

MD. RT. 216 BOOSTER PUMPING STATION

CONTRACT NO. 44-3886

CAPITAL PROJECT NO. W-8212

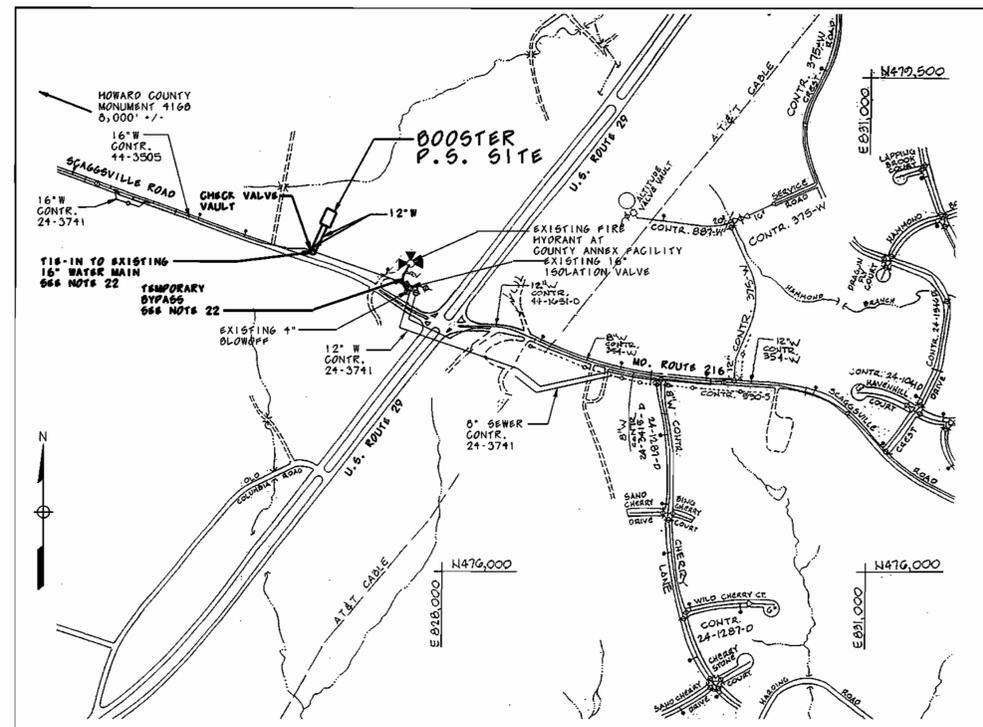
HOWARD COUNTY, MARYLAND

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OUTSIDE PIPING QUANTITIES

ITEM	ESTIMATED	AS-BUILT		
		QUANTITIES	TYPE	SUPPLIER
16" WATER	25 LF	36	D.I.P.	CLOW
12" WATER	540 LF	558	D.I.P.	CLOW
6" WATER	75 LF	67	D.I.P.	CLOW
16" GATE VALVE	2	2	GV	MUELLER
12" GATE VALVE	2	2	GV	MUELLER
6" GATE VALVE	2	2	GV	MUELLER
CHECK VALVE VAULT	1	1	-	SMITH-MID.
FIRE HYDRANTS	2	2	3-NOZZLE	MUELLER



TYPE OF BUILDING: NA
 NUMBER OF PARCELS: NA
 WATER HOUSE CONNECTIONS: 0
 SEWER HOUSE CONNECTIONS: 0
 DRAINAGE AREA: LITTLE PATUXENT

VICINITY MAP
 SCALE 1" = 600'

WATER CODES
 FOR COUNTY USE ONLY:
 WATER NO. E 18

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 SUPPLY. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE.
- THE COORDINATES SHOWN HEREIN ARE BASED UPON THE HOWARD COUNTY GEODETIC COUNTY CONTROL WHICH IS BASED UPON THE MARYLAND PLANE COORDINATE SYSTEM. (NORTH AMERICAN DATUM OF 1983-NAD 83). HOWARD COUNTY MONUMENTS NO 4108 AND 4109 WERE USED FOR THIS PROJECT.
- ALL VERTICAL CONTROLS ARE BASED ON U.S.G.S. DATUM (NAVD29).
- ALL PIPE ELEVATIONS ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON PLANS.
- CLEAR ALL UTILITIES BY A MINIMUM OF 6" CLEAR ALL POLES BY 2'-0" MINIMUM, OR TUNNEL AS REQUIRED. THE CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO SCHEDULE THE BRACING OF THE POLES, IF REQUIRED.
- FOR DETAILS NOT SHOWN ON 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 SITE.
- EXISTING UTILITIES IN THE VICINITY OF PROPOSED WORK SHALL BE VERIFIED BY THE CONTRACTOR TO HIS OWN SATISFACTION. ANY DAMAGE TO EXISTING FACILITIES DUE TO THE CONTRACTOR'S NEGLIGENCE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
- CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS:
 - BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION, HOWARD CO. DPW 410-313-1880
 - STATE HIGHWAY ADMINISTRATION 410-531-5533
 - BOE (CONTRACTOR SERVICES) 410-850-4620
 - BOE (UNDERGROUND DAMAGE CONTROL) 410-291-4607
 - BUREAU OF UTILITIES, HOWARD CO. DPW 410-313-4900
 - MISS UTILITY 1-800-257-7777
 - AT&T 410-865-3808
 - COLONIAL PIPELINE CO. 410-795-1390
 - BELL ATLANTIC 1-800-446-5266
- TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT POSSIBLE. ALL TREES AND SHRUBS REMOVED/DAMAGED DURING CONSTRUCTION SHALL BE REPLACED IN KIND AFTER COMPLETION OF CONSTRUCTION.
- CONTRACTOR SHALL REMOVE TREES, STUMPS AND ROOTS ALONG LINE OF EXCAVATION. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE PRICE BID FOR CONSTRUCTION OF THE BOOSTER PUMPING STATION AND WATER MAIN.
- ALL WATER MAINS SHALL HAVE A MINIMUM OF 3'-6" OF COVER UNLESS OTHERWISE NOTED.
- VALVES ADJACENT TO TEES SHALL BE STRAPPED TO TEES.
- ALL DIP FITTINGS SHALL BE IN ACCORDANCE WITH ANWA SPECIFICATIONS C-153: DUCTILE IRON COMPACT FITTINGS.
- NO WETLANDS EXISTS WITHIN THE LIMITS OF THIS CONTRACT.
- THE CONTRACTOR SHALL NOT OPERATE ANY WATER VALVES ON THE EXISTING WATER SYSTEM. THE CONTRACTOR SHALL CONTACT HOWARD COUNTY DPW BUREAU OF UTILITIES IF OPERATION OF VALVES IS NEEDED.
- ALL WATER MAIN JOINTS SHALL HAVE RESTRAINED JOINTS.
- TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL DEVICES AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
- THE EXISTING TOPOGRAPHY IS TAKEN FROM FIELD RUN SURVEY PERFORMED BY WHITMAN, REQUARDT AND ASSOCIATES IN FEBRUARY, 2000.
- CONTRACTOR TO PROTECT EXISTING PROPERTY MARKERS FROM BEING DISTURBED. IF A DISTURBANCE OCCURS, REPLACEMENT MUST BE DONE BY A LICENSED LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE.
- ALL WATER MAINS TO BE SPECIAL THICKNESS CLASS S2 D.I.P. UNLESS OTHERWISE NOTED.
- SET ALL FIRE HYDRANTS AS SHOWN ON DRAWINGS. FIRE HYDRANTS SHALL BE SET TO BURY ELEVATIONS SHOWN ON THE DRAWINGS. ALL FIRE HYDRANTS SHALL BE RESTRAINED AND BUTTRESSED WITH CONCRETE IN ACCORDANCE WITH THE STANDARD DETAILS. SOIL AROUND THE FIRE HYDRANT SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 1000 AND 1005 OF THE STANDARD SPECIFICATIONS.
- SEE DRAWING C-2 FOR WATER MAIN TIE-IN SEQUENCE OF CONSTRUCTION NOTES.

REVIEWED FOR HOWARD S.C.D. AND MEETS THE TECHNICAL REQUIREMENTS.
Chris Sumner 10/6/00
 USDA-NATURAL RESOURCES CONSERVATION SERVICE
 DATE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
John Hunter 10/4/00
 HOWARD S.C.D.
 DATE

DEVELOPER'S 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."
Paul Deegan 9/25/00
 SIGNATURE OF DEVELOPER DATE

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."
James A. Avirett Jr. 11/10/2000
 JAMES A. AVIRETT JR. P.E. 16210 DATE

11/21/02
RECORD DRAWING

As-Built

G-1

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND.
James M. Shaw 10/1/00
 DIRECTOR OF PUBLIC WORKS
Robert Dummer 9-28-00
 CHIEF, BUREAU OF UTILITIES

PREPARED BY:
WR&A
 Whitman, Requardt and Associates, LLP.
 2315 ST. Paul ST.
 Baltimore, Md. 21218
 410-235-3450

Paul Deegan 9/25/00
 CHIEF, BUREAU OF ENGINEERING
John Hunter 9-25-00
 CHIEF, UTILITY DESIGN DIVISION

DES: WFH
 DRN: WFH
 CHK: SEA
 DATE: 9/20/00

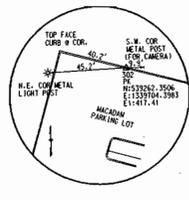
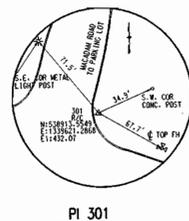
BY NO. REVISION DATE

TITLE SHEET- VICINITY MAP, INDEX OF DRAWINGS, AND GENERAL NOTES

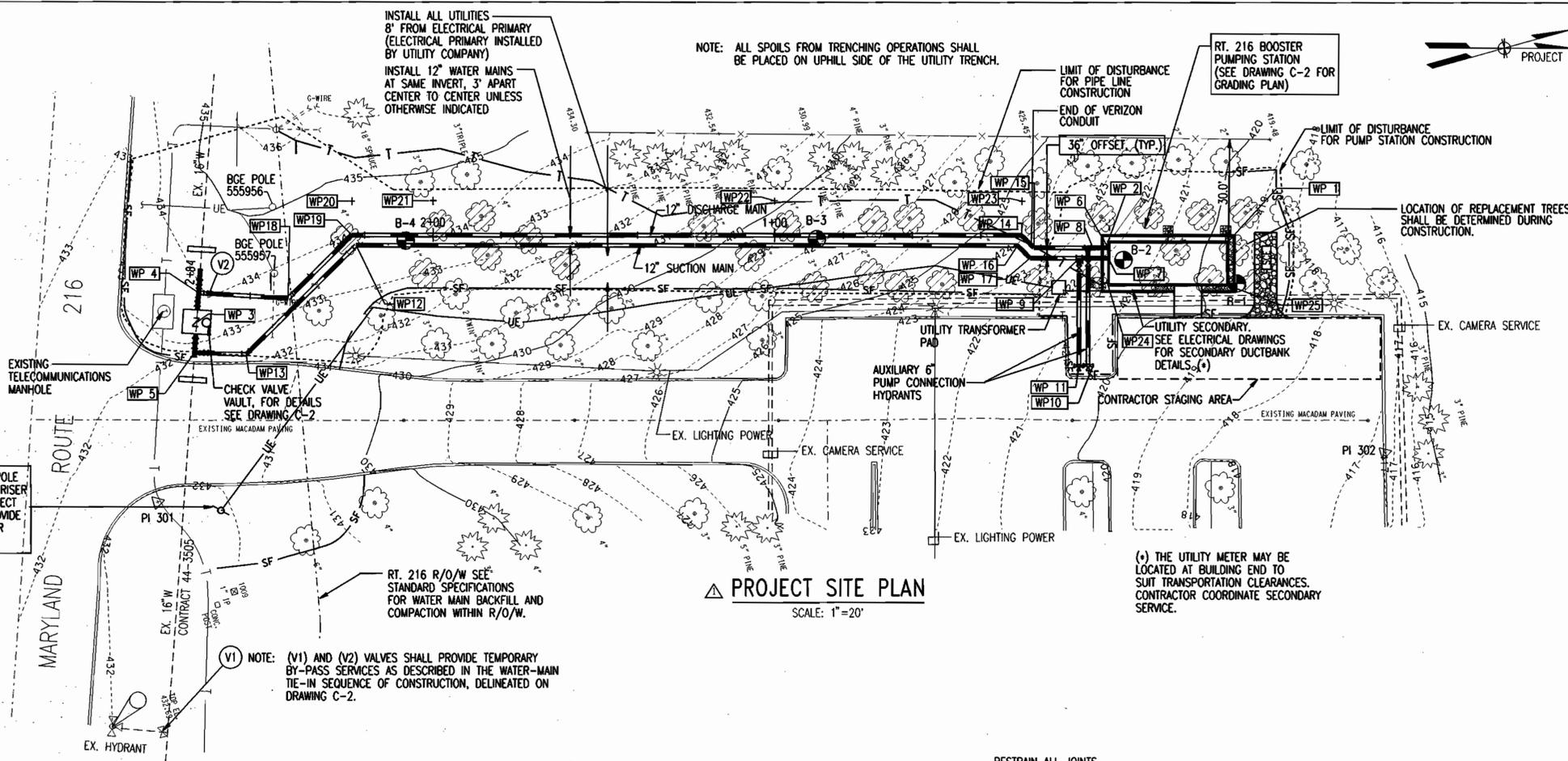
MD 216 BOOSTER PUMPING STATION
 CONTRACT NO. 44-3886
 CAPITAL PROJECT NO. W-8212
 HOWARD COUNTY, MARYLAND

600' SCALE MAP NO. 46 BLOCK NO. 4

SCALE AS SHOWN
 SHEET 1 OF 14



BGE TO INSTALL NEW UTILITY POLE AND PROVIDE UTILITY PRIMARY RISER AT POLE LOCATION. "BGE PROJECT NO. WMS610663". BGE TO PROVIDE PRIMARY FEEDER, TRANSFORMER AND SECONDARY METER.



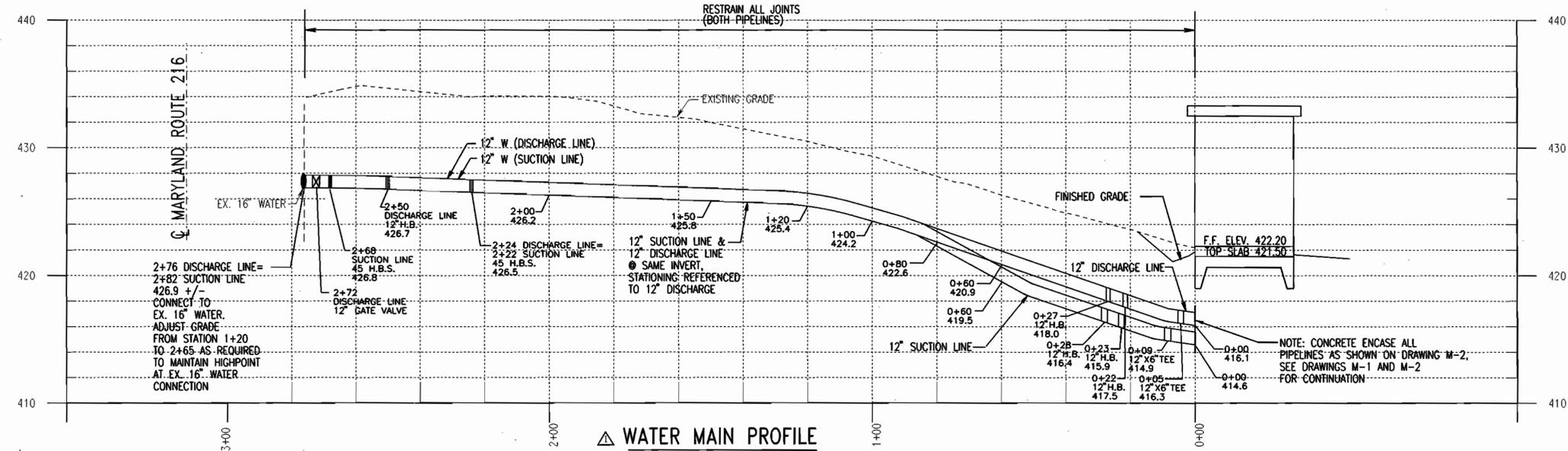
PROJECT SITE PLAN
SCALE: 1"=20'

CIVIL/SITE LEGEND

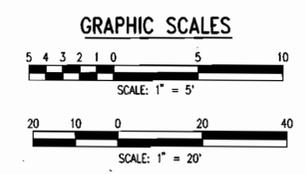
TRAVERSE STATION	△
DECIDUOUS TREE (EX.)	⊗
CONIFEROUS TREE	⊙
FIRE HYDRANT (EX.)	⊕
FIRE HYDRANT (NEW)	⊕
WATER VALVE (EX.)	⊕
WATER VALVE (NEW)	⊕
TELEPHONE MANHOLE	⊕
LIGHT POLE	⊕
UTILITY POLE	⊕
GUY WIRE	---
PROPERTY EVIDENCE	⊕
PK NAIL	⊕
SIGN	⊕
FENCE LINE	---
UNDERGROUND WATER LINE (EX.)	---
UNDERGROUND WATER LINE (NEW)	---
UNDERGROUND TELEPHONE LINE (EX.)	---
UNDERGROUND TELEPHONE LINE (NEW)	---
UNDERGROUND ELECTRIC LINE (NEW)	---
EX. DECIDUOUS TREE TO BE REMOVED DURING CONSTRUCTION AND REPLACED IN KIND AND QUANTITY AFTER CONSTRUCTION	⊗
SILT FENCE	SF
STRAW BAIL DIKE	SBD
LIMIT OF DISTURBANCE	---
STABILIZED CONSTRUCTION ENTRANCE	---
CONTOURS (EX.)	---
CONTOURS (PROPOSED)	---
BORING (SEE SPECIFICATIONS FOR BORING LOGS)	⊕
WORKING POINT	WP

WORKING POINT (WP) SCHEDULE

POINT NO.	DESCRIPTION	NORTH	EAST
POINT NO. 1	NORTH WEST CORNER OF P.S. SLAB	539235.21	1339632.14
POINT NO. 2	SOUTH WEST CORNER OF P.S. SLAB	539201.52	1339622.65
POINT NO. 3	CENTER OF VALVE VAULT MANHOLE (1.)	538938.79	1339573.49
POINT NO. 4	16X12" TEE (DISCHARGE MAIN)	538941.72	1339565.28
POINT NO. 5	16X12" TEE (SUCTION MAIN)	538935.76	1339581.92
POINT NO. 6	12" DISCHARGE MAIN @ P.S. SLAB	539201.00	1339624.49
POINT NO. 7	12" SUCTION MAIN @ P.S. SLAB	539200.19	1339627.38
POINT NO. 8	12X6" TEE (DISCHARGE MAIN)	539196.68	1339623.28
POINT NO. 9	12X6" TEE (SUCTION MAIN)	539192.00	1339625.08
POINT NO. 10	FIRE HYDRANT	539187.32	1339656.62
POINT NO. 11	FIRE HYDRANT	539183.36	1339655.63
POINT NO. 12	45" - 12" SUCTION MAIN	538987.77	1339564.27
POINT NO. 13	45" - 12" SUCTION MAIN	538950.13	1339586.48
POINT NO. 14	45" - 12" DISCHARGE MAIN	539177.59	1339614.07
POINT NO. 15	45" - 12" DISCHARGE MAIN	539180.14	1339618.62
POINT NO. 16	45" - 12" SUCTION MAIN	539175.66	1339616.64
POINT NO. 17	45" - 12" SUCTION MAIN	539178.21	1339621.19
POINT NO. 18	45" - 12" DISCHARGE MAIN	538966.42	1339573.91
POINT NO. 19	45" - 12" DISCHARGE MAIN	538989.39	1339561.04
POINT NO. 20	10' OFFSET 45" HB DISCHARGE LINE	538992.07	1339551.50
POINT NO. 21	10' OFFSET STA. 2+00 DISCH. LINE	539014.93	1339557.83
POINT NO. 22	10' OFFSET STA. 1+00 DISCH. LINE	539111.19	1339584.93
POINT NO. 23	10' OFFSET 45" HB DISCHARGE LINE	539180.44	1339604.53
POINT NO. 24	SOUTH EAST CORNER OF P.S. SLAB	539197.99	1339635.16
POINT NO. 25	NORTH EAST CORNER OF P.S. SLAB	539231.68	1339664.65



WATER MAIN PROFILE
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=5'



(1.) LOCATION OF VALVE VAULT APPROXIMATE. TEST PIT EXISTING WATER LINE AND COORDINATE CONSTRUCTION OF VALVE VAULT AND WATER MAIN CONNECTION WITH RESPECT TO EXISTING PIPING AS REQUIRED FOR FINAL VAULT AND TIE-IN LOCATION.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND.

