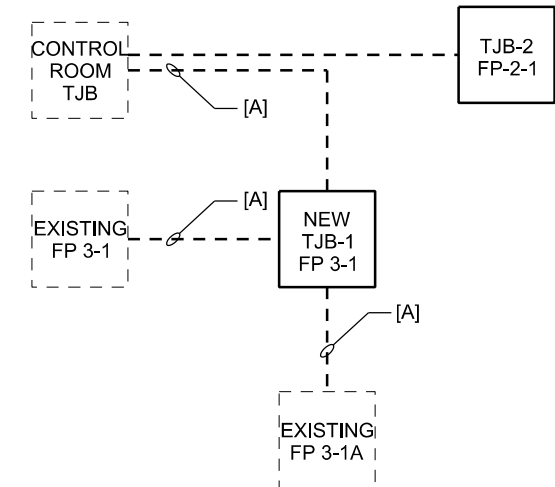


- NOTE:**
- [1] INSTALL CONDUIT ON TRAPEZ HANGERS 1-5/8 STAINLESS STRUT W/ 3/8 STAINLESS STEEL ALL THREