

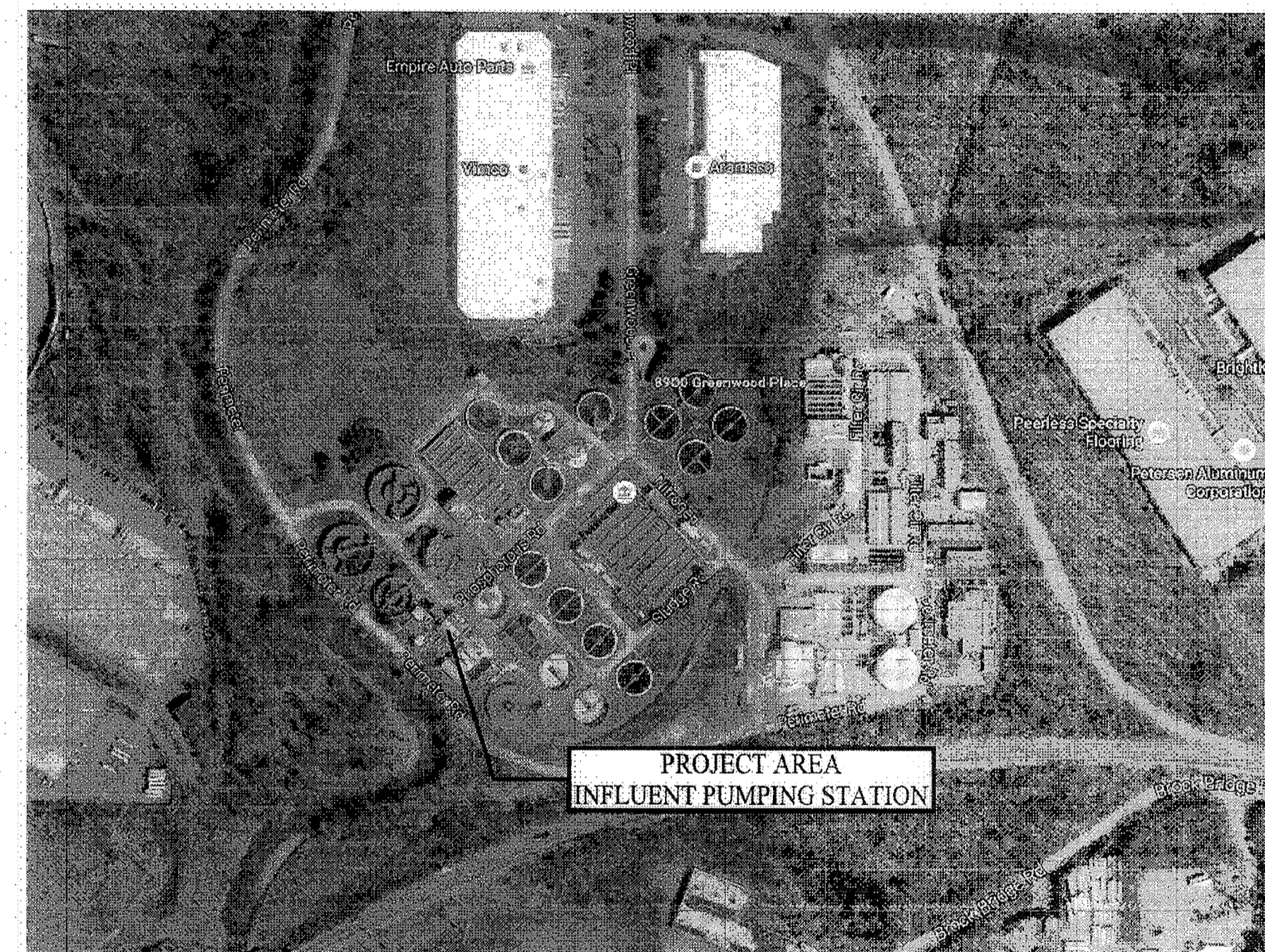
# LITTLE PATUXENT WATER RECLAMATION PLANT INFLUENT PUMPING STATION PUMP REPLACEMENT HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS  
CAPITAL PROJECT NO. S-6264  
CONTRACT NO. 20-4991

| SHEET NO.              | DRAWING NO. | DESCRIPTION                                    |
|------------------------|-------------|--|
| <b>GENERAL</b>         |             |  |
| 1                      | G1          | COVER  |
| 2                      | G2          | ABBREVIATIONS, LEGEND AND CODE DATA            |
| 3                      | G3          | SITE STAGING AREA                              |
| 4                      | G4          | SYSTEM SCHEMATIC                               |
| 5                      | G5          | PUMP CURVES & DESIGN CRITERIA                  |
| <b>MECHANICAL</b>      |             |  |
| 6                      | M1          | BOTTOM PLAN AND SECTIONS- DEMOLITION           |
| 7                      | M2          | BOTTOM PLAN AND SECTIONS                       |
| <b>DETAILS</b>         |             |  |
| 8                      | D1          | MISCELLANEOUS STANDARD DETAILS                 |
| <b>STRUCTURAL</b>      |             |  |
| 9                      | S1          | GENERAL STRUCTURAL NOTE SHEET 1                |
| 10                     | S2          | GENERAL STRUCTURAL NOTE SHEET 2                |
| 11                     | S3          | DEMOLITION INTERMEDIATE PLAN AND DETAILS       |
| 12                     | S4          | PROPOSED INTERMEDIATE PLAN, SECTIONS & DETAILS |
| <b>HVAC</b>            |             |  |
| 13                     | H1          | GENERAL NOTES, ABBREVIATIONS, AND DETAILS      |
| 14                     | H2          | SCHEDULES AND DETAILS                          |
| 15                     | H3          | DEMOLITION PLANS                               |
| 16                     | H4          | PROPOSED PLANS                                 |
| <b>ELECTRICAL</b>      |             |  |
| 17                     | E1          | LEGEND AND SYMBOLS                             |
| 18                     | E2          | ONE-LINE DIAGRAM MCC-02-MAIN                   |
| 19                     | E3          | ONE-LINE DIAGRAM MCC-02-01                     |
| 20                     | E4          | PUMP MOTOR CONTROL SCHEMATIC                   |
| 21                     | E5          | RISER DIAGRAMS AND SCHEDULES                   |
| 22                     | E6          | SCHEDULES                                      |
| 23                     | E7          | UPPER LEVEL PLAN                               |
| 24                     | E8          | UPPER LEVEL SECTION                            |
| 25                     | E9          | LOWER LEVEL PLAN                               |
| <b>INSTRUMENTATION</b> |             |  |
| 26                     | I1          | LEGEND AND SYMBOLS                             |
| 27                     | I2          | PROCESS & INSTRUMENTATION DIAGRAM              |



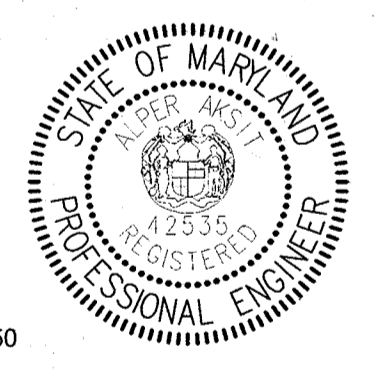
VICINITY MAP



LOCATION MAP

**RECORD DRAWING STATEMENT:**  
THESE RECORD DRAWINGS REFLECT DEVIATIONS FROM THE ORIGINAL CONTRACT DRAWINGS BASED ON "AS-BUILT" RED-LINE MARK-UPS PROVIDED BY OTHERS, AND SUPPLEMENTED BY VISUAL OBSERVATIONS OF PROJECT FEATURES AT OR ABOVE GRADE AT COMPLETION OF THE PROJECT.

SIGNATURE:  
DESIGN PROFESSIONAL SIGNATURE  
DATE: 2/21/19 MD P.E. LICENSE 42535  
DATE: ALPER AKSIT, P.E.  
FIRM NAME: HAZEN & SAWYER  
ADDRESS: 1 SOUTH STREET, SUITE 1150  
BALTIMORE, MD 21202



AS-BUILT REPLACEMENT SHEET 1/2019

| DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>Director of Public Works: [Signature] 3/7/19<br>Chief Bureau of Engineering: [Signature] 2-28-19<br>Chief Bureau of Utilities: [Signature] 2-26-19<br>Chief Utility Design Division: [Signature] 2/26/19 |            | <b>Hazen</b><br>HAZEN AND SAWYER<br>1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202<br>410-539-7881 | PROFESSIONAL CERTIFICATION:<br>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. 42535, EXPIRATION DATE 07/25/2018.<br>SIGNED: [Signature] 2/21/19 | DESIGNED: AA<br>DRAWN: BRC<br>CHECKED: JCS<br>PROJ. ENGR: AA<br>APPROVED: [Signature] | <table border="1"> <tr> <th>NO.</th> <th>ISSUED FOR</th> <th>DATE</th> <th>BY</th> </tr> <tr> <td>3</td> <td>AS-BUILT</td> <td>1/9/19</td> <td>AA</td> </tr> <tr> <td>2</td> <td>ADDENDUM</td> <td>5/9/17</td> <td>AA</td> </tr> <tr> <td>1</td> <td>ADDENDUM</td> <td>5/9/17</td> <td>AA</td> </tr> </table> | NO. | ISSUED FOR | DATE | BY | 3 | AS-BUILT | 1/9/19 | AA | 2 | ADDENDUM | 5/9/17 | AA | 1 | ADDENDUM | 5/9/17 | AA | COVER | INFLUENT PUMPING STATION<br>PUMP REPLACEMENT CONTRACT<br>LITTLE PATUXENT WATER RECLAMATION PLANT<br>CAPITAL PROJECT NUMBER S-6264<br>CONTRACT NUMBER 20-4991<br>6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND | DATE: JAN 2017<br>DRAWING NUMBER: G1<br>SCALE: AS SHOWN<br>SHEET 1 OF 27 |
|---|------------|---|--|---|---|-----|------------|------|----|---|----------|--------|----|---|----------|--------|----|---|----------|--------|----|-------|---|--|
| NO.   | ISSUED FOR | DATE  | BY   |   |   |     |            |      |    |   |          |        |    |   |          |        |    |   |          |        |    |       |   |  |
| 3   | AS-BUILT   | 1/9/19  | AA   |   |   |     |            |      |    |   |          |        |    |   |          |        |    |   |          |        |    |       |   |  |
| 2   | ADDENDUM   | 5/9/17  | AA   |   |   |     |            |      |    |   |          |        |    |   |          |        |    |   |          |        |    |       |   |  |
| 1   | ADDENDUM   | 5/9/17  | AA   |   |   |     |            |      |    |   |          |        |    |   |          |        |    |   |          |        |    |       |   |  |

MAKE: LOCATION MAP, VICINITY MAP, Vicinity-Map-600.  
 XREF: 32232-1B  
 20170126 12:59P D:\32232-BAI\32232-C05\Drawings\General\G-1.dwg Loc:SaveBy:EPPOSSER

ABBREVIATIONS

PIPE DESIGNATIONS

LEGEND

|  |  |                       |                              |
|--|--|-----------------------|------------------------------|
| AB ANCHOR BOLT                         | FAB FABRICATE                                | N NORTH               | T TREAD                      |
| AC ALTERNATING CURRENT/ASBESTOS CEMENT | F&G FRAME AND COVER                          | NA NOT APPLICABLE     | T&B TOP AND BOTTOM           |
| ACT ACOUSTIC TILE                      | FC FRAME AND GRATE                           | NF NEAR FACE          | T&G TONGUE AND GROOVE        |
| AD AREA DRAIN                          | FD FLOOR DRAIN                               | NIC NOT IN CONTRACT   | TAN TANGENT                  |
| ADJ ADJUSTABLE                         | FDN FOUNDATION                               | NO NUMBER             | TBM TEMPORARY BENCH MARK     |
| AFF ABOVE FINISHED FLOOR               | FF FIRE EXTINGUISHER                         | NOM NOMINAL           | TC TOP OF CURB               |
| AGGR AGGREGATE                         | FFH FINISH FLOOR                             | NPW NON POTABLE WATER | TDH TOTAL DYNAMIC HEAD       |
| AL ALUMINUM                            | FFH FIRE HYDRANT                             | NTS NOT TO SCALE      | TECH TECHNICAL               |
| ALLOW ALLOWANCE/ALLOWABLE              | FIN FINISH                                   |                       | TEL TELEPHONE                |
| ALT ALTERNATE                          | FIX FIXTURE                                  |                       | TEMP TEMPERATURE             |
| APPROX APPROXIMATE                     | FL FLASHING/FLOOR                            |                       | TER TERRAZZO                 |
| ARCH ARCHITECTURAL                     | FLEX FLEXIBLE                                |                       | THM THERMOSTAT               |
| ASB ASBESTOS                           | FLG FLANGE                                   |                       | THK THICK                    |
| ASPH ASPHALT                           | FLUOR FLUORESCENT                            | OC ON CENTER          | THRU THROUGH                 |
| AT ASPHALT TILE                        | FLXC FLEXIBLE CONNECTION                     | OD OUTSIDE DIAMETER   | TOD TOP OF DECK              |
|  | FM FORCE MAIN                                | OF OUTSIDE FACE       | TOF TOP OF FOOTING           |
|  | FRP FIBERGLASS REINFORCED POLYESTER LAMINATE | OFF OFFICE            | TOM TOP OF MASONRY/MANHOLE   |
|  |  | OPER OPERATOR         | TOS TOP OF SLAB              |
|  |  | OPNG OPENING          | TOW TOP OF WALL              |
|  |  | OPP OPPOSITE          | TOL TOLERANCE                |
|  |  | ORIG ORIGINAL         | TPS TWISTED PAIR SHIELDED    |
|  |  | OT OPEN TRUSS         | TRAMS TRANSFORMER            |
|  |  | OVHD OVERHEAD         | TYP TYPICAL                  |
|  |  |                       | UG UNDERGROUND               |
|  |  |                       | UH UNIT HEATER               |
|  |  |                       | UNFIN UNFINISHED             |
|  |  |                       | UNO UNLESS NOTED OTHERWISE   |
|  |  |                       | UR URINAL                    |
|  |  |                       | UTIL UTILITY                 |
|  |  |                       | VAC VACUUM                   |
|  |  |                       | VAT VINYL ASBESTOS TILE      |
|  |  |                       | VCP VITRIFIED CLAY PIPE      |
|  |  |                       | VEL VELOCITY                 |
|  |  |                       | VENT VENTILATING/VENTILATION |
|  |  |                       | VERT VERTICAL                |
|  |  |                       | VOL VOLUME                   |
|  |  |                       | VP VENT PIPE                 |
|  |  |                       | VWC VINYL WALL COVERING      |
|  |  |                       | W WEST/WIDTH                 |
|  |  |                       | WC WATER CLOSET              |
|  |  |                       | WF WIDE FLANGE               |
|  |  |                       | WH WALL HYDRANT              |
|  |  |                       | WI WROUGHT IRON              |
|  |  |                       | WL WATER LEVEL               |
|  |  |                       | W/L WATER LINE               |
|  |  |                       | WO WINDOW OPENING            |
|  |  |                       | W/O WITHOUT                  |
|  |  |                       | WP WATERPROOF                |
|  |  |                       | WPFG WATER PROOFING          |
|  |  |                       | WPT WALL PENETRATING TYPE    |
|  |  |                       | WSE WATER SURFACE ELEVATION  |
|  |  |                       | WSP WEATHERSTRIP             |
|  |  |                       | WT WEIGHT                    |
|  |  |                       | WV WATER VALVE               |
|  |  |                       | WWF WELDED WIRE FABRIC       |
|  |  |                       | YD YARD                      |
|  |  |                       | YR YEAR                      |

EQUIPMENT / RATINGS

LINETYPES

| MATERIALS |                     |
|-----------|---------------------|
|           | GRADE OR EARTH      |
|           | ROCK                |
|           | ASPHALT PAVING      |
|           | STEEL               |
|           | SAND                |
|           | INSULATION          |
|           | GRAVEL              |
|           | WATER SURFACE       |
|           | CONCRETE            |
|           | GRATING             |
|           | CONC. FILL OR GROUT |
|           | CHECKERED PLATE     |
|           | CONC. MASONRY UNIT  |
|           | GLASS               |
|           | BRICK               |
|           | WOOD BLOCKING       |

| SYMBOLS |  |  |                     |
|---------|--|--|---------------------|
|         | GATE VALVE                             |  | SLUICE GATE         |
|         | BUTTERFLY VALVE                        |  | SLIDE/STOP GATE     |
|         | PLUG VALVE                             |  | HOSE BIBB           |
|         | SWING CHECK VALVE                      |  | FIRE HYDRANT        |
|         | GLOBE VALVE                            |  | SOIL BORING         |
|         | PINCH VALVE                            |  | TEST HOLE           |
|         | DIAPHRAGM VALVE                        |  | CLEAN OUT           |
|         | BALL VALVE                             |  | SEWER MANHOLE       |
|         | BALL CHECK VALVE                       |  | STORM DRAIN MANHOLE |
|         | NEEDLE VALVE                           |  | WATER MAIN          |
|         | PRESSURE RELIEF OR SAFETY VALVE        |  | SIGN                |
|         | HARNESSED FLANGED ADAPTER              |  | MAILBOX             |
|         | HARNESSED SLEEVE TYPE COUPLING         |  |                     |
|         | SLEEVE TYPE COUPLING                   |  |                     |
|         | HARNESSED                              |  |                     |
|         | MECHANICAL COUPLING                    |  |                     |
|         | WELDED JOINT                           |  |                     |
|         | MECHANICAL PUSH ON OR RESTRAINED JOINT |  |                     |
|         | FLANGED JOINT                          |  |                     |
|         | WALL PENETRATION                       |  |                     |
|         | CENTRIFUGAL PUMP                       |  |                     |

LINETYPES

|  |                            |
|--|----------------------------|
|  | PROPOSED ITEMS             |
|  | EXISTING ITEMS             |
|  | HIDDEN ITEMS               |
|  | DEMOLITION ITEMS           |
|  | CENTER LINE                |
|  | MATCH LINE                 |
|  | EXISTING TOPO              |
|  | PROPOSED TOPO              |
|  | PROPERTY LINE              |
|  | WATER MAIN                 |
|  | SEWER                      |
|  | UNDERGROUND ELECTRIC       |
|  | UNDERGROUND COMMUNICATIONS |
|  | GAS LINE                   |
|  | FENCE                      |
|  | TREE LINE                  |

SECTION AND DETAIL KEYING

DRAWINGS ARE CROSS REFERENCED IN THE FOLLOWING METHOD:

(A) A SECTION CUT ON DRAWING A3 IS IDENTIFIED AS FOLLOWS:

(B) THE SECTION SHOWN ON DRAWING A6 IS IDENTIFIED AS FOLLOWS:

DETAILS ARE CROSS REFERENCED IN A SIMILAR MANNER, EXCEPT DETAILS ARE IDENTIFIED BY A SQUARE WITH A NUMBER IN THE UPPER HALF.

AS - BUILT

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*John G. Ke...* 2/13/17  
DIRECTOR OF PUBLIC WORKS DATE

*Mona B. Butler* 2/13/17  
CHIEF BUREAU OF ENGINEERING DATE

*...* 2/13/17  
CHIEF BUREAU OF UTILITIES DATE

*...* 2/13/17  
CHIEF UTILITY DESIGN DIVISION DATE

**Hazen**

HAZEN AND SAWYER  
1 SOUTH STREET, SUITE 1150; BALTIMORE, MD 21202  
410-539-7881

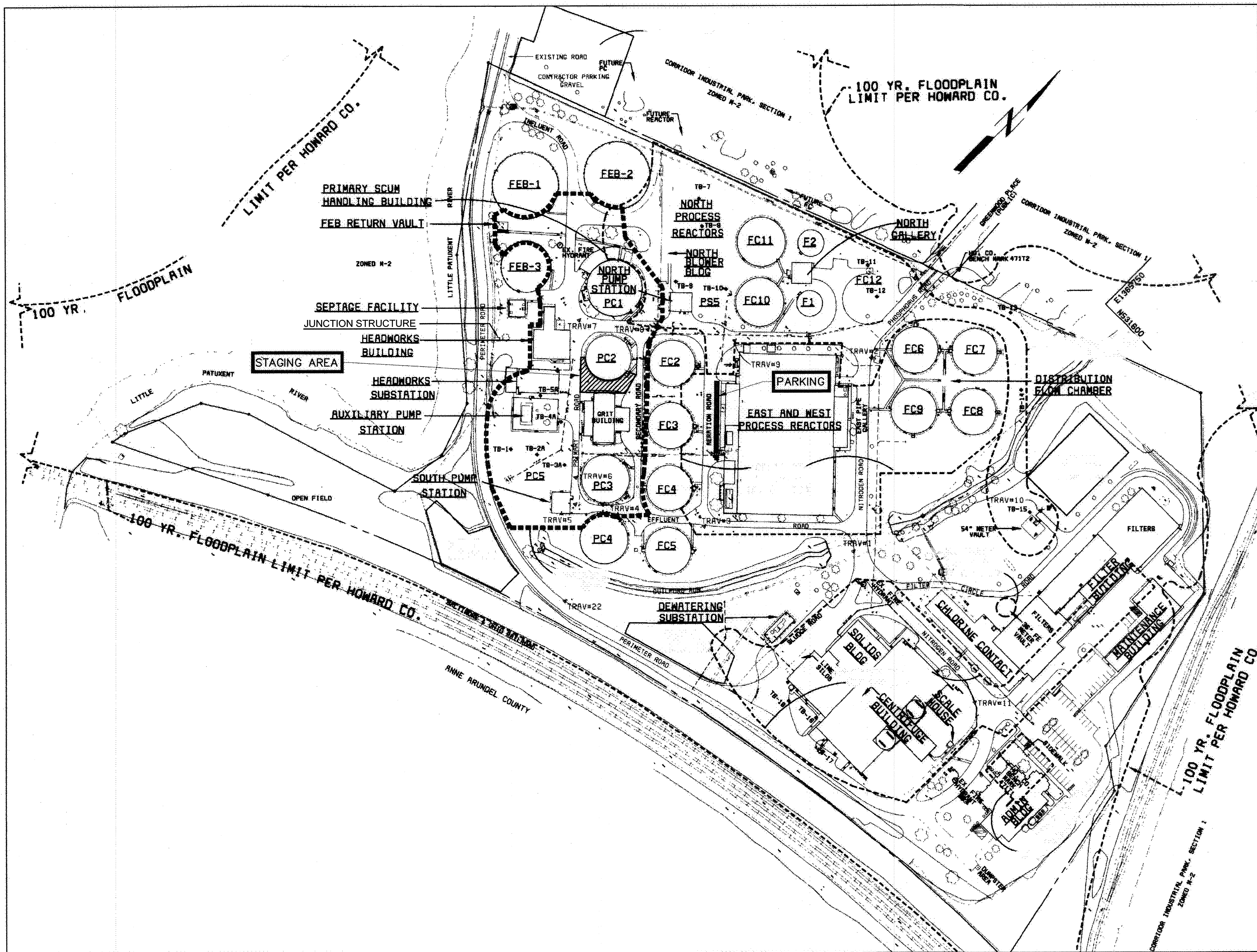
PROFESSIONAL ENGINEERING  
STATE OF MARYLAND  
REGISTERED PROFESSIONAL ENGINEER  
42535  
EXPIRATION DATE 3/1/2018

|             |     |     |            |      |    |
|-------------|-----|-----|------------|------|----|
| DESIGNED    | AA  |     |            |      |    |
| DRAWN       | BRC |     |            |      |    |
| CHECKED     | JCS |     |            |      |    |
| PROJ. ENGR. | AA  |     |            |      |    |
| APPROVED    |     | NO. | ISSUED FOR | DATE | BY |

ABBREVIATIONS LEGEND AND  
CODE DATA

INFLUENT PUMPING STATION  
PUMP REPLACEMENT CONTRACT  
LITTLE PATUXENT WATER RECLAMATION PLANT  
CAPITAL PROJECT NUMBER S-6264  
CONTRACT NUMBER 20-4991  
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE JAN 2017  
DRAWING NUMBER G2  
SCALE AS SHOWN  
SHEET 2 OF 27



AS-BUILT REPLACEMENT SHEET 1/2019

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

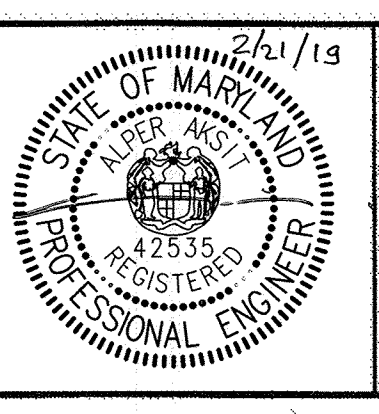
*[Signature]* 3/7/19  
DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 2-20-19  
CHIEF BUREAU OF ENGINEERING DATE

*[Signature]* 2/26/19  
CHIEF UTILITY DESIGN DIVISION DATE

**Hazen**

HAZEN AND SAWYER  
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202  
410-639-7681



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. 22335, EXPIRATION DATE 07/25/2018.

SIGNED: \_\_\_\_\_

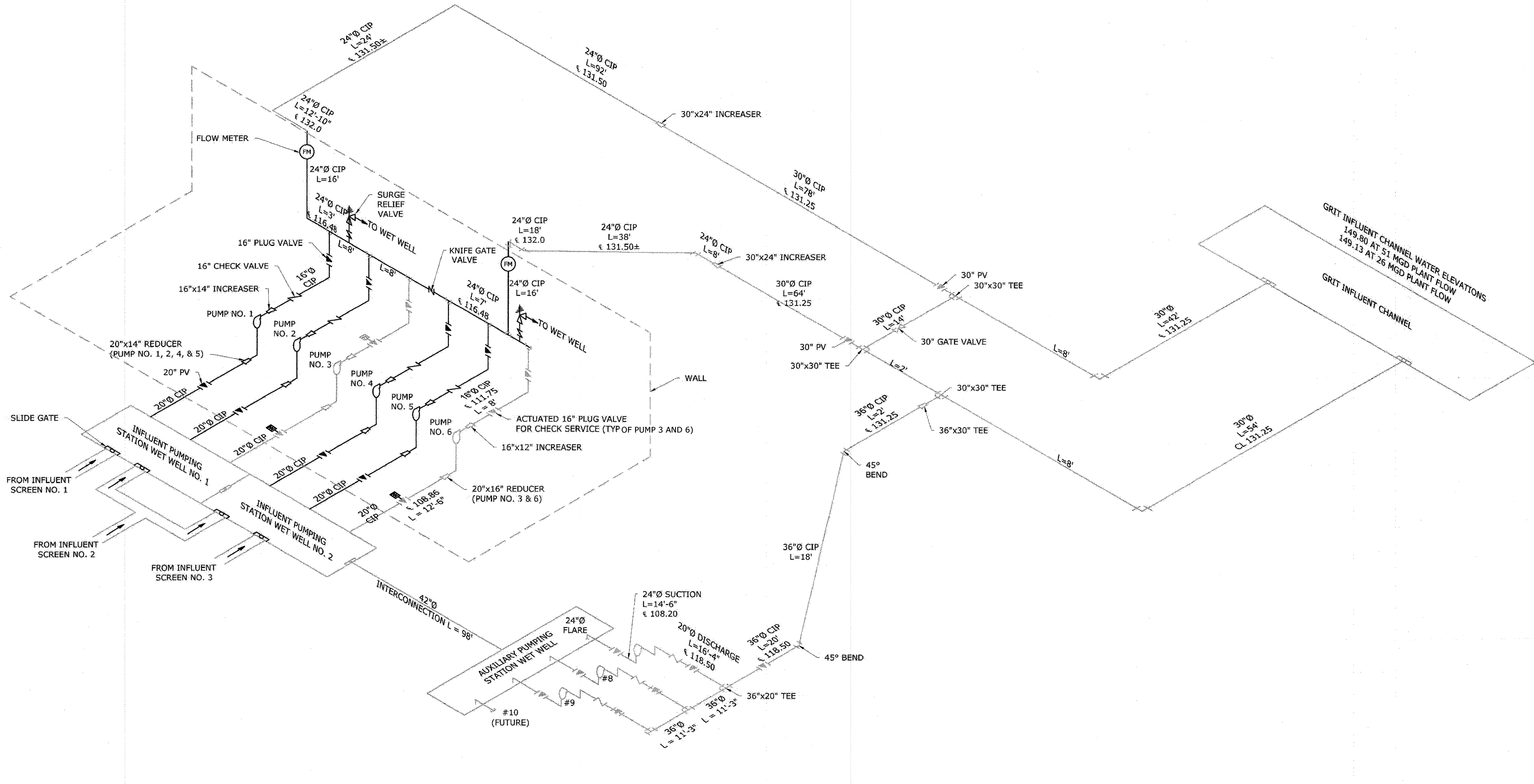
|             |     |   |            |        |    |
|-------------|-----|---|------------|--------|----|
| DESIGNED    | AA  |   |            |        |    |
| DRAWN       | BRC |   |            |        |    |
| CHECKED     | JCS |   |            |        |    |
| PHOU. ENGR. | AA  | 3 | AS-BUILT   | 1/9/19 | AA |
|             |     | 2 | ADDENDUM   | 5/9/17 | AA |
|             |     | 1 | ADDENDUM   | 5/9/17 | AA |
| APPROVED    | NO. |   | ISSUED FOR | DATE   | BY |

SITE STAGING AREA

INFLUENT PUMPING STATION  
PUMP REPLACEMENT CONTRACT  
LITTLE PATUXENT WATER RECLAMATION PLANT  
CAPITAL PROJECT NUMBER S-6264  
CONTRACT NUMBER 20-4991  
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE JAN 2017  
DRAWING NUMBER G3  
SCALE AS SHOWN  
SHEET 3 OF 27

20170126 11:00P G:\32232-84\32232-1505\Drawings\General\5-1.dwg LastSaveBy: EPROSSER



PROPOSED INFLUENT AND AUXILIARY PUMP STATION SYSTEM ISOMETRIC DIAGRAM  
NTS

NOTE: THIS SCHEMATIC IS FOR INFORMATION PURPOSES ONLY.

**LEGEND**

|  |                  |  |                           |
|--|------------------|--|---------------------------|
|  | PUMP             |  | SLIDE GATE                |
|  | GATE VALVE       |  | PLUG VALVE                |
|  | CHECK VALVE      |  | MOTOR OPERATED PLUG VALVE |
|  | BUTTERFLY VALVE  |  |                           |
|  | KNIFE GATE VALVE |  |                           |

**AS-BUILT REPLACEMENT SHEET 1/2019**

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* 3/1/19  
Chief Bureau of Engineering: *[Signature]* 2-20-19  
Chief Utility Design Division: *[Signature]* 2/26/19

**Hazen**  
HAZEN AND SAWYER  
1 SOUTH STREET, SUITE 1150; BALTIMORE, MD 21202  
410-539-7881

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. 42535, EXPIRATION DATE 5/26/2018.

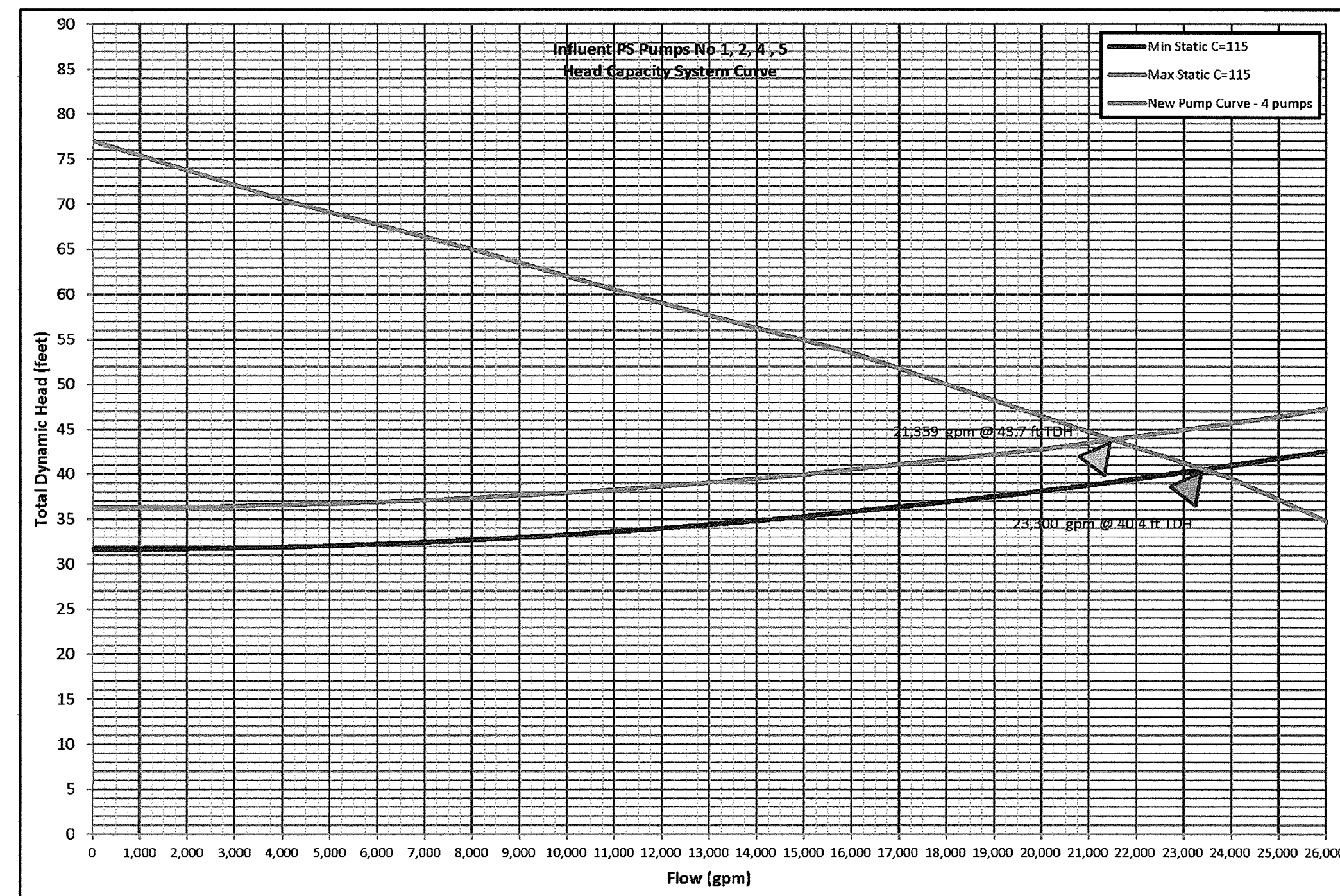
|             |     |   |            |        |    |
|-------------|-----|---|------------|--------|----|
| DESIGNED    | AA  |   |            |        |    |
| DRAWN       | BRC |   |            |        |    |
| CHECKED     | JCS |   |            |        |    |
| PROJ. ENGR. | AA  | 3 | AS-BUILT   | 1/9/19 | AA |
|             |     | 2 | ADDENDUM   | 5/9/17 | AA |
|             |     | 1 | ADDENDUM   | 5/9/17 | AA |
| APPROVED    | NO. |   | ISSUED FOR |        |    |

SYSTEM SCHEMATIC

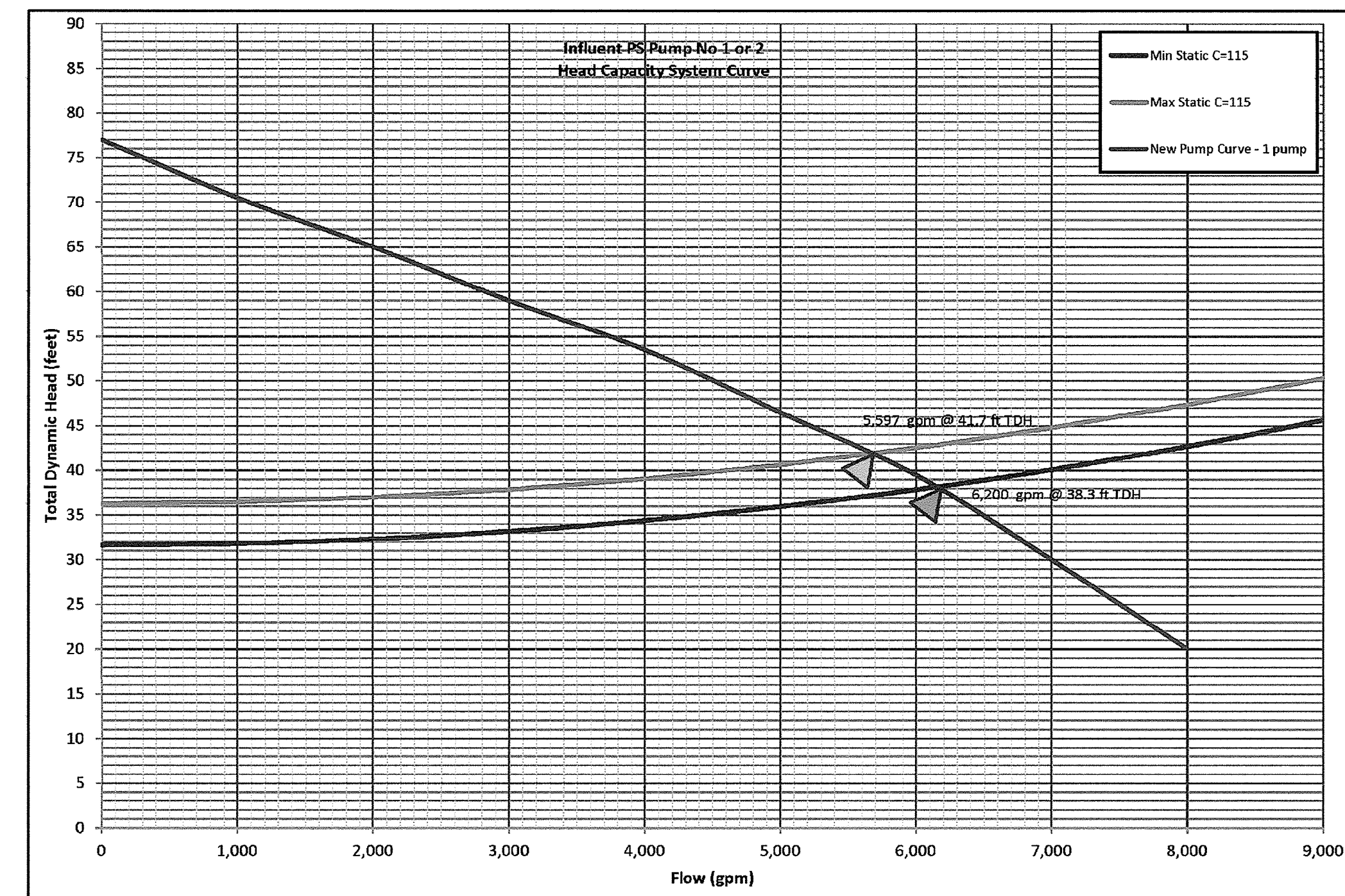
INFLUENT PUMPING STATION  
PUMP REPLACEMENT CONTRACT  
LITTLE PATUXENT WATER RECLAMATION PLANT  
CAPITAL PROJECT NUMBER S-6264  
CONTRACT NUMBER 20-4991  
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE: JAN 2017  
DRAWING NUMBER: G4  
SCALE: AS SHOWN  
SHEET 4 OF 27

20170126 1:00P 0:\32232-BAL\32232-005\Drawings\General\6-4.dwg LastSaveBy:EPROSSEP



HEAD CAPACITY SYSTEM CURVE FOR FOUR REPLACEMENT PUMP OPERATION



HEAD CAPACITY SYSTEM CURVE FOR ONE PUMP OPERATION

DESIGN CRITERIA

|  |                          |
|--|--------------------------|
| NUMBER OF PUMPS  | 4                        |
| PUMP ID  | NO. 1, 2, 4, 5           |
| DUTY POINT 1   | 4,788 GPM AT 47.2 FT TDH |
| DUTY POINT 2   | 5,597 GPM AT 41.7 FT TDH |
| DUTY POINT 3   | 6,200 GPM AT 37.0 FT TDH |
| MINIMUM SHUT OFF HEAD  | 77 FT                    |
| MINIMUM EFFICIENCY AT PRIMARY DESIGN POINT                           | 82%                      |
| MAXIMUM PUMP SPEED   | 1160 RPM                 |
| MAXIMUM MOTOR HP   | 75 HP                    |
| MAXIMUM NET POSITIVE SUCTION HEAD REQUIRED (NPSHR) AT DUTY POINT 2   | 21 FT                    |
| MAXIMUM NPSHR AT DUTY POINT 3  | 25 FT                    |
| MAXIMUM NET POSITIVE SUCTION HEAVE AVAILABLE (NPSHA) AT DUTY POINT 2 | 32 FT                    |
| MAXIMUM NPSHA AT DUTY POINT 3  | 35 FT                    |

AS - BUILT

IMAGE: No. 1 Curve, No. 1-2-4-5, XREFs: 32232-TB

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*[Signature]* 2/13/17  
DIRECTOR OF PUBLIC WORKS DATE

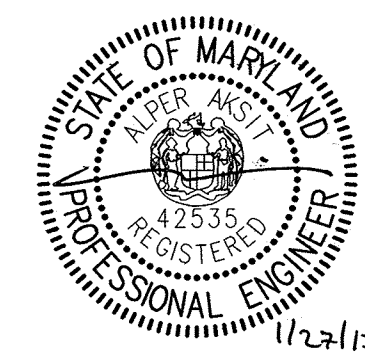
*[Signature]* 2/13/17  
CHIEF BUREAU OF ENGINEERING DATE

*[Signature]* 2/16/17  
CHIEF BUREAU OF UTILITIES DATE

*[Signature]* 2/16/17  
CHIEF UTILITY DESIGN DIVISION DATE

**Hazen**

HAZEN AND SAWYER  
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202  
410-539-7881



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. 42535, EXPIRATION DATE 07/25/2018.

SIGNED: \_\_\_\_\_

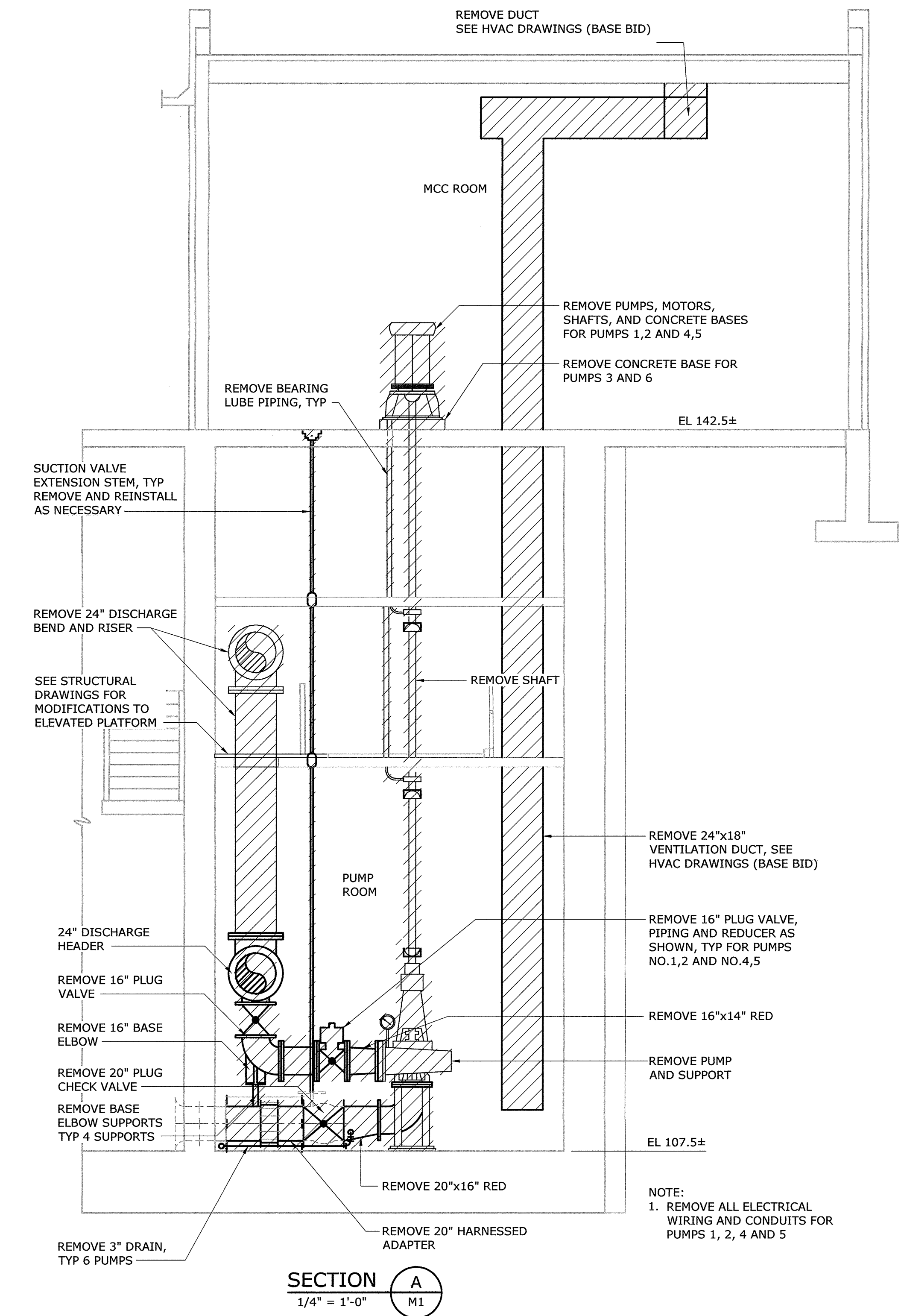
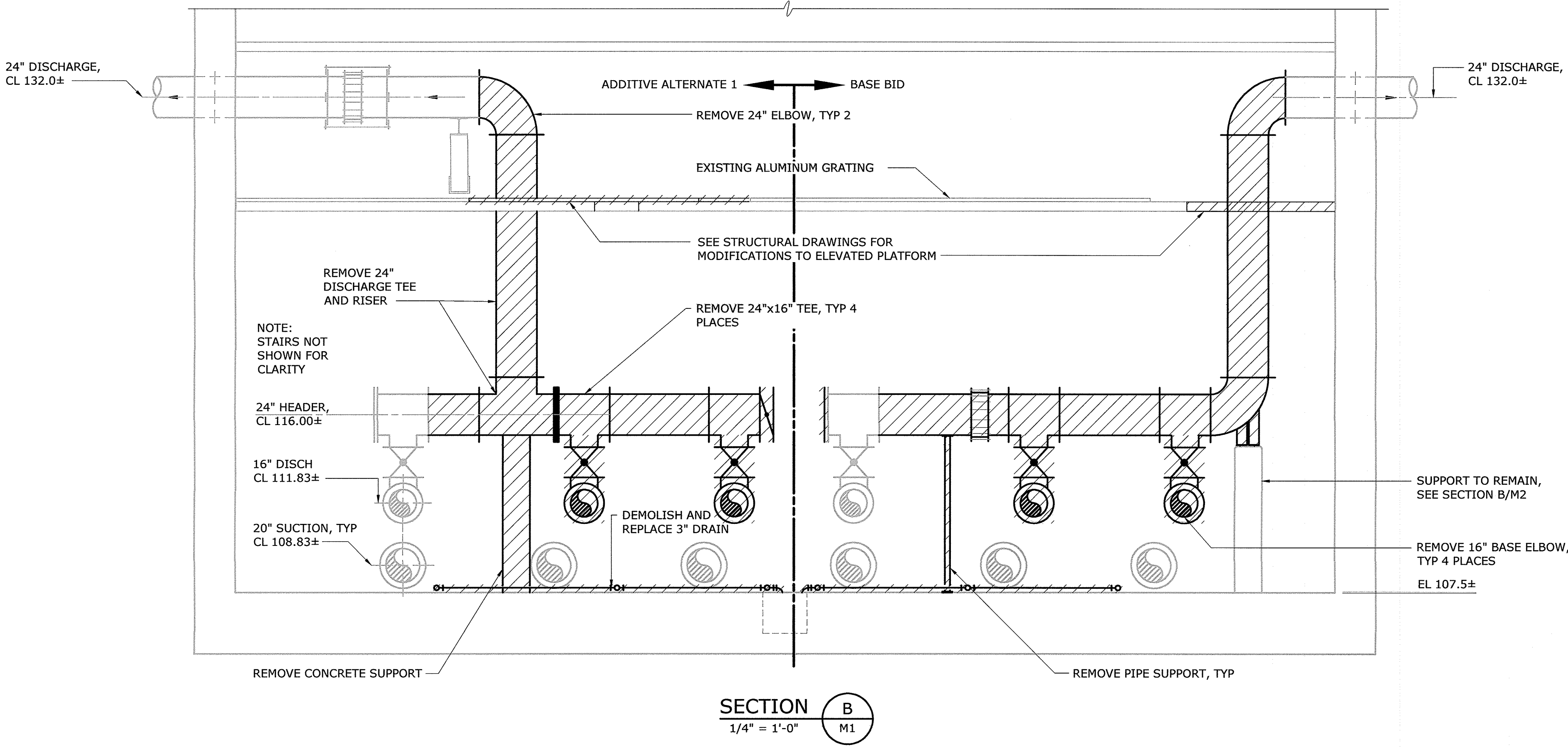
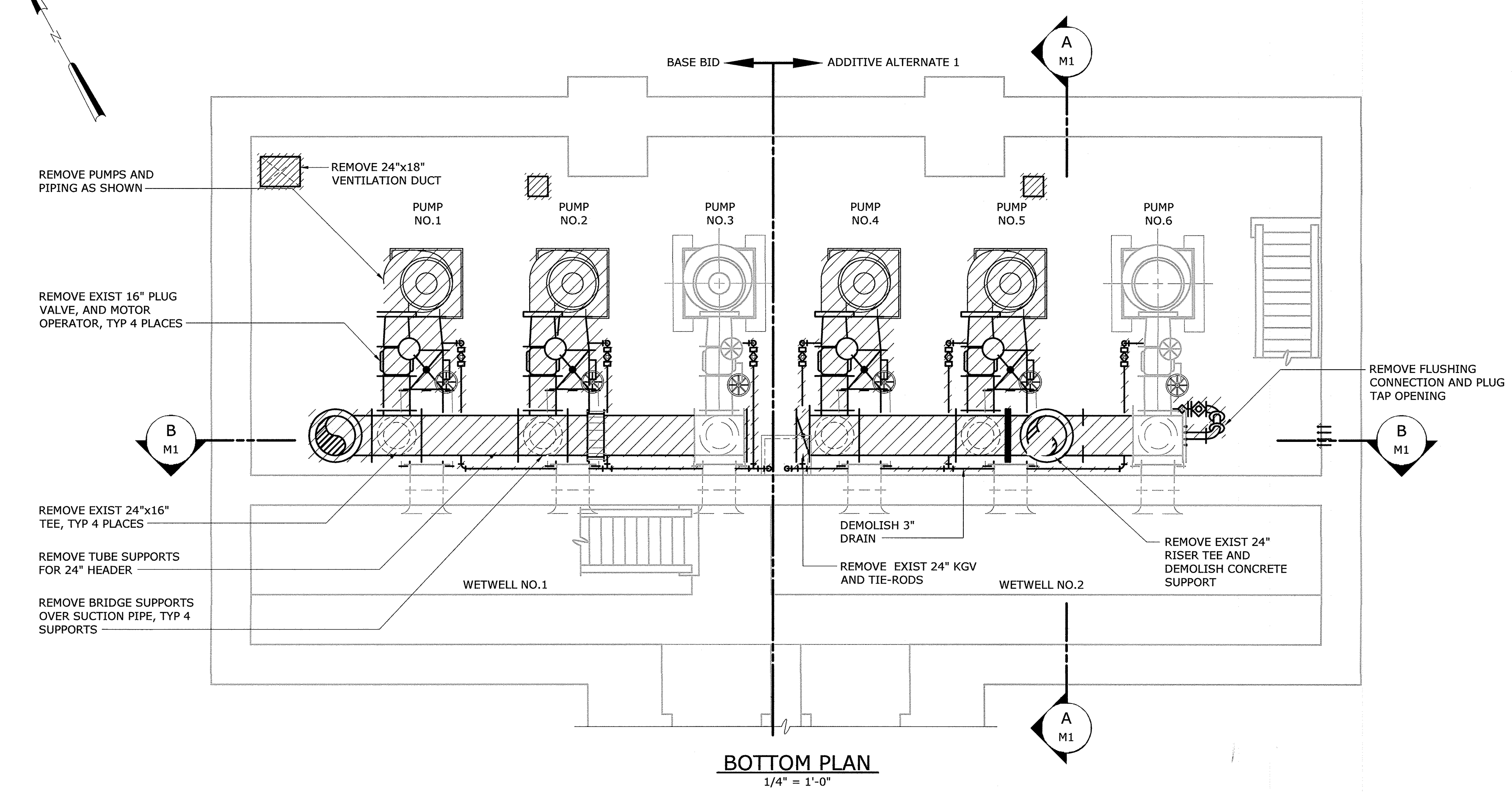
|             |     |            |      |    |  |
|-------------|-----|------------|------|----|--|
| DESIGNED    | AA  |            |      |    |  |
| DRAWN       | BRC |            |      |    |  |
| CHECKED     | JCS |            |      |    |  |
| PROJ. ENGR. | AA  |            |      |    |  |
| APPROVED    | NO. | ISSUED FOR | DATE | BY |  |

PUMP CURVES & DESIGN CRITERIA

INFLUENT PUMPING STATION  
PUMP REPLACEMENT CONTRACT  
LITTLE PATUXENT WATER RECLAMATION PLANT  
CAPITAL PROJECT NUMBER S-6264  
CONTRACT NUMBER 20-4991  
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

|                |          |
|----------------|----------|
| DATE           | JAN 2017 |
| DRAWING NUMBER | G5       |
| SCALE          | AS SHOWN |
| SHEET          | 5 OF 27  |

**NOTES:**  
 1. REFER TO SPECIFICATIONS SECTION 01520 FOR MAINTENANCE OF PLANT OPERATIONS DURING CONSTRUCTION.



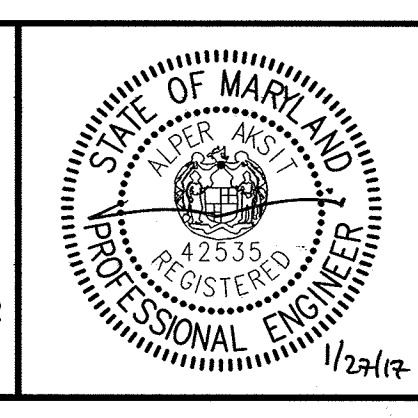
AS - BUILT

20170126 1:01P O:\32232-BAL\32232-005\Drawings\Mechanical\M1.dwg LostSaveBy:EPROSSER  
 XREFS= 32232-TB, Influent PS -PS-PB, Influent PS -PS-S01, Influent PS -PS-S02, Influent PS -PS-PB-H

|  |  |
|--|--|
| DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND            |  |
| Director of Public Works<br><i>[Signature]</i><br>DATE: 2/3/17   | Chief Bureau of Engineering<br><i>[Signature]</i><br>DATE: 2/16/17   |
| Chief Bureau of Utilities<br><i>[Signature]</i><br>DATE: 2/16/17 | Chief Utility Design Division<br><i>[Signature]</i><br>DATE: 2/16/17 |

**Hazen**

HAZEN AND SAWYER  
 1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202  
 410-539-7881



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. 42535, EXPIRATION DATE 07/25/2018.

