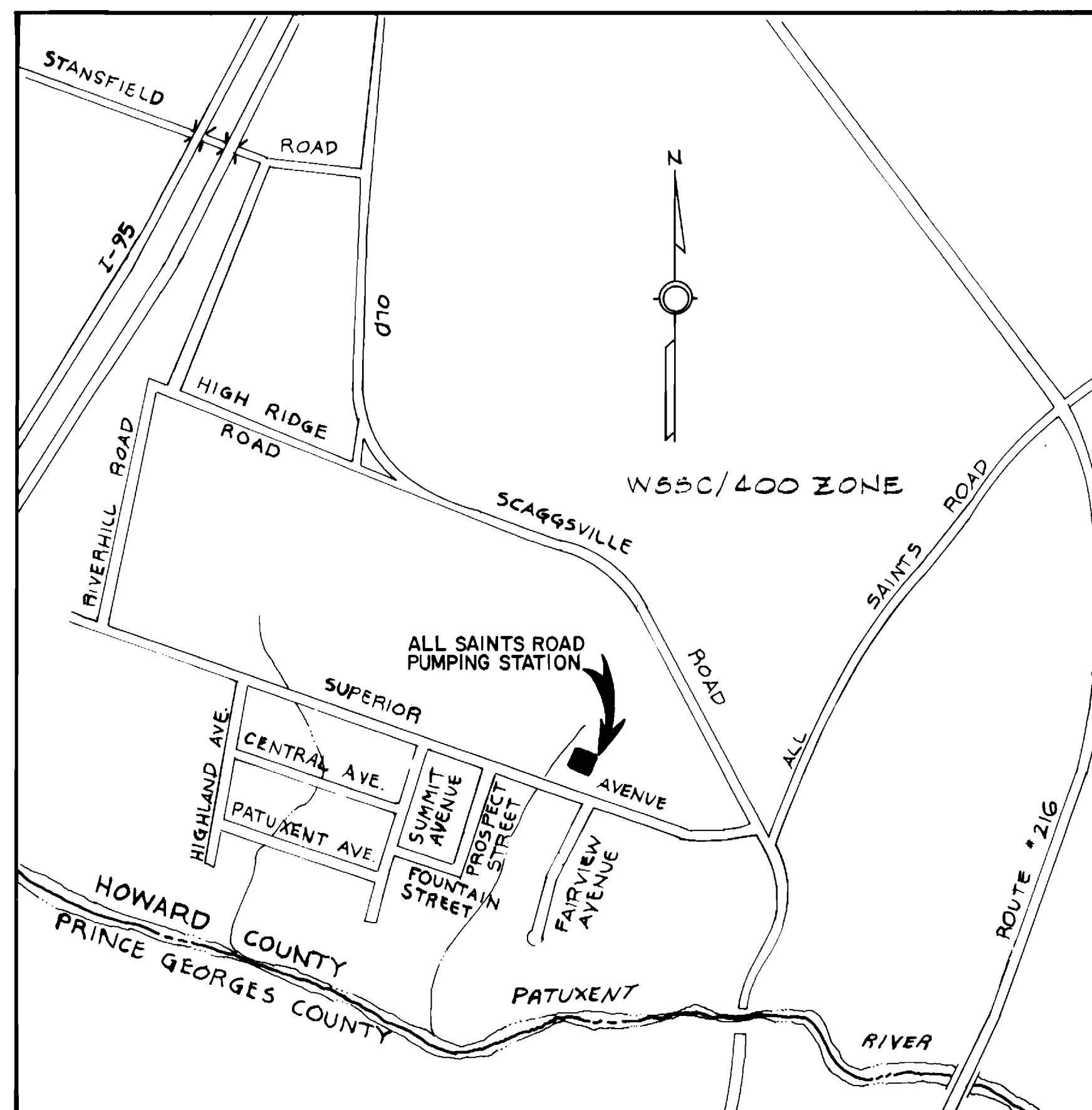
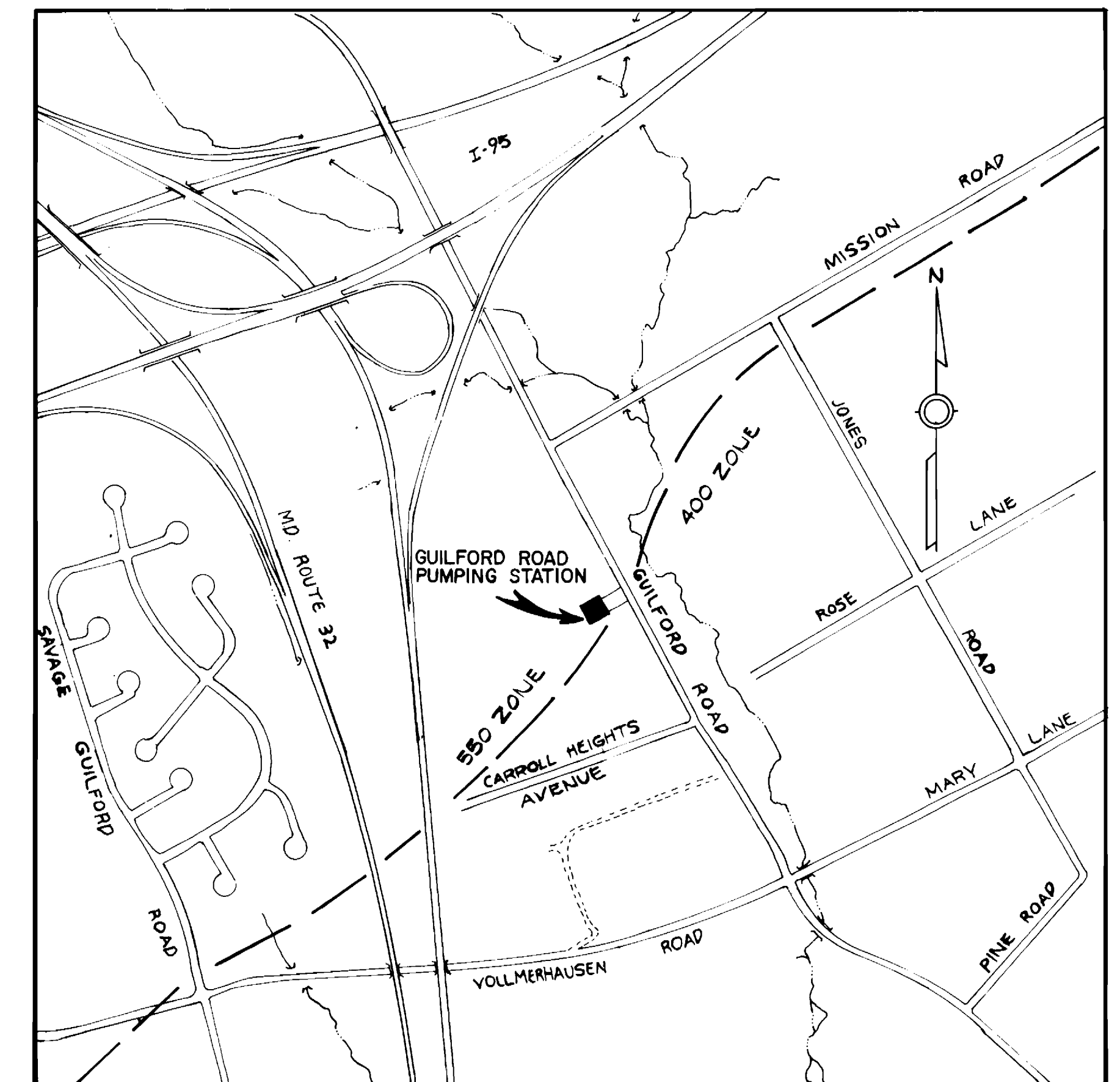


LIST OF DRAWINGS

SHEET	TITLE
1	VICINITY MAP
2	ALL SAINTS ROAD PUMPING STATION MECHANICAL AND ELECTRICAL PLANS AND SECTIONS
3	GUILFORD ROAD PUMPING STATION MECHANICAL PLANS, SECTION, AND P & I DIAGRAM
4	GUILFORD ROAD PUMPING STATION ELECTRICAL PLANS AND DIAGRAMS
5	GUILFORD ROAD PUMPING STATION MECHANICAL AND ELECTRICAL PLANS, SECTIONS AND DETAILS



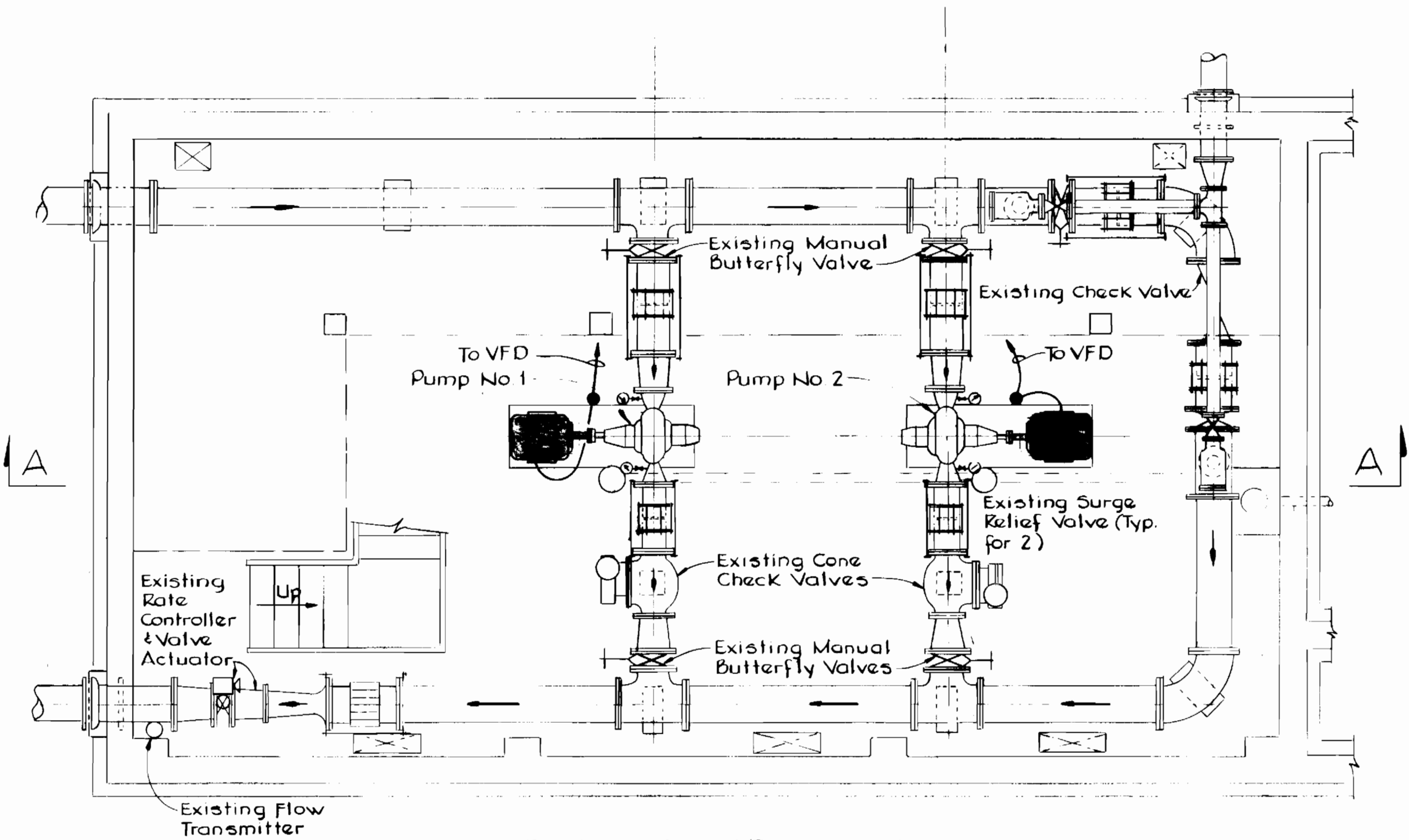
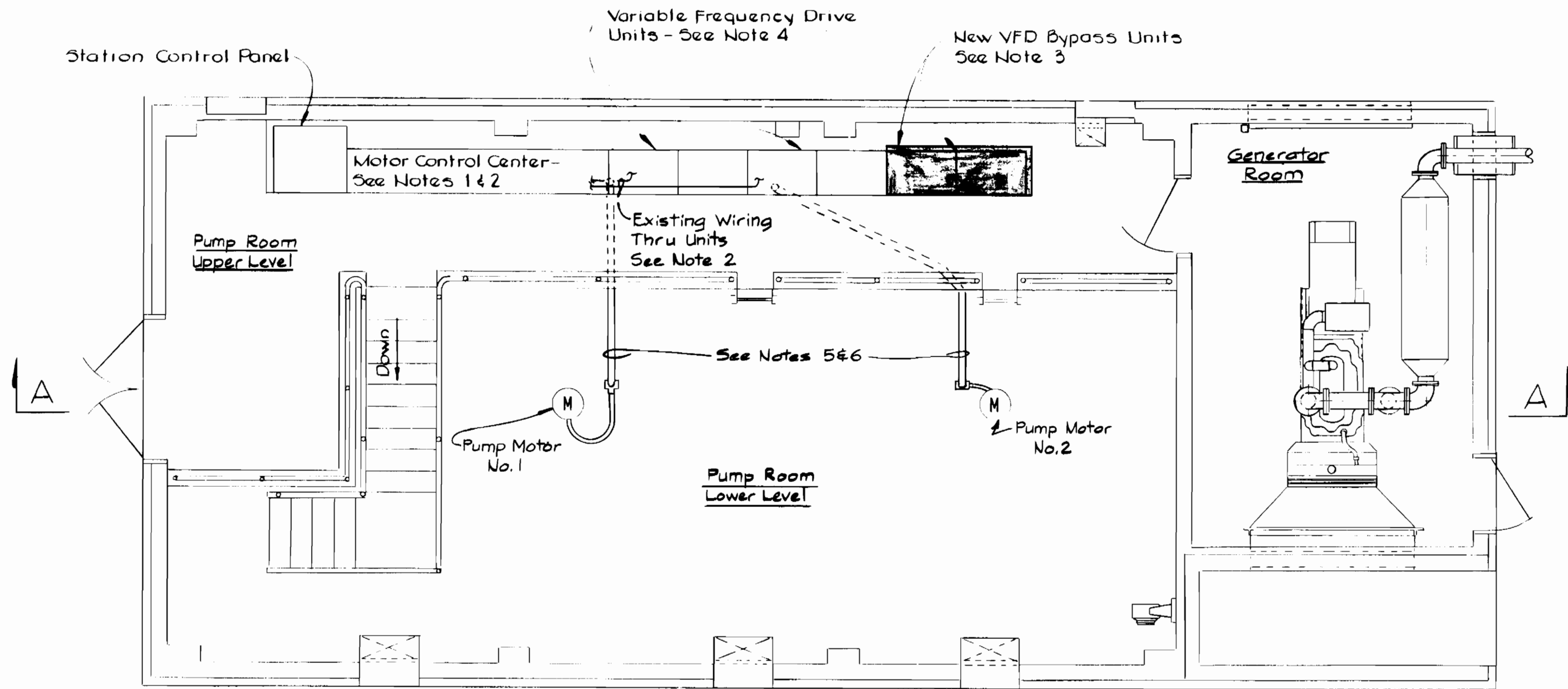
VICINITY MAP - ALL SAINTS ROAD PUMPING STATION  
SCALE : 1" = 600'



VICINITY MAP - GUILFORD ROAD PUMPING STATION  
SCALE : 1" = 600'

CONTRACT NO. 44-1690  
PROJECT NO. W-8165  
IMPROVEMENTS TO  
ALL SAINTS ROAD AND GUILFORD ROAD  
WATER PUMPING STATIONS  
HOWARD COUNTY, MARYLAND  
DEPARTMENT OF PUBLIC WORKS

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND DIRECTOR OF PUBLIC WORKS - DATE <i>Robert M. Beninger</i> 9-14-97 CHIEF - BUREAU OF UTILITIES - DATE CHIEF - BUREAU OF UTILITIES - DATE	WHITMAN, REQUARDT AND ASSOCIATES ENGINEERS 2315 ST PAUL ST BALTIMORE, MARYLAND CHIEF - BUREAU OF ENGINEERING - DATE CHIEF - UTILITY DESIGN DIVISION	DES. E.F.D. DRN. CS CHK. R.B.N. DATE 9/3/87 BY NO. _____ REVISION _____ DATE _____	VICINITY MAP 600' SCALE MAP NO. _____ BLOCK NO. _____	ALL SAINTS ROAD AND GUILFORD ROAD WATER PUMPING STATIONS CONTRACT NO. 44-1690 PROJECT NO. W-8165	SCALE AS SHOWN SHEET 1 OF 5
---	---	--	---	---	--------------------------------

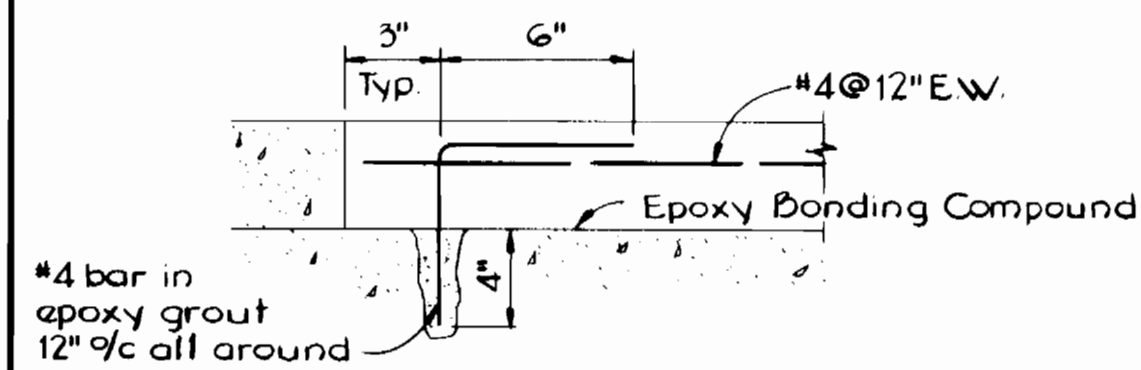


PLAN-OPERATING LEVEL

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

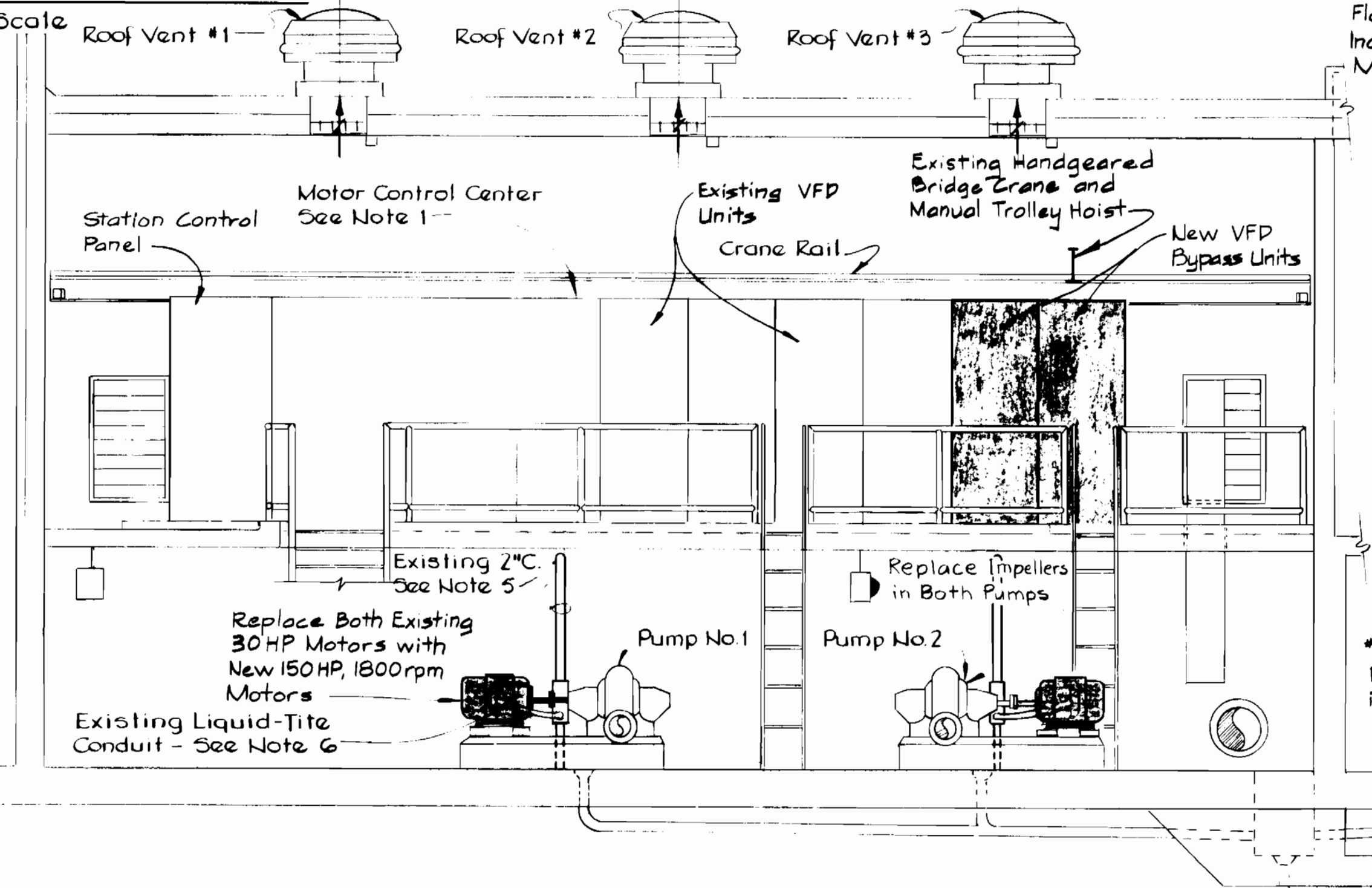
PLAN-PUMP FLOOR

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



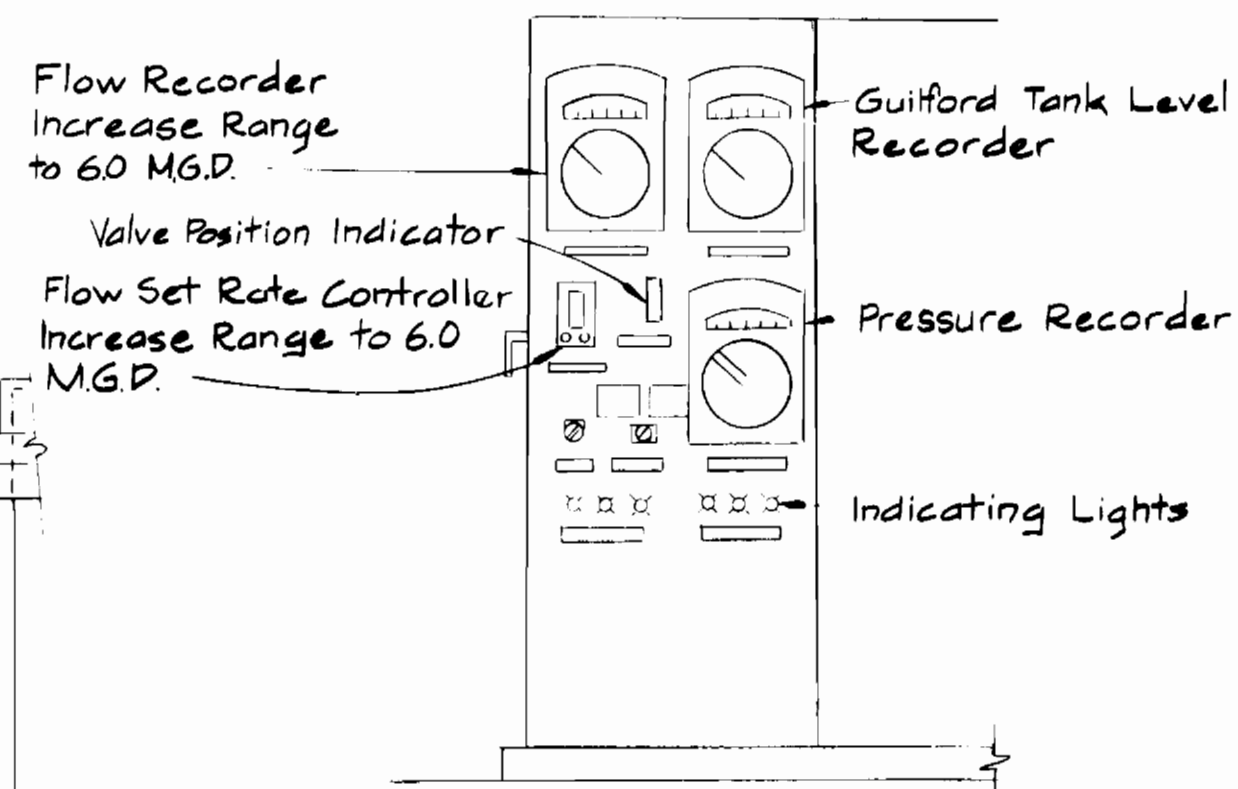
DETAIL OF CONCRETE BASE FOR PANELS

Not to Scale



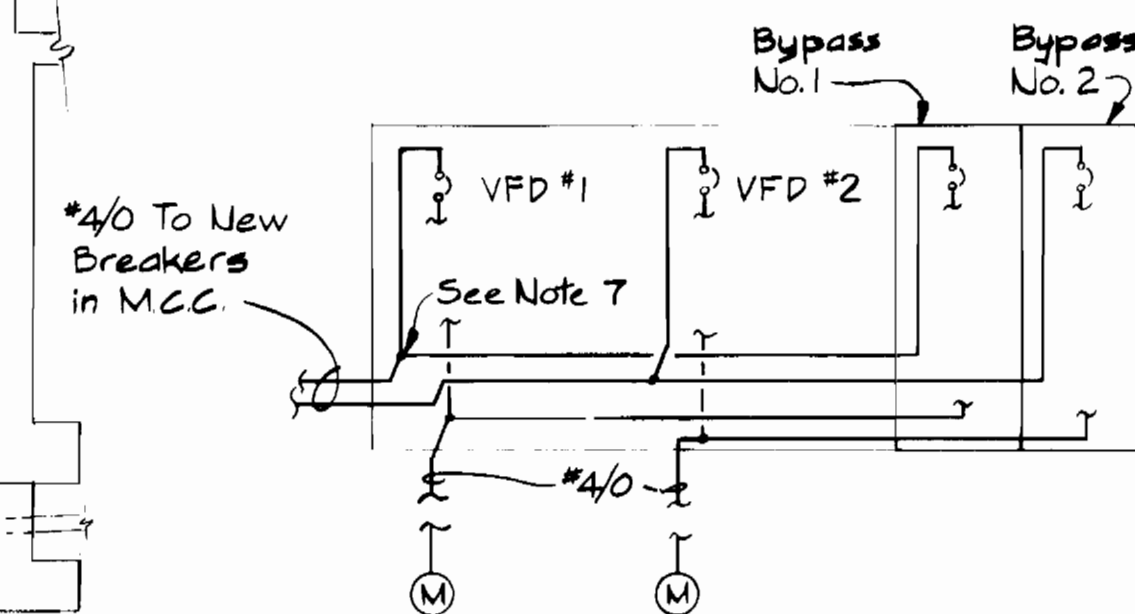
SECTION A-A

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



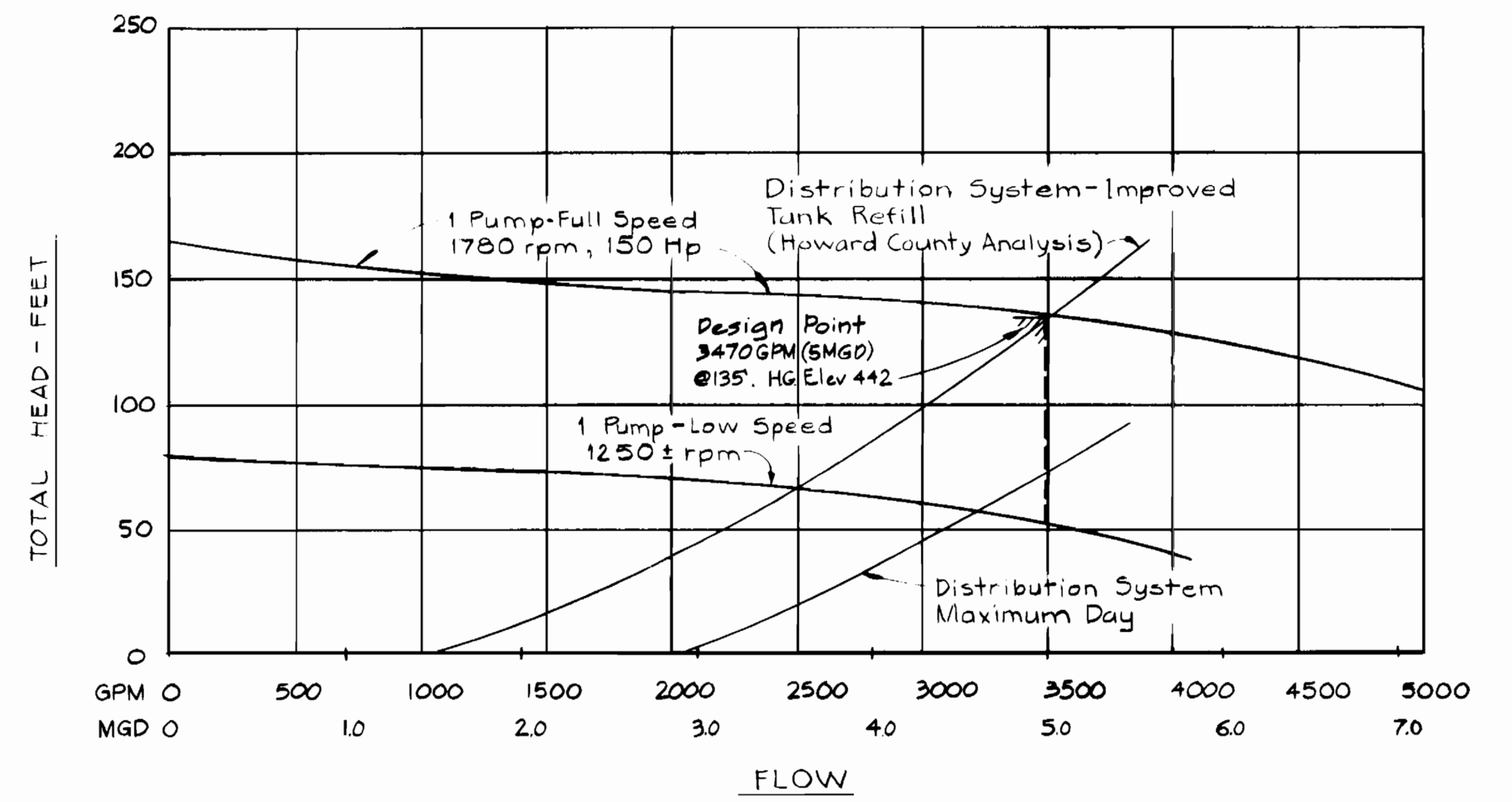
ELEVATION OF EXISTING STATION CONTROL PANEL

Scale: 1/2" = 1'-0"



POWER ONE LINE DIAGRAM FOR NEW PUMP MOTORS

(See Specifications)



PUMP AND SYSTEM CURVE

ELECTRICAL NOTES

- CHANGE BREAKERS FOR BOTH PUMPS FROM 100A - 3POLE TO 400A - 250A - TRIPS - 3POLE - EXISTING M.C.C. IS SQUARE "D", MODEL 4.
- REMOVE EXISTING WIRING 3 #6, 1 #8 FROM THE PUMP BREAKERS TO THE VFD'S AND INSTALL 3 #4/0 AND 1 #4 GROUND; INSTALL THRU THE BOTTOM SECTIONS OF THE VFD'S WHERE NECESSARY.
- INSTALL TWO VFD BYPASS UNITS NEXT TO EXISTING VFD'S. EXTEND CONCRETE PAD, SIZE AS REQUIRED. SEE DETAIL THIS SHEET.
- REMOVE COMPONENTS REQUIRED TO CHANGE OVER THE VFD UNITS FROM 30 TO 150 HP. INSTALL NEW COMPONENTS, PREPURCHASED BY THE COUNTY AND LOCATED ON THE JOB SITE. THESE ITEMS ARE TO BE COORDINATED WITH RUBICON-MR. MARK BOLHA- PHONE 412-327-7000. RETURN EXISTING COMPONENTS TO THE OWNER.
- REMOVE THE 3 #6 - 1 #8 GROUND IN THE 2" CONDUIT AND INSTALL 3 #4/0 - 1 #4 GROUND TO THE NEW MOTORS, EXTEND THRU THE BOTTOM OF THE VFD'S, WHERE NECESSARY, TO TERMINATIONS. RETURN WIRE TO OWNER.
- EXTEND OR SHORTEN LIQUID-TITE FLEX. CONDUITS AS REQUIRED FOR NEW MOTORS.
- PROVIDE TERMINAL CONNECTION BLOCKS FOR SPLICING WIRING.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*James M. Lewis* 9/11/87  
DIRECTOR OF PUBLIC WORKS - DATE

*Robert W. Reinger* 9-14-87  
CHIEF - BUREAU OF UTILITIES - DATE

*James M. Lewis* 9-11-87  
CHIEF - BUREAU OF ENGINEERS - DATE

*James M. Lewis* 9-11-87  
CHIEF - UTILITIES DESIGN DIVISION

WHITMAN, REQUARDT  
AND ASSOCIATES  
ENGINEERS

2315 ST PAUL ST  
BALTIMORE, MARYLAND

*Whitman Requardt*  
DATE 9/3/87

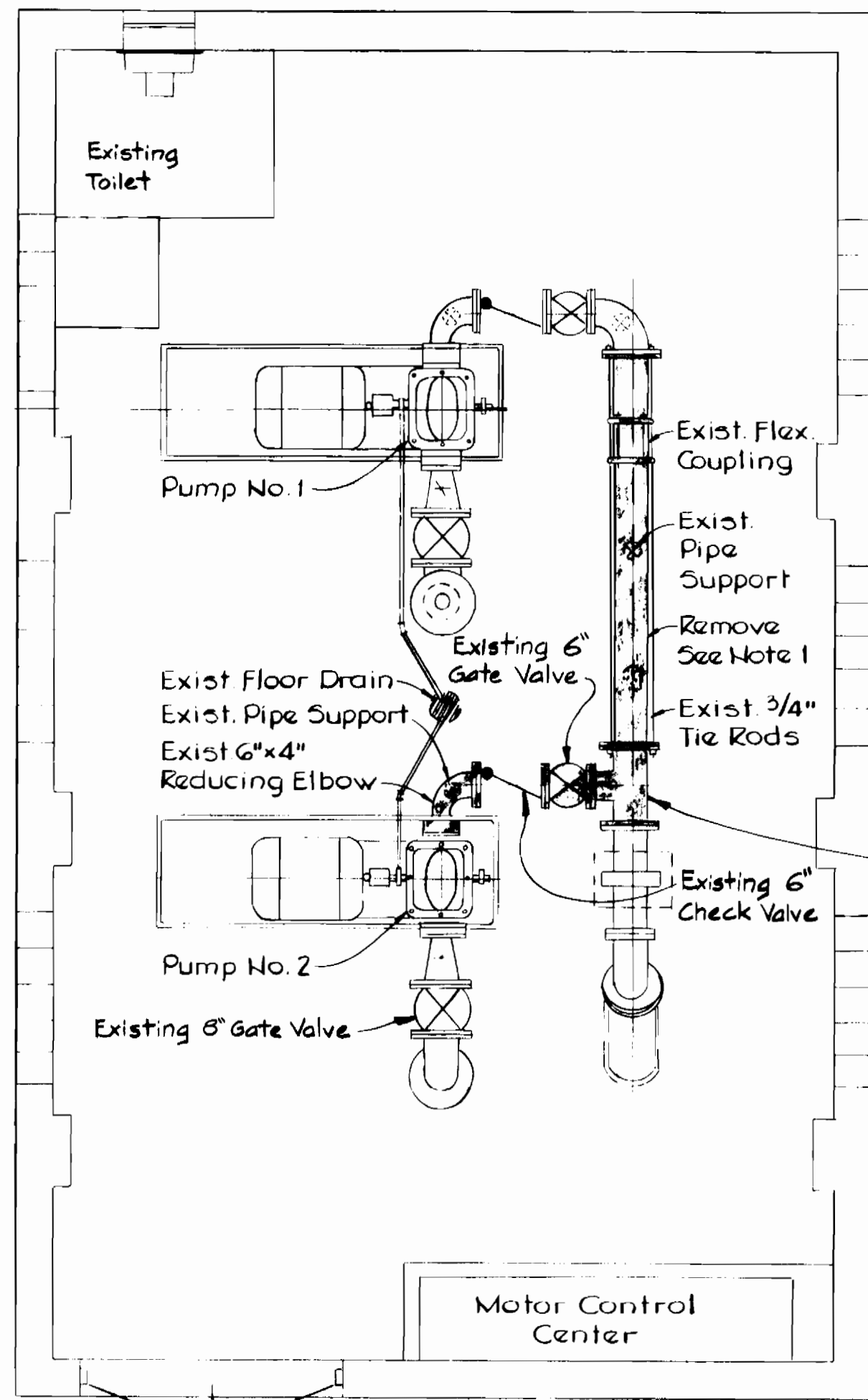
DES. E.F.D.			
DRN. C.S.			
CHK. RBN			
DATE 9/3/87	BY NO.	REVISION	DATE

MECHANICAL AND ELECTRICAL  
PLANS AND SECTIONS

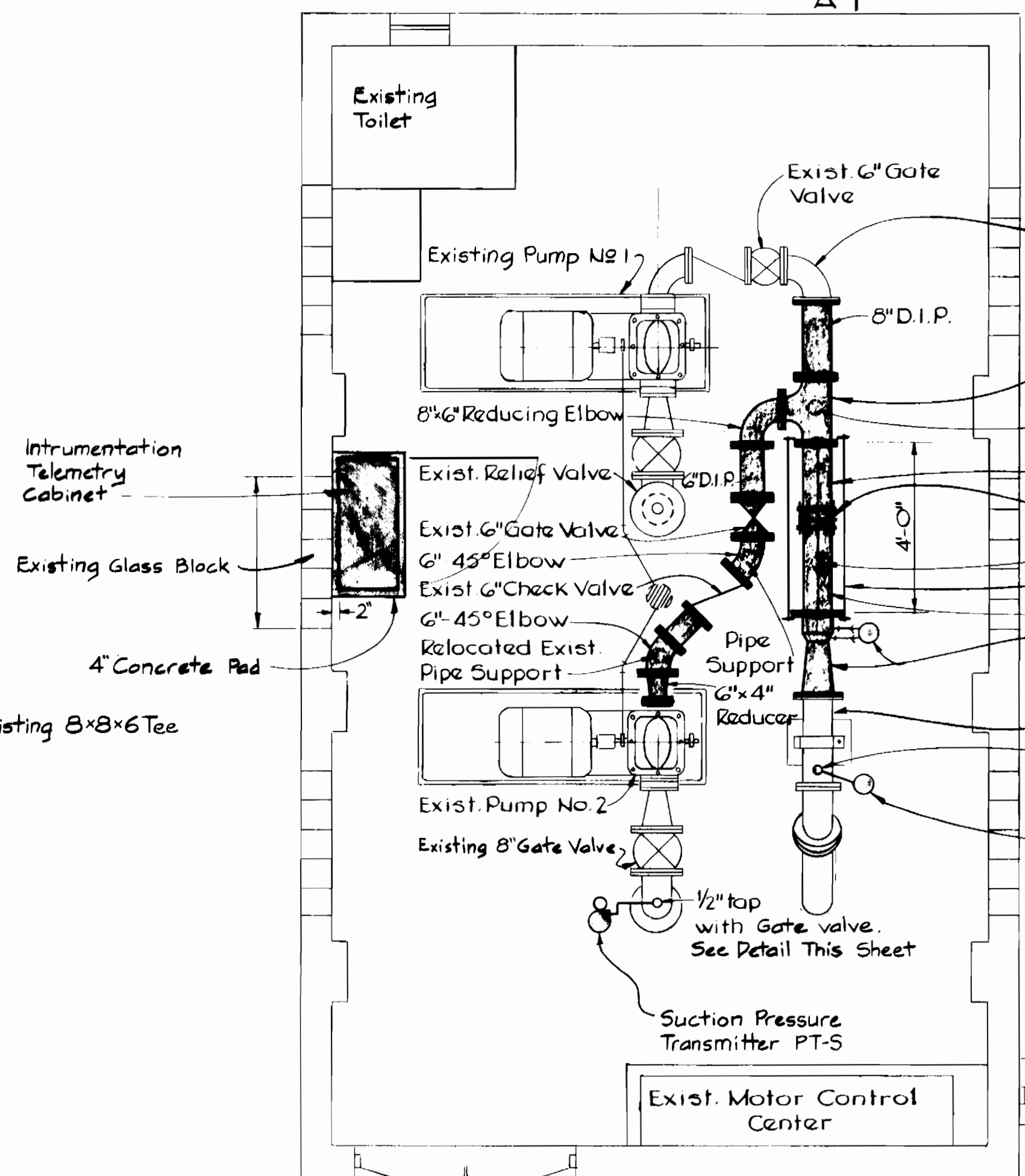
ALL SAINTS ROAD PUMPING STATION  
PROJECT NO. W-8165  
CONTRACT NO. 44-1690

SCALE AS SHOWN  
SHEET 2 OF 5

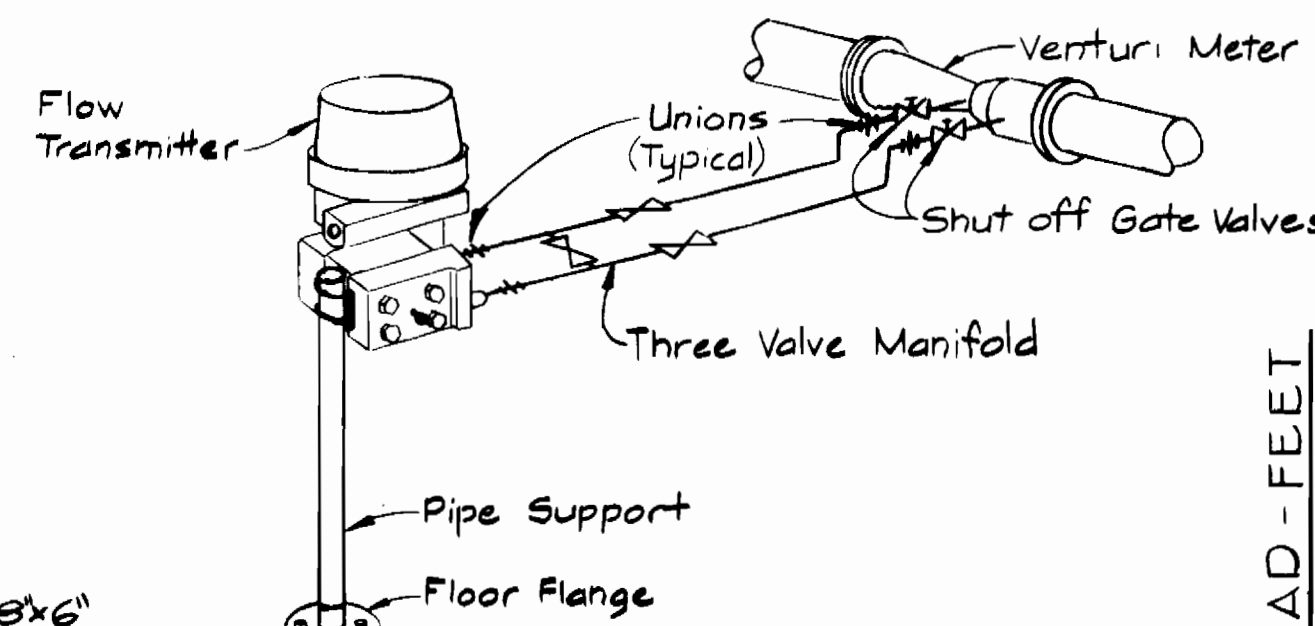




**REMOVAL PLAN**  
Scale: 3/8" = 1'-0"

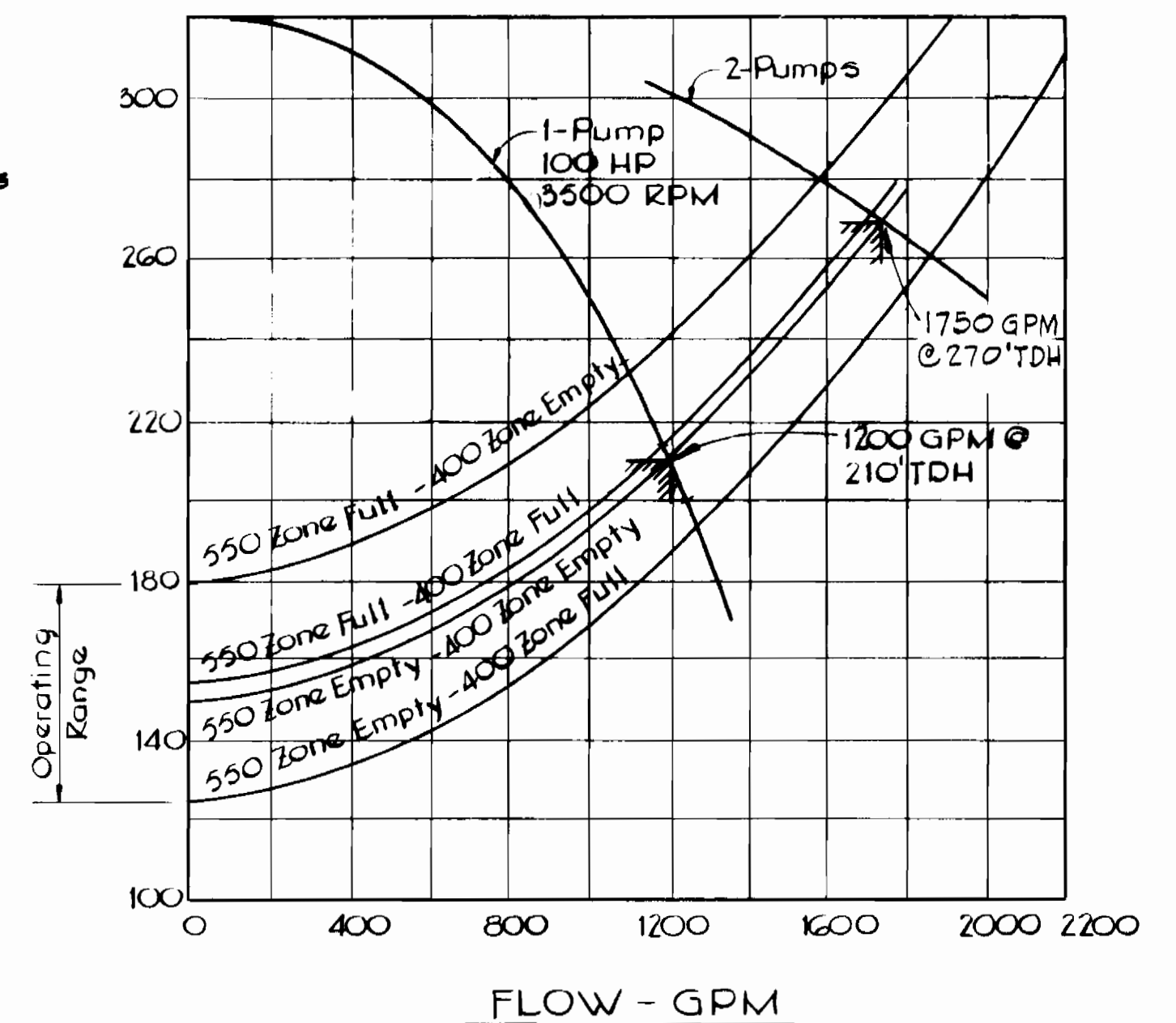


**PLAN OF PROPOSED WORK**  
Scale: 3/8" = 1'-0"



**DETAIL OF FLOW TRANSMITTER INSTALLATION**  
Not to Scale

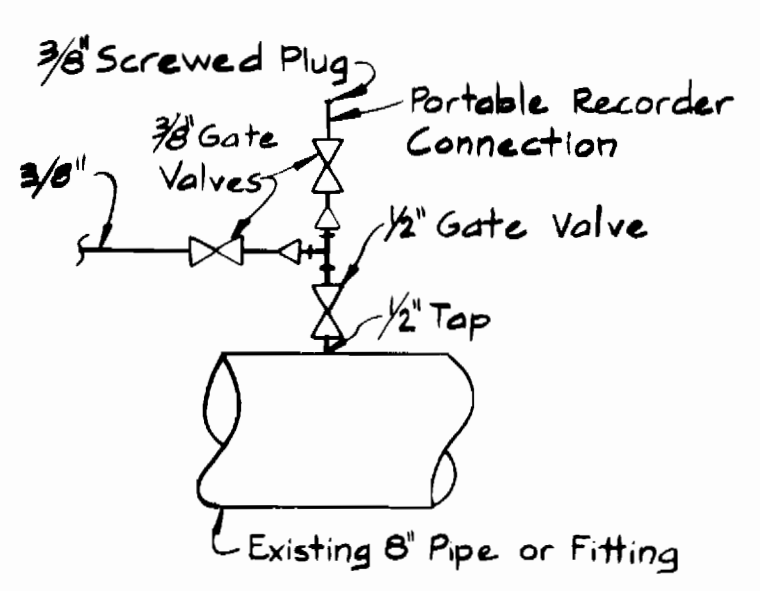
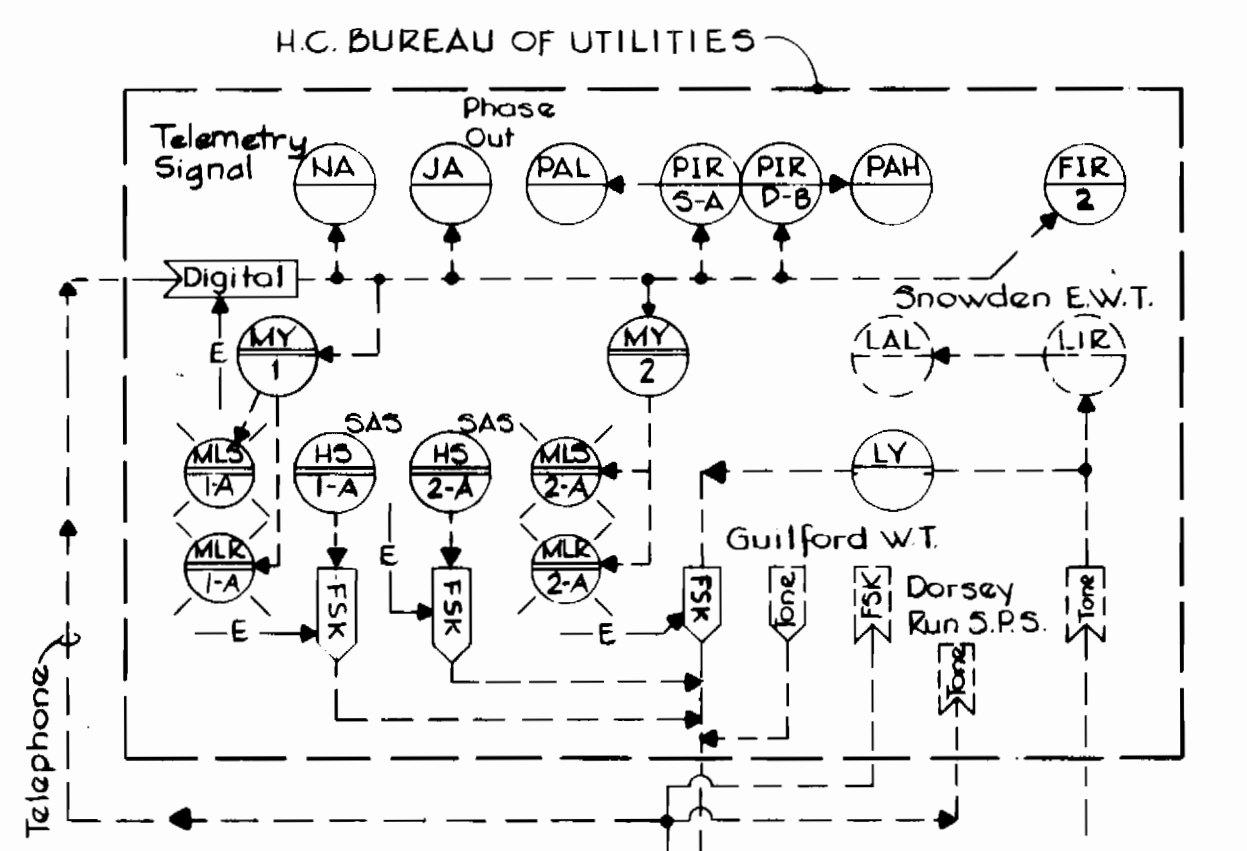
TOTAL HEAD - FEET



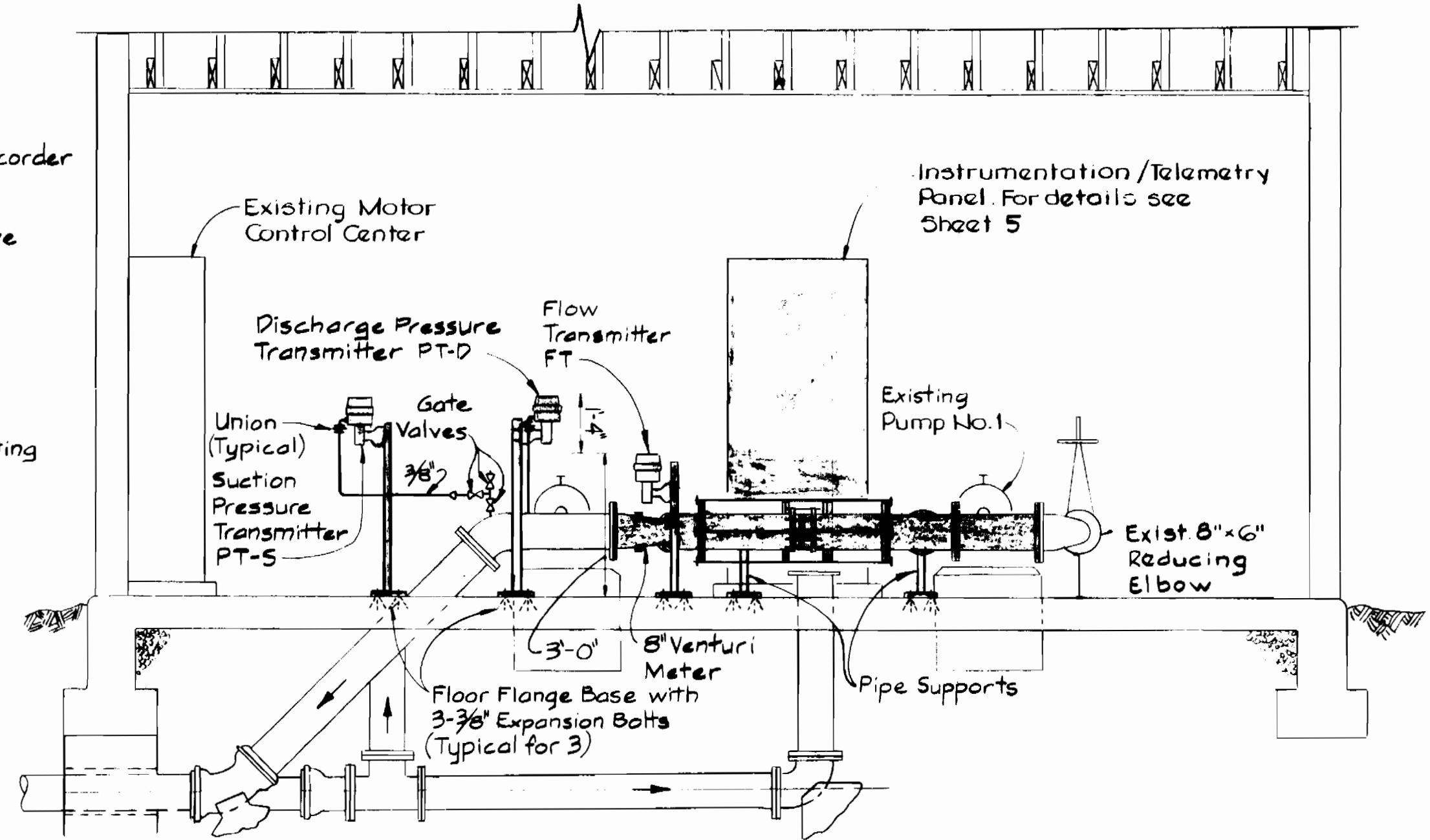
**SYSTEM CHARACTERISTICS**

**INSTRUMENT IDENTIFICATION**

- (X) FE Flow Element
- FT Flow Transmitter
- FIR Flow Indicator Recorder
- FQ Flow Integrator
- LAL Level Alarm Low
- LT Level Transmitter
- LIR Level Indicating Recorder
- LIRC Level Indicating Recorder Controller
- LRSH Level Recorder Switch - High (Stop)
- LRSL Level Recorder Switch - Low (Start)
- LY Level Retransmission Relay
- MLR Motor Light - Running
- MLS Motor Light - Stopped
- PT Pressure Transmitter
- PIR Pressure Indicator Recorder
- PAL Pressure Alarm Low
- PAH Pressure Alarm High
- NA Telemetering Failure Alarm
- JA Power Failure Alarm
- HS Hand Switch
- QY Telemetry Controlled Relay
- MY Motor Relay
- FSK Frequency Shift Tone
- SAS Step - Auto-Start

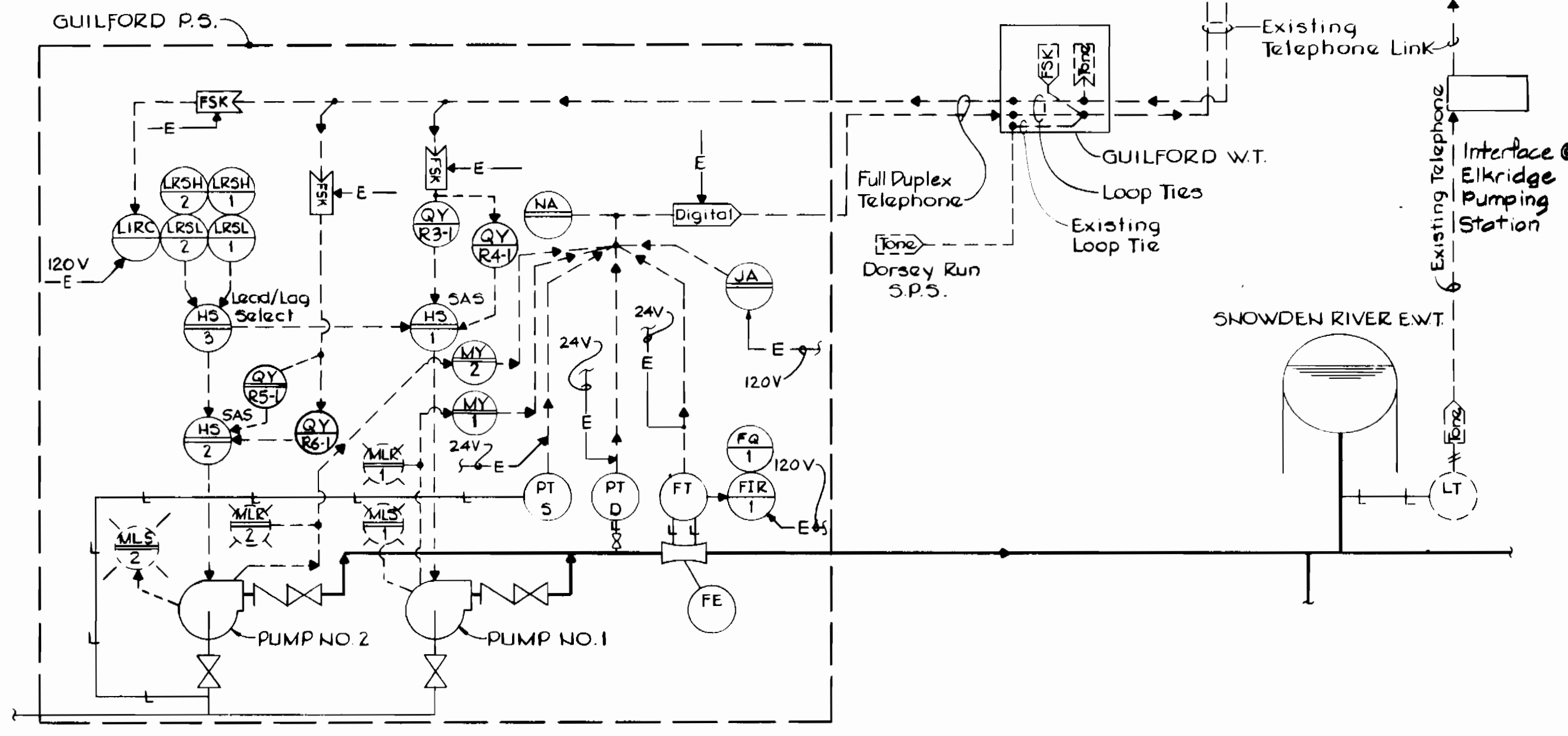


**DETAIL OF 1/2 TAP**  
Not to Scale



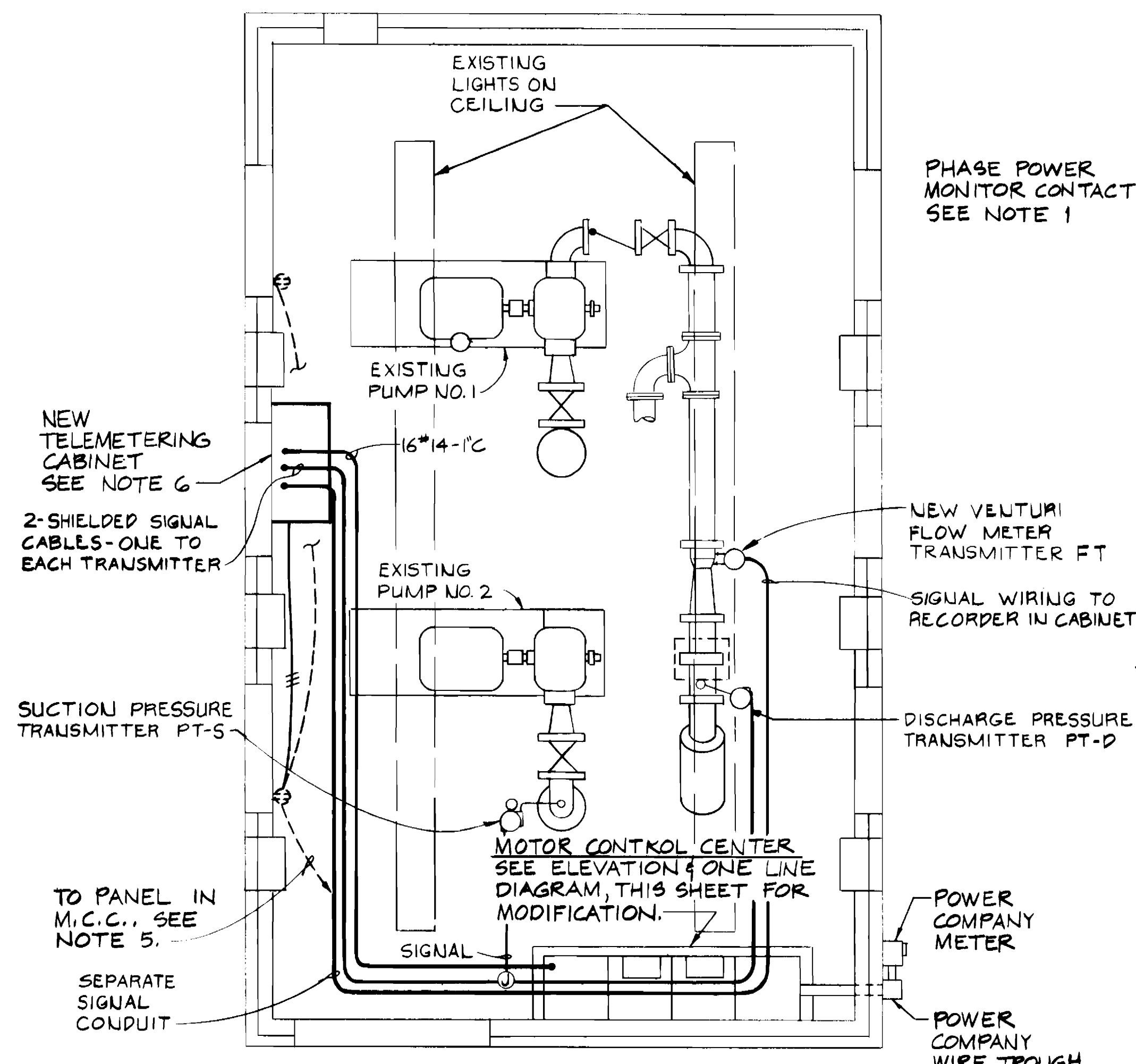
**SECTION A-A**  
Scale: 3/8" = 1'-0"

- INSTRUMENT SYMBOLS**
- (Circle with dot) Existing Instrument
  - (Circle) New Instrument
  - (Circle with horizontal line) Mounted on Instrument Panel
  - (Circle with vertical line) Mounted on Motor Control Center or Control panel
  - (Circle with diagonal line) Indicating Lamp
  - (Square) Telemetry transmitter
  - (Square with dot) Telemetry receiver
  - (Solid line) System Water
  - (Line with T) Hydraulic signal
  - (Dashed line) Electrical signal
  - (Line with E) Electrical Power

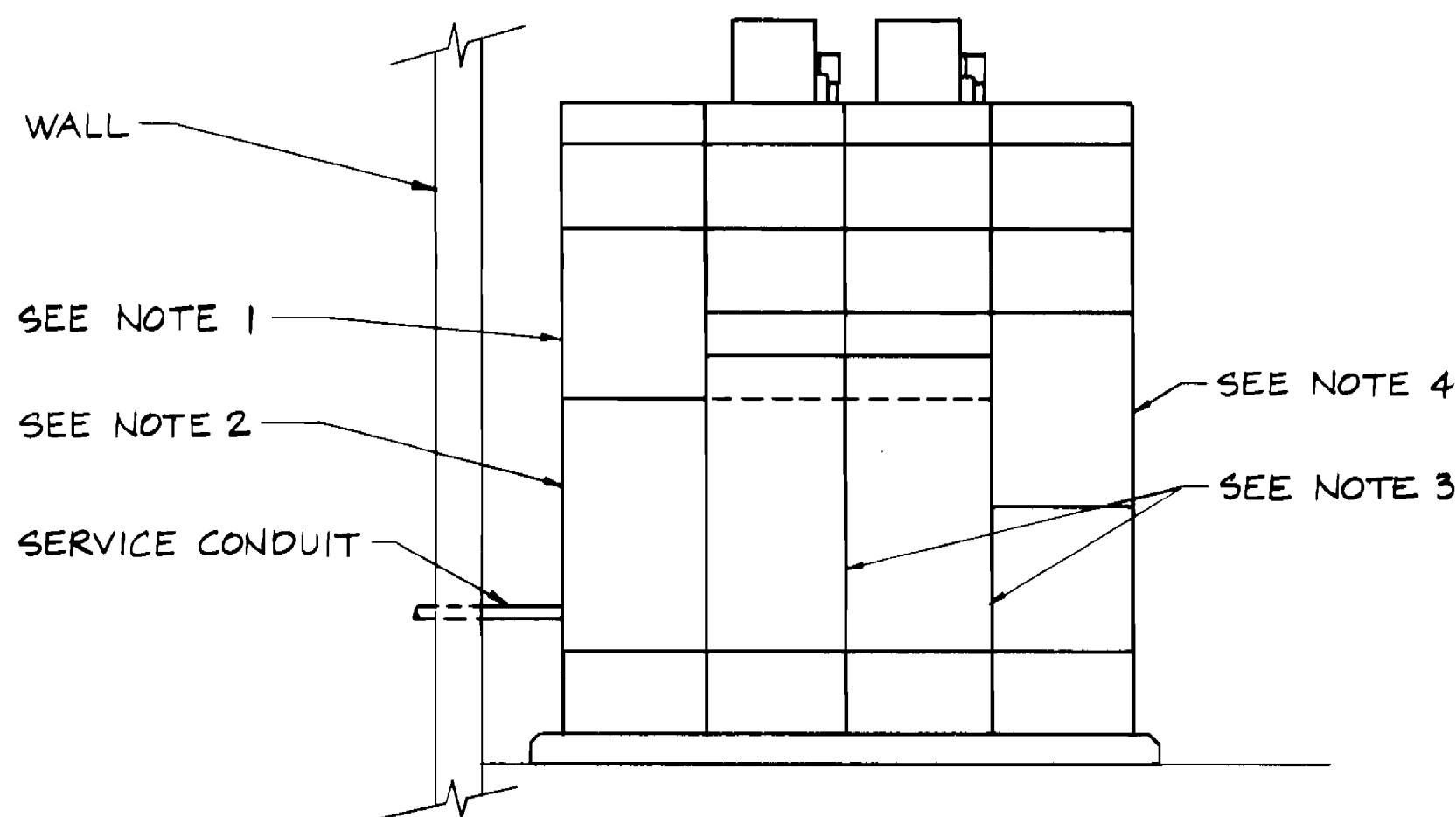


**PROCESS AND INSTRUMENTATION DIAGRAM**

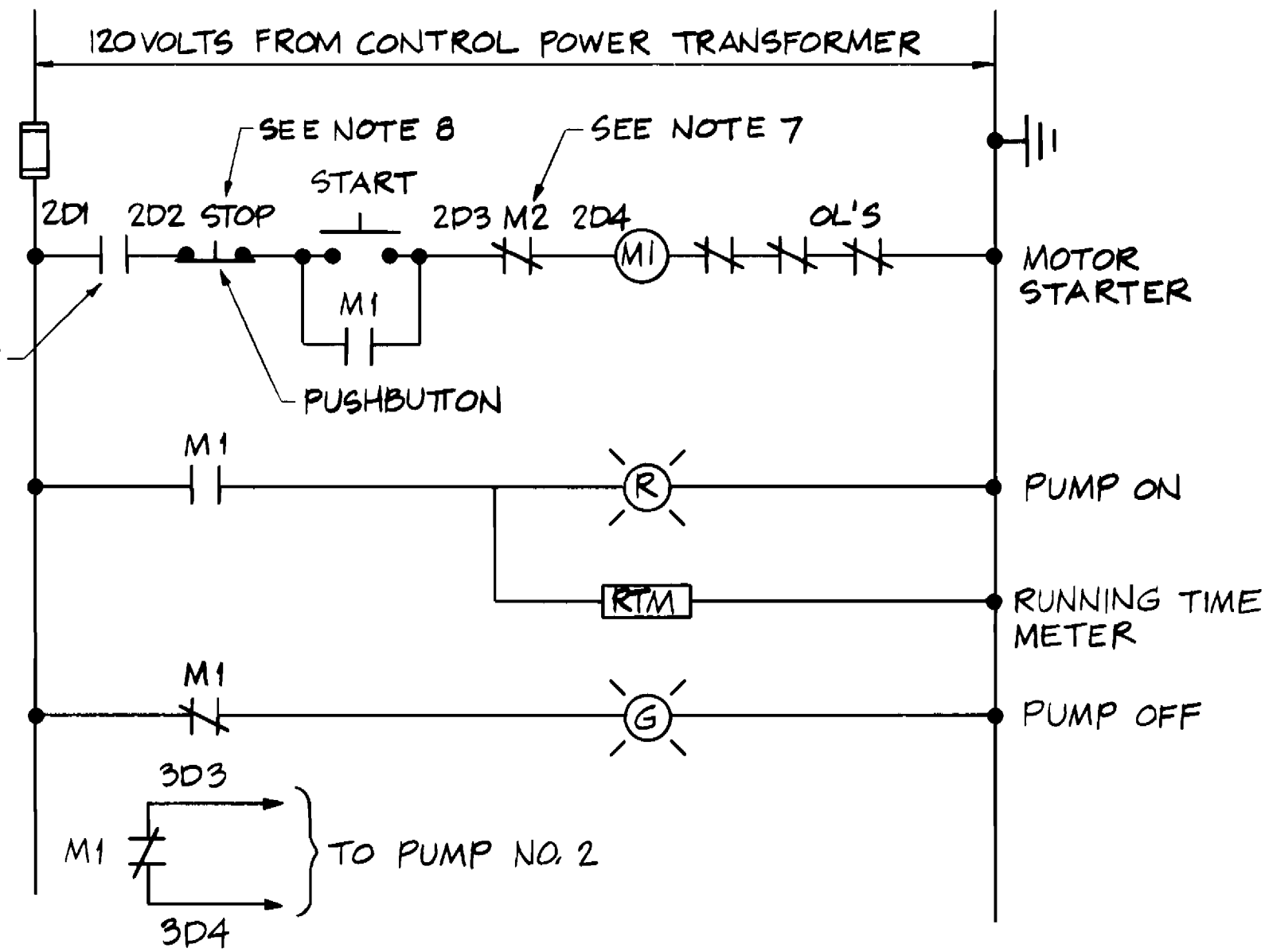
<p>DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND</p> <p><i>James M. ...</i> DIRECTOR OF PUBLIC WORKS - DATE 9-14-87</p> <p><i>Robert M. ...</i> CHIEF - BUREAU OF UTILITIES - DATE 9-14-87</p>	<p>WHITMAN, REQUARDT AND ASSOCIATES ENGINEERS</p> <p>2315 ST PAUL ST BALTIMORE, MARYLAND</p> <p><i>Whitman Requardt</i> CHIEF - BUREAU OF ENGINEERING - DATE 9-11-87</p> <p><i>Small ...</i> CHIEF - UTILITIES DESIGN DIVISION - DATE 2/11/87</p>	<p>DES. EFD</p> <p>DRN. T.A.</p> <p>CHK. RBN</p> <p>DATE 9/3/87</p>	<p>MECHANICAL</p> <p>PLANS, SECTION AND P&amp;I DIAGRAM</p>	<p>GUILFORD ROAD PUMPING STATION</p> <p>PROJECT NO. W-8165</p> <p>CONTRACT NO. 44-1690</p>	<p>SCALE AS SHOWN</p> <p>SHEET 3 OF 5</p>
---	---	---	---	--	---



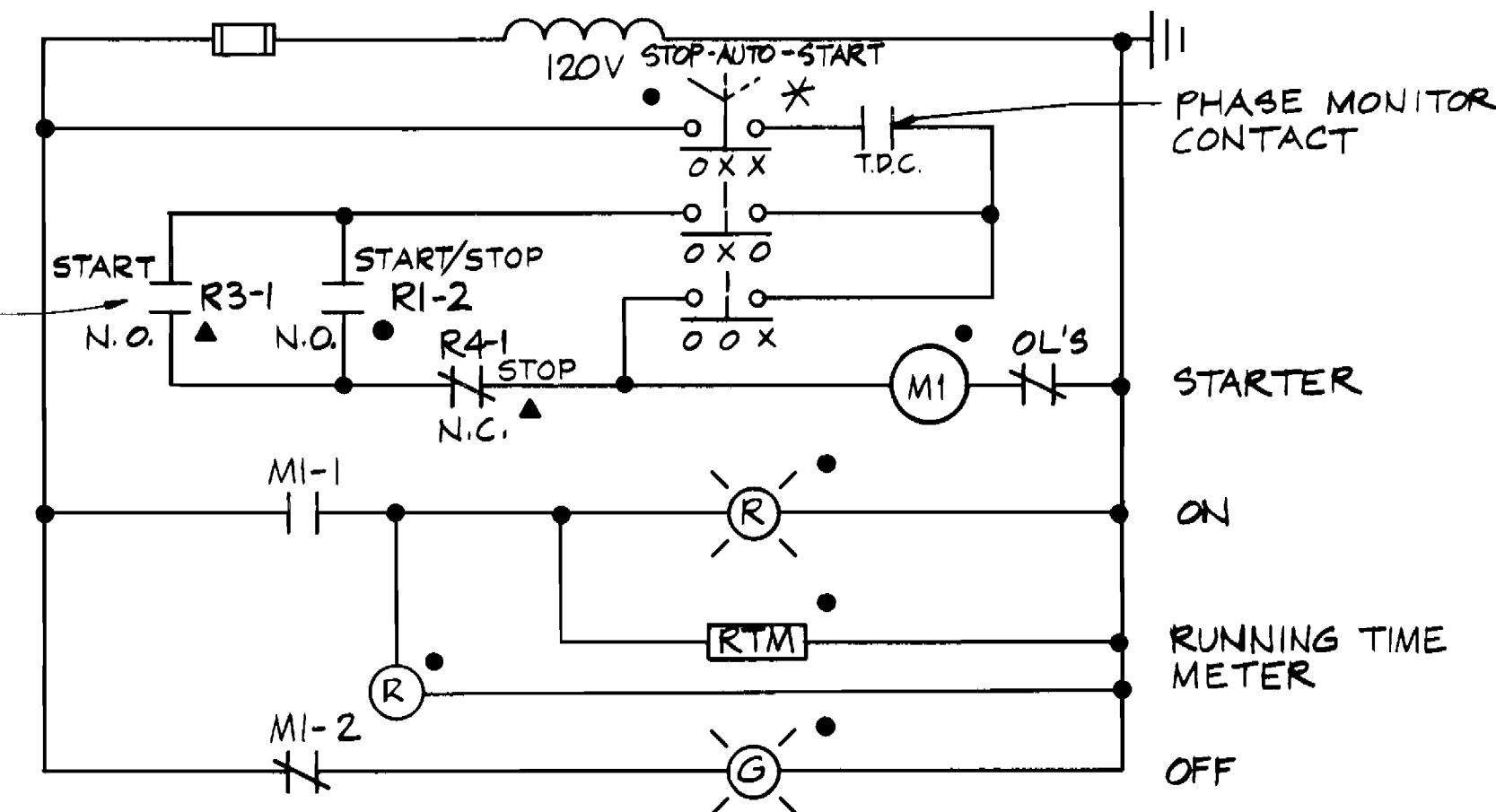
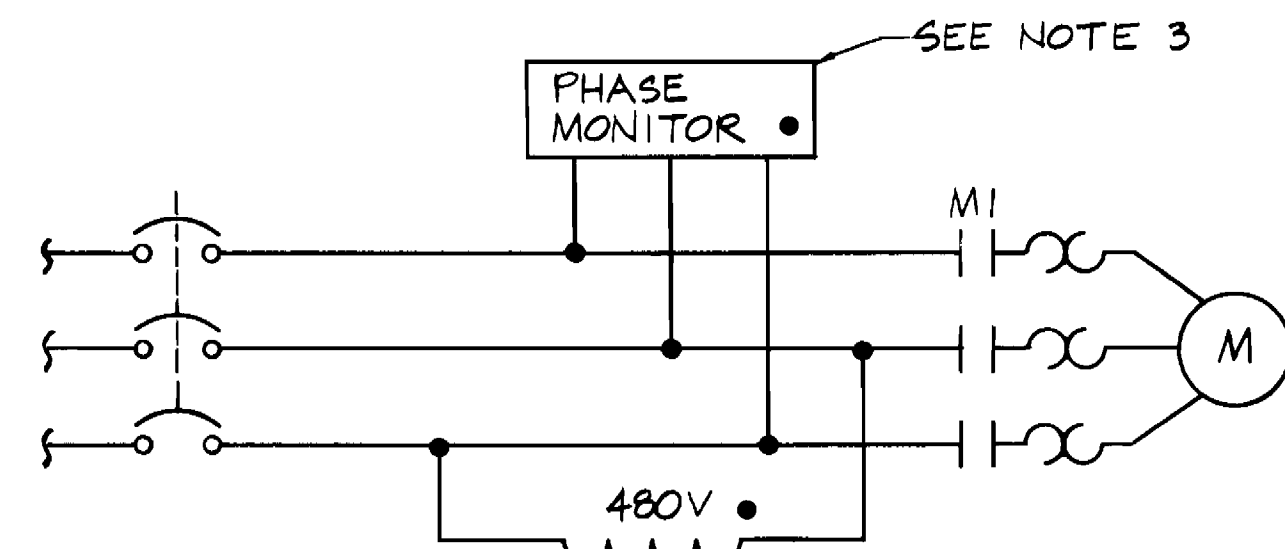
PLAN-EXISTING PUMPING STATION  
SCALE: 3/8" = 1'-0"



ELEVATION-EXISTING MOTOR CONTROL CENTER  
NOT TO SCALE



EXISTING CONTROL DIAGRAM PUMP NO. 1  
(PUMP NO. 2-SIMILAR)



REVISED CONTROL WIRING DIAGRAM-PUMP NO. 1 (SIMILAR FOR PUMP NO. 2)

\* (SEE LEAD-LAG & TELEMETERING DIAGRAMS)

LOCATION LEGEND:

- IN MOTOR CONTROL CENTER
- ▲ IN TELEMETERING CABINET FROM TONE RECEIVER
- IN MCC DOOR OF PUMP NO. 1
- IN RECORDER IN TELEMETER CABINET

SWITCH LEGEND:

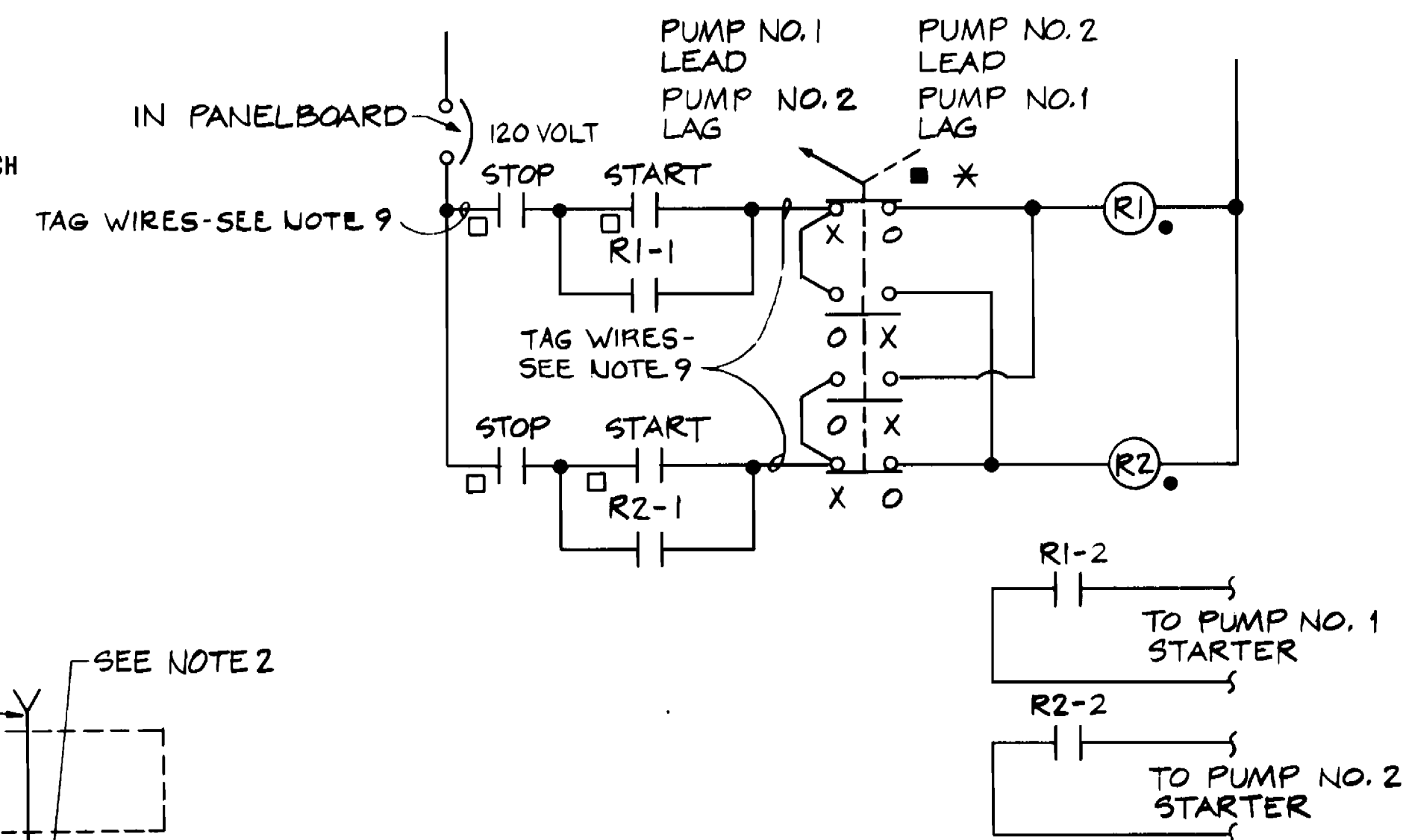
- O - DENOTES NORMALLY OPEN.
- X - DENOTES NORMALLY CLOSED.

ELECTRICAL LEGEND

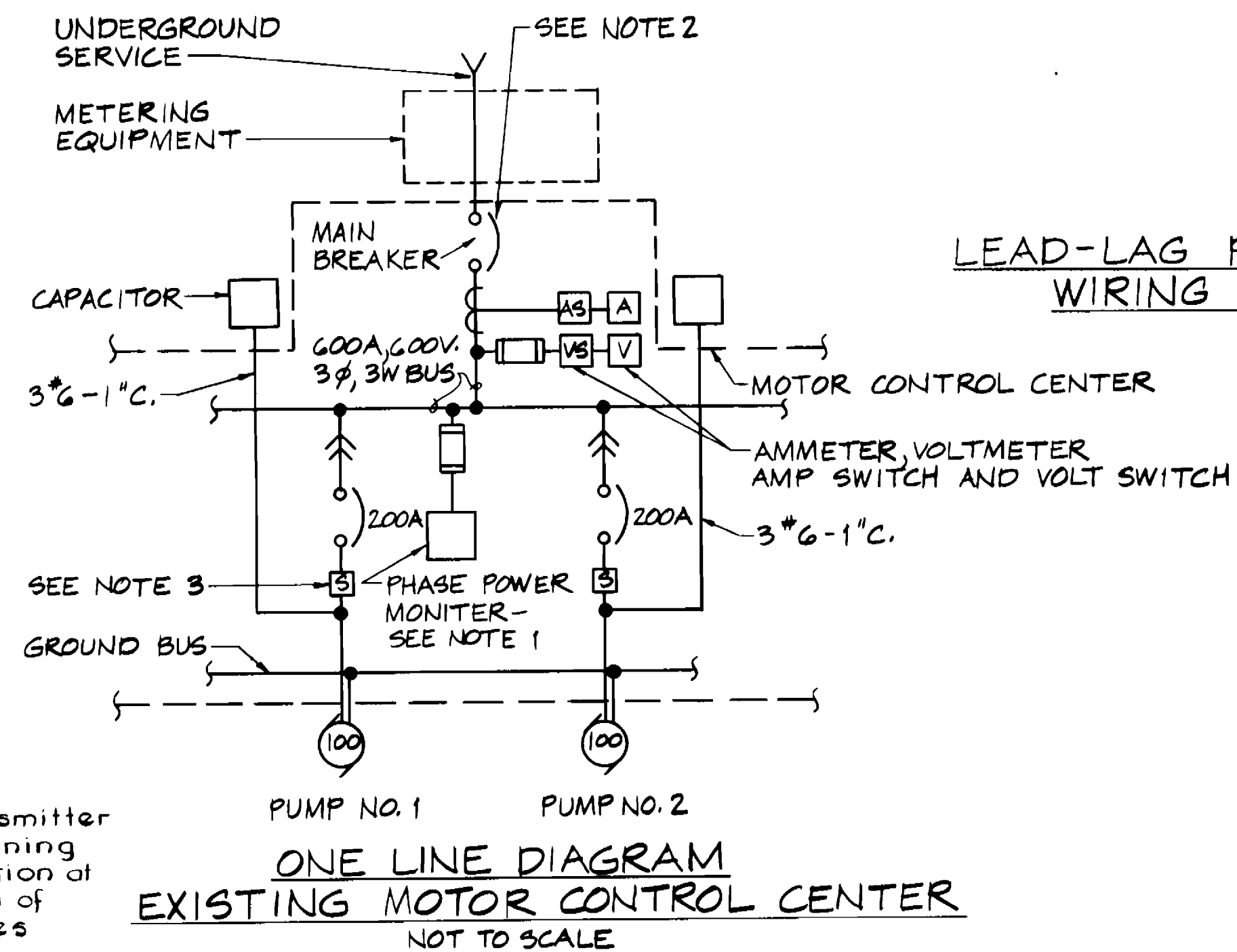
- ☐ - MOLDED CASE CIRCUIT BREAKER
- S - MAGNETIC STARTER - FULL VOLTAGE
- 100 - MOTOR - HORSEPOWER AS INDICATED
- J - JUNCTION BOX
- R - RED INDICATING LIGHT
- G - GREEN INDICATING LIGHT
- CONDUIT DOWN-UP
- CONDUIT ON CEILING OR WALLS
- EXISTING CONDUIT-EXPOSED OR CONCEALED
- ☐ FUSE
- ⌋ CURRENT TRANSFORMER
- C - CONDUIT
- GRD. - GROUND
- A, AS - AMMETER, AMMETER SWITCH
- V, VS - VOLTMETER, VOLTMETER SWITCH

NOTES

1. REMOVE THE INTERLOCKING WIRING FROM THE PHASE MONITOR TO THE PUMP STARTERS. REUSE THE PHASE MONITOR TO ACTUATE A "PHASE LOSS" ALARM AT THE BUREAU OF UTILITIES BY INSTALLING WIRING FROM THE MONITOR TO THE TELEMETERING CABINET TRANSMITTER.
2. REMOVE THE 300 AMP, 3 POLE, 480 VOLT MAIN SERVICE BREAKER AND INSTALL A 350 AMP, 3 POLE, 480 VOLT BREAKER, RETURN EXISTING BREAKER TO OWNER.
3. INSTALL A PHASE MONITOR WITH A DELAY-ON FEATURE IN EACH PUMP STARTER CUBICLE AND WIRE AS SHOWN IN THE DIAGRAM.
4. CONNECT THE NEW VENTURI FLOW METER, TELEMETERY AND TANK RECORDER CIRCUITS TO EXISTING SPARE BREAKERS IN THE LIGHTING PANEL, PROVIDE LOCK-"ON" BARS ON BREAKERS AND IDENTIFY EQUIPMENT ON CIRCUIT DIRECTORY.
5. INSTALL 120 VOLT CIRCUITS FOR THE TELEMETERING AND TANK LEVEL RECORDER THRU THE EXISTING CONDUIT AND EXTEND WITH NEW CONDUIT FROM THE OUTLET TO THE EQUIPMENT.
6. INSTALL A TELEMETERY/RECORDER CABINET WITH COMPONENTS AS SPECIFIED AND WIRE AS SHOWN.
7. REMOVE THE INTERLOCKING WIRING THAT ALLOWS ONLY ONE PUMP TO RUN SO THAT ONE OR BOTH CAN RUN WHEN CALLED FOR.
8. REMOVE THE MOMENTARY STOP-START CONTROLS AND INSTALL HEAVY DUTY OIL TIGHT SELECTOR SWITCHES WITH LEGEND PLATES AND SEQUENCE OF CONTACTS AS SHOWN, RETURN EXISTING EQUIPMENT TO THE OWNER.
9. TAG WIRES WITH RED TAGS "WARNING-VOLTAGE FROM EXTERNAL SOURCE" AND STATE FROM WHERE SUPPLIED.



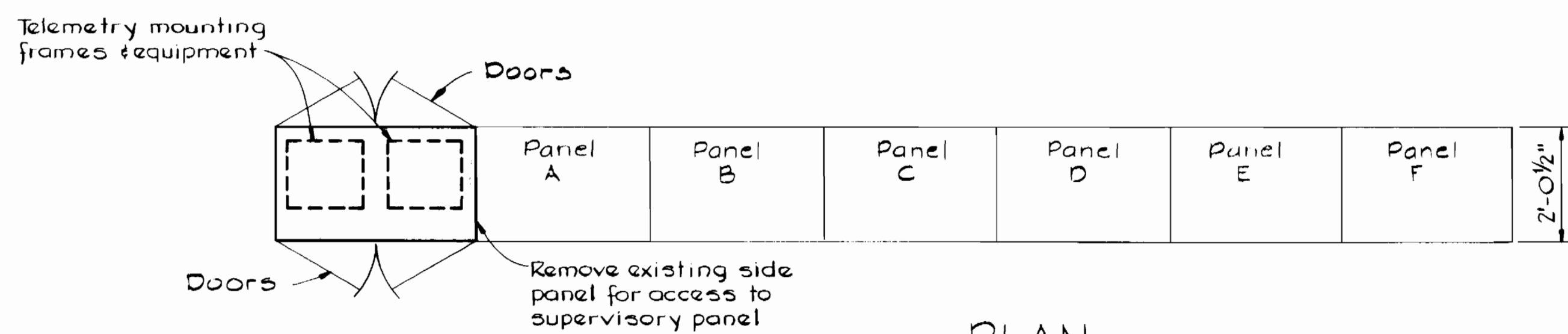
LEAD-LAG PUMP CONTROL WIRING DIAGRAM



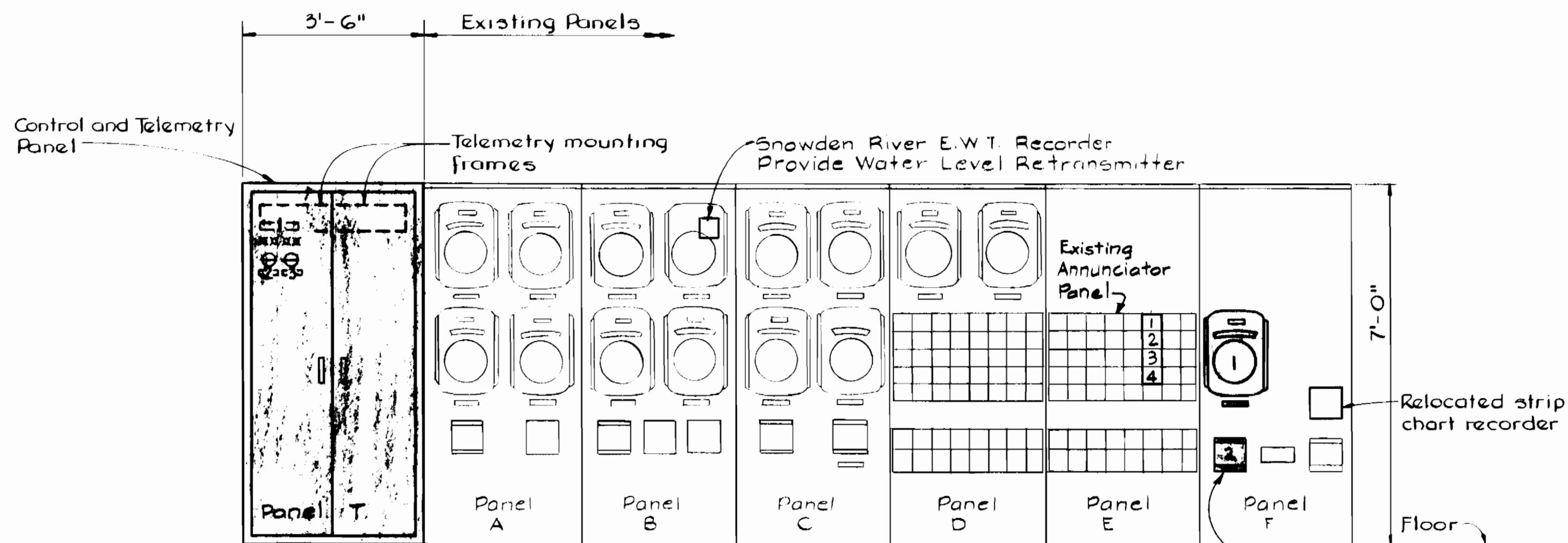
ONE LINE DIAGRAM EXISTING MOTOR CONTROL CENTER  
NOT TO SCALE

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Director of Public Works - DATE 9-14-87 Chief - Bureau of Utilities - DATE	WHITMAN, REQUARDT AND ASSOCIATES ENGINEERS 2315 ST. PAUL ST. BALTIMORE, MARYLAND Chief - Bureau of Engineering & DATE 9-11-87 Chief - Utility Design Division	DES. J.E.L. DRN. C.S. CHK. R.B.N. DATE 9/3/87	ELECTRICAL PLANS AND DIAGRAMS	GUILFORD ROAD PUMPING STATION PROJECT NO. W-8165 CONTRACT NO. 44-1690	SCALE AS SHOWN
					SHEET 4 OF 5

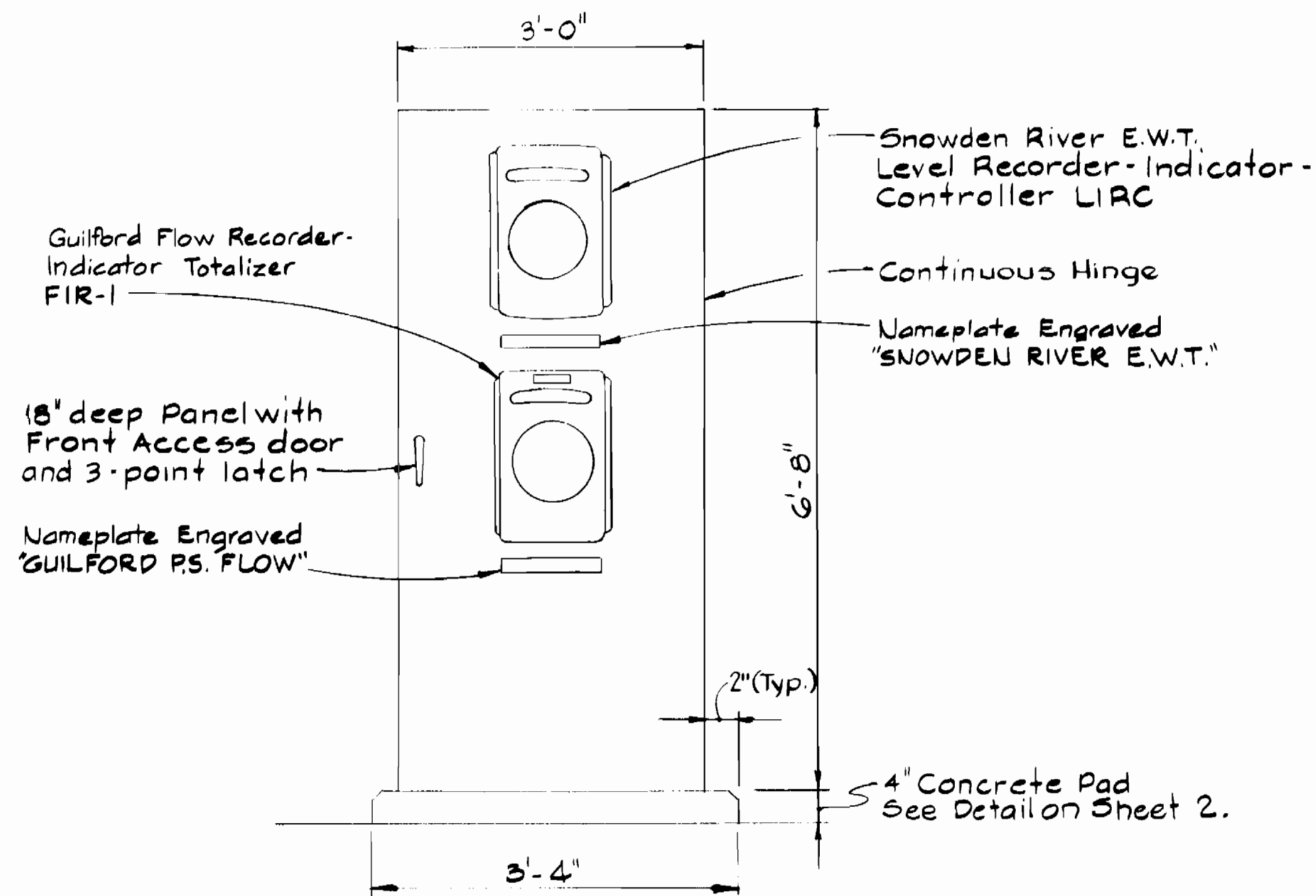




PLAN  
Scale: 1/2" = 1'-0"



ELEVATION  
Scale: 1/2" = 1'-0"



INSTRUMENT - TELEMETRY PANEL  
GUILFORD PUMPING STATION  
Scale: 3/4" = 1'-0"

LEGEND

ITEM	DESCRIPTION	NAMEPLATE ENGRAVING
Panel T		
1.	Nameplate	GUILFORD ROAD PUMPING STATION
2.	Start-Auto-Stop Selector Switch with Red and Green Indicating Lights	PUMP NO.1
3.	Start-Auto-Stop Selector Switch with Red and Green Indicating Lights	PUMP NO.2
Panel E Annunciator		
1.	Window	LOW SUCTION PRESSURE GUILFORD P.S.
2.	"	HIGH DISCHARGE PRESSURE GUILFORD P.S.
3.	"	PHASE OUT GUILFORD P.S.
4.	"	TELEMETRY FAILURE GUILFORD P.S.
Panel F		
1.	Circular Chart Recorder	GUILFORD P.S. RED-SUCTION PRESSURE 0-100 PSI BLUE-DISCHARGE PRESSURE 0-200 PSI
2.	Strip Chart Recorder	GUILFORD P.S. FLOW

SUPERVISORY AND CONTROL PANEL  
BUREAU OF UTILITIES MAINTENANCE BUILDING

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Director: James H. Slawson Chief - Bureau of Utilities: Robert R. Benjamin		WHITMAN, REQUARDT AND ASSOCIATES ENGINEERS 2315 ST PAUL ST BALTIMORE, MARYLAND Chief - Bureau of Engineers: Robert R. Benjamin Chief - Utility Design Division: [Signature]		PROFESSIONAL SEAL STATE OF MARYLAND 1974 M. T. K.		MECHANICAL AND ELECTRICAL PLANS, SECTIONS AND DETAILS		GUILFORD ROAD PUMPING STATION PROJECT NO. W-8165 CONTRACT NO. 44-1690		SCALE AS SHOWN SHEET 5 OF 5	
DATE: 9/14/87		DATE: 9/11/87		DATE: 9/3/87		600' SCALE MAP NO. _____ BLOCK NO. _____					