

# ROUTE 108 WASTEWATER PUMPING STATION IMPROVEMENTS

CONTRACT NO. 24-4129

CAPITAL PROJECT NO. S-6190  
HOWARD COUNTY, MARYLAND

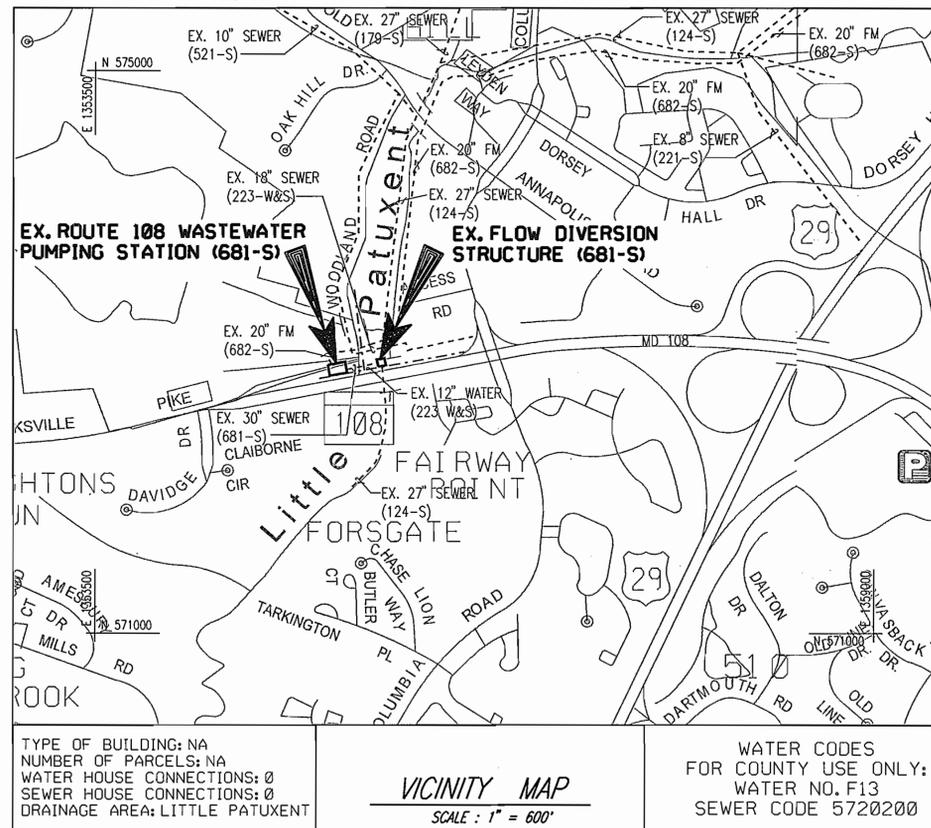
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## GENERAL NOTES

- APPROXIMATE LOCATION OF EXISTING MAINS ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING MAINS AND SERVICES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE.
- ALL HORIZONTAL CONTROLS ARE BASED ON MARYLAND STATE COORDINATES, NAD 83/91
- ALL VERTICAL CONTROLS ARE BASED ON NAVD 88.
- ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON PLANS.
- CLEAR ALL UTILITIES BY A MINIMUM OF 12". CLEAR ALL POLES BY 5'-0" MINIMUM, OR TUNNEL AS REQUIRED UNLESS OTHERWISE NOTED. THE OWNER HAS CONTACTED UTILITY COMPANIES AND HAS MADE ARRANGEMENTS FOR BRACING OF THE POLES AS SHOWN ON DRAWINGS. IN THE EVENT THE CONTRACTOR'S WORK REQUIRES THE BRACING OF ADDITIONAL POLES, ANY COST INCURRED BY THE OWNER FOR THE BRACING OF ADDITIONAL POLES OR DAMAGES SHALL BE DEDUCTED FROM MONIES OWED THE CONTRACTOR. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO SCHEDULE THE BRACING OF THE POLES.
- FOR DETAILS NOT SHOWN ON THE DRAWINGS, AND FOR MATERIALS AND CONSTRUCTION METHODS, 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.
- WHERE TEST PITS/ BORINGS HAVE BEEN MADE ON EXISTING UTILITIES, THEY ARE NOTED BY THE SYMBOL  AT THE LOCATIONS OF THE PITS. A NOTE OR NOTES CONTAINING THE RESULTS OF THE TEST PIT OR PITS IS INCLUDED ON THE DRAWINGS. EXISTING UTILITIES IN THE VICINITY OF THE PROPOSED WORK FOR WHICH TEST PITS HAVE NOT BEEN DUG SHALL BE LOCATED BY CONTRACTOR TWO WEEKS IN ADVANCE OF CONSTRUCTION OPERATIONS AT HIS OWN EXPENSE.
- CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS

AT&T	1-800-252-1133
BGE (CONTRACTOR SERVICES)	410-850-4620
BGE (UNDERGROUND DAMAGE CONTROL)	410-787-9068
BUREAU OF UTILITIES	410-313-4900
BELL ATLANTIC MARYLAND, INC.	1-800-621-9900
COLONIAL PIPELINE CO.	410-795-1390
MISS UTILITY	1-800-257-7777
STATE HIGHWAY ADMINISTRATION	410-531-5533
VERIZON	1-800-743-0033/410-224-9210



TYPE OF BUILDING: NA NUMBER OF PARCELS: NA WATER HOUSE CONNECTIONS: 0 SEWER HOUSE CONNECTIONS: 0 DRAINAGE AREA: LITTLE PATUXENT	<b>VICINITY MAP</b> SCALE: 1" = 600'	WATER CODES FOR COUNTY USE ONLY: WATER NO. F13 SEWER CODE 5720200
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DIRECTIONS: FROM I-95, TAKE RT 100 WEST. TAKE RT 29 SOUTH. TAKE RT 108 (CLARKSVILLE PIKE) WEST. TURN RIGHT ON WOODLAND ROAD. PUMPING STATION IS LOCATED ON LEFT HAND SIDE.

## SEQUENCE OF CONSTRUCTION

- SEE THE SECTION "SEQUENCE OF CONSTRUCTION" IN DOCUMENT D OF THE SPECIFICATIONS FOR GENERAL REQUIREMENTS.
- COORDINATE SEQUENCE OF CONSTRUCTION OF WORK IN PUMPING STATION WITH THE FLOW DIVERSION STRUCTURE SEQUENCE OF CONSTRUCTION ON DRAWING C-2. SEE "REQUIRED SEQUENCE OF CONSTRUCTION" ON DRAWING SC-1.
- INSTALL ROOF EXHAUST FAN, WALL LOUVER AND ASSOCIATED VENTILATION CONTROLS.
- INSTALL ULTRASONIC LEVEL TRANSDUCER, FLOATS AND ASSOCIATED WIRING AND CONDUIT.
- REMOVE CABLES AND CONDUITS CONNECTED BETWEEN JUNCTION BOX 1, 2 AND 3 AND MCC CELL 4A, 5A AND 5B AS SHOWN ON DEMOLITION PLAN ME-1 TO DISCONNECT PUMPS NOS. 1, 2 AND 3.
- REMOVE EXISTING JUNCTION BOX NO.1, 2 AND 3 AND CONCRETE PADS AS SHOWN ON DEMOLITION PLAN ME-1, AND PREPARE AREA FOR NEW CONCRETE PAD FOR NEW VFDS.
- CAST NEW CONCRETE PAD FOR NEW VFDS.
- INSTALL ALL THREE NEW VFDS AND ALL THREE NEW JUNCTION BOXES PER DRAWING E-2.
- INSTALL ALL POWER AND CONTROL CABLES AND CONDUITS FOR PUMPS NO.1, 2 AND 3 PER DRAWINGS E-1 AND E-2.
- TEMPORARILY RELOCATE EXISTING BUBBLER CONTROL PANEL AND INSTALL TEMPORARY PIPING AND WIRING CONNECTIONS.
- POUR NEW CONCRETE PAD FOR NEW PUMP CONTROL PANEL.
- INSTALL NEW PUMP CONTROL PANEL.
- INSTALL ALL REQUIRED CONTROL CONNECTIONS FOR PUMPS NO. 1, 2 AND 3.
- COMPLETE START-UP AND TESTING FOR THESE PUMPS AND THE NEW VFDS, CONTROLS, ULTRASONIC LEVEL DETECTION SYSTEM AND BACK-UP FLOAT SYSTEM. CONTRACTOR SHALL COORDINATE ALL OTHER WORK RELATED TO THIS PROJECT TO MINIMIZE THE DOWNTIME FOR THESE PUMPS. SEE PARAGRAPH 1.15 OF THE SPECIAL PROVISIONS IN THE SPECIFICATIONS.
- COMPLETE DEMOLITION OF EXISTING BUBBLER SYSTEM, VFD AND CONTROLS. (SEE GENERAL NOTE 18 ON THIS SHEET)

EQUIPMENT QUANTITIES				
ITEM	ESTIMATED	QUANTITIES	AS-BUILT	
			TYPE	SUPPLIER
36"x42" SLUICE GATE	1	1	SELF-CONTAINED PULSE VFD	HYDRO GATE
36"x36" SLUICE GATE	1	1	SELF-CONTAINED PULSE VFD	HYDRO GATE
36"x36" HATCH	2	2	THOMPSON FAB.	THOMPSON FAB.
30"x36" HATCH	1	1	THOMPSON FAB.	THOMPSON FAB.
125 HP VARIABLE FREQUENCY DRIVE	3	3	1B PULSE VFD	MICRO TECH
PLC	1	1		U.S. FILTER
ULTRASONIC LEVEL TRANSDUCER	1	1		U.S. FILTER
ULTRASONIC LEVEL TRANSMITTER	1	1		
ROOF EXHAUST FAN	1	1	ACRU-B	HORTON MECH.

AS-BUILT 12/07

G-1

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

PREPARED BY:



Whitman, Reardon and Associates, LLP.  
801 SOUTH CAROLINE ST.  
BALTIMORE, MD. 21231  
410-235-3450



DES: CAT	
DRN: CAT	
CHK: HWL	
DATE: 1/21/05	
BY NO.	AS-BUILT REVISIONS
	12/07

TITLE SHEET- VICINITY MAP,  
NOTES AND INDEX  
OF DRAWINGS

ROUTE 108 WASTEWATER PUMPING  
STATION IMPROVEMENTS  
CONTRACT NO. 24-4129  
CAPITAL PROJECT NO. S-6190

SCALE  
AS  
SHOWN

SHEET

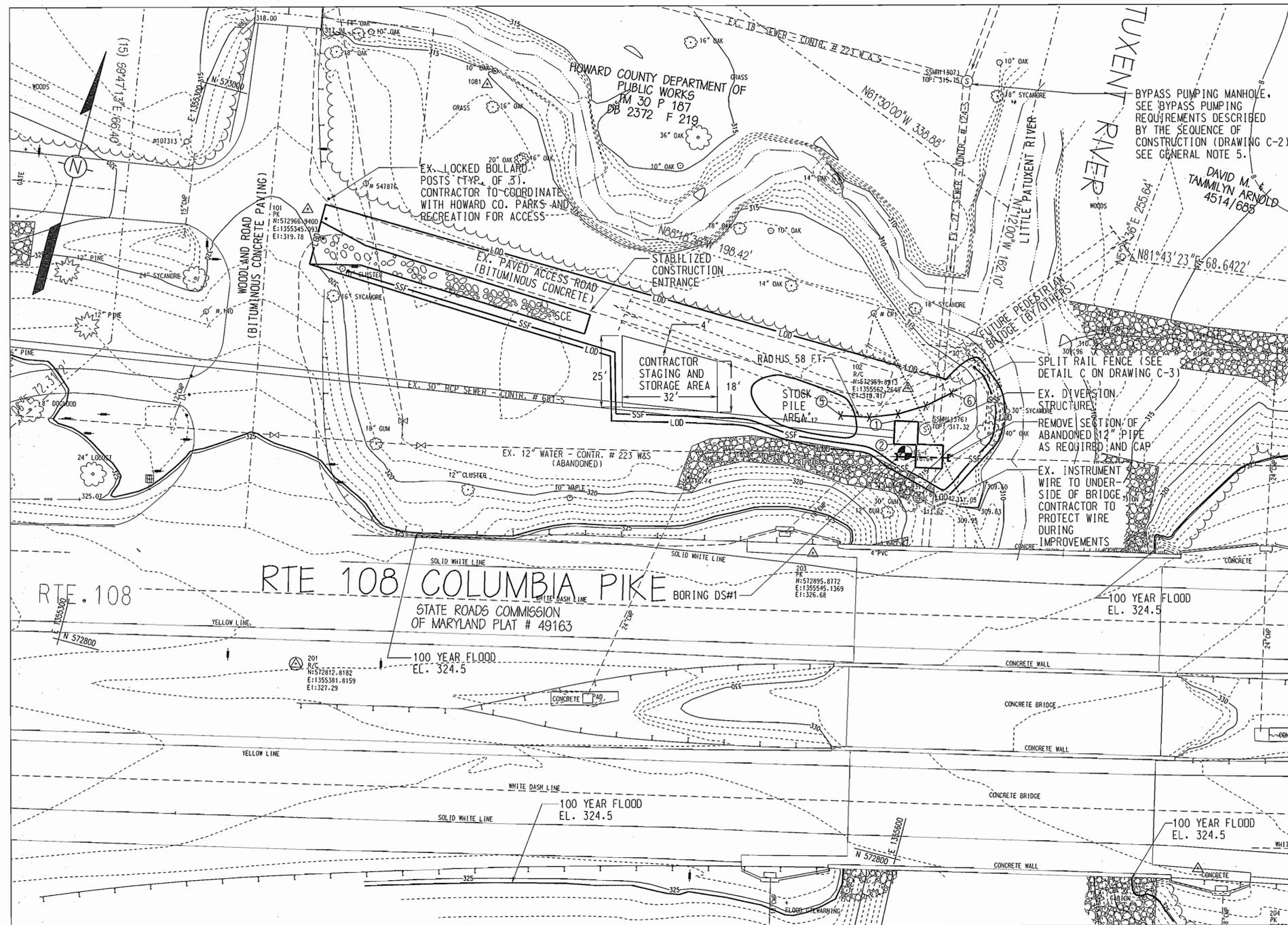
1 OF 18

600' SCALE MAP NO. 30 BLOCK NO. 9

ELECTION DISTRICT 5

HOWARD COUNTY, MARYLAND

FINAL JULY, 2005



**GENERAL NOTES:**

1. SEE DRAWING C-2 FOR SEQUENCE OF CONSTRUCTION.
2. CONTRACTOR SHALL PROTECT THE EXISTING SEWER FROM DAMAGE DURING CONSTRUCTION.
3. CONTRACTOR SHALL EXCAVATE ENTIRE PERIMETER OF EXISTING DIVERSION STRUCTURE DURING CONSTRUCTION OF NEW DIVERSION STRUCTURE CHAMBERS.
4. CONTRACTOR SHALL RESTORE GRADE TO MATCH EXISTING CONDITIONS.
5. CONTRACTOR COORDINATE ACCESS WITH HOWARD COUNTY BUREAU OF UTILITIES.

DIVERSION STRUCTURE STAKEOUT GEOMETRY			
STAKEOUT LABEL	NORTH	EAST	REMARKS
①	572947.7016	1355560.7821	WEST CHAMBER - NW CORNER
②	572939.7985	1355562.4797	WEST CHAMBER - SW CORNER
③	572933.7851	1355571.7836	SOUTH CHAMBER - SW CORNER
④	572935.7453	1355580.9087	SOUTH CHAMBER - SE CORNER
⑤	572944.6232	1355542.1369	FENCE - WEST END
⑥	572962.0114	1355577.3350	FENCE - EAST END

**LEGEND**

- 335 --- CONTOURS
- △ TRAVERSE STATION
- DECIDUOUS TREE
- ⊙ SAN. SEWER MANHOLE
- ⊕ WATER VALVE
- ⊙ SOIL BORING
- ⊕ UTILITY POLE
- GUY WIRE
- SIGN BOLLARD
- TREE LINES
- FENCE
- STORM DRAIN PIPES
- GUARDRAIL
- EDGE OF WATER
- RIP RAP
- EXISTING TO REMAIN
- NEW WORK
- EXISTING TO BE REMOVED
- L.O.D. LIMIT OF DISTURBANCE
- S.F. SILT FENCE
- S.S.F. SUPER SILT FENCE

**ABBREVIATIONS**

- ACP ASBESTOS CONCRETE PIPE
- APPROX. APPROXIMATE
- CONTR. CONTRACT
- EL. ELEVATION
- EX. EXISTING
- O.C. ON CENTER
- RCP REINFORCED CONCRETE PIPE
- TYP. TYPICAL

100 YEAR FLOODWAY ELEVATION: 324.5 (ZONE AE)  
 FEDERAL EMERGENCY MANAGEMENT AGENCY  
 FLOOD INSURANCE RATE MAP  
 HOWARD COUNTY, MARYLAND  
 PANEL 2400440028C, APRIL 2, 1997.  
 PROFILE 46P, LITTLE PATUXENT RIVER

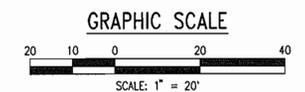
**TRAVERSE DATA:**  
 COORDINATES AND ELEVATIONS SHOWN HEREON ARE BASED ON THE MARYLAND COORDINATE SYSTEM (NAD 83/91) AND WERE DERIVED FROM THE FOLLOWING SURVEY CONTROL STATIONS:

POINT	NORTH	EAST	ELEV.
30DB	572298.1330	1353001.7900	409.1740
30BA	573149.0470	1357083.2100	397.2040

DATE OF SURVEY: 6/30/03

TRAVERSE POINTS	NORTH	EAST	ELEVATION
101	572966.9400	1355345.0931	319.7763 CP
102	572959.8913	1355562.2649	318.4051 CP
201	572812.8182	1355381.8159	327.2850 GP
203	572895.8772	1355545.1369	326.6844 CP

**1 DIVERSION STRUCTURE SITE PLAN**  
 SCALE: 1" = 20'



DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND.  
 Director of Public Works: [Signature] 9/20/05  
 Chief, Bureau of Engineering: [Signature] 2/16/05  
 Chief, Bureau of Utilities: [Signature] 9/16/05  
 Chief, Utility Design Division: [Signature]

PREPARED BY:  
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DES:	CAT		
DRN:	CAT		
CHK:	HWL		
DATE:	1/21/05		
BY:	NO.	REVISION	DATE

DIVERSION STRUCTURE -  
 SITE PLAN, NOTES, LEGEND  
 AND ABBREVIATIONS

ROUTE 108 WASTEWATER PUMPING  
 STATION IMPROVEMENTS  
 CONTRACT NO. 24-4129  
 CAPITAL PROJECT NO. S-6190  
 ELECTION DISTRICT 5  
 HOWARD COUNTY, MARYLAND

C-1  
 SCALE AS SHOWN  
 SHEET 2 OF 18

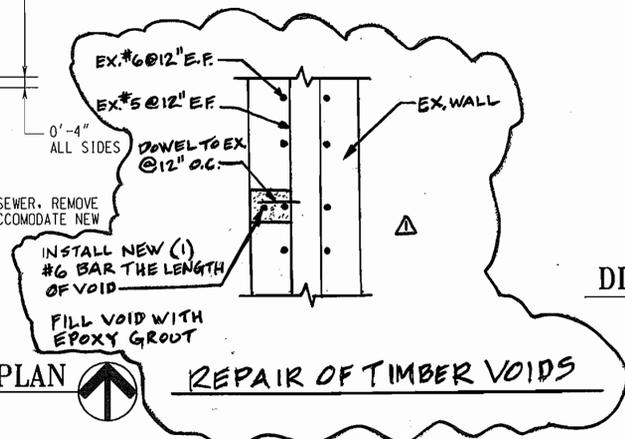
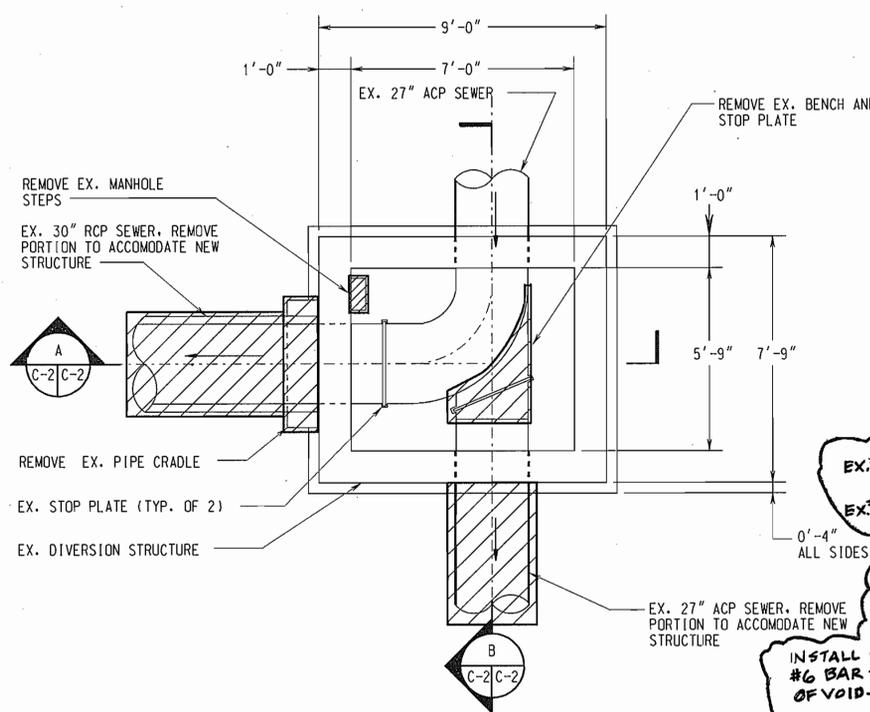
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**GENERAL NOTES:**

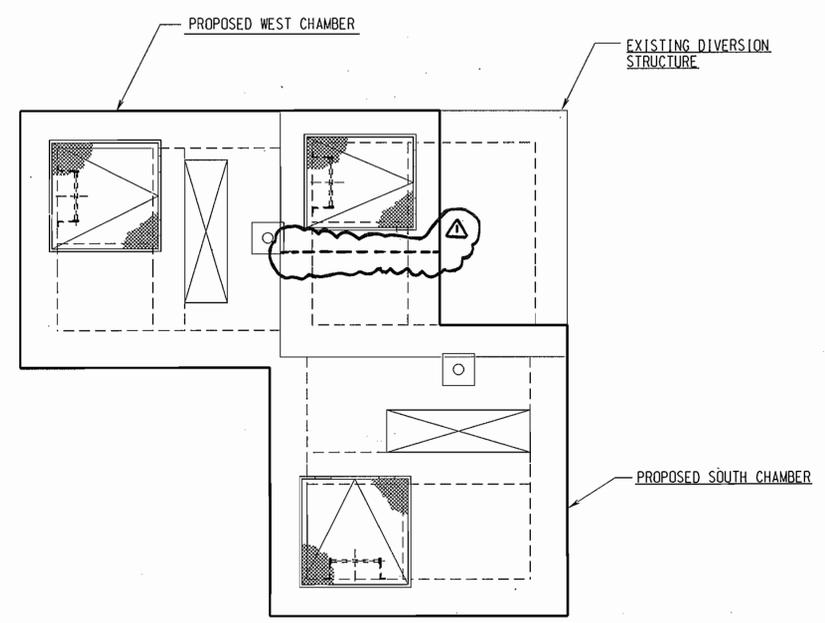
1. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DIMENSIONS INCLUDING ELEVATIONS INSIDE DIVERSION STRUCTURE.
2. CONTRACTOR SHALL PROTECT THE EXISTING SEWER FROM DAMAGE DURING CONSTRUCTION.
3. CONTRACTOR SHALL CONSTRUCT TEMPORARY BARRIERS TO PROTECT SEWER FLOW FROM FALLING DEBRIS DURING DEMOLITION AND CONSTRUCTION.
4. SEE DRAWINGS C-3 AND S-2 FOR NEW WORK.

