

ROUTE 216 PUMPING STATION UPGRADE HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS

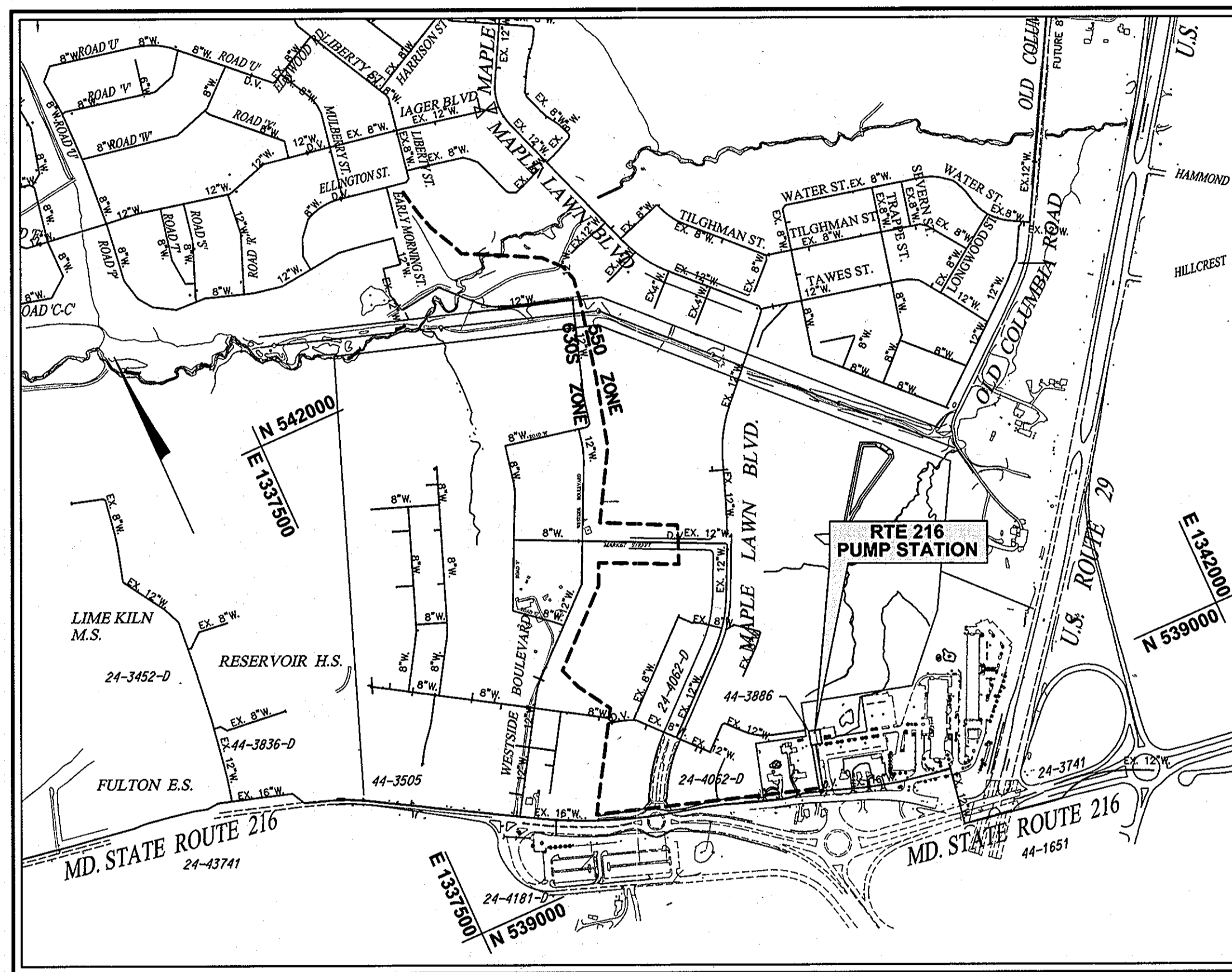
CAPITAL PROJECT No. W8280

CONTRACT NO. 44-4579

GENERAL NOTES

- APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS TO PROTECT EXISTING STRUCTURES, UTILITIES AND SERVICES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE.
- TOPOGRAPHIC FIELD SURVEYS WERE PERFORMED IN FEBRUARY 2008 BY KCI TECHNOLOGIES, INC.
- THE CONTRACTOR SHALL PROVIDE SURVEY CONSTRUCTION STAKEOUT FOR ALL NECESSARY LINES, GRADES AND ELEVATION OF THE PROPOSED FACILITY.
- ALL EXCAVATION SHALL BE KEPT FREE OF WATER UNTIL BACKFILL IS PROPERLY TAMPED IN PLACE TO FINISHED GRADE.
- FOR DETAILS NOT SHOWN ON THE DRAWINGS, AND FOR MATERIALS AND CONSTRUCTION METHODS, USE HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (LATEST EDITION). THE CONTRACTOR SHALL HAVE A COPY OF VOLUME IV AT THE JOB SITE.
- CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS.

AT&T	1-800-252-1133
BG&E (CONSTRUCTION SERVICES)	410-850-4620
BG&E (EMERGENCY)	410-685-1400
BUREAU OF UTILITIES (DPW)	410-313-4900
COLONIAL PIPELINE CO.	410-795-1390
MISS UTILITY	1-800-257-7777
STATE HIGHWAY ADMINISTRATION	410-531-5533
VERIZON	1-800-743-0033 / 410-224-9210
- CONTRACTOR SHALL REMOVE TREES, STUMPS AND ROOTS ALONG THE LINE OF EXCAVATION. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONSTRUCTION OF THE RESPECTIVE FEATURES AND FACILITIES SHOWN HEREIN.
- TREES AND SHRUBS OUTSIDE THE LOD SHALL BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT. TREES AND SHRUBS WITHIN THE CONSTRUCTION AREA ARE NOT TO BE REMOVED UNLESS DESIGNATED FOR REMOVAL ON THE PLANS OR AS DIRECTED BY ENGINEER.
- THE CONTRACTOR SHALL NOT OPERATE ANY WATER VALVES ON THE EXISTING WATER SYSTEM. THE CONTRACTOR SHALL NOTIFY THE BUREAU OF UTILITIES, HOWARD COUNTY 15 DAYS PRIOR TO WATER MAIN SHUT DOWNS.
- CLEAR ALL UTILITIES BY A MINIMUM OF 12". CLEAR ALL POLES BY 5'-0" MINIMUM OR TUNNEL AS REQUIRED UNLESS OTHERWISE NOTED. THE OWNER HAS CONTACTED 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 THE BRACING OF ADDITIONAL POLES OR DAMAGES SHALL BE DEDUCTED FROM MONIES OWED THE CONTRACTOR. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO SCHEDULE THE BRACING OF THE POLES



TYPE OF BUILDING: N/A
 NUMBER OF PARCELS: N/A
 DRAINAGE AREA: HAMMOND BRANCH
 PRESSURE ZONE: 550/630S

VICINITY MAP
 SCALE: 1" = 600'

NO. OF WHC: 0
 NO. OF SHC: 0

DIRECTIONS: TAKE ROUTE 216 WEST FROM 1-95. PASS OVER U.S. 29 TURN RIGHT AT FIRST TRAFFIC CIRCLE, ENTER COUNTY ANNEX PARKING LOT, SITE ON LEFT.

ADJACENT WATER & SEWER FACILITY CONTRACTS:

- | | |
|---------------------|---|
| YR. 1987, 44-1651 | MD. RTE. 216 ROUTINE WATER EXTENSION |
| YR. 1996, 44-3505 | WESTERN SCHOOL COMPLEX WATER MAIN EXTENSION |
| YR. 1996, 24-3452-D | WESTERN ELEMENTARY SCHOOL NO. 2 PARCEL NO. 115 WATER AND SEWER |
| YR. 1998, 24-3741 | MD. RTE. 216 AND U.S. RTE. 29 12-INCH WATER AND 8-INCH SEWER RELOCATION |
| YR. 2000, 44-3886 | MD. RTE. 216 BOOSTER PUMPING STATION |
| YR. 2000, 44-3836-D | EASTERN HIGH SCHOOL NO. 2 WATER SERVICE |
| YR. 2003, 24-4062-D | MAPLE LAWN FARMS BUSINESS DISTRICT - AREA -1 |
| YR. 2004, 24-4181-D | GRACE COMMUNITY CHURCH WATER AND SEWER |

HORIZONTAL & VERTICAL CONTROL

THE HORIZONTAL AND VERTICAL CONTROL BASED ON MARYLAND NAD 83/91 (HORIZONTAL) AND NAVD '88 (VERTICAL) DATUM. HOWARD COUNTY GEODETIC SURVEY CONTROL NUMBERS

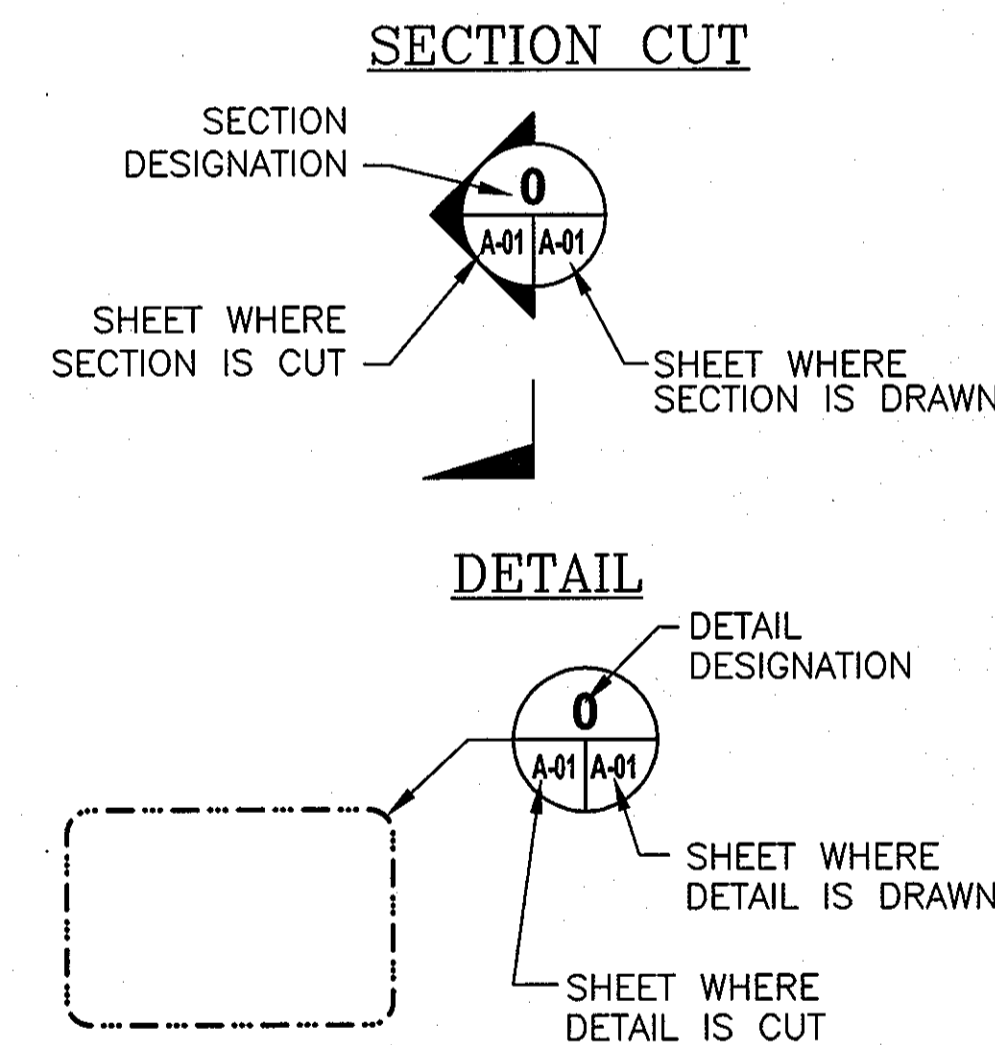
NO. 46BC N 539925.113 E 1337205.733 ELEV. 472.028	NO. 41GD N 541496.623 E 1333747.187 ELEV. 463.443
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PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 14364, Expiration Date 03/29/09

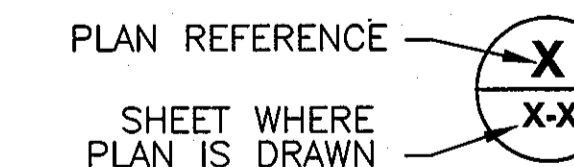
INDEX OF SHEETS

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C-2	ENLARGED SITE PLAN
SC-1	SEDIMENT AND EROSION CONTROL NOTES AND DETAILS
ME-1	PUMP STATION SCHEMATIC SYSTEM CURVES AND DESIGN CRITERIA
ME-2	EXISTING PUMP STATION DEMOLITION
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I-2	PROCESS & INSTRUMENTATION DIAGRAM AND RISER DIAGRAMS
I-3	CONTROL DIAGRAMS

DRAWING SYMBOLS

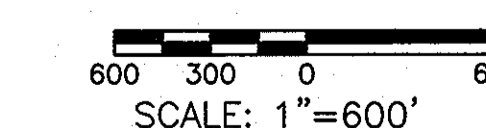


PLAN/SCHEMATIC REFERENCE



AS-BUILT
 DATE 2/24/2010

GRAPHIC SCALE

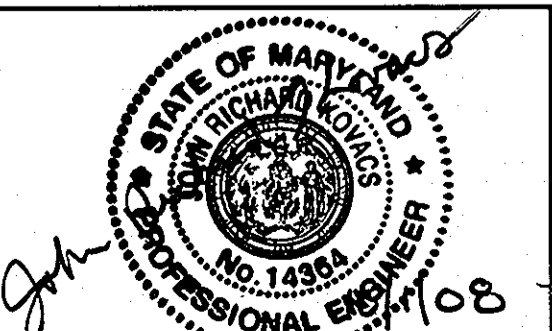


RTE 216 PUMP STATION UPGRADE
 CAPITAL PROJECT No. W8280
 CONTRACT No. 44-4579
 ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

<i>[Signature]</i> DIRECTOR OF PUBLIC WORKS DATE 10/1/08	<i>[Signature]</i> CHIEF, BUREAU OF ENGINEERING DATE 10/1/08
<i>[Signature]</i> CHIEF, BUREAU OF UTILITIES DATE 10/1/08	<i>[Signature]</i> CHIEF, UTILITY DESIGN DIVISION DATE 10/1/08

KCI TECHNOLOGIES
 ENGINEERS
 PLANNERS
 SCIENTISTS
 CONSTRUCTION MANAGERS
 10 NORTH PARK DRIVE
 HUNT VALLEY, MD 21030
 PHONE: (410) 316-7800
 FAX: (410) 316-7817
 WWW.KCI.COM



DES: SEA					
DRN: LFN					
CHK: JRK					
DATE: 9/08	LFN	AS BUILT	2/24/10		
	BY	NO.	REVISION	DATE	

600' SCALE MAP NO. 46 BLOCK NO. 4

G-1
 SCALE AS SHOWN
 SHEET 1 OF 11

Sep 30, 2008 - 3:30pm User: jones, jones, kci Drawing: RTE 216 UPGRADE-310-1 TITLE SHEET.dwg

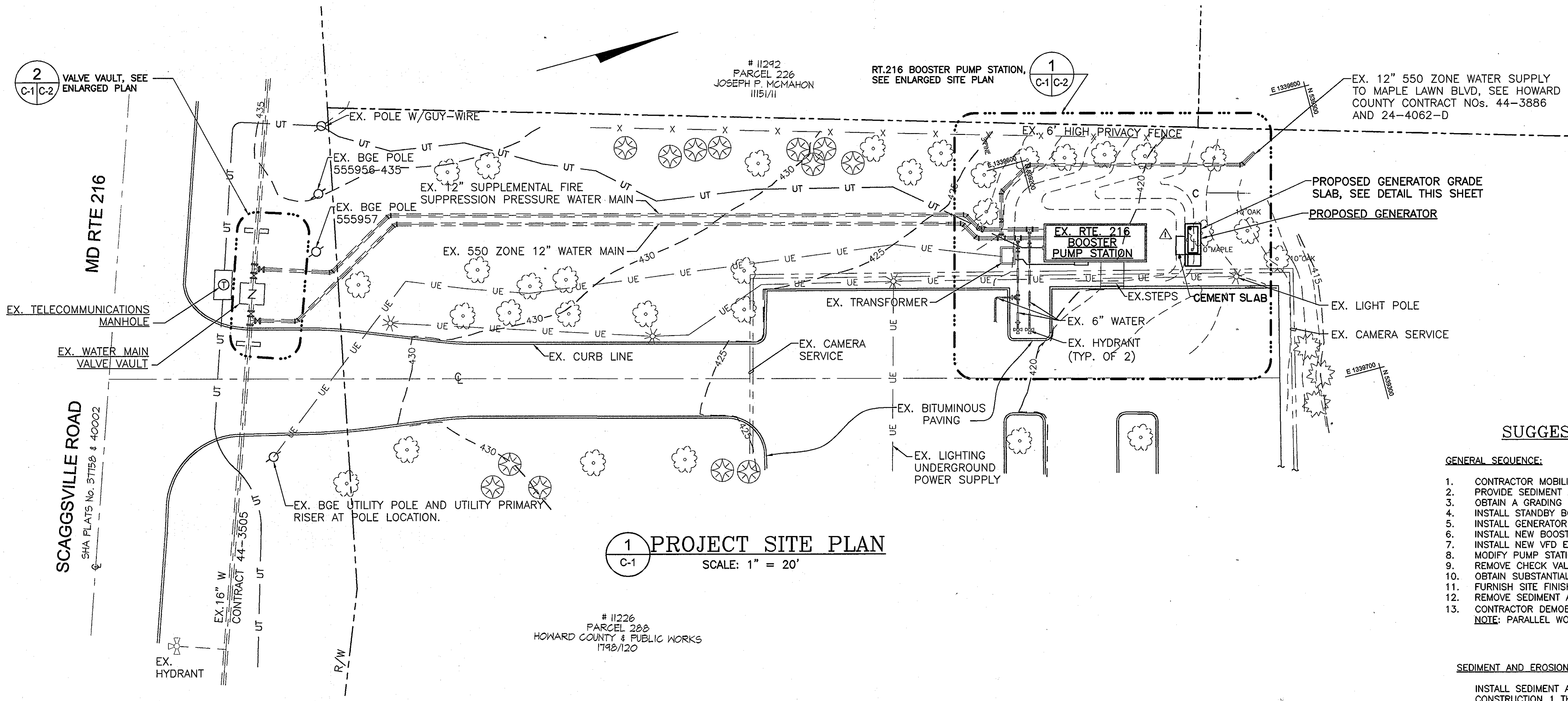
CIVIL/SITE LEGEND:

- DECIDUOUS TREE
- CONIFEROUS TREE
- FIRE HYDRANT
- WATER VALVE
- TELEPHONE MANHOLE
- LIGHT POLE
- UTILITY POLE
- GUY WIRE
- FENCE LINE
- UNDERGROUND WATER LINE
- UNDERGROUND TELEPHONE LINE
- CONTOURS
- UNDERGROUND ELECTRIC
- PROPOSED FEATURES
- RIGHT OF WAY
- PROPERTY LINE

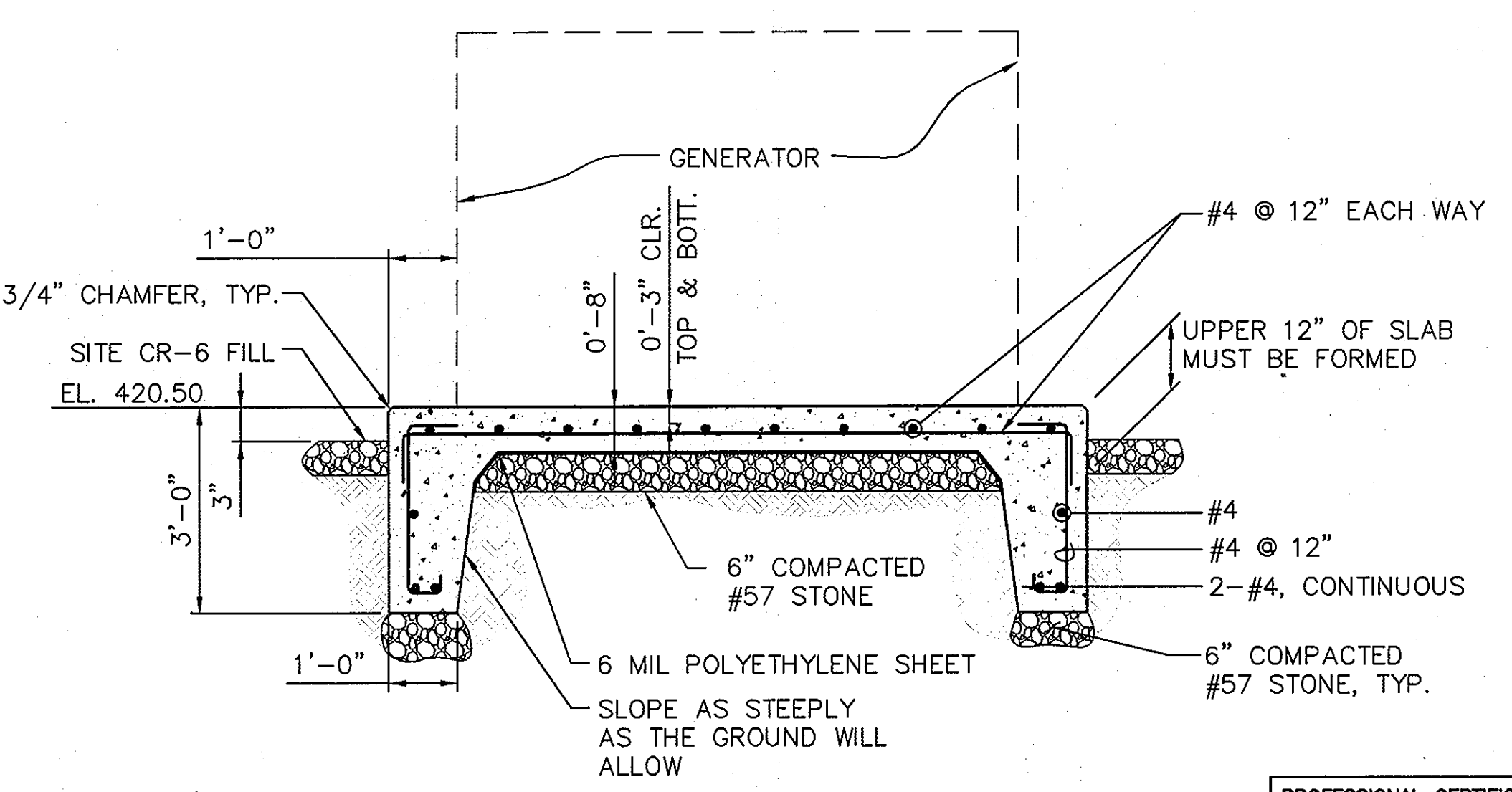
SUGGESTED SEQUENCE OF CONSTRUCTION

- GENERAL SEQUENCE:**
1. CONTRACTOR MOBILIZATION.
 2. PROVIDE SEDIMENT AND EROSION CONTROL MEASURES.
 3. OBTAIN A GRADING PERMIT.
 4. INSTALL STANDBY BOOSTER PUMPING SYSTEM.
 5. INSTALL GENERATOR FACILITIES.
 6. INSTALL NEW BOOSTER PUMP EQUIPMENT AND APPURTENANCES.
 7. INSTALL NEW VFD EQUIPMENT.
 8. MODIFY PUMP STATION CONTROLS.
 9. REMOVE CHECK VALVE FROM VALVE VAULT.
 10. OBTAIN SUBSTANTIAL COMPLETION.
 11. FURNISH SITE FINISH GRADING AND SEEDING.
 12. REMOVE SEDIMENT AND EROSION CONTROL MEASURES.
 13. CONTRACTOR DEMOBILIZATION / CONTRACT CLOSE-OUT.
- NOTE:** PARALLEL WORK EFFORTS ARE NOT DEFINED.

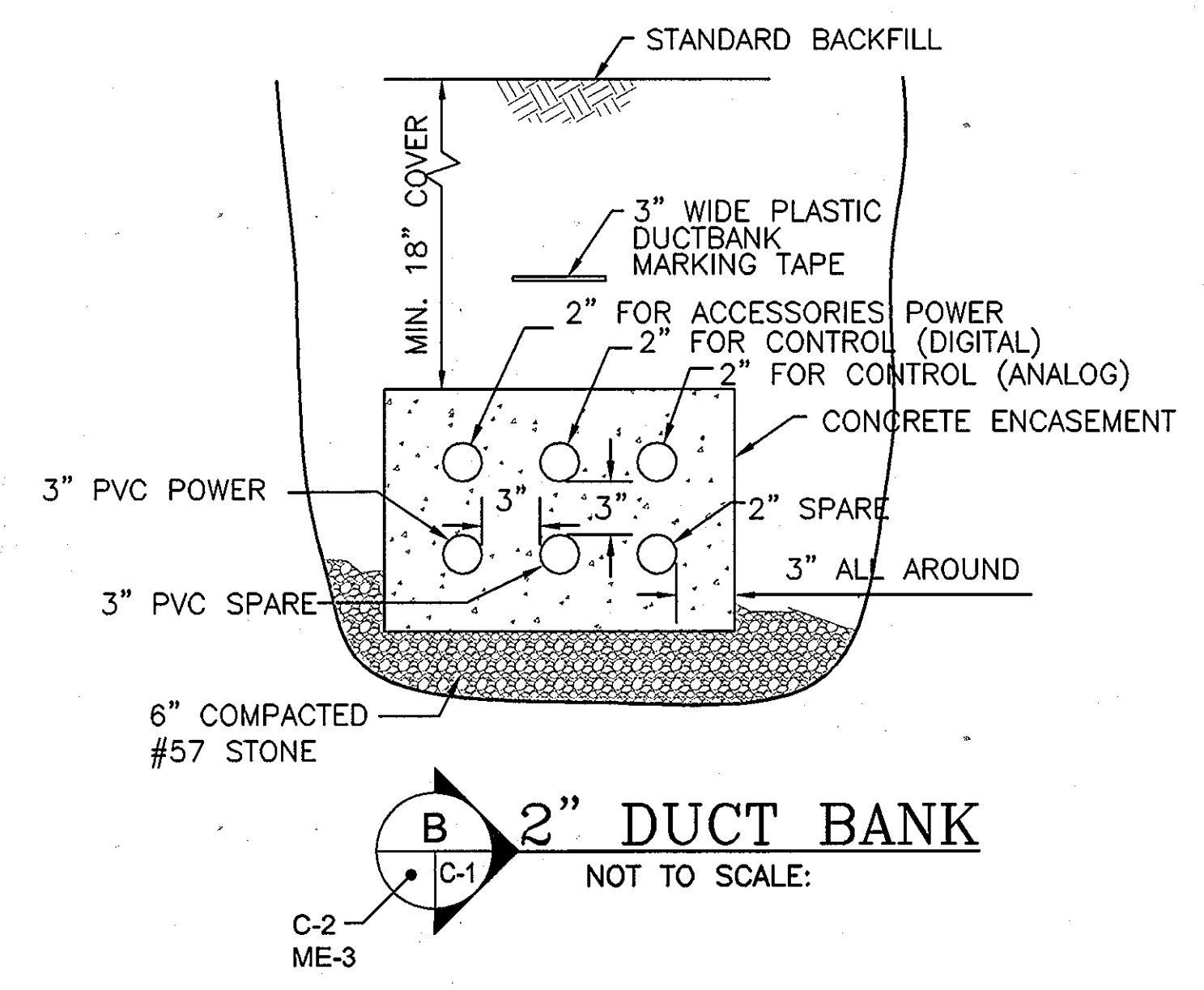
- SEDIMENT AND EROSION CONTROL:**
- INSTALL SEDIMENT AND EROSION CONTROL MEASURES PER SUGGESTED SEQUENCE OF CONSTRUCTION 1 THRU 8 - SEDIMENT AND EROSION CONTROL NOTES AND DETAILS, SC-1 SHEET 4.
- MECHANICAL:**
- INSTALL PUMP STATION PUMPS, VALVES, AND PIPING PER SUGGESTED SEQUENCE OF CONSTRUCTION 1 THRU 11 - EXISTING PUMP STATION DEMOLITION, ME-2 SHEET 6.
- ELECTRICAL AND CONTROLS:**
- INSTALL ELECTRICAL PER SUGGESTED SEQUENCE OF CONSTRUCTION 1 THRU 10 - SINGLE-LINE DIAGRAM AND PROPOSED LOADS, E-1 SHEET 8.



1 PROJECT SITE PLAN
SCALE: 1" = 20'



A GENERATOR GRADE SLAB SECTION
SCALE: 1/2" = 1'-0"



B 2\"/>

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 33925, Expiration Date 01/15/09

AS-BUILT
DATE: 2/24/2010

GRAPHIC SCALE
SCALE: 1" = 20'
SCALE: 1/2" = 1'-0"

Oct 01, 2008 - 11:15am User: hweez.nweezk
 M:\2007\01070400\Drawings\RT 216 UPGRADE-3\C-1 SITE PLAN LEGEND AND DETAILS.dwg

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 Director of Public Works: *John A. White* 10/1/08
 Chief, Bureau of Engineering: *Paul J. Simon* 10/1/08
 Chief, Bureau of Utilities: *Steve C. Green* 10/1/08
 Chief, Utility Design Division: *Dr. On Iwu* 10-1-08

KCI TECHNOLOGIES
 ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS
 10 North Park Drive
 Hunt Valley, MD 21030
 Phone: (410) 316-7800
 Fax: (410) 316-7817
 www.kci.com

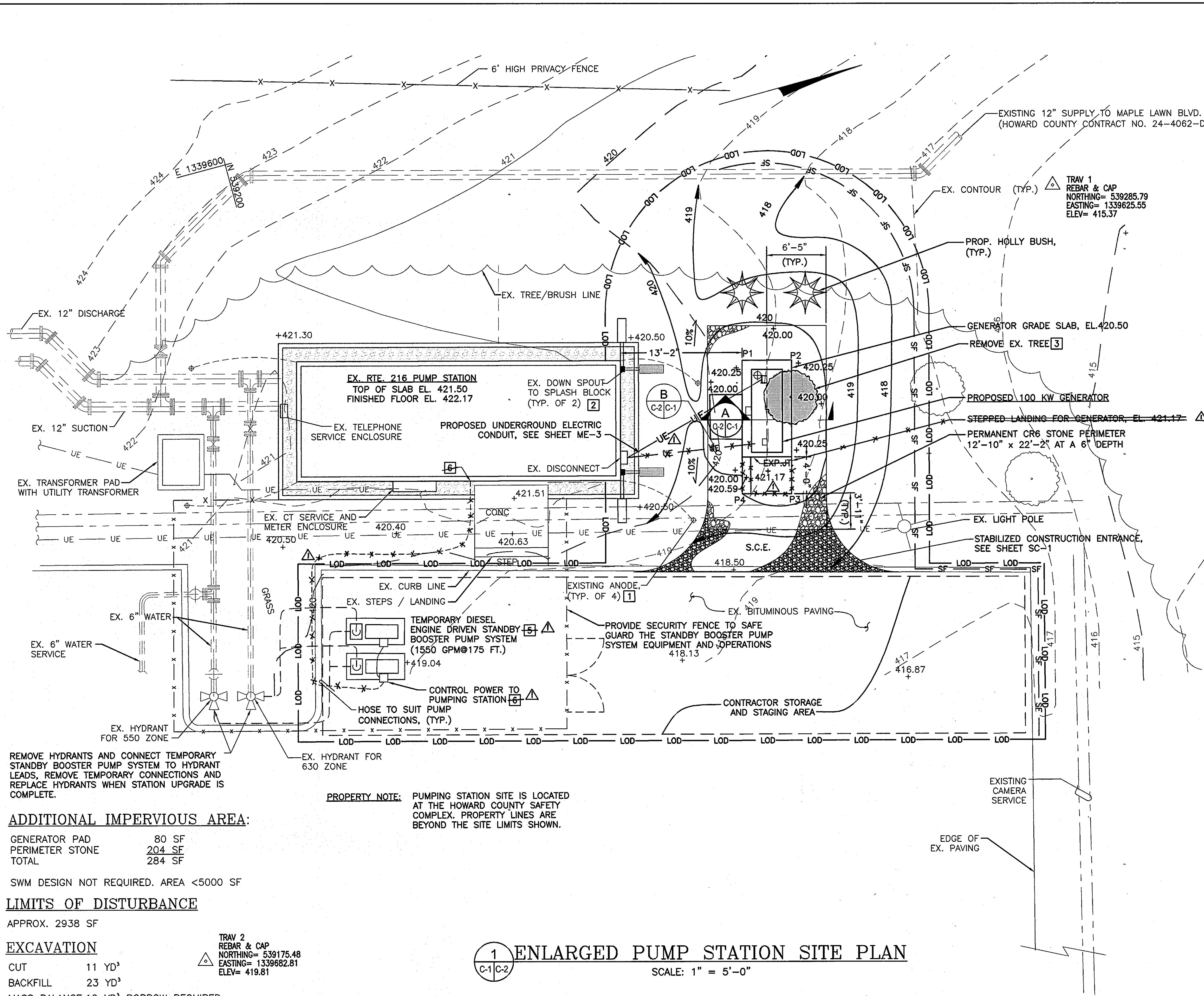
STATE OF MARYLAND
 PROFESSIONAL ENGINEER
 License No. 33925
 Expiration Date 01/15/09

DES:	SEA				
DRN:	LFN				
CHK:	JRK				
DATE:	9/08				
BY:	LFN	AS BUILT			2/24/10
NO.:					
REVISION:					

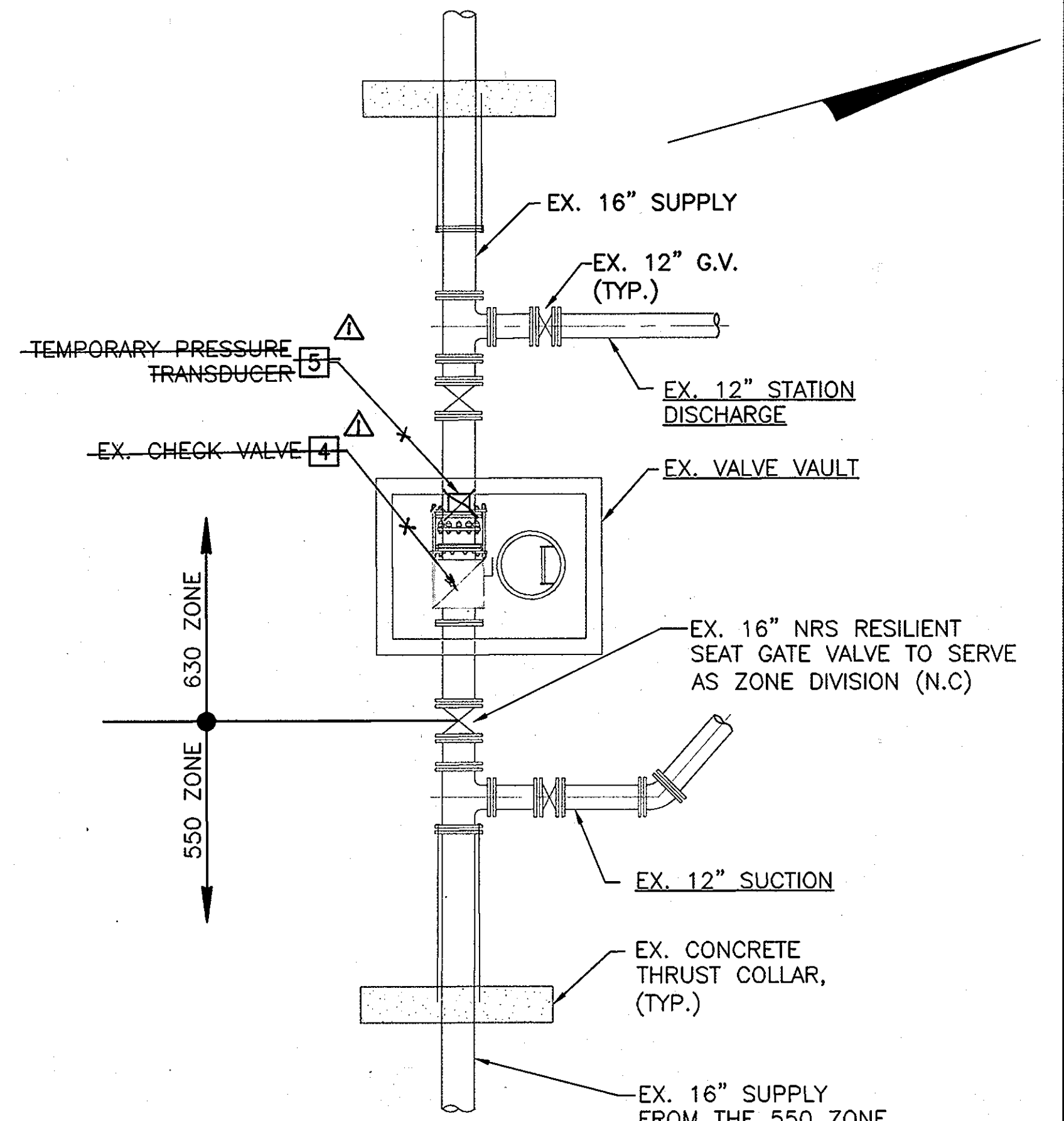
SITE PLAN, LEGEND AND DETAILS
 600' SCALE MAP NO. 46 BLOCK NO. 4

RTE 216 PUMP STATION UPGRADE
 CAPITAL PROJECT No. W8280
 CONTRACT No. 44-4579
 ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