Director of Public Works: *Janet M. ...* DATE: 12-10-02
Chief, Bureau of Utilities: *Robert M. ...* DATE: 12-9-02

PREPARED BY:
WR&A
Whitman, Reardon and Associates, LLP.
2315 ST. PAUL ST.
BALTIMORE, MD. 21218
410-235-3450



DES: WFH			
DRN: EM			
CHK: WRD	WFH	CONSTRUCTION REVISIONS FOR STATION AND VAULT RELOCATION	2/7/02
DATE: 9/20/00	BY: NO.	REVISION	DATE

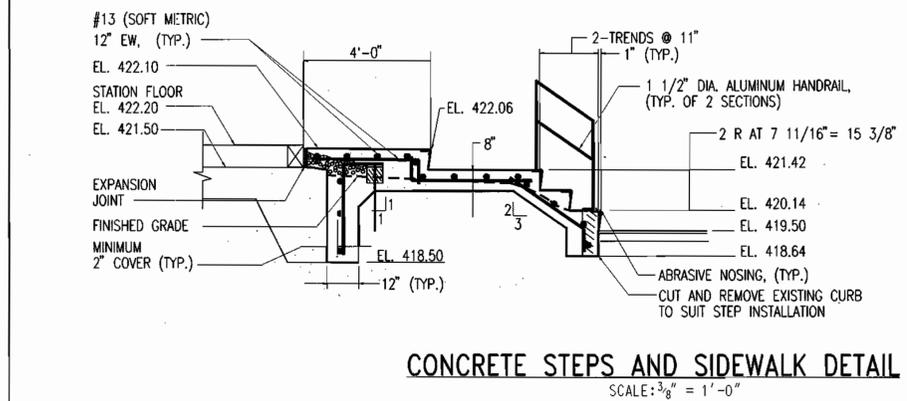
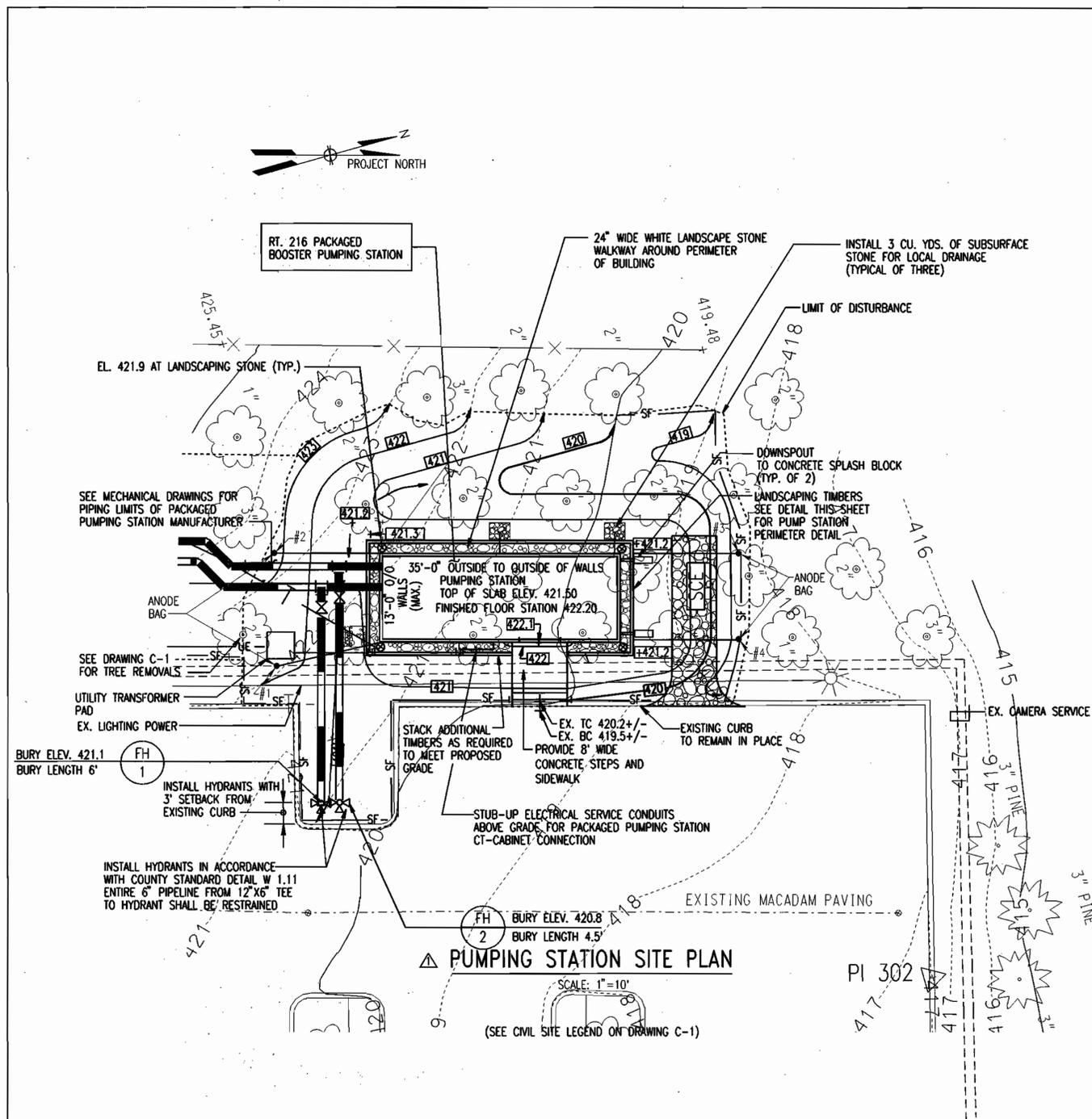
ADDENDUM DRAWING
UTILITY PLAN/PROFILE AND
SEDIMENT AND EROSION
CONTROL PLAN

MD 216 BOOSTER PUMPING STATION
CONTRACT NO. 44-3886
CAPITAL PROJECT NO. W-8212
HOWARD COUNTY, MARYLAND

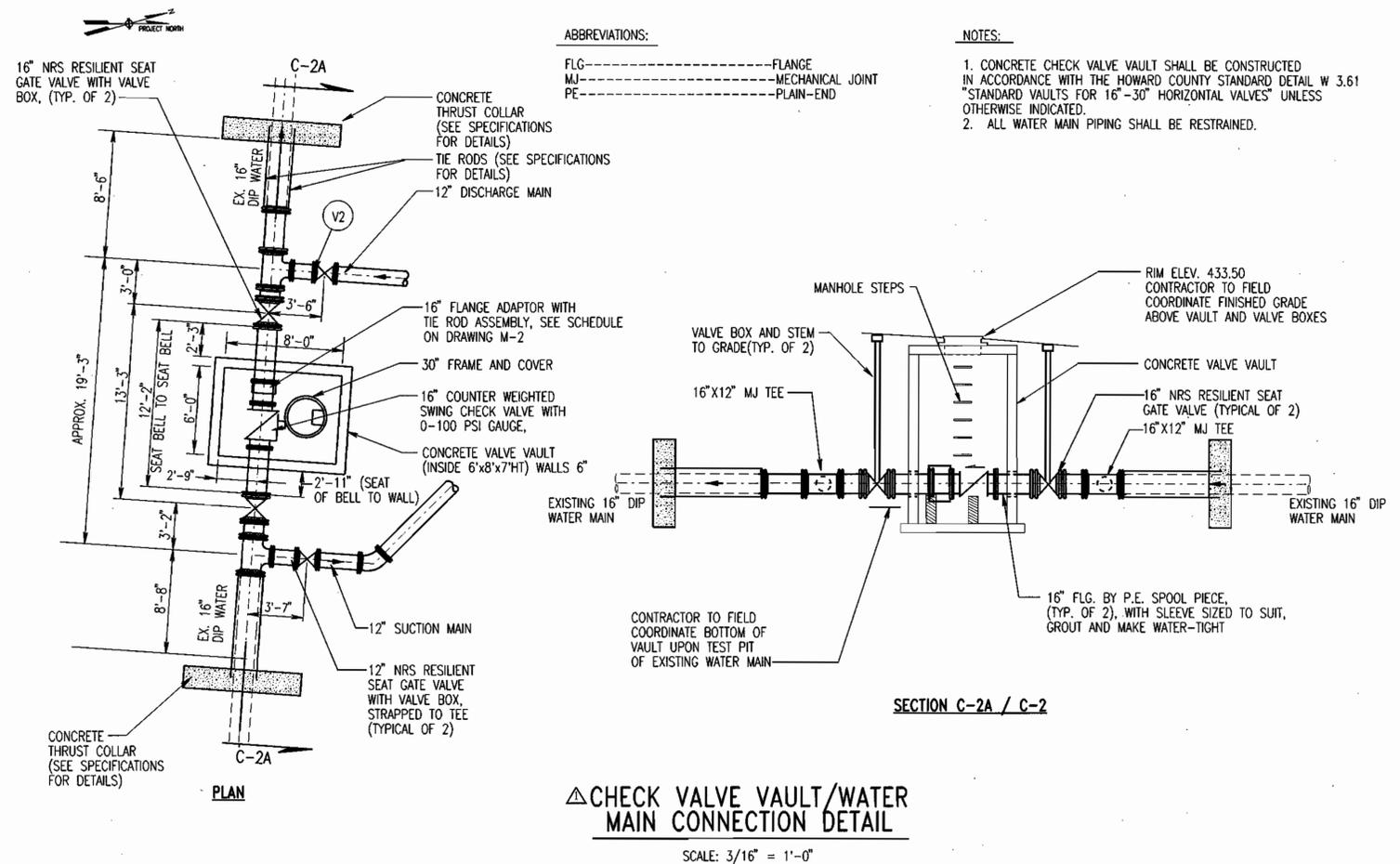
11/21/02
RECORD
DRAWING

As-Built

C-1
SCALE AS SHOWN
SHEET
2 OF 14



- NOTES:**
1. WALKWAY AND STEPS SHALL BE 8'-0" WIDE CENTERED AT STATION DOOR.
 2. PROVIDE 4000 PSI CONCRETE. MINIMUM GUIDE LINES SHALL CONFORM TO SECTION 603 SIDEWALKS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIAL.



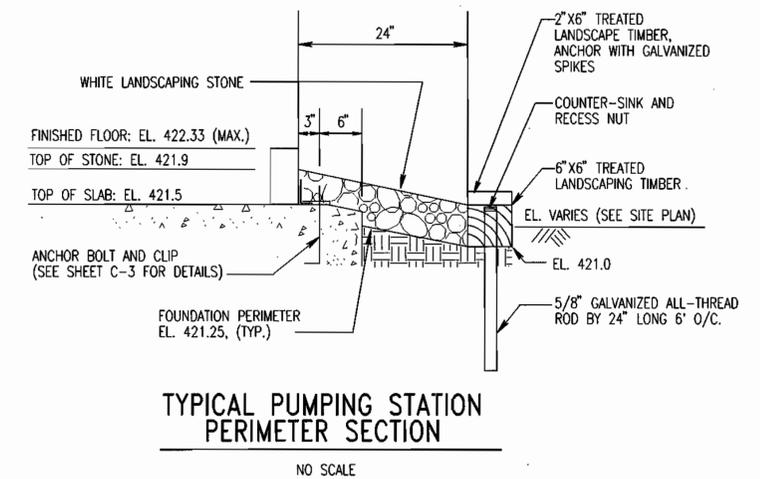
WATER MAIN TIE-IN SEQUENCE OF CONSTRUCTION

GENERAL

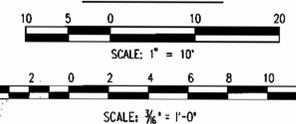
1. CONTRACTOR SHALL COORDINATE ALL UTILITY TIE-IN OPERATIONS WITH THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS. THE CONTRACTOR SHALL NOT OPERATE ANY WATER MAIN VALVES ON THE EXISTING WATER SYSTEM. UNINTERRUPTED WATER SUPPLY TO THE COUNTY ANNEX FACILITY MUST BE MAINTAINED AT ALL TIMES.
2. THE OWNER AND ENGINEER WILL CONSIDER ALTERNATIVE CONSTRUCTION SEQUENCES, WHICH ARE BELIEVED TO ACCOMPLISH THE INTENDED GOAL OF MAXIMUM RELIABILITY AND EFFICIENCY DURING CONSTRUCTION WITH THE SHORTEST CONSTRUCTION TIME. IN THE EVENT THAT THE OWNER AND ENGINEER DO NOT ACCEPT THE CONTRACTOR'S PROPOSED SEQUENCE, THE SEQUENCE OUTLINED BELOW MUST BE FOLLOWED BY THE CONTRACTOR AT NO INCREASE IN CONTRACT COST OR TIME.

SEQUENCE OF CONSTRUCTION

1. CONSTRUCT CONCRETE THRUST COLLARS WITH TIE RODS AROUND EXISTING 16" WATER MAIN. ALLOW CONCRETE TO CURE UNTIL 4,000 PSI STRENGTH HAS BEEN ACHIEVED.
2. PROVIDE TEMPORARY BYPASS (BYPASS 1) FROM EXISTING 4" BLOWOFF TO THE ANNEX FACILITY HYDRANT (SEE PROJECT VICINITY MAP ON DRAWING G-1 FOR APPROXIMATE BLOWOFF, ISOLATION VALVE, AND HYDRANT LOCATION).
3. CONTACT HOWARD COUNTY DPW TO ISOLATE 16" WATER MAIN ALONG PROPOSED TIE-IN LOCATION AS REQUIRED FOR TEMPORARY WATER MAIN SHUT DOWN. ALL WATER MAIN SHUT DOWNS SHALL BE PERFORMED AT NIGHT. THE CONTRACTOR SHALL CONTACT ALL HOMEOWNERS AND BUSINESSES AFFECTED BY A WATER MAIN SHUTDOWN 8 HOURS PRIOR TO WATER DISRUPTION.
4. CONNECT TO EXISTING 16" WATER WEST AND EAST OF PROPOSED CHECK VALVE VAULT AND INSTALL ALL REQUIRED VALVES, TEES, SLEEVES, AND SPACERS UP TO NEW 16" ISOLATION VALVES. CONNECT TIE RODS FROM THRUST BLOCKS TO MJ SLEEVES.
5. PERFORM TEMPORARY BYPASS (BYPASS 2) OF THE EXISTING 16" WATER MAIN THROUGH INSTALLATION OF TEMPORARY PIPING FROM THE EXISTING HYDRANT (V1) LOCATED EAST OF THE PROPOSED WATER MAIN CONNECTION POINT (SEE DRAWING C-1 FOR HYDRANT LOCATION) TO INSTALLED 12" DISCHARGE MAIN VALVE (V2) WEST OF THE PROPOSED CHECK VALVE VAULT. PROVIDE TEMPORARY RESTRAINT FOR ALL CONNECTIONS DURING BYPASS OPERATIONS.
6. REMOVE TEMPORARY BYPASS 1.
7. INSTALL CONCRETE VALVE VAULT, CHECK VALVE, APPURTENANCES, AND REMAINDER OF 16" WATER MAIN PIPING.
8. REMOVE TEMPORARY BYPASS 2.
9. CONSTRUCT REMAINDER OF 12" SUCTION AND DISCHARGE MAINS TO THE BOOSTER PUMPING STATION.



GRAPHIC SCALE



As-Built

11/21/02
RECORD DRAWING

C-2

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND.

James A. ...
DIRECTOR OF PUBLIC WORKS
DATE 12-10-02
CHIEF, BUREAU OF UTILITIES

Robert ...
CHIEF, BUREAU OF ENGINEERING
DATE 12-9-02
CHIEF, UTILITY DESIGN DIVISION

PREPARED BY:

WR&A
Whitman, Reardon and Associates, LLP.
2315 ST. PAUL ST.
BALTIMORE, MD. 21218
410-235-3450



DES: WFH

DRN: WFH

CHK: WRD

DATE: 9/20/00

CONSTRUCTION REVISIONS FOR STATION AND VAULT

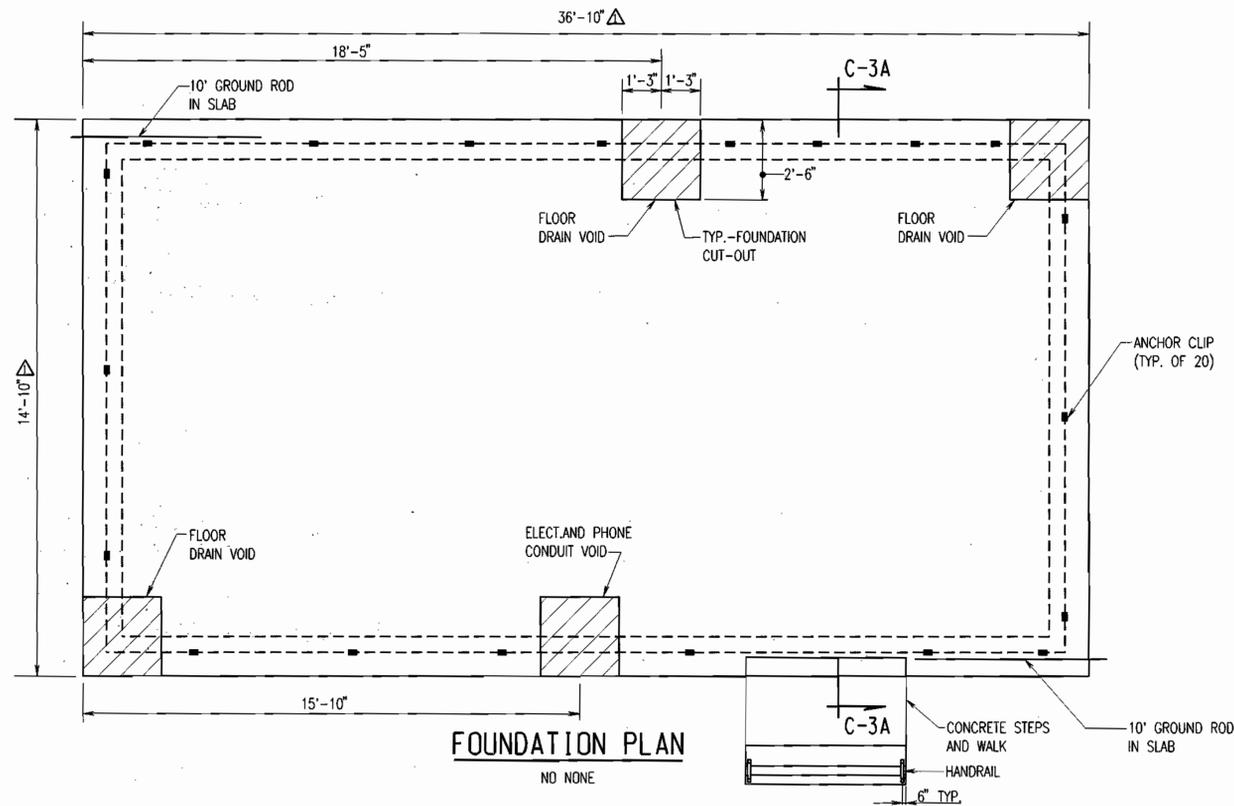
RELOCATION

ADDENDUM DRAWING
GRADING PLAN AND MISCELLANEOUS
CIVIL DETAILS

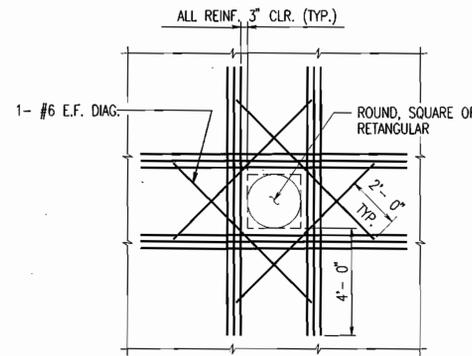
600' SCALE MAP NO. 46 BLOCK NO. 4

MD 216 BOOSTER PUMPING STATION
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CAPITAL PROJECT NO. W-8212
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 3 OF 14



FOUNDATION PLAN
NO NONE



ADDITIONAL REINFORCING E.W. E.F. MIN. OF ONE-HALF THE NUMBER OF PRINCIPLE REINFORCING BARS INTERRUPTED BY THE OPENING SHALL BE PROVIDED ON EACH SIDE AND EACH FACE OF THE OPENING.

NOTE:

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

ADDITIONAL REINFORCING

AROUND OPENINGS

NO SCALE

GENERAL NOTES:

1. 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 THIS DRAWING. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR SIZES AND LOCATIONS OF SUCH PADS AND SUPPORTS.

2. LOCATIONS OF BORINGS ARE SHOWN ON CIVIL DRAWING C-1. BORING LOGS ARE INCLUDED IN THE SPECIFICATION (APPENDIX A), SUBSURFACE INVESTIGATION.

CONCRETE NOTES:

- ALL CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS.
- REINFORCED CONCRETE SHALL BE DETAILED AND CONSTRUCTED IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE, (ACI 301) "STANDARD SPECIFICATION FOR STRUCTURAL CONCRETE".
- ALL REINFORCEMENT SHALL CONFORM TO ASTM SPECIFICATION A615 DEFORMED, GRADE 60
- 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.
- SEE 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 THIS DRAWING.

7. SUBGRADE SHALL BE PROOF ROLLED WITH A LOADED 20 TON TANDEM AXIAL DUMP TRUCK AND APPROVED BY THE ENGINEER BEFORE CONCRETE SLAB MAY BE CONSTRUCTED. IF ANY UNSUITABLE SUBGRADE IS FOUND, THE UNSUITABLE MATERIAL SHALL BE EXCAVATED AND REPLACED BY STONE OR SOIL COMPACTED IN 8-INCH LIFTS TO 95-PERCENT OF AASHTO T-99-97 STANDARD PROCTOR MAXIMUM DENSITY. SEE SECTION M-2A FOR PIPING CONNECTIONS BELOW FOUNDATION.

NOT PERFORMED

8. CONTRACTOR TO COORDINATE QUANTITY AND LOCATION OF ANCHOR BOLTS WITH PACKAGED PUMPING STATION MANUFACTURE

STRUCTURAL LEGEND:

DESCRIPTION	ABBREVIATION
EACH FACE	E.F.
EACH WAY	E.W.
TOP AND BOTTOM	T. & B.

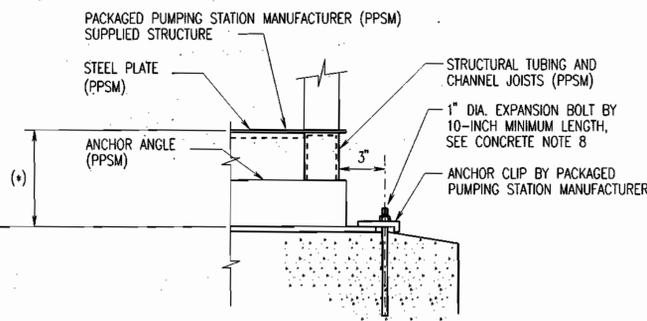
SOIL CRITERIA

STATION WEIGHT:
IN ACCORDANCE WITH E.F.I. CORRESPONDENCE (#87271) DATED APRIL 26, 2002 TO MR. RAY SCHUMMER OF SCHUMMER INCORPORATED, THE STATION DESIGN WEIGHTS ARE AS FOLLOWS:

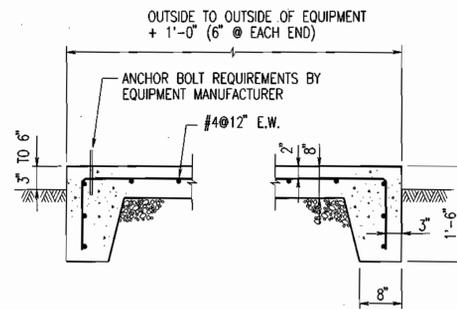
DRY WEIGHT: 67,827 LBS.
WET WEIGHT: 69,827 LBS.

SOIL BEARING CAPACITY:
THE MINIMUM CALCULATED LOAD BEARING VALUE OF SUPPORTING SOILS IS A NOMINAL 550 LBS/SF FOR FOOTING DESIGN. MAXIMUM ANTICIPATED SETTLEMENT IS 1/2-INCH. IN ACCORDANCE WITH SOIL BORING LOGS AND GEOTECHNICAL INVESTIGATIONS THE MAXIMUM LOAD BEARING CAPACITY OF THE SOIL IS 3,000 LBS/SF.

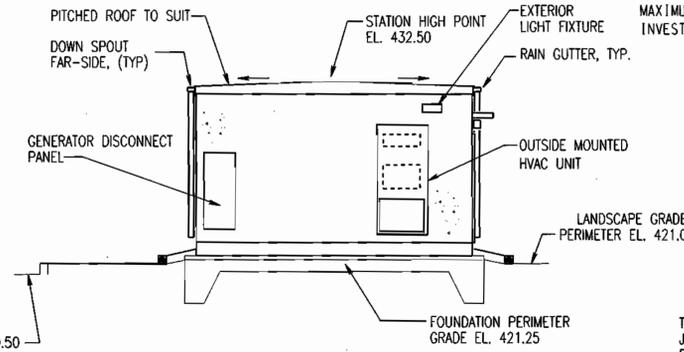
CONTRACTOR COORDINATE FOUNDATION AND SITE REQUIREMENTS



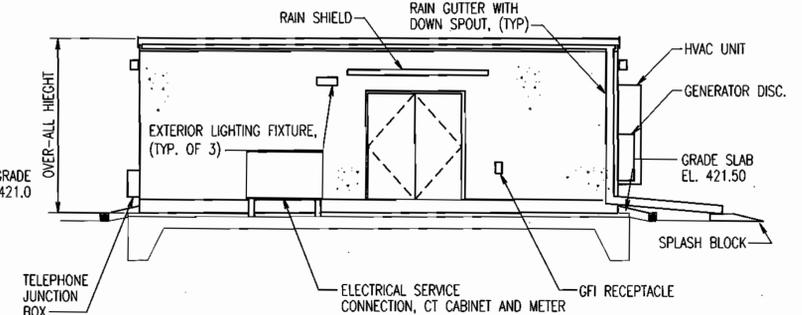
TYPICAL ANCHOR DETAIL
NO SCALE



TYPICAL EXTERIOR EQUIPMENT PAD DETAIL
NO SCALE



NORTH ELEVATION
(SEE E.F.I. DRAWINGS)



EAST ELEVATION
(SEE E.F.I. DRAWINGS)

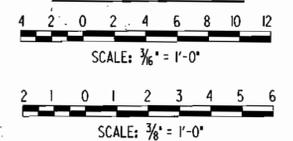
STATION CRITERIA

FOUNDATION BASEEL. 418.50
GRADE SLABEL. 421.50
STATION FLOOREL. 422.33 (MAX.)

STATION EXTERIOR FINISHPRECAST PLANK
OVER-ALL HEIGHT11'-0" (MAX.)

NOTE: SEE M-1 FOR A COMPLETE STATION EQUIPMENT LIST.

