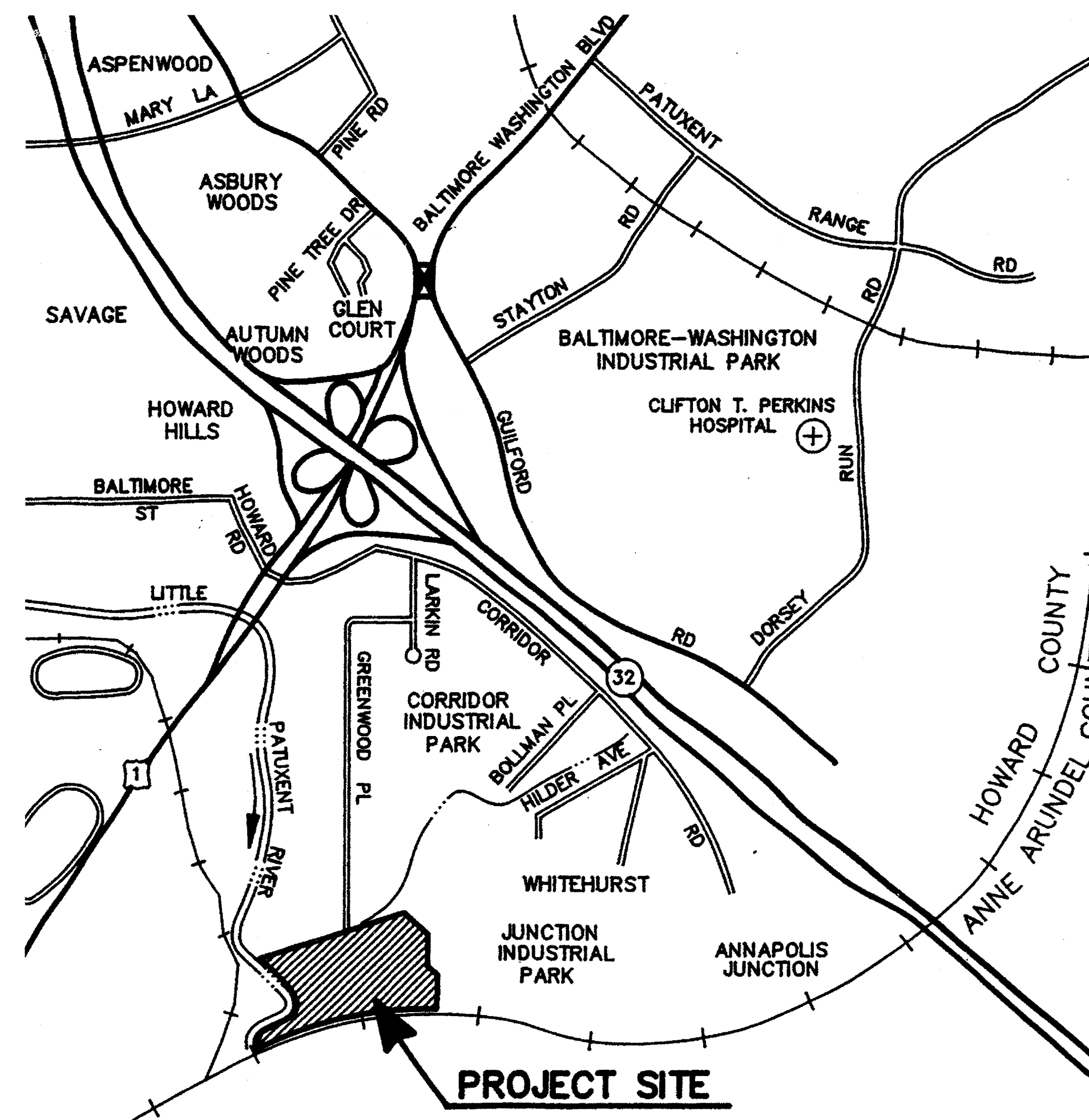


HOWARD COUNTY, MARYLAND

LITTLE PATUXENT WATER RECLAMATION PLANT



ADDITION NO. 6 CONTROL SYSTEM EXPANSION

CAPITAL PROJECT NO. S-6205

CONTRACT NO. 20-3842

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

_____ DIRECTOR OF PUBLIC WORKS	_____ DATE	_____ CHIEF, BUREAU OF ENGINEERING	_____ DATE
_____ CHIEF, BUREAU OF UTILITIES	_____ DATE	_____ CHIEF, WATER & SEWER DIVISION	_____ DATE

THIS DRAWING WAS
ORIGINALLY APPROVED
FOR CONSTRUCTION
AND SEALED BY
ROBERT J. RECTANUS, JR.,
A REGISTERED
PROFESSIONAL ENGINEER
IN THE
STATE OF MARYLAND,
NO. 22927



BLACK & VEATCH LLP
Gaithersburg, Maryland

ASSOCIATE DESIGN FIRMS

STANTEC CONSULTING, LTD.
Surrey, British Columbia

BRYANT, BRYANT, & WILLIAMS
Washington, D. C.

A. MORTON THOMAS & ASSOC., INC.
Rockville, Maryland

LACH ELECTRIC CORPORATION
Baltimore, Maryland


CONFORMED TO CONSTRUCTION RECORDS 07/22/05

SHEET 1 OF 39
L1

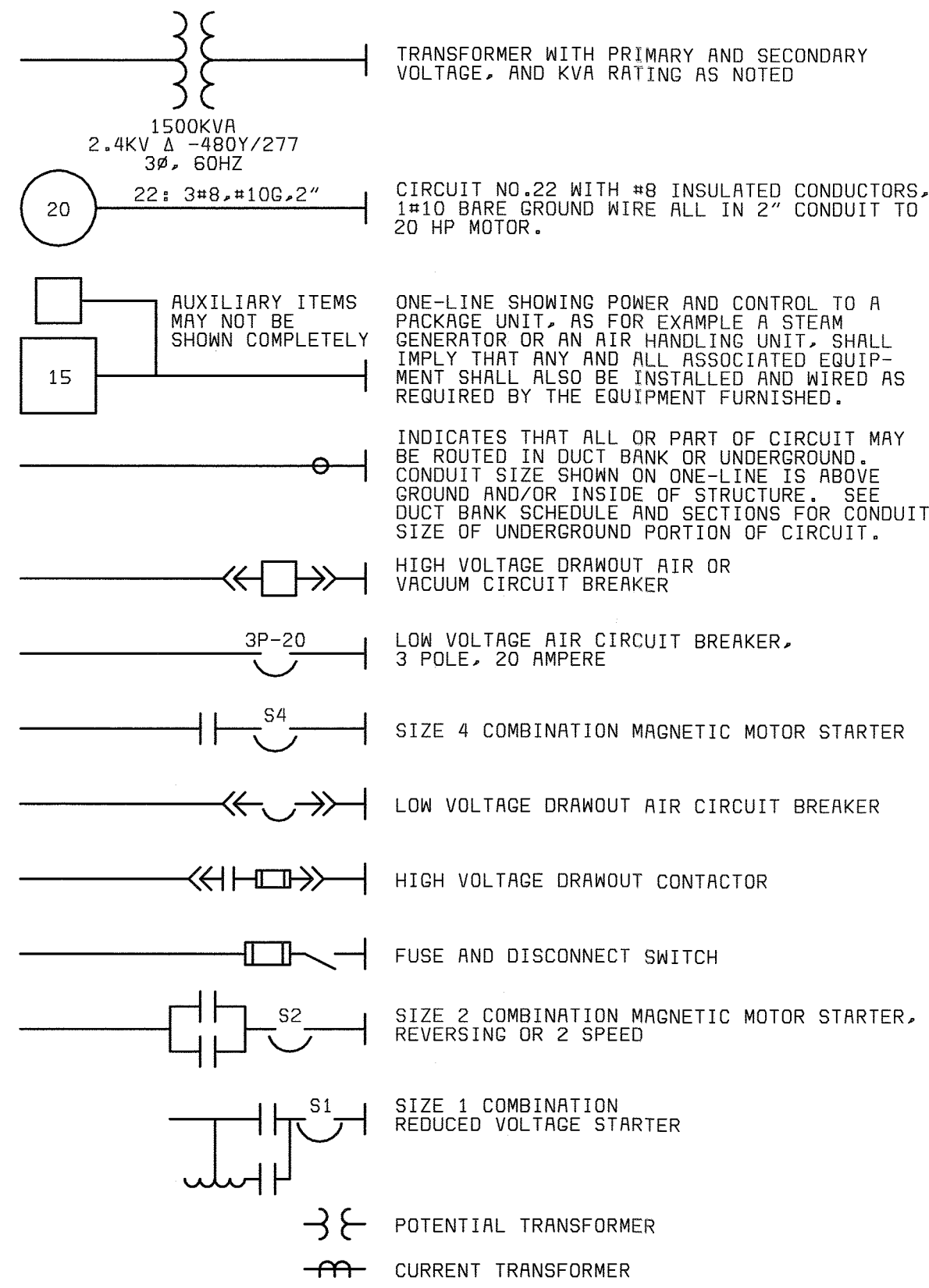
LIST OF DRAWINGS

<u>SHEET NO.</u>	<u>DRAWING NO.</u>	<u>DRAWING TITLE</u>
<u>LAYOUT/OVERVIEW</u>		
1	L1	COVER SHEET/LOCATION MAP
2	L2	LIST OF DRAWINGS
<u>ELECTRICAL</u>		
3	E1	LEGEND AND ABBREVIATIONS
4	E2	SITE PLAN
5	E3	MISCELLANEOUS ONE-LINE DIAGRAMS
<u>INSTRUMENTATION AND CONTROLS</u>		
6	I1	P&ID - LEGEND AND ABBREVIATIONS
7	I2	P&ID - PROCESS REACTOR NO. 5
8	I3	P&ID - PROCESS REACTOR NO. 6
9	I4	P&ID - PROCESS REACTOR NO. 7
10	I5	P&ID - FINAL CLARIFIERS 10, 11, 12
11	I6	P&ID - WEST GALLERY
12	I7	P&ID - FERMENTER
13	I8	P&ID - NORTH BLOWERS
14	I9	P&ID - MISCELLANEOUS
15	I10	SOLIDS PROCESSING P & ID
16	I11	SOLIDS PROCESSING P & ID
17	I12	POLYMER FEED SCHEMATIC
18	I13	HEADWORKS AND INFLUENT PUMPING P & ID
19	I14	GRIT BASINS & PRIMARY CLARIFIERS P & ID
20	I15	P&ID - SCUM CONCENTRATOR
21	I16	PROCESS REACTOR NO. 1 P & ID
22	I17	PROCESS REACTOR NO. 7 P & ID
23	I18	NOT USED
24	I19	NOT USED
25	I20	P&ID - FSU LINES WEST GALLERY
26	I21	NOT USED
27	I22	NOT USED
28	I23	NOT USED
29	I24	P&ID - RAS CHLORINATION SYSTEM
30	I25	CONTROL SYSTEM SCHEMATIC ONE-LINE DIAGRAM CTP-10
31	I26	CONTROL SYSTEM ONE-LINE DIAGRAM, CTP-10 CONTINUATION AND WEST GALLERY
32	I27	CONTROL SYSTEM ONE-LINE DIAGRAM, CTP-5
33	I28	ONE-LINE DIAGRAM - CONTROLS TERMINATION PANEL-3
34	I29	ONE-LINE DIAGRAM - CONTROLS TERMINATION PANEL-3 CONTINUED
35	I30	INSTRUMENTATION ONE-LINE DIAGRAMS
36	I31	NOT USED
37	I32	NOT USED
38	I33	CONTROL SYSTEM SCHEMATIC ONE-LINE DIAGRAM, CTP-06/PIU-4
39	I34	CONTROL BLOCK DIAGRAM

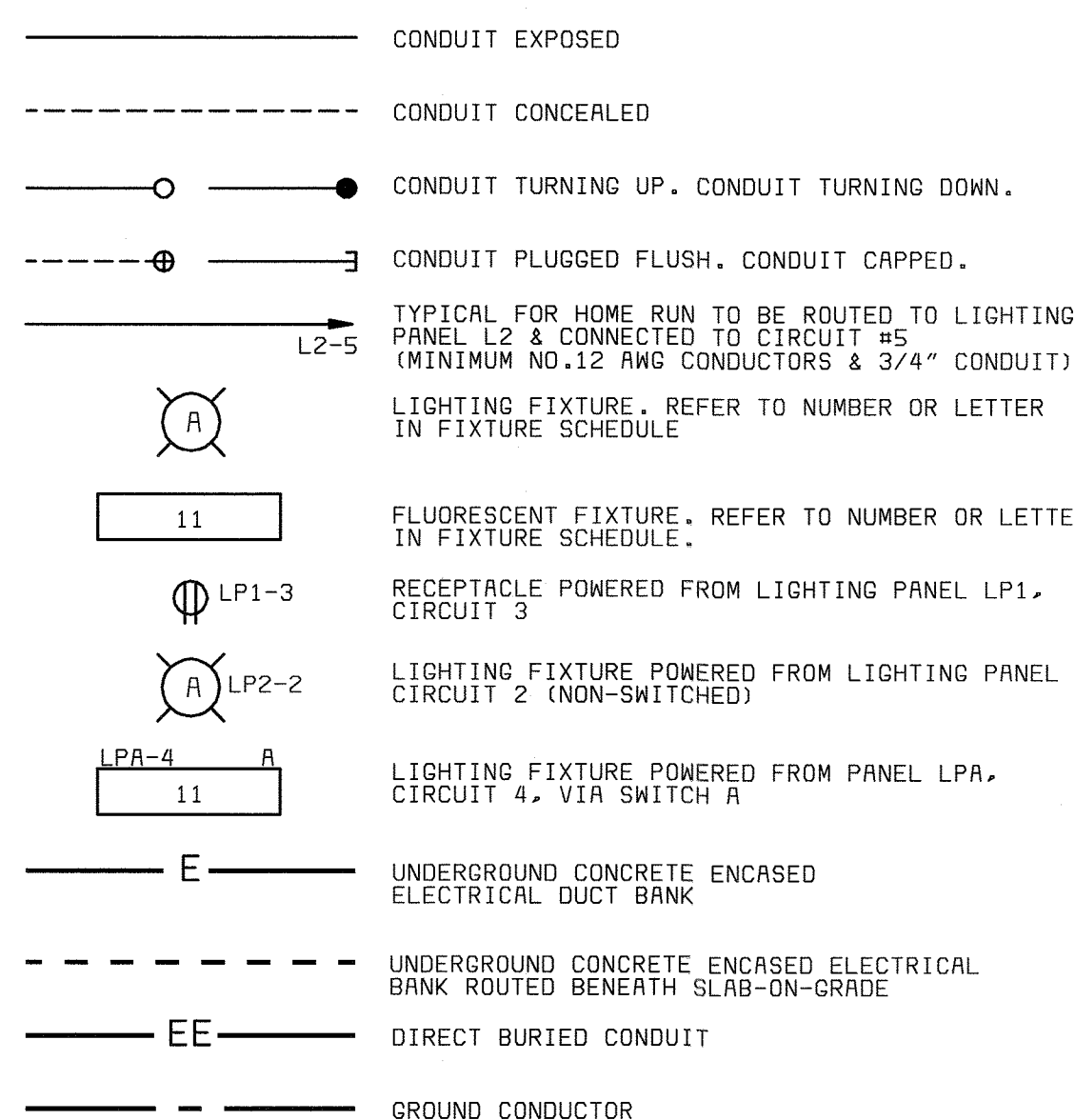
A B C D E F
Z00000059.pcx
D58472-6
FD58472R

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND CHIEF, BUREAU OF UTILITIES DATE	 BLACK & VEATCH Gaithersburg, Maryland REG. PROF. ENGR. DATE	THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT J. RECTANUS, JR. A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF MARYLAND, NO. 22927	DES: FKA DRN: RLC CHK: WLK DATE: 2/19/01	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>DATE</td> <td>REVISIONS AND RECORD OF ISSUE</td> <td>NO.</td> <td>BY</td> <td>CK</td> <td>APP</td> </tr> <tr> <td>7/22/05</td> <td>CONFORMED TO CONSTRUCTION RECORDS</td> <td></td> <td>RHH</td> <td>RJR</td> <td>RJR</td> </tr> </table>	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP	7/22/05	CONFORMED TO CONSTRUCTION RECORDS		RHH	RJR	RJR	LAYOUT/OVERVIEW CIVIL LIST OF DRAWINGS	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 CONTROL SYSTEM EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3842 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN SHEET 2 OF 39 L2
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP														
7/22/05	CONFORMED TO CONSTRUCTION RECORDS		RHH	RJR	RJR														

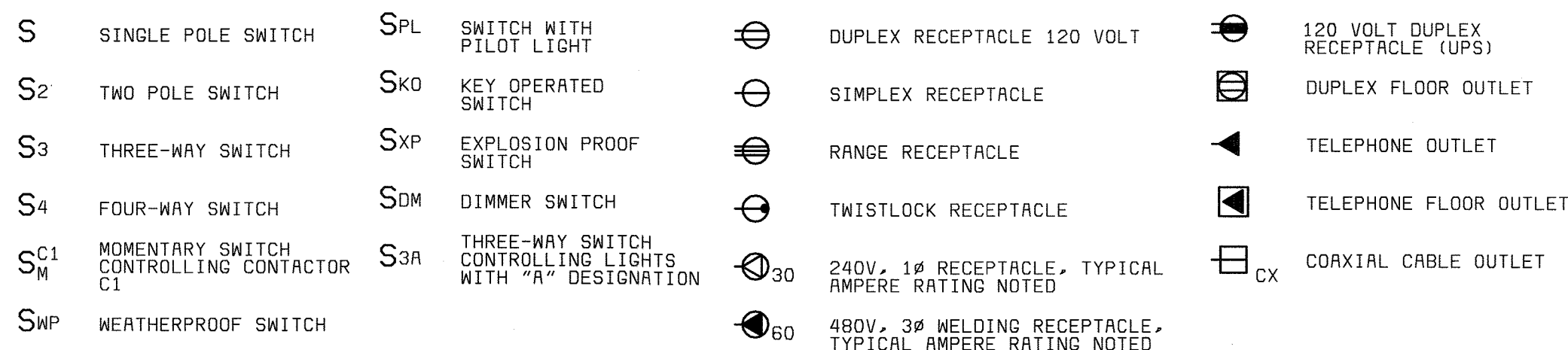
ONE-LINE DIAGRAM LEGEND



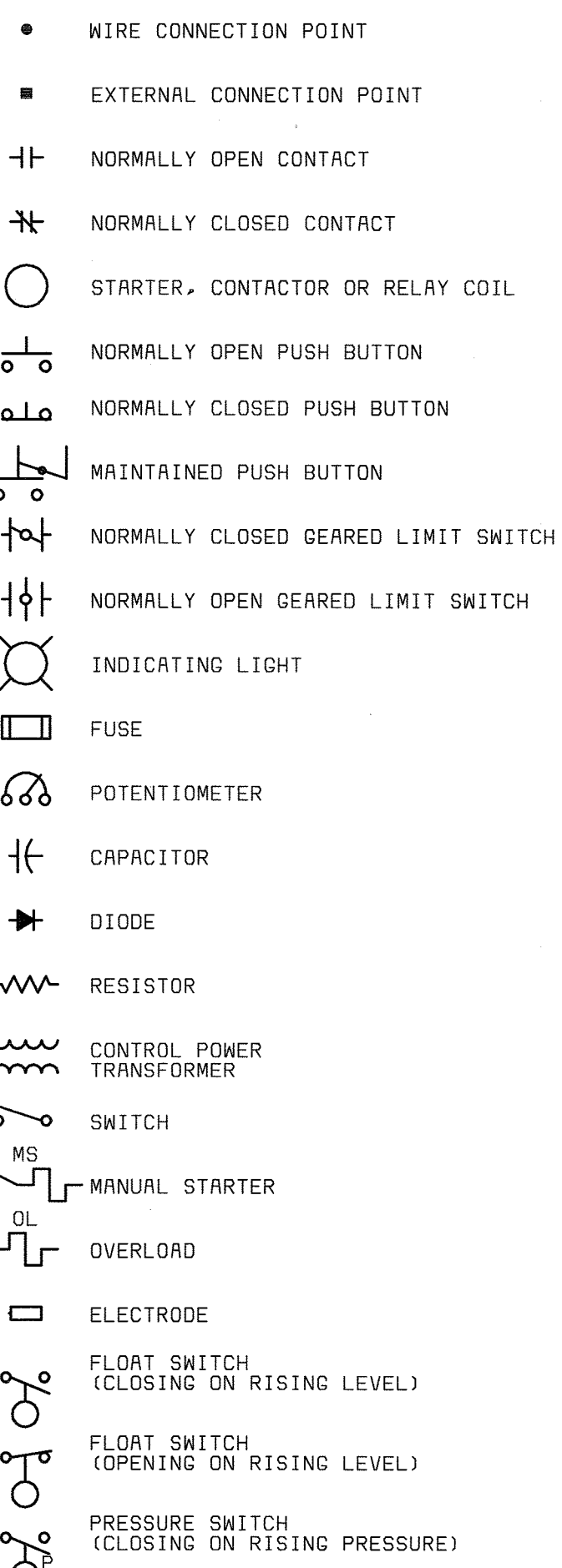
CONDUIT & WIRING INSTALLATION LEGEND



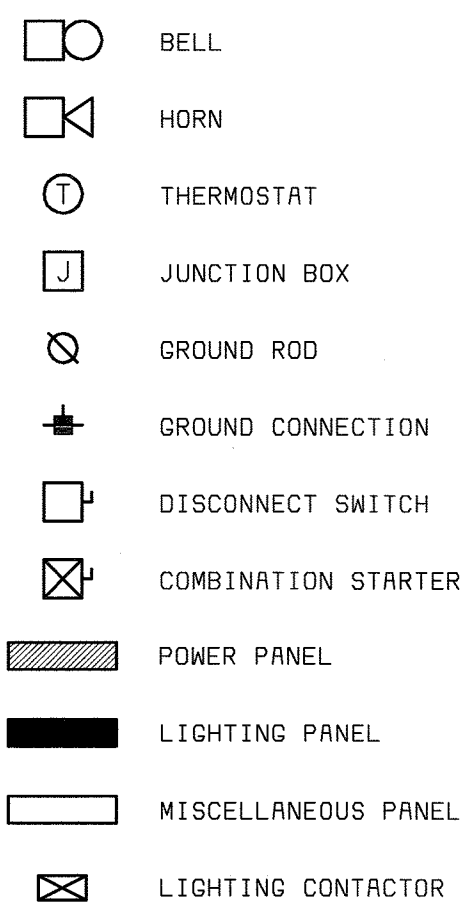
SWITCH & OUTLET SYMBOLS



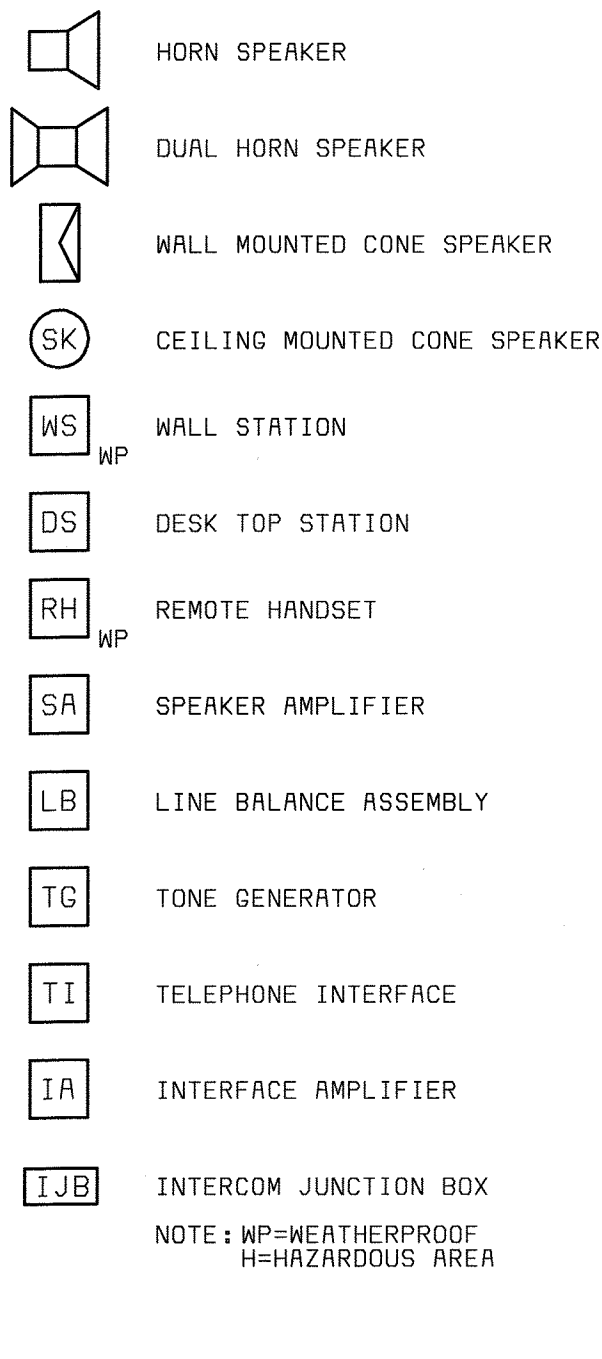
SCHEMATIC SYMBOLS



MISCELLANEOUS SYMBOLS



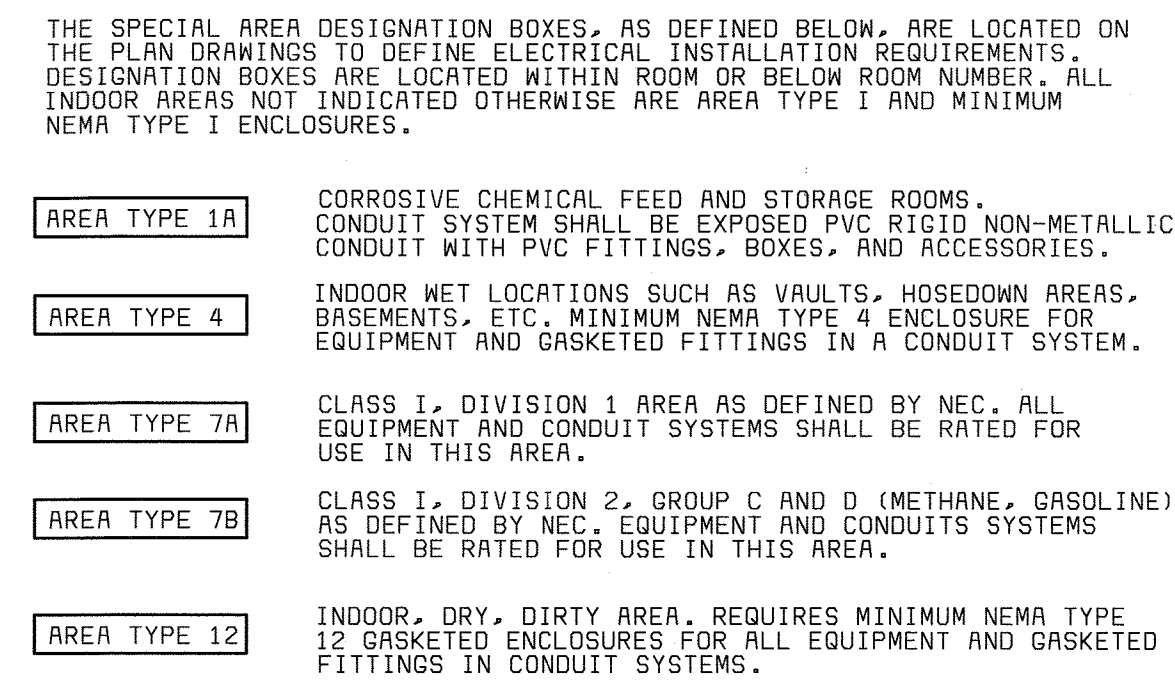
COMMUNICATION SYMBOLS



ABBREVIATIONS

Table of abbreviations including AMBER, AMPERE, ALARM, ALTERNATING CURRENT, AIR CIRCUIT BREAKER, AMPERE FRAME, ADJUSTABLE FREQUENCY DRIVE, AMMETER, ANNUNCIATOR, ALARM RELAY, AMMETER SWITCH, AMPERE TRIP, AMERICAN WIRE GAGE, BATTERY CHARGER, BRAKE, BEARING TEMPERATURE, CLOSE, COUNTER OR CONTACTOR, CAPACITOR, CIRCUIT BREAKER, CIRCUIT BREAKER AUXILIARY CONTACT, ON TIME DELAY SWITCH, OFF TIME DELAY SWITCH, TORQUE SWITCH, LIMIT SWITCH, DIFFERENTIAL PRESSURE SWITCH, ELECTRIC OPERATOR FOR CONTROL, DAMPER OR VALVE, EMPTY CONDUIT, ELEVATION OR EMERGENCY LIGHT, ELECTRICAL MANHOLE, ELECTRODE RELAY, END SWITCH, ELAPSED TIME METER, EXISTING, FORWARD, FIBER OPTIC TERMINATIONS, FLOW SWITCH, GREEN OR GROUND, GROUND DETECTOR, GENERATOR, GROUND FAULT INTERRUPTER, GEARED LIMIT SWITCH, #8 GROUND WIRE, HIGH OR HUMIDISTAT, HOT CIRCUIT, HANDHOLE, HIGH MOTOR TEMPERATURE, HAND-OFF-AUTO, HAND-OFF-REMOTE, HORSEPOWER, HIGH WATER CUTOFF, HERTZ (CYCLE), INPUT/OUTPUT INSTANTANEOUS, JUNCTION BOX, JUNCTION BOX, KEY INTERLOCK, KILOVOLT, KILOVOLT AMPERE, KILOWAR, KILOWATT, KILOWATT HOUR, LOW, LEVEL, LIGHTNING ARRESTER, LOCAL AREA NETWORK, LIGHTING CONTACTOR, LOCAL-ON-OFF, LOCAL-OFF-REMOTE, LIGHTING PANEL, LIMIT OR LEVEL SWITCH, LOW WATER CUTOFF, ONE, SINGLE PAIR, TWISTED, SHIELDED #16 CABLE, THREE, SINGLE, SEVEN CONDUCTOR #14 MULTICONDUCTOR CONTROL CABLES, MAGNETIC MOTOR STARTER, MILLIAMPERE, MAIN CIRCUIT BREAKER, MOTOR CONTROL CENTER, MOTOR CONTROL LINEUP, THOUSAND CIRCULAR MIL, MOISTURE DETECTOR, MAGNETIC FLOW METER, MANUFACTURER, MANHOLE OR MOUNTING HEIGHT, MOTOR OPERATED VALVE, MOTOR PROTECTION RELAY, MANUAL MOTOR STARTER, MOTOR SPACE HEATER, MILLIVOLT, MEGA VOLT AMPERE, NEUTRAL, NORMALLY CLOSED, NORMALLY OPEN, NUMBER, OPEN, OIL CIRCUIT BREAKER, OVERLOAD, ON-OFF-AUTO, ON-OFF-REMOTE, PRIMARY, PLANT CONTROL SYSTEM, PUSH BUTTON OR PULL BOX, POWER FACTOR METER, PHASE, CHEMICAL TERM, PROGRAMMABLE LOGIC CONTROLLER, POWER PANEL, PROTECTIVE RELAYING, PROCESS REACTOR #5,6 OR 7, PROXIMITY SWITCH, PRESSURE SWITCH, POTENTIAL TRANSFORMER, PROGRAM TIMER, 2 POLE, RED, RAISE, RELAY OR REVERSE, RECEPTACLE, RESISTOR, REPEATING TIMER, REMISTANCE TYPE TEMP DETECTOR, REMOTE TERMINAL UNIT, REDUCED VOLTAGE SOLID STATE STARTER, SIZE 2 STARTER, SUPERVISORY CONTROL AND DATA ACQUISITION, SPACE HEATER, SOLID NEUTRAL, SOLENOID OILER, SINGLE POLE, SINGLE POLE DOUBLE THROW, SINGLE POLE SINGLE THROW, SELECTOR SWITCH, SOLID STATE METERING, SOLID STATE STARTER, SUPERVISORY CONTROL, SOLENOID VALVE, SWITCHBOARD, SWITCHGEAR, THERMOSTAT, TIMER, OR TOTALIZER, TACHOMETER, TERMINAL BLOCK, TIMER CLUTCH, TIME DELAY RELAY, TEMPERATURE, TIMER MOTOR, TORQUE, TEMPERATURE SWITCH, TELEPHONE TERMINAL BOX, UNDERGROUND, UNDER VOLTAGE, UNINTERRUPTIBLE POWER SUPPLY, VOLTS, VOLT AMPERE, VARMETER, VALVE LIMIT SWITCH, VOLTMETER, VALVE POSITION INDICATOR, VOLTMETER SWITCH, WHITE OR WATTS, WATT HOUR METER, WATT METER, WEATHERPROOF, AUXILIARY RELAY, TRANSFORMER, EXPLOSION PROOF, YELLOW, AUXILIARY RELAY, POSITION SWITCH, ZERO SPEED SWITCH.