**DIVERSION STRUCTURE SEQUENCE OF CONSTRUCTION:**

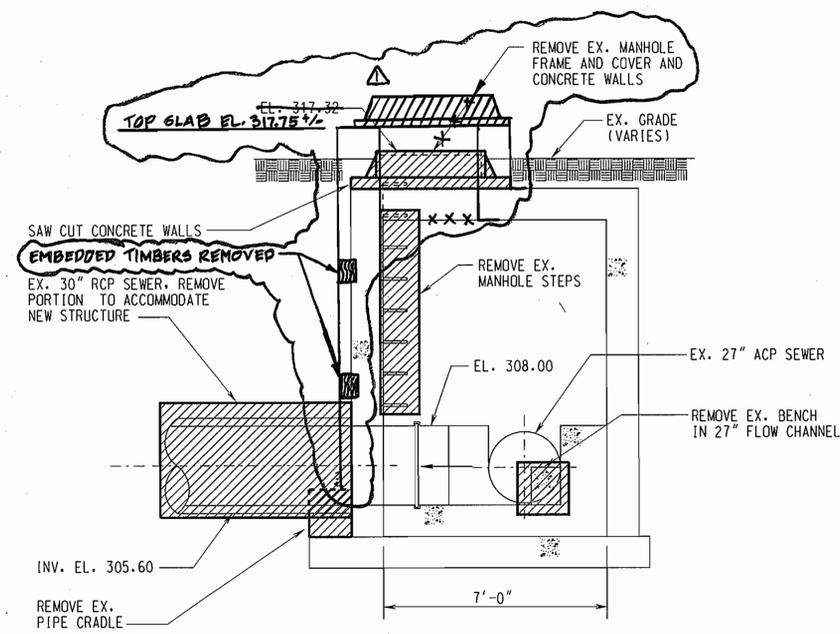
1. SEE THE SECTION "SEQUENCE OF CONSTRUCTION" IN DOCUMENT D IN THE SPECIFICATIONS FOR GENERAL REQUIREMENTS.
2. THE WEST CHAMBER SHOULD BE COMPLETED FIRST. COMPLETE AS MUCH WORK ON THE CHAMBER AS POSSIBLE WHILE THE EXISTING SEWER IS IN SERVICE WITHOUT DISTURBING THE EXISTING 30" RCP PIPE.
3. THE EXISTING STOP PLATE SHALL BE INSTALLED IN THE EXISTING DIVERSION CHAMBER TO STOP FLOW INTO THE EXISTING 30" RCP SEWER AND THE RT. 108 WFPS. THE CONTRACTOR SHALL MAKE PLATE CLOSURE WATER TIGHT. IF WATER TIGHT SEAL CANNOT BE MAINTAINED, THEN CONTRACTOR SHALL BE RESPONSIBLE FOR SUITABLE DEWATERING OPERATION. FLOW WILL CONTINUE DOWN THE EXISTING 27" ACP SEWER.
4. THE STATION WILL BE TAKEN OFF LINE TO CUT THE EXISTING 30" RCP SEWER, FORM THE FLOW CHANNEL AND BENCH AND INSTALL THE SLUICE GATE.
5. THE CONTRACTOR SHALL COORDINATE THE DURATION AND TIME THAT THE STATION WILL BE OFF LINE WITH THE COUNTY AND WITH OTHER SHUTDOWNS REQUIRED AT THE STATION.
6. WHEN THE WEST CHAMBER IS COMPLETE AND THE RT 108 WFPS IS FULLY OPERATIONAL, WORK CAN BEGIN ON THE SOUTH CHAMBER. COMPLETE AS MUCH WORK ON THE CHAMBER AS POSSIBLE WHILE THE EXISTING SEWER IS IN SERVICE WITHOUT DISTURBING THE EXISTING 27" ACP SEWER.
7. BEFORE FLOWS CAN BE DIVERTED TO THE RT 108 WFPS, THE CONTRACTOR SHALL PERFORM 5-DAY ACCEPTANCE TEST AS SPECIFIED IN THE SPECIAL PROVISIONS. TEST SHALL USE CLEAR WATER. TEST MUST BE APPROVED PRIOR TO DIVERTING WASTEWATER TO THE STATION.
8. THE EXISTING STOP PLATE SHALL BE INSTALLED IN THE EXISTING DIVERSION CHAMBER TO STOP FLOW INTO THE 27" ACP SEWER. THE CONTRACTOR SHALL MAKE PLATE CLOSURE WATER TIGHT. IF WATER TIGHT SEAL CANNOT BE MAINTAINED, THEN THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUITABLE DEWATERING OPERATION. FLOW WILL BE DIVERTED INTO THE RT.108 WFPS.
9. THE RT 108 WFPS WILL BE REQUIRED TO OPERATE CONTINUOUSLY. THE EXISTING 27" SEWER WILL BE SHUT DOWN IN ORDER TO CUT THE EXISTING 27" ACP SEWER, FORM THE FLOW CHANNEL AND BENCH AND INSTALL THE SLUICE GATE.
10. THE CONTRACTOR SHALL COORDINATE THE TIME AND DURATION OF THE SHUTDOWN WITH THE COUNTY. THE DURATION OF THE SHUTDOWN SHALL NOT EXCEED 5 CALANDER DAYS.
11. WHEN THE WEST AND SOUTH CHAMBERS ARE COMPLETE, THE EXISTING BENCH IN THE FLOW CHANNEL TO THE 27" ACP SEWER SHALL BE REMOVED. TWO TEMPORARY BYPASS PUMPS WILL BE REQUIRED TO PERFORM THIS WORK. THE TEMPORARY BYPASS PUMPS SHALL PUMP FROM THE MANHOLE UPSTREAM OF THE DIVERSION STRUCTURE TO THE WEST OR SOUTH CHAMBER OF THE DIVERSION STRUCTURE (COUNTY'S CHOICE). A TEMPORARY PLUG SHALL BE INSTALLED IN THE UPSTREAM MANHOLE TO STOP FLOW TO THE DIVERSION STRUCTURE AND THE SLUICE GATES SHALL BE CLOSED IN THE NEW DIVERSION STRUCTURE CHAMBERS. TWO BYPASS PUMPS SHALL BE REQUIRED, ONE DUTY, ONE STANDBY; THE CAPACITY OF THE BYPASS PUMPS SHALL BE ~~3,000~~ **5,200** GPM EACH. ALL BYPASS PUMPING SHALL BE CONTINUOUSLY MONITORED BY THE CONTRACTOR UNTIL THE FLOW CHANNEL HAS BEEN REPAIRED AND THE NEW GROUT IS CURED TO THE MANUFACTURER'S REQUIREMENTS. THE TEMPORARY BYPASS PUMPS SHALL BE REMOVED AND FLOW RESTORED TO THE FLOW DIVERSION STRUCTURE, WHEN DESCRIBED WORK IS COMPLETE.
12. RESTORE GRADE TO EXISTING CONDITIONS. REMOVE ALL SEDIMENT AND EROSION CONTROL MEASURES. STABILIZE REMAINING AREAS (SEE "REQUIRED SEQUENCE OF CONSTRUCTION" ON DRAWING SC-1).



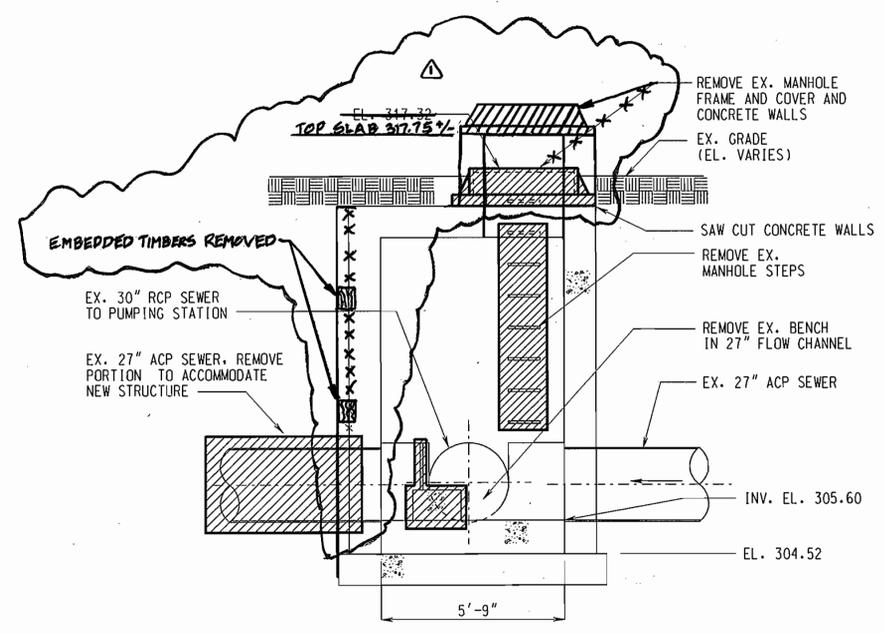
**DIVERSION STRUCTURE SEQUENCE OF CONSTRUCTION KEY**  
N.T.S.



**2 DIVERSION STRUCTURE - DEMOLITION PLAN**  
SCALE: 3/8" = 1'-0"



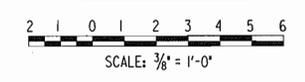
**A DIVERSION STRUCTURE - DEMOLITION SECTION**  
SCALE: 3/8" = 1'-0"



**B DIVERSION STRUCTURE - DEMOLITION SECTION**  
SCALE: 3/8" = 1'-0"

**5.2**  
**3,600**

**GRAPHIC SCALE**



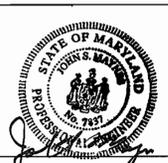
**AS-BUILT 12/07**

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

PREPARED BY:  
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Whitman, Reardon & Associates, LLP.  
801 SOUTH CAROLINE ST.  
Baltimore, Md. 21231  
410-235-3450

DATE: 9/16/05  
DATE: 9/16/05

DATE: 9-19-05  
DATE: 9/16/05



DES: CAT	
DRN: CAT	
CHK: HWL	
DATE: 1/21/05	
BY NO.	
REVISION	
DATE	
	<b>AS-BUILT REVISION</b>
	12/07

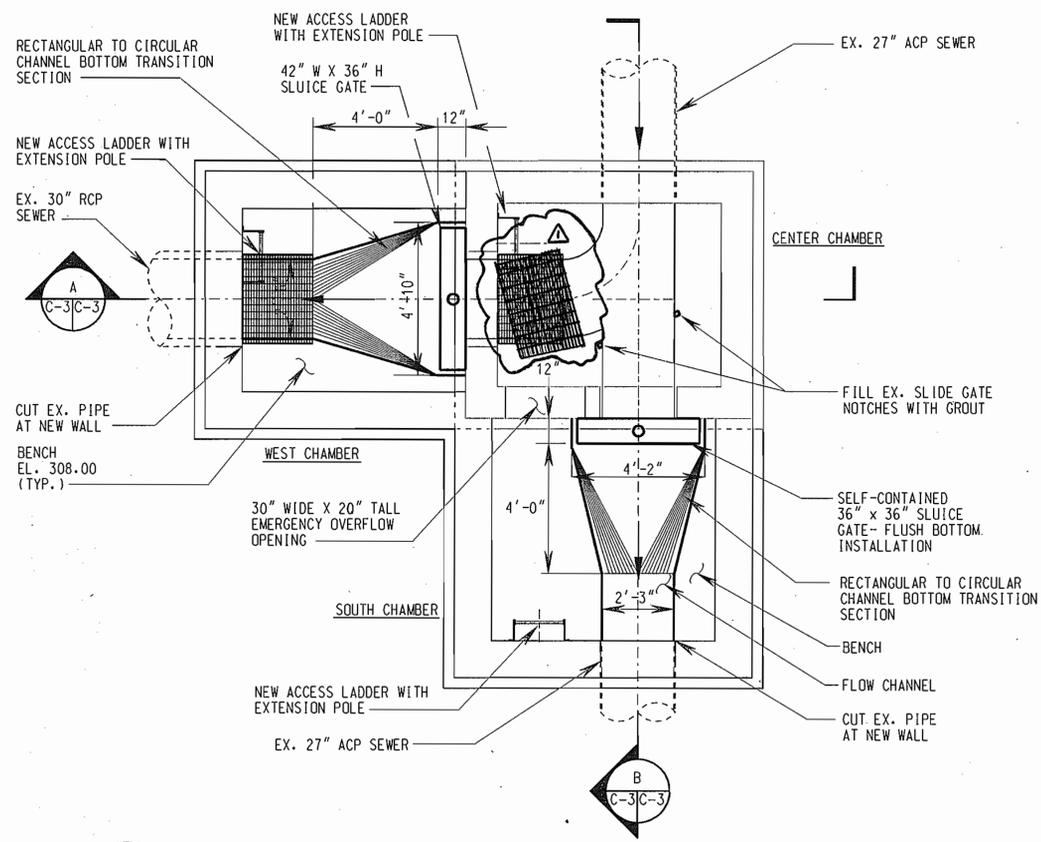
DIVERSION STRUCTURE - SEQUENCE OF CONSTRUCTION AND DEMOLITION PLAN AND SECTIONS

600' SCALE MAP NO. 30 BLOCK NO. 9

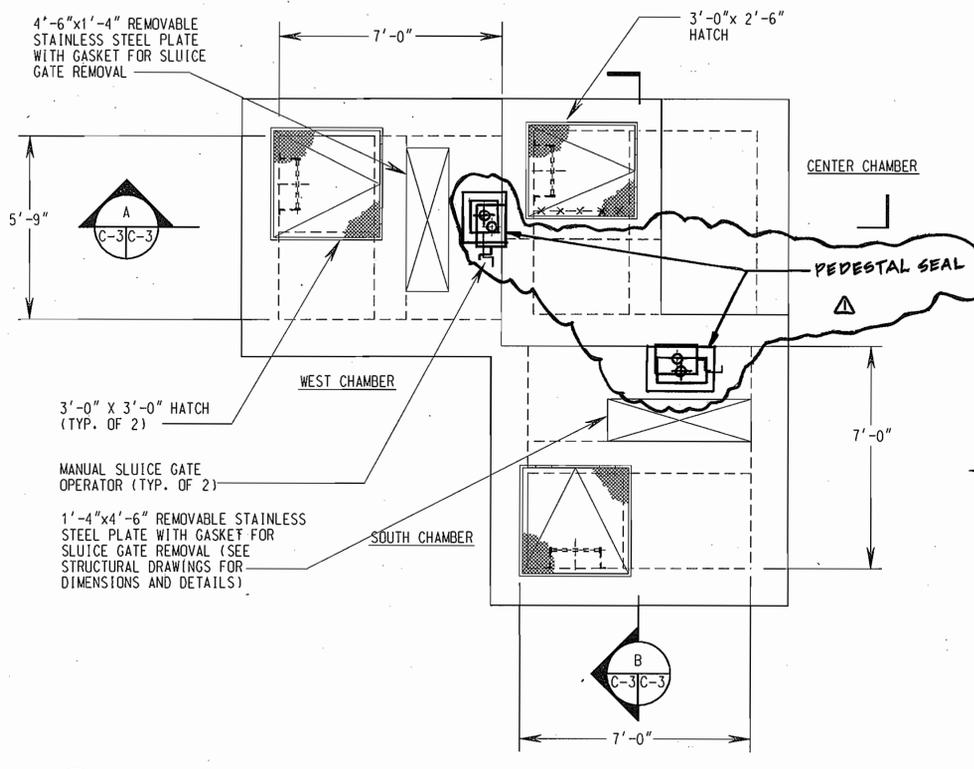
ROUTE 108 WASTEWATER PUMPING STATION IMPROVEMENTS  
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ELECTION DISTRICT 5 HOWARD COUNTY, MARYLAND

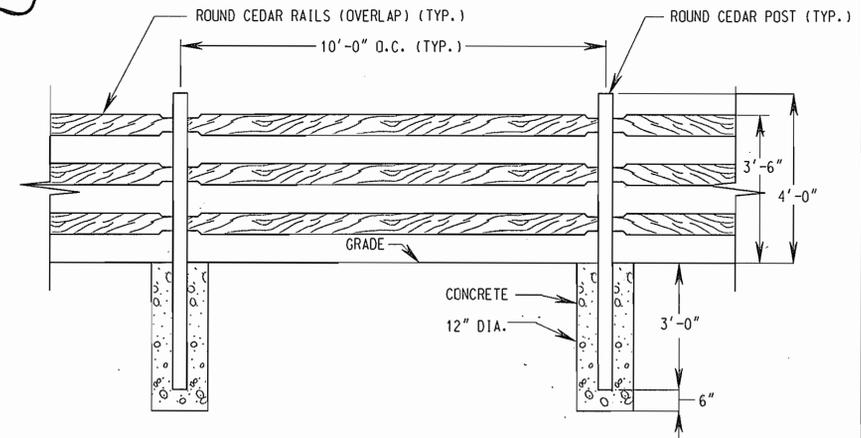
SCALE AS SHOWN  
SHEET **3 OF 18**



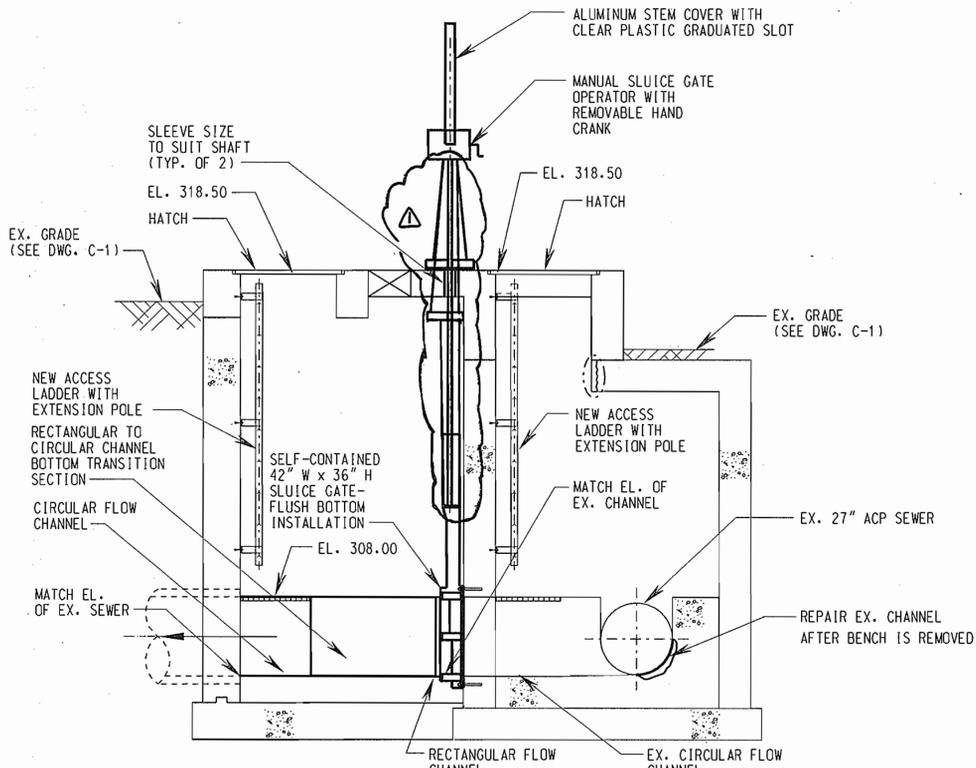
1 DIVERSION STRUCTURE - NEW PLAN  
SCALE: 3/8" = 1'-0"



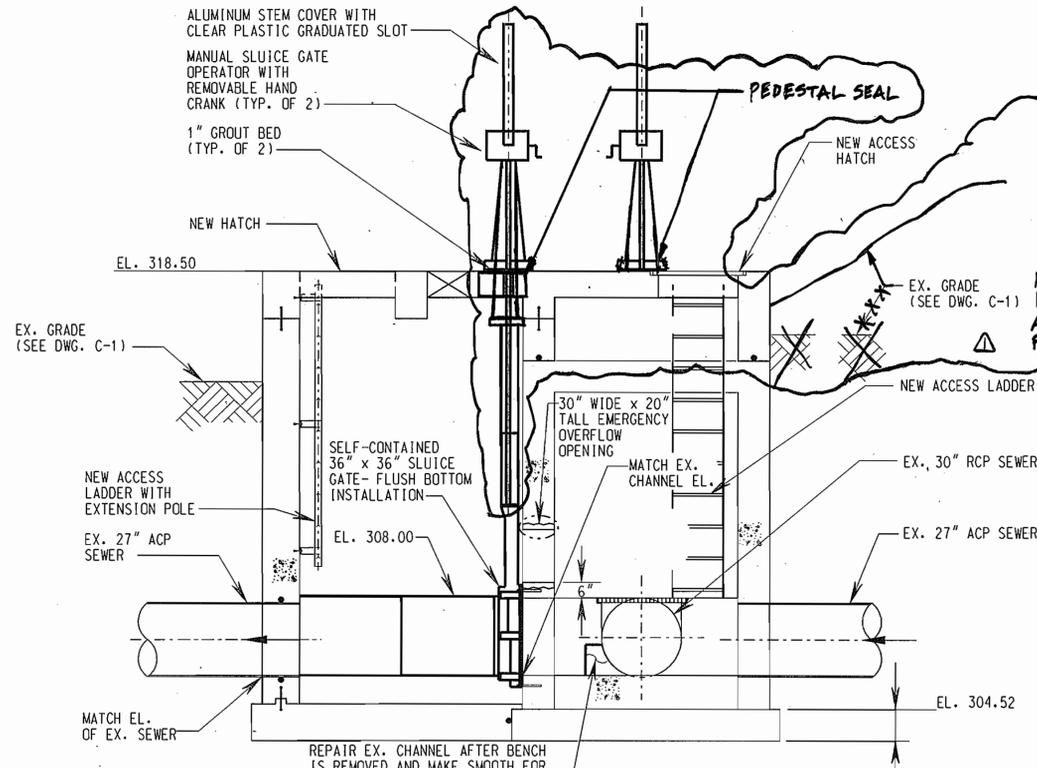
2 DIVERSION STRUCTURE - NEW TOP SLAB PLAN  
SCALE: 3/8" = 1'-0"



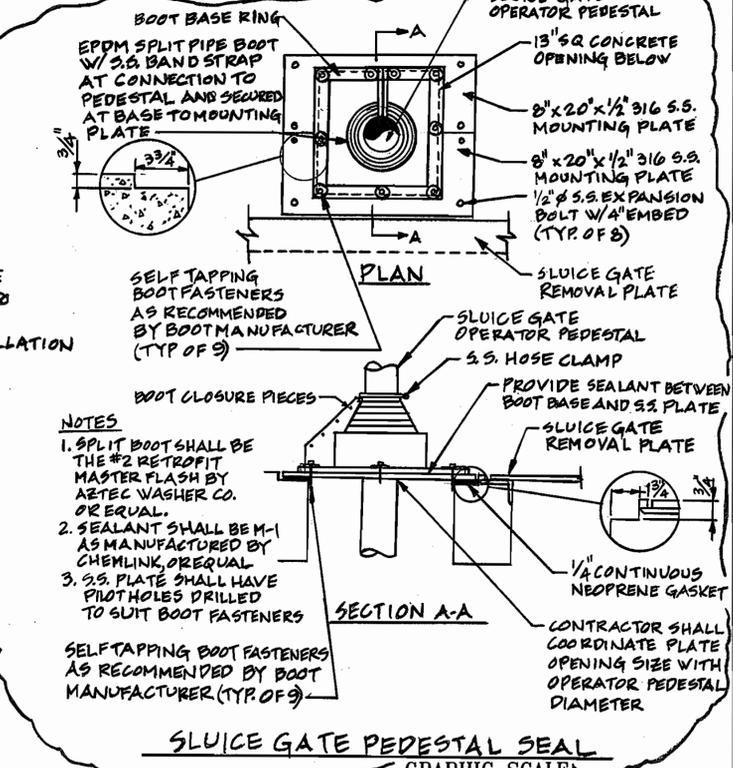
C SPLIT RAIL FENCE DETAIL  
NO SCALE



A DIVERSION STRUCTURE - NEW SECTION  
SCALE: 3/8" = 1'-0"



B DIVERSION STRUCTURE - NEW SECTION  
SCALE: 3/8" = 1'-0"



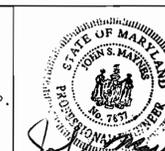
SLUICE GATE PEDESTAL SEAL  
GRAPHIC SCALE  
AS-BUILT 12/07

- NOTES**
- SPLIT BOOT SHALL BE THE #2 RETROFIT MASTER FLASH BY AETEC WASHER CO. OR EQUAL.
  - SEALANT SHALL BE M-1 AS MANUFACTURED BY CHEMLINK OR EQUAL.
  - S.S. PLATE SHALL HAVE PILOT HOLES DRILLED TO SUIT BOOT FASTENERS.
- CONTRACTOR SHALL COORDINATE PLATE OPENING SIZE WITH OPERATOR PEDESTAL DIAMETER.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

Director of Public Works: *Joseph A. Zalos* 9/26/05  
 Chief, Bureau of Engineering: *Robert J. Mason* 9/16/05  
 Chief, Bureau of Utilities: *Robert J. Mason* 9-19-05  
 Chief, Utility Design Division: *Robert J. Mason* 9/16/05

PREPARED BY:  
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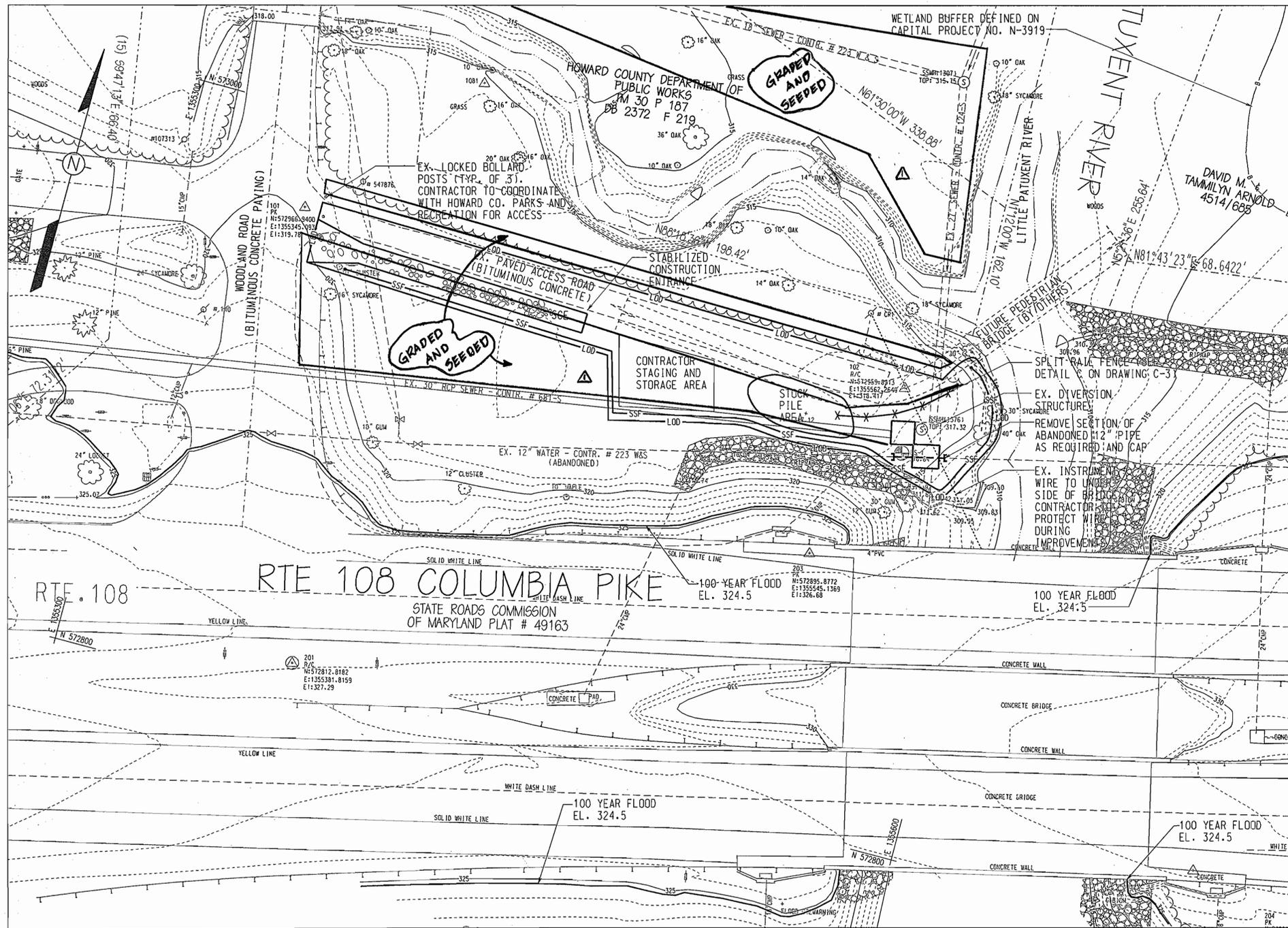
DIVERSION STRUCTURE -  
PLANS, SECTIONS, NOTES  
AND DETAIL - NEW WORK

600' SCALE MAP NO. 30 BLOCK NO. 9

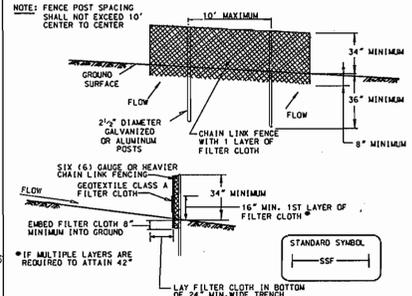
ROUTE 108 WASTEWATER PUMPING  
STATION IMPROVEMENTS  
CONTRACT NO. 24-4129  
CAPITAL PROJECT NO. S-6190

ELECTION DISTRICT 5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN SHEET 4 OF 18



**SUPER SILT FENCE**



**CONSTRUCTION SPECIFICATIONS**

- FENCING SHALL BE 42" IN HEIGHT AND CONSTRUCTED IN ACCORDANCE WITH THE LATEST MARYLAND STATE HIGHWAY DETAILS FOR CHAIN LINK FENCING. THE SPECIFICATION FOR A 6" FENCE SHALL BE USED, SUBSTITUTING 42" FABRIC AND 6" LENGTH POSTS.
- CHAIN LINK FENCE SHALL BE FASTENED SECURELY TO THE FENCE POSTS WITH WIRE TIES. THE LOWER TENSION WIRE, BRACE AND TRUSS RODS, DRIVE ANCHORS AND POST CAPS ARE NOT REQUIRED EXCEPT ON THE ENDS OF THE FENCE. THE CHAIN LINK FENCING SHALL BE SIX (6) GAUGE OR HEAVIER.
- FILTER CLOTH SHALL BE FASTENED SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24" AT THE TOP AND MID SECTION.
- FILTER CLOTH SHALL BE EMBEDDED A MINIMUM OF 8" INTO THE GROUND.
- WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVER LAPPED BY 6" AND FOLDED.
- MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SILT BUILDUPS REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE, OR WHEN SILT REACHES 50% OF FENCE HEIGHT.
- FILTER CLOTH SHALL BE FASTENED SECURELY TO EACH FENCE POST WITH WIRE TIES OR STAPLES AT TOP AND MID SECTION AND SHALL MEET THE REQUIREMENTS FOR GEOTEXTILE CLASS A:

Design Criteria			
Slope	Slope Steepness	Slope Length (maximum)	Silt Fence Length (maximum)
0 - 10%	0 - 10:1	Unlimited	Unlimited
10 - 20%	10:1 - 5:1	200 feet	1,500 feet
20 - 33%	5:1 - 3:1	100 feet	1,000 feet
33 - 50%	3:1 - 2:1	100 feet	500 feet
50% +	2:1 +	50 feet	250 feet

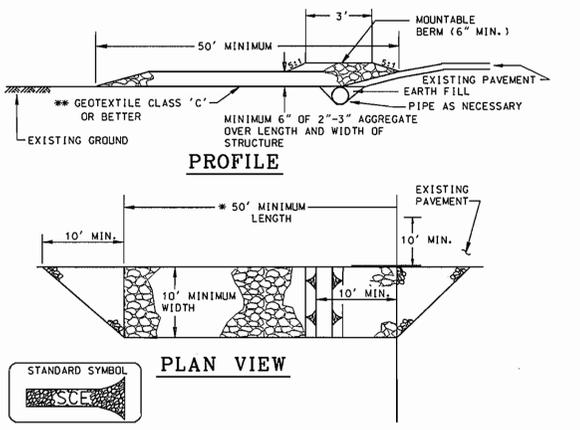
**SEDIMENT CONTROL NOTES**

- A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION. (410-313-1855)
- ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE 1984 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, AND REVISIONS THEREOF.
- FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: a) 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3:1; b) 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
- ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL. 1, CHAPTER 7 OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
- ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1984 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AS SHOWN ON DRAWING SC-1 FOR PERMANENT SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3:1. TEMPORARY STABILIZATION WITH MULCH ALLOW SHALL ONLY BE DONE WHEN RECOMMENDED STABILIZATION DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
- ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
- SITE ANALYSIS:  
 TOTAL AREA OF SITE: 1.43 ACRES  
 AREA DISTURBED: 0.16 ACRES  
 AREA TO BE ROOFED OR PAVED: 0.004 ACRES  
 AREA TO BE VEGETATIVELY STABILIZED: 0.12 ACRES  
 TOTAL CUT: 300 CU. YDS.  
 TOTAL FILL: 160 CU. YDS.  
 APPROVED SITE OFFSITE WASTE AREA LOCATION
- ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
- ADDITIONAL SEDIMENT CONTROLS MUST BE PROVIDED, IF DEEMED NECESSARY BY HOWARD COUNTY DPW SEDIMENT CONTROL INSPECTOR.
- ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS OBTAINED.
- TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS THAT WHICH SHALL BE BACK-FILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER.

**REQUIRED SEQUENCE OF CONSTRUCTION**

- OBTAIN THE REQUIRED GRADING PERMIT. (10 DAYS)
- NOTIFY MISS UTILITY 48 HOURS BEFORE BEGINNING ANY WORK @ (1-800-257-7777). NOTIFY HOWARD COUNTY CONSTRUCTION INSPECTION DIVISION 24 HOURS BEFORE STARTING ANY WORK @ 410-313-1870. (2 DAYS)
- INSTALL THE REQUIRED SEDIMENT AND EROSION CONTROL DEVICES AND STABILIZED CONSTRUCTION ENTRANCE (SCE) IN THE INITIAL POSITION SHOWN ON THE PLAN.
- CLEAR AND GRUB SITE, AND EXCAVATE AS REQUIRED. (5 DAYS)
- CONSTRUCT FLOW DIVERSION STRUCTURE MODIFICATIONS (60-DAYS)
- FOLLOWING SUCCESSFUL STABILIZATION OF ALL DISTURBED AREAS, AND AFTER PERMISSION HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, REMOVE SEDIMENT CONTROL MEASURES AND STABILIZE REMAINING DISTURBED AREAS WITH PERMANENT SEEDING MIXTURE AND STRAW MULCH. (3 DAYS)

**STABILIZED CONSTRUCTION ENTRANCE**



**CONSTRUCTION SPECIFICATIONS**

- LENGTH - MINIMUM OF 50' (\* 30' FOR SINGLE RESIDENCE LOT).
- WIDTH - 10' MINIMUM. SHOULD BE FLARED AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
- GEOTEXTILE FABRIC (FILTER CLOTH) SHALL BE PLACED OVER THE EXISTING GROUND PRIOR TO PLACING STONE. \*\* THE PLAN APPROVAL AUTHORITY MAY NOT REQUIRE SINGLE FAMILY RESIDENCES TO USE GEOTEXTILE.
- STONE - CRUSHED AGGREGATE (2" TO 3") OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT SHALL BE PLACED AT LEAST 6" DEEP OVER THE LENGTH AND WIDTH OF THE ENTRANCE.
- SURFACE WATER - ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PLACED THROUGH THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PIPE INSTALLED THROUGH THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE PROTECTED WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 6" OF STONE OVER THE PIPE. PIPE HAS TO BE SIZED ACCORDING TO THE DRAINAGE. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY A PIPE WILL NOT BE NECESSARY. PIPE SHOULD BE SIZED ACCORDING TO AMOUNT OF RUNOFF TO BE CONVEYED. A 6" MINIMUM WILL BE REQUIRED.
- LOCATION - A STABILIZED CONSTRUCTION ENTRANCE SHALL BE LOCATED AT EVERY POINT WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES A CONSTRUCTION SITE. VEHICLES LEAVING THE SITE MUST TRAVEL OVER THE ENTIRE LENGTH OF THE STABILIZED CONSTRUCTION ENTRANCE.

**1 SEDIMENT AND EROSION CONTROL SITE PLAN**

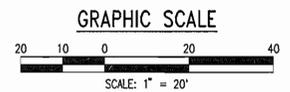
SC-1

SCALE: 1" = 20'

**OWNER/DEVELOPER CERTIFICATION**  
 "I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."  
 [Signature] 2/16/05  
 HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 UTILITY DESIGN DIVISION

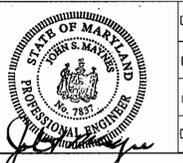
**ENGINEER CERTIFICATION**  
 I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.  
 [Signature] 2/15/05  
 JOHN S. MAYNES P.E. 7807

REVIEWED FOR HOWARD S.C.D. AND MEETS THE TECHNICAL REQUIREMENTS.  
 [Signature] 3/16/05  
 JOHN S. MAYNES  
 CONSERVATION SERVICE  
 THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.  
 [Signature] 3/16/05  
 JOHN R. ROBERTSON  
 HOWARD S.C.D.



DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND.  
 [Signature] 2/16/05  
 DIRECTOR OF PUBLIC WORKS  
 [Signature] 2-19-05  
 CHIEF, BUREAU OF UTILITIES

PREPARED BY:  
**WR&A**  
 Whitman, Reardon and Associates, LLP.  
 801 SOUTH CAROLINE ST.  
 BALTIMORE, MD. 21231  
 410-235-3450

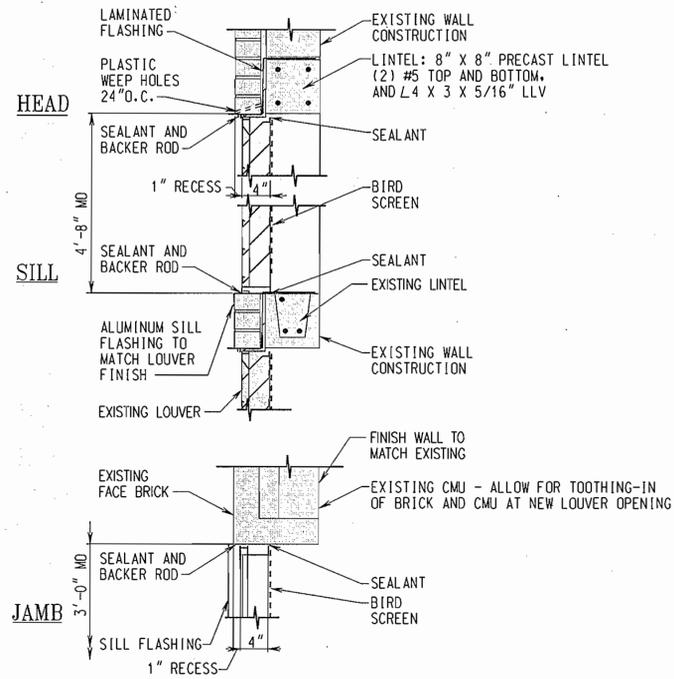


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DRN:	CAT				
CHK:	HWL				
DATE:	1/21/05				
BY:	NO.	NO.	REVISION	DATE	
			AS-BUILT REVISIONS	12/07	

SEDIMENT AND EROSION CONTROL - SITE PLAN, NOTES AND DETAILS

ROUTE 108 WASTEWATER PUMPING STATION IMPROVEMENTS  
 CONTRACT NO. 24-4129  
 CAPITAL PROJECT NO. S-6190  
 ELECTION DISTRICT 5  
 HOWARD COUNTY, MARYLAND

SC-1  
 SCALE AS SHOWN  
 SHEET 5 OF 18  
 FINAL JANUARY, 2005 - JULY, 2005

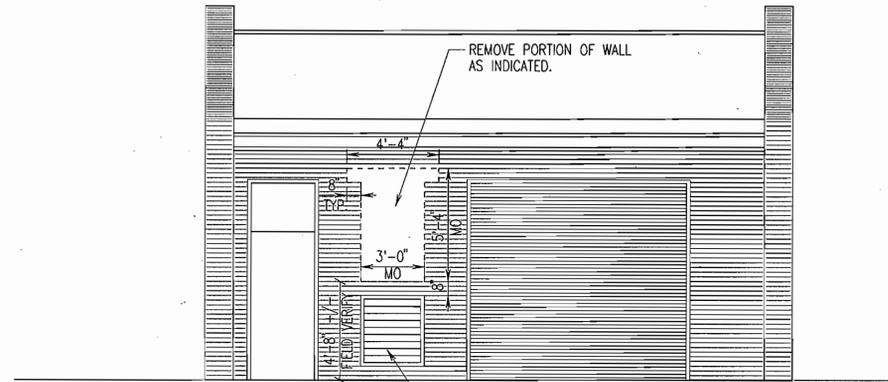


**LOUVER DETAILS**

SCALE: 1" = 1'-0"

**LOUVER NOTES:**

1. ALL LINTELS SHALL HAVE A 8" MINIMUM BEARING ON EACH END.
2. LOUVER RECESS TO MATCH EXISTING LOUVER RECESS.
3. LOUVER SHALL BE 4" DEEP, FIXED, EXTRUDED ALUMINUM WITH DRAINABLE EXTRUDED BLADES.
4. NEW LOUVER FINISH TO MATCH EXISTING.

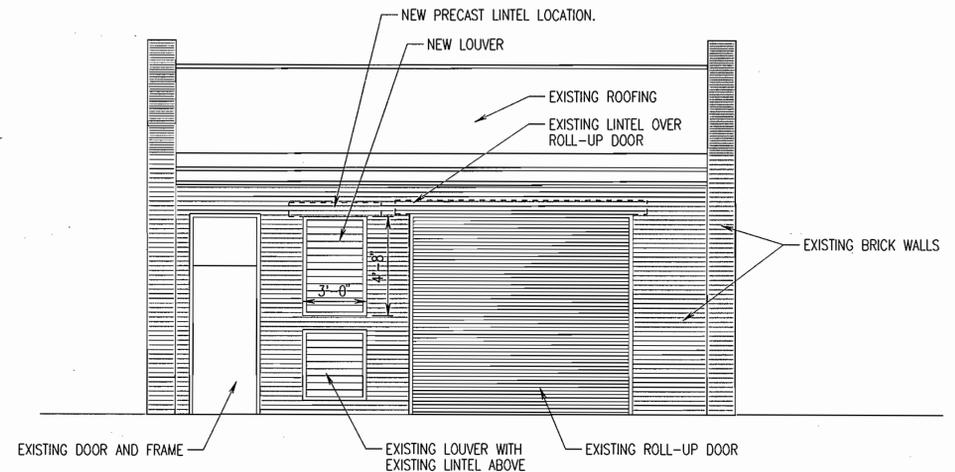


**NORTH ELEVATION - DEMOLITION**

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

**DEMOLITION NOTES:**

1. CONTRACTOR SHALL USE CARE IN REMOVING EXISTING WALL AND MATERIALS AS INDICATED. ANY MATERIALS WHICH ARE TO REMAIN AND ARE DAMAGED DURING DEMOLITION MUST BE REPAIRED AND PATCHED TO MATCH EXISTING.
2. CONTRACTOR SHALL TAKE MEASURES NECESSARY TO PROTECT THE EXISTING STRUCTURE AND EQUIPMENT FROM ANY DAMAGE.
3. CAREFULLY SALVAGE BRICK AS REQUIRED TO REPAIR JAMB, HEAD AND SILL AT NEW LOUVER OPENING.
4. MASONRY OPENING FOR NEW LOUVER SHALL BE DIRECTLY ALIGNED WITH EXISTING LOUVER BELOW.



**NORTH ELEVATION - NEW LOUVER**

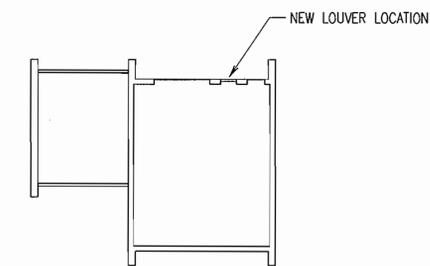
SCALE: 1/4" = 1'-0"

**NEW WORK NOTES:**

1. ALL ELEMENTS ARE NEW UNLESS SPECIFICALLY NOTED AS EXISTING.
2. NEW BRICK AND MORTAR TO MATCH EXISTING.
3. REPAIR INTERIOR WALL, WHERE DISTURBED, TO MATCH EXISTING.
4. NEW LOUVER SHALL BE DIRECTLY ALIGNED WITH EXISTING LOUVER BELOW.

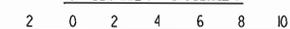
**ARCHITECTURAL/STRUCTURAL ABBREVIATIONS**

ALUM.	ALUMINUM
CLR.	CLEAR
CMU	CONCRETE MASONRY UNIT
CONC.	CONCRETE
CONT.	CONTINUOUS
DIA.	DIAMETER
DIAG.	DIAGONAL
DWG.	DRAWING
E.F.	EACH FACE
ELEV.	ELEVATION
EMB.	EMBEDMENT
EO.	EQUAL
E.W.	EACH WAY
E.W.E.F.	EACH WAY, EACH FACE
EXIST.	EXISTING
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
MO	MASONRY OPENING
O.C.	ON CENTER
PCF	POUNDS PER CUBIC FOOT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
REINF.	REINFORCEMENT
S.S.	STAINLESS STEEL
T&B	TOP AND BOTTOM
TYP.	TYPICAL



**LOCATION PLAN**  
 NO SCALE

**GRAPHIC SCALES**



AS-BUILT 12/07

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND.

Director of Public Works: *Robert J. Demin* 9/20/05  
 Chief, Bureau of Utilities: *Robert J. Demin* 9/20/05

Prepared by: *WR&A* 9/16/05  
 Chief, Bureau of Engineering: *Robert J. Demin* 9/16/05  
 Chief, Utility Design Division: *Robert J. Demin* 9/16/05

PREPARED BY:  
**WR&A**  
 Whitman, Reardon and Associates, LLP.  
 801 SOUTH CAROLINE ST.  
 Baltimore, Md. 21231  
 410-235-3450



DES:	L E L				
DRN:	L E L				
CHK:	E T M				
DATE:	1/21/05	BY:	NO.	REVISION	DATE

ARCHITECTURAL ELEVATIONS  
 AND DETAILS - DEMOLITION  
 AND NEW WORK

ROUTE 108 WASTEWATER PUMPING  
 STATION IMPROVEMENTS  
 CONTRACT NO. 24-4129  
 CAPITAL PROJECT NO. S-6190

ELECTION DISTRICT 5  
 HOWARD COUNTY, MARYLAND

A-1  
 SCALE AS SHOWN  
 SHEET 6 OF 18

MAN3429 (R10) 01.09' 2005  
 Thu Jul 28 09:06:59 2005

# STRUCTURAL GENERAL NOTES

## GENERAL NOTES

- UNLESS OTHERWISE SPECIFIED, ALL MANUALS AND SPECIFICATIONS REFERENCED IN THESE NOTES AND DRAWINGS SHALL BE THE CURRENT EDITION.
- THE CONTRACT DRAWINGS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR. ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
- THE SIZES AND LOCATIONS OF EQUIPMENT PADS AND PEDESTALS, AS WELL AS EQUIPMENT RELATED FLOOR AND SLAB OPENINGS ARE DEPENDENT UPON THE ACTUAL EQUIPMENT FURNISHED. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY AND COORDINATE ALL SUCH ITEMS. NO DIMENSIONS INDICATED ON THESE DRAWINGS SHALL BE ALTERED WITHOUT THE ENGINEER'S APPROVAL. ALL EQUIPMENT PADS AND OTHER EQUIPMENT SUPPORTS REQUIRED MAY NOT HAVE BEEN SHOWN ON THE STRUCTURAL DRAWINGS. REFER TO CIVIL, ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR SIZES AND LOCATIONS OF SUCH PADS AND SUPPORTS.
- LOCATIONS OF BORINGS ARE SHOWN ON CIVIL DRAWINGS. BORING LOGS ARE INCLUDED IN THE SPECIFICATION.
- FOR NOTES PERTAINING TO INDIVIDUAL STRUCTURES, SEE DRAWINGS FOR THOSE STRUCTURES.

## CONCRETE NOTES

- ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS.
- REINFORCED CONCRETE SHALL BE DETAILED AND CONSTRUCTED IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE, (ACI 301) "SPECIFICATION FOR STRUCTURAL CONCRETE".
- ALL REINFORCEMENT SHALL CONFORM TO ASTM SPECIFICATION A615, DEFORMED, GRADE 60.
- WELDED WIRE FABRIC SHALL CONFORM TO ASTM SPECIFICATION A185.
- UNLESS OTHERWISE NOTED ON THE DRAWINGS, CONCRETE COVER FOR REINFORCEMENT SHALL BE AS FOLLOWS:
  - UNIFORMED CONCRETE BOTTOM BARS IN FOOTINGS AND SLABS ON EARTH, OR GRAVEL - 3"
  - BEAMS, SLABS, COLUMNS AND WALLS EXPOSED TO GROUND, WEATHER OR PROCESS LIQUID AFTER THE REMOVAL OF FORMS - 2"
  - BEAMS, COLUMNS AND PIERS NOT EXPOSED TO WEATHER OR PROCESS LIQUID OR TRUCK TRAFFIC - 1 1/2"
  - STRUCTURAL SLABS NOT EXPOSED TO GROUND, WEATHER, PROCESS LIQUID OR TRUCK TRAFFIC - 1"
  - STRUCTURAL SLAB NOT EXPOSED TO GROUND, WEATHER OR PROCESS LIQUID BUT SUBJECT TO TRUCK TRAFFIC:
    - TOP OF SLAB - 1 1/2"
    - BOTTOM OF SLAB - 1"
- ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 3/4" UNLESS OTHERWISE NOTED.
- THE CONTRACTOR SHALL SUBMIT SHOP DETAILS OF REINFORCING STEEL BEFORE PROCEEDING WITH FABRICATION.
- REINFORCING STEEL SHALL BE DETAILED IN ACCORDANCE WITH ACI DETAILING MANUAL.
- ALL SPLICES FOR REINFORCING BARS NOT DIMENSIONED ON THE DRAWINGS SHALL BE DETAILED AS TABULATED ON THIS DRAWING.
- CONSTRUCTION JOINTS SHALL BE AS DETAILED ON THE DRAWINGS AND NO ADDITIONAL JOINTS SHALL BE USED NOR ANY OMITTED EXCEPT BY WRITTEN AUTHORIZATION OF THE ENGINEER. ENGINEER APPROVED ADDITIONAL CONSTRUCTION JOINTS SHALL NOT RESULT IN ADDITIONAL EXPENSE TO THE OWNER.
- ANCHOR BOLTS AND EQUIPMENT PEDESTALS SHALL BE SIZED AND LOCATED AS REQUIRED TO SUIT EQUIPMENT FURNISHED.
- SEE ARCHITECTURAL, CIVIL, MECHANICAL AND ELECTRICAL DRAWINGS FOR ALL EMBEDDED ITEMS SUCH AS SLEEVES, ANCHORS, ELECTRICAL CONDUITS, OPENINGS, WHICH MAY INTERFERE WITH CONCRETE CONSTRUCTION. ALL PIPING AND OTHER EMBEDDED ITEMS ARE NOT SHOWN ON STRUCTURAL DRAWINGS.

## CODES

- BUILDING OFFICIALS AND CODE ADMINISTRATORS, "BOCA BUILDING CODE".
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION, (AISC) "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS - ALLOWABLE STRESS DESIGN AND PLASTIC DESIGN".
- AMERICAN CONCRETE INSTITUTE, (ACI-318) "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE".

## DESIGN LOADS

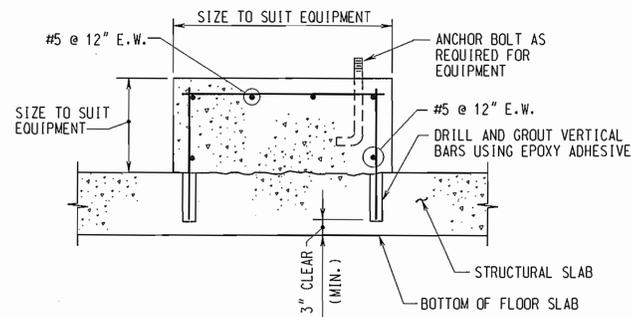
- DEAD LOADS - ACTUAL WEIGHT OF STRUCTURE.  
WEIGHT OF SOIL - 100 P.C.F. TO RESIST UPLIFT.  
120 P.C.F. DEAD LOAD
- LIVE LOADS - FLOOR - 150 P.S.F. IN AREAS NOT OCCUPIED BY EQUIPMENT OR SUBJECT TO TRUCK LOADING.
  - EQUIPMENT - ACTUAL WEIGHT - 150 P.S.F. MINIMUM.
  - TRUCK - H20-44 AASHTO LOADING
  - WALKWAYS - 150 P.S.F.
  - ROOF - 30 P.S.F.
- SNOW LOAD - GROUND SNOW LOAD - 25 PSF
- WIND LOAD - BASIC WIND SPEED - 100 MPH (EXPOSURE C)
- GROUND WATER ASSUMED AT GROUND SURFACE.

## FOUNDATION NOTES

- FOR MECHANICAL AND ELECTRICAL WORK TO BE INCORPORATED IN FOUNDATION WORK, SEE MECHANICAL AND ELECTRICAL DRAWINGS.
- ALL EXCAVATION SHALL BE KEPT DRY. STANDING WATER SHALL NOT BE ALLOWED IN EXCAVATIONS.
- BEFORE PLACING ANY POROUS FILL OR CONCRETE ON SUBGRADE, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
- POROUS FILL, WHERE SHOWN, SHALL BE AASHTO NO. 57 AGGREGATE.

## SITE PREPARATION NOTES

- ALL PAVEMENT, CONCRETE, ABANDON STRUCTURES AND FOUNDATION ELEMENTS TO BE DEMOLISHED SHOULD BE REMOVED PRIOR TO CONSTRUCTION OF THE FOUNDATIONS.
- THE SUBGRADE SHOULD BE PROOF ROLLED USING A LOADED TANDEM AXIAL DUMP TRUCK UNDER THE DIRECTION OF A GEOTECHNICAL ENGINEER. ANY SOFT AREAS SHOULD BE UNDERCUT AND REPLACED WITH CONTROLLED COMPACTED BACKFILL MATERIAL.



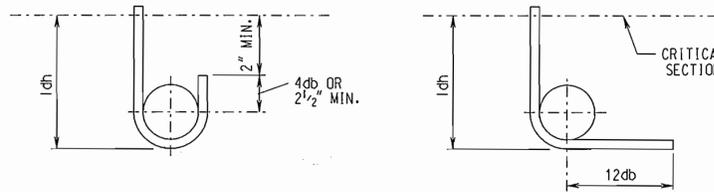
**TYPICAL EQUIPMENT SUPPORT**

SCALE: NONE

LAP SPLICE LENGTH						MINIMUM TENSION EMBEDMENTS			
BAR SIZE		SLAB AND WALL		BEAM		STANDARD 90° HOOK		STANDARD 180° HOOK	
SOFT METRIC	ENGLISH	OTHER BARS	TOP BARS	OTHER BARS	TOP BARS	ldh	12db	ldh	4db
#10	#3	12"	16"	13"	18"	6"	5"	6"	2 1/2"
#13	#4	15"	20"	22"	28"	7"	6"	7"	2 1/2"
#16	#5	20"	24"	32"	41"	9"	8"	9"	3"
#19	#6	22"	30"	40"	52"	10"	9"	10"	3"
#22	#7	37"	48"	59"	76"	12"	14"	12"	4"
#25	#8	48"	60"	68"	89"	14"	12"	14"	4"
#29	#9	58"	74"	77"	101"	15"	14"	15"	5"
#32	#10	70"	91"	88"	114"	17"	16"	17"	5"
#36	#11	83"	108"	98"	128"	19"	17"	19"	6"

SLAB AND WALL: 6" MINIMUM REBAR SPACING WITH CONCRETE COVER = 1.5" CLEAR  
 BEAM: MINIMUM CLEAR SPACING BETWEEN BARS = 1.5 (BAR DIAMETER)  
 MINIMUM CONCRETE COVER = 1.5" CLEAR  
 MINIMUM STIRRUP PROVIDED #4@12"

TOP BAR: TOP BAR FOR SLAB AND BEAM SHALL BE DEFINED AS REINFORCEMENT SO PLACED THAT MORE THAN 12" OF CONCRETE IS CAST BELOW THE SPLICE.

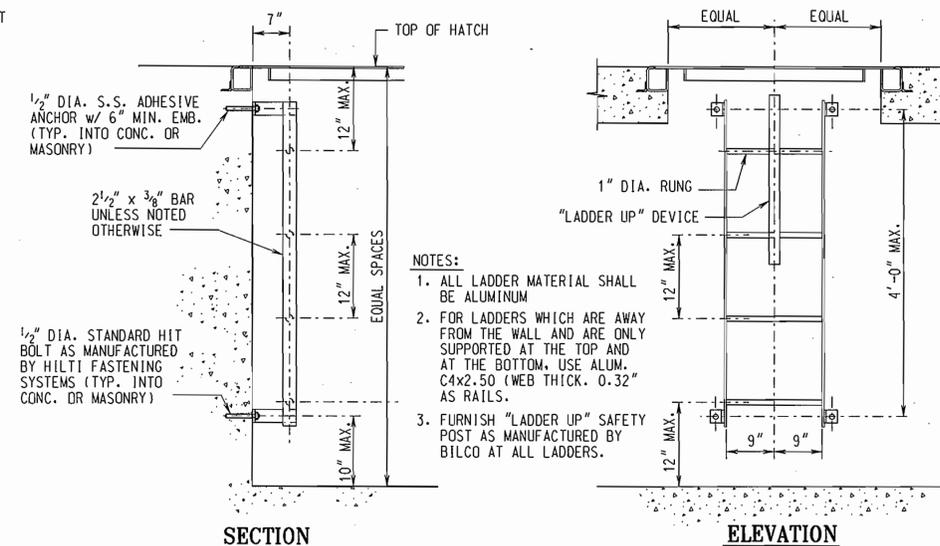


STANDARD HOOKS: SIDE COVER MORE THAN 2.5"  
 END COVER (90° HOOK) MORE THAN 2"  
 MINIMUM COVER TO TAIL = 2"

**STANDARD 180° AND 90° END HOOKS**

## TENSION LAP SPLICE AND STANDARD HOOK LENGTH (ACI 318-99)

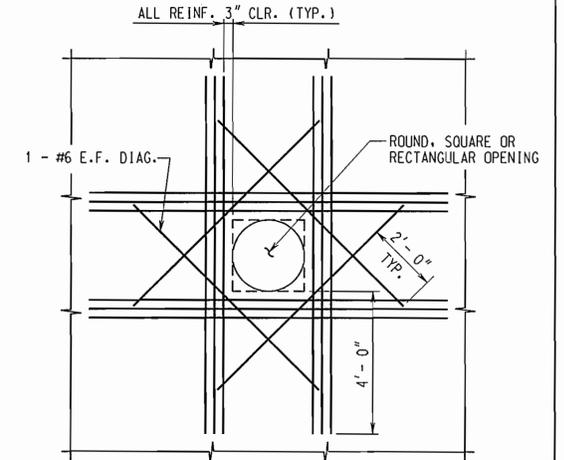
(NON-EPOXY COATED)



**TYPICAL LADDER DETAILS**

SCALE: NONE

NOTE:  
 FOR OPENINGS LESS THAN 12" DIA., NO ADDITIONAL REINFORCING IS REQUIRED PROVIDED NO REINFORCING IS INTERRUPTED BY THE OPENING



PROVIDE ADDITIONAL REINFORCING. (MINIMUM OF ONE-HALF THE NUMBER OF PRINCIPLE REINFORCING BARS INTERRUPTED BY THE OPENING) ON EACH SIDE AND EACH FACE OF THE OPENING.

**ADDITIONAL REINFORCING AROUND OPENINGS**

SCALE: NONE

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND.

*[Signature]* 9/26/05  
 DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 9/16/05  
 CHIEF, BUREAU OF ENGINEERING DATE

PREPARED BY:



Whitman, Reardon and Associates, LLP.  
 801 SOUTH CAROLINE ST.  
 Baltimore, Md. 21231  
 410-235-3450



DES: SVD

DRN: SI

CHK: SVD

DATE: 1/21/05

BY NO. REVISION DATE 600' SCALE MAP NO. 30 BLOCK NO. 9

DIVERSION STRUCTURE -  
 STRUCTURAL NOTES  
 AND TYPICAL DETAILS

ROUTE I08 WASTEWATER PUMPING  
 STATION IMPROVEMENTS  
 CONTRACT NO. 24-4129  
 CAPITAL PROJECT NO. S-6190

ELECTION DISTRICT 5 HOWARD COUNTY, MARYLAND

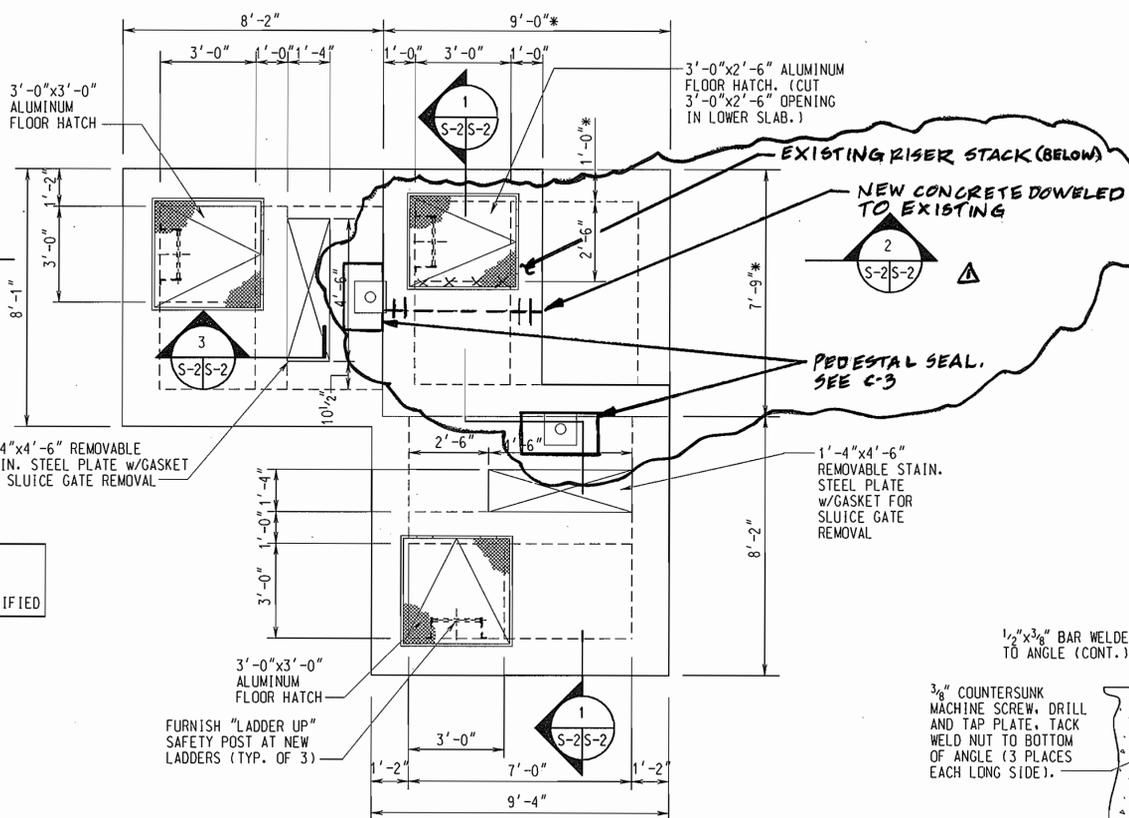
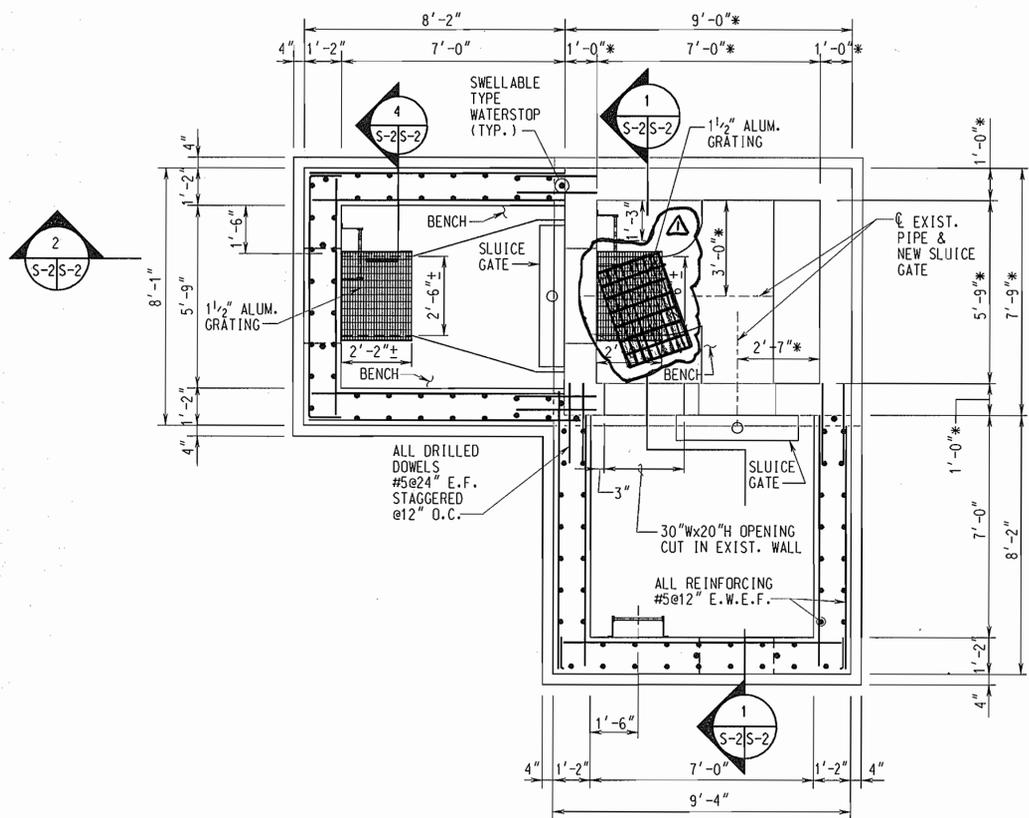
S-1

SCALE AS SHOWN

SHEET

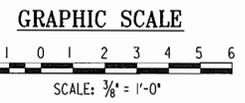
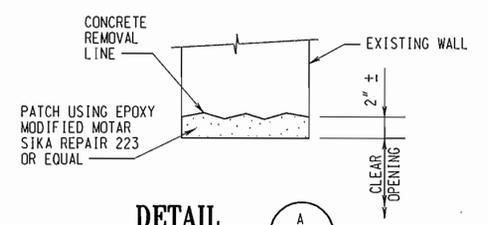
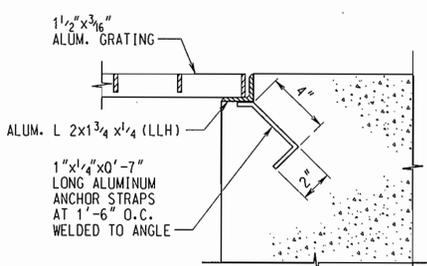
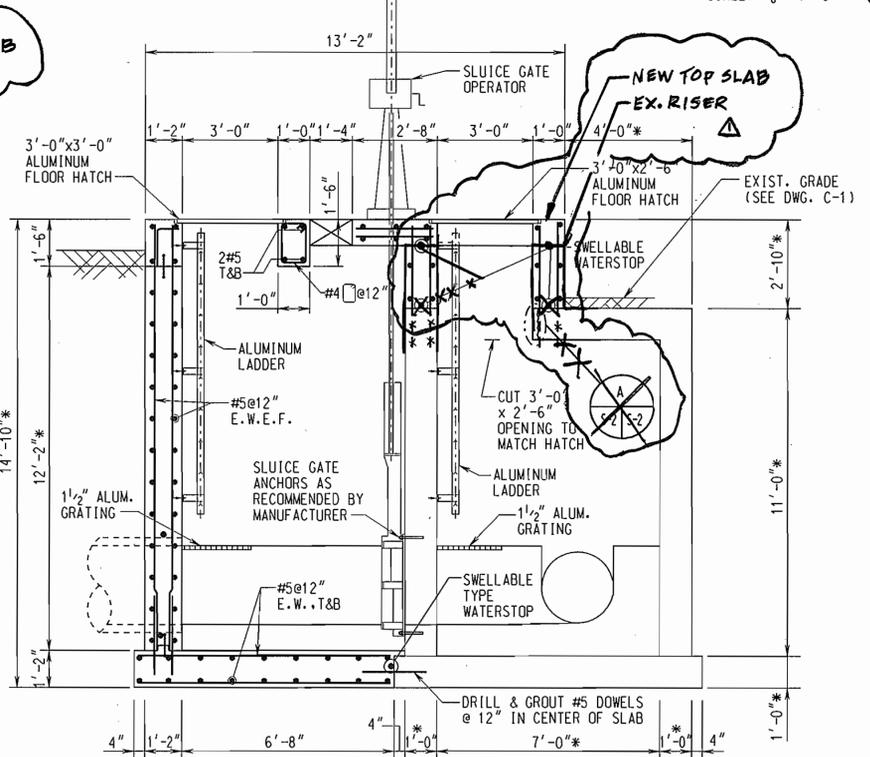
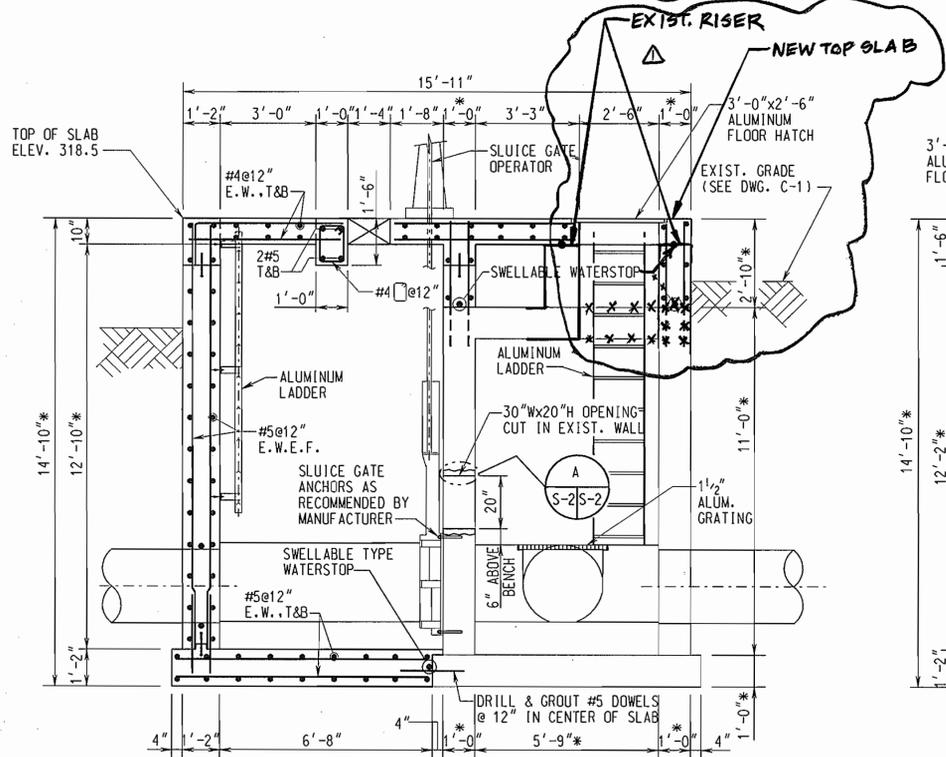
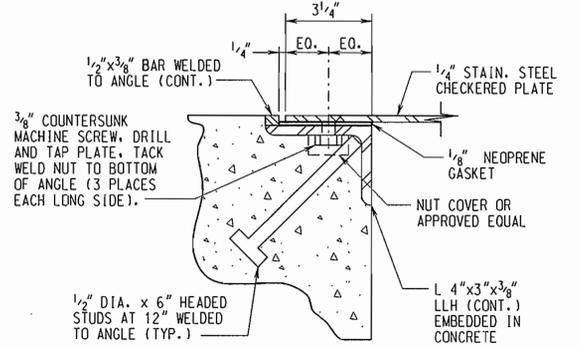
7 OF 18

FINAL JULY, 2005



- NOTES:**
1. ALL ALUMINUM FLOOR HATCHES SHALL BE TYPE TH WATER TIGHT, GAS TIGHT AND ODOR TIGHT AS MANUFACTURED BY THOMPSON FABRICATING CO., BIRMINGHAM AL.
  2. FLOW DIVERSION STRUCTURE WILL BE IN SERVICE DURING CONSTRUCTION. SEE SEQUENCE OF CONSTRUCTION ON DRAWING C-2.
  3. CONTRACTOR SHALL PROTECT EXISTING SEWER FROM CONSTRUCTION DEBRIS AND DAMAGE DURING WORK IN AND AROUND EXISTING DIVERSION STRUCTURE.
  4. SEE CIVIL DRAWINGS FOR BENCH WORK AND DEMOLITION.

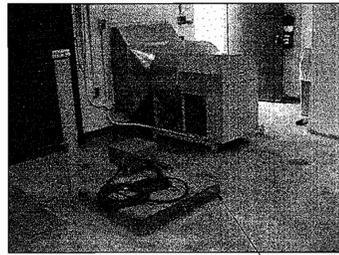
NOTE: DIMENSIONS MARKED BY AN ASTERISK \* SHALL BE FIELD VERIFIED



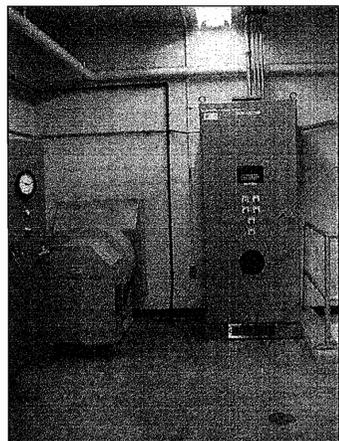
AS-BUILT 12/07

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND. Director of Public Works: <i>Janet M. ...</i> 9/26/05 Chief, Bureau of Engineering: <i>Paul D. ...</i> 9/16/05 Chief, Bureau of Utilities: <i>...</i> 9-19-05 Chief, Utility Design Division: <i>...</i> 9/16/05		PREPARED BY: <b>WR&amp;A</b> Whitman, Reardon and Associates, LLP. 801 SOUTH CAROLINE ST. Baltimore, Md. 21231 410-235-3450		DES: SVD DRN: ST CHK: SVD DATE: 1/21/05		DIVERSION STRUCTURE - PLANS AND SECTIONS 600' SCALE MAP NO. 30 BLOCK NO. 9		ROUTE I08 WASTEWATER PUMPING STATION IMPROVEMENTS CONTRACT NO. 24-4129 CAPITAL PROJECT NO. S-6190		SCALE AS SHOWN SHEET 8 OF 18	
ELECTION DISTRICT 5 HOWARD COUNTY, MARYLAND				DATE: 12/07		BY: NO. REVISION		FINAL JULY, 2005		S-2	





1 PICTURE #1  
ME-1



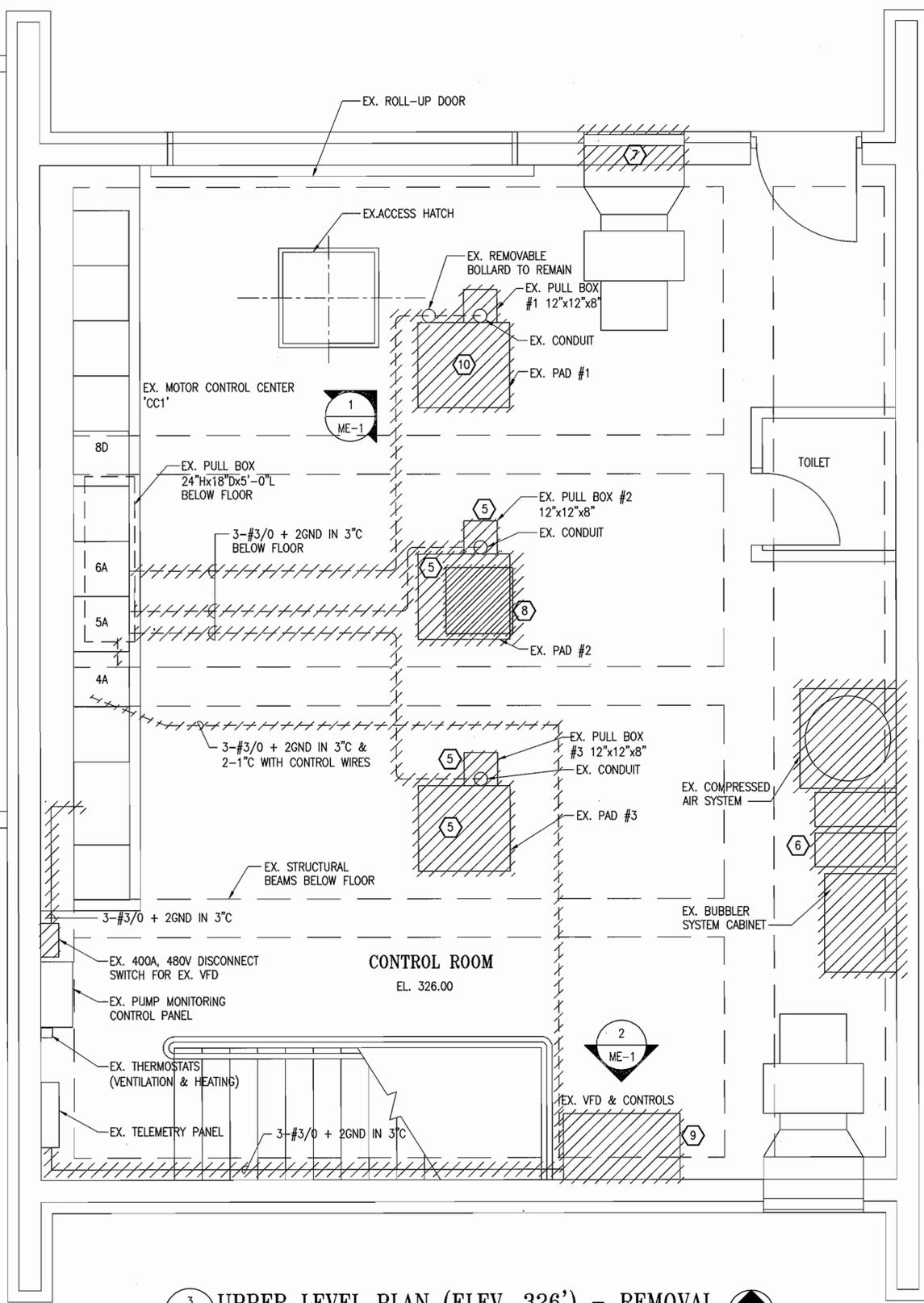
2 PICTURE #2  
ME-1

**REMOVAL LEGEND:**

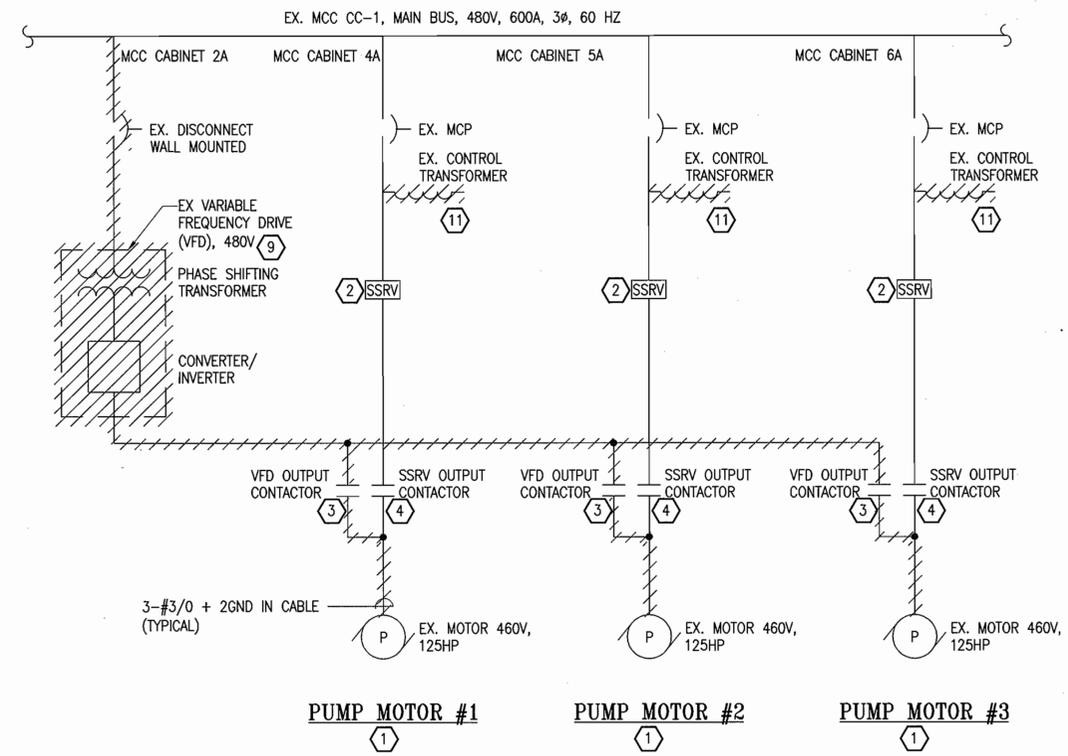
- OL THERMAL OVERLOAD RELAY
- SSRV SOLID STATE REDUCED VOLTAGE STARTER
- CONTACTOR, FUNCTION AS INDICATED
- (P) MOTOR HP & VOLTAGE AS INDICATED
- POWER TRANSFORMER
- GROUND/GROUND ROD
- CONDUIT ON CEILING OR WALL
- CONDUIT UNDER FLOOR/GRADE
- EQUIPMENT OR CONDUITS TO BE REMOVED
- STRUCTURAL BEAMS BELOW FLOOR

**REMOVAL NOTES:**

- 1 SEWAGE PUMPS ARE INTERLOCKED SO THAT ONLY TWO OF THE THREE PUMPS CAN RUN AT THE SAME TIME WHETHER IN HAND OR AUTOMATIC MODE. THIS FEATURE SHALL BE RETAINED.
- 2 EX. SOLID STATE REDUCED VOLTAGE STARTER TO REMAIN AND USED AS BYPASS FOR NEW VFD PER DWG. E-1.
- 3 EX. VFD (AFC) OUTPUT CONTACTOR TO REMAIN AND REUSED AS SSRV INPUT CONTACTOR PER DWG. E-1.
- 4 EX. SSRV OUTPUT CONTACTOR TO REMAIN AND REUSED AS SSRV BYPASS CONTACTOR FOR SSRV PER DWG. E-1.
- 5 REMOVE EX. JUNCTION BOX #2 & 3, WIRING AND CONDUITS. SEE PICTURE #1 THIS SHEET. REMOVE EX. PADS #2 & 3 ALSO.
- 6 REMOVE EX. BUBBLER SYSTEM (COMPRESSORS, TANK, CONTROL CABINET, AIR DRYER AND ALL ASSOCIATED CONDUITS, WIRING, PIPING, AND CONCRETE PADS). RELOCATE EX. STRIP CHART RECORDERS FROM BUBBLER CABINET TO NEW PUMP CONTROL PANEL. ALL REMOVED MATERIAL SHALL BE RETURNED TO THE HOWARD COUNTY BUREAU OF UTILITIES.
- 7 REMOVE PORTION OF WALL ABOVE EX. LOUVER TO ACCOMMODATE NEW INTAKE LOUVER. SEE DWG. A-1.
- 8 REMOVE EX. ROOF MOUNTED EXHAUST VENT AND DAMPER.
- 9 REMOVE EX. VFD AND CONTROLS AFTER ALL PUMPS ARE CONNECTED AND OPERATIONAL WITH NEW VFD'S, PER NEW PLANS. SEE PICTURE #2 FOR EX. VFD. RETURN ALL REMOVED EQUIPMENT TO THE HOWARD COUNTY BUREAU OF UTILITIES.
- 10 REMOVE EX. JUNCTION BOX #1, WIRING AND CONDUIT. REMOVE EXISTING PAD #1 AND ALSO FINISH AND MATCH WITH ADJOINING SURFACE.
- 11 REMOVE EX. CONTROL TRANSFORMER.