GRAPHIC SCALES



11/21/02
RECORD DRAWING

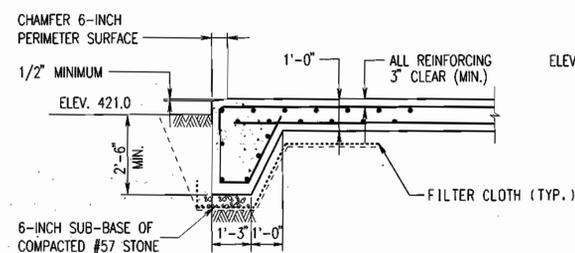
PUMPING STATION ELEVATIONS

SCALE: 3/16" = 1'-0"

As-Built

SECTION C-3A

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



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND.

Law M. Slaw
DIRECTOR OF PUBLIC WORKS
12-10-02
DATE

Robert J. Seaman
CHIEF, BUREAU OF ENGINEERING
12-9-02
DATE

PREPARED BY:

WR&A
Whitman, Reardon and Associates, LLP.
2315 ST. PAUL ST.
BALTIMORE, MD. 21218
410-235-3450



DES: SD			
DRN: SEA/MMM			
CHK: SD	SEA	REVISION INCLUDES FOUNDATION DIMENSIONS AND SOILS CRITERIA	5-1-02
DATE: 9/20/00	BY: NO.	REVISION	DATE

FOUNDATION PLAN, SECTIONS
AND MISCELLANEOUS DETAILS

600' SCALE MAP NO. 46 BLOCK NO. 4

MD 216 BOOSTER PUMPING STATION
CONTRACT NO. 44-3886
CAPITAL PROJECT NO. W-8212
HOWARD COUNTY, MARYLAND

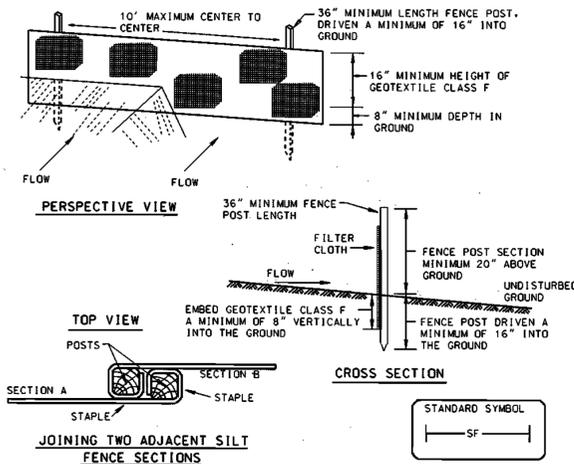
C-3

SCALE AS SHOWN

SHEET

4 OF 14

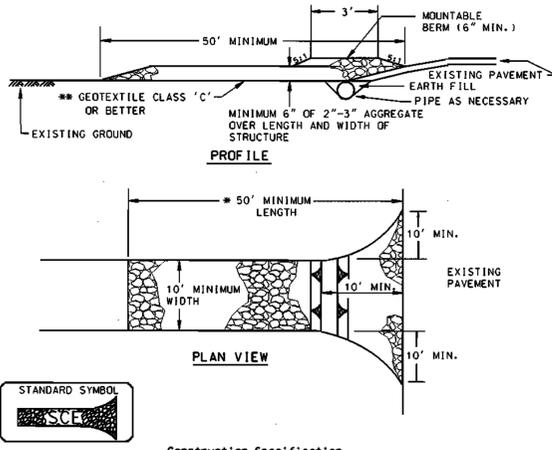
DETAIL 22 - SILT FENCE



- Construction Specifications**
- Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 1 1/2" x 1 1/2" square (minimum cut), or 1 3/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighting not less than 1.00 pound per linear foot.
 - Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the following requirements for Geotextile Class F:

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal/ft ² /minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322
 - Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.
 - Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reached 50% of the fabric height.

DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE



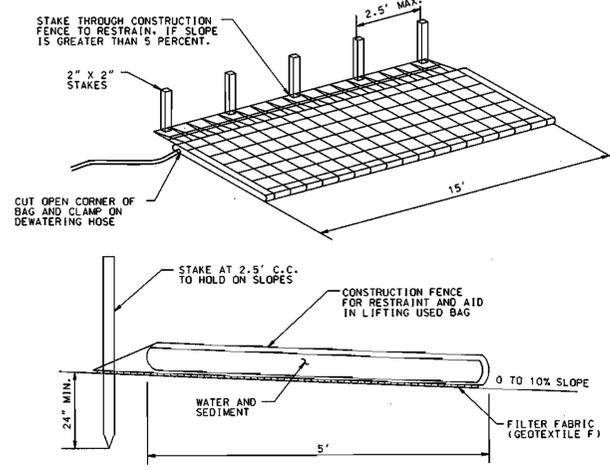
- Construction Specification**
- Length - minimum of 50' (#30' for single residence lot).
 - Width - 10' minimum, should be flared at the existing road to provide a turning radius.
 - Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. The plan approval authority 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 piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mounded berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe 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 the amount of runoff to be conveyed. A 6" minimum will be required.

SEDIMENT CONTROL NOTES

- A MINIMUM OF 24 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. (410-313-1859)
- ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, AND REVISIONS THERETO.
- FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN 017 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1, 014 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 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDINGS, SO2. TEMPORARY SEEDING AND MULCHING (SEC. 6). TEMPORARY STABILIZATION WITH MULCH ALLOW CAN ONLY BE DONE WHEN RECOMMENDED SEEDING 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	N/A
AREA DISTURBED	3225 SF +/-
AREA TO BE PAVED	N/A
AREA TO BE VEGETATIVELY STABILIZED	2400 SF +/-
TOTAL CUT	500 CU. YDS. +/-
TOTAL BACKFILL	500 CU. YDS. +/-

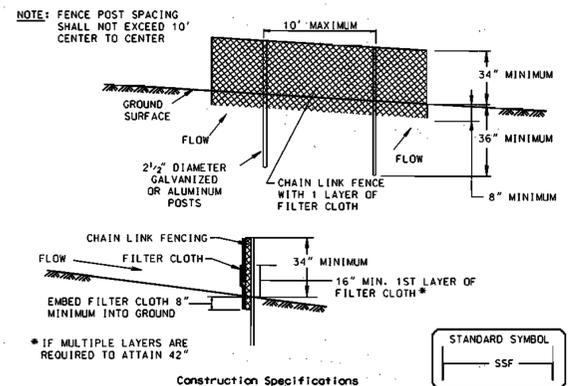
 OFFSITE WASTE/BORROW AREA LOCATION:
- ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
- ADDITIONAL SEDIMENT CONTROLS MUST BE PROVIDED, IF DEEMED NECESSARY BY HOWARD COUNTY SEDIMENT CONTROL INSPECTOR. IN PARTICULAR, EROSION CONTROL MATTING SHALL BE USED TO RE-LINE EXISTING ROAD-SIDE DITCHES DISTURBED BY CONSTRUCTION.
- 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 MADE.
- TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH SHALL BE BACKFILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER. IMMEDIATELY FOLLOWING PIPE INSTALLATION, THE TRENCH SHALL BE BACKFILLED, COMPACTED AND IMMEDIATELY STABILIZED (CRUSHER RUN STONE AND TEMPORARY COLD PATCH MATERIALS, MULCHED, SEEDED, AND OR SODDED MECHANICAL STABILIZATION) AT THE END OF EACH WORKING DAY. SILT FENCE SHALL BE PLACED IMMEDIATELY DOWNHILL OF ANY DISTURBED AREA INTENDED TO REMAIN DISTURBED LONGER THAN ONE (1) DAY.



- NOTES:**
- FILTER BAG SHALL BE PLACED ON A SLOPING OR LEVEL, WELL GRADED VEGETATED SITE SUCH THAT WATER WILL FLOW AWAY FROM DEVICE AND ANY WORK AREAS.
 - WIDTH AND LENGTH SHALL BE AS SHOWN.
 - THE FILTER BAG MUST BE STAKED IN PLACE AND SECURED TO THE PUMP DISCHARGE LINE.
 - FILTER BAG SHALL NOT BE USED FOR DISCHARGE FLOWS GREATER THAN 300 GPM.
 - DEVICE SHALL BE REMOVED AND DISPOSED OF AFTER BAG IS FILLED WITH SEDIMENT. SEDIMENT FROM BAG SHALL BE SPREAD IN AN UPLAND AREA.
 - FILTER FABRIC SHALL MEET THE FOLLOWING REQUIREMENTS FOR GEOTEXTILE CLASS F:

TENSILE STRENGTH	50 LBS/IN (MIN.)	TEST: MSMT 509
TENSILE MODULUS	20 LBS/IN (MIN.)	TEST: MSMT 509
FLOW RATE	0.3 GAL/FT ² /MINUTE (MAX.)	TEST: MSMT 322
FILTERING EFFICIENCY	75% (MIN.)	TEST: MSMT 322
- FILTER BAG**
TEMPORARY EROSION CONTROL MEASURE (FB)

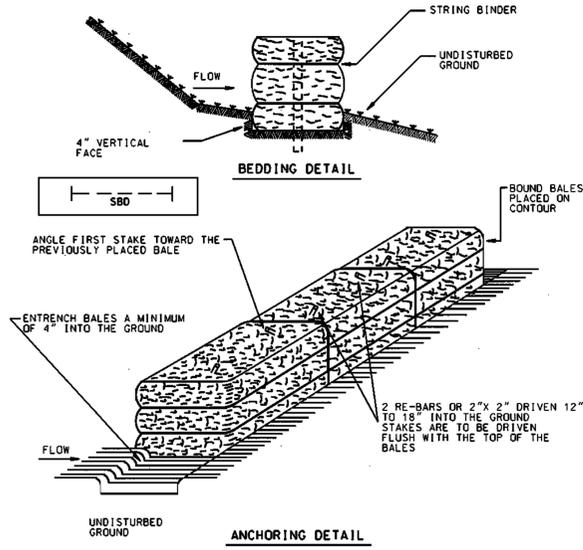
DETAIL 33 - SUPER SILT FENCE



- 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.
 - 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 overlapped 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 following requirements for Geotextile Class F:

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal/ft ² /minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

DETAIL 32 - STRAW BALE DIKE

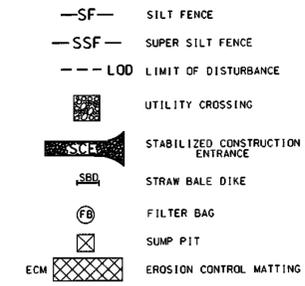


- Construction Specifications**
- Bales shall be placed at the toe of a slope, on the contour, and in a row with the ends of each bale tightly abutting the adjacent bales.
 - Each bale shall be entrenched in the soil a minimum of 4" and placed so the bindings are horizontal.
 - Bales shall be securely anchored in place by either two stakes or re-bars driven through the bale 12" to 18" into the ground. The first stake in each bale shall be driven toward the previously laid bale at an angle to force the bales together. Stakes shall be driven flush with the top of the bale.
 - Straw bale dikes shall be inspected frequently and after each rain event and maintenance performed as necessary.
 - All bales shall be removed when the site has been stabilized. The trench where the bales were located shall be graded flush and stabilized.

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)
- CLEAR AND GRUB FOR SEDIMENT AND EROSION CONTROL MEASURES. (2 DAYS)
- INSTALL THE REQUIRED SEDIMENT AND EROSION CONTROL DEVICES AS INDICATED ON THESE PLANS. (1 DAY)
- NOTIFY HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS, SEDIMENT CONTROL DIVISION UPON COMPLETION OF INSTALLATION.
- THE CONTRACTOR SHALL INSPECT AND PROVIDE NECESSARY MAINTENANCE ON THE SEDIMENT AND EROSION CONTROL DEVICES SHOWN HEREIN, AFTER EACH RAINFALL AND ON A DAILY BASIS. (2 DAYS)
- CONSTRUCT WATER MAIN UTILITIES (2 MONTHS). SEE WATER MAIN TIE-IN SEQUENCES OF CONSTRUCTION NOTES ON DRAWING C-2.
- EXCAVATE FOR FOUNDATION, CONSTRUCT BOOSTER STATION AND APPURTENANCES (6 MONTHS)
- FINE GRADE ALL AREAS DISTURBED BY PROJECT CONSTRUCTION AND STABILIZE SITE. (4 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. (2 DAYS)

SEDIMENT CONTROL LEGEND



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND.

PREPARED BY:
WR&A
Whitman, Reardon and Associates, LLP.
2315 ST. PAUL ST.
BALTIMORE, MD. 21218
410-235-3450



DES: EM					
DRN: EM					
CHK: WFH					
DATE: 9/20/00	BY	NO.	REVISION	DATE	600' SCALE MAP NO. 46 BLOCK NO. 4

SEDIMENT CONTROL NOTES
AND DETAILS

MD 216 BOOSTER PUMPING STATION
CONTRACT NO. 44-3886
CAPITAL PROJECT NO. W-8212
HOWARD COUNTY, MARYLAND

11/21/02
RECORD
DRAWING

SC-1

SCALE
AS
SHOWN
SHEET
5 OF 14

20.0 STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

Definition

Using vegetation as cover for barren soil to protect it from forces that cause erosion.

Purpose

Vegetative Stabilization specifications 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, and improving wildlife habitat and visual resources.

Conditions Where Practice Applies

This practice shall be used on denuded areas as specified on the plans and may be used on highly erodible or critically eroding areas. This specification is divided into Temporary Seeding, to quickly establish vegetative cover for short duration (up to one year), and Permanent Seeding, for long term vegetative cover. Examples of applicable areas for Temporary Seeding are temporary soil stockpiles, cleared areas being left idle between construction phases, earth dikes, etc. and for Permanent Seeding are lawns, dunes, cut and fill slopes and other areas at final grade, former stockpile and staging areas, etc.

Effects on Water Quality and Quantity

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. Vegetation, over time, 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 devices must remain in place during grading, seeded preparation, seeding, mulching and vegetative establishment to prevent large quantities of sediment and associated chemicals and nutrients from washing into surface waters.

Section I - Vegetative Stabilization Methods and Materials

A. Site Preparation

- i. Install erosion and sediment control structures (either temporary or permanent) such as diversions, grade stabilization structures, berms, waterways, or sediment control basins.
- ii. Perform all grading operations at right angles to the slope. Final grading and shaping is not usually necessary for temporary seeding.
- iii. Schedule required soil tests to determine soil amendment composition and application rates for sites having disturbed area over 5 acres.

B. Soil Amendments (Fertilizer and Lime Specifications)

- i. Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas over 5 acres. Soil analysis may be performed by the University of Maryland or a recognized commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analyses.
- ii. Fertilizers shall be uniform in composition, free flowing and suitable for accurate application by approved equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers shall all be delivered to the site fully labeled according to the applicable state fertilizer laws and shall bear the name, trade name or trademark and warrantee of the producer.
- iii. Lime materials shall be ground limestone (hydrated or burnt lime may be substituted) which contains at least 50% total oxides (calcium oxide plus magnesium oxide). Limestone shall be ground to such fineness that at least 50% will pass through a #100 mesh sieve and 98% - 100% will pass through a #20 mesh sieve.
- iv. Incorporate lime and fertilizer into the top 3 - 5" of soil by disking or other suitable means.

C. Seeded Preparation

- i. Temporary Seeding
 - a. Seeded preparation shall consist of loosening soil to a depth of 3" to 5" 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 should not be rolled or dragged smooth but left in the roughened condition. Sloped areas (greater than 3:1) should be tracked leaving the surface in an irregular condition 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 - 5" of soil by disking or other suitable means.
- ii. Permanent Seeding
 - a. Minimum soil conditions required for permanent vegetative establishment:
 1. Soil pH shall be between 6.0 and 7.0
 2. Soluble salts shall be less than 500 parts per million (ppm).
 3. The soil shall contain less than 40% clay but enough fine grained material (60% silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception is if lowgrass or serotia lespedeza is to be planted, then a sandy soil (40% silt plus clay) would be acceptable.
 4. Soil shall contain 1-5% minimum organic matter by weight.
 5. Soil must contain sufficient pore space to permit adequate root penetration.
 6. If these conditions cannot be met by soils on site, adding topsoil is required in accordance with Section 21 Standard and Specification for Topsoil.
 - b. Areas previously graded in conformance with the drawings shall be maintained in a true and even grade, then scarified or otherwise loosened to a depth of 3 - 5" to permit bonding of the topsoil to the surface area and to create horizontal erosion check slots to prevent topsoil from sliding down a slope.
 - c. Apply soil amendments as per soil test or as included on the plans.
 - d. Mix soil amendments into the top 3 - 5" of topsoil by disking or other suitable means. Lawn areas should be raked to smooth the surface, remove large objects (like stones and branches), and ready the area for seed application. Where site conditions will not permit normal seeded preparation, loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface. Steep slopes (steeper than 3:1) should be tracked by a dozer leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. The top 1 - 3" of soil should be loose and friable. Seeded loosening may not be necessary on newly disturbed areas.

D. Seed Specifications

- i. All seed must meet the requirements of the Maryland State Seed Law. All seed shall be subject to re-testing by a recognized seed laboratory. All seed used shall have been tested within the 6 months immediately preceding the date of sowing such material on this job.

Note: Seed tags shall be made available to the inspector to verify type and rate of seed used.
- ii. Inoculant - The inoculant for treating legume seed in the seed mixtures shall be a pure culture of nitrogen-fixing bacteria prepared specifically for the species. Inoculants shall not be used later than the date indicated on the container. Add fresh inoculant as directed on package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. Temperatures above 75 - 80°F. can weaken bacteria and make the inoculant less effective.

E. Methods of Seeding

- i. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer), broadcast or drop seeder, or a cultipacker seeder.
 - a. If fertilizer is being applied at the time of seeding, the application rates amounts will not exceed the following: nitrogen: maximum of 100 lbs. per acre total of soluble nitrogen P205 (phosphorous): 200 lbs/acre; K20 (potassium): 200 lbs/acre.
 - b. 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 of any one time. Do not use burnt or hydrated lime when hydroseeding.
 - c. Seed and fertilizer shall be mixed on site and seeding shall be done immediately and without interruption.
- ii. Dry Seeding: This includes use of conventional drop or broadcast spreaders.
 - a. Seed spread dry shall be incorporated into the subsoil at the rates prescribed on the temporary or Permanent Seeding Summaries or Tables 25 or 26. The seeded area shall then be rolled with a weighted roller to provide good seed to soil contact.
 - b. Where practical, seed should be applied in two directions perpendicular to each other. Apply half the seeding rate in each direction.
- iii. Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil.
 - a. 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.
 - b. Where practical, seed should be applied in two directions perpendicular to each other. Apply half the seeding rate in each direction.

F. Mulch Specifications (In order of preference)

- i. Straw shall consist of thoroughly threshed wheat, rye or oat straw, reasonably bright in color, and shall not be musty, moldy, caked, decayed, or excessively dusty and shall be free of noxious weed seeds as specified in the Maryland Seed Law.
 - ii. Wood Cellulose Fiber Mulch (WCFM)
 - a. WCFM shall consist of specially prepared wood cellulose processed into a uniform fibrous physical state.
 - b. WCFM shall 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.
 - c. WCFM, including dye, shall contain no germination or growth inhibiting factors.
 - d. WCFM materials shall 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 shall form a blotter-like ground cover, on application, having moisture absorption and percolation properties and shall cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
 - e. WCFM material shall contain no elements or compounds at concentration levels that will be phytotoxic.
 - f. WCFM must conform to the following physical requirements: fiber length to approximately 10 mm, diameter approximately 1 mm, pH range of 4.0 to 8.5, ash content of 1.6% maximum and water holding capacity of 90% minimum.
- Note: Only sterile straw mulch should be used in areas where one species of grass is desired.

G. Mulching Seeded Areas - Mulch shall be applied to all seeded areas immediately after seeding.

- i. If grading is completed outside of the seeding season, mulch alone shall be applied as prescribed in this section and maintained until the seeding season returns and seeding can be performed in accordance with these specifications.
- ii. When straw mulch is used, it shall be spread over all seeded areas at the rate of 2 tons/acre. Mulch shall be applied to a uniform loose depth of between 1" and 2". Mulch applied shall achieve a uniform distribution and depth so that the soil surface is not exposed. If a mulch anchoring tool is to be used, the rate should be increased to 2.5 tons/acre.
- iii. Wood cellulose fiber used as a mulch shall be applied at a net dry weight of 1,500 lbs. per acre. The wood cellulose fiber shall be mixed with water, and the mixture shall contain a maximum of 50 lbs. of wood cellulose fiber per 100 gallons of water.
- H. Securing Straw Mulch (Mulch Anchoring): Mulch anchoring shall be performed immediately following mulch application to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon size of area:
 - i. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of two (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 be used on the contour if possible.
 - ii. Wood cellulose fiber may be used for anchoring straw. The fiber binder shall be applied at a net dry weight of 750 pounds/acre. The wood cellulose fiber shall be mixed with water and the mixture shall contain a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
 - iii. Application of liquid binders should be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. The remainder of area should be appear uniform after binder application. Synthetic binders - such as Acrylic DLR (Agra-Tack), DCA-70, Petrosel, Terra Tax II, Terra Tack AR or other approved equal may be used at rates recommended by the manufacturer to anchor mulch.
 - iv. Lightweight plastic netting may be stapled over the mulch according to manufacturer's recommendations. Netting is usually available in rolls 4' to 15' feet wide and 300 to 3,000 feet long.

Section III - Temporary Seeding

Vegetation - annual grass or grain used to provide cover on a disturbed area for up to 12 months. For longer duration of vegetative cover, Permanent Seeding is required.

A. Seed Mixtures - Temporary Seeding

- i. Select one or more of the species or mixtures listed in Table 26 for the appropriate Plant Hardiness Zone (from Figure 5) 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 plans and completed, then Table 26 must be put on the plans.
- ii. For sites having soil tests performed, the rates shown on this table shall be deleted and the rates recommended by the testing agency shall be written in. Soil tests are not required for Temporary Seeding.

TEMPORARY SEEDING SUMMARY

NO.	SPECIES	SEED MIXTURE (FOR HARDINESS ZONE 6-b)		SEEDING DATES	SEEDING DEPTHS	FERTILIZER RATE (10-10-10)	LIME RATE
		APPLICATION RATE (lb/oc)	SEEDING RATES				
	ANNUAL RYEGRASS	50		3/1 - 4/30 8/15 - 11/1	1/4" - 1/2"	600 lb/oc (15 lb/1000 sf)	2 tons/oc (100 lb/1000 sf)

Section III: Permanent Seeding

Seeding grass and legumes to establish ground cover for a minimum period of one year on disturbed areas generally receiving low maintenance.

A. Seed Mixtures - Permanent Seeding

- i. Select one or more of the species or mixtures listed in Table 25 for the appropriate Plant Hardiness Zone (from Figure 5) and enter them in the Permanent Seeding Summary below, along with application rates and seeding dates. Seeding depths can be estimated using Table 26. If this summary is not put on the construction plans and completed, then Table 25 must be put on the plans. Additional planting specifications for exceptional sites such as shorelines, streambanks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-SCS Technical Field Office Guide, Section 342 - Critical Area Planting. For special lawn maintenance areas, see Section IV Sod and V Turfgrass.
- ii. For sites having disturbed area over 5 acres, the rates shown on this table shall be deleted and the rates recommended by the soil testing agency shall be written.
- iii. For areas receiving low maintenance, apply ureaform fertilizer (46-0-0) at 3/2 lbs./1000 sq. ft. (110 lbs/oc), in addition to the above soil amendments shown in the table below, to be performed at the time of seeding.