C-1
 SCALE AS SHOWN
 SHEET 2 OF 11



1 ENLARGED PUMP STATION SITE PLAN
SCALE: 1" = 5'-0"



2 VALVE VAULT PARTIAL PLAN
SCALE: 1" = 5'-0"

LEGEND:

- EXISTING FEATURES
- PROPOSED FEATURES
- 419 EXISTING CONTOURS
- 419 PROPOSED CONTOURS
- REMOVALS
- SF SILT FENCE
- LOD LIMITS OF DISTURBANCE
- UE UNDERGROUND ELECTRIC
- △ TRAVERSE POINT

REQUIRED MODIFICATIONS:

- 1 CONTRACTOR SHALL LOCATE EXISTING ANODES FOR REPLACEMENT.
- 2 RELOCATE DOWN SPOUT EXTENSION AND SPLASH BLOCKS TO SUIT PROPOSED GRADING MODIFICATIONS.
- 3 REMOVE TREE INDICATED TO ACCOMMODATE NEW GENERATOR INSTALLATION.
- 4 REMOVE EXISTING 16 INCH SWING CHECK VALVE, PROVIDE PIPE SPOOL TO SUIT, TURN OVER CHECK VALVE TO COUNTY.
- 5 INSTALLATION OF THE STANDBY BOOSTER PUMPING SYSTEM SHALL REQUIRE A TEMPORARY PRESSURE TRANSDUCER FOR REMOTE PRESSURE MONITORING OPERATIONS. THE TRANSDUCER SHALL BE INCLUDED WITH THE BOOSTER PUMPING SYSTEM. TEMPORARY POWER AND SIGNAL WIRING SHALL BE RUN FROM THE STANDBY SYSTEM CONTROLLER TO THE VALVE VAULT. PUMP RUN STATUS AND FAIL ALARMS SHALL BE TEMPORARILY CONNECTED TO THE RTE 216 PUMP STATION SCADA SYSTEM CONTROLLER. CONTRACTOR COORDINATE TEMPORARY POWER.
- 6 PROVIDE 2#12 & 1#12 GND AND 1" PVC CONDUIT TO PANEL RP. CONTRACTOR TO INSTALL PER NEC MINIMUM COVER REQUIREMENTS. PENETRATE EXTERIOR WALL OF PUMPING STATION, SEAL AGAINST MOISTURE. WHEN ROUTING UNDERGROUND BRANCH CIRCUIT, MAINTAIN FIVE FOOT CLEARANCE FROM FENCE POST AND OTHER METALLIC OBSTRUCTIONS.

LOCATION COORDINATES		
POINT	NORTH	EAST
P1	539248.45	1339635.05
P2	539253.60	1339636.43
P3	539249.86	1339650.44
P4	539244.71	1339649.06

REMOVE HYDRANTS AND CONNECT TEMPORARY STANDBY BOOSTER PUMP SYSTEM TO HYDRANT LEADS, REMOVE TEMPORARY CONNECTIONS AND REPLACE HYDRANTS WHEN STATION UPGRADE IS COMPLETE.

ADDITIONAL IMPERVIOUS AREA:
GENERATOR PAD 80 SF
PERIMETER STONE 204 SF
TOTAL 284 SF

SWM DESIGN NOT REQUIRED. AREA <5000 SF

LIMITS OF DISTURBANCE

APPROX. 2938 SF

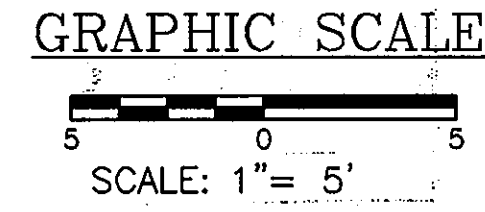
EXCAVATION

CUT 11 YD³
BACKFILL 23 YD³
MASS BALANCE 12 YD³ BORROW REQUIRED

TRAV 2
REBAR & CAP
NORTHING= 539175.48
EASTING= 1339682.81
ELEV= 419.81

PROPERTY NOTE: PUMPING STATION SITE IS LOCATED AT THE HOWARD COUNTY SAFETY COMPLEX. PROPERTY LINES ARE BEYOND THE SITE LIMITS SHOWN.

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 33925, Expiration Date 01/15/09



AS-BUILT
DATE 2/24/2010

Oct 01, 2008 - 11:16am User: hmwznewark File: hmwznewark\Drawings\RT216 UPGRADE\3-C-2 SITE PLAN AND DETAILS.DWG

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* 10/1/08
Chief, Bureau of Engineering: *[Signature]* 10/1/08
Chief, Bureau of Utilities: *[Signature]* 10/1/08
Chief, Utility Design Division: *[Signature]* 10/1/08

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

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Fax: (410) 316-7817
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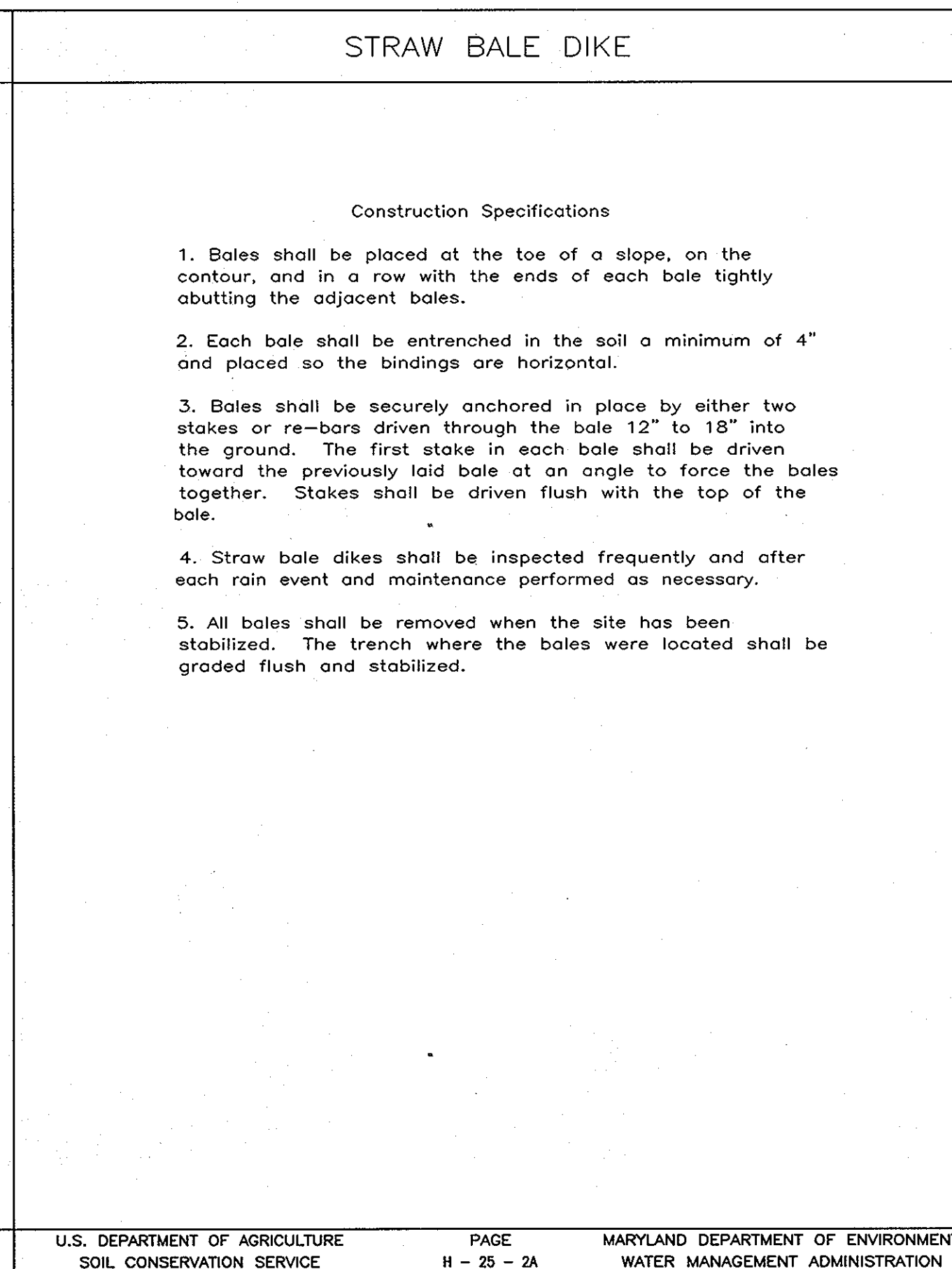
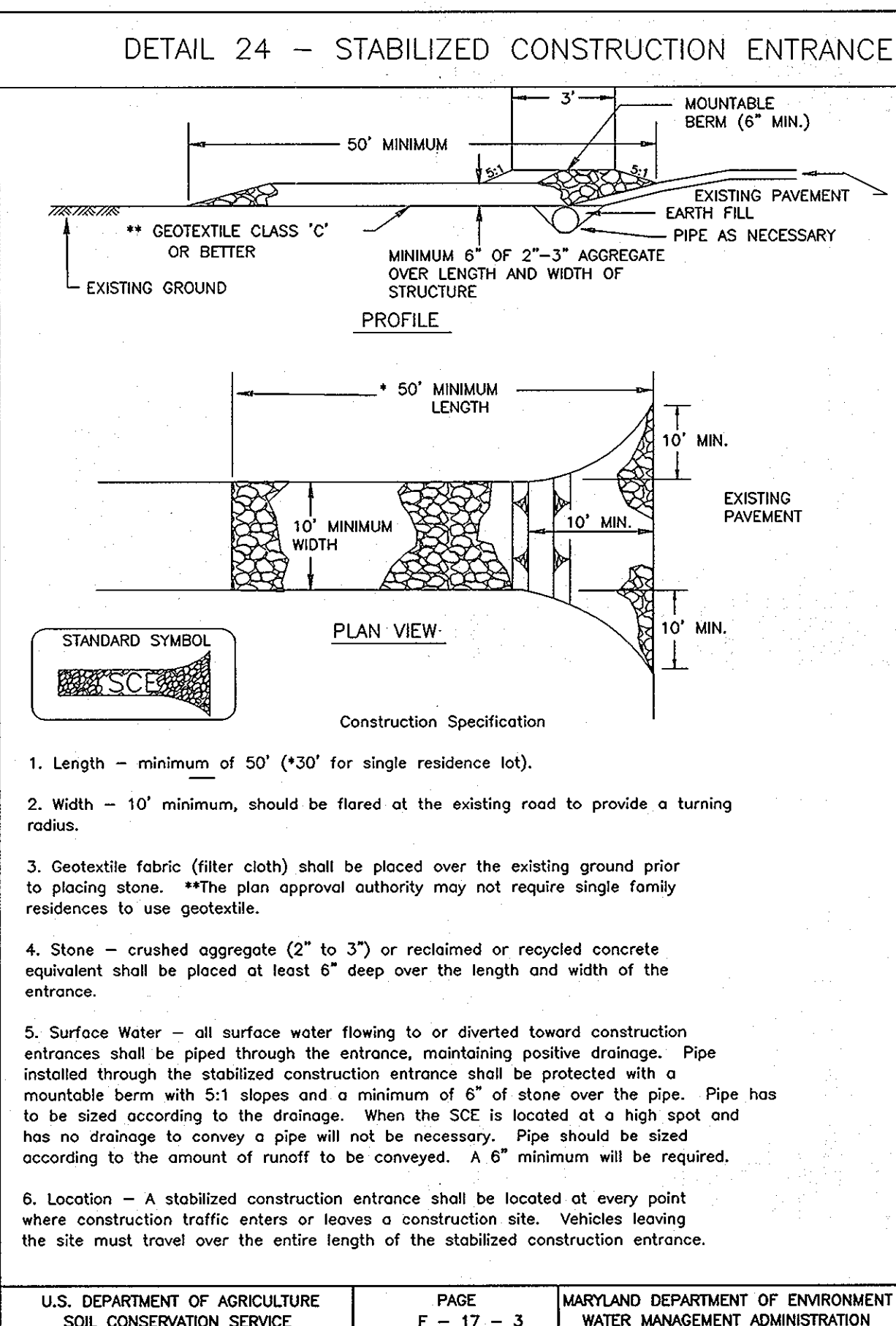
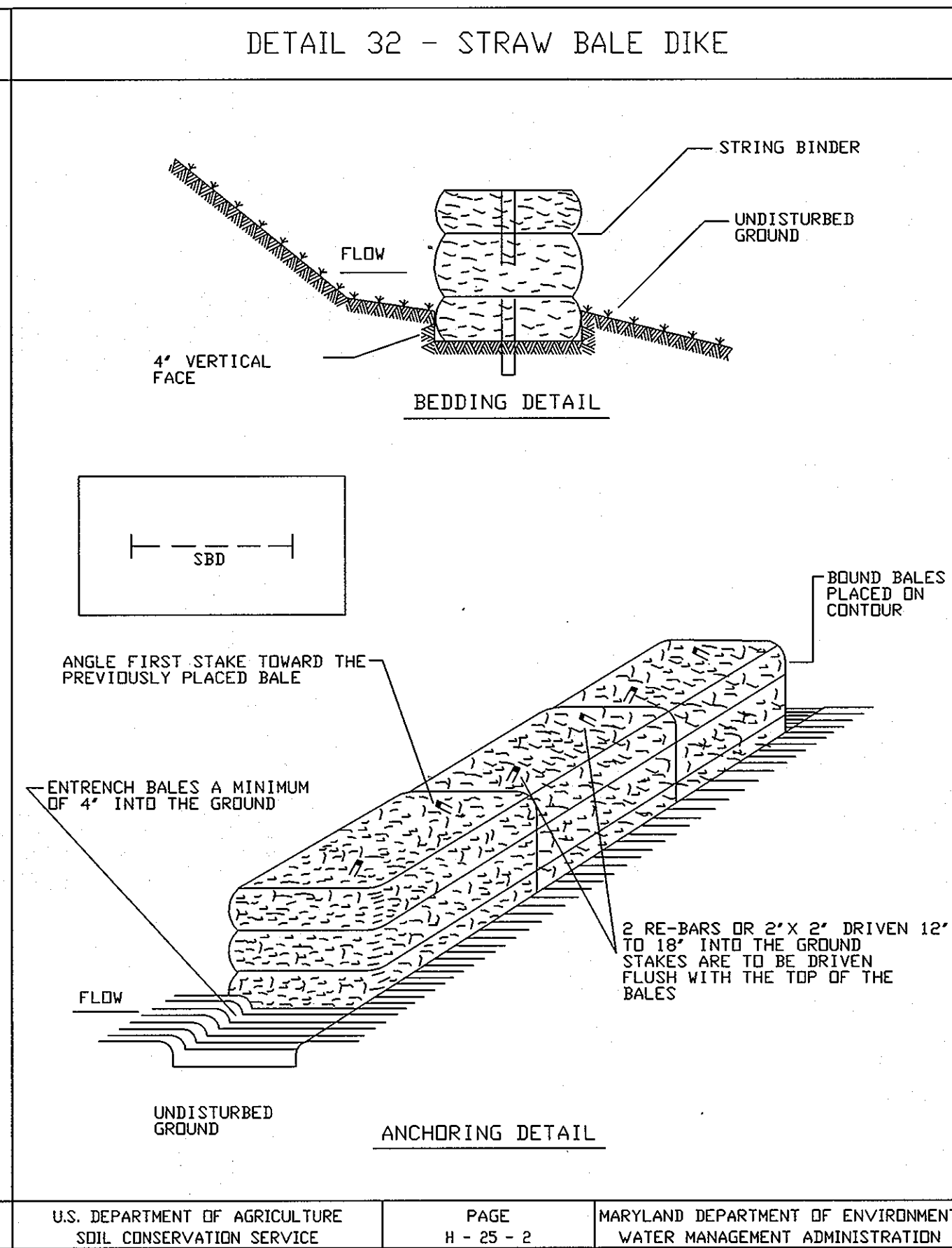
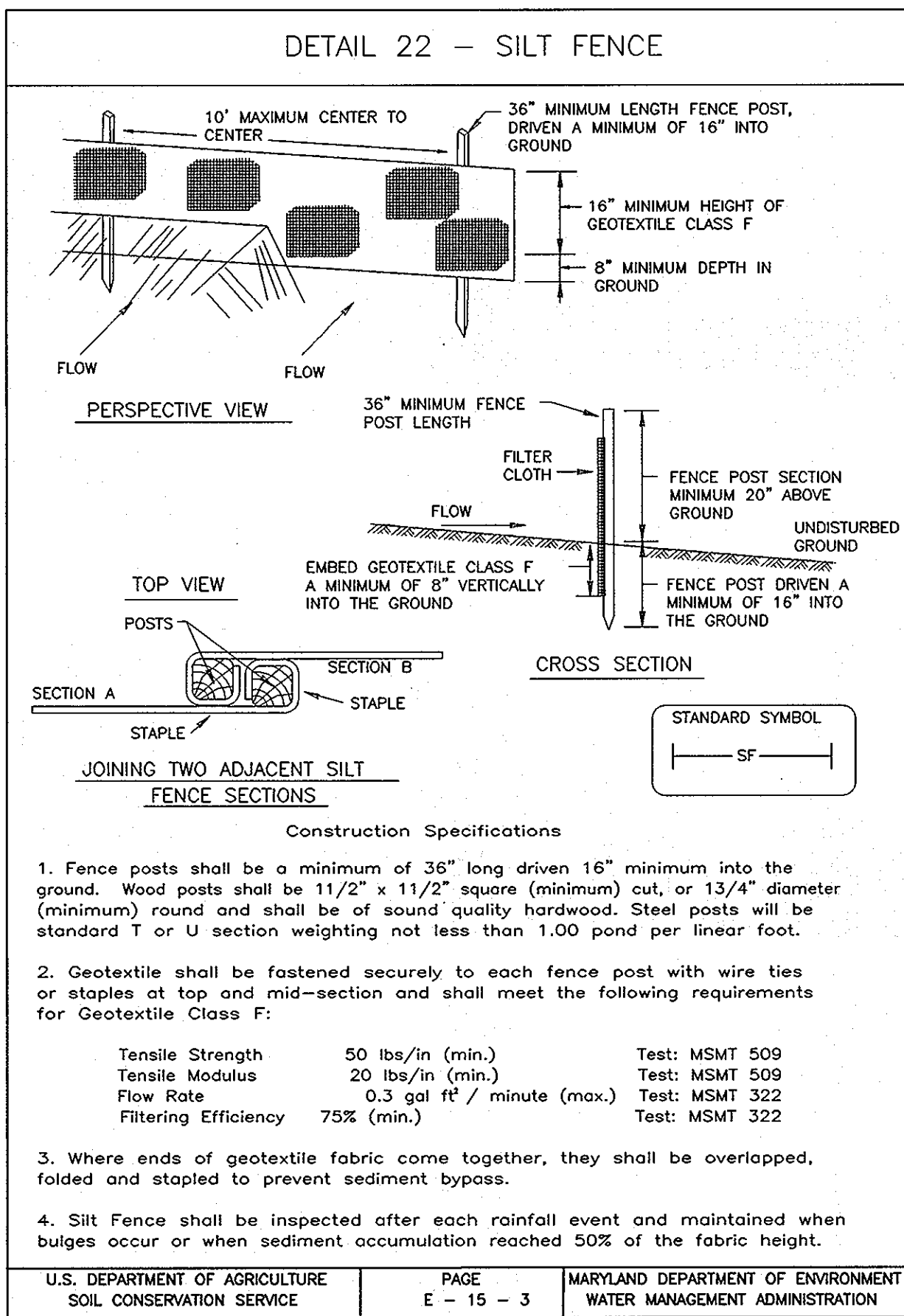
STATE OF MARYLAND
PROFESSIONAL ENGINEER
No. 33925
10/1/08

