

# HOWARD COUNTY, MARYLAND

## LITTLE PATUXENT WATER RECLAMATION PLANT

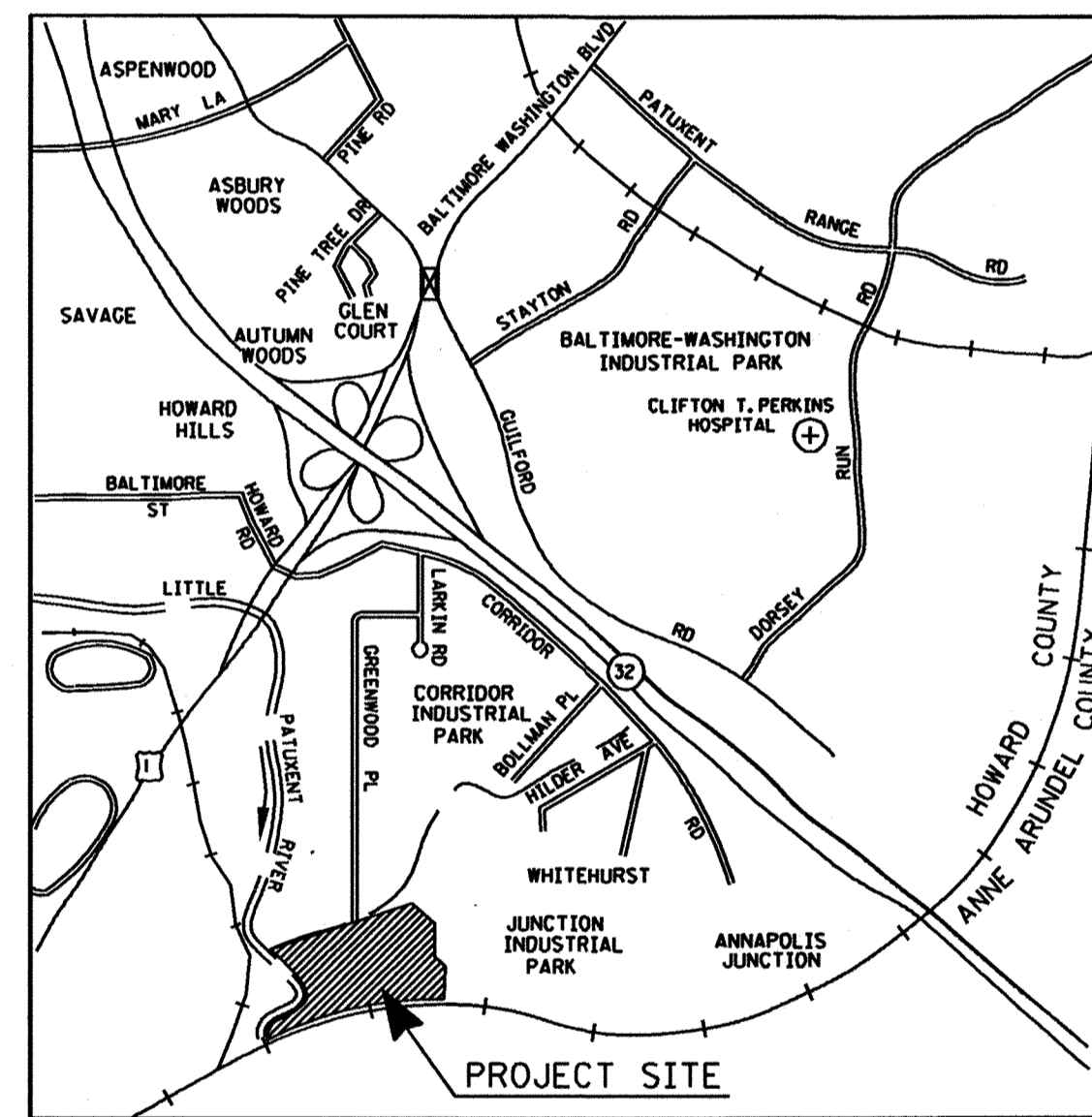
### MULTIPLE IMPROVEMENTS

### PLANT ELECTRICAL DISTRIBUTION

### SYSTEM UPGRADE

### CAPITAL PROJECT NO. S-6223

### CONTRACT NO. 20-3838






VICINITY MAP

SCALE IN FEET 0 1000 2000 4000 6000  
SCALE: 1" = 2000'

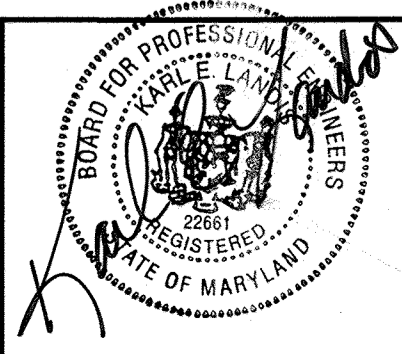
DRAWING NUMBER	SHEET NUMBER	DRAWING TITLE
T-1	1 OF 13	TITLE PAGE
E-1	2 OF 13	SITE PLAN
E-2	3 OF 13	SITE PLAN
E-3	4 OF 13	EXISTING ONE-LINE
E-4	5 OF 13	MCCI AND MCC3 MODIFICATIONS
E-5	6 OF 13	MCC14 MODIFICATIONS
E-6	7 OF 13	MCC21 AND MCC22 MODIFICATIONS
E-7	8 OF 13	SUBSTATION PSI MODIFICATIONS
E-8	9 OF 13	SUBSTATION PS3 MODIFICATIONS
E-9	10 OF 13	SUBSTATION PS4 MODIFICATIONS
E-10	11 OF 13	SUBSTATION SSI MODIFICATIONS
E-11	12 OF 13	FLOCCULATION BASINS ELECTRICAL PLAN
E-12	13 OF 13	MCC21 MODIFICATIONS

(bheffer)  
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DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND	
 DIRECTOR OF PUBLIC WORKS DATE: 8/16/00	 CHIEF, BUREAU OF UTILITIES DATE: 8-15-00
CHIEF, WATER AND SEWER DIVISION	CHIEF, BUREAU OF UTILITIES



Engineers, Architects and Planners

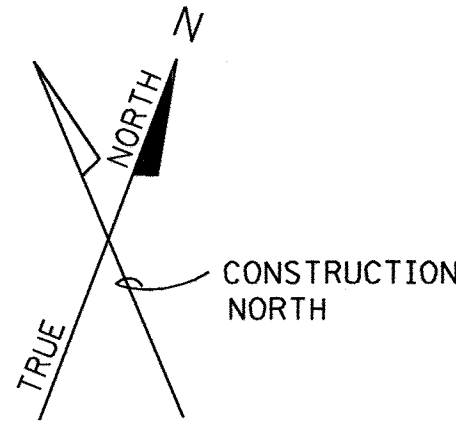


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CHK: JLS	BY: _____	NO. _____	REVISION _____	DATE: _____

TITLE PAGE

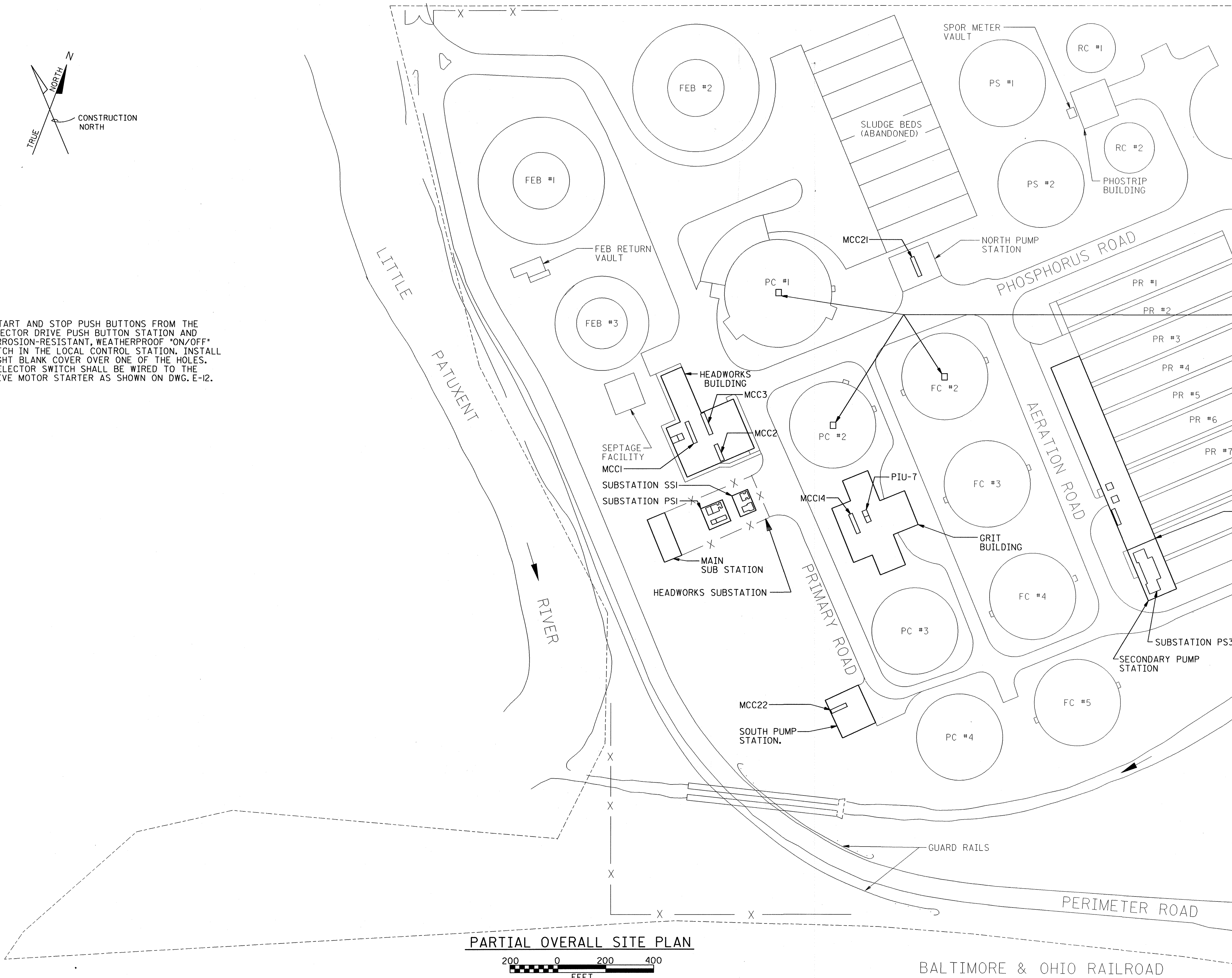
LITTLE PATUXENT WATER RECLAMATION PLANT  
 MULTIPLE IMPROVEMENTS  
 PLANT ELECTRICAL DISTRIBUTION SYSTEM UPGRADE  
 CAPITAL PROJECT NO. S-6223  
 CONTRACT NO. 20-3838  
 ELECTION DISTRICT NO. 6  
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
 SHEET 1 OF 13  
 T-1



**NOTES:**

- REMOVE THE START AND STOP PUSH BUTTONS FROM THE EXISTING COLLECTOR DRIVE PUSH BUTTON STATION AND INSTALL A CORROSION-RESISTANT, WEATHERPROOF "ON/OFF" SELECTOR SWITCH IN THE LOCAL CONTROL STATION. INSTALL A WEATHER-TIGHT BLANK COVER OVER ONE OF THE HOLES. THE OFF/ON SELECTOR SWITCH SHALL BE WIRED TO THE COLLECTOR DRIVE MOTOR STARTER AS SHOWN ON DWG. E-12.



EXISTING COLLECTOR DRIVE PUSH BUTTON STATION SEE NOTE 1.

MATCHLINE - SEE SHEET E-2.

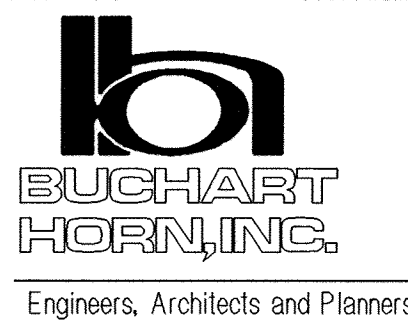
LIME BUILDING / SECONDARY / LAB AND WEST PIPE GALLERY.

PARTIAL OVERALL SITE PLAN



BALTIMORE & OHIO RAILROAD

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND



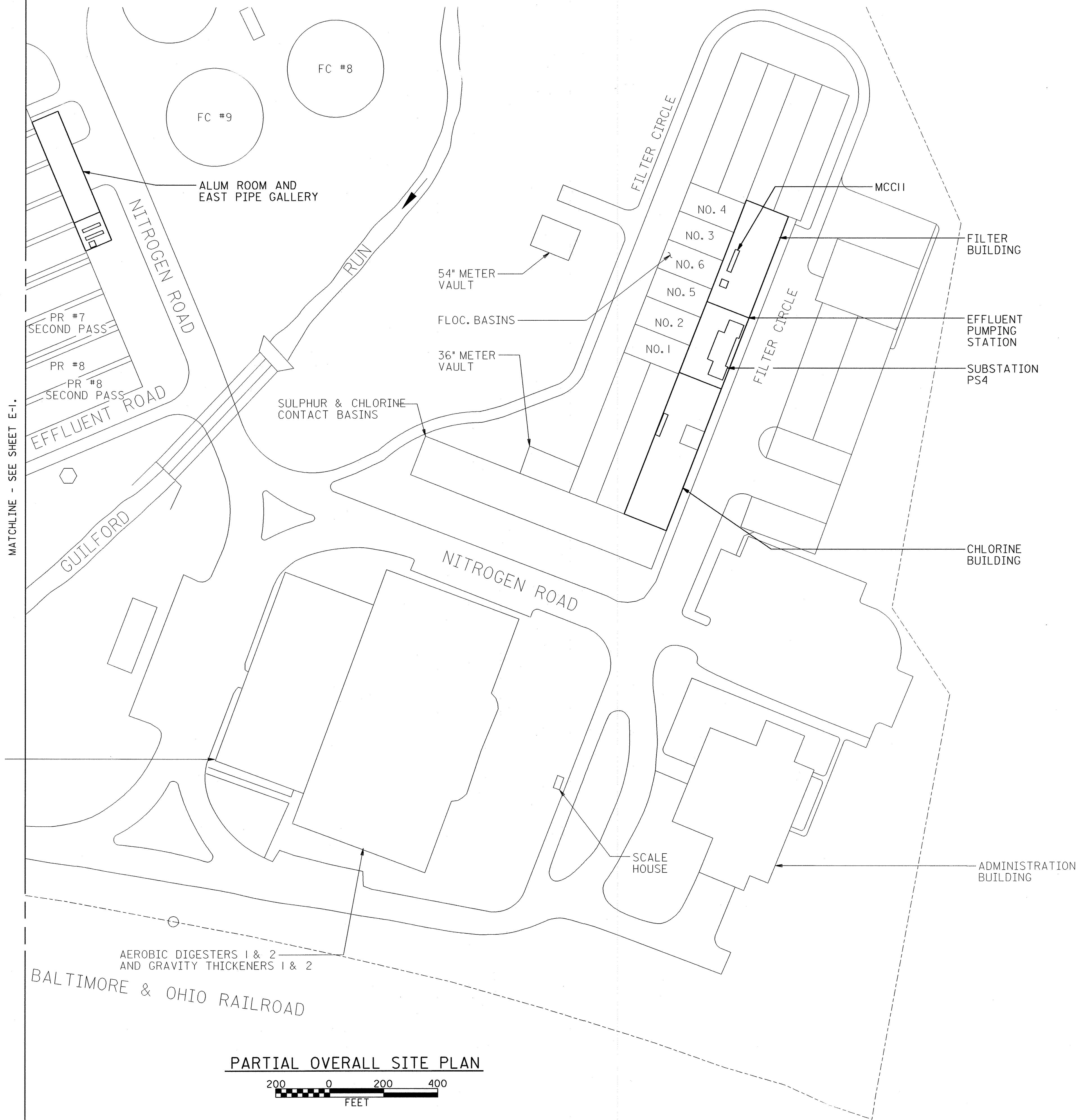
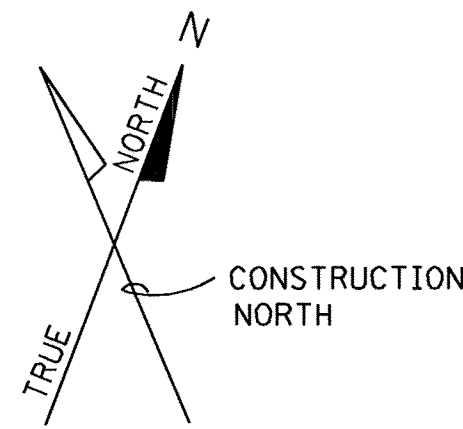
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**SITE PLAN**

LITTLE PATUXENT WATER RECLAMATION PLANT  
MULTIPLE IMPROVEMENTS  
PLANT ELECTRICAL DISTRIBUTION SYSTEM UPGRADE  
CAPITAL PROJECT NO. S-6223  
CONTRACT NO. 20-3838  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 2 OF 13  
E-1

06/13/2000 (bheffler)  
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MATCHLINE - SEE SHEET E-1.