PERMANENT SEEDING SUMMARY

NO.	SPECIES	Seed Mixture (For Hardiness Zone 6-b)		Seeding Dates	Seeding Depths	Fertilizer Rate (10-20-20)			Lime Rate
		Application Rate (lb/oc)	Seeding Rates			N	P205	K20	
2	KENTUCKY BLUEGRASS 50%	150		3/1 - 5/15 8/15 - 11/15	1/4" - 1/2"				
	CREeping RED FESCUE 40%					90 lb/oc (2.0lb/1000 sf)	175 lb/oc (14 lb/1000 sf)	175 lbs/oc (14 lb/1000 sf)	2 tons/oc (100 lb/1000 sf)
	RED TOP 10%								

Section IV - Sod: To provide quick cover on disturbed areas (2:1 grade or flatter).

A. General Specifications

- i. Class of turfgrass sod shall be Maryland or Virginia State Certified or Approved. Sod labels shall be made available to the job foreman and inspector.
- ii. Sod shall be machine cut at a uniform soil thickness of 3/4", plus or minus 1/8", at the time of cutting. Measurement for thickness shall exclude top growth and thatch. Individual pieces of sod shall be cut to the supplier's width and length. Maximum allowable deviation from standard widths and lengths shall be 5 percent. Broken pods and torn or uneven ends will not be acceptable.
- iii. Standard size sections of sod shall be strong enough to support their own weight and retain their size and shape when suspended vertically with a firm grasp on the upper 10 percent of the section.
- iv. Sod shall not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.
- v. Sod shall be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period shall be approved by an agronomist or soil scientist prior to its installation.

B. Sod Installation

- i. During periods of excessively high temperature or in areas having dry subsoil, the subsoil shall be lightly irrigated immediately prior to laying the sod.
- ii. The first row of sod shall be laid in a straight line with subsequent rows placed parallel to and tightly wedged against each other. Lateral joints shall be staggered to promote more uniform growth and strength. Ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause air drying of the roots.
- iii. Wherever possible, sod shall be laid with the long edges parallel to the contour and with staggering joints. Sod shall be rolled and tamped, pegged or otherwise secured to prevent slippage on slopes and to ensure solid contact between sod roots and the underlying soil surface.
- iv. Sod shall be watered immediately following rolling or tamping until the underside of the new sod pad and soil surface below the sod are thoroughly wet. The operations of laying, tamping and irrigating for any piece of sod shall be completed within eight hours.

C. Sod Maintenance

- i. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary during the first week and in sufficient quantities to maintain moist soil to a depth of 4". Watering should be done during the heat of the day to prevent wilting.
- ii. After the first week, sod watering is required as necessary to maintain adequate moisture content.
- iii. The first mowing of sod should not be attempted until the sod is firmly rooted. No more than 1/3 of the grass leaf shall be removed by the initial cutting or subsequent cuttings. Grass height shall be maintained between 2" and 3" unless otherwise specified.

SECTION IV - TURFGRASS ESTABLISHMENT

Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance. Areas to receive seed shall be filled by disking or other approved methods to a depth of 2 to 4 inches, leveled and raked to prepare a proper seedbed. Stones and debris over 1/2 inches in diameter shall be removed. The resulting seedbed shall be in such condition that future mowing of grasses will pose no difficulty.

NOTE: Choose certified material. Certified material is the best guarantee of cultivar purity. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assures a pure genetic line.

A. Turfgrass Mixtures

- i. Kentucky Bluegrass - Full sun mixture - For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and eastern shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds/1000 square feet. A minimum of three bluegrass cultivars should be chosen ranging from a minimum of 10% to a maximum of 35% of the mixture by weight.
- ii. Kentucky Bluegrass/Perennial Rye - Full sun mixture - For use in full sun areas where rapid establishment is necessary and when turf will receive medium to intensive management. Certified Perennial Rye/Cultivars/Certified Kentucky Bluegrass Seeding rate: 2 pounds mixture/1000 square feet. A minimum of 3 Kentucky Bluegrass Cultivars must be chosen, with each cultivar ranging from 10% to 35% of the mixture by weight.
- iii. Tall Fescue/Kentucky Bluegrass - Full sun mixture - For use in drought prone areas and/or for areas receiving low to medium management in full sun to medium shade. Recommended mixture includes certified Tall Fescue Cultivars 95 - 100%, certified Kentucky Bluegrass Cultivars 0 - 5%. Seeding rate: 5 to 8 lb/1000 sf. One or more cultivars may be blended.
- iv. Kentucky Bluegrass/Fine Fescue - Shade Mixture - For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf area. Mixture includes: certified Kentucky Bluegrass Cultivars 30-40% and certified Fine Fescue and 60-70%. Seeding rate: 1 1/2 - 3 lbs/1000 square feet. A minimum of 3 Kentucky bluegrass cultivars must be chosen, with each cultivar ranging from a minimum of 10% to a maximum of 35% of the mixture by weight.

NOTE: Turfgrass varieties should be selected from those listed in the most current University of Maryland Publication, Agronomy Memo #77, "Turfgrass Cultivar Recommendations for Maryland".

B. Ideal times of seeding

- Western MD: March 15 - June 1, August 1 - October 1 (Hardiness Zones - 5b, 6a)
- Central MD: March 1 - May 15, August 1 - October 15 (Hardiness Zone - 6b)
- Southern MD, Eastern Shore: March 1 - May 15, August 15 - October 15 (Hardiness Zones - 7a, 7b)

C. Irrigation

If soil moisture is deficient, supply new seedlings with adequate water for plant growth (1/2" - 1" every 3 to 4 days depending on soil texture) until they are firmly established. This is especially true when seedlings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

D. Repair and Maintenance

- i. Inspect all seeded areas for failures and make necessary repairs, replacements, and reseeding within the planting season.
- ii. Once the vegetation is established, the site shall have 95% groundcover to be considered adequately stabilized.
- iii. If the stand provides less than 40% ground coverage, overseeding and fertilizing using half of the rates originally applied may be necessary.
- iv. If the stand provides between 40% and 94% ground coverage, overseeding and fertilizing using half of the rates originally applied may be necessary.
- v. Maintenance fertilizer rates for permanent seedings are shown in Table 24. For lawns and other medium to high maintenance turfgrass areas, refer to the University of Maryland publication "Lawn Care in Maryland" Bulletin No. 171.

11/21/02
RECORD DRAWING

AS-BUILT

SC-2

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND.

PREPARED BY:
WR&A
Whitman, Reardon and Associates, LLP.
2315 ST. PAUL ST.
BALTIMORE, MD. 21218
410-235-3450

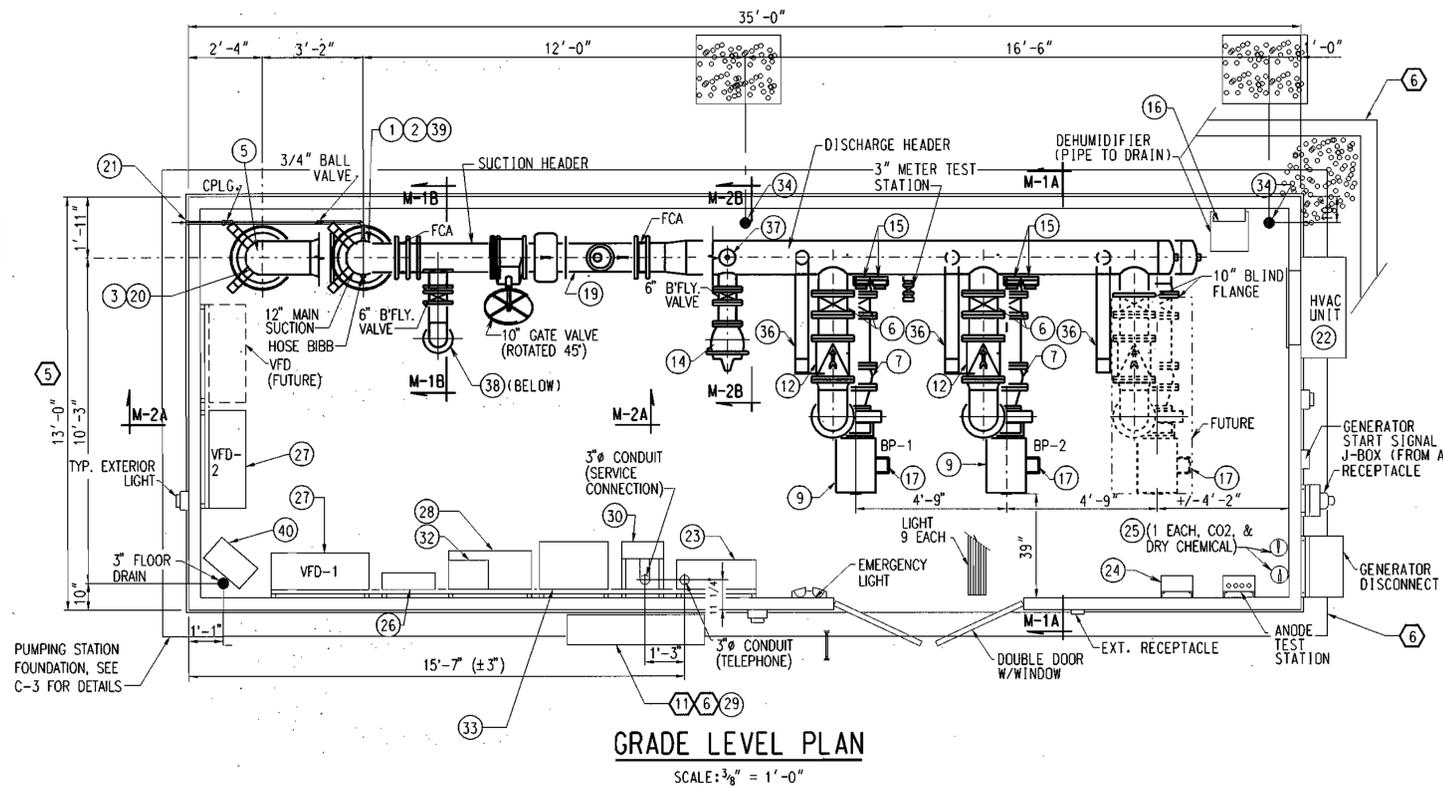


DES:EM					
DRN:EM					
CHK:WFH					
DATE: 9/20/00					
BY	NO.	REVISION	DATE	600' SCALE MAP NO.	46 BLOCK NO.

SEDIMENT CONTROL NOTES

MD 216 BOOSTER PUMPING STATION
CONTRACT NO. 44-3886
CAPITAL PROJECT NO. W-8212
HOWARD COUNTY, MARYLAND

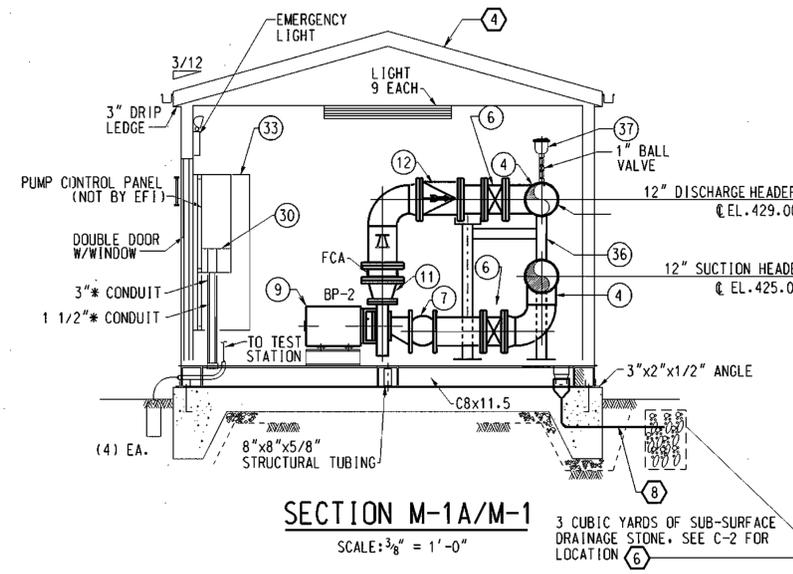
SCALE AS SHOWN
SHEET 6 OF 14



GRADE LEVEL PLAN

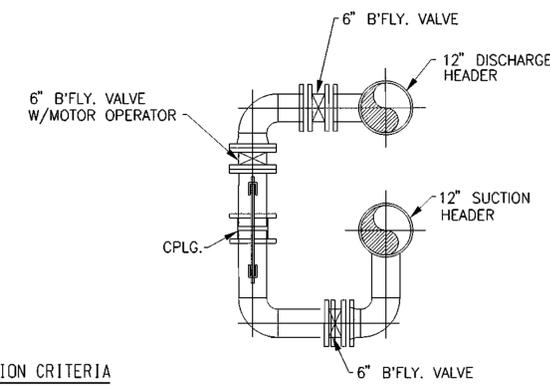
SCALE: 3/8" = 1'-0"

SEE EFl-0 & M FOR DETAILED COMPONENTS



SECTION M-1A/M-1

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



SECTION M-1B/M-1

NTS

NOTES:

- 1 SEE INSTRUMENTATION DRAWING FOR PROCESS SCHEMATIC, INSTRUMENT SCHEDULE AND TELEMETRY REQUIREMENTS.
- 2 PRESSURE INDICATION PANELS SHALL BE FREE-STANDING OR WALL MOUNTED TO PROVIDE PROPER VIEWING AND ACCESS. PUMP SUCTION GAUGES SHALL BE 0-60 PSIG. RANGE, AND DISCHARGE SHALL BE 0-100 PSIG. RANGE.
- 3 SET STATION FLOOD ELEVATION AT 422.50. WALL MOUNT TO SUIT.
- 4 OVERALL OUTSIDE HEIGHT OF PUMPING STATION SHALL NOT EXCEED 11'-0".
- 5 PACKAGED PUMPING STATION MANUFACTURE SHALL COORDINATE STATION WIDTH AND EQUIPMENT LAYOUT IN ACCORDANCE WITH NEC AND OSHA SPACE REQUIREMENTS FOR SAFE OPERATION AND MAINTENANCE PROCEDURES.
- 6 CONTRACTOR COORDINATE INSTALLATION OF ELECTRICAL SERVICE CT CABINET, STRUCTURAL FOUNDATION AND FINISHED GRADE WITH LANDSCAPE FEATURES SHOWN.
- 7 SUCTION AND DISCHARGE HEADERS ARE THE SAME LENGTH FOR SRV CONNECTION AND SUPPORTS.
- 8 TERMINATE 4" FOUNDATION DRAIN AT ELEVATION 422.00. CONTRACTOR COORDINATE STATION DRAIN INSERTION.
- 9 PROVIDE DRAIN LINE TO LOCAL FLOOR DRAIN.
- 10 INSTALL THERMOSTAT 60-INCHES FROM FINISHED FLOOR.
- 11 THE UTILITY METER MAY BE LOCATED AT BUILDING END TO SUIT TRANSPORTATION CLEARANCES. CONTRACTOR COORDINATE SECONDARY SERVICE. METER SHALL BE PROVIDED BY "BGE". CONTRACTOR COORDINATE SERVICE CONNECTION.

STATION EQUIPMENT LIST

- | | |
|--|---|
| 1 12" STATION SUCTION (SLEEVE) | 20 12" STATION DISCHARGE (FLOOR SLEEVE) |
| 2 12" 90-DEGREE ELBOW | 21 3/4" NON-FREEZE WALL HYDRANT (WOOLFORD MODEL 17CP3) |
| 3 12" BUTTERFLY VALVE (M&H) | 22 HVAC UNIT (BARD MODEL WA361-C15EWXLJ) |
| 4 12"x10" REDUCING TEE | 23 PUMP CONTROL PANEL (PCP) (U.S. FILTER) |
| 5 10" 90-DEGREE ELBOW | 24 FIRST AID KIT (JOHNSON & JOHNSON MODEL 08-207) |
| 6 10" BUTTERFLY VALVE (M&H) | 25 FIRE EXTINGUISHER (BUCKEYE EQUIP. MODEL 10H15A30ABC MODEL 45610CD) |
| * 7 PUMP SUCTION EXPANSION JOINT | 26 120/240 VOLT PANEL |
| * 8 PUMP SECTION ECCENTRIC REDUCER | 27 40 HP. VARIABLE FREQUENCY DRIVE (VFD) (DANFOSS) |
| 9 40 HP., 1750 RPM BOOSTER PUMP (AURORA 341A) | 28 480 VOLT PANEL |
| * 10 PUMP DISCHARGE EXPANSION JOINT | 29 CT CABINET (BGE APPROVED UTILITY METERING) |
| * 11 PUMP DISCHARGE CONCENTRIC REDUCER | 30 MAIN BREAKER |
| 12 10" SILENT CHECK VALVE (VAL-MATIC MODEL 1810 BN) | 31 STATION FLOOD FLOAT SWITCH |
| 13 12" DISCHARGE HEADER | 32 TRANSFORMER 480 TO 120/240 V (GE MODEL GT21B1006G02) |
| 14 6" SURGE RELIEF VALVE (CLA-VAL MODEL 50A-01BKC) | 33 AUTOMATIC TRANSFER SWITCH (ATS) (RUSSELECTRIC MODEL 2000) |
| 15 PUMP PRESSURE INDICATION PANEL | 34 3" FLOOR DRAIN |
| 16 STATION PRESSURE INDICATION PANEL | 35 10" X 12" INC. 90° ELBOW |
| 17 OVER-HEAD ELECTRIC CONNECTION | 36 SUPPORT STEEL TO SUIT |
| 18 10" FLANGE ADAPTOR WITH TIE-RODS | 37 1" AIR RELEASE VALVE (VAL-MATIC MODEL 25.5) |
| 19 10" TURBINE METER WITH TRANSMITTER (NEPTUNE MODEL HP WITH STRAINER) | 38 6" MOTORIZED RECIRCULATION BUTTERFLY VALVE (M&H MODEL 10FM) |
| * SIZE TO MATCH PUMP CONNECTIONS | 39 3" VALVED FIRE HOSE CONNECTION (HAMMOND 667) |
| | 40 HARMONIC FILTER (TYP. OF 2, UNIT STACKED IN VERTICAL) |

HYDRAULIC CRITERIA

SUCTION TANK SCAGGSVILLE FACILITY
 MAXIMUM SUCTION GRADIENT.....510.6 FIRE FLOW
 MINIMUM SUCTION GRADIENT.....482.6 FIRE FLOW
 PUMPING STATION.....RT. 216
 PUMPING STATION EL.....422.33 (F.F.)
 INITIAL CONDITIONS
 FIRE FLOW.....20 PSIG.
 DESTINATION HYDRANT GRADE.....458.0
 FULTON HYDRANT GRADIENT.....504.2 (MIN)
 STATION GRADIENT.....543.2
 FIRE FLOW MINIMUM.....1500 GPM
 PUMP EQUIPMENT
 TYPE.....CENTRIFUGAL END-SUCTION (BUILT TOGETHER)
 QUANTITY.....2, INCLUDING 1 STANDBY
 MANUFACTURER.....AURORA OR EQUAL
 MODEL.....341
 DESIGN POINT.....1550 GPM @ 63 FT.
 MOTOR.....40 HP., 1750 RPM
 CONTROL.....VARIABLE SPEED
 CONTROLS
 PUMP START GRADIENT.....514.0
 MAINTAIN GRADIENT.....543.0
 PUMP STOP GRADIENT.....560.0
 STATION GRADE (APPROXIMATE).....422.0
 START PRESSURE.....40 PSIG
 MAINTAIN PRESSURE.....50 PSIG
 STOP PRESSURE.....60 PSIG
 OVER-RIDE STOP PRESSURE.....65 PSIG
 LOW PRESSURE OVER-RIDE.....5 PSIG.
 CONTROLLER.....CENTRAL CONTROLLER

(BASIS OF DESIGN)

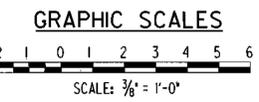
STATION CRITERIA

MECHANICAL
 PUMPS.....(2) 40 HP. AC/HEAT.....3-TON/15 KW
 RELIEF VALVE SETTING.....65 PSIG.
ELECTRICAL
 NEMA.....12
 SERVICE.....300 AMP
 GENERATOR CONNECTION.....PLUG TYPE
 AUTOMATIC TRANSFER SWITCH.....(INCLUDED)
CONTROL/TELEMETRY
 EQUIPMENT.....AUTOCON RECORDING.....30 DAY CHART RECORDER (3 PEN)
 ANALOG TRANSMISSION.....SUCTION PRESSURE DISCHARGE PRESSURE FLOW
 CRITICAL ALARMS TRANSMISSION.....BP-1 FAIL BP-2 FAIL TELEMETRY FAIL POWER FAIL
PUMP CONTROL PANEL
 ENCLOSURE.....NEMA 12 INTERIOR MOUNT.....PHONE CONNECTION/MODEM
 EXTERIOR MOUNT.....BACKUP BATTERY CCU TOUCH SCREEN 30 DAY CHART RECORDER CLOCK PHONE JACK

(BASIS OF DESIGN)

MECHANICAL LEGEND

DESCRIPTION	ABBREVIATION
AIR RELEASE VALVE	ARV
BOOSTER PUMP	BP-X
CENTER LINE ELEVATION	CL EL.
CENTRAL CONTROL UNIT	CCU
FLANGED COUPLING ADAPTER	FCA
FIRE EXTINGUISHER (DRY CHEMICAL)	FE-1
FIRE EXTINGUISHER (CARBON DIOXIDE)	FE-2
FLANGE	FLG.
FLOW METER	FM
GALLONS PER MINUTE	GPM
HEATING, VENTILATING AND AIR CONDITIONING	HVAC
NORMALLY CLOSED	N.C.
NORMALLY OPEN	N.O.
PUMP CONTROL PANEL	PCP
RESTRAINED JOINT	R.J.
STAINLESS STEEL	S.S.
SURGE RELIEF VALVE	SRV
VARIABLE FREQUENCY DRIVE	VFD



As-Built

11/21/02
RECORD DRAWING

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND.

Director of Public Works: *John J. ...* DATE: 12/10/02
 Chief, Bureau of Engineering: *Paul D. ...* DATE: 12-9-02
 Chief, Bureau of Utilities: *...* DATE: 12-9-02
 Chief, Utility Design Division: *...* DATE: 12-9-02

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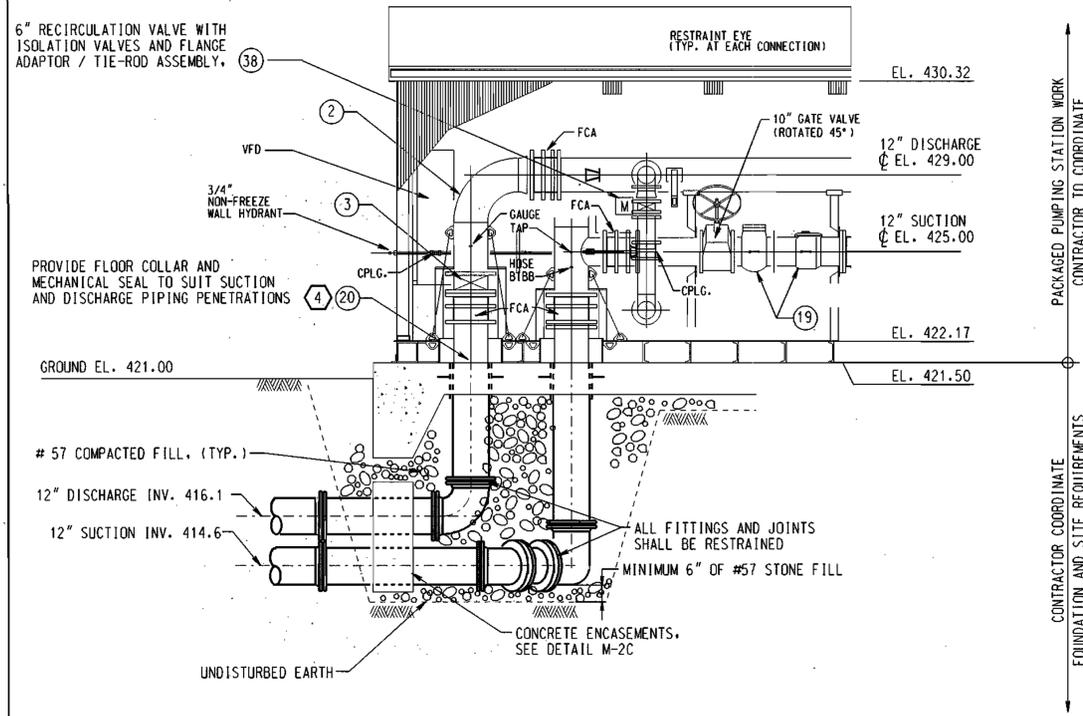


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BY NO.	REVISION

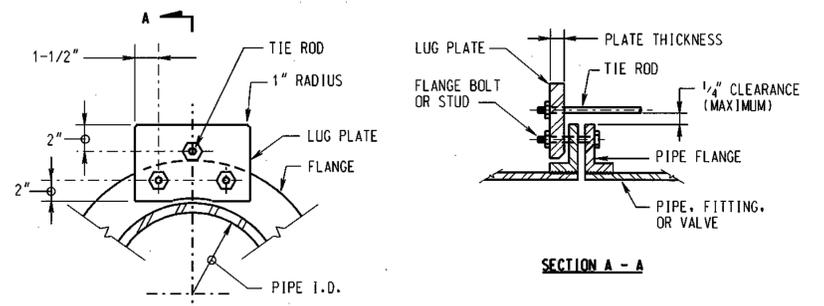
STATION PLAN, SECTION, LEGEND
 AND DESIGN CRITERIA

MD 216 BOOSTER PUMPING STATION
 CONTRACT NO. 44-3886
 CAPITAL PROJECT NO. W-8212
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
 SHEET 7 OF 14



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



NOTE: IF PLATE IS REQUIRED TO BE MOUNTED ON REVERSE SIDE OF FLANGE, PROVIDE A PIPE SLEEVE AND WASHER ON THE END OF THE TIE ROD SO THAT THE MAXIMUM CLEARANCE BETWEEN THE SLEEVE AND THE FLANGE CAN BE MAINTAINED. FLANGE SURFACE IN CONTACT WITH LUG PLATE SHALL BE GROUND SMOOTH TO CLEAR THE CASTING IRREGULARITY AND EMBOSSED LETTERING. CONTACT SURFACE OF LUG PLATE SHALL BE MACHINED TO A ONE DEGREE TAPER FOR PIPE DIAMETERS 12-INCH AND LARGER.

ROD MATERIAL - ASTM A588
PLATE MATERIAL - ASTM A36
SLEEVE MATERIAL - SCHEDULE 40 STEEL PIPE

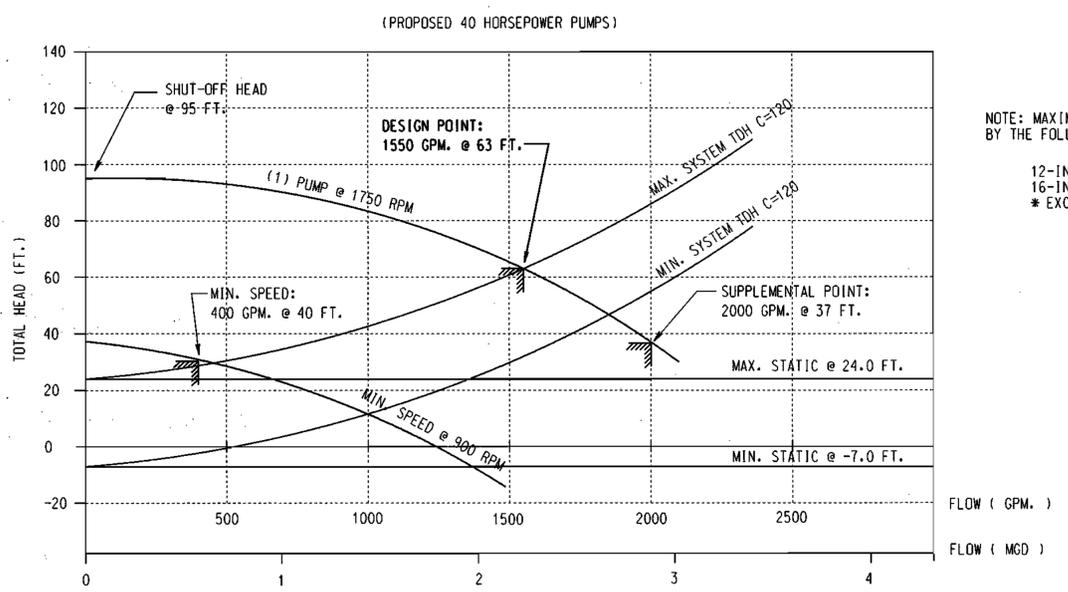
PIPE SIZE	NUMBER OF RODS	DIAMETER OF RODS	PLATE THICKNESS	PIPE SLEEVE (IF REQUIRED)	DESIGN PRESSURE PSI
6"	2	3/4"	3/4"	7/8"	150
10"	2	3/4"	1"	7/8"	150
12"	4	3/4"	1"	7/8"	150
16"	4	7/8"	1 1/4"	1"	150

TIE-ROD INSTALLATION REQUIREMENTS
DETAIL M-2B
NO SCALE

PACKAGE SYSTEM A/C - HEAT CRITERIA

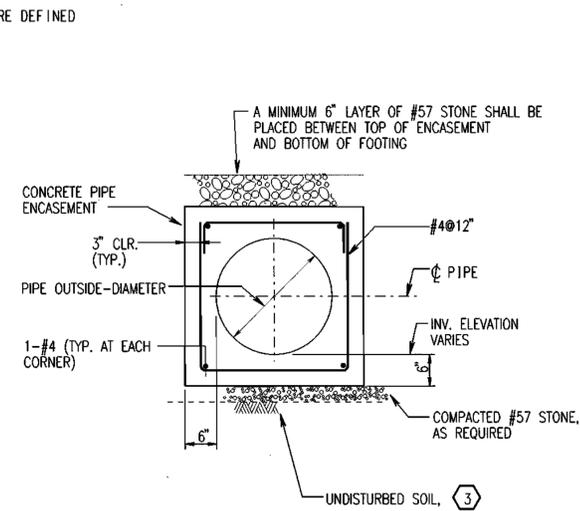
SUPPLY FAN CFM	1100
OUTDOOR CFM (1)	VARIABLE
FAN ESP (2)	0.375
FAN RPM	1100
MAX. FAN MOTOR HP	.3333
TOTAL COOLING, BTUH	36000
SENSIBLE COOLING, BTUH	25000
CONDENSER COIL EDB	95F
EVAPORATOR COIL EDB/ENB	75/62F
EVAPORATOR COIL LDB/LWB	55/53F
COOLING CONTROL STEPS	1
ELECTRICAL HEATER KW	15.0
ELECTRICAL HEATER STEPS	2
ELECTRICAL CHARACTERISTICS VOLT/PH/Hz	460V/3Ø/60

- SPLIT SYSTEM NOTES:**
- ECONOMIZER CONTROL WITH VARIABLE OUTSIDE AIR FROM 10-100% TO SUIT THERMOSTATIC CONDITIONS.
 - FAN PERFORMANCE INCLUDES INTERNAL PRESSURE DROP OF RETURN AIR GRILLE, FILTERS, COOLING COIL, AND ELECTRIC HEATER.
 - SPACE DESIGN CONDITIONS: 75F DB 45% RH (COOLING), 60F DB (HEATING).
 - CAPACITY CONTROL (COOLING): COMPRESSOR CYCLING THRU SPACE THERMOSTAT.
 - CAPACITY CONTROL (HEATING): ELECTRIC HEATER STAGING THRU SPACE THERMOSTAT.

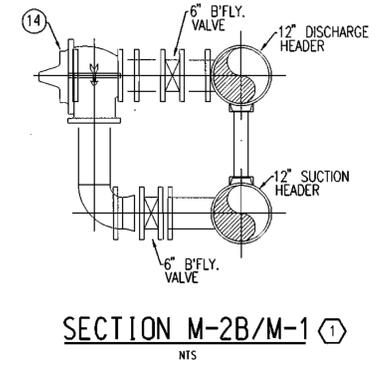


SYSTEM CHARACTERISTICS

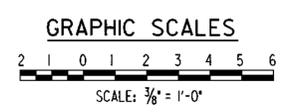
NOTE: MAXIMUM AND MINIMUM SYSTEM DYNAMICS ARE DEFINED BY THE FOLLOWING FORCE MAIN CONDITIONS:
12-INCH FM = 2,900 LINEAR FEET
16-INCH FM = 4,390 LINEAR FEET
* EXCLUDING MINOR LOSSES



DETAIL M-2C / M-2
NO SCALE



SECTION M-2B/M-1
NTS



As-Built

11/21/02
RECORD DRAWING

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND.
12/10/02
12-9-02

PREPARED BY:
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BALTIMORE, MD. 21218
410-235-3450



BY	NO.	REVISION	DATE
DES: SEA			
DRN: SEA/MM			
CHK: HWL			
DATE: 9/20/00			

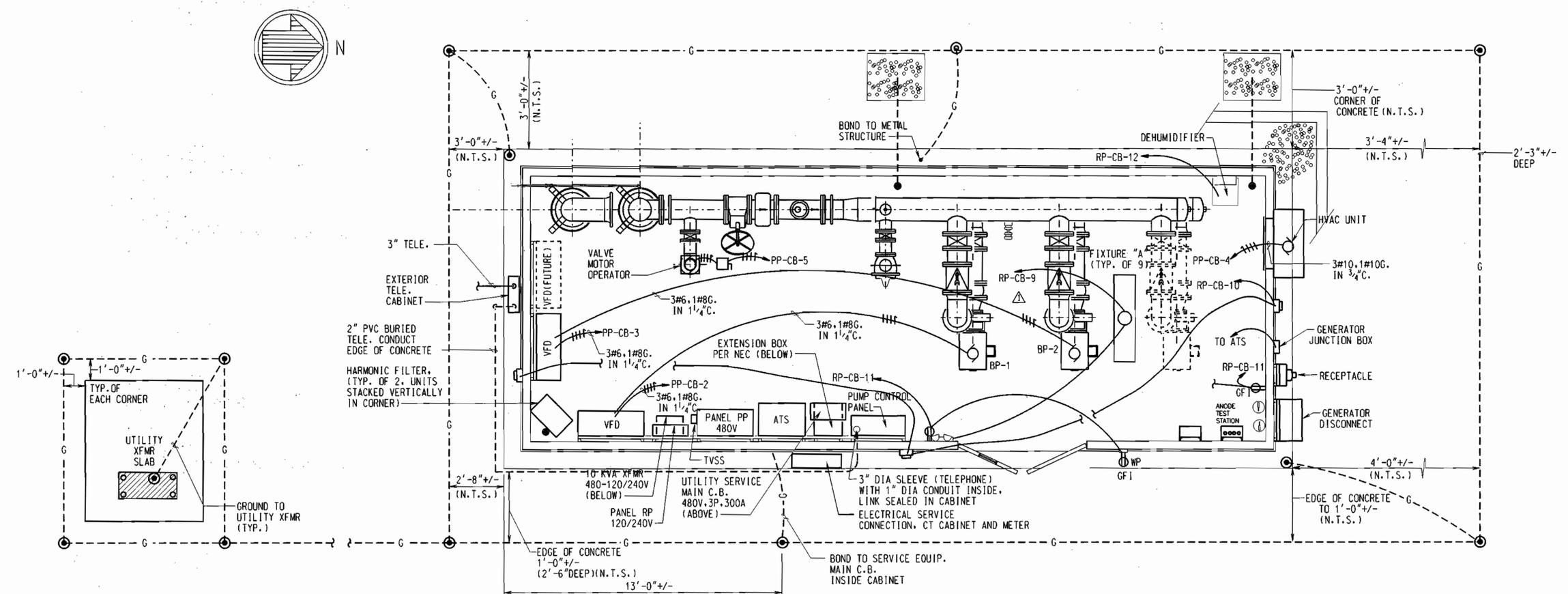
SCHEDULES, SECTION, DETAILS AND PUMPING CHARACTERISTICS

600' SCALE MAP NO. 46 BLOCK NO. 4

MD 216 BOOSTER PUMPING STATION
CONTRACT NO. 44-3886
CAPITAL PROJECT NO. W-8212
HOWARD COUNTY, MARYLAND
SCALE AS SHOWN
SHEET 8 OF 14

ABBREVIATIONS

ABBREV.	DESCRIPTION
A	AMPERE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIC	AMPERES INTERRUPTING CAPACITY, (SYM. RMS AMPS)
AUTO	AUTOMATIC
AUX	AUXILIARY
AWG	AMERICAN WIRE GAUGE
BLDG	BUILDING
C	CONDUIT
CB	CIRCUIT BREAKER
COMM	COMMUNICATION
CT	CURRENT TRANSFORMER
DWG	DRAWING
EA	EACH
ELEV	ELEVATION
EX	EXISTING
F	FUSE
FA	FRAME AMPS
G	GROUND
GEN	GENERATOR
GFI	GROUND FAULT INTERRUPTER
HH	HANDHOLE
HOA	HAND-OFF-AUTOMATIC
HP	HORSEPOWER
HZ	HERTZ
ID	IDENTIFICATION
JB	JUNCTION BOX
K	THOUSAND
KVA	KILOVOLT-AMPERE
KW	KILOWATT
LO	LOCKOUT
LOR	LOCAL OFF REMOTE
LR	LOCAL/REMOTE
MCB	MAIN CIRCUIT BREAKER
MCCB	MOLDED CASE CIRCUIT BREAKER
M.H.	MOUNTING HEIGHT
MLO	MAIN LUGS ONLY
N	NEUTRAL
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NFSS	NON-FUSED SAFETY SWITCH
NO	NORMALLY OPEN
OL	OVERLOAD
P	POLE OR POLES
PB	PUSH BUTTON
PR	PAIR
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE
RECEPT	RECEPTACLE
RMS	ROOT MEAN SQUARE
SE	SERVICE EQUIPMENT
SS	SAFETY SWITCH
SYM	SYMMETRICAL
TA	TRIP AMPS
TELECOM	TELECOMMUNICATIONS
TPS	TWISTED PAIR SHIELDED
TTB/TTC	TELEPHONE TERMINAL BOARD/CABINET
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
V	VOLTS OR VOLTAGE
VFD	VARIABLE FREQUENCY DRIVE
VOB	VFD-OFF-BYPASS
W	WATTS/WIRE
W/	WITH
WP	WEATHERPROOF
XFMR	TRANSFORMER
#	NUMBER



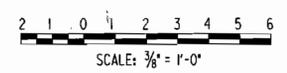
ELECTRICAL POWER & LIGHTING PLAN

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

LEGEND

SYMBOL	DESCRIPTION	M.H.	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	FLUORESCENT LIGHTING FIXTURE	AS NOTED		GROUND ROD		MOTOR OPERATED DAMPER		TORQUE SWITCH - NO - CLOSING ON HIGH TORQUE
	LIGHTING FIXTURE WALL MOUNTED	AS NOTED		GROUND CONDUCTOR (#4/0 BARE COPPER)		LIMIT SWITCH		LIMIT SWITCH - NO
	EMERGENCY BATTERY LIGHTING UNIT	AS NOTED		LOCAL PANEL		MOTOR OPERATED VALVE		LIMIT SWITCH - NC
	SINGLE POLE SWITCH	42"		JUNCTION BOX		CIRCUIT BREAKER		OVERCURRENT ELEMENT - THERMAL TYPE
	TELEPHONE OUTLET, WALL	48"		MOTOR CONNECTION		DISCONNECTING SWITCH		INDICATING LIGHT - R-RED, G-GREEN, W-WHITE, B-BLUE, A-AMBER
	DUPLEX RECEPTACLE, NEMA 5-20R	18"		SAFETY SWITCH-FUSED, UNFUSED-30A NFSS UON		CONTACTS - NO		PLC INPUT
	GROUND FAULT INTERRUPTER TYPE RECEPTACLE, NEMA 5-20R	18"		UTILITY METER/C.T. CABINET		CONTACTS - NC		PLC OUTPUT
	SPECIAL PURPOSE RECEPTACLE, 600V, 400A, 3P, 4W, WEATHERPROOF WITH PROTECTIVE COVER, HUBBELL #HBL4001TBK OR EQUAL.	48"		MANUAL MOTOR STARTER		CONTROL TRANSFORMER		THERMOSTAT
	RACEWAY - UP, DOWN			PANELBOARD - 120/240V, 480V		GROUND - EARTH, CHASSIS		CONTROL RELAY - DESIGNATION AS INDICATED
	HOMERUN-3/4" RACEWAY, NO. OF ARROWS INDICATES NO. OF CIRCUITS, CROSS LINES INDICATE NO. OF #12 PHASE AND NEUTRAL CONDUCTORS UON, WHERE NO CROSS LINES PROVIDE 2 #12 AND 1 #12 G. UON			TRANSFORMER		FUSE		ELAPSED TIME METER
				DELTA CONNECTION		PUSH-PULLBUTTON - MAINTAINED CONTACT		MANUAL MOTOR STARTER, ONE-POLE
				WYE CONNECTION, GROUNDED WYE CONNECTION		PUSHBUTTON - MOMENTARY CONTACT		
				PUSHBUTTONS		START-STOP PUSHBUTTON - MAINTAINED CONTACT		
				CONDUCTORS CROSSING, NOT CONNECTED		FLOAT SWITCH - NO		
				CONDUCTORS CONNECTED		FLOAT SWITCH - NC		

GRAPHIC SCALE



11/21/02
RECORD
DRAWING

E-1

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND.

Paul J. Berman 12/10/02
DIRECTOR OF PUBLIC WORKS
DATE

Paul J. Berman 12/9/02
CHIEF, BUREAU OF ENGINEERING
DATE

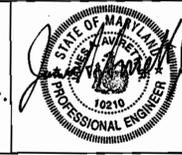
Paul J. Berman 12-10-02
CHIEF, BUREAU OF UTILITIES
DATE

Paul J. Berman 12-9-02
CHIEF, UTILITY DESIGN DIVISION
DATE

PREPARED BY:

WR&A

Whitman, Reardon and Associates, LLP.
2315 ST. PAUL ST.
BALTIMORE, MD. 21218
410-235-3450



DES:	JVL		
DRN:	AGT		
CHK:	RJK		
DATE:	9/20/00		
BY	NO.	REVISION	DATE

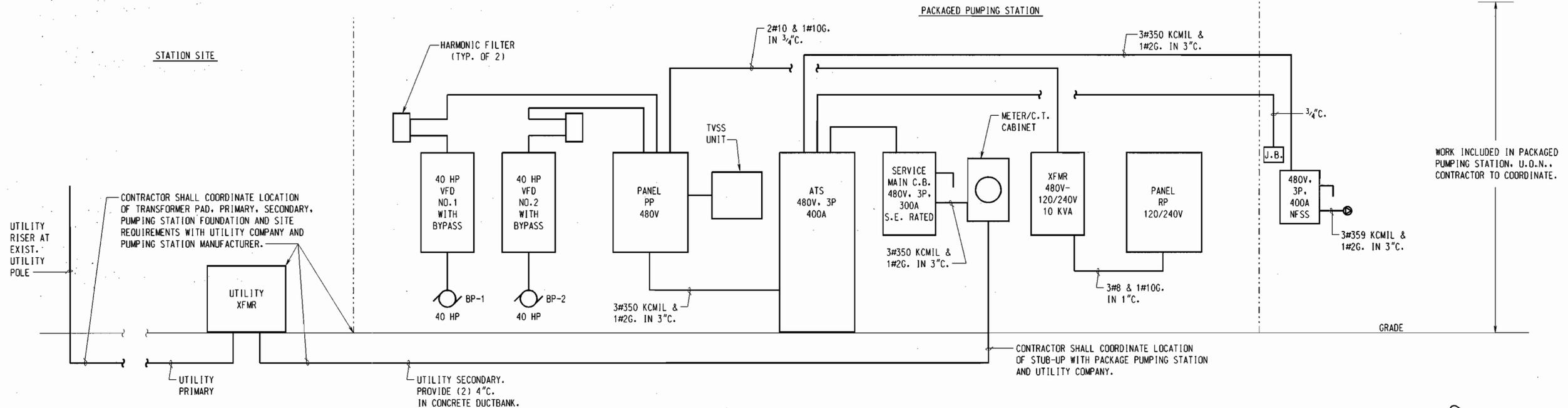
ELECTRICAL
POWER AND LIGHTING PLAN

600' SCALE MAP NO. 46 BLOCK NO. 4

MD 216 BOOSTER PUMPING STATION
CONTRACT NO. 44-3886
CAPITAL PROJECT NO. W-8212
HOWARD COUNTY, MARYLAND

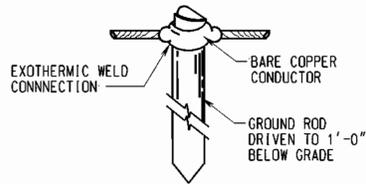
SCALE AS SHOWN

SHEET 9 OF 14



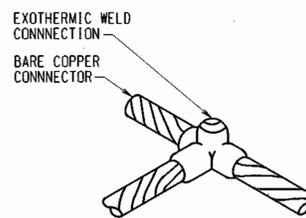
ELECTRICAL ONE-LINE DIAGRAM

NOT TO SCALE



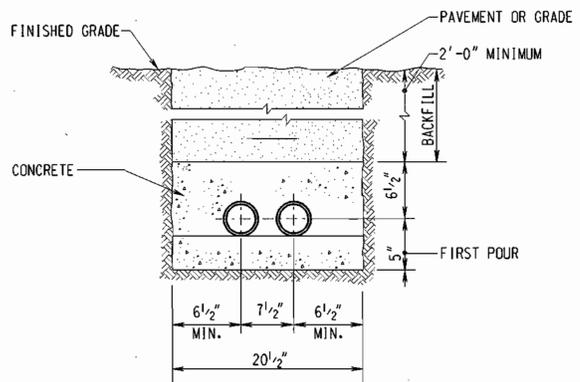
DETAIL-GROUND ROD

NOT TO SCALE



DETAIL-EXOTHERMIC CONNECTION

NOT TO SCALE



SECTION-SECONDARY DUCTBANK

NOT TO SCALE

PANELBOARD RP											
100 AMP BUS 25K RMS AIC NEMA 1 ENCLOSURE 120/240 VOLTS SURFACE MOUNTED 50 AMP MCB 1 PHASE, 3 WIRE + GROUND											
CB NO.	LOAD SERVED	CIRCUIT BRKR			CKT. NO.	CIRCUIT BRKR			LOAD SERVED	CB NO.	
		FRAME	TRIP	P		P	TRIP	FRAME			
8	PUMP CONTROL PANEL	100	20	1	1	2	1	15	100	INTERIOR LIGHTING	9
10	EXTERIOR LIGHTING	100	15	1	3	4	1	20	100	RECEPTACLES	11
12	DEHUMIDIFIER	100	15	1	5	6	1	20	100	SPARE	13
14	SPARE	100	20	1	7	8	1	20	100	SPARE	15
16	SPARE	100	20	1	9	10	1	-	100	SPACE	17
18	SPACE	100	-	1	11	12	1	-	100	SPACE	19

PANELBOARD PP											
400 AMP BUS 35K RMS AIC NEMA 12 ENCLOSURE 480 VOLTS SURFACE MOUNTED MLD 3 PHASE, 3 WIRE + GROUND											
CB NO.	LOAD SERVED	CIRCUIT BRKR			CKT. NO.	CIRCUIT BRKR			LOAD SERVED	CB NO.	
		FRAME	TRIP	P		P	TRIP	FRAME			
2	BOOSTER PUMP NO.1/VFD	100	100	3	1	2	3	100	100	BOOSTER PUMP NO.2/VFD	3
-	-	-	-	-	3	4	-	-	-	-	-
-	-	-	-	-	5	6	-	-	-	-	-
4	HVAC SYSTEM	100	30	3	7	8	3	15	100	RECIRCULATION VALVE	5
-	-	-	-	-	9	10	-	-	-	-	-
-	-	-	-	-	11	12	-	-	-	-	-
6	PANEL RP VIA XFMR	100	25	2	13	14	3	-	100	SPACE	7
-	-	-	-	-	15	16	-	-	-	-	-
-	SPACE	100	-	3	17	18	-	-	-	-	-
-	-	-	-	-	19	20	3	-	100	SPACE	-
-	-	-	-	-	21	22	-	-	-	-	-
-	SPACE	100	-	3	23	24	-	-	100	SPACE	-
-	-	-	-	-	25	26	3	-	100	SPACE	-
-	-	-	-	-	27	28	-	-	-	-	-
-	UNUSABLE SPACE	100	-	1	29	30	-	-	-	-	-

LIGHTING FIXTURE SCHEDULE								
FIXTURE TYPE	DESCRIPTION	MOUNTING	LAMPS			MANUFACTURER AND CATALOG NO.	VOLTS	QUANTITY
			No.	WATTS	TYPE			
A	4' FLUORESCENT VAPOR TIGHT FIXTURE, FIBERGLASS HOUSING, ELECTRONIC BALLAST, WET LOCATION, SHATTER RESISTANT ACRYLIC LENS.	SURFACE	2	32	F32T8	LITHONIA DMW-2-32-120-GEB10	120	9
B	HIGH PRESSURE SODIUM WALLPACK, DIE-CAST ALUMINUM HOUSING, UV STABILIZED POLYCARBONATE LENS.	WALL M.H.=8'-0" A.F.G.	1	50	HPS	LITHONIA TWP50S120PE	120	3
E	EMERGENCY LIGHTING UNIT, POLYCARBONATE HOUSING, LEAD CALCIUM BATTERY, TEST SWITCH, CHARGE INDICATOR.	WALL M.H.=8'-0" A.F.G.	2	12W	DC	LITHONIA IND636WH1206	120	1

11/21/02
RECORD DRAWING

E-2

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND.