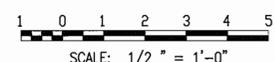


3 UPPER LEVEL PLAN (ELEV. 326') - REMOVAL  
ME-1 SCALE: 1/2" = 1'-0"



4 EX. ONE LINE DIAGRAM (PARTIAL)  
ME-1 NOT TO SCALE

**GRAPHIC SCALE**



AS-BUILT 12/07



**DHILLON ENGINEERING, INC.**  
10902 REISTERSTOWN ROAD, SUITE 204  
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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

Director of Public Works: *[Signature]* 9/26/05  
Date: 9-19-05

Chief, Bureau of Engineering: *[Signature]* 9/16/05  
Date: 9-16-05

Chief, Utility Design Division: *[Signature]* 9/16/05  
Date: 9-16-05

PREPARED BY:  
**WR&A**  
Whitman, Reardon and Associates, LLP.  
801 South Caroline Street  
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410-235-3450

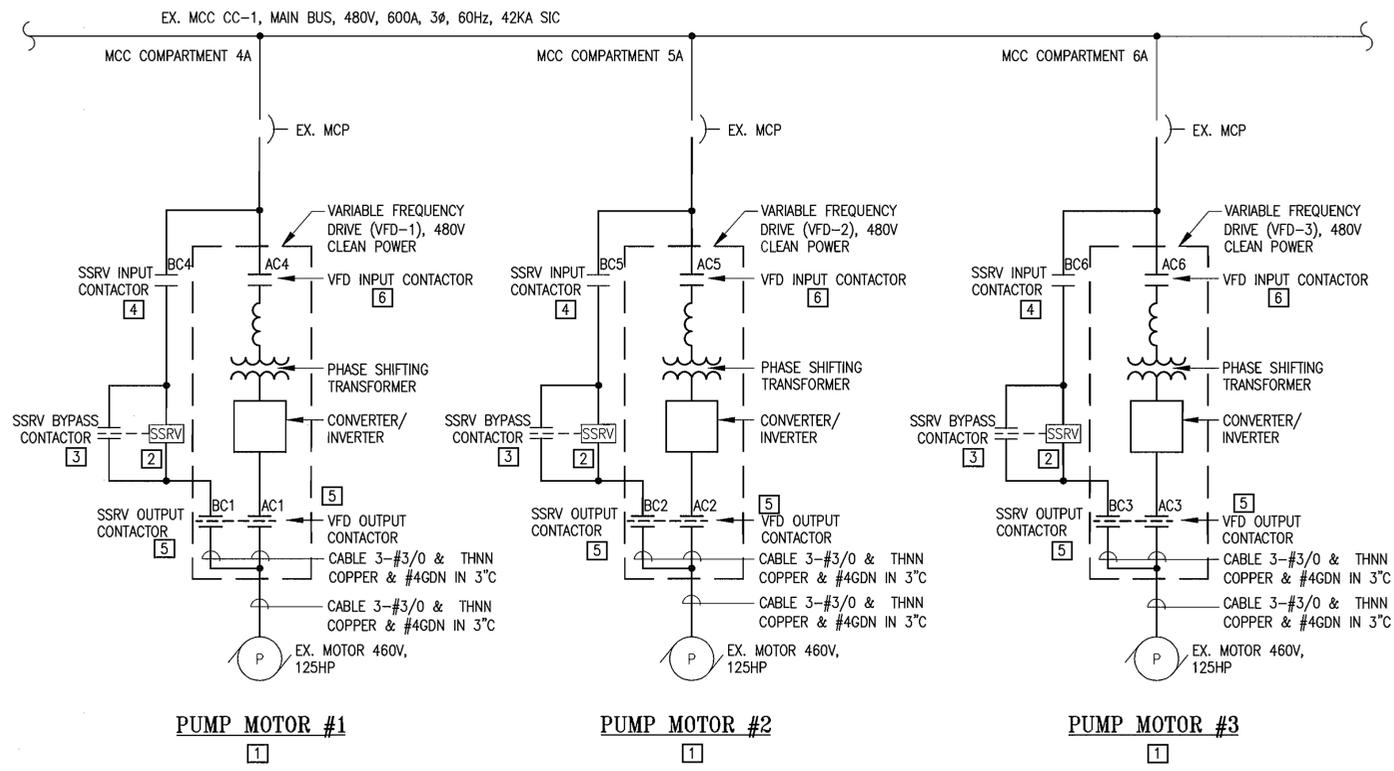
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DRN: AS				
CHK: AM				
DATE: 1/21/05	BY	NO.	REVISION	DATE

ONE LINE DIAGRAM, CONTROL ROOM PLAN, NOTES AND LEGEND - REMOVAL

600' SCALE MAP NO. 30 BLOCK NO. 9

ROUTE 108 WASTEWATER PUMPING STATION IMPROVEMENTS  
CONTRACT NO. 24-4129  
CAPITAL PROJECT NO. S-6190  
ELECTION DISTRICT 5 HOWARD COUNTY, MARYLAND

10 OF 18



1 MODIFIED ONE LINE DIAGRAM (PARTIAL)  
E-1 NOT TO SCALE

**ELECTRICAL ABBREVIATIONS:**

A, AMP	AMPERE	MAX	MAXIMUM
A	AMBER COLOR LENS	MCP	MOTOR CIRCUIT PROTECTOR
AC	ALTERNATING CURRENT	MIN	MINIMUM
AFC	AUTOMATIC FREQUENCY CONTROL		
AFF	ABOVE FINISHED FLOOR	O/L	OVER LOAD
AUTO	AUTOMATIC		
B	BLUE COLOR LENS	P	POLE
		PB	PUSH BUTTON
		PL	PANEL
C	CONDUIT	PH	PHASE
CB	CIRCUIT BREAKER	PWR	POWER
CKT	CIRCUIT	PVC	POLYVINYL CHLORIDE
CONN	CONNECTION OR CONNECT		
DET	DETAIL	R	RED COLOR LENS
DWG	DRAWING	RECP	RECEPTACLE
		RMC	RIGID METAL CONDUIT
		RTU	REMOTE TERMINAL UNIT
ELECT	ELECTRICAL	SIC	SHORT-CIRCUIT INTERRUPTING CURRENT
EX.	EXISTING	SSRV	SOLID STATE REDUCED VOLTAGE STARTER
		STR	STARTER
G	GREEN COLOR LENS	SW	SWITCH
GND	GROUND		
HOA	HAND-OFF-AUTO	TO	TIMED TO OPEN
HS	HAND SWITCH	TC	TIMED TO CLOSE
HZ	HERTZ		
JB	JUNCTION BOX	UF	ULTRASONIC-FLOATS
		UON	UNLESS OTHERWISE NOTED
KW	KILOWATT	V	VOLTS
KVA	KILOVOLT AMPERE	VA	VOLT AMPERE
		VFD	VARIABLE FREQUENCY DRIVE
LHOA	LOW-HIGH-OFF-AUTO	W	WHITE COLOR LENS

**LEGEND:**

EX. TO REMAIN	NEW		
OL		THERMAL OVERLOAD RELAY	
(PB)		PUSH BUTTON	
T		TIMER	
(C)	(C)	CONTACTOR	
(PR)		PILOT RELAY	
(R1)		RELAY 1	
S		STARTER	
SSRV		SOLID STATE REDUCED VOLTAGE STARTER	
(GFR)		GROUND FAULT RELAY	
(M)		MASTER CONTACTOR	
(SOL)		SOLENOID	
(B)	PUSH TO TEST	INDICATING LIGHT, LETTER DENOTES COLOR OF LIGHT	
(P)		PUMP MOTOR	
		CURRENT TRANSFORMER	
		POTENTIAL TRANSFORMER	
		POWER TRANSFORMER	
		GROUND	
		FUSE	
		CONDUIT/CABLES ON CEILING OR WALL	
		CONDUIT/CABLES UNDER FLOOR/GRADE	
		STRUCTURAL BEAM BELOW FLOOR	
		NEW EQUIPMENT	
		TIME DELAY RELAY CONTACT TIMED TO CLOSE	
		TIME DELAY RELAY CONTACT TIMED TO OPEN	
		NORMALLY OPEN CONTACT	
		NORMALLY CLOSED CONTACT	
		LIMIT SWITCH ON VALVES	
		KEYED NOTES	
		PLC CONTACT WITH INTERPOSING RELAY	
		CONTROL RELAY	
		NORMALLY OPEN FLOAT SWITCH	
		SELECTOR SWITCH	
		NORMALLY OPEN THERMOSTAT	

**GENERAL NOTES:**

- ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE LATEST EDITION OF NATIONAL ELECTRICAL CODE AND APPLICABLE CODES, RULES AND REGULATIONS.
- ALL CONDUITS AND EQUIPMENT SHALL BE INSTALLED, WIRED AND GROUNDED IN ACCORDANCE WITH THE LATEST RULES AND REGULATIONS OF NATIONAL ELECTRICAL CODE (NEC).
- CONDUIT RUNS ARE SHOWN DIAGRAMMATICALLY ONLY AND SHALL BE INSTALLED IN A MANNER TO PREVENT CONFLICTS WITH ALL OTHER EQUIPMENT. EXPOSED CONDUITS SHALL BE RUN ON THE WALLS HORIZONTALLY AND VERTICALLY.
- CONDUITS SHALL BE TERMINATED SO AS TO PERMIT NEAT CONNECTION TO EQUIPMENT.
- CONDUIT ENDS SHALL BE SUITABLY SEALED TO PREVENT TRANSGRESS OF MOISTURE THROUGH CONDUITS FROM ONE EQUIPMENT TO OTHER.
- CONDUITS AND WIRES SHALL BE SIZED IN ACCORDANCE WITH LATEST EDITION OF NEC, UON.
- CONDUITS INSTALLED EXPOSED ON INTERIOR OF BUILDING SHALL BE RMC. PULL/JUNCTION BOXES REQUIRED AS PART OF CONDUIT RUN SHALL BE NEMA-4, UON.
- ALL WALL AND FLOOR PENETRATIONS FOR ELECTRICAL CONDUITS SHALL BE CORE DRILLED. PROVIDE SEGMENTED RUBBER COMPRESSION SEALS ON BOTH SIDES.
- THIS IS A REHABILITATION PROJECT, CONTRACTOR SHALL VERIFY DIMENSIONS IN THE FIELD.
- CONTRACTOR SHALL HAVE TO CUT EX. CONCRETE SLABS/WALLS TO REMOVE/INSTALL ELECTRICAL CONDUITS, IN SUCH OCCURRENCES CONTRACTOR SHALL REPAIR EX. STRUCTURE TO MATCH THE ORIGINAL CONDITION.
- INSTALL BLANK PLATES TO COVER HOLES ON MCC AFTER DEVICE REMOVAL. REMOVE UNUSED NAME PLATES. PAINT TO MATCH EX. PANEL.
- PROVIDE A SEPARATE, INSULATED GROUND WIRE IN ALL CONDUITS FOR EQUIPMENT GROUNDING.

**SPECIFIC NOTES:**

- SEWAGE PUMPS ARE INTERLOCKED SO THAT ONLY TWO OF THE THREE PUMPS CAN RUN AT THE SAME TIME WHETHER IN HAND OR AUTOMATIC MODE. CONTRACTOR SHALL MAINTAIN THIS FEATURE.
- USE EX. SOLID STATE REDUCED VOLTAGE STARTER AS BYPASS FOR VFD.
- USE EX. SSRV OUTPUT CONTACTOR AS BYPASS CONTACTOR FOR SSRV, THIS CONTACTOR CLOSES WHEN MOTOR ATTAINS FULL SPEED ON SSRV OPERATION. REMOVE EXISTING MECHANICAL INTERLOCKING. 3-PHASE CONTACTOR SHALL BE REHABILITATED BY REPLACING CONTACT BLOCKS.
- USE EX. VFD (AFC) OUTPUT CONTACTOR AS INPUT CONTACTOR FOR SSRV. THIS SHALL BE CONTROLLED FROM VFD. PROVIDE CONTROLS FOR THE CONTACTOR SO THAT DIAGNOSTIC ROUTINES CAN BE PERFORMED ON SSRV'S TO CHECK THE READINESS TO START. THIS CONTACTOR SHALL DISCONNECT SSRV FROM POWER SUPPLY IN CASE OF SSRV INTERNAL FAULTS. CONTACTORS SHALL BE REHABILITATED BY REPLACING CONTACT BLOCKS.
- PROVIDE TWO NEW MECHANICALLY INTERLOCKED CONTACTORS IN VFD'S TO BE USED AS OUTPUT CONTACTORS FOR SSRV & VFD. PROVIDE CONTROLS FOR THE CONTACTORS TO MATCH WITH EX. CONTROLS SHOWN FOR VALVES & LEVEL CONTROL.
- PROVIDE VFD INPUT CONTACTORS AND CONTROLS SO THAT AUTO DIAGNOSTIC ROUTINES CAN BE PERFORMED ON VFD'S WHEN NOT IN OPERATION. THIS CONTACTOR SHALL DISCONNECT VFD FROM POWER SUPPLY IN CASE OF INTERNAL FAULT IN VFD.

**DHILLON ENGINEERING, INC.**  
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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

Director of Public Works: *Janet C. ...* 9/26/05  
Chief, Bureau of Utilities: *Robert L. Durrant* 9/19/05

Chief, Bureau of Engineering: *Paul J. ...* 9/16/05  
Chief, Utility Design Division: *Robert L. Durrant* 9/16/05

PREPARED BY:  
**WR&A**  
Whitman, Reardon and Associates, LLP.  
801 South Caroline Street  
Baltimore, Md. 21231  
410-235-3450

DES: SS			
DRN: AS			
CHK: AM			
DATE: 1/21/05	BY	ND.	REVISION

ONE LINE DIAGRAM, LEGEND,  
ABBREVIATIONS AND GENERAL  
NOTES - NEW WORK

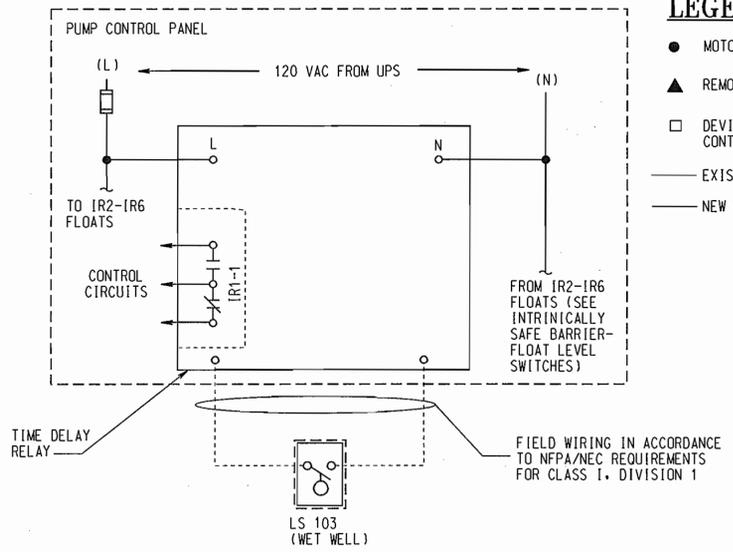
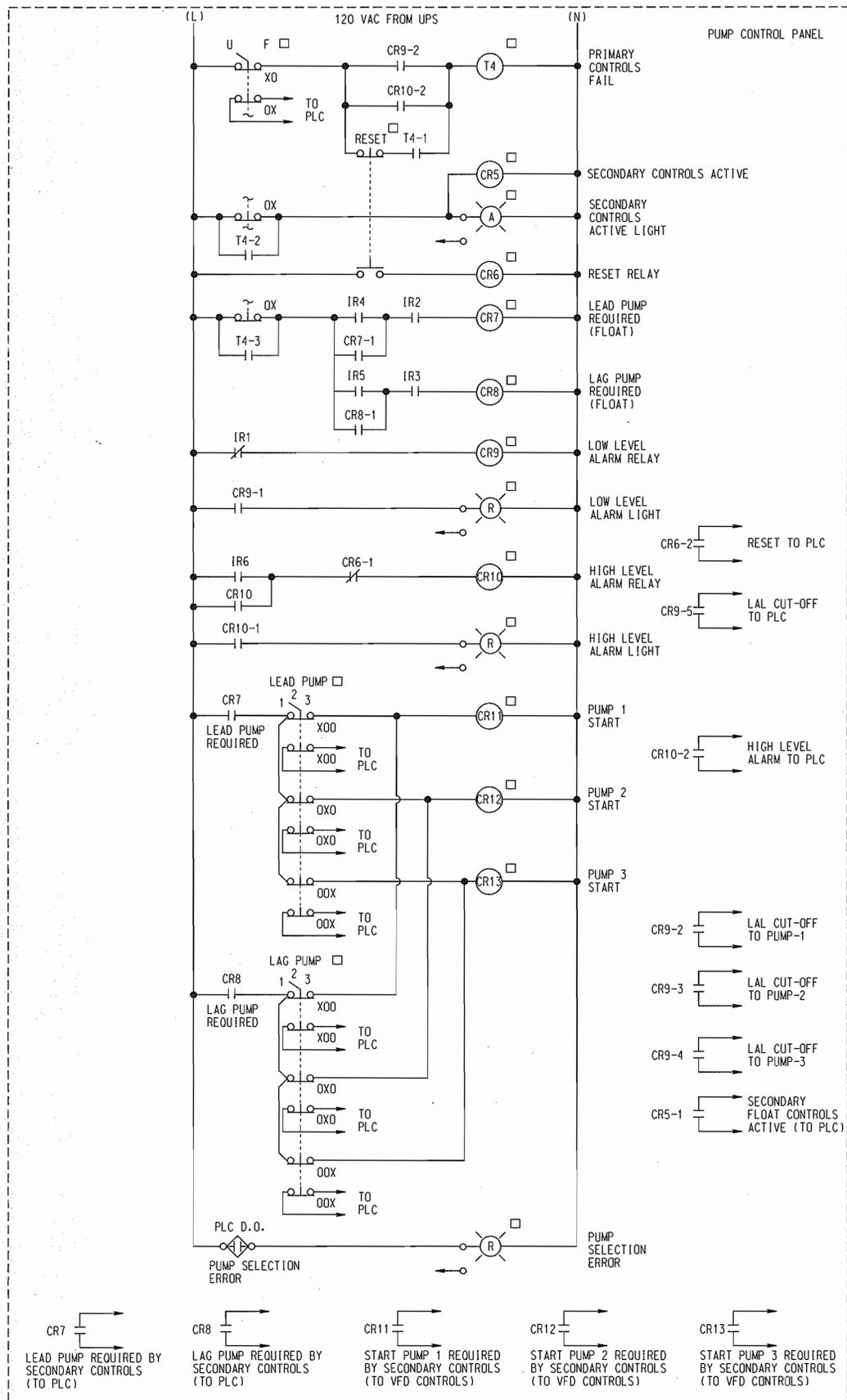
600' SCALE MAP NO. 30 BLOCK NO. 9

ROUTE 108 WASTEWATER PUMPING  
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ELECTION DISTRICT 5 HOWARD COUNTY, MARYLAND