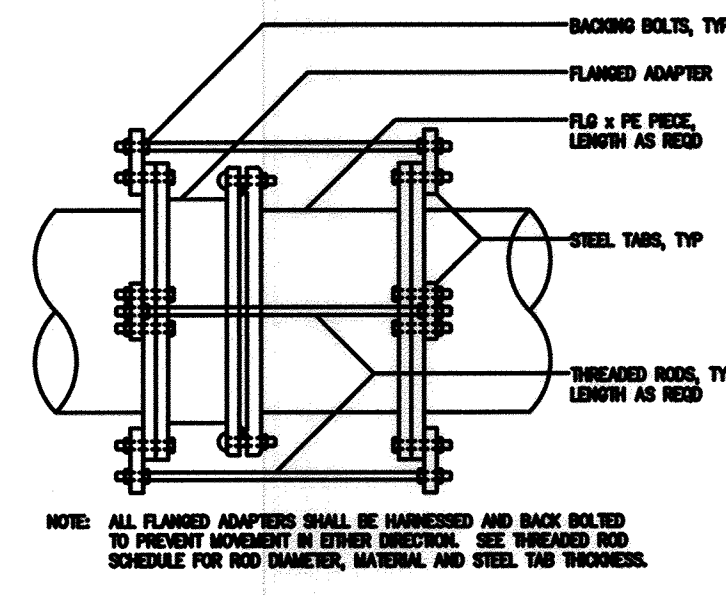
SIGNED: \_\_\_\_\_

|             |     |            |      |    |  |
|-------------|-----|------------|------|----|--|
| DESIGNED    | AA  |            |      |    |  |
| DRAWN       | BRC |            |      |    |  |
| CHECKED     | JCS |            |      |    |  |
| PROJ. ENGR. | AA  |            |      |    |  |
| APPROVED    | NO. | ISSUED FOR | DATE | BY |  |

**INFLUENT PUMPING STATION  
 MECHANICAL  
 BOTTOM PLAN AND SECTIONS-  
 DEMOLITION**

**INFLUENT PUMPING STATION  
 PUMP REPLACEMENT CONTRACT  
 LITTLE PATUXENT WATER RECLAMATION PLANT  
 CAPITAL PROJECT NUMBER S-6264  
 CONTRACT NUMBER 20-4991  
 6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND**

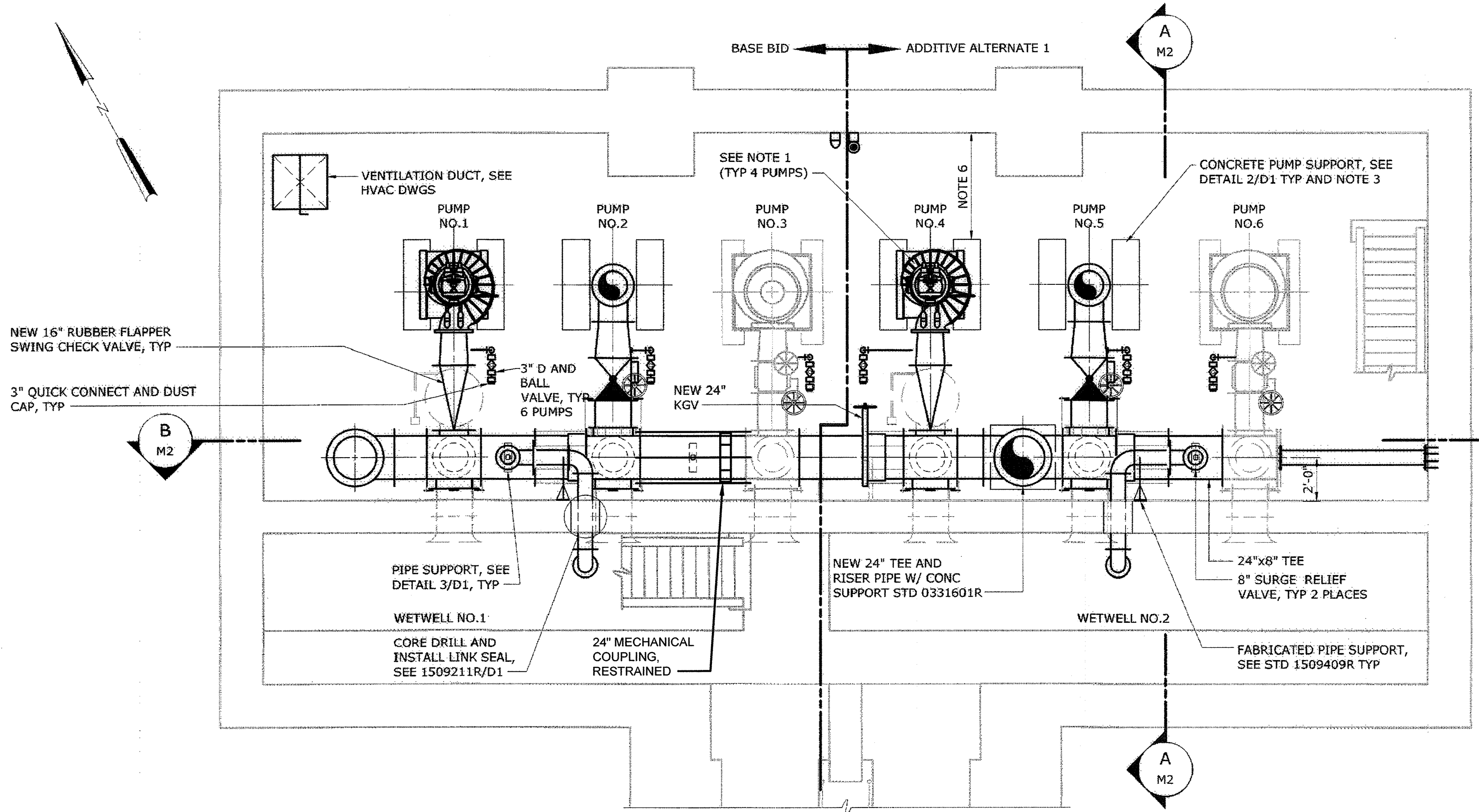
|                |          |
|----------------|----------|
| DATE           | JAN 2017 |
| DRAWING NUMBER | M1       |
| SCALE          | AS SHOWN |
| SHEET          | 6 OF 27  |



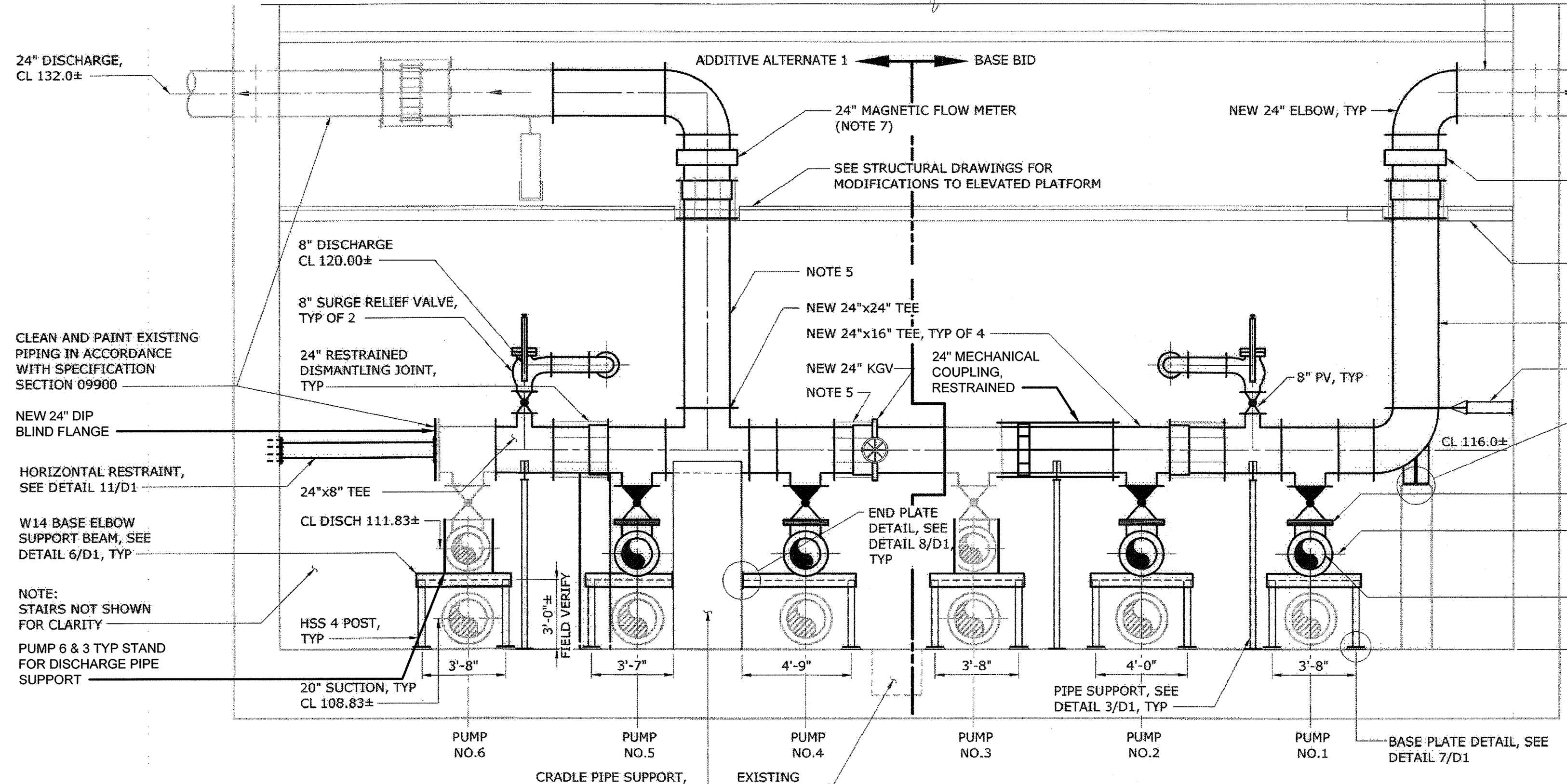
- NOTES:**
1. PROVIDE PORT FOR ANTIFREEZE FILL AND DRAIN PER MANUFACTURERS RECOMMENDATIONS AND PROVIDE VALVE AS NECESSARY.
  2. REALIGN STEM TO MATCH NEW VALVE OPERATOR POSITION. PROVIDE NEW PENETRATIONS AND SEAL OPENINGS IF NECESSARY.
  3. GEOMETRY AND REINFORCEMENT OF PUMP SUPPORTS ARE SHOWN FOR BID PURPOSES ONLY WITH FINAL GEOMETRY AND REINFORCING DETAILS TO BE BASED ON MANUFACTURER'S REQUIREMENTS FOR ACTUAL EQUIPMENT INSTALLED. SUBMIT TO ENGINEER MANUFACTURERS INFORMATION INDICATING BASEPLATE GEOMETRY, ANCHOR BOLT PATTERN AND WORST CASE VERTICAL AND LATERAL LOADS TO THE ANCHORS FOR ENGINEER'S REVIEW PRIOR TO CONSTRUCTION OF THE PUMP SUPPORTS.
  4. CONTRACTOR SHALL FIELD VERIFY SIZE OF FLOOR PENETRATION TO BE FILLED. SIZE OF PLATE SHOWN IS SUCH TO ACCOMMODATE A 16" OPENING WHILE MAINTAINING A 4" EDGE DISTANCE BETWEEN THE EDGE OF OPENING AND THE CENTERLINE OF ADHESIVE ANCHORS. IF SIZE OF OPENINGS IS DIFFERENT THAN THAT SHOWN COORDINATE WITH ENGINEER PRIOR TO FABRICATION OF PLATE.
  5. REINSTALL TIE-RODS IF ADDITIVE ALTERNATE 1 IS NOT IMPLEMENTED. INCLUDE COST IN ADDITIVE ALTERNATE 1.
  6. SHALL NOT BE LESS THAN 58 INCHES. COORDINATE CONCRETE PUMP SUPPORT DIMENSIONS WITH MANUFACTURER. LAYOUT IS SHOWN FOR SPECIFIED PUMP MANUFACTURED BY FLYGT. IF SPECIFIED BY KSB IS PROVIDED, PROVIDE A 16-INCH RESTRAINED FLANGED COUPLING ADAPTER BETWEEN CHECK VALVE AND ELBOW INCLUDING A 16-INCH FLXPE PIPE WITH APPROPRIATE LENGTH PROVIDED THAT THE DIMENSION BETWEEN PUMP SUPPORT AND WALL IS NOT LESS THAN 58 INCHES.
  7. PROVIDE A 24-INCH SPOOL PIECE EQUAL TO LAY LENGTH OF EACH MAGNETIC FLOWMETER. HAND OVER TO OWNER FOR STORAGE.
  8. 3 INCH DRAIN PIPING SHALL BE ASTM A312, TYPE 304, SCHEDULE 40 SEAMLESS STAINLESS STEEL. ALL JOINTS AND FITTINGS SHALL HAVE NPT THREADED CONNECTIONS. DRAIN PIPE SHALL BE CONNECTED TO THE DI SUCTION PIPING VIA A BOSS AND THREADED TAP. BALL VALVE SHALL BE FULL PORT, STAINLESS STEEL WITH TEFLON SEAT AND PACKING AND QUARTER TURN HANDLE, MANUFACTURED BY FLOW-TEK, APOLLO, OR EQUAL. QUICK CONNECT COUPLINGS SHALL BE STAINLESS STEEL CAM AND GROOVE STYLE COUPLINGS (MALE END), MANUFACTURED BY EVER-TITE, OR EQUAL.

**THREADED ROD SCHEDULE**

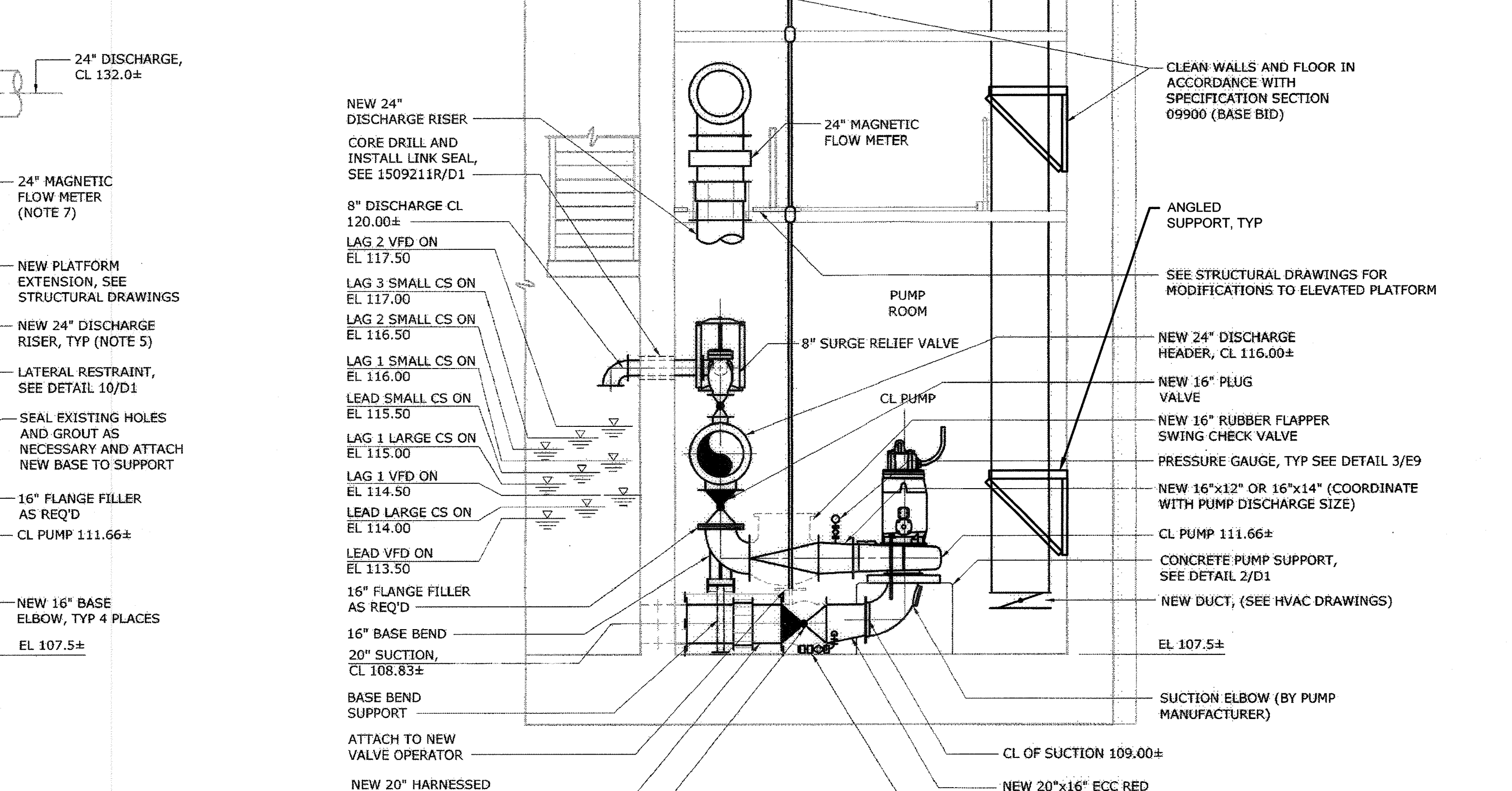
| NO. | SIZE | TYPE | QTY | DESCRIPTION     |
|-----|------|------|-----|-----------------|
| 1   | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 2   | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 3   | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 4   | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 5   | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 6   | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 7   | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 8   | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 9   | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 10  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 11  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 12  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 13  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 14  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 15  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 16  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 17  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 18  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 19  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 20  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 21  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 22  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 23  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 24  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 25  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 26  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 27  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 28  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 29  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 30  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 31  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 32  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 33  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 34  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 35  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 36  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 37  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 38  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 39  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 40  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 41  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 42  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 43  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 44  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 45  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 46  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 47  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 48  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 49  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 50  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 51  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 52  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 53  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 54  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 55  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 56  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 57  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 58  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 59  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 60  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 61  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 62  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 63  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 64  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 65  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 66  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 67  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 68  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 69  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 70  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 71  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 72  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 73  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 74  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 75  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 76  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 77  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 78  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 79  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 80  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 81  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 82  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 83  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 84  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 85  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 86  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 87  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 88  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 89  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 90  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 91  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 92  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 93  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 94  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 95  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 96  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 97  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 98  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 99  | 1/2" | A312 | 1   | FLANGED ADAPTER |
| 100 | 1/2" | A312 | 1   | FLANGED ADAPTER |



**BOTTOM PLAN**  
1/4" = 1'-0"



**SECTION B**  
1/4" = 1'-0"



**SECTION A**  
1/4" = 1'-0"

**AS-BUILT REPLACEMENT SHEET 1/2019**

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

3/7/19  
DATE

2-28-19  
DATE

2-26-19  
DATE

**Hazen**

HAZEN AND SAWYER  
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202  
410-539-7681

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DAILY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 22535. EXPIRATION DATE: 07/25/2018.

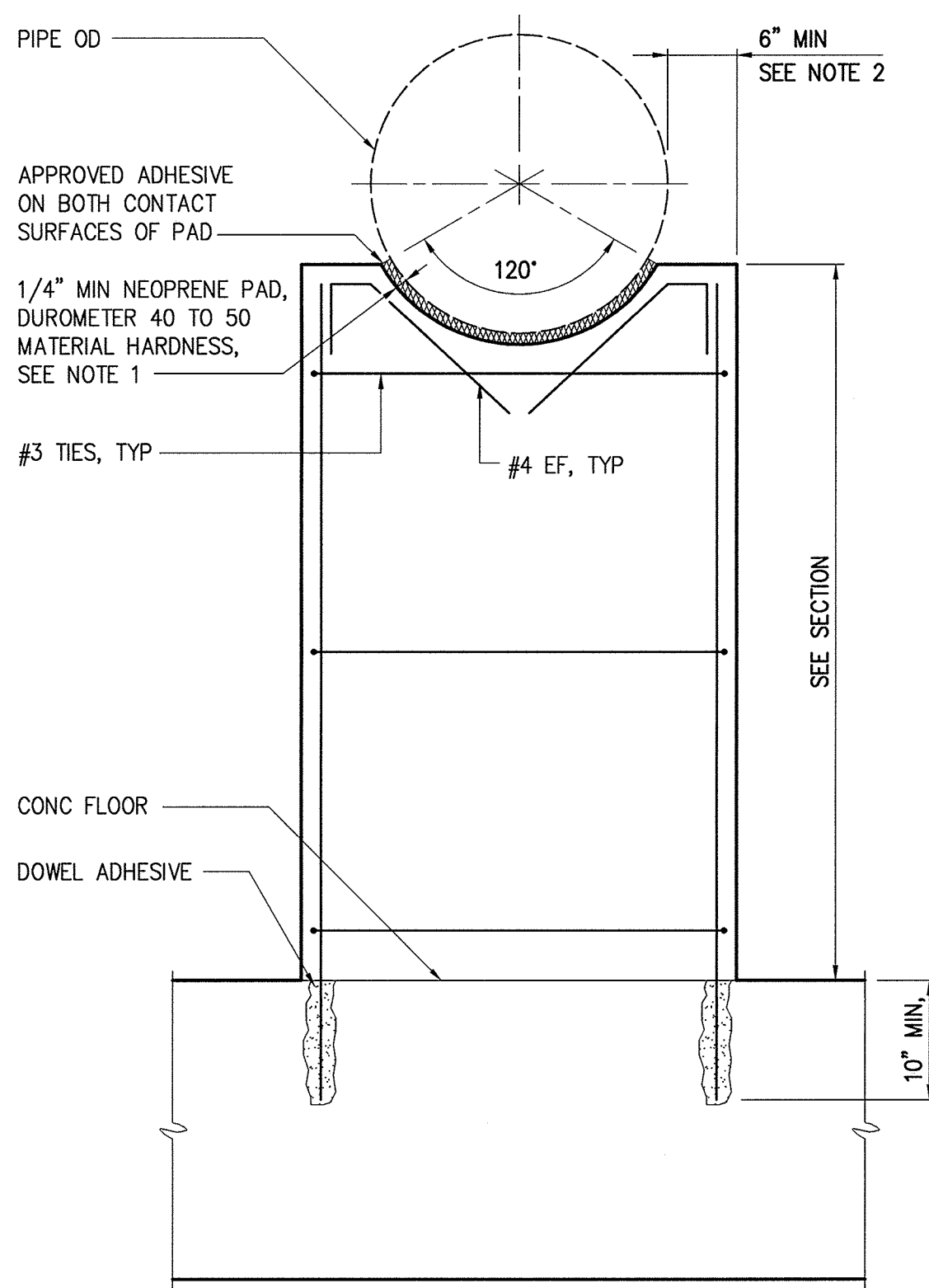
SIGNED: \_\_\_\_\_

|             |     |     |            |        |    |
|-------------|-----|-----|------------|--------|----|
| DESIGNED    | AA  |     |            |        |    |
| DRAWN       | BRC |     |            |        |    |
| CHECKED     | JCS |     |            |        |    |
| PROJ. ENGR. | AA  | 3   | AS-BUILT   | 1/9/19 | AA |
|             |     | 2   | ADDENDUM   | 5/9/17 | AA |
|             |     | 1   | ADDENDUM   | 5/9/17 | AA |
| APPROVED    |     | NO. | ISSUED FOR | DATE   | BY |

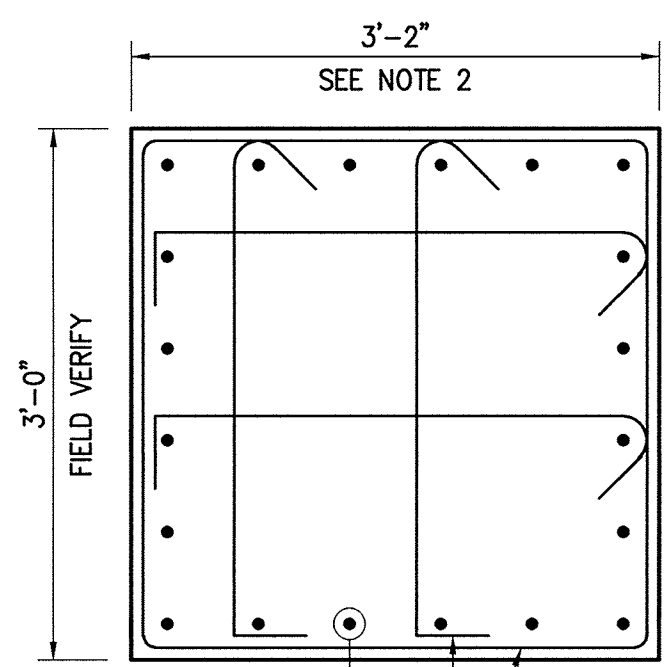
**INFLUENT PUMPING STATION MECHANICAL BOTTOM PLAN AND SECTIONS**

**INFLUENT PUMPING STATION PUMP REPLACEMENT CONTRACT**  
LITTLE PATUXENT WATER RECLAMATION PLANT  
CAPITAL PROJECT NUMBER S-6264  
CONTRACT NUMBER 20-4991  
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE: JAN 2017  
DRAWING NUMBER: M2  
SCALE: AS SHOWN  
SHEET 7 OF 27



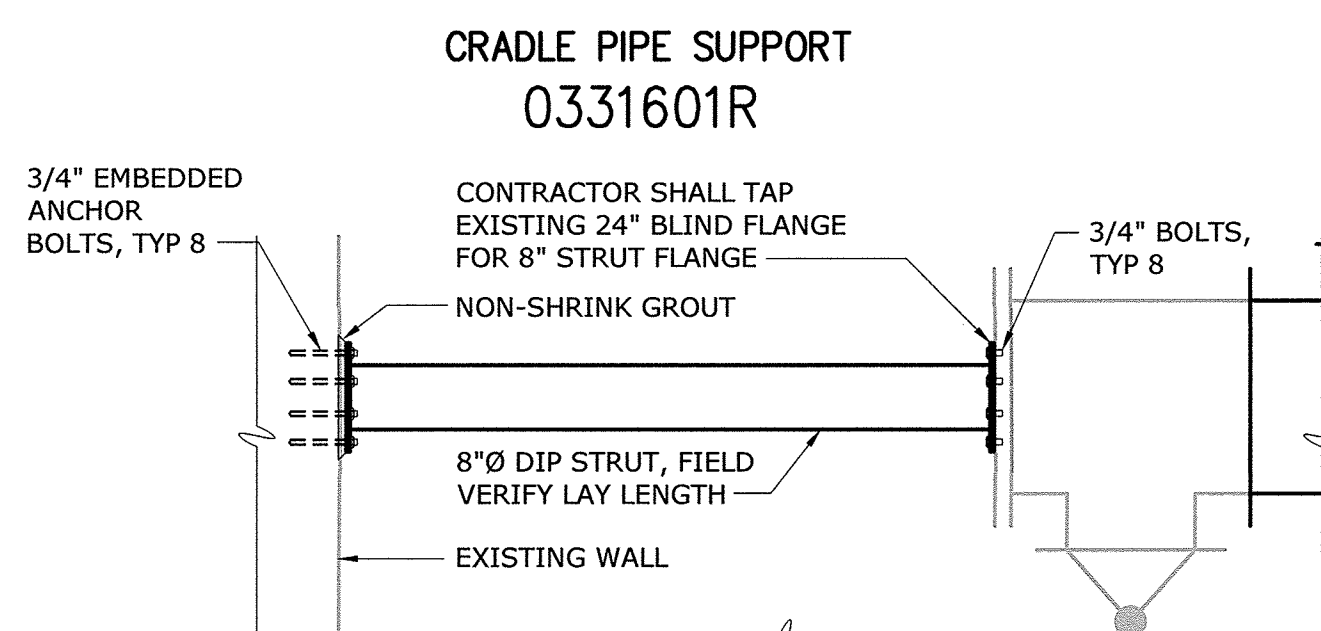
SECTION



PLAN

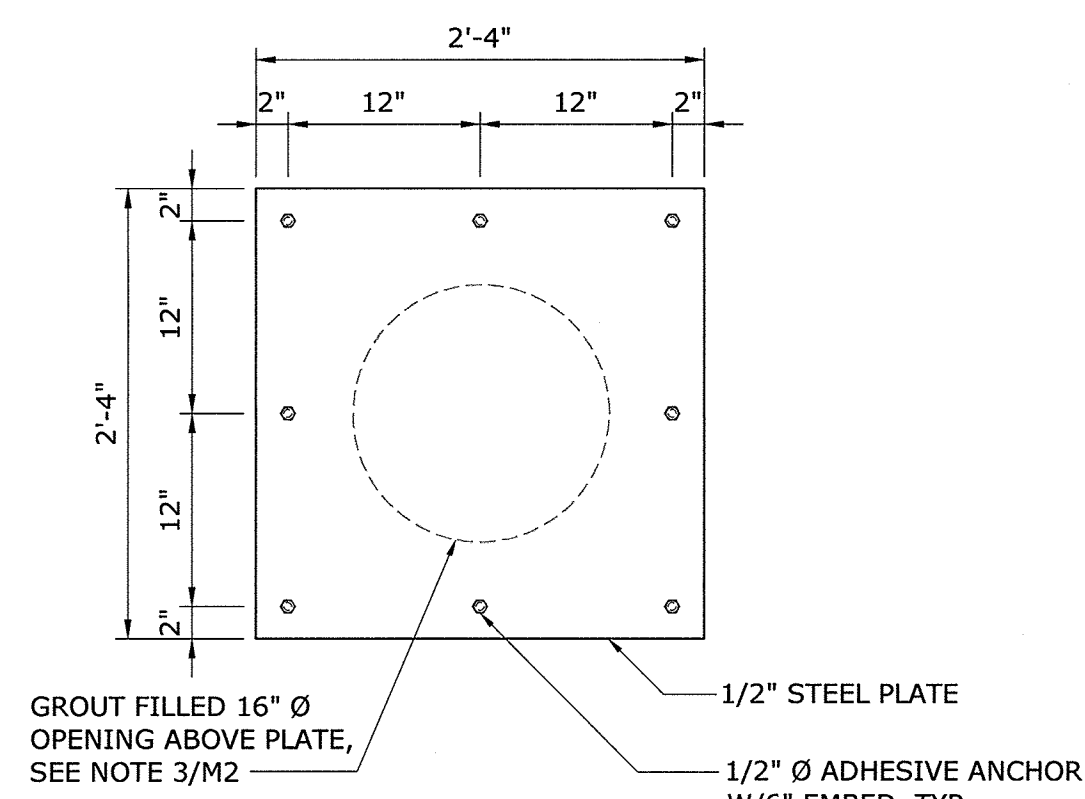
NOTES:

- ENGINEER SHALL VERIFY THICKNESS OF PAD WILL ACCOMMODATE DESIGN MOVEMENT, PARTICULARLY FOR OUTSIDE AERIAL PIPE.
- COORDINATE SUPPORT WIDTH WITH PIPE STRAP ANCHORAGE REQUIREMENTS. PROVIDE 6" MINIMUM, FROM CENTER OF PIPE STRAP ANCHOR ROD TO EDGE OF CONCRETE.



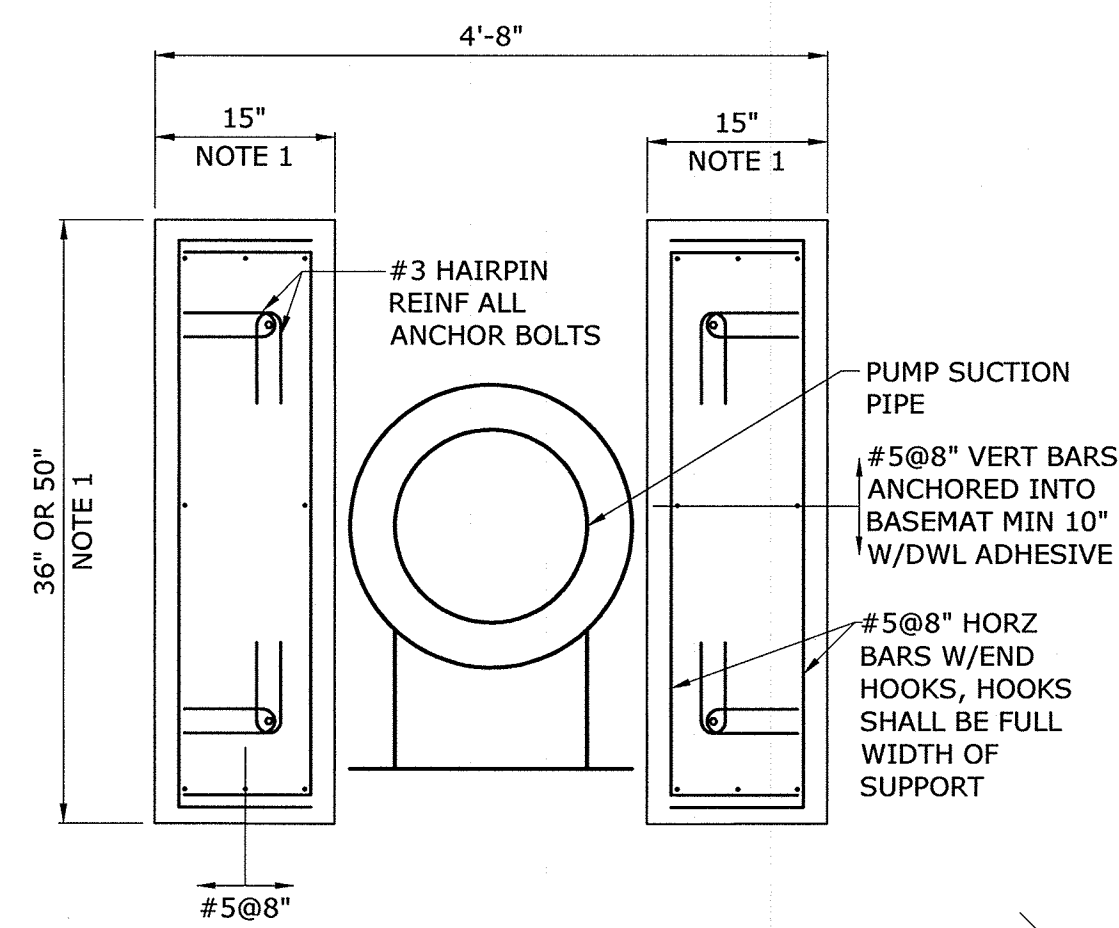
HORIZONTAL RESTRAINT

|               |           |
|---------------|-----------|
| <b>DETAIL</b> | <b>11</b> |
| 1/2" = 1'-0"  | D1        |



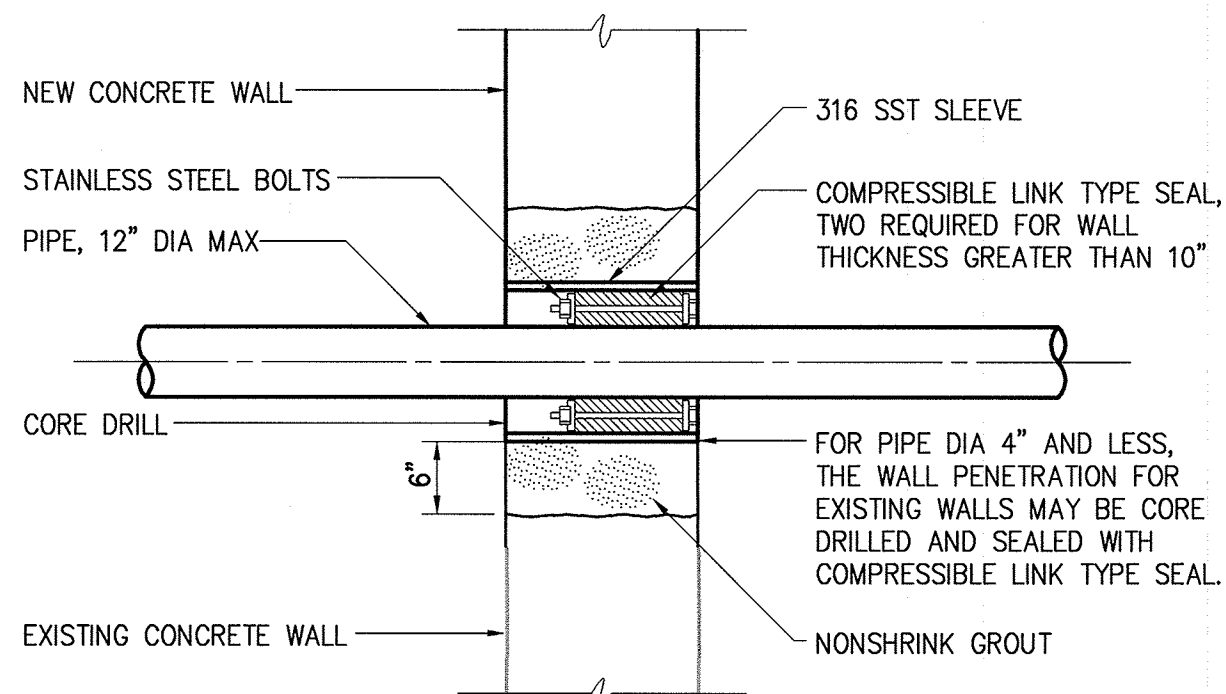
FLOOR OPENING PLATE DETAIL

|               |          |
|---------------|----------|
| <b>DETAIL</b> | <b>1</b> |
| 1" = 1'-0"    | D1       |

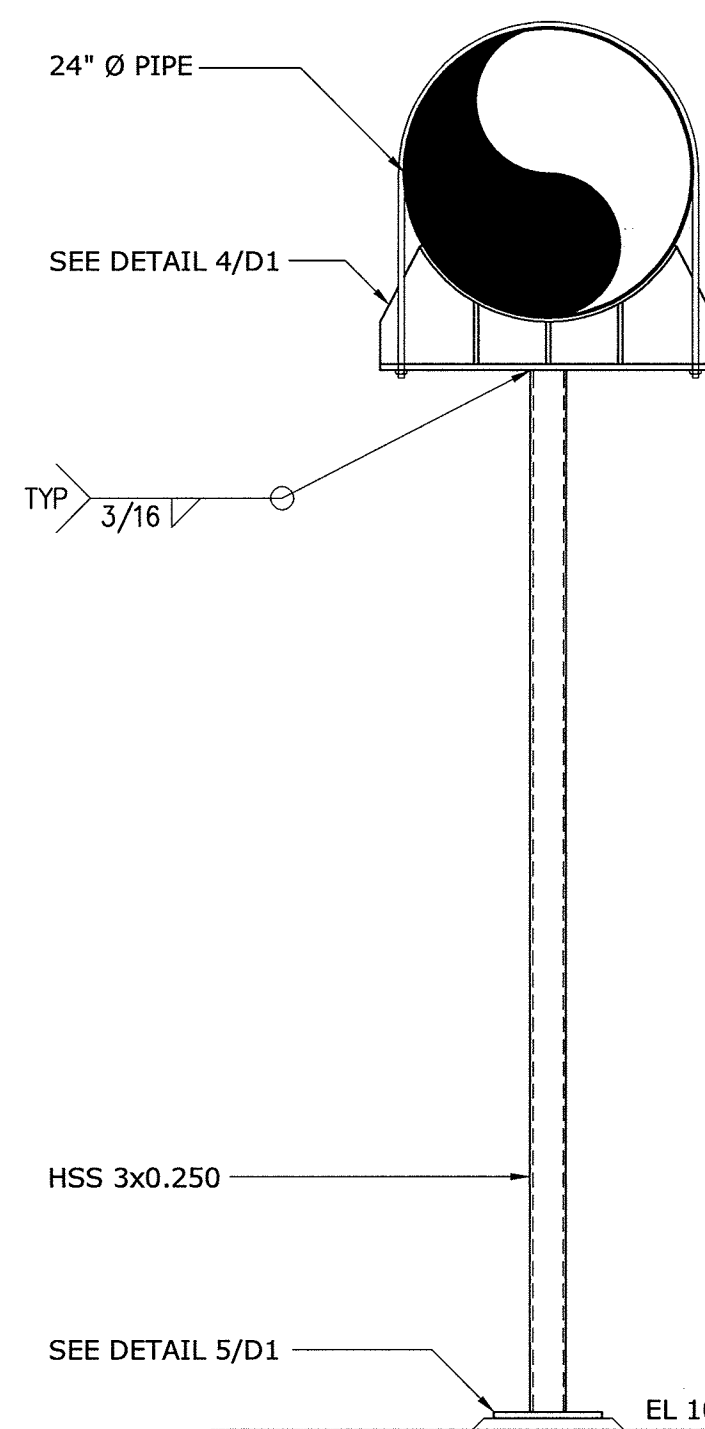


PUMP SUPPORT DETAIL

|               |          |
|---------------|----------|
| <b>DETAIL</b> | <b>2</b> |
| 3/4" = 1'-0"  | D1       |

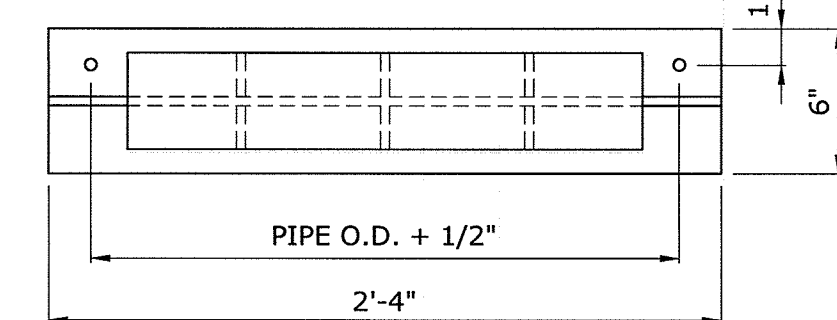


1509211R



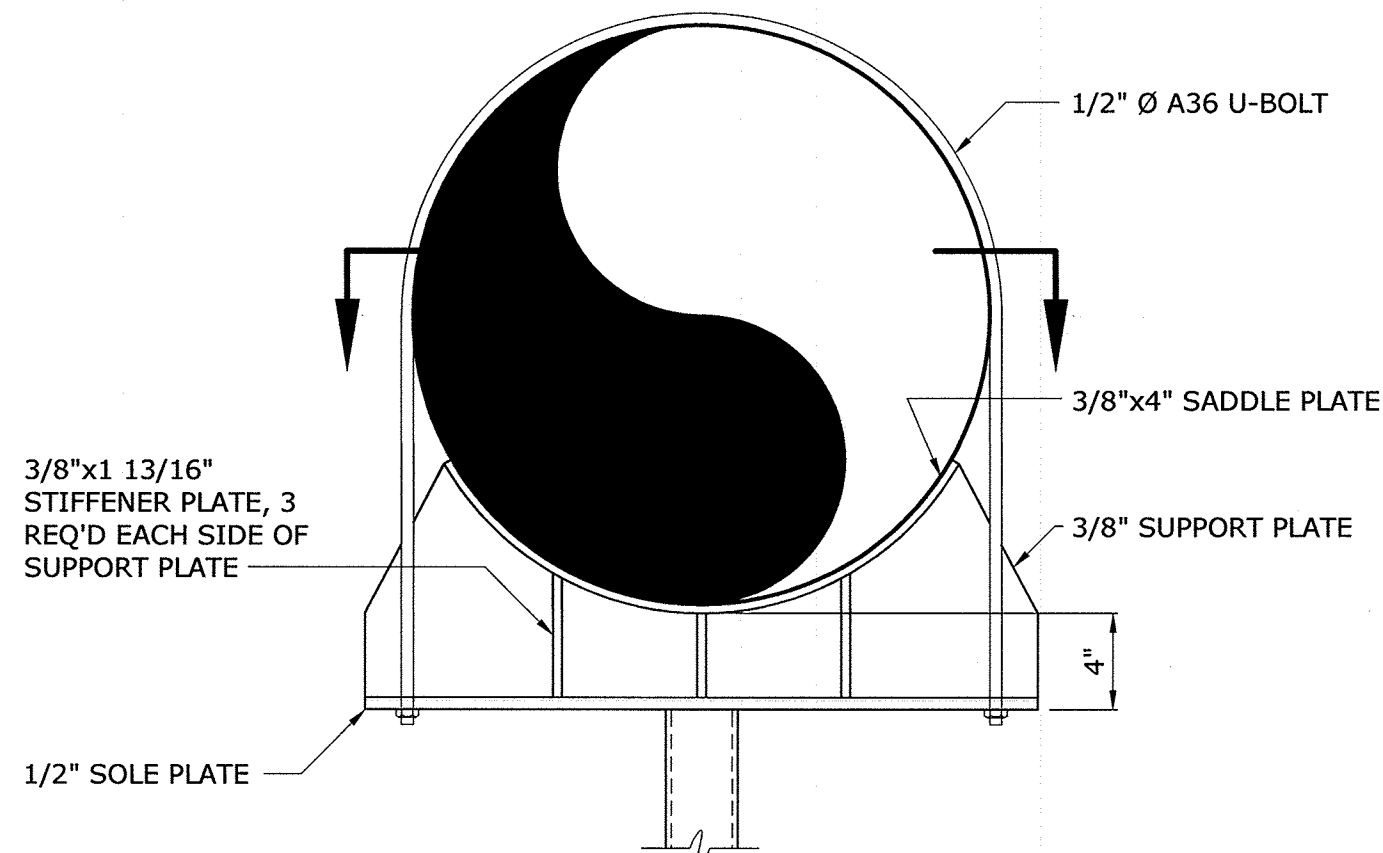
PIPE SUPPORT DETAIL

|               |          |
|---------------|----------|
| <b>DETAIL</b> | <b>3</b> |
| 3/4" = 1'-0"  | D1       |



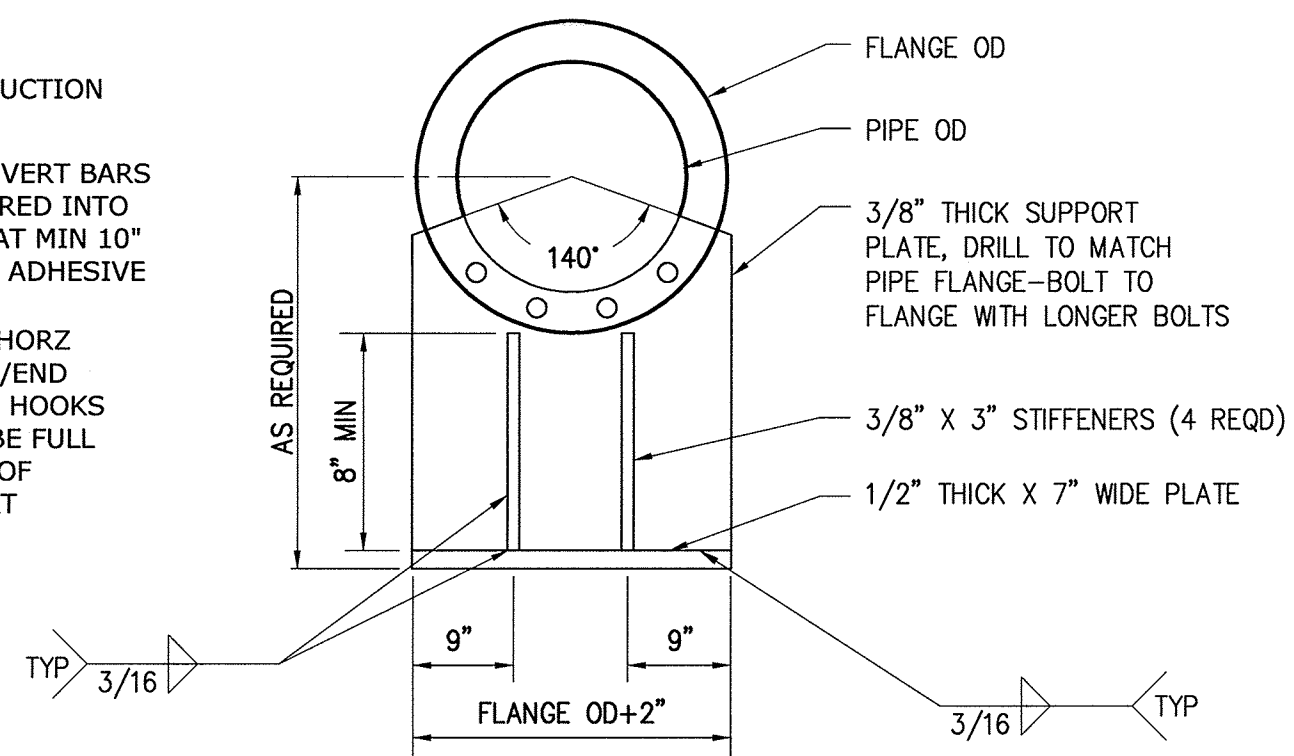
PIPE SUPPORT PLATE DETAIL

|                |          |
|----------------|----------|
| <b>DETAIL</b>  | <b>4</b> |
| 1 1/2" = 1'-0" | D1       |