DEWATERING BUILDING

AEROBIC DIGESTERS 1 & 2  
AND GRAVITY THICKENERS 1 & 2

BALTIMORE & OHIO RAILROAD

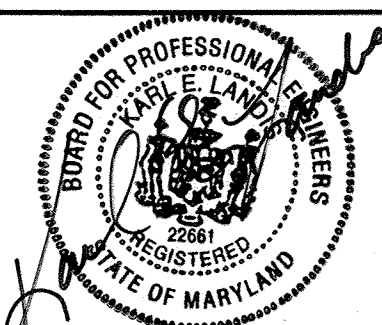
**PARTIAL OVERALL SITE PLAN**



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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert Bauman* 8-15-00  
CHIEF, BUREAU OF UTILITIES DATE



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**SITE PLAN**

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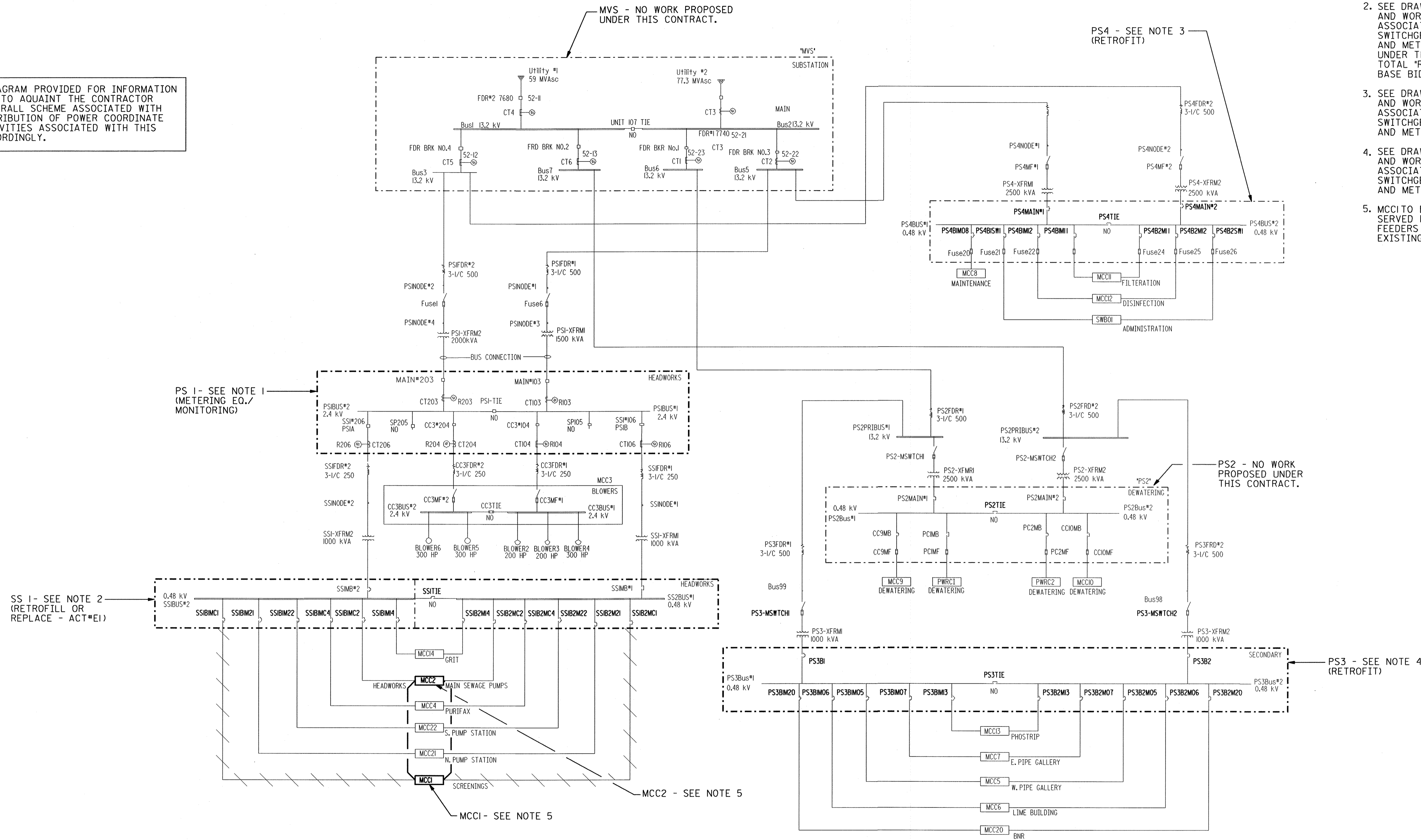
SCALE AS SHOWN  
SHEET 3 OF 13  
E-2



**NOTES:**

- SEE DRAWING E-7 FOR QUANTITIES AND WORK TO BE PERFORMED. WORK ASSOCIATED WITH THIS SWITCHGEAR INVOLVES METERING EQUIPMENT REPLACEMENT.
- SEE DRAWING E-10 FOR QUANTITIES AND WORK TO BE PERFORMED. WORK ASSOCIATED WITH THIS LOW VOLTAGE SWITCHGEAR INVOLVES "RETROFIT" WORK AND METERING EQUIPMENT REPLACEMENT UNDER THE "BASE BID" CONTRACT AND TOTAL "REPLACEMENT" UNDER THE ALTERNATE BASE BID CONTRACT.
- SEE DRAWING E-9 FOR QUANTITIES AND WORK TO BE PERFORMED. WORK ASSOCIATED WITH THIS LOW VOLTAGE SWITCHGEAR INVOLVES "RETROFIT" WORK AND METERING EQUIPMENT REPLACEMENT.
- SEE DRAWING E-8 FOR QUANTITIES AND WORK TO BE PERFORMED. WORK ASSOCIATED WITH THIS LOW VOLTAGE SWITCHGEAR INVOLVES "RETROFIT" WORK AND METERING EQUIPMENT REPLACEMENT.
- MCC10 TO BE DISCONNECTED FROM SSI AND SERVED FROM MCC2. PROVIDE NEW FEEDERS AS INDICATED ON DWG. E-4. EXISTING FEEDERS TO BE REMOVED.

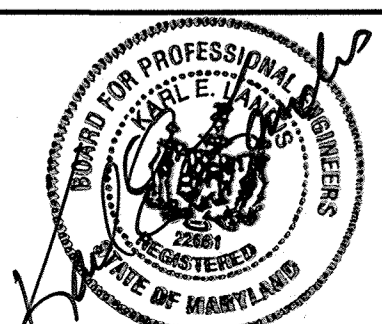
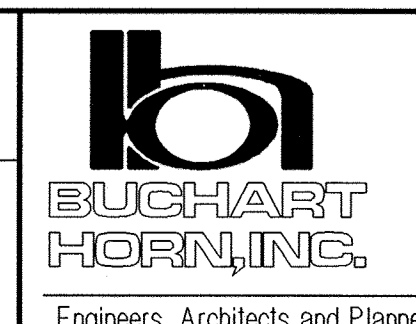
THIS RISER DIAGRAM PROVIDED FOR INFORMATION PURPOSES AND TO AQUIANT THE CONTRACTOR AS TO THE OVERALL SCHEME ASSOCIATED WITH THE SITE DISTRIBUTION OF POWER COORDINATE ALL WORK ACTIVITIES ASSOCIATED WITH THIS CONTRACT ACCORDINGLY.



**ONELINE POWER DISTRIBUTION RISER DIAGRAM - EXISTING**

**NOTE:**  
 IN ADDITION TO THE WORK ASSOCIATED WITH THE POWER MODIFICATIONS, REFER TO SECTION I6950 FOR MISCELLANEOUS COMPUTER MONITOR LOCATIONS ASSOCIATED WITH THE POWER DISTRIBUTION EQUIPMENT (TYP).

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND



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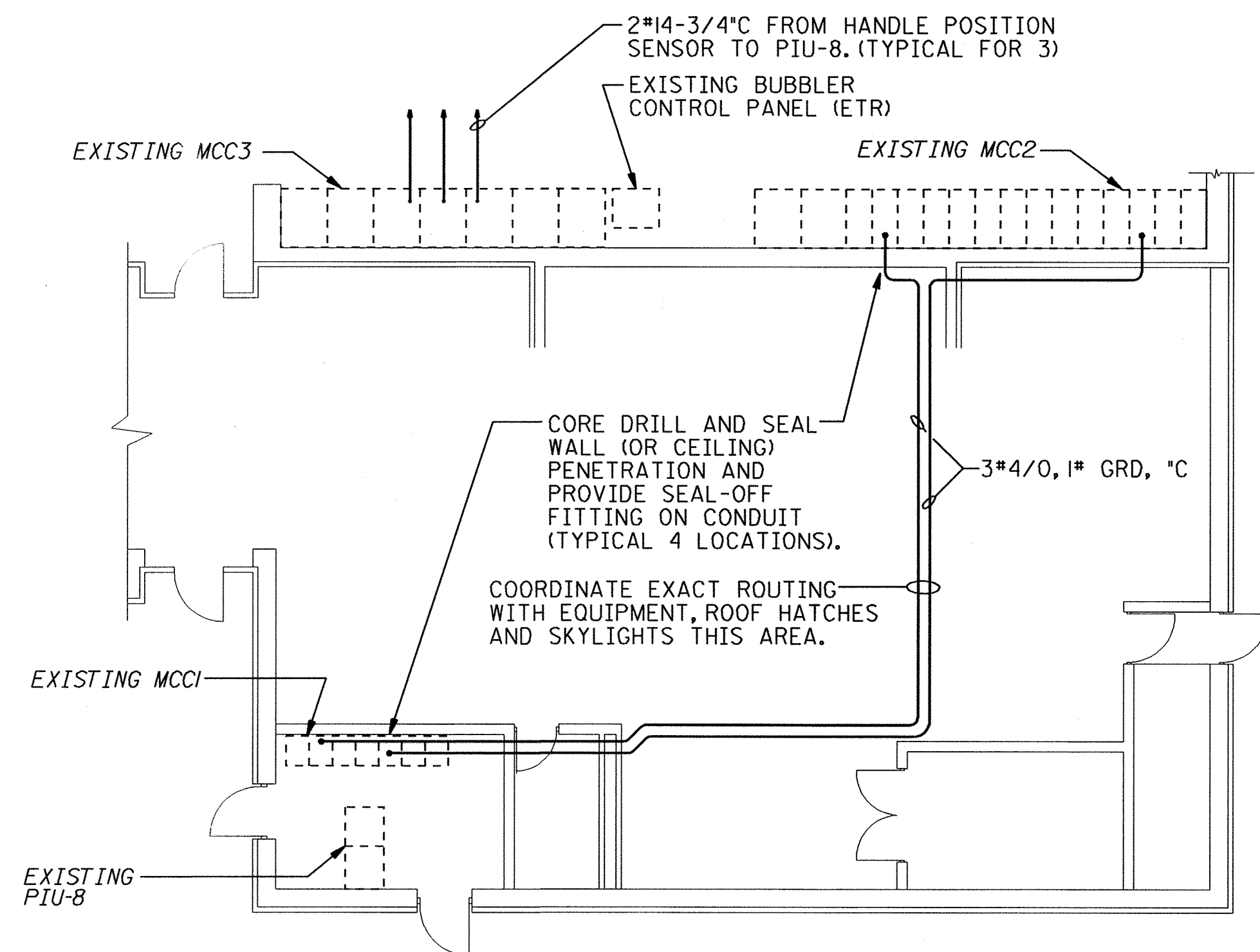
EXISTING ONE-LINE

LITTLE PATUXENT WATER RECLAMATION PLANT  
 MULTIPLE IMPROVEMENTS  
 PLANT ELECTRICAL DISTRIBUTION SYSTEM UPGRADE  
 CAPITAL PROJECT NO. S-6223  
 CONTRACT NO. 20-3838  
 ELECTION DISTRICT NO. 6  
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
 SHEET 4 OF 13  
 E-3

10/13/2000 (bheffler)  
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*Robert H. Bauman* 8-15-00  
 CHIEF, BUREAU OF UTILITIES DATE

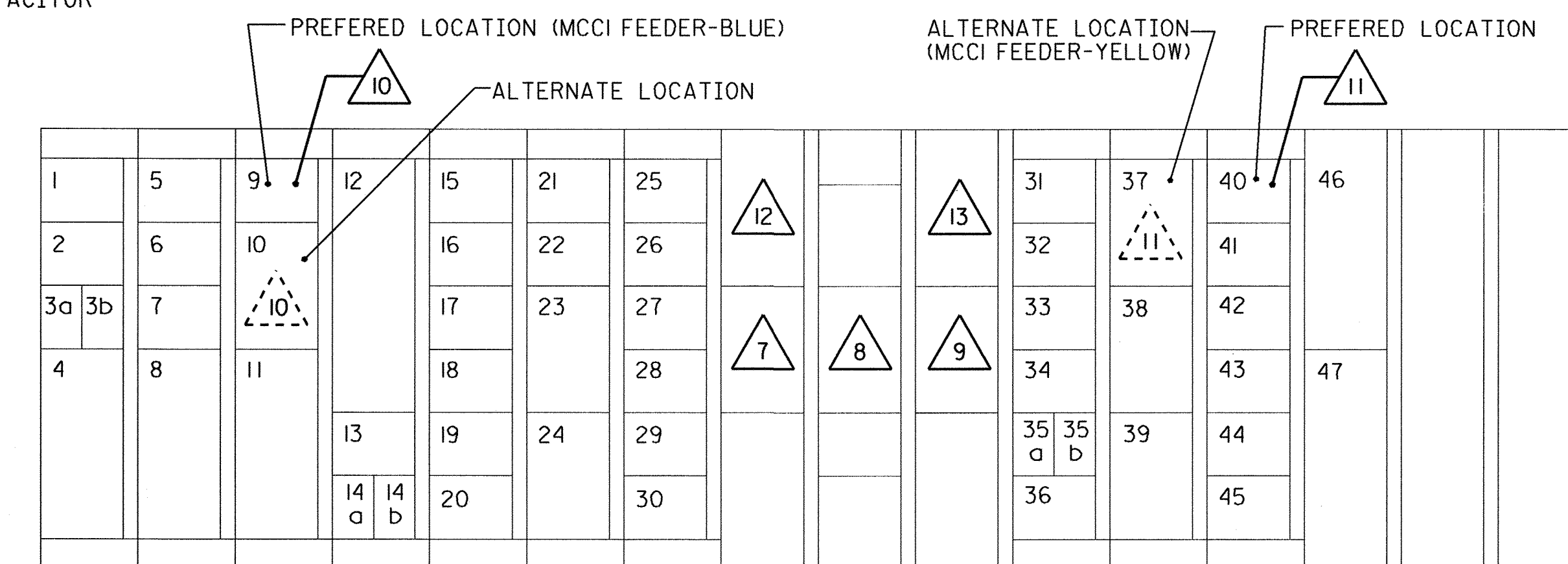
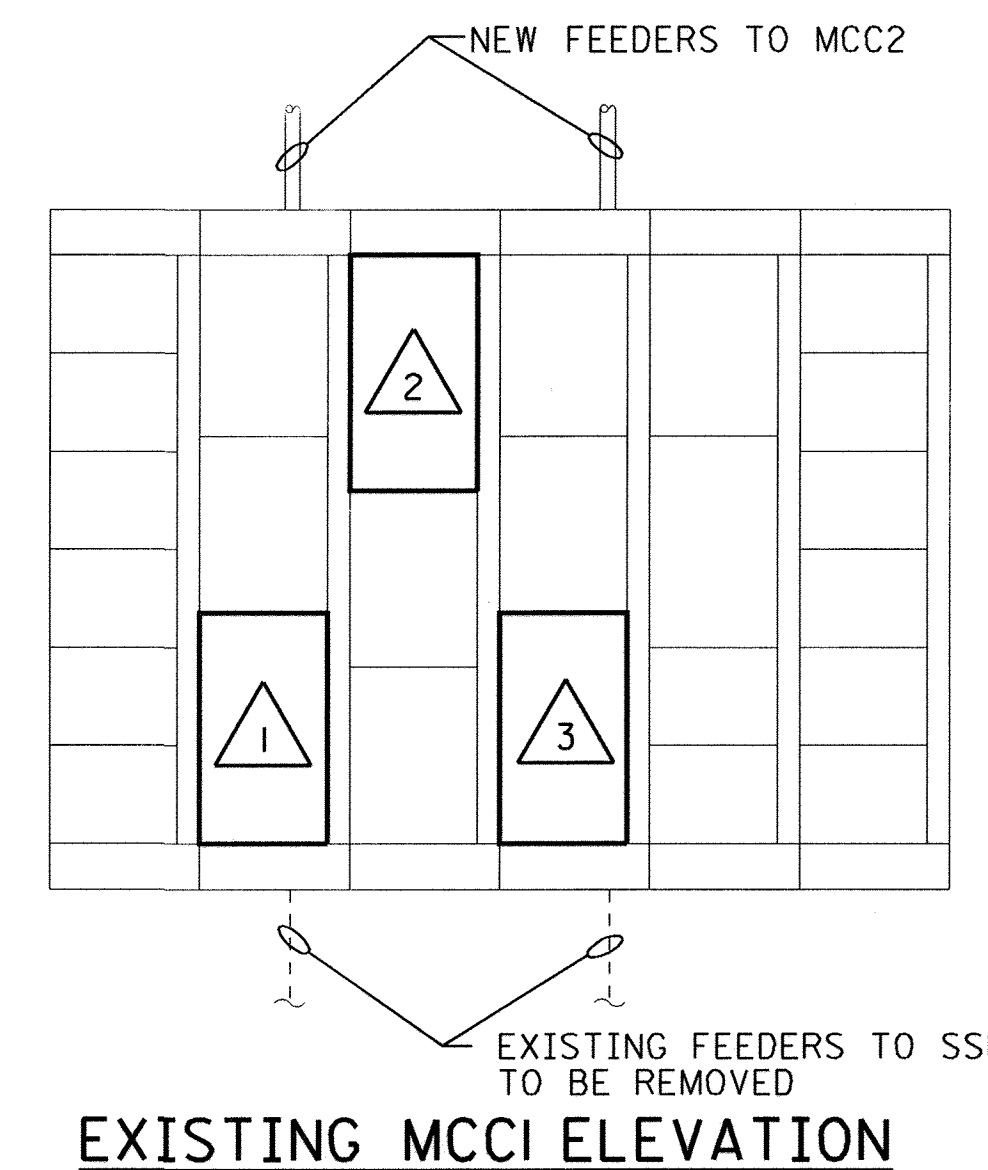


