


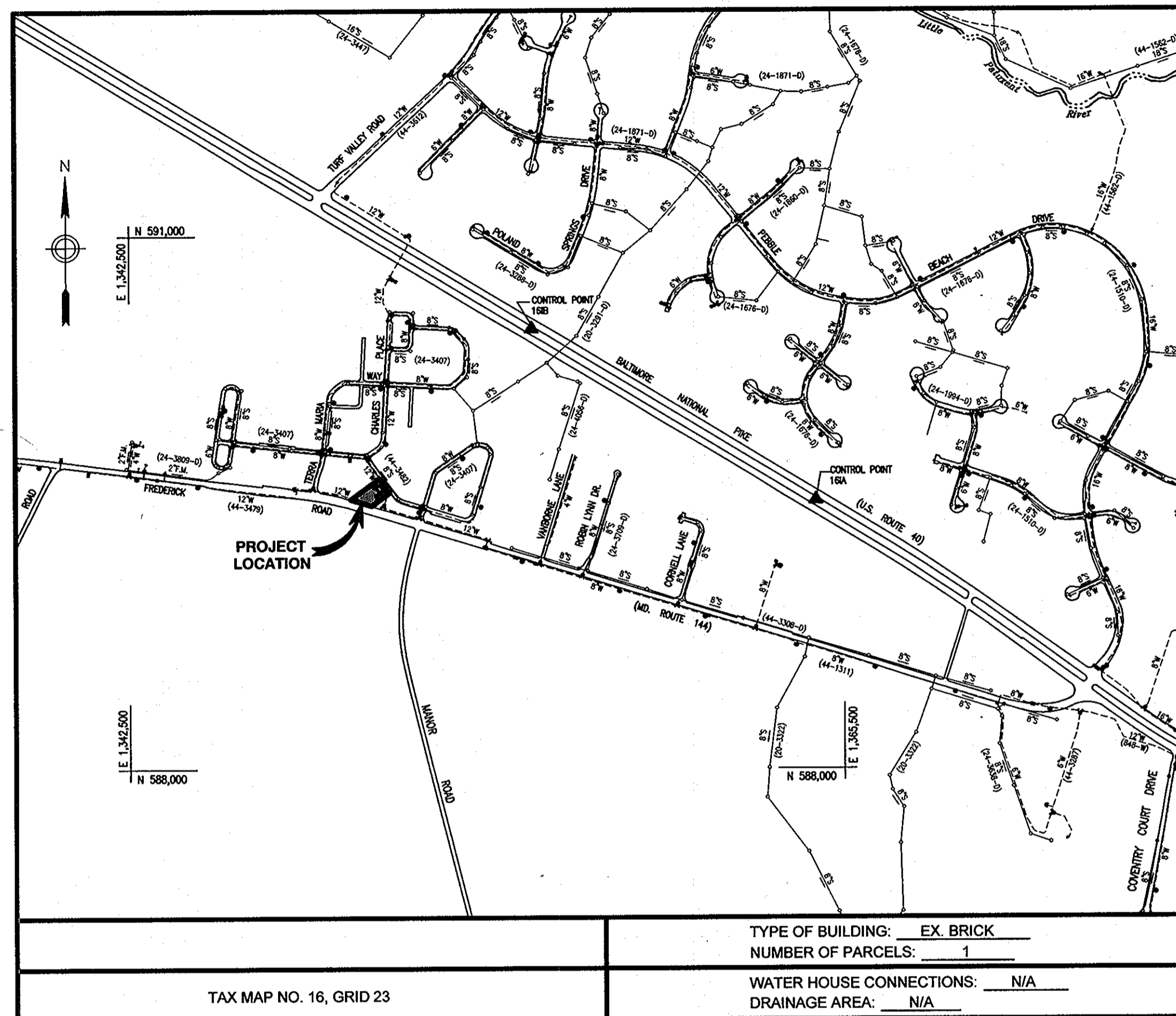
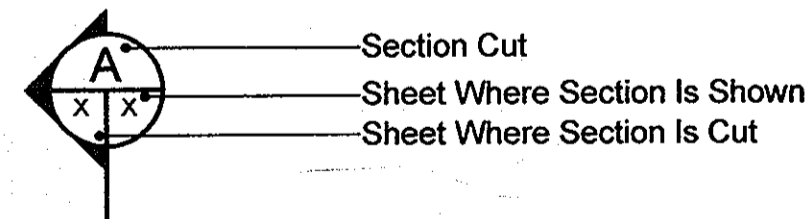
HOWARD COUNTY

DEPARTMENT OF PUBLIC WORKS

ELLCOTT CITY, MARYLAND 21043

GENERAL NOTES

- Approximate location of existing mains is shown. The Contractor shall take all necessary precautions to protect existing mains and services and to maintain all uninterrupted water supply. Any damage incurred shall be repaired immediately to the satisfaction of the Engineer at the Contractor's expense.
- Topographic field surveys were performed on August, 1995 by PATTON HARRIS RUST & ASSOCIATES (formerly Riemer Muegge & Associates).
- Horizontal and Vertical Survey Controls:
The coordinates shown on the drawings are based on the Maryland State Plane Coordinate System (NAD '83/91) as projected by Howard County Geodetic Control Stations No. 161A and No. 161B.
All vertical controls are based on NAVD '88.
- All pipe elevations shown are invert elevations, unless otherwise noted.
- 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 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 Details for Construction and MSHA Standards and Specifications (latest edition). The Contractor shall have a copy of Volume IV on the job at all times.
- 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 five working days before starting work shown on these plans:
 - AT&T.....1-800-252-1133
 - BGE (Construction Services).....410-850-4620
 - BGE (Emergency).....410-685-1400
 - Bureau of Utilities.....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
- Trees and shrubs are to be protected from damage to the 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 the 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)-313-7450 at least five working days before open cutting or boring/jacking of any County road for laying water/sewer mains or house connections. The approval of these drawings will constitute compliance with DPW requirements per section 18.114(a) of the Howard County Code.
- All water mains to be D.I.P. Class 54, unless otherwise noted.
- Top of all water mains shall have a minimum of 3'-6" of cover unless otherwise noted.
- Valves adjacent to tees shall be strapped to tee.
- All fittings shall be buttressed or anchored with concrete in accordance with the Standard Details, unless otherwise provided for on the drawings.
- The Contractor shall not operate any water main valves on the existing water system.
- Trench repair shall be in accordance with Howard County Standard Details.
- All work shall be in accordance with Howard County Standards and specifications for Soil Erosion and Sediment Control Section 219.
- All mechanical components removed from the water pumping station shall be transported, at the Contractor's expense, to the Little Patuxent Water Reclamation Facility, unless otherwise agreed to by the County.
- Sections and Elevations:



VICINITY MAP
SCALE: 1" = 600'

FREDERICK ROAD

PUMPING STATION UPGRADES

CAPITAL PROJECT W-8264

CONTRACT NO. 44-4468

INDEX OF SHEETS

SHEET NO.	DWG. NO.	DESCRIPTION
1	C-1	TITLE SHEET
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3	M-2	PROPOSED PUMP STATION PLANS AND SECTIONS
4	M-3	PUMP CURVE & MISCELLANEOUS DETAILS
5	H-1	HVAC NOTES, ABBREVIATIONS, SYMBOLS AND DETAILS
6	E-1	ELECTRICAL ABBREVIATIONS, NOTES AND SYMBOLS
7	E-2	ELECTRICAL FLOOR PLANS AND DETAILS
8	E-3	ELECTRICAL SCHEMATICS AND DETAILS
9	E-4	ELECTRICAL RISER & ONE LINE DIAGRAM
10	E-5	ELECTRICAL SCHEDULES AND DETAILS

QUANTITIES				
ITEM	UNIT	ESTIMATE	AS-BUILT	SUPPLIER
FURNISH AND INSTALL NEW 800 GPM PUMPS, VALVES AND VALVE STANDS	EACH	3	3	GOULD/KENNEDY
MISC. PIPING, PRESSURE/SURGE VALVES FLOW ELEMENT AND SPOOL PIECES	LOT	1	1	JOBE & COMPANY/CAVAL
DIESEL GENERATOR AND SUPPORT SYSTEMS	EACH	1	1	KOHLER
VFD DRIVES	EACH	3	3	SIEMENS (CUTLER HAMMER)
ELECTRICAL WIRING, DEVICES, AND CONNECTIONS	LOT	1	1	CME
CONTROL WIRING, DEVICES, CONNECTIONS AND PROGRAMMING	LOT	1	1	SIEMENS
REPLACE/REPAIR QUOINS	EACH	4	4	N/A
NAME OF UTILITY CONTRACTOR: EMH ENVIRONMENTAL, INC.				
CHECK BOX				
AS-BUILT DATE:				

NOTE: Quantities in the above table are solely for record purposes. Contractor shall not rely on the quantities in the table and shall use his/her own takeoff to establish materials and quantities needed for this project.

NOTE: BUILDING WAS TREATED FOR TERMITES ON 11-19-12 AND IS GUARANTEED FOR ONE (1) YEAR. INFESTATION WITHIN THAT YEAR WILL BE TREATED BY TERMINIX AFTER THEIR CONFIRMATION OF INFESTATION FREE OF CHARGE.

AS-BUILTS
02-04-13

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

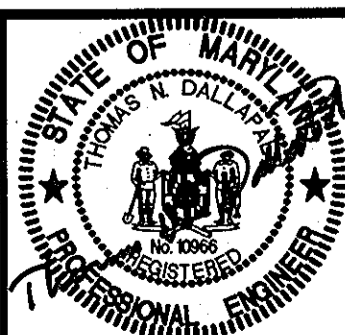
[Signature] DATE: 6/25/10
DIRECTOR OF PUBLIC WORKS

[Signature] DATE: 6/25/10
CHIEF, BUREAU OF ENGINEERING

[Signature] DATE: 6/25/10
CHIEF, BUREAU OF UTILITIES

[Signature] DATE: 6/25/10
CHIEF, UTILITY DESIGN DIVISION

Dewberry
Dewberry & Davis LLC
3106 LORD BALTIMORE DRIVE
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BALTIMORE, MD 21244-2662
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DES:	FRN				
DRN:	AZV				
CHK:	TND				
DATE:	2/11/09	BY:	NO.	REVISIONS	DATE

TITLE SHEET

600' SCALE MAP NO. 16 BLOCK NO. 23

ELECTION DISTRICT NO. 2

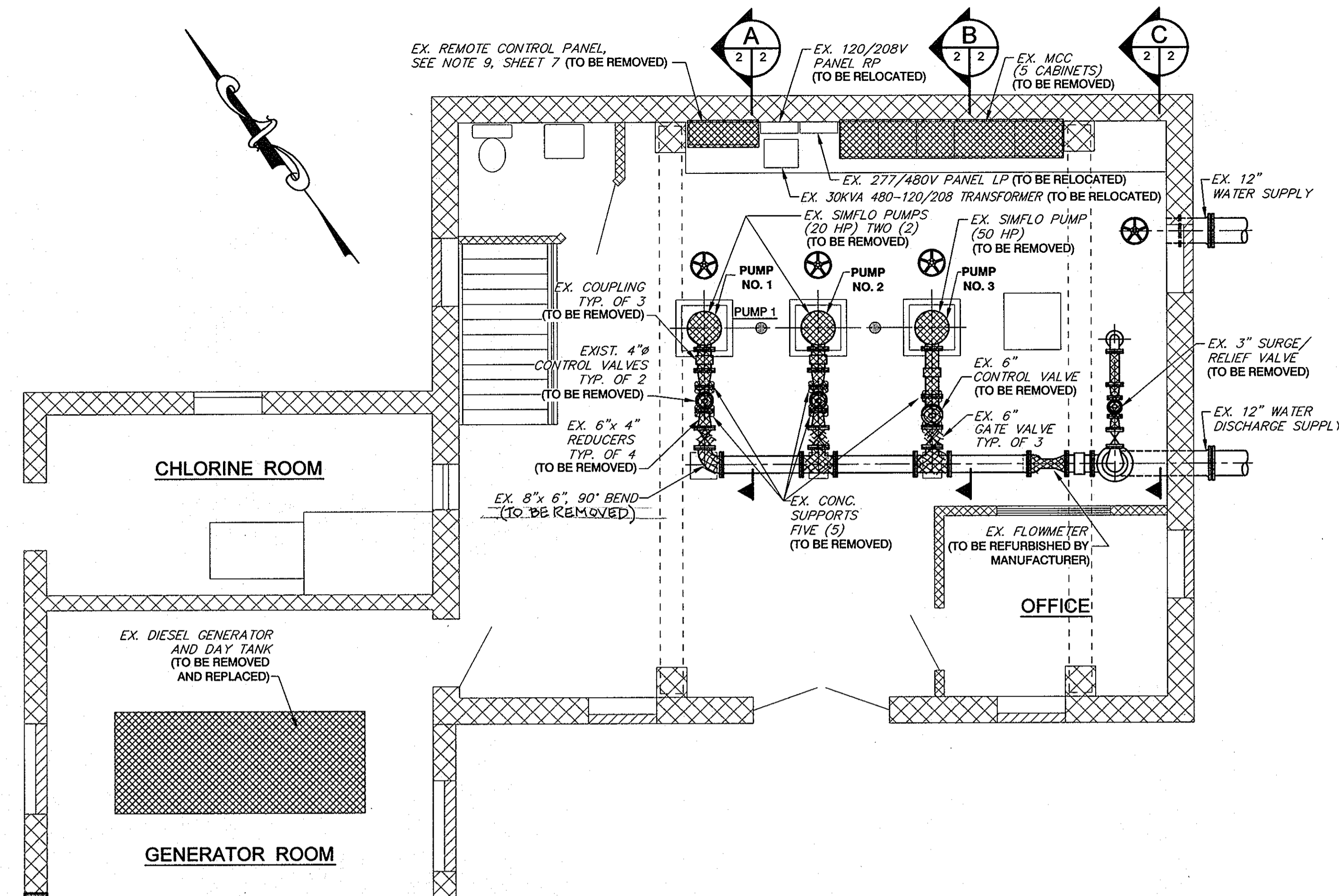
FREDERICK ROAD
PUMPING STATION UPGRADES
CAPITAL PROJECT W-8264
CONTRACT 44-4468

HOWARD COUNTY, MARYLAND

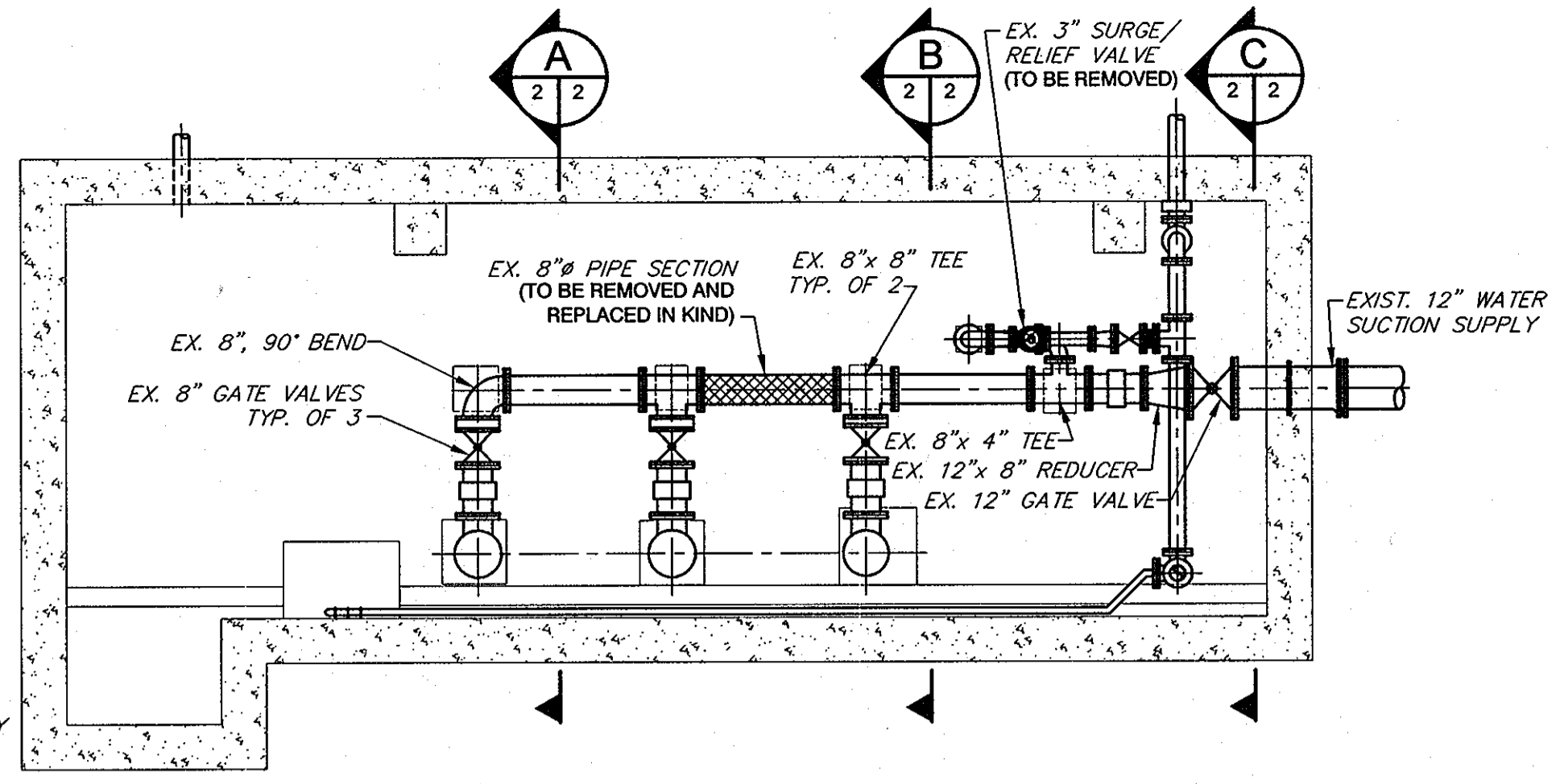
DWG. NO.
C-1

SCALE:
SHOWN

SHEET
1 OF 10

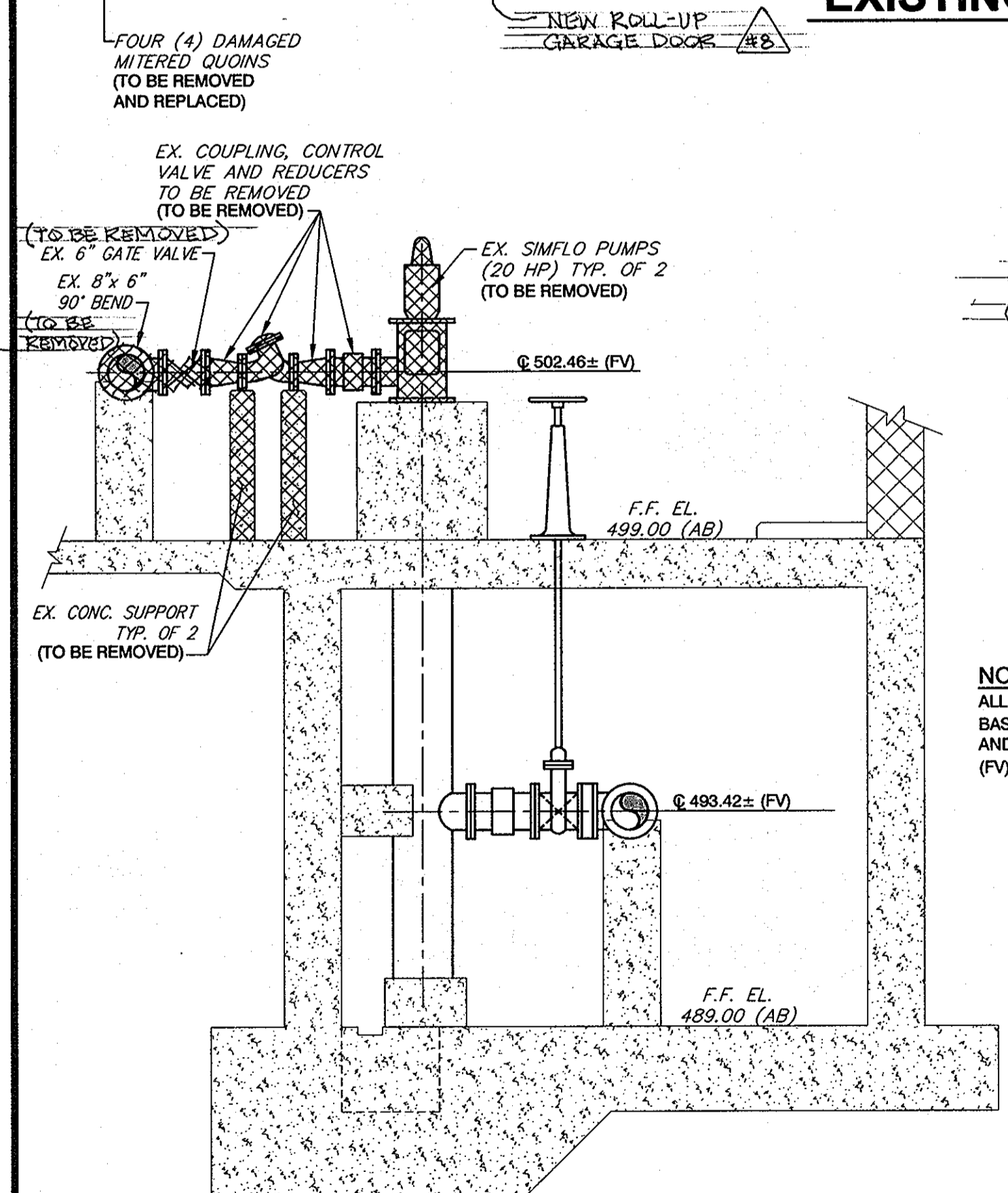


EXISTING OPERATOR LEVEL PLAN
SCALE: 1/4" = 1'-0"

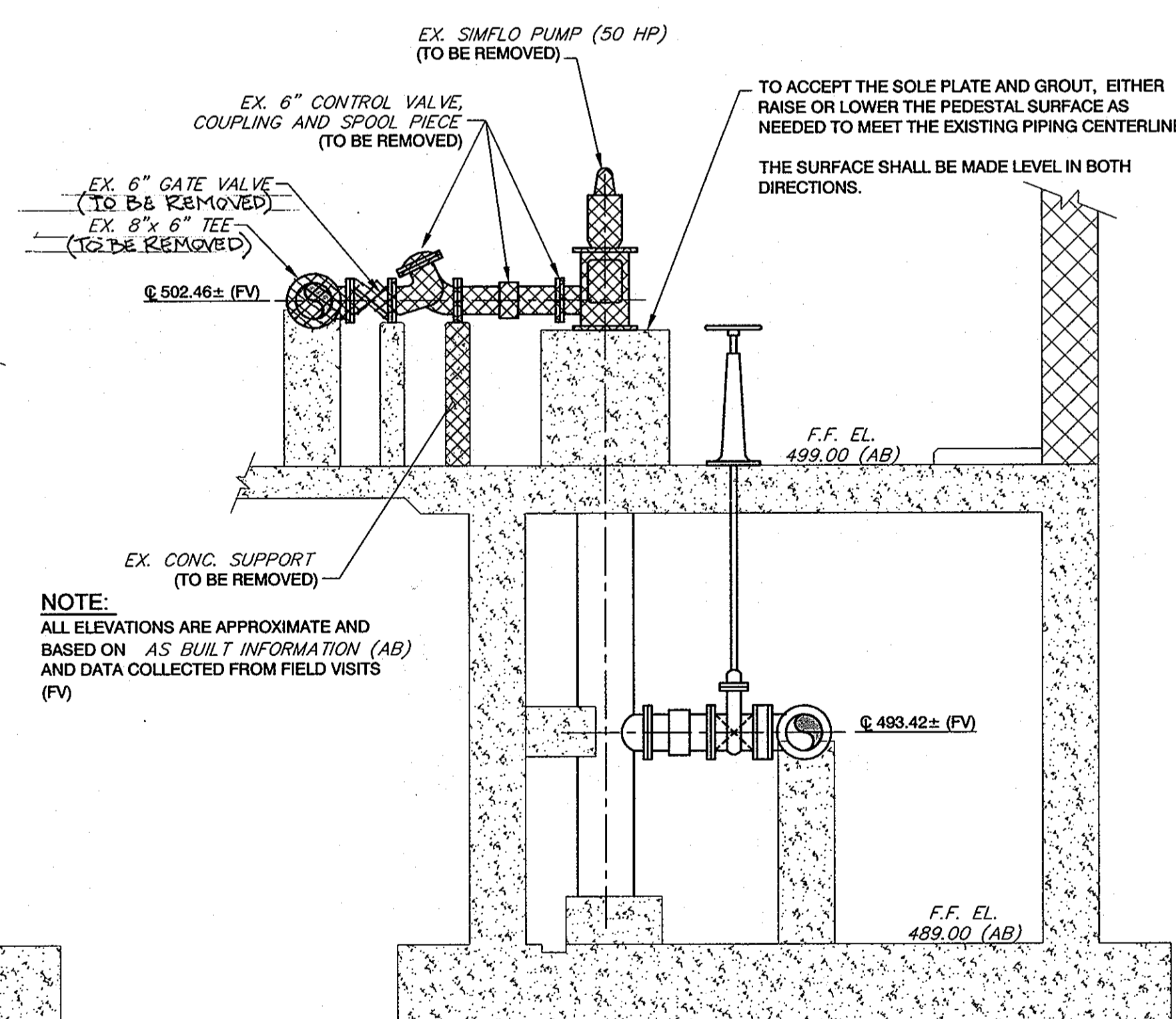


EXISTING LOWER LEVEL PLAN
SCALE: 1/4" = 1'-0"

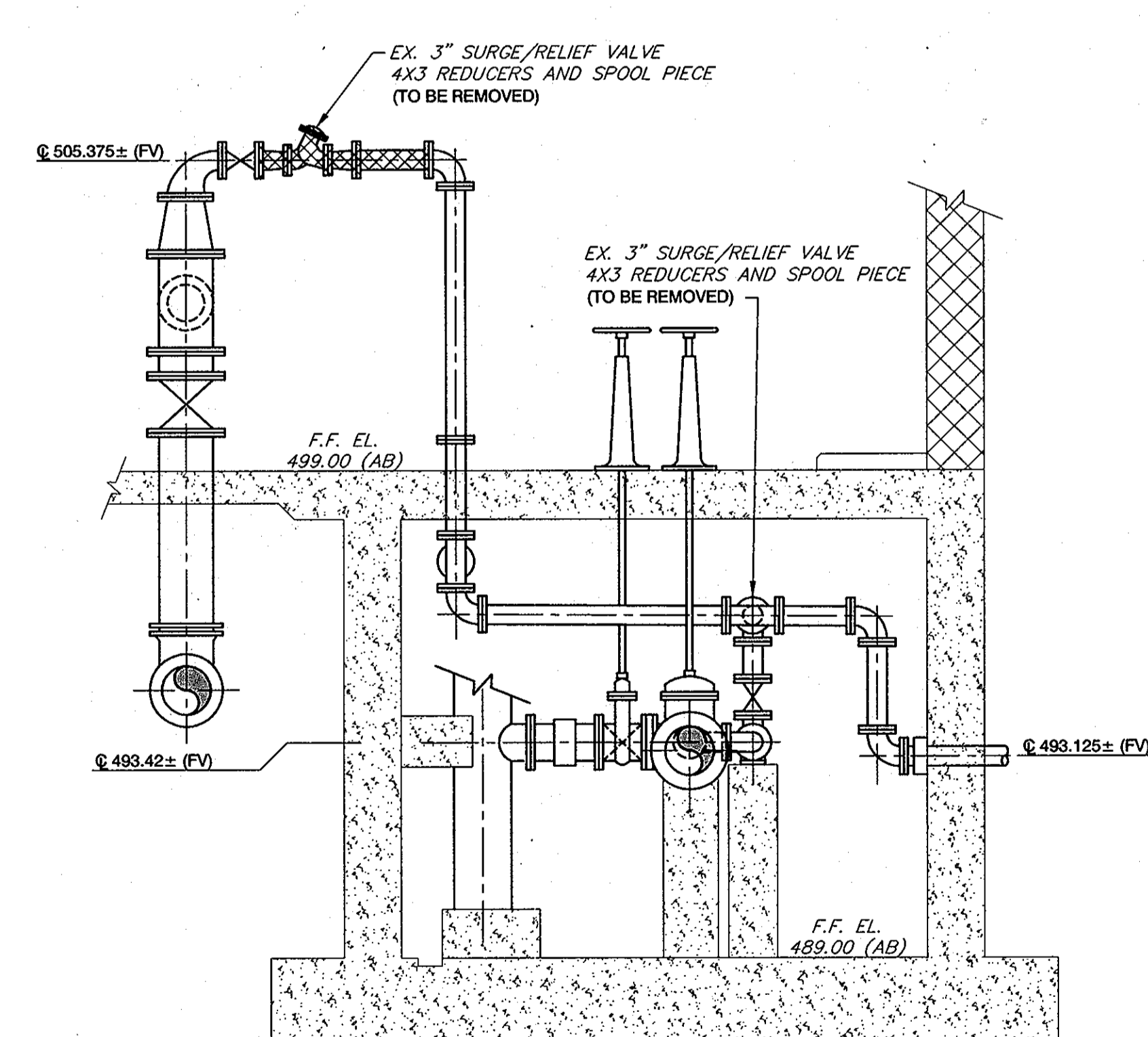
NOTE:
SEE GENERAL NOTE # 19 OF SHEET #1
CONCERNING DISPOSITION OF REMOVED/SALVAGED
EQUIPMENT



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



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



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

SEQUENCE OF CONSTRUCTION

- A. The sequence of construction given herein is intended as a generalized guideline to the Contractor of the general sequencing of major construction activities included in this project. The Contractor may revise this sequence as necessary to fit his schedule requirements, provided that the Contractor in no way inhibits or lessens the ability of the pumping station to maintain the required flow and pressure. The contractor shall submit a written sequence of construction for review and approval by the Engineer.
- B. Any shutdowns that may be required shall be coordinated with the Engineer to be performed at times that will minimize impacts on the system. The Contractor shall not operate any equipment or valves except under the direct supervision of the Engineer. If the Contractor requires a shutdown or change in operations, he shall notify the Engineer at least 48 hours in advance.
- C. Sequence of Construction.
Note that this sequence is intended to demonstrate that the pumping station is to remain in operation during the construction. Shutdowns are to be minimized. The desire to minimize shutdowns shall NOT be taken as a license to minimize safety of personnel and equipment. The following task and sequence is not all inclusive and is to be considered only a guide that is to be extended and enhanced by the contractor.

- Task 1
1. Mobilize
- Task 2
1. Provide temporary standby power for existing load.
2. Wire in/test/verify
- Task 3
1. Remove existing generator, fuel system etc.
2. Rig and install new generator complete with all systems.
3. Revise the generator room heating and ventilating system as indicated.
4. Test/verify operation.
5. Complete wiring.
6. Remove temporary standby power generator.
7. Repair any architectural modifications to original condition.
8. repair/replace Quoins.
- Task 4
1. Install temporary bypass pumping system.
2. Test/verify bypass pumping system.
3. Remove flow element, package and ship for renewal.
4. Replace flow element with fabricated spool piece.
- Task 4b
1. Place station on bypass pumping operation.
2. Disconnect the power from the existing MCC and remove the MCC sections to be replaced. Disconnect the pumps from the existing MCC.
3. Install the new 12" x 12" tap wireway tap connection and install the double throw switch.
4. Install the three new VFD's and restore power to the MCC.
5. Temporarily reconnect the existing pumps to the new drives. Note that pump No. 3 will now be temporarily connected to a VFC.
6. Remove the existing control and sequence systems and install the new systems. Place the new control and sequence systems in temporary operation with the existing pumps.
- Task 5
1. Block off the suction and discharge for pump No. 1 and lock the valves closed.
2. Remove the existing control valve, piping spools, and couplings using the facility overhead hoist.
3. Remove the existing piping support pedestals for the control valve
4. Construct new piping support pedestals - allow a min. of 7 days cure time before initial usage/removal of forms.
5. Disconnect and remove power cables from pump No. 1.
6. Remove motor and pump of Unit No. 1.
7. Modify the pump mounting pedestal to accept the new pump.
8. Mount and align the new pump with outlet centerline matching that of the existing piping
9. Install the new motor for Pump No. 1.
10. Complete power and instrumentation cabling from the MCC to the pump head
11. Install the coupling, piping spool, pump control valve and misc. control wiring/piping
12. Complete the RTU programming and the control wiring between the RTU, relay logic circuitry and VFD for Pump No. 1
13. Test pump and VFD per specification.
14. Bring Pump No. 1 on line.
15. Coordinate bypass pumping with the use of Pump No. 1.
16. Revise the system control settings as needed for the larger Pump No. 1.
- Task 6
1. Repeat steps 1 thru 16 (Task 5) for Pump No. 2
- Task 7
1. Repeat steps 1 thru 16 (Tasks 5 & 6) for Pump No. 3
a. Note that existing Power wiring may be re-used for pump No. 3.
b. The bypass pumping can be shut down after pump No. 3 is operational.
- Task 8
1. Install the Discharge line relief line surge/relief valve.
a. Fabricate the new spool piece and surge/relief valve assembly.
b. Close and lock the surge/relief valve manual isolation valves.
c. Block and support the existing piping to prevent springing and remove the existing valve, reducers, and pipe spool.
d. Install the new pipe spool and valve.
e. Reopen isolation valves and set / test the surge/relief valve.
a. Fabricate the new spool piece and surge/relief valve assembly.
b. Close and lock the surge/relief valve manual isolation valves.
c. Block and support the existing piping to prevent springing and remove the existing valve, reducers, and pipe spool.
d. Install the new pipe spool and valve.
e. Reopen isolation valve and set / test the surge/relief valve.
3. Install miscellaneous piping spools.
4. Replace flow element.
- Task 9
1. De-commission and remove the bypass pumping.
- D. The Contractor is responsible for the proper coordination of his work and this subcontractor's work and to ensure that the Owner is made aware in advance of proposed construction activities.
- E. There will be no basis for claim for extra compensation or contract time extension due to delay caused by the Contractor's failure to give proper notice for requested shutdowns or to advise the Owner of proposed construction activities that in the judgment of the Owner will interfere with operation of the facility.
- F. Should an emergency condition arise at the facilities, the Owner has the authority to require that Contractor and his subcontractors to suspend their operations temporarily until conditions return to normal, without claim for extra cost or contract time extension by the Contractor and his subcontractors.
- G. The contractor shall be responsible for coordinating with subcontractors to determine the location, size and arrangement of all chases and openings and shall establish clearances in concealed spaces required for the proper installation of its work and shall see that such are provided.

AS-BUILTS
02-04-13

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: [Signature] DATE: 6/25/10
Chief, Bureau of Engineering: [Signature] DATE: 6/25/10
Chief, Bureau of Utilities: [Signature] DATE: 6/25/10

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DES:	FRN				
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EXISTING PUMP STATION
PLANS, SECTIONS
AND DEMOLITION

600' SCALE MAP NO. 16
BLOCK NO. 23

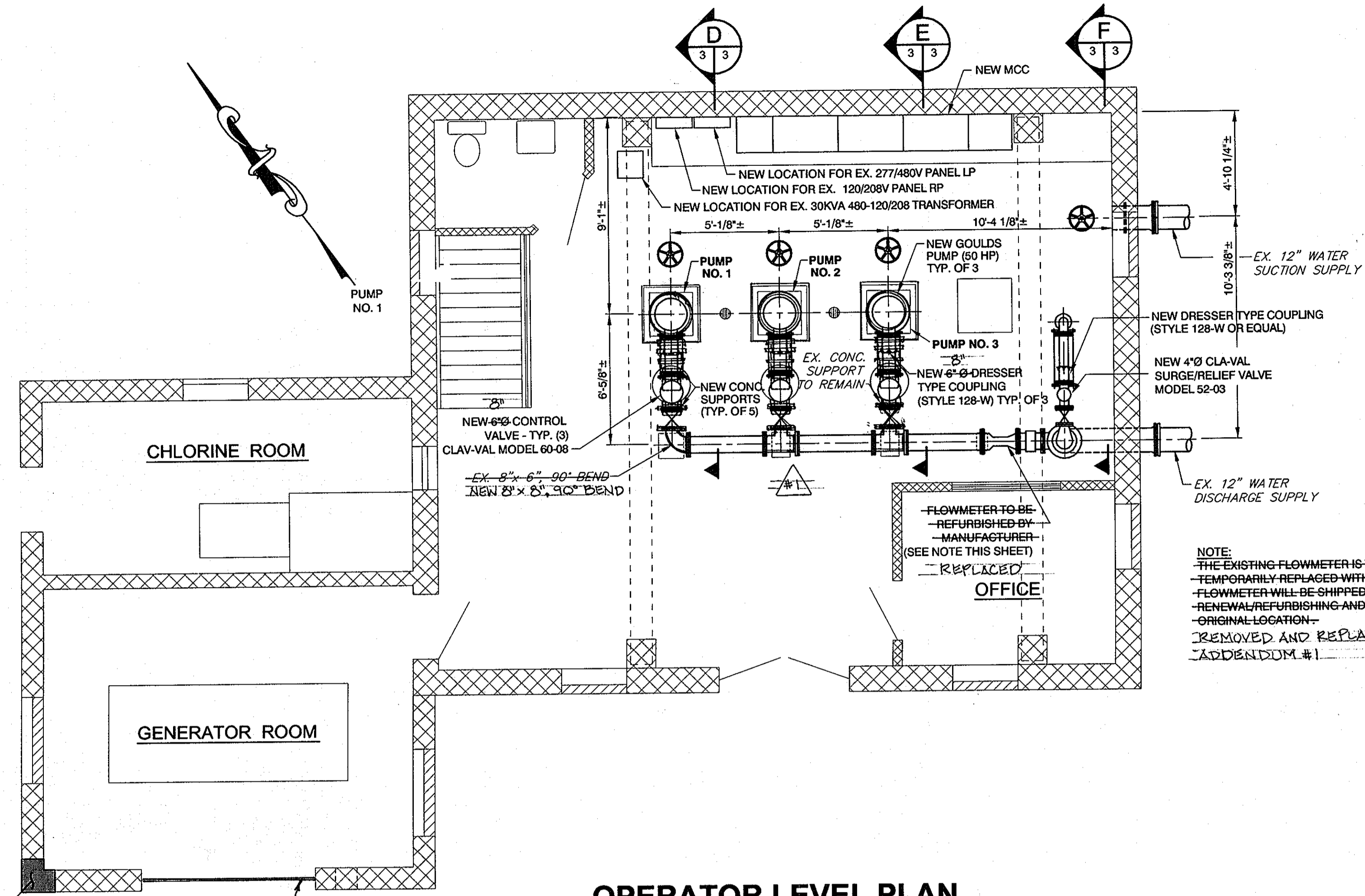
FREDERICK ROAD
PUMPING STATION UPGRADES
CAPITAL PROJECT W-8264
CONTRACT 44-4468

ELECTION DISTRICT NO. 2
HOWARD COUNTY, MARYLAND

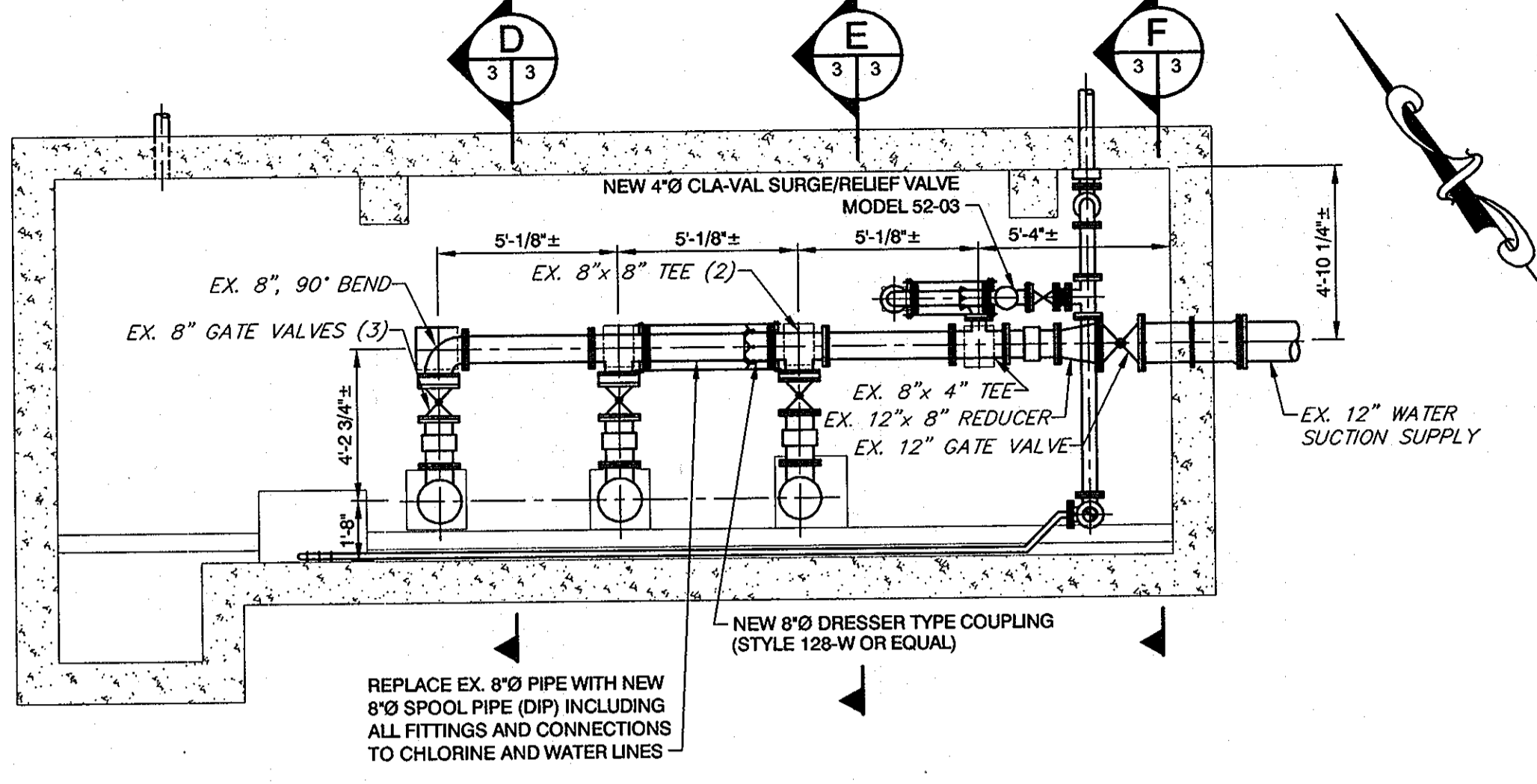
DWG. NO.
M-1

SCALE:
SHOWN

SHEET
2 OF 10



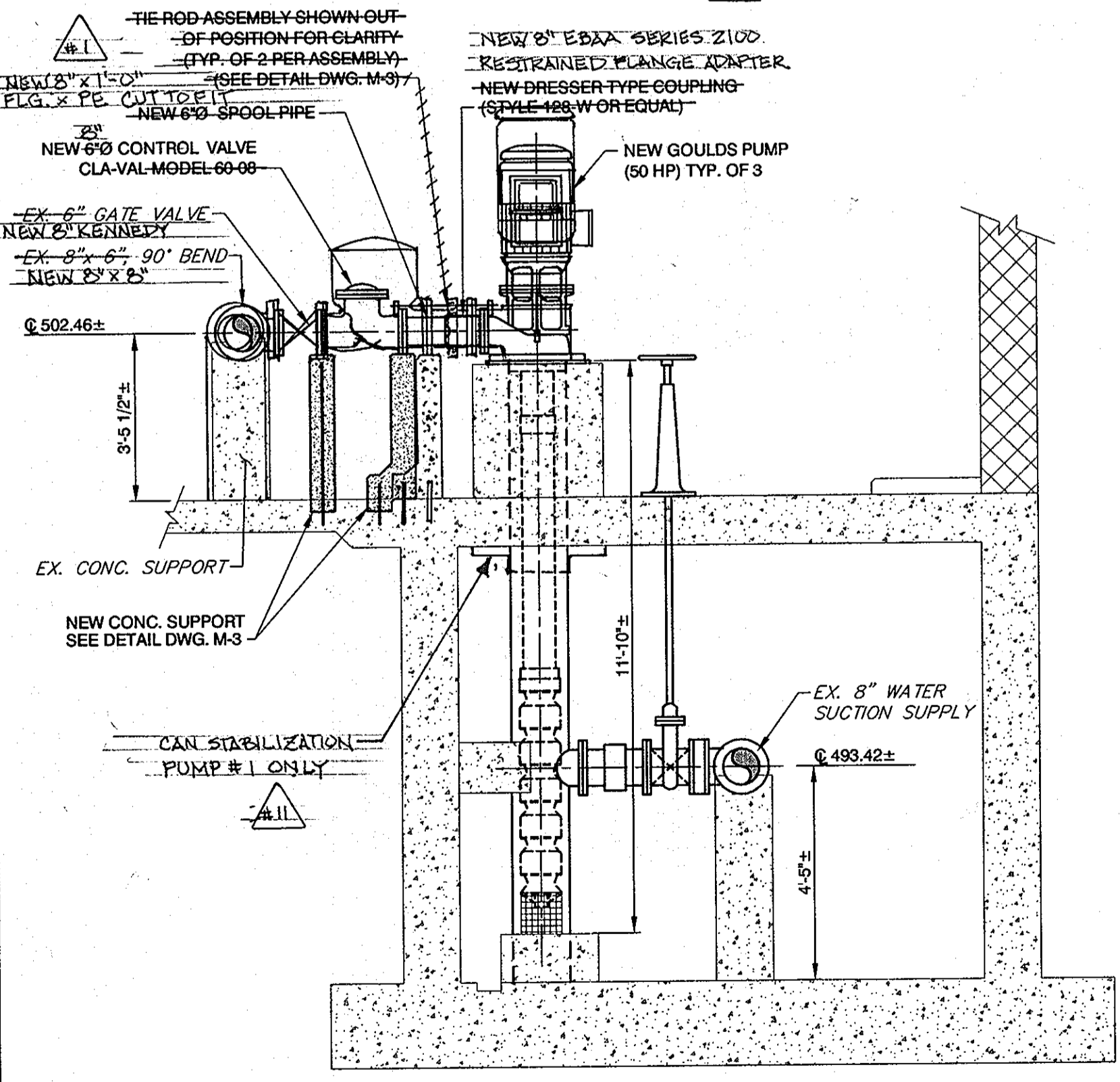
OPERATOR LEVEL PLAN
SCALE: 1/4" = 1'-0"



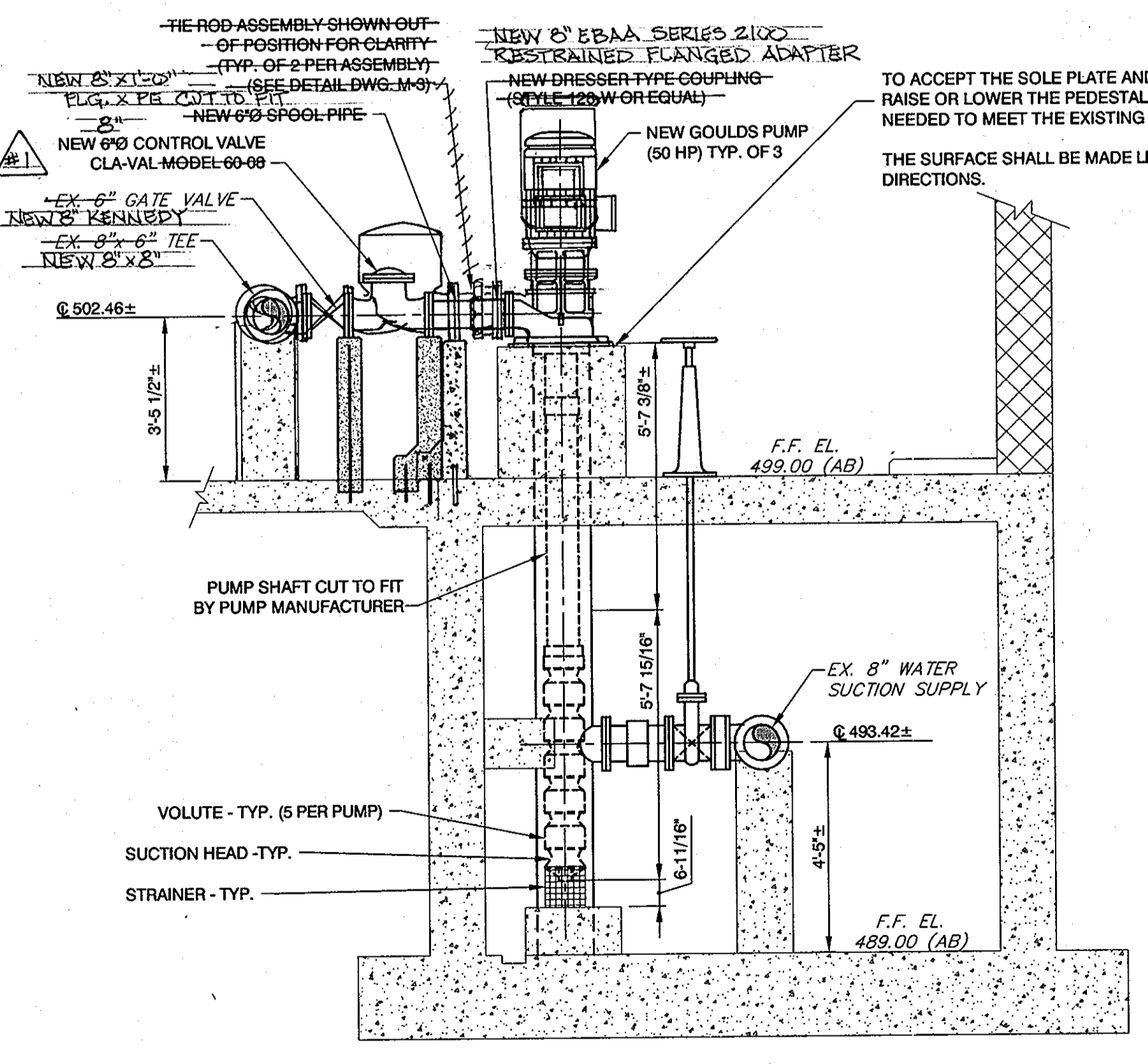
LOWER LEVEL PLAN
SCALE: 1/4" = 1'-0"

NOTE:
THE EXISTING FLOWMETER IS TO BE REMOVED AND TEMPORARILY REPLACED WITH A 6" DIA. SPOOL PIECE. THE FLOWMETER WILL BE SHIPPED TO THE MANUFACTURER FOR RENEWAL/REFURBISHING AND THEN REINSTALLED IN ITS ORIGINAL LOCATION.
~~REMOVED AND REPLACED PER ADDENDUM #1.~~

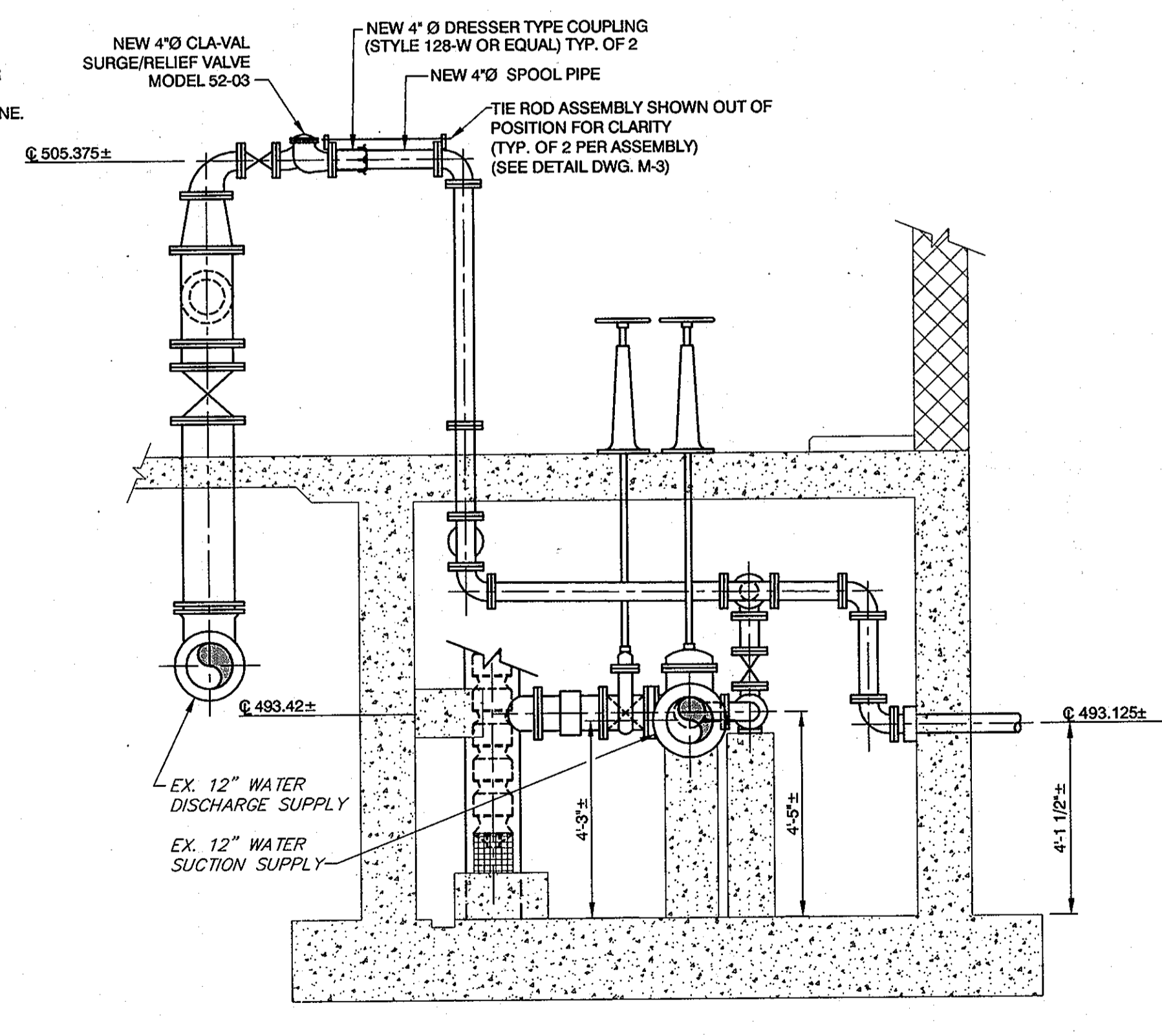
NOTE:
ALL DIMENSIONS AND ELEVATIONS ARE APPROXIMATE AND BASED ON AS BUILT INFORMATION (AB) AND DATA COLLECTED IN THE FIELD.



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



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



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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* 6/25/10
 Chief, Bureau of Engineering: *[Signature]* 6/25/10
 Chief, Bureau of Utilities: *[Signature]* 6/25/10

Chief, Utility Design Division: *[Signature]* 6/25/10

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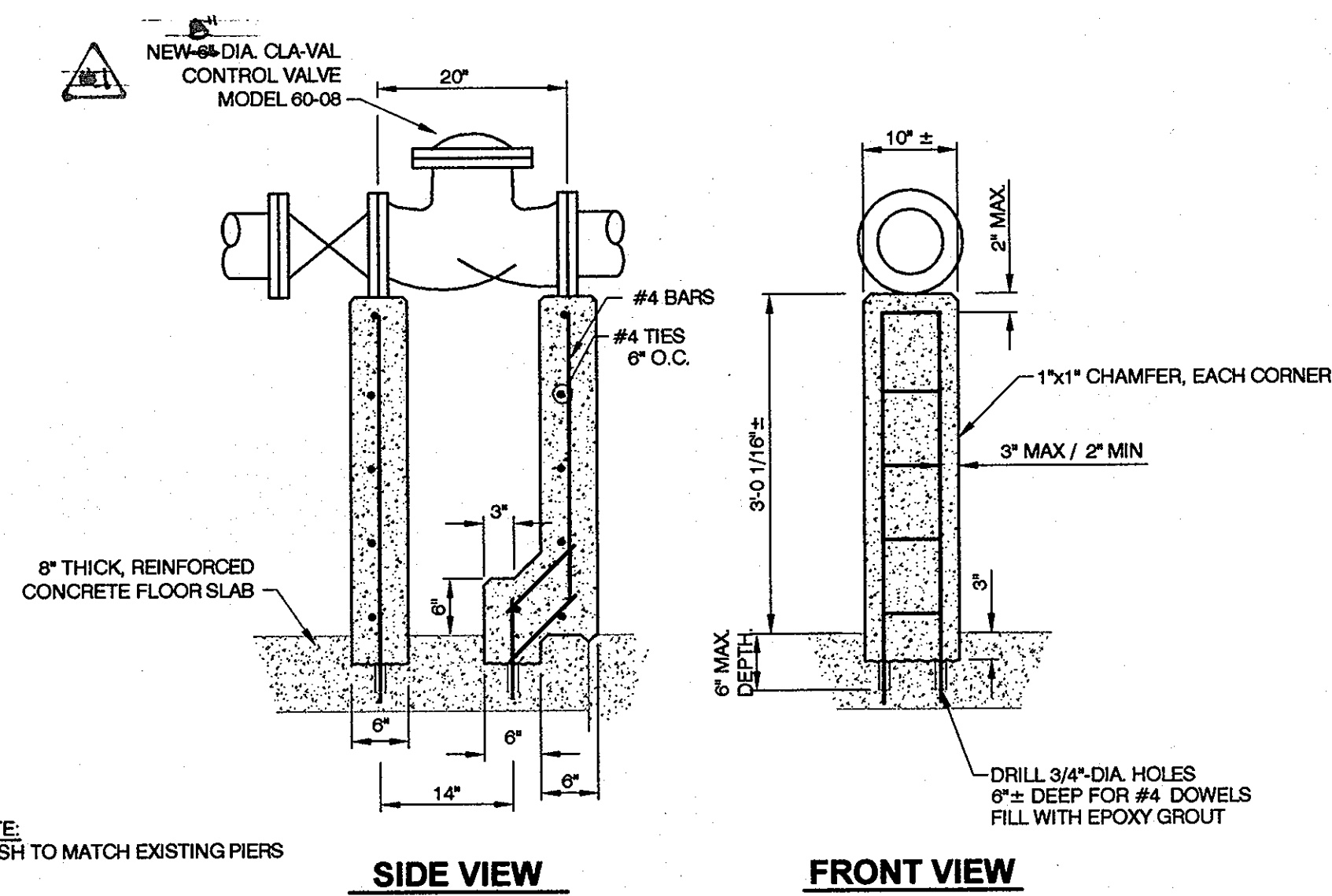
PROPOSED PUMP STATION PLANS AND SECTIONS

600' SCALE MAP NO. 16 BLOCK NO. 23

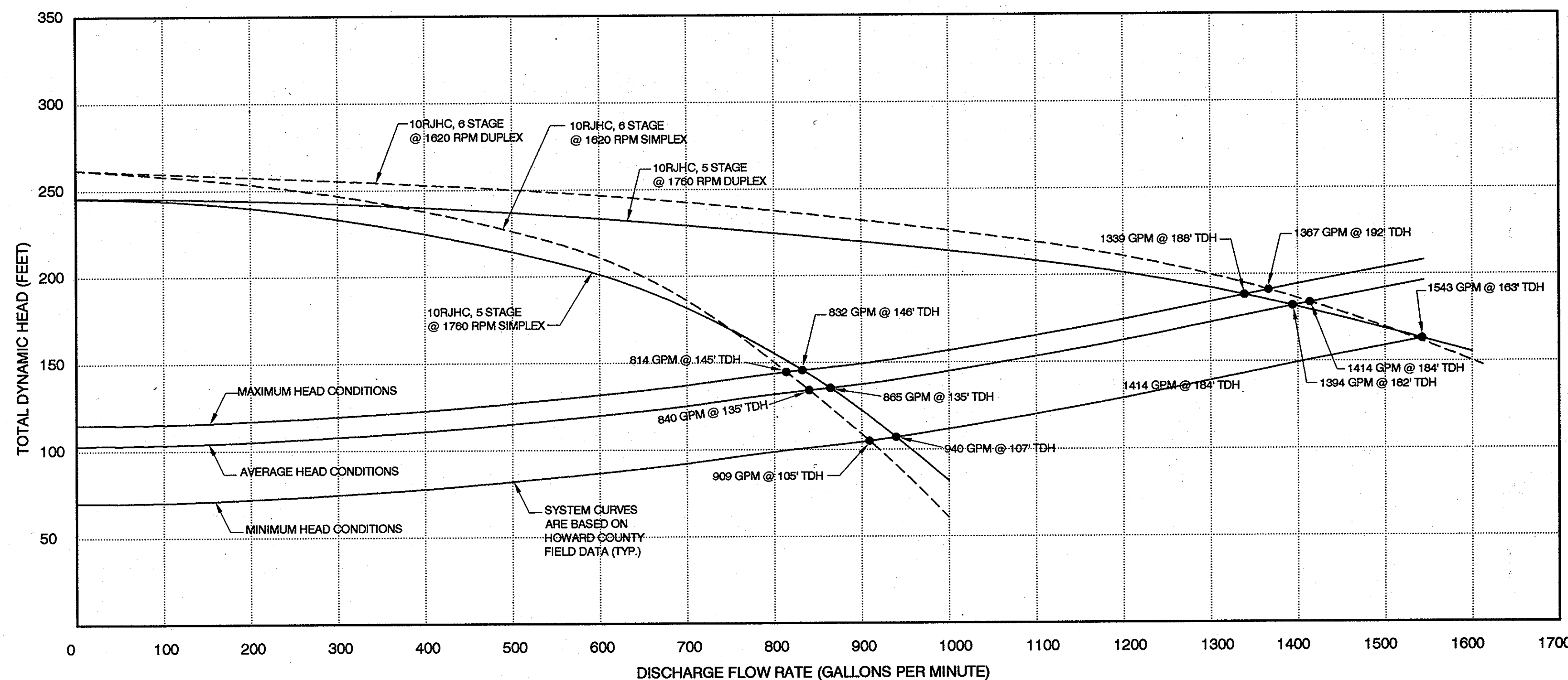
FREDERICK ROAD PUMPING STATION UPGRADES
CAPITAL PROJECT W-8264
CONTRACT 44-4468

ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

DWG. NO. M-2
SCALE: SHOWN
SHEET 3 OF 10

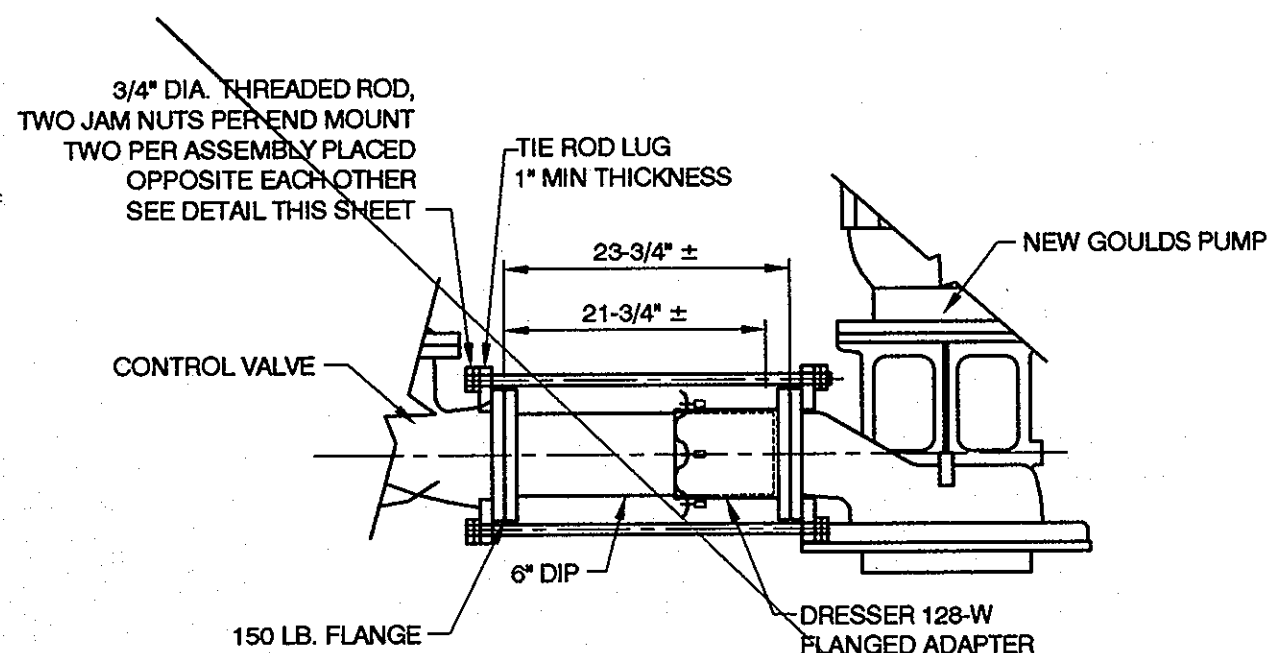


DETAIL - NEW CONCRETE SUPPORTS
SCALE: 3/4" = 1'-0"



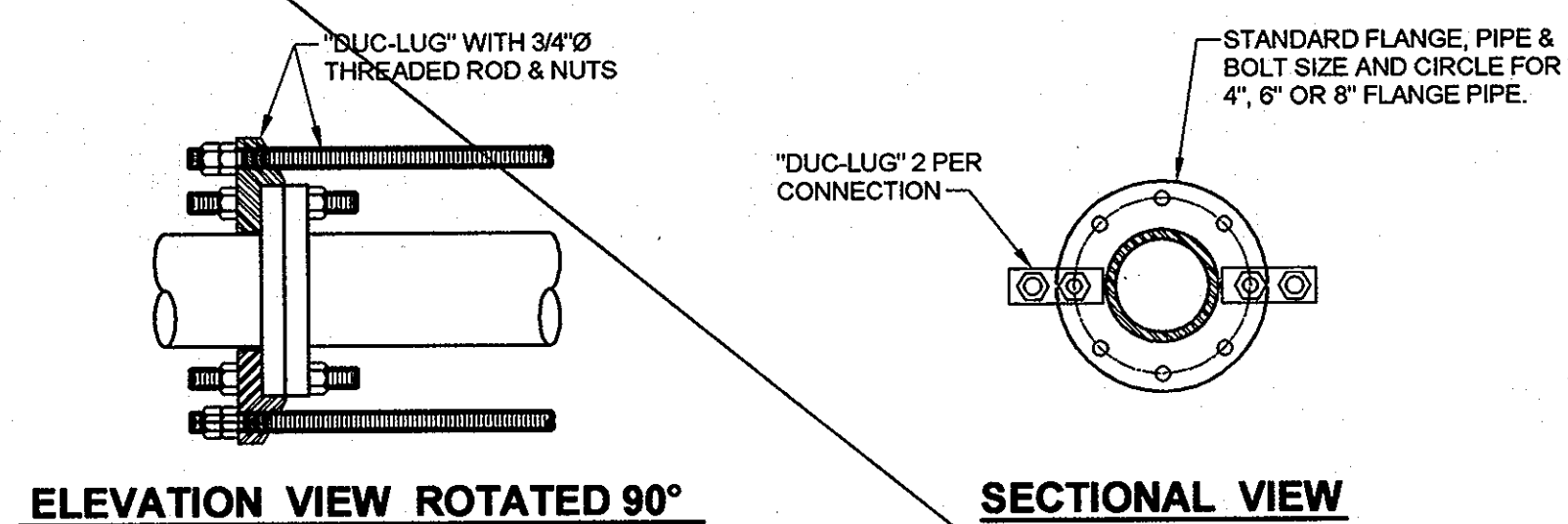
PUMPING STATION SYSTEM CURVE FOR THE 730 ZONE USING GOULDS 10RJHC 5 STAGE @ 1760 RPM VERTICAL TURBINE PUMPS