DES:	SEA
DRN:	LFN
CHK:	JRK
DATE:	9/08
BY:	NO.
REVISION:	
DATE:	2/24/10

ENLARGED SITE PLAN
600' SCALE MAP NO. 46 BLOCK NO. 4

RTE 216 PUMP STATION UPGRADE
CAPITAL PROJECT No. W8280
CONTRACT No. 44-4579
ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

C-2
SCALE AS SHOWN
SHEET 3 OF 11



STANDARD SEDIMENT CONTROL NOTES

- A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION, (313-1855).
- ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT "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:
 - 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1.
 - 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
- ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL. I, CHAPTER 12, 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 (SEC. C20.0) FOR PERMANENT SEEDINGS, SOD, TEMPORARY SEEDING AND MULCHING. TEMPORARY STABILIZATION WITH MULCH ALONE 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	0.90	ACRES
AREA DISTURBED	0.043	ACRES
AREA TO BE ROOFED OR PAVED	0.007	ACRES
AREA TO BE VEGETATIVELY STABILIZED	0.035	ACRES
TOTAL CUT	11	CU. YDS.
TOTAL FILL	23	CU. YDS.
OFFSITE WASTE/BORROW AREA LOCATION	CONTRACTOR COORDINATE	
- ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF THE DISTURBANCE.
- ADDITIONAL SEDIMENT CONTROLS MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
- ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
- TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE (3) PIPE LENGTHS OR THAT WHICH CAN BE BACK FILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER.
- CONTRACTOR SHALL PLACE EXCAVATED MATERIALS ON UPHILL SIDE OF TRENCH AND PLACE SILT FENCE ON DOWNHILL SIDE OF TRENCH.

SUGGESTED SEQUENCE OF CONSTRUCTION

- LAYOUT SITE ALIGNMENT (1 DAY).
- INSTALL SEDIMENT CONTROL DEVICES AS SHOWN ON PLAN.
- OBTAIN A GRADING PERMIT.
- EXCAVATE SITE FOR GENERATOR GRADE SLAB AND CONNECTION OF ELECTRICAL CONDUIT (1 DAY).
- BACKFILL AROUND FOUNDATION AND DUCTBANK TRENCH AND STABILIZE (5 DAYS).
- PERFORM FINAL GRADING, SEEDING AND LANDSCAPING (2-DAYS).
- CLEAN UP CONSTRUCTION SITE, DEMOBILIZE (1-DAY).
- REMOVE SEDIMENT CONTROL DEVICES AFTER PERMISSION IS GRANTED BY THE SEDIMENT CONTROL INSPECTOR (2 DAYS).

PERMANENT SEEDING NOTES

APPLY TO GRADED OR CLEARED AREAS NOT SUBJECT TO IMMEDIATE FURTHER DISTURBANCE WHERE A PERMANENT LONG-LIVED VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISKING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED.

SOIL AMENDMENTS: IN LIEU OF SOIL TEST RECOMMENDATIONS, USE ONE OF THE FOLLOWING SCHEDULES:

- PREFERRED** - APPLY 2 TONS PER ACRES DOLOMITIC LIMESTONE (92 LBS/1000 SQ FT.) AND 600 LBS PER ACRE 10-10-10 FERTILIZER (14LBS/1000 SQ FT.) BEFORE SEEDING. HARROW OR DISK INTO UPPER THREE INCHES OF SOIL. AT TIME OF SEEDING, APPLY 400 LBS PER ACRE 30-0-0 UREAFORM FERTILIZER (9 LBS/1000 SQ FT.).
- ACCEPTABLE** - APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SQ FT.) AND 1000 LBS PER ACRE 10-10-10 FERTILIZER (23 LBS/1000 SQ FT.) BEFORE SEEDING. HARROW OF DISK INTO UPPER THREE INCHES OF SOIL.

SEEDING - FOR THE PERIODS MARCH 1 THRU APRIL 30, AND AUGUST 1 THRU OCTOBER 15, SEED WITH 60 LBS PER ACRE (1.4 LBS/1000 SQ FT.) OF KENTUCKY 31 TALL FESCUE. FOR THE PERIOD MAY 1 THRU JULY 31, SEED WITH 60 LBS KENTUCKY 31 TALL FESCUE PER ACRE AND 2 LBS PER ACRE (.05 LBS/1000 SQ FT.) OF WEEPING LOVEGRASS. DURING THE PERIOD OF OCTOBER 16 THRU FEBRUARY 28, PROTECT SITE BY: OPTION (1) 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING. OPTION (2) USE SOD. OPTION (3) SEED WITH 60 LBS/ACRE KENTUCKY 31 TALL FESCUE AND MULCH WITH 2 TONS/ACRE WELL ANCHORED STRAW.

MULCHING - APPLY 1-1/2 TO 2 TONS PER ACRE (70 TO 90 LBS/1000 SQ FT.) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GALLONS PER ACRE (5 GAL/1000 SQ FT.) OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPES 8 FEET OR HIGHER, USE 348 GALLONS PER ACRE (8 GAL/1000 SQ FT.) FOR ANCHORING.

MAINTENANCE - INSPECT ALL SEEDED AREAS AND MAKE NEEDED REPAIRS, REPLACEMENTS AND RESEEDINGS.

TEMPORARY SEEDING NOTES

APPLY TO GRADED OR CLEARED AREAS LIKELY TO BE REDISTURBED WHERE A SHORT-TERM VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISKING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED.

SOIL AMENDMENTS: - APPLY 600 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ FT.).

SEEDING - FOR PERIODS MARCH 1 THRU APRIL 30 AND FROM AUGUST 15 THRU OCTOBER 15, SEED WITH 2-1/2 BUSHEL PER ACRE OF ANNUAL RYE (3.2 LBS/1000 SQ FT.), FOR THE PERIOD MAY 1 THRU AUGUST 14, SEED WITH 3 LBS PER ACRE OF WEEPING LOVEGRASS (.07 LBS/1000 SQ FT.). FOR THE PERIOD NOVEMBER 16 THRU FEBRUARY 28, PROTECT SITE BY APPLYING 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING, OR USE SOD.

MULCHING - APPLY 1-1/2 TO 2 TONS PER ACRE (70 TO 90 LBS/1000 SQ FT.) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GAL PER ACRE (5 GAL/1000 SQ FT.) OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPES 8 FT OR HIGHER, USE 348 GAL PER ACRE (8 GAL/1000 SQ FT.) FOR ANCHORING.

REFER TO THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR RATE AND METHODS NOT COVERED.

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

John R. Redmond / 10/2/08
APPROVED DATE
HOWARD S.C.D.

ENGINEER'S CERTIFICATION

I/WE CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL, REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

Steven E. Anderson / 10/1/08
STEVEN E. ANDERSON DATE
KCI TECHNOLOGIES, INC
10 NORTH PARK DRIVE
HUNT VALLEY, MD 21030

DEVELOPER'S CERTIFICATION

I/WE CERTIFY THAT 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 R. Johnson / 10/1/08
SIGNATURE OF DEVELOPER DATE

AS-BUILT
DATE 2/24/2010

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 33925, Expiration Date 01/15/09

User: kmcguckin Date: 10/1/08 File: 216 UPGRADE-3 SEDIMENT AND DETAILS.dwg

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Shah C. Chinn / 10/1/08
DIRECTOR OF PUBLIC WORKS DATE
Paul R. Johnson / 10/1/08
CHIEF, BUREAU OF ENGINEERING DATE
Paul R. Johnson / 10/1/08
CHIEF, UTILITY DESIGN DIVISION DATE

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

KCI TECHNOLOGIES
10 NORTH PARK DRIVE
HUNT VALLEY, MD 21030
PHONE: (410) 316-7800
FAX: (410) 316-7817
www.kci.com

STATE OF MARYLAND
LICENSED PROFESSIONAL ENGINEER
No. 33925
10/1/08

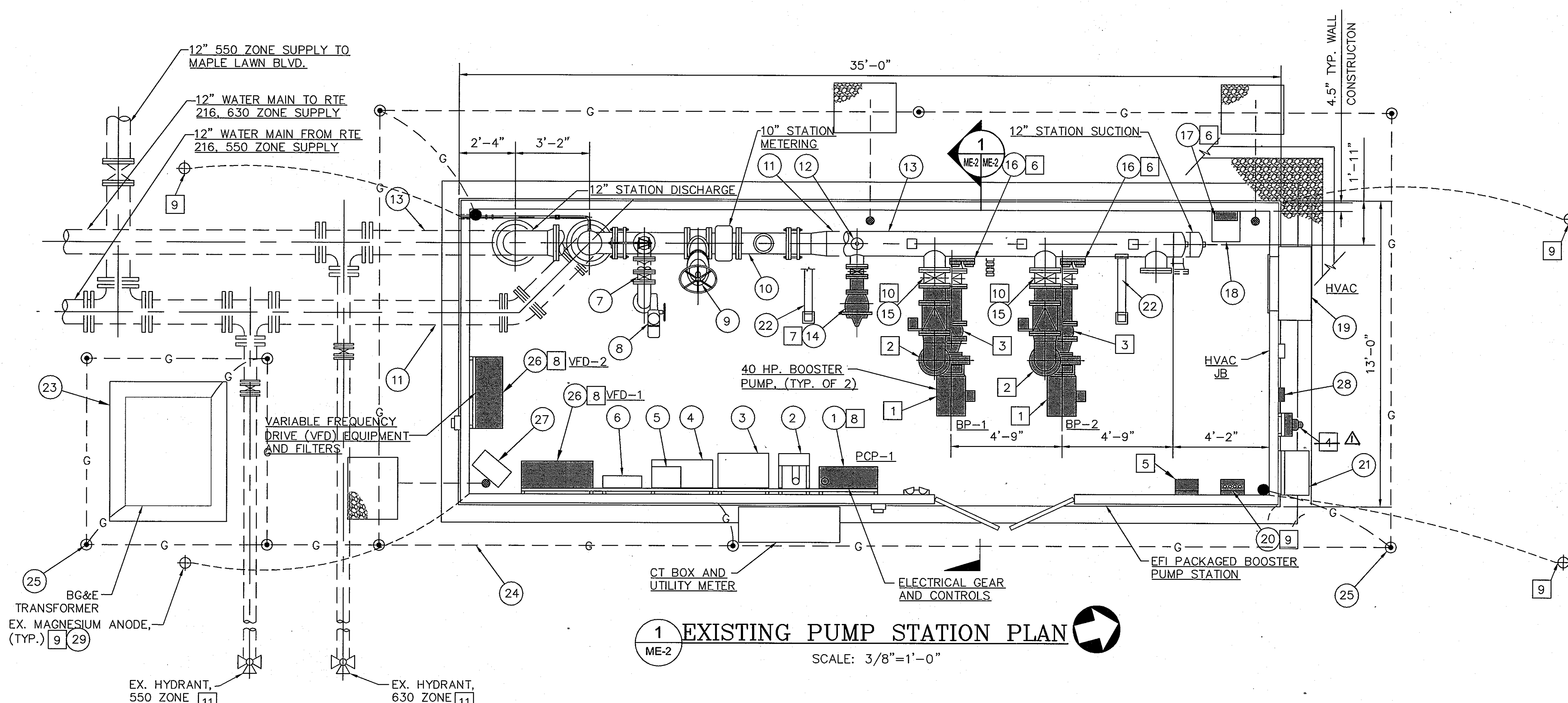
DES: SEA			
DRN: LFN			
CHK: JRK			
DATE: 9/08	LFN	AS BUILT	22410
	BY	NO.	REVISION

600' SCALE MAP NO.	46	BLOCK NO.	4
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SEDIMENT AND EROSION CONTROL NOTES AND DETAILS

RTE 216 PUMP STATION UPGRADE
CAPITAL PROJECT No. W8280
CONTRACT No. 44-4579
ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 4 OF 11



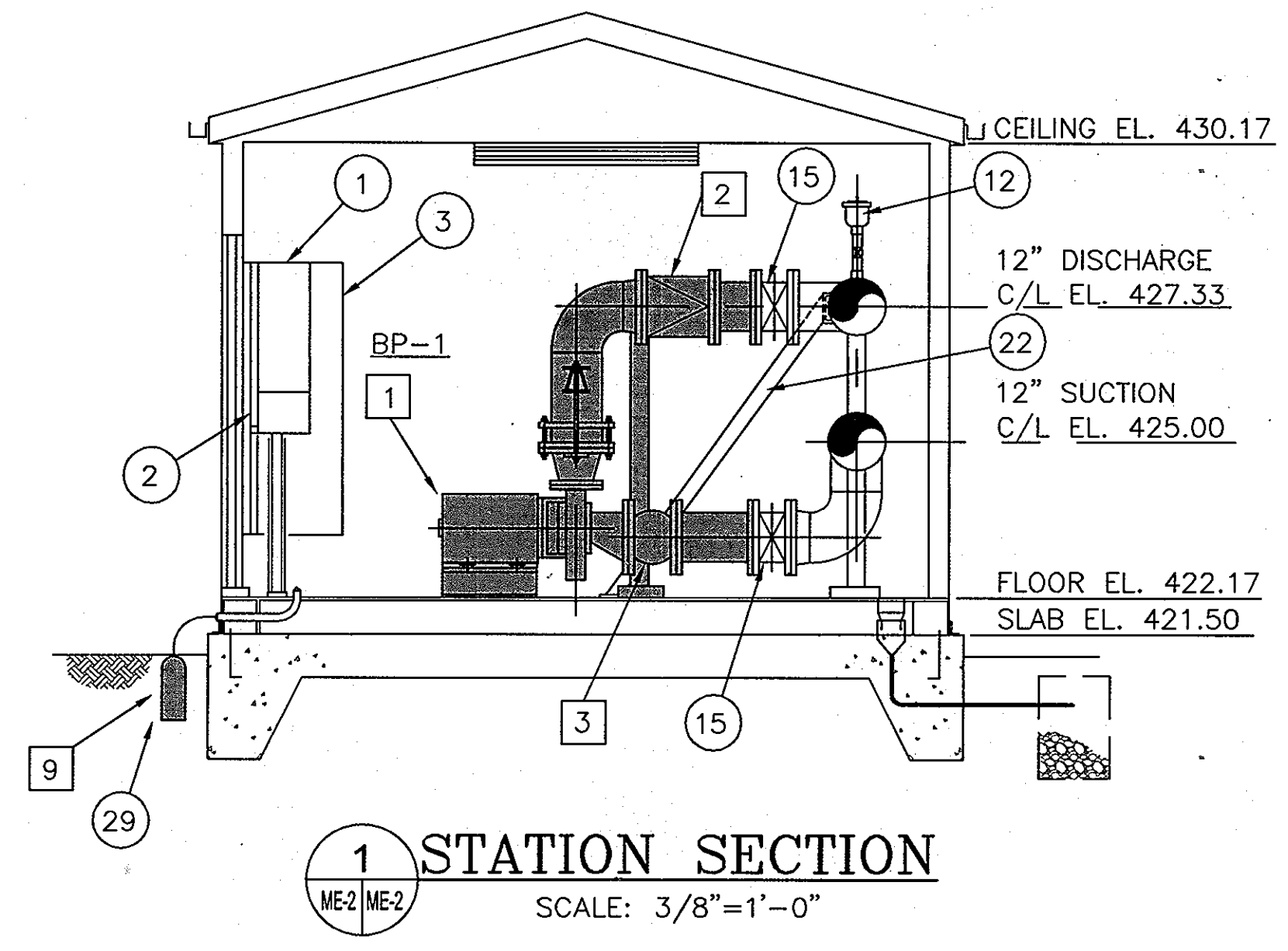
1 EXISTING PUMP STATION PLAN
 ME-2
 SCALE: 3/8"=1'-0"