HEADWORKS BUILDING  
PARTIAL FLOOR PLAN - ELECTRICAL

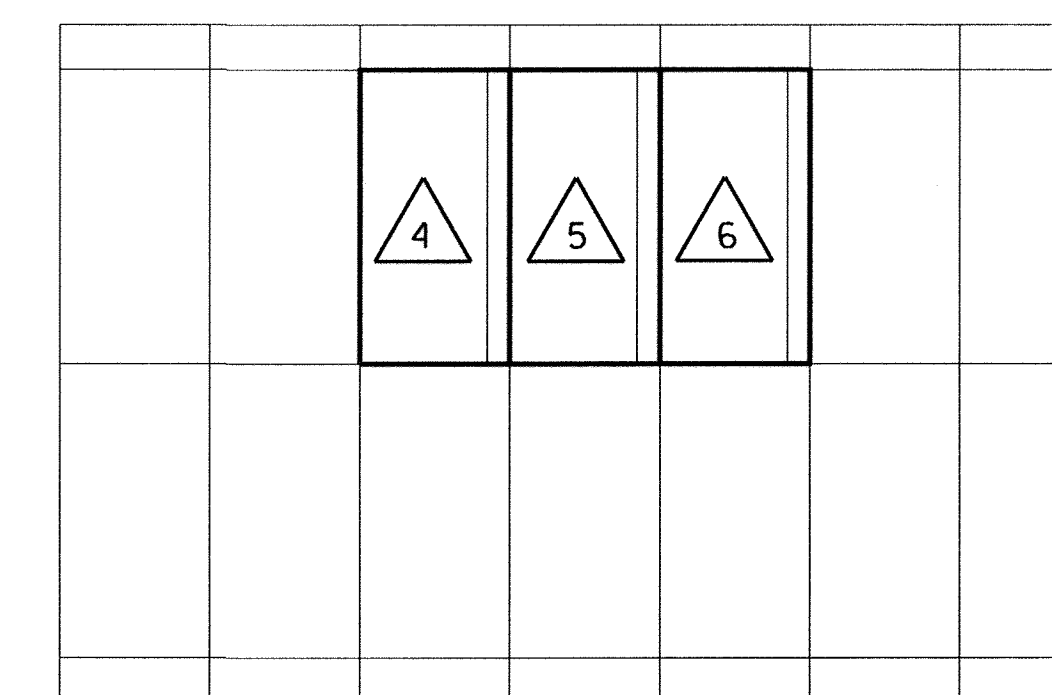


MCC 2 IDENTIFICATION NOTES (FOR GENERAL REFERENCE ONLY):

1. COOLING FAN 3 - HEADWORKS
2. SPARE STARTER
- 3a. THED I36015 - "SPARE" CIRCUIT BREAKER
- 3b. THED I36015 - HEADWORKS BLOWER FOR MOV
4. MAIN SEWAGE PUMP 4
5. SPACE - NO BUCKET (SIZE 1)
6. COOLING FAN 2
7. SPARE STARTER - POWER FAILURE - FEEDER NO. 2 CONTROL POWER TRANSFORMER SWITCH PANEL "LB"
8. MAIN SEWAGE PUMP 5
9. SPARE STARTER - 15A MCP (12" BUCKET)
10. SPARE STARTER - 15A MCP (24" BUCKET)
11. MSP #3
12. PANEL "LB"
13. ALARM BELL - ACKNOWLEDGE
- 14a. PANEL "LB" - PRIMARY TRANSFORMER
- 14b. 10KVAC CAPAC
15. UNIT HEATER CONTROL RELAYS
16. SPARE STARTER - 15A MCP
17. HEATER 4 BLOWER ROOM
18. HEATER 6 MSP DRYWELL
19. EXHAUST FAN 3 - BLOWER ROOM
20. EXHAUST FAN 7 - MSP DRYWELL
21. EXHAUST FAN CONTROL TIMER
22. LIGHTS MSP DRYWALL
23. SPARE STARTER (24") 15A MCP
24. SPARE STARTER (24") 15A MCP
25. ALTERNATOR CONTROL RELAY
26. SPARE STARTER (12") 15A MCP
27. SPARE STARTER (12") 15A MCP
28. SPARE STARTER (12") 20A MCP
29. SPARE STARTER (12") 20A MCP
30. SPARE STARTER (12") 15A MCP
31. PCI COLLECTOR
32. SPARE 12" - 15A MCP
33. UNKNOWN
34. SUMP PUMP 1MSP DRYWELL
- 35a. HEADWORKS BLOWER 5 MOV
- 35b. HEADWORKS BLOWER 6 MOV
36. SPARE 12" - 20A MCP
37. SPARE 24" - 20A MCP
38. SPARE 24" - 20A MCP
39. SPARE 24" - 20A MCP
40. SPARE 12" - 20A MCP
41. POWER TO TRANSFORMER "LB"
42. HEATER 3 BLOWER ROOM
43. HEATER 5 MSP DRYWELL
44. COOLING FAN/HEADWORKS
- 45a. RUN TO PANEL "LF" AT FEB. 2
- 45b. 10KVAC CAPACITOR
46. MSP #6
47. MSP #1



EXISTING MCC2 ELEVATION



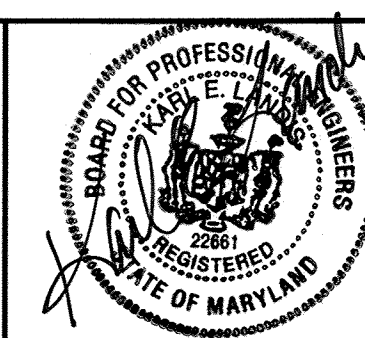
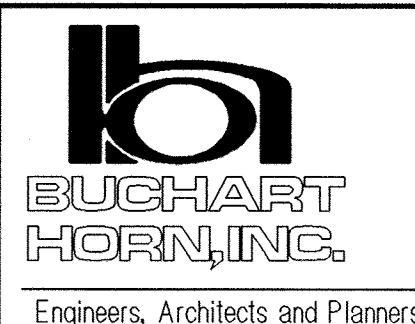
EXISTING MCC3 ELEVATION

MCC MODIFICATIONS

- |  |  |   |
|--|--|---|
| <p>1. EXISTING MAIN NO. 1 CIRCUIT BREAKER TO REMAIN. DISCONNECT EXISTING FEEDER FROM SSI (FEEDER CONDUCTORS TO BE REMOVED BACK TO SSI UNDER THIS CONTRACT). RECONNECT MAIN BREAKER TO NEW FEEDER FROM MCC2. (FEEDER PROVIDED AS INDICATED UNDER THIS CONTRACT)</p> <p>2. EXISTING TIE CIRCUIT BREAKER TO REMAIN.</p> <p>3. EXISTING MAIN NO. 2 CIRCUIT BREAKER TO REMAIN. DISCONNECT EXISTING FEEDER FROM SSI (FEEDER CONDUCTORS TO BE REMOVED BACK TO SSI UNDER THIS CONTRACT). RECONNECT MAIN BREAKER TO NEW FEEDER FROM MCC2. (FEEDER PROVIDED AS INDICATED UNDER THIS CONTRACT)</p> <p>4. FURNISH AND INSTALL A SD MODEL *XCKJ10511 AT MAIN FUSE SWITCH NO. 2 HANDLE FOR HANDLE POSITION SENSING. WIRE HANDLE POSITION SENSOR TO +24 VOLTS AND EXISTING TERMINAL I00226-7 IN PIU-8.</p> <p>5. FURNISH AND INSTALL A SD MODEL *XCKJ10511 AT TIE FUSE SWITCH HANDLE FOR HANDLE POSITION SENSING. WIRE HANDLE POSITION SENSOR TO +24 VOLTS AND EXISTING TERMINAL I00226-8 IN PIU-8.</p> | <p>6. FURNISH AND INSTALL A SD MODEL *XCKJ10511 AT MAIN FUSE SWITCH NO. 1 HANDLE FOR HANDLE POSITION SENSING. WIRE HANDLE POSITION SENSOR TO +24 VOLTS AND EXISTING TERMINAL I00226-9 IN PIU-8.</p> <p>7. EXISTING MAIN BREAKER NO. 2 (BLUE) TO BE REFUBISHED AS WORK UNDER THIS CONTRACT. RETROFIT WORK TO INCLUDE REPLACEMENT OF AUXILIARY CONTRACTS FOR BREAKER POSITION MONITORING AND PROTECTIVE TRIP UNIT WITH A NEW SOLID-STATE DEVICE.</p> <p>8. EXISTING "TIE" CIRCUIT BREAKER TO BE REFUBISHED AS WORK UNDER THIS CONTRACT. RETROFIT WORK TO INCLUDE REPLACEMENT OF AUXILIARY CONTRACTS FOR BREAKER POSITION MONITORING AND PROTECTIVE TRIP UNIT WITH A NEW SOLID-STATE DEVICE.</p> <p>9. EXISTING MAIN BREAKER NO. 1 (YELLOW) TO BE REFUBISHED AS WORK UNDER THIS CONTRACT. RETROFIT WORK TO INCLUDE REPLACEMENT OF AUXILIARY CONTRACTS FOR BREAKER POSITION MONITORING AND PROTECTIVE TRIP UNIT WITH A NEW SOLID-STATE DEVICE.</p> | <p>10. UTILIZE EXISTING SPARE STARTER UNIT TO PROVIDE NEW BRANCH CIRCUIT FEEDER TO MCC1. REMOVE EXISTING STARTER COMPONENTS AND INSTALL NEW 150AMP THERMAL MAGNETIC CIRCUIT BREAKER WITH ADJUSTABLE INSTANTANEOUS TRIP, 65KAIC MIN. RATING. PROVIDE NEW DOOR AND HANDLE MECHANISM; RELABEL AS OUTLINED BY SPECIFICATIONS.</p> <p>11. UTILIZE EXISTING SPARE STARTER UNIT TO PROVIDE NEW BRANCH CIRCUIT FEEDER TO MCC1. REMOVE EXISTING STARTER COMPONENTS AND INSTALL NEW 150AMP THERMAL MAGNETIC CIRCUIT BREAKER WITH ADJUSTABLE INSTANTANEOUS TRIP, 65KAIC MIN. RATING. PROVIDE NEW DOOR AND HANDLE MECHANISM; RELABEL AS OUTLINED BY SPECIFICATIONS.</p> <p>12. 13. REMOVE THE EXISTING METERING AND INSTALL AN ELECTRONIC DIGITAL POWER METER IN THIS SECTION. PROVIDE NEW DOOR ON ENCLOSURE.</p> |
|--|--|---|

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert Deming* 8-15-00  
CHIEF, BUREAU OF UTILITIES



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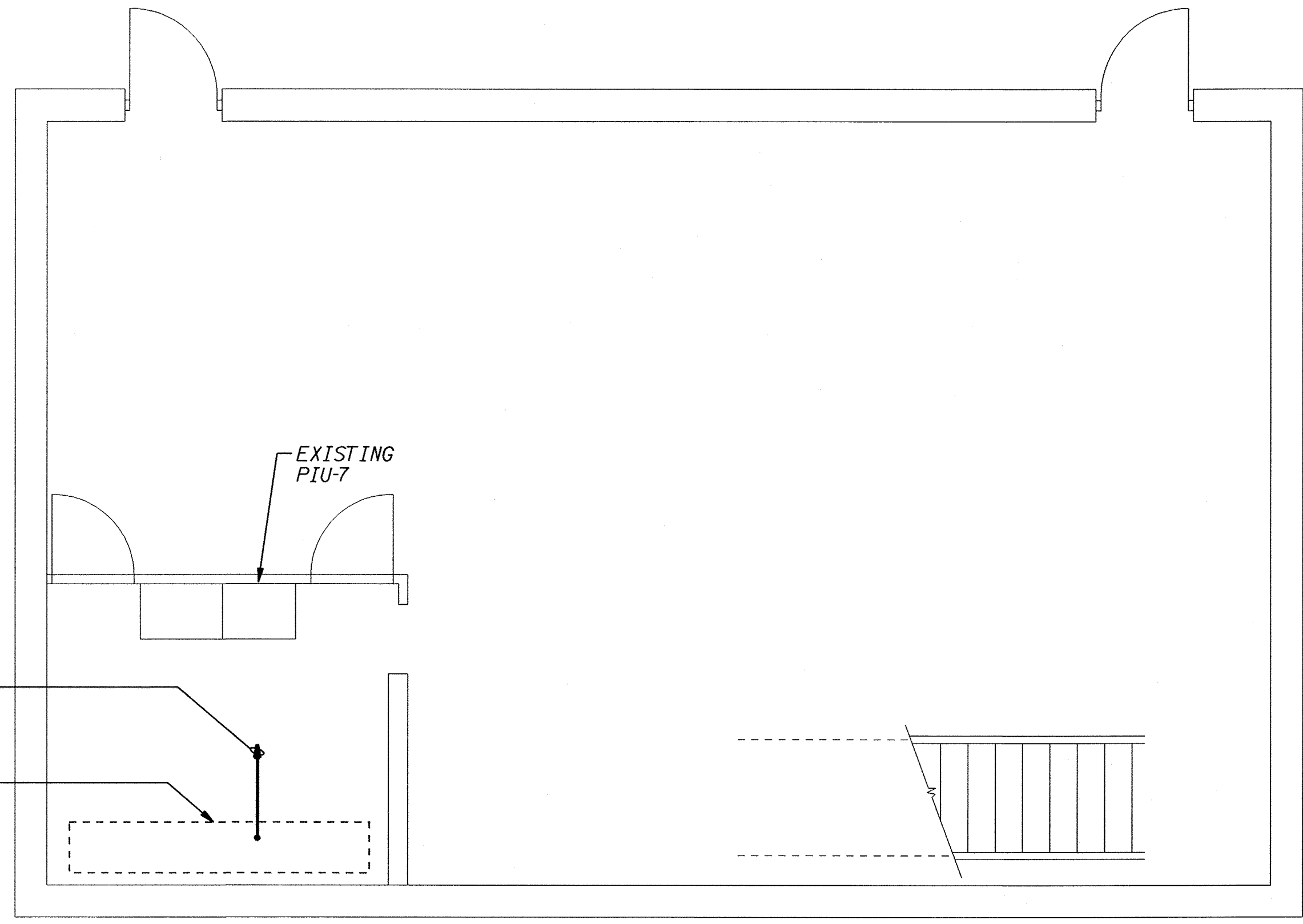
MCCI AND MCC3  
MODIFICATIONS

LITTLE PATUXENT WATER RECLAMATION PLANT  
MULTIPLE IMPROVEMENTS  
PLANT ELECTRICAL DISTRIBUTION SYSTEM UPGRADE  
CAPITAL PROJECT NO. S-6223  
CONTRACT NO. 20-3838  
ELECTION DISTRICT NO. 6  
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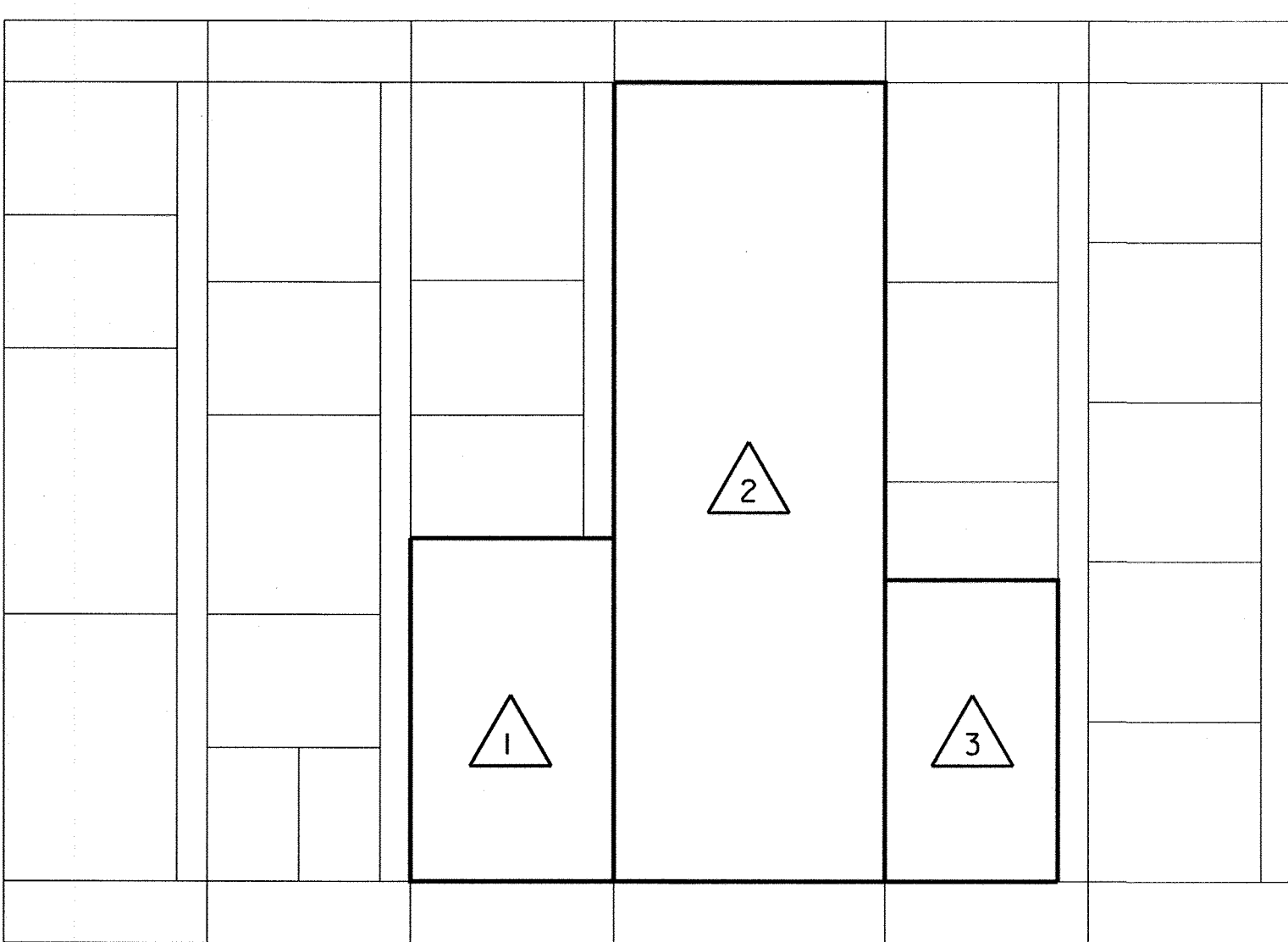
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E-4

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GRIT BUILDING  
FLOOR PLAN - ELECTRICAL



EXISTING MCCI4 ELEVATION

MCCI4 MODIFICATIONS

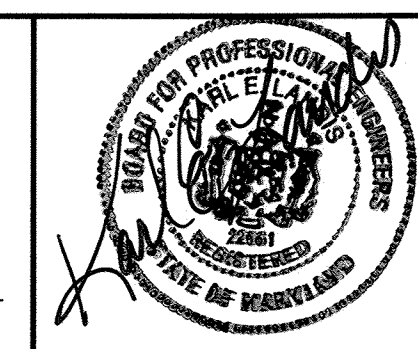
- 1 INSTALL 2#14 FROM EXISTING MAIN BREAKER NO. 2 TERMINALS NO. 29 AND NO. 30 TO EXISTING PIU-7 +24 VOLTS AND TERMINAL NO. 100233-12.
- 2 INSTALL 2#14 FROM EXISTING TIE BREAKER TERMINALS NO. 35 AND NO. 36 TO EXISTING PIU-7 +24 VOLTS AND TERMINAL NO. 100233-13.
- 3 INSTALL 2#14 FROM EXISTING MAIN BREAKER NO. 1 TERMINALS NO. 39 AND NO. 40 TO EXISTING PIU-7 +24 VOLTS AND TERMINAL NO. 100233-14.

(bheffler)  
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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*R. J. Bauman* 8-15-00  
CHIEF, BUREAU OF UTILITIES DATE

**BUCHART HORN, INC.**  
Engineers, Architects and Planners

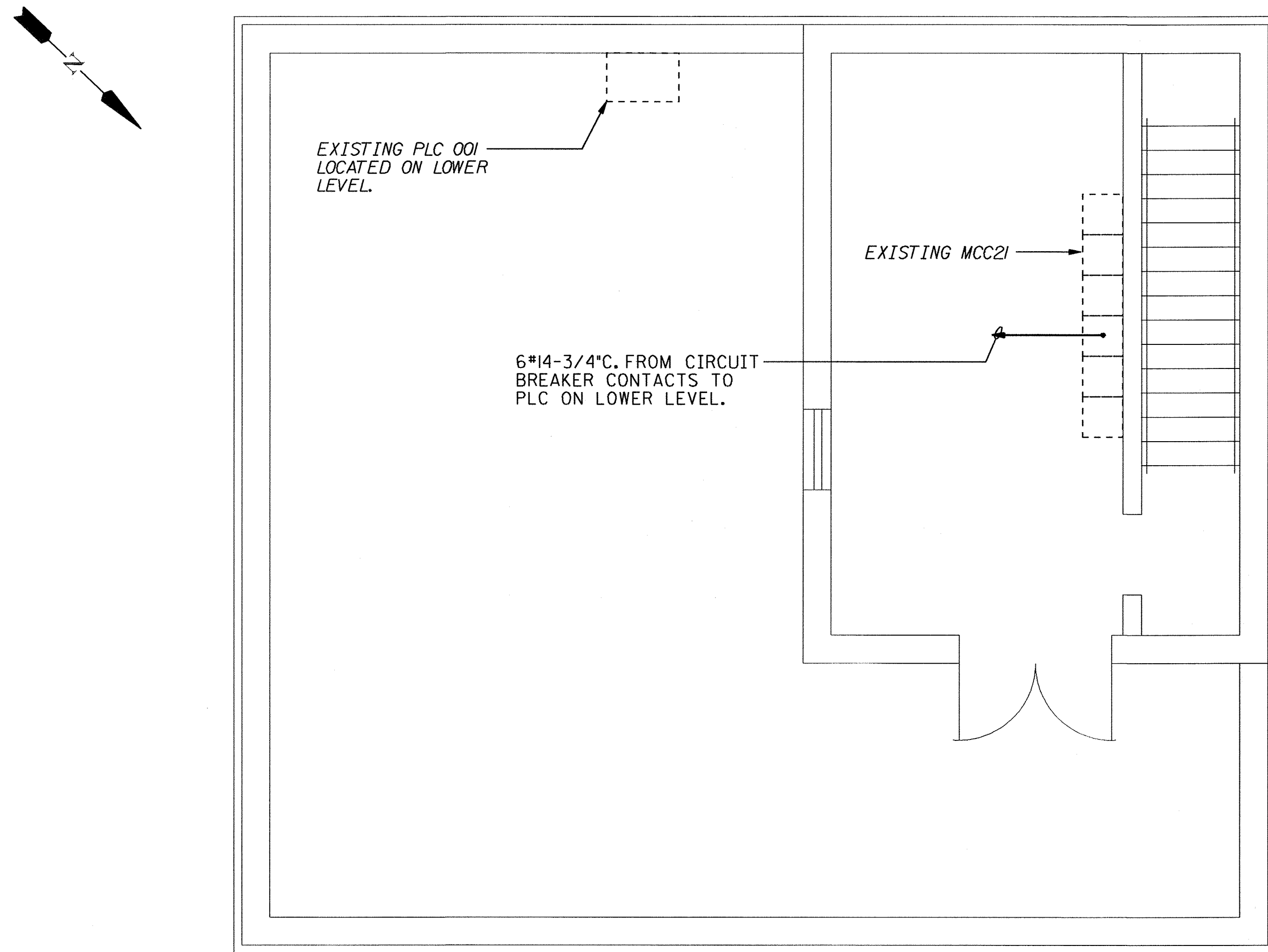


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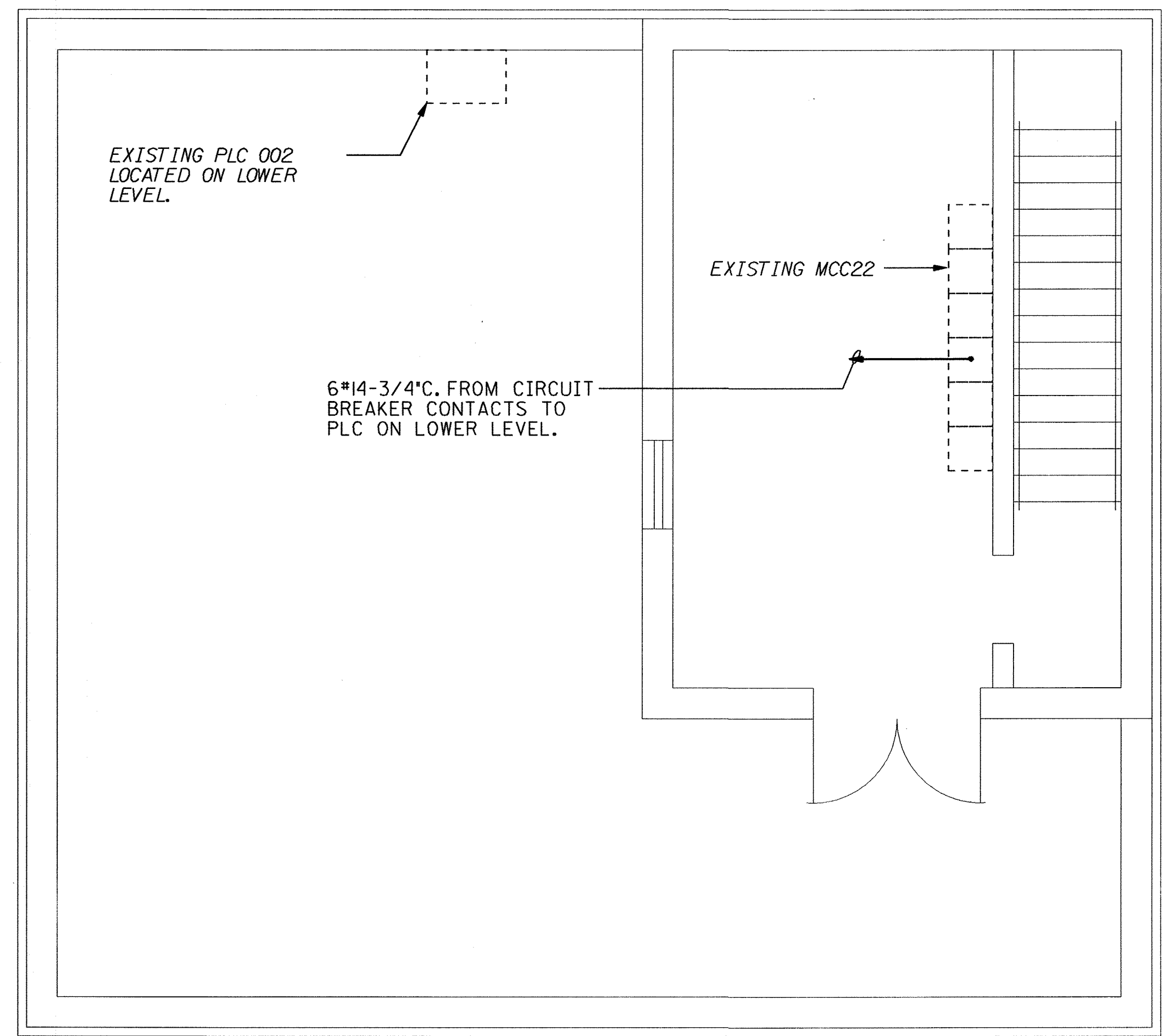
MCC 14 MODIFICATIONS

LITTLE PATUXENT WATER RECLAMATION PLANT  
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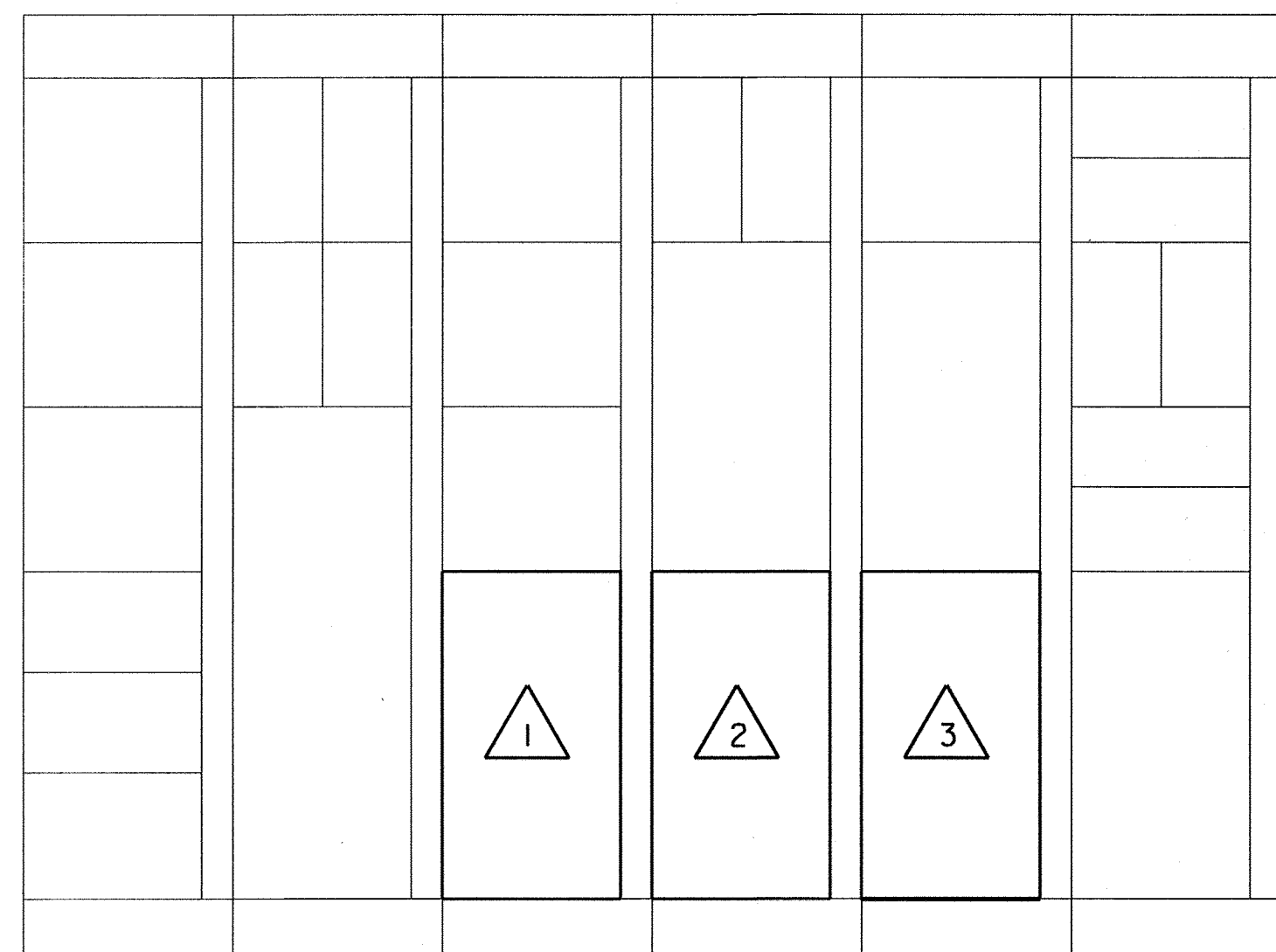
SCALE AS SHOWN SHEET 6 OF 13 E-5



**NORTH PUMPING STATION  
FLOOR PLAN - ELECTRICAL**



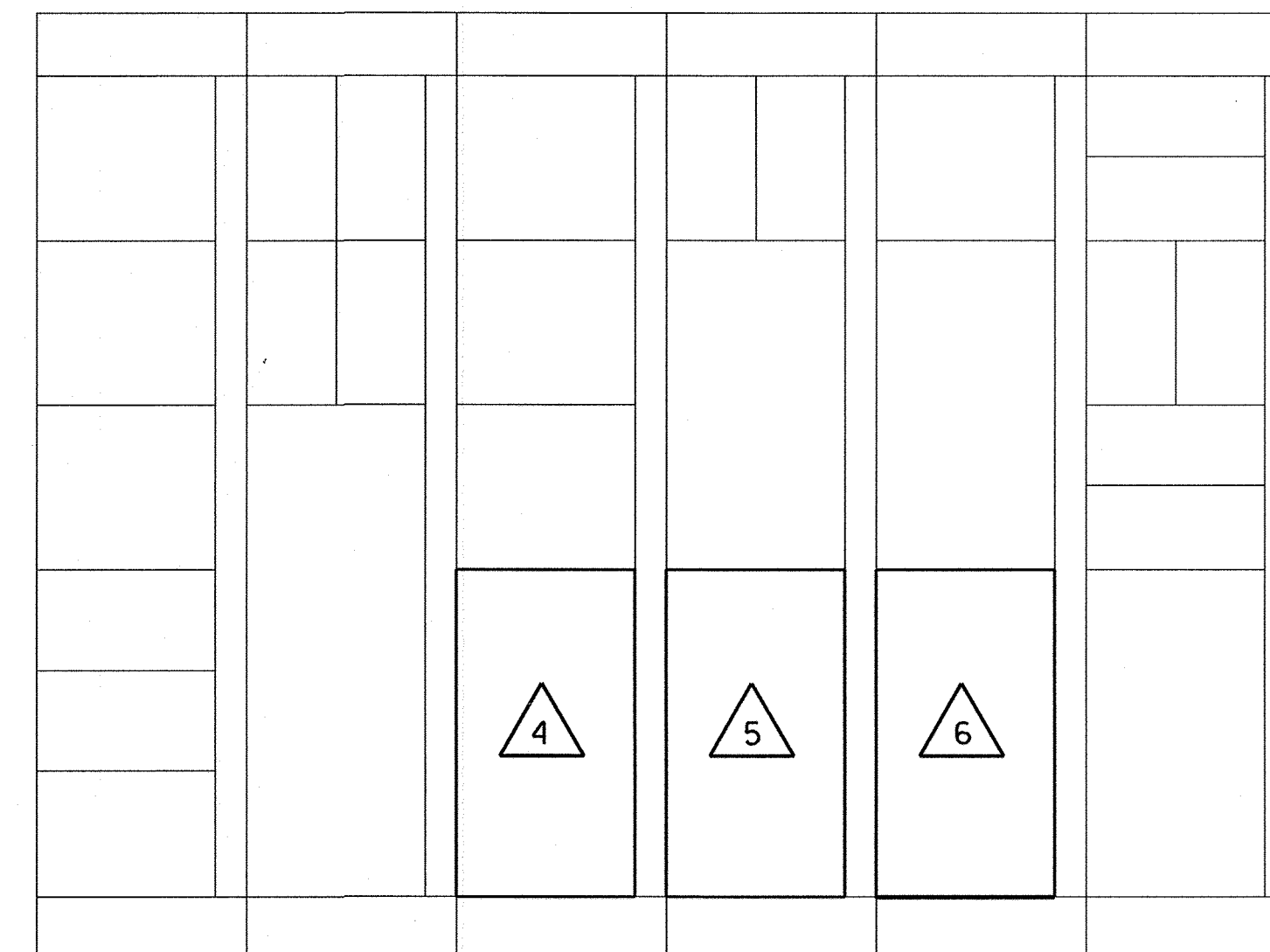
**SOUTH PUMPING STATION  
FLOOR PLAN - ELECTRICAL**



**EXISTING MCC21 ELEVATION**  
(LOCATED IN NORTH PUMP STATION)

**MCC21 MODIFICATIONS**

- 1 INSTALL AN AUXILIARY CONTACT (WESTINGHOUSE MODEL \*AA114\*PK) ON THE MAIN BREAKER NO. 1 AND WIRE THIS CONTACT TO THE EXISTING PLC LOCATED ON THE LOWER LEVEL OF THE PUMP STATION. WIRE TO +24 VOLTS AND EXISTING SPARE POINT 17.1 IN PLC 001.
- 2 INSTALL AN AUXILIARY CONTACT (WESTINGHOUSE MODEL \*AA114\*PK) ON THE TIE BREAKER AND WIRE TO THE EXISTING PLC. WIRE TO +24 VOLT AND EXISTING SPARE POINT 17.2 IN PLC 001.
- 3 INSTALL AN AUXILIARY CONTACT (WESTINGHOUSE MODEL \*AA114\*PK) ON THE MAIN BREAKER NO. 2 AND WIRE TO THE EXISTING PLC. WIRE TO +24 VOLT AND EXISTING SPARE POINT 17.3 IN PLC 001.



**EXISTING MCC22 ELEVATION**  
(LOCATED IN SOUTH PUMP STATION)

**MCC22 MODIFICATIONS**

- 4 INSTALL AN AUXILIARY CONTACT (WESTINGHOUSE MODEL \*AA114\*PK) ON THE MAIN BREAKER NO. 1 AND WIRE THIS CONTACT TO THE EXISTING PLC LOCATED ON THE LOWER LEVEL OF THE PUMP STATION. WIRE TO +24 VOLTS AND EXISTING SPARE POINT 17.7 IN PLC 002.
- 5 INSTALL AN AUXILIARY CONTACT (WESTINGHOUSE MODEL \*AA114\*PK) ON THE TIE BREAKER AND WIRE TO THE EXISTING PLC. WIRE TO +24 VOLT AND EXISTING SPARE POINT 17.8 IN PLC 002.
- 6 INSTALL AN AUXILIARY CONTACT (WESTINGHOUSE MODEL \*AA114\*PK) ON THE MAIN BREAKER NO. 2 AND WIRE TO THE EXISTING PLC. WIRE TO +24 VOLT AND EXISTING SPARE POINT 17.9 IN PLC 002.

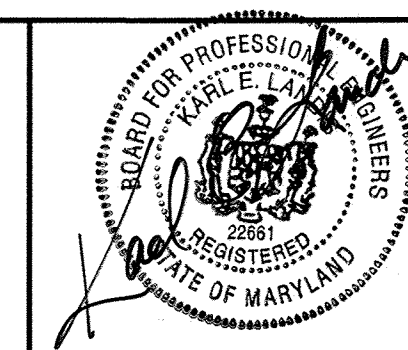
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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert B. ...*  
CHIEF, BUREAU OF UTILITIES

DATE: 8.15.02

**BUCHART  
HORN, INC.**  
Engineers, Architects and Planners

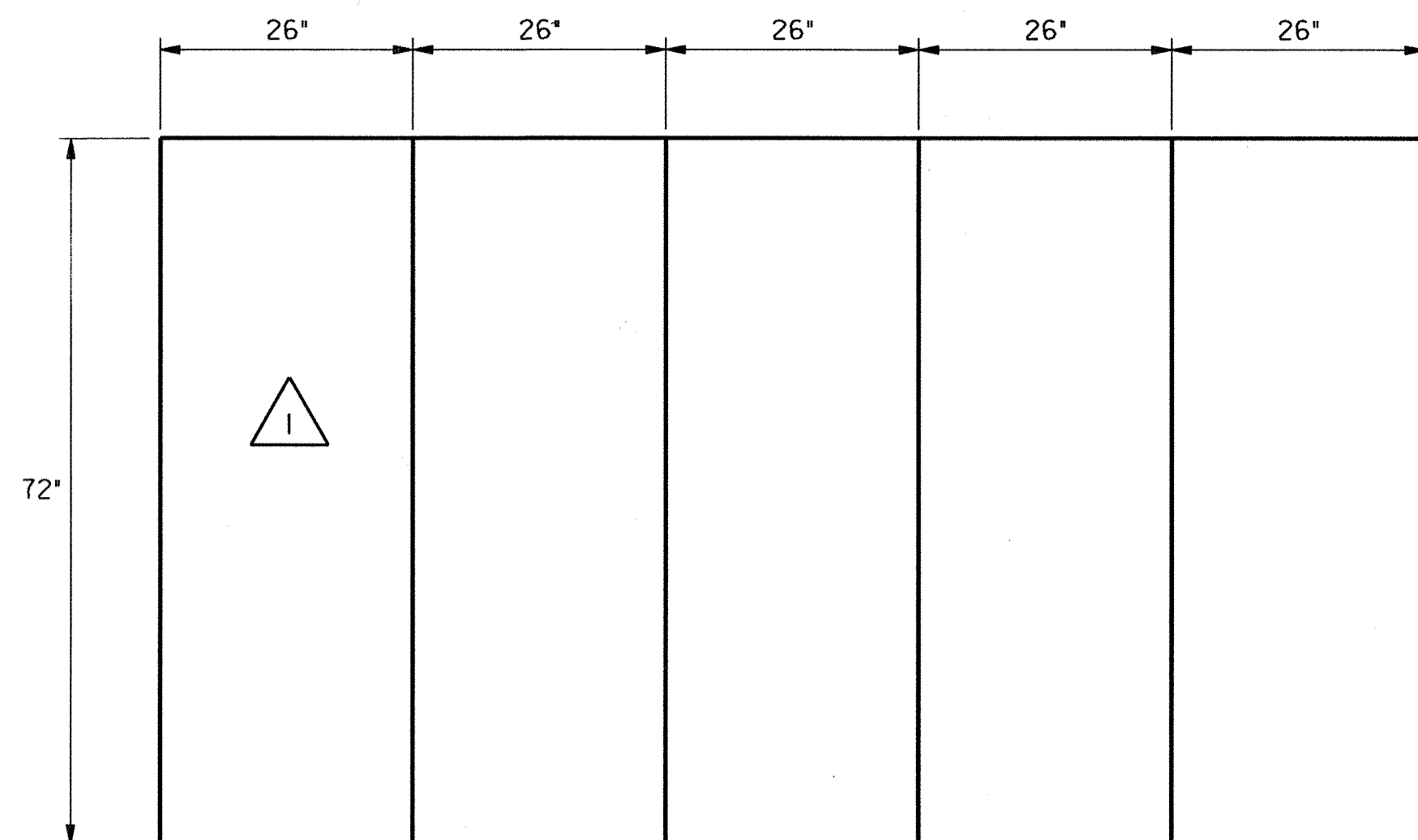


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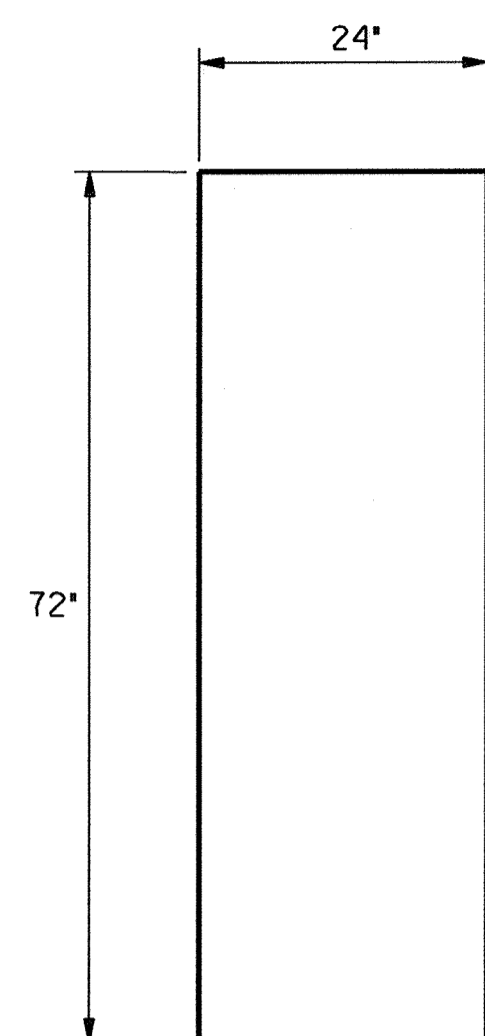
**MCC21 AND MCC22  
MODIFICATIONS**

LITTLE PATUXENT WATER RECLAMATION PLANT  
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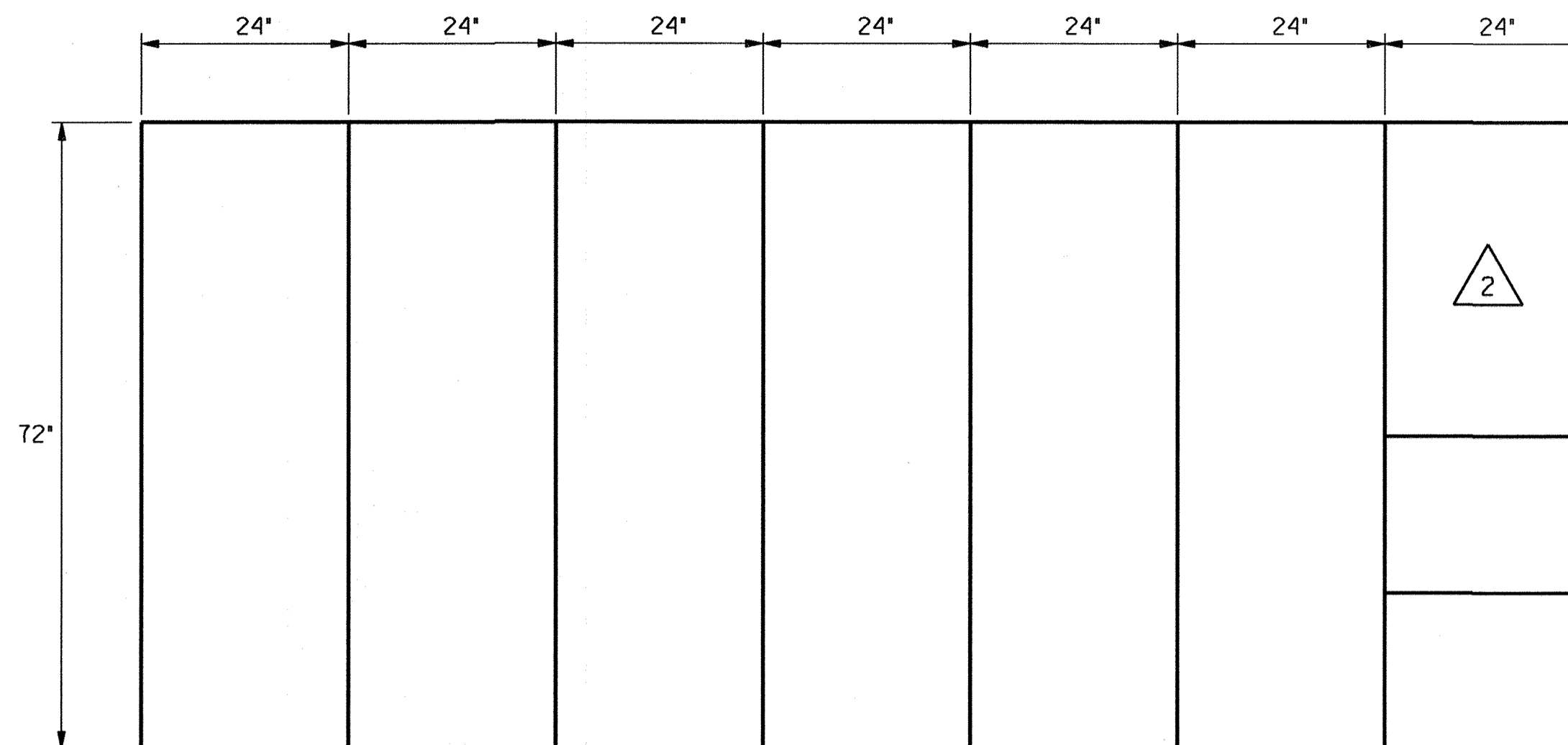
SCALE AS SHOWN  
SHEET 7 OF 13  
E-6



PSI SECTION 1



TIE SECTION

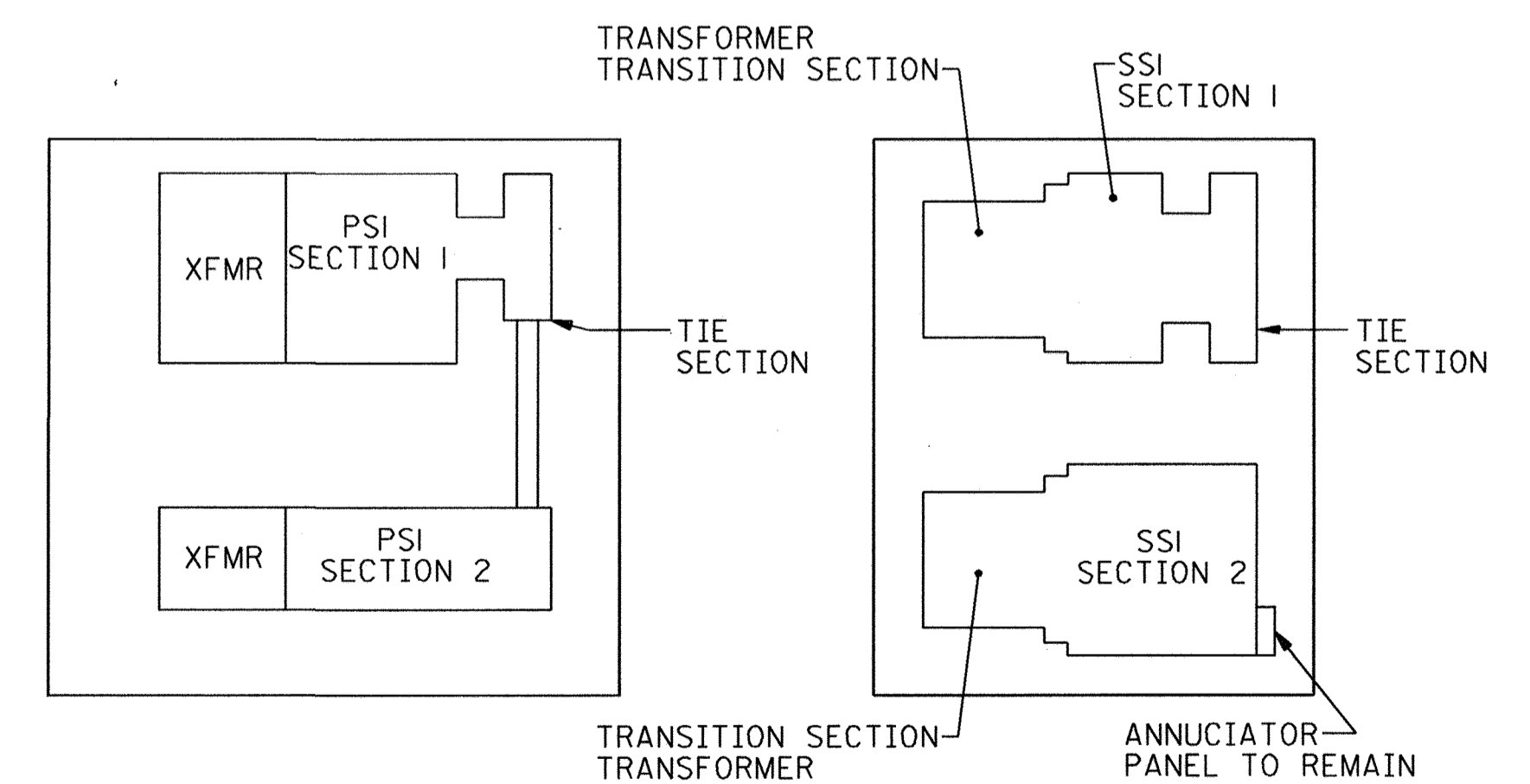


PSI SECTION 2

"PSI" ELEVATION  
(LOCATED IN HEADWORKS SUBSTATION)

SUBSTATION "PSI" MODIFICATIONS

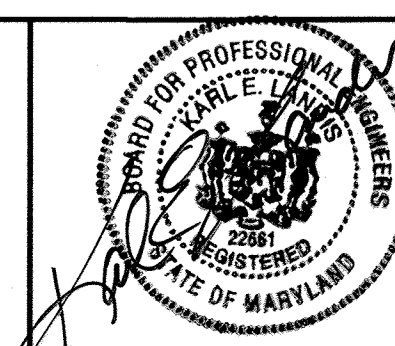
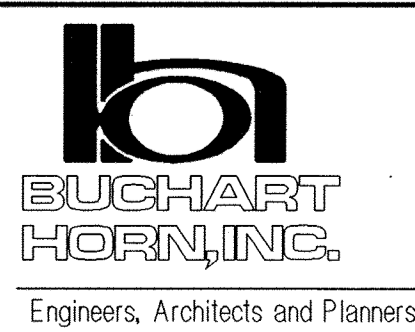
- 1 REMOVE THE EXISTING METERING FOR SERVICE NO. 1 AND INSTALL AN ELECTRONIC DIGITAL POWER METER IN THIS SECTION.
- 2 REMOVE THE EXISTING METERING FOR SERVICE NO. 2 AND INSTALL AN ELECTRONIC DIGITAL POWER METER IN THIS SECTION.



KEY PLAN  
NO SCALE

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert Benjamin* 8-15-02  
CHIEF, BUREAU OF UTILITIES DATE



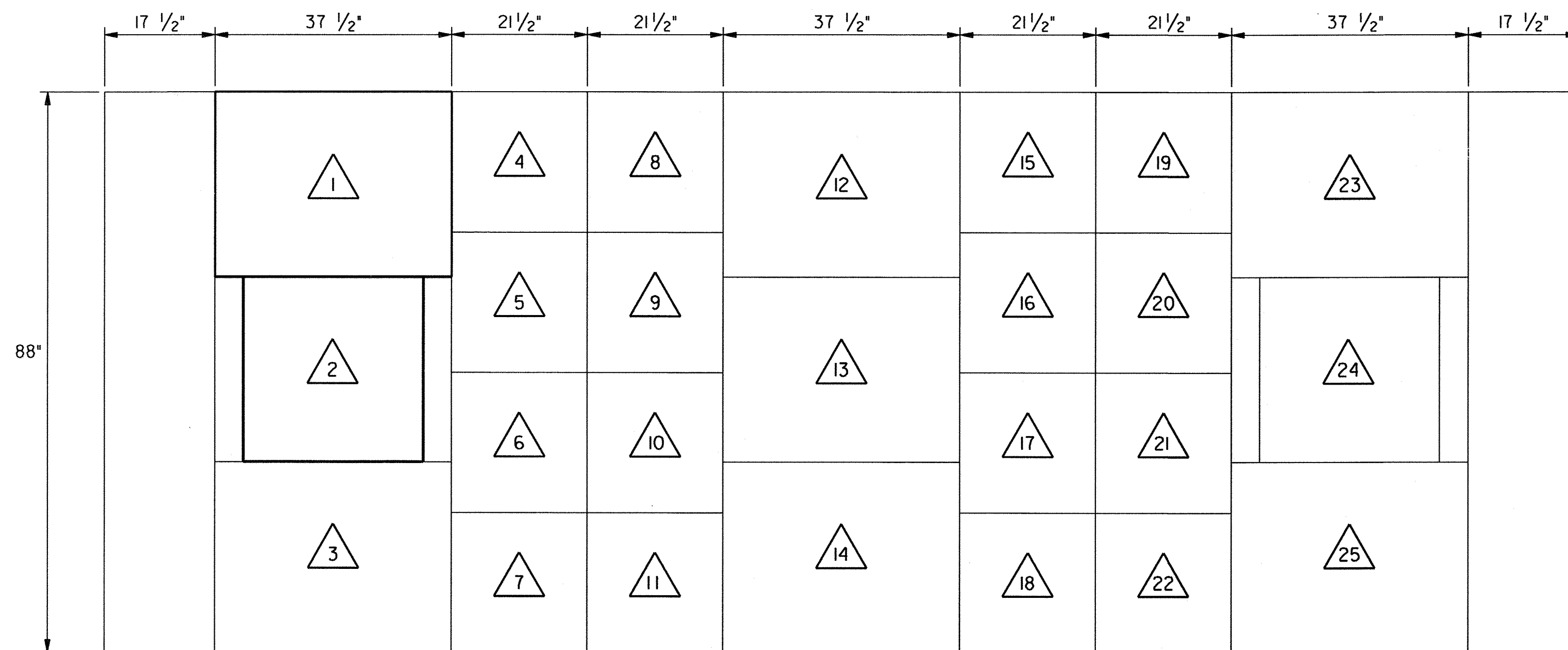
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DRN:	KGD				
CHK:	JLS				
DATE:	2/29/00	BY	NO.	REVISION	DATE

SUBSTATION PSI MODIFICATIONS

LITTLE PATUXENT WATER RECLAMATION PLANT  
MULTIPLE IMPROVEMENTS  
PLANT ELECTRICAL DISTRIBUTION SYSTEM UPGRADE  
CAPITAL PROJECT NO. S-6223  
CONTRACT NO. 20-3838  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 8 OF 13  
E-7





EXISTING SUBSTATION "PS3" ELEVATION

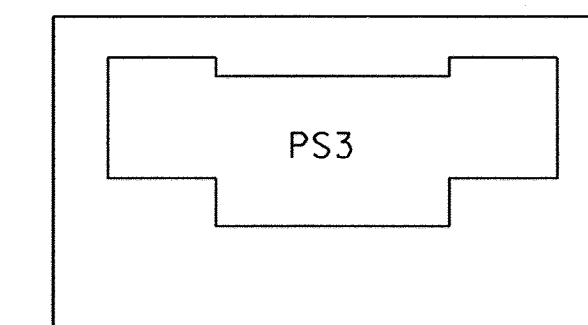
UNIT LOCATION	DESCRIPTION
1	POWER METER AND CONTROLS
2	MAIN BREAKER NO. 1
3	SPACE
4	BREAKER CONTROL
5	SUBBREAKER TO MCC 20
6	SUBBREAKER TO MCC 13
7	SUBBREAKER TO MCC 5
8	BREAKER CONTROL
9	SPARE
10	SUBBREAKER TO MCC 6

UNIT LOCATION	DESCRIPTION
11	SUBBREAKER TO MCC 7
12	PANALARM
13	TIEBREAKER
14	SPACE
15	BREAKER CONTROL
16	SPARE
17	SUBBREAKER TO MCC 6
18	SUBBREAKER TO MCC 7
19	BREAKER CONTROL
20	SUBBREAKER TO MCC 20

UNIT LOCATION	DESCRIPTION
21	SUBBREAKER TO MCC 13
22	SUBBREAKER TO MCC 5
23	POWER METERING AND CONTROLS
24	MAIN BREAKER NO. 2
25	SPACE

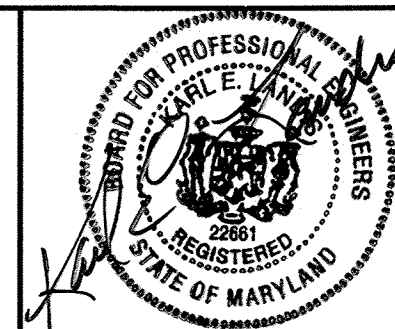
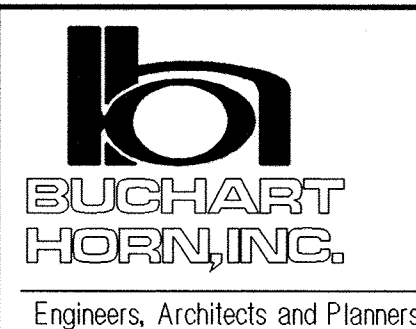
**SUBSTATION "PS3" MODIFICATIONS**

- 1 REMOVE THE EXISTING METERING FOR SERVICE NO.1 AND INSTALL AN ELECTRONIC DIGITAL POWER METER IN THIS SECTION. REPLACE THE EXISTING "CASCADE" TRIP CONTROL RELAY SYSTEM FOR MAIN BREAKER NO.1 WITH A TAYLOR PHASE GUARD RELAY UNIT.
- 2 RETROFIT MAIN BREAKER NO.1 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE WITH GROUND FAULT PROTECTION.
- 5 RETROFIT SUBBREAKER TO MCC 20 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 6 RETROFIT SUBBREAKER TO MCC 13 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 7 RETROFIT SUBBREAKER TO MCC 5 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 9 RETROFIT SPARE SUBBREAKER AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 10 RETROFIT SUBBREAKER TO MCC 6 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 11 RETROFIT SUBBREAKER TO MCC 7 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 13 RETROFIT TIEBREAKER AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 16 RETROFIT SPARE SUBBREAKER AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 17 RETROFIT SUBBREAKER TO MCC 6 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 18 RETROFIT SUBBREAKER TO MCC 7 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 20 RETROFIT SUBBREAKER TO MCC 20 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 21 RETROFIT SUBBREAKER TO MCC 13 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 22 RETROFIT SUBBREAKER TO MCC 5 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 23 REMOVE THE EXISTING METERING FOR SERVICE NO.2 AND INSTALL AN ELECTRICAL DIGITAL POWER METER IN THIS SECTION. REPLACE THE EXISTING "CASCADE" TRIP CONTROL RELAY SYSTEM FOR MAIN BREAKER NO. 2 WITH A TAYLOR PHASE GUARD RELAY UNIT.
- 24 RETROFIT MAIN BREAKER NO.2 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE WITH GROUND FAULT PROTECTION.



KEY PLAN  
NO SCALE

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

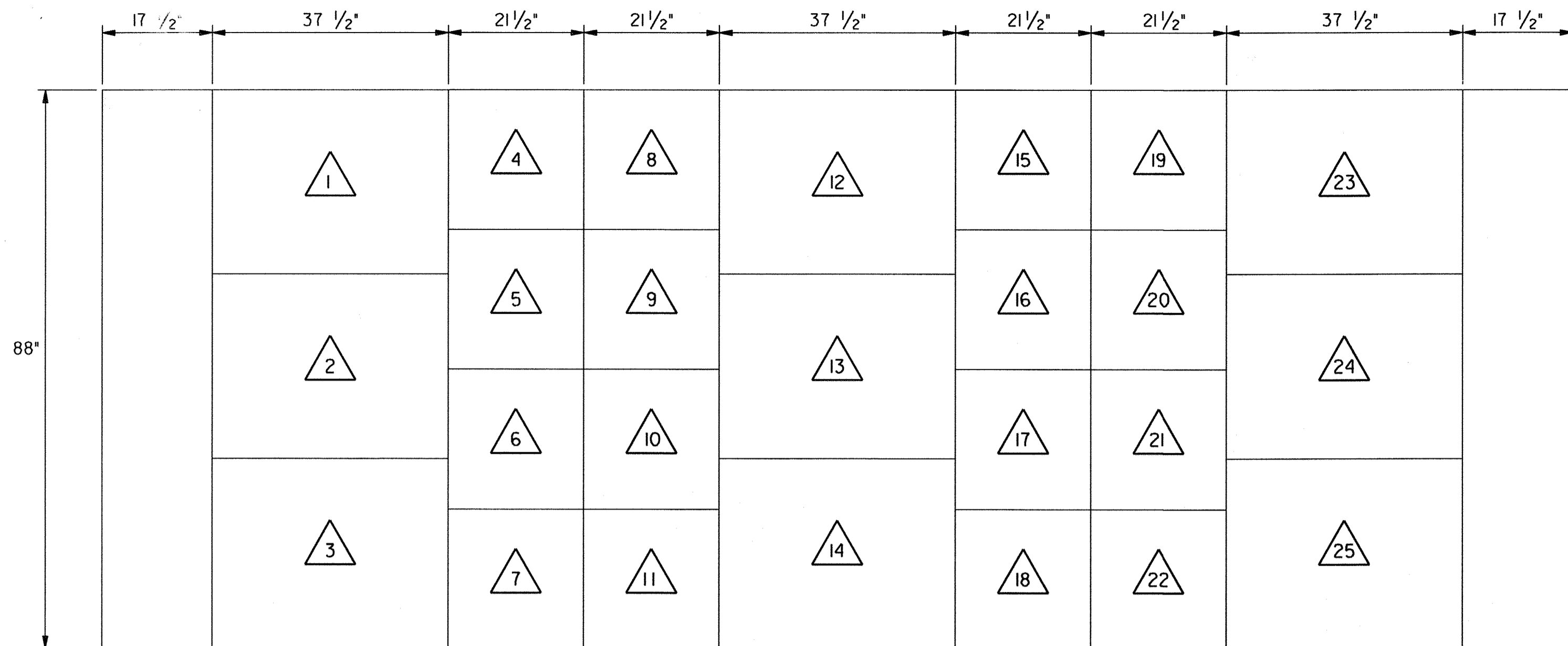


DES:	KEL				
DRN:	KGD				
CHK:	JLS				
DATE:	2/29/00	BY	NO.	REVISION	DATE

**SUBSTATION PS3 MODIFICATIONS**

LITTLE PATUXENT WATER RECLAMATION PLANT  
MULTIPLE IMPROVEMENTS  
PLANT ELECTRICAL DISTRIBUTION SYSTEM UPGRADE  
CAPITAL PROJECT NO. S-6223  
CONTRACT NO. 20-3838  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 9 OF 13  
E-8



EXISTING SUBSTATION "PS4" ELEVATION

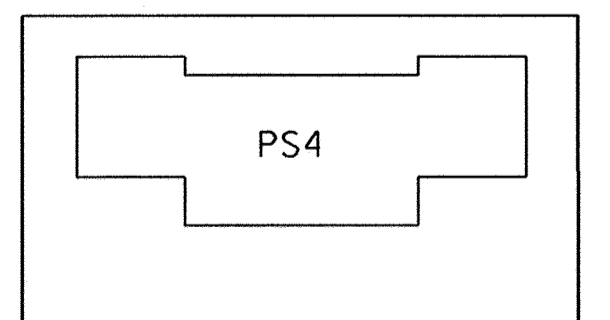
UNIT LOCATION	DESCRIPTION
1	POWER METERING AND CONTROLS
2	MAIN BREAKER NO. 1
3	SPACE
4	BREAKER CONTROL
5	SUBBREAKER TO MCC 8
6	SPARE
7	SUBBREAKER TO MCC 11
8	BREAKER CONTROL
9	SUBBREAKER TO SWBD 1
10	SPARE

UNIT LOCATION	DESCRIPTION
11	SUBBREAKER TO MCC 12
12	PANALARM
13	TIEBREAKER
14	SPACE
15	BREAKER CONTROL
16	SPARE
17	SPARE
18	SUBBREAKER TO MCC 12
19	BREAKER CONTROL
20	SPARE

UNIT LOCATION	DESCRIPTION
21	SPARE
22	SUBBREAKER 2 TO MCC 11
23	POWER METERING AND CONTROLS
24	MAIN BREAKER NO. 2
25	SPACE

**SUBSTATION "PS4" MODIFICATIONS**

- 1 REMOVE THE EXISTING METERING FOR SERVICE NO.1 AND INSTALL AN ELECTRONIC DIGITAL POWER METER IN THIS SECTION. REPLACE THE EXISTING "CASCADE" TRIP CONTROL RELAY SYSTEM FOR MAIN BREAKER NO.1 WITH A TAYLOR PHASE GUARD RELAY UNIT.
- 2 RETROFIT MAIN BREAKER NO.1 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE WITH GROUND FAULT PROTECTION.
- 5 RETROFIT SUBBREAKER TO MCC 8 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 6 RETROFIT SPARE BREAKER AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 7 RETROFIT SUBBREAKER TO MCC 11 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 9 RETROFIT SUBBREAKER TO SWBD1 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 10 RETROFIT SPARE SUBBREAKER AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 11 RETROFIT SUBBREAKER TO MCC 12 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 13 RETROFIT TIEBREAKER AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 16 RETROFIT SPARE SUBBREAKER AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 17 RETROFIT SPARE SUBBREAKER AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 18 RETROFIT SUBBREAKER TO MCC 12 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 20 RETROFIT SPARE SUBBREAKER AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 21 RETROFIT SPARE SUBBREAKER AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 22 RETROFIT SUBBREAKER TO MCC 11 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE.
- 23 REMOVE THE EXISTING METERING FOR SERVICE NO.2 AND INSTALL AN ELECTRICAL DIGITAL POWER METER IN THIS SECTION. REPLACE THE EXISTING "CASCADE" TRIP CONTROL RELAY SYSTEM FOR MAIN BREAKER NO.2 WITH A TAYLOR PHASE GUARD RELAY UNIT.
- 24 RETROFIT MAIN BREAKER NO.2 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVICE FOR THE BREAKER WITH A NEW SOLID STATE DEVICE WITH GROUND FAULT PROTECTION.



KEY PLAN  
NO SCALE

Plot Date: 08/13/2000 (bheffler)  
 PR: 4:\PROJ\71805\CADD\ELEC\Referb\ps4.dwg  
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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert M. Bauman* 8-15-00  
CHIEF, BUREAU OF UTILITIES

**BUCHART HORN, INC.**  
Engineers, Architects and Planners



DES: KEL			
DRN: KGD			
CHK: JLS			
DATE: 2/29/00	BY	NO.	REVISION

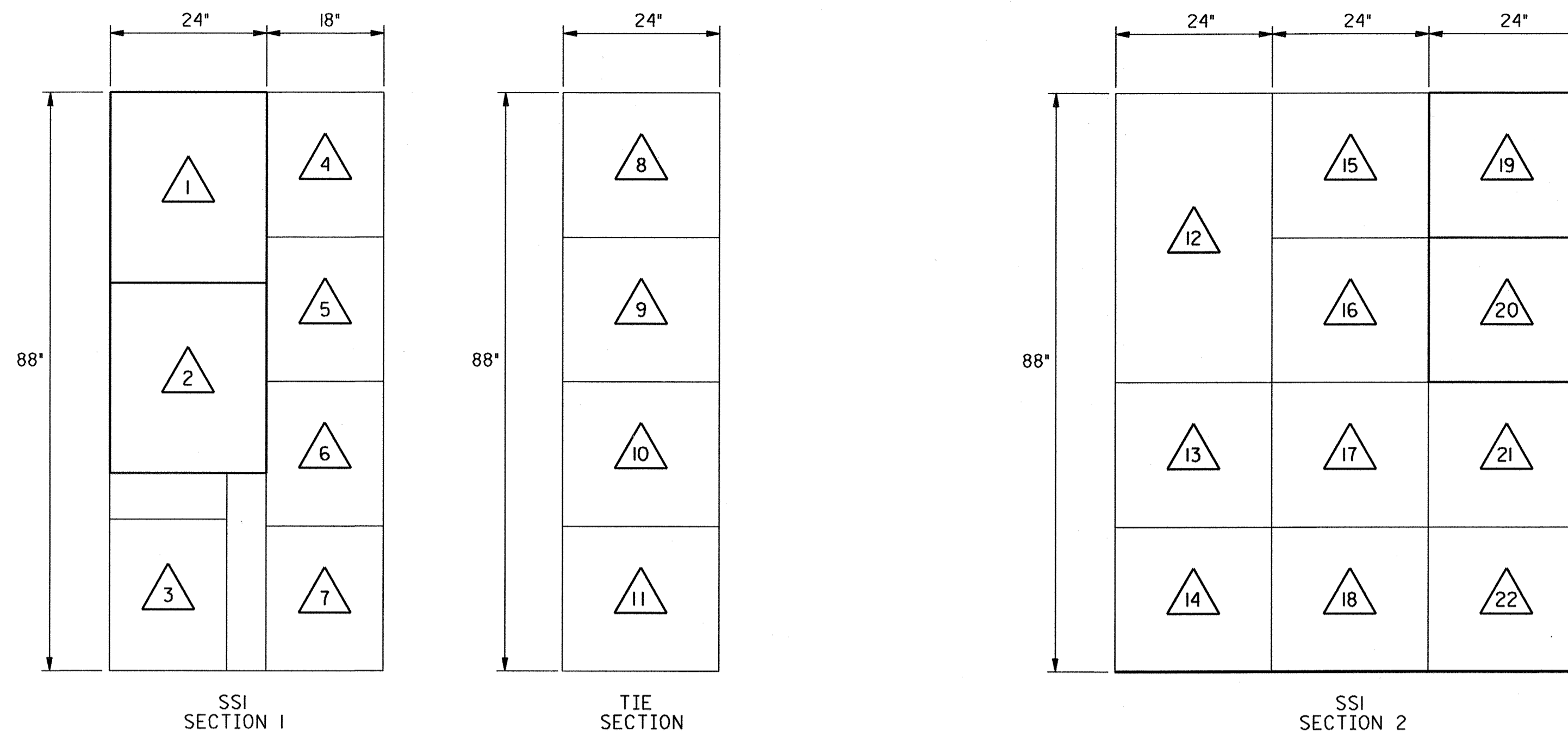
**SUBSTATION PS4 MODIFICATIONS**

LITTLE PATUXENT WATER RECLAMATION PLANT  
MULTIPLE IMPROVEMENTS  
PLANT ELECTRICAL DISTRIBUTION SYSTEM UPGRADE  
CAPITAL PROJECT NO. S-6223  
CONTRACT NO. 20-3838  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 10 OF 13  
E-9



**SUBSTATION "SSI" MODIFICATIONS**

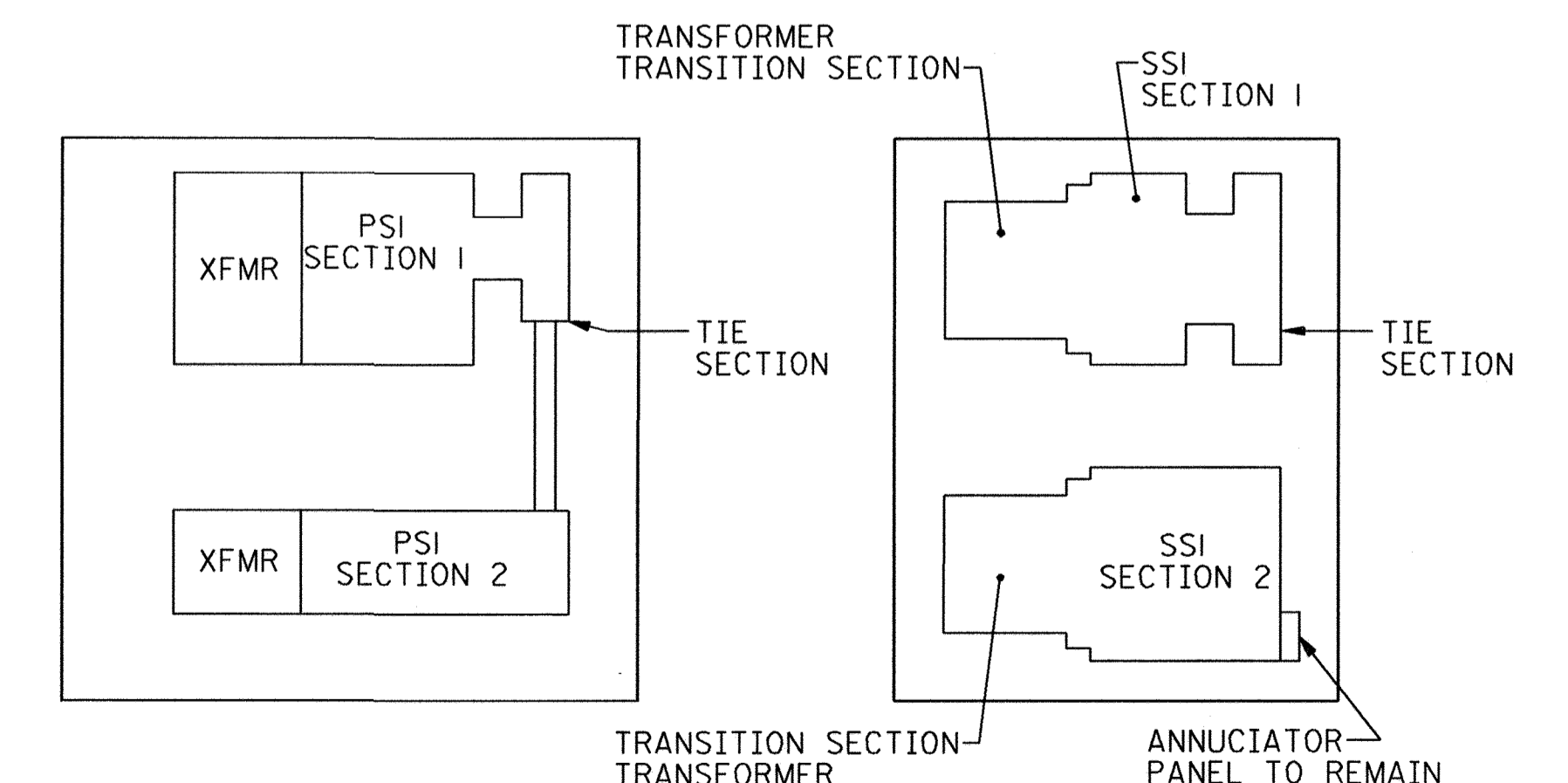


**SUBSTATION "SSI" ELEVATION**  
(LOCATED IN HEADWORKS SUBSTATION)

- 1 REMOVE THE EXISTING METERING FOR SERVICE NO.1 AND INSTALL AN ELECTRONIC DIGITAL POWER METER IN THIS SECTION.
- 2 RETROFILL MAIN BREAKER NO.1 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVISE FOR THE BREAKER WITH A NEW SOLID STATE TRIP UNIT WITH GROUND FAULT PROTECTION.
- 3 RETROFILL SUBBREAKER TO MCC 21 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVISE FOR THE BREAKER WITH A NEW SOLID STATE TRIP UNIT.
- 4 RETROFILL SUBBREAKER TO MCC 14 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVISE FOR THE BREAKER WITH A NEW SOLID STATE TRIP UNIT.
- 5 RETROFILL SUBBREAKER TO MCC 22 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVISE FOR THE BREAKER WITH A NEW SOLID STATE TRIP UNIT.
- 6 RETROFILL SUBBREAKER TO MCC 2 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVISE FOR THE BREAKER WITH A NEW SOLID STATE TRIP UNIT.
- 7 RETROFILL SUBBREAKER TO MCC 1 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVISE FOR THE BREAKER WITH A NEW SOLID STATE TRIP UNIT.
- 9 RETROFILL THE TIE BREAKER AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVISE FOR THE BREAKER WITH A NEW SOLID STATE TRIP UNIT.
- 10 RETROFILL SUBBREAKER TO MCC 4 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVISE FOR THE BREAKER WITH A NEW SOLID STATE TRIP UNIT.
- 13 RETROFILL SUBBREAKER TO MCC 4 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVISE FOR THE BREAKER WITH A NEW SOLID STATE TRIP UNIT.
- 14 RETROFILL SUBBREAKER TO MCC 14 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVISE FOR THE BREAKER WITH A NEW SOLID STATE TRIP UNIT.
- 16 RETROFILL SUBBREAKER TO MCC 2 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVISE FOR THE BREAKER WITH A NEW SOLID STATE TRIP UNIT.
- 17 RETROFILL SUBBREAKER TO MCC 22 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVISE FOR THE BREAKER WITH A NEW SOLID STATE TRIP UNIT.
- 18 RETROFILL SUBBREAKER TO MCC 1 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVISE FOR THE BREAKER WITH A NEW SOLID STATE TRIP UNIT.
- 19 REMOVE THE EXISTING METERING FOR SERVICE NO.2 AND INSTALL AN ELECTRICAL DIGITAL POWER METER IN THIS SECTION.
- 20 RETROFILL MAIN BREAKER NO.2 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVISE FOR THE BREAKER WITH A NEW SOLID STATE TRIP UNIT WITH GROUND FAULT PROTECTION.
- 21 RETROFILL SUBBREAKER TO MCC 21 AND REPLACE THE EXISTING PROTECTIVE RELAY TRIP CONTROL DEVISE FOR THE BREAKER WITH A NEW SOLID STATE TRIP UNIT.

UNIT LOCATION	DESCRIPTION
1	POWER METER
2	MAIN BREAKER NO. 1
3	SUBBREAKER TO MCC 21
4	SUBBREAKER TO MCC 14
5	SUBBREAKER TO MCC 22
6	SUBBREAKER TO MCC 2
7	SPARE
8	GAUGES
9	TIE BREAKER
10	SUBBREAKER TO MCC 4
11	SPACE
12	LOADCENTER

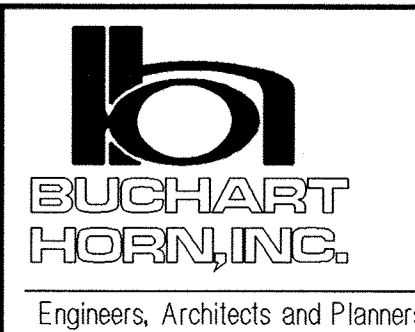
UNIT LOCATION	DESCRIPTION
13	SUBBREAKER TO MCC 4
14	SUBBREAKER TO MCC 14
15	LIGHTS AND GAUGES
16	SUBBREAKER TO MCC 2
17	SUBBREAKER TO MCC 22
18	SPARE
19	POWER METER
20	MAIN BREAKER NO. 2
21	SUBBREAKER TO MCC 21
22	SPACE



**KEY PLAN**  
NO SCALE

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert B. ...* 8-15-00  
CHIEF, BUREAU OF UTILITIES



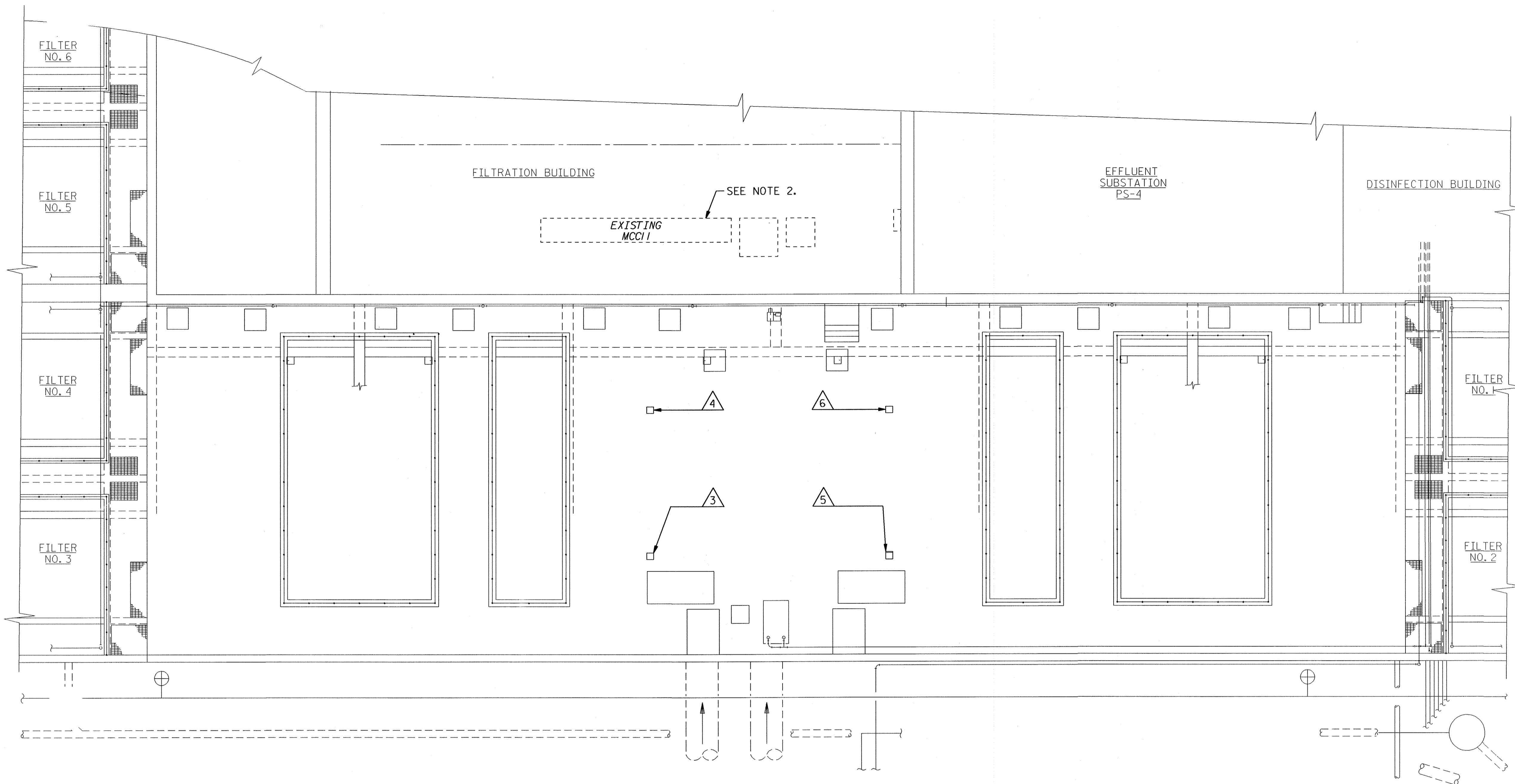
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DRN: KGD			
CHK: JLS			
DATE: 2/29/00	BY	NO.	REVISION
			DATE

**SUBSTATION SSI MODIFICATIONS**

LITTLE PATUXENT WATER RECLAMATION PLANT  
MULTIPLE IMPROVEMENTS  
PLANT ELECTRICAL DISTRIBUTION SYSTEM UPGRADE  
CAPITAL PROJECT NO. S-6223  
CONTRACT NO. 20-3838  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 11 OF 13  
E-10

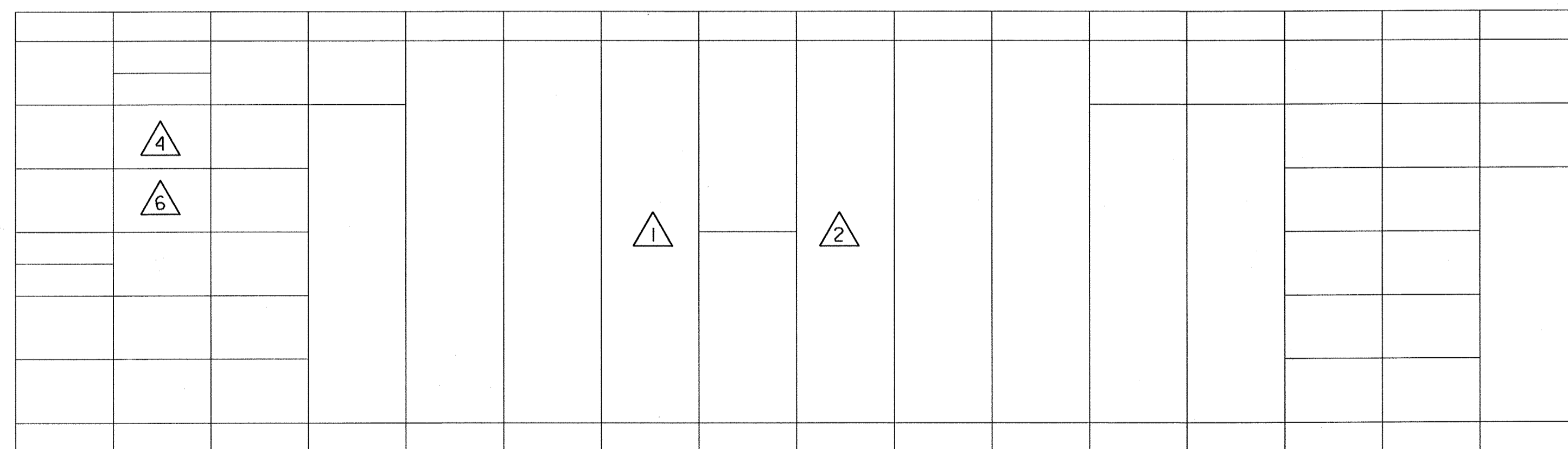




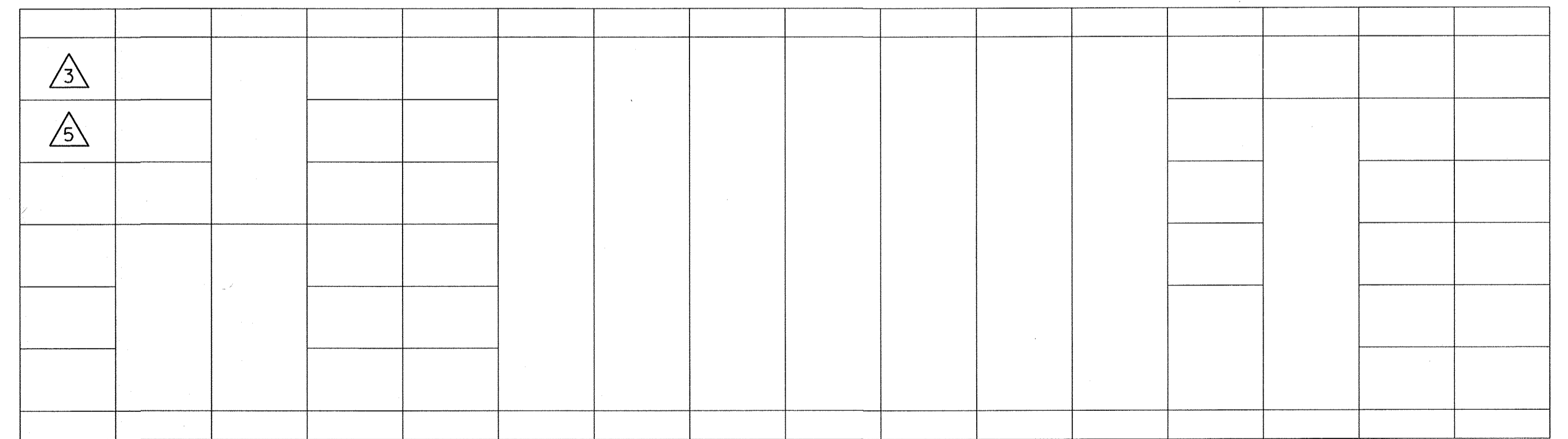
**NOTES**

- 1 REMOVE EXISTING METERING FOR SERVICE NO.1 AND INSTALL AN ELECTRONIC DIGITAL POWER METER IN THIS SECTION.
- 2 REMOVE EXISTING METERING FOR SERVICE NO.2 AND INSTALL AN ELECTRONIC DIGITAL POWER METER IN THIS SECTION.
- 3 EXISTING START/STOP PUSH BUTTON FOR FLOCCULATOR DRIVE 3A. REMOVE EXISTING START/STOP PUSH BUTTON STATION AND INSTALL A NEW NEMA 4X CONTROL STATION WITH AN ON/OFF SELECTOR SWITCH IN ITS PLACE.
- 4 EXISTING START/STOP PUSH BUTTON FOR FLOCCULATOR DRIVE 3B. REMOVE EXISTING START/STOP PUSH BUTTON STATION AND INSTALL A NEW NEMA 4X CONTROL STATION WITH AN ON/OFF SELECTOR SWITCH IN ITS PLACE.
- 5 EXISTING START/STOP PUSH BUTTON FOR FLOCCULATOR DRIVE 4A. REMOVE EXISTING START/STOP PUSH BUTTON STATION AND INSTALL A NEW NEMA 4X CONTROL STATION WITH AN ON/OFF SELECTOR SWITCH IN ITS PLACE.
- 6 EXISTING START/STOP PUSH BUTTON FOR FLOCCULATOR DRIVE 4B. REMOVE EXISTING START/STOP PUSH BUTTON STATION AND INSTALL A NEW NEMA 4X CONTROL STATION WITH AN ON/OFF SELECTOR SWITCH IN ITS PLACE.

**FLOCCULATION BASINS - ELECTRICAL PLAN**



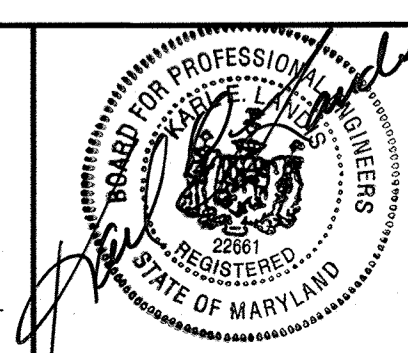
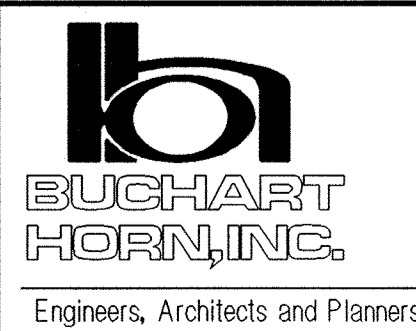
FRONT



BACK

**MCC II - ELEVATION**

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND



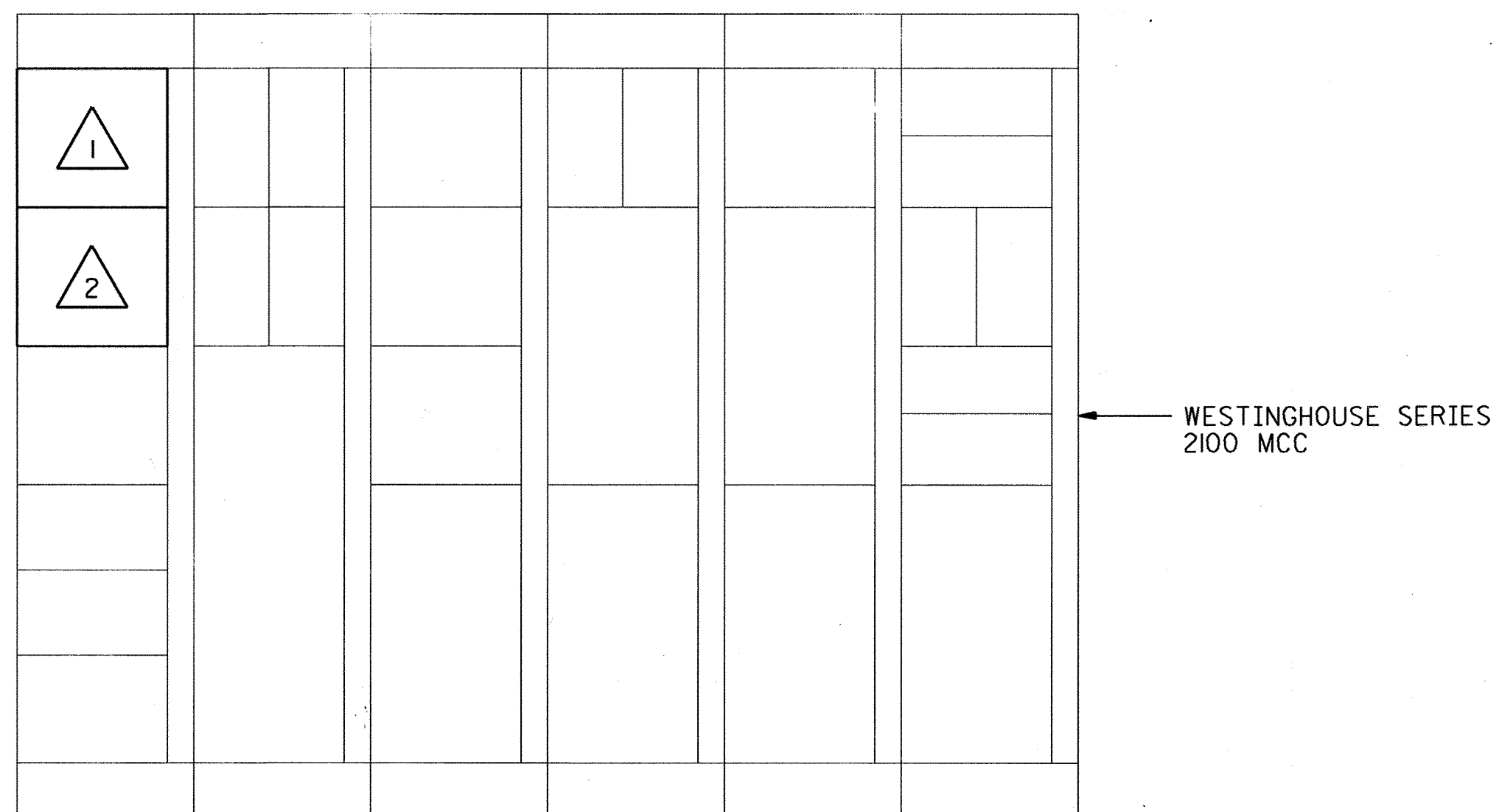
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DRN:	KGD				
CHK:	JLS				
DATE:	2/29/00	BY:	NO.	REVISION	DATE

**FLOCCULATION BASINS ELECTRICAL PLAN**

LITTLE PATUXENT WATER RECLAMATION PLANT  
MULTIPLE IMPROVEMENTS  
PLANT ELECTRICAL DISTRIBUTION SYSTEM UPGRADE  
CAPITAL PROJECT NO. S-6223  
CONTRACT NO. 20-3838  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 12 OF 13  
E-11

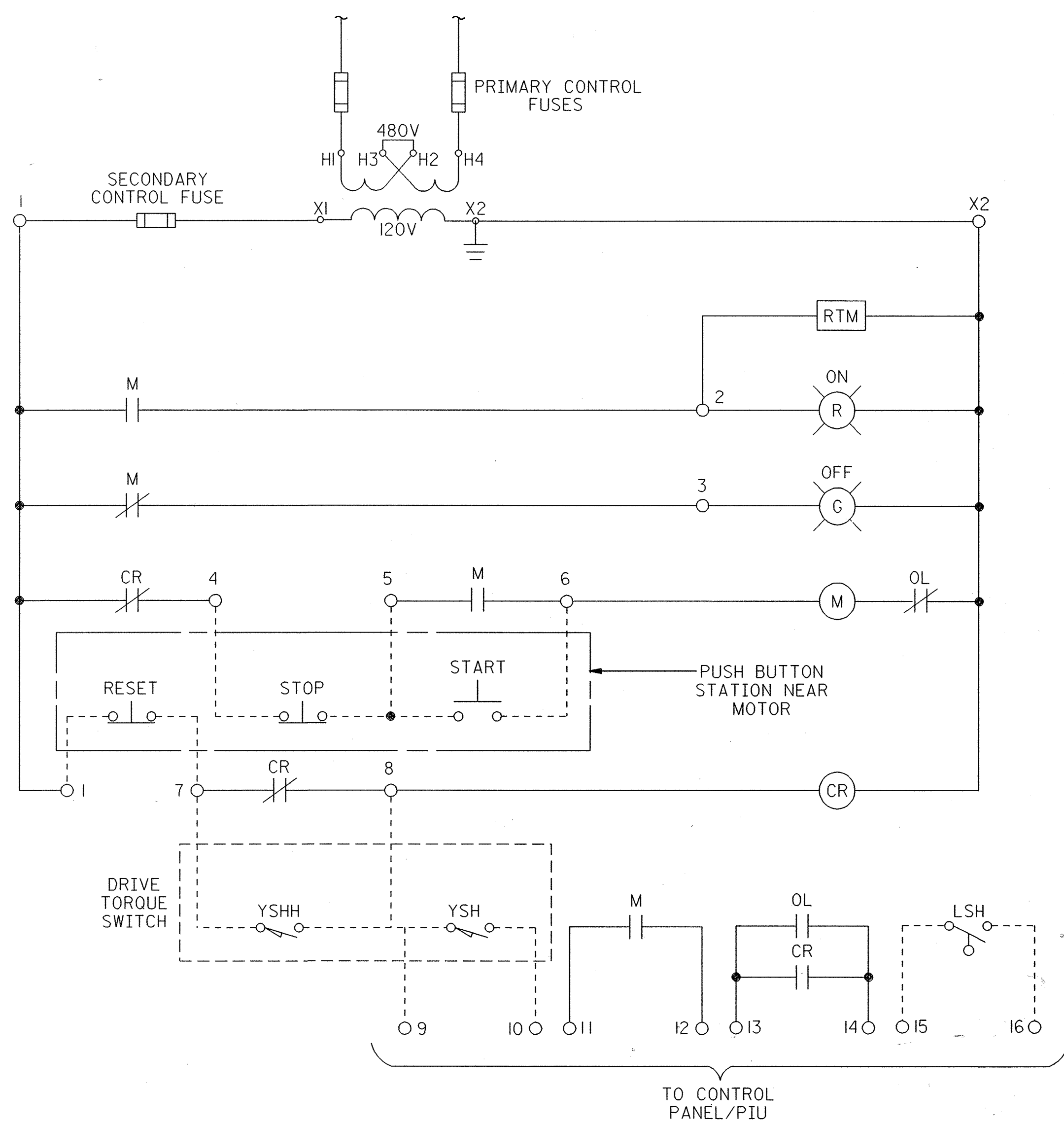
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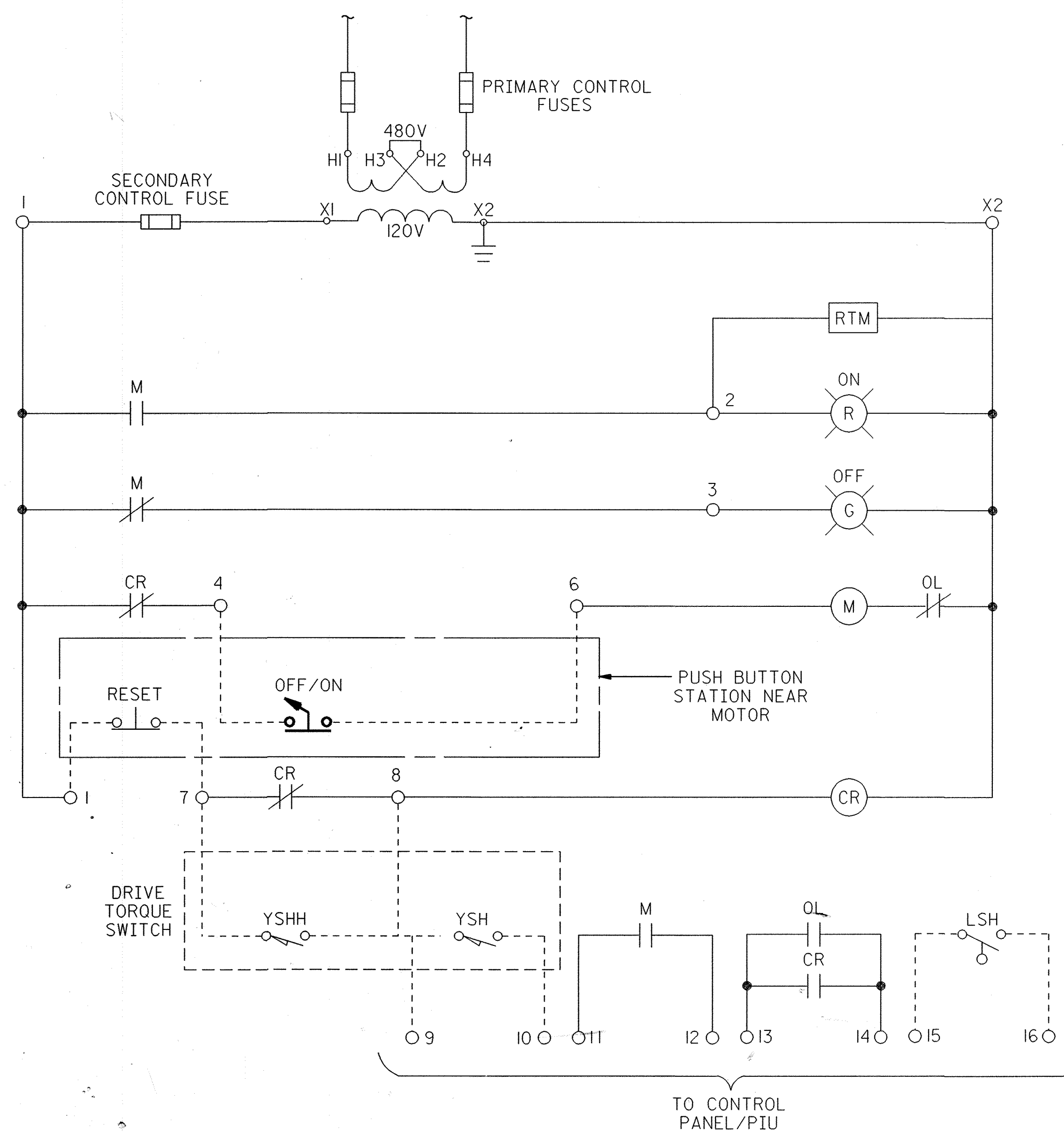
**EXISTING MCC2I ELEVATION**  
(LOCATED IN NORTH PUMP STATION)

**MCC 2I MODIFICATIONS**

- 1 MODIFY THE EXISTING CONTROL WIRING FOR THE COLLECTOR DRIVE FOR PRIMARY CLARIFIER PC2 AS SHOWN ON THIS DWG.
- 2 MODIFY THE EXISTING CONTROL WIRING FOR THE COLLECTOR DRIVE FOR FINAL CLARIFIER FC2 AS SHOWN ON THIS DWG.



**PRIMARY CLARIFIER PC2 COLLECTOR DRIVE**  
**EXISTING CONTROL WIRING DIAGRAM**  
(TYP. FOR FINAL CLARIFIER FC2)

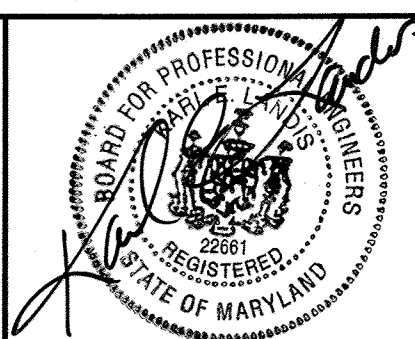


**PRIMARY CLARIFIER PC2 COLLECTOR DRIVE**  
**REVISED CONTROL WIRING DIAGRAM**  
(TYP. FOR FINAL CLARIFIER FC2)

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*R. J. ...*  
8-15-00  
DATE

**BUCHART HORN, INC.**  
Engineers, Architects and Planners



DES: KEL			
DRN: KGD			
CHK: JLS			
DATE: 2/29/00	BY	NO.	REVISION
			DATE

**MCC2I MODIFICATIONS**

LITTLE PATUXENT WATER RECLAMATION PLANT  
MULTIPLE IMPROVEMENTS  
PLANT ELECTRICAL DISTRIBUTION SYSTEM UPGRADE  
CAPITAL PROJECT NO. S-6223  
CONTRACT NO. 20-3838  
ELECTION DISTRICT NO. 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 13 OF 13  
E-12

Plot Date: 08/13/2000 (cheffler)  
 PRF: J:\PROJ\71805\CADD\ELEC\REFERB\mc2l.dgn  
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