PREPARED BY: **WR&A**
Whitman, Reardon and Associates, LLP.
2315 ST. PAUL ST.
BALTIMORE, MD. 21218
410-235-3450

DES: JVL
DRN: AGT
CHK: RJK
DATE: 9/20/00

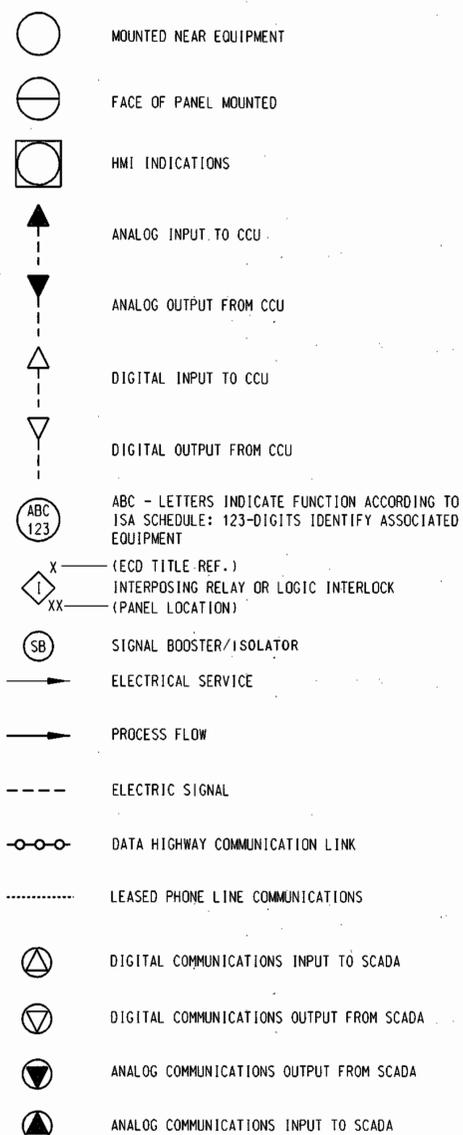
ELECTRICAL ONE-LINE DIAGRAM & PANELBOARD SCHEDULES

MD 216 BOOSTER PUMPING STATION
CONTRACT NO. 44-3886
CAPITAL PROJECT NO. W-8212
HOWARD COUNTY, MARYLAND

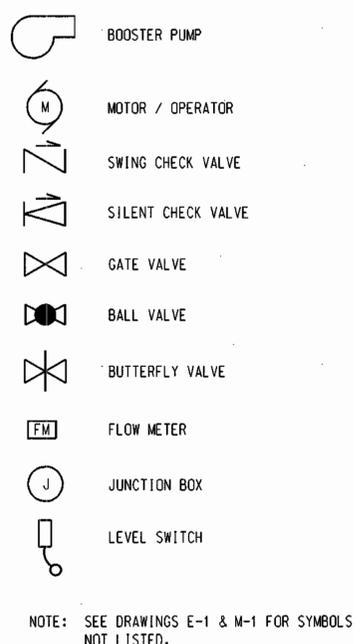
SCALE AS SHOWN
SHEET 10 OF 14

FEBRUARY 7, 2002

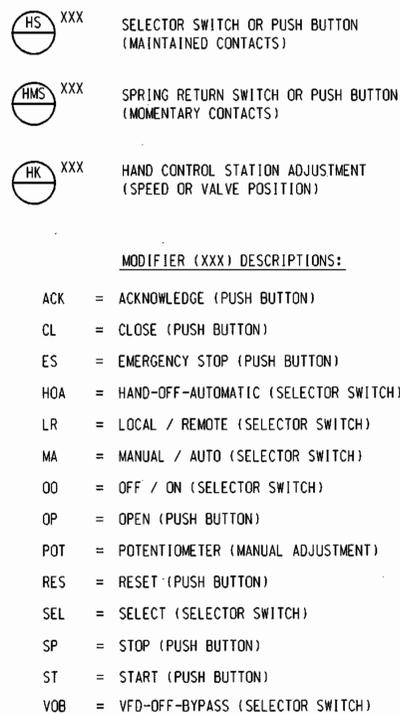
PROCESS AND INSTRUMENTATION SYMBOLS



EQUIPMENT SYMBOLS



HAND SWITCHES



ABBREVIATIONS

- AUTO = AUTOMATIC
 CCU = CENTRAL CONTROL UNIT
 FOM = FIBER OPTIC MODEM
 HMI = HUMAN MACHINE INTERFACE
 I/O = INPUT/OUTPUT
 PCP = PUMP CONTROL PANEL
 SCADA = SUPERVISORY CONTROL AND DATA ACQUISITION
 VAC = VOLTS/ALTERNATING CURRENT
 VDC = VOLTS/DIRECT CURRENT
 VFD = VARIABLE FREQUENCY DRIVE
 NOTE: SEE DRAWINGS E-1 & M-1 FOR ABBREVIATIONS NOT LISTED.

INSTRUMENT IDENTIFICATION SCHEDULE

FIRST LETTER	SUCCEEDING LETTER		
	VARIABLE	MODIFIER	PASSIVE FUNCTION / OUTPUT FUNCTION / MODIFIER
A	ANALYSIS		ALARM
B	BREAKER		USER'S CHOICE
C	CONDUCTIVITY		
D	DENSITY	DIFFERENTIAL	
E	VOLTAGE (EMF)		PRIMARY ELEMENT
F	FLOW RATE	RATIO	FAIL
G	GAUGING		GLASS
H	HAND		
I	CURRENT		INDICATE
J	POWER	SCAN	
K	TIME	TIME RATE	
L	LEVEL		LIGHT
M	MOTOR	MOMENTARY	
N	USER'S CHOICE		
O			
P	PRESSURE	PNEUMATIC	
Q	QUANTITY OR EVENT	TOTALIZE	
R	RADIOACTIVITY		RECORD OR PRINT
S	SPEED OR FREQUENCY	SUM	SEQUENCE
T	TEMPERATURE		
U	MULTIVARIABLE		MULTIFUNCTION
V	VARIABLE OR VISCOSITY		
W	WEIGHT OR FORCE		WELL
X	MOD. LIGHT OR VALVE		UNCLASSIFIED
Y	INTERLOCK		
Z	POSITION		

EXAMPLES

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

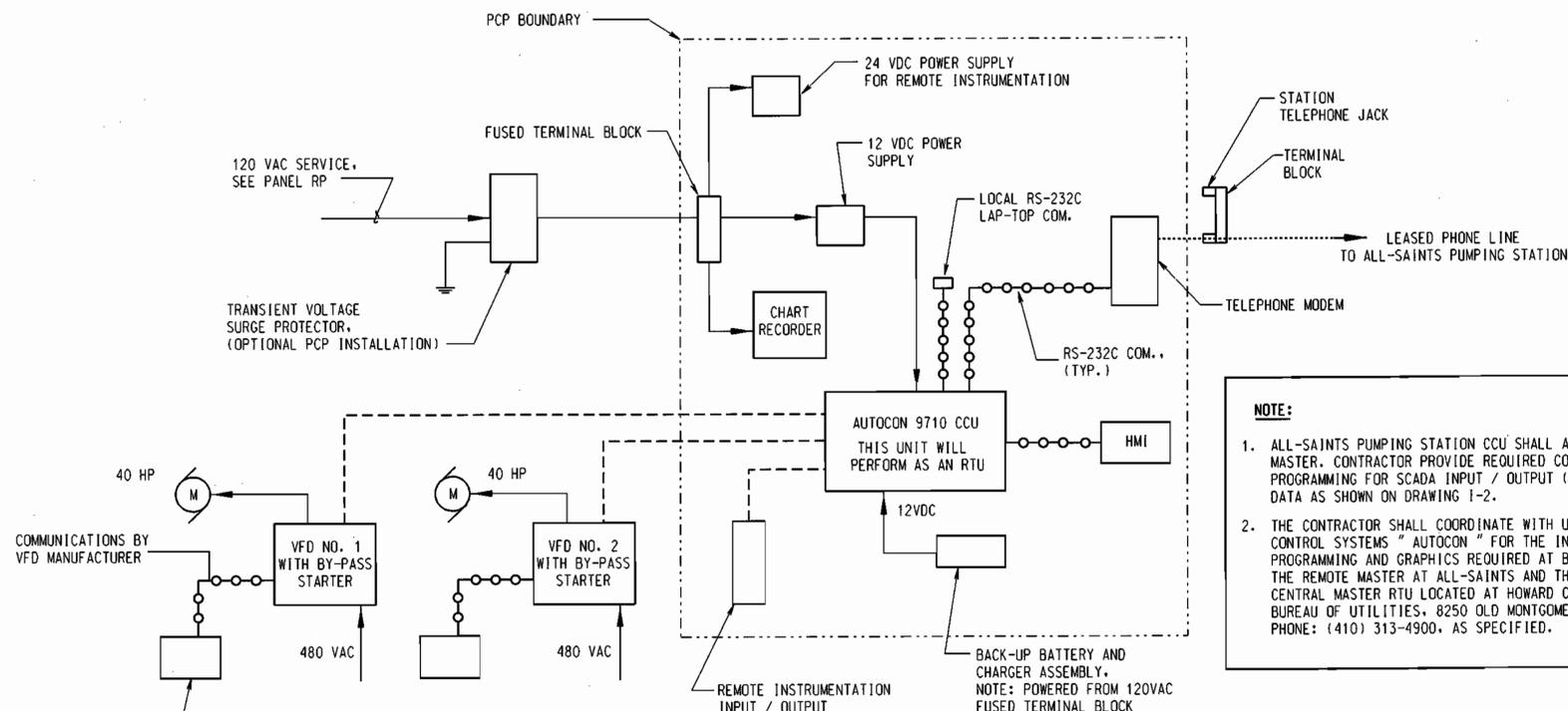
NUMBERING SEQUENCE

- 100 SERIES - PROCESS EQUIPMENT
 200 SERIES - ELECTRICAL GEAR
 300 SERIES - HVAC EQUIPMENT

P & I LEGEND

PANEL LEGEND:

- A = LOCAL PUMP PRESSURE INDICATION PANEL
 B = SYSTEM PRESSURE INDICATION PANEL
 H = HUMAN MACHINE INTERFACE (HMI)
 L = LOCAL CONTROL PANEL
 M = MODEM (SCADA INTERFACE)
 P = PUMP CONTROL PANEL WITH CCU
 V = VARIABLE FREQUENCY DRIVE UNIT
 X = NOTES OR REFERENCE NOTES



NOTE:

- ALL-SAINTS PUMPING STATION CCU SHALL ACT AS A MASTER. CONTRACTOR PROVIDE REQUIRED COMMUNICATIONS PROGRAMMING FOR SCADA INPUT / OUTPUT (I/O) DATA AS SHOWN ON DRAWING I-2.
- THE CONTRACTOR SHALL COORDINATE WITH U.S. FILTER CONTROL SYSTEMS "AUTOCON" FOR THE INTERFACE PROGRAMMING AND GRAPHICS REQUIRED AT BOTH THE REMOTE MASTER AT ALL-SAINTS AND THE CENTRAL MASTER RTU LOCATED AT HOWARD COUNTY BUREAU OF UTILITIES, 8250 OLD MONTGOMERY ROAD, PHONE: (410) 313-4900, AS SPECIFIED.

PUMP CONTROL / SCADA PLC ONE-LINE DIAGRAM

NO SCALE

11/21/02
RECORD DRAWING



MD 216 BOOSTER PUMPING STATION
 CONTRACT NO. 44-3886
 CAPITAL PROJECT NO. W-8212
 HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND.

PREPARED BY:



Whitman, Reardon and Associates, LLP.
2315 ST. PAUL ST.
Baltimore, Md. 21218
410-235-3450



DES: SEA

DRN: SEA

CHK: PCD

DATE: 9/20/00

PROCESS AND INSTRUMENTATION
ONE LINE DIAGRAM,
LEGEND AND ABBREVIATIONS

600' SCALE MAP NO. 46 BLOCK NO. 4

1-1

SCALE AS SHOWN
SHEET 12 OF 14

DRAWING NOTES:

- 1 SEE I-1 FOR PUMP CONTROL/SCADA PLC ONE-LINE RISER.
- 2 PROVIDE SPARE I/O AT PLC FOR THE ADDITION OF FUTURE BP-3.
- 3 CCU SHALL GENERATE ALARM POINT BASED ON FT-103 I/O.
- 4 CCU SHALL GENERATE ALARM POINT BASED ON TRANSMITTER INPUT.
- 5 THE SCADA RESET SHALL BE PROGRAMMED TO "RESET" ALL CCU GENERATED ALARMS, IF ALARM CONDITIONS HAVE CLEARED.
- 6 EXERCISE MODE START FUNCTION TO INTERFACE WITH CCU.

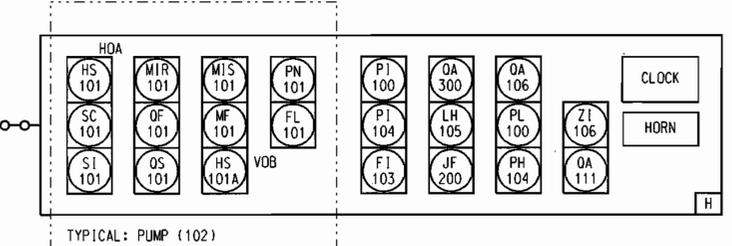
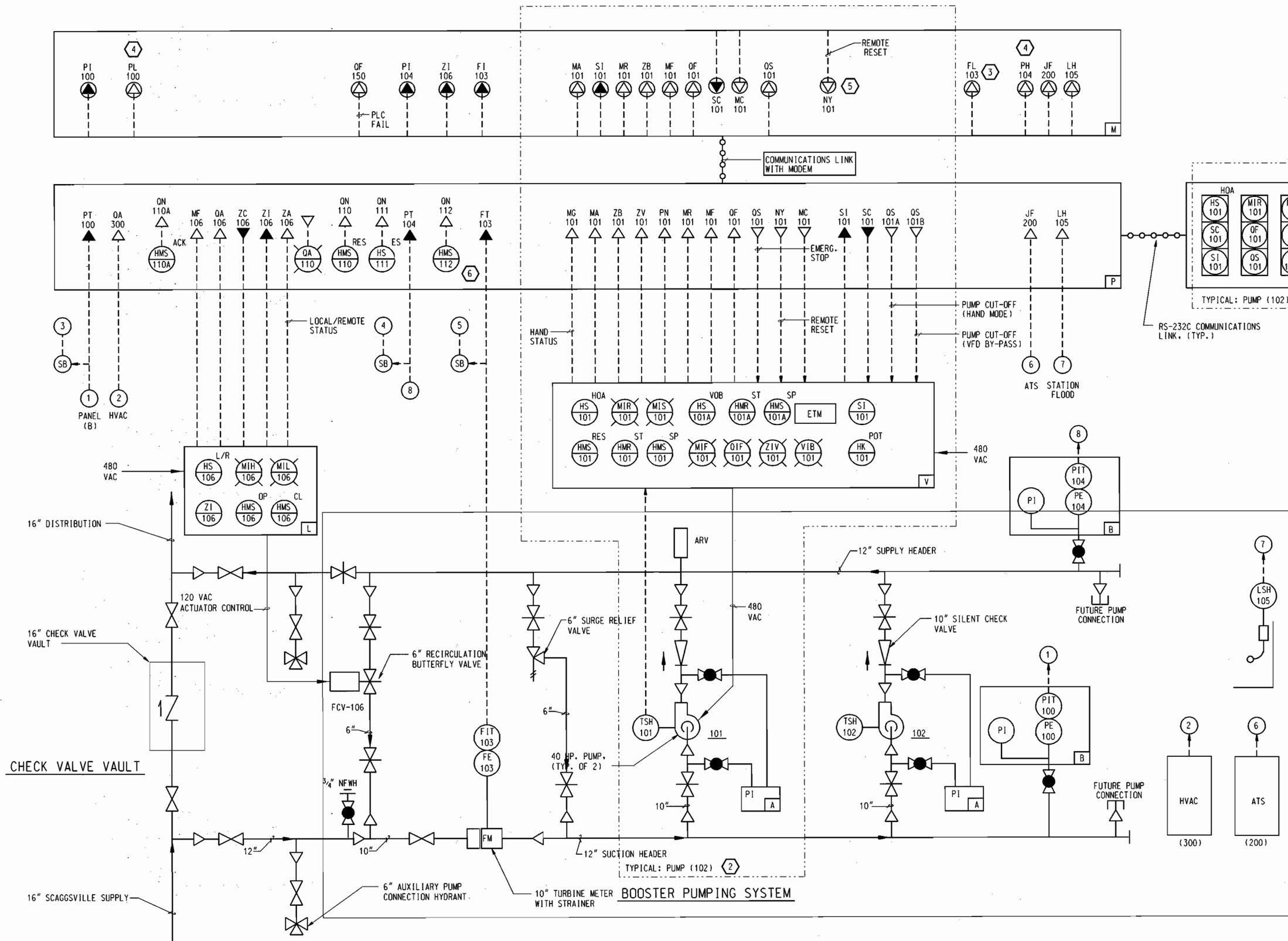
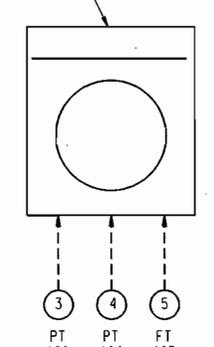


CHART RECORDER SHALL BE LOCATED ON THE PUMP CONTROL PANEL. SEE (1-3)



NOTE:
(*) SEE I-1 FOR PROCESS AND INSTRUMENTATION SYMBOLS.

LEGEND:
 ——— MECHANICAL PROCESS BOUNDARY
 - - - - - DUPLICATED INSTRUMENTATION (I/O) BOUNDARY.
 IE: TYPICAL: PUMP (XXX)

11/21/02
RECORD
DRAWING

As-Built

I-2

BOOSTER PUMPING STATION (*)

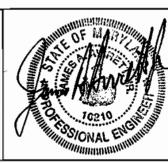
DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND.

James Z. ... 12/10/02
DIRECTOR OF PUBLIC WORKS DATE

Robert ... 12/9/02
CHIEF, BUREAU OF ENGINEERING DATE

... 12-9-02
CHIEF, UTILITY DESIGN DIVISION DATE

PREPARED BY:
WR&A
Whitman, Reardon and Associates, LLP.
2315 ST. PAUL ST.
BALTIMORE, MD. 21218
410-235-3450



DES: SEA			
DRN: SEA			
CHK: PCD			
DATE: 9/20/00	BY NO.	REVISION	DATE

PROCESS AND INSTRUMENTATION
DIAGRAM

600' SCALE MAP NO. 46 BLOCK NO. 4

MD 216 BOOSTER PUMPING STATION
CONTRACT NO. 44-3886
CAPITAL PROJECT NO. W-8212
HOWARD COUNTY, MARYLAND

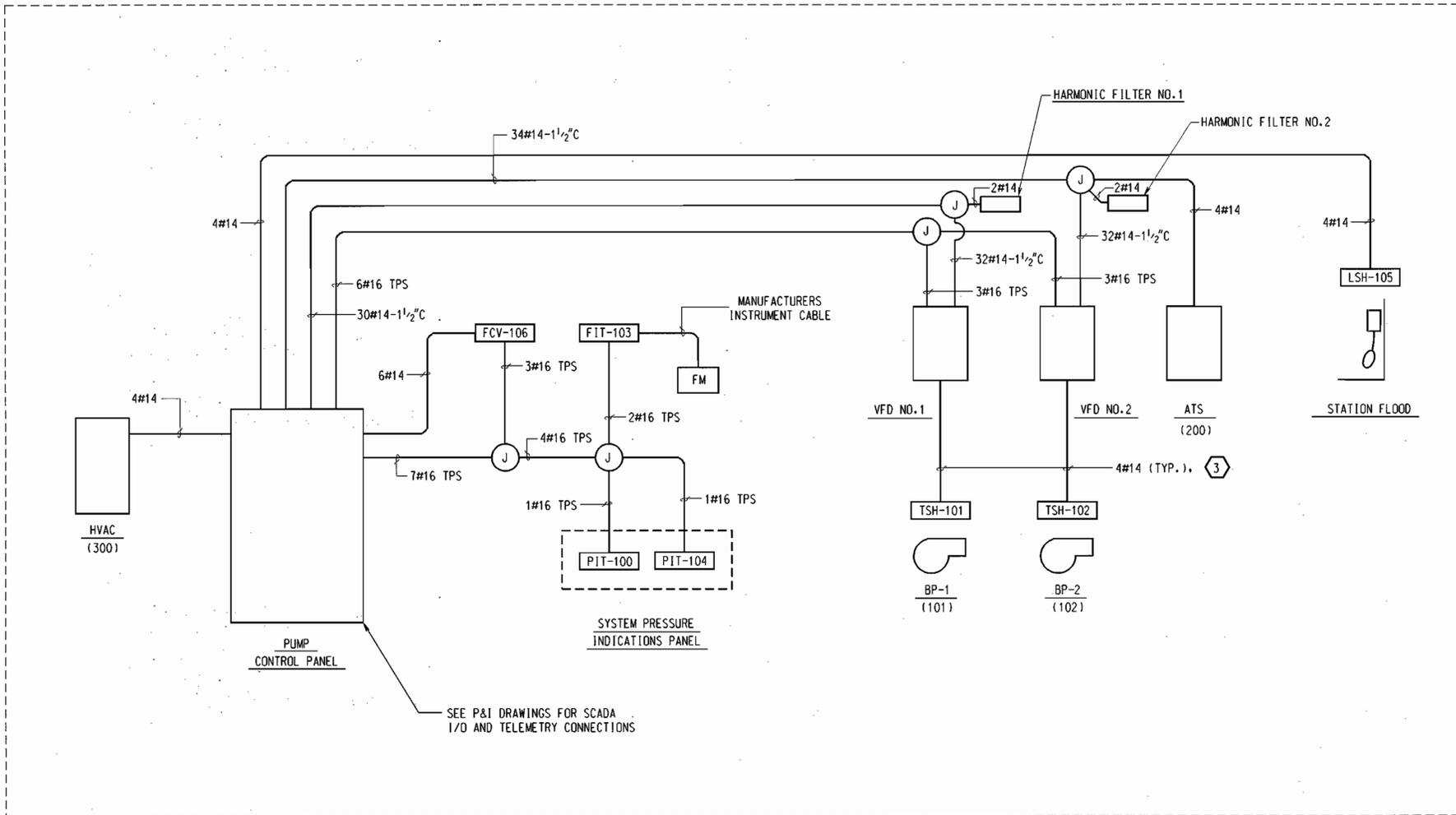
SCALE AS SHOWN
SHEET 13 OF 14

DRAWING NOTES:

- ① ALL CONDUITS SHALL BE A MINIMUM OF 3/4-INCH UNLESS OTHERWISE NOTED.
- ② SPARE CONDUCTORS ARE INCLUDED IN INSTRUMENT RISER COUNT. SYSTEMS INTEGRATOR TO COORDINATE ADDITIONAL CONDUCTORS TO SUIT EQUIPMENT REQUIREMENTS THAT VARY FROM THAT SPECIFIED.
- ③ THERMAL WINDING CONDUCTORS CAN BE INCLUDED WITH POWER FEEDER. CONTRACTOR COORDINATE TERMINATIONS.