SCALE: H: 1" = 100 gpm
V: 1" = 50 feet

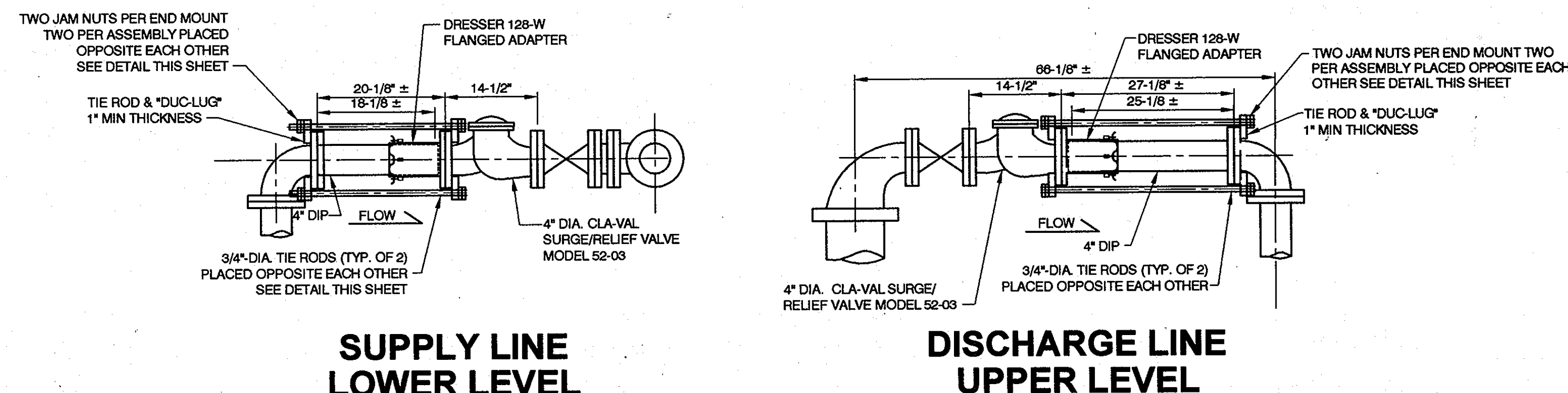


DETAIL - PIPING, COUPLING AND RESTRAINT
SCALE: 3/4" = 1'-0"

SEE M-2 SECTION E



DETAIL - TIE ROD LUG FOR 4", 6" & 8" PIPE
SCALE: 1-1/2" = 1'-0"



DETAIL - NEW SURGE/RELIEF VALVE INSTALLATION
SCALE: 3/4" = 1'-0"

AS-BUILTS
02-04-13

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

J.P.H. 6/25/10
DIRECTOR OF PUBLIC WORKS DATE

abok 6/25/10
CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 6/25/10
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 6/25/10
CHIEF, UTILITY DESIGN DIVISION DATE

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DES:	FRN		
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REVISIONS		DATE:	

PUMP CURVE & MISCELLANEOUS DETAILS

FREDERICK ROAD PUMPING STATION UPGRADES
CAPITAL PROJECT W-8264
CONTRACT 44-4468

ELECTION DISTRICT NO. 2
HOWARD COUNTY, MARYLAND

DWG. NO.
M-3

SCALE:
SHOWN

SHEET
4 OF 10

EXHAUST FAN/SUPPLY FAN SCHEDULE

MARK	TYPE	AIR FLOW (CFM)	EXTERNAL STATIC	SIZE INCHES	RPM	FAN MOTOR HP	VOLTAGE PHASE	TYPE	CONTROL TYPE	FEATURES	MODEL
EF-1	DIRECT DRIVE IN-LINE CENTRIFUGAL	600	0.375	9	1550	1/8	120/1	OPEN	AS DETAILED	SIDE DISCHARGE	GREENHECK SQ-95-D

HEATING AND VENTILATING ABBREVIATIONS

HP	HORSEPOWER
CFM	CUBIC FEET PER MINUTE
CLG	CEILING
DN	DOWN
EX	EXISTING
EA	EACH
EF	EXHAUST FAN
FLR	FLOOR
ELEC	ELECTRICAL
ESP	EXTERNAL STATIC PRESSURE
IN WG	INCH WATER GAUGE
KW	KILOWATT
MTD	MOUNTED
SP	STATIC PRESSURE
T'SAT	THERMOSTAT TYPICAL

HEATING AND VENTILATING GENERAL CONSTRUCTION NOTES

- ALL WORK SHALL BE DONE IN ACCORDANCE WITH NATIONAL FIRE PROTECTION ASSOCIATION STANDARD 90A, "INSTALLATION OF AIR CONDITIONING AND VENTILATING SYSTEMS", SHEET METAL AND AIR CONDITIONING CONTRACTOR'S NATIONAL ASSOCIATION, "HVAC DUCT CONSTRUCTION STANDARDS-METAL AND FLEXIBLE", AND THE HOWARD COUNTY BUILDING CODE.
- PRIOR TO BID, THE CONTRACTOR SHALL EXAMINE ALL PROJECT DRAWINGS TO DEVELOP A COMPLETE UNDERSTANDING OF THE PROJECT SCOPE. FAILURE TO REVIEW ALL CONTRACT DOCUMENTS WILL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO PERFORM ALL WORK REQUIRED.
- CONTRACTOR SHALL COORDINATE THE WORK WITH OTHER TRADES BEFORE FABRICATION AND INSTALLATION.
- CONTRACTOR IS RESPONSIBLE TO PROVIDE A COMPLETE AIR DISTRIBUTION SYSTEM(S) AS REQUIRED BY SMACNA STANDARDS AND A COMPLETE INSTALLATION OF ALL EQUIPMENT AS REQUIRED BY CODE AND THE UNIT MANUFACTURER AT NO ADDITIONAL COST TO THE OWNER REGARDLESS WHETHER THE ITEMS ARE SHOWN ON THE PLAN OR COVERED IN THE SPECIFICATIONS. SUCH ITEMS COULD BE, BUT NOT LIMITED TO, SUPPORT, VIBRATION ELIMINATORS, MOTOR CONTROLS, INSULATION, ELECTRICAL WIRING, LUBRICATION, REFRIGERANTS, START-UP AND SERVICE, ETC.
- ALL NEW DUCTWORK SHALL RUN AS HIGH AS POSSIBLE UNLESS NOTED OTHERWISE. ALL DUCT SIZES SHOWN ARE CLEAN INSIDE DIMENSIONS. 90 DEGREE ELBOW DUCTS ARE TO HAVE RADII OF 1.5 TIMES THE DUCT WIDTH.
- MOUNT THERMOSTAT 4'-6" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED OR INDICATED.
- SYSTEMS SHALL BE BALANCED AND TESTED AT THE COMPLETION OF THE PROJECT AND SHALL BE CHECKED FOR VIBRATION AND NOISE DEEMED EXCESSIVE BY THE ENGINEER. ALL SUCH CONDITIONS SHALL BE CORRECTED. PROVIDE TEST REPORT TO OWNER.

SCHEDULE OF GRILLES

MARK	TYPE	SIZE	MODEL NO.	REMARKS
A	HEAVY DUTY STL. 0 DEFLECTION BAR GRILLE	12x12	30RL	WHITE FINISH

SCHEDULE OF LOUVERS AND DAMPERS

MARK	TYPE	USE	HxW IN.	FREE AREA SQ. FT.	REMARKS	TYPE
L-1	LOUVER	EXHAUST	24x24	0.70	NOTE 1	DUAL COMBINATION
D-1	DAMPER	SUPPLY	16x24	2.1	NOTE 1	LOW LEAKAGE CONTROL

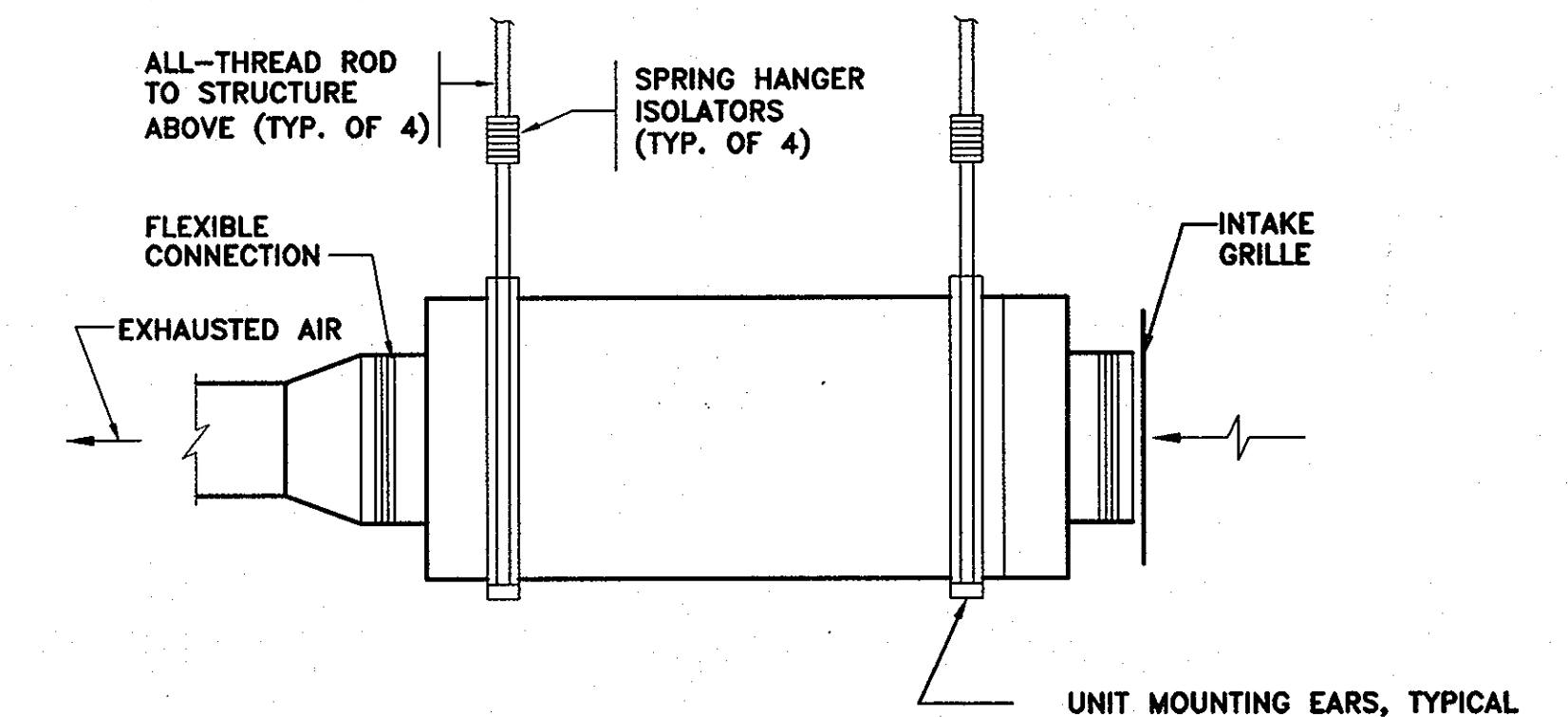
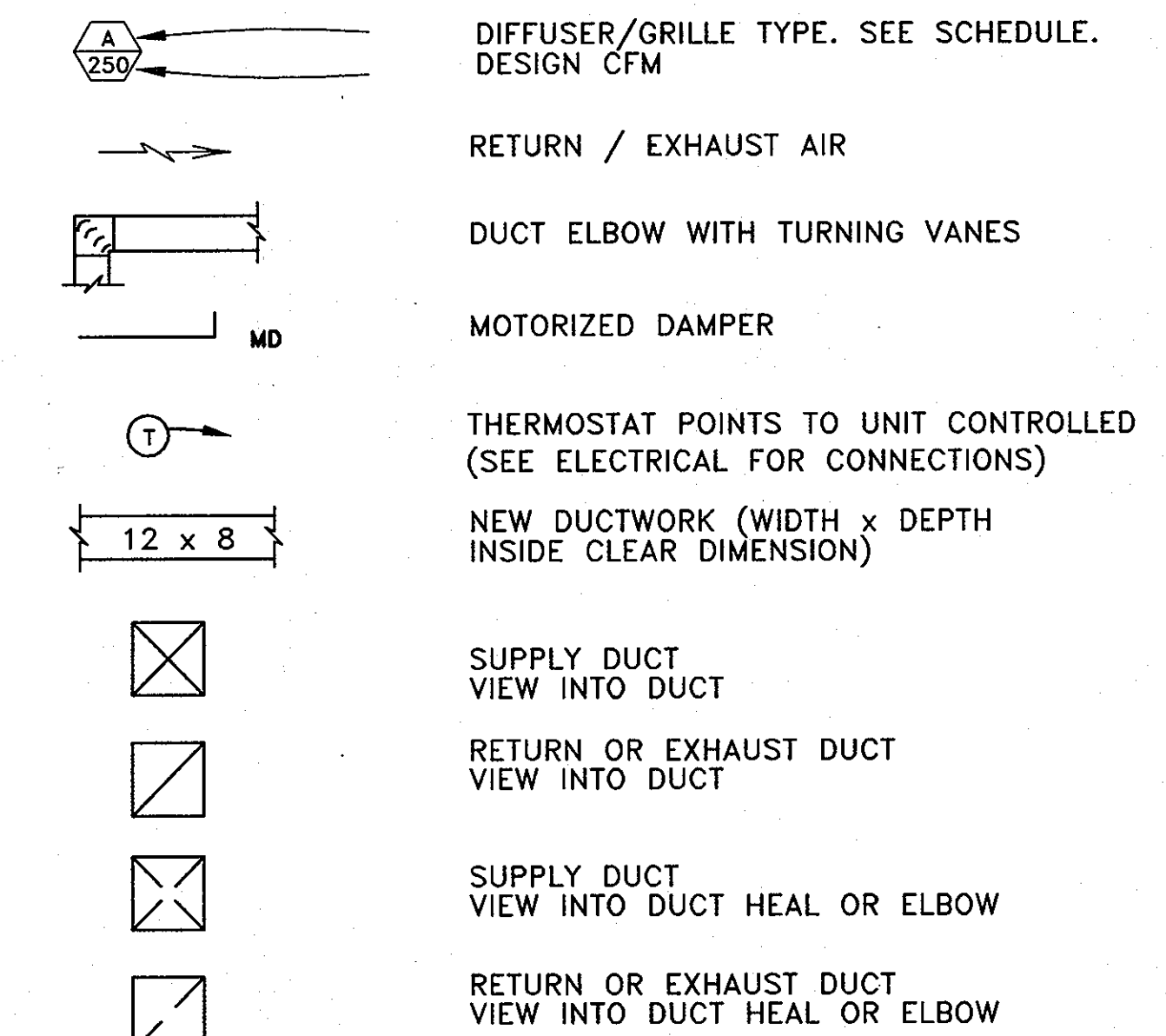
NOTES:
1. MOTOR OPEN, SPRING CLOSED 120VAC OPERATOR.

TYPE:

L-1 TO MATCH EXISTING IN FINISH. EXTRUDED ALUMINUM DUAL COMBINATION, BAKED ENAMEL FINISH WITH REMOVABLE ALUMINUM BIRD SCREEN. EQUAL TO C/S MODEL 4115/4830.

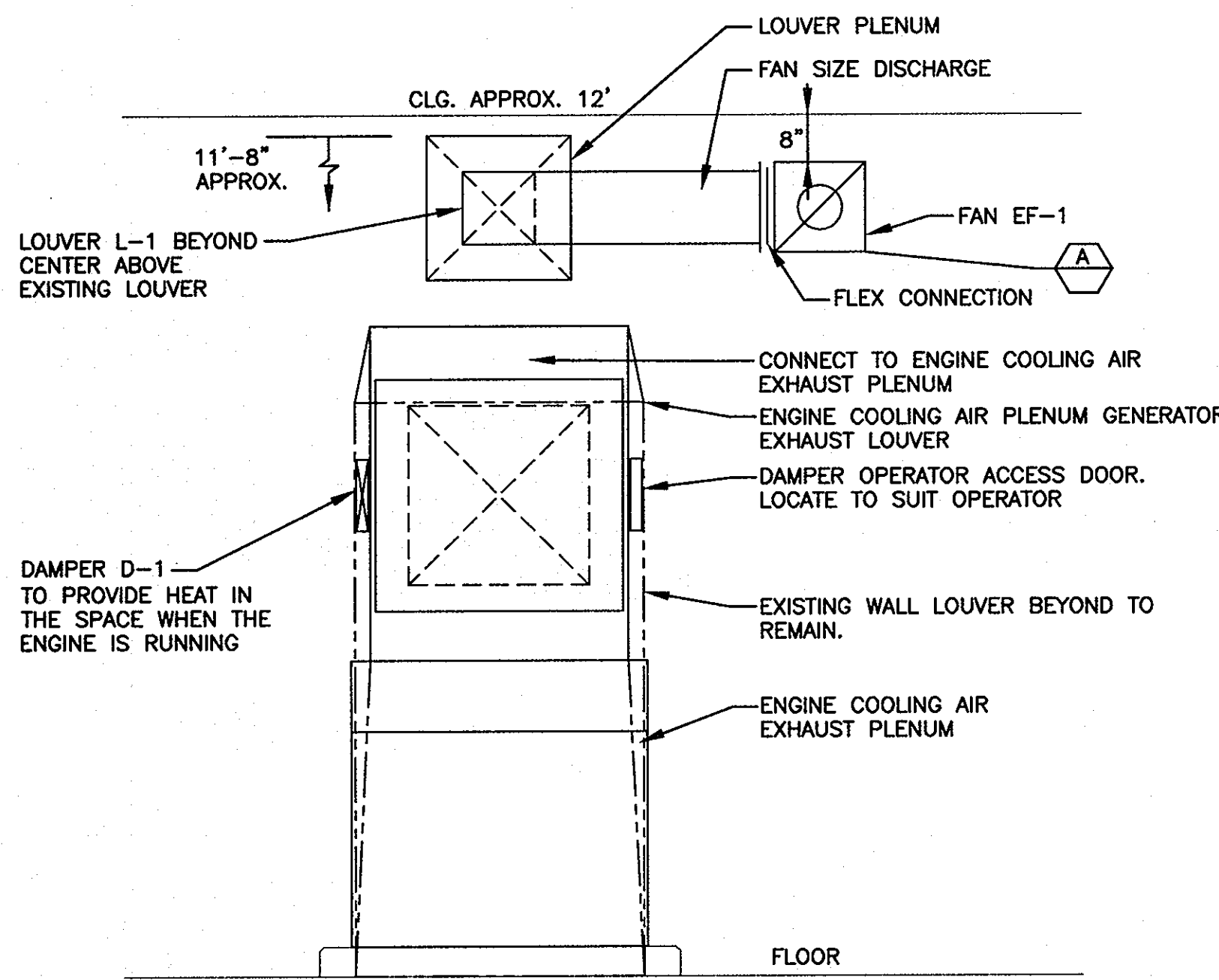
D-1 LOW LEAKAGE AIR FOIL CONTROL DAMPER. GALVANIZED STEEL CONSTRUCTION EQUAL TO RUSKIN CD-60.

HEATING AND VENTILATING SYMBOLS

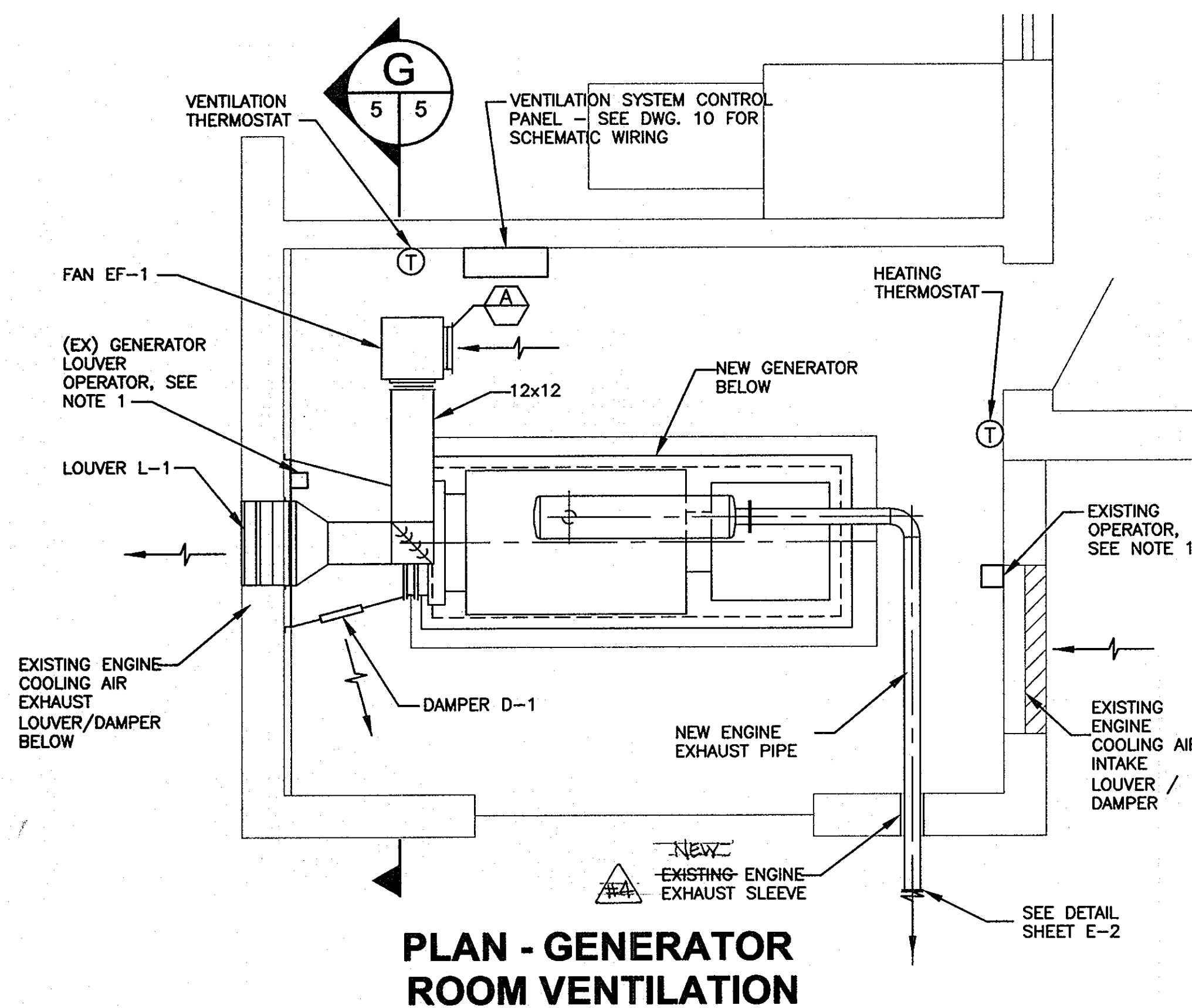


**FAN EF-1
INSTALLATION DETAIL**

SCALE: NTS



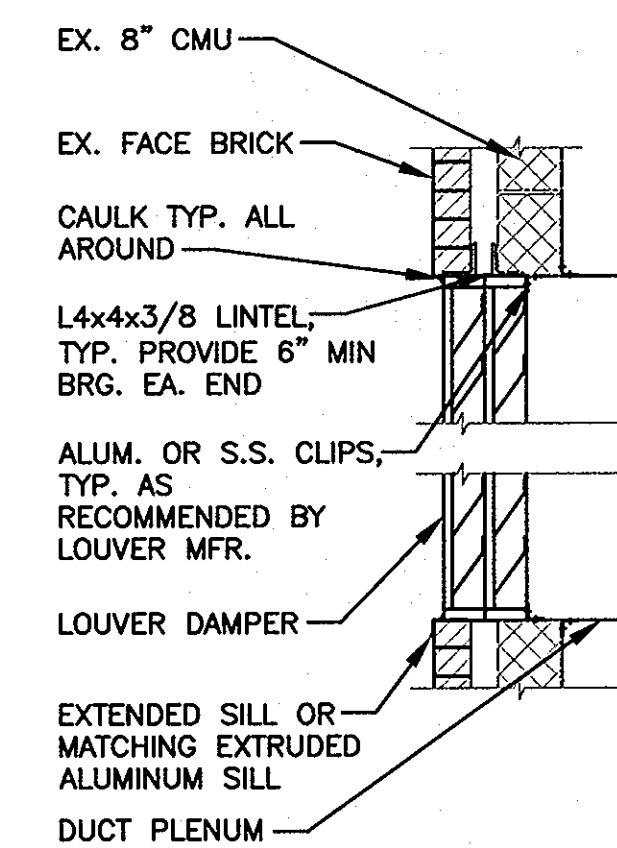
**SECTION
G-5**
SCALE: 1/2" = 1'-0"



**PLAN - GENERATOR
ROOM VENTILATION**

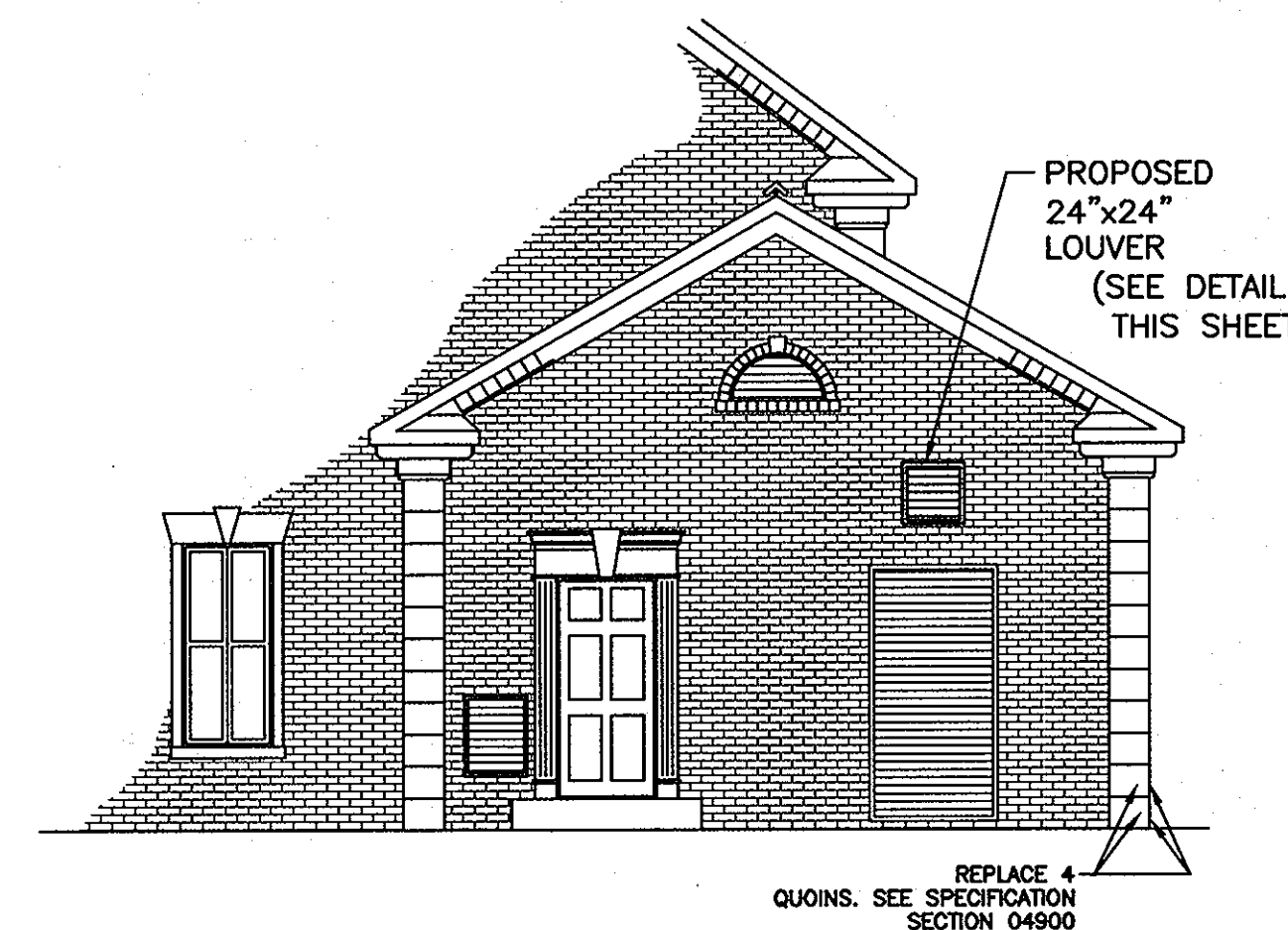
SCALE: 3/8" = 1'-0"

- NOTES:
1. REPLACE EXISTING LOUVER OPERATORS WITH 120VAC SPRING OPEN, MOTOR CLOSED OPERATORS SIZED TO OPERATE 48"Wx96"H CONSTRUCTION SPECIALTIES 4115/4830 LOUVER/DAMPERS.



**DETAIL, INSTALLATION OF
LOUVER L-1 IN EX. WALL**

SCALE: NTS



**DETAIL, ELEVATION OF
LOUVER L-1 IN EX. WALL**

SCALE: NTS

PROFESSIONAL CERTIFICATION
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David Wayne Klein 6/23/10
SIGNATURE OF ENGINEER DATE

**DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND**
Director of Public Works: *James B. ...* DATE: 6/25/10
Chief, Bureau of Engineering: *...* DATE: 6/23/10
Chief, Bureau of Utilities: *...* DATE: 6/23/10
Chief, Utility Design Division: *...* DATE: 6/23/10

Dewberry
Dewberry & Davis LLC
3106 LORD BALTIMORE DRIVE
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410.265.9500
FAX: 410.265.8875



DES:	DWB			
DRN:				
CHK:	DWB			
DATE:	06/23/10	BY:	NO.	
		REVISIONS		DATE

HVAC NOTES, ABBREVIATIONS,
SYMBOLS & DETAILS

600' SCALE MAP NO. 16 BLOCK NO. 23

ELECTION DISTRICT NO. 2

**FREDERICK ROAD
PUMPING STATION UPGRADES**
CAPITAL PROJECT W-8264
CONTRACT 44-4468

HOWARD COUNTY, MARYLAND

DWG. NO.
H-1

SCALE:
SHOWN

SHEET
5 OF 10

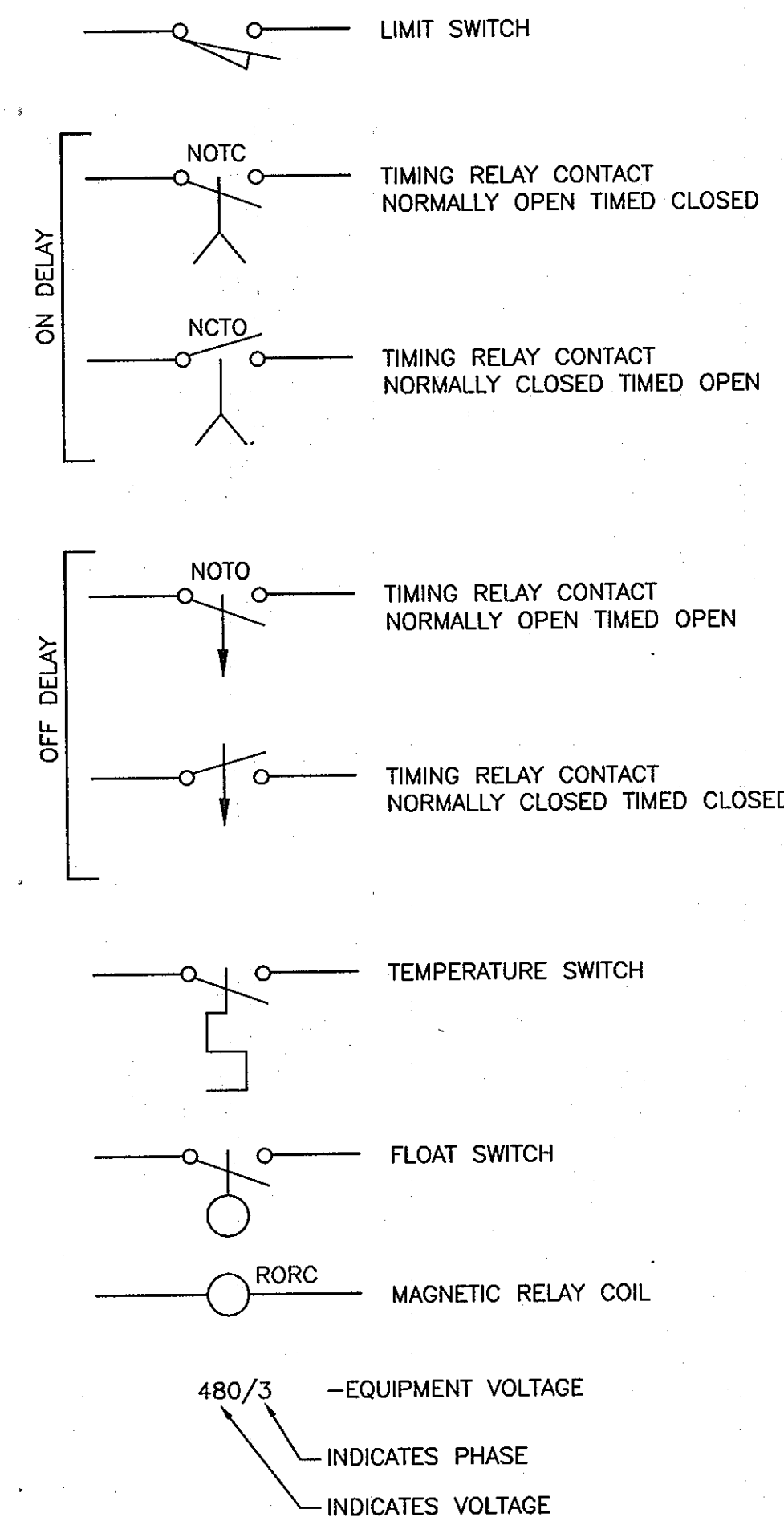
ELECTRICAL ABBREVIATIONS

A	AMP	NF	NON-FUSED
AFF	ABOVE FINISHED FLOOR	OP	OUTPUT OR ISOLATION CONTACTOR
AIC	AMPS INTERRUPTING CAPACITY	OL	OVERLOAD SENSOR OR RELAY
AL	ALUMINUM	P	POLE
ATS	AUTOMATIC TRANSFER SWITCH	PH	PHASE
BP	BYPASS CONTACTOR	UG, U/G	UNDERGROUND
CB	CIRCUIT BREAKER	V	VOLT
CFM	CUBIC FEET PER MINUTE	VFD	VARIABLE FREQUENCY AC MOTOR DRIVE
CKT	CIRCUIT	VA	VOLTAMPS
CU	COPPER, COMPRESSOR UNIT	W	WATTS
DN	DOWN	WP	WEATHER PROOF
EX	EXISTING	XFMR	TRANSFORMER
EC	EMPTY CONDUIT		
GFI	GROUND FAULT INTERRUPTER		
GND	GROUND		
HMI	HUMAN MACHINE INTERFACE		
HR	HOUR		
HP	HORSE POWER		
IG	ISOLATED GROUND		
KVA	KILOVOLT AMPS		
KW	KILOWATTS		
NEC	NATIONAL ELECTRICAL CODE		
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION		

ELECTRICAL SYMBOLS

- \$ SINGLE POLE TOGGLE SWITCH - 20 AMP, 120 VOLT, M.H. 48" AFF, UNLESS NOTED OTHERWISE.
- \$3 THREE WAY TOGGLE SWITCH - 20 AMP, 120 VOLT, M.H. 48" AFF, UNLESS NOTED OTHERWISE.
- \$M MOTOR RATED SWITCH WITH THERMAL OVERLOAD PROTECTION, MOUNT ADJACENT TO OR ON THE MOTOR BEING CONTROLLED.
- Ⓢ JUNCTION BOX, CEILING OR WALL MOUNTED.
- Ⓢ DUPLX GROUNDING TYPE RECEPTACLE - 20 AMP, 120 VOLT, NEMA 5-20R, M.H. 18" AFF, UNLESS NOTED OTHERWISE.
- Ⓢ DOUBLE DUPLX GROUNDING TYPE RECEPTACLE - 20 AMP, 120 VOLT, NEMA 5-20R, M.H. 18" AFF, UNLESS NOTED OTHERWISE.
- Ⓢ DUPLX RECEPTACLE WITH GROUND FAULT CIRCUIT INTERRUPTER PROTECTION - 20 AMP, 120 VOLT, NEMA 5-20R, M.H. 42" AFF, UNLESS NOTED OTHERWISE.
- Ⓢ DISCONNECT SWITCH, AMP, VOLT, POLES AND FUSING AS NOTED ON DRAWING.
- Ⓢ ELECTRIC MOTOR CONNECTION - HORSEPOWER AS NOTED.
- Ⓢ POWER COMPANY METER, RATING AS INDICATED ON DRAWING.
- #10 BRANCH CIRCUIT CONDUIT AND WIRING WITH A DEDICATED EQUIPMENT GROUND WIRE. CROSSMARKS AND NUMERALS INDICATE NUMBER AND SIZE OF CONDUCTORS, AND SHOWN ONLY WHERE REQUIRED FOR CLARITY.
- 2 BRANCH CIRCUIT CONDUIT AND WIRING WITH A DEDICATED EQUIPMENT GROUND WIRE, UNDER GROUND OR UNDER SLAB. CROSSMARKS AND NUMERALS INDICATE NUMBER AND SIZE OF CONDUCTORS, AND SHOWN ONLY WHERE REQUIRED FOR CLARITY.
- 2 HOMERUN WIRING WITH A DEDICATED EQUIPMENT GROUND WIRE TO THE REFERENCED PANELBOARD. ARROW HEADS AND NUMERALS INDICATE THE CIRCUIT NUMBERS.
- × CONDUIT SEALING FITTING

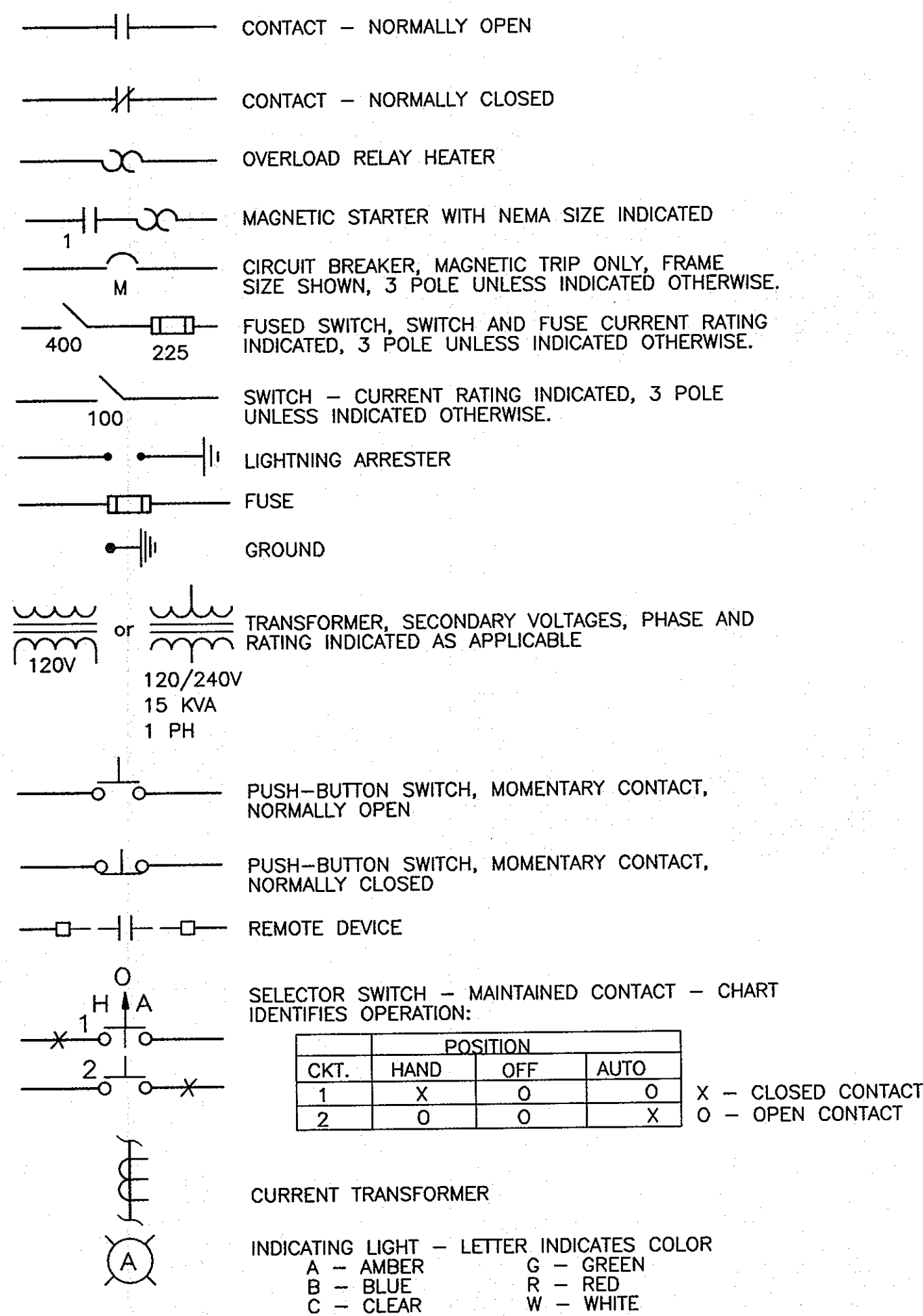
ELECTRICAL SYMBOLS CONT'D



ELECTRICAL DEMOLITION NOTES

- THE CONTRACTOR SHALL REMOVE EXISTING WORK AS CALLED FOR ON THE DRAWINGS OR AS REQUIRED TO CLEAR THE AREAS OF NEW CONSTRUCTION.
- WHERE EXISTING EQUIPMENT IS TO BE RELOCATED, CARE SHALL BE TAKEN TO PREVENT DAMAGE DURING THE REMOVAL AND REINSTALLATION. WHERE DAMAGE OCCURS, THE EQUIPMENT SHALL BE REPLACED OR REPAIRED AT NO ADDITIONAL COST TO THE OWNER.
- ALL EQUIPMENT REMOVED THAT IS NOT BEING REUSED SHALL REMAIN THE PROPERTY OF THE OWNER AND SHALL BE STORED OR DISPOSED OF AS DIRECTED.
- EXCEPT AS OTHERWISE NOTED, ALL EXISTING ELECTRICAL MATERIAL AND EQUIPMENT RENDERED OBSOLETE AND WHICH MAY BE DISTURBED DUE TO CHANGES REQUIRED BY THIS WORK SHALL BE RESTORED TO ITS ORIGINAL OPERATING CONDITION. OTHER ELECTRICAL EQUIPMENT AND/OR MATERIAL RENDERED OBSOLETE SHALL BE ABANDONED WHERE CONCEALED AND REMOVED WHERE EXPOSED. OLD UNUSED WIRING SHALL BE REMOVED FROM THE ABANDONED(CONCEALED) CONDUITS. ANY CONDUITS STUBBED OUT OF CONCRETE SURFACE SHALL BE CUT INTO SURFACE AND PATCHED.
- WHERE EXISTING ELECTRICAL WORK INTERFERES WITH NEW WORK AND WHERE SUCH INSTALLATIONS ARE TO REMAIN IN USE, THE INSTALLATIONS SHALL BE DISCONTINUED AND RELOCATED AND/OR RECONNECTED TO COORDINATE WITH THE WORK INDICATED ON THE DRAWINGS AND AS SPECIFIED.
- WHERE EXISTING RACEWAYS THAT ARE NOT TO BE REUSED INTERFERE WITH NEW WORK, THESE RACEWAYS SHALL BE REMOVED BACK TO THE NEAREST JUNCTION BOX OR PULLBOX AND THE OPENINGS BLANKED.
- EXISTING RACEWAYS AND/OR WIRING MAY BE REUSED WHERE PRACTICABLE.
- ALL WORK SHALL BE PERFORMED IN SUCH A MANNER TO CREATE MINIMAL POWER OUTAGES FOR THE OWNER. ALL SUCH OUTAGES SHALL BE CAREFULLY COORDINATED WITH THE OWNER SO THAT POWER TO ESSENTIAL SERVICES CAN BE MAINTAINED.
- CONTRACTOR SHALL MAINTAIN THE CONTINUITY OF CIRCUITS SERVING MULTIPLE ITEMS OF WHICH ONE OR MORE ARE BEING DEMOLISHED. CONDUCTORS AND CONDUITS FOR THOSE ITEMS BEING DEMOLISHED SHALL BE REMOVED AS FAR AS PRACTICABLE.
- ALL EQUIPMENT INDICATED TO REMAIN IN PLACE SHALL REMAIN IN NORMAL OPERATION AT ALL TIMES DURING CONSTRUCTION. IF ANY CIRCUIT WIRING FEEDING THIS EQUIPMENT IS DAMAGED DURING CONSTRUCTION, THE CONTRACTOR SHALL REPLACE WITH NEW WIRING OF THE SAME SIZE AND TYPE.
- WHERE EXISTING FLUORESCENT AND INCANDESCENT LIGHTING FIXTURES ARE INDICATED TO BE REMOVED, REMOVE FIXTURE, ALL MOUNTING APPURTENANCES, AND ALL BRANCH CIRCUIT WIRING FROM THE CONNECTION AT THE CIRCUIT BREAKER PANEL. WHERE THE FIXTURE IS CONTROLLED BY SWITCH, REMOVE THE WIRING, CONDUIT AND SWITCH.

ELECTRICAL SYMBOLS



CONDUIT & WIRE SIZE SCHEDULE (UNLESS OTHERWISE SHOWN)

CIRCUIT BREAKER TRIP	GROUND WIRE SIZE	1 OR 2 POLE		3 POLE	
		CONDUIT	WIRE	CONDUIT	WIRE
15A	1 #12	1/2"	#12	1/2"	#12
20A	1 #12	1/2"	#12	1/2"	#12
30A	1 #10	1/2"	#10	3/4"	#10
40A	1 #10	3/4"	#8	1"	#8
50A	1 #10	3/4"	#8	1"	#8
60A	1 #8	1"	#6	1"	#6
70A	1 #8	1"	#4	1-1/4"	#4
80A	1 #8	1-1/4"	#4	1-1/4"	#4
90A	1 #8	1-1/4"	#2	1-1/4"	#2
100A	1 #8	1-1/4"	#2	1-1/4"	#2

GENERAL ELECTRICAL CONSTRUCTION NOTES

- THE DRAWINGS INDICATE THE EXTENT AND GENERAL ARRANGEMENT OF THE ELECTRICAL SYSTEMS
- LOCATIONS OF LINES AND EQUIPMENT SHALL BE DETERMINED FROM ACTUAL FIELD CONDITIONS. THE OUTLINES OF THE CONSTRUCTION SHOWN ON THE ELECTRICAL DRAWINGS ARE INTENDED ONLY AS A GUIDE TO INDICATE RELATIVE LOCATIONS OF THE WORK. REFER TO THE EQUIPMENT SUPPLIER'S INSTALLATION INSTRUCTIONS FOR EXACT LOCATIONS AND ARRANGEMENTS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION AND PROPER RELATION OF HIS WORK TO THE FACILITY STRUCTURES AND TO THE WORK OF OTHER TRADES. NO ADDITIONAL COMPENSATION NOR EXTENSION OF COMPLETION TIME WILL BE GRANTED FOR EXTRA WORK CAUSED BY THE LACK OF COORDINATION.
- DUE TO MINOR DIFFERENCES IN VARIOUS MANUFACTURER'S EQUIPMENT CONNECTIONS THE ELECTRICAL CONTRACTOR SHALL COORDINATE HIS INSTALLATION WITH THAT EQUIPMENT ACTUALLY FURNISHED AND SHALL VERIFY THE CORRECT SIZES AND DETAILS OF INSTALLATION BEFORE ROUGHING IN.
- THE ELECTRICAL CONTRACTOR SHALL CONSULT WITH THE GENERAL CONSTRUCTION SUPERINTENDENT REGARDING THE LOCATION OF EQUIPMENT, DOOR SWINGS, BLOCK COURSING, ALIGNMENT OF THIS AND OTHER SIMILAR FEATURES BEFORE ROUGHING IN FOR SWITCHES, RECEPTACLES, THERMOSTATS, AND SIMILAR WIRING DEVICES.
- THE CORRECT NUMBER OF WIRES IS NOT INDICATED FOR MOST BRANCH CIRCUITS, ONLY THOSE WHERE CLARIFICATION IS NECESSARY. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL WIRES NECESSARY FOR THE PROPER FUNCTION OF THE SYSTEM.
- ALL WORK SHALL COMPLY WITH THE CURRENT EDITION OF THE HOWARD COUNTY BUILDING CODE AND OTHER APPLICABLE LOCAL REGULATIONS.
- PAINTING: (WHERE NOT OTHERWISE SPECIFIED).
 - CONCEALED AREAS: ALL METAL SURFACES NOT OTHERWISE PROTECTED IN CONCEALED SPACES SHALL BE PAINTED WITH ONE THOROUGH COAT OF ENAMEL PAINT. COPPER, ALUMINUM, STAINLESS STEEL AND GALVANIZED MATERIAL SHALL NOT BE PAINTED EXCEPT WHERE GALVANIZED FINISH HAS BEEN DAMAGED.
 - FINISHED AREAS: ALL EQUIPMENT AND MATERIAL IN OTHER AREAS WILL BE PAINTED WITH TWO COATS OF ENAMEL PAINT APPLIED IN ACCORDANCE WITH THE WRITTEN INSTRUCTIONS OF THE PAINT MANUFACTURER.
 - PAINT SHALL BE APPLIED UNDER THE INSTRUCTION OF THE OWNER'S REPRESENTATIVE.
- THE CONTRACTOR SHALL INSTRUCT THE REPRESENTATIVE OF THE OWNER IN THE PROPER OPERATION AND MAINTENANCE OF ALL ELEMENTS OF THE ELECTRICAL SYSTEM.

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David Wayne Klein 6/23/10
 SIGNATURE OF ENGINEER DATE

AS-BUILTS
 02-04-13

DWG. NO.
 E-1

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

Director of Public Works DATE: 6/25/10
 Chief, Bureau of Engineering DATE: 6/25/10
 Chief, Bureau of Utilities DATE: 6/25/10
 Chief, Utility Design Division DATE: 6/25/10

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 Dewberry & Davis LLC
 3100 LORD BALTIMORE DRIVE
 SUITE 110
 BALTIMORE, MD 21244-2962
 410.285.9000
 FAX: 410.285.9875



DES: DWB
 DRN:
 CHK: DWB
 DATE: 06/23/10
 BY NO. REVISIONS DATE

ELECTRICAL ABBREVIATIONS,
 NOTES & SYMBOLS

FREDERICK ROAD
 PUMPING STATION UPGRADES

CAPITAL PROJECT W-8264
 CONTRACT 44-4468

ELECTION DISTRICT NO. 2

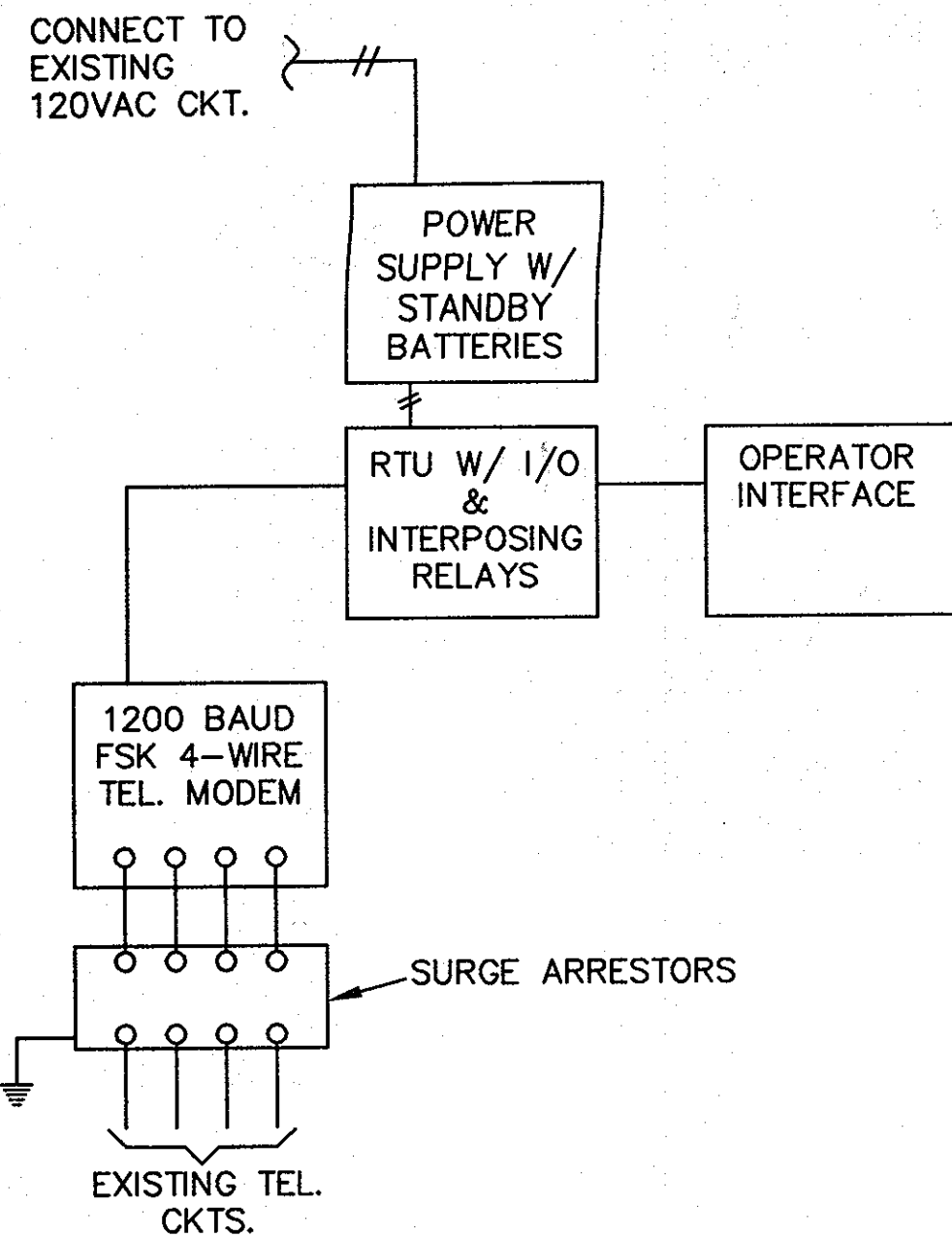
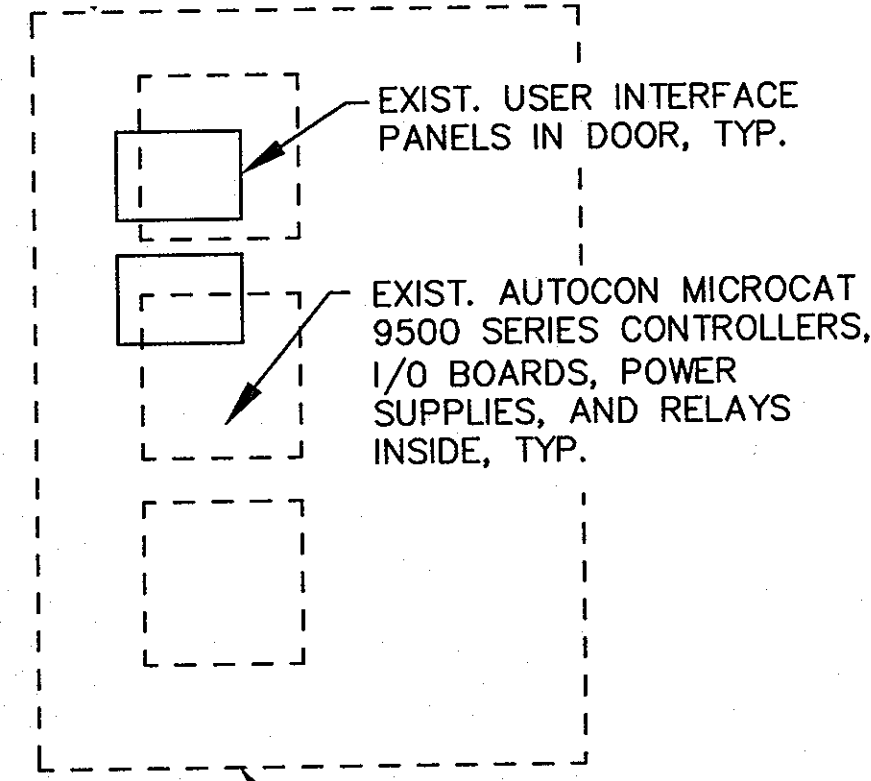
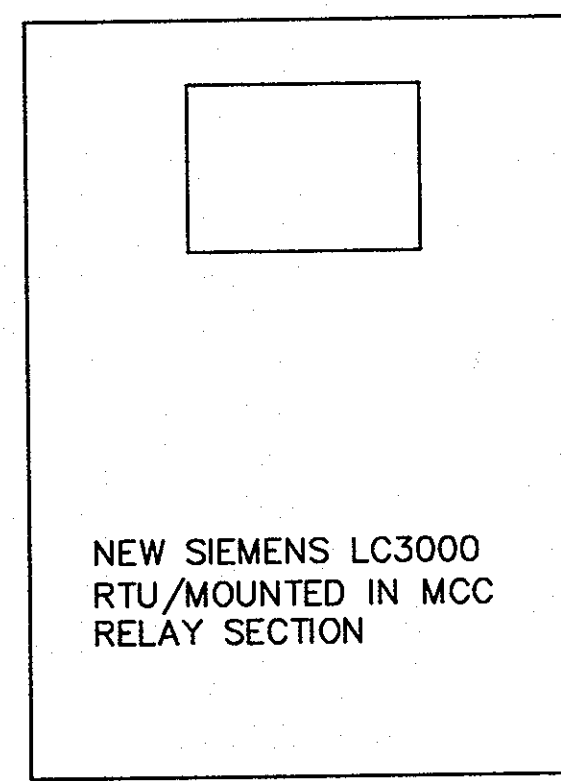
HOWARD COUNTY, MARYLAND

SCALE:
 SHOWN

SHEET
 6 OF 10

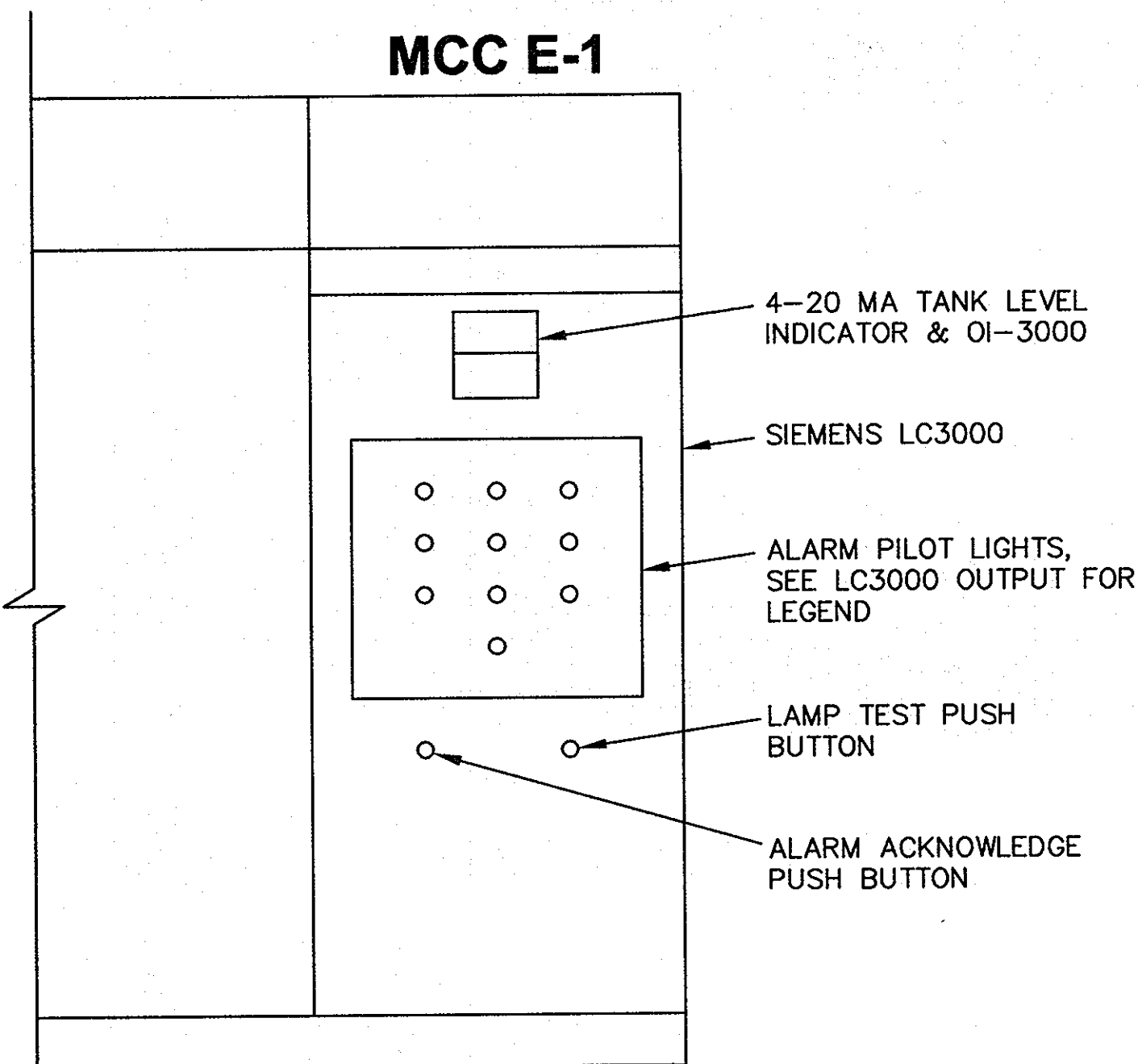
600' SCALE MAP NO. 16

BLOCK NO. 23



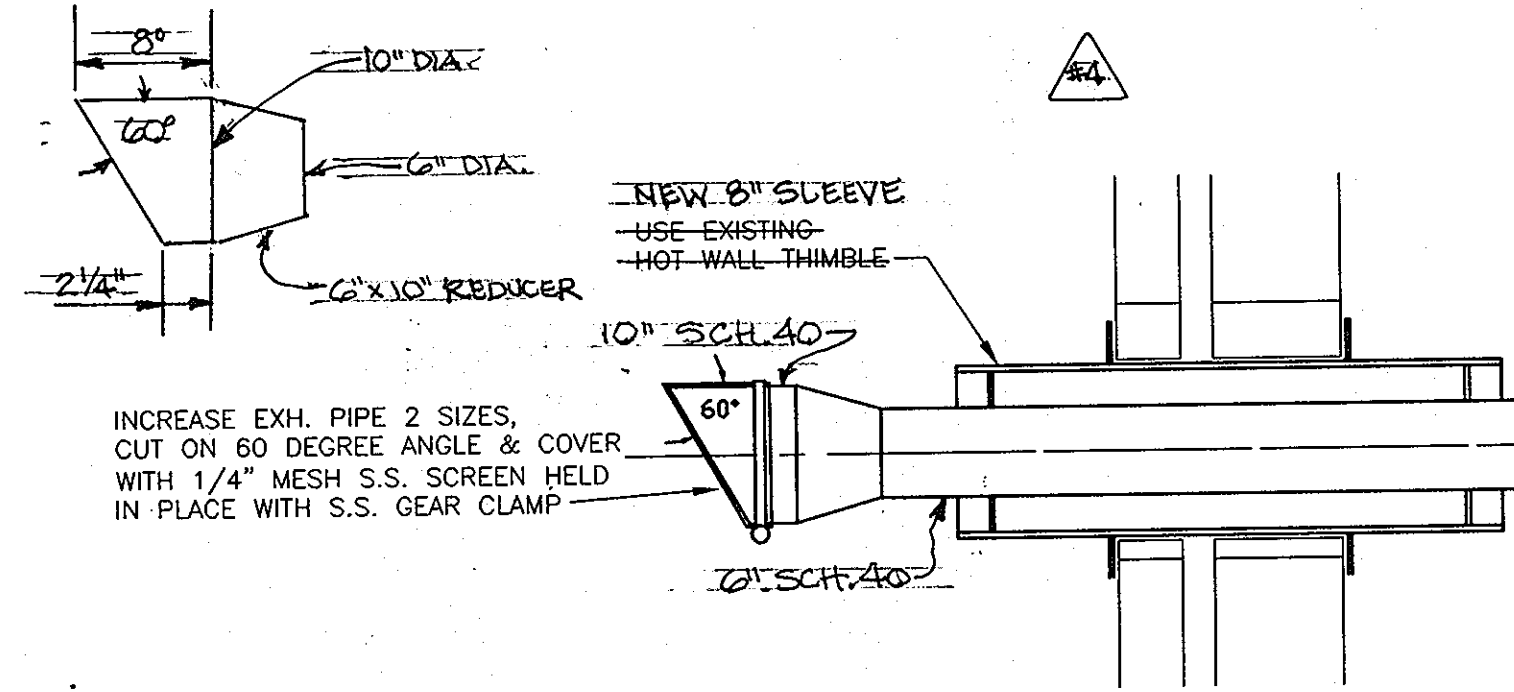
LC3000 RTU GENERAL ARRANGEMENT & PANEL ELEVATION

NTS



FRONT PANEL ARRANGEMENT MCC SECTION E-1

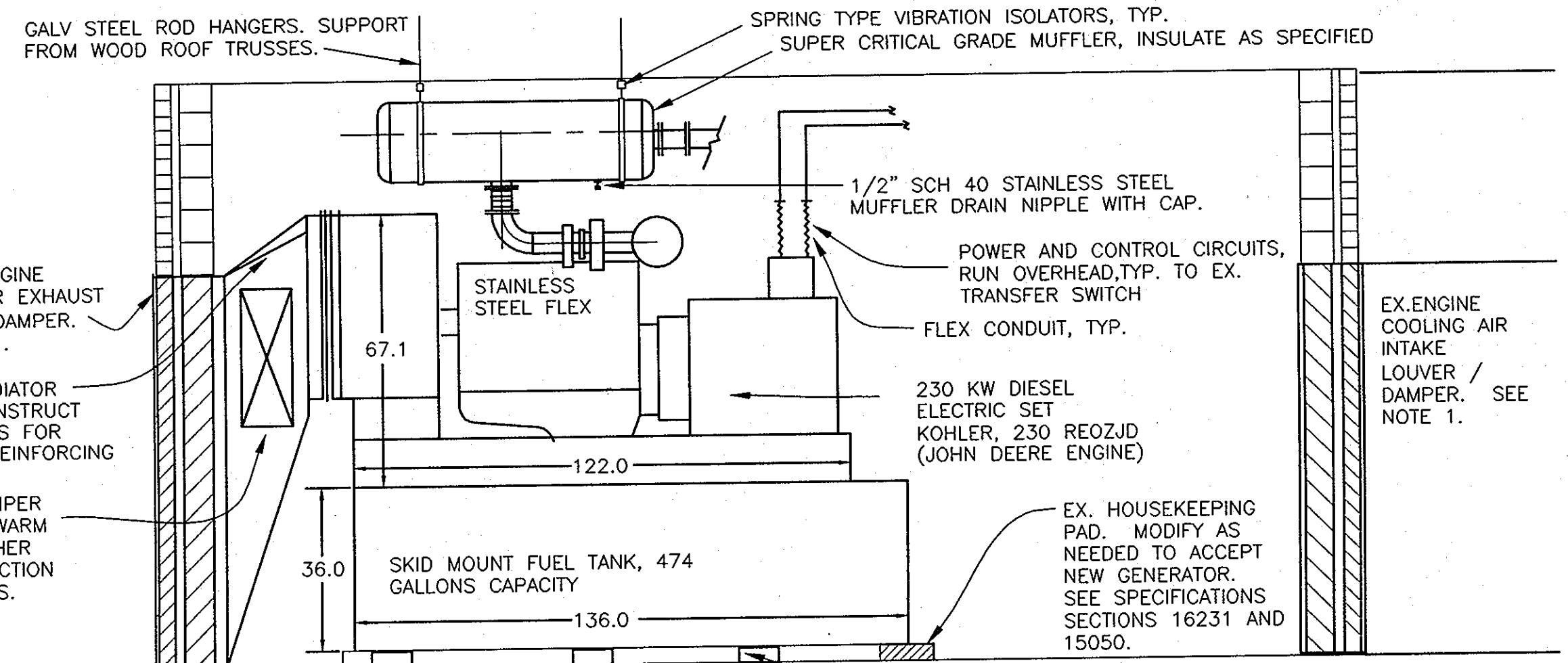
NTS



DETAIL - EXHAUST OUTLET

SCALE: NTS

NOTES:
1. MODIFY EXISTING INTAKE AND EXHAUST LOUVER OPERATORS AND INTERLOCKS AS INDICATED. SEE SHEET 10.