- CODED NOTES:**
EXISTING COMPONENTS:
- 1 PUMP STATION CONTROL PANEL (PCP)
 - 2 MAIN SERVICE BREAKER
 - 3 AUTOMATIC TRANSFER SWITCH
 - 4 480V POWER DISTRIBUTION PANEL PP
 - 5 480V TO 120/240V XFMR
 - 6 120/240V RECEPTACLE PANEL RP
 - 7 6" ISOLATION BUTTERFLY VALVE (BV)
 - 8 6" MOTORIZED RECIRCULATION BV
 - 9 10" ISOLATION RESILIENT SEAT GATE VALVE (GV)
 - 10 10" TURBINE METER WITH STRAINER
 - 11 12" STATION SUCTION HEADER
 - 12 1" AIR RELEASE VALVE
 - 13 12" STATION DISCHARGE HEADER
 - 14 6" SURGE RELIEF VALVE
 - 15 10" PUMP ISOLATION BUTTERFLY VALVE (BV)
 - 16 BOOSTER PUMP PRESSURE INDICATION PANEL
 - 17 STATION SUCTION / DISCHARGE PRESSURE INDICATION PANEL
 - 18 PORTABLE DEHUMIDIFIER UNIT
 - 19 PACKAGED STATION HVAC UNIT
 - 20 ANODE TEST STATION
 - 21 DISCONNECT FOR PORTABLE GENERATOR RECEPTACLE
 - 22 STEEL SUPPORT
 - 23 TRANSFORMER PAD
 - 24 GROUND CONDUCTOR
 - 25 GROUND ROD
 - 26 40HP VFD WITH SSRV BYPASS STARTER
 - 27 LINE SIDE HARMONIC FILTER (TYP. OF 2)
 - 28 FUTURE GENERATOR CONTROL WIRING JUNCTION BOX
 - 29 MAGNESIUM ANODE
- LEGEND:**
 ——— EXISTING FEATURES
 ■ REMOVALS/MODIFICATIONS

- REQUIRED MODIFICATIONS:**
- 1 REMOVE 40HP BOOSTER PUMP WITH ELECTRICAL SERVICE BACK TO VFD. TURN PUMP OVER TO OWNER, VFD EQUIPMENT TO REMAIN.
 - 2 REMOVE 10" SILENT CHECK VALVE, SUPPORT AND PIPING FROM PUMP DISCHARGE.
 - 3 REMOVE 10" EXPANSION JOINT AND PIPING FROM PUMP SUCTION.
 - 4 REMOVE PORTABLE GENERATOR RECEPTACLE AND JUNCTION BOX, TURN OVER TO OWNER.
 - 5 RELOCATE FIRST-AID KIT TO NORTH WALL OF PUMP STATION.
 - 6 REPLACE PRESSURE GAUGES.
 - 7 ADJUST SURGE RELIEF VALVE SET POINT.
 - 8 MODIFY STATION PROGRAMING AND HARDWIRED INTERLOCKS.
 - 9 CONTRACTOR TO LOCATE EXISTING MAGNESIUM ANODES. REPLACE ANODES AND CALIBRATE TEST STATION.
 - 10 INSTALL TEMPORARY BLIND FLANGE.
 - 11 TEMPORARILY REMOVE HYDRANTS FROM 6" LEAD PIPING. CONNECT TEMPORARY STANDBY PUMPING SYSTEM SUCTION AND DISCHARGE HOSES TO HYDRANT LEADS FOR EXTERIOR TRAILER MOUNTED EQUIPMENT. COUNTY COORDINATE TEMPORARY 630S ZONE RELIEF TO THE 550 ZONE THROUGH LOCAL DIVISION VALVES.

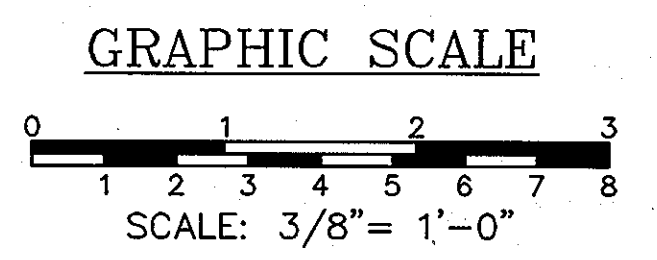
SUGGESTED SEQUENCE OF CONSTRUCTION

1. SCHEDULE WITH HOWARD COUNTY DPW FOR THE INSTALLATION OF THE TEMPORARY STANDBY BOOSTER PUMP SYSTEM. WHEN THIS SYSTEM IS INSTALLED AND APPROVED BY THE COUNTY, THE EXISTING STATION MAY BE TAKEN OUT OF SERVICE FOR UPGRADE. THE SERVICE AREA WILL MAINTAIN NORMAL 550 ZONE PRESSURE OPERATIONS THROUGH THE RTE 216 550 ZONE SUPPLY.
 - (* 2. INSTALL BP-3 SUCTION AND DISCHARGE ISOLATION BUTTERFLY VALVES. CLOSE BP-3 VALVES AND CHECK FOR LEAKAGE. INSTALL TEMPORARY BLIND FLANGES ON BP-3 SUCTION AND DISCHARGE VALVES.
 - (* 3. INSTALL BP-3 PUMP PAD, PUMP AND PIPING.
 - (* 4. REMOVE BP-3 TEMPORARY BLIND FLANGES, COMPLETE PIPING AND INSTALL REDUCING GROOVE BY GROOVE ELBOW WITH A VIC-FLANGE ADAPTOR AND STEEL ECCENTRIC REDUCER (FOT) WITH WELDNECK FLANGE AND PLAIN-END GROOVED SPOOL.
 - (* 5. CLOSE BP-2 SUCTION AND DISCHARGE VALVES, REMOVE PIPING AND INSTALL TEMPORARY BLIND FLANGES ON SUCTION AND DISCHARGE VALVES.
 - (* 6. INSTALL BP-2 PUMP PAD, PUMP AND PIPING.
 - (* 7. REMOVE BP-2 TEMPORARY BLIND FLANGES, COMPLETE PIPING AND INSTALL REDUCING GROOVE BY GROOVE ELBOW WITH VIC-FLANGE ADAPTOR AND STEEL ECCENTRIC REDUCER (FOT) WITH WELDNECK FLANGE AND PLAIN-END GROOVED SPOOL.
 - (* 8. CLOSE BP-1 SUCTION AND DISCHARGE VALVES, REMOVE PIPING AND INSTALL TEMPORARY BLIND FLANGES ON SUCTION AND DISCHARGE VALVES.
 - (* 9. INSTALL BP-1 PUMP PAD, PUMP AND PIPING.
 - (* 10. REMOVE BP-1 TEMPORARY BLIND FLANGES, COMPLETE PIPING AND INSTALL REDUCING GROOVE BY GROOVE ELBOW WITH VIC-FLANGE ADAPTOR AND STEEL ECCENTRIC REDUCER (FOT) WITH WELDNECK FLANGE AND PLAIN-END GROOVED SPOOL.
 11. TEST PUMPS, PIPING AND COORDINATE CONTROLS AND POWER TESTING.
- (* CONTRACTOR COORDINATE PARALLEL WORK EFFORTS.



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

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 33925, Expiration Date 01/15/09.



Oct 01, 2008 - 11:17am User: lorenacasek
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DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

Director of Public Works: *10/2/08*
 Chief, Bureau of Engineering: *10/1/08*
 Chief, Bureau of Utilities: *10/1/08*
 Chief, Utility Design Division: *10-1-08*

KCI TECHNOLOGIES
 ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS
 10 NORTH PARK DRIVE
 HUNT VALLEY, MD 21030
 PHONE: (410) 316-7800
 FAX: (410) 316-7817
 WWW.KCI.COM

STATE OF MARYLAND
 PROFESSIONAL ENGINEER
 License No. 33925
 10/1/08

DES: SEA			
DRN: LFN			
CHK: JRK			
DATE: 9/08			
BY: LFN	AS BUILT		22410
NO.		REVISION	DATE

EXISTING PUMP STATION DEMOLITION

600' SCALE MAP NO. 46 BLOCK NO. 4

RTE 216 PUMP STATION UPGRADE
 CAPITAL PROJECT No. W8280
 CONTRACT No. 44-4579
 ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

ME-2
 SCALE AS SHOWN
 SHEET 6 OF 11

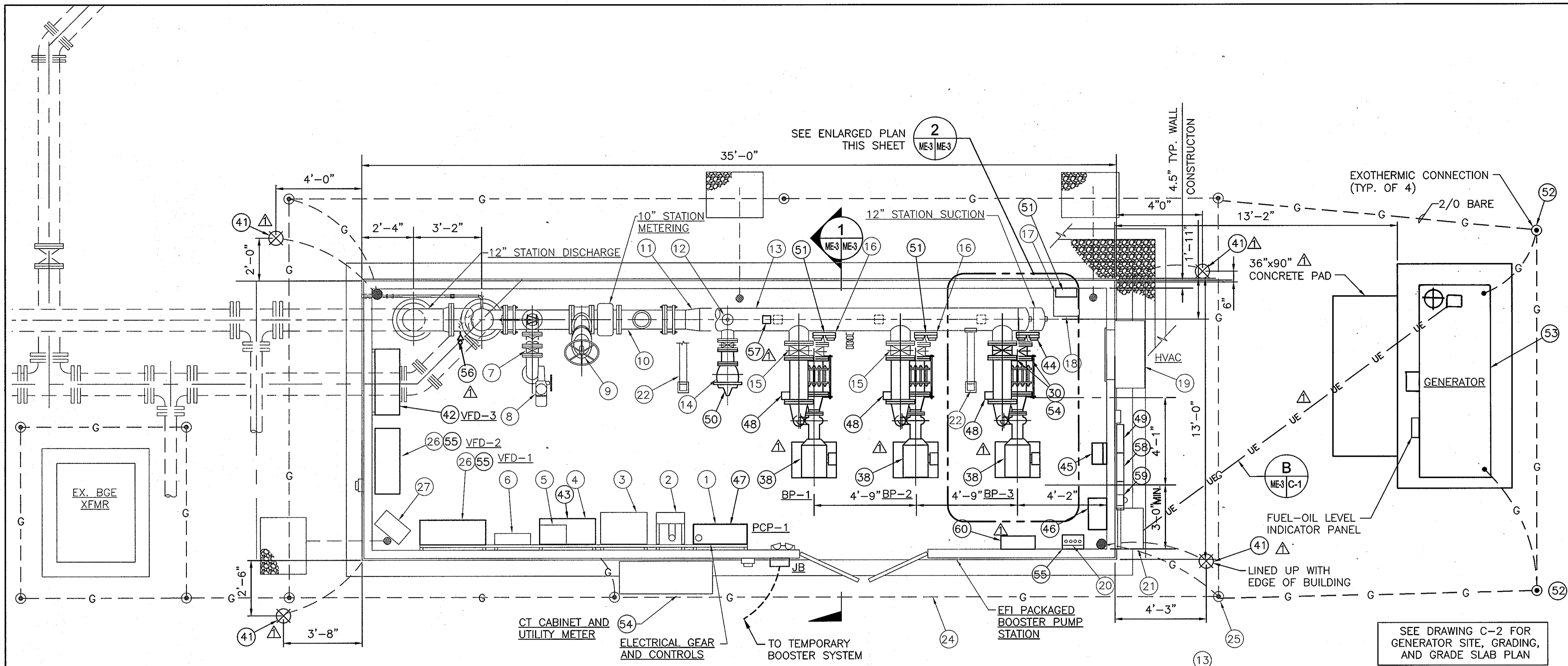
NOTES:

- △ 1. FABRICATE A 30-DEGREE WELDED STEEL ELBOW FROM A 45-DEGREE ELBOW. FIELD VERIFY ALIGNMENT AND ANGLE, AND FABRICATE ELBOW WITH WELDNECK FLANGE AND PLAIN-END SPOOL FOR CONNECTION OF VICTAULIC TRANSITION COUPLING.
- 2. RECONNECT PRESSURE GAUGE SENSING LINES AS REQUIRED.
- 3. SEE SHEET ME-2 FOR EXISTING COMPONENTS 1 THROUGH 29 AND REMOVALS.

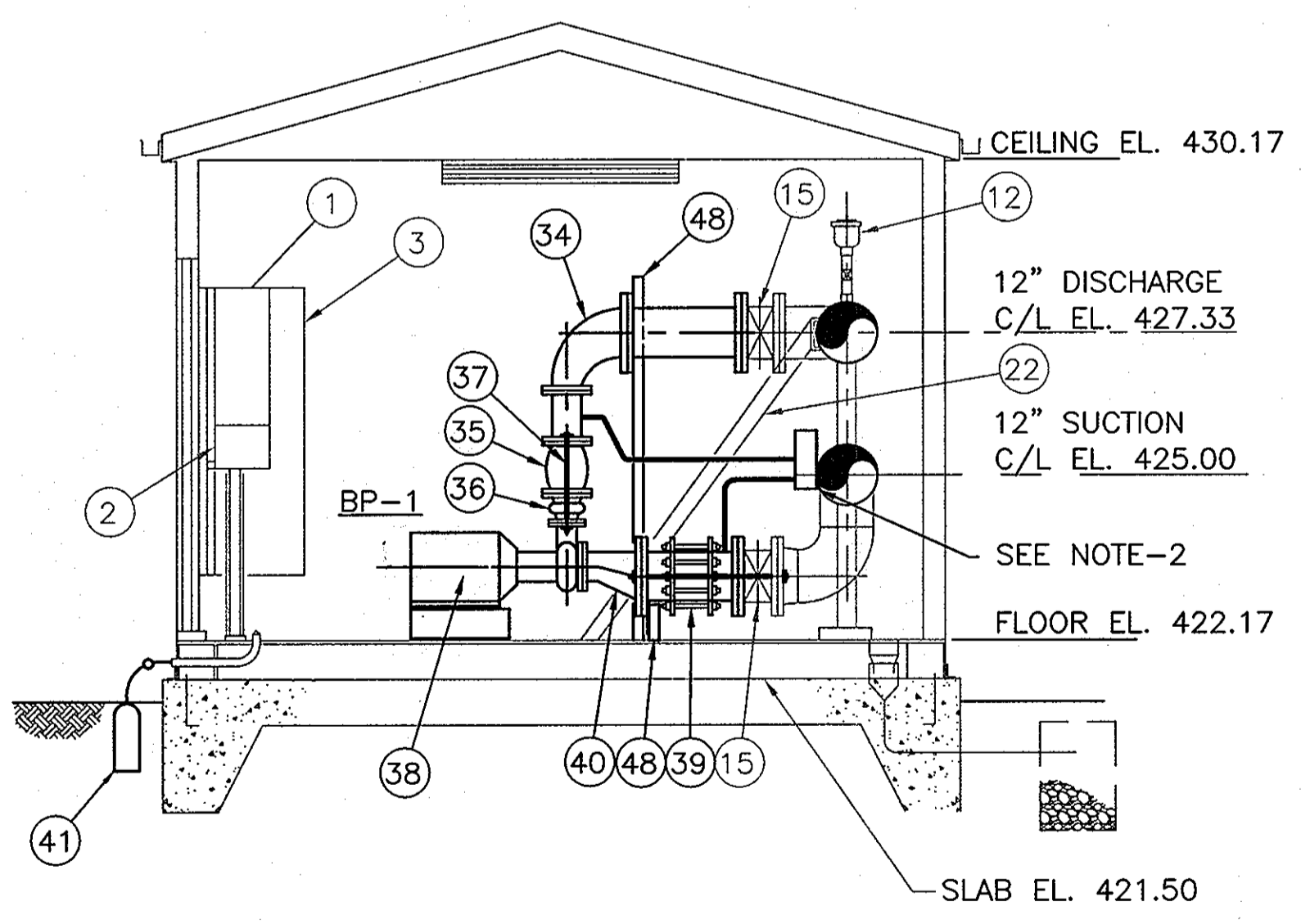
CODED NOTES:

PROPOSED COMPONENTS:

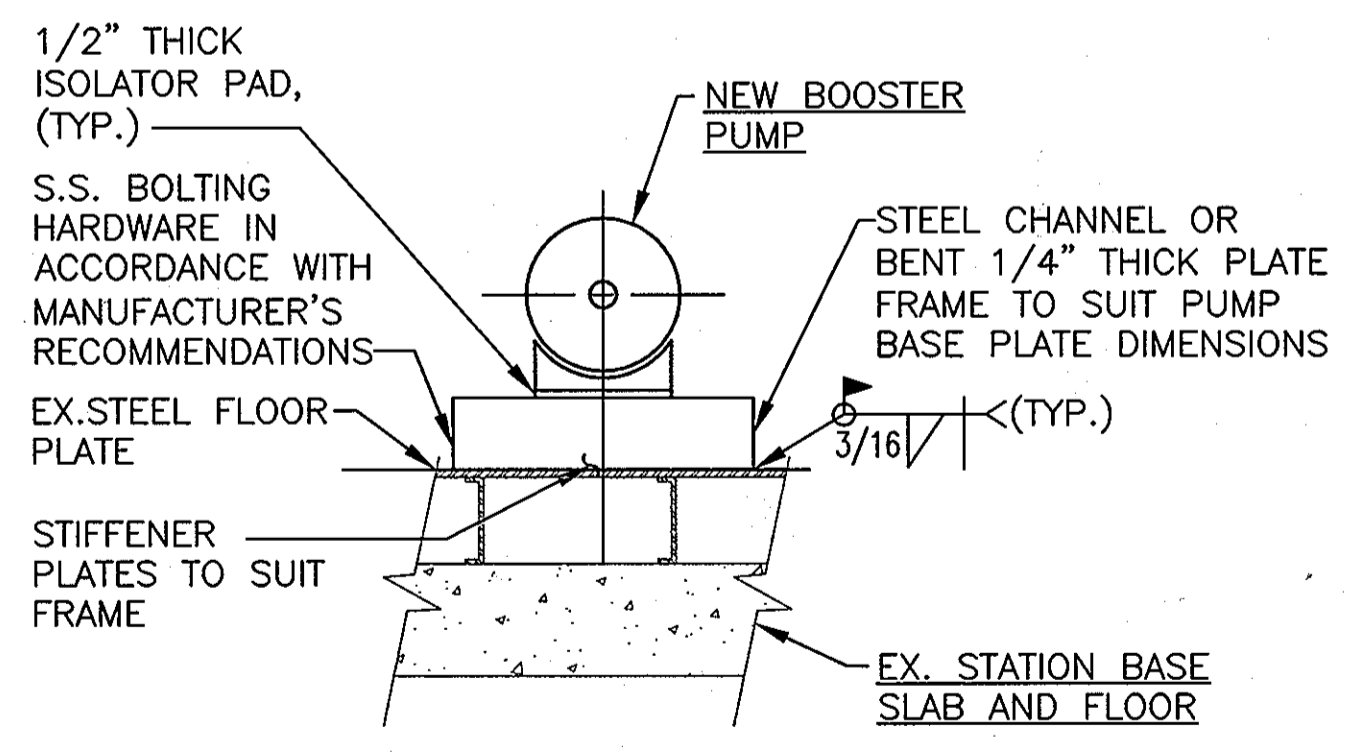
- ③0 10" FLANGED BUTTERFLY VALVE
- ③1 10" WELDNECK FLANGE
- ③2 FABRICATED STEEL ELBOW, SEE NOTE-2
- ③3 VICTAULIC STEEL TO DIP 307-TRANSITION COUPLING
- △ ③4 10"x6" DIA D.I. FLANGED ELBOW.
- ③5 6" FLANGED CENTER-GUIDED SILENT CHECK VALVE
- △ ③6 6"x4" FLANGED ECCENTRIC REDUCING EXPANSION JOINT.
- ③7 TIE ROD ASSEMBLY TO SUIT REDUCING EXPANSION JOINT AND PUMP CONNECTION.
- △ ③8 40HP END SUCTION CENTRIFUGAL PUMP (FLEXIBLE COUPLED STYLE)
- △ ③9 10" FLEXIBLE COUPLING WITH TIE-RODS.
- △ ④0 10"x6" FLANGED ECCENTRIC REDUCER (FOT) WITH FLANGE BY P.E. SPOOL, LENGTH TO SUIT.
- ④1 NEW MAGNESIUM ANODE SET WITH CALIBRATED TEST STATION.
- ④2 40HP VFD WITH SSRV BYPASS STARTER, SEE I-3.
- ④3 PROVIDE NEW 90 AMP, 3-POLE BREAKER FOR BP-3 IN PANEL PP AND MATCH FAULT RATING (40-HP).
- ④4 BP-3 SUCTION AND DISCHARGE PRESSURE PANEL WITH 100 PSIG SUCTION AND 160 PSIG DISCHARGE GAUGES.
- ④5 RELOCATED FIRST AID KIT.
- ④6 BP-3 LINE SIDE HARMONIC FILTER FOR VFD-3 IN ACCORDANCE WITH IEEE-519 GUIDELINES. SYSTEMS INTEGRATOR SHALL COORDINATE LOCATION OF HARMONIC FILTER IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- ④7 REVISE CCU PROGRAMMING TO DEFAULT TO STANDARD TANK CONTROLS (PRIMARY), AND PRESSURE CONTROL (SECONDARY). COORDINATE BUREAU OF UTILITIES OVER-RIDE PROGRAMMING FEATURES.
- △ ④8 PIPE SUPPORT CONNECTED TO STATION FLOOR.
- ④9 16"x16"x4" GASKETED NEMA 3R JUNCTION BOX FOR AUXILIARY GENERATOR CIRCUIT.
- ⑤0 ADJUST SURGE RELIEF SET POINT TO 105 PSIG.
- ⑤1 REPLACE GAUGES AS FOLLOWS:
SUCTION - 100 PSIG
DISCHARGE - 160 PSIG
- ⑤2 GROUND ROD, 3/4" DIA. BY 10'-0" LONG.
- ⑤3 STANDBY GENERATOR, 100KW, 480/277 VAC, 3-PHASE, 4-WIRE WITH FUEL-OIL LEVEL INDICATOR PANEL.
- ⑤4 INSTALL TEMPORARY BLIND FLANGE.
- ⑤5 MODIFY EXISTING VFD EQUIPMENT TO INCLUDE INTERLOCKS AS SHOWN ON I-3.
- ⑤6 1/2" SAMPLE TAP FIXTURE AND WELDOLET.
- △ ⑤7 1/2" CHEMICAL DIFFUSER WITH A 1" WELDOLET, (TOP).
- ⑤8 16"x16"x4" DIGITAL JUNCTION BOX.
- ⑤9 16"x16"x4" ANALOG JUNCTION BOX.
- △ ⑥0 FUEL MONITORING SYSTEM DISPLAY



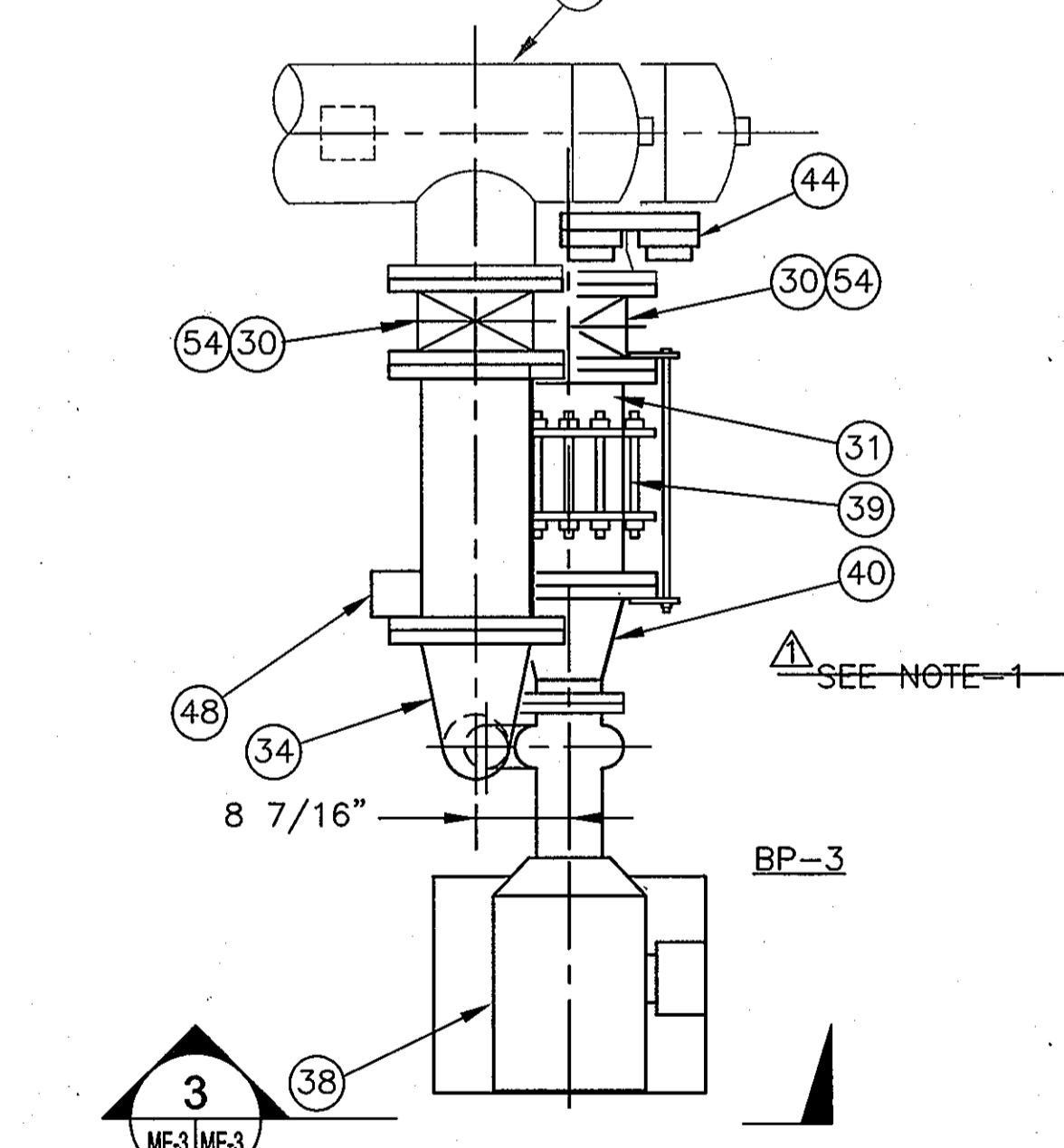
1 PUMP STATION PLAN
ME-3 SCALE: 3/8"=1'-0"



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



3 TYPICAL PUMP BASE SECTION
ME-3 SCALE: 3/4"=1'-0"



2 ENLARGED PLAN
ME-3 SCALE: 3/4"=1'-0"

LEGEND:

- EXISTING FEATURES
- PROPOSED UPGRADES
- UE — UNDERGROUND ELECTRIC
- ⊙ GROUND ROD
- ⊗ MAGNESIUM ANODE

GRAPHIC SCALES

0 1 2 3
1 2 3 4 5 6 7 8
SCALE: 3/8"= 1'-0"

0 1 2 3
1 2 3 4
SCALE: 3/4"= 1'-0"

PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 33925, Expiration Date 01/15/09

AS BUILT REPLACEMENT SHEET
DATE: 2-24-2010

Feb 25, 2010 - 3:45pm User: lorenz.ponack ME-3007-0107460-Drawings RTE 216 UPGRADE-3-ME-3 PROPOSED RTE 216 PS.dwg

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* 4/5/10
Date: 4/1/10
Chief, Bureau of Utilities

Chief, Bureau of Engineering: *[Signature]* 4/1/10
Date: 3/31/10
Chief, Utility Design Division

ENGINEERS
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KCI TECHNOLOGIES

10 NORTH PARK DRIVE
HUNT VALLEY, MD 21030
PHONE: (410) 316-7800
FAX: (410) 316-7817
www.kci.com

STATE OF MARYLAND
LICENSED PROFESSIONAL ENGINEER
LEWIS E. ANDERSON
No. 33925
3/11/2010

DES: SEA	
DRN: LFN	
CHK: JRK	
DATE: 9/08	
BY: LFN	AS BUILT
NO.:	
REVISION:	
DATE:	2-24-10

PROPOSED PUMP STATION UPGRADES

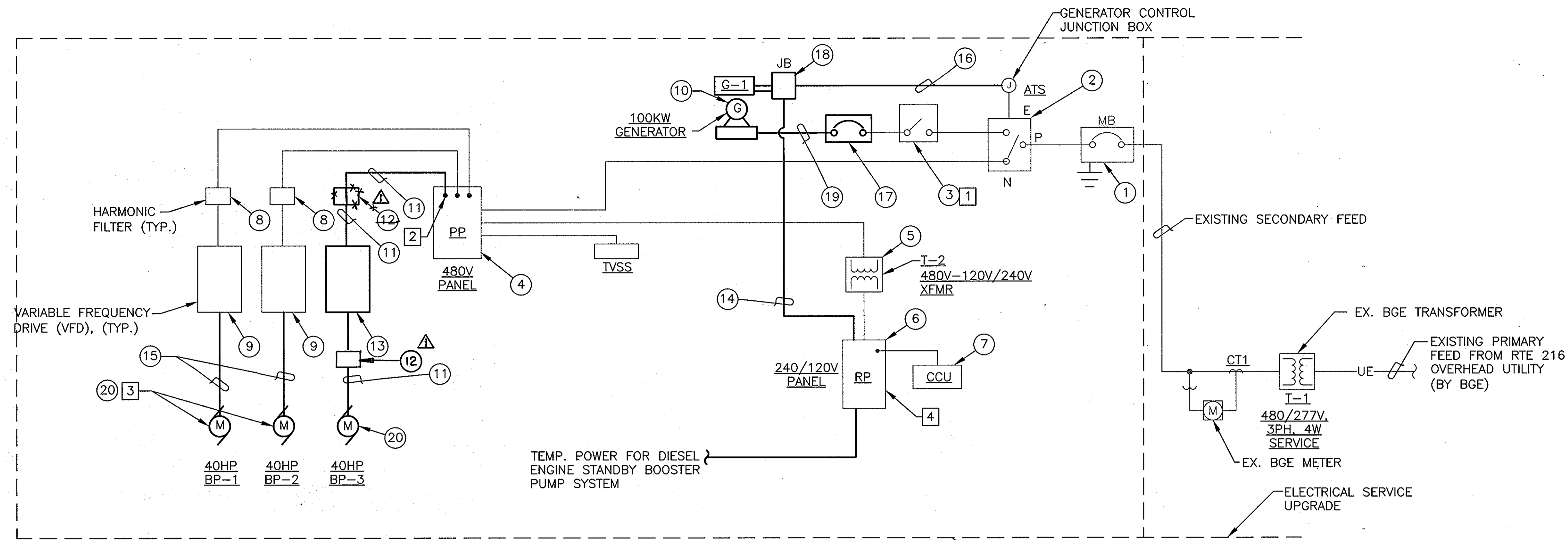
600' SCALE MAP NO. 46 BLOCK NO. 4

RTE 216 PUMP STATION UPGRADE

CAPITAL PROJECT No. WB280
CONTRACT No. 44-4579

ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

ME-3
SCALE AS SHOWN
SHEET 7 OF 11



1 ELECTRICAL SINGLE-LINE DIAGRAM
E-1

PROPOSED AND EXISTING ELECTRICAL LOADS

DESCRIPTION	VOLTS	PHASE	AMP.	KW	HP	KVA	TOTAL
BP-1	480	3	52	30	40	43.23	-
BP-2	480	3	52	30	40	43.23	-
BP-3	480	3	52	30	40	43.23	-
HVAC	480	3	7.22	6	-	9.02	-
RV-1	480	3	0.29	0.25	0.33	0.42	-
TOTAL 480V LOAD	-	-	-	-	-	-	139.13
LIGHTS	120	1	8.33	1	-	1.11	-
EXT. LIGHTS	120	1	2.50	0.30	-	0.33	-
CCU	120	1	2.08	0.25	-	0.28	-
FLOW METER	120	1	0.42	0.05	-	0.06	-
PRESSURE TRANSMITTER	120	1	0.82	0.10	-	0.12	-
CHART RECORDER	120	1	0.83	0.10	-	0.11	-
DEHUMIDIFIER	120	1	2.08	0.25	0.33	0.41	-
GENERATOR HEATER	120	1	12	1.44	-	1.44	-
GENERATOR BATTERY CHARGER	120	1	12	1.44	-	1.44	-
TOTAL 120V LOAD	-	-	-	-	-	-	5.3
CONNECTED LOAD	-	-	-	-	-	-	144.43
OPERATING LOAD	-	-	-	-	-	-	101.2
TEMP. BOOSTER PUMP SYSTEM	120	1	10	1.2	-	-	1.2

NOTE: ① 120V, 1PH, LOADS HAVE BEEN PHASE BALANCED.
 ② MAX DEMAND IS BASED ON RUNNING TWO PUMPS SIMULTANEOUSLY PLUS OTHER MISC. LOADS.
 ③ PROPOSED LOADS.

SUGGESTED SEQUENCE OF CONSTRUCTION

- ELECTRICAL AND CONTROLS:
- INSTALL GENERATOR PAD, EQUIPMENT AND CONTROLS.
 - TEST GENERATOR AND SETUP GENERATOR EXERCISE MODE IN ACCORDANCE WITH COUNTY DPW OPERATIONS. GENERATOR SHALL BE TESTED AND APPROVED.
 - INSTALL BP-3 VFD AND HARMONIC FILTER, ELECTRICAL TERMINATIONS, BREAKER AND PRESSURE INDICATION PANEL WITH STATION SUCTION AND DISCHARGE GAUGE UPGRADES.
 - TEST BP-3 PUMP ROTATION AND ELECTRICAL SERVICE CONNECTIONS.
 - INSTALL BP-2 ELECTRICAL CONNECTIONS. TEST PUMP ROTATION AND ELECTRICAL SERVICE CONNECTIONS.
 - INSTALL BP-1 ELECTRICAL CONNECTIONS. TEST PUMP ROTATION AND ELECTRICAL SERVICE CONNECTIONS.
 - ADJUST THE STATION PRESSURE RELIEF VALVE SETTING IN ACCORDANCE WITH CONTRACT DRAWINGS. ALL SETTINGS AND ADJUSTMENTS MUST BE PERFORMED BY A FACTORY TRAINED REPRESENTATIVE CERTIFIED TO WORK ON THE VALVE.
 - MODIFY CONTROLS TO SUIT THE ADDITION OF BP-3 WITHIN LEAD/LAG ALTERNATIONS AND CONSTANT AND VARIABLE SPEED OPERATIONS.
 - MODIFY CONTROLS TO INCLUDE BOTH PRESSURE AND TANK CONTROL MODES ACCORDANCE WITH CONTRACT SPECIFICATIONS. TEST PUMPING STATION PUMP OPERATIONS.
 - COORDINATE REMOVAL OF CHECK VALVE FROM THE 16-INCH WATER MAIN VALVE VAULT WITH THE COUNTY AND COMPLETION OF THE FULTON ELEVATED TANK. WHEN THE 630S ZONE IS OPERATIONAL, PERMANENTLY POSITION THE ZONE DIVISION GATE VALVE CLOSED AT THE ROUTE 216 PUMP STATION WATER MAIN VAULT. COUNTY TO DETERMINE THE STATION CONTROL MODE PRIOR TO 630S ZONE COMPLETION (CONSTANT SPEED BOOSTER SERVICE OR VARIABLE SPEED ZONE OPERATIONS).
- (*) CONTRACTOR COORDINATE PARALLEL WORK EFFORTS.

