARK MODEL MUH-15

NOTES:

1. PROVIDE INTEGRAL THERMOSTAT
2. MOUNTING HEIGHT IS TO BOTTOM OF UNIT
3. PROVIDE INTEGRAL DISCONNECT
4. SEE ELECTRICAL DRAWINGS FOR CONNECTION REQUIREMENTS

PUMP SCHEDULE						
ID	DESCRIPTION	LOCATION	Q (GPM)	TDH (FT)	RPM (MAX)	REMARKS
P1	PUMP #1	PUMP ROOM	600	192	1800	NEW DRY-PIT SUBMERSIBLE
P2	PUMP #2	PUMP ROOM	600	192	1800	NEW DRY-PIT SUBMERSIBLE

DAMPER SCHEDULE						
ID	SIZE (INCHES)	DEPTH (INCHES)	MATERIAL	NOTES	TYPE	REMARKS
DA1	24" x 72"	NA	NA	3,4	EXISTING	OPEN WHEN SUPPLY FAN SF1 IS OPERATING, OTHERWISE CLOSED (NEW ACTUATOR ONLY)
DA2	30" x 30"	4	ALUMINUM	1,3,4,6,7,9	THIN LINE CONTROL DAMPER	OPEN WHEN SUPPLY FAN SF1 IS OPERATING, OTHERWISE CLOSED

NOTES:

1. CLEAR ANODIZED FINISH	4. ACTUATOR MOUNTING BRACKET	7. REAR FLANGE FRAME
2. PNEUMATIC ACTUATOR	5. SWITCH PACKAGE	8. SPRING LOADED OPEN
3. ELECTRIC ACTUATOR	6. FRONT FLANGE FRAME	9. SPRING LOADED CLOSED

CENTRIFUGAL SQUARE INLINE FAN SCHEDULE											
ID	SERVICE	LOCATION	DRIVE	CFM	S.P. (IN W.G.)	FAN RPM	MOTOR HP	VOLTAGE/PHASE	SOUND (MAX AT 5')	NOTES	MANUFACTURER & MODEL NO.
SF1	SUPPLY	CONTROL ROOM	BELT	3,400	0.67	727	1.0	460/3	59 dBA	4,7,11,12,13,14,17,19,21,25,26,27,28	LOREN COOK MODEL NO. 225SQN-B, OR APPROVED EQUAL

NOTES:

1. NEMA 4 DISCONNECT	11. INLET FLEXIBLE CONNECTOR	21. REINFORCED WHEEL
2. GRAVITY BACKDRAFT DAMPER	12. OUTLET FLEXIBLE CONNECTOR	22. EXTERNAL INLET VANE DAMPER - ALUMINUM
3. MOTORIZED BACKDRAFT DAMPER	13. FLANGED INLET CONNECTION WITH COMPANION FLANGE	23. FILTER BOX WITH ALUMINUM FILTER
4. SIDE DISCHARGE PACKAGE	14. FLANGED OUTLET CONNECTION WITH COMPANION FLANGE	24. FILTER BOX WITH 30% ALUMINUM FILTER
5. DUEL SIDE DISCHARGE PACKAGE	15. CEILING MOUNTED RUBBER-IN-SHEAR INSULATORS	25. EXTENDED LUBE LINES
6. BELT GUARD	16. FLOOR MOUNTED RUBBER-IN-SHEAR INSULATORS	26. SPARE BELT KIT
7. OSHA GUARD/MOTOR COVER	17. CEILING MOUNTED SPRING ISOLATORS	27. BELT TENSIONER-ROTARY
8. INSULATED HOUSING	18. FLOOR MOUNTED SPRING ISOLATORS	28. THERMOSTATICALLY CONTROLLED
9. INLET GUARD	19. LORENZIZED COATING	
10. OUTLET GUARD	20. EPOXY POWDER COATING	

ACCESS HATCH SCHEDULE			
ID	SLAB OPENING	CLEAR OPENING	REMARKS
H1	48" X 48"	45 1/2" X 42 1/8"	CONTROL ROOM NEW GENERAL PURPOSE RETROFIT ACCESS HATCH W/ GRATING
H2	54" X 96"	51" X 96"	TOP SLAB NEW GENERAL PURPOSE RETROFIT ACCESS HATCH

FIBERGLASS DUCT AXIAL FAN SCHEDULE											
ID	SERVICE	LOCATION	DRIVE	CFM	S.P. (IN W.G.)	FAN RPM	MOTOR HP	VOLTAGE/PHASE	SOUND (MAX AT 5 FEET)	NOTES	MANUFACTURER & MODEL NO.
SF2	SUPPLY	WETWELL TOP SLAB	BELT	1,400	0.50	1591	1/2"	460/3	68 dBA	3,4,5,6,7,11,18,19,20	HARTZELL FAN INC. FRP DUCT AXIAL MODEL NO. A35-166E, OR APPROVED EQUAL

NOTES:

1. DISCONNECT SWITCH	8. FRP ROOF CURB	15. VIBRATION ISOLATOR
2. VANE SECTION	9. ROOF MOUNT	16. INLET BELL
3. 316 SS HARDWARE AND SHAFT	10. DUCT MOUNT	17. 316 SS INLET GUARD
4. ACCESS DOOR	11. FIBERGLASS MOTOR COVER	18. EXPLOSION PROOF
5. STATIC GROUNDING - CARBON/GRAPHITE IMPREGNATION	12. HORIZONTAL MOUNTING ANGLES FOR SUSPENDED MOUNTING	19. INVERTER DUTY MOTOR
6. ALL VINYL ESTER CONSTRUCTION	13. VERTICAL MOUNTING FEET/ANGLES (FLOOR/CEILING MOUNTING)	20. WEATHER COVER
7. SURFACE VEIL	14. HORIZONTAL BASE FOR FLOOR MOUNTING	

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James E. Butler 4/19
DIRECTOR OF PUBLIC WORKS DATE
James E. Butler 4/19
CHIEF, BUREAU OF ENGINEERING DATE

James E. Butler 4/19
CHIEF, BUREAU OF UTILITIES DATE
James E. Butler 4/19
CHIEF, UTILITY DIVISION DATE

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT REDLINE REVISIONS INCLUDED IN 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. 28478. EXPIRATION DATE 9/15/2019

RK&K 700 EAST PRATT STREET SUITE 600 BALTIMORE, MARYLAND 21202

DES: DAO

DRN: NAP

CHK: RAL

DATE: 4/02/19

MECHANICAL DETAILS AND SCHEDULES
PATAPSCO PARK SPS -
2019 UPGRADES

MOUNT HEBRON SEWER MAINS
2019 UPGRADES

CAPITAL PROJECT NO. S6600
CONTRACT NO. 745-S

ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

SCALE
NTS

SHEET
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