AREA DESIGNATIONS



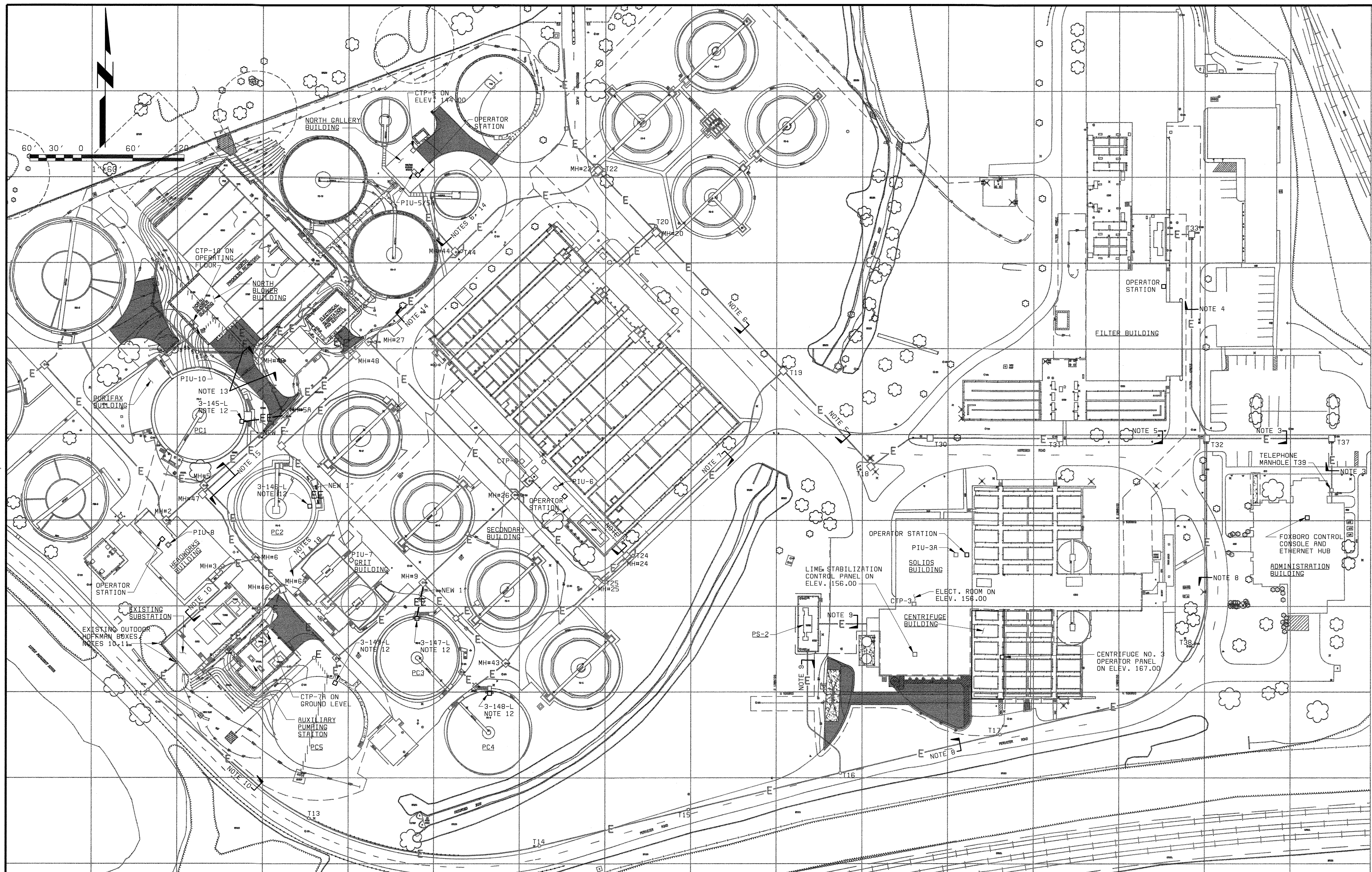
GENERAL REQUIREMENTS

- 1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ROUTING ALL CONDUITS NOT SHOWN ON THE PLANS. THIS SHALL INCLUDE ALL CONDUITS SHOWN ON THE ONE-LINES AND HOME-RUNS SHOWN ON THE PLAN DRAWINGS. CONDUITS SHALL BE ROUTED AS DEFINED IN THE SPECIFICATIONS.
2. SPARE WIRES SHALL BE TAPED AND COILED.
3. IF EQUIPMENT SUPPLIED BY MANUFACTURER HAS A LARGER LOAD THAN VALUE SHOWN, THE CABLE CONDUIT AND ELECTRICAL EQUIPMENT SHALL BE ENLARGED, AS REQUIRED, TO ACCOMMODATE THE HIGHER VALUE.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING PROPERLY SIZED STARTER OVERLOADS FOR EQUIPMENT FURNISHED.
5. LIGHTING AND RECEPTACLE CIRCUITS DESIGNATED ON THE FLOOR PLANS ARE NOT SHOWN ON THE ONE-LINES. CONDUCTORS FOR LIGHTING, RECEPTACLES, AND MISCELLANEOUS 120VAC CIRCUITS SHALL BE MINIMUM NO. 12AWG. CONDUIT FOR LIGHTING, RECEPTACLES, AND MISCELLANEOUS 120VAC CIRCUITS SHALL BE MINIMUM 3/4".
6. IN AREAS WHERE THERE ARE OVERHEAD BRIDGE CRANES, HOISTS, ETC., NO CONDUITS SHALL BE RUN OVERHEAD THAT WILL INTERFERE WITH THE OPERATION OF THE EQUIPMENT.

GENERAL NOTES

- 1. SOLID LINES (—) INDICATE NEW WORK OR EQUIPMENT.
2. SCREENED LINES (—) INDICATE EXISTING WORK OR EQUIPMENT.
3. DASHED LINES (- - -) INDICATE FUTURE WORK OR EQUIPMENT.
4. THIS IS A GENERAL LEGEND SHEET. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
5. INFORMATION RELATED TO CIRCUIT IDENTIFICATION, WIRE & CONDUIT SIZES, AND ROUTING, IS ON THE FOLLOWING DRAWING TYPES.
A. ONE-LINE DIAGRAMS SHOW CIRCUIT IDENTIFICATION, WIRE QUANTITY AND SIZES, AND CONDUIT SIZE WITHIN STRUCTURES. ONE-LINE DIAGRAMS ALSO INDICATE ORIGIN AND DESTINATION OF CIRCUITS, AND IDENTIFY CIRCUITS ROUTED UNDERGROUND.
B. FOR CIRCUITS WITHOUT UNDERGROUND PORTIONS, BUILDING FLOOR PLANS SHOW LOCATION OF EQUIPMENT FOR DETERMINING CIRCUIT LENGTH WITHIN THE STRUCTURE. FOR CIRCUITS WITH UNDERGROUND PORTIONS, ANTICIPATED PENETRATION OF UNDERGROUND CONDUITS ARE SHOWN ON STRUCTURE PLANS FOR DETERMINING THE LENGTH OF THE IN-STRUCTURE PORTIONS OF CIRCUITS. BUILDING FLOOR PLANS MAY ALSO SHOW HOME RUNS FOR LIGHTING, RECEPTACLE, AND OTHER MISCELLANEOUS EQUIPMENT CIRCUITS.
C. SITE PLANS INDICATE THE GENERAL ROUTING OF UNDERGROUND CONDUITS AND DUCT BANKS. CIRCUITS ROUTED IN UNDERGROUND CONDUITS OR DUCT BANKS ARE INDICATED IN DUCT BANK SECTIONS REFERENCED ON THE SITE PLAN.
D. DUCT BANK SECTIONS AND SCHEDULES IDENTIFY CONDUIT SIZE, CONDUIT MATERIAL, ARRANGEMENT OF THE UNDERGROUND CONDUITS, AND CIRCUITS ROUTED IN EACH UNDERGROUND CONDUIT.

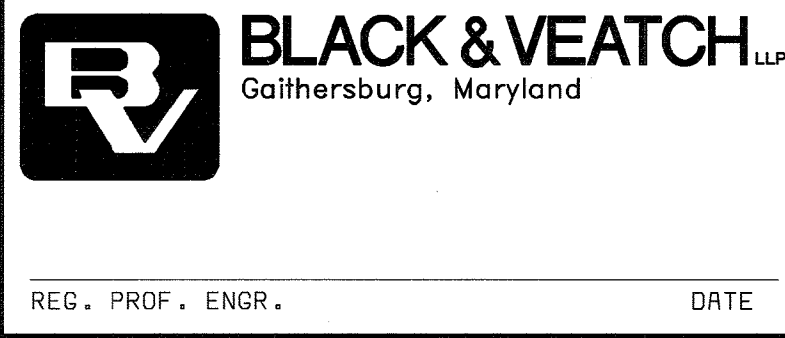
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND. BLACK & VEATCH, L.P. Gaithersburg, Maryland. THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY DONALD R. STEVENS A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF MARYLAND, NO. 21876. DES: GNS, DRN: BAL, CHK: GNS, DATE: 04/22/02. LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 CONTROL SYSTEM EXPANSION. SCALE AS SHOWN. SHEET 3 OF 39. CAPITAL PROJECT S-6205 CONTRACT NO. 20-3842. HOWARD COUNTY, MARYLAND. E1.



- NOTES:**
- FOR ELECTRICAL LEGEND AND ABBREVIATIONS SEE DWG E1.
 - SCALE IS FOR SITE PLAN BACKGROUND ONLY. OTHER ELECTRICAL EQUIPMENT ADDED TO THIS DRAWING IS NOT TO SCALE. EXACT LOCATIONS OF EXISTING EQUIPMENT SHALL BE FIELD VERIFIED, WITH OWNER'S ASSISTANCE. ALL DUCT BANKS SHOWN ON THIS DRAWING ARE EXISTING.
 - ROUTE THE 5 NEW FIBER OPTIC CABLES FROM THE ADMIN BLDG TO MANHOLE T32 IN EXISTING 5-INCH CONDUIT CONTAINING EXISTING ETHERNET AND PHONE CABLES.
 - ROUTE 1 NEW FIBER OPTIC CABLE (CKT NO. FO-4) FROM T32 TO T33 AND THEN TO THE FILTER BLDG IN EXISTING CONDUIT CONTAINING EXISTING ETHERNET CABLE.
 - ROUTE 2 NEW FIBER OPTIC CABLES (CKT NO. FO-2, FO-3) FROM T32 TO T31, T30, T18, T19 USING SPARE 4-INCH CONDUIT.
 - CONTINUE 1 FIBER OPTIC CABLE (CKT NO. FO-2) TO T20, T22, T44, AND INTO NORTH GALLERY BUILDING USING EXISTING CONDUIT (SEE NOTE 14).
 - CONTINUE 1 FIBER OPTIC CABLE (CKT NO. FO-3) TO T24 AND INTO THE SECONDARY BUILDING USING SPARE CONDUIT.
 - ROUTE 2 NEW FIBER OPTIC CABLES (CKT NO. FO-1, FO-5, FO-8, FO-9) FROM T32 TO T38, T17, T16 IN SPARE CONDUIT.
 - ROUTE 1 NEW FIBER OPTIC CABLE (CKT NO. FO-1, FO-8, FO-9) FROM T16 TO THE PS-2 VAULT IN SPARE 5 INCH CONDUIT. CONTINUE FROM THE VAULT TO THE SOLIDS BUILDING IN EXISTING 4 INCH CONDUIT TO THE TELEPHONE CABINET IN BASEMENT. CONTINUE IN EXISTING 2 INCH CONDUIT UP TO ELECTRICAL ROOM, THEN SPLIT OUT TO CONTROL PANELS AND OPERATORS STATION, AS REQUIRED.
 - CONTINUE 1 NEW FIBER OPTIC CABLE (CKT NO. FO-5) FROM T16 TO T15, T14, T13 AND T12 IN EXISTING CONDUITS. FROM T12 RUN IN EXISTING CONDUIT TO EXISTING OUTDOOR HOFFMAN BOX ON WEST WALL, THEN IN EXISTING CONDUIT ON WALL TO SECOND EXISTING HOFFMAN BOX LOCATED ON THE NORTH WEST CORNER OF EXISTING SUBSTATION WALL. FROM THIS BOX, ROUTE CABLE IN EXISTING UNDERGROUND 2 INCH DIRECT BURIED CONDUIT CONTAINING 50-PAIR PHONE CABLE TO EXISTING INDOOR BOX LOCATED IN THE HEADWORKS BUILDING.
 - REPLACE OUTDOOR TELEPHONE HOFFMAN BOX ON WEST GROUND OF NORTH WALL WITH NEW NEW 3R STAINLESS STEEL HOFFMAN BOX WITH A 24"x36" BACK PLATE. FOR THE EXISTING BOX ON WEST WALL, CLEAN/BLAST BOX AND RE-PAINT.
 - PROVIDE/INSTALL CIRCUITS FROM 3-145-L & 3-146-L USING NEW DIRECT BURIED CONDUIT TO EXISTING DUCT BANK SYSTEM. TO PIU-10. PROVIDE/INSTALL CIRCUITS FROM 3-147-L & 3-148-L USING NEW DIRECT BURIED CONDUIT TO EXISTING DUCT BANK SYSTEM, TO PIU-6 IN SECONDARY BUILDING. PROVIDE/INSTALL CIRCUIT FROM 3-149-L IN EXISTING DUCT BANK SYSTEM TO CTP-7A IN AUXILIARY PUMPING STATION.
 - ROUTE 1 NEW FIBER OPTIC CABLE (CKT NO. FO-6) FROM THE NORTH BLOWER BUILDING TO MH#49 AND MH#5A IN EXISTING SPARE 4 INCH CONDUIT.
 - CONTINUE 1 FIBER OPTIC CABLE (CKT NO. FO-6) TO MH#48, MH#27, T44, AND INTO NORTH BLOWER BUILDING USING EXISTING CONDUIT. NOTE THAT THIS CABLE IS TO BE COMBINED WITH CABLE CKT FO-2 FROM T44 INTO BUILDING (SEE NOTE 6).
 - NOT USED
 - SPARE FIBER OPTIC CABLE FIBERS SHALL BE TERMINATED WITHIN A FIBER OPTIC PATCH PANEL FOR FUTURE USE. PATCH PANELS SHALL BE LOCATED WITHIN OR IN CLOSE PROXIMITY OF THE FINAL DESTINATION EQUIPMENT LOCATIONS.
 - (1) FO CABLE (FO-7) PIU-8 HEADWORKS TO PIU-7 GRIT BUILDING.
 - (1) FO CABLE (FO-8) PIU-7, GRIT BUILDING TO PIU-7A AUX PS.

T000004CC.dwg
 T000004CB.dwg
 T000004CF.dwg
 058472-6
 F058472R

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 CHIEF, BUREAU OF UTILITIES DATE



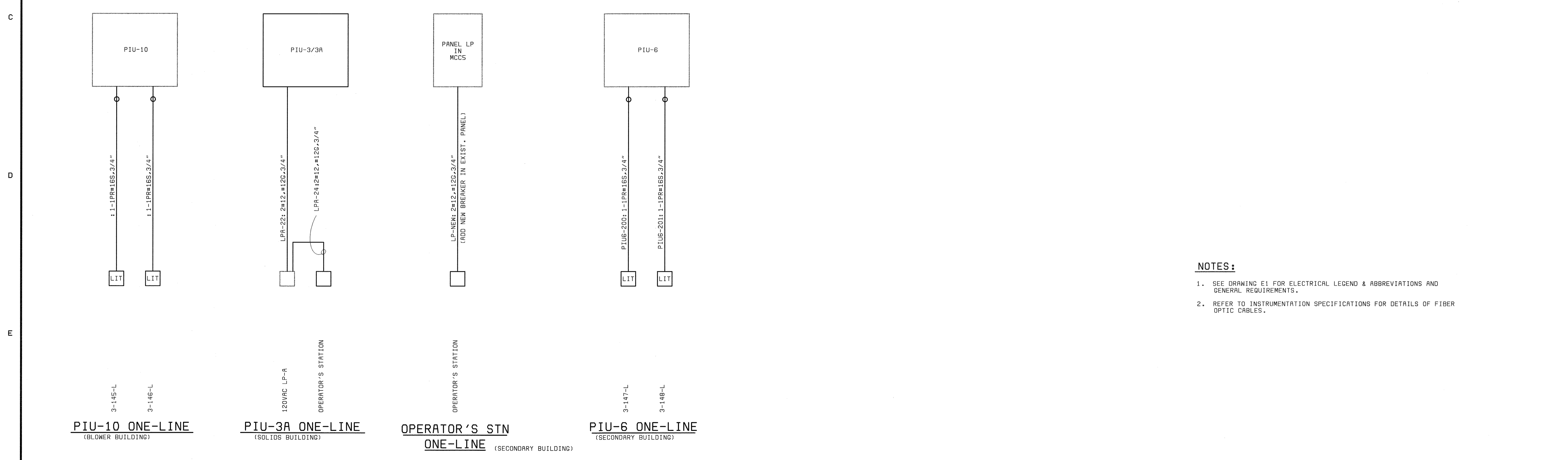
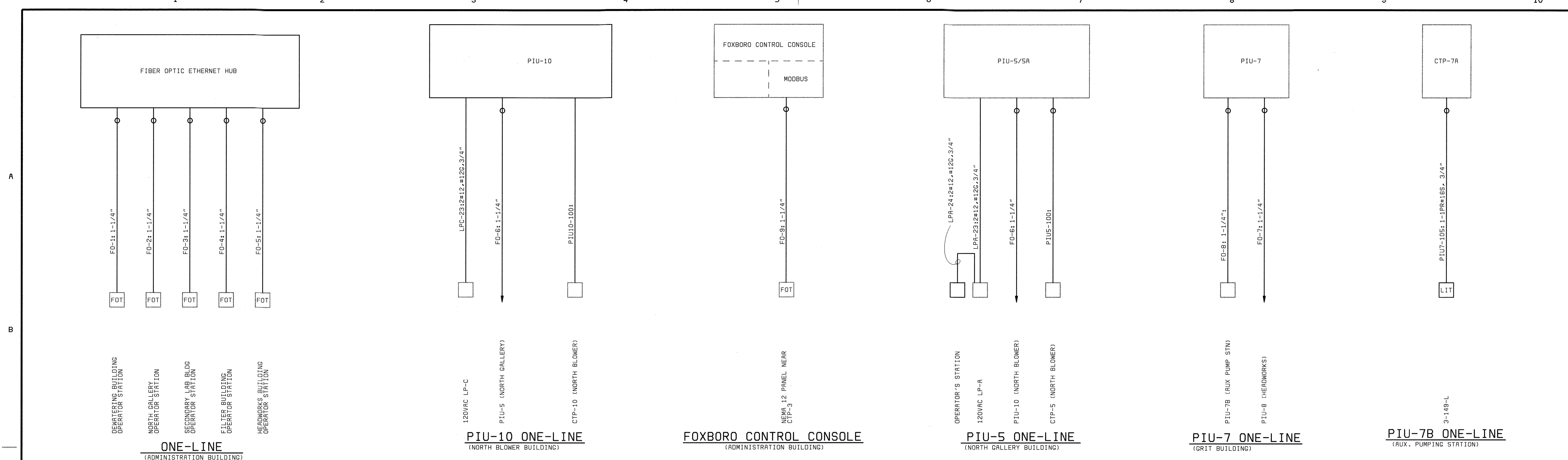
THIS DRAWING WAS
 ORIGINALLY APPROVED
 FOR CONSTRUCTION
 AND SEALED BY
 DONALD R. STEVENS
 A REGISTERED
 PROFESSIONAL ENGINEER
 IN THE
 STATE OF MARYLAND,
 NO. 21876

DES: GNS					
DRN: BAL					
CHK: GNS					
DATE: 04/22/02	7/22/05	CONFORMED TO CONSTRUCTION RECORDS		RHH/RJR/RJR	
	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

ELECTRICAL
 SITE PLAN

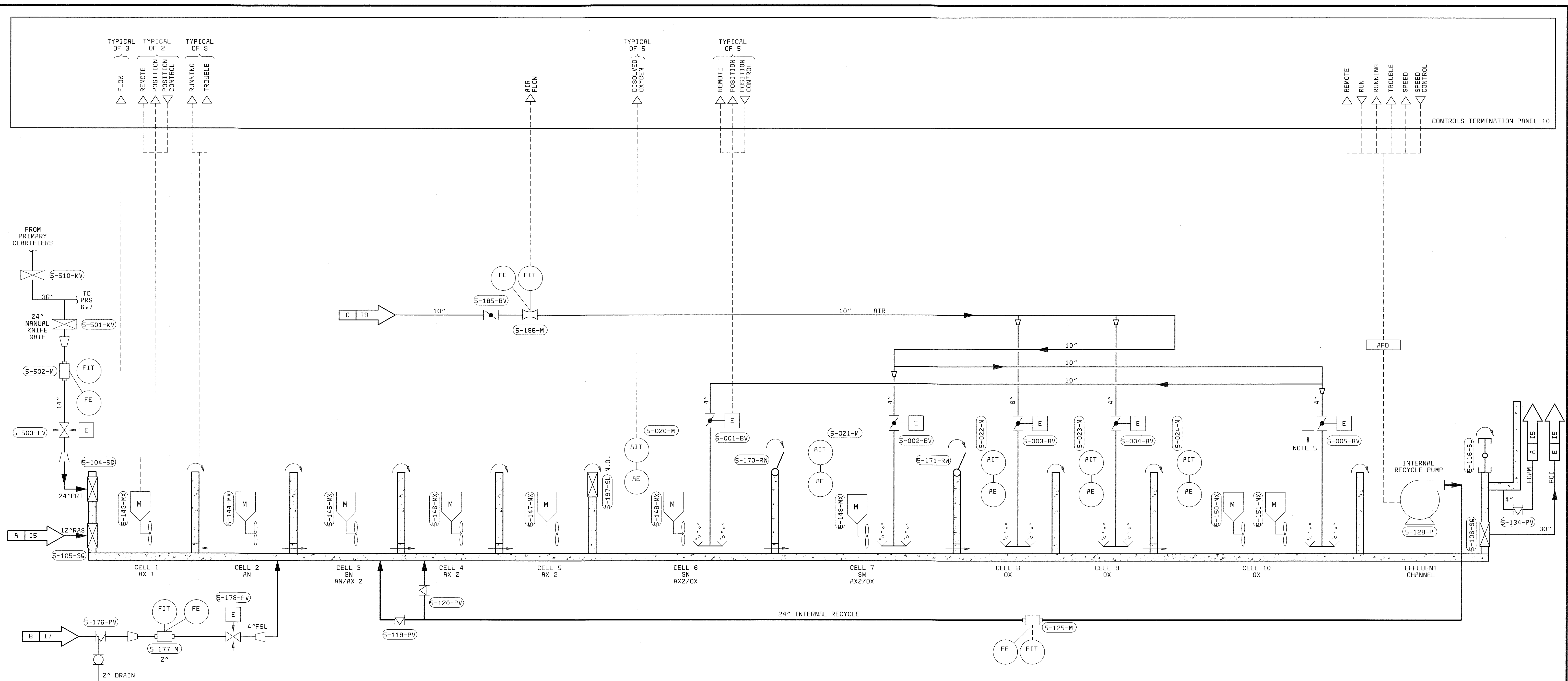
LITTLE PATUXENT WATER RECLAMATION PLANT
 ADDITION NO. 6
 CONTROL SYSTEM EXPANSION
 CAPITAL PROJECT S-6205
 CONTRACT NO. 20-3842
 HOWARD COUNTY, MARYLAND

SCALE
 AS
 SHOWN
 SHEET
 4 OF 39
 E2




- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 - REFER TO INSTRUMENTATION SPECIFICATIONS FOR DETAILS OF FIBER OPTIC CABLES.