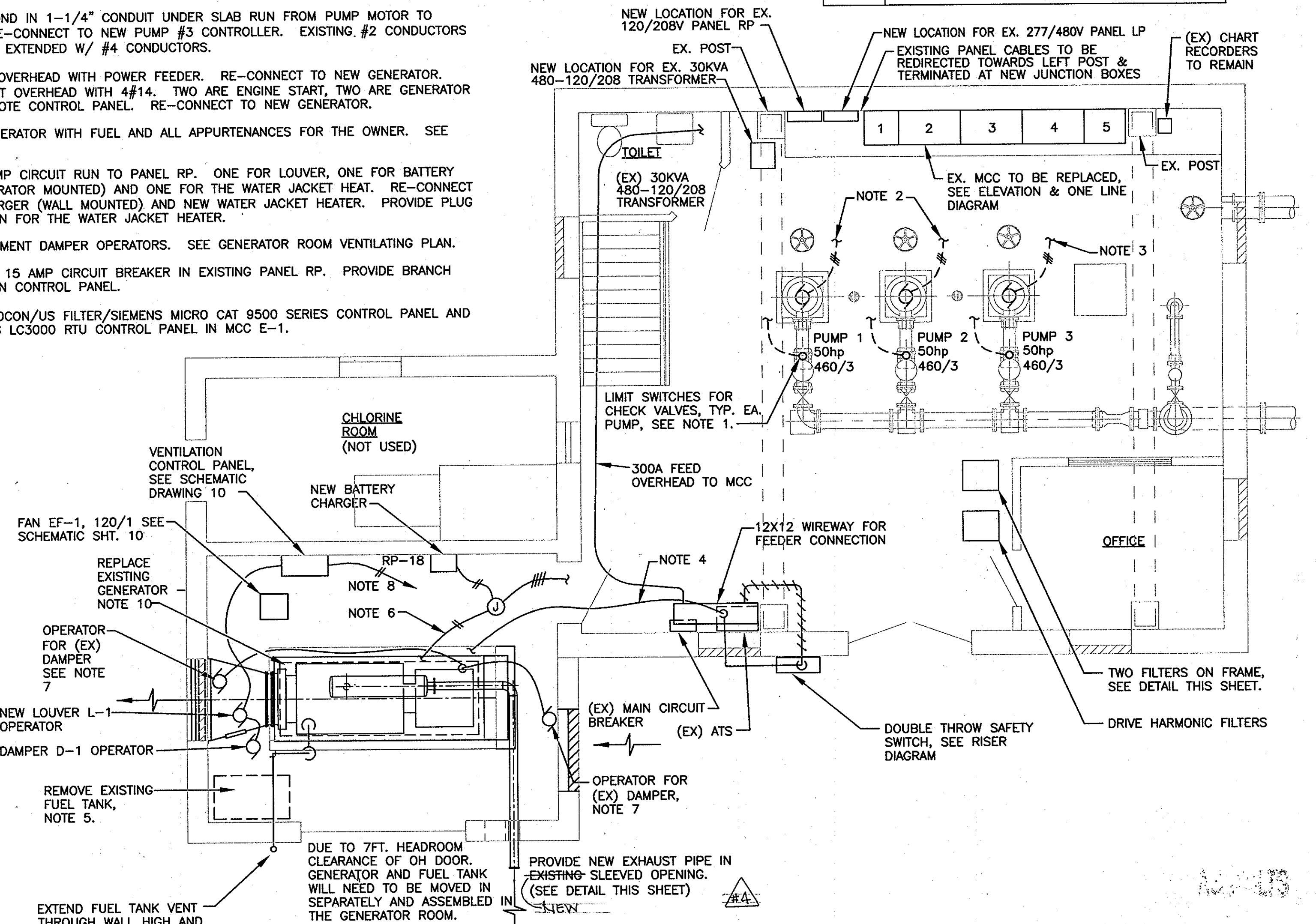
DETAIL - GENERATOR SET INSTALLATION

SCALE: NTS

ELECTRICAL PLAN NOTES:

- 6#14 NEEDED FROM CHECK VALVE TO SECTION E1 OF MCC (SEE ELEVATION ON SHEET 8). EXISTING CONDUIT IS UNDER SLAB. IF FEASIBLE RE-USE EXISTING CONDUCTORS, OTHERWISE PROVIDE NEW.
- EXISTING 3#6, 1#10 BOND IN 1" CONDUIT UNDER SLAB RUN FROM PUMP MOTOR TO EXISTING STARTER. REPLACE WITH 3#4, 1#6 BOND IN EXISTING 1" CONDUIT. CONNECT TO NEW PUMP CONTROLLER.
- EXISTING 3#2, 1#8 BOND IN 1-1/4" CONDUIT UNDER SLAB RUN FROM PUMP MOTOR TO EXISTING STARTER. RE-CONNECT TO NEW PUMP #3 CONTROLLER. EXISTING #2 CONDUCTORS MAY BE REPLACED OR EXTENDED W/ #4 CONDUCTORS.
- EXISTING 4" CONDUIT OVERHEAD WITH POWER FEEDER. RE-CONNECT TO NEW GENERATOR. EXISTING 3/4" CONDUIT OVERHEAD WITH 4#14. TWO ARE ENGINE START, TWO ARE GENERATOR RUN TO EXISTING REMOTE CONTROL PANEL. RE-CONNECT TO NEW GENERATOR.
- SALVAGE EXISTING GENERATOR WITH FUEL AND ALL APPURTENANCES FOR THE OWNER. SEE NOTE 19, SHEET 1
- EXISTING THREE 20 AMP CIRCUIT RUN TO PANEL RP. ONE FOR LOUVER, ONE FOR BATTERY CHARGER, (NOW GENERATOR MOUNTED) AND ONE FOR THE WATER JACKET HEAT. RE-CONNECT TO NEW BATTERY CHARGER (WALL MOUNTED) AND NEW WATER JACKET HEATER. PROVIDE PLUG AND CORD CONNECTION FOR THE WATER JACKET HEATER.
- RE-CONNECT REPLACEMENT DAMPER OPERATORS. SEE GENERATOR ROOM VENTILATING PLAN.
- PROVIDE NEW 1 POLE 15 AMP CIRCUIT BREAKER IN EXISTING PANEL RP. PROVIDE BRANCH CIRCUIT TO VENTILATION CONTROL PANEL.
- REMOVE EXISTING AUTOCON/US FILTER/SIEMENS MICRO CAT 9500 SERIES CONTROL PANEL AND PROVIDE NEW SIEMENS LC3000 RTU CONTROL PANEL IN MCC E-1.

NEW MCC	
SECTION	DESCRIPTION
1	20" - MLO & 480/277 - PANEL, 6 CIRCUITS
2	36" - VFD W/RVSS BYPASS & FILTER
3	36" - VFD W/RVSS BYPASS & FILTER
4	36" - VFD W/RVSS BYPASS & FILTER
5	24" - RELAY SECTION, LC3000 & ANNUNCIATOR



ELECTRICAL PLAN

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

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David Wayne Klein 6/23/10
SIGNATURE OF ENGINEER DATE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John J. Deane 6/25/10
DIRECTOR OF PUBLIC WORKS DATE
Sharon C. ... 6/25/10
CHIEF, BUREAU OF UTILITIES DATE

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DES: DWB
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FRN	NO.	REVISIONS	DATE
FRN	7/14/09	MOD NOTE 9, LEGEND ON RTU PANEL	
FRN	5/19/09	ADDED LC3000 LOCATION OPTION	

ELECTRICAL FLOOR PLANS & DETAILS

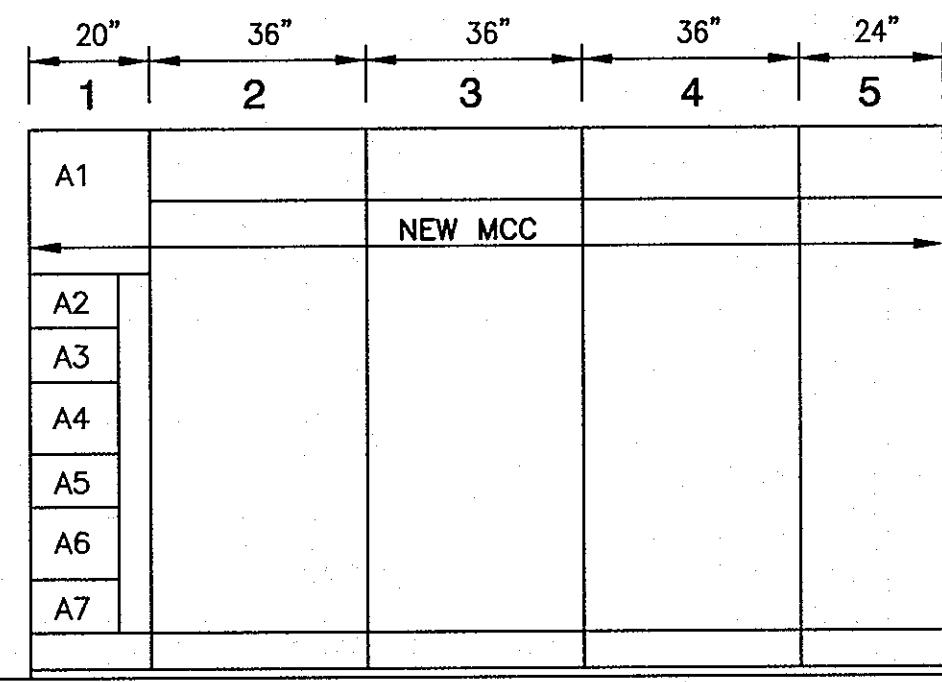
600' SCALE MAP NO. 16 BLOCK NO. 23

FREDERICK ROAD
PUMPING STATION UPGRADES
CAPITAL PROJECT W-8264
CONTRACT 44-4468

ELECTION DISTRICT NO. 2 HOWARD COUNTY, MARYLAND

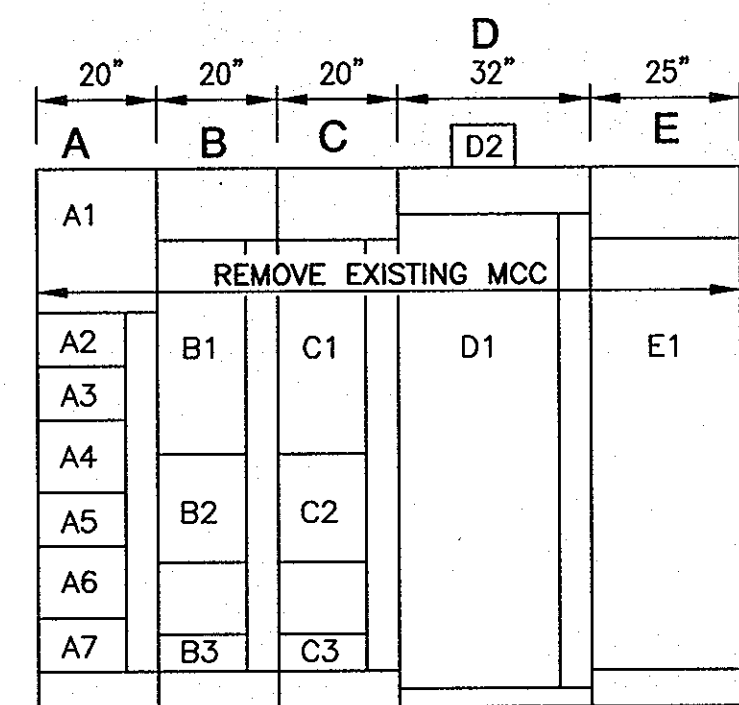
DWG. NO. E-2

SCALE: SHOWN
SHEET 7 OF 10



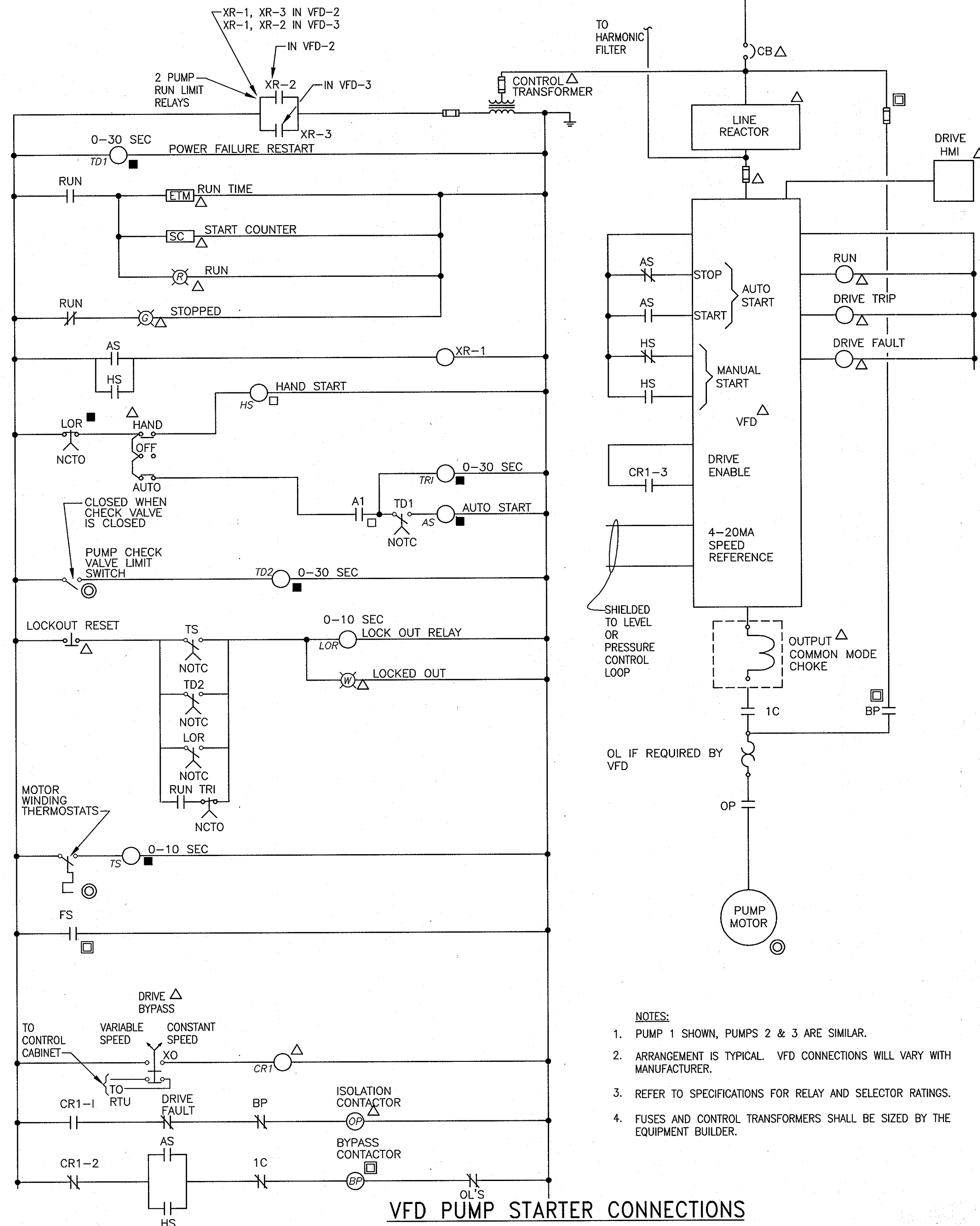
**ELEVATION:
NEW MCC**

E2 SCALE: 3/8" = 1'-0"
SEE SCHEDULE AND ONE LINE DIAGRAM FOR DEVICES.



**ELEVATION:
EXISTING MCC**

E1 SCALE: 3/8" = 1'-0"
SEE ONE LINE DIAGRAM FOR DEVICES



PUMP CONTROL ARRANGEMENT
NOT TO SCALE

VFD PUMP STARTER CONNECTIONS

- - LOCATED IN SEQUENCE CONTROL COMPARTMENT
- △ - LOCATED IN VFD COMPARTMENT
- - LOCATED IN RTU PANEL
- - LOCATED REMOTELY
- - LOCATED IN BYPASS COMPARTMENT

- NOTES:**
- PUMP 1 SHOWN, PUMPS 2 & 3 ARE SIMILAR.
 - ARRANGEMENT IS TYPICAL. VFD CONNECTIONS WILL VARY WITH MANUFACTURER.
 - REFER TO SPECIFICATIONS FOR RELAY AND SELECTOR RATINGS.
 - FUSES AND CONTROL TRANSFORMERS SHALL BE SIZED BY THE EQUIPMENT BUILDER.

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HOWARD COUNTY, MARYLAND**
Director of Public Works: *John D. ...* DATE: 6/25/10
Chief, Bureau of Engineering: *Paul ...* DATE: 6/25/10
Chief, Bureau of Utilities: *Steve ...* DATE: 6/25/10
Chief, Utility Design Division: *...* DATE: 6/25/10

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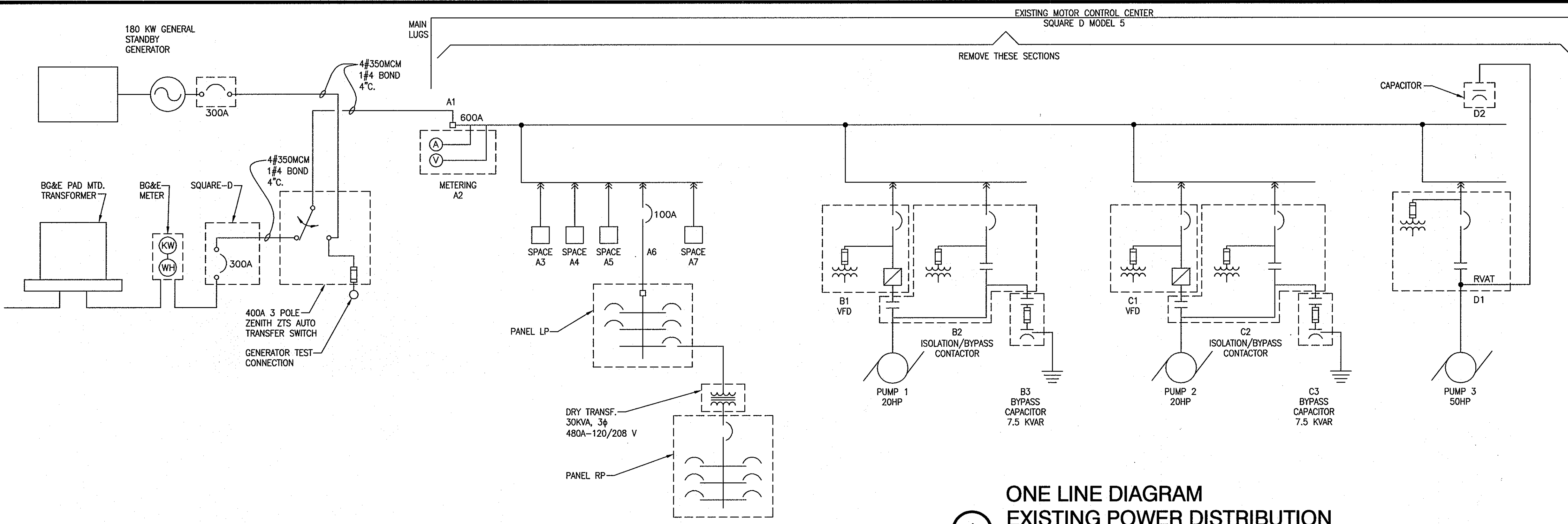
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BY:	NO.
NO.	
REVISIONS	
DATE	