LEGEND:

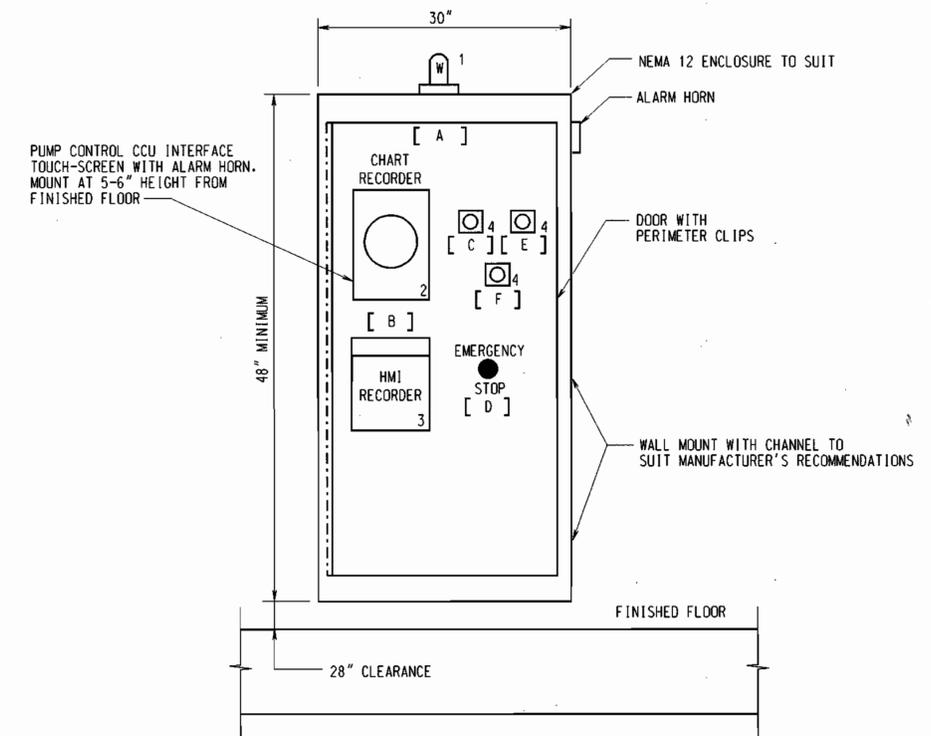
- (J) JUNCTION BOX
- PUMPING STATION BOUNDARY



PUMPING STATION

INSTRUMENTATION RISER DIAGRAM

NO SCALE



DEVICE LEGEND

- 1. ALARM INDICATING LIGHT W-WHITE
- 2. CHART RECORDER (3- PEN, 30-DAY)
1- INFLUENT PRESSURE
2- EFFLUENT PRESSURE
3- STATION FLOW
- 3. TOUCH SCREEN
- 4. MOMENTARY PUSH-BUTTON

NAMEPLATE LEGEND

- A. PUMP CONTROL PANEL - MD RT.216 PUMP CONTROL PANEL
- B. STATION PRESSURE AND FLOW RECORDING - #1 FLOW, #2 SUCTION PRESSURE, #3 DISCHARGE PRESSURE
- C. GENERAL ALARMS RESET - GENERAL RESET
- D. EMERGENCY STOP
- E. ALARM ACKNOWLEDGE (OPTIONAL AT HMI)
- F. EXERCISE CYCLE START

U.S. FILTER PUMP CONTROL PANEL ELEVATION

NO SCALE

11/21/02
RECORD
DRAWING

As-Built

1-3

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND.

[Signature] 12/12/02
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 12/10/02
CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 12-9-02
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 12-9-02
CHIEF, UTILITY DESIGN DIVISION DATE

PREPARED BY :

WR&A

Whitman, Requardt and Associates, LLP.
2315 ST. PAUL ST.
BALTIMORE, MD. 21218
410-235-3450



DES: SEA				
DRN: SEA				
CHK: PCD				
DATE: 9/20/00	BY	NO.	REVISION	DATE

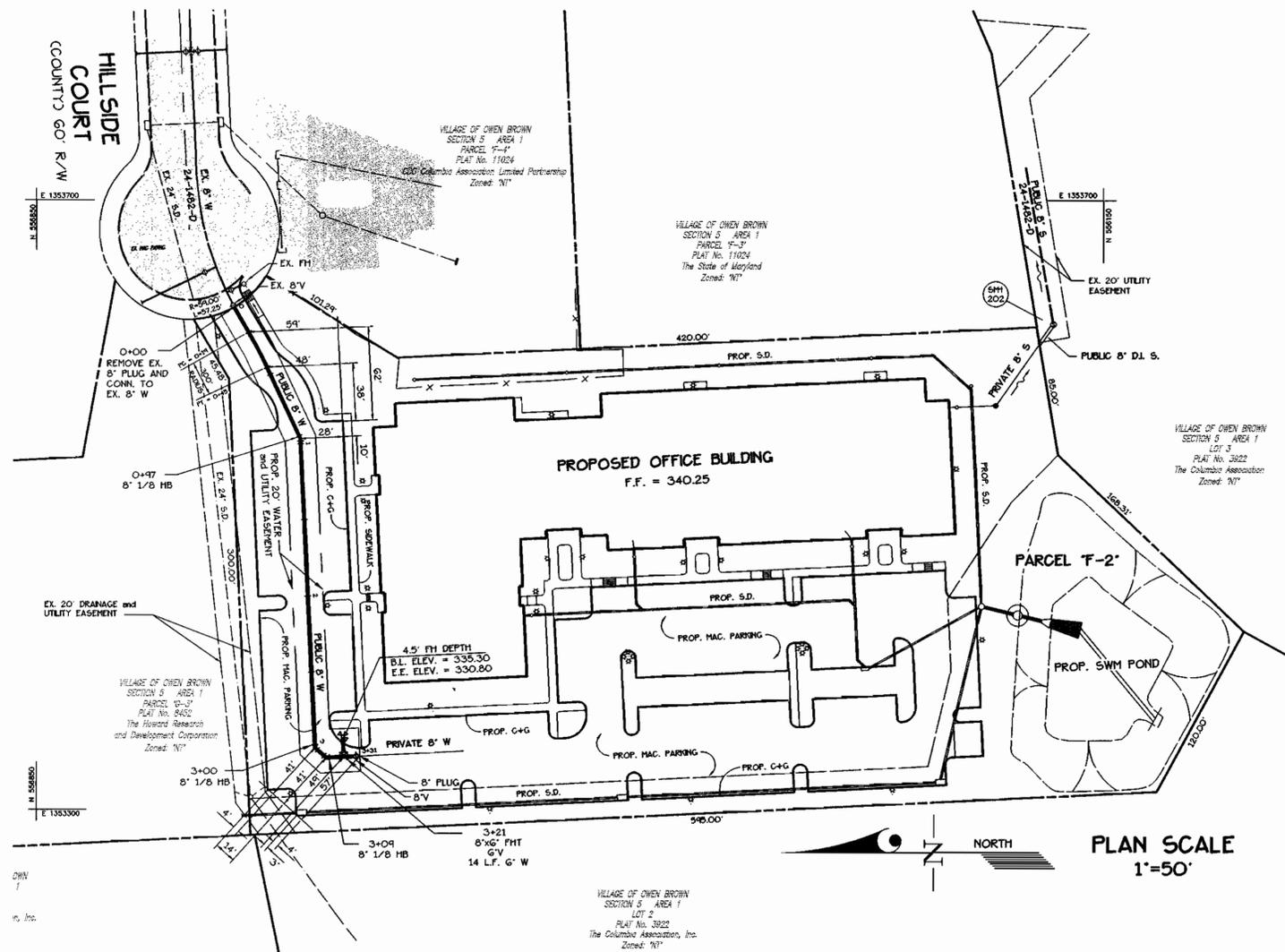
PROCESS AND INSTRUMENTATION
RISER DIAGRAM AND PANEL
DETAILS

600' SCALE MAP NO. 46 BLOCK NO. 4

MD 216 BOOSTER PUMPING STATION
CONTRACT NO. 44-3886
CAPITAL PROJECT NO. W-8212
HOWARD COUNTY, MARYLAND

SCALE
AS
SHOWN

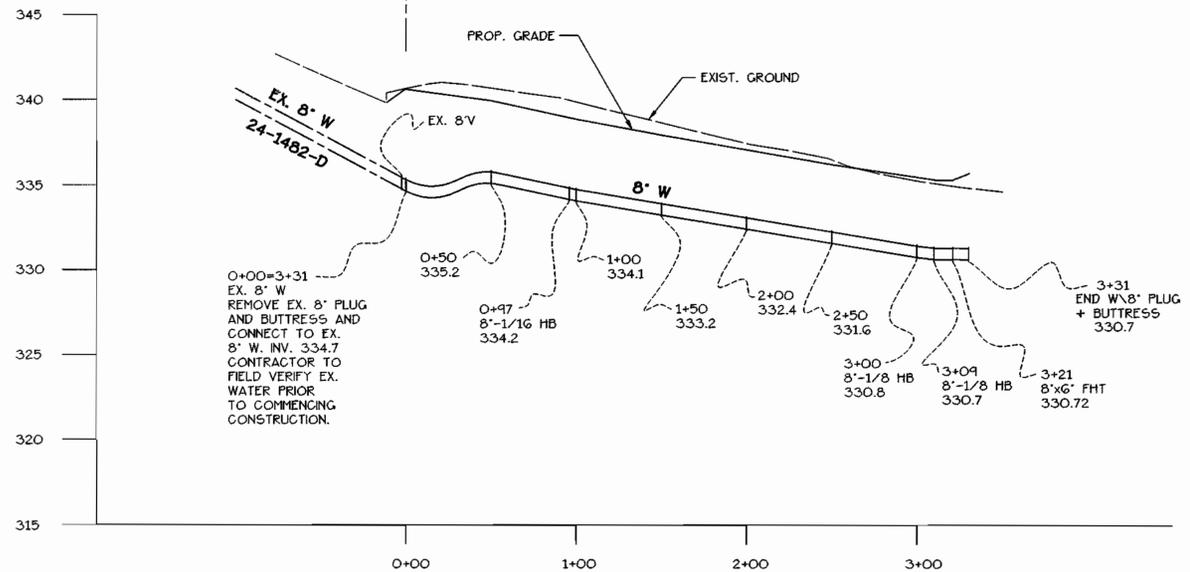
SHEET
14 OF 14



PLAN SCALE
1"=50'

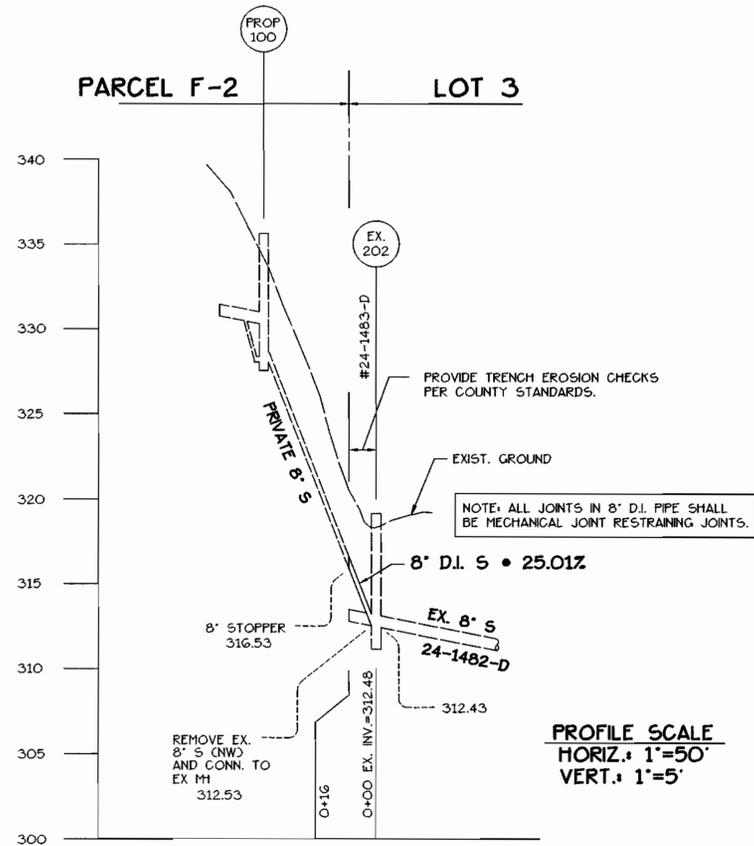
HILLSIDE COURT PARCEL F-2

PROFILE SCALE
HORIZ.: 1"=50'
VERT.: 1"=5'



PARCEL F-2 LOT 3

PROFILE SCALE
HORIZ.: 1"=50'
VERT.: 1"=5'



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
R. J. Deane
CHIEF, BUREAU OF UTILITIES
DATE: 8-29-00

DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY, MARYLAND
H. J. Deane
CHIEF, DEVELOPMENT ENGINEERING DIVISION
DATE: 8-29-00

GLW GUTSCHICK LITTLE & WEBER, P.A.
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE - SUITE 250 - BURTONSVILLE OFFICE PARK
BURTONSVILLE, MARYLAND 20866
TEL: 301-421-4024 BALT: 410-880-1020 DC/VA: 301-989-2524 FAX: 301-421-4186



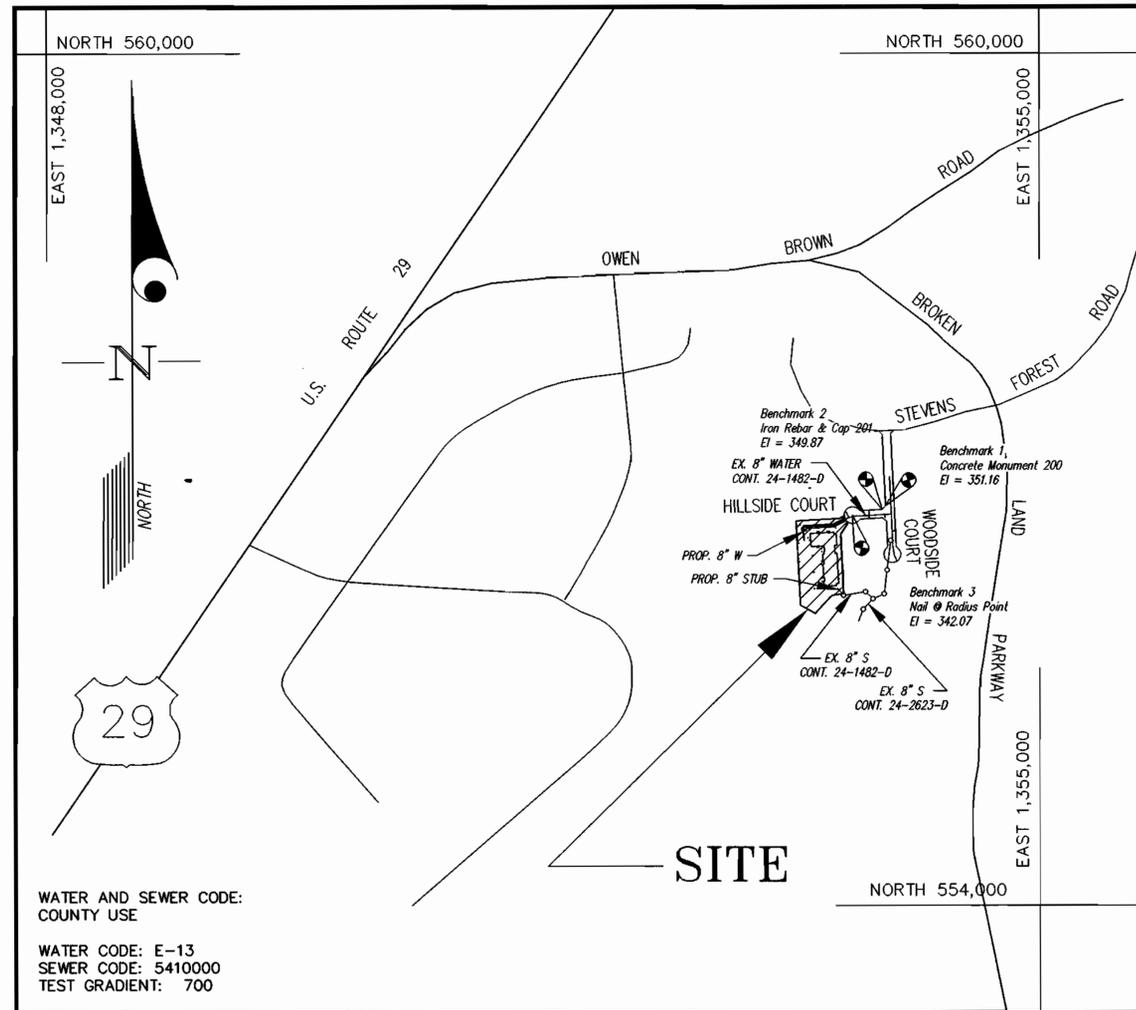
DES: SCC					
DRN: BB					
CHK: SCC					
DATE: 8/00	BY	NO	REVISION	DATE	

PUBLIC WATER & SEWER
PLAN and PROFILES
600' SCALE MAP NO. 36 BLOCK NO. 14

VILLAGE OF OWEN BROWN
CONTRACT# 24-3887-D
SECTION 5 AREA 1
PARCEL "F-2"
PLAT No. 7044
GLW ELECTION DISTRICT No. 6
HOWARD COUNTY, MARYLAND

GLW FILE No. 99115
SCALE AS SHOWN
SHEET 2 OF 2

QUANTITIES				
ITEMS	QUANTITIES ESTIMATED	AS-BUILT		
		QUANTITIES	TYPE	MANUFACTURER/SUPPLIER
8" 1/8 HB	3	2 EA.	J.F.	U.S. PIPE/A-1 PIPE
8" V	1	1 EA.	CATE VALVE	MUELLER/MUELLER
8"x6" FHT	1	1 EA.	M.J.F.	U.S. PIPE/A-1 PIPE
FIRE HYDRANT (4.5')	1	1 EA.	GENURION	MUELLER/MUELLER
8" PLUG	1	~	~	~
8" D.I.P. (WATER)	331 L.F.	231 L.F.	TYTON JOINT	U.S. PIPE / AL PIPE
6" D.I.P. (WATER)	13 L.F.	10 L.F.	"	"
8" D.I.P. (SEWER)	16 L.F.	~	"	"
8" STOPPER	1	~	~	~
NAME OF UTILITY CONTRACTOR: IACOBONI				
SURVEY AND DRAFTING DIV.		CHECKBOX: AS-BUILT DATE:		



VICINITY MAP
SCALE: 1"=600'

CONTRACT No. 24-3887-D

HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS

TYPE OF BUILDING	OFFICE
NUMBER OF UNITS	1
NUMBER OF S.H.C.'s	1
NUMBER OF W.H.C.'s	1
DRAINAGE AREA	LITTLE PATUXENT
TREATMENT PLANT	LITTLE PATUXENT

GENERAL NOTES

- PART I**
- Approximate location of existing mains are shown. The contractor shall take all necessary precautions to protect existing mains and services and maintain uninterrupted supply. 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 [North American Datum 1983 (NAD '83)].
 - All vertical controls are based on U.S.G.S. data.
 - All pipe elevations shown are invert elevations.
 - Clear all utilities by a minimum of 6". Clear all poles by 2'-0" minimum or tunnel as required. The owner has contacted the utility companies and has made arrangements for bracing of poles as shown on the drawings. In the event the contractor's work requires the bracing of additional poles, any cost incurred by the owner for bracing of additional poles or damages shall be deducted from money 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 Detail for Construction (Latest Edition). The contractor shall have a copy of Volume IV on the job.
 - Where test pits have been made on existing utilities, they are noted by the symbol at the location of the test pit. 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 the contractor two weeks in advance of construction operations at his own expense.
 - Contractor shall notify the following utility companies or agencies at least (5) working days before starting work shown on these plans:
 - State Highway Administration 531-5533
 - BGE Contractor Services 850-4620
 - BGE Under Ground Damage Control 787-9068
 - Miss Utility 1-800-257-7777
 - Colonial Pipeline Co. 795-1390
 - Howard County Department of Public Works Bureau of Utilities 313-4900
 - Trees and shrubs are to be protected from damage to maximum extent. Trees and shrubs located within the construction strip are not to be removed or damaged by the contractor.
 - Contractor shall remove trees, stumps and roots along line of excavation. Payment for such removal shall be included in the unit price bid for construction of the main.
 - The contractor shall notify the Bureau of Highways, Howard County, at (410) 313-2450 at least five (5) working days before any open cut of any County road or boring/jacking operation on County roads for laying water/sewer mains or house connections. The approval of these drawings will constitute compliance with DPW requirement per Section 18.114(a) of the Howard County Code.

PART II - WATER

- All water mains to be D.I.P. Class 52 unless otherwise noted.
- Tops of all water mains to have a minimum of 3-1/2' cover unless otherwise noted.
- Valves adjacent to tees shall be strapped to tees.
- All fittings shall be buttressed or anchored with concrete in accordance with the Standard Details unless otherwise provided for on the drawings.
- Fire hydrants shall be set to the bury line elevations shown on the drawings. All fire hydrants shall be restrained and buttressed with concrete in accordance with the Standard Details. Soil around the fire hydrant shall be compacted in accordance with Section 1000 and 1005 of the Standard Specifications.
- The contractor shall not operate any water main valves on the existing water system.
- All water house connections shall be for inside meter setting unless otherwise noted on plans or in specifications.
- For sprinkler system for all townhomes or multi-family dwelling units should have a minimum of 1' connection with a 3/4" meter.

PART III - SEWER

- All sewer mains shall be DIP and P.V.C. unless otherwise noted.
- All manholes shall be 4' - 0" inside diameter unless otherwise noted.
- Force mains shall be D.I.P. only.
- Manholes shown with 12" and 16" walls are for brick manholes only. Manholes designated W.T. in plan and profile shall have watertight frame and covers, Standard Detail G5.52. Where watertight frame and cover is used, set top of frame 1'-6" above finished grade unless otherwise noted on drawings.
- House(s) with the symbol "C.N.S." indicates that cellar cannot be served.

Sediment Control Measures will be implemented in accordance with SDP 01-04.

REVIEWED FOR HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENT.