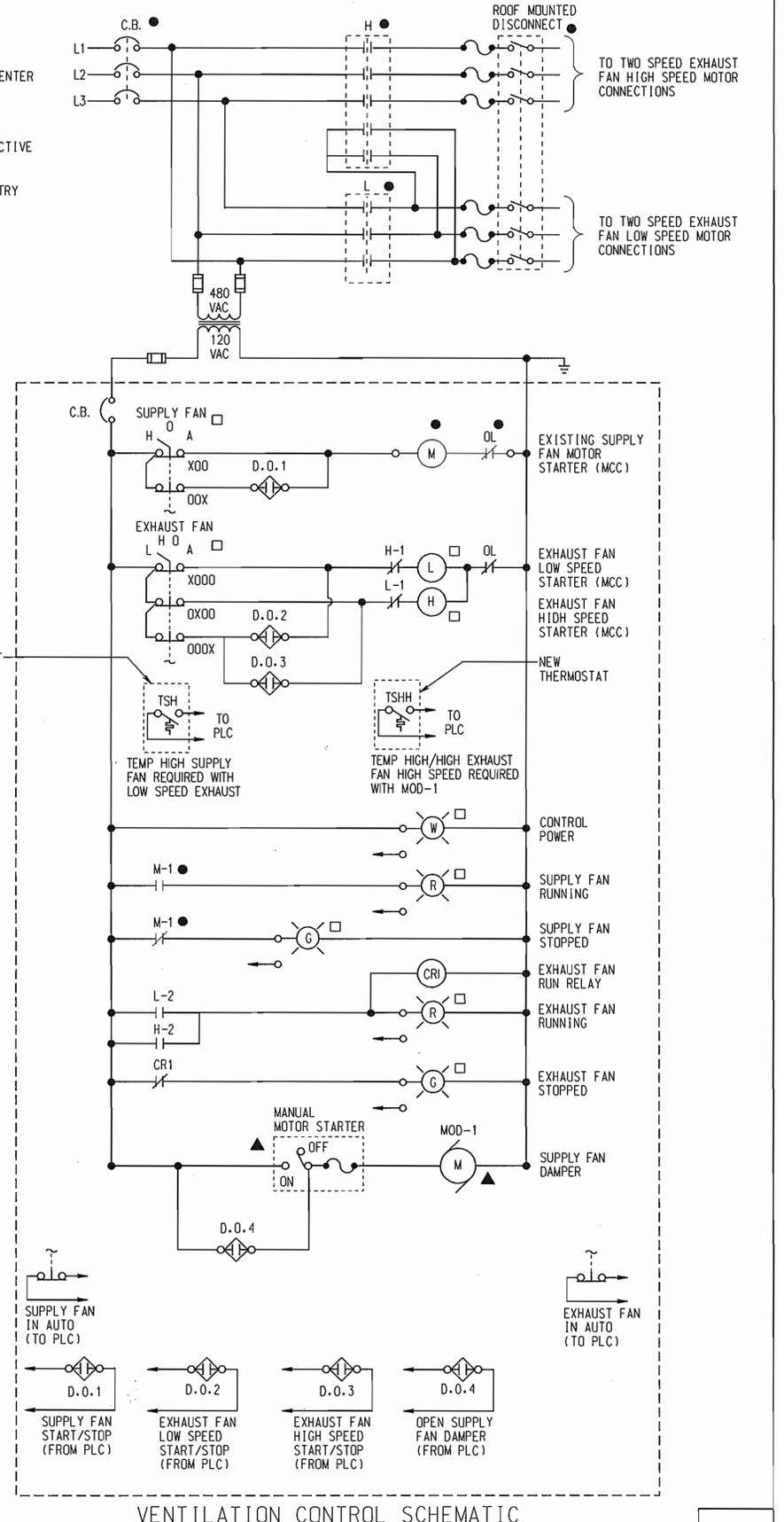
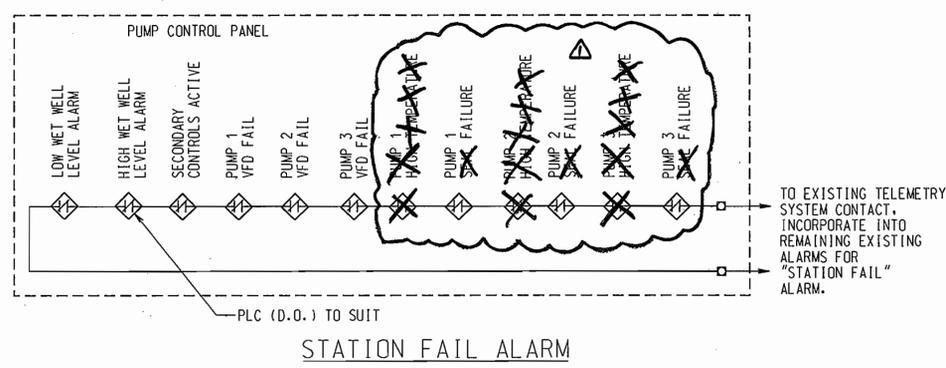
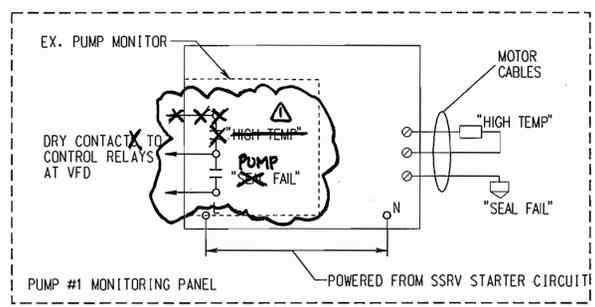






**INTRINSICALLY SAFE BARRIER**  
(IR1 SHOWN FOR LS-103, TYPICAL FOR IR2-IR6 FOR LS-104 TO LS-108 RESPECTIVELY)

FLOAT LEVEL SWITCHES		
LS 103	IR1	LOW LEVEL ALARM
LS 104	IR2	LEAD PUMP STOP
LS 105	IR3	LAG PUMP STOP
LS 106	IR4	LEAD PUMP START
LS 107	IR5	LAG PUMP START
LS 108	IR6	HIGH LEVEL ALARM



DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

Director of Public Works: *John A. Kelos*  
DATE: 9-19-05

Chief, Bureau of Utilities: *John A. Kelos*  
DATE: 9-19-05

Chief, Bureau of Engineering: *Paul D. Sporn*  
DATE: 9/16/05

Chief, Utility Design Division: *Paul D. Sporn*  
DATE: 9/16/05

PREPARED BY:

**WR&A**

Whitman, Reardon and Associates, LLP.  
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Baltimore, Md. 21231  
410-235-3450

STATE OF MARYLAND  
DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY

DES: PG	
DRN: AGT	
CHK: HWL	
DATE: 1/21/05	
BY: NO.	
REVISION	
DATE	

AS-BUILT REVISIONS 12/07

CONTROL SCHEMATICS

600' SCALE MAP NO. 30 BLOCK NO. 9

AS-BUILT 12/07

ROUTE 108 WASTEWATER PUMPING STATION IMPROVEMENTS  
CONTRACT NO. 24-4129  
CAPITAL PROJECT NO. S-6190

ELECTION DISTRICT 5 HOWARD COUNTY, MARYLAND

E-4

SCALE AS SHOWN

SHEET 14 OF 18

MD13429R08E04.dgn Thu Jul 28 09:06:00 2005

**PROCESS AND INSTRUMENTATION SYMBOLS**

- FIELD MOUNTED DEVICE
- PANEL MOUNTED DEVICE
- INDICATING LAMP - X INDICATES LENS COLOR
- DIGITAL READOUT DISPLAY
- PLC INPUT/OUTPUT
- HMI DATABASE POINT
- ANALOG INPUT
- ANALOG OUTPUT
- DIGITAL INPUT
- DIGITAL OUTPUT
- ABC - LETTERS INDICATE FUNCTION ACCORDING TO ISA SCHEDULE: 123 DIGITS IDENTIFY ASSOCIATED EQUIPMENT
- ELECTRICAL SERVICE
- PROCESS FLOW
- ELECTRIC SIGNAL
- SOFTWARE OR COMMUNICATIONS DATA SIGNAL
- INDICATES MULTIPLE SIGNALS TO PLC (X) DENOTES NUMBER OF SIGNALS
- INTERLOCK-PLC LOGIC OR HARDWIRED AS SHOWN ON DRAWINGS. (X) DENOTES CONDITIONS REFERENCE MODIFIERS
- EQUIPMENT GROUPED AS A TYPICAL ARRANGEMENT. GROUPING TYPICAL OF MULTIPLES OF THE SAME PROCESS.

**INSTRUMENT, EQUIPMENT AND CONTROL DEVICE EXAMPLES**

- AIT = ANALYSIS INDICATING TRANSMITTER
- FIT = FLOW INDICATING TRANSMITTER
- LIT = LEVEL INDICATING TRANSMITTER
- PAH = PRESSURE ALARM HIGH
- PAL = PRESSURE ALARM LOW
- ZSO = POSITION SWITCH OPEN
- ZSC = POSITION SWITCH CLOSED

**HAND SWITCHES**

- SELECTOR SWITCH OR PUSH BUTTON (MAINTAINED CONTACTS)

**EQUIPMENT SYMBOLS**

- BOOSTER PUMP
- PROCESS DESCRIPTION XXX(3) PROCESS FLOW
- FLOAT SWITCH
- CHECK VALVE
- BUTTERFLY VALVE
- PLUG VALVE
- ULTRASONIC LEVEL TRANSDUCER
- MAGNETIC FLOWMETER
- INTERPOSING RELAY

**CONTROL PANEL EQUIPMENT SYMBOLS**

- PILOT LIGHT - PUSH-TO-TEST X INDICATES LENS COLOR
- PUSH BUTTON
- SELECTOR SWITCH POSITION AS INDICATED

**ABBREVIATIONS**

- AFF ABOVE FINISHED FLOOR
- DPDT DOUBLE POLE-DOUBLE THROW
- ETM ELAPSED TIME METER
- F/U FLOAT/ULTRASONIC CONTROL MODE
- HMI HUMAN MACHINE INTERFACE
- HOA HAND-OFF-AUTOMATIC (SELECTOR SWITCH)
- I/O INPUT/OUTPUT
- LHOA LOW-HIGH-OFF-AUTOMATIC (SELECTOR SWITCH)
- LR LOCAL/REMOTE
- L/S LEAD PUMP SELECTOR SWITCH
- MOV MOTOR OPERATED VALVE
- N.C. NORMALLY CLOSED
- N.O. NORMALLY OPEN
- PLC PROGRAMMABLE LOGIC CONTROLLER
- R POTENTIOMETER
- POT RED INDICATOR LIGHT LENS
- RES RESET
- VOB VFD/BYPASS

**INSTRUMENT IDENTIFICATION SCHEDULE**

FIRST LETTER	SUCCEEDING LETTER		
	VAR IABLE	MODIFIER	
A	ANALYSIS		
B	BREAKER		
C	CONDUCTIVITY		
D	DENSITY	DIFFERENTIAL	
E	VOLTAGE (ENF)		
F	FLOW RATE	RATIO	
G	GAUGING		
H	HAND/HOA		
I	CURRENT		
J	POWER	SCAN	
K	TIME	TIME RATE	
L	LEVEL		
M	MOTOR	MOMENTARY	
N	USER'S CHOICE		
O			
P	PRESSURE	PNEUMATIC	
Q	QUANTITY OR EVENT	TOTALIZE	
R	RADIOACTIVITY		
S	SPEED OR FREQUENCY	SUM	
T	TEMPERATURE		
U	MULTIVARIABLE		
V	VARIABLE OR VISCOSITY		
W	WEIGHT OR FORCE		
X	MOD. LIGHT OR VALVE		
Y	INTERLOCK		
Z	POSITION		

**PLC AND HMI EXAMPLES**

- AN = ANALYSIS INPUT
- ANH = ANALYSIS HIGH LIMIT
- ANL = ANALYSIS LOW LIMIT
- B = BYPASS POSITION SELECTED
- CN = COMMUNICATION INPUT
- CI = COMMUNICATION STATUS (WITH DESCRIPTOR)
- FN = FLOW INPUT
- FNH = FLOW INPUT HIGH
- FNL = FLOW INPUT LOW
- HN = HAND INPUT (WITH DESCRIPTOR)
- IN = CURRENT INPUT
- JN = POWER INPUT
- LN = LEVEL INPUT
- LNH = LEVEL INPUT HIGH
- LNL = LEVEL INPUT LOW
- MAF = MOTOR FAILURE ALARM
- MC = MOTOR COMMAND
- MCR = MOTOR COMMAND RUN
- MCS = MOTOR COMMAND STOP
- MIF = MOTOR FAILURE INDICATION
- MIR = MOTOR RUN INDICATION
- MIS = MOTOR STOP INDICATION
- MK = HMI MOTOR START COMMAND
- MN = MOTOR INPUT
- MNR = MOTOR INPUT RUN
- MNS = MOTOR INPUT STOP
- MZL = MOTOR COMMAND POSITION LOCAL
- MZR = MOTOR COMMAND POSITION REMOTE
- PN = PRESSURE INPUT
- PNH = PRESSURE INPUT HIGH
- PNL = PRESSURE INPUT LOW
- ON = QUALITY INPUT (WITH DESCRIPTOR)
- SC = SPEED CONTROL
- SI = SPEED INDICATION
- SN = SPEED INPUT
- TN = TEMPERATURE INPUT
- TNH = TEMPERATURE INPUT HIGH
- TNL = TEMPERATURE INPUT LOW

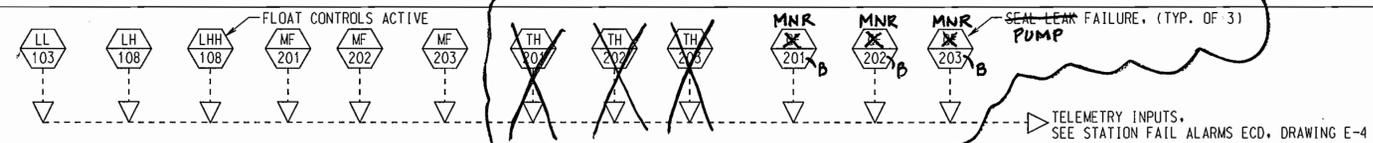
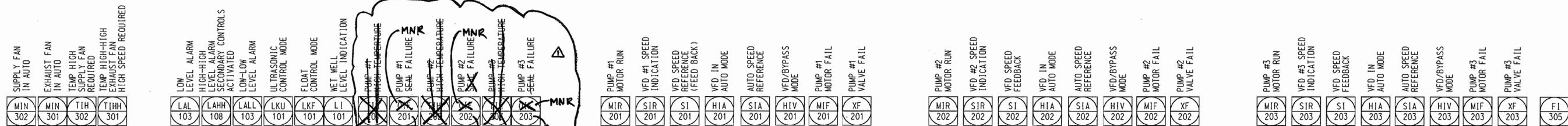
**INSTRUMENT INPUT/OUTPUT LIST**

Point Name	Description
HNA-201	PUMP #1 HOA IN AUTO
MNR-201	PUMP #1 MOTOR RUN IN VFD
SNA-201	PUMP #1 AUTO SPEED REFERENCE
HNV-201	PUMP #1 VOB IN VFD MODE
<del>MNF-201</del>	<del>PUMP #1 FAIL</del>
<del>MNR201B</del>	<del>PUMP #1 RUN IN BYPASS MODE</del>
<del>MNF201</del>	<del>PUMP #1 HIGH TEMPERATURE</del>
<del>MNR201B</del>	<del>PUMP #1 SEAL FAIL</del>
HNA-202	PUMP #2 HOA IN AUTO
MNR-202	PUMP #2 MOTOR RUN IN VFD
SNA-202	PUMP #2 AUTO SPEED REFERENCE
HNV-202	PUMP #2 VOB IN VFD MODE
<del>MNF-202</del>	<del>PUMP #2 FAIL</del>
<del>MNR202B</del>	<del>PUMP #2 RUN IN BYPASS MODE</del>
<del>MNF202</del>	<del>PUMP #2 HIGH TEMPERATURE</del>
<del>MNR202B</del>	<del>PUMP #2 SEAL FAIL</del>
HNA-203	PUMP #3 HOA IN AUTO
MNR-203	PUMP #3 MOTOR RUN IN VFD
SNA-203	PUMP #3 AUTO SPEED REFERENCE
HNV-203	PUMP #3 VOB IN VFD MODE
<del>MNF-203</del>	<del>PUMP #3 FAIL</del>
<del>MNR203B</del>	<del>PUMP #3 RUN IN BYPASS MODE</del>
<del>MNF203</del>	<del>PUMP #3 HIGH TEMPERATURE</del>
<del>MNR203B</del>	<del>PUMP #3 SEAL FAIL</del>
LNR-107	LAG PUMP START
LNS-105	LAG PUMP STOP
LNR-106	LEAD PUMP START
LNS-104	LEAD PUMP STOP
LNL-103	LOW WATER LEVEL
LNH-108	HIGH/HIGH WATER LEVEL
LNF-108	SECONDARY CONTROLS ACTIVATED
HN-200A	PUMP #1 LEAD SELECT
HN-200B	PUMP #2 LEAD SELECT

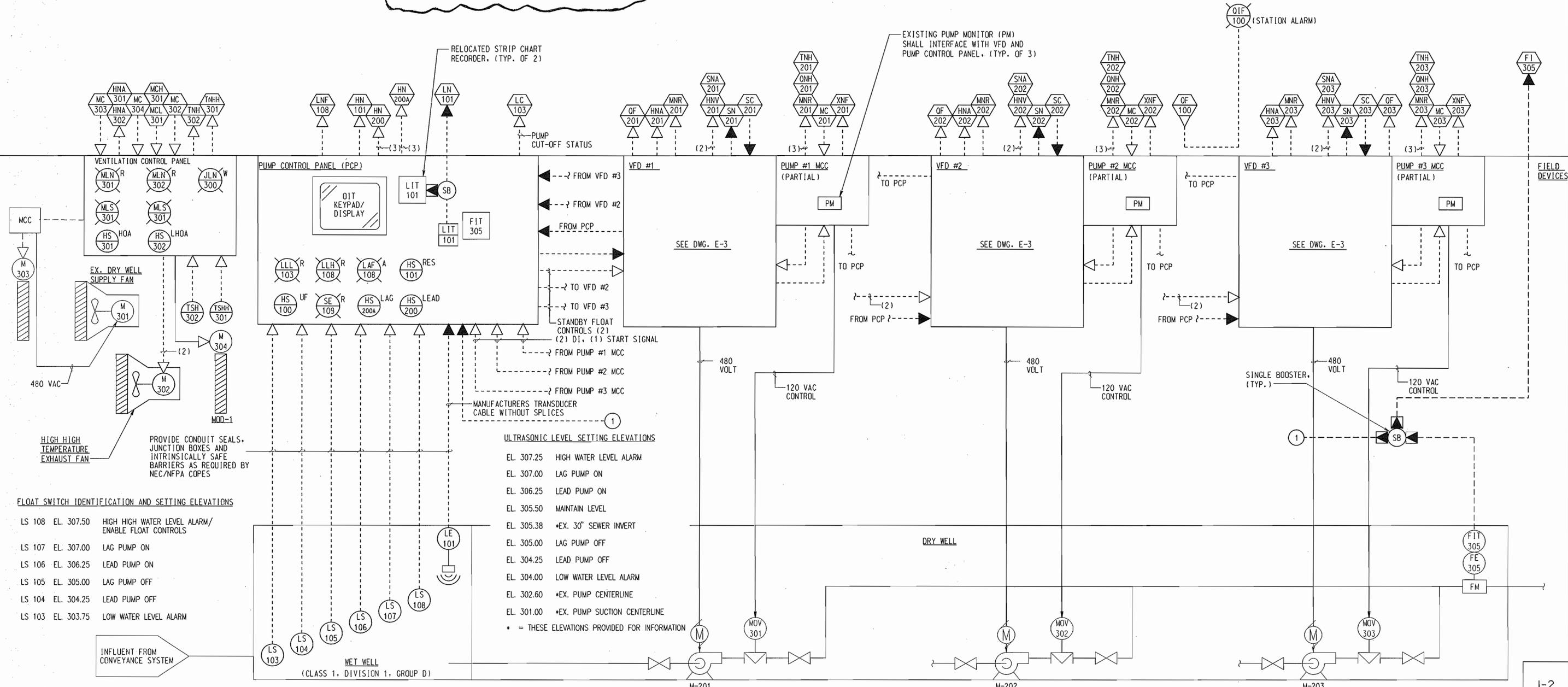
Point	Type	Data Field 1	Data Field 2	Point Name	Description	Point	Type	Data Field 1	Data Field 2
1	DI	AUTO	MANUAL	HN-200C	PUMP #3 LEAD SELECT	34	DI	---	---
2	DI	RUNNING	STOP	HN-201A	PUMP #1 LAG SELECT	35	DI	---	---
3	DI	AUTO	MANUAL	HN-201B	PUMP #2 LAG SELECT	36	DI	---	---
4	DI	VFD	BYPASS	HN-201C	PUMP #3 LAG SELECT	37	DI	---	---
5	DI	ALARM	NORMAL	HN-301	SUPPLY FAN IN AUTO	38	DI	AUTO	MANUAL
6	DI	RUN	NORMAL	HN-302	EXHAUST FAN IN AUTO	39	DI	AUTO	MANUAL
7	DI	NORMAL	FAIL	QN-101	LEAD PUMP REQUIRED	40	DI	---	---
8	DI	ALARM	NORMAL	QN-102	LAG PUMP REQUIRED	41	DI	---	---
9	DI	AUTO	MANUAL	TSH-302	TEMP HIGH	42	DI	ALARM	NORMAL
10	DI	RUNNING	STOP	TSHH-301	TEMP HIGH/HIGH	43	DI	ALARM	NORMAL
11	DI	AUTO	MANUAL	HN-101	FLOAT SYSTEM RESET PUSHBUTTON	44	DI	---	---
12	DI	VFD	BYPASS	MC-201	PUMP #1 START	1	DO	START	STOP
13	DI	ALARM	NORMAL	MC-202	PUMP #2 START	2	DO	START	STOP
14	DI	RUN	NORMAL	MC-203	PUMP #3 START	3	DO	START	STOP
15	DI	NORMAL	FAIL	SE-109	PUMP SELECTION ERROR PILOT LIGHT	4	DO	ON	OFF
16	DI	ALARM	NORMAL	MC-301	SUPPLY FAN START/STOP	5	DO	START	STOP
17	DI	AUTO	MANUAL	MC-302A	EXHAUST FAN LOW SPEED START/STOP	6	DO	START	STOP
18	DI	RUNNING	STOP	MC-302B	EXHAUST FAN HIGH SPEED START/STOP	7	DO	START	STOP
19	DI	AUTO	MANUAL	MC-304	SUPPLY FAN DAMPER OPEN	8	DO	OPEN	CLOSED
20	DI	VFD	BYPASS	MC-303	EXHAUST FAN DAMPER OPEN	9	DO	OPEN	CLOSED
21	DI	ALARM	NORMAL	LN-101	WETWELL LEVEL	1	AI	4-20mA	---
22	DI	RUN	NORMAL	SN-201	PUMP #1 SPEED FEEDBACK	2	AI	4-20mA	---
23	DI	NORMAL	FAIL	SN-202	PUMP #2 SPEED FEEDBACK	3	AI	4-20mA	---
24	DI	ALARM	NORMAL	SN-203	PUMP #3 SPEED FEEDBACK	4	AI	4-20mA	---
25	DI	START	---	SC-201	PUMP #1 SPEED CONTROL	1	AO	---	4-20mA
26	DI	STOP	---	SC-202	PUMP #2 SPEED CONTROL	2	AO	---	4-20mA
27	DI	START	---	SC-203	PUMP #3 SPEED CONTROL	3	AO	---	4-20mA
28	DI	STOP	---	FI-305	PUMPING STATION FLOW	5	AI	4-20mA	---
29	DI	ALARM	NORMAL	LC-103	PUMP CUT-OFF (STATUS)	45	DI	---	---
30	DI	ALARM	NORMAL	XNF-201	PUMP #1 VALVE FAIL	46	DI	NORMAL	FAIL
31	DI	---	---	XNF-202	PUMP #2 VALVE FAIL	47	DI	NORMAL	FAIL
32	DI	---	---	XNF-203	PUMP #3 VALVE FAIL	48	DI	NORMAL	FAIL
33	DI	---	---						