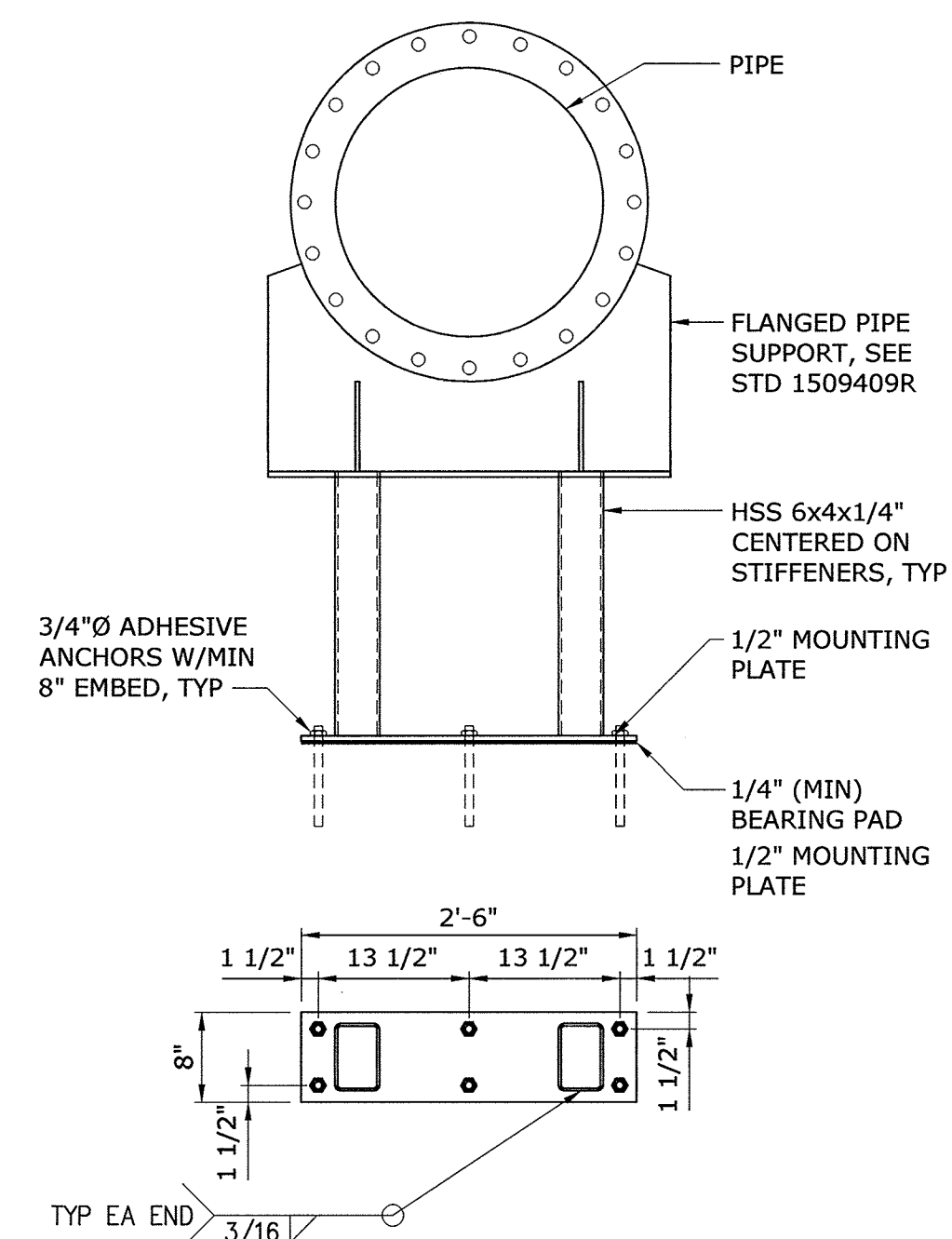
PIPE SUPPORT PLATE DETAIL

|                |          |
|----------------|----------|
| <b>DETAIL</b>  | <b>4</b> |
| 1 1/2" = 1'-0" | D1       |



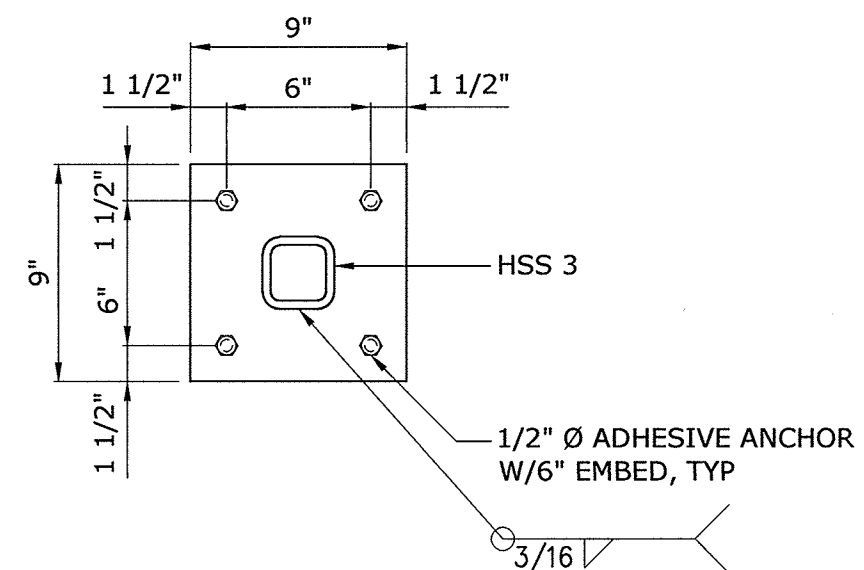
FABRICATED PIPE SUPPORT (AT FLANGE)

1509409R



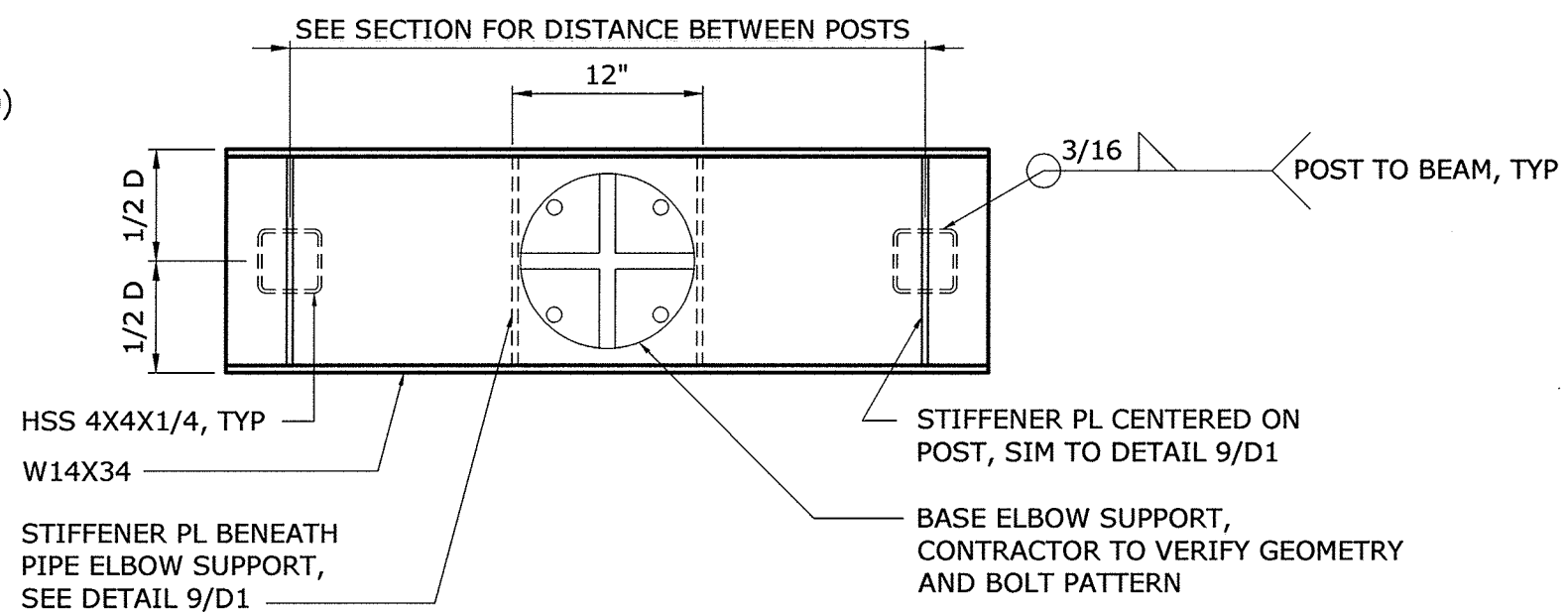
LATERAL RESTRAINT

|               |           |
|---------------|-----------|
| <b>DETAIL</b> | <b>10</b> |
| 3/4" = 1'-0"  | D1        |



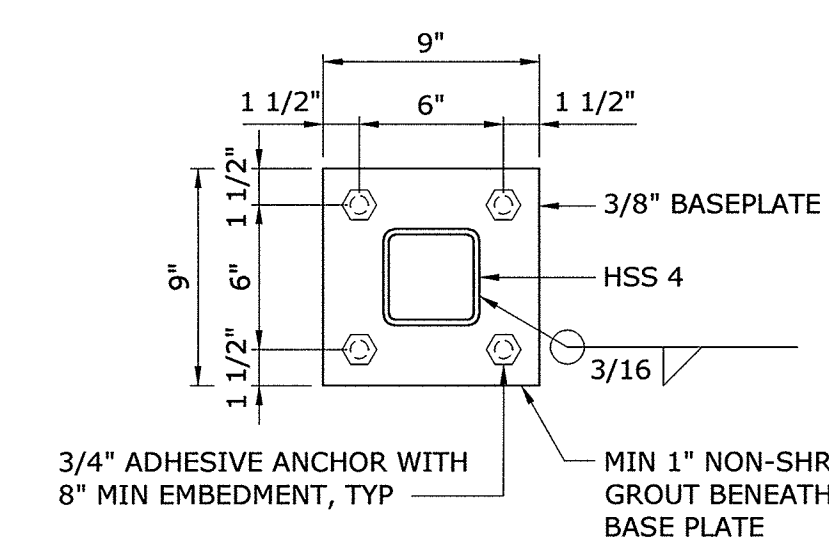
BASEPLATE DETAIL

|                |          |
|----------------|----------|
| <b>DETAIL</b>  | <b>5</b> |
| 1 1/2" = 1'-0" | D1       |



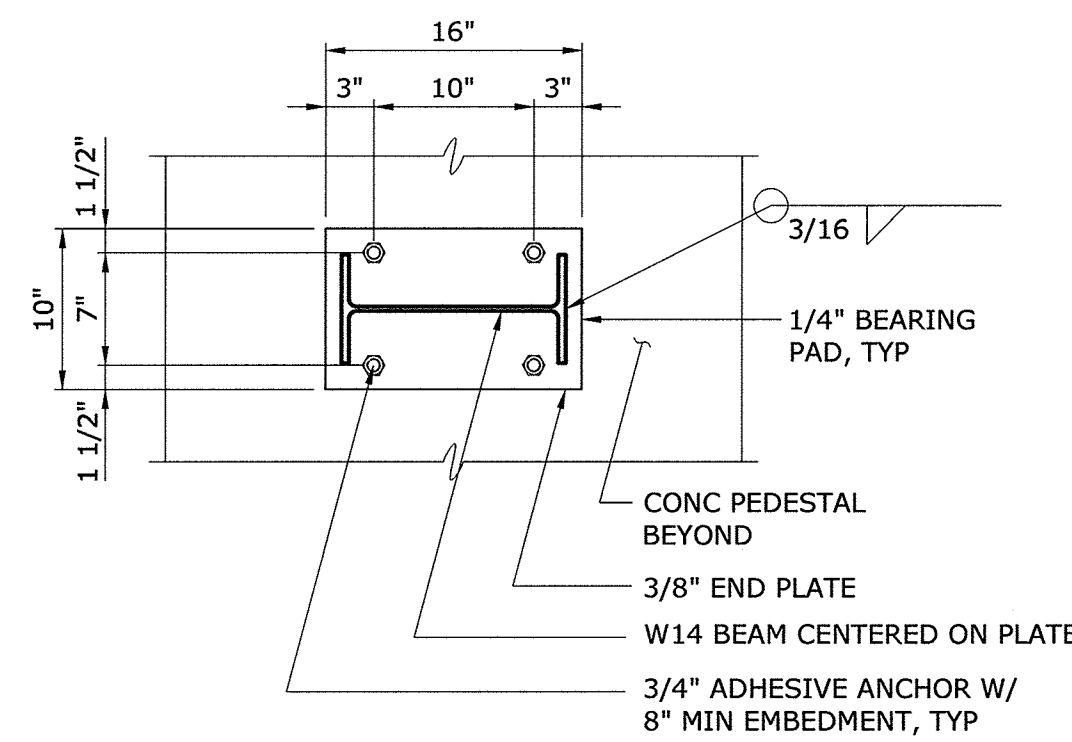
BEAM DETAIL

|               |          |
|---------------|----------|
| <b>DETAIL</b> | <b>6</b> |
| 1" = 1'-0"    | D1       |



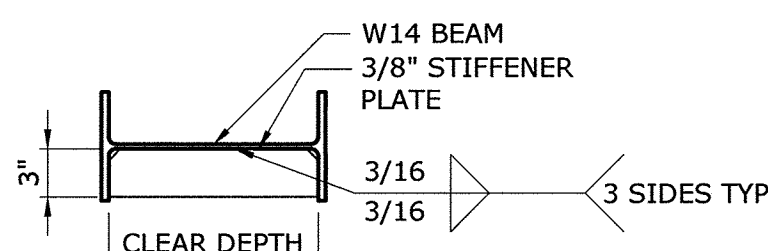
BASE PLATE DETAIL

|                |          |
|----------------|----------|
| <b>DETAIL</b>  | <b>7</b> |
| 1 1/2" = 1'-0" | D1       |



END PLATE DETAIL

|               |          |
|---------------|----------|
| <b>DETAIL</b> | <b>8</b> |
| 1" = 1'-0"    | D1       |



STIFFENER PLATE DETAIL

|               |          |
|---------------|----------|
| <b>DETAIL</b> | <b>9</b> |
| 1" = 1'-0"    | D1       |

NOTES:

- GEOMETRY AND REINFORCEMENT OF PUMP SUPPORTS ARE SHOWN FOR BID PURPOSES ONLY WITH FINAL GEOMETRY AND REINFORCING DETAILS TO BE BASED ON MANUFACTURER'S REQUIREMENTS FOR ACTUAL EQUIPMENT INSTALLED. SUBMIT TO ENGINEER MANUFACTURER'S INFORMATION INDICATING BASEPLATE GEOMETRY, ANCHOR BOLT PATTERN AND WORST CASE VERTICAL AND LATERAL LOADS TO THE ANCHORS FOR ENGINEER'S REVIEW PRIOR TO CONSTRUCTION OF THE PUMP SUPPORTS.
- SEE SHEET S1 FOR CONCRETE SPECIFICATIONS.

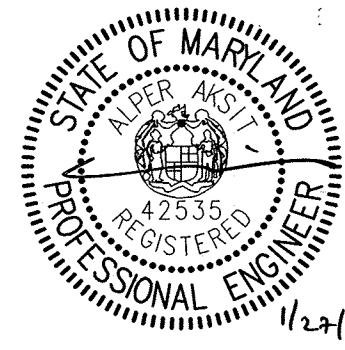
AS - BUILT

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Jan G. K.* 2/13/17  
DIRECTOR OF PUBLIC WORKS DATE  
*Thomas B. Buttle* 2/10/17  
CHIEF BUREAU OF ENGINEERING DATE  
*Robert C. Gann* 2/10/17  
CHIEF BUREAU OF UTILITIES DATE  
*[Signature]* 2/10/17  
CHIEF UTILITY DESIGN DIVISION DATE

**Hazen**

HAZEN AND SAWYER  
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202  
410-539-7881



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. 42535, EXPIRATION DATE 07/25/2018.

SIGNED: \_\_\_\_\_

DESIGNED: H&S  
DRAWN: BRC  
CHECKED: JCS  
PROJ. ENGR.: AA

APPROVED: \_\_\_\_\_ NO. \_\_\_\_\_ ISSUED FOR: \_\_\_\_\_ DATE: \_\_\_\_\_ BY: \_\_\_\_\_

MISCELLANEOUS STANDARD  
DETAILS

INFLUENT PUMPING STATION  
PUMP REPLACEMENT CONTRACT  
LITTLE PATUXENT WATER RECLAMATION PLANT  
CAPITAL PROJECT NUMBER S-6264  
CONTRACT NUMBER 20-4991  
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE: JAN 2017  
DRAWING NUMBER: D1  
SCALE: AS SHOWN  
SHEET 8 OF 27





**CONCRETE (CONT.)**

- C-13 SPLICES SHALL BE CLASS "B" CONFORMING TO THE PROVISIONS OF ACI 318 UNLESS NOTED OTHERWISE. SPLICE LENGTH FOR TWO DIFFERENT SIZED BARS TO BE LAP SPliced TOGETHER SHALL BE THE LENGTH OF THE LARGER BAR UNLESS NOTED OTHERWISE.
- C-14 CONSTRUCTION JOINTS SHALL BE LOCATED AS SHOWN ON THE DRAWINGS. CONSTRUCTION JOINTS NOT SHOWN SHALL BE SUBMITTED BY THE CONTRACTOR FOR THE APPROVAL OF THE ENGINEER PRIOR TO SUBMITTING REBAR SHOP DRAWINGS.
- C-15 ALL EXPOSED CORNERS SHALL HAVE A 3/4" CHAMFER OR A 1/2" RADIUS TOOLED CORNER.
- C-16 EQUIPMENT SUPPORTS, ANCHORAGES, OPENINGS, RECESSES AND REVEALS NOT SHOWN ON THE STRUCTURAL DRAWINGS BUT REQUIRED BY OTHER CONTRACT DOCUMENTS, SHALL BE PROVIDED FOR PRIOR TO PLACING CONCRETE.
- C-17 DOWELS, ANCHOR BOLTS, PIPES, WATERSTOPS AND OTHER EMBEDDED ITEMS SHALL BE HELD SECURELY IN POSITION WHILE CONCRETE IS BEING PLACED.
- C-18 CONDUITS AND OTHER SIMILAR ITEMS EMBEDDED IN OR PENETRATING THROUGH CONCRETE SHALL BE SPACED ON CENTER NOT LESS THAN 3 TIMES THEIR OUTSIDE DIMENSION, BUT NOT LESS THAN 2 1/2" CLEAR. WHEN SUCH ITEMS ARE EMBEDDED IN WALLS OR SLABS, THEY SHALL NOT OCCUPY MORE THAN 1/3 OF THE MEMBER THICKNESS.
- C-19 AT ALL TYPICAL CURBS, EQUIPMENT PADS, AND PIPE SUPPORT PIERS, REINFORCING DOWELS SHOWN MAY BE REPLACED WITH MATCHING DOWELS SET IN EPOXY IN DRILLED HOLES AS SPECIFIED. DOWELS LOCATED CLOSER THAN 3" FROM ANY EDGE OF CONCRETE SHALL NOT BE REPLACED WITH DRILLED DOWELS.
- C-20 CLEAR DISTANCE FROM ANCHOR BOLTS TO ANY CONCRETE EDGE SHALL BE 4" MINIMUM UNLESS NOTED OTHERWISE.
- C-21 CONCRETE COMPRESSIVE STRENGTH TESTS SHALL BE AVAILABLE ON THE JOB SITE FOR REVIEW BY THE ENGINEER.
- C-22 WHERE FRESH CONCRETE IS TO BE PLACED AGAINST HARDENED CONCRETE AN EPOXY BONDING AGENT SHALL BE USED. EPOXY BONDING AGENT SHALL CONFORM TO ASTM C881 AND SHALL BE SIKADUR 32 HI-MOD, SIKA CORPORATION, LYNDHURST, NJ; EUCCO #452 EPOXY SYSTEM, EUCLID CHEMICAL COMPANY, CLEVELAND, OH; MASTERUNJECT 1500 BY BASF MASTER BUILDER SOLUTIONS (BASF)

**DEMOLITION**

- D-1 FOR DEMOLITION REQUIREMENTS, REFER TO SPECIFICATION 01540 - DEMOLITION.
- D-2 CONCRETE DEMOLITION WITHIN STRUCTURES BEING MODIFIED SHALL BE SELECTIVE DEMOLITION BY CORE DRILLING OR SAWCUTTING AND CAREFUL REMOVAL OF CONCRETE SHOWN TO BE REMOVED. NO OVER CUTTING OF AREAS TO BE DEMOLISHED SHALL BE PERMITTED. CONTRACTOR SHALL CORE DRILL CORNERS OF OPENING PRIOR TO SAWCUTTING. EXPLOSIVES AND VIBRATORY HAMMERS SHALL NOT BE USED FOR DEMOLITION WORK.
- D-3 UNLESS ANCHORING DEVICES AND/OR REINFORCEMENT IS NOTED TO REMAIN FOLLOWING DEMOLITION, REMOVE AND/OR BURN BACK ANCHORS AND REINFORCEMENT STEEL 1/2" MIN BELOW SURFACE AND VOIDS CREATED SHALL BE FILLED WITH EPOXY RESIN BINDER. SUCH AS "SIKADUR 52" BY SIKA CORPORATION, "DURALCRETE LV" BY EUCLID CHEMICAL COMPANY, OR EQUAL.
- D-4 EMBEDDED CONDUIT ENCOUNTERED DURING DEMOLITION WORK LIMITS SHALL BE PERMANENTLY REROUTED AS NECESSARY. CONTRACTOR SHALL SUBMIT PROPOSED MEANS OF REROUTING ANY INTERFERING CONDUIT.
- D-5 WHERE DRAWINGS INDICATE A CONCRETE EQUIPMENT PAD TO BE DEMOLISHED, THE FLOOR SLAB SURFACE SHALL BE REPAIRED AS APPROVED BY ENGINEER. FOLLOWING SELECT DEMOLITION AND REMOVAL OF THE EQUIPMENT PAD REMOVAL THE REPAIR SHALL BE:  
 A. SAWCUT THE FLOOR AROUND THE EQUIPMENT PAD PERIMETER TO A DEPTH OF 1/4".  
 B. SCARIFY AND REMOVE SLAB CONCRETE WITHIN THE PERIMETER TO A NOMINAL 1/4" DEPTH CLEAN AND REMOVE ALL CONCRETE LIFTANCE.  
 C. RESURFACE THE AREA BY APPLYING A POLYMER MODIFIED OR SILICA FUME ENHANCED CEMENTITIOUS REPAIR MORTAR, APPROVED BY THE ENGINEER, FOLLOWING THE MANUFACTURER'S SURFACE PREPARATION AND APPLICATION RECOMMENDATIONS. LEVEL AND FINISH THE SURFACE TO MATCH THE FLOOR SLAB SURROUNDING AREA.
- D-6 PRIOR TO DEMOLITION OF SMALL OPENINGS (LESS THAN 6 INCHES IN SIZE) FOR PENETRATIONS, ETC., CONTRACTOR SHALL USE NON-DESTRUCTIVE MEANS TO FIELD LOCATE REINFORCEMENT. OPENINGS SHALL BE LOCATED TO AVOID CUTTING THROUGH EXISTING REINFORCEMENT, IF POSSIBLE. EXISTING REINFORCEMENT SHALL NOT BE CUT WITHOUT APPROVAL OF ENGINEER.
- D-7 CONCRETE SURFACES LEFT EXPOSED FOLLOWING DEMOLITION SHALL BE SEALED WITH EPOXY RESIN COATING SUCH AS "SIKAGARD" BY SIKA CORPORATION, "DURACOTE 240" BY TAMMS INDUSTRIES, OR APPROVED EQUAL.
- D-8 DETAILED CONSTRUCTION AND DEMOLITION PLAN SHALL BE SUBMITTED TO THE ENGINEER AND APPROVED BY THE ENGINEER AND OWNER PRIOR TO BEGINNING CONSTRUCTION. ANY SHUTDOWNS SHALL BE SUBMITTED TO, COORDINATED WITH, AND APPROVED BY THE OWNER. ONCE APPROVED, CONTRACTOR SHALL PROVIDE A MINIMUM OF THREE (3) WEEKS NOTICE TO OWNER PRIOR TO SHUTDOWN.

**NONSTRUCTURAL COMPONENT ANCHORAGE**

- A-1 ALL ARCHITECTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS SHALL BE DESIGNED AND INSTALLED TO RESIST THE CONTROLLING CONDITION OF OPERATIONAL FORCES OR SEISMIC FORCES IN ACCORDANCE WITH THE GOVERNING BUILDING CODE. SEISMIC FORCES SHALL ALSO BE AS PER ASCE 7. COMPONENT SEISMIC ATTACHMENTS SHALL BE BOLTED, WELDED, OR OTHERWISE POSITIVELY FASTENED WITHOUT CONSIDERATION OF FRICTIONAL RESISTANCE PRODUCED BY THE EFFECTS OF GRAVITY. A CONTINUOUS LOAD PATH OF SUFFICIENT STRENGTH AND STIFFNESS BETWEEN THE COMPONENT AND THE SUPPORTING STRUCTURE SHALL BE PROVIDED. CONNECTIONS FOR BOTH ORTHOGONAL DIRECTIONS (TRANSVERSE AND LONGITUDINAL) SHALL BE DESIGNED BY THE CONTRACTOR'S ENGINEER CURRENTLY REGISTERED IN THE STATE OF MARYLAND.
- A-2 COMPONENT REACTION FORCES AT THE POINT OF ATTACHMENT TO THE STRUCTURE SHALL BE SUBMITTED TO AND COORDINATED WITH THE ENGINEER FOR CONFIRMATION SUPPORTING STRUCTURE CAN WITHSTAND REACTION FORCES.
- A-3 CONTRACTOR SHALL PROVIDE SPECIAL SEISMIC CERTIFICATION (SSC) FROM MANUFACTURER OF EQUIPMENT FOR ALL SYSTEMS DEEMED NECESSARY BY SPECIFICATIONS. SPECIAL SEISMIC CERTIFICATION SHALL BE IN COMPLIANCE WITH ASCE 7.

**EXISTING INFORMATION**

- X-1 ALL EXISTING INFORMATION SHOWN ON THESE DRAWINGS INCLUDING LOCATION, DIMENSIONS, ELEVATIONS, AND CONFIGURATIONS IS DERIVED FROM THE SAVAGE SEWAGE TREATMENT PLANT ADDITION NO. 2 CONTRACT DRAWINGS BY WHITMAN, REQUARDT AND ASSOCIATES DATED JUNE 5, 1972. CONTRACTOR IS TO BE AWARE THAT ADDITIONAL MODIFICATIONS HAVE BEEN MADE TO THE PLATFORM AREA THAT ARE NOT REFLECTED IN THESE EXISTING DRAWINGS. THESE CONTRACT DOCUMENTS REPRESENT THE PLATFORM AREA TO THE EXTENTS POSSIBLE BUT ARE NOT GUARANTEED TO BE COMPLETE OR CORRECT.
- X-2 THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING INFORMATION IN THE FIELD AS REQUIRED FOR DEMOLITION AND MODIFICATIONS.

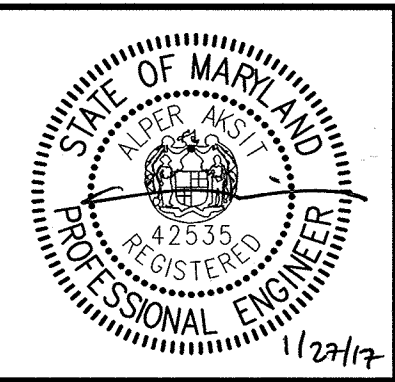
**AS - BUILT**

IMAGE# = 37232-TB  
XREF# =

|  |  |  |  |
|--|--|--|--|
| <b>DEPARTMENT OF PUBLIC WORKS</b><br>HOWARD COUNTY, MARYLAND |  |  |  |
| <br>DIRECTOR OF PUBLIC WORKS<br>DATE: 2/3/17                 | <br>CHIEF BUREAU OF ENGINEERING<br>DATE: 2/16/17 | <br>CHIEF BUREAU OF UTILITIES<br>DATE: 2/16/17 | <br>CHIEF UTILITY DESIGN DIVISION<br>DATE: 2/16/17 |

Hazen

HAZEN AND SAWYER  
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202  
410-539-7681



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. 42535, EXPIRATION DATE 07/25/2018.  
SIGNED: \_\_\_\_\_

|             |     |     |            |      |    |
|-------------|-----|-----|------------|------|----|
| DESIGNED    | AGM |     |            |      |    |
| DRAWN       | SBS |     |            |      |    |
| CHECKED     | JCS |     |            |      |    |
| PROJ. ENGR. | AA  |     |            |      |    |
| APPROVED    |     | NO. | ISSUED FOR | DATE | BY |

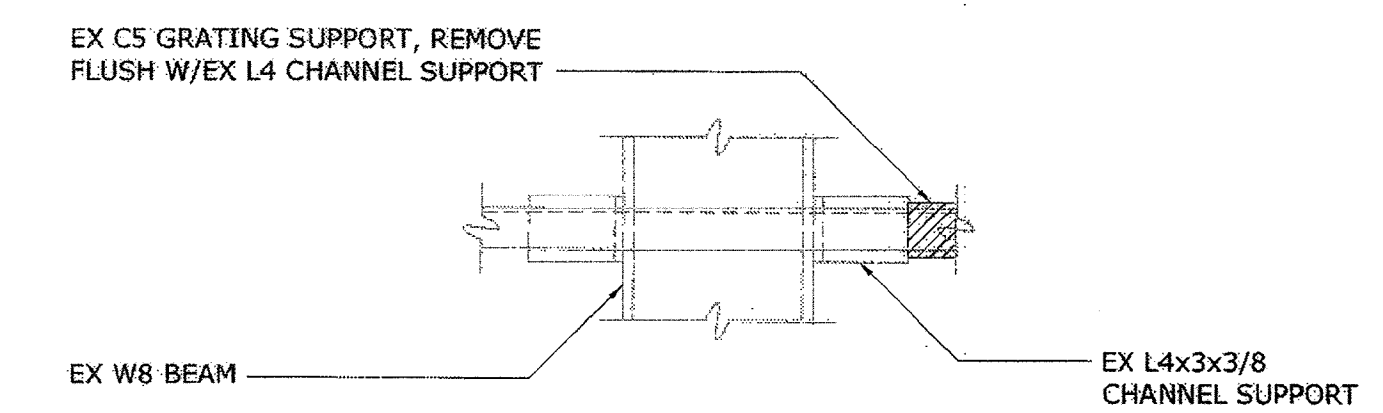
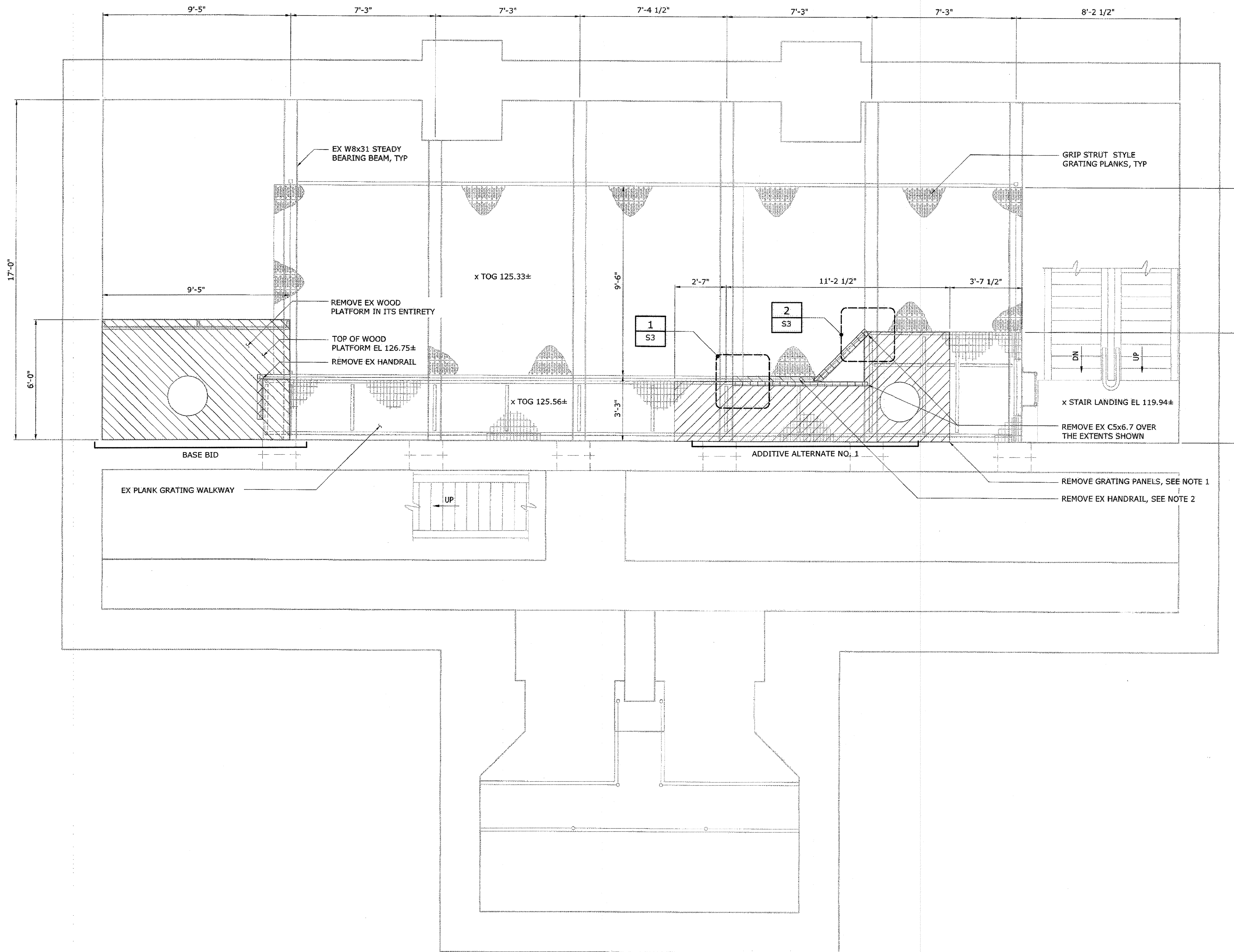
STRUCTURAL  
  
GENERAL STRUCTURAL NOTE  
SHEET 2

INFLUENT PUMPING STATION  
PUMP REPLACEMENT CONTRACT  
LITTLE PATUXENT WATER RECLAMATION PLANT  
CAPITAL PROJECT NUMBER S-6264  
**CONTRACT NUMBER 20-4991**  
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

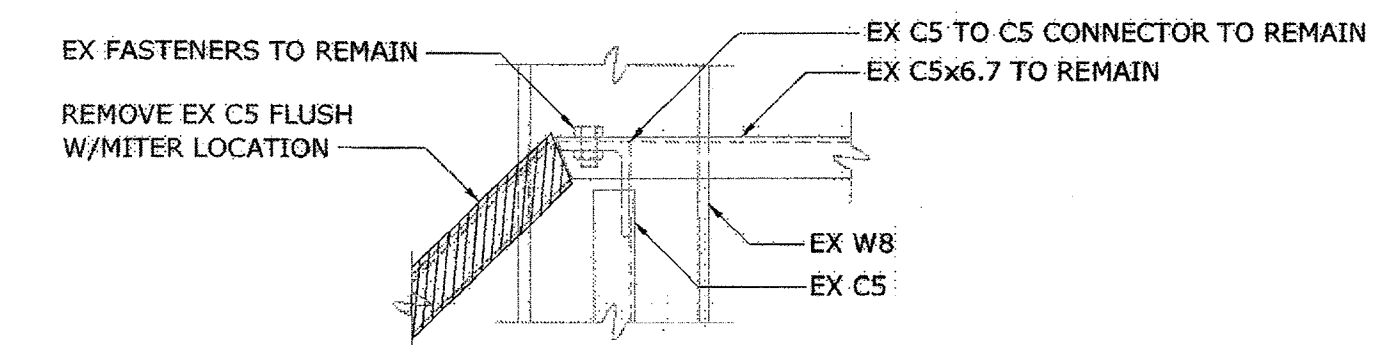
|                |          |
|----------------|----------|
| DATE           | JAN 2017 |
| DRAWING NUMBER | S2       |
| SCALE AS SHOWN |          |
| SHEET          | 10 OF 27 |

**NOTES:**

- EXTENTS OF GRATING TO BE REMOVED IS BASED ON THE LOCATIONS OF GRATING PANELS SEAMS IN THE AREA TO BE MODIFIED. CONTRACTOR TO VERIFY THE DIMENSIONS SHOWN. FOR THE PURPOSE OF DEMOLITION THE ENTIRE GRATING PANEL SHALL BE REMOVED AND THE DIMENSIONS SHOWN MODIFIED IF NECESSARY. EXISTING PANELS SHALL NOT BE FIELD CUT TO OBTAIN THE DIMENSIONS SHOWN.
- FINAL EXTENTS OF EXISTING HANDRAIL TO BE REMOVED SHALL BE VERIFIED IN THE FIELD TO ACCOMMODATE FINAL LAYOUT OF REVISED PLATFORM AREA.



**DETAIL 1**  
1 1/2" = 1'-0"  
S3



**DETAIL 2**  
1 1/2" = 1'-0"  
S3

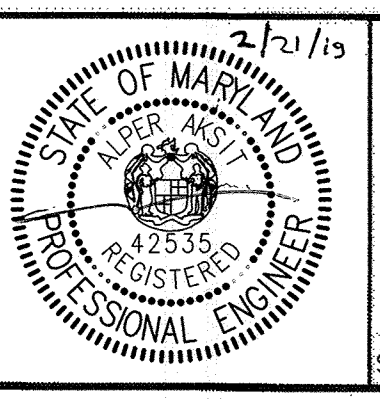
**INTERMEDIATE PLAN - DEMOLITION**  
3/8" = 1'-0"

**AS-BUILT REPLACEMENT SHEET 1/2019**

MADE IN: 32232-TB-Influent-PS-FI-XD, Influent PS - FI-TB, PS-S-DU, PS-S-DK  
 REF: 32232-TB-Influent-PS-FI-XD, Influent PS - FI-TB, PS-S-DU, PS-S-DK  
 20170126 1:02P Q:\32232-EAL\32232-005\Drawings\Mechanical\S3.dwg LastSaveBy: EPROSSER

**DEPARTMENT OF PUBLIC WORKS**  
 HOWARD COUNTY, MARYLAND  
 Director of Public Works: *[Signature]* 3/7/19  
 Chief Bureau of Engineering: *[Signature]* 2/20/19  
 Chief Bureau of Utilities: *[Signature]* 2-20-19  
 Chief Utility Design Division: *[Signature]* 2/20/19

**Hazen**  
 HAZEN AND SAWYER  
 1 SOUTH STREET, SUITE 1150; BALTIMORE, MD 21202  
 410-539-7881



PROFESSIONAL CERTIFICATION  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DAILY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 42535, EXPIRATION DATE 07/25/2018.  
 SIGNED:

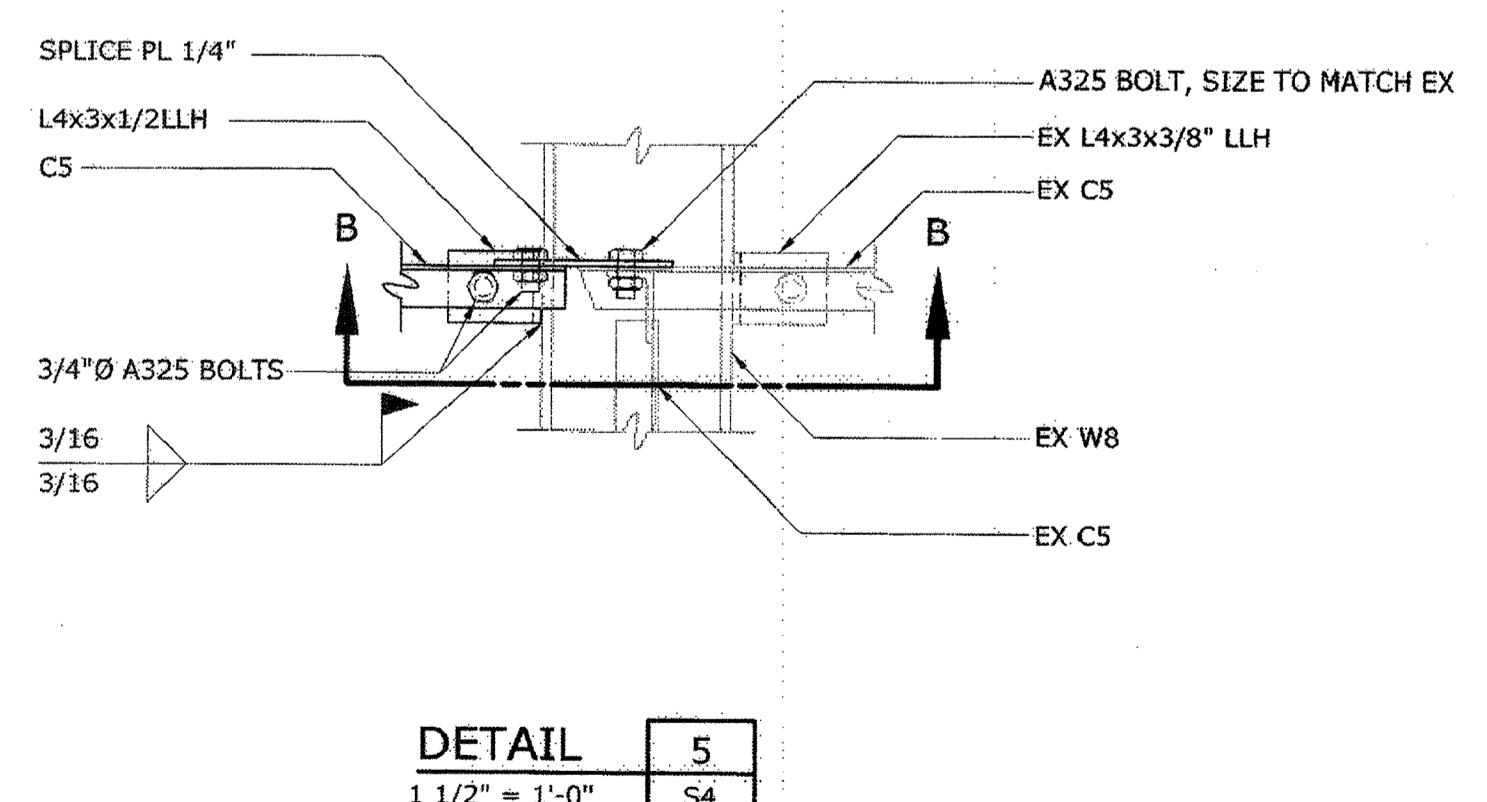
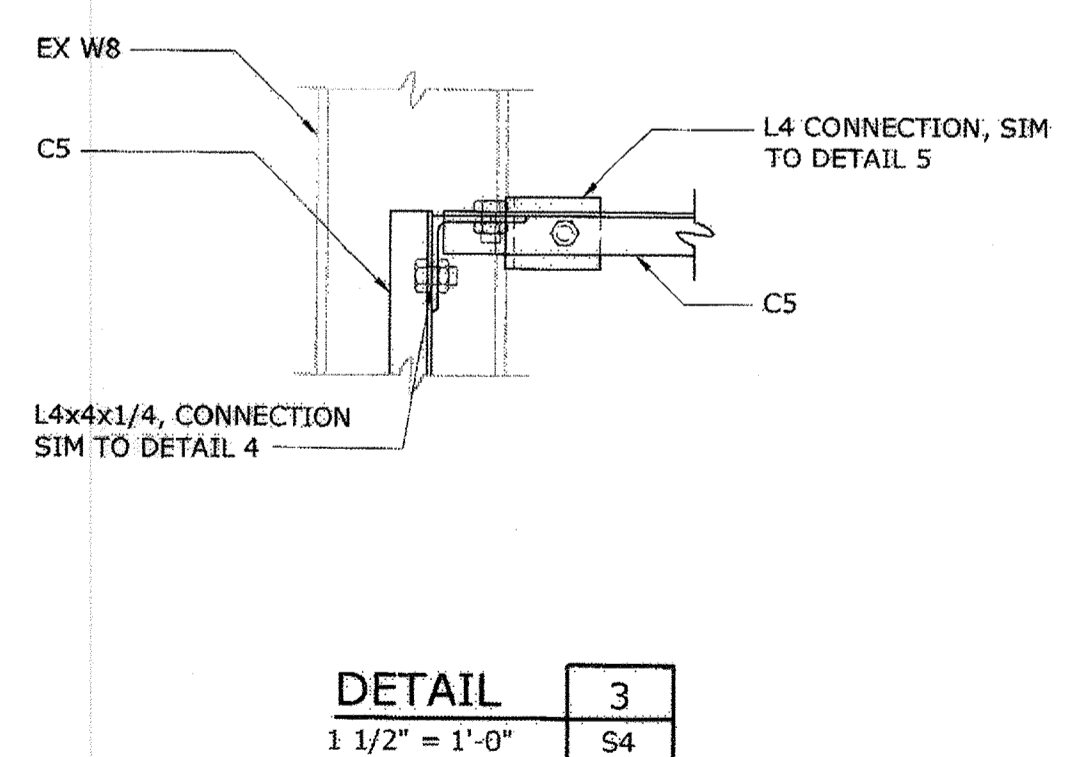
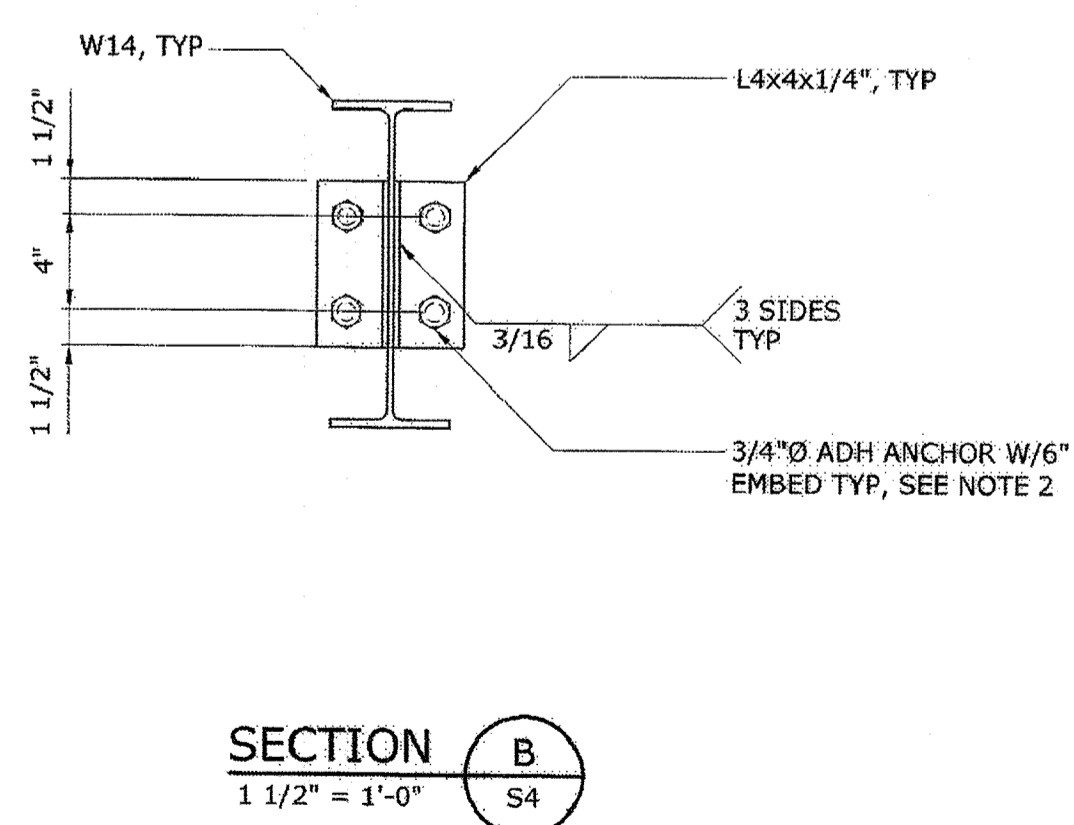
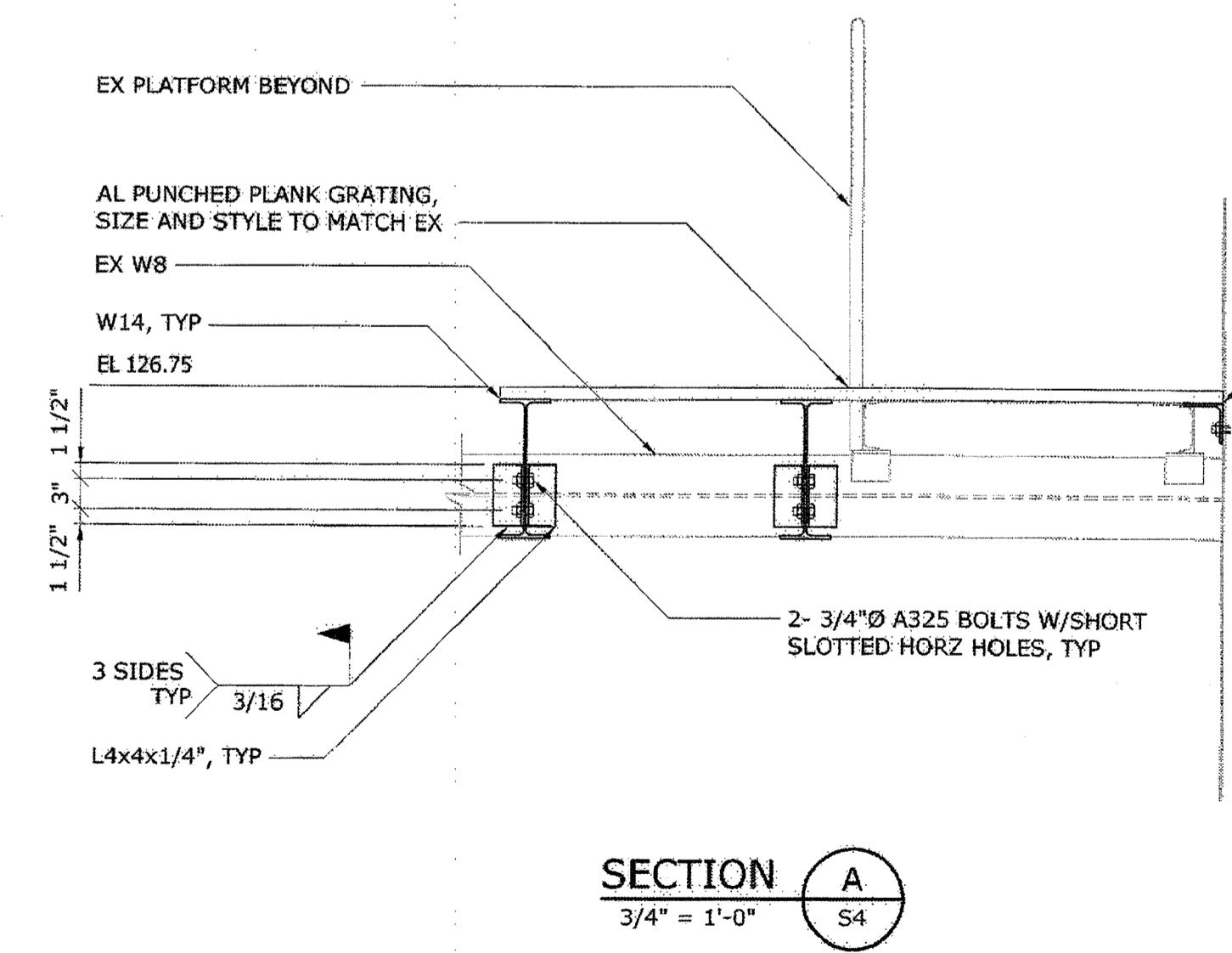
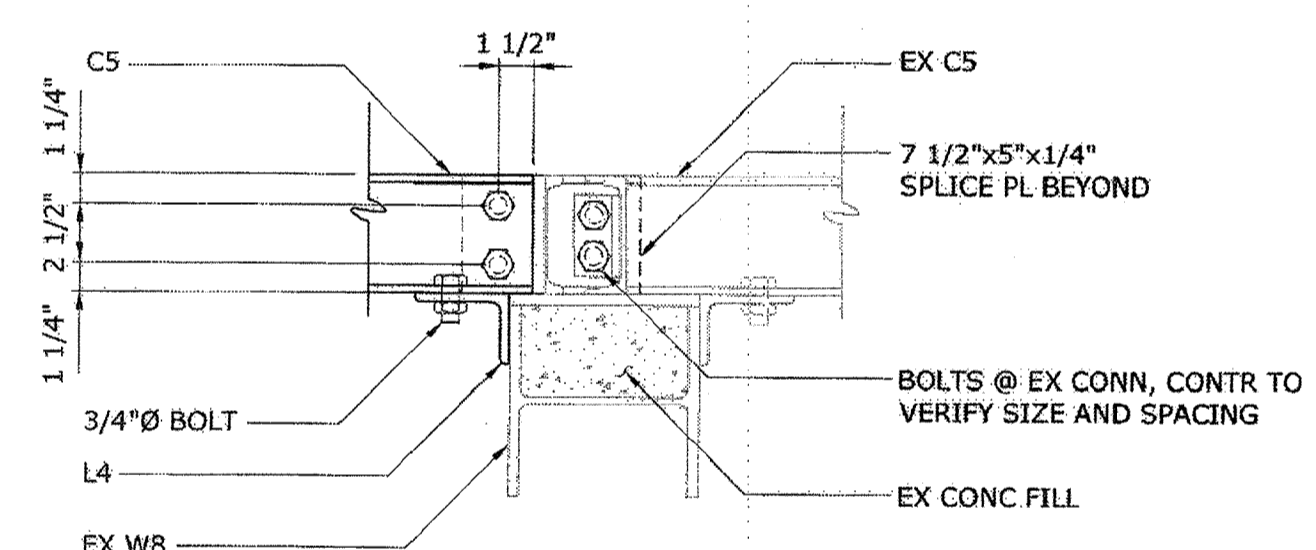
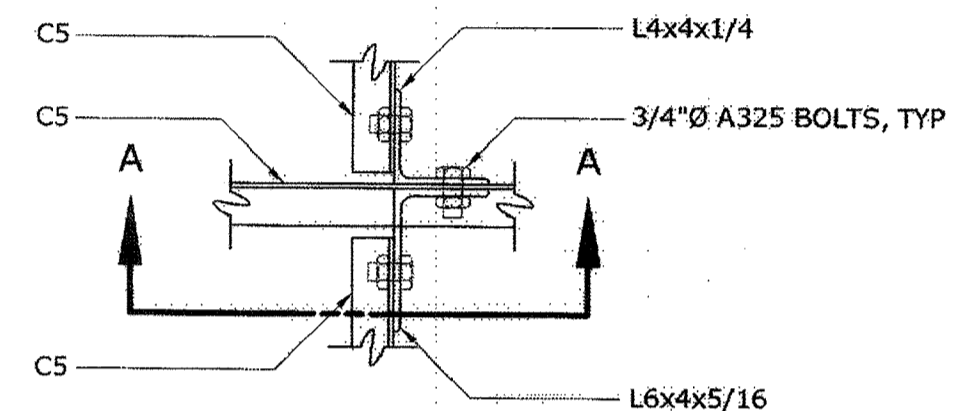
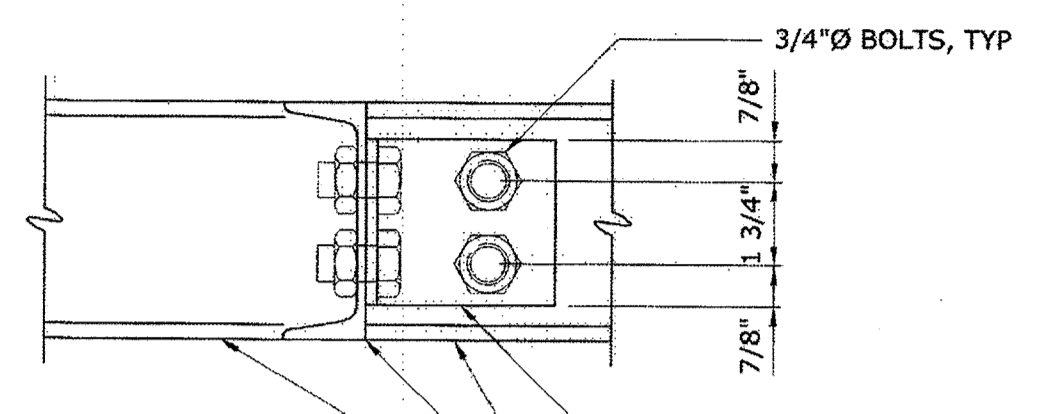
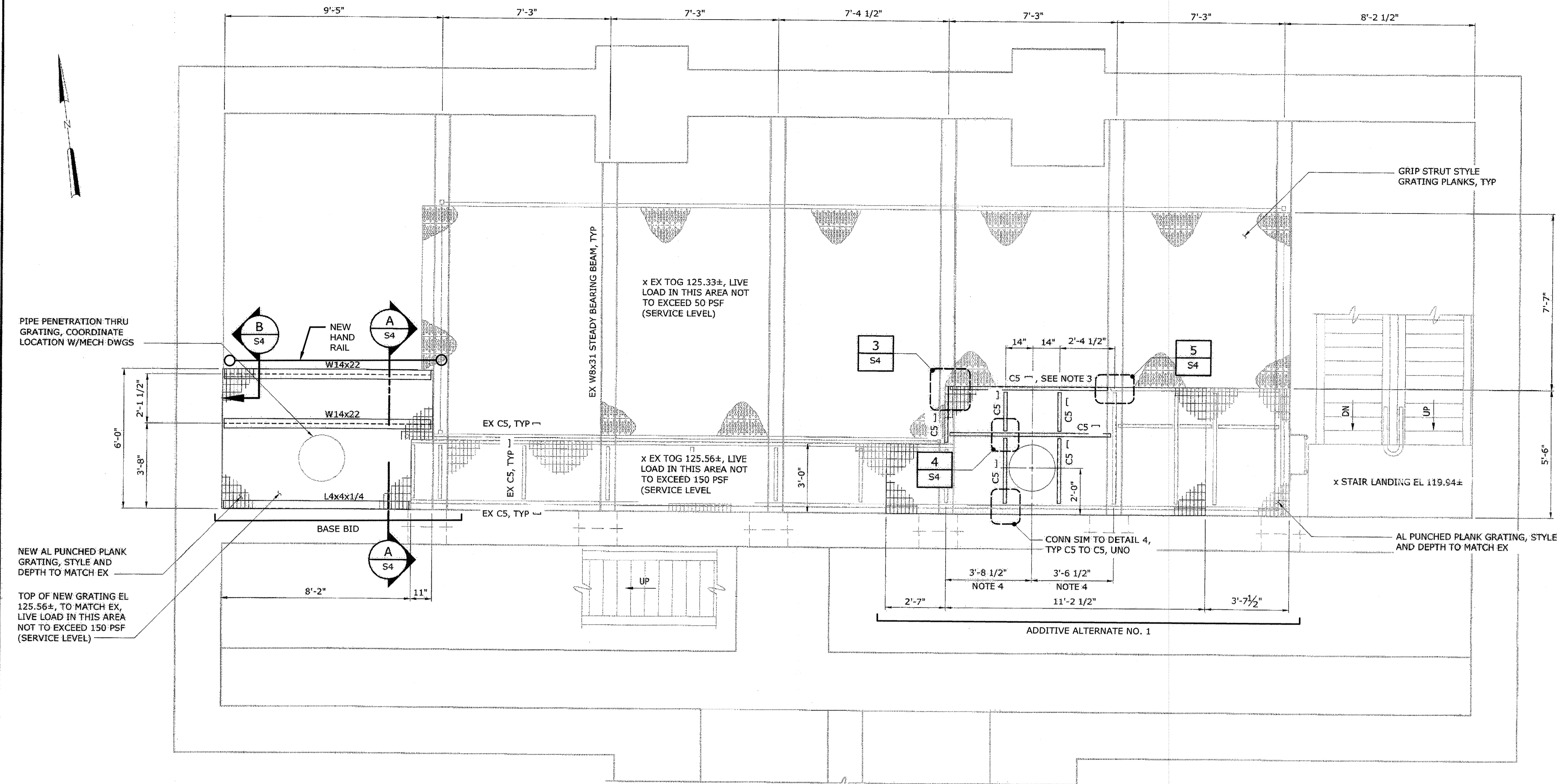
|             |     |     |            |        |    |
|-------------|-----|-----|------------|--------|----|
| DESIGNED    | AGM |     |            |        |    |
| DRAWN       | SBS |     |            |        |    |
| CHECKED     | JCS |     |            |        |    |
| PROJ. ENGR. | AA  | 3   | AS-BUILT   | 1/9/19 | AA |
|             |     | 2   | ADDENDUM   | 5/9/17 | AA |
|             |     | 1   | ADDENDUM   | 5/9/17 | AA |
| APPROVED    |     | NO. | ISSUED FOR | DATE   | BY |

**STRUCTURAL**  
 DEMOLITION INTERMEDIATE  
 PLAN AND DETAILS

INFLUENT PUMPING STATION  
 PUMP REPLACEMENT CONTRACT  
 LITTLE PATUXENT WATER RECLAMATION PLANT  
 CAPITAL PROJECT NUMBER S-6264  
 CONTRACT NUMBER 20-4991  
 6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

|                |          |
|----------------|----------|
| DATE           | JAN 2017 |
| DRAWING NUMBER | S3       |
| SCALE          | AS SHOWN |
| SHEET          | 11 OF 27 |

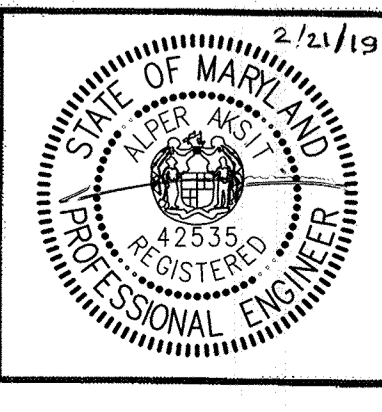
- NOTES:**
- 1. CONTRACTOR SHALL LOAD TEST AT LEAST 2 ANCHORS IN TENSION TO A LOAD OF 1500 LBS. ENGINEER TO DETERMINE ANCHORS TO BE TESTED ONCE ALL ANCHORS HAVE BEEN INSTALLED.
  - 2. CONTRACTOR SHALL LOAD TEST AT LEAST 1 ANCHORS PER ANCHOR GROUP IN TENSION TO A LOAD OF 1500 LBS. ENGINEER TO DETERMINE ANCHORS TO BE TESTED ONCE ALL ANCHORS HAVE BEEN INSTALLED.
  - 3. CS DENOTES C5x6.7
  - 4. COORDINATE DIMENSIONS WITH ACTUAL LOCATION OF RELOCATED RISER.



I:\ACES- 32232-TB, Influent PS -PI-HB, PS-S-DM, PS-SO1-S, PS-SO2-S, PS-SO3-S, PS-SO4-S  
 DATE 2-25-19  
 20170126 1:03P D:\32232-BAL\32232-005\Drawings\Mechanical\S4.dwg

| DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND |               |  |               |
|---|---------------|--|---------------|
|   | DATE: 2/25/19 |  | DATE: 2/25/19 |
|   | DATE: 2-25-19 |  | DATE: 2/25/19 |

**Hazen**  
HAZEN AND SAWYER  
1 SOUTH STREET, SUITE 1150; BALTIMORE, MD 21202  
410-539-7881



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. 42535, EXPIRATION DATE 02/25/2018.  
SIGNED: \_\_\_\_\_

|             |     |     |            |
|-------------|-----|-----|------------|
| DESIGNED    | AGM |     |            |
| DRAWN       | SBS |     |            |
| CHECKED     | JCS |     |            |
| PROJ. ENGR. | AA  | 3   | AS-BUILT   |
|             |     | 2   | ADDENDUM   |
|             |     | 1   | ADDENDUM   |
| APPROVED    |     | NO. | ISSUED FOR |

DATE: 1/9/19  
DATE: 5/9/17  
DATE: 5/9/17








**STRUCTURAL**  
**PROPOSED INTERMEDIATE PLAN, SECTIONS & DETAILS**

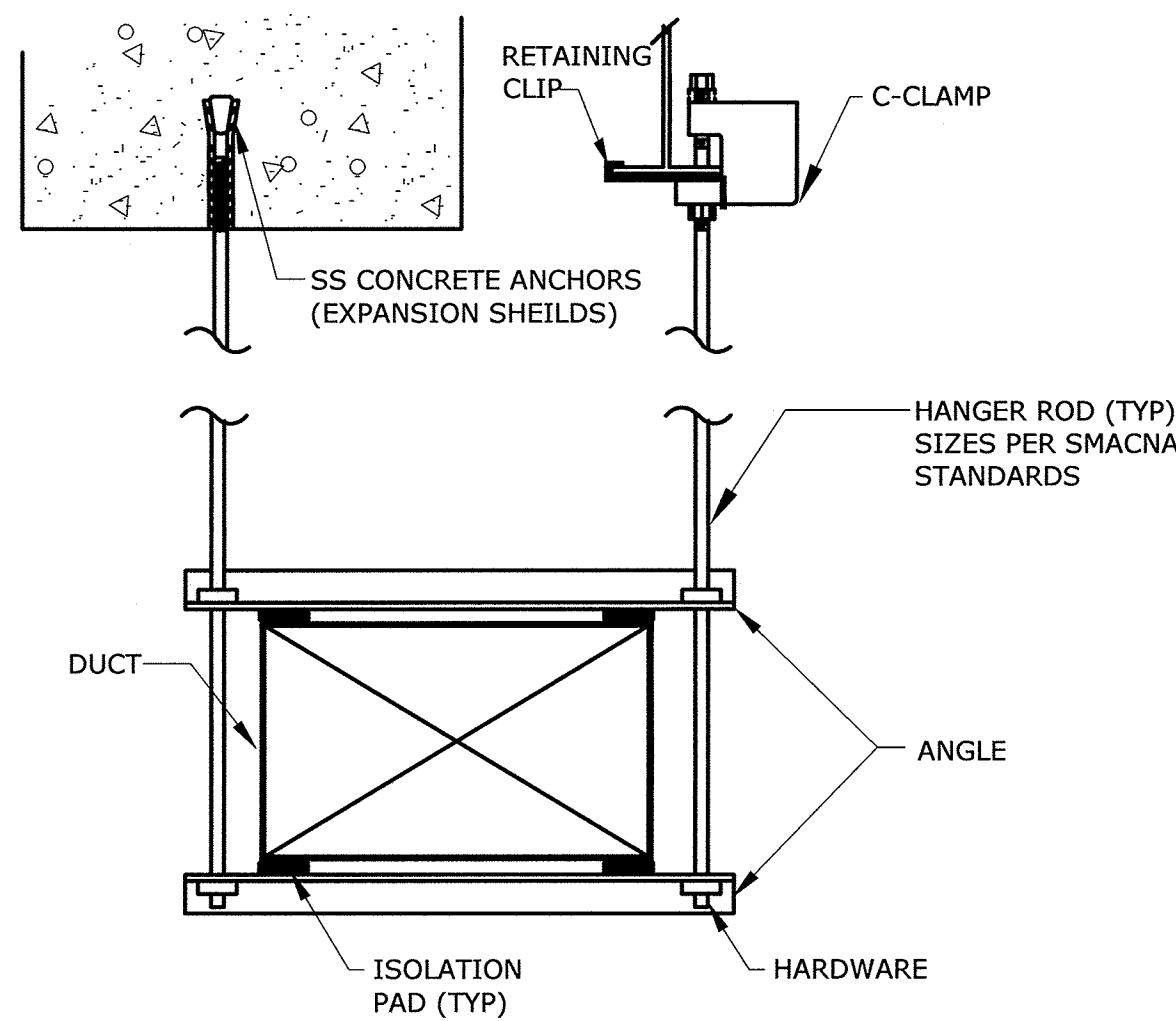
**INFLUENT PUMPING STATION  
PUMP REPLACEMENT CONTRACT  
LITTLE PATUXENT WATER RECLAMATION PLANT  
CAPITAL PROJECT NUMBER S-6264  
CONTRACT NUMBER 20-4991  
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND**

|                |          |
|----------------|----------|
| DATE           | JAN 2017 |
| DRAWING NUMBER | S4       |
| SCALE AS SHOWN |          |
| SHEET 12 OF 27 |          |

AS-BUILT REPLACEMENT SHEET 1/2019

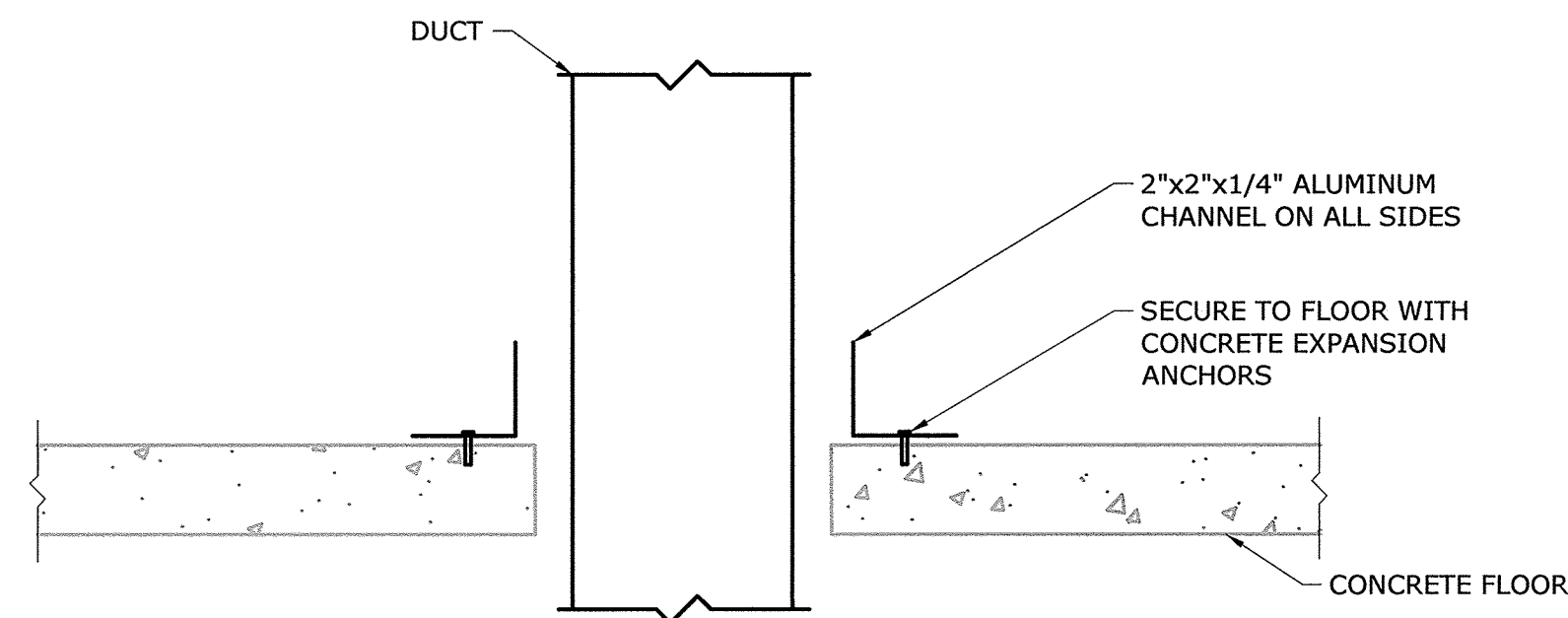
**DUCT SYMBOLS**

-  SUPPLY AIR DUCT SECTION-UP
-  SUPPLY AIR DUCT SECTION-DOWN
-  RETURN AIR DUCT SECTION-UP
-  RETURN AIR DUCT SECTION-DOWN
-  EXHAUST AIR DUCT SECTION-UP
-  EXHAUST AIR DUCT SECTION-DOWN
-  MITERED ELBOW WITH TURNING VANES

















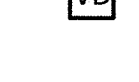





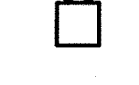


THREADED ROD, ANGLE, AND HARDWARE MATERIAL SHALL MATCH DUCT MATERIAL.

**DUCT HANGING DETAIL**  
NOT TO SCALE



**DUCT PENETRATION THROUGH FLOOR**  
NOT TO SCALE

**CONTROL SYMBOLS**

-  SMOKE DETECTOR
-  THERMOSTAT
-  TEMPERATURE SENSOR
-  SURFACE TEMPERATURE SENSOR
-  TEMPERATURE AND HUMIDITY SENSOR
-  HAND-OFF-AUTO
-  FLOW SENSOR
-  KEY SWITCH
-  LIGHT SWITCH
-  PUSH BUTTON
-  AIRFLOW TEMPERATURE SENSOR
-  LOUVER/DAMPER
-  MOTOR OPERATED DAMPER
-  BACKDRAFT DAMPER
-  VOLUME DAMPER
-  PANEL LAMP
-  COUNTDOWN TIMER
-  STROBE
-  HORN
-  INSTRUMENT TAP
-  DIAL
-  LIGHT SWITCH
-  FAN

**ABBREVIATIONS**

- AFF ABOVE FLOOR FINISH
- AI ANALOG INPUT
- AL ALUMINUM
- AO ANALOG OUTPUT
- BD BACKDRAFT DAMPER
- CFM CUBIC FEET PER MINUTE
- CRAC CONTROL ROOM AIR CONDITIONING
- DB DRY BULB
- DI DISCRETE INPUT
- DN DOWN
- DO DISCRETE OUTPUT
- DWG DRAWING
- EF EXHAUST FAN
- EL ELEVATION
- EQPT EQUIPMENT
- EX EXISTING
- FA FREE AREA
- FACP FIRE ALARM CONTROL PANEL
- FRP FIBERGLASS REINFORCED PLASTIC
- FS FLOW SENSOR
- GALV GALVANIZED
- H HEIGHT
- HMI HUMAN MACHINE INTERFACE
- HP HORSEPOWER
- KW KILOWATT
- L LENGTH
- LBS POUNDS
- LS LIGHT SWITCH
- M MOTOR
- MBH THOUSAND BTU PER HOUR
- MD MOTORIZED DAMPER
- MECH MECHANICAL
- MTD MOUNTED
- OPD OVERCURRENT PROTECTION DEVICE
- PD PRESSURE DIFFERENTIAL
- RF RECIRCULATION FAN
- SD SMOKE DAMPER
- SF SUPPLY FAN
- S.P. STATIC PRESSURE
- TH THERMOSTAT
- TYP TYPICAL
- UH UNIT HEATER
- VEL VELOCITY
- WSA WIRE SIZE AMPS

**GENERAL NOTES**

1. THE SYMBOLS AND ABBREVIATIONS LIST ON THIS SHEET IS A COMPREHENSIVE STANDARD GUIDE INTENDED FOR GENERAL USE ON ALL PROJECTS. THEREFORE NOT ALL THE SYMBOLS AND ABBREVIATIONS CONTAINED IN THIS LIST ARE NECESSARILY USED ON THIS PARTICULAR PROJECT AND SHOULD BE USED FOR CLARIFICATION ONLY.
2. ALL DUCT DIMENSIONS ARE CLEAR DIMENSIONS TO INSIDE OF DUCT. DIMENSIONS TO DUCTS FROM FLOOR OR WALL SHALL BE TO THE OUTSIDE OF DUCT/INSULATION. WHERE INTERNAL INSULATION IS REQUIRED THE DUCT SIZE SHALL BE INCREASED TO GIVE CLEAR INSIDE DIMENSIONS AS NOTED ON THE DRAWINGS.
3. EQUIPMENT SIZES AND LOCATIONS ARE APPROXIMATE. ACTUAL DIMENSIONS TO BE DETERMINED BY EQUIPMENT FURNISHED. COORDINATE HVAC WORK WITH THE WORK OF ALL OTHER TRADES.
4. FINAL OPENING DIMENSIONS, CONCRETE PAD SIZES, AND LOCATIONS MUST BE COORDINATED DURING CONSTRUCTION WITH APPROVED EQUIPMENT.
5. FINAL SIZES OF FLOOR OPENINGS, DUCT PLENUMS, TRANSITIONS AND PIPING CONNECTIONS TO ALL EQUIPMENT SHALL BE DETERMINED BY EQUIPMENT FURNISHED.
6. THE DRAWINGS ARE SCHEMATIC IN NATURE AND SHOW INTENDED GENERAL LOCATION OF HVAC EQUIPMENT AND SYSTEMS. NOT ALL OFFSETS AND REQUIRED FITTINGS FOR ACTUAL FIELD INSTALLATION ARE INTENDED TO BE SHOWN FOR INSTALLATION OF SYSTEMS IN THE SPACE AVAILABLE IN CONSIDERATION OF WORK OF OTHER TRADES AND FIELD CONDITIONS. CONTRACTOR SHALL PROVIDE ADDITIONAL OFFSETS IN DUCTWORK AND PIPING AS REQUIRED TO AVOID SUCH INTERFERENCES OR FIELD CONDITIONS AT NO ADDITIONAL COST TO THE ORIGINAL CONTRACT AMOUNT.
7. FIRST FIGURE OF DUCT SIZE INDICATES DIMENSION OF FACE SHOWN OR INDICATED OR WIDTH OF DUCT IN PLAN VIEW.
8. COORDINATE THE REQUIREMENTS FOR HVAC OPENINGS AND SLEEVES IN BUILDING ELEMENTS WITH THE GC.
9. REFER TO ELECTRICAL DRAWINGS OR SPECIFICATIONS FOR INTERLOCKING WIRING REQUIREMENTS.
10. CONTRACTOR SHALL COORDINATE DUCTWORK INSTALLATION WITH OTHER TRADES SO THAT THE DUCTWORK IS INSTALLED BEFORE THE PIPING, LIGHTING AND ELECTRICAL CONDUIT.
11. PROVIDE ADEQUATE SUPPORT, PER THE MANUFACTURER'S RECOMMENDATIONS, FOR ALL HVAC EQUIPMENT.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING ELECTRICAL RATINGS FROM CERTIFIED DRAWINGS OF EQUIPMENT AND SHALL MAKE ANY BRANCH CIRCUIT DISTRIBUTION MODIFICATION REQUIREMENTS WITHOUT ANY ADDITIONAL COST TO OWNER. THE CONTRACTOR SHALL SUBMIT A SCHEDULE OF SUCH CHANGES FOR APPROVAL BY ENGINEER.
13. WHEREVER THE REQUIREMENTS AND REGULATIONS OF STATE, FEDERAL AND LOCAL AUTHORITIES HAVING JURISDICTION DIFFER FROM THE DRAWINGS OR SPECIFICATIONS, THEY SHALL TAKE PRECEDENCE AND SHALL BE MADE PART OF THE CONTRACT (EXCEPT WHERE THE DRAWINGS OR SPECIFICATIONS ARE MORE STRINGENT).
14. DUCTWORK AND PLENUM TO LOUVERS SHALL BE CONNECTED TO FRAMED OPENINGS AND, SEALED AIRTIGHT AND WEATHER RESISTANT.
15. THERMOSTATS, SENSORS, AND/OR CONTROL PANEL LOCATIONS SHOWN ARE APPROXIMATE AND SHALL BE COORDINATED TO SUIT FIELD CONDITIONS.
16. INSTALL WALL MTD SENSORS, CONTROLS AND THERMOSTATS 4'-0" AFF UNLESS OTHERWISE NOTED. ALIGN WITH OTHER NEARBY ITEMS SUCH AS LIGHT SWITCHES. DO NOT INSTALL CLOSER THAN 6-INCHES FROM EDGE OF DOOR FRAME OR CORNER OF WALL AS SHOWN ON ARCH PLANS. WHERE CONFLICTS MAY OCCUR WITH ITEMS SUCH AS LIGHT SWITCHES, MOUNT THE SENSOR OR CONTROL DEVICE 4'-6" AFF CENTERED ABOVE THE LIGHT SWITCH.
17. PROVIDE ADEQUATE MEANS OF ACCESS CLEARANCE FOR ALL HVAC/MECHANICAL EQUIPMENT AND SYSTEMS THAT REQUIRE ACCESS FOR PROPER OPERATION, MAINTENANCE AND REPAIR PER RECOMMENDED MANUFACTURER CLEARANCES. PROVIDE ACCESS DOORS WHERE NECESSARY IN FINISHED WALLS OR DRYWALL CEILINGS FOR ACCESS TO VALVES, DAMPERS, OR CONTROL DEVICES.
18. COORDINATE THE REQUIREMENTS OF HVAC HANGERS AND SUPPORTS W/ OTHER PRIME CONTRACTORS PROVIDING STRUCTURAL AND/OR ARCHITECTURAL BUILDING ELEMENTS WHICH HVAC SUPPORTS SHALL INTERFACE.
19. HVAC CONTRACTOR SHALL PROVIDE ALL FIRESTOPPING AND PIPE SLEEVES FOR ALL PIPE AND DUCT PENETRATIONS THRU FIRE RATED BUILDING ASSEMBLIES.
20. CONTRACTOR SHALL OBTAIN AND PAY ALL FEES RELATED TO PERMITTING, AND INSPECTIONS.
21. FOR ADDITIONAL REQUIREMENTS REFER TO SPECIFICATIONS.

**AS - BUILT**

20170126 1:04P 0:\32232-BAL\32232-005\Drawings\HVAC\H1.dwg LastSaveBy:EPROSSER

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*[Signature]* 2/3/17  
DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 2/16/17  
CHIEF BUREAU OF ENGINEERING DATE

*[Signature]* 2/16/17  
CHIEF BUREAU OF UTILITIES DATE

*[Signature]* 2/16/17  
CHIEF UTILITY DESIGN DIVISION DATE

**Hazen**

HAZEN AND SAWYER  
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202  
410-539-7881

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. 42535, EXPIRATION DATE 07/25/2018.

SIGNED: \_\_\_\_\_

|             |     |            |      |    |  |
|-------------|-----|------------|------|----|--|
| DESIGNED    | AJC |            |      |    |  |
| DRAWN       | MJB |            |      |    |  |
| CHECKED     | NB  |            |      |    |  |
| PROJ. ENGR. | AA  |            |      |    |  |
| APPROVED    | NO. | ISSUED FOR | DATE | BY |  |

**HVAC**

**GENERAL NOTES, ABBREVIATIONS, AND DETAILS**

**INFLUENT PUMPING STATION**  
**PUMP REPLACEMENT CONTRACT**  
**LITTLE PATUXENT WATER RECLAMATION PLANT**  
**CAPITAL PROJECT NUMBER S-6264**  
**CONTRACT NUMBER 20-4991**

6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

|                |          |
|----------------|----------|
| DATE           | JAN 2017 |
| DRAWING NUMBER | H1       |
| SCALE          | AS SHOWN |
| SHEET          | 13 OF 27 |

FAN SCHEDULE

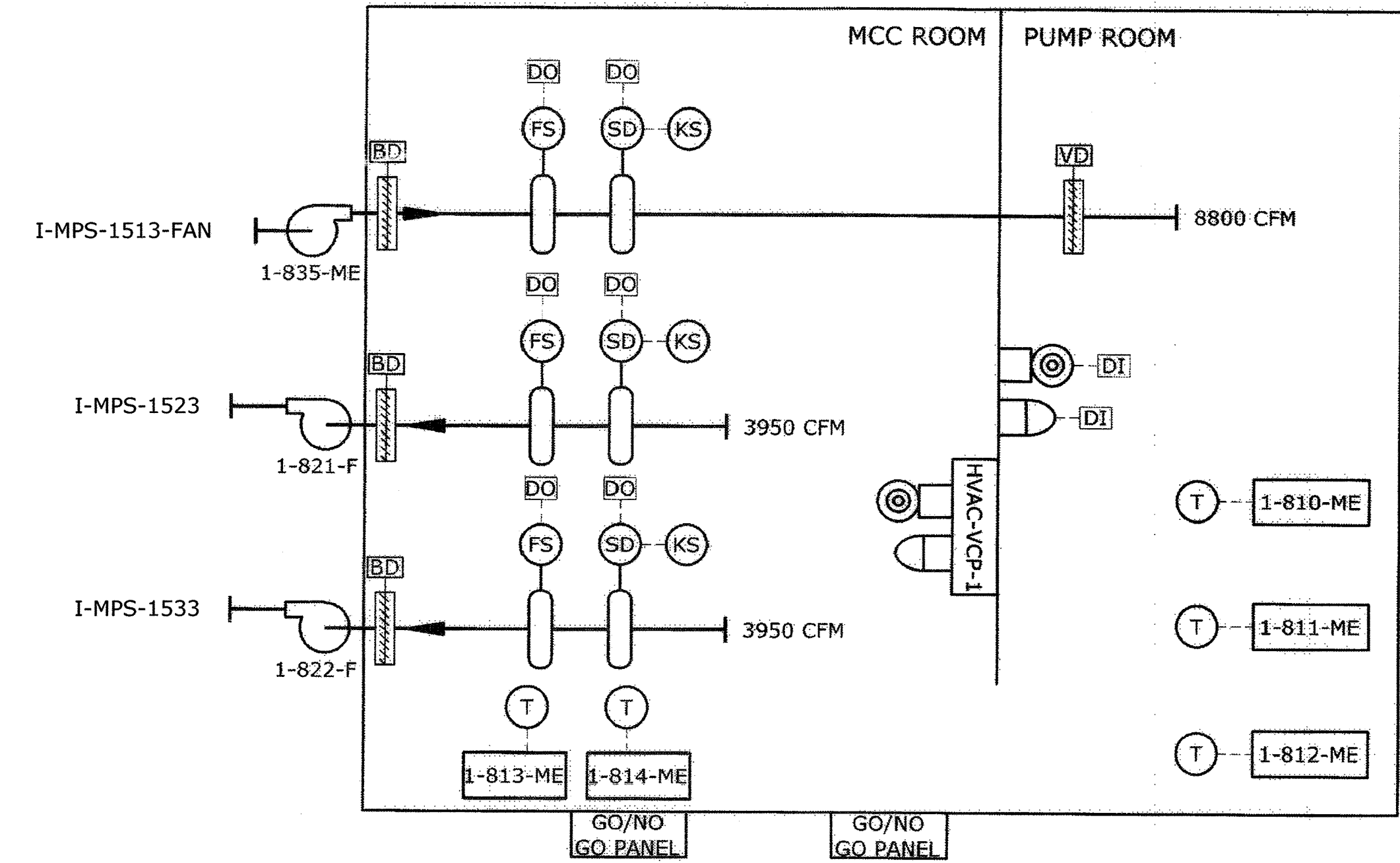
| FAN No.  | LOCATION | AREA SERVED | MANUFACTURER | MODEL NO. | FAN TYPE   | DRIVE TYPE | CFM   | SP (IN WG) | FAN RPM | MOTOR |      |       | REMARKS  |     |
|----------|----------|-------------|--------------|-----------|------------|------------|-------|------------|---------|-------|------|-------|----------|-----|
|          |          |             |              |           |            |            |       |            |         | HP    | BHP  | ELEC. |          |     |
| 1-835-ME | ROOF     | PUMP ROOM   | LOREN COOK   | 28CVR-S   | MIXED FLOW | BELT       | 8,800 | 2.25       | 1101    | 10    | 7.71 | 1725  | 460/3/60 | 1-6 |
| 1-821-F  | ROOF     | MCC ROOM    | LOREN COOK   | 180ACRUB  | UPBLAST    | BELT       | 3,950 | 0.25       | 1109    | 1     | 0.85 | 1725  | 460/3/60 | 1-6 |
| 1-822-F  | ROOF     | MCC ROOM    | LOREN COOK   | 180ACRUB  | UPBLAST    | BELT       | 3,950 | 0.25       | 1109    | 1     | 0.85 | 1725  | 460/3/60 | 1-6 |

- NOTES:
- FURNISH WITH BIRDSCREEN.
  - PROVIDE WIRE MESH SCREEN OVER INLET.
  - ALUMINUM CONSTRUCTION.
  - PROVIDE BACKDRAFT DAMPER.
  - FAN WEIGHT CAN NOT EXCEED 30 LBS PER SQUARE FOOT.
  - ROOF CURB ADAPTER WITH DAMPER TRAY.

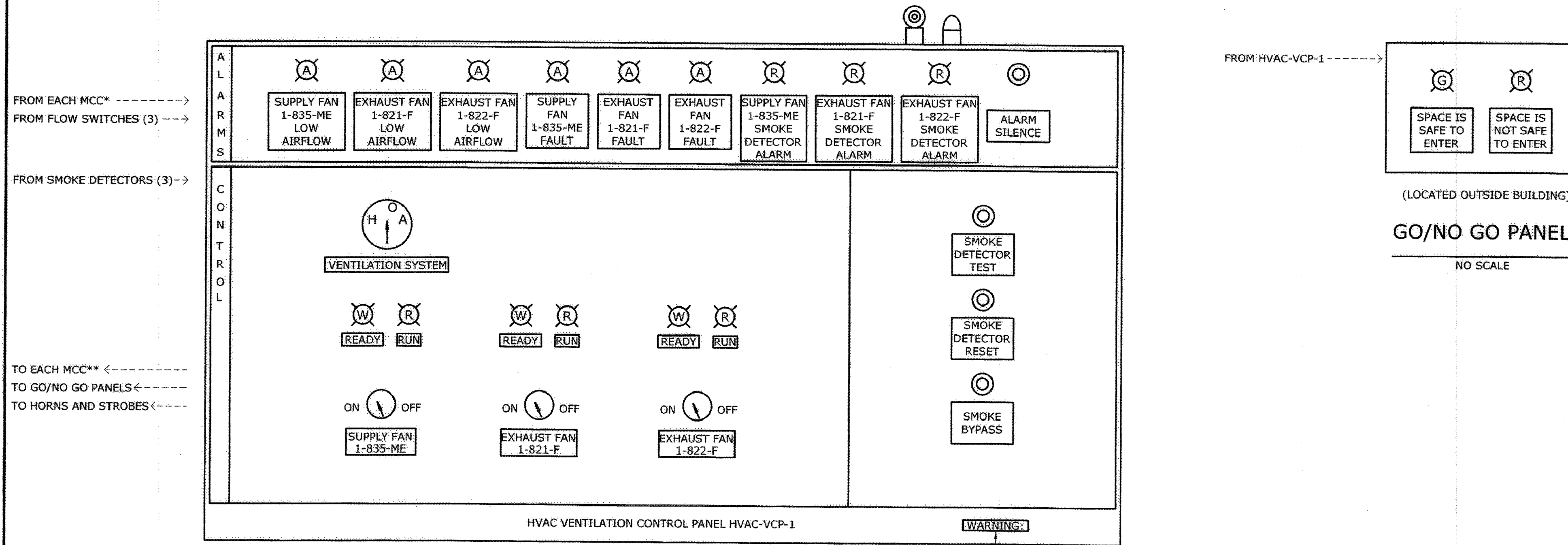
ELECTRIC UNIT HEATER SCHEDULE

| UNIT NO. | LOCATION     | AREA SERVED | MANUFACTURER | MODEL NO.      | UNIT HEATER TYPE | AIR FLOW (CFM) | FLA | MOTOR HP | POWER SUPPLY VOLTS/PHASE/HZ | CAPACITY (KW) | REMARKS    |
|----------|--------------|-------------|--------------|----------------|------------------|----------------|-----|----------|-----------------------------|---------------|------------|
| 1-810-ME | PUMP STATION | PUMP ROOM   | INDEECO      | 234-U11A-0390U | ELECTRIC         | 2,400          | 48  | 1/4      | 460/3/60                    | 38.4          | 1,3,4,5,6  |
| 1-811-ME | PUMP STATION | PUMP ROOM   | INDEECO      | 234-U11A-0390U | ELECTRIC         | 2,400          | 48  | 1/4      | 460/3/60                    | 38.4          | 1,3,4,5,6  |
| 1-812-ME | PUMP STATION | PUMP ROOM   | INDEECO      | 234-U11A-0390U | ELECTRIC         | 2,400          | 48  | 1/4      | 460/3/60                    | 38.4          | 1, 3, 4, 6 |
| 1-813-ME | MCC ROOM     | MCC ROOM    | INDEECO      | 234-U11L-0150U | ELECTRIC         | 2,400          | 20  | 1/4      | 460/3/60                    | 15            | 2, 3, 4, 6 |
| 1-814-ME | MCC ROOM     | MCC ROOM    | INDEECO      | 234-U11L-0150U | ELECTRIC         | 2,400          | 20  | 1/4      | 460/3/60                    | 15            | 2, 3, 4, 6 |

- NOTES:
- MOUNT 10" A.F.F.
  - MOUNT 8" A.F.F.
  - FURNISH WITH WALL MOUNTING BRACKET.
  - CORROSION RESISTANT CONSTRUCTION.
  - UNIT MUST BE PLACED WITHIN 10 FT OF SUPPLY AIR DUCT.
  - WASHDOWN/CORROSION RESISTANT WALL MOUNTED THERMOSTAT (40°F - 100°F RANGE) WITH ADJUSTABLE DIAL.



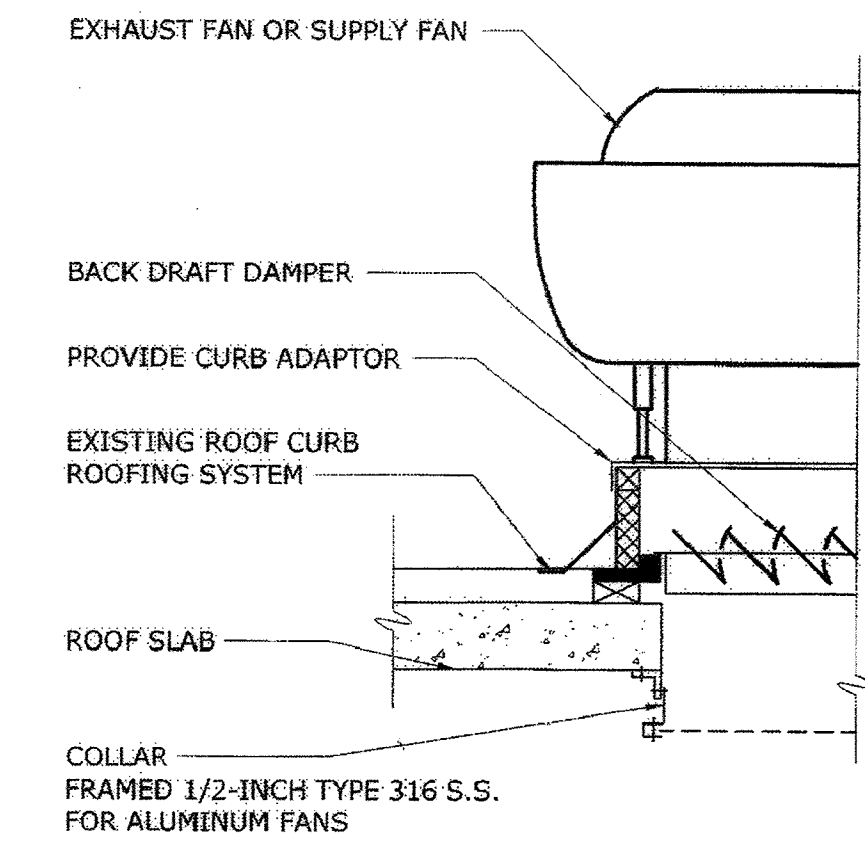
VENTILATION SYSTEM CONTROL DIAGRAM  
NO SCALE



\* - MULTIPLE SIGNALS FROM MCC INCLUDING FAN READY, RUN AND FAULT.  
 \*\* - RUN COMMAND TO MCC. SEE 15950 FOR CONTROLS.  
 GENERAL ALARM AND GENERAL SMOKE ALARM SHALL ALSO BE SENT TO FAN MCC. SEE ELECTRICAL DRAWINGS FOR DETAILS.

MCC AND PUMP ROOM VENTILATION CONTROL PANEL  
NO SCALE

WARNING  
THIS PANEL CONNECTED TO MULTIPLE SOURCES OF POWER



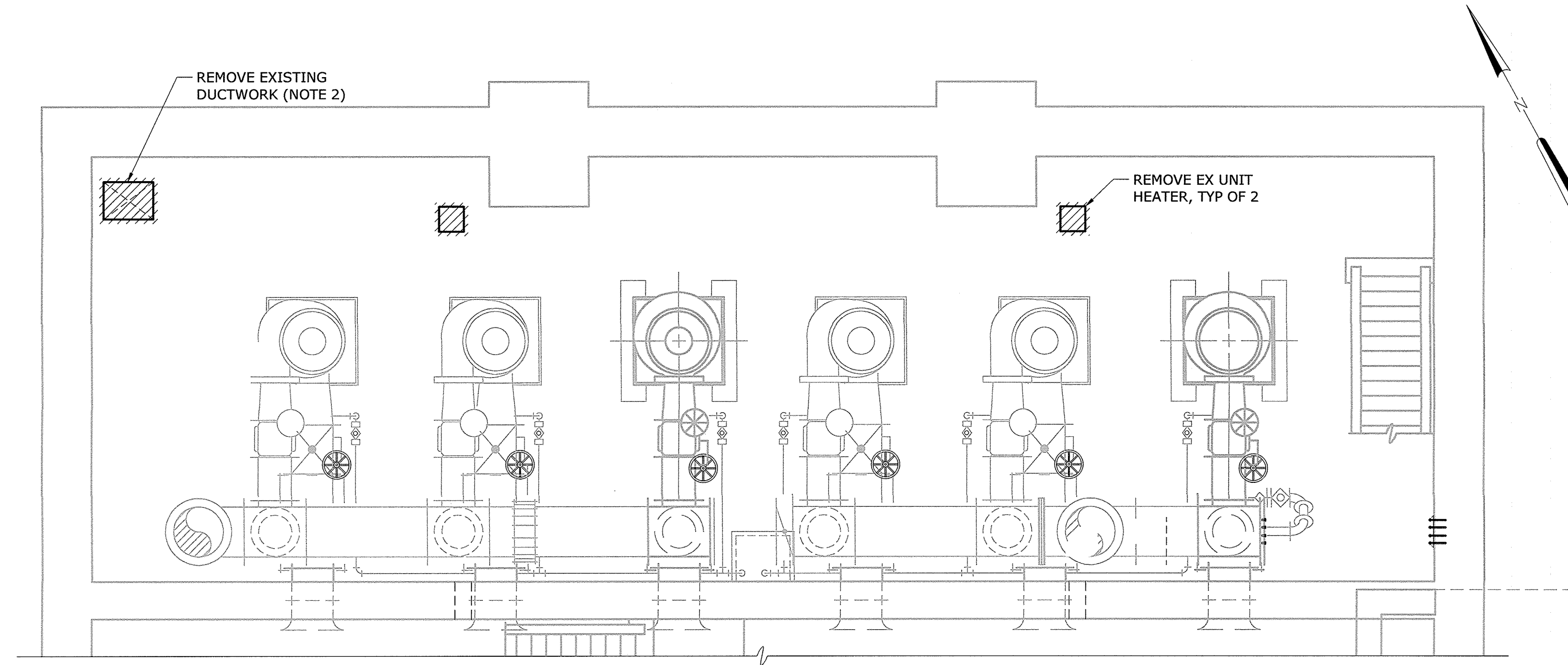
NOTE:  
PROTECT ROOFING SYSTEM WHILE PERFORMING WORK.  
TYPICAL ROOF MOUNTED FAN DETAIL  
NO SCALE

AS-BUILT REPLACEMENT SHEET 1/2019

|   |  |   |  |  |  |  |  |                         |  |   |  |                |  |                               |  |   |  |  |  |
|---|--|---|--|--|--|--|--|-------------------------|--|---|--|----------------|--|-------------------------------|--|---|--|--|--|
| DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>Director of Public Works: <i>[Signature]</i> 3/7/19<br>Chief Bureau of Engineering: <i>[Signature]</i> 2-28-19<br>Chief Bureau of Utilities: <i>[Signature]</i> 2-26-19<br>Chief Utility Design Division: <i>[Signature]</i> 2/26/19 |  | <b>Hazen</b><br>HAZEN AND SAWYER<br>1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202<br>410-539-7681 |  | PROFESSIONAL CERTIFICATION:<br>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.<br>LICENSE NO. 42535<br>EXPIRATION DATE 07/25/2018<br>SIGNED: _____ |  | DESIGNED: <b>AJC</b><br>DRAWN: <b>MJB</b><br>CHECKED: <b>NB</b><br>PRG. ENGR. <b>AA</b><br>APPROVED: _____ |  | NO. 3<br>NO. 2<br>NO. 1 |  | AS-BUILT 1/9/19<br>ADDENDUM 5/9/17<br>ADDENDUM 5/9/17 |  | AA<br>AA<br>AA |  | HVAC<br>SCHEDULES AND DETAILS |  | INFLUENT PUMPING STATION<br>PUMP REPLACEMENT CONTRACT<br>LITTLE PATUXENT WATER RECLAMATION PLANT<br>CAPITAL PROJECT NUMBER S-6264<br>CONTRACT NUMBER 20-4991<br>6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND |  | DATE: JAN 2017<br>DRAWING NUMBER: H2<br>SCALE AS SHOWN<br>SHEET 14 OF 27 |  |
|---|--|---|--|--|--|--|--|-------------------------|--|---|--|----------------|--|-------------------------------|--|---|--|--|--|

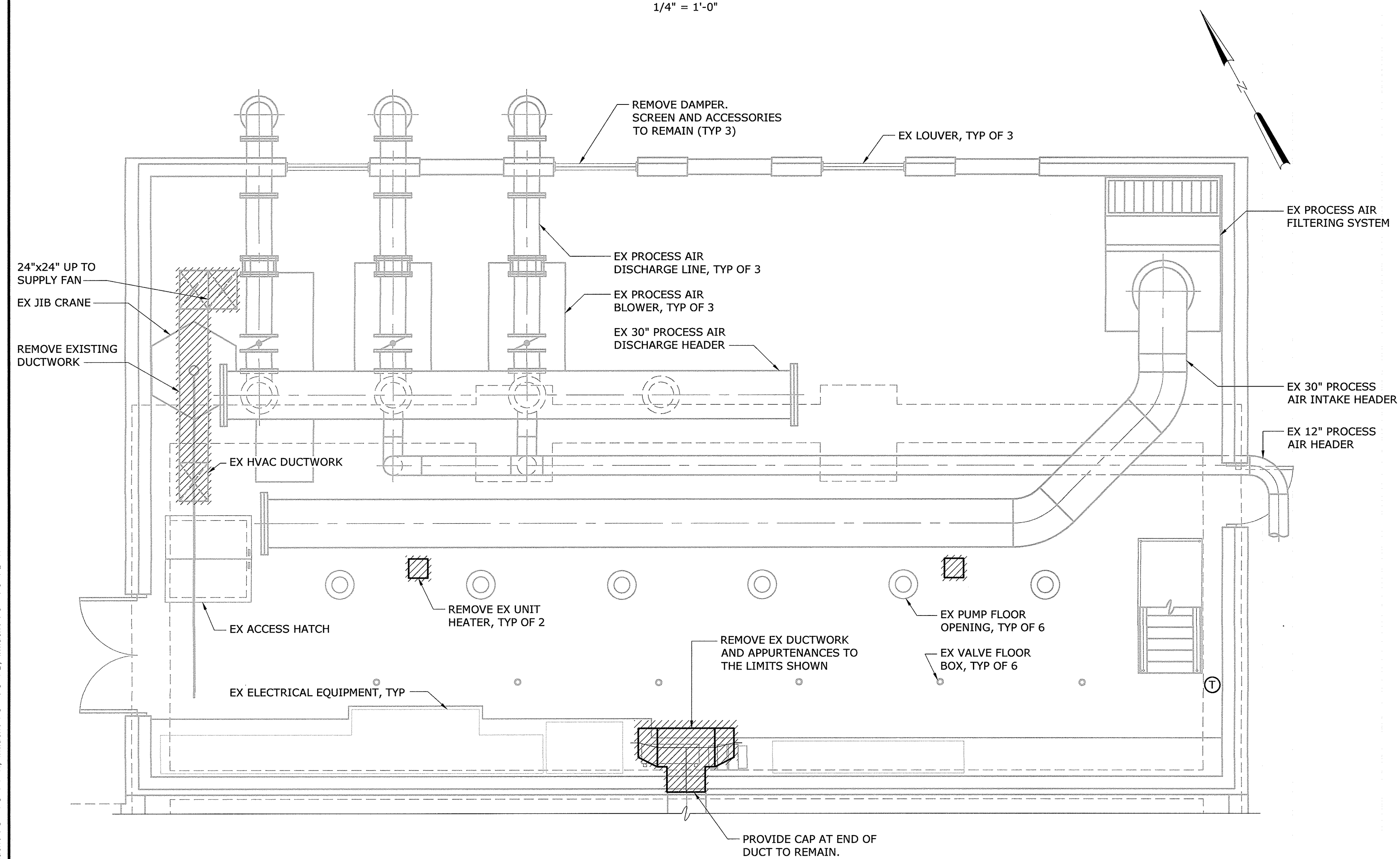
IMAGE# 3232-2B CONTROL DIAGRAM - MGrondano  
 XREF# 20170126 1:10P C:\ACAD\ACAD-TEMP\AcPublish\_11632\H2.dwg LostSaveBy:EPROSSER

- NOTES:
1. PROTECT EXISTING ROOF SYSTEM. ROOF CURB AND FLASHING TO REMAIN.
  2. REFER TO SECTION A ON DRAWING M1 FOR ADDITIONAL DEMOLITION INFORMATION FOR DUCTWORK.