Kevin Simmons 8/30/00
SIGNATURE DATE

U.S.D.A. NATURAL RESOURCES CONSERVATION SERVICE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

APPROVED: *John R. Roberts* 8/30/00
HOWARD S.C.D. DATE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY, MARYLAND

GLW GUTSCHICK LITTLE & WEBER, P.A.
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE - SUITE 250 - BURTONSVILLE OFFICE PARK
BURTONSVILLE, MARYLAND 20866
TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186



DES: SCC			
DRN: BB			
CHK: SCC			
DATE: 8/00	K.C.I. 1	AS-BUILT CONDITIONS ADDED TO PLAN	8/28/01
	BY: NO	REVISION	DATE

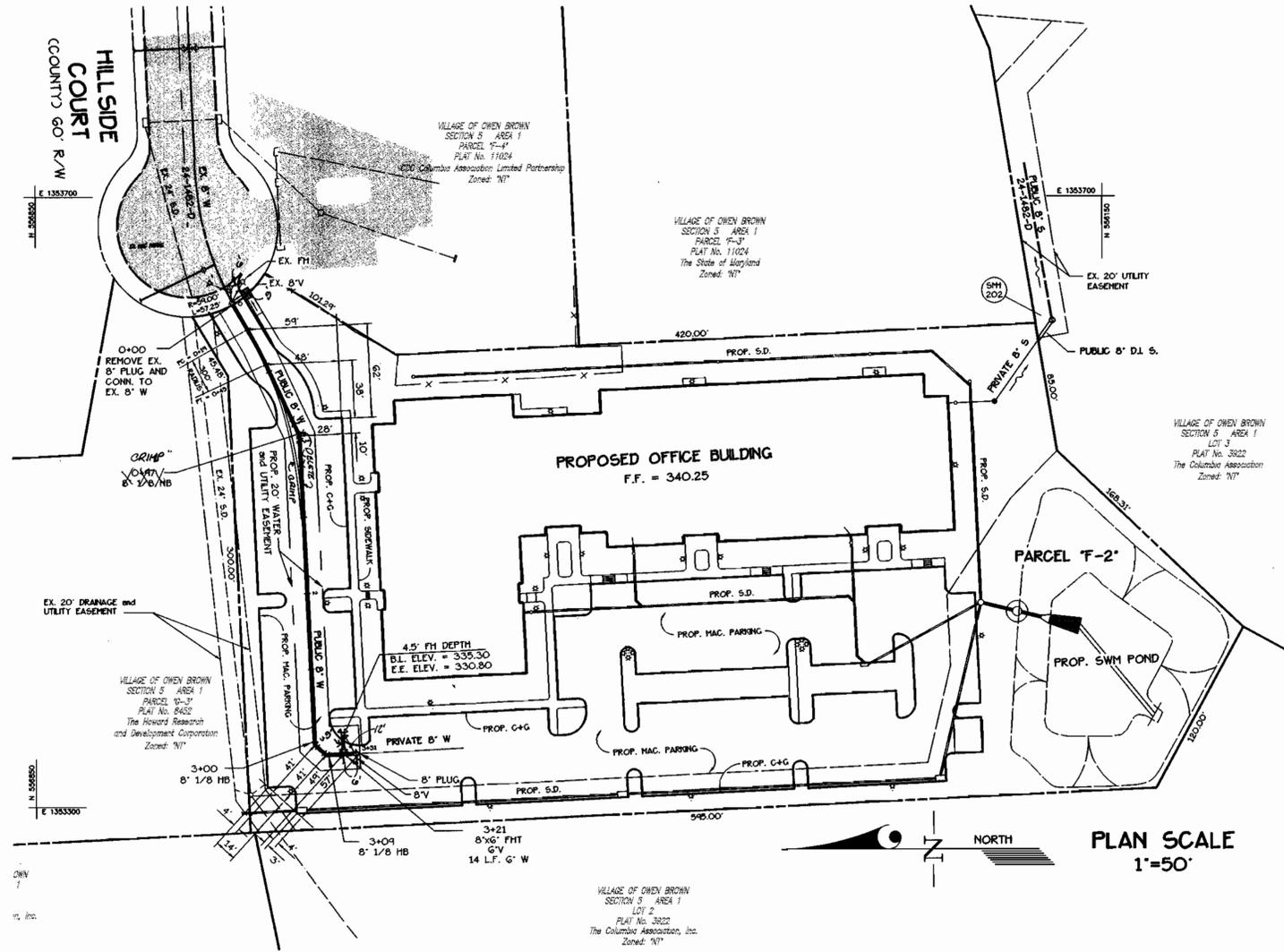
WATER & SEWER COVER SHEET

VILLAGE OF OWEN BROWN
CONTRACT# 24-3887-D
SECTION 5 AREA 1
PARCEL "F-2"
PLAT No. 7044

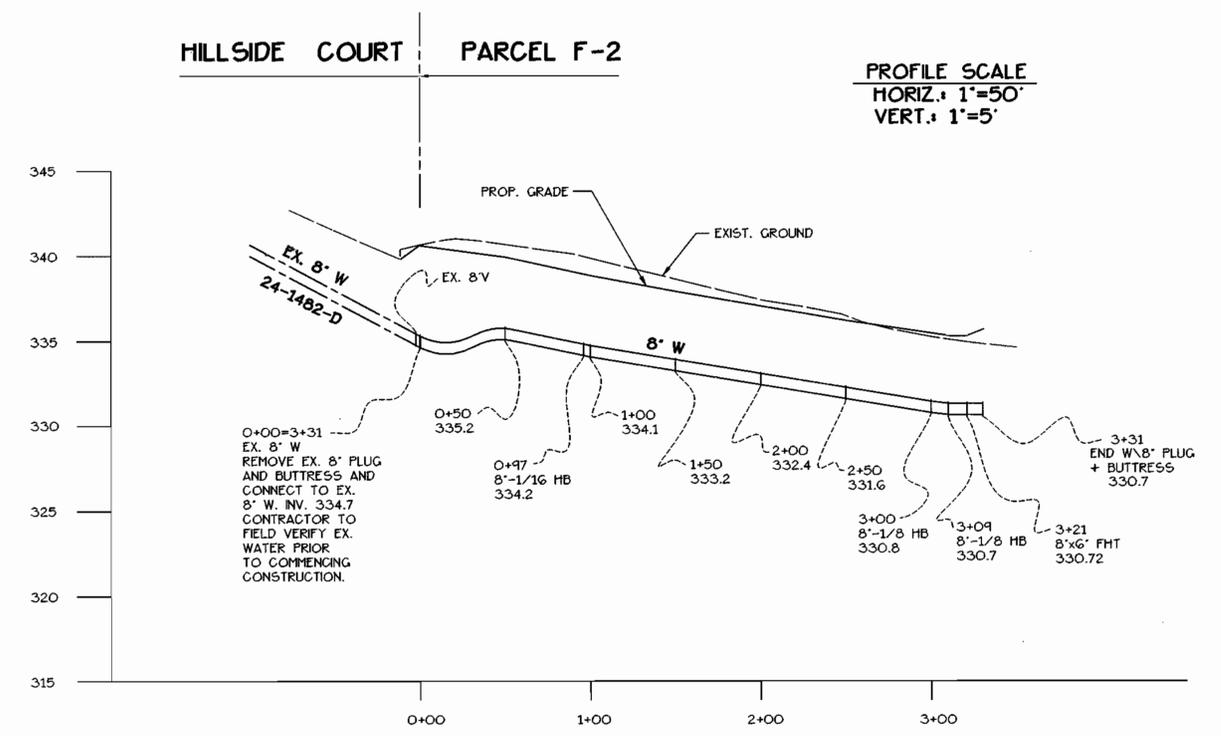
GLW FILE No. 99115

SCALE AS SHOWN

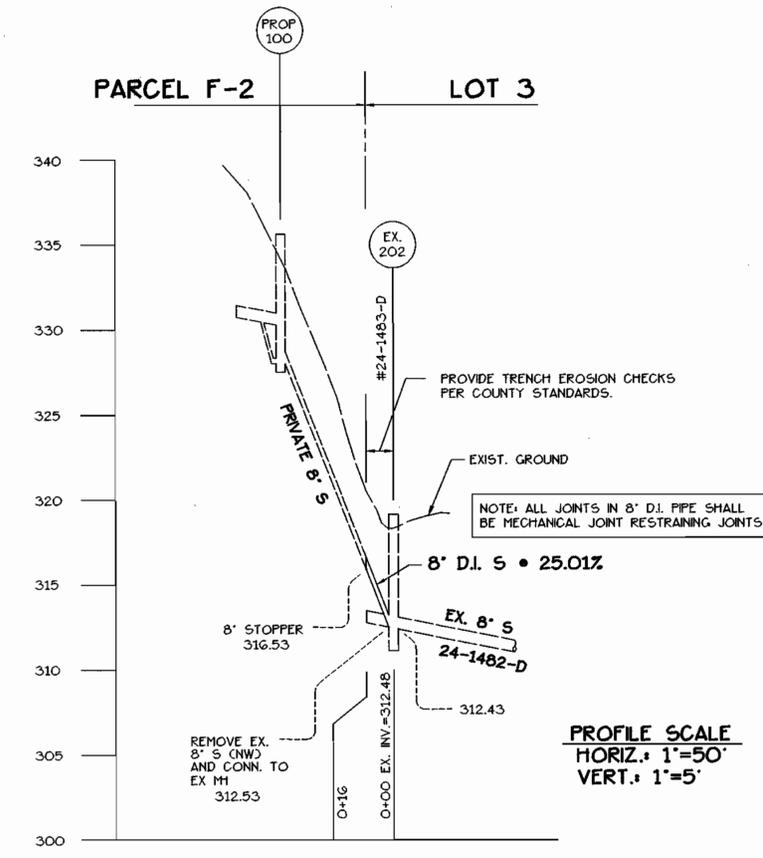
SHEET 1 OF 2



PLAN SCALE
1"=50'



PROFILE SCALE
HORIZ.: 1"=50'
VERT.: 1"=5'



PROFILE SCALE
HORIZ.: 1"=50'
VERT.: 1"=5'

DEPARTMENT OF
PUBLIC WORKS
HOWARD COUNTY, MARYLAND
R. J. [Signature]
CHIEF, BUREAU OF UTILITIES
8-29-00
DATE

DEPARTMENT OF
PLANNING AND ZONING
HOWARD COUNTY, MARYLAND
[Signature]
CHIEF, DEVELOPMENT ENGINEERING DIVISION
DATE

GLW GUTSCHICK LITTLE & WEBER, P.A.
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE - SUITE 250 - BURTONSVILLE OFFICE PARK
BURTONSVILLE, MARYLAND 20886
TEL: 301-421-4024 BALT: 410-380-1620 DC/VA: 301-989-2524 FAX: 301-421-4186

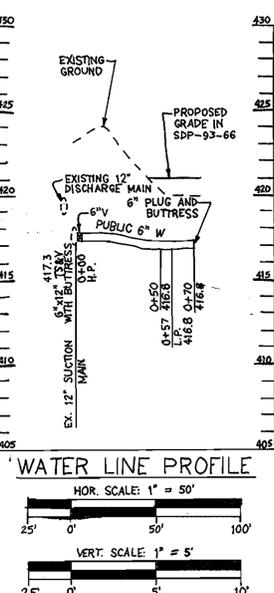
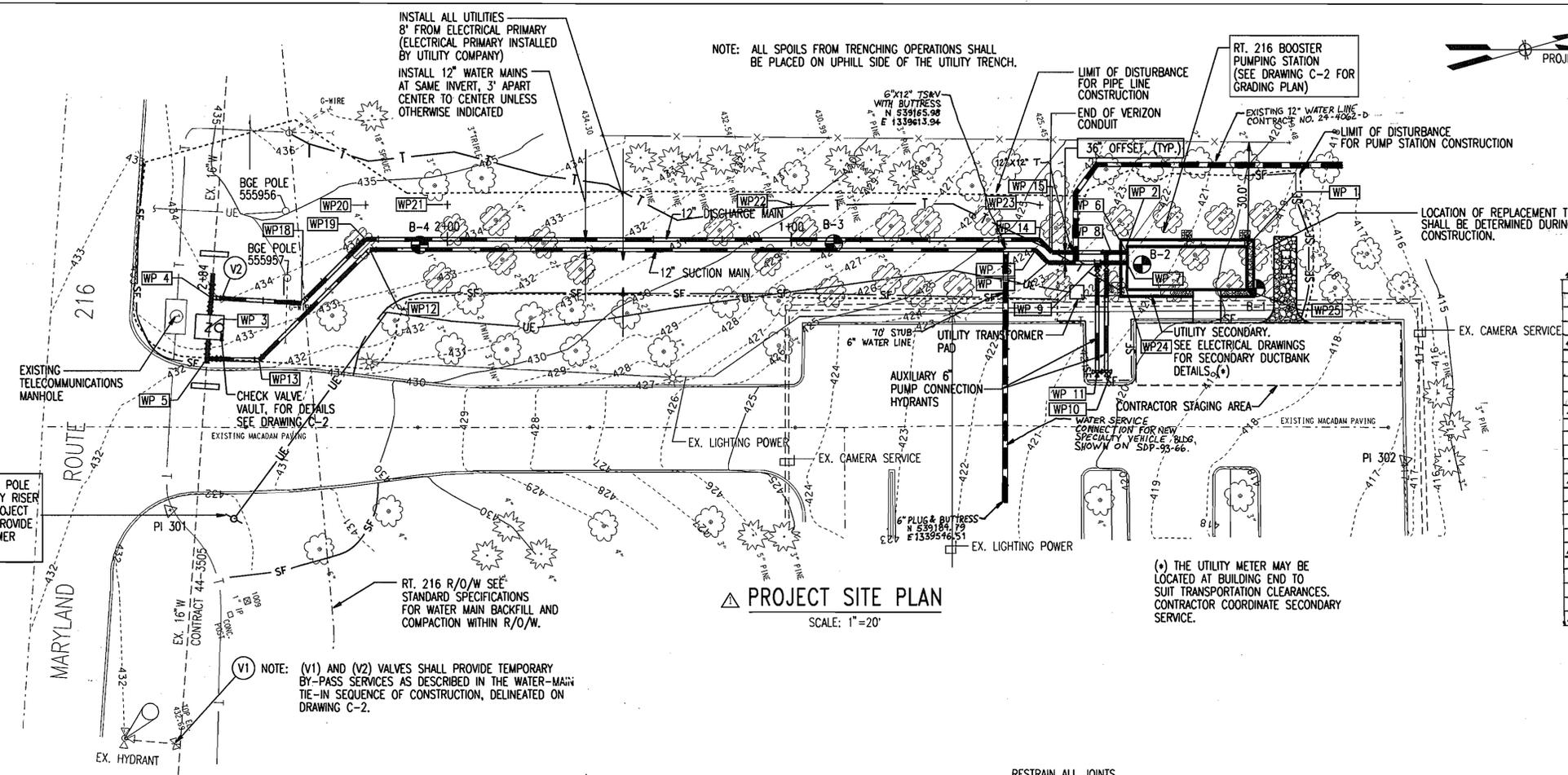
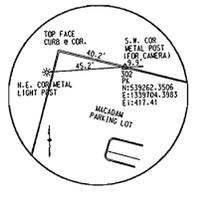
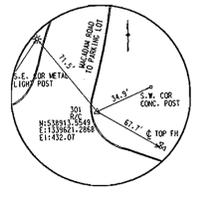


DES:	SCC				
DRN:	BB				
CHK:	SCC				
DATE:	8/00				
BY:	K.C.I.	1	AS-BUILT CONDITIONS ADDED TO PLAN	8/29/01	
NO:			REVISION		

PUBLIC WATER & SEWER
PLAN and PROFILES
600' SCALE MAP NO. 36 BLOCK NO. 14

VILLAGE OF OWEN BROWN
CONTRACT# 24-3887-D
SECTION 5 AREA 1
PARCEL "F-2"
PLAT No. 7044
GILFORD ELECTION DISTRICT No. 6
HOWARD COUNTY, MARYLAND

GLW FILE No.
99115
SCALE
AS
SHOWN
SHEET
2 OF 2

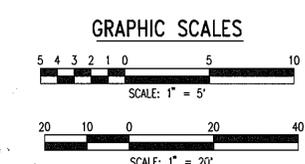
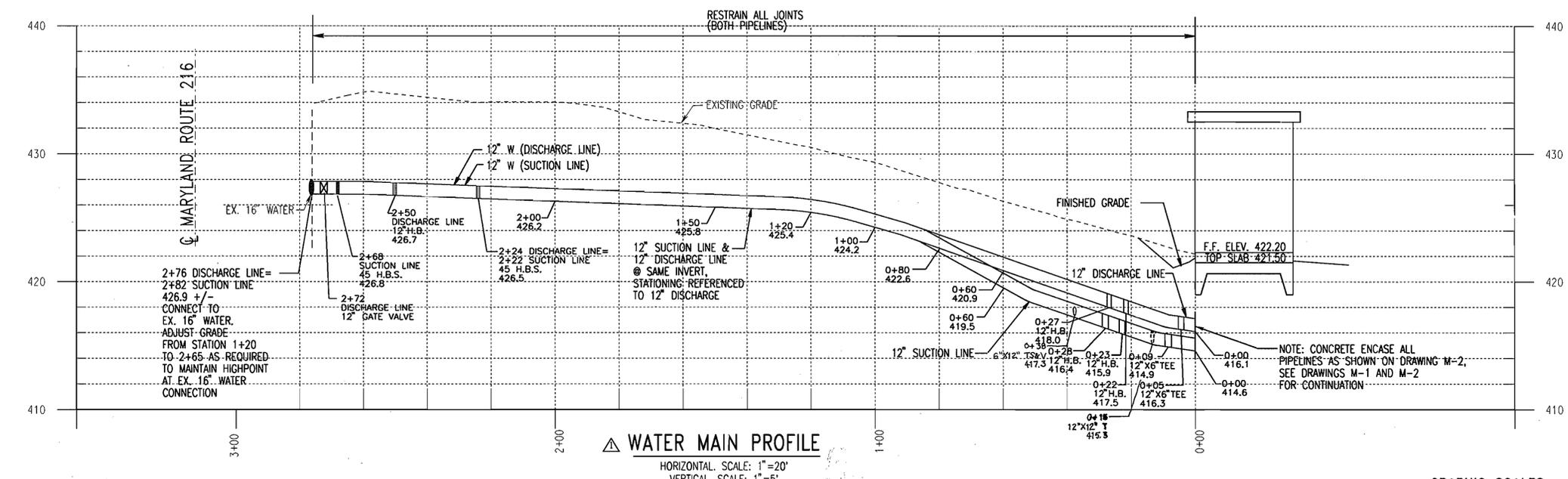


CIVIL/SITE LEGEND

TRAVERSE STATION	△
DECIDUOUS TREE (EX.)	⊗
CONIFEROUS TREE	⊗
FIRE HYDRANT (EX.)	⊗
FIRE HYDRANT (NEW)	⊗
WATER VALVE (EX.)	⊗
WATER VALVE (NEW)	⊗
TELEPHONE MANHOLE	⊗
LIGHT POLE	⊗
UTILITY POLE	⊗
GUY WIRE	⊗
PROPERTY EVIDENCE	⊗
PK NAIL	⊗
SIGN	⊗
FENCE LINE	⊗
UNDERGROUND WATER LINE (EX.)	⊗
UNDERGROUND WATER LINE (NEW)	⊗
UNDERGROUND TELEPHONE LINE (EX.)	⊗
UNDERGROUND TELEPHONE LINE (NEW)	⊗
UNDERGROUND ELECTRIC LINE (NEW)	⊗
EX. DECIDUOUS TREE TO BE REMOVED DURING CONSTRUCTION AND REPLACED IN KIND AND QUANTITY AFTER CONSTRUCTION	⊗
SILT FENCE	⊗
STRAW BAIL DIKE	⊗
LIMIT OF DISTURBANCE	⊗
STABILIZED CONSTRUCTION ENTRANCE	⊗
CONTOURS (EX.)	⊗
CONTOURS (PROPOSED)	⊗
BORING (SEE SPECIFICATIONS FOR BORING LOGS)	⊗
WORKING POINT	⊗

WORKING POINT (WP) SCHEDULE

POINT NO.	DESCRIPTION	NORTH	EAST
POINT NO. 1	NORTH WEST CORNER OF P.S. SLAB	539235.21	1339632.14
POINT NO. 2	SOUTH WEST CORNER OF P.S. SLAB	539201.52	1339622.65
POINT NO. 3	CENTER OF VALVE VAULT MANHOLE (1.)	538938.79	1339573.49
POINT NO. 4	16X12" TEE (DISCHARGE MAIN)	538941.72	1339565.28
POINT NO. 5	16X12" TEE (SUCTION MAIN)	538935.76	1339581.92
POINT NO. 6	12" DISCHARGE MAIN @ P.S. SLAB	539201.00	1339624.49
POINT NO. 7	12" SUCTION MAIN @ P.S. SLAB	539200.19	1339627.38
POINT NO. 8	12X6" TEE (DISCHARGE MAIN)	539196.68	1339623.28
POINT NO. 9	12X6" TEE (SUCTION MAIN)	539192.00	1339625.08
POINT NO. 10	FIRE HYDRANT	539187.32	1339656.62
POINT NO. 11	FIRE HYDRANT	539183.36	1339655.63
POINT NO. 12	45" - 12" SUCTION MAIN	538987.77	1339564.27
POINT NO. 13	45" - 12" SUCTION MAIN	538950.13	1339586.48
POINT NO. 14	45" - 12" DISCHARGE MAIN	539177.59	1339614.07
POINT NO. 15	45" - 12" DISCHARGE MAIN	539180.14	1339618.62
POINT NO. 16	45" - 12" SUCTION MAIN	539175.66	1339616.64
POINT NO. 17	45" - 12" SUCTION MAIN	539178.21	1339621.91
POINT NO. 18	45" - 12" DISCHARGE MAIN	538966.42	1339573.99
POINT NO. 19	45" - 12" DISCHARGE MAIN	538989.39	1339561.04
POINT NO. 20	10' OFFSET 45" HB DISCHARGE LINE	538992.07	1339551.50
POINT NO. 21	10' OFFSET STA. 2+00 DISCH. LINE	539014.93	1339557.83
POINT NO. 22	10' OFFSET STA. 1+00 DISCH. LINE	539111.19	1339584.93
POINT NO. 23	10' OFFSET 45" HB DISCHARGE LINE	539180.44	1339604.53
POINT NO. 24	SOUTH EAST CORNER OF P.S. SLAB	539197.99	1339635.16
POINT NO. 25	NORTH EAST CORNER OF P.S. SLAB	539231.68	1339664.65



(1.) LOCATION OF VALVE VAULT APPROXIMATE. TEST PIT EXISTING WATER LINE AND COORDINATE CONSTRUCTION OF VALVE VAULT AND WATER MAIN CONNECTION WITH RESPECT TO EXISTING PIPING AS REQUIRED FOR FINAL VAULT AND TIE-IN LOCATION.



As-Built

11/21/02
RECORD DRAWING

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND. Director of Public Works: [Signature] DATE: 12/10/02 Chief, Bureau of Utilities: [Signature] DATE: 12-9-02		PREPARED BY: WR&A Whitman, Reardon and Associates, LLP. 2315 St. Paul St. Baltimore, Md. 21218 410-235-3450		DES: WFH DRN: EM CHK: WRD DATE: 9/20/00		ADDENDUM DRAWING UTILITY PLAN/PROFILE AND SEDIMENT AND EROSION CONTROL PLAN 600' SCALE MAP NO. 46 BLOCK NO. 4		MD 216 BOOSTER PUMPING STATION CONTRACT NO. 44-3886 CAPITAL PROJECT NO. W-8212 HOWARD COUNTY, MARYLAND SCALE AS SHOWN SHEET 2 OF 14	
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