ELECTRICAL SCHEMATICS & DETAILS

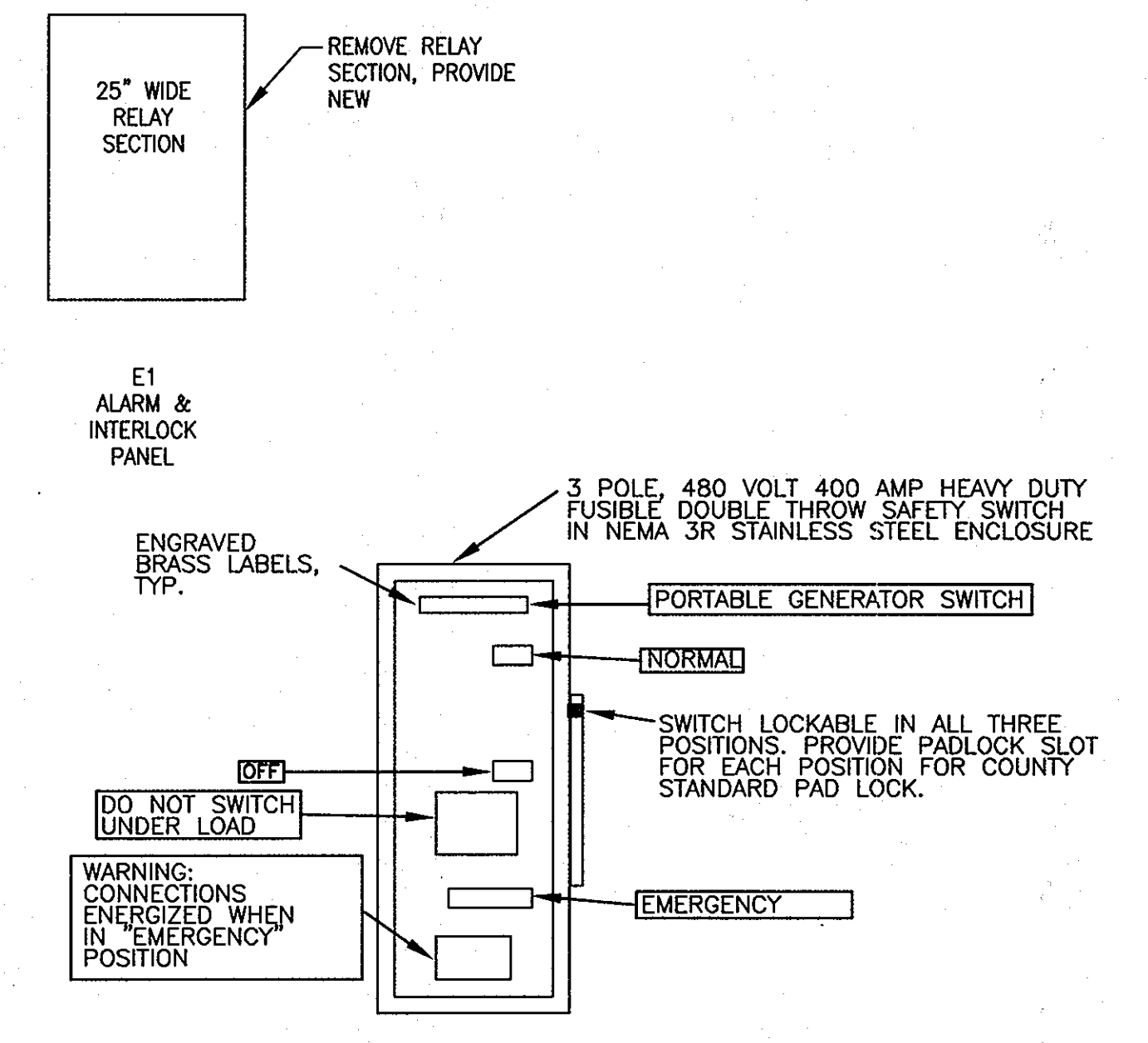
600' SCALE MAP NO. 16 BLOCK NO. 23

**FREDERICK ROAD
PUMPING STATION UPGRADES**
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HOWARD COUNTY, MARYLAND

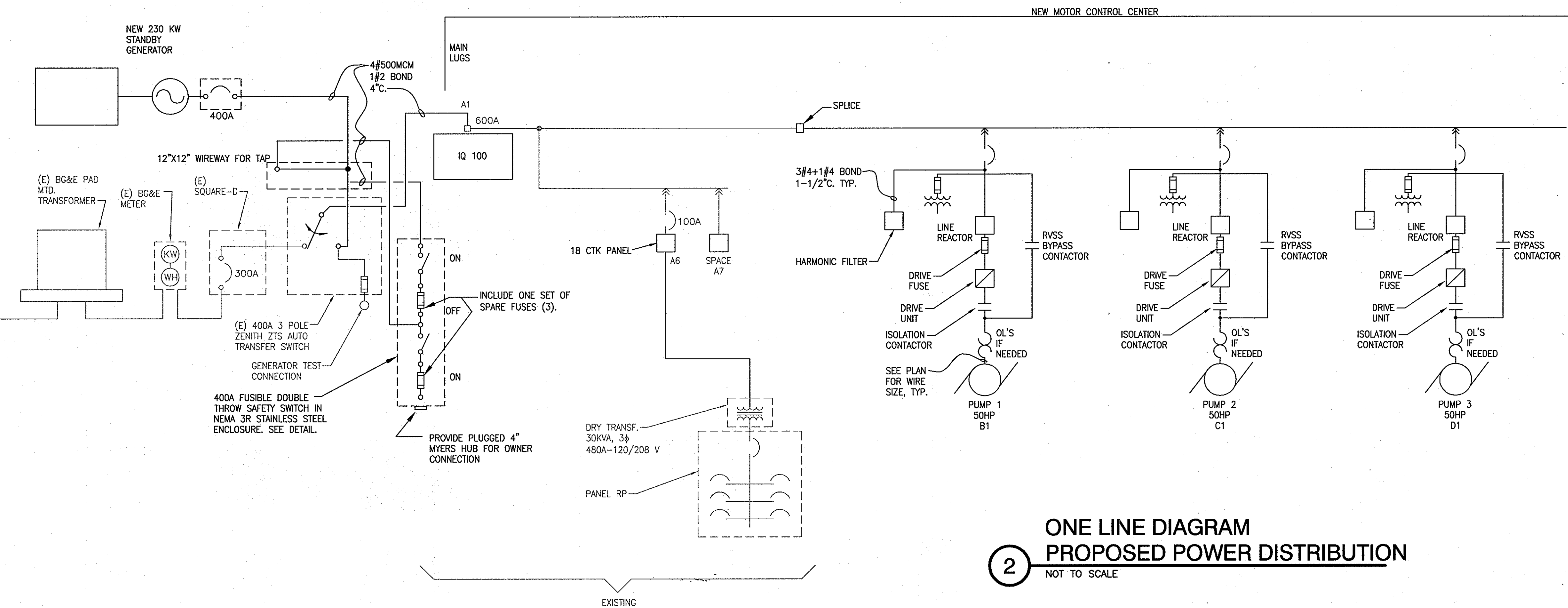
DWG. NO. E-3
SCALE: SHOWN
SHEET 8 OF 10



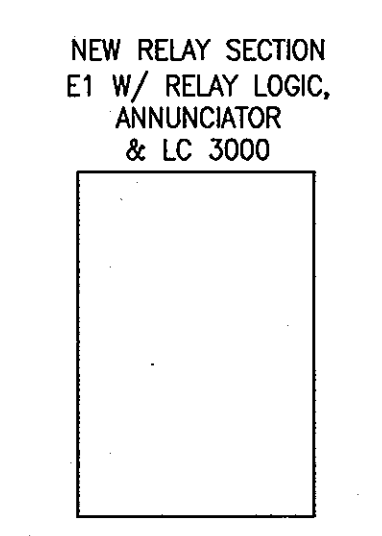
1 ONE LINE DIAGRAM
EXISTING POWER DISTRIBUTION
NOT TO SCALE



3 DETAIL - DOUBLE THROW SAFETY SWITCH
SCALE: NTS



2 ONE LINE DIAGRAM
PROPOSED POWER DISTRIBUTION
NOT TO SCALE

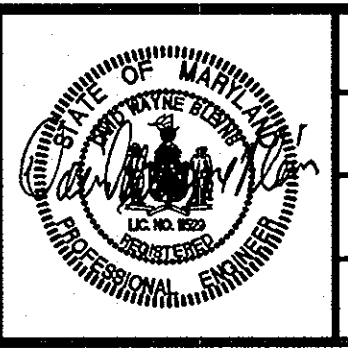


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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
DIRECTOR OF PUBLIC WORKS: *James H. ...* DATE: 6/25/10
CHIEF, BUREAU OF UTILITIES: *Shelley ...* DATE: 6/25/10
CHIEF, UTILITY DESIGN DIVISION: *...* DATE: *...*

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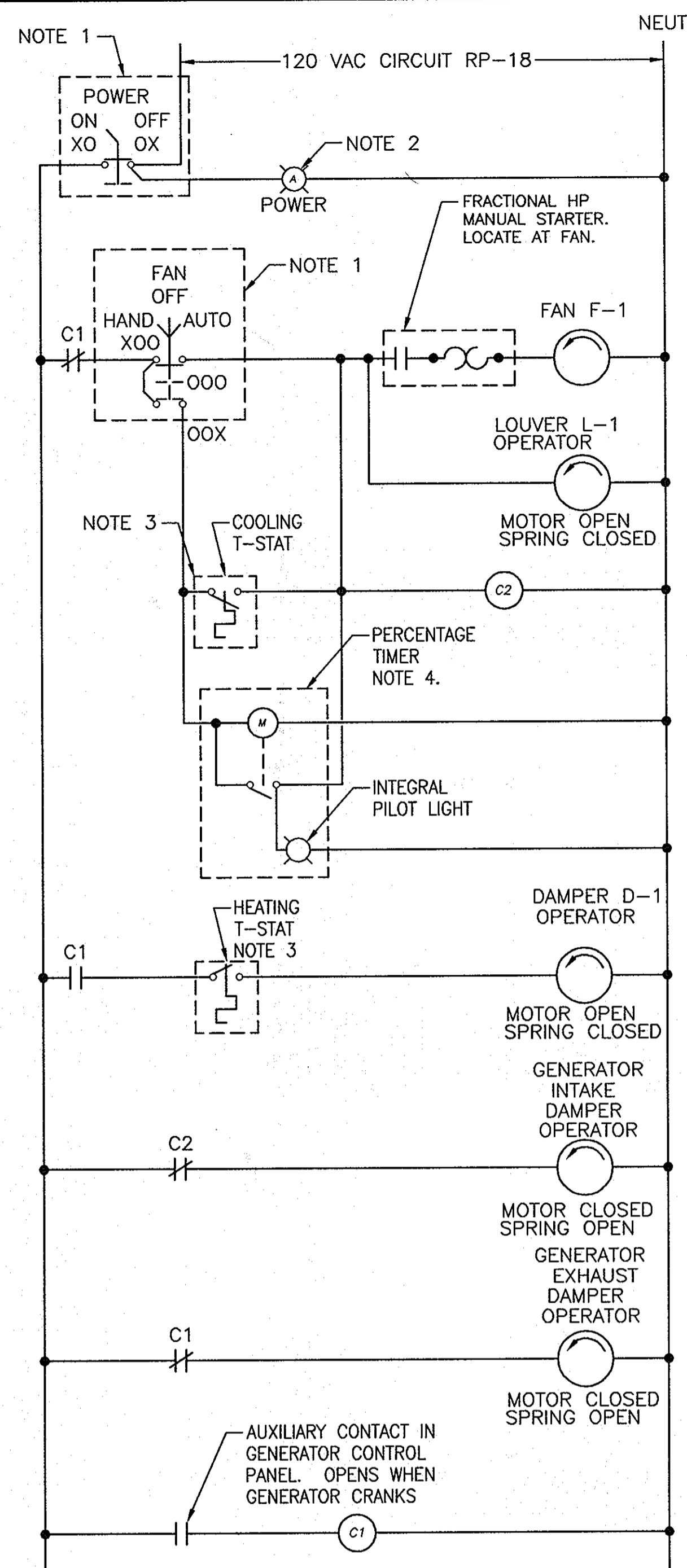


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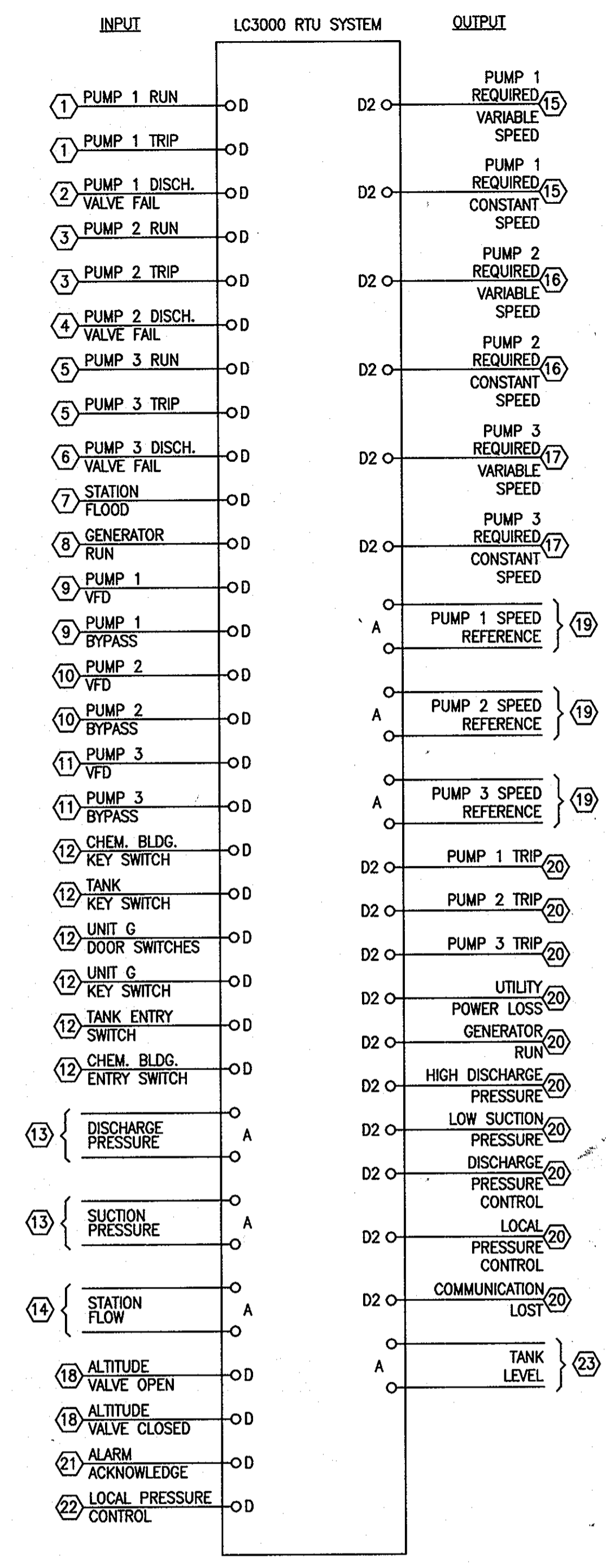
ELECTRICAL RISER & ONE LINE DIAGRAM
600' SCALE MAP NO. 16
BLOCK NO. 23

FREDERICK ROAD PUMPING STATION UPGRADES
CAPITAL PROJECT W-8264
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HOWARD COUNTY, MARYLAND

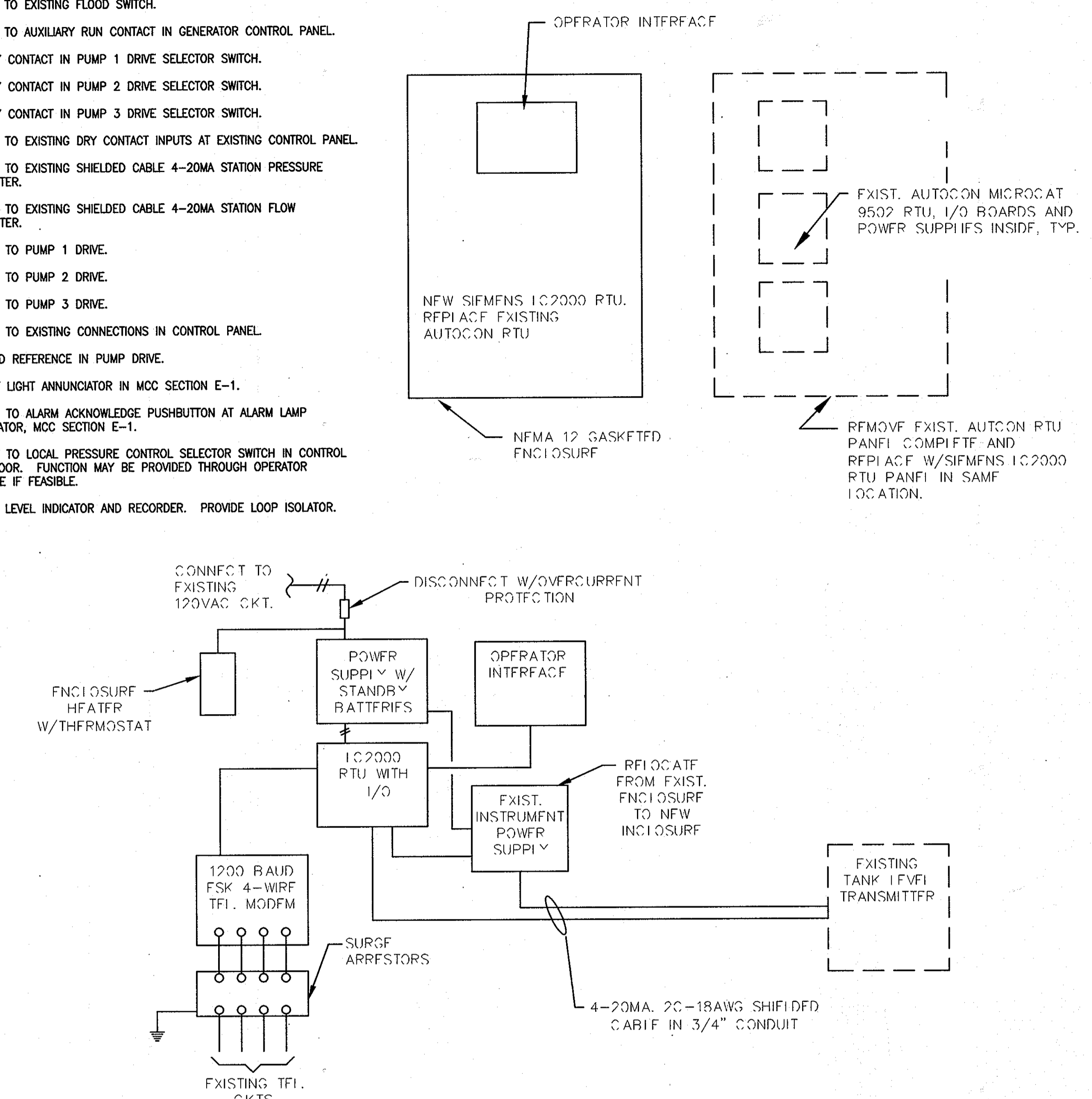
DWG. NO. E-4
SCALE: SHOWN
SHEET 9 OF 10



- VENTILATION CONTROL PANEL NOTES:**
1. USE 30mm HEAVY DUTY CONTROL UNITS FOR SELECTOR SWITCHES AND PILOT LIGHTS. PROVIDE ENGRAVED LABELS AS INDICATED.
 2. PILOT LIGHT SHALL BE LED TYPE.
 3. HEATING AND COOLING THERMOSTATS SHALL BE HEAVY DUTY LINE VOLTAGE TYPE IN DUST PROOF METAL CASE WITH THERMOMETER AND HYDRAULIC SENSING ELEMENT. WHITE ROGERS MODEL 152-9 FOR HEATING AND MODEL 151-6 FOR COOLING OR EQUAL.
 4. PERCENTAGE TIMER SHALL BE MOTOR DRIVEN PANEL MOUNT TYPE WITH INTEGRAL LOAD ON PILOT LIGHT, 60 MINUTE RANGE, 1% ADJUSTMENT. EAGLE SIGNAL MODEL HQ9 OR EQUAL.
 5. INSTALL VENTILATION CONTROLS IN NEMA 12 HINGED DOOR PANEL ENCLOSURE.



- RTU LC3000 INPUT/OUTPUT KEYNOTES:**
- 1 CONNECT TO PUMP 1 DRIVE.
 - 2 CONNECT TO VALVE SEQUENCE CONTROLS IN MCC E-1.
 - 3 CONNECT TO PUMP 2 DRIVE.
 - 4 CONNECT TO VALVE SEQUENCE CONTROLS IN MCC E-1.
 - 5 CONNECT TO PUMP 3 DRIVE.
 - 6 CONNECT TO VALVE SEQUENCE CONTROLS IN MCC E-1.
 - 7 CONNECT TO EXISTING FLOOD SWITCH.
 - 8 CONNECT TO AUXILIARY RUN CONTACT IN GENERATOR CONTROL PANEL.
 - 9 AUXILIARY CONTACT IN PUMP 1 DRIVE SELECTOR SWITCH.
 - 10 AUXILIARY CONTACT IN PUMP 2 DRIVE SELECTOR SWITCH.
 - 11 AUXILIARY CONTACT IN PUMP 3 DRIVE SELECTOR SWITCH.
 - 12 CONNECT TO EXISTING DRY CONTACT INPUTS AT EXISTING CONTROL PANEL.
 - 13 CONNECT TO EXISTING SHIELDED CABLE 4-20MA STATION PRESSURE TRANSMITTER.
 - 14 CONNECT TO EXISTING SHIELDED CABLE 4-20MA STATION FLOW TRANSMITTER.
 - 15 CONNECT TO PUMP 1 DRIVE.
 - 16 CONNECT TO PUMP 2 DRIVE.
 - 17 CONNECT TO PUMP 3 DRIVE.
 - 18 CONNECT TO EXISTING CONNECTIONS IN CONTROL PANEL.
 - 19 TO SPEED REFERENCE IN PUMP DRIVE.
 - 20 TO PILOT LIGHT ANNUNCIATOR IN MCC SECTION E-1.
 - 21 CONNECT TO ALARM ACKNOWLEDGE PUSHBUTTON AT ALARM LAMP ANNUNCIATOR, MCC SECTION E-1.
 - 22 CONNECT TO LOCAL PRESSURE CONTROL SELECTOR SWITCH IN CONTROL PANEL DOOR. FUNCTION MAY BE PROVIDED THROUGH OPERATOR INTERFACE IF FEASIBLE.
 - 23 TO TANK LEVEL INDICATOR AND RECORDER. PROVIDE LOOP ISOLATOR.



**ALPHA RIDGE TANK, LC2000 RTU
GENERAL ARRANGEMENT & PANEL ELEVATION**
NTS

2 SCHEMATIC ARRANGEMENT: VENTILATION SYSTEM CONTROL PANEL
NOT TO SCALE

1 LC3000 INPUT/OUTPUT
NOT TO SCALE

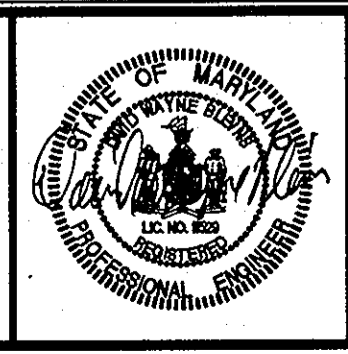
MCC - SCHEDULE						
MARK	DEVICE	LOAD	SIZE	CABLE	CONDUIT	REMARKS
A1	MLO	-	-	-	-	RVSS
A2	IQ 100	-	-	-	-	RVSS
A3	PANEL BOARD	-	-	-	-	RVSS
B1	VFD	PUMP 1	50HP	3#4	EXISTING 1"	COMBINATION WITH INTEGRATED BYPASS & LINE REACTOR, SEE NOTES 1 & 2. RVSS & FILTER
C1	VFD	PUMP 2	50HP	3#4	EXISTING 1"	COMBINATION WITH INTEGRATED BYPASS & LINE REACTOR, SEE NOTES 1 & 2. RVSS & FILTER
D1	VFD	PUMP 3	50HP	EXISTING 3#2	EXISTING 1-1/4"	COMBINATION WITH INTEGRATED BYPASS & LINE REACTOR, SEE NOTES 1 & 2. RVSS & FILTER
E1	RELAY CABINET	-	-	-	-	

- NOTES:**
1. PROVIDE CONTROLS AND INTERLOCKS AS INDICATED.
 2. EXTEND EXISTING CONDUITS IN SLAB TO NEW PUMP MOTORS & MCC.

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. 11529 EXPIRATION DATE: JULY 9, 2011
David Wayne Klein 6/23/10
SIGNATURE OF ENGINEER DATE

**DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND**
Director of Public Works: *Clayton* 6/23/10
Chief, Bureau of Engineering: *Robert* 6/23/10
Chief, Bureau of Utilities: *Clayton* 6/23/10
Chief, Utility Design Division: *WD* 6/23/10

Dewberry
Dewberry & Davis LLC
3120 LORD BALTIMORE DRIVE
SUITE 211
BALTIMORE, MD 21244-2662
410.265.9900
FAX: 410.265.9875



DES:	DWB
DRN:	
CHK:	DWB
DATE:	06/23/10
BY:	
NO.:	
REVISIONS:	
DATE:	

ELECTRICAL SCHEDULES & DETAILS
600' SCALE MAP NO. 16
BLOCK NO. 23

**FREDERICK ROAD
PUMPING STATION UPGRADES
CAPITAL PROJECT W-8264
CONTRACT 44-4468**
ELECTION DISTRICT NO. 2
HOWARD COUNTY, MARYLAND

DWG. NO. E-5
SCALE: SHOWN
SHEET 10 OF 10

AS-BUILTS
02-04-13