AS-BUILT 12/07

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND. Director of Public Works: <i>9/20/05</i> Chief, Bureau of Utilities: <i>9-19-05</i>	PREPARED BY: <b>WR&amp;A</b> Whitman, Requardt and Associates, LLP. 801 SOUTH CAROLINE ST. Baltimore, Md. 21231 410-235-3450	DES: PG DRN: AGT CHK: HWL DATE: 1/21/05	PROCESS AND INSTRUMENTATION LEGEND, ABBREVIATIONS AND NOTES 600' SCALE MAP NO. <u>30</u> BLOCK NO. <u>9</u>	ROUTE 108 WASTEWATER PUMPING STATION IMPROVEMENTS CONTRACT NO. 24-4129 CAPITAL PROJECT NO. S-6190 ELECTION DISTRICT 5 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN SHEET 15 OF 18
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PROGRAMMABLE LOGIC CONTROLLER



**FLOAT SWITCH IDENTIFICATION AND SETTING ELEVATIONS**

LS 108	EL. 307.50	HIGH HIGH WATER LEVEL ALARM/ENABLE FLOAT CONTROLS
LS 107	EL. 307.00	LAG PUMP ON
LS 106	EL. 306.25	LEAD PUMP ON
LS 105	EL. 305.00	LAG PUMP OFF
LS 104	EL. 304.25	LEAD PUMP OFF
LS 103	EL. 303.75	LOW WATER LEVEL ALARM

**ULTRASONIC LEVEL SETTING ELEVATIONS**

EL. 307.25	HIGH WATER LEVEL ALARM
EL. 307.00	LAG PUMP ON
EL. 306.25	LEAD PUMP ON
EL. 305.50	MAINTAIN LEVEL
EL. 305.38	+EX. 30" SEWER INVERT
EL. 305.00	LAG PUMP OFF
EL. 304.25	LEAD PUMP OFF
EL. 304.00	LOW WATER LEVEL ALARM
EL. 302.60	+EX. PUMP CENTERLINE
EL. 301.00	+EX. PUMP SUCTION CENTERLINE

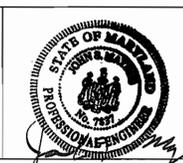
\* = THESE ELEVATIONS PROVIDED FOR INFORMATION

AS-BUILT 12/07

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

Director of Public Works: *Robert Bauman* 9/19/05  
 Chief, Bureau of Utilities: *Robert Bauman* 9/19/05  
 Chief, Bureau of Engineering: *Paul J. Szymanski* 9/16/05  
 Chief, Utility Design Division: *Paul J. Szymanski* 9/16/05

PREPARED BY:  
**WR&A**  
Whitman, Reardon and Associates, LLP.  
801 SOUTH CAROLINE ST.  
Baltimore, Md. 21231  
410-235-3450



DES: PG	
DRN: AGT	
CHK: HWL	
DATE: 1/21/05	
BY: NO.	REVISION
	AS-BUILT REVISIONS 12/07

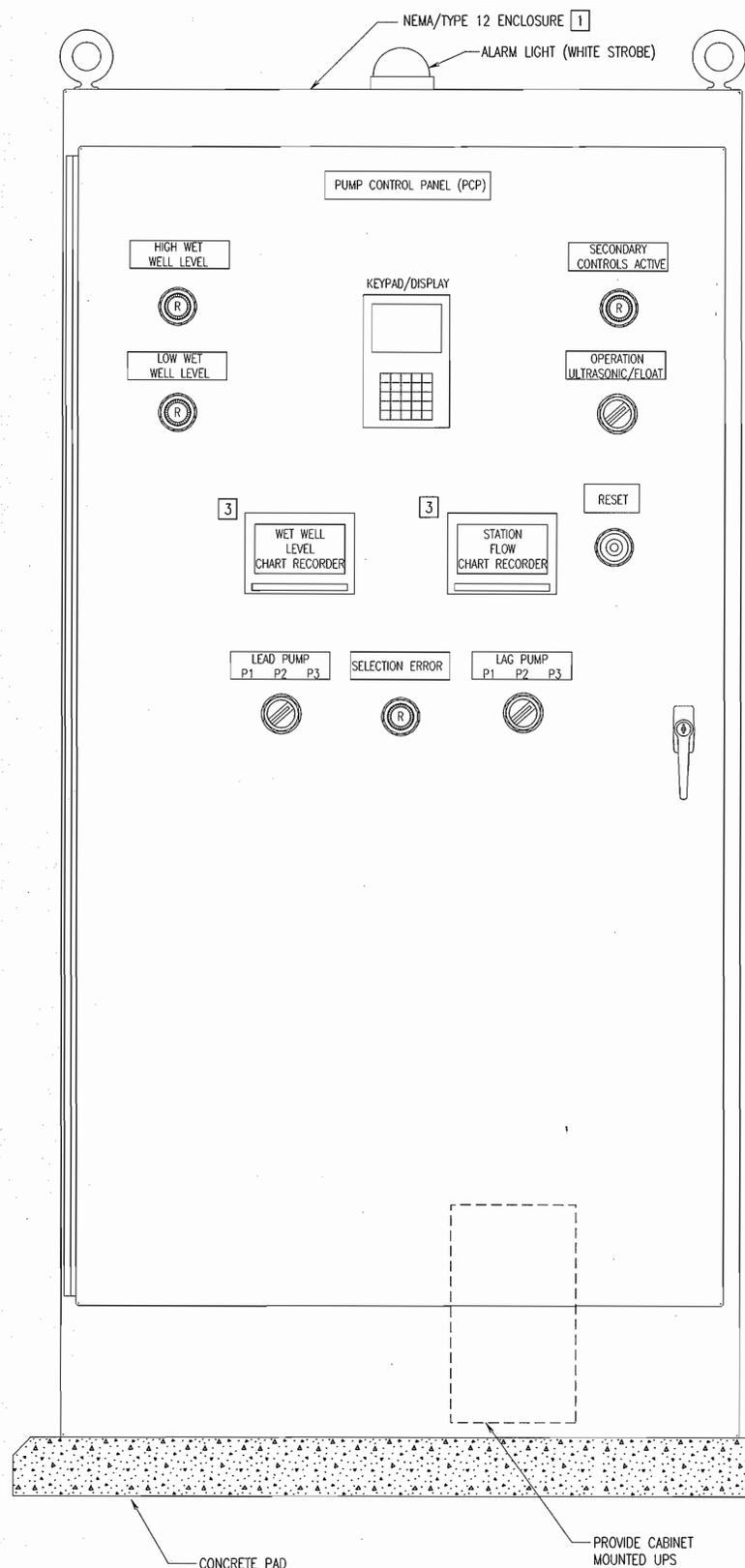
PUMPING STATION  
PROCESS AND INSTRUMENTATION  
DIAGRAM

600' SCALE MAP NO. 30 BLOCK NO. 9

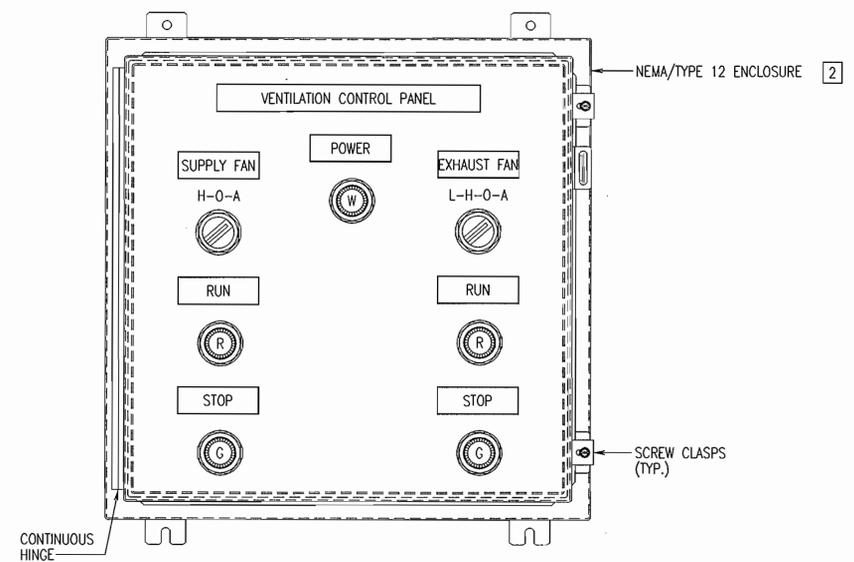
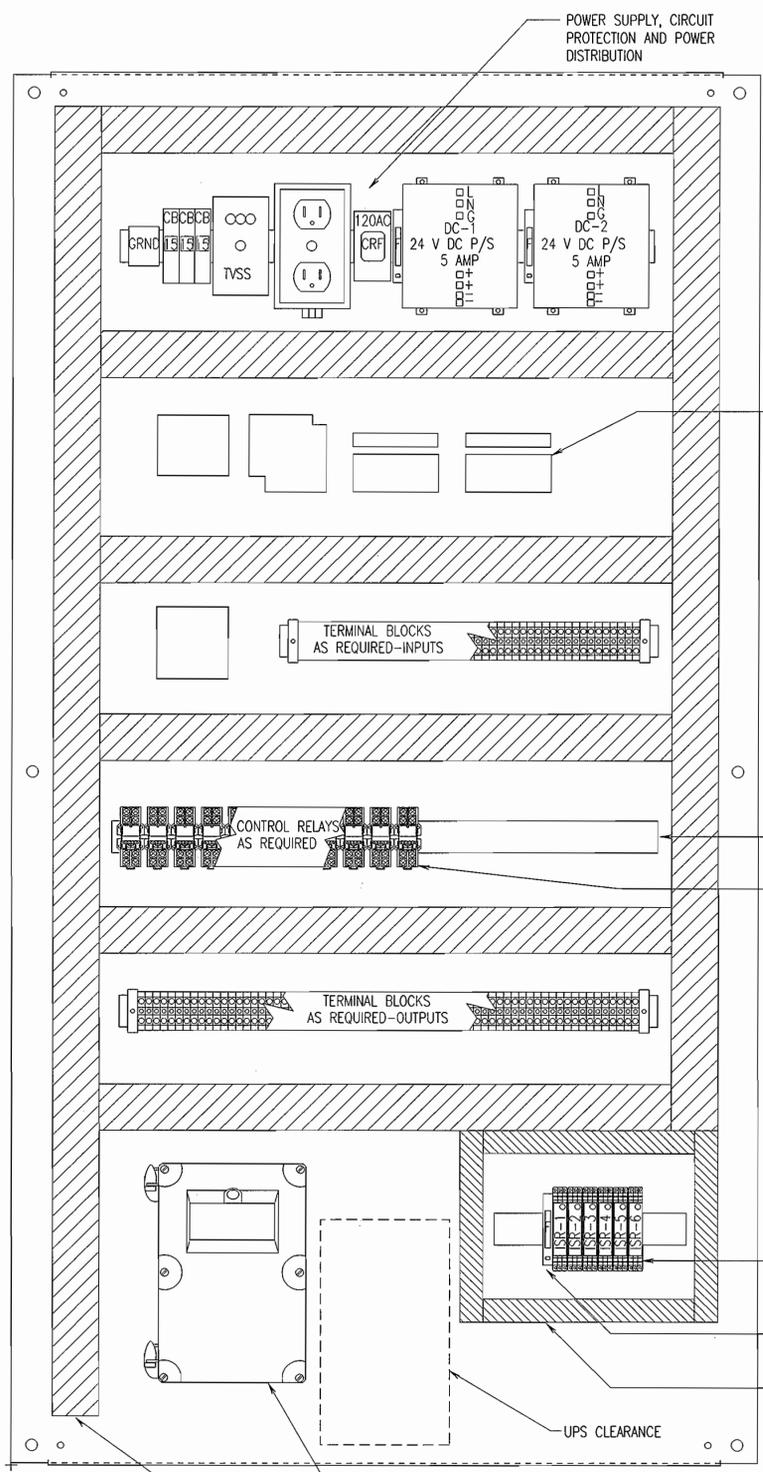
ROUTE 108 WASTEWATER PUMPING  
STATION IMPROVEMENTS  
CONTRACT NO. 24-4129  
CAPITAL PROJECT NO. S-6190

ELECTION DISTRICT 5 HOWARD COUNTY, MARYLAND

1-2  
SCALE AS SHOWN  
SHEET 16 OF 18



**PUMP CONTROL PANEL**  
NOT TO SCALE



**VENTILATION CONTROL PANEL**  
NOT TO SCALE

- DRAWING NOTES:**
- ENCLOSURE SHOWN IS APPROXIMATELY 36"Wx72"Hx24"D. LAYOUT IS SHOWN FOR GENERAL INFORMATION ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL LAYOUT AND SIZING OF PUMP CONTROL PANEL.
  - CONTRACTOR SHALL BE RESPONSIBLE FOR DIMENSION OF VENTILATION CONTROL PANEL.
  - REMOVE CHART RECORDERS FROM EXISTING BUBBLER PANEL AND REINSTALL IN NEW PUMP CONTROL PANEL AS SHOWN.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*R. A. ...* 9/20/05  
DIRECTOR OF PUBLIC WORKS DATE

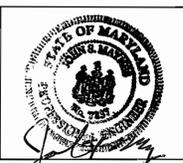
*Robert ...* 9/16/05  
CHIEF, BUREAU OF ENGINEERING DATE

*...* 9/16/05  
CHIEF, UTILITY DESIGN DIVISION DATE

PREPARED BY:

**WR&A**

Whitman, Reardon and Associates, LLP.  
801 SOUTH CAROLINE ST.  
BALTIMORE, MD. 21231  
410-235-3450



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BY: NO.		REVISION	DATE

PANEL ELEVATIONS

600' SCALE MAP NO. 30 BLOCK NO. 9

AS-BUILT 12/07

ROUTE 108 WASTEWATER PUMPING STATION IMPROVEMENTS  
CONTRACT NO. 24-4129  
CAPITAL PROJECT NO. S-6190

ELECTION DISTRICT 5 HOWARD COUNTY, MARYLAND

1-3

SCALE AS SHOWN

SHEET 17 OF 18

**LEGEND**

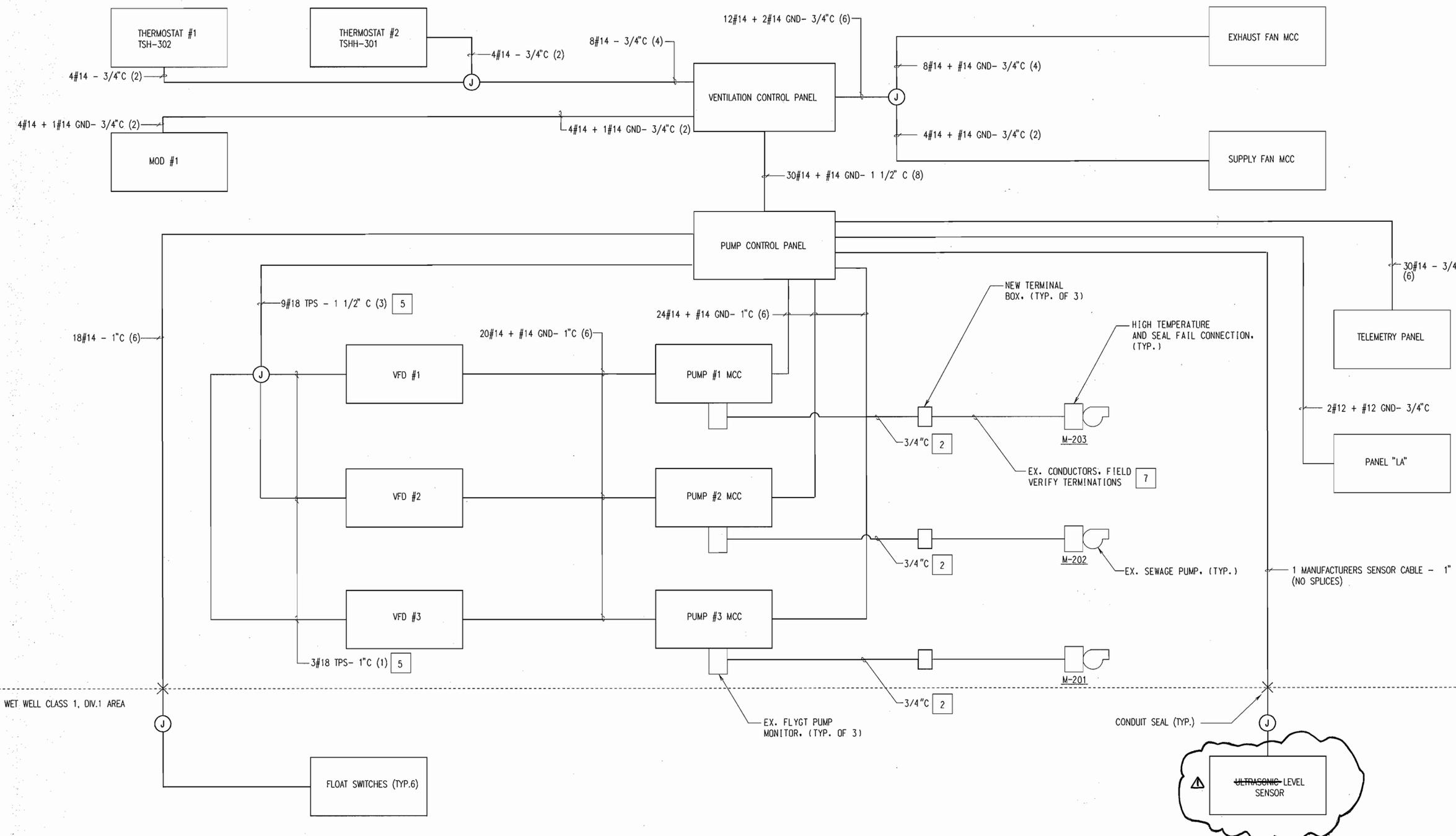
- EXISTING
- NEW WORK
- CLASS 1, DIV.1, NEMA 7 DIVISION

**CONDUCTOR IDENTIFICATION**

- A #14 - B C (C)  
 A - TOTAL QUANTITY OF CONDUCTORS  
 B - SIZE OF CONDUIT  
 C - QUANTITY OF SPARE CONDUCTORS INCLUDED IN TOTAL COUNT (ITEM - A)

**NOTES:**

- 1 CONDUIT SIZING SHALL BE IN ACCORDANCE WITH NEC RECOMMENDATIONS.
- 2 VERIFY CONDUCTOR COUNTS WITH FIELD INSTALLED PUMP MONITOR.
- 3 PROVIDE 48-INCHES SLACK WIRE AT EACH END FOR ALL SPARE INSTRUMENTATION WIRES. LABEL AND COIL SPARE WIRE TERMINATIONS AT RESPECTIVE JB OR CP.
- 4 SEE SYSTEM P&I DIAGRAMS AND ECD DETAILS FOR CONTROL WIRE IDENTIFICATIONS.
- 5 CONDUIT CONTAINING #18 TPS (4-20mA) WIRE SHALL BE LOCATED 6-INCHES (MINIMUM) AWAY FROM CONDUIT CONTAINING POWER CONDUCTORS AND CONDUIT CONTAINING #14 OR #12 POWER AND DIGITAL SIGNAL WIRE.
- 6 SYSTEMS INTEGRATOR SHALL VERIFY ALL APPROVED EQUIPMENT AND TERMINATIONS PRIOR TO INSTALLATION. THE SYSTEMS INTEGRATOR SHALL VERIFY ALL WIRE COUNTS AND INCLUDE 40% SPARES AND ASSEMBLE INSTRUMENT RISERS FOR CONSTRUCTION. THE RISERS SHALL BE SUBMITTED FOR APPROVAL AS A SHOP DRAWING.
- 7 MOTOR THERMAL OVERLOAD CONDUCTORS MAY BE INCLUDED WITH MAIN FEEDER. CONTRACTOR COORDINATE.

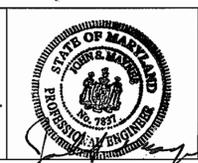


**RISER DIAGRAM** 1 3 4 6

NOT TO SCALE

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND.  
 Director of Public Works: *Jan P. I...* 9/16/05  
 Chief, Bureau of Engineering: *Paul J. ...* 9/16/05  
 Chief, Bureau of Utilities: *Robert ...* 9/19/05  
 Chief, Utility Design Division: *...* 9/16/05

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RISER DIAGRAM  
 600' SCALE MAP NO. 30 BLOCK NO. 9

AS-BUILT 12/07  
 ROUTE 108 WASTEWATER PUMPING STATION IMPROVEMENTS  
 CONTRACT NO. 24-4129  
 CAPITAL PROJECT NO. S-6190  
 ELECTION DISTRICT 5 HOWARD COUNTY, MARYLAND

1-4  
 SCALE AS SHOWN  
 SHEET 18 OF 18

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