ABBREVIATIONS:

- A AMPERE
- ATS AUTOMATIC TRANSFER SWITCH
- CCU CENTRAL CONTROL UNIT
- CT CURRENT TRANSFORMER
- DS DISCONNECT SWITCH
- E EMERGENCY
- EXT EXTERIOR
- F FUSE
- G GENERATOR
- J/JB JUNCTION BOX
- M METER OR MOTOR
- MB MAIN BREAKER
- MISC MISCELLANEOUS
- N NORMAL
- PH PHASE
- PP POWER PANEL, 3-PHASE
- P PRIMARY
- RP RECEPTACLE PANEL, 1 AND 3 PHASE
- RV RECIRCULATION VALVE
- T-X TRANSFORMER
- TVSS TRANSIENT VOLTAGE SURGE SUPPRESSION
- UE UNDERGROUND ELECTRIC
- UPS UNINTERRUPTIBLE POWER SUPPLY/BATTERY
- V VOLT
- VFD VARIABLE FREQUENCY DRIVE
- XFMR TRANSFORMER

LEGEND:
 ——— EXISTING FEATURES
 ——— MODIFICATIONS

CODED NOTES:

- EXISTING COMPONENTS:**
- 480V, 300A, 3PH, 3P, MAIN BREAKER.
 - 480V, 3PH, 3W, 400 AMP, ATS.
 - 480V, 3PH, 400A EXTERIOR DISCONNECT (PROVIDE LOCK IN CLOSED POSITION).
 - 480V, 3PH, 3W, 400 AMP POWER PANEL (PP). PANEL INCLUDES A 480V TVSS MONITOR.
 - 480V-120/240V, 10KVA XFMR.
 - 240/120V, 1PH, 3W, 100 AMP RECEPTACLE PANEL (RP).
 - STATION CENTRAL CONTROL UNIT WITH UPS/BATTERY BACKUP.
 - 480V, 3PH, 4W LINE-SIDE HARMONIC FILTER.
 - 40HP, 480V, 4W VFD WITH SOFT-START BYPASS STARTER.
- PROPOSED COMPONENTS:**
- PROVIDE A 100 KW, 480/277V, 3PH, 4W STANDBY GENERATOR WITH SUB-BASE FUEL-OIL STORAGE AND ACOUSTICAL GRADE ENCLOSURE.
 - PROVIDE 3 #6 & 1 #8 G IN 1 1/4" CONDUIT.
 - 480V, 3PH, 4W HARMONIC LINE-SIDE FILTER IN ACCORDANCE WITH IEEE-519 REGULATIONS.
 - 40HP, 480V, 3PH, 4W VFD WITH SOFT-START BYPASS STARTER. THE VFD SHALL BE A MINIMUM 100 AMP FRAME UNIT.
 - PROVIDE SINGLE-PHASE 120V AUXILIARY CIRCUITS FOR GENERATOR BATTERY CHARGER, LEVEL CONTROL AND HEATERS IN 2" CONDUIT TO SUIT MANUFACTURER'S LOAD REQUIREMENTS. MINIMUM CIRCUIT CONDUCTORS SHALL BE 2 #12 AWG WITH 1 #12 AWG GROUND.
 - PROVIDE 3 #6 & 1 #8 G IN EXISTING 1 1/4" C. PROVIDE EXTENSION FOR CONDUIT AS REQUIRED.
 - PROVIDE ATS CALL SIGNALS AND GENERATOR RUN STATUS WIRING IN 2" CONDUIT FOR ATS TRANSFER AUTOMATION, SEE INSTRUMENTATION DRAWINGS FOR CONTROL CIRCUITS AND CONDUCTORS. SEE DWG. I-2 FOR WIRE COUNT, AND DWG. C-1 FOR DUCTBANK DETAIL.
 - CIRCUIT BREAKER 480V, 3PH, AND 200A PROVIDED WITH THE GENERATOR.
 - 16"x16"x4" GASKETED NEMA 3R JUNCTION BOX.
 - 4 #4/0 & 1 #4 G IN 3" CONDUIT.
 - NEW 40HP PUMP.

ELECTRICAL MODIFICATIONS:

- REMOVE EXISTING 480V, 3-POLE, 400AMP RECEPTACLE FOR PORTABLE GENERATOR SERVICE. TURN OVER EQUIPMENT TO OWNER.
- PROVIDE A 480V, 90A 3-POLE BREAKER IN AVAILABLE SPACE TO POWER THE NEW PUMP. NEW BREAKER TO MATCH EXISTING PANEL.
- REMOVE EXISTING 480V CONDUCTORS AND TERMINATIONS FROM MOTOR TO VFD. TURN OVER ALL EQUIPMENT TO OWNER.
- PROVIDE 1P, 120V, 20A CIRCUIT BREAKERS IN AVAILABLE SPACE IN PANEL RP FOR GENERATOR AUXILIARY LOADS. CIRCUIT BREAKERS TO MATCH EXISTING PANELS.

AS-BUILT
DATE 2/24/2010

04.01.2008 - 10:57am User: jones@owock MA_2007_0107460 Drawing: RTE 216 UPGRADE-3/E-1 PROPOSED ELEC.dwg

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 10/2/08
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 10/1/08
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 10/1/08
CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 10-1-08
CHIEF, UTILITY DESIGN DIVISION DATE

ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS

KCI TECHNOLOGIES

10 NORTH PARK DRIVE
HUNT VALLEY, MD 21030
PHONE: (410) 316-7800
FAX: (410) 316-7817
www.kci.com



DES: MA			
DRN: LFN			
CHK: RW			
DATE: 9/08			
BY: LFN	AS BUILT	2/24/10	
NO.			
REVISION			

SINGLE-LINE DIAGRAM AND PROPOSED LOADS

600' SCALE MAP NO. 46 BLOCK NO. 4

RTE 216 PUMP STATION UPGRADE

CAPITAL PROJECT No. W8280
CONTRACT No. 44-4579

ELECTION DISTRICT NO.5 HOWARD COUNTY, MARYLAND

E-1
SCALE AS SHOWN
SHEET
8 OF 11

EQUIPMENT SYMBOLS

- GROUND
- CONTROL TRANSFORMER
- MOTOR
- CENTRIFUGAL PUMP
- CONTROL FLOAT
- TERMINAL ENCLOSURE OR J - JUNCTION
- VALVE
- BUTTERFLY VALVE
- CENTER GUIDED CHECK VALVE
- TURBINE FLOW METER WITH STRAINER

HAND SWITCHES

- XXX SELECTOR SWITCH OR PUSH BUTTON (MAINTAINED CONTACTS)
 - XXX SPRING RETURN SWITCH OR PUSH BUTTON (MOMENTARY CONTACTS)
 - XXX HAND CONTROL STATION (SPEED OR POSITION)
- MODIFIER (XXX) DESCRIPTIONS**
- ACK = ACKNOWLEDGE PUSHBUTTON
 - CL = CLOSE (PUSH BUTTON)
 - ES = EMERGENCY STOP (PUSHBUTTON)
 - HOA = HAND-OFF-AUTOMATIC (SELECTOR SWITCH)
 - LO = LOCAL/REMOTE (SELECTOR SWITCH)
 - MA = MANUAL/AUTOMATIC (SELECTOR SWITCH)
 - POT = POTENTIOMETER
 - RES = RESET
 - SP = STOP
 - ST = START
 - VOB = VFD - OFF - BYPASS (SELECTOR SWITCH)

ECD SYMBOLS

- CIRCUIT BREAKER
- DISCONNECT SWITCH
- LIMIT SWITCH - NORMALLY OPEN
- CONTACTS - NORMALLY OPEN
- CONTACTS - NORMALLY CLOSED
- PUSH BUTTON - MOMENTARY CONTACT
- PUSHBUTTON - MOMENTARY CONTACT START/STOP
- PUSH-PULL BUTTON - MAINTAINED CONTACT
- START-STOP PUSHBUTTON - MAINTAINED CONTACT
- FLOAT SWITCH - NORMALLY OPEN, CLOSE ON LEVEL RISE
- FLOAT SWITCH - NORMALLY OPEN, CLOSE ON LEVEL DROP
- THERMOSTAT, NORMALLY CLOSED
- OVERCURRENT ELEMENT THERMOSTAT
- LIMIT SWITCH
- PRESSURE SWITCH - NORMALLY OPEN - CLOSES ON PRESSURE RISE
- PRESSURE SWITCH - NORMALLY OPEN - CLOSES ON PRESSURE DROP
- INCOMING LINE
OUTGOING LINE
- HAND-OFF AUTOMATIC SWITCH
- PLC OUTPUT
- FUSE
- PUSH TO TEST (TRANSFORMER TYPE) INDICATING LAMP - X INDICATES LENS COLOR:
R = RED (RUN) B = BLUE (POSITION)
G = GREEN (STOP) Y = YELLOW (POSITION)
W = WHITE (POWER) A = AMBER (ALARM)
- CONTROL RELAY (SEQUENTIAL)

ECD SYMBOLS (CONT.)

- TIMER
- NOTC NCTO
- STARTER OR CONTACT COIL - DESIGNATION AS INDICATED
- RUN TIME METER (ETM)

PROCESS & INSTRUMENTATION SYMBOLS

- FIELD-MOUNTED DEVICE
 - PANEL-MOUNTED DEVICE
 - INDICATING LAMP - X INDICATES LENS COLOR:
R = RED G = GREEN
W = WHITE A = AMBER
 - CCU INPUT/OUTPUT
 - PUMP CONTROLLER DISPLAY
 - SCADA INPUT/OUTPUT
 - ANALOG INPUT
 - ANALOG OUTPUT
 - DIGITAL INPUT
 - DIGITAL OUTPUT
 - ELECTRICAL SERVICE
 - PROCESS FLOW
 - ELECTRICAL SIGNAL
 - JUNCTION BOX, HAZARDOUS LOCATION
 - JUNCTION BOX, NON-HAZARDOUS LOCATION
 - SIGNAL BOOSTER/ISOLATOR
 - PANEL JUNCTION
- ABC - LETTERS INDICATE FUNCTION ACCORDING TO IDENTIFICATION ASSOCIATED WITH ISA SCHEDULE.
123 - DIGITS INDICATE SEQUENTIAL EQUIPMENT

(ISA)-INSTRUMENT IDENTIFICATION SCHEDULE

	FIRST LETTER		SUCCEEDING LETTER		
	VARIABLE	MODIFIER	PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		AUTOMATIC
B	BREAKER		USER'S CHOICE	CLOSE OR STOP	BYPASS
C	COMMUNICATIONS			CONTROL	
D	DENSITY	DIFFERENTIAL		OPEN OR START	
E	VOLTAGE (EMF)		PRIMARY ELEMENT	SENSOR	
F	FLOW RATE	RATIO	FAIL	FAIL	FAIL
G	GAUGING		GLASS		LOCAL/MANUAL/HAND
H	HAND				HIGH OR OPEN
I	CURRENT		INDICATE		INTERMEDIATE
J	POWER	SCAN			
K	TIME	TIME RATE		CONTROL STATION	
L	LEVEL		LIGHT		LOW OR CLOSE
M	MOTOR	MOMENTARY		MOTOR	MIDDLE
N	STATUS		INPUT	FORWARD	ON OR OPERATE
O				OFF	OVERLOAD
P	PRESSURE	PNEUMATIC	POINT (TEST)	POSITION	
Q	QUALITY OR EVENT	TOTALIZE		EMERGENCY/ABNORMAL	
R	RADIOACTIVITY		RECORD OR PRINT	REMOTE	RUN
S	SPEED OR FREQUENCY	SUM	SWITCH	SWITCH	STOP
T	TEMPERATURE			TRANSMIT	MULTIFUNCTION
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	VFD/VALVE
V	VARIABLE OR VISCOSITY			VALVE OR DAMPER	
W	WEIGHT OR FORCE	TORQUE	WELL		UNCLASSIFIED
X	MOD. LIGHT OR VALVE		UNCLASSIFIED	UNCLASSIFIED	RESET
Y	INTERLOCK			RELAY OR COMPUTE	
Z	POSITION			DRIVE OR ACTUATOR	

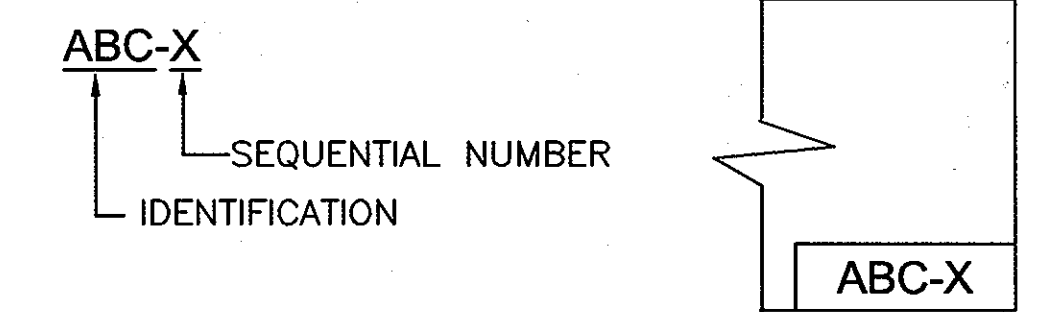
INSTRUMENT EXAMPLES

- FIT = FLOW INDICATING TRANSMITTER
- PIT = PRESSURE INDICATING TRANSMITTER
- ZS = POSITION SWITCH

GENERAL ABBREVIATIONS

- AUTO = AUTOMATIC
- ATS = AUTOMATIC TRANSFER SWITCH
- CB = CIRCUIT BREAKER
- DPDT = DOUBLE POLE-DOUBLE THROW
- ECD = ELECTRICAL CONTROL DIAGRAM
- ETM = ELAPSED TIME METER
- GND = GROUND
- HOA = HAND-OFF-AUTOMATIC
- I/O = INPUT/OUTPUT
- MB = MAIN BREAKER
- PM = PHASE MONITOR
- POT = POTENTIOMETER
- RTU = REMOTE TELEMETRY UNIT
- SF = SUPPLY FAN
- SSRV = SOLID STATE REDUCED VOLTAGE - STARTER
- TEMP = TEMPERATURE
- TPS = TWISTED PAIR SHIELDED
- TVSS = TRANSIENT VOLTAGE SURGE SUPPRESSION
- TYP = TYPICAL
- VAC = VOLTS/ALTERNATING CURRENT
- VFD = VARIABLE FREQUENCY DRIVE
- XFMR = TRANSFORMER

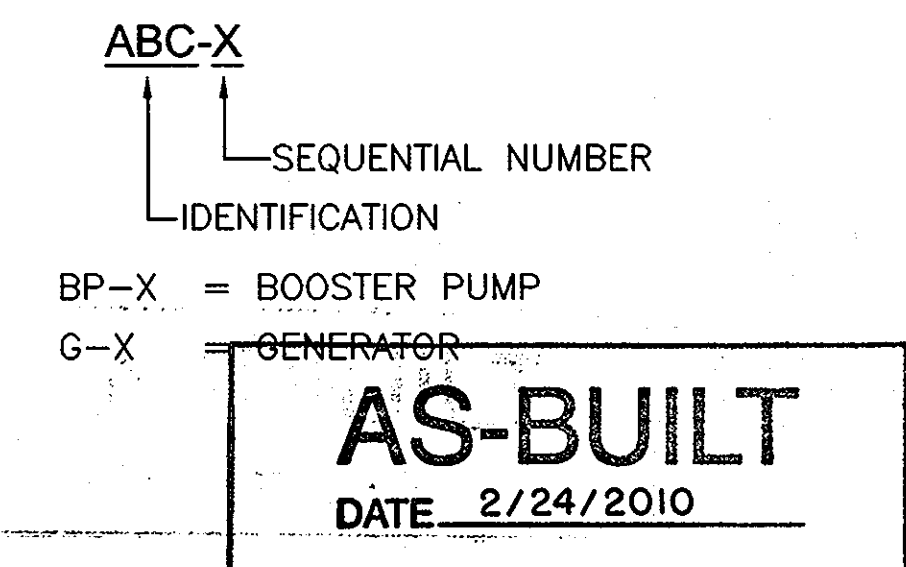
P & I LEGEND



PANEL LEGEND

- BC = BATTERY CHARGER
- CCU-X = CENTRAL CONTROL UNIT
- HMI = HUMAN MACHINE INTERFACE
- I = INDICATION PANEL
- L = LOCAL CONTROL PANEL
- PCP = PUMP CONTROL PANEL
- VFD-X = VARIABLE FREQUENCY DRIVE

EQUIPMENT LEGEND



PROFESSIONAL CERTIFICATION. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 33925, Expiration Date 01/15/09

04/01/2008 - 11:18am User: kmcneaney M:\2007\01070460\Drawings\ITE 216 UPGRADE\SY-1-LC LEGEND AND SYMBOLS.dwg

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signatures]
DIRECTOR OF PUBLIC WORKS DATE 10/26/08
CHIEF, BUREAU OF ENGINEERING
CHIEF, BUREAU OF UTILITIES DATE 10-1-08
CHIEF, UTILITY DESIGN DIVISION