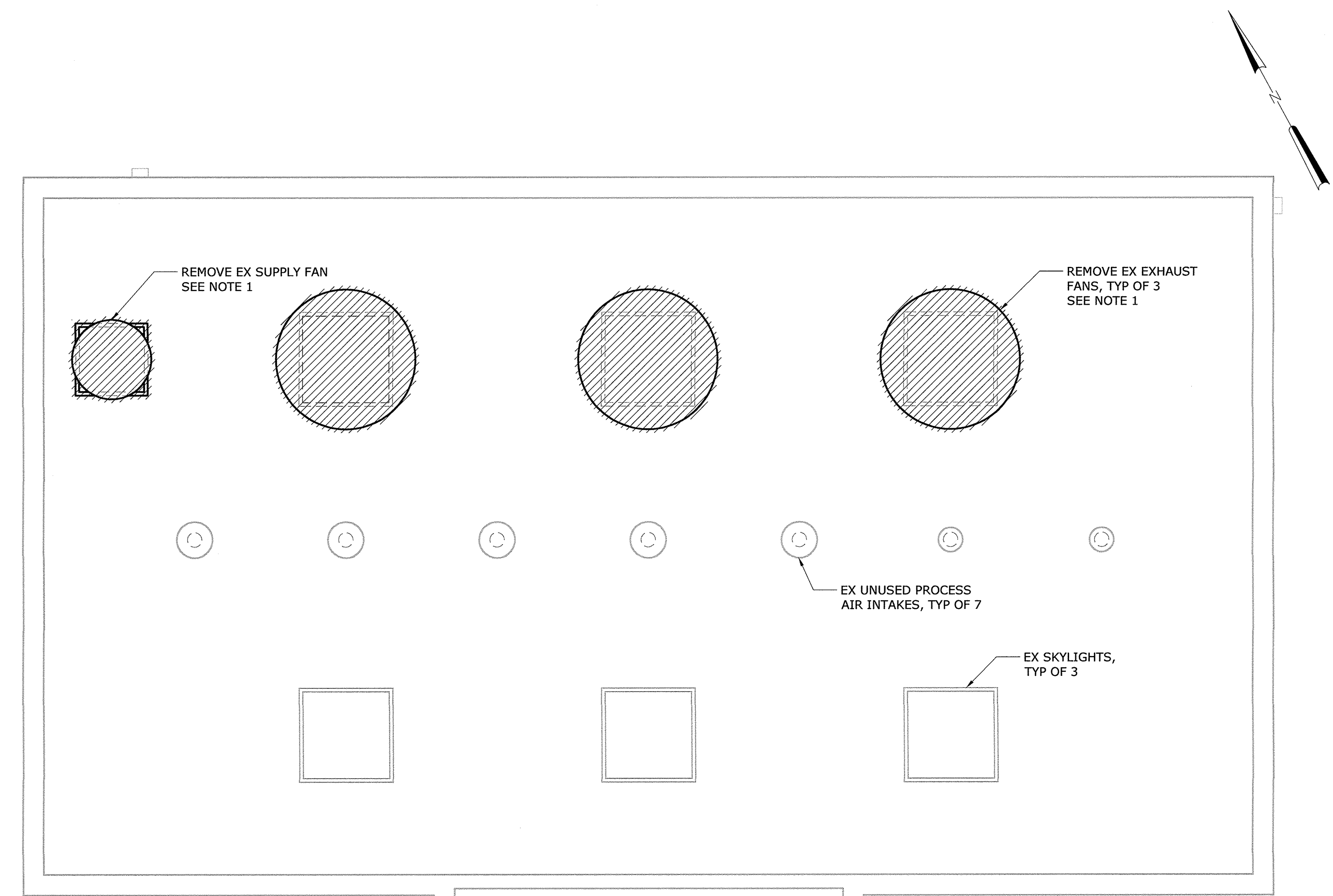
**PUMP ROOM DEMOLITION PLAN**

1/4" = 1'-0"



**MCC ROOM DEMOLITION PLAN**

1/4" = 1'-0"



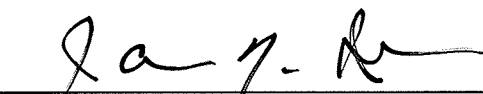
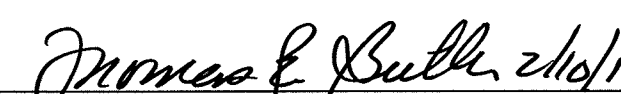

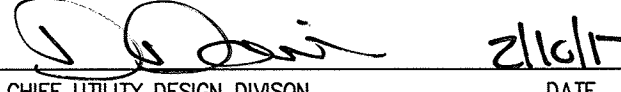
**ROOF LEVEL DEMOLITION PLAN**

1/4" = 1'-0"

AS - BUILT

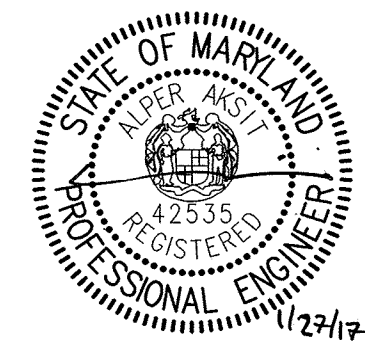
IMAGE= Operating Room Plan, XREF= 32232-B, Influent PS -PS-PR, Influent PS -PS-PT, Influent PS -PS-PB, Influent PS -PS-PB-H  
 20170126 1:04P O:\32232-BAL\32232-005\Drawings\HVAC\H3.dwg LastSaveBy:EPROSSER

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

|   |        |   |        |
|---|--------|---|--------|
|  | 2/3/17 |  | 2/3/17 |
| DIRECTOR OF PUBLIC WORKS  | DATE   | CHIEF BUREAU OF ENGINEERING   | DATE   |
|  | 2/3/17 |  | 2/3/17 |
| CHIEF BUREAU OF UTILITIES   | DATE   | CHIEF UTILITY DESIGN DIVISION   | DATE   |

**Hazen**

HAZEN AND SAWYER  
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202  
410-539-7681



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. 42535, EXPIRATION DATE 07/25/2018.

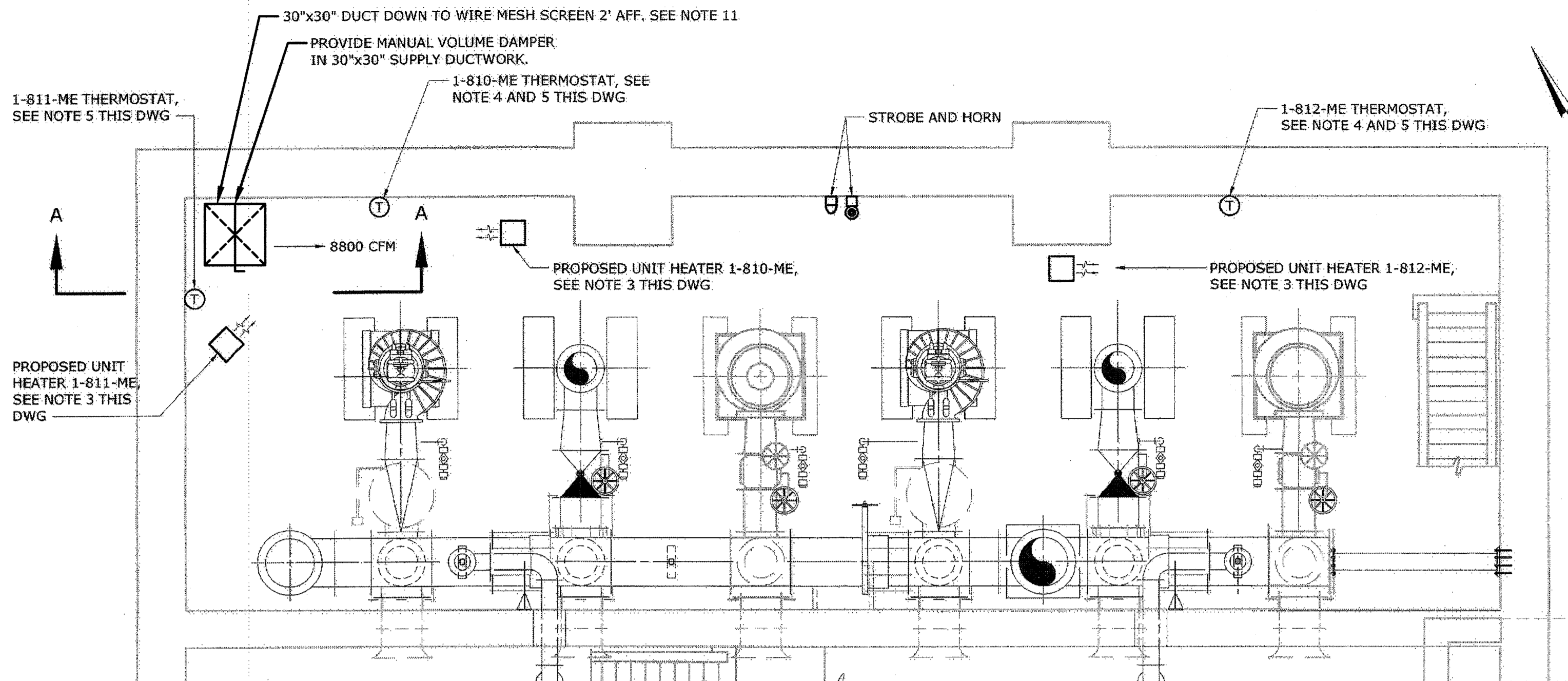
SIGNED:

|             |     |
|-------------|-----|
| DESIGNED    | AJC |
| DRAWN       | MJB |
| CHECKED     | NB  |
| PROJ. ENGR. | AA  |
| APPROVED    |     |

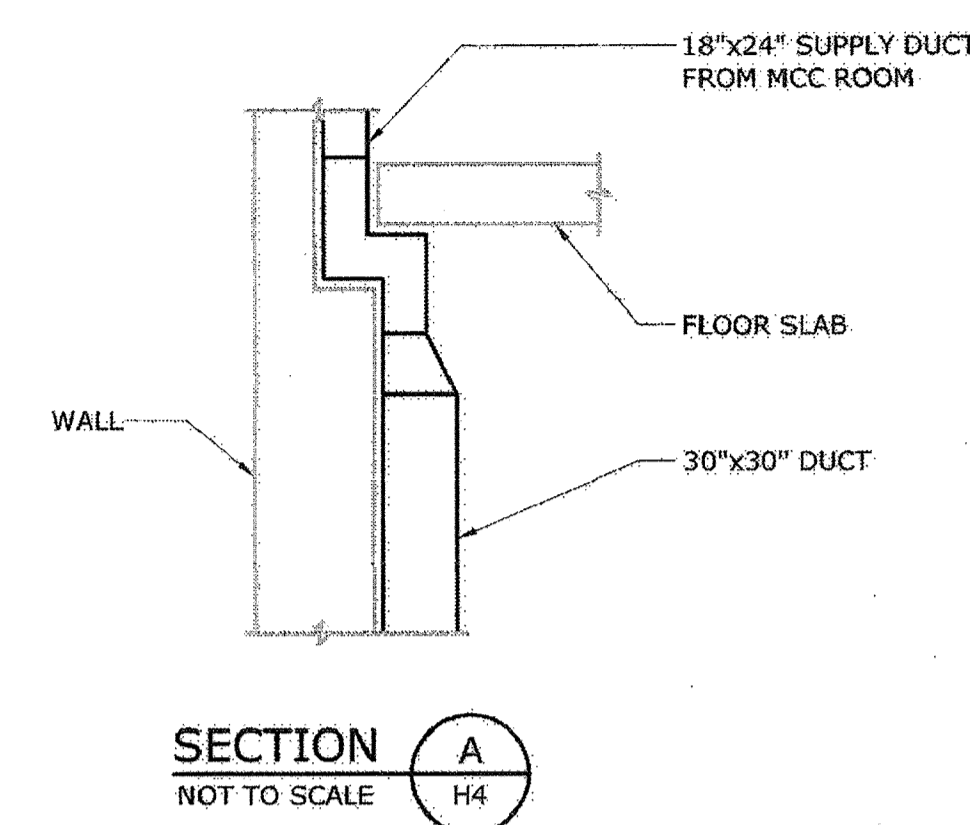
INFLUENT PUMPING STATION  
HVAC  
DEMOLITION PLANS

INFLUENT PUMPING STATION  
PUMP REPLACEMENT CONTRACT  
LITTLE PATUXENT WATER RECLAMATION PLANT  
CAPITAL PROJECT NUMBER S-6264  
**CONTRACT NUMBER 20-4991**  
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

|                |          |
|----------------|----------|
| DATE           | JAN 2017 |
| DRAWING NUMBER | H3       |
| SCALE AS SHOWN |          |
| SHEET          | 15 OF 27 |

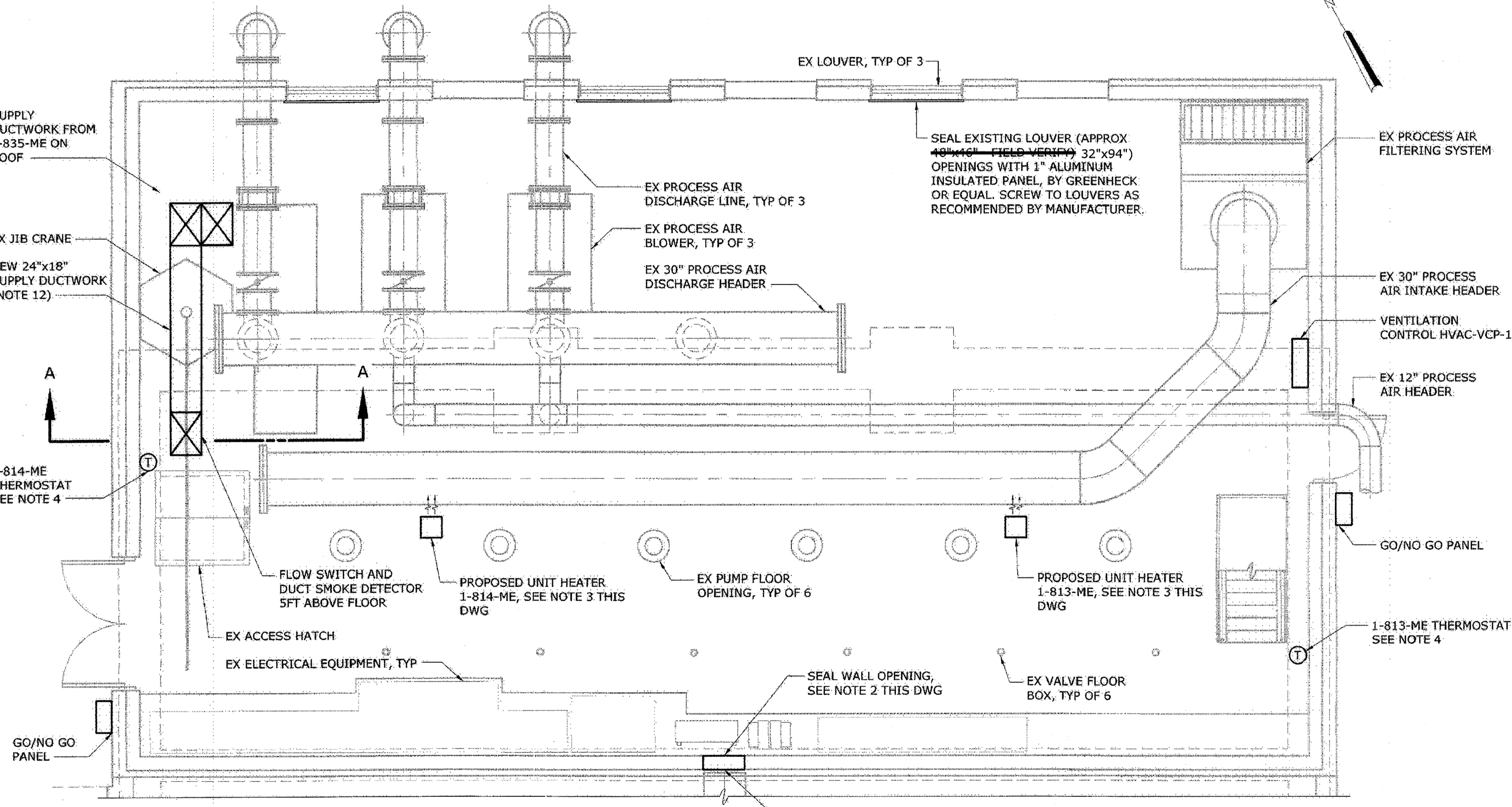


**PUMP ROOM PROPOSED PLAN**  
1/4" = 1'-0"

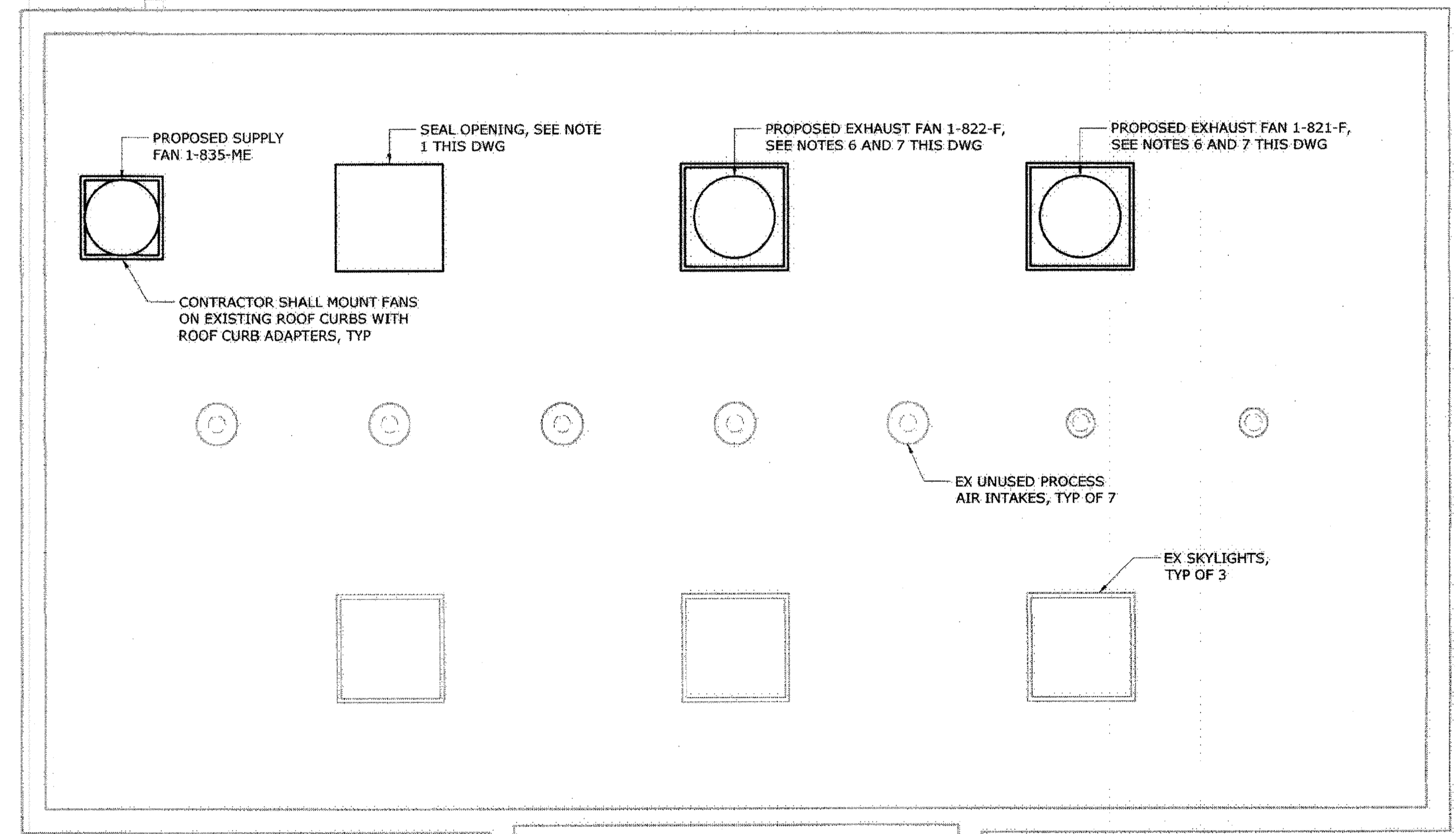


**NOTES:**

1. PROVIDE INSULATED CURB COVER, APPROXIMATELY 55"x55", FIELD VERIFY. CURB COVER SHALL SUPPORT 50 PSI MINIMUM EXPOSED METALS SHALL BE 18GA STEEL MINIMUM WITH PLYWOOD SUBSTRATE, MINIMUM 3/4". INSTALL IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS. PROVIDE COVER BY PATE ROOF PRODUCTS INC, ROOF CURB SYSTEMS OR EQUAL.
2. FILL 12" CMU WALL OPENING (APPROXIMATELY 24"x24") WITH MATERIAL TO MATCH EXISTING. MATCH WIDTH AND ALIGN MORTAR JOINTS. USE TYPE N MORTAR.
3. UNIT HEATERS IN THE LOWER LEVEL (1-810-ME, 1-811-ME, 1-812-ME) SHALL BE MOUNTED 10 FEET AFF. UNIT HEATERS IN THE UPPER LEVEL (1-813-ME, 1-814-ME) SHALL BE MOUNTED 8 FEET AFF.
4. THERMOSTATS SHALL BE MOUNTED 4 FEET AFF.
5. THERMOSTATS FOR 1-810-ME AND 1-811-ME SHALL BE LOCATED WITHIN 4 FEET HORIZONTALLY OF THEIR RESPECTIVE UNIT HEATERS.
6. PROVIDE FLOW SWITCHES AT EXHAUST FAN DUCTS. ATTACH 4 FT OF INTAKE DUCT TO FAN WITH VOLUME DAMPER.
7. PROVIDE SMOKE DETECTORS AT EXHAUST FAN DUCTS.
8. REFER TO DWG H2 FOR VENTILATION, INSTRUMENTATION, AND CONTROL PANEL DETAILS.
9. MCC AND PUMP ROOM WILL BE UNCLASSIFIED PER NFPA 820 WITH CONTINUOUS VENTILATION AT 6 AIR CHANGES PER HOUR.
10. ALL VENTILATION WORK TO BE INCLUDED IN BASE BID.
11. TRANSITION EXISTING 24"x18" DUCT TO NEW 30"x30" DUCT BELOW CEILING OR PUMP ROOM.
12. NEW 24"x18" SUPPLY DUCTWORK IN MCC ROOM SHALL REPLACE EXISTING 24"x18" DUCTWORK. NEW DUCT ALIGNMENT SHALL MATCH EXISTING DUCTWORK. CONTRACTOR SHALL COORDINATE NEW DUCTWORK INSTALLATION TO AVOID INTERFERENCE WITH EXISTING CRANE OPERATION.



**MCC ROOM PROPOSED PLAN**  
1/4" = 1'-0"



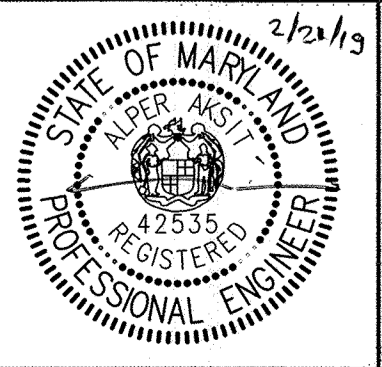
**ROOF LEVEL PROPOSED PLAN**  
1/4" = 1'-0"

**AS-BUILT REPLACEMENT SHEET 1/2019**

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

Director of Public Works: *George J. ...* 3/6/19  
 Chief Bureau of Engineering: *Thomas E. ...* 2-20-19  
 Chief Utility Design Division: *...* 2/20/19

**Hazen**  
HAZEN AND SAWYER  
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202  
410-639-7881



PROFESSIONAL CERTIFICATION:  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 42535, EXPIRATION DATE 07/25/2018.

|            |     |     |            |        |    |
|------------|-----|-----|------------|--------|----|
| DESIGNED   | AJC |     |            |        |    |
| DRAWN      | MJB |     |            |        |    |
| CHECKED    | NB  |     |            |        |    |
| PROF. ENGR | AA  | 3   | AS-BUILT   | 1/9/19 | AA |
|            |     | 2   | ADDENDUM   | 5/9/17 | AA |
|            |     | 1   | ADDENDUM   | 5/9/17 | AA |
| APPROVED   |     | NO. | ISSUED FOR | DATE   | BY |

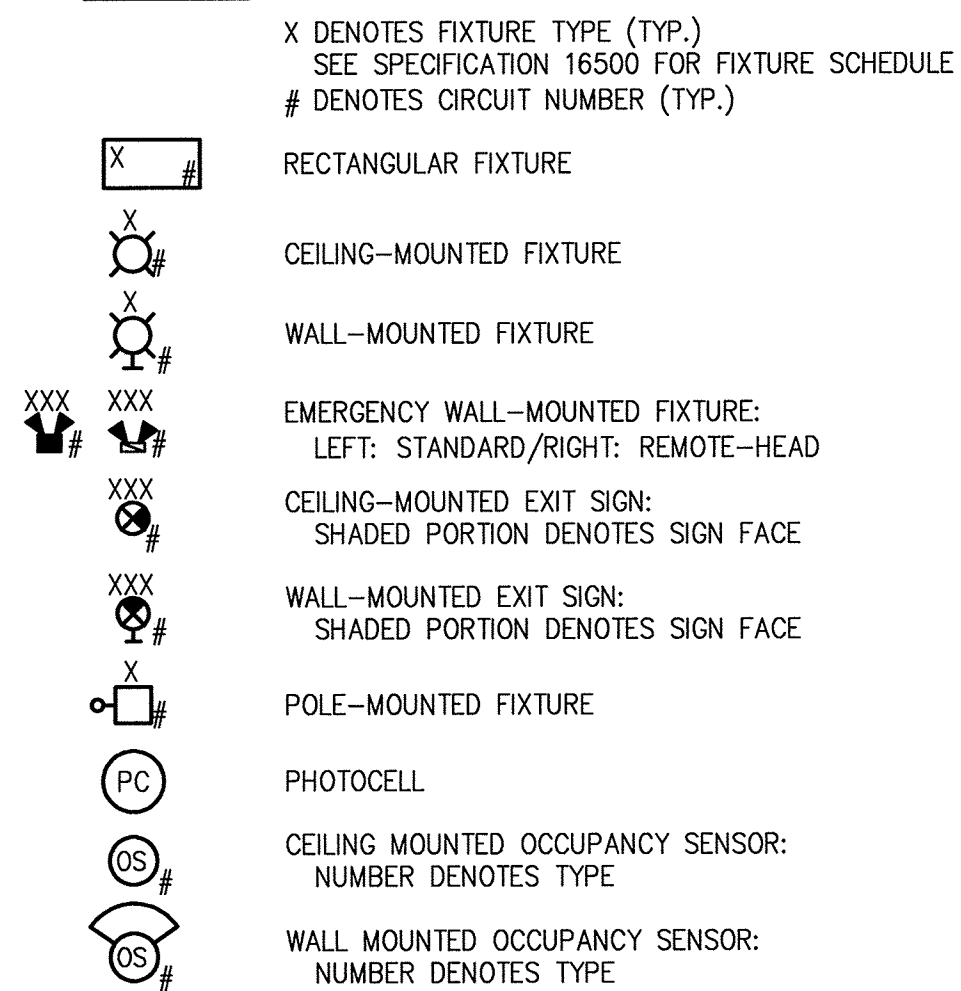
**INFLUENT PUMPING STATION HVAC**  
**PROPOSED PLANS**

**INFLUENT PUMPING STATION PUMP REPLACEMENT CONTRACT**  
**LITTLE PATUXENT WATER RECLAMATION PLANT**  
CAPITAL PROJECT NUMBER S-6264  
**CONTRACT NUMBER 20-4991**  
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

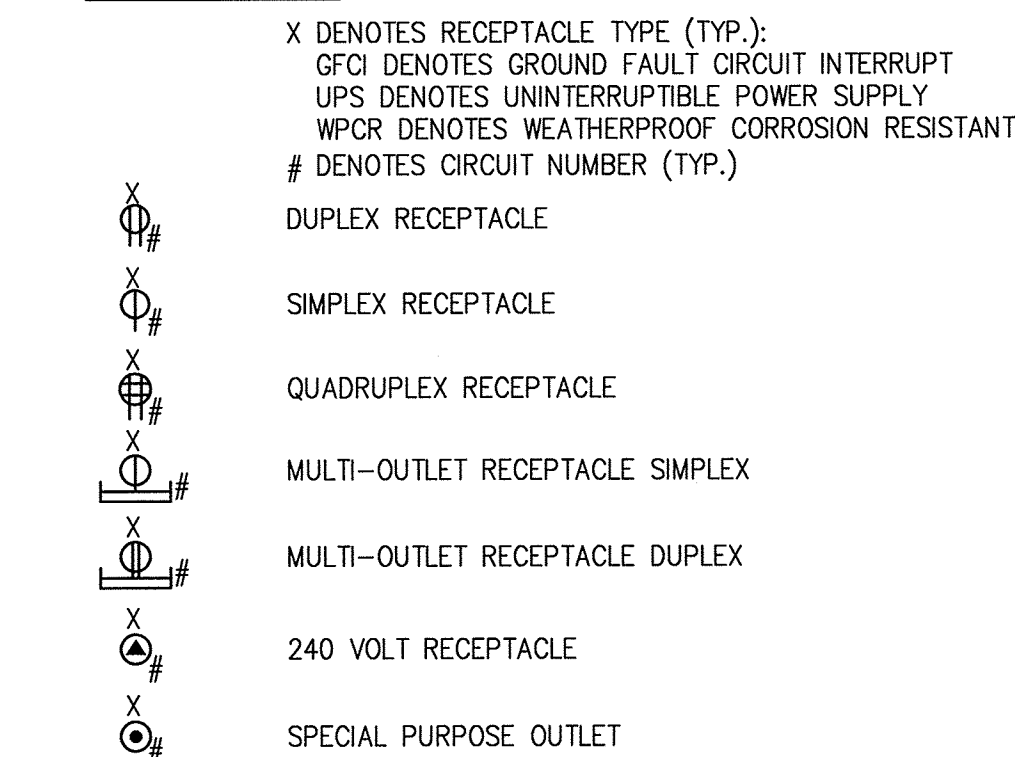
|                |          |
|----------------|----------|
| DATE           | JAN 2017 |
| DRAWING NUMBER | H4       |
| SCALE          | AS SHOWN |
| SHEET          | 16 OF 27 |



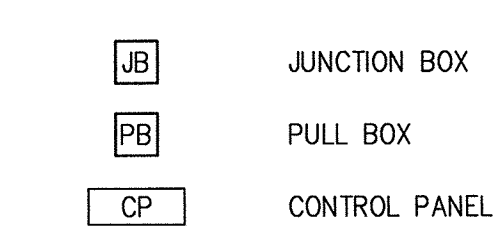
**LIGHTING:**



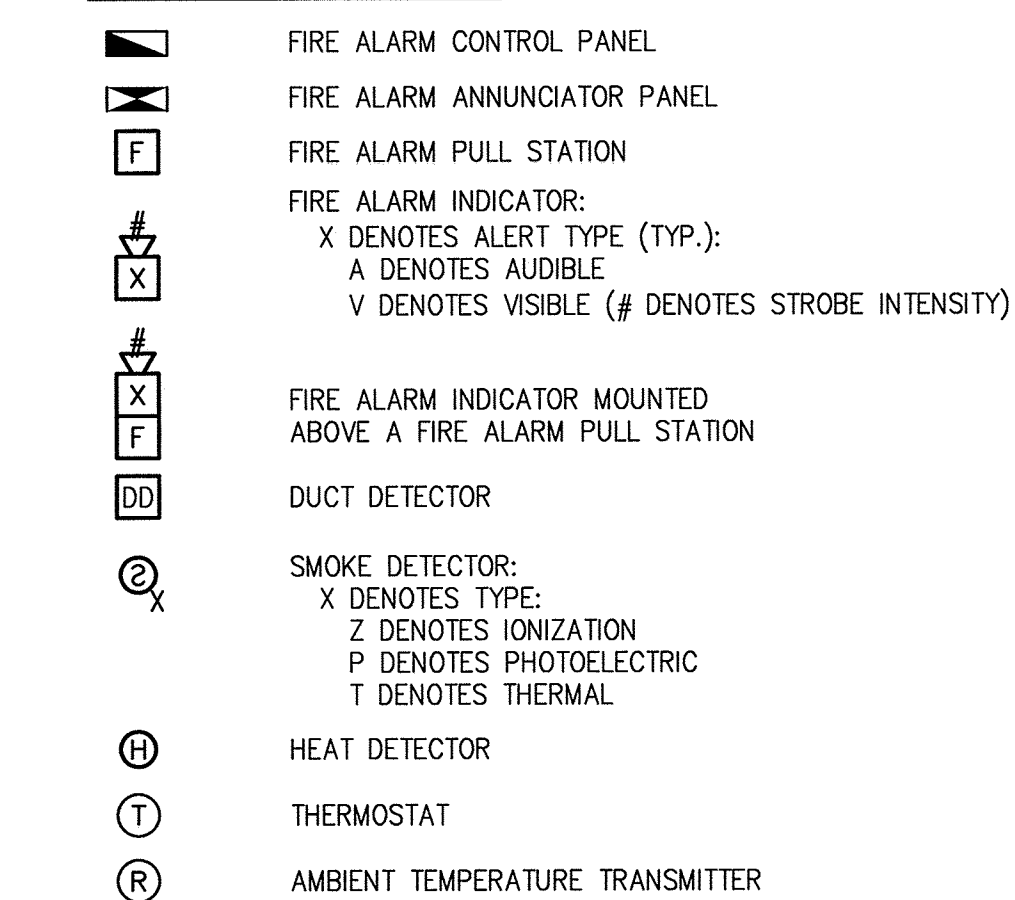
**RECEPTACLES:**



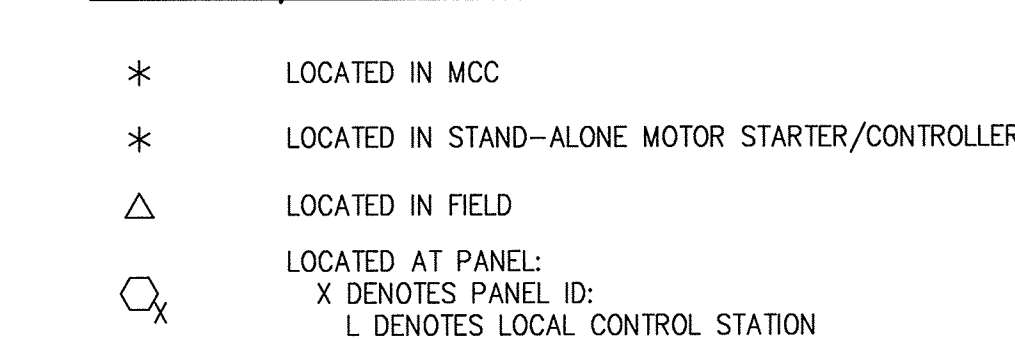
**PANELS AND BOXES**



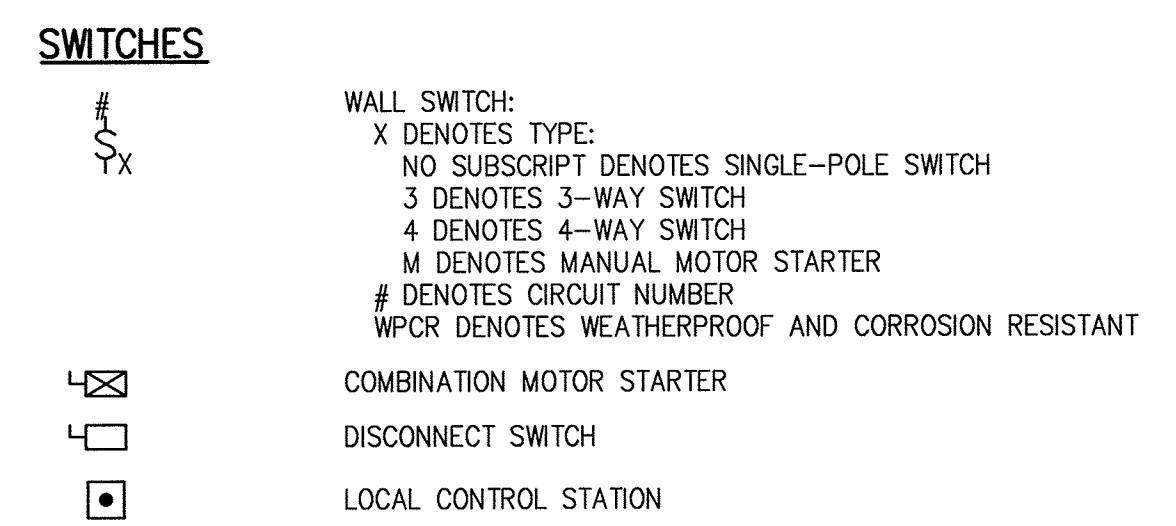
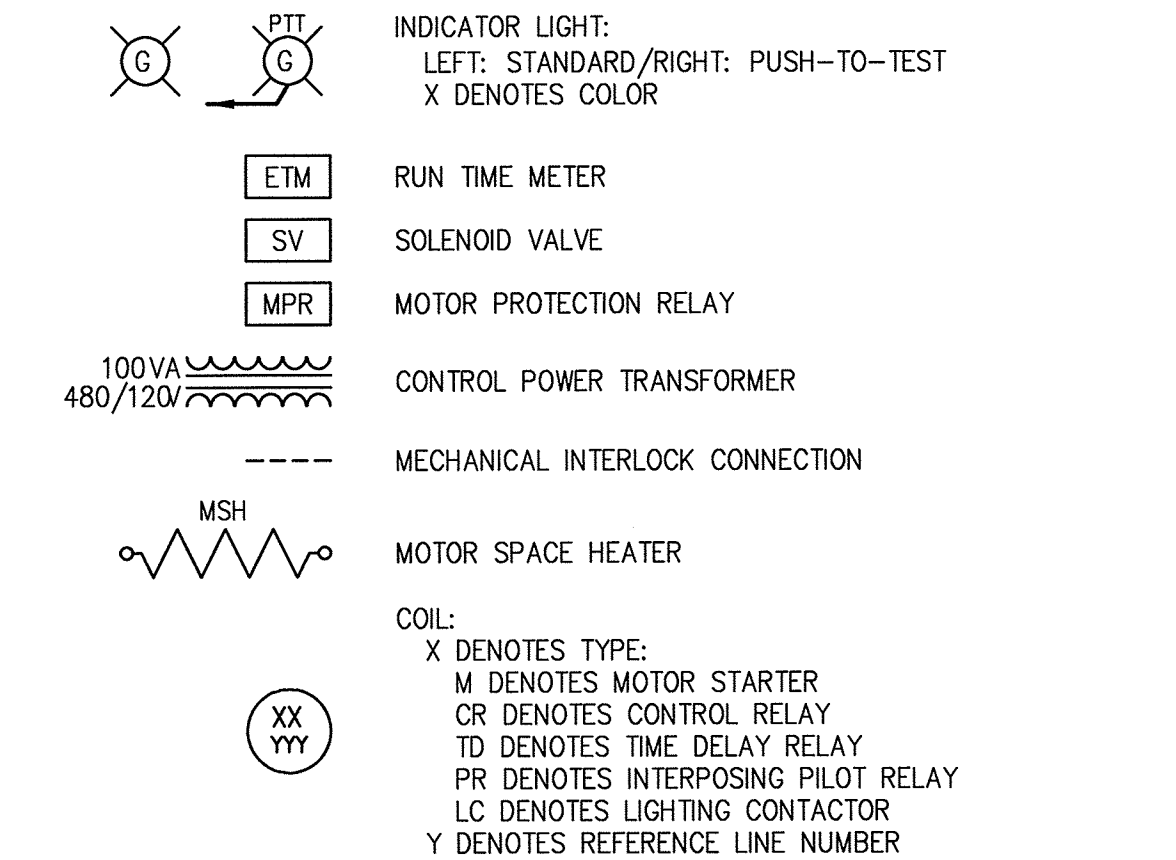
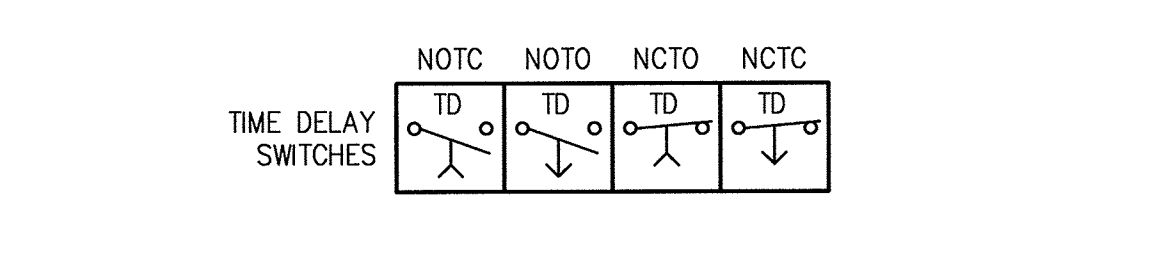
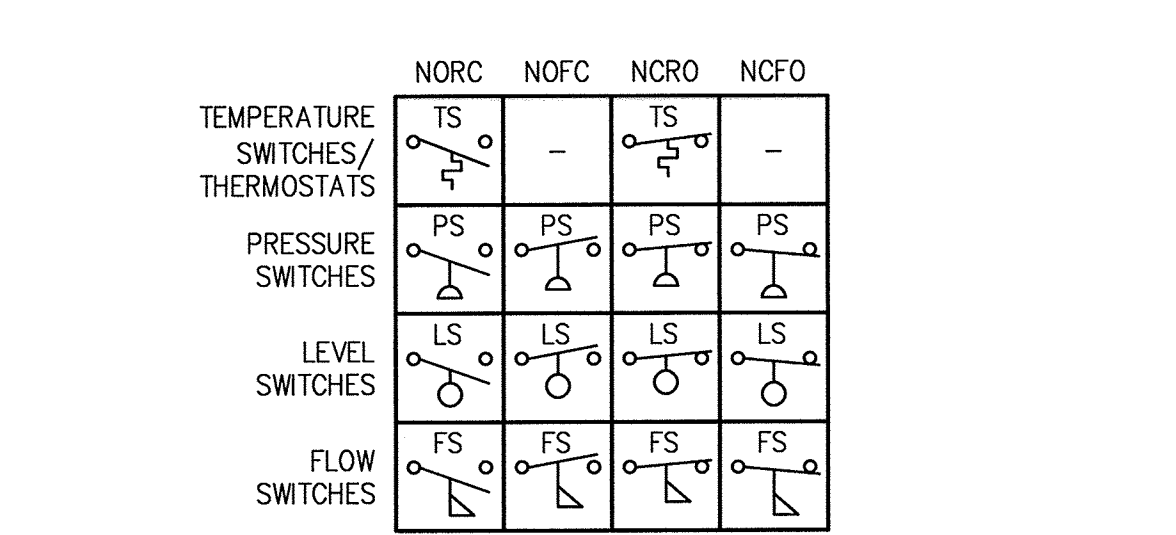
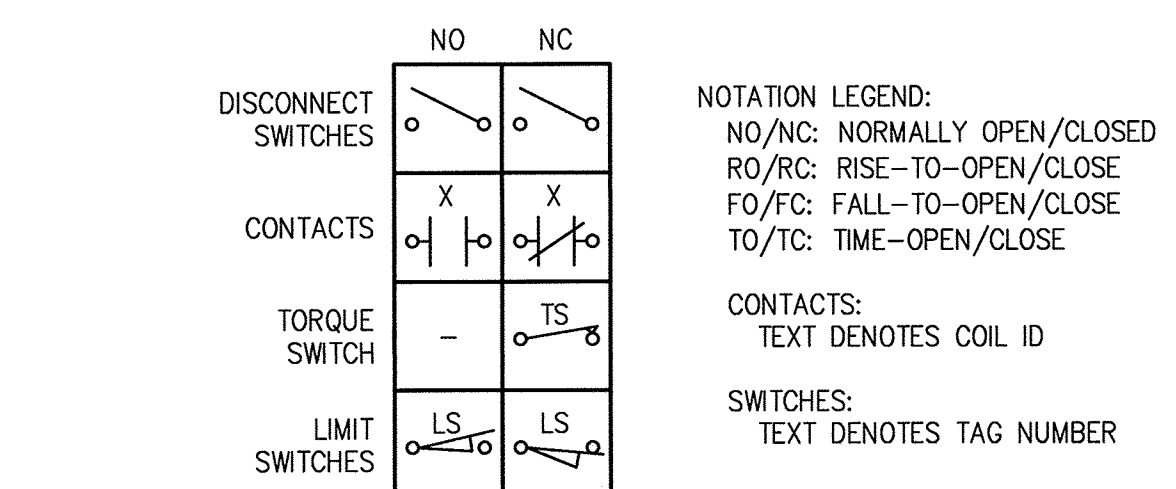
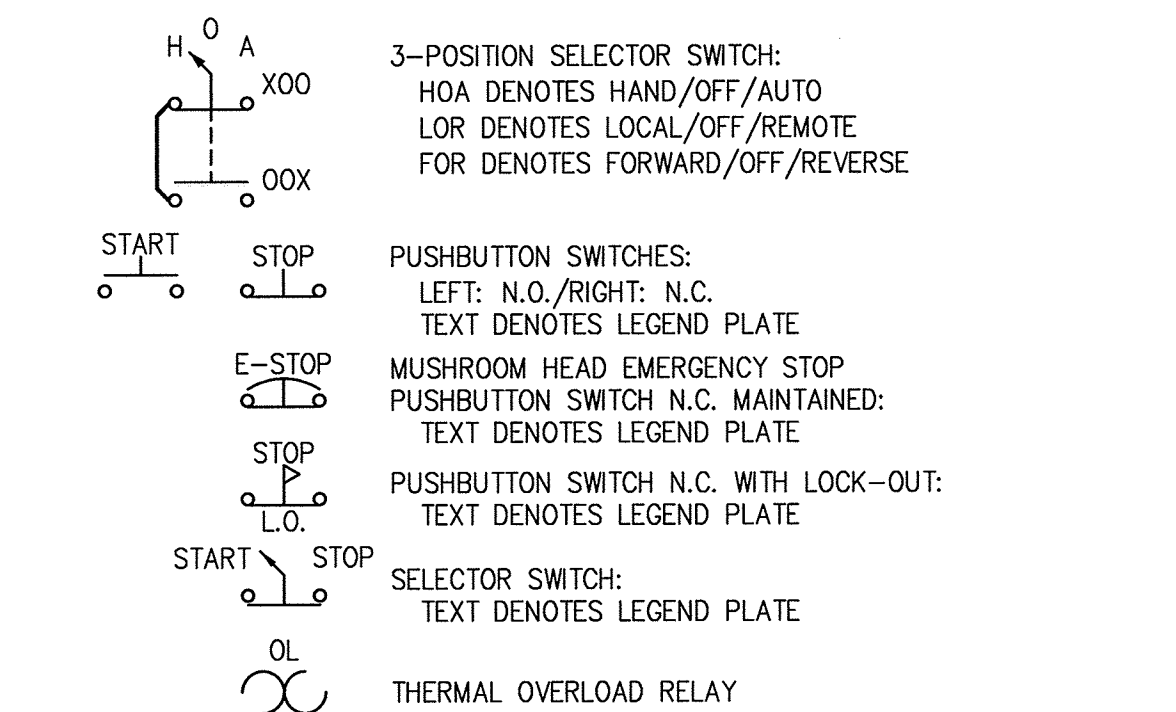
**HVAC AND FIRE ALARM**



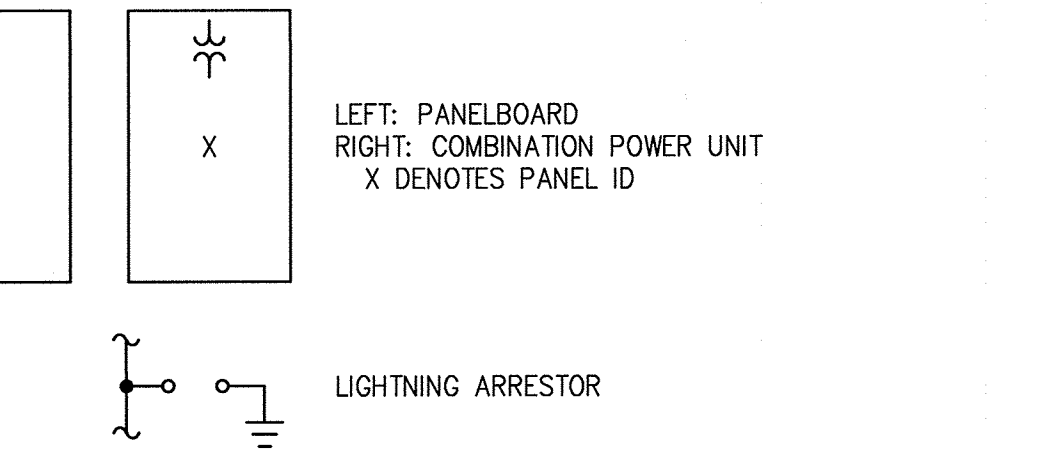
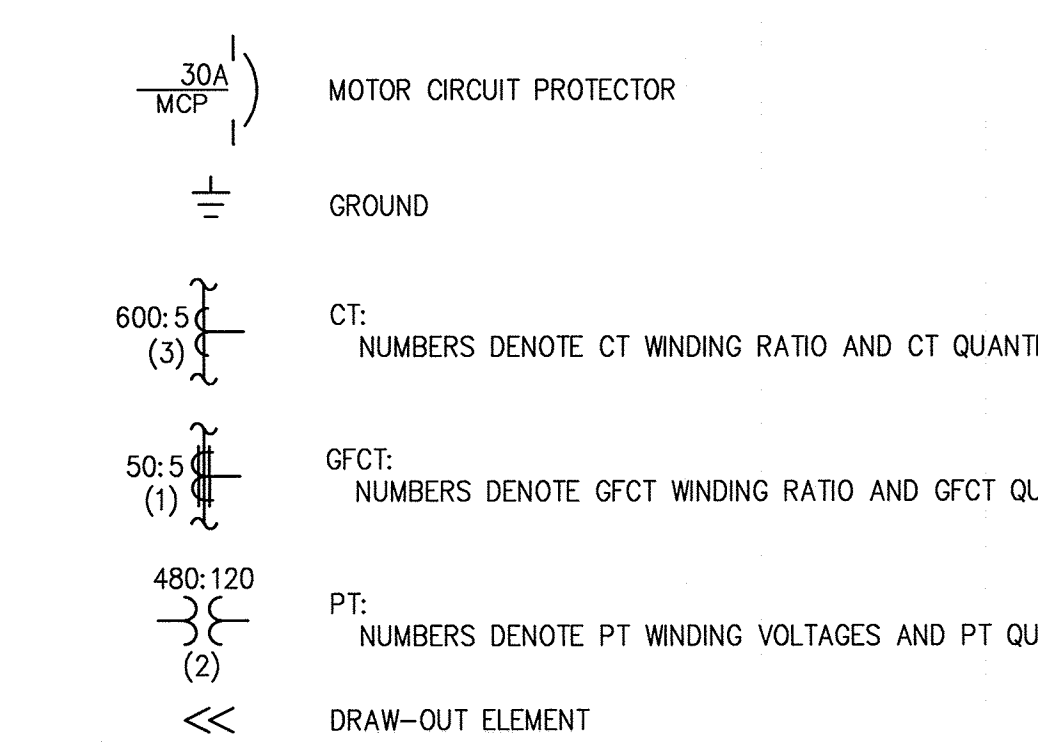
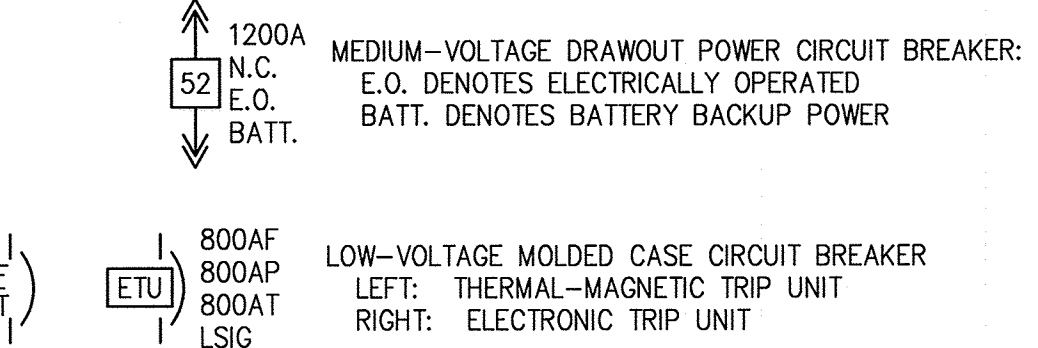
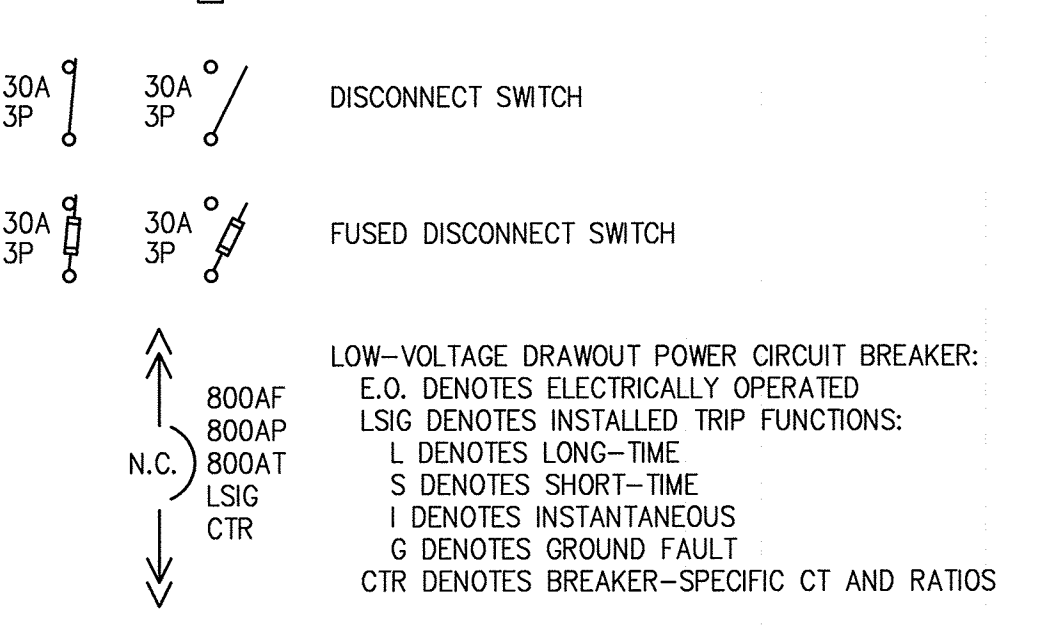
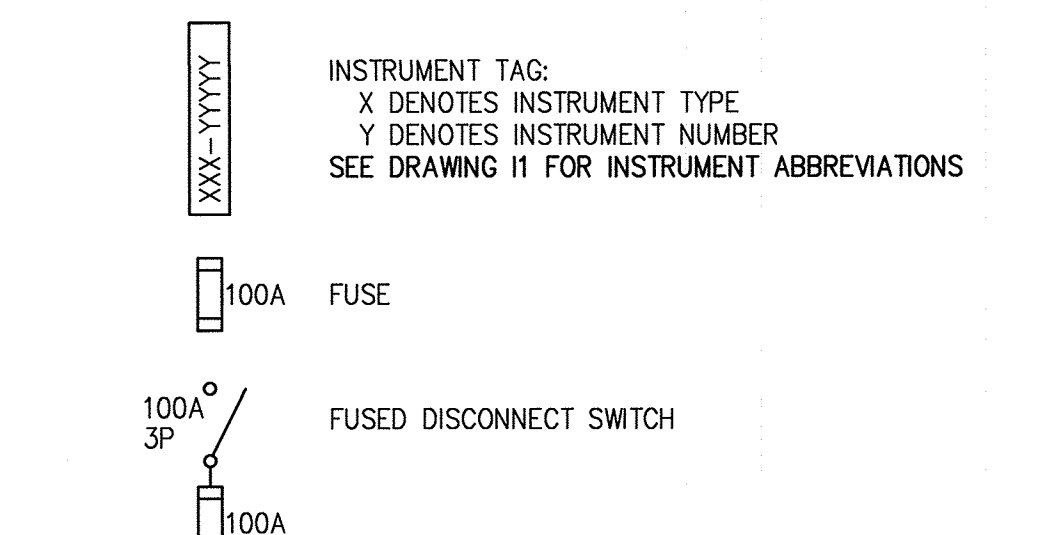
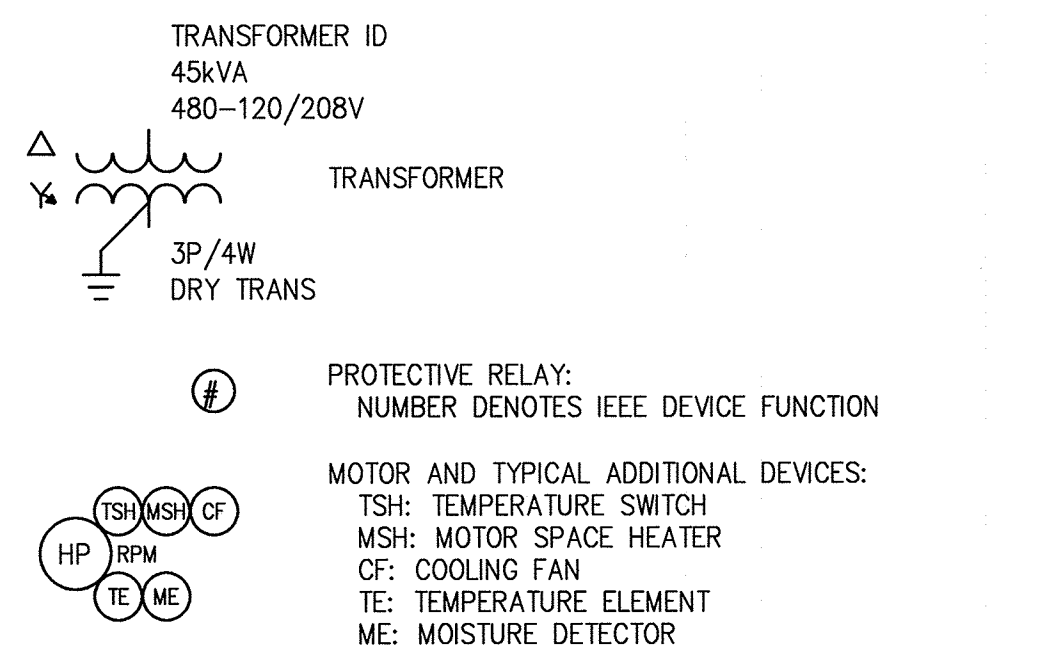
**EQUIPMENT/DEVICE LOCATION SYMBOLS**



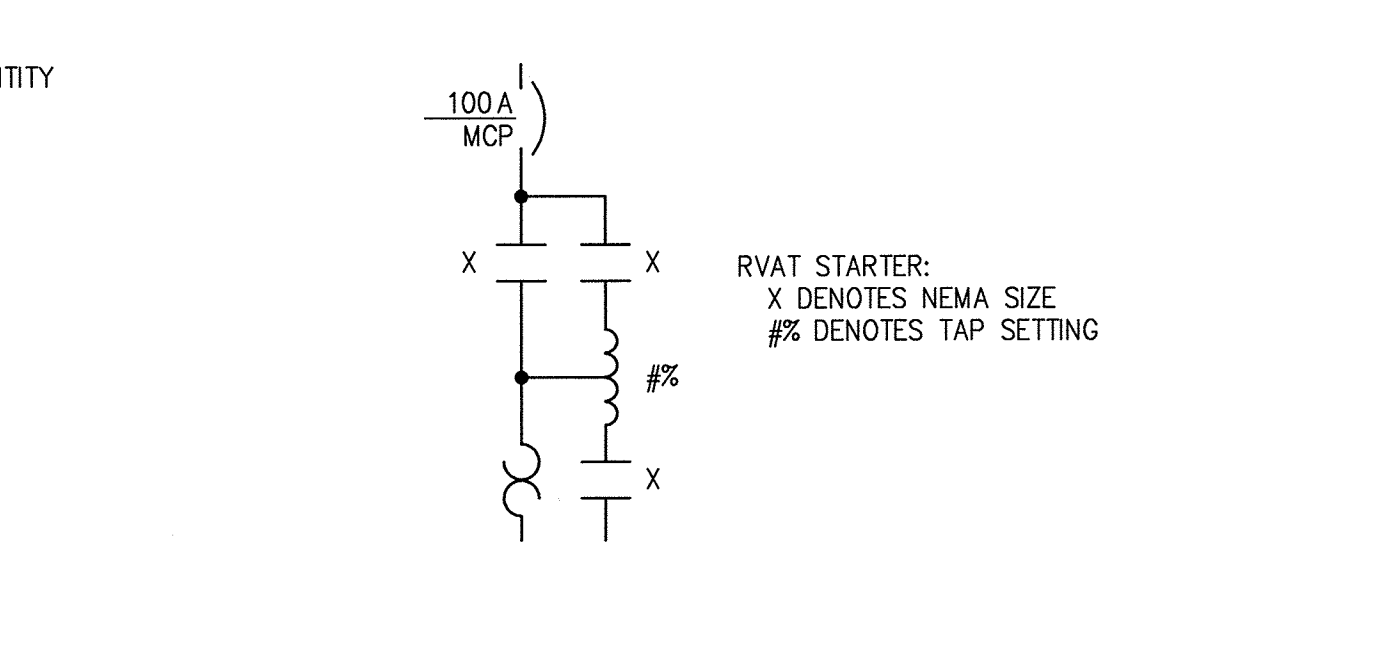
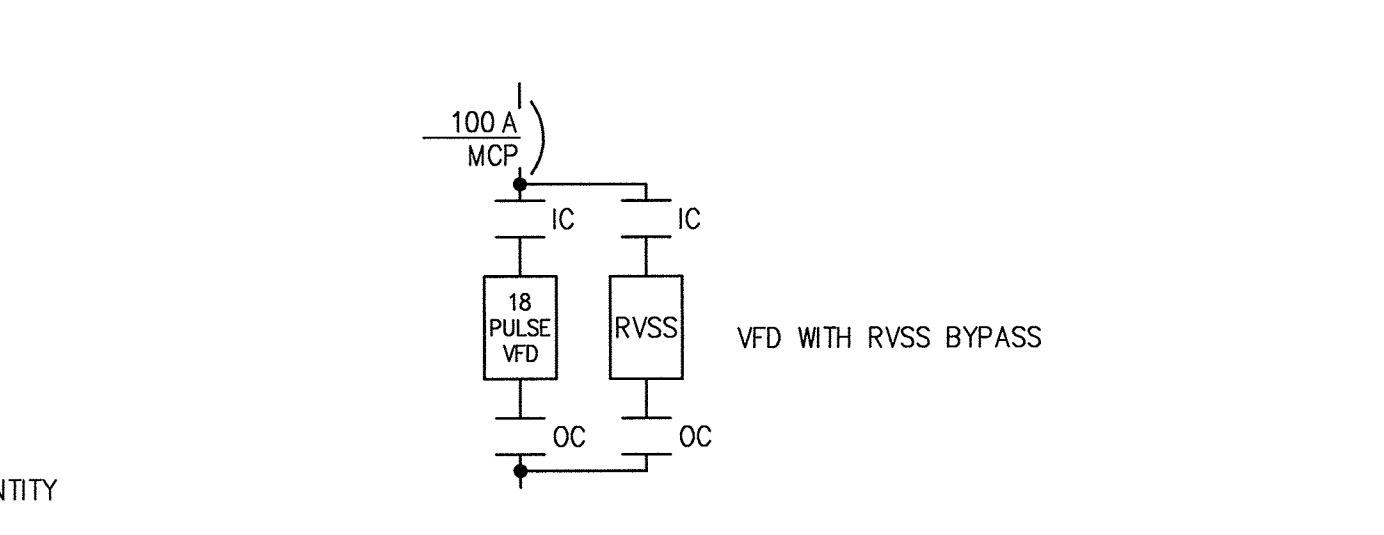
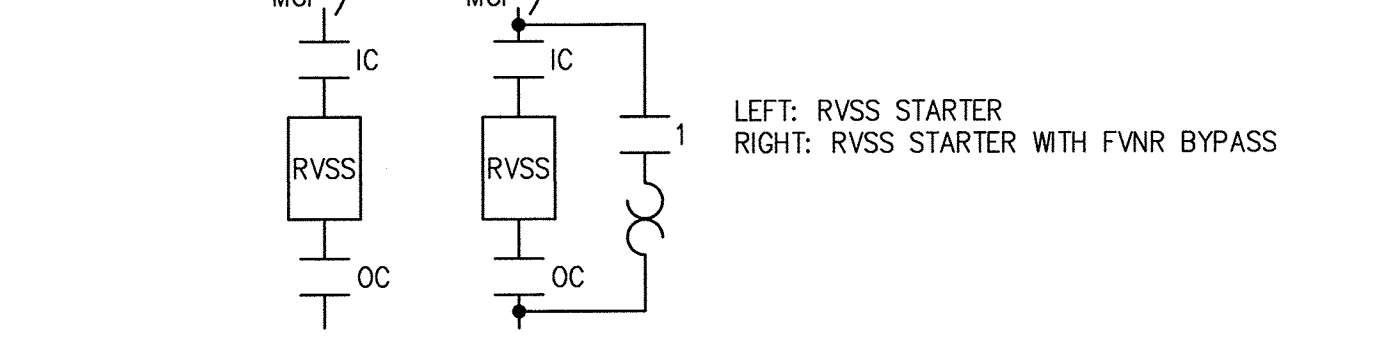
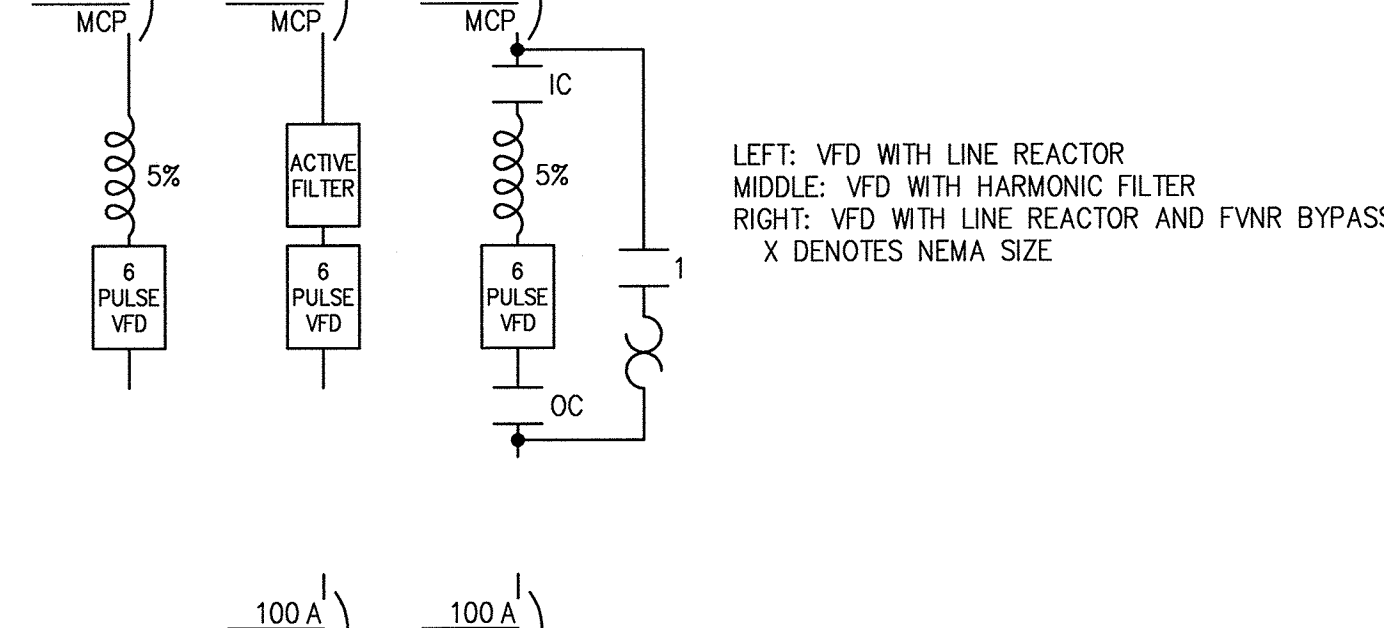
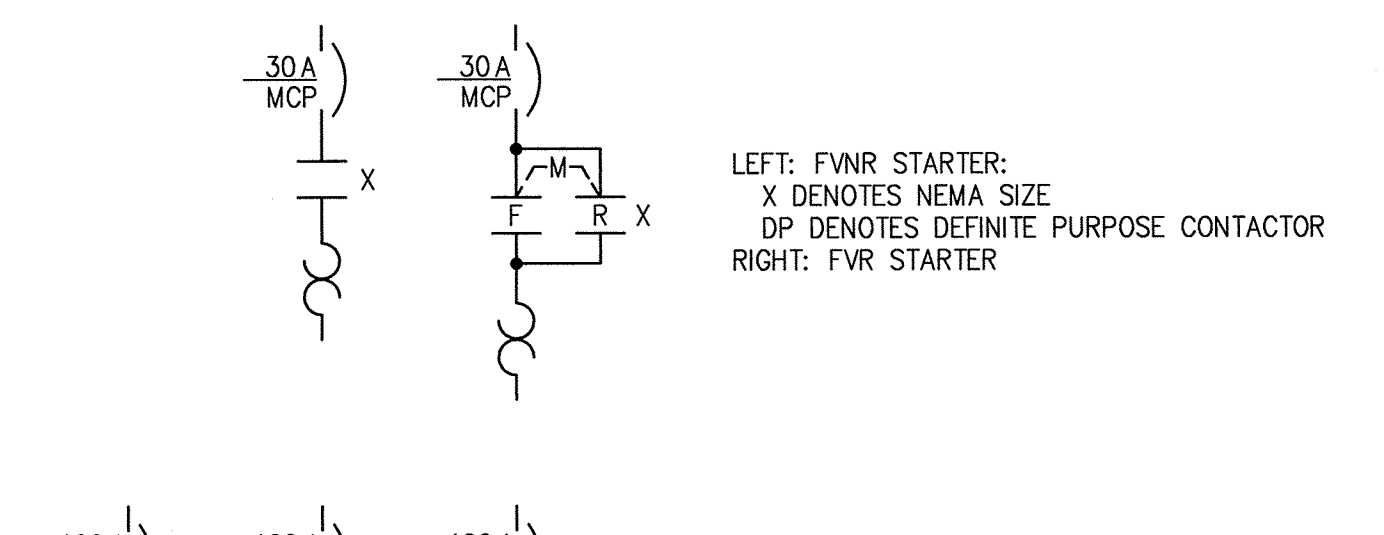
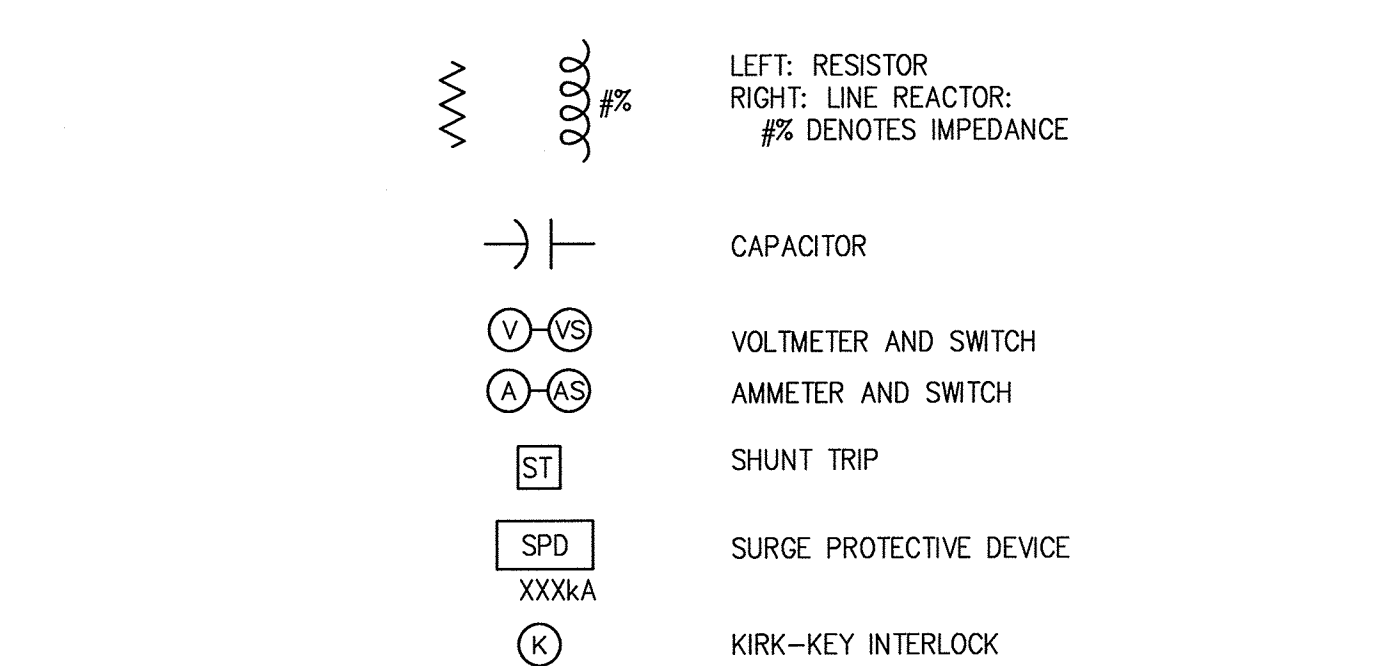
**ELEMENTARY CONTROL SCHEMATICS**



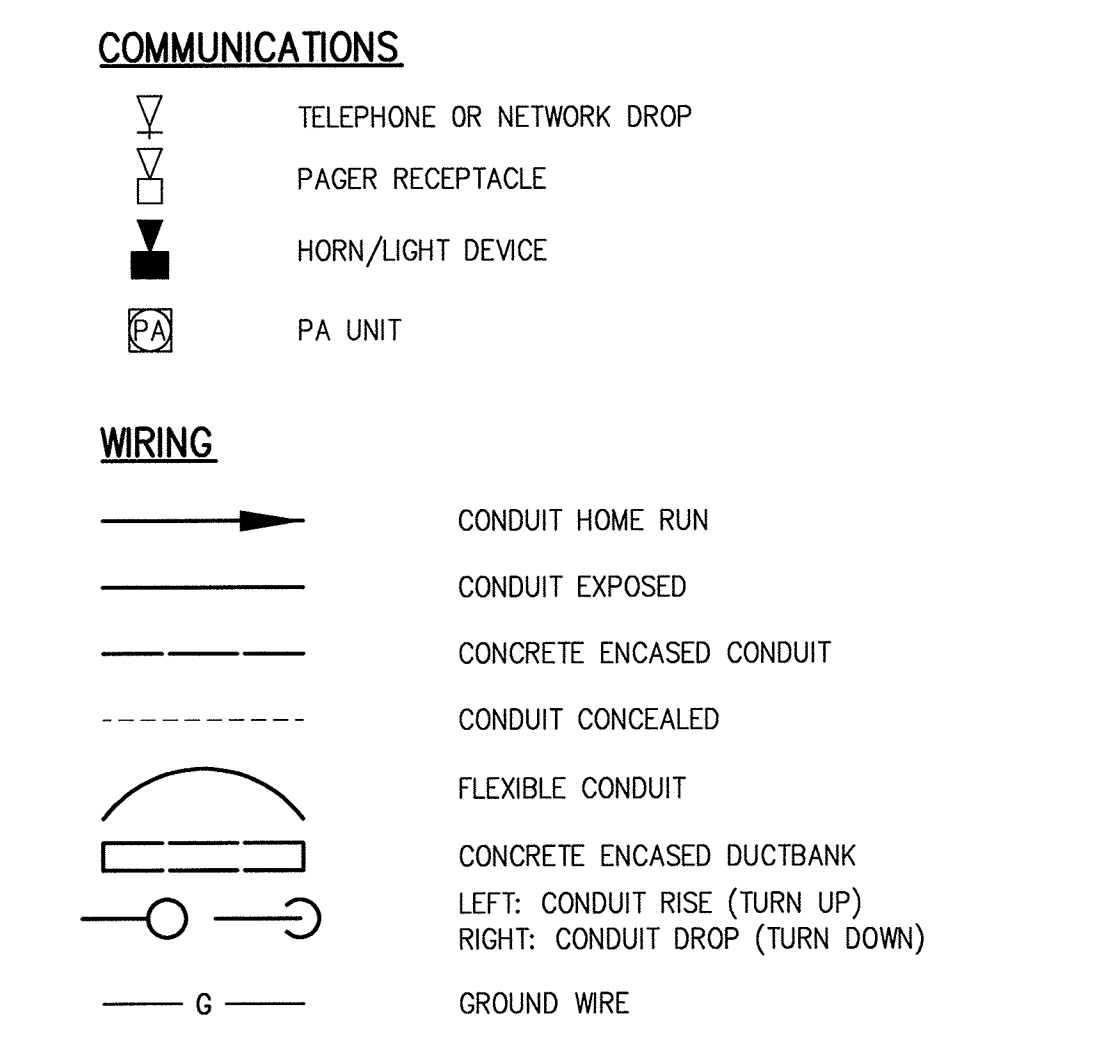
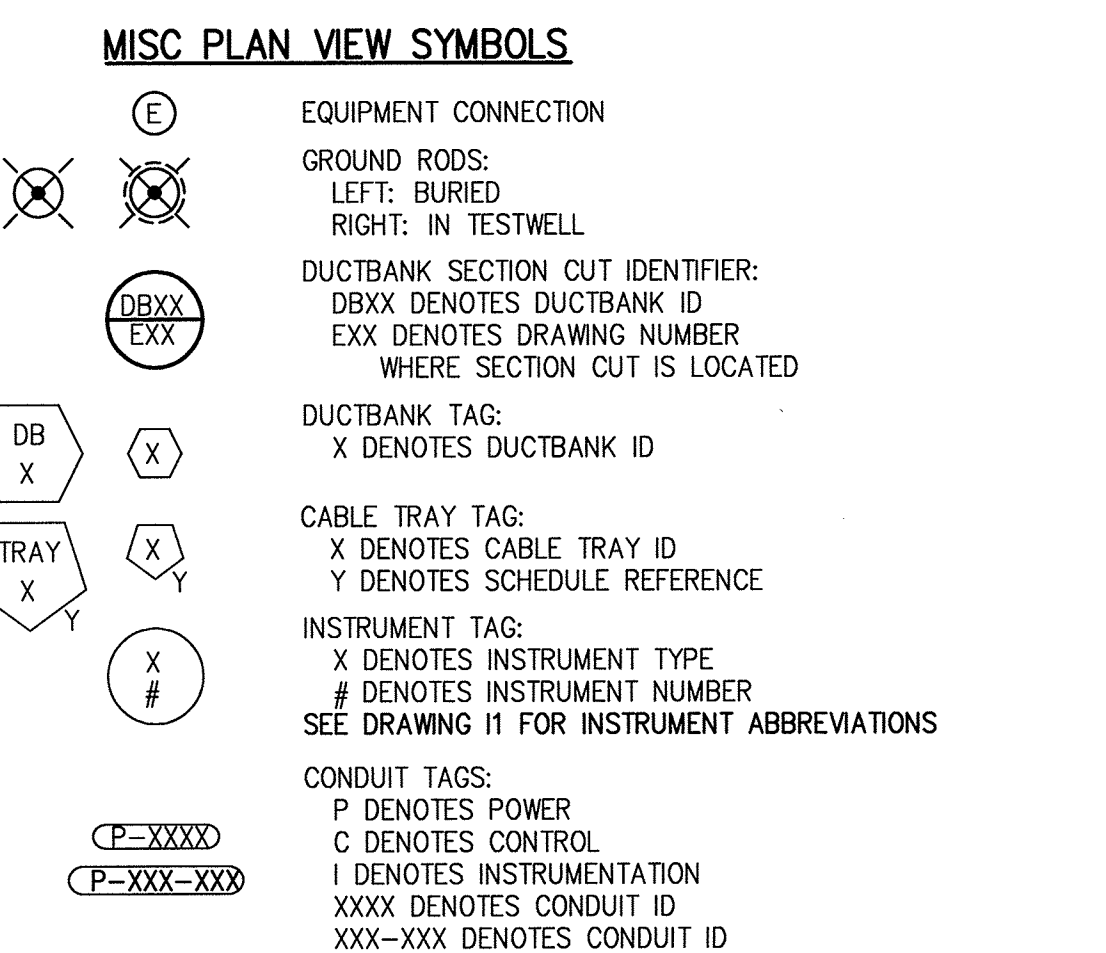
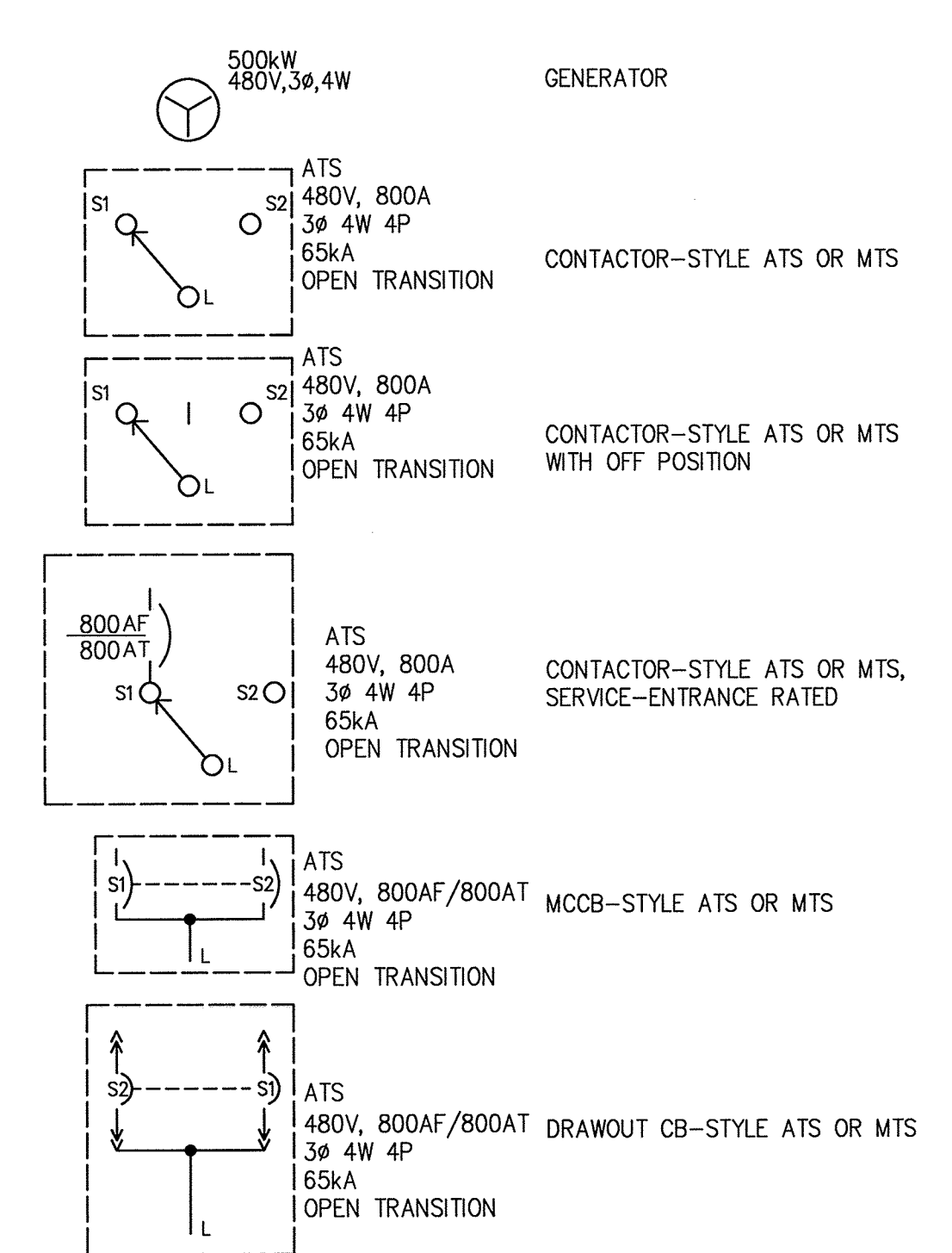
**SINGLE-LINE DIAGRAMS**



**SINGLE-LINE DIAGRAMS, CONT'D.**



**SINGLE-LINE DIAGRAMS, CONT'D.**



AS - BUILT

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*J. G. De...* 2/13/17  
DIRECTOR OF PUBLIC WORKS DATE

*Mamas E. Butler* 2/14/17  
CHIEF BUREAU OF ENGINEERING DATE

*S. C. G...* 2/14/17  
CHIEF BUREAU OF UTILITIES DATE

*[Signature]* 2/14/17  
CHIEF UTILITY DESIGN DIVISION DATE

**Hazen**

HAZEN AND SAWYER  
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202  
410-539-7681

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. 42535, EXPIRATION DATE 07/25/2018.

DESIGNED: DPW  
DRAWN: MRB  
CHECKED: JCS  
PROJ. ENGR.: AA

SIGNED: \_\_\_\_\_  
APPROVED: \_\_\_\_\_ NO. \_\_\_\_\_ ISSUED FOR: \_\_\_\_\_ DATE: \_\_\_\_\_ BY: \_\_\_\_\_

**ELECTRICAL**

LEGEND AND SYMBOLS

INFLUENT PUMPING STATION  
PUMP REPLACEMENT CONTRACT  
LITTLE PATUXENT WATER RECLAMATION PLANT  
CAPITAL PROJECT NUMBER S-6264  
CONTRACT NUMBER 20-4991  
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE: JAN 2017  
DRAWING NUMBER: E1  
SCALE: AS SHOWN  
SHEET 17 OF 27

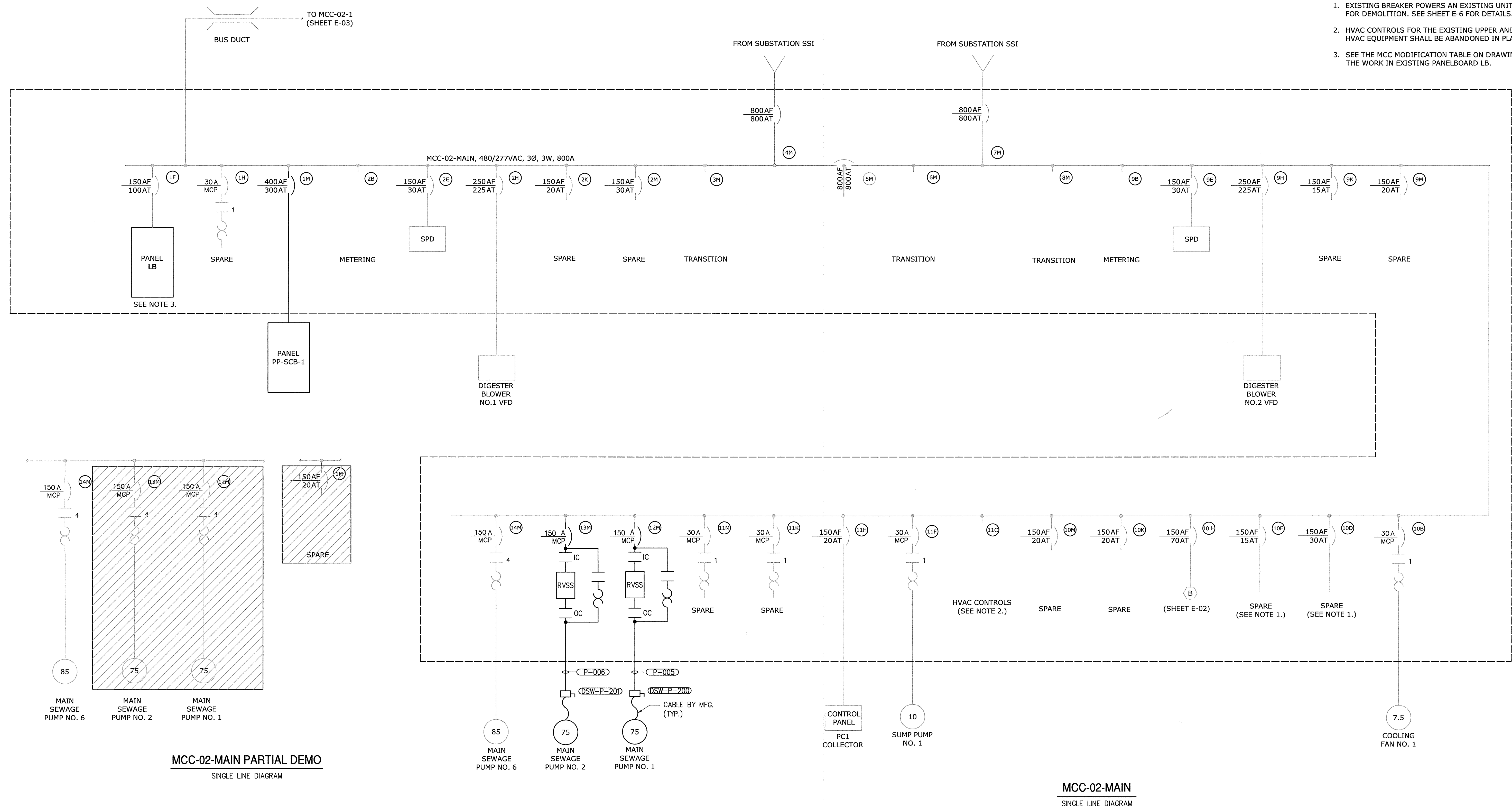
MADE BY: 32732-1B

**GENERAL ELECTRICAL NOTES:**

1. ALL WORK SHALL BE INCLUDED IN BASE BID UNLESS INDICATED TO BE INCLUDED IN ADDITIVE ALTERNATIVE NO. 1.

**NOTES:**

1. EXISTING BREAKER POWERS AN EXISTING UNIT HEATER SCHEDULED FOR DEMOLITION. SEE SHEET E-6 FOR DETAILS.
2. HVAC CONTROLS FOR THE EXISTING UPPER AND LOWER PUMP ROOM HVAC EQUIPMENT SHALL BE ABANDONED IN PLACE.
3. SEE THE MCC MODIFICATION TABLE ON DRAWING E-6 FOR DETAILS ON THE WORK IN EXISTING PANELBOARD LB.



**MCC-02-MAIN PARTIAL DEMO**  
SINGLE LINE DIAGRAM

**MCC-02-MAIN**  
SINGLE LINE DIAGRAM

**AS - BUILT**

|   |   |
|---|---|
| DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND         |   |
| <i>Jay Lee</i><br>DIRECTOR OF PUBLIC WORKS<br>DATE: 2/14/17   | <i>Thomas E. Butler</i><br>CHIEF BUREAU OF ENGINEERING<br>DATE: 2/14/17 |
| <i>John Doe</i><br>CHIEF BUREAU OF UTILITIES<br>DATE: 2/14/17 | <i>John Doe</i><br>CHIEF UTILITY DESIGN DIVISION<br>DATE: 2/14/17       |

**Hazen**  
HAZEN AND SAWYER  
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202  
410-539-7681



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. 42535, EXPIRATION DATE 07/25/2018.  
SIGNED: 2/14/17

|             |     |
|-------------|-----|
| DESIGNED    | DPW |
| DRAWN       | DPW |
| CHECKED     | JCS |
| PROJ. ENGR. | AA  |
| APPROVED    |     |

|                  |  |
|------------------|--|
| ELECTRICAL       |  |
| ONE-LINE DIAGRAM |  |
| MCC-02-MAIN      |  |

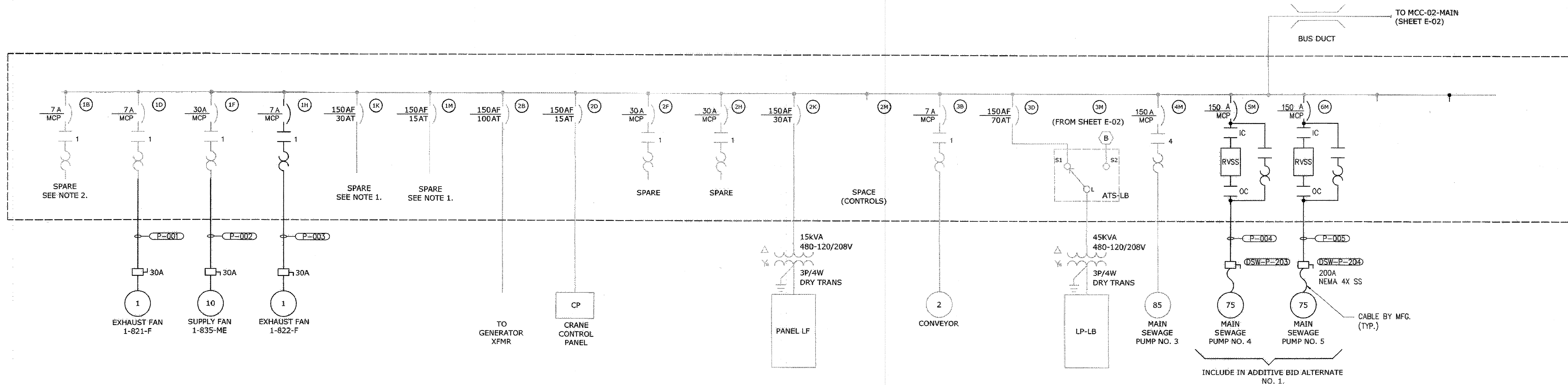
INFLUENT PUMPING STATION  
PUMP REPLACEMENT CONTRACT  
LITTLE PATUXENT WATER RECLAMATION PLANT  
CAPITAL PROJECT NUMBER S-6264  
**CONTRACT NUMBER 20-4991**  
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

|                |          |
|----------------|----------|
| DATE           | JAN 2017 |
| DRAWING NUMBER | E2       |
| SCALE          | AS SHOWN |
| SHEET          | 18 OF 27 |

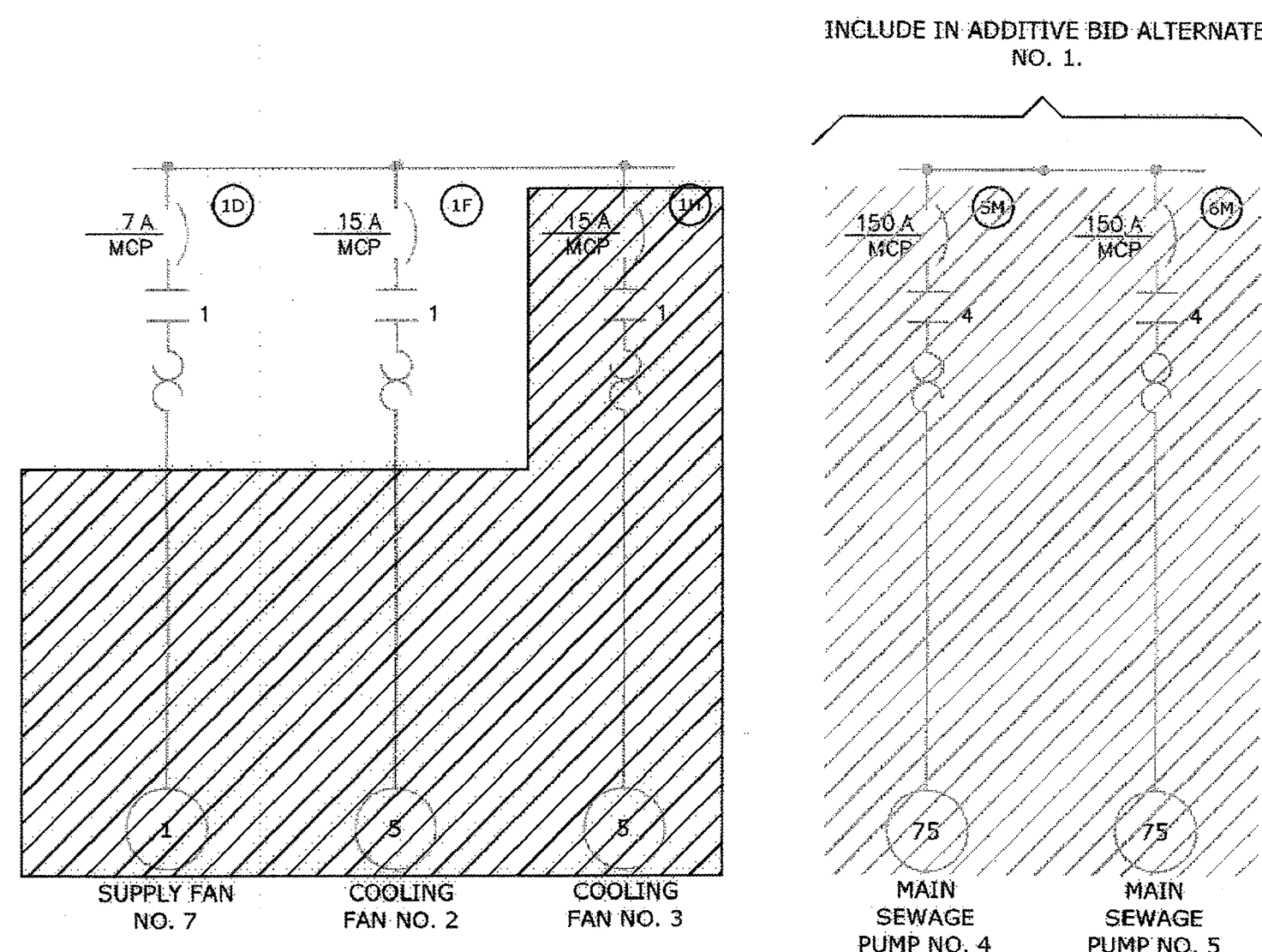
IMAGE# 32232-TB

**NOTES:**

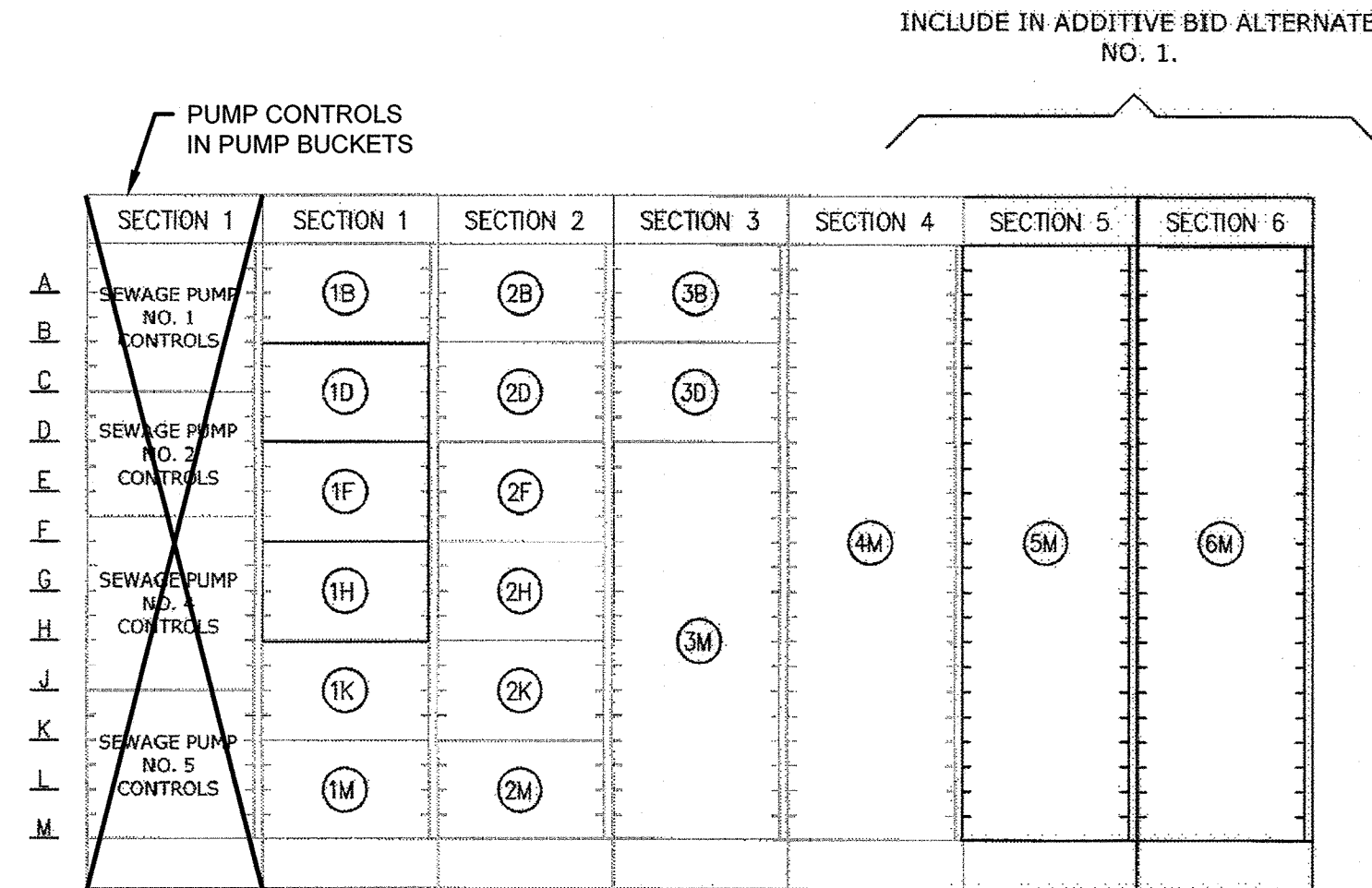
- EXISTING BREAKER POWERS AN EXISTING UNIT HEATER SCHEDULED FOR DEMOLITION. SEE SHEET E-6 FOR DETAILS.
- EXISTING BREAKER POWERS EXISTING EXHAUST FAN EF-3 SCHEDULED FOR DEMOLITION. SEE SHEET E-6 FOR DETAILS



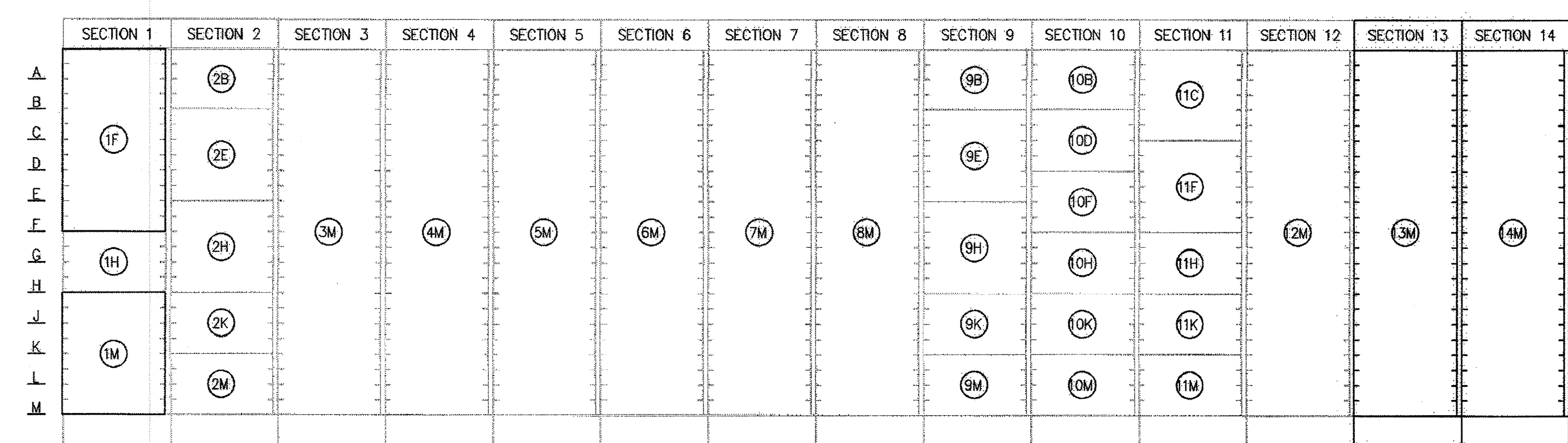
**MCC-02-1**  
SINGLE LINE DIAGRAM



**MCC-02-1 PARTIAL DEMOLITION**  
SINGLE LINE DIAGRAM



**MCC-02-1 ELEVATION**  
NO SCALE



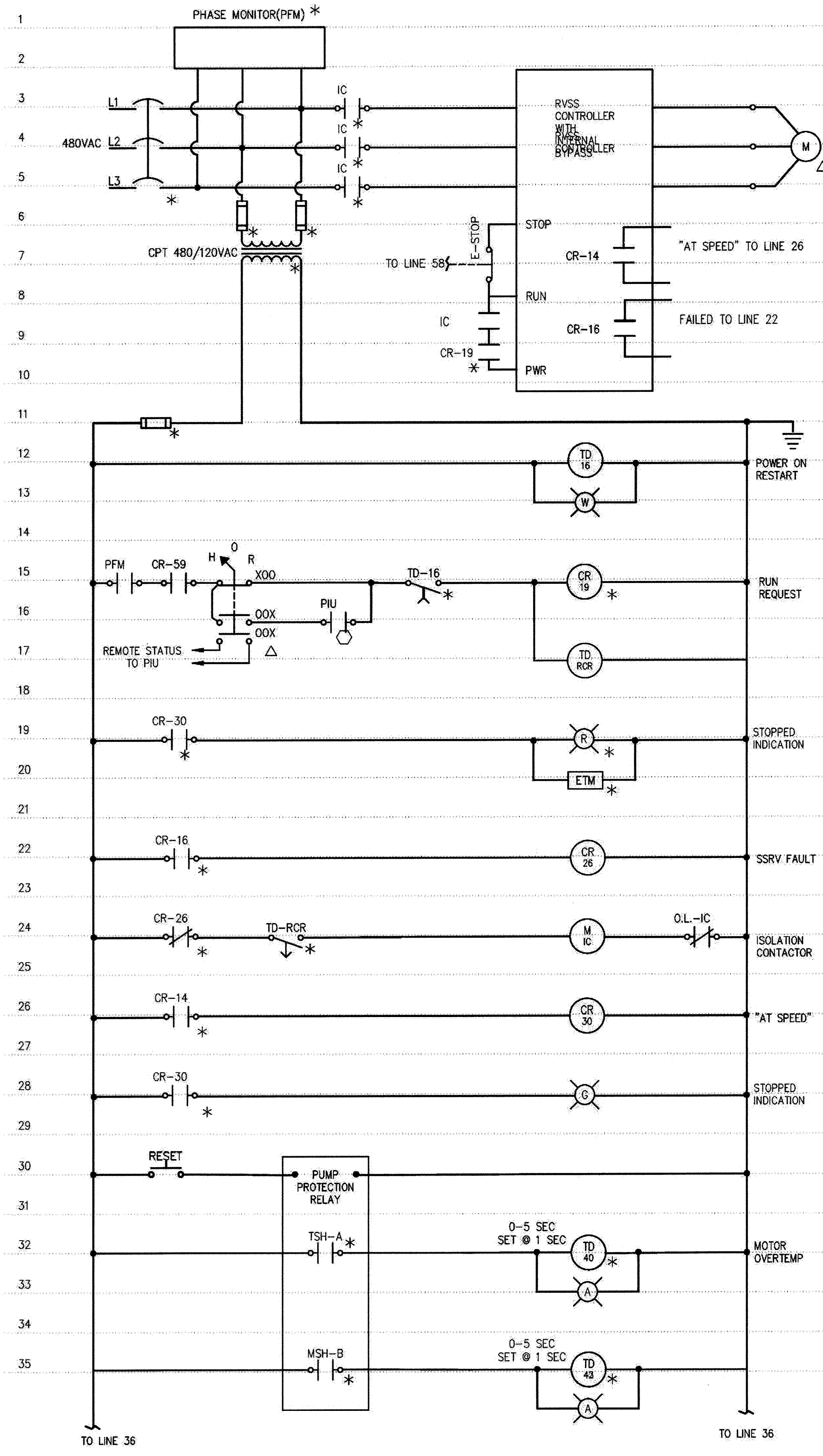
**MCC-02-MAIN ELEVATION**  
NO SCALE

**AS-BUILT REPLACEMENT SHEET 1/2019**

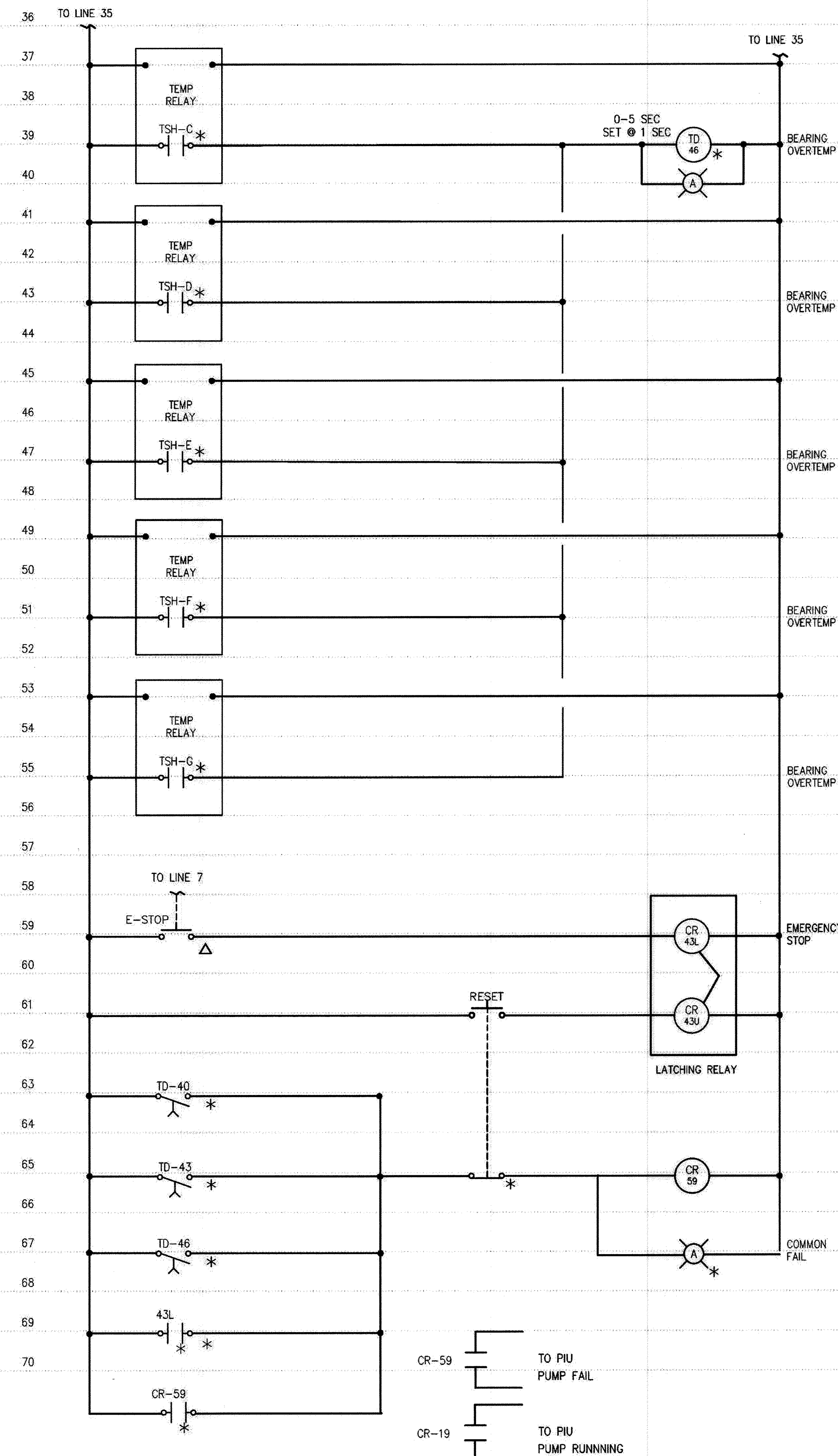
|  |  |   |  |  |  |   |  |  |  |   |  |  |  |
|--|--|---|--|--|--|---|--|--|--|---|--|--|--|
| DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>DATE: 3/7/19<br>DATE: 2-26-19 |  | <b>Hazen</b><br>HAZEN AND SAWYER<br>1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202<br>410-539-7681 |  | PROFESSIONAL CERTIFICATION:<br>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. 42535, EXPIRATION DATE 07/25/2018.<br>SIGNED: |  | DESIGNED: DPW<br>DRAWN: DPW<br>CHECKED: JCS<br>PROJ. ENGR.: AA<br>APPROVED: |  | ELECTRICIAL<br>ONE-LINE DIAGRAM<br>MCC-02-01 |  | INFLUENT PUMPING STATION<br>PUMP REPLACEMENT CONTRACT<br>LITTLE PATUXENT WATER RECLAMATION PLANT<br>CAPITAL PROJECT NUMBER S-6264<br>CONTRACT NUMBER 20-4991<br>6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND |  | DATE: JAN 2017<br>DRAWING NUMBER: E3<br>SCALE AS SHOWN<br>SHEET 19 OF 27 |  |
|--|--|---|--|--|--|---|--|--|--|---|--|--|--|

MAKE: XREF: 32232-1B  
 20170116 12:58P O:\32232-BAL\32232-005\Drawings\Electrical\E3.dwg LostSovBy:EPROSSER

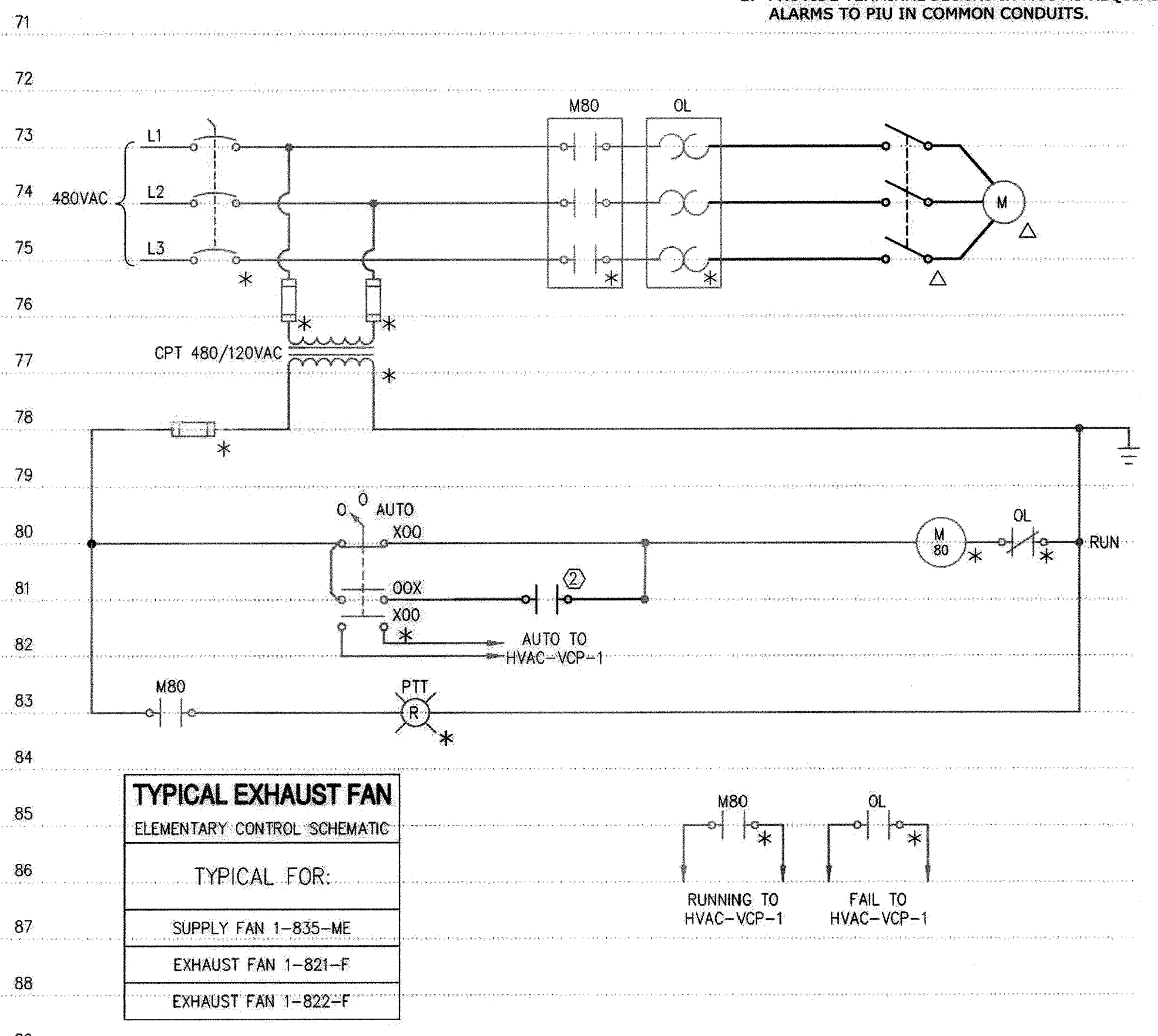
- NOTES:**
1. PROVIDE ADDITIONAL PUMP PROTECTION SENSOR, TIME DELAY RELAY AND PILOT LIGHT FOR BEARING HIGH TEMPERATURE ALARM AS SPECIFIED IF PROVIDED BY THE PUMP MANUFACTURER.
  2. PROVIDE TERMINAL BLOCKS IN MCC AS REQUIRED TO ROUTE FIELD ALARMS TO PIU IN COMMON CONDUITS.



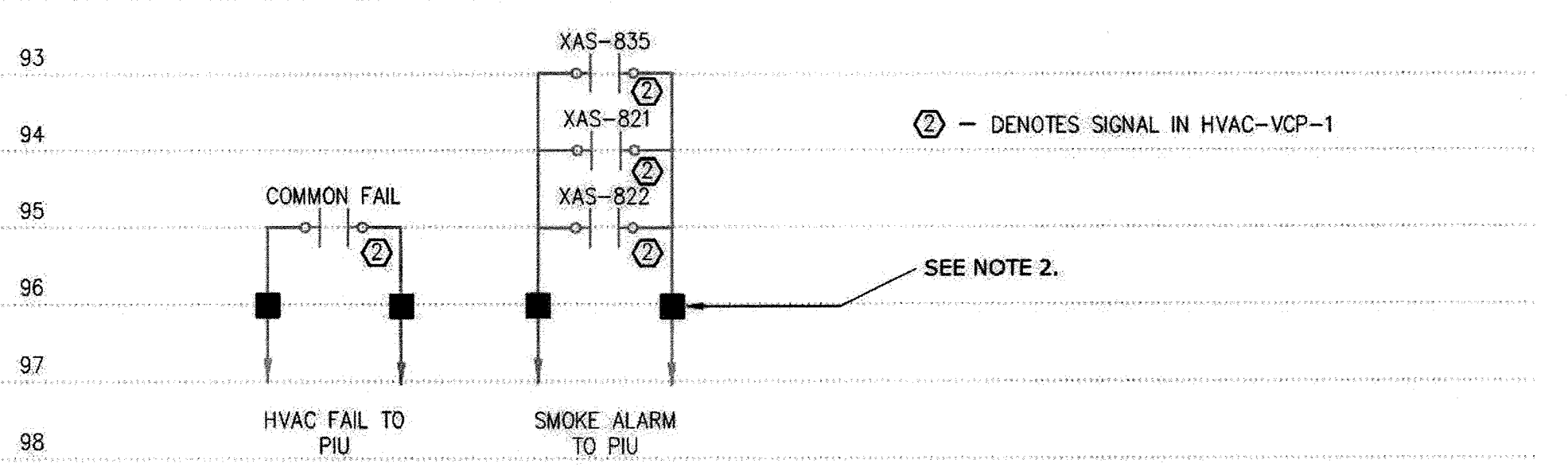
**INFLUENT PUMPS 1, 2, 4 AND 5 MOTOR CONTROL SCHEMATIC**  
NO SCALE



**INFLUENT PUMPS 1, 2, 4 AND 5 PROTECTION SCHEMATIC**  
NO SCALE



**TYPICAL EXHAUST FAN ELEMENTARY CONTROL SCHEMATIC**  
NO SCALE



**HVAC ALARMS**  
NO SCALE

**AS-BUILT REPLACEMENT SHEET 1/2019**

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

3/6/19  
DIRECTOR OF PUBLIC WORKS

2/28/19  
CHIEF BUREAU OF ENGINEERING

2/26/19  
CHIEF BUREAU OF UTILITIES

2/26/19  
CHIEF UTILITY DESIGN DIVISION

**Hazen**

HAZEN AND SAWYER  
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202  
410-539-7881



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. 42535, EXPIRATION DATE 2/28/19.

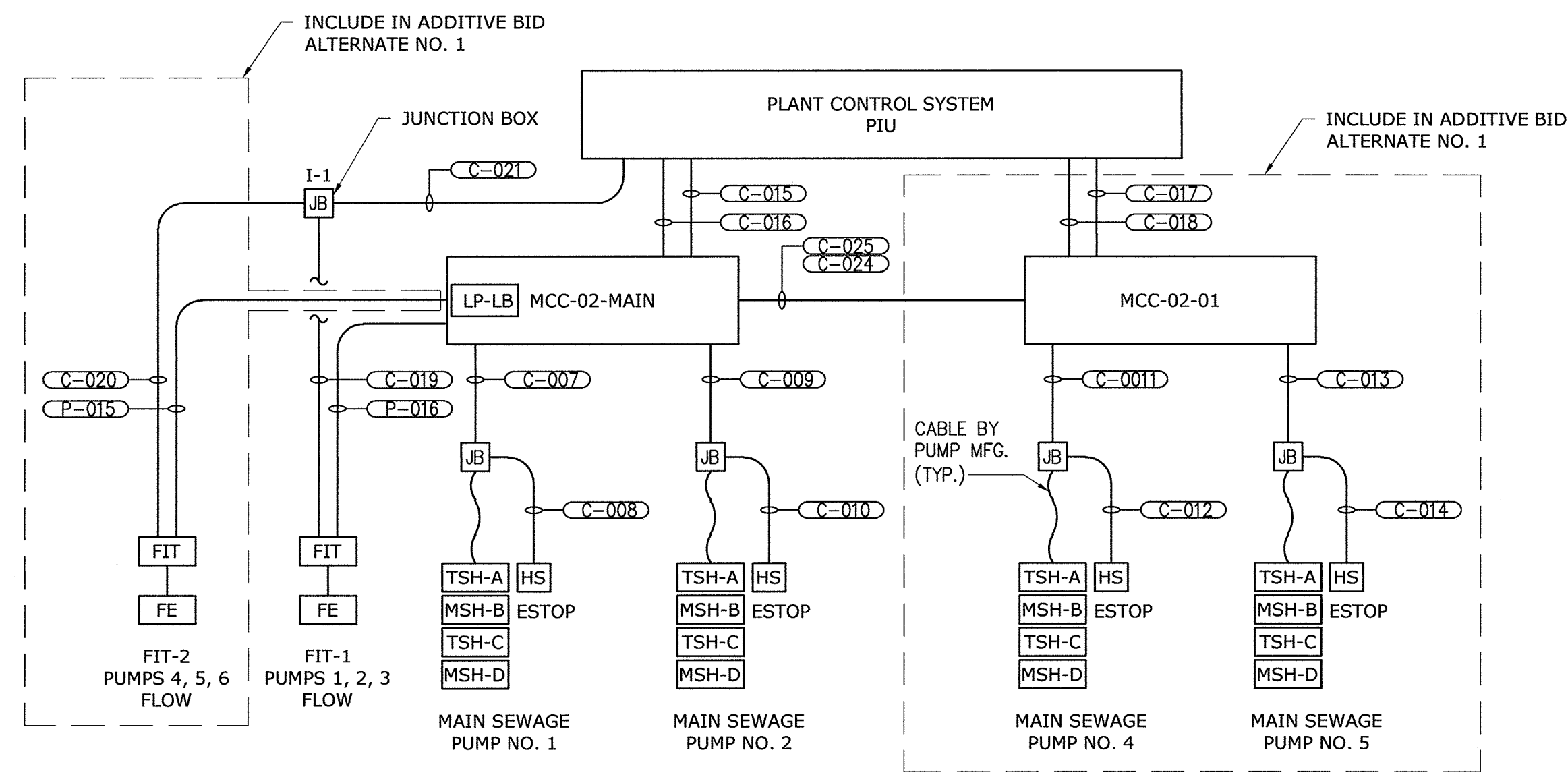
|             |     |            |        |    |  |
|-------------|-----|------------|--------|----|--|
| DESIGNED    |     |            |        |    |  |
| DRAWN       |     |            |        |    |  |
| CHECKED     |     |            |        |    |  |
| PROJ. ENGR. | 3   | AS-BUILT   | 1/9/19 | AA |  |
|             | 2   | ADDENDUM   | 5/9/17 | AA |  |
|             | 1   | ADDENDUM   | 5/9/17 | AA |  |
| APPROVED    | NO. | ISSUED FOR | DATE   | BY |  |

**ELECTRICAL**

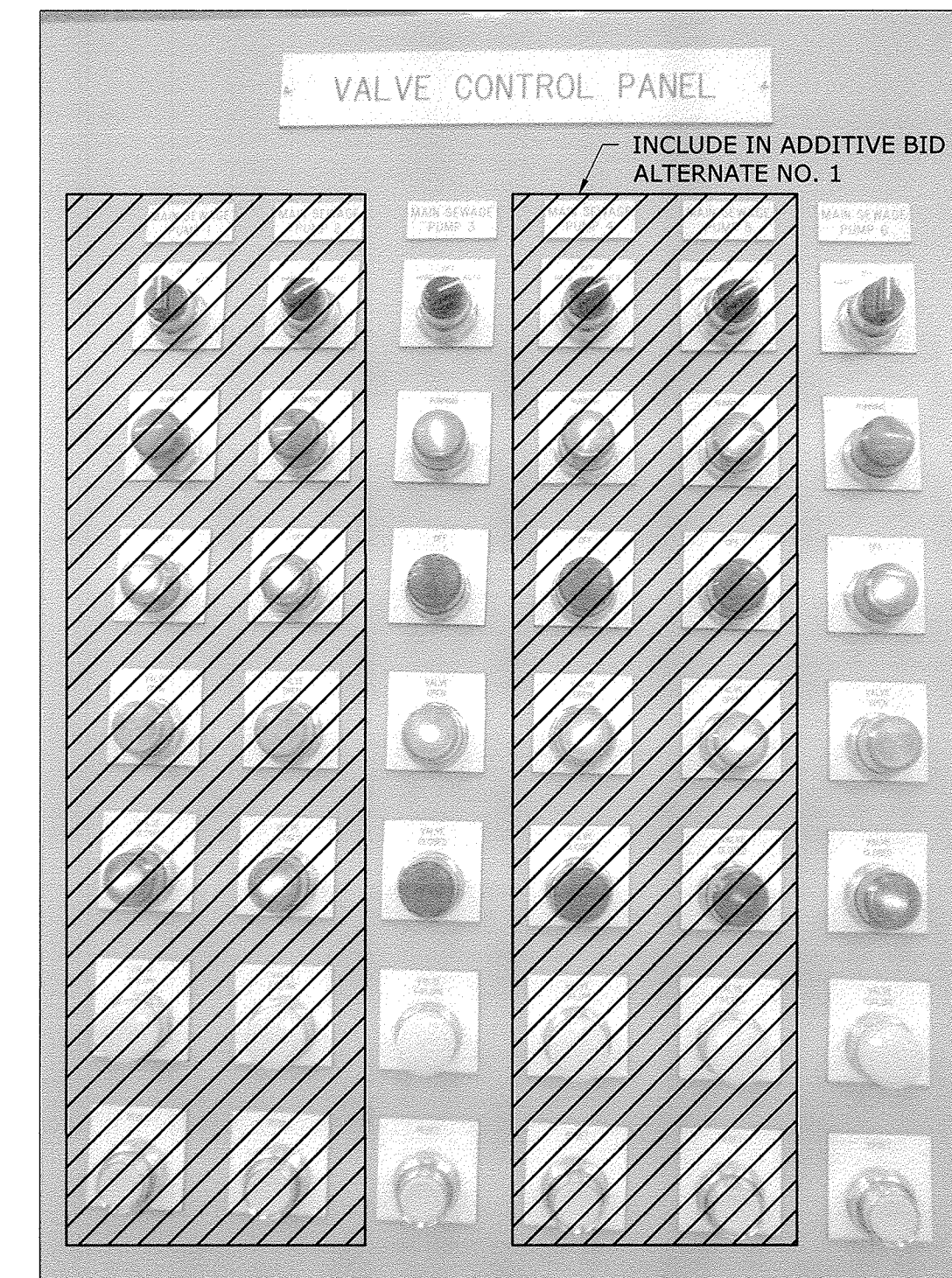
**PUMP MOTOR CONTROL STARTER**

INFLUENT PUMPING STATION  
PUMP REPLACEMENT CONTRACT  
LITTLE PATUXENT WATER RECLAMATION PLANT  
CAPITAL PROJECT NUMBER S-6264  
**CONTRACT NUMBER 20-4991**  
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE JAN 2017  
DRAWING NUMBER E-4  
SCALE AS SHOWN  
SHEET 20 OF 27



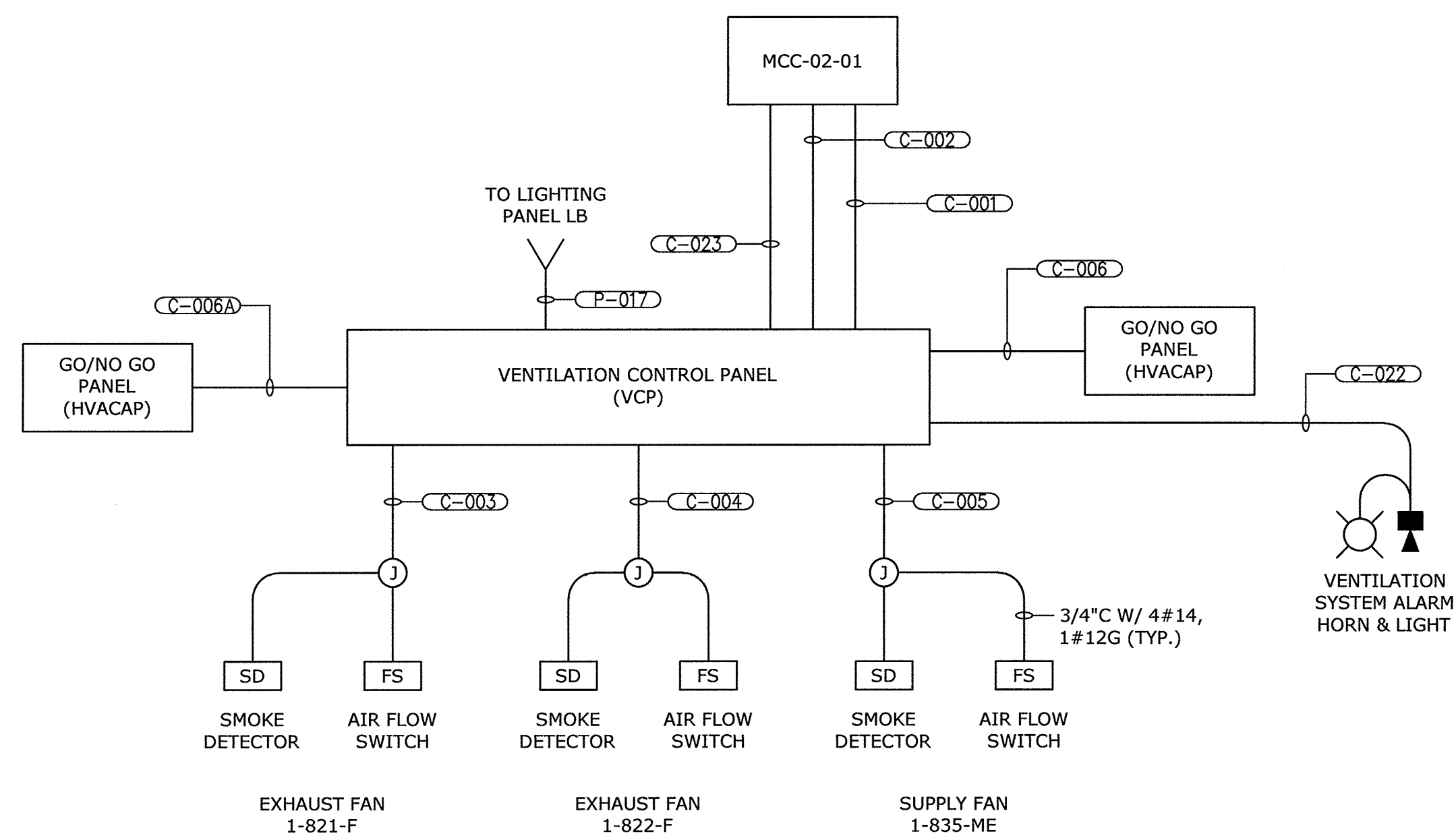
**MAIN SEWAGE PUMP CONTROL RISER**  
NO SCALE



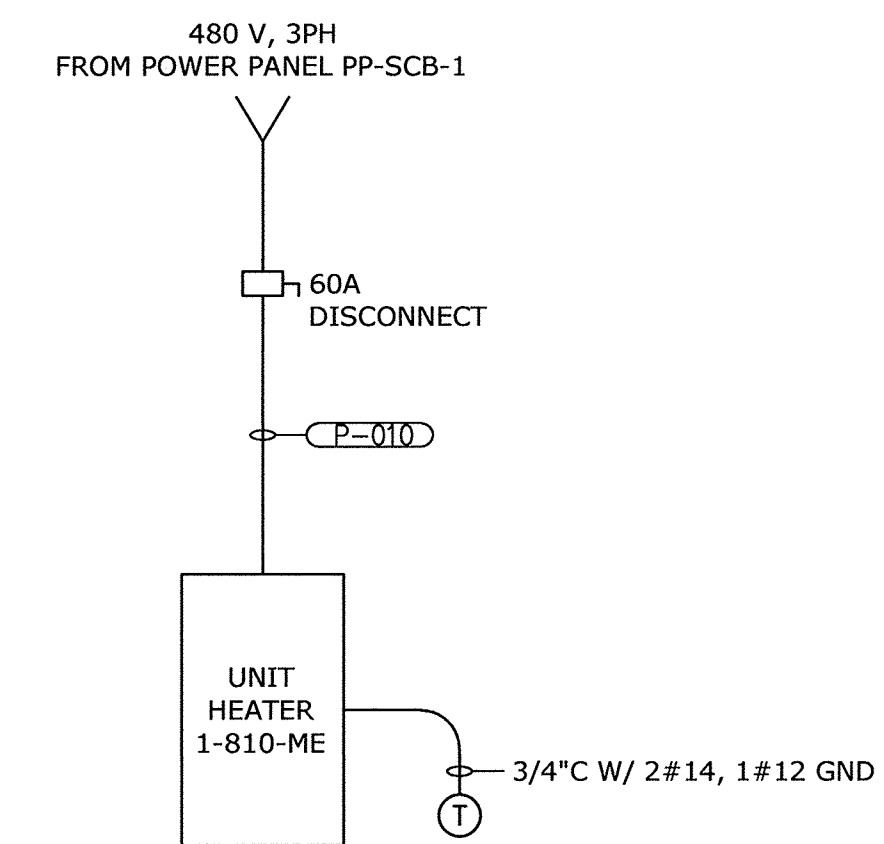
**VALVE CONTROL PANEL - PARTIAL DEMOLITION**  
NO SCALE

**VALVE CONTROL PANEL DEMOLITION NOTES:**

1. SUBSEQUENT TO THE SUCCESSFUL DEMONSTRATION OF THE NEW PUMPS, THE EXISTING VALVE/PUMP CONTROLS FOR PUMPS 1, 2, 4 AND 5 SHALL BE DEMOLISHED. VALVE CONTROLS FOR PUMPS 1 AND PUMP 3 SHALL REMAIN IN SERVICE.
2. DISCONNECT WIRING FOR DEMOLISHED PUMPS IN THE VALVE CONTROL CABINET. ENSURE NO ABANDONED WIRING HAS VOLTAGE PRESENT.
3. REMOVE EXISTING PILOT LIGHTS AND DEVICES FROM THE PANEL DOOR.
4. REMOVE TAGS AND LABELS FOR DEMOLISHED PUMPS.
5. PLUG HOLES IN VALVE CONTROL PANEL WITH FITTED PLUGS.



**VENTILATION SYSTEM RISER DIAGRAM**  
NO SCALE



**UNIT HEATER 1-810-ME**  
NO SCALE  
TYPICAL FOR 5 HEATERS

**AS - BUILT**

IMAGE= Valve Control Panel, XREFs= 32232-TB

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Jan G. K...* 2/3/17  
DIRECTOR OF PUBLIC WORKS DATE

*Muham B. B...* 2/16/17  
CHIEF BUREAU OF ENGINEERING DATE

*...* 2/16/17  
CHIEF UTILITY DESIGN DIVISION DATE

CHIEF BUREAU OF UTILITIES DATE

**Hazen**

HAZEN AND SAWYER  
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202  
410-539-7881

STATE OF MARYLAND  
REGISTERED PROFESSIONAL ENGINEER  
42535  
1/29/17

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. 42535, EXPIRATION DATE 02/25/2018.

SIGNED: \_\_\_\_\_

|             |     |     |            |      |    |
|-------------|-----|-----|------------|------|----|
| DESIGNED    | DPW |     |            |      |    |
| DRAWN       | MRB |     |            |      |    |
| CHECKED     | JCS |     |            |      |    |
| PROJ. ENGR. | AA  |     |            |      |    |
| APPROVED    |     | NO. | ISSUED FOR | DATE | BY |

**ELECTRICAL**

**RISER DIAGRAMS AND SCHEDULES**

INFLUENT PUMPING STATION  
PUMP REPLACEMENT CONTRACT  
LITTLE PATUXENT WATER RECLAMATION PLANT  
CAPITAL PROJECT NUMBER S-6264  
**CONTRACT NUMBER 20-4991**  
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

|                |          |
|----------------|----------|
| DATE           | JAN 2017 |
| DRAWING NUMBER | E5       |
| SCALE          | AS SHOWN |
| SHEET          | 21 OF 27 |

| CONDUIT NO. | SIZE   | FROM                    | TO                       | CONDUCTORS          | REMARKS        |
|-------------|--------|-------------------------|--------------------------|---------------------|----------------|
| P-001       | 3/4"   | MCC-02-01               | EXHAUST FAN EF-1         | 3#12, 1-#12 GND     | VIA DISCONNECT |
| P-002       | 3/4"   | MCC-02-01               | SUPPLY FAN SF-1          | 3#12, 1-#12 GND     | VIA DISCONNECT |
| P-003       | 3/4"   | MCC-02-01               | EXHAUST FAN EF-2         | 3#12, 1-#12 GND     | VIA DISCONNECT |
| P-004       | 1 1/2" | MCC-02-01               | MAIN SEWAGE PUMP NO. 4   | 3-#1, 1#1 GND       | VIA DISCONNECT |
| P-005       | 1 1/2" | MCC-02-01               | MAIN SEWAGE PUMP NO. 5   | 3-#1, 1#1 GND       | VIA DISCONNECT |
| P-006       | 1 1/2" | MCC-02-MAIN             | MAIN SEWAGE PUMP NO. 1   | 3-#1, 1#1 GND       | VIA DISCONNECT |
| P-007       | 1 1/2" | MCC-02-MAIN             | MAIN SEWAGE PUMP NO. 2   | 3-#1, 1#1 GND       | VIA DISCONNECT |
| P-008       |        |                         |                          | NOT USED            |                |
| P-009       | 3"     | MCC-02-MAIN             | POWER PANEL PP-SCB-1     | 4-350 kcmil, #4 GND |                |
| P-010       | 1"     | POWER PANEL PP-SCB-1    | UNIT HEATER UH-1         | 3#6, 1#6 GND        | VIA DISCONNECT |
| P-011       | 1"     | POWER PANEL PP-SCB-1    | UNIT HEATER UH-2         | 3#6, 1#6 GND        | VIA DISCONNECT |
| P-012       | 1"     | POWER PANEL PP-SCB-1    | UNIT HEATER UH-3         | 3#6, 1#6 GND        | VIA DISCONNECT |
| P-013       | 3/4"   | POWER PANEL PP-SCB-1    | UNIT HEATER UH-4         | 3#10, 1#10 GND      | VIA DISCONNECT |
| P-014       | 3/4"   | POWER PANEL PP-SCB-1    | UNIT HEATER UH-5         | 3#10, 1#10 GND      | VIA DISCONNECT |
| P-015       | 3/4"   | PANEL LB IN MCC-02-MAIN | FIT-1 (PUMPS 1-3)        | 2#12, 1-#12 GND     |                |
| P-016       | 3/4"   | PANEL LB IN MCC-02-MAIN | FIT-2 (PUMPS 4-6)        | 2#12, 1-#12 GND     |                |
| P-017       | 3/4"   | PANEL LB IN MCC-02-MAIN | CONTROL PANEL HVAC-VCP-1 | 2#12, 1-#12 GND     |                |

| CONDUIT NO. | SIZE | FROM                                     | TO                                       | CONDUCTORS            | REMARKS               |
|-------------|------|--|--|-----------------------|-----------------------|
| C-001       | 3/4" | MOTOR CONTROL CENTER MCC-02-01           | CONTROL PANEL HVAC-VCP-1                 | 8#14, 1#12 GND        |                       |
| C-002       | 3/4" | MOTOR CONTROL CENTER MCC-02-01           | CONTROL PANEL HVAC-VCP-1                 | 16#14, 1#12 GND       |                       |
| C-003       | 3/4" | HVAC CONTROL PANEL HVAC-VCP-1            | JB BY EXHAUST FAN 1-821-F                | 6#14, 1#12 GND; 1-TSP |                       |
| C-004       | 3/4" | HVAC CONTROL PANEL HVAC-VCP-1            | JB BY EXHAUST FAN 1-822-F                | 6#14, 1#12 GND; 1-TSP |                       |
| C-005       | 3/4" | HVAC CONTROL PANEL HVAC-VCP-1            | JB BY EXHAUST FAN 1-835-ME               | 6#14, 1#12 GND; 1-TSP |                       |
| C-006       | 3/4" | HVAC CONTROL PANEL HVAC-VCP-1            | GO/NO GO PANEL EAST ENTRANCE             | 8#14, 1#12 GND        | INCLUDES 4 SPARE      |
| C-006A      | 3/4" | HVAC CONTROL PANEL HVAC-VCP-1            | GO/NO GO PANEL WEST ENTRANCE             | 8#14, 1#12 GND        | INCLUDES 4 SPARE      |
| C-007       | 3/4" | MOTOR CONTROL CENTER MCC-02-MAIN         | JUNCTION BOX ON PUMP ROOM PLATFORM LEVEL | 6-#16 TSP, 1#12 GND   | INCLUDES 2 SPARE      |
| C-008       | 3/4" | JUNCTION BOX ON PUMP ROOM PLATFORM LEVEL | EMERGENCY STOP SWITCH (PUMP 1)           | 4#14, 1 #12 GND       |                       |
| C-009       | 3/4" | MOTOR CONTROL CENTER MCC-02-MAIN         | JUNCTION BOX ON PUMP ROOM PLATFORM LEVEL | 6-#16 TSP, 1#12 GND   | INCLUDES 2 SPARE      |
| C-010       | 3/4" | JUNCTION BOX ON PUMP ROOM PLATFORM LEVEL | EMERGENCY STOP SWITCH (PUMP 2)           | 4#14, 1 #12 GND       |                       |
| C-011       | 3/4" | MOTOR CONTROL CENTER MCC-02-01           | JUNCTION BOX ON PUMP ROOM PLATFORM LEVEL | 6-#16 TSP, 1#12 GND   | INCLUDES 2 SPARE      |
| C-012       | 3/4" | JUNCTION BOX ON PUMP ROOM PLATFORM LEVEL | EMERGENCY STOP SWITCH (PUMP 4)           | 4#14, 1 #12 GND       |                       |
| C-013       | 3/4" | MOTOR CONTROL CENTER MCC-02-01           | JUNCTION BOX ON PUMP ROOM PLATFORM LEVEL | 6-#16 TSP, 1#12 GND   | INCLUDES 2 SPARE      |
| C-014       | 3/4" | JUNCTION BOX ON PUMP ROOM PLATFORM LEVEL | EMERGENCY STOP SWITCH (PUMP 5)           | 4#14, 1 #12 GND       |                       |
| C-015       | 1"   | MOTOR CONTROL CENTER MCC-02-MAIN         | PLANT CONTROL SYSTEM PIU                 | 20#14, 1 #12 GND      |                       |
| C-016       | 1"   | MOTOR CONTROL CENTER MCC-02-MAIN         | PLANT CONTROL SYSTEM PIU                 | SPARE                 |                       |
| C-017       | 1"   | MOTOR CONTROL CENTER MCC-02-01           | PLANT CONTROL SYSTEM PIU                 | 20#14, 1 #12 GND      |                       |
| C-018       | 1"   | MOTOR CONTROL CENTER MCC-02-01           | PLANT CONTROL SYSTEM PIU                 | SPARE                 |                       |
| C-019       | 3/4" | FIT (PUMPS 1-3)                          | JUNCTION BOX JB-II                       | 1-#16 TSP, 1#12 GND   |                       |
| C-020       | 3/4" | FIT (PUMPS 4-6)                          | JUNCTION BOX JB-II                       | 1-#16 TSP, 1#12 GND   |                       |
| C-021       | 1"   | JUNCTION BOX JB-II                       | PLANT CONTROL SYSTEM PIU                 | 2-#16 TSP, 2#12 GND   |                       |
| C-022       | 3/4" | HVAC CONTROL PANEL HVAC-VCP-1            | LOWER PUMP ROOM ALARM HORN AND BEACON    | 8#14, 1#12 GND        |                       |
| C-023       | 3/4" | HVAC CONTROL PANEL HVAC-VCP-1            | MOTOR CONTROL CENTER MCC-02-01           | 8#14, 1#12 GND        | SCADA SIGNALS-4 SPARE |
| C-024       | 3"   | MOTOR CONTROL CENTER MCC-02-01           | MOTOR CONTROL CENTER MCC-02-MAIN         | DETERMINED BY MCC MFG |                       |
| C-025       | 3"   | MOTOR CONTROL CENTER MCC-02-01           | MOTOR CONTROL CENTER MCC-02-MAIN         | DETERMINED BY MCC MFG |                       |

**CONDUIT AND CABLE SCHEDULE**  
NO SCALE

| LOCATION      | EXISTING LABEL         | NEW LABEL              | DESCRIPTION OF CHANGE  |
|---------------|------------------------|------------------------|--|
| MCC-02-MAIN   |                        |                        |  |
| SECTION 1F    | LIGHTING PANEL LB      |                        | ADD TWO 20 A CIRCUIT BREAKERS TO LIGHTING PANEL LB FOR THE NEW FLOW METER AND THE NEW HVAC CONTROL PANEL. (FLOWMETER BREAKER IS IN ADDITIVE BIS ALTERNATE NO.2 |
| SECTION 1K/1M | SPARE                  | POWER PANEL PP-81      | REPLACE THE EXISTING 20 A, 3 POLE BREAKER AND THE SPARE STARTER WITH A 300 A, 3 POLE BREAKER.  |
| SECTION 10B   | COOLING FAN NO. 1      | SPARE                  | DEMOLISH EXISTING WIRING. MARK STARTER AS SPARE.   |
| SECTION 10D   | UNIT HEATER NO. 3      | SPARE                  | DEMOLISH EXISTING FIELD WIRING TO UNIT HEATER NO. 3. LABEL EXISTING BREAKER AS SPARE.  |
| SECTION 10F   | UNIT HEATER NO. 5      | SPARE                  | DEMOLISH EXISTING FIELD WIRING TO UNIT HEATER NO. 5. LABEL EXISTING BREAKER AS SPARE.  |
| SECTION 12M   | MAIN SEWAGE PUMP NO. 1 | MAIN SEWAGE PUMP NO. 1 | REPLACE THE EXISTING STARTER WITH RVSS STARTER AS SHOWN ON THE ONE LINE DRAWINGS.  |
| SECTION 13M   | MAIN SEWAGE PUMP NO. 2 | MAIN SEWAGE PUMP NO. 2 | REPLACE THE EXISTING STARTER WITH RVSS STARTER AS SHOWN ON THE ONE LINE DRAWINGS.  |
| MCC-02-01     |                        |                        |  |
| SECTION 1B    | EXHAUST FAN NO. 3      | SPARE                  | DEMOLISH EXISTING FIELD WIRING TO EXHAUST FAN NO. 3. LABEL EXISTING STARTER AS SPARE.  |
| SECTION 1D    | SUPPLY FAN NO. 7       | EXHAUST FAN EF-1       | DEMOLISH EXISTING FIELD WIRING. REUSE EXISTING STARTER FOR FAN EF-1. ADJUST OVERLOADS FOR NEW MOTOR FLA.   |
| SECTION 1F    | COOLING FAN NO. 2      | SUPPLY FAN SF-1        | DEMOLISH EXISTING FIELD WIRING. REUSE EXISTING STARTER FOR FAN EF-1. ADJUST OVERLOADS FOR NEW MOTOR FLA.   |
| SECTION 1H    | COOLING FAN NO. 3      | EXHAUST FAN EF-2       | REPLACE EXISTING STARTER WITH A NEW STARTER AS SHOWN ON THE ONE LINE DRAWINGS. DEMOLISH EXISTING WIRING AND PROVIDE NEW CONNECTIONS TO FAN EF-2.               |
| SECTION 1K    | UNIT HEATER NO.4       | SPARE                  | DEMOLISH EXISTING FIELD WIRING TO UNIT HEATER NO. 4. LABEL EXISTING BREAKER AS SPARE.  |
| SECTION 1M    | UNIT HEATER NO.6       | SPARE                  | DEMOLISH EXISTING FIELD WIRING TO UNIT HEATER NO. 6. LABEL EXISTING BREAKER AS SPARE.  |
| SECTION 5M    | MAIN SEWAGE PUMP NO. 4 | MAIN SEWAGE PUMP NO. 4 | REPLACE THE EXISTING STARTER WITH RVSS STARTER AS SHOWN ON THE ONE LINE DRAWINGS. INCLUDE AS PART OF ADDITIVE BID ALTERNATE NO. 1                              |
| SECTION 6M    | MAIN SEWAGE PUMP NO. 5 | MAIN SEWAGE PUMP NO. 5 | REPLACE THE EXISTING STARTER WITH RVSS STARTER AS SHOWN ON THE ONE LINE DRAWINGS. INCLUDE AS PART OF ADDITIVE BID ALTERNATE NO. 1                              |

**MCC MODIFICATION SUMMARY**

NO SCALE

| 480/277 VOLTS<br>3 PHASE, 4 WIRE |                  | PANEL PP-SCB-1<br>MAIN BREAKER |      | TYPE: NEMA 12<br>MOUNT: SURFACE |     |              |        |        |     |      |      |       |                  |      |  |
|----------------------------------|------------------|--------------------------------|------|---------------------------------|-----|--------------|--------|--------|-----|------|------|-------|------------------|------|--|
|                                  |                  | 300A 3P                        |      |                                 |     |              |        |        |     |      |      |       |                  |      |  |
| MODS                             | DESCRIPTION      | WIRE                           | TRIP | POLE                            | No. | VOLT-AMPERES |        |        | No. | POLE | TRIP | WIRE  | DESCRIPTION      | MODS |  |
|                                  |                  |                                |      |                                 |     | A            | B      | C      |     |      |      |       |                  |      |  |
| -                                | UNIT HEATER UH-1 | P-010                          | 60   | 3                               | 1   | 16,000       |        |        | 2   |      |      |       |                  |      |  |
|                                  |                  |                                |      |                                 | 3   |              | 16,000 |        | 4   | 3    | 60   | P-011 | UNIT HEATER UH-2 | -    |  |
|                                  |                  |                                |      |                                 | 5   |              |        | 16,000 | 6   |      |      |       |                  |      |  |
| -                                | UNIT HEATER UH-3 | P-012                          | 60   | 3                               | 7   | 16,000       |        |        | 8   |      |      |       |                  |      |  |
|                                  |                  |                                |      |                                 | 9   |              | 16,000 |        | 10  | 3    | 30   | P-013 | UNIT HEATER UH-4 | -    |  |
|                                  |                  |                                |      |                                 | 11  |              |        | 16,000 | 12  |      |      |       |                  |      |  |
| -                                | UNIT HEATER UH-5 | P-014                          | 30   | 3                               | 13  | 5,000        |        |        | 14  |      |      |       |                  |      |  |
|                                  |                  |                                |      |                                 | 15  |              | 5,000  |        | 16  | 3    | 20   |       | SPARE            | -    |  |
|                                  |                  |                                |      |                                 | 17  |              |        | 5,000  | 18  |      |      |       |                  |      |  |
| -                                | SPARE            |                                | 20   | 3                               | 19  |              |        |        | 20  |      |      |       |                  |      |  |
|                                  |                  |                                |      |                                 | 21  |              |        |        | 22  | 3    | 20   |       | SPARE            | -    |  |
|                                  |                  |                                |      |                                 | 23  |              |        |        | 24  |      |      |       |                  |      |  |
| -                                | SPACE            |                                |      | 3                               | 25  |              |        |        | 26  |      |      |       |                  |      |  |
|                                  |                  |                                |      |                                 | 27  |              |        |        | 28  | 3    |      |       | SPACE            | -    |  |
|                                  |                  |                                |      |                                 | 29  |              |        |        | 30  |      |      |       |                  |      |  |
| -                                | SPACE            |                                |      | 3                               | 31  |              |        |        | 32  |      |      |       |                  |      |  |
|                                  |                  |                                |      |                                 | 33  |              |        |        | 34  | 3    |      |       | SPACE            | -    |  |
|                                  |                  |                                |      |                                 | 35  |              |        |        | 36  |      |      |       |                  |      |  |
| -                                | SPACE            |                                |      | 3                               | 37  |              |        |        | 38  |      |      |       |                  |      |  |
|                                  |                  |                                |      |                                 | 39  |              |        |        | 40  | 3    |      |       | SPACE            | -    |  |
|                                  |                  |                                |      |                                 | 41  |              |        |        | 42  |      |      |       |                  |      |  |

|             |        |        |        |
|-------------|--------|--------|--------|
| TOTAL       | 37,000 | 37,000 | 37,000 |
| PHASE TOTAL | 58,000 | 58,000 | 58,000 |

|                 |        |        |       |
|-----------------|--------|--------|-------|
| 21,000          | 21,000 | 21,000 | TOTAL |
| TOTAL LOAD (VA) |        |        |       |
| 174,000         |        |        |       |
| TOTAL LOAD (A)  |        |        |       |
| 209             |        |        |       |

MODIFICATION (MODS) LEGEND:  
 GFCI - GROUND FAULT CIRCUIT INTERRUPTER  
 LOD - LOCK-ON DEVICE  
 LFD - LOCK-OFF DEVICE

NOTES:  
 65K AIC  
 100KA SPD

**POWER PANEL SCHEDULE**

NO SCALE

**AS-BUILT REPLACEMENT SHEET 1/2019**

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

Director: *[Signature]* 3/5/19  
 Chief Bureau of Utilities: *[Signature]* 2-26-19  
 Chief Bureau of Engineering: *[Signature]* 2/28/19  
 Chief Utility Design Division: *[Signature]* 2/26/19

**Hazen**  
HAZEN AND SAWYER  
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202  
410-539-7881



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. 42535, EXPIRATION DATE 02/25/2018.

|             |     |     |            |        |    |
|-------------|-----|-----|------------|--------|----|
| DESIGNED    | DPW |     |            |        |    |
| DRAWN       | DPW |     |            |        |    |
| CHECKED     | JCS |     |            |        |    |
| PROJ. ENGR. | AA  | 3   | AS-BUILT   | 1/9/19 | AA |
|             |     | 2   | ADDENDUM   | 5/9/17 | AA |
|             |     | 1   | ADDENDUM   | 5/9/17 | AA |
| APPROVED    |     | NO. | ISSUED FOR | DATE   | BY |

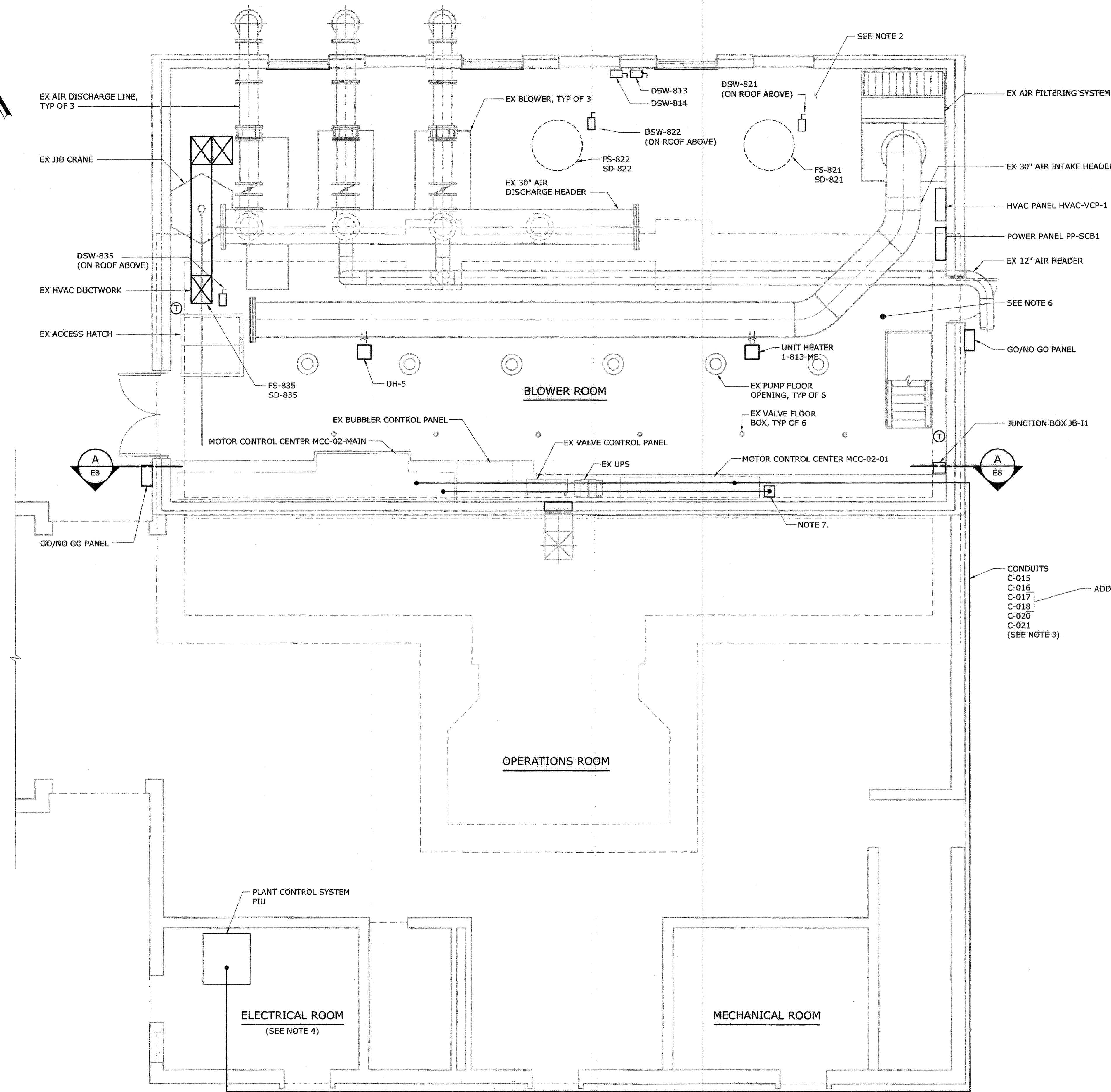
**ELECTRICAL SCHEDULES**

**INFLUENT PUMPING STATION**  
**PUMP REPLACEMENT CONTRACT**  
**LITTLE PATUXENT WATER RECLAMATION PLANT**  
**CAPITAL PROJECT NUMBER S-6264**  
**CONTRACT NUMBER 20-4991**  
 6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

|                |          |
|----------------|----------|
| DATE           | JAN 2017 |
| DRAWING NUMBER | E6       |
| SCALE AS SHOWN |          |
| SHEET          | 22 OF 27 |

**NOTES:**

1. SEE ONE-LINE DIAGRAMS FOR MODIFICATIONS TO EXISTING MOTOR CONTROL CABINETS.
2. UPPER LEVEL PUMP ROOM IS A DRY UNCLASSIFIED SPACE. AREA HAS BEEN DE-RATED FROM CLASS 1, DIVISION II USING MONITORED AIR CHANGES.
3. ROUTE CONDUITS OUTSIDE OF OPERATIONS ROOM TO AVOID HAZARDOUS/CORROSIVE ENVIRONMENT.
4. ELECTRICAL ROOM IS AN UNCLASSIFIED, DRY ENVIRONMENT.
5. SEE HVAC PLANS FOR LOCATIONS OF HVAC CONTROLS.
6. BLOWER ROOM IS A DRY PROCESS AREA PER SPECIFICATION SECTION 16111. CONDUIT SHALL BE HEAVY WALL ALUMINUM.
7. SUPPLEMENTAL CABINET FOR NEW SEWAGE PUMP SOFT STARTER CONTROLS. SOFT STARTER CONTROLS SHALL BE SPLIT BETWEEN THE MAIN STARTER BUCKETS AND THE SUPPLEMENTAL CONTROL SPACE AS DETERMINED BY THE MCC VENDOR DURING CONSTRUCTION.



CONDUITS  
 C-015  
 C-016  
 C-017  
 C-018  
 C-020  
 C-021  
 (SEE NOTE 3)

ADDITIVE ALTERNATE NO. 1

**UPPER LEVEL ROOM PLAN**  
 1/4" = 1'-0"

**AS-BUILT REPLACEMENT SHEET 1/2019**

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

3/6/19  
 DIRECTOR OF PUBLIC WORKS

2-28-19  
 CHIEF BUREAU OF ENGINEERING

2/26/19  
 CHIEF UTILITY DESIGN DIVISION

**Hazen**

HAZEN AND SAWYER  
 1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202  
 410-539-7681

2/21/19  
 REGISTERED PROFESSIONAL ENGINEER  
 LICENSE NO. 42535  
 EXPIRATION DATE 02/25/2018

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. 42535, EXPIRATION DATE 02/25/2018.

SIGNED: \_\_\_\_\_

|             |     |  |  |  |  |
|-------------|-----|--|--|--|--|
| DESIGNED    | DPW |  |  |  |  |
| DRAWN       | MJB |  |  |  |  |
| CHECKED     | JCS |  |  |  |  |
| PROJ. ENGR. | AA  |  |  |  |  |
| APPROVED    |     |  |  |  |  |

**ELECTRICAL**  
**UPPER LEVEL PLAN**

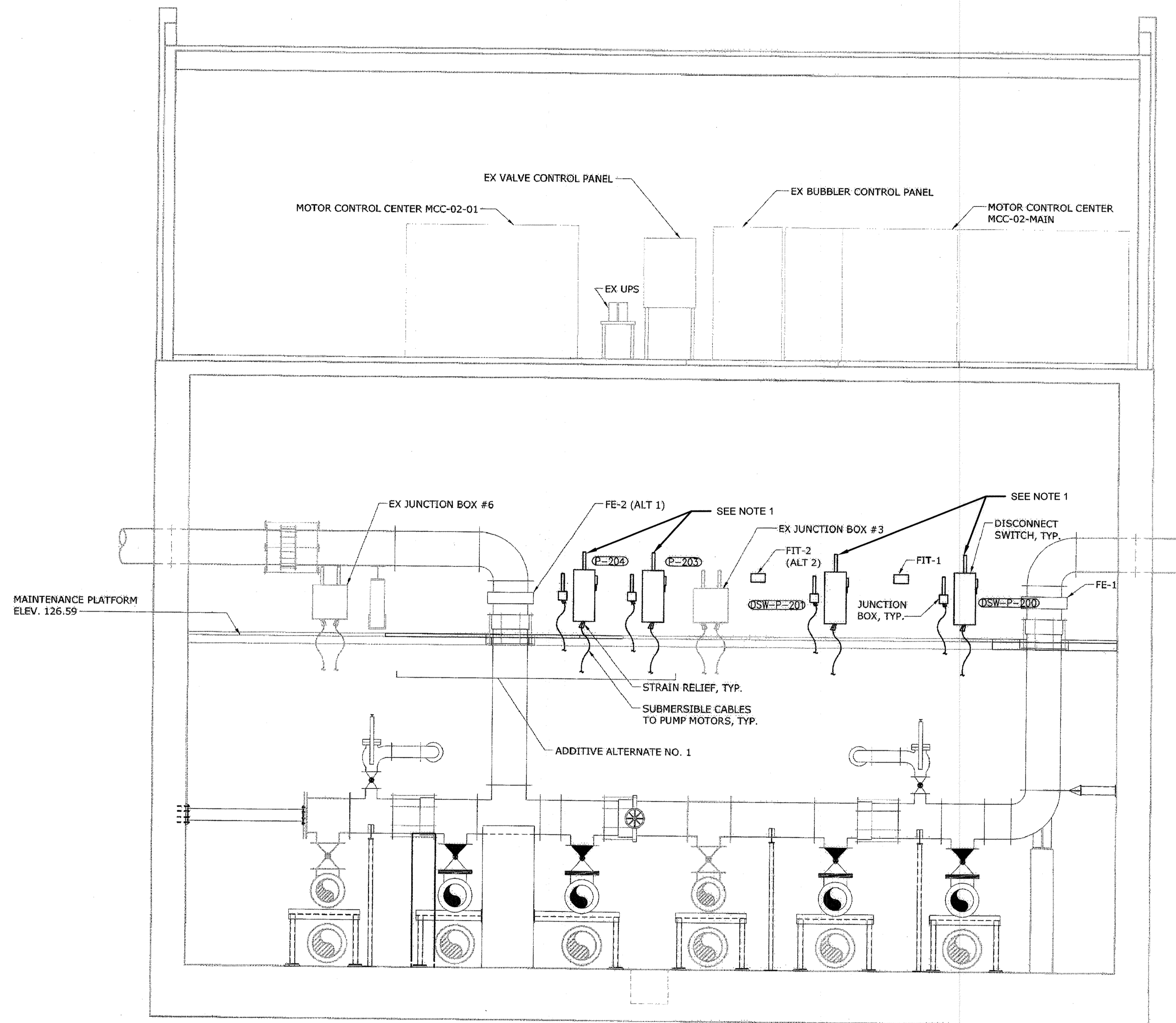
|     |            |        |    |
|-----|------------|--------|----|
| NO. | ISSUED FOR | DATE   | BY |
| 3   | AS-BUILT   | 1/9/19 | AA |
| 2   | ADDENDUM   | 5/9/17 | AA |
| 1   | ADDENDUM   | 5/9/17 | AA |

**INFLUENT PUMPING STATION**  
**PUMP REPLACEMENT CONTRACT**  
 LITTLE PATUXENT WATER RECLAMATION PLANT  
 CAPITAL PROJECT NUMBER S-6264  
**CONTRACT NUMBER 20-4991**  
 6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE: JAN 2017  
 DRAWING NUMBER: E7  
 SCALE: AS SHOWN  
 SHEET 23 OF 27

**CODED NOTES:**

1. PUMP DISCONNECTS INSTALLED ON EXISTING HANDRAIL



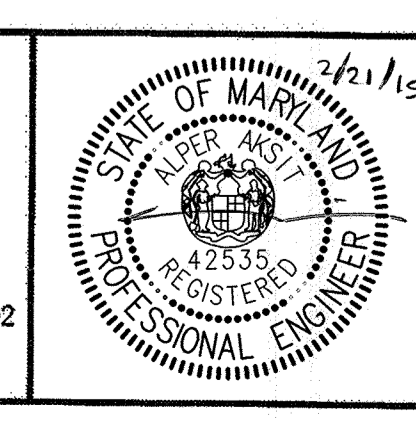
SECTION **A**  
1/4" = 1'-0" **E7**

**AS-BUILT REPLACEMENT SHEET 1/2019**

I:\2232-TB-Influent PS -PS-SD2-Influent PS -PS-SD2-E  
 XREF= 3/23/19 12:58P 0:\32232-BAL\32232-005\Drawings\Electrical\E8.dwg LastSaveBy: EPROSSER

|  |  |
|--|--|
| DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND            |  |
| Director of Public Works<br><i>[Signature]</i><br>DATE: 3/7/19   | Chief Bureau of Engineering<br><i>[Signature]</i><br>DATE: 2-28-19   |
| Chief Bureau of Utilities<br><i>[Signature]</i><br>DATE: 2-26-19 | Chief Utility Design Division<br><i>[Signature]</i><br>DATE: 2/26/19 |

**Hazen**  
 HAZEN AND SAWYER  
 1 SOUTH STREET, SUITE 1150; BALTIMORE, MD 21202  
 410-539-7681



PROFESSIONAL CERTIFICATION:  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 42335, EXPIRATION DATE 07/25/2018.  
 SIGNED:

|              |     |     |            |        |    |
|--------------|-----|-----|------------|--------|----|
| DESIGNED:    | DPW |     |            |        |    |
| DRAWN:       | MJB |     |            |        |    |
| CHECKED:     | JCS |     |            |        |    |
| PROJ. ENGR.: | AA  | 3   | AS-BUILT   | 1/9/19 | AA |
|              |     | 2   | ADDENDUM   | 5/9/17 | AA |
|              |     | 1   | ADDENDUM   | 5/9/17 | AA |
| APPROVED:    |     | NO. | ISSUED FOR | DATE   | BY |

**ELECTRICAL**  
 UPPER LEVEL SECTION

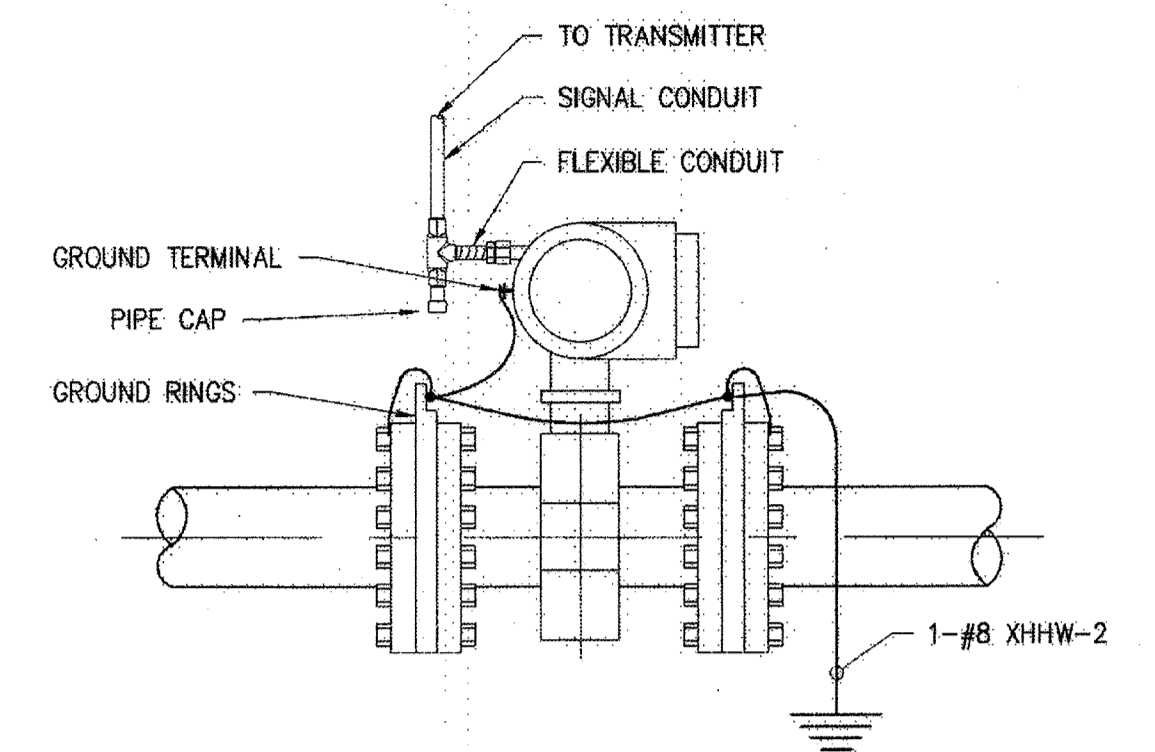
INFLUENT PUMPING STATION  
 PUMP REPLACEMENT CONTRACT  
 LITTLE PATUXENT WATER RECLAMATION PLANT  
 CAPITAL PROJECT NUMBER S-6264  
**CONTRACT NUMBER 20-4991**  
 6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

|                |          |
|----------------|----------|
| DATE           | JAN 2017 |
| DRAWING NUMBER | E8       |
| SCALE          | AS SHOWN |
| SHEET          | 24 OF 27 |



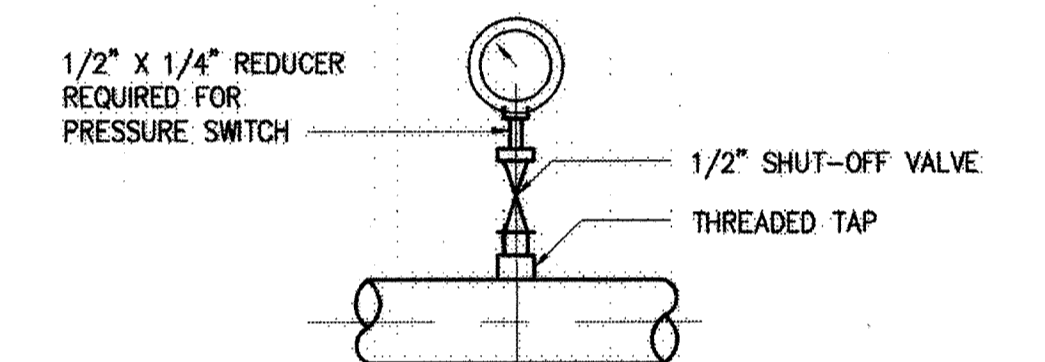
**NOTES:**

1. MOTOR PROTECTION EQUIPMENT INCLUDES TSH-A, MSH-B, TSH-C, AND MSH-D AS INDICATED ON SHEET E4. PROVIDE ELECTRICAL WORK TO CONNECT BEARING TEMPERATURE SWITCH TSH-E IF IT IS PROVIDED BY THE MANUFACTURER. TYPICAL OF ALL NEW MOTORS.
2. MOTOR TERMINAL HOUSING. TYPICAL FOR ALL NEW MOTORS.
3. THE LOWER PUMP ROOM SHALL BE CONSIDERED A WET ENVIRONMENT. CONDUIT SHALL BE PVC COATED HEAVY WALL CONDUIT PER SECTION 16111, PARAGRAPH 3.02F.



**INTEGRAL MAGNETIC FLOW METER INSTALLATION**

|          |    |
|----------|----|
| DETAIL   | 1  |
| NO SCALE | E9 |

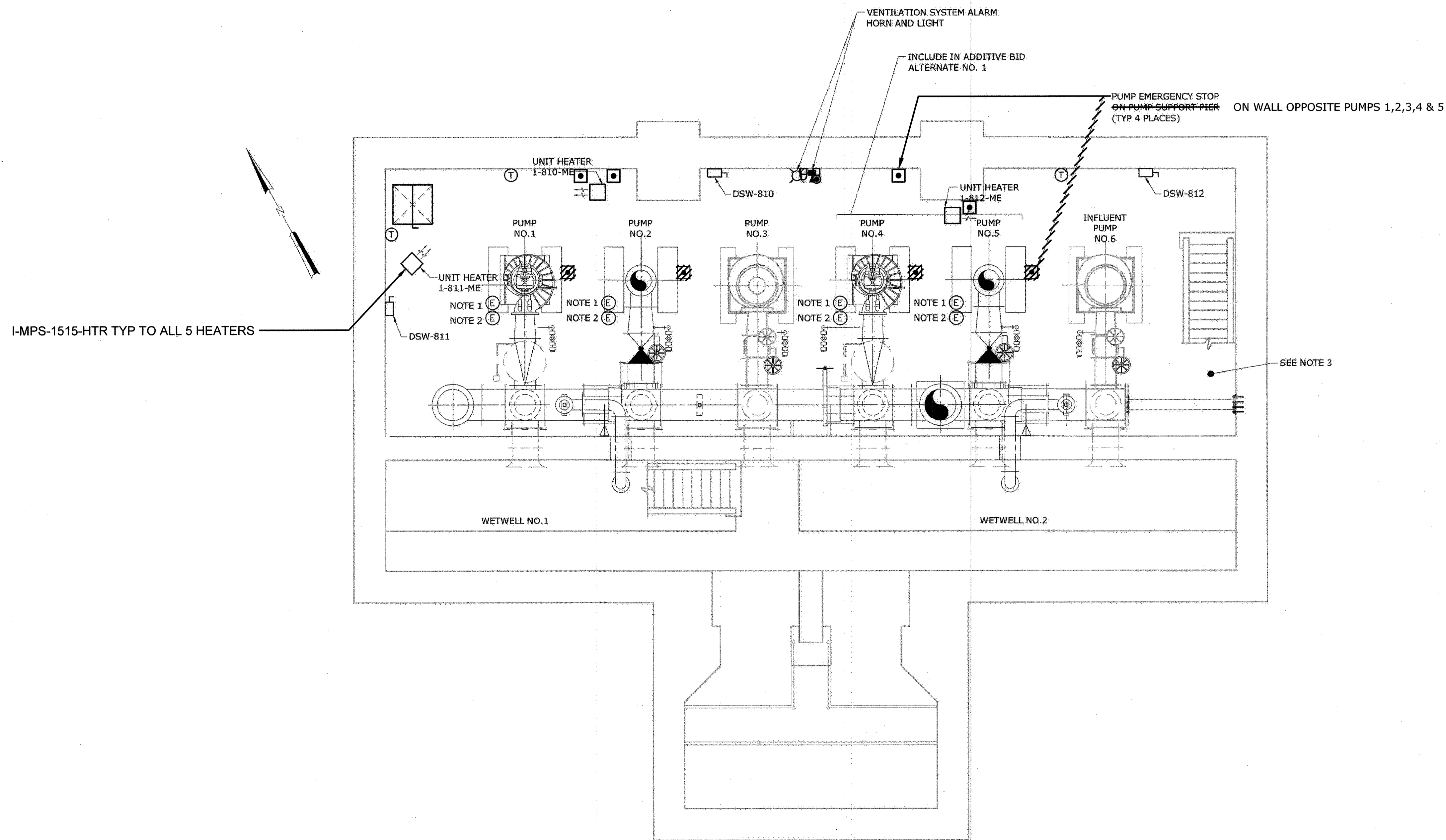


**PRESSURE GAUGE OR SWITCH  
INSTALLATION WITH THREADED TAP  
(SHOWN WITHOUT DIAPHRAGM SEAL)  
USED FOR PIPES 2" AND LARGER**

|                |    |
|----------------|----|
| PRESSURE GAUGE |    |
| DETAIL         | 3  |
| NO SCALE       | E9 |

**NOTES:**

1. PRESSURE GAUGE PIPING SHALL BE ASTM A312, TYPE 316, SCHEDULE 80 SEAMLESS STAINLESS STEEL. ALL JOINTS AND FITTINGS SHALL HAVE NPT THREADED CONNECTIONS. SHUT-OFF VALVE SHALL BE A FULL PORT, STAINLESS STEEL BALL VALVE WITH TEFLON SEAT AND PACKING AND QUARTER TURN HANDLE, MANUFACTURED BY FLOW-TEK, APOLLO, OR EQUAL.
2. SEE SPECIFICATION 17650 IN THE ADDENDUM FOR REQUIREMENTS



**PUMP ROOM PLAN**

1/4" = 1'-0"

**AS-BUILT REPLACEMENT SHEET 1/2019**

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

3/7/19  
DATE

2-20-19  
DATE

2/26/19  
DATE

**Hazen**

HAZEN AND SAWYER  
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202  
410-539-7681

STATE OF MARYLAND  
REGISTERED PROFESSIONAL ENGINEER  
2/2/2019

PROFESSIONAL CERTIFICATION:  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DAILY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 22535. EXPIRATION DATE 02/25/2018.

|             |     |     |            |        |    |
|-------------|-----|-----|------------|--------|----|
| DESIGNED    | DPW |     |            |        |    |
| DRAWN       | MRB |     |            |        |    |
| CHECKED     | JCS |     |            |        |    |
| PROJ. ENGR. | AA  | 3   | AS-BUILT   | 1/9/19 | AA |
|             |     | 2   | ADDENDUM   | 5/9/17 | AA |
|             |     | 1   | ADDENDUM   | 5/9/17 | AA |
| APPROVED    |     | NO. | ISSUED FOR | DATE   | BY |

**ELECTRICAL**

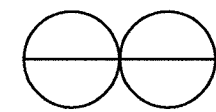
**LOWER LEVEL PLAN**

INFLUENT PUMPING STATION  
PUMP REPLACEMENT CONTRACT  
LITTLE PATUXENT WATER RECLAMATION PLANT  
CAPITAL PROJECT NUMBER S-6264  
CONTRACT NUMBER 20-4991  
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

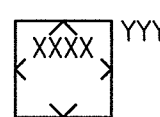
DATE JAN 2017  
DRAWING NUMBER  
**E9**  
SCALE AS SHOWN  
SHEET 25 OF 27

### INSTRUMENT AND FUNCTION SYMBOLS

|  | PRIMARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR | FIELD MOUNTED | AUXILIARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR | NORMALLY INACCESSIBLE OR BEHIND THE PANEL DEVICES OR FUNCTIONS |
|--|--|---------------|--|--|
| FIELD/PANEL EQUIPMENT                      | XXX<br>000                                       | XXX<br>000    | XXX<br>000   | XXX<br>000   |
| SHARED DISPLAY, SHARED CONTROL (OIT)       | XXX<br>000                                       | XXX<br>000    | XXX<br>000   | XXX<br>000   |
| PROGRAMMABLE LOGIC CONTROLLER              | XXX<br>000                                       | XXX<br>000    | XXX<br>000   | XXX<br>000   |
| SUPERVISORY COMPUTER FUNCTION (HMI/SERVER) | ABC<br>12345                                     | ABC<br>12345  | ABC<br>12345                                       | ABC<br>12345   |



SINGLE INSTRUMENT OR OTHER DEVICE HAVING MULTIPLE FUNCTIONS OR SHARING A COMMON HOUSING

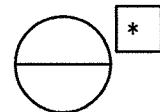


SOFTWARE LOGIC OR CONTROL MODULE XXXX AND SUB-MODULE YYY RESIDENT IN DISTRIBUTED CONTROL SYSTEM (DCS) OR PROGRAMMABLE LOGIC CONTROLLER (PLC) REFER TO CONTRACT DOCUMENTS FOR CONTROL AND MODULE DESCRIPTIONS.



DESIGNATIONS OF CONTROL FUNCTIONS (ZZZ) ASSOCIATED WITH INSTRUMENT OR OTHER DEVICES.

|                        |                        |
|------------------------|------------------------|
| AHC - AUTO/HOLD/CLOSE  | OC - OPEN/CLOSE        |
| AM - AUTO/MANUAL       | OSC - OPEN/STOP/CLOSED |
| DEV - DEVIATION        | POT - POTENTIOMETER    |
| HOA - HAND/OFF/AUTO    | RL - RAISE/LOWER       |
| MOA - MANUAL/OFF/AUTO  | RSL - RAISE/STOP/LOWER |
| HOR - HAND/OFF/REMOTE  | SD - SHUTDOWN          |
| LOS - LOCKOUT STOP     | SEL - SELECT           |
| LR - LOCAL/REMOTE      | SP - SET POINT         |
| LOR - LOCAL/OFF/REMOTE | SR - START/RESET       |
| OO - ON/OFF            | SS - START/STOP        |



INSTRUMENT PANEL MOUNTED WITH COMPUTING OR CONVERTING FUNCTION



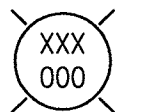
CONVERT

|               |                            |
|---------------|----------------------------|
| E - VOLTAGE   | H - HYDRAULIC              |
| I - CURRENT   | O - ELECTROMAGNETIC, SONIC |
| P - PNEUMATIC | R - RESISTANCE (ELECT.)    |
| A - ANALOG    | D - DIGITAL                |
| B - BINARY    |                            |



COMPUTE

|                   |                            |
|-------------------|----------------------------|
| Σ SUMMING         | x <sup>n</sup> EXPONENTIAL |
| Δ SUBTRACTOR      | P/n AVERAGING              |
| X MULTIPLYING     | : RATIO                    |
| ÷ DIVIDING        | > HIGH SELECTING           |
| √ ROOT EXTRACTION | < LOW SELECTING            |
| K PROPORTIONAL    | ∫ INTEGRAL                 |
| d/dt DERIVATIVE   | PID PID                    |



PANEL MOUNTED PILOT LIGHT



ANALYZER, XXXX = TYPE

|  |                                     |
|--|-------------------------------------|
| XXXX ALK - ALKALINITY                    | O <sub>3</sub> - OZONE              |
| CL <sub>2</sub> - CHLORINE CONCENTRATION | ORP - OXIDATION/REDUCTION POTENTIAL |
| COMB - COMBUSTIBLE GAS                   | pH - HYDROGEN ION CONCENTRATION     |
| COND - CONDUCTIVITY                      | TH - TOTAL HARDNESS                 |
| DO - DISSOLVED OXYGEN                    | UV - ULTRAVIOLET                    |
| H <sub>2</sub> S - HYDROGEN SULFIDE      |                                     |
| LEL - LOWER EXPLOSIVE LIMIT              |                                     |
| O <sub>2</sub> - OXYGEN CONCENTRATION    |                                     |

(\*) ASTERISK IDENTIFIES FIELD INSTRUMENTS FURNISHED BY EQUIPMENT SUPPLIER

⊕ ASTERISK IDENTIFIES LOCAL CONTROL PANELS FURNISHED BY EQUIPMENT SUPPLIER



OPERATIONAL INTERLOCK



COMPLEX INTERLOCK



AND LOGIC



# = 1, 2, 3, etc. INTERLOCK NUMBER DESCRIPTION ON SAME SHEET



OR LOGIC

### VALVE AND ACTUATOR SYMBOLS

|                                 |                           |                             |  |
|---------------------------------|---------------------------|-----------------------------|--|
| GENERIC VALVE                   | PLUG VALVE                | GLOBE VALVE                 | BALL VALVE                                   |
| BALL VALVE (3-WAY)              | 3-WAY VALVE (GENERAL)     | PINCH VALVE                 | COMBINATION VACUUM AND PRESSURE RELIEF VALVE |
| BUTTERFLY VALVE                 | SWING CHECK VALVE         | BALL CHECK VALVE            | DIAPHRAGM VALVE                              |
| NEEDLE VALVE                    | ANGLE VALVE               | ROTARY VALVE                | THROUGH PLUG VALVE                           |
| PRESSURE RELIEF OR SAFETY VALVE | VACUUM RELIEF VALVE       | PRESSURE-REDUCING REGULATOR | BACKPRESSURE REGULATOR                       |
| BACKFLOW PREVENTER              | SLUICE GATE               | STOP/SLIDE GATE             | STRAINER                                     |
| BACKFLOW PREVENTER              | ELECTRIC ACTUATOR         | SOLENOID ACTUATOR           | PNEUMATIC ACTUATOR                           |
| ELECTROPNEUMATIC ACTUATOR       | ELECTROHYDRAULIC ACTUATOR | HAND WHEEL                  | HYDRANT                                      |
| CENTRIFUGAL PUMP                |                           |                             |  |

### INSTRUMENT SYMBOLS

|                     |                      |                     |                |                       |                               |                             |                                  |
|---------------------|----------------------|---------------------|----------------|-----------------------|-------------------------------|-----------------------------|----------------------------------|
| MAGNETIC FLOW METER | VENTURI FLOW TUBE    | TURBINE FLOW METER  | ROTAMETER      | ULTRASONIC FLOW METER | PADDLE WHEEL FLOW METER       | VORTEX FLOW METER           | POSITIVE DISPLACEMENT FLOW METER |
| PITOT TUBE          | PARSHALL FLUME       | WEIR                | ORIFICE PLATES | STRAIGHTENING VANES   | ULTRASONIC LEVEL SENSOR       | SUBMERSIBLE LEVEL SENSOR    | FLOAT TYPE LEVEL SWITCH          |
| TAPPED RING SEAL    | DIAPHRAGM SEAL       | FULL LINE RING SEAL | VALVED TAP     | RTD AND THERMOWELL    | RADAR LEVEL SENSOR (UNGUIDED) | RADAR LEVEL SENSOR (GUIDED) | CAPACITANCE LEVEL SENSOR         |
| SIGNAL BOOSTER      | SEQUENTIAL EQUIPMENT | ANALOG INPUT        | ANALOG OUTPUT  | DIGITAL INPUT         | DIGITAL OUTPUT                |                             |                                  |

### INSTRUMENT/DEVICE IDENTIFICATION LETTERS

|   | FIRST-LETTER                    |                     | SUCCEEDING-LETTERS          |                       |   |
|---|---------------------------------|---------------------|-----------------------------|-----------------------|---|
|   | MEASURED OR INITIATING VARIABLE | MODIFIER            | READOUT OR PASSIVE FUNCTION | OUTPUT FUNCTION       | MODIFIER                                |
| A | ANALYSIS                        |                     | ALARM                       |                       |   |
| B | BURNER, COMBUSTION              |                     |                             |                       |   |
| C |                                 |                     |                             | CONTROL               | CLOSE, CLOSED                           |
| D |                                 | DIFFERENTIAL        |                             |                       |   |
| E | VOLTAGE                         |                     | PRIMARY ELEMENT SENSOR      |                       |   |
| F | FLOW RATE                       | FRACTION RATIO      |                             |                       |   |
| G | GAUGE                           |                     | GLASS, VIEWING DEVICE       |                       |   |
| H | HAND                            |                     |                             |                       | HIGH                                    |
| I | ELECTRICAL CURRENT              |                     | INDICATE                    |                       |   |
| J | POWER                           | SCANE               |                             |                       |   |
| K | TIME, TIME SCHEDULE             | TIME RATE OF CHANGE |                             |                       | CONTROL STATION                         |
| L | LEVEL                           |                     | LIGHT                       |                       | LOW                                     |
| M |                                 | MOMENTARY           |                             |                       | MIDDLE, INTERMEDIATE                    |
| N | TORQUE                          |                     |                             |                       |   |
| O |                                 |                     | ORIFICE, RESTRICTION        |                       | OPEN, OPENED                            |
| P | PRESSURE, VACUUM                |                     | TEXT POINT CONNECTION       |                       |   |
| Q | QUANTITY                        | INTEGRATE, TOTALIZE |                             |                       |   |
| R | RUN                             |                     | RECORD & STORE              | REPORT                |   |
| S | SPEED, FREQUENCY                | SAFETY              |                             | SWITCH                |   |
| T | TEMPERATURE                     |                     |                             | TRANSMIT              |   |
| U | MULTIVARIABLE                   |                     | MULTIFUNCTION               | MULTIFUNCTION         | MULTIFUNCTION                           |
| V | VIBRATION, VOLUME               |                     |                             | VALVE, DAMPER, LOUVER |   |
| W | WEIGHT, FORCE                   |                     | WELL                        |                       |   |
| X | FAILURE OR TROUBLE              | X AXIS              |                             |                       |   |
| Y | EVENT, STATE/PRESENCE           | Y AXIS              |                             |                       | COMPUTE, REVERT, RELAY                  |
| Z | POSITION, DIMENSION             | Z AXIS              |                             |                       | DRIVER, ACTUATOR, FINAL CONTROL ELEMENT |

### LINETYPE LEGEND

|  |   |
|--|---|
|  | MAJOR PROCESS PIPES OR CHANNELS             |
|  | SECONDARY PROCESS OR MECHANICAL CONNECTIONS |
|  | CAPILLARY OR IMPULSE TUBING                 |
|  | AIR SUPPLY OR SIGNAL                        |
|  | HYDRAULIC SUPPLY OR SIGNAL                  |
|  | ELECTRICAL SIGNAL                           |
|  | DATA LINK OR INTERNAL SOFTWARE LINK         |
|  | PROCESS FLOW                                |
|  | TYPICAL PUMP                                |
|  | PUMPING STATION EQUIPMENT                   |

AS - BUILT

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

2/14/17  
DIRECTOR OF PUBLIC WORKS DATE

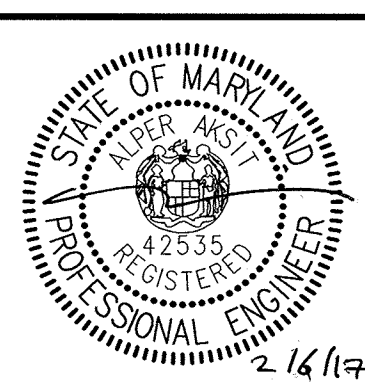
2/16/17  
CHIEF BUREAU OF ENGINEERING DATE

2/14/17  
CHIEF BUREAU OF UTILITIES DATE

2/16/17  
CHIEF UTILITY DESIGN DIVISION DATE

**Hazen**

HAZEN AND SAWYER  
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202  
410-539-7681



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. 42535, EXPIRATION DATE 07/25/2018.

SIGNED:

DESIGNED: AA

DRAWN: MRB

CHECKED: JCS

PROJ. ENGR.: AA

APPROVED:

| NO. | ISSUED FOR | DATE | BY |
|-----|------------|------|----|
|     |            |      |    |
|     |            |      |    |
|     |            |      |    |

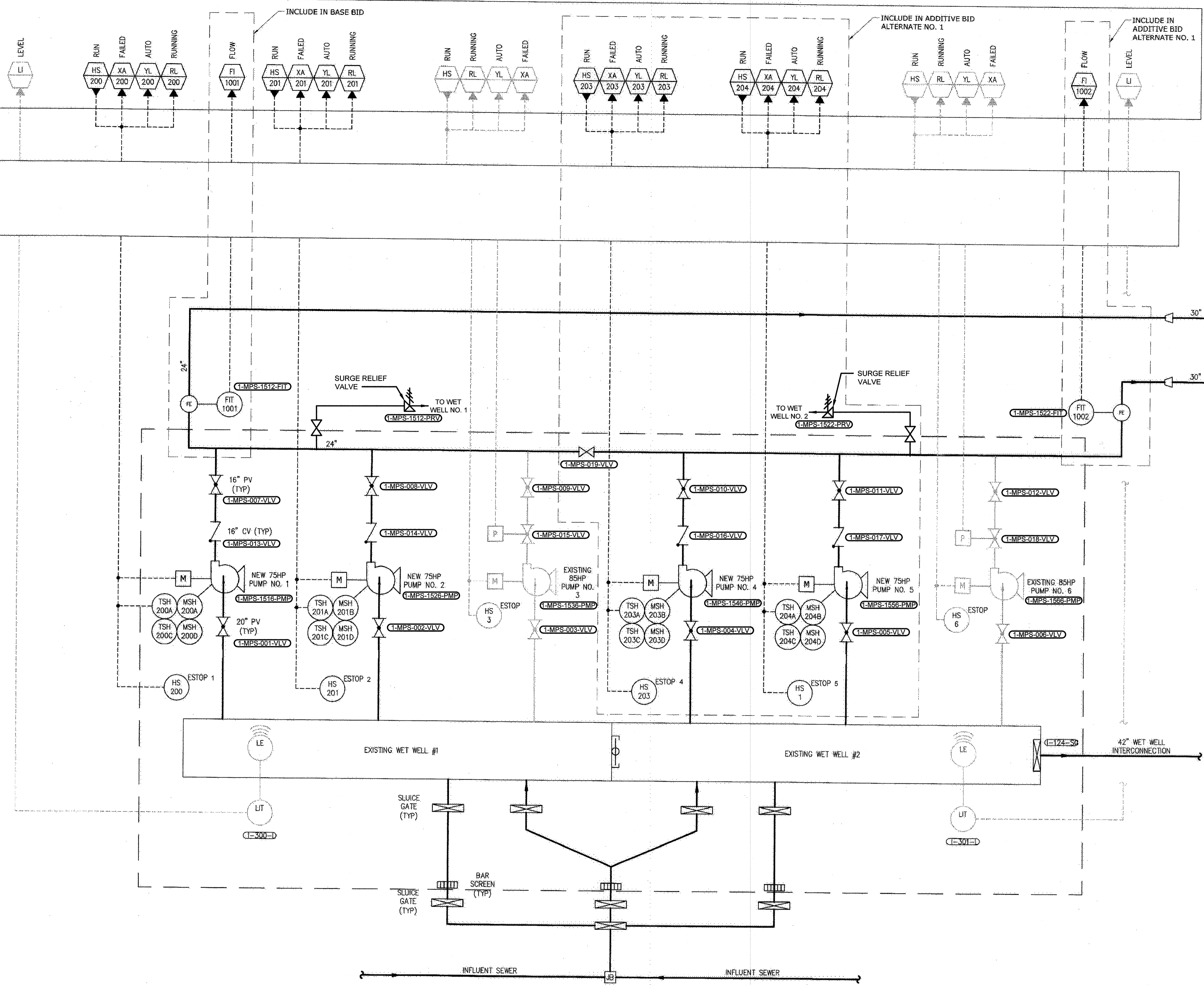
INSTRUMENTATION  
LEGEND AND SYMBOLS

INFLUENT PUMPING STATION  
PUMP REPLACEMENT CONTRACT  
LITTLE PATUXENT WATER RECLAMATION PLANT  
CAPITAL PROJECT NUMBER S-6264  
CONTRACT NUMBER 20-4991  
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE: JAN 2017  
DRAWING NUMBER  
I1  
SCALE AS SHOWN  
SHEET 26 OF 27

EXISTING PLANT SCADA PIU

MCC



NOTES:

1. SEE SPECIFICATION SECTION 17920 FOR ADDITIONAL SYSTEM I/O.
2. REFER TO O&M MANUAL FOR PUMP PROTECTION DEVICES.
3. BEARING TEMPERATURES MEASURED IN FIVE LOCATIONS.

AS-BUILT REPLACEMENT SHEET 1/2019

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

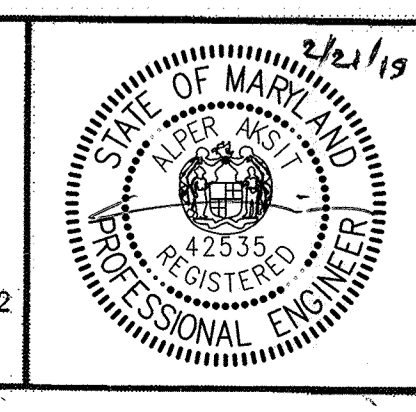
*[Signature]* 3/6/19 DATE  
DIRECTOR OF PUBLIC WORKS

*[Signature]* 2-28-19 DATE  
CHIEF BUREAU OF ENGINEERING

*[Signature]* 2/26/19 DATE  
CHIEF BUREAU OF UTILITIES

*[Signature]* 2/26/19 DATE  
CHIEF UTILITY DESIGN DIVISION

**Hazen**  
HAZEN AND SAWYER  
1 SOUTH STREET, SUITE 1150, BALTIMORE, MD 21202  
410-539-7681



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. 42535, EXPIRATION DATE 02/26/2018.

SIGNED: \_\_\_\_\_

|             |     |     |            |        |    |
|-------------|-----|-----|------------|--------|----|
| DESIGNED    | AA  |     |            |        |    |
| DRAWN       | MRB |     |            |        |    |
| CHECKED     | JCS |     |            |        |    |
| PROJ. ENGR. | AA  | 3   | AS-BUILT   | 1/9/19 | AA |
|             |     | 2   | ADDENDUM   | 5/9/17 | AA |
|             |     | 1   | ADDENDUM   | 5/9/17 | AA |
| APPROVED    |     | NO. | ISSUED FOR | DATE   | BY |

INSTRUMENTATION  
PROCESS & INSTRUMENTATION  
DIAGRAM

INFLUENT PUMPING STATION  
PUMP REPLACEMENT CONTRACT  
LITTLE PATUXENT WATER RECLAMATION PLANT  
CAPITAL PROJECT NUMBER S-6264  
CONTRACT NUMBER 20-4991  
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

DATE JAN 2017  
DRAWING NUMBER I2  
SCALE AS SHOWN  
SHEET 27 OF 27

20170206 8:51A O:\32232-bd\32232-005\Drawings\instrumentation\I2.dwg LastSaveBy:DOLSEN