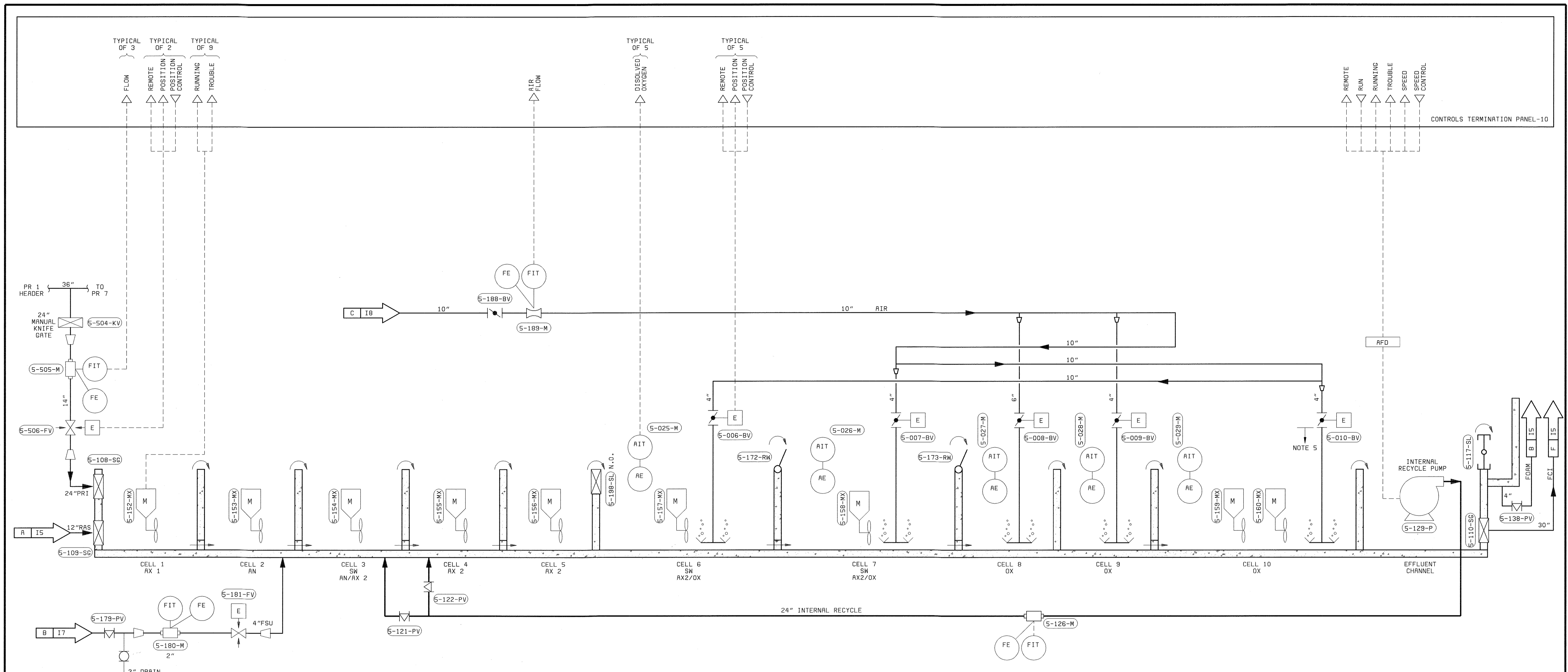
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND CHIEF, BUREAU OF UTILITIES DATE	 Gaithersburg, Maryland REG. PROF. ENGR. DATE	THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY DONALD R. STEVENS A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF MARYLAND, NO. 21876	DES: GNS				ELECTRICAL MISCELLANEOUS ONE-LINE DIAGRAMS	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 CONTROL SYSTEM EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3842 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: BAL						7/22/05
			CHK: GNS						E3
			DATE: 04/22/02						



PROCESS REACTOR #5
5-101-PR

- NOTES:**
1. SEE P&ID LEGEND ON DRAWING I-1.
 2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
 3. ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS P&ID.
 4. REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.
 5. PIPING BY DIFFUSER SUPPLIER (TYP.)

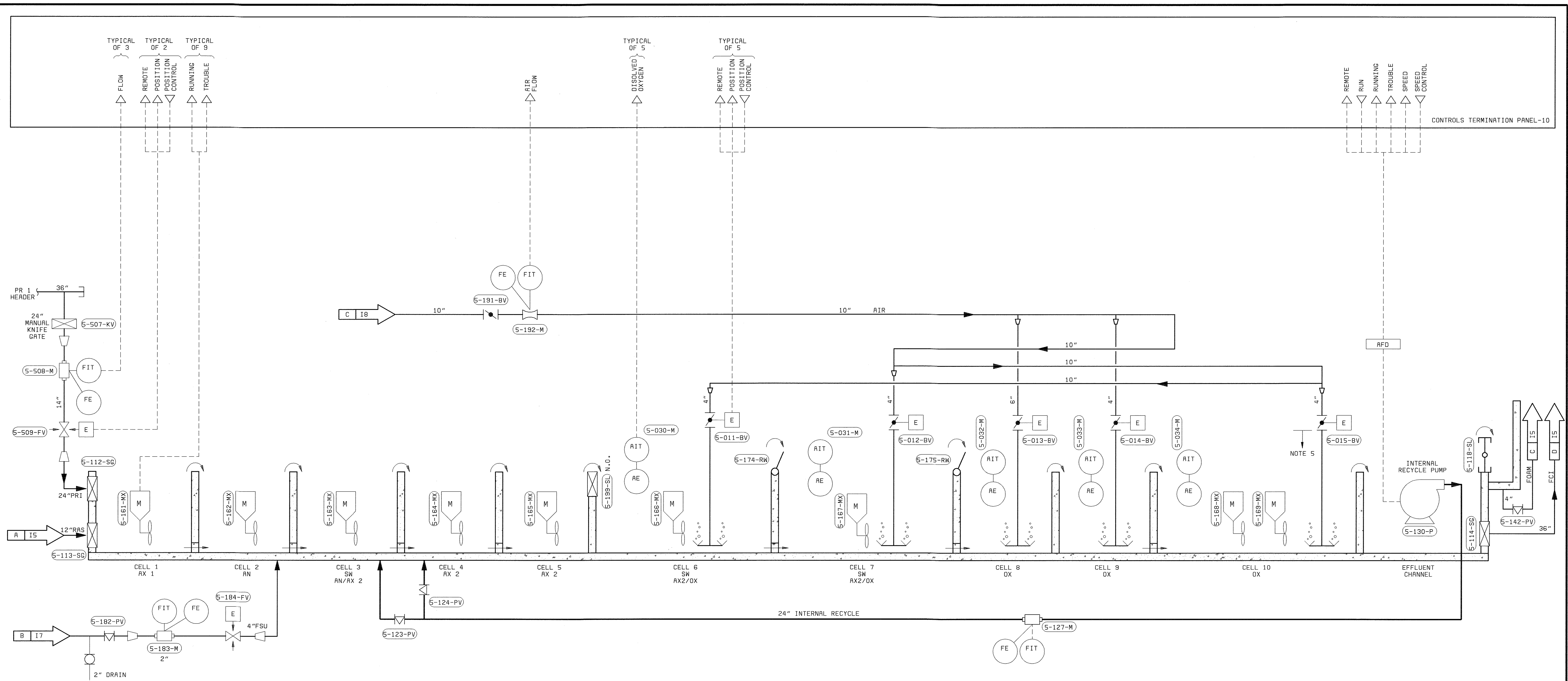
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND CHIEF, BUREAU OF UTILITIES DATE	 BLACK & VEATCH Gaithersburg, Maryland REG. PROF. ENGR. _____ DATE _____	THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY DONALD R. STEVENS A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF MARYLAND, NO. 21876	DES: RSF DRN: MDR CHK: PWM DATE: 04/22/02	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>7/22/05</td> <td>CONFORMED TO CONSTRUCTION RECORDS</td> <td>RHH</td> <td>RJR</td> <td>RJR</td> </tr> <tr> <td>DATE</td> <td>REVISIONS AND RECORD OF ISSUE</td> <td>NO.</td> <td>BY</td> <td>CK APP</td> </tr> </table>	7/22/05	CONFORMED TO CONSTRUCTION RECORDS	RHH	RJR	RJR	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP	INSTRUMENTATION P & ID PROCESS REACTOR NO.5	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 CONTROL SYSTEM EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3842 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN SHEET 7 OF 39 12
7/22/05	CONFORMED TO CONSTRUCTION RECORDS	RHH	RJR	RJR													
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP													



PROCESS REACTOR #6
5-102-PR

- NOTES:**
- SEE P&ID LEGEND ON DRAWING I-1.
 - LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
 - ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS P&ID.
 - REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.
 - PIPING BY DIFFUSER SUPPLIER (TYP.)

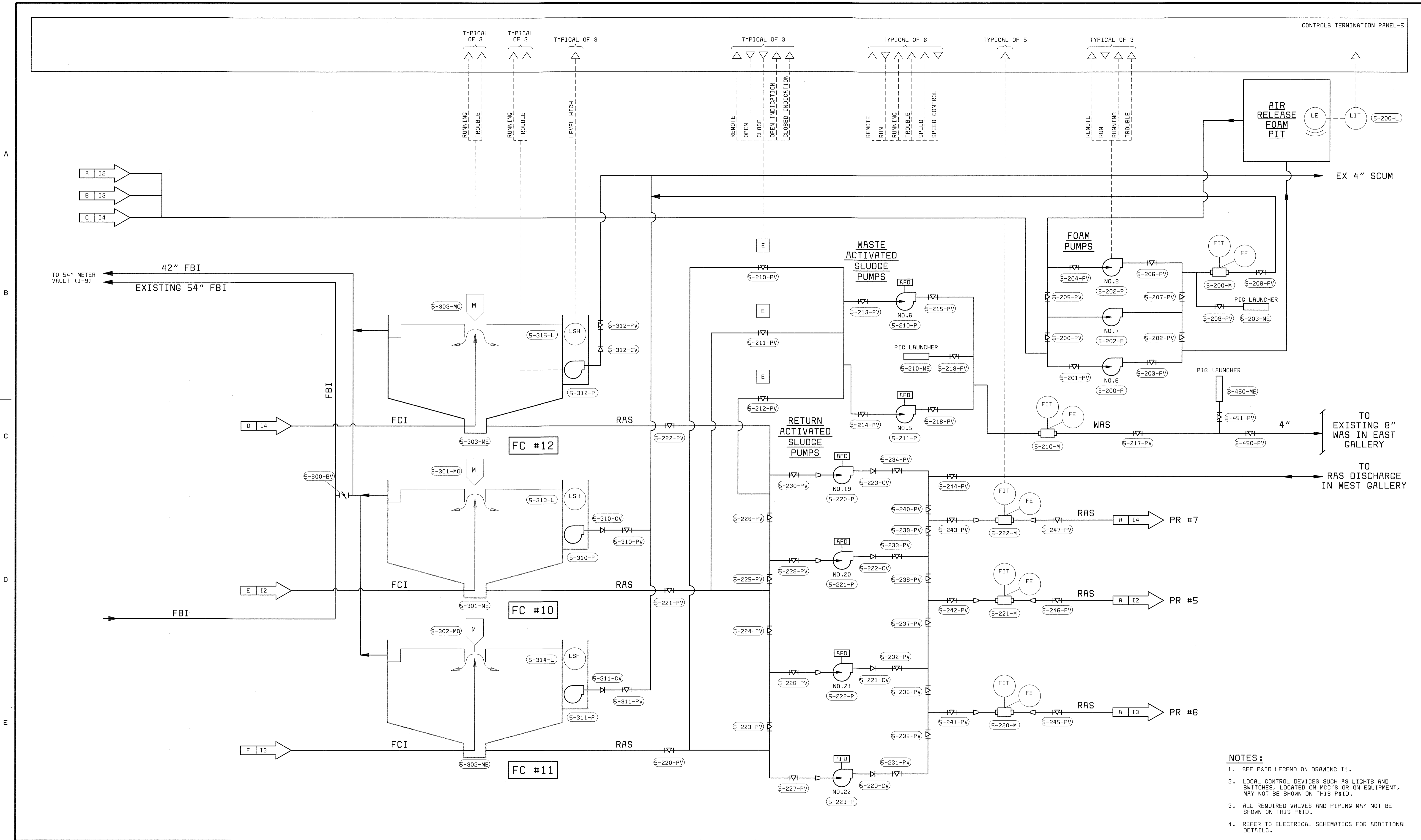
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND CHIEF, BUREAU OF UTILITIES DATE	BLACK & VEATCH Gaithersburg, Maryland REG. PROF. ENGR. DATE	THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY DONALD R. STEVENS A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF MARYLAND, NO. 21876	DES: RSF					INSTRUMENTATION P & ID PROCESS REACTOR NO.6	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 CONTROL SYSTEM EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3842 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: DAH	CHK: PWM	7/22/05	CONFORMED TO CONSTRUCTION RECORDS	RHH/RJR/RJR			
			DATE: 04/22/02	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP	13



PROCESS REACTOR #7
5-103-PR

- NOTES:**
- SEE P&ID LEGEND ON DRAWING I-1.
 - LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
 - ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS P&ID.
 - REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.
 - PIPING BY DIFFUSER SUPPLIER (TYP.)

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND CHIEF, BUREAU OF UTILITIES DATE	BLACK & VEATCH Gaithersburg, Maryland REG. PROF. ENGR. DATE	THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY DONALD R. STEVENS A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF MARYLAND, NO. 21876	DES: RSF					INSTRUMENTATION P & ID PROCESS REACTOR NO.7	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 CONTROL SYSTEM EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3842 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: MDR	CHK: PWM	7/22/05	CONFORMED TO CONSTRUCTION RECORDS	RHH			RJR
			DATE: 04/22/02	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP	I 4



- NOTES:**
- SEE P&ID LEGEND ON DRAWING I1.
 - LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCC'S OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
 - ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS P&ID.
 - REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH
Gaithersburg, Maryland

REG. PROF. ENGR. DATE

THIS DRAWING WAS
ORIGINALLY APPROVED
FOR CONSTRUCTION
AND SEALED BY
DONALD R. STEVENS
A REGISTERED
PROFESSIONAL ENGINEER
IN THE
STATE OF MARYLAND,
NO. 21876

DES: RSF					
DRN: RLC					
CHK: PWM					
DATE: 04/22/02	7/22/05	CONFORMED TO CONSTRUCTION RECORDS		RHH/RJR/RJR	
	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

INSTRUMENTATION

P & ID
FINAL CLARIFIERS
NO. 10, 11 AND 12

LITTLE PATUXENT WATER RECLAMATION PLANT
ADDITION NO. 6
CONTROL SYSTEM EXPANSION

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3842

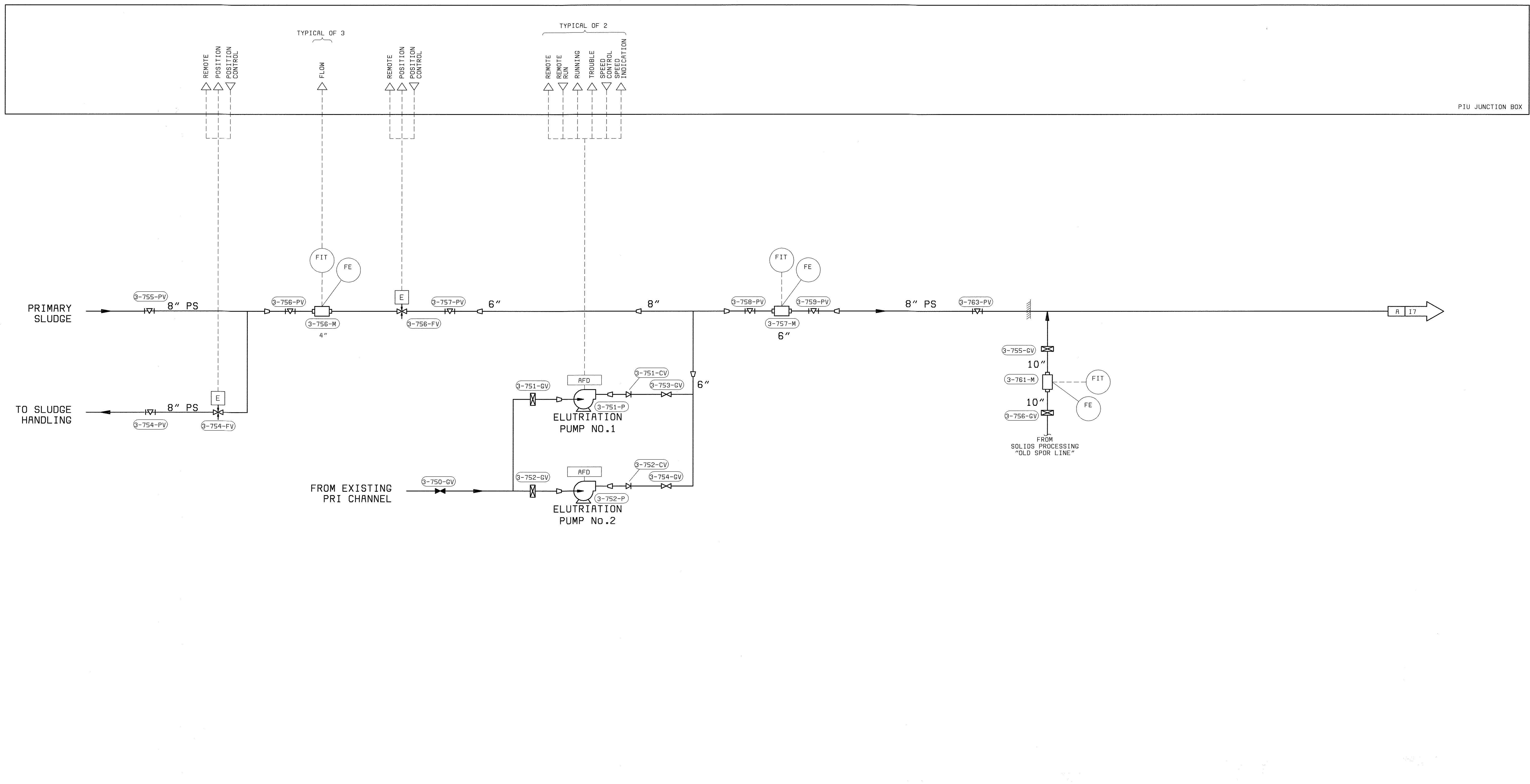
HOWARD COUNTY, MARYLAND

SCALE
AS
SHOWN

SHEET
10 OF 39

15

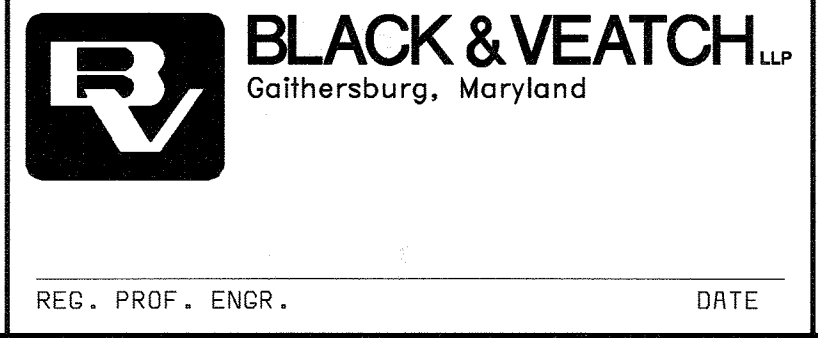
A
B
C
D
E
F



- NOTES:**
1. SEE P&ID LEGEND ON DRAWING I-1.
 2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
 3. ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS PID.
 4. REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF UTILITIES DATE



THIS DRAWING WAS
ORIGINALLY APPROVED
FOR CONSTRUCTION
AND SEALED BY
DONALD R. STEVENS
A REGISTERED
PROFESSIONAL ENGINEER
IN THE
STATE OF MARYLAND,
NO. 21876

DES: RSF					
DRN: JGT, DAH					
CHK: PWM					
DATE: 04/22/02	7/22/05	CONFORMED TO CONSTRUCTION RECORDS		RHH	RJR
	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

INSTRUMENTATION

P & ID
WEST GALLERY

LITTLE PATUXENT WATER RECLAMATION PLANT
ADDITION NO. 6
CONTROL SYSTEM EXPANSION

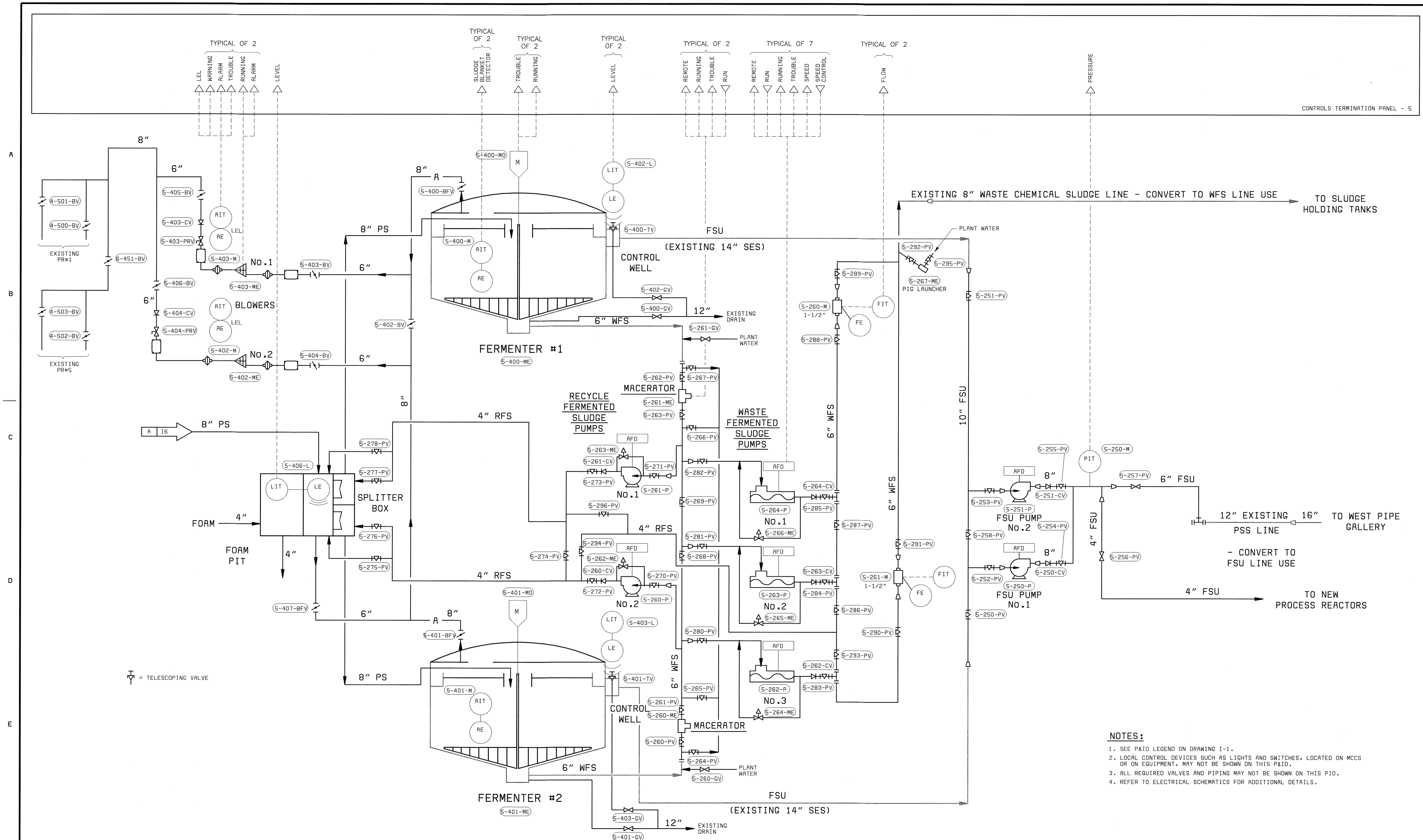
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3842

HOWARD COUNTY, MARYLAND

SCALE
AS
SHOWN

SHEET
11 OF 39

I6



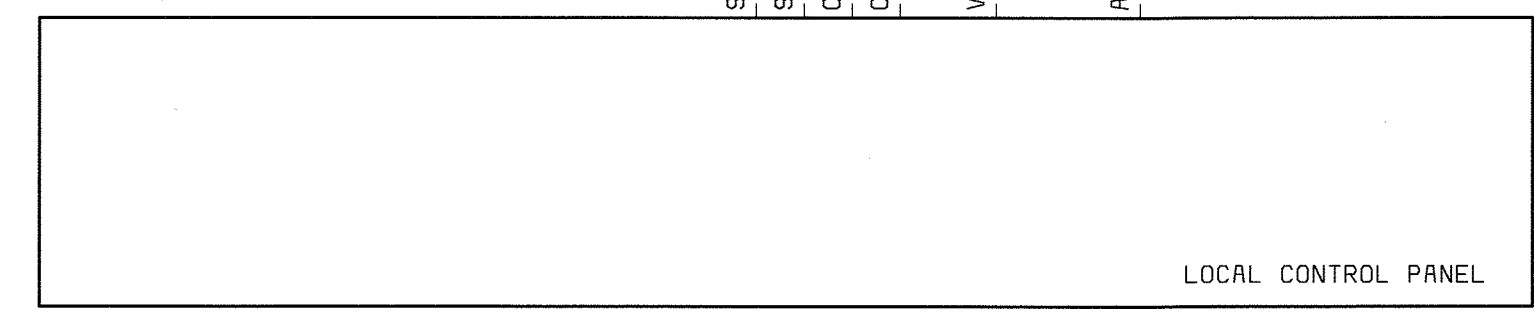
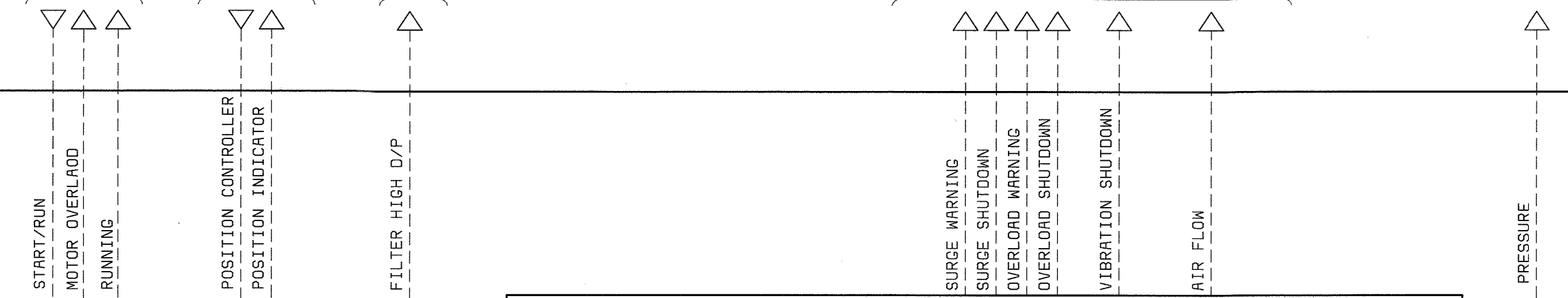
- NOTES:**
- SEE P&ID LEGEND ON DRAWING I-1.
 - LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
 - ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS PID.
 - REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND CHIEF, BUREAU OF UTILITIES DATE	BLACK & VEATCH Gaithersburg, Maryland REG. PROF. ENGR. DATE	THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY DONALD R. STEVENS A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF MARYLAND, NO. 21876	DES: RSF							INSTRUMENTATION P & ID FERMENTER	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 CONTROL SYSTEM EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3842 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: DAH	CHK: PWM	DATE: 01/25/02	7/22/05	CONFORMED TO CONSTRUCTION RECORDS	RHH/RJR/RJR	REVISIONS AND RECORD OF ISSUE			NO. BY CK APP

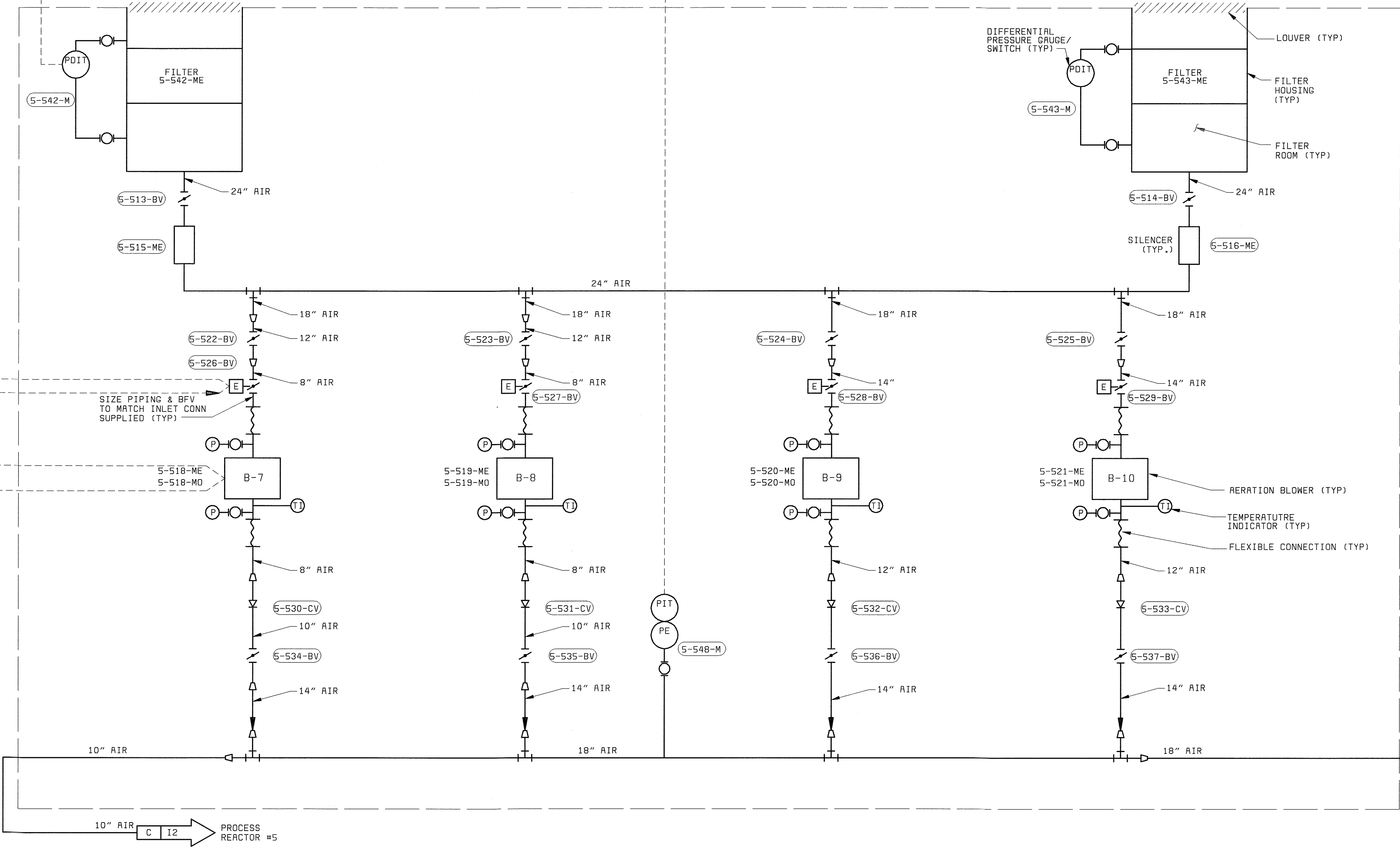
TYPICAL OF 4 TYPICAL OF 4 TYPICAL OF 2

TYPICAL OF 4

CONTROLS TERMINATION PANEL - 10



OUTPUT
INPUT



NOTES:

1. SEE P&ID LEGEND ON DRAWING I-1.
2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
3. ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS PID.
4. REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH
Gaithersburg, Maryland
REG. PROF. ENGR. DATE

THIS DRAWING WAS
ORIGINALLY APPROVED
FOR CONSTRUCTION
AND SEALED BY
DONALD R. STEVENS
A REGISTERED
PROFESSIONAL ENGINEER
IN THE
STATE OF MARYLAND,
NO. 21876

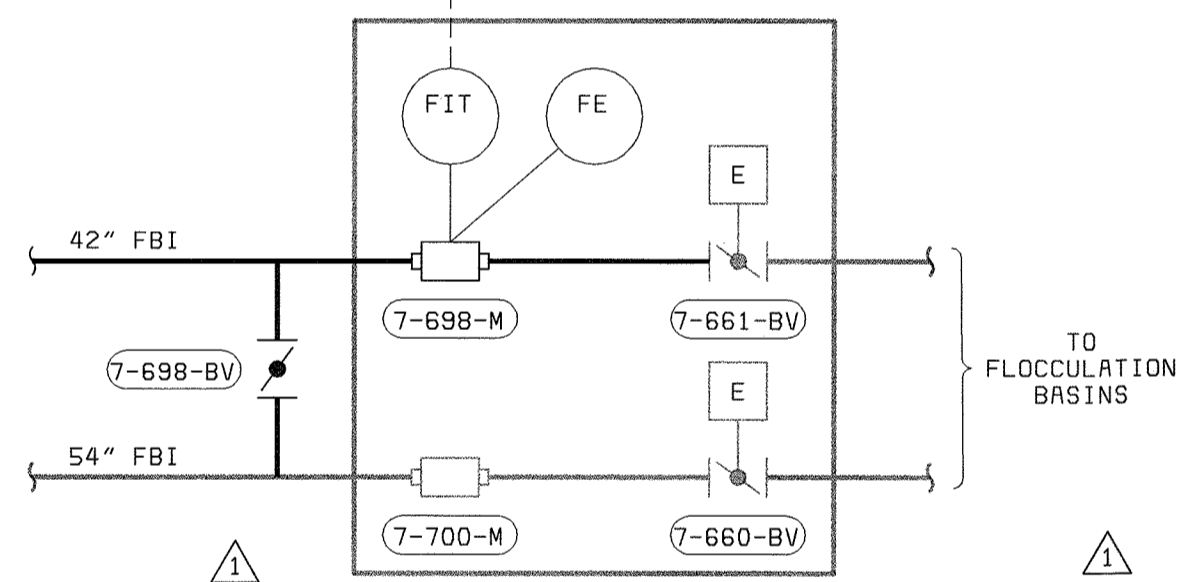
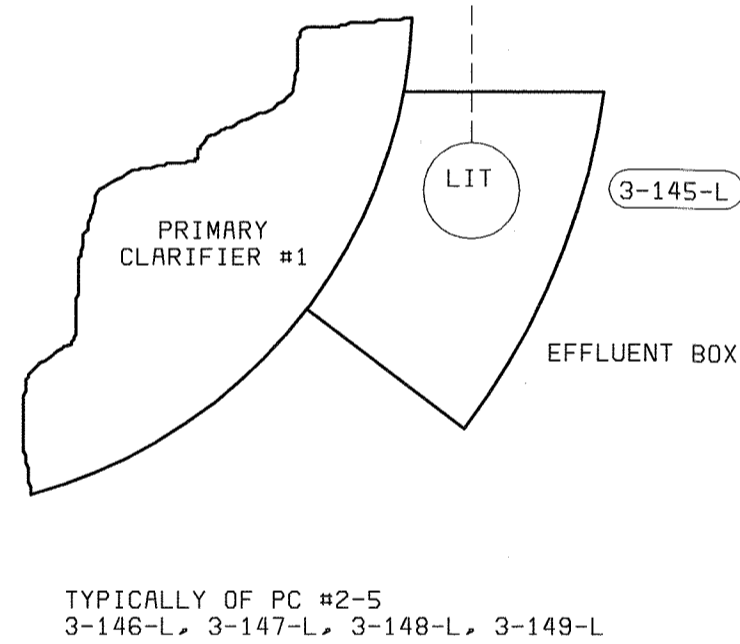
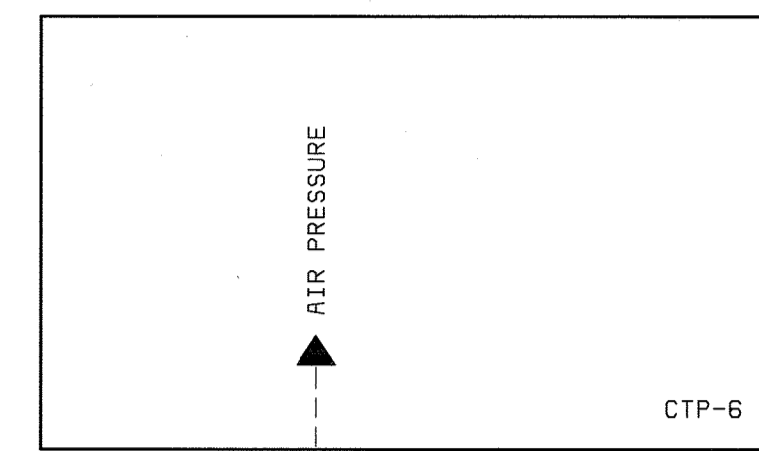
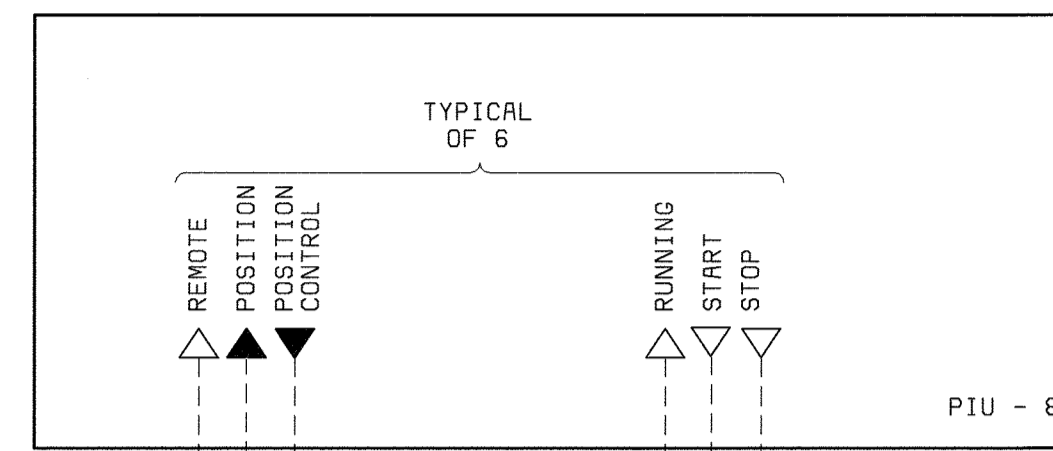
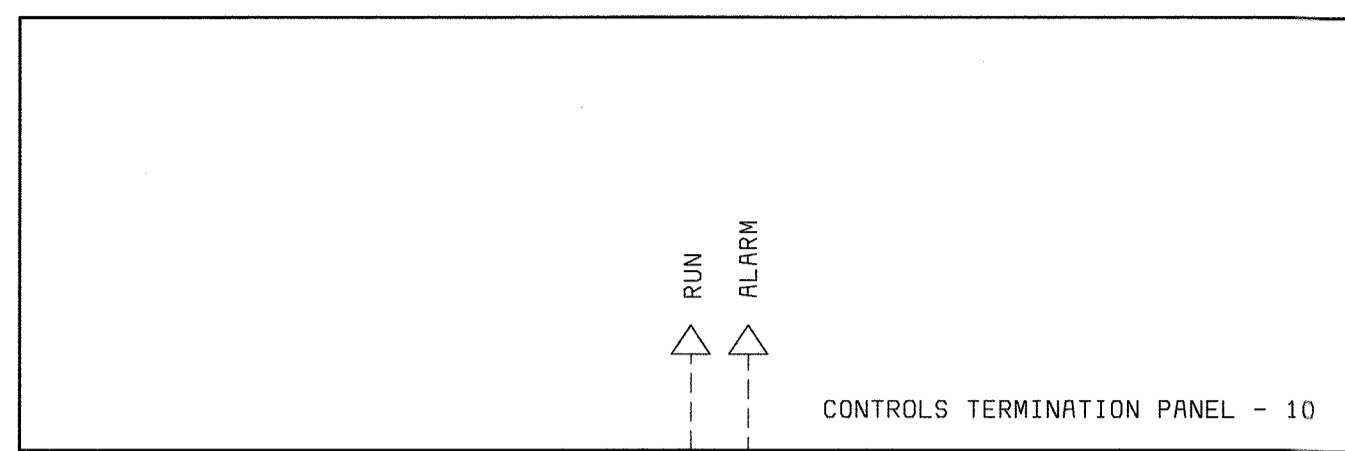
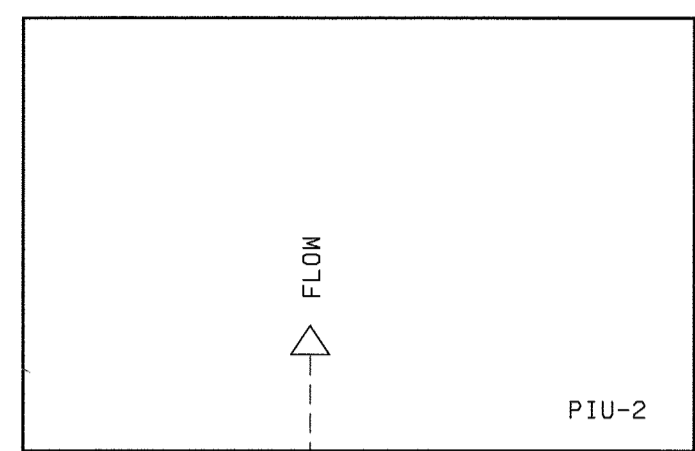
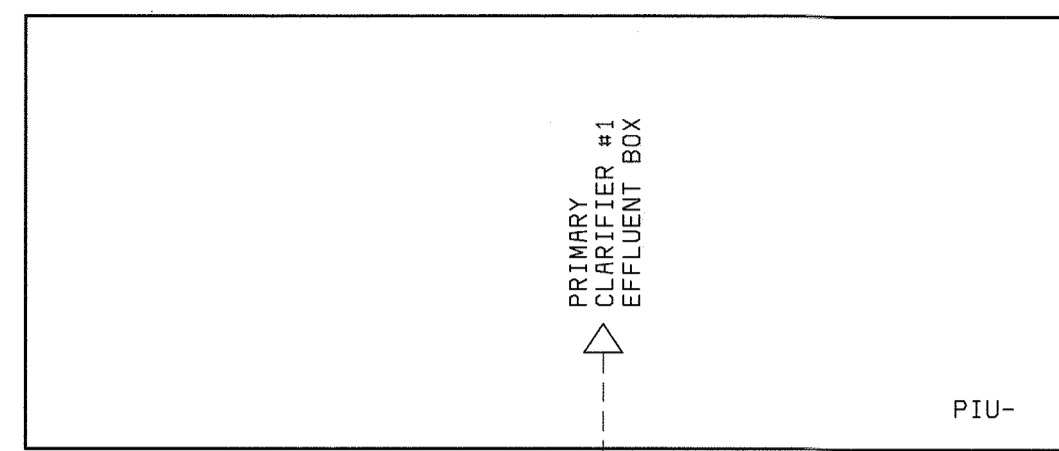
DES: RSF					
DRN: JGT					
CHK: PWM					
DATE: 04/22/02	7/22/05	CONFORMED TO CONSTRUCTION RECORDS	RHH	RJR	RJR
	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

INSTRUMENTATION
P & ID
NORTH
BLOWERS

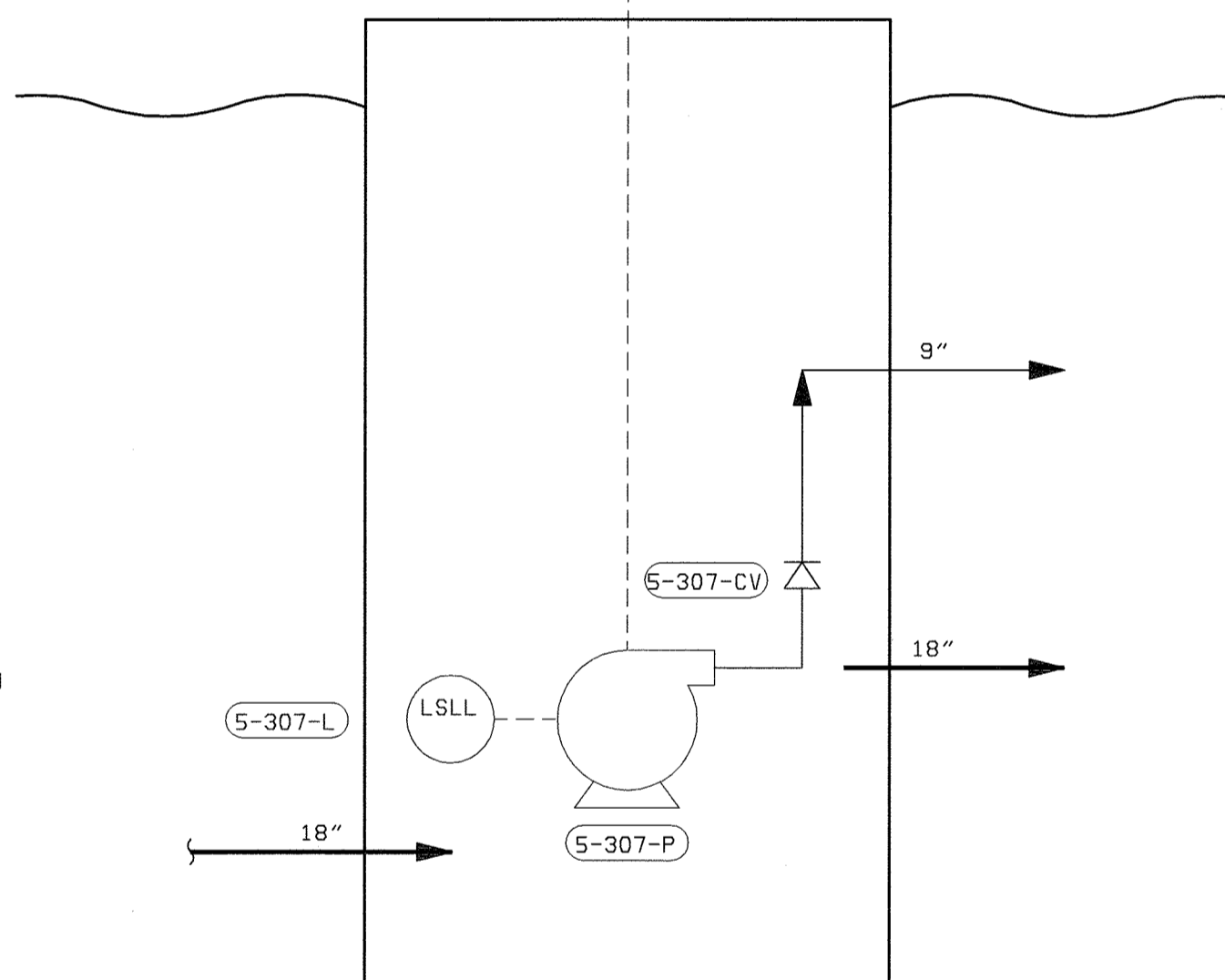
LITTLE PATUXENT WATER RECLAMATION PLANT
ADDITION NO. 6
CONTROL SYSTEM EXPANSION
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3842
HOWARD COUNTY, MARYLAND

SCALE
AS
SHOWN
SHEET
13 OF 39
18

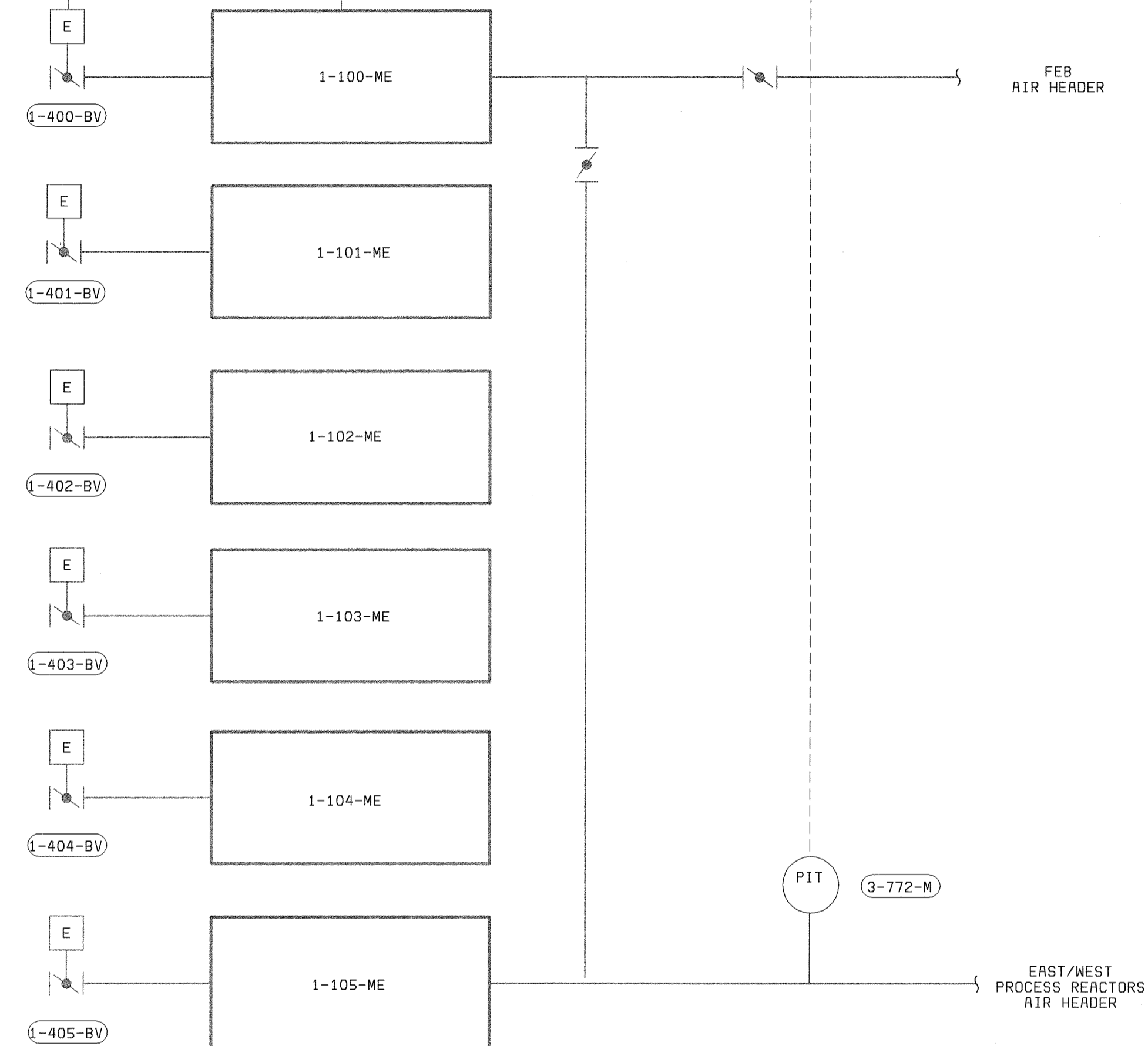
DB6725.6
FD58472A



54" METER VAULT



PLANT DRAIN MANHOLE PUMP STATION



BLOWERS IN HEADWORKS

NOTES:

1. SEE P&ID LEGEND ON DRAWING I-1.
2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
3. ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS P&ID.
4. REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF UTILITIES DATE



BLACK & VEATCH
Gaithersburg, Maryland

REG. PROF. ENGR. DATE

THIS DRAWING WAS
ORIGINALLY APPROVED
FOR CONSTRUCTION
AND SEALED BY
DONALD R. STEVENS
A REGISTERED
PROFESSIONAL ENGINEER
IN THE
STATE OF MARYLAND,
NO. 21876

DES: RSF

DRN: DAH

CHK: PWM

DATE: 04/22/02

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
7/22/05	CONFORMED TO CONSTRUCTION RECORDS		RHH	RJR	RJR
04/22/02	CONFORMED TO NEGOTIATED CHANGES	1	RSF	PWM	

INSTRUMENTATION & CONTROLS

P & ID
MISCELLANEOUS

LITTLE PATUXENT WATER RECLAMATION PLANT
ADDITION NO. 6
CONTROL SYSTEM EXPANSION

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3842

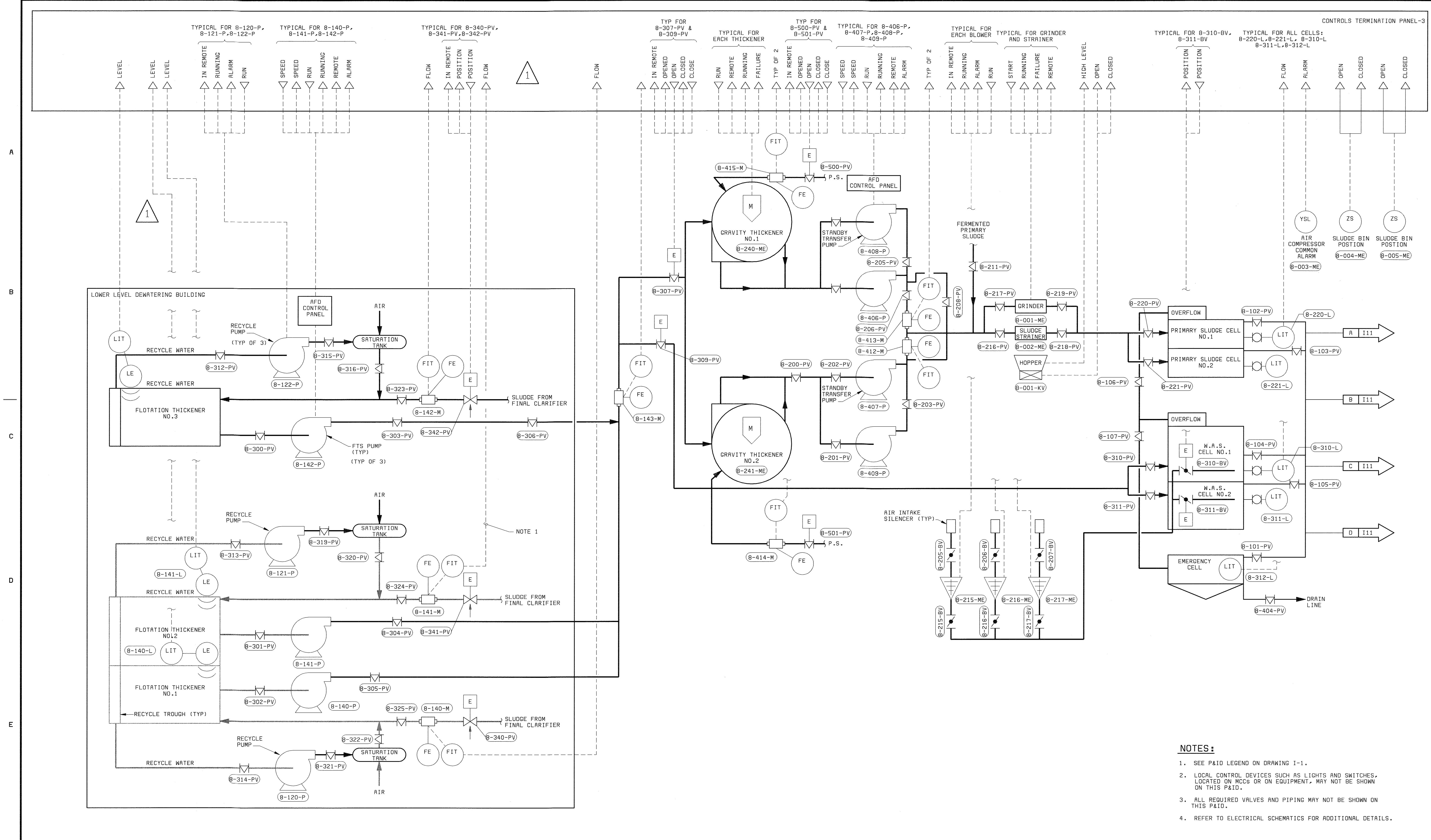
HOWARD COUNTY, MARYLAND

SCALE
AS
SHOWN

SHEET
14 OF 39

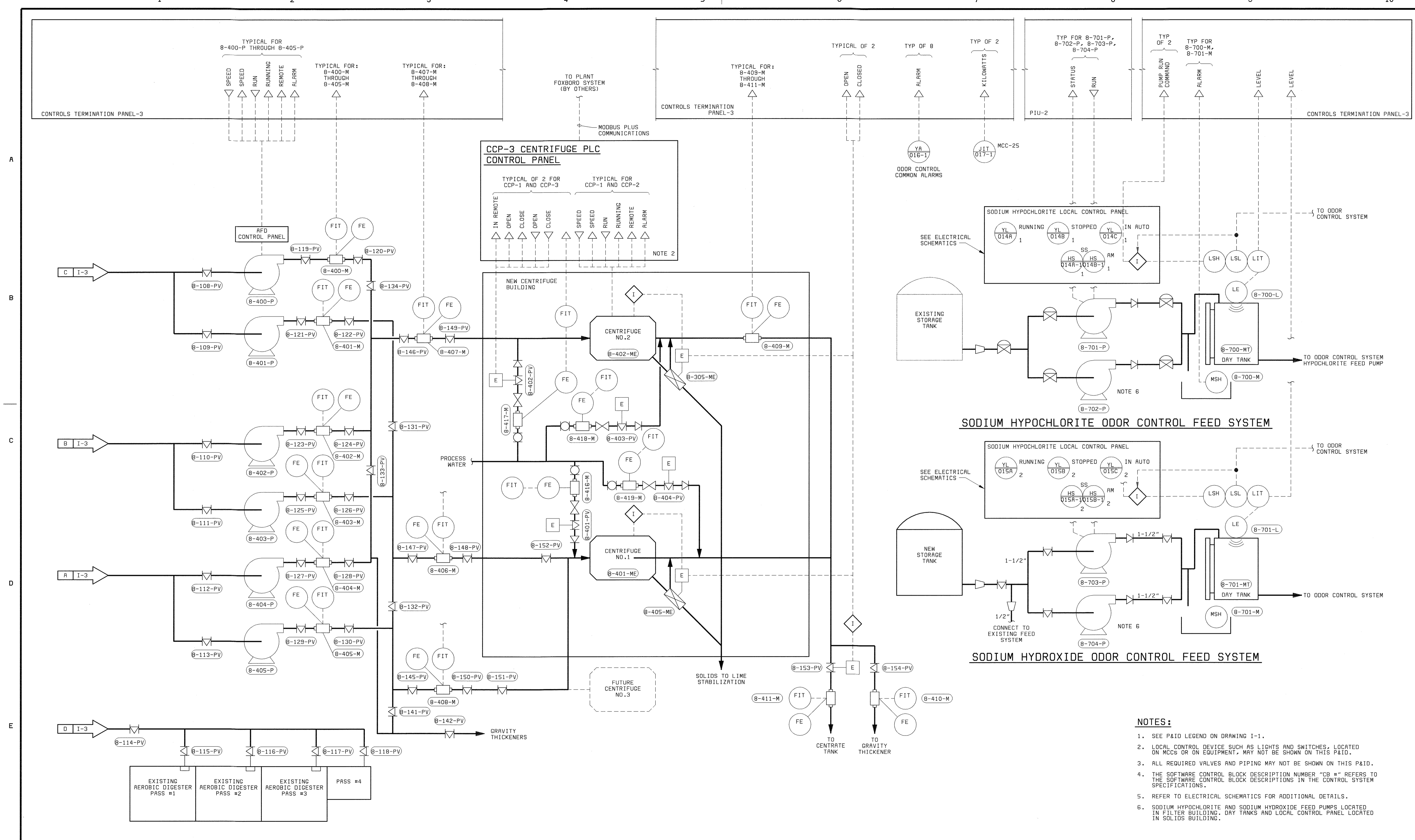
19

058472-6
FD58472A



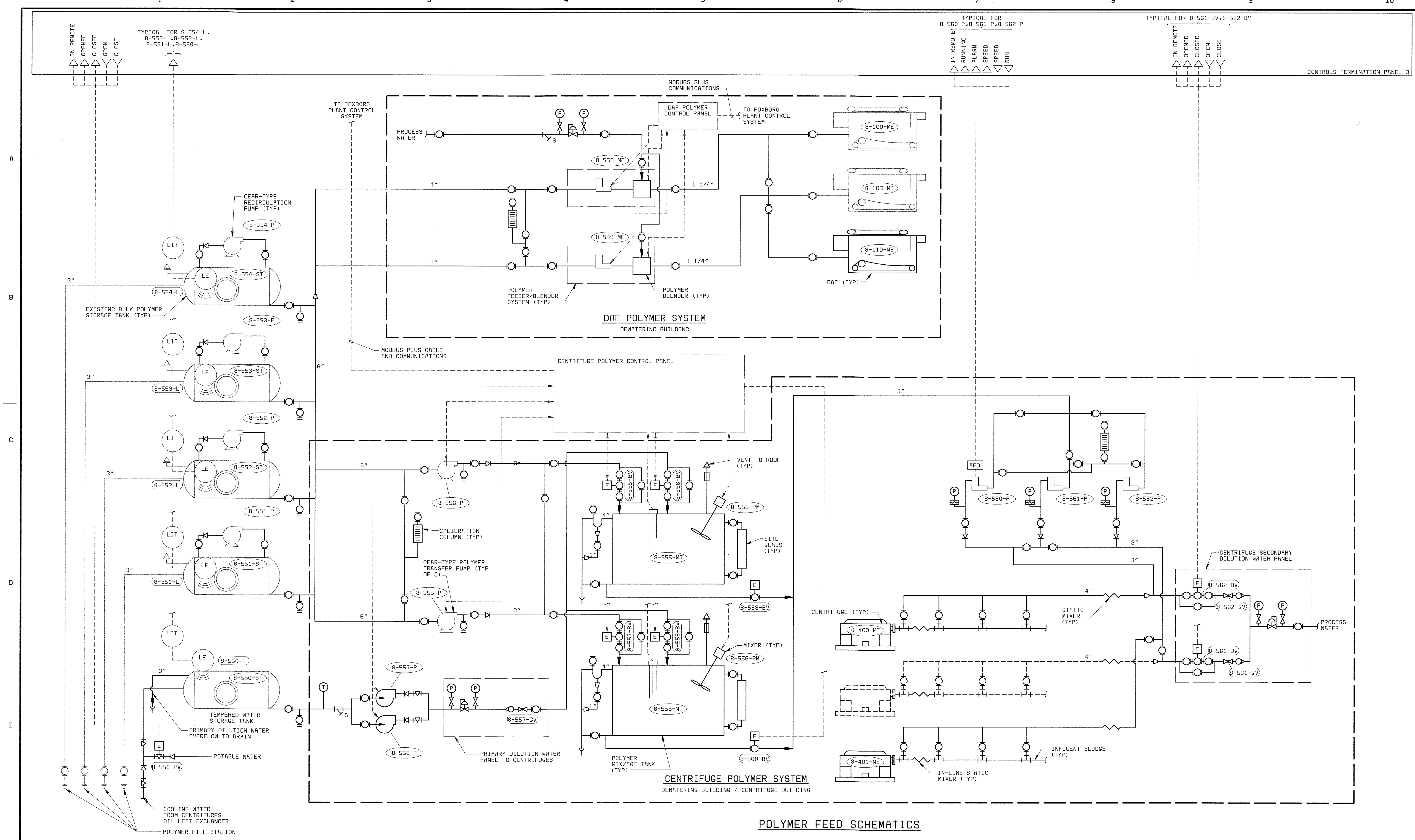
- NOTES:**
1. SEE P&ID LEGEND ON DRAWING I-1.
 2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
 3. ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS P&ID.
 4. REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND CHIEF, BUREAU OF UTILITIES DATE	BLACK & VEATCH Gaithersburg, Maryland REG. PROF. ENGR. _____ DATE _____	THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY DONALD R. STEVENS A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF MARYLAND, NO. 21876	DES: RLS DRN: DAH CHK: PWM DATE: 04/22/02	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:10%;">7/22/05</td> <td style="width:50%;">CONFORMED TO CONSTRUCTION RECORDS</td> <td style="width:10%;">RHH</td> <td style="width:10%;">RJR</td> <td style="width:15%;">RJR</td> </tr> <tr> <td>04/22/02</td> <td>CONFORMED TO NEGOTIATED CHANGES</td> <td>1</td> <td>RSF</td> <td>PWM</td> </tr> <tr> <td>DATE</td> <td>REVISIONS AND RECORD OF ISSUE</td> <td>NO.</td> <td>BY</td> <td>CK APP</td> </tr> </table>	7/22/05	CONFORMED TO CONSTRUCTION RECORDS	RHH	RJR	RJR	04/22/02	CONFORMED TO NEGOTIATED CHANGES	1	RSF	PWM	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP	INSTRUMENTATION SOLIDS PROCESSING P&ID	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 CONTROL SYSTEM EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3842 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN SHEET 15 OF 39 I 10
7/22/05	CONFORMED TO CONSTRUCTION RECORDS	RHH	RJR	RJR																		
04/22/02	CONFORMED TO NEGOTIATED CHANGES	1	RSF	PWM																		
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP																		



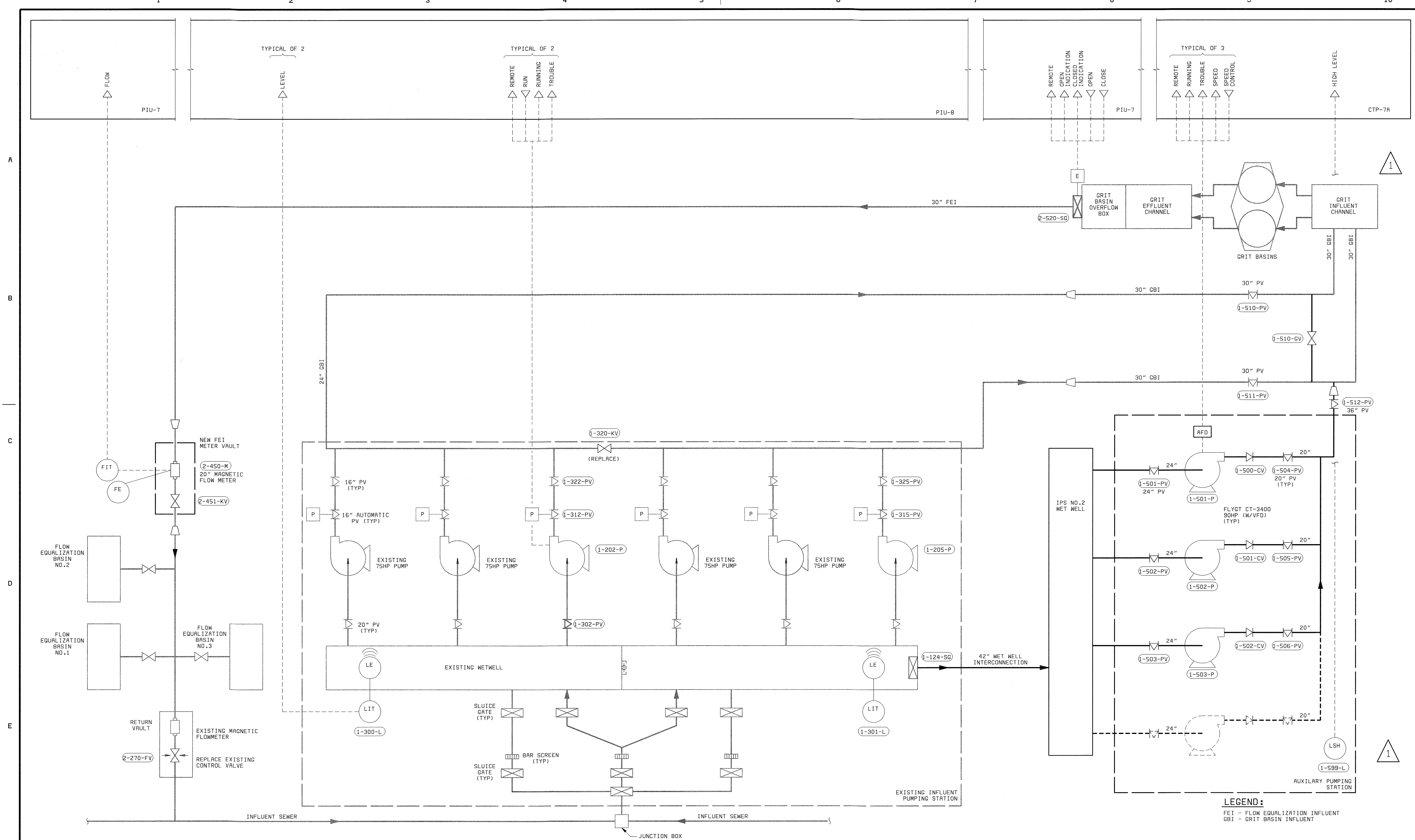
- NOTES:**
- SEE P&ID LEGEND ON DRAWING I-1.
 - LOCAL CONTROL DEVICE SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
 - ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS P&ID.
 - THE SOFTWARE CONTROL BLOCK DESCRIPTION NUMBER "CB #" REFERS TO THE SOFTWARE CONTROL BLOCK DESCRIPTIONS IN THE CONTROL SYSTEM SPECIFICATIONS.
 - REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.
 - SODIUM HYPOCHLORITE AND SODIUM HYDROXIDE FEED PUMPS LOCATED IN FILTER BUILDING. DAY TANKS AND LOCAL CONTROL PANEL LOCATED IN SOLIDS BUILDING.

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND CHIEF, BUREAU OF UTILITIES DATE	BLACK & VEATCH Gaithersburg, Maryland REG. PROF. ENGR. DATE	THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY DONALD R. STEVENS A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF MARYLAND, NO. 21876	DES: RLS					INSTRUMENTATION SOLIDS PROCESSING P&ID	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 CONTROL SYSTEM EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3842 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: DAH	CHK: PWM	DATE: 04/22/02	7/22/05	CONFORMED TO CONSTRUCTION RECORDS			RHH
			DATE			REVISIONS AND RECORD OF ISSUE			I 11	



POLYMER FEED SCHEMATICS

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND CHIEF, BUREAU OF UTILITIES DATE	BLACK & VEATCH Gaithersburg, Maryland REG. PROF. ENGR. _____ DATE _____	THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY DONALD R. STEVENS A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF MARYLAND, NO. 21876	DES: RLS					INSTRUMENTATION POLYMER FEED SCHEMATIC	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 CONTROL SYSTEM EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3842 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: DAH	CHK: PWM	DATE: 04/22/02	7/22/05	CONFORMED TO CONSTRUCTION RECORDS			RHH/RJR/RJR



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH
Gaithersburg, Maryland

REG. PROF. ENGR. DATE

THIS DRAWING WAS
ORIGINALLY APPROVED
FOR CONSTRUCTION
AND SEALED BY
DONALD R. STEVENS
A REGISTERED
PROFESSIONAL ENGINEER
IN THE
STATE OF MARYLAND,
NO. 21876

DES: RSF									
DRN: DAH									
CHK: PWM	7/22/05	CONFORMED TO CONSTRUCTION RECORDS		RHH	RJR	RJR			
DATE: 04/22/02	04/22/02	CONFORMED TO NEGOTIATED CHANGES		1	RSF	PWM			
	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

INSTRUMENTATION

HEADWORKS & INFLUENT PUMPING P & ID

**LITTLE PATUXENT WATER RECLAMATION PLANT
ADDITION NO. 6
CONTROL SYSTEM EXPANSION**

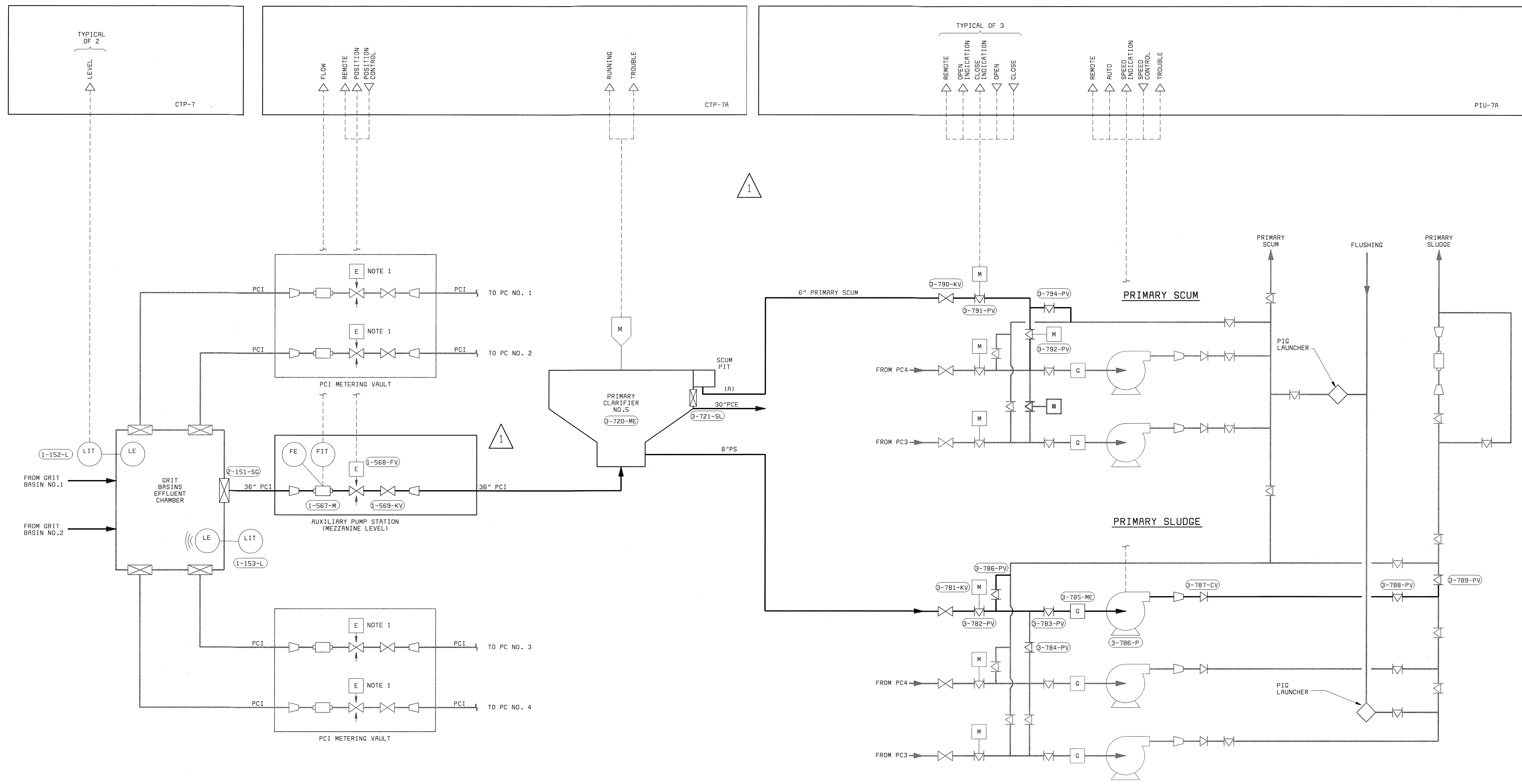
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3842

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

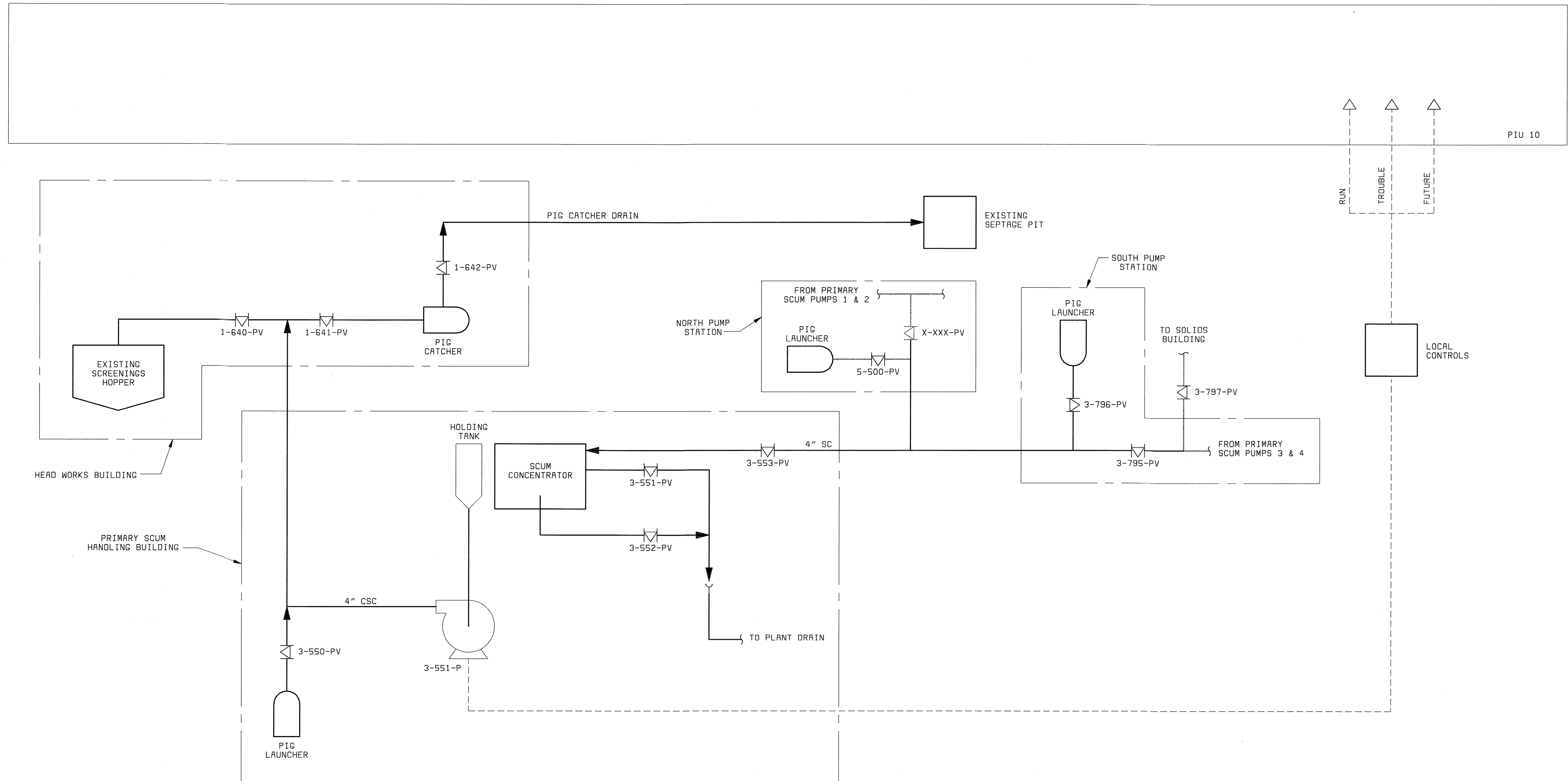
SHEET 18 OF 39

113




- NOTE:**
- SEE P&ID LEGEND ON DRAWING I-1.
 - LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
 - ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS P&ID.
 - REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.

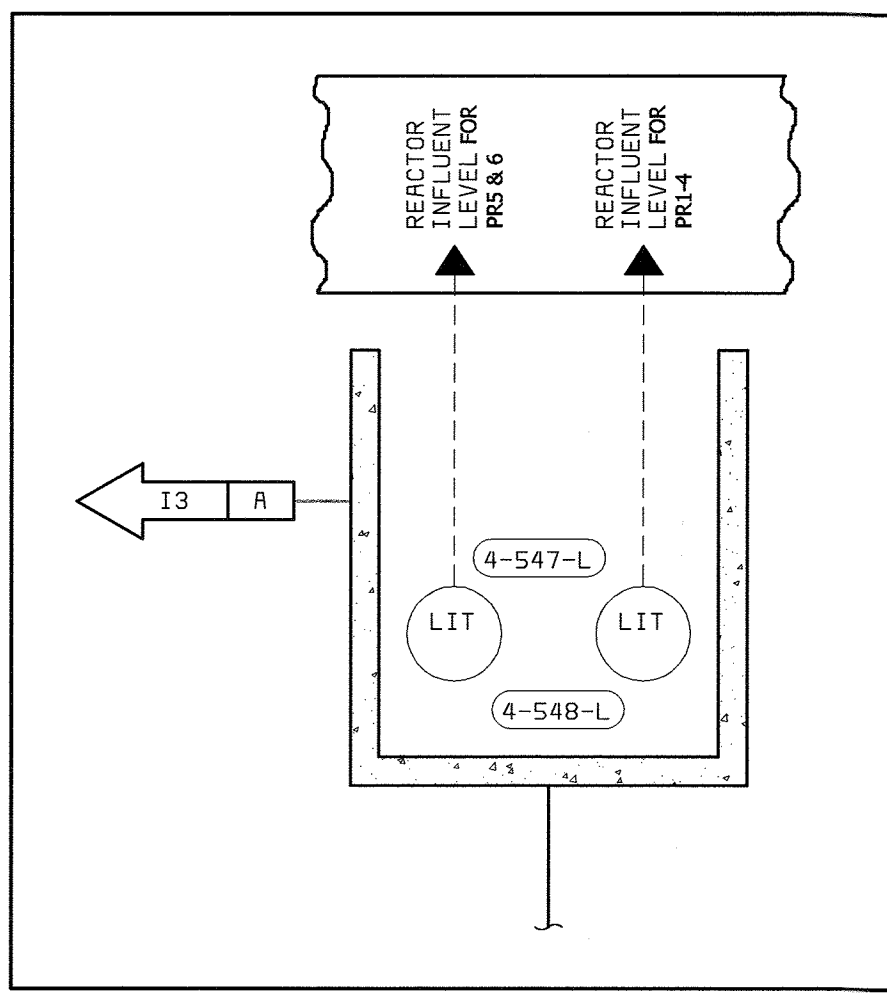
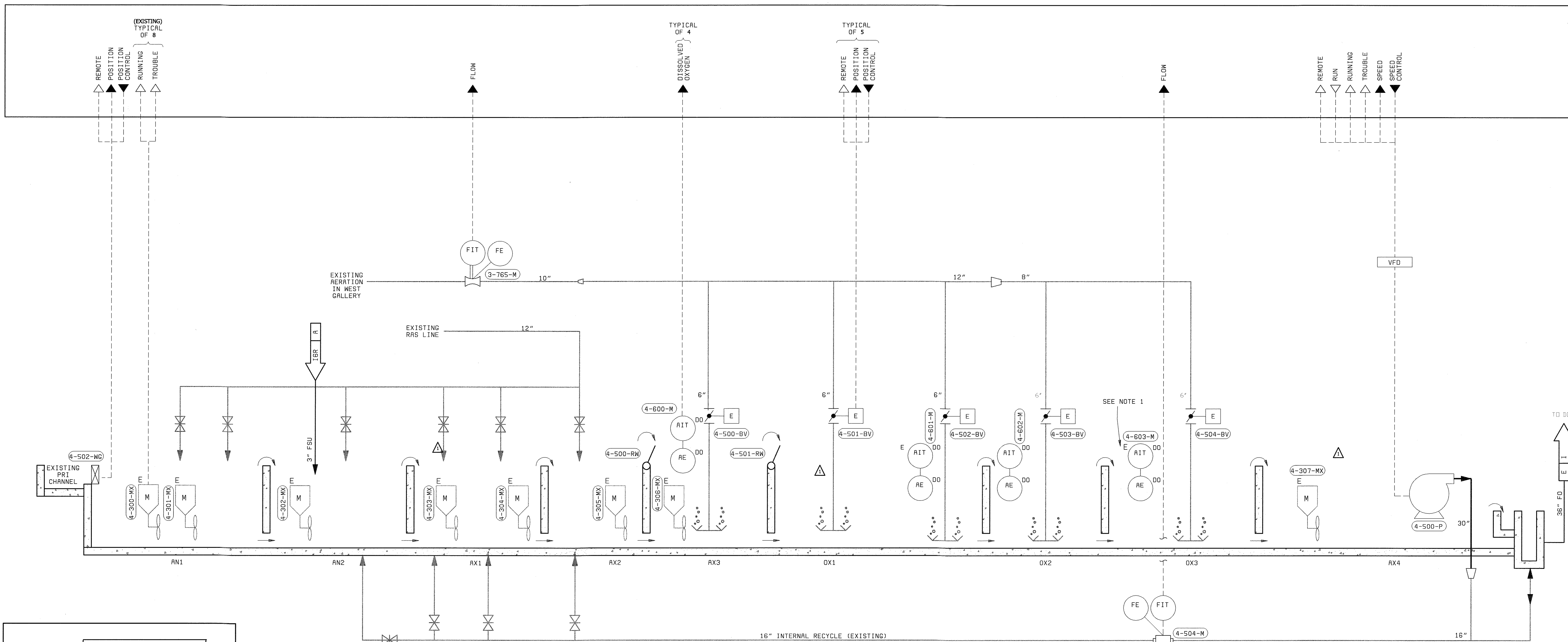
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND CHIEF, BUREAU OF UTILITIES DATE	 BLACK & VEATCH Gaithersburg, Maryland REG. PROF. ENGR. _____ DATE _____	THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY DONALD R. STEVENS A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF MARYLAND. NO. 21876	DES: RSF DRN: DAH CHK: PWM DATE: 04/22/02	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>DATE</th> <th>REVISIONS AND RECORD OF ISSUE</th> <th>NO.</th> <th>BY</th> <th>CK</th> <th>APP</th> </tr> <tr> <td>7/22/05</td> <td>CONFORMED TO CONSTRUCTION RECORDS</td> <td></td> <td>RHH</td> <td>RJR</td> <td>RJR</td> </tr> <tr> <td>04/22/02</td> <td>CONFORMED TO NEGOTIATED CHANGES</td> <td>1</td> <td>RSF</td> <td>PWM</td> <td></td> </tr> </table>	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP	7/22/05	CONFORMED TO CONSTRUCTION RECORDS		RHH	RJR	RJR	04/22/02	CONFORMED TO NEGOTIATED CHANGES	1	RSF	PWM		INSTRUMENTATION GRIT BASINS AND PRIMARY CLARIFIERS P & ID	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 CONTROL SYSTEM EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3842 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN SHEET 19 of 39 I 14
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP																				
7/22/05	CONFORMED TO CONSTRUCTION RECORDS		RHH	RJR	RJR																				
04/22/02	CONFORMED TO NEGOTIATED CHANGES	1	RSF	PWM																					



- NOTES:**
1. SEE P&ID LEGEND ON DRAWING I1.
 2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
 3. ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS P&ID.
 4. REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND CHIEF, BUREAU OF UTILITIES DATE	 BLACK & VEATCH Gaithersburg, Maryland REG. PROF. ENGR. DATE	THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY DONALD R. STEVENS A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF MARYLAND, NO. 21876	DES: RSF					INSTRUMENTATION P & ID SCUM CONCENTRATOR	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 CONTROL SYSTEM EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3842 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: TDR							
			CHK: PWM							
			DATE: 04/22/02	7/22/05	CONFORMED TO CONSTRUCTION RECORDS		RHR/RJR/RJR			
				DATE	REVISIONS AND RECORD OF ISSUE		NO. BY CK APP			

DES: RJS
FD: SRT



DETAIL A
NO SCALE

	AN1	AN2	AX1	AX2	AX3	OX1	OX2	OX3	AX4
PROCESS REACTOR 1	4-300-MX 4-301-MX	4-302-MX	4-303-MX 4-304-MX	4-305-MX	4-306-MX				4-307-MX
PROCESS REACTOR 2	4-310-MX 4-311-MX	4-312-MX	4-313-MX 4-314-MX	4-315-MX	4-316-MX				4-317-MX
PROCESS REACTOR 3	4-320-MX 4-321-MX	4-322-MX	4-323-MX 4-324-MX	4-325-MX	4-326-MX				4-327-MX
PROCESS REACTOR 4	4-330-MX 4-331-MX	4-332-MX	4-333-MX 4-334-MX	4-335-MX	4-336-MX				4-337-MX
PROCESS REACTOR 5	4-340-MX 4-341-MX	4-342-MX	4-343-MX 4-344-MX	4-345-MX	4-346-MX				4-347-MX
PROCESS REACTOR 6	4-350-MX 4-351-MX	4-352-MX	4-353-MX 4-354-MX	4-355-MX	4-356-MX				4-357-MX

	AN1	AN2	AX1	AX2	AX3	OX1	OX2	OX3	AX4
PROCESS REACTOR 1					4-600-M	4-601-M	4-602-M		4-603-M
PROCESS REACTOR 2					4-610-M	4-611-M	4-612-M		4-613-M
PROCESS REACTOR 3					4-620-M	4-621-M	4-622-M		4-623-M
PROCESS REACTOR 4					4-630-M	4-631-M	4-632-M		4-633-M
PROCESS REACTOR 5					4-640-M	4-641-M	4-642-M		4-643-M
PROCESS REACTOR 6					4-650-M	4-651-M	4-652-M		4-653-M

	AN1	AN2	AX1	AX2	AX3	OX1	OX2	OX3	AX4
PROCESS REACTOR 1					4-500-BV	4-501-BV	4-503-BV	4-504-BV	
PROCESS REACTOR 2					4-510-BV	4-511-BV	4-513-BV	4-514-BV	
PROCESS REACTOR 3					4-520-BV	4-521-BV	4-523-BV	4-524-BV	
PROCESS REACTOR 4					4-530-BV	4-531-BV	4-533-BV	4-534-BV	
PROCESS REACTOR 5					4-540-BV	4-541-BV	4-543-BV	4-544-BV	
PROCESS REACTOR 6					4-550-BV	4-551-BV	4-553-BV	4-554-BV	

	INFLUENT WEIR GATE	INTERNAL RECYCLE PUMP	INTERNAL RECYCLE FLOW	AERATION FLOW
PROCESS REACTOR 1	4-502-WG	4-500-P	4-504-M	3-765-M
PROCESS REACTOR 2	4-510-WG	4-501-P	4-505-M	3-766-M
PROCESS REACTOR 3	4-520-WG	4-502-P	4-506-M	3-772-M
PROCESS REACTOR 4	4-530-WG	4-503-P	4-507-M	3-767-M
PROCESS REACTOR 5	4-540-WG	4-504-P	4-508-M	3-768-M
PROCESS REACTOR 6	4-550-WG	4-505-P	4-509-M	3-769-M

NOTES:

- "E" DENOTES EXISTING MIXER TO BE RELOCATED AS SHOWN.
- "M" DENOTES 3.2 HP MOTOR, ALL OTHER 1.5 HP.
- SEE P&ID LEGEND ON DRAWING I-1.
- LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
- ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS P&ID.
- REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH
Gaithersburg, Maryland
REG. PROF. ENGR. DATE

THIS DRAWING WAS
ORIGINALLY APPROVED
FOR CONSTRUCTION
AND SEALED BY
DONALD R. STEVENS
A REGISTERED
PROFESSIONAL ENGINEER
IN THE
STATE OF MARYLAND,
NO. 21876

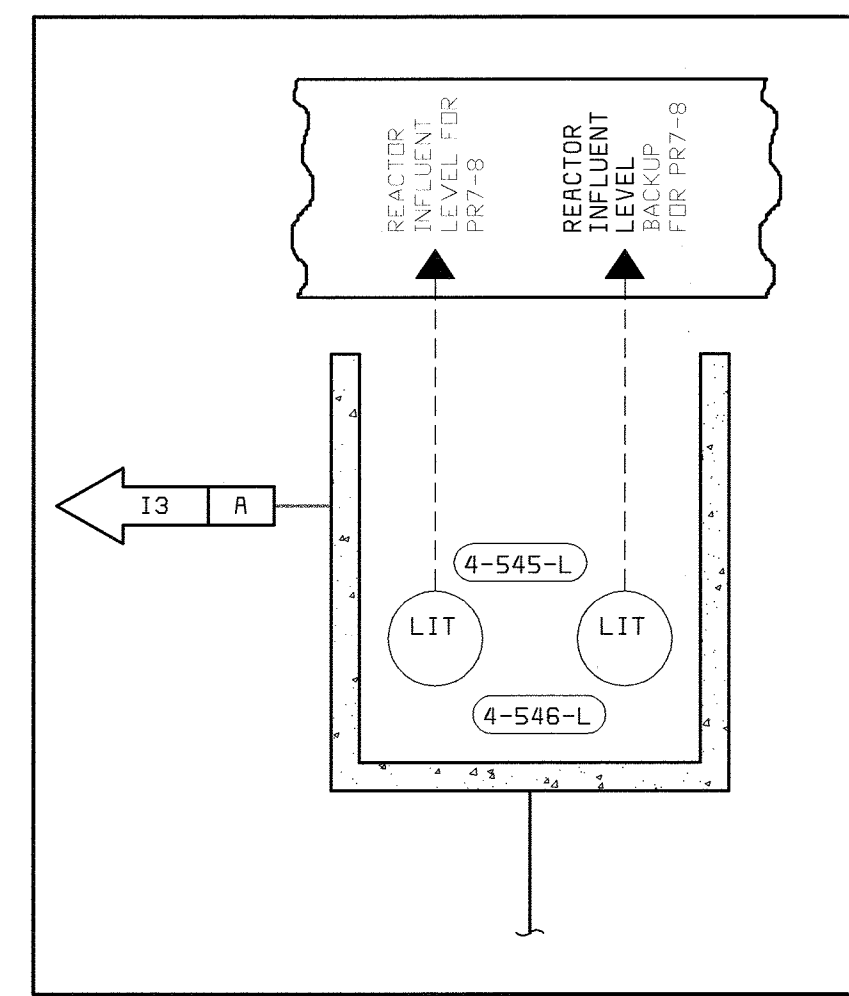
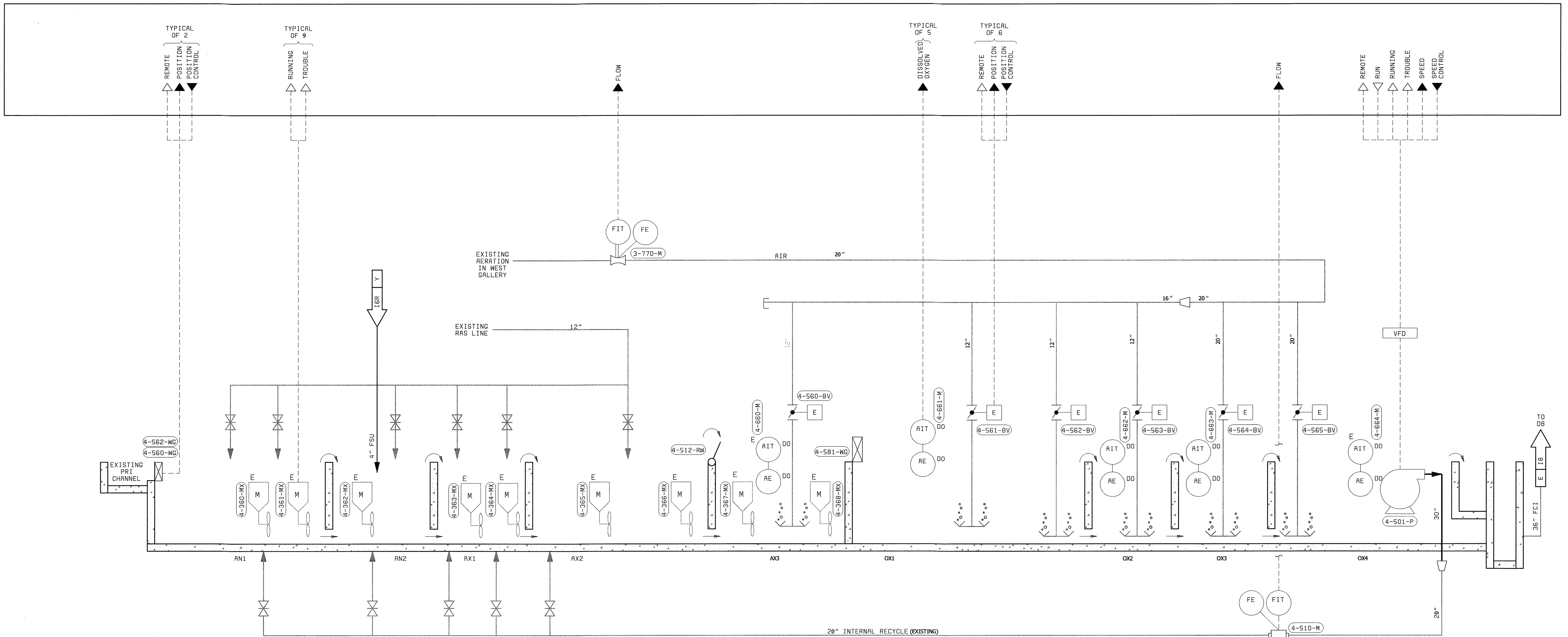
DES: RSF									
DRN: DAH									
CHK: PWM	7/22/05	CONFORMED TO CONSTRUCTION RECORDS		RHH	RJR	RJR			
DATE: 04/22/02	04/22/02	CONFORMED TO NEGOTIATED CHANGES	1	RSF	PWM				
	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

INSTRUMENTATION
PROCESS REACTOR NO.1 P & ID
(TYPICAL OF PR'S 1 - 6)

LITTLE PATUXENT WATER RECLAMATION PLANT
ADDITION NO. 6
CONTROL SYSTEM EXPANSION
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3842
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 21 OF 39
I16

D58472.6
FD58472R



	MIXER								
	AN1	AN2	AX1	AX2	AX3	OX1	OX2	OX3	AX4
PROCESS REACTOR 7	4-360-MX	4-362-MX	4-363-MX	4-365-MX	4-367-MX				
PROCESS REACTOR 8	4-361-MX	4-364-MX	4-364-MX	4-366-MX	4-368-MX				
	4-380-MX	4-382-MX	4-383-MX	4-385-MX	4-387-MX				
	4-381-MX	4-384-MX	4-384-MX	4-386-MX	4-388-MX				

	ELECTRIC BUTTERFLY VALVE								
	AN1	AN2	AX1	AX2	AX3	OX1	OX2	OX3	AX4
PROCESS REACTOR 7					4-560-BV	4-561-BV	4-562-BV	4-563-BV	4-564-BV
PROCESS REACTOR 8					4-580-BV	4-581-BV	4-582-BV	4-583-BV	4-584-BV

	DO PROBE								
	AN1	AN2	AX1	AX2	AX3	OX1	OX2	OX3	AX4
PROCESS REACTOR 7					4-660-M	4-661-M	4-662-M	4-663-M	4-664-M
PROCESS REACTOR 8					4-680-M	4-681-M	4-682-M	4-683-M	4-684-M

	INFLUENT WEIR GATE	INTERNAL RECYCLE PUMP	INTERNAL RECYCLE FLOW	AERATION FLOW
	PROCESS REACTOR 7	4-560-WG	4-506-P	4-510-M
PROCESS REACTOR 8	4-562-WG	4-508-P	4-511-M	3-771-M
	4-580-WG			
	4-582-WG			

- NOTES:**
- "E" DENOTES EXISTING MIXER TO BE RELOCATED AS SHOWN.
 - "*" DENOTES 3.2 HP MOTOR, ALL OTHER 1.5 HP.
 - SEE P&ID LEGEND ON DRAWING I-1.
 - LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCs OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
 - ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS P&ID.
 - REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH
Gaithersburg, Maryland
REG. PROF. ENGR. DATE

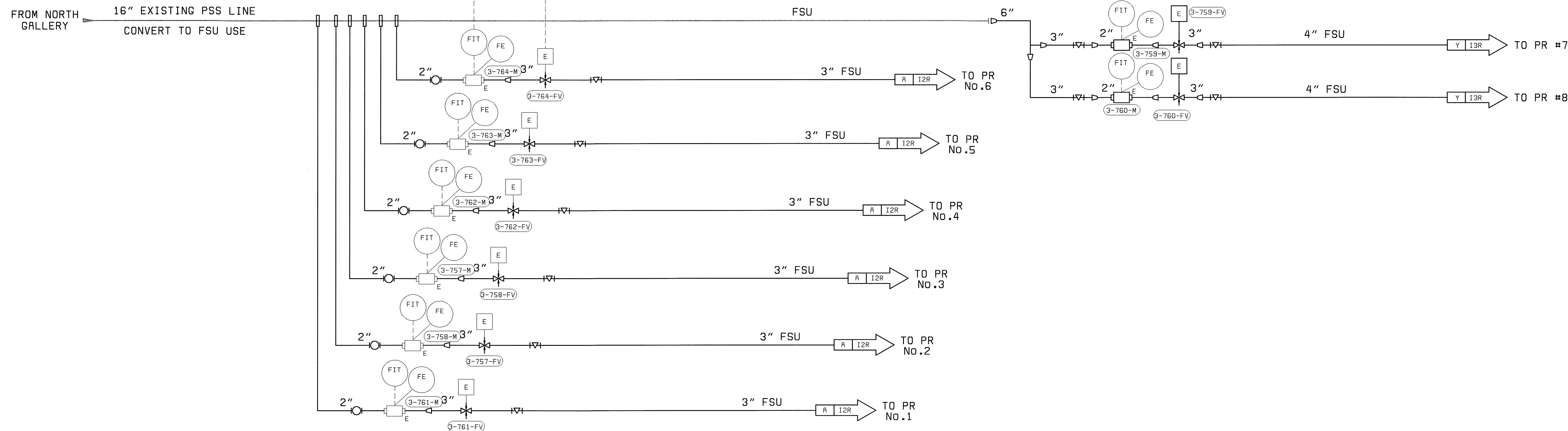
THIS DRAWING WAS
ORIGINALLY APPROVED
FOR CONSTRUCTION
AND SEALED BY
DONALD R. STEVENS
A REGISTERED
PROFESSIONAL ENGINEER
IN THE
STATE OF MARYLAND,
NO. 21876

DES: RSF									
DRN: DAH									
CHK: PWM									
DATE: 04/22/02	7/22/05	CONFORMED TO CONSTRUCTION RECORDS					RHH/RJR/RJR		
	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

INSTRUMENTATION
PROCESS REACTOR NO. 7 P & ID
(TYPICAL OF PR'S 7 & 8)

LITTLE PATUXENT WATER RECLAMATION PLANT
ADDITION NO. 6
CONTROL SYSTEM EXPANSION
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3842
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 22 OF 39
I 17



NOTES:

1. SEE P&ID LEGEND ON DRAWING I-1.
2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCC'S OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
3. ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS P&ID.
4. REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND



THIS DRAWING WAS
ORIGINALLY APPROVED
FOR CONSTRUCTION
AND SEALED BY
DONALD R. STEVENS
A REGISTERED
PROFESSIONAL ENGINEER
IN THE
STATE OF MARYLAND,
NO. 21876

DES:	RVJ/RSF
DRN:	RCF
CHK:	PWM
DATE:	04/22/02

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
7/22/05	CONFORMED TO CONSTRUCTION RECORDS		RHH	RJR	RJR
04/22/02	CONFORMED TO NEGOTIATED CHANGES	1	RSF	PWM	

INSTRUMENTATION

P & ID
FSU LINES
WEST GALLERY

LITTLE PATUXENT WATER RECLAMATION PLANT
ADDITION NO. 6
CONTROL SYSTEM EXPANSION

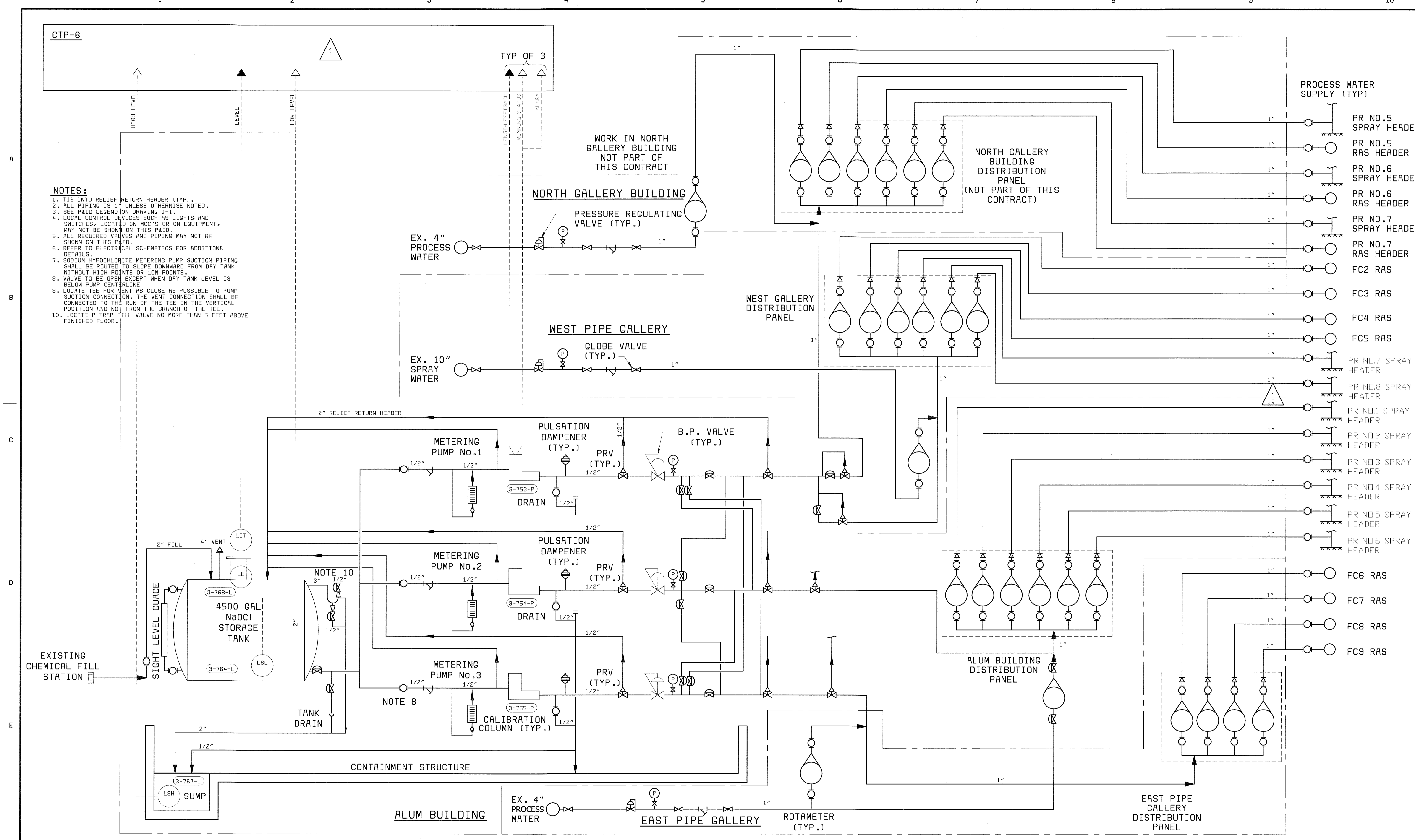
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3842

HOWARD COUNTY, MARYLAND

SCALE
AS
SHOWN

SHEET
25 OF 39

I20



CTP-6

- NOTES:**
1. TIE INTO RELIEF RETURN HEADER (TYP).
 2. ALL PIPING IS 1" UNLESS OTHERWISE NOTED.
 3. SEE P&ID LEGEND ON DRAWING 1-1.
 4. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCC'S OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
 5. ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS P&ID.
 6. REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.
 7. SODIUM HYPOCHLORITE METERING PUMP SUCTION PIPING SHALL BE ROUTED TO SLOPE DOWNWARD FROM DAY TANK WITHOUT HIGH POINTS OR LOW POINTS.
 8. VALVE TO BE OPEN EXCEPT WHEN DAY TANK LEVEL IS BELOW PUMP CENTERLINE.
 9. LOCATE TEE FOR VENT AS CLOSE AS POSSIBLE TO PUMP SUCTION CONNECTION. THE VENT CONNECTION SHALL BE CONNECTED TO THE RUN OF THE TEE IN THE VERTICAL POSITION AND NOT FROM THE BRANCH OF THE TEE.
 10. LOCATE P-TRAP FILL VALVE NO MORE THAN 5 FEET ABOVE FINISHED FLOOR.

- PROCESS WATER SUPPLY (TYP)
- PR NO.5 SPRAY HEADER
 - PR NO.5 RAS HEADER
 - PR NO.6 SPRAY HEADER
 - PR NO.6 RAS HEADER
 - PR NO.7 SPRAY HEADER
 - PR NO.7 RAS HEADER
 - FC2 RAS
 - FC3 RAS
 - FC4 RAS
 - FC5 RAS
 - PR NO.7 SPRAY HEADER
 - PR NO.8 SPRAY HEADER
 - PR NO.1 SPRAY HEADER
 - PR NO.2 SPRAY HEADER
 - PR NO.3 SPRAY HEADER
 - PR NO.4 SPRAY HEADER
 - PR NO.5 SPRAY HEADER
 - PR NO.6 SPRAY HEADER
 - FC6 RAS
 - FC7 RAS
 - FC8 RAS
 - FC9 RAS

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH
Gaithersburg, Maryland
REG. PROF. ENGR. DATE

THIS DRAWING WAS
ORIGINALLY APPROVED
FOR CONSTRUCTION
AND SEALED BY
DONALD R. STEVENS
A REGISTERED
PROFESSIONAL ENGINEER
IN THE
STATE OF MARYLAND,
NO. 21876

DES: RSF					
DRN:					
CHK: PWM	7/22/05	CONFORMED TO CONSTRUCTION RECORDS		RHH	RJR
DATE: 04/22/02	04/22/02	CONFORMED TO NEGOTIATED CHANGES		1	RSF
		REVISIONS AND RECORD OF ISSUE		NO.	BY
				CK	APP

INSTRUMENTATION
P & ID
RAS CHLORINATION
SYSTEM

LITTLE PATUXENT WATER RECLAMATION PLANT
ADDITION NO. 6
CONTROL SYSTEM EXPANSION
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3842
HOWARD COUNTY, MARYLAND

SCALE
AS
SHOWN
SHEET
29 OF 39
124

CTP-10

CONTINUED BELOW

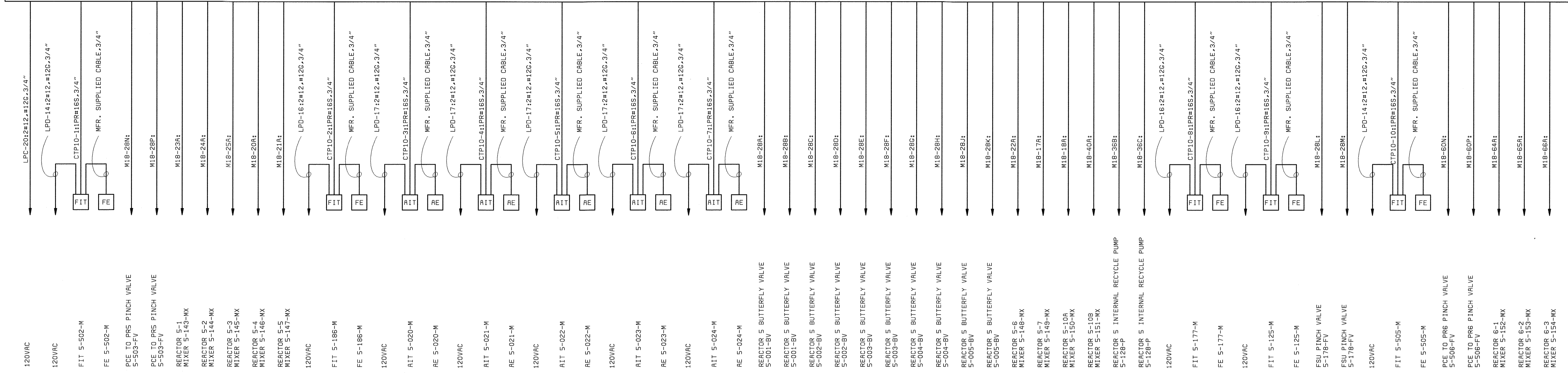
A B C

D E

F

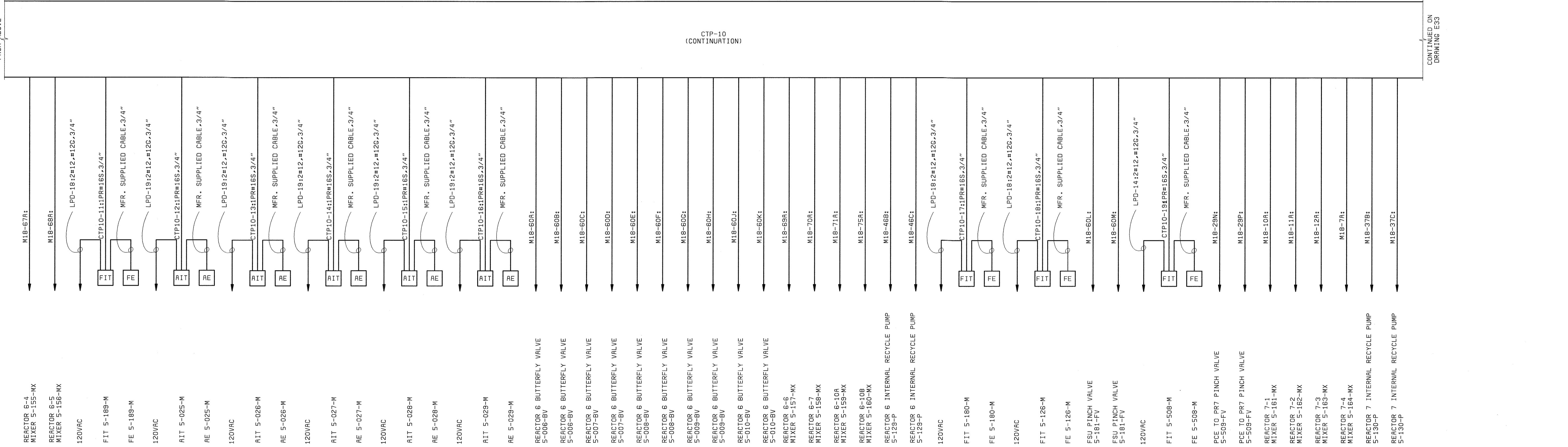
G

H



CTP-10 ONE-LINE DIAGRAM (NBB)

CTP-10 (CONTINUATION)



CTP-10 ONE-LINE DIAGRAM (NBB) (CONTINUED)

NOTES:
1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF UTILITIES DATE



THIS DRAWING WAS
ORIGINALLY APPROVED
FOR CONSTRUCTION
AND SEALED BY
DONALD R. STEVENS
A REGISTERED
PROFESSIONAL ENGINEER
IN THE
STATE OF MARYLAND,
NO. 21876

DES: RSF					
DRN: TDR					
CHK: PWM					
DATE: 04/22/02	7/22/05	CONFORMED TO CONSTRUCTION RECORDS	RHH	RJR	RJR
	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	APP

NORTH BLOWER BUILDING
INSTRUMENTATION

CONTROL SYSTEM SCHEMATIC
ONE-LINE DIAGRAM
CTP-10

LITTLE PATUXENT WATER RECLAMATION PLANT
ADDITION NO. 6
CONTROL SYSTEM EXPANSION

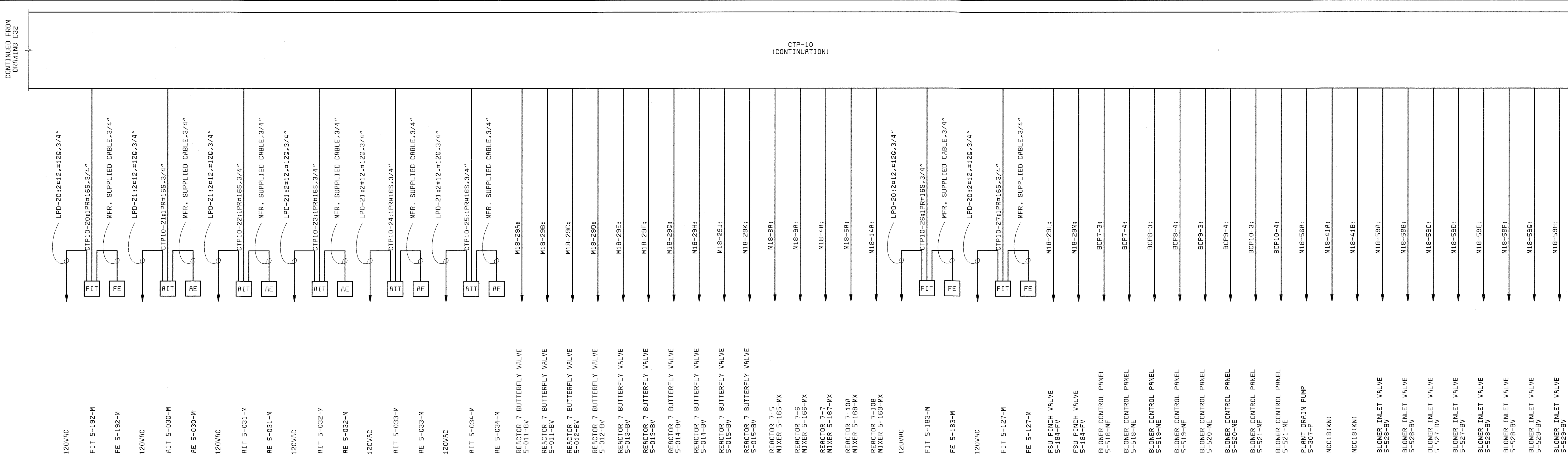
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3842

HOWARD COUNTY, MARYLAND

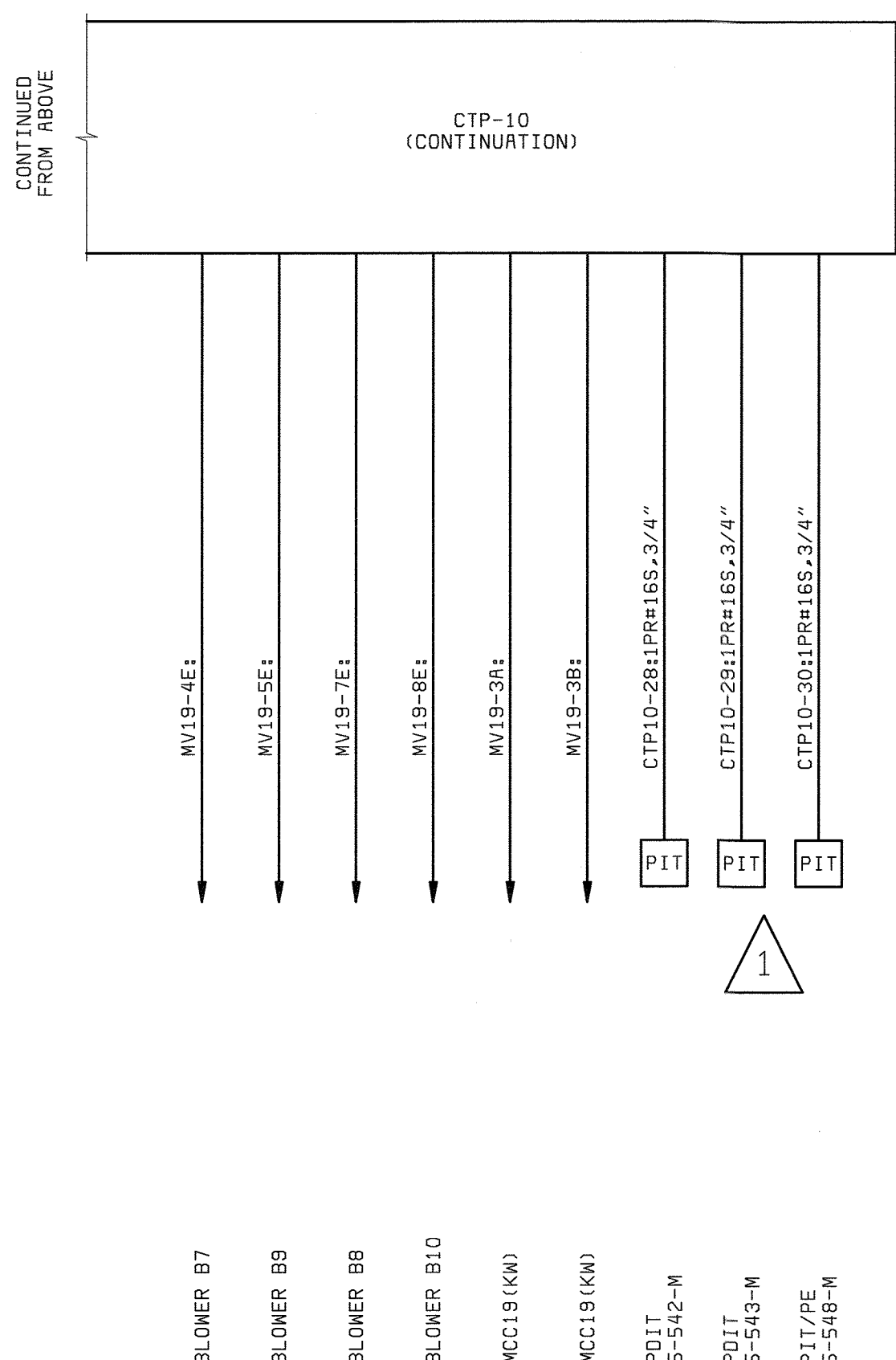
SCALE
AS
SHOWN

SHEET
30 OF 39

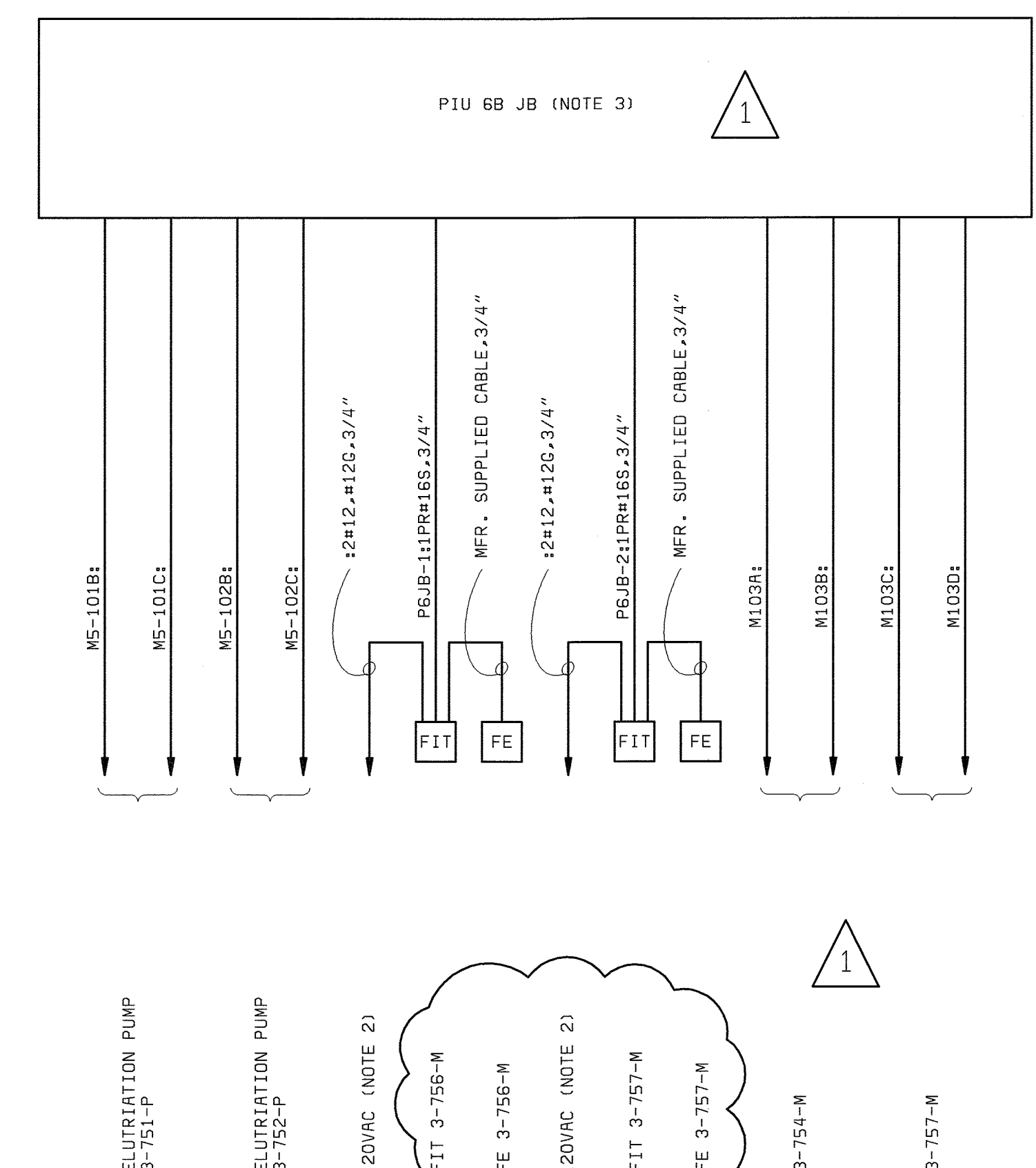
125



CTP-10 ONE-LINE DIAGRAM (NBB) (CONTINUED)



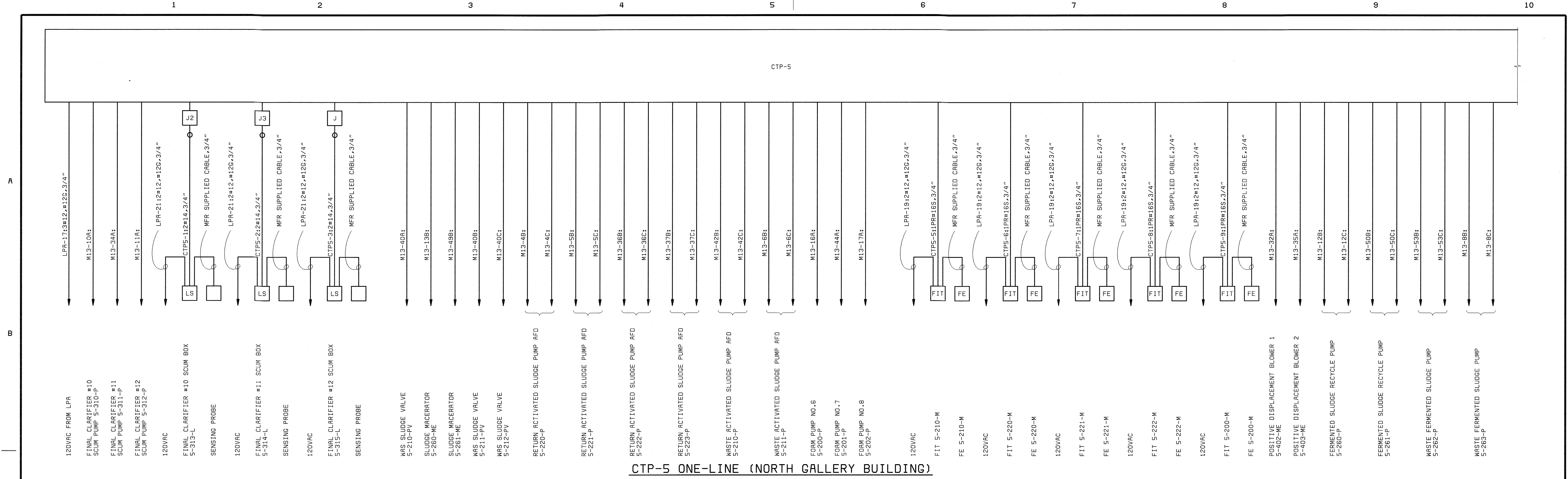
CTP-10 ONE-LINE DIAGRAM (NBB) (CONTINUED)



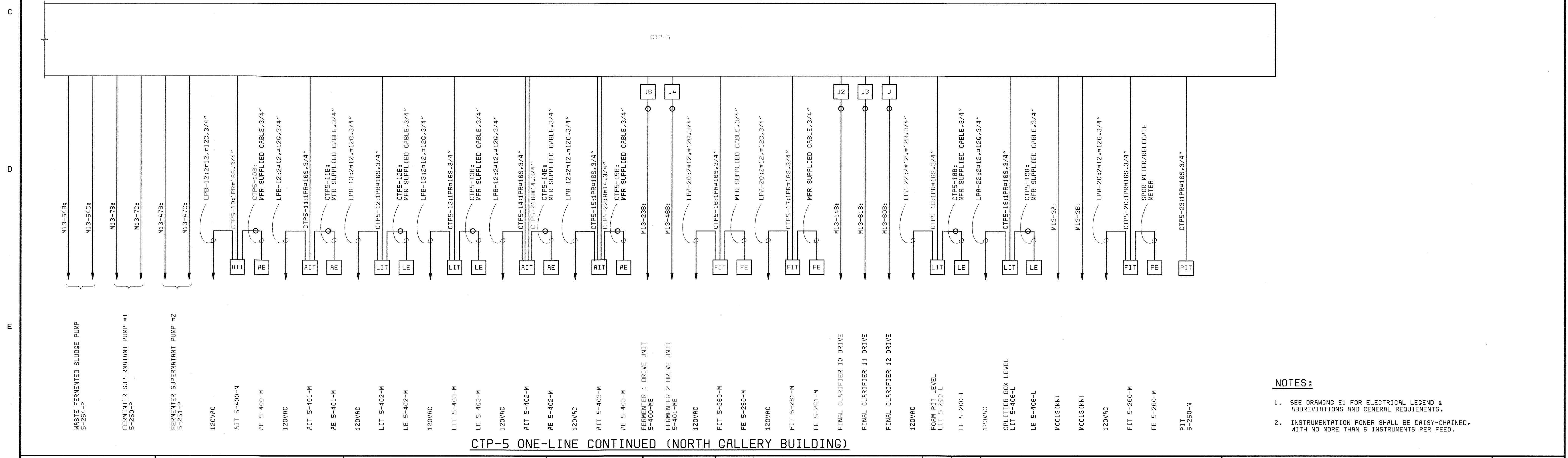
PIU 6B JUNCTION BOX ONE-LINE DIAGRAM (WEST GALLERY)

- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 - DAISY CHAIN INSTRUMENTS TO EXISTING LIGHTING PANEL CIRCUIT.
 - COIL ENOUGH WIRE INTO JB TO EXTEND TO PIU IN FUTURE CONTRACT.

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND CHIEF, BUREAU OF UTILITIES DATE	 Gaithersburg, Maryland	THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY DONALD R. STEVENS A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF MARYLAND, NO. 21876	DES: RSF						NORTH BLOWER BUILDING & WEST PIPE GALLERY FIELD LAB INSTRUMENTATION	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 CONTROL SYSTEM EXPANSION	SCALE AS SHOWN
			DRN: RSF								
			CHK: PWM	7/22/05	CONFORMED TO CONSTRUCTION RECORDS		RHH	RJR	CONTROL SYSTEM ONE-LINE DIAGRAM CTP-10 CONTINUATION AND WEST GALLERY	CAPITAL PROJECT S-6205 CONTRACT NO. 20-3842 HOWARD COUNTY, MARYLAND	126
			DATE: 04/22/02	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK			APP



CTP-5 ONE-LINE (NORTH GALLERY BUILDING)



CTP-5 ONE-LINE CONTINUED (NORTH GALLERY BUILDING)

- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 - INSTRUMENTATION POWER SHALL BE DAISY-CHAINED, WITH NO MORE THAN 6 INSTRUMENTS PER FEED.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

REG. PROF. ENGR. DATE



THIS DRAWING WAS
ORIGINALLY APPROVED
FOR CONSTRUCTION
AND SEALED BY
DONALD R. STEVENS
A REGISTERED
PROFESSIONAL ENGINEER
IN THE
STATE OF MARYLAND,
NO. 21876

DES: GNS, RSF					
DRN: MDR					
CHK: PWM					
DATE: 04/22/02	7/22/05	CONFORMED TO CONSTRUCTION RECORDS	RHH	RJR	RJR
	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	APP

NORTH GALLERY BUILDING
INSTRUMENTATION

CONTROL SYSTEM
ONE-LINE DIAGRAM
CTP-5

LITTLE PATUXENT WATER RECLAMATION PLANT
ADDITION NO. 6
CONTROL SYSTEM EXPANSION

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3842

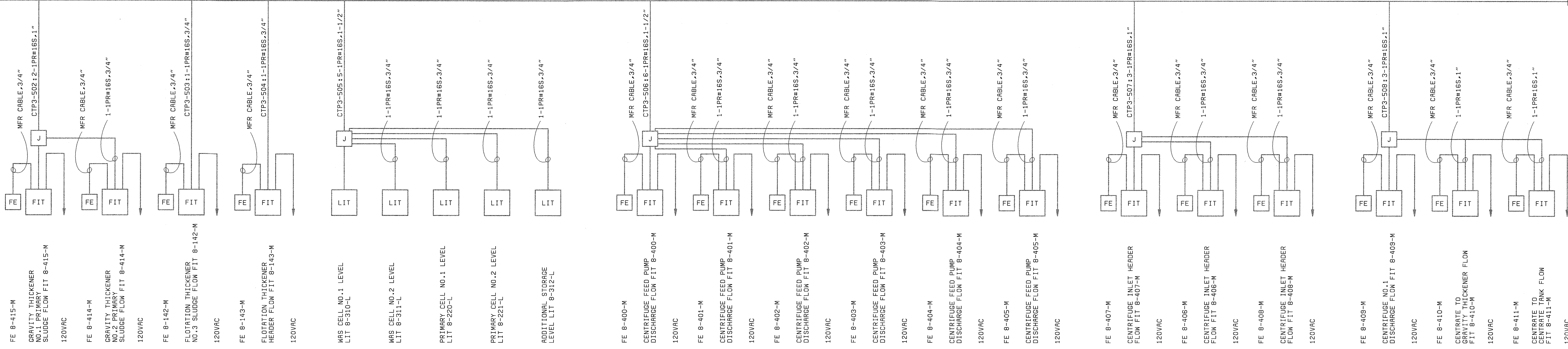
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

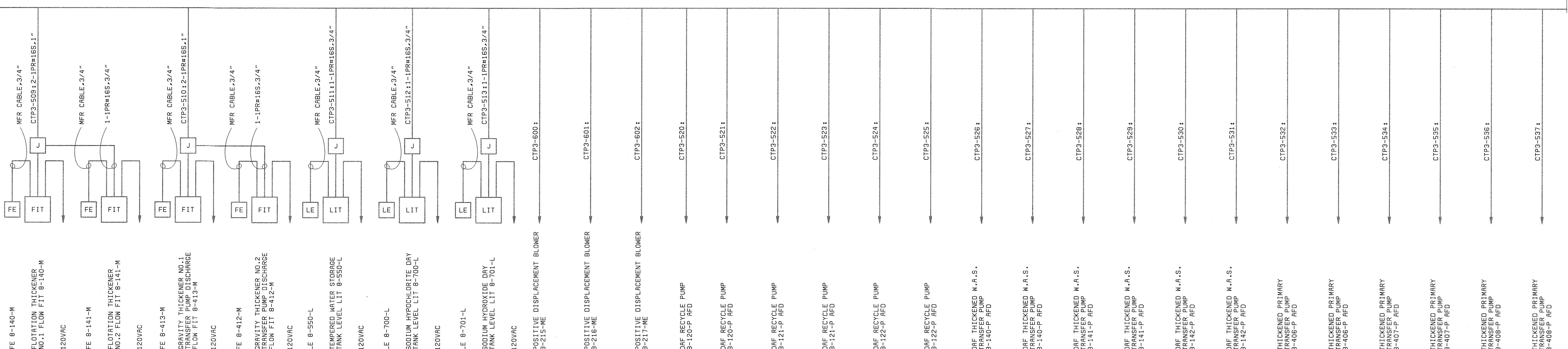
SHEET 32 OF 39

127


CONTROLS TERMINATION PANEL-3

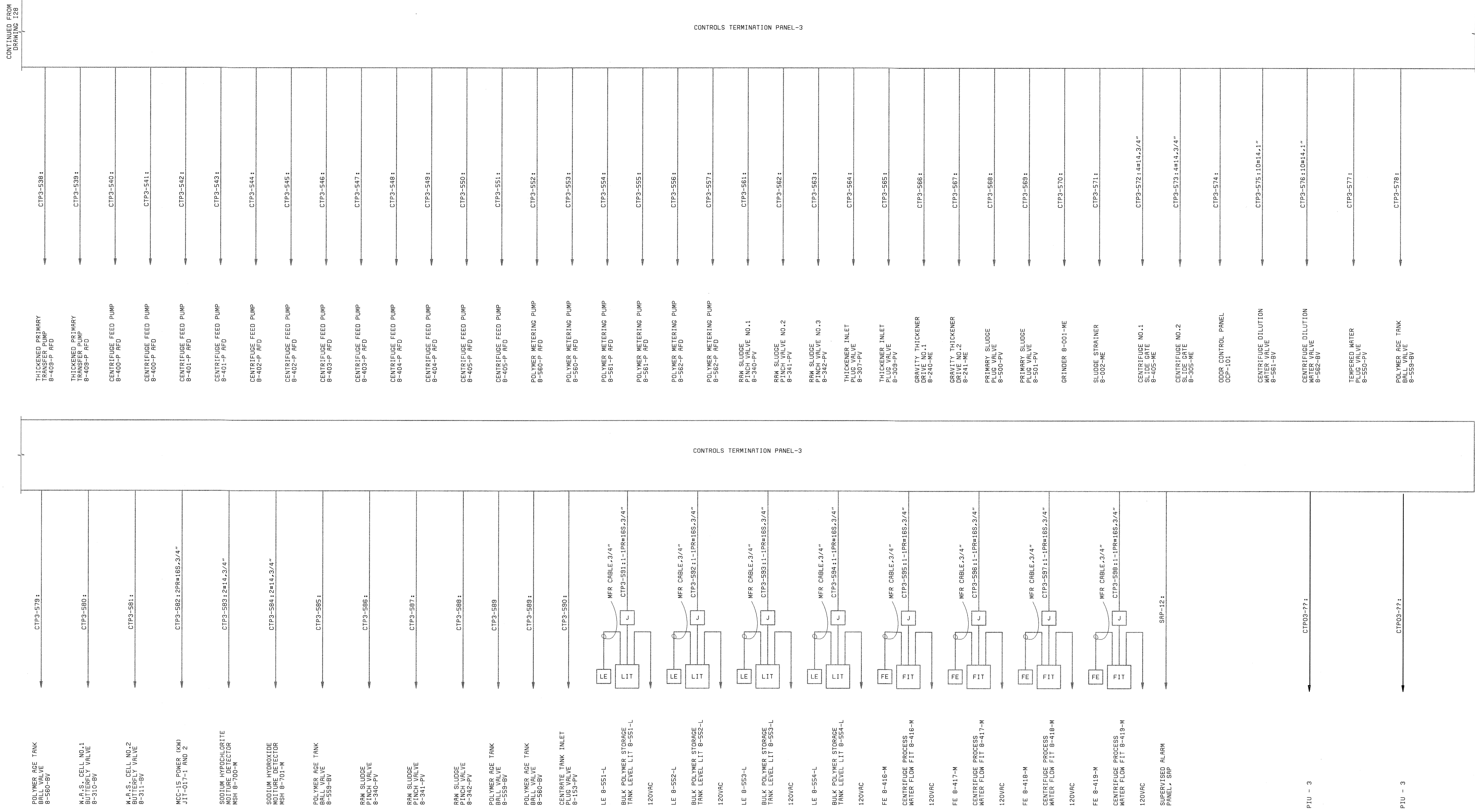


CONTROLS TERMINATION PANEL-3



- NOTES:**
- SEE DRAWING 11 FOR LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 - INSTRUMENTATION POWER SHALL BE FROM 120V POWER PANEL PP, AND SHALL BE DAISY-CHAINED AS REQUIRED. NO MORE THAN 6 INSTRUMENTS SHALL BE DAISY-CHAINED FROM ONE CIRCUIT BREAKER.

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND CHIEF, BUREAU OF UTILITIES DATE	 BLACK & VEATCH Gaithersburg, Maryland REG. PROF. ENGR. DATE	THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY DONALD R. STEVENS A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF MARYLAND, NO. 21876	DES: GNS, RSF DRN: RSF CHK: PWM DATE: 04/22/02	7/22/05 CONFORMED TO CONSTRUCTION RECORDS REVISIONS AND RECORD OF ISSUE	RHH/RJR/RJR NO. BY CK APP	SOLIDS PROCESSING BUILDING INSTRUMENTATION ONE-LINE DIAGRAM CONTROLS TERMINATION PANEL - 3	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 CONTROL SYSTEM EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3842 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN SHEET 33 OF 39 128
--	---	---	---	--	------------------------------	---	--	---



NOTES:
 1. SEE DRAWING I1 FOR LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

 CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH
 Gaithersburg, Maryland

 REG. PROF. ENGR. DATE

THIS DRAWING WAS
 ORIGINALLY APPROVED
 FOR CONSTRUCTION
 AND SEALED BY
 DONALD R. STEVENS
 A REGISTERED
 PROFESSIONAL ENGINEER
 IN THE
 STATE OF MARYLAND,
 NO. 21876

DES: RSF					
DRN: RSF					
CHK: PWM					
DATE: 04/22/02	7/22/05	CONFORMED TO CONSTRUCTION RECORDS	RHH	RJR	RJR
	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

SOLIDS PROCESSING BUILDING
 INSTRUMENTATION

 ONE-LINE DIAGRAM
 CONTROLS TERMINATION PANEL - 3
 CONTINUED

LITTLE PATUXENT WATER RECLAMATION PLANT
 ADDITION NO. 6
 CONTROL SYSTEM EXPANSION

 CAPITAL PROJECT S-6205
 CONTRACT NO. 20-3842

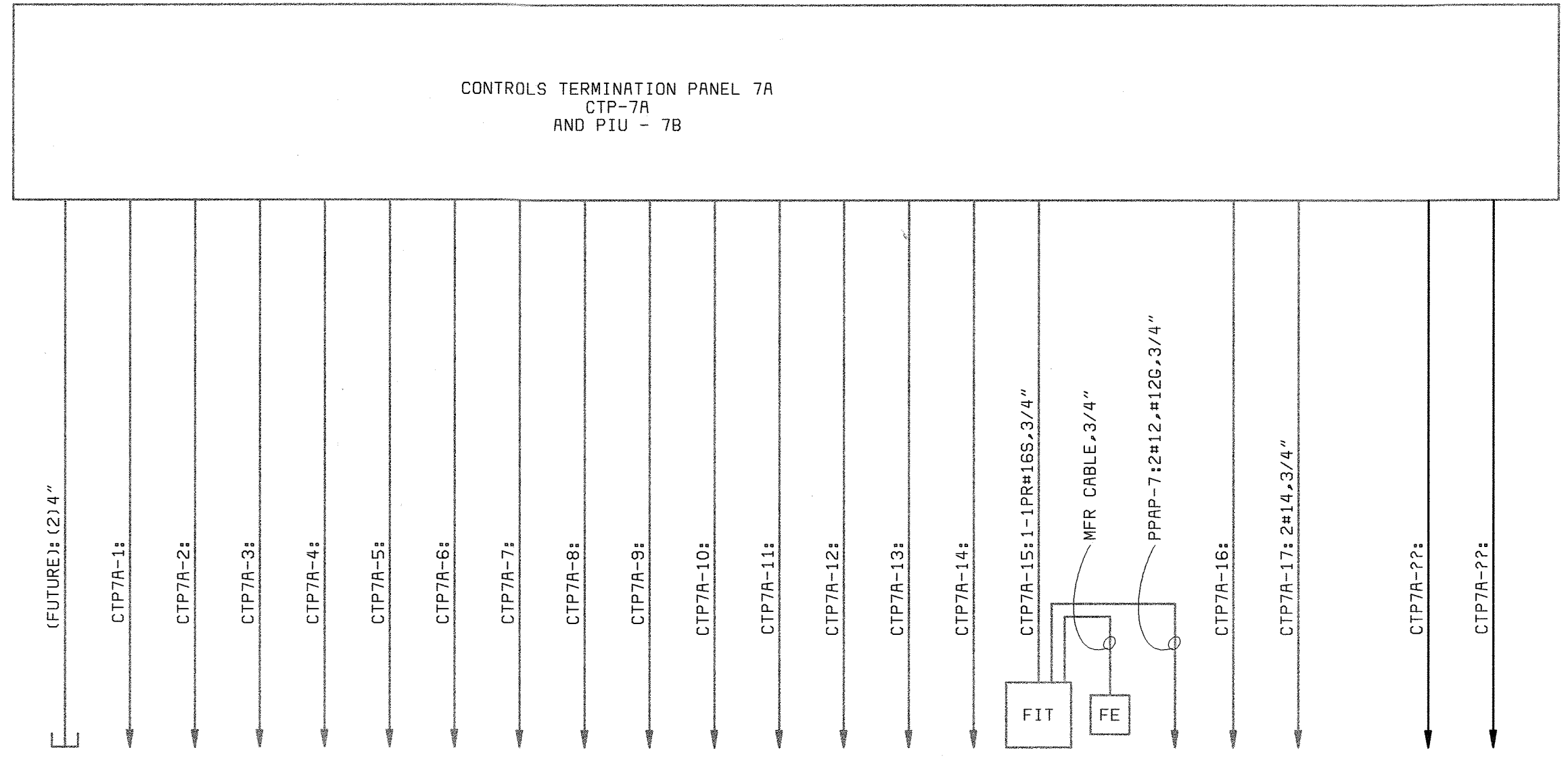
 HOWARD COUNTY, MARYLAND

SCALE
 AS
 SHOWN

 SHEET
 34 OF 39

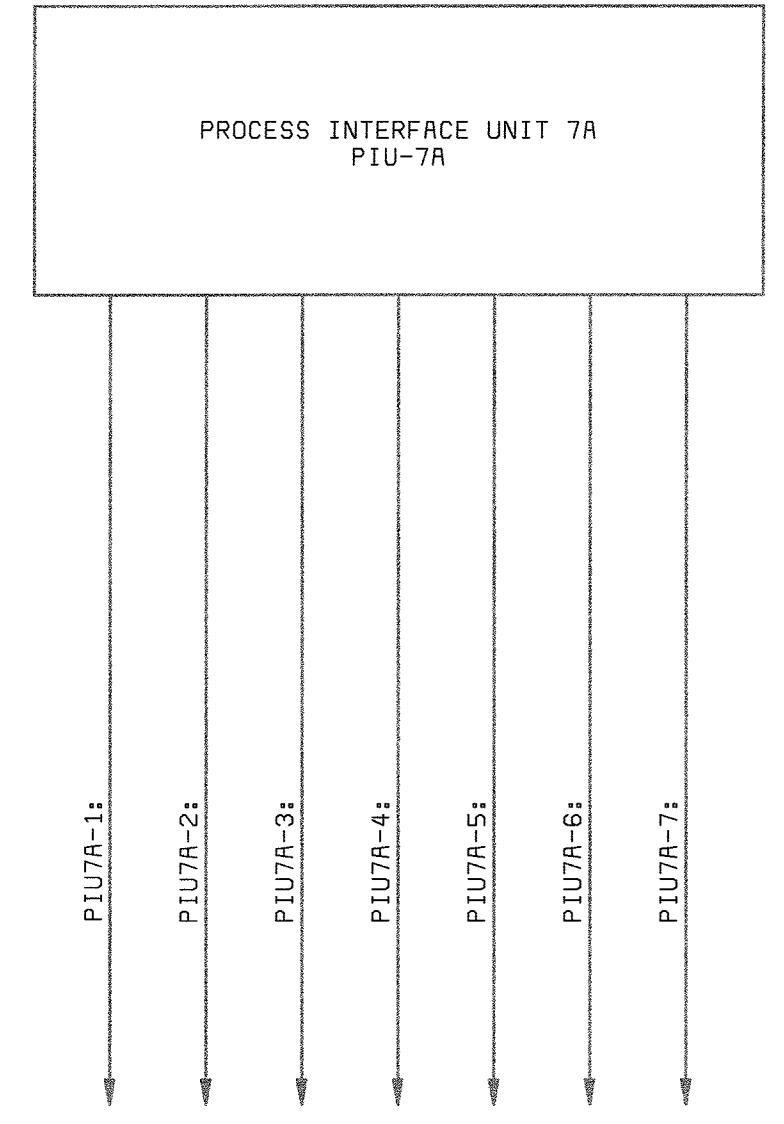
 129

058472-6
 F058472A



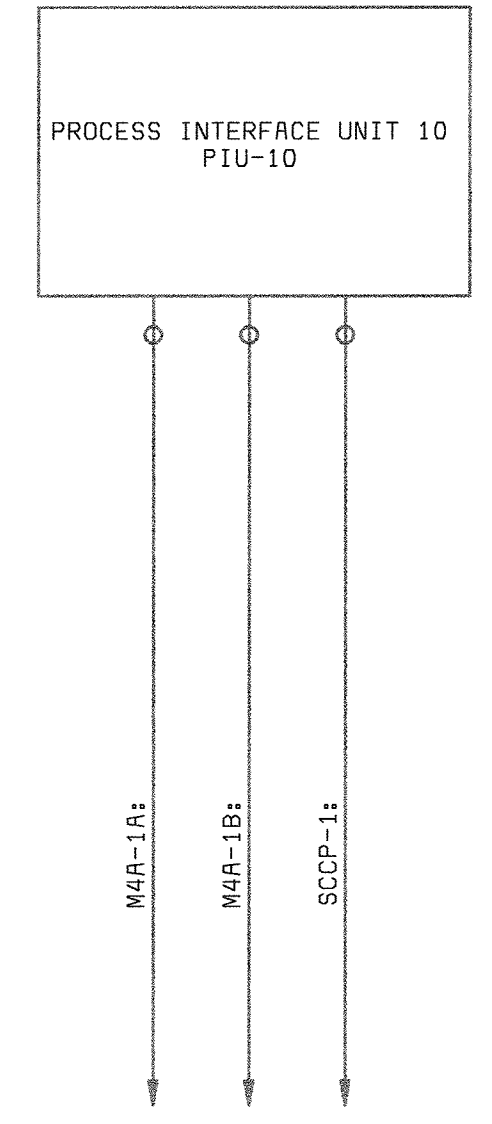
- TO GRIT BUILDING
- MAIN SEWAGE PUMP NO.7
1-501-P AFD
- MAIN SEWAGE PUMP NO.7
1-501-P AFD
- MAIN SEWAGE PUMP NO.9
1-503-P AFD
- MAIN SEWAGE PUMP NO.9
1-503-P AFD
- PCS CLARIFIER DRIVE
CONTROL PANEL
- INFLUENT PINCH VALVE
1-568-TV
- INFLUENT PINCH VALVE
1-568-TV
- MAIN SEWAGE PUMP NO.8
1-502-P AFD
- MAIN SEWAGE PUMP NO.8
1-502-P AFD
- 480V MCC16 MAIN, UNIT 1A
(KW SIGNAL)
- 480V MCC16 MAIN, UNIT 1A
(BREAKER STATUS)
- 480V MCC16 IIC2 UNIT 5A
(BREAKER STATUS)
- 480V MCC16 MAIN, UNIT 10A
(KW SIGNAL)
- 480V MCC16 MAIN, UNIT 10A
(BREAKER STATUS)
- PCS FLOW METER
1-567-M
- FLOW ELEMENT
- 120VAC POWER
- SUMP PUMP 1-589-P
CONTROL PANEL
- TEMPERATURE CONTROL PANEL
TCP-1
- PIU-7
- PIU-7

PROCESS INTERFACE UNIT 7 EXPANSION
(AUXILIARY PUMP STATION)



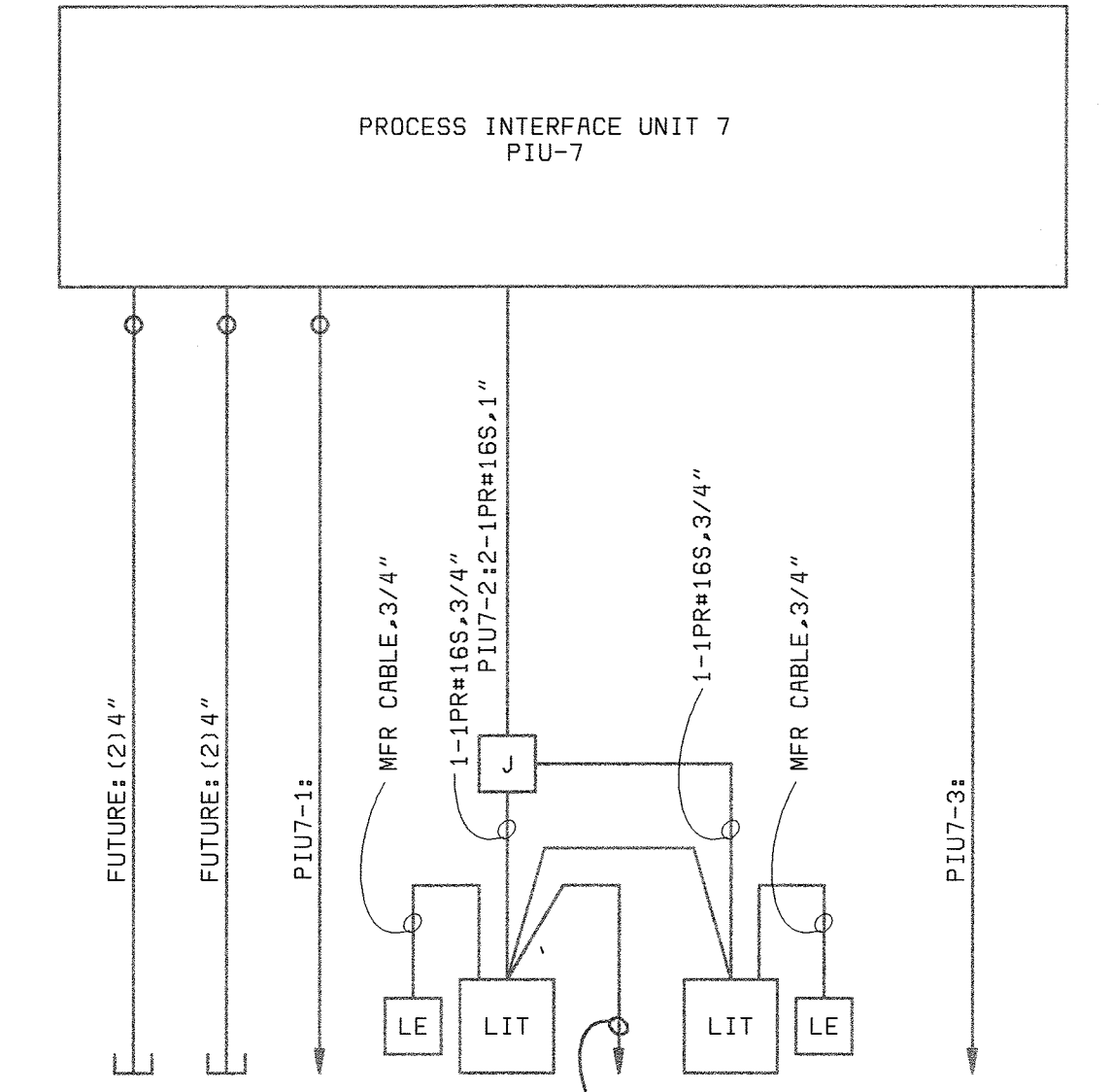
- SLUDGE GRINDER
CONTROL PANEL
- SLUDGE PUMP
3-117-P AFD
- SLUDGE PUMP
3-117-P AFD
- PLUG VALVE
3-782-P AFD
- PLUG VALVE
3-791-PV
- PLUG VALVE
3-792-PV
- PLUG VALVE
3-793-PV

PROCESS INTERFACE UNIT 7A
(SOUTH SLUDGE PUMPING STATION)



- 480V MCC4A UNIT 1B
(KW SIGNAL)
- 480V MCC4A UNIT 1C
(BREAKER STATUS)
- SOLUBLE CONCENTRATOR
CONTROL PANEL, SSCP

PROCESS INTERFACE UNIT 10
(NORTH BLOWER BUILDING)



- TO AUX PUMPING STATION
- TO HEADWORKS BUILDING
- FEL FLOW METER
2-450-M
- LEVEL ELEMENT
- GRIT BASIN LEVEL
1-152-L
- 120VAC POWER FROM EXISTING
GRIT BUILDING PANEL GBLP
(NOTE 2)
- GRIT BASIN LEVEL
1-153-L
- LEVEL ELEMENT
- SLUDGE GATE
2-520-SG

PROCESS INTERFACE UNIT 7
(GRIT BUILDING)

NOTES:

1. SEE DRAWING I1 FOR LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

058472.6
F058472A

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH
Gaithersburg, Maryland

REG. PROF. ENGR. _____ DATE _____

THIS DRAWING WAS
ORIGINALLY APPROVED
FOR CONSTRUCTION
AND SEALED BY
DONALD R. STEVENS
A REGISTERED
PROFESSIONAL ENGINEER
IN THE
STATE OF MARYLAND,
NO. 21876

DES: RSF					
DRN: RSF					
CHK: PWM	7/22/05	CONFORMED TO CONSTRUCTION RECORDS		RHH	RJR
	04/22/02	CONFORMED TO NEGOTIATED CHANGES	1	RSF	PWM
DATE: 04/22/02	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

INSTRUMENTATION

**INSTRUMENTATION ONE-LINE
DIAGRAMS**

**LITTLE PATUXENT WATER RECLAMATION PLANT
ADDITION NO. 6
CONTROL SYSTEM EXPANSION**

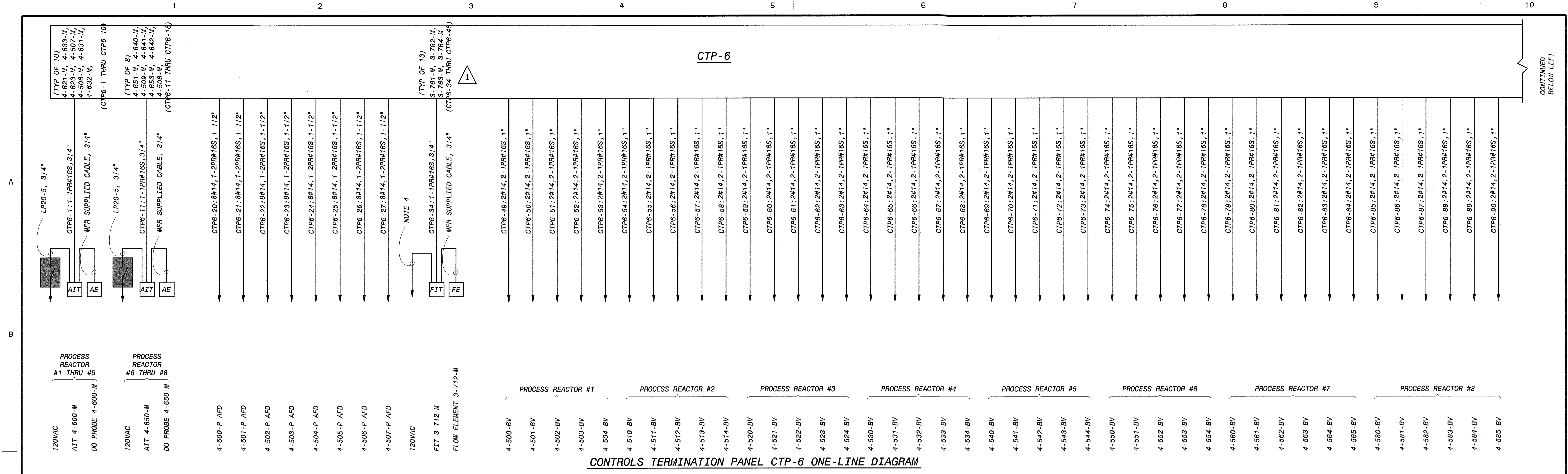
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3842

HOWARD COUNTY, MARYLAND

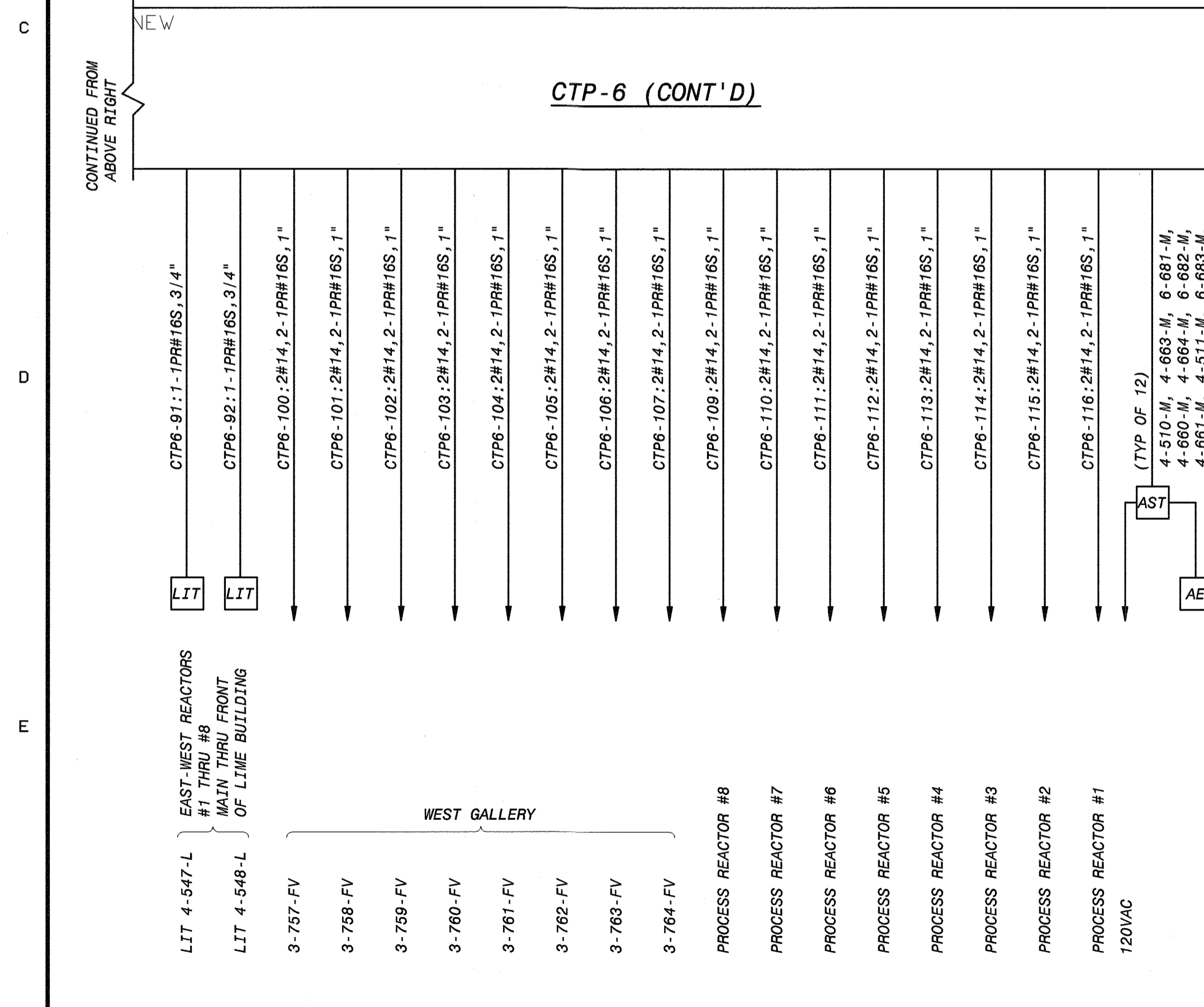
SCALE
AS
SHOWN

SHEET
35 OF 39

I 30



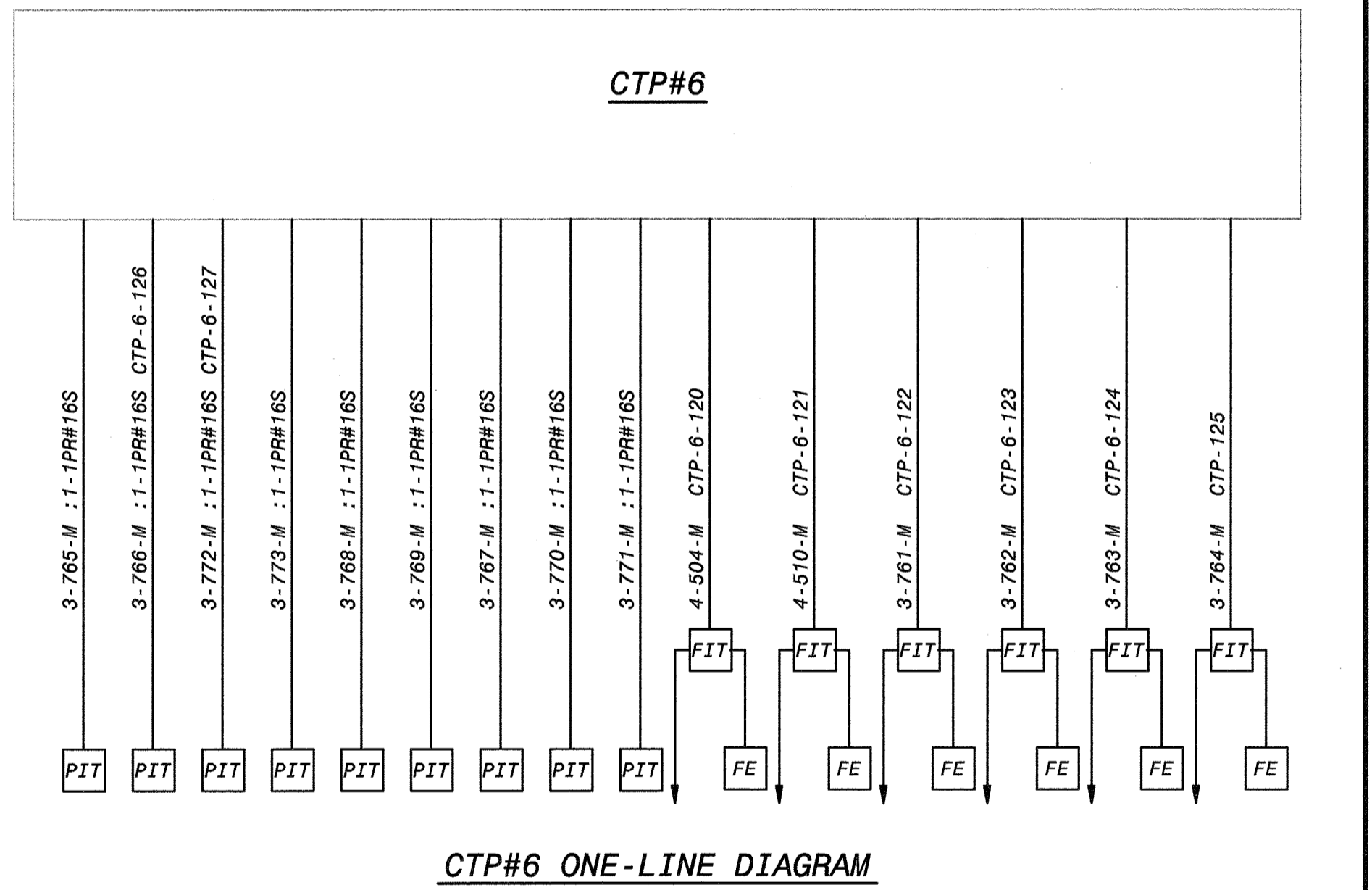
CONTROLS TERMINATION PANEL CTP-6 ONE-LINE DIAGRAM



TYP CLARIFIER DRIVE ONE-LINE DIAGRAM (TYPICAL FOR FC6, FC7, FC8, FC9)

NAOCL CONTROL PANEL NO. 1 LOCATED IN EXISTING ALUM BUILDING

PIU-4 ONE-LINE DIAGRAM



CTP#6 ONE-LINE DIAGRAM

NOTES:

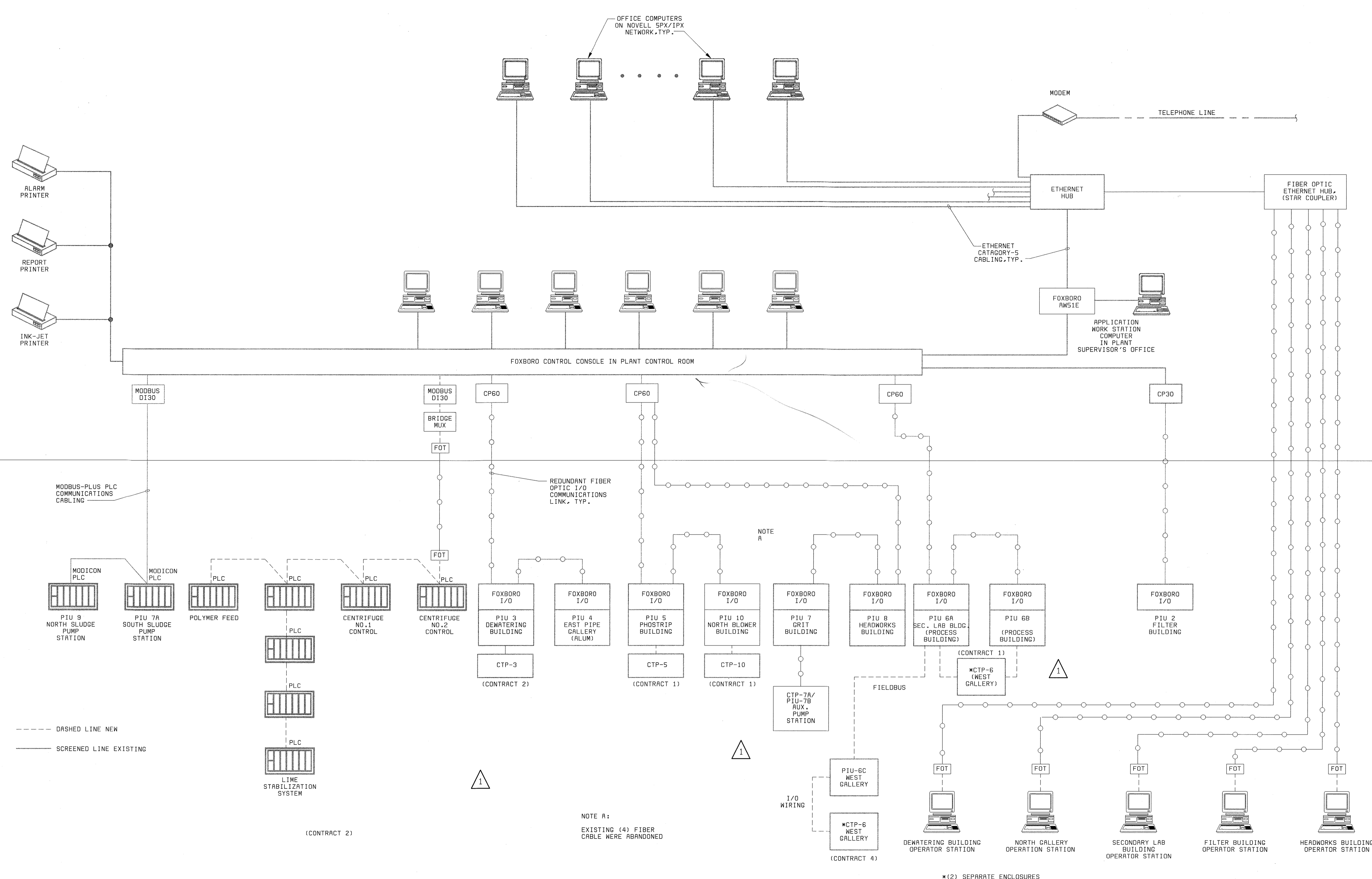
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 - REFER TO P&ID'S AND POWER PLANS FOR ALL EQUIPMENT, DESIGNATIONS AND LOCATIONS.
 - (NOT USED)
 - EXISTING POWER & SIGNAL CIRCUITS TO FLOWMETERS IN PIPE GALLERIES SHALL BE EXTENDED OUT TO NEW LOCATIONS.
 - EXISTING CONDUIT AND CABLES FROM EXISTING MCC7A/7B TO FINAL CLARIFIER LOCATIONS SHALL BE RE-USED.
- NOTES
EXTEND EXISTING POWER & SIGNAL CIRCUITS AS REQUIRED TO RECONNECT TO NEW EQUIPMENT.

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND CHIEF, BUREAU OF UTILITIES DATE	 Gaithersburg, Maryland REG. PROF. ENGR. DATE	THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY DONALD R. STEVENS A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF MARYLAND, NO. 21876	DES: RSF	WEST PIPE GALLERY FIELD LAB INSTRUMENTATION			LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 CONTROL SYSTEM EXPANSION		SCALE AS SHOWN
			DRN: TDR	CONTROL SYSTEM SCHEMATIC ONE-LINE DIAGRAM CTP-6/PIU-4			CAPITAL PROJECT S-6205 CONTRACT NO. 20-3842 HOWARD COUNTY, MARYLAND		SHEET 38 OF 39
			CHK: PWM	7/22/05 CONFORMED TO CONSTRUCTION RECORDS RHH RJR RJR			133		
			DATE: 04/22/02	04/22/02 CONFORMED TO NEGOTIATED CHANGES 1 RSF PWM					
			DATE REVISIONS AND RECORD OF ISSUE NO. BY CK APP						

A
B
C
D
E

ADMIN. BUILDING

OTHER PLANT AREAS



--- DASHED LINE NEW
 --- SCREENED LINE EXISTING

NOTE A:
 EXISTING (4) FIBER
 CABLE WERE ABANDONED

* (2) SEPARATE ENCLOSURES
 ARE LABELED "CTP-6"

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH
 Gaithersburg, Maryland
 REG. PROF. ENGR. DATE

DES: RSF					
DRN: RSF					
CHK: PWM					
DATE: 04/22/02	04/22/02	CONFORMED TO NEGOTIATED CHANGES	1	RSF	PWM
		REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

INSTRUMENTATION
 CONTROL BLOCK DIAGRAM

LITTLE PATUXENT WATER RECLAMATION PLANT
 ADDITION NO. 6
 CONTROL SYSTEM EXPANSION
 CAPITAL PROJECT S-6205
 CONTRACT NO. 20-3842
 HOWARD COUNTY, MARYLAND

SCALE
 AS
 SHOWN
 SHEET
 39 OF 39
 I34

058472-6
 F058472A