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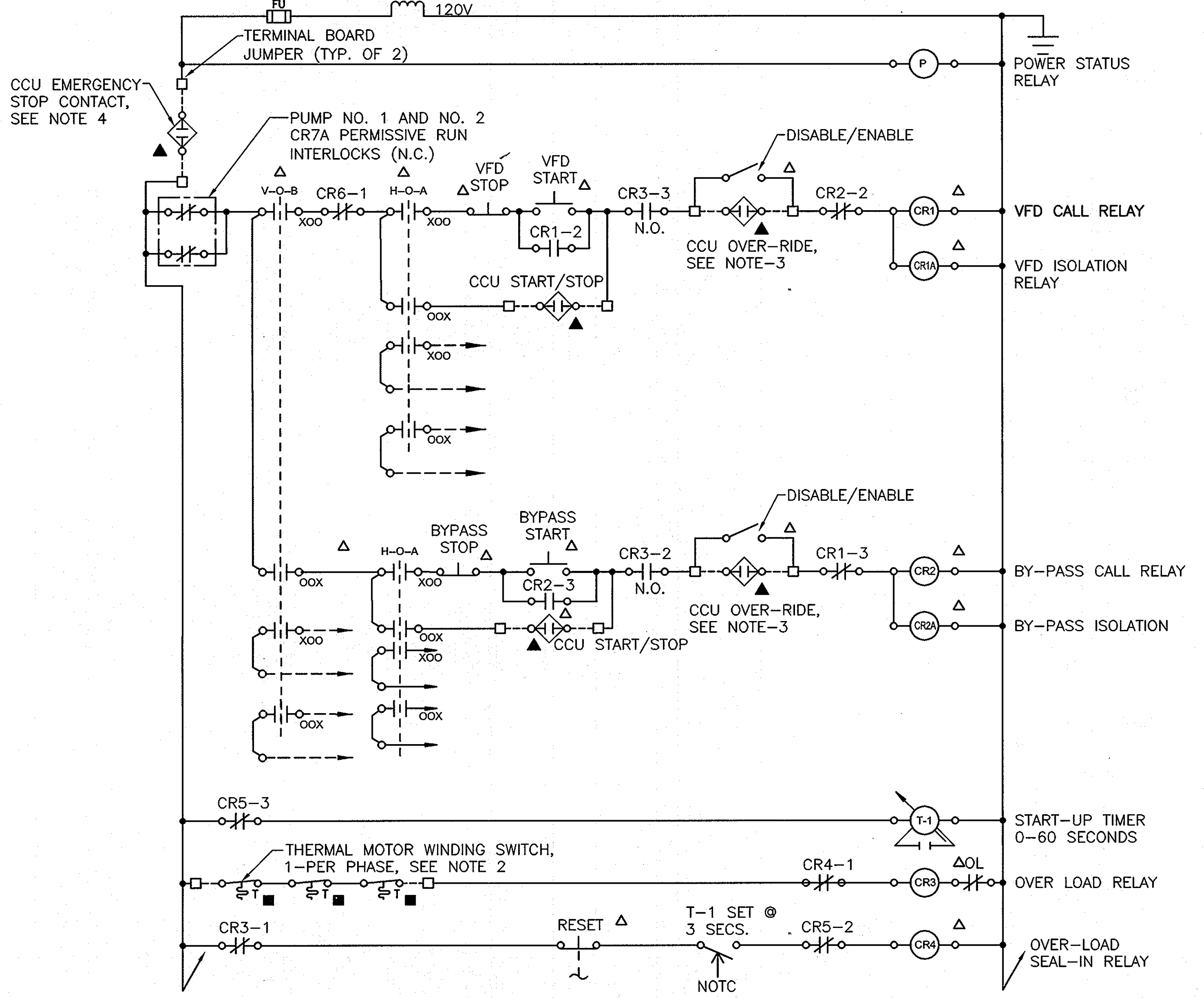
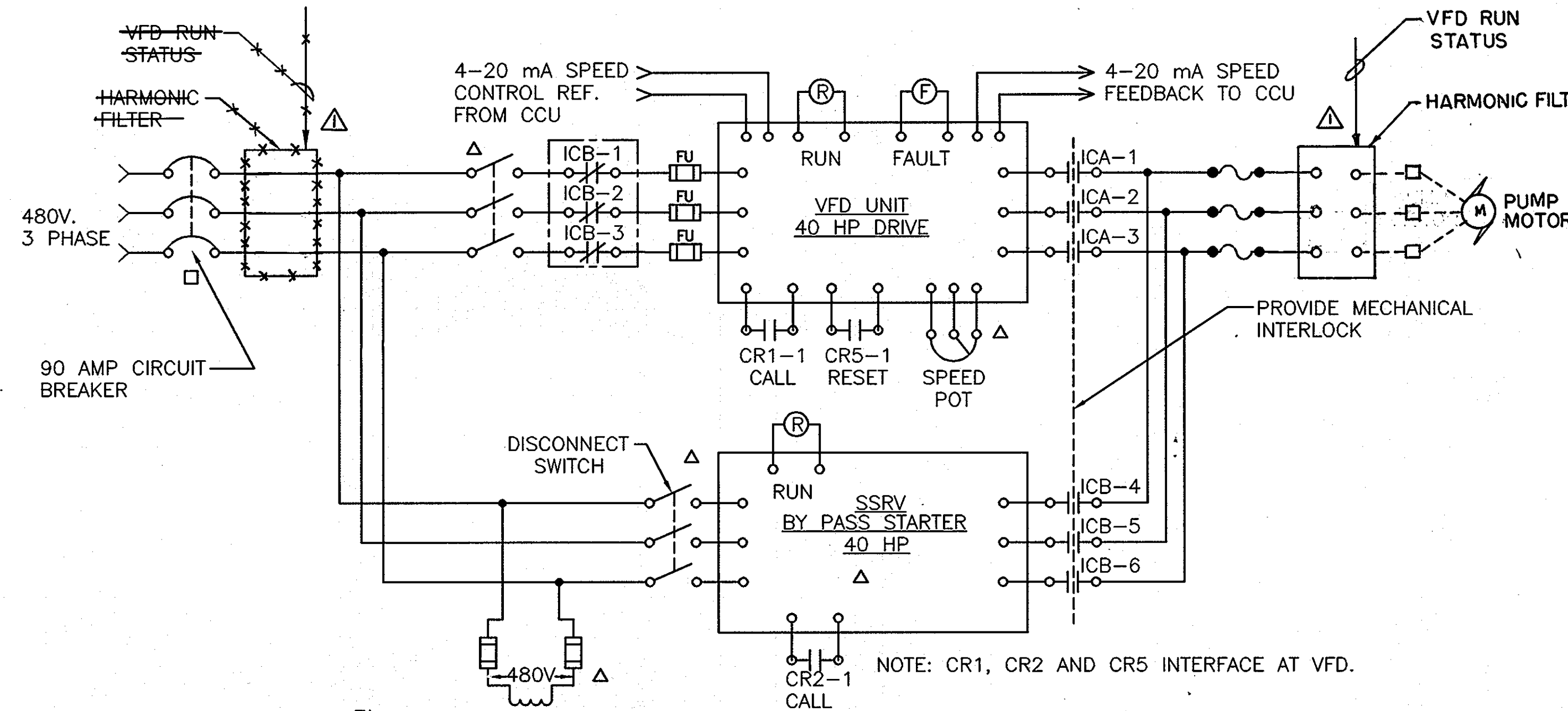
STATE OF MARYLAND
REGISTERED PROFESSIONAL ENGINEER
No. 33925
10/1/08

DES: SEA			
DRN: LFN			
CHK: JRK			
DATE: 9/08	LFN	AS BUILT	2/24/10
	BY	NO.	REVISION

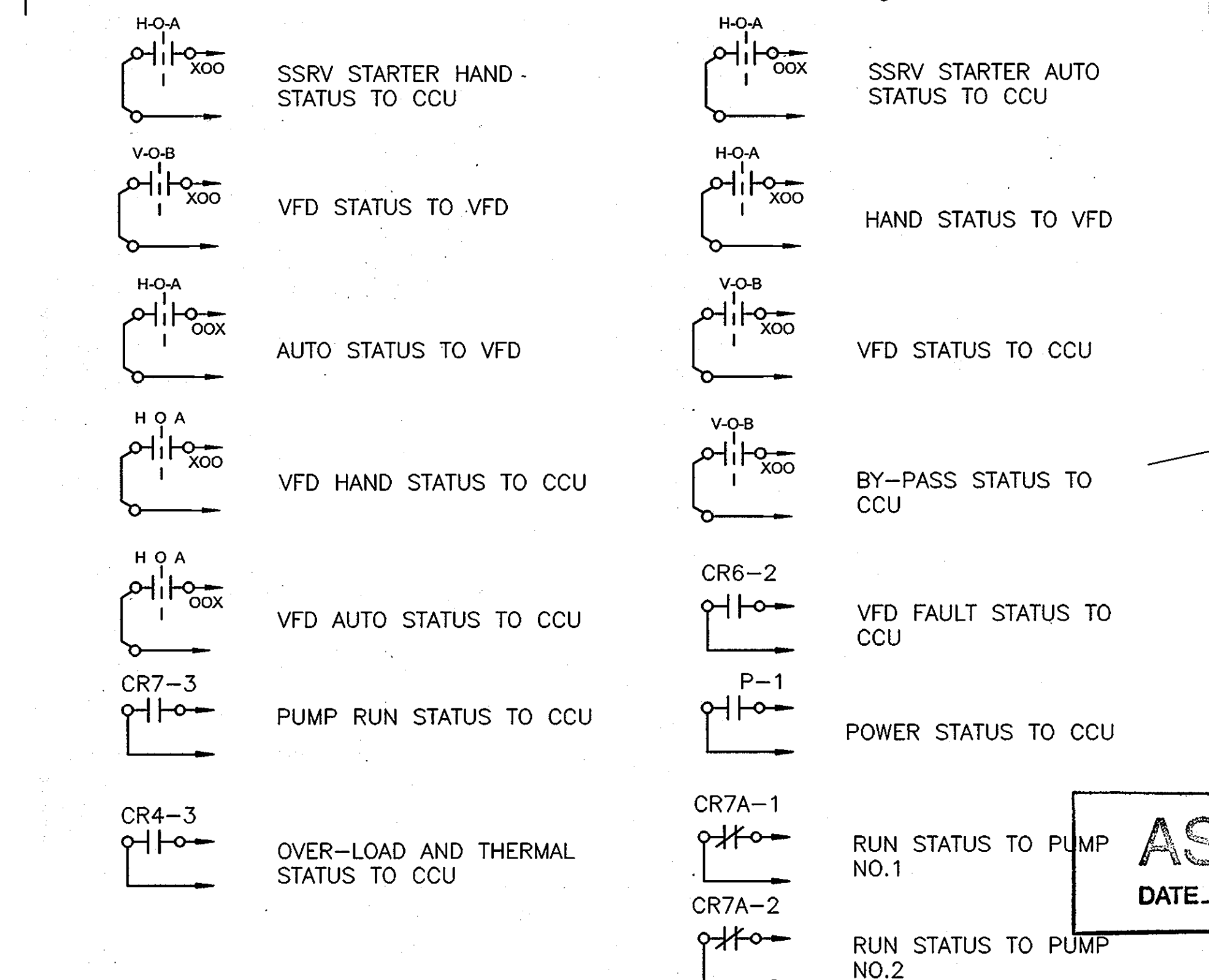
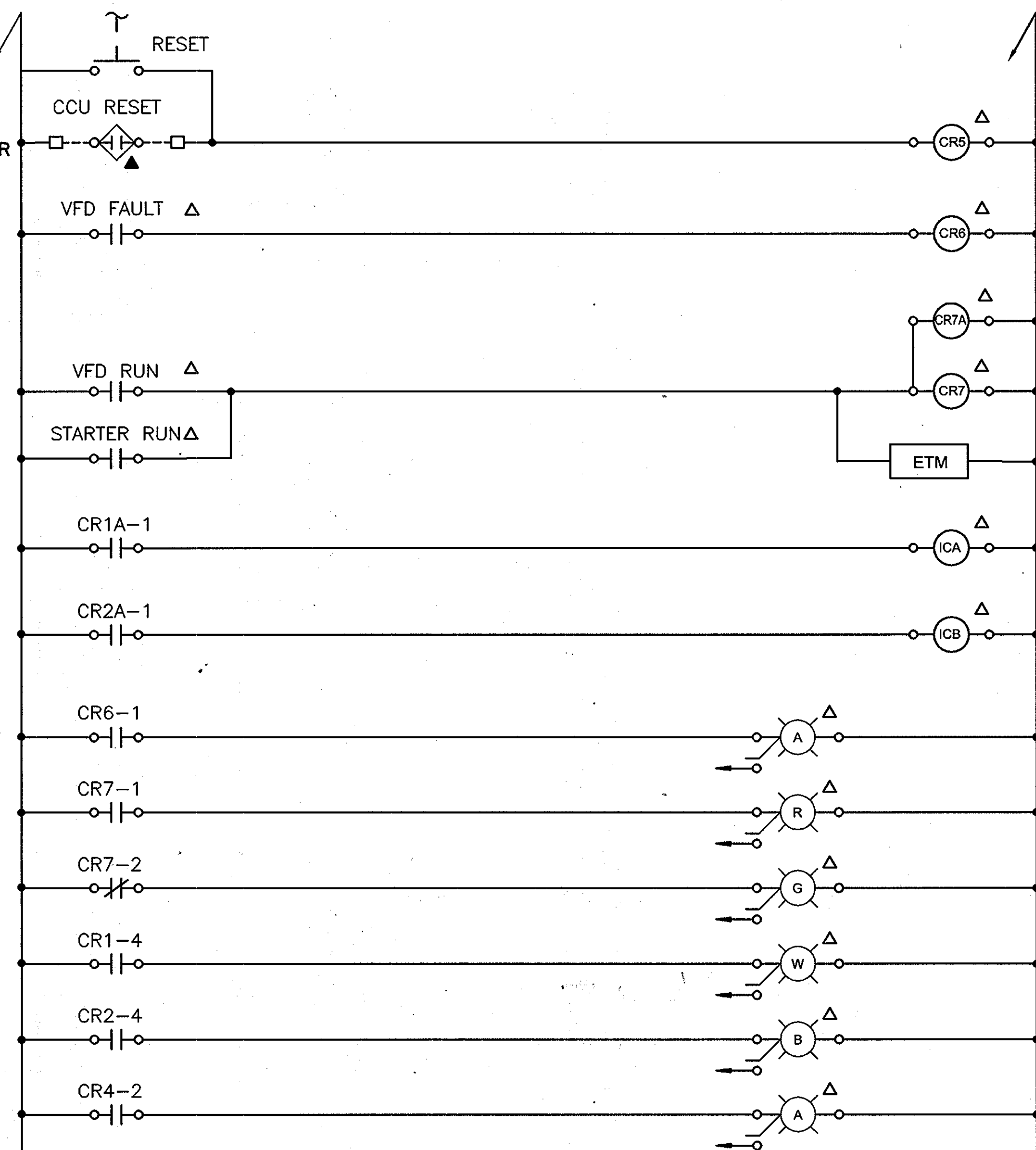
PROCESS & INSTRUMENTATION
SYMBOLS

RTE 216 PUMP STATION UPGRADE
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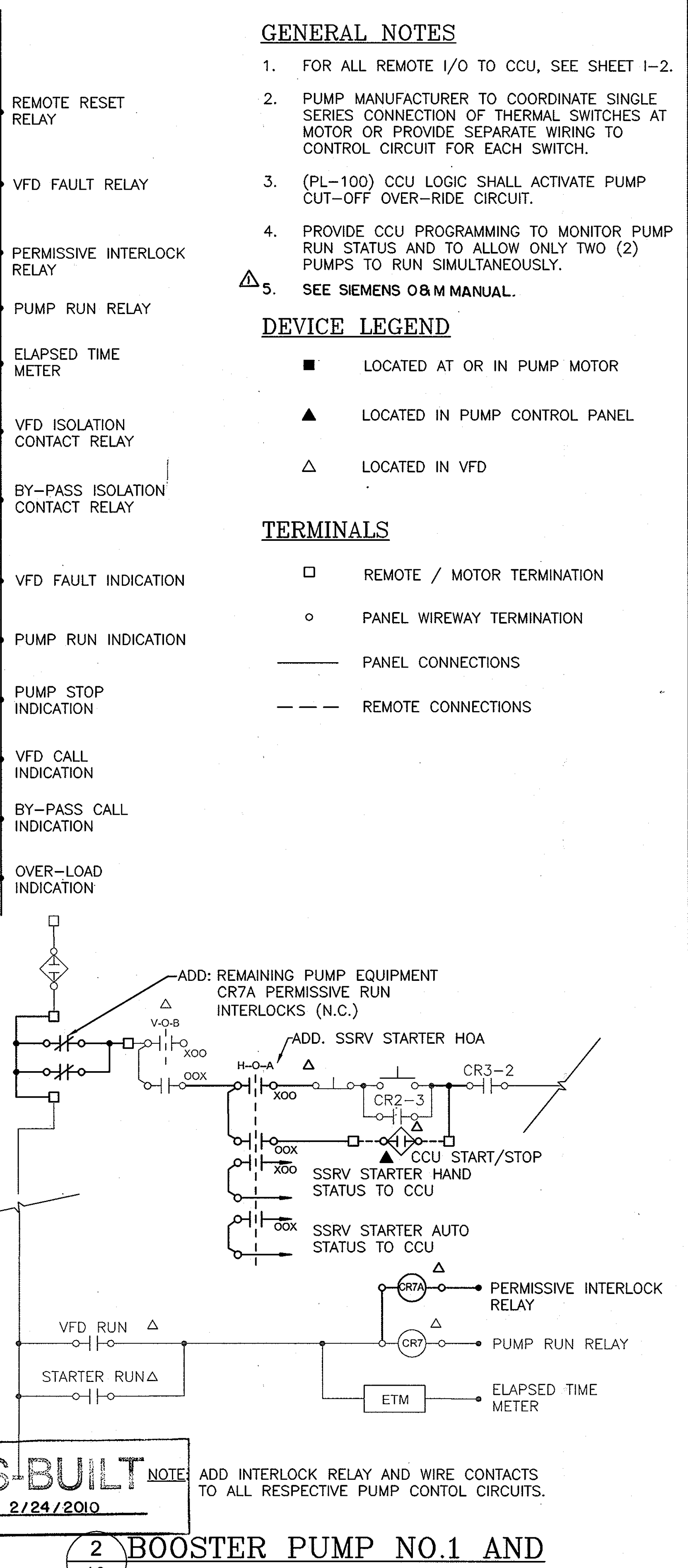
SCALE AS SHOWN
SHEET 9 OF 11



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1 BOOSTER PUMP NO.3 CONTROL DIAGRAM
SEE NOTE 5



2 BOOSTER PUMP NO.1 AND NO.2 VFD MODIFICATIONS

- GENERAL NOTES**
- FOR ALL REMOTE I/O TO CCU, SEE SHEET I-2.
 - PUMP MANUFACTURER TO COORDINATE SINGLE SERIES CONNECTION OF THERMAL SWITCHES AT MOTOR OR PROVIDE SEPARATE WIRING TO CONTROL CIRCUIT FOR EACH SWITCH.
 - (PL-100) CCU LOGIC SHALL ACTIVATE PUMP CUT-OFF OVER-RIDE CIRCUIT.
 - PROVIDE CCU PROGRAMMING TO MONITOR PUMP RUN STATUS AND TO ALLOW ONLY TWO (2) PUMPS TO RUN SIMULTANEOUSLY.
 - SEE SIEMENS O&M MANUAL.

- DEVICE LEGEND**
- LOCATED AT OR IN PUMP MOTOR
 - ▲ LOCATED IN PUMP CONTROL PANEL
 - △ LOCATED IN VFD

- TERMINALS**
- REMOTE / MOTOR TERMINATION
 - PANEL WIREWAY TERMINATION
 - PANEL CONNECTIONS
 - - - REMOTE CONNECTIONS

AS-BUILT
DATE 2/24/2010

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CONTROL DIAGRAMS

600' SCALE MAP NO. 46 BLOCK NO. 4

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SCALE AS SHOWN
SHEET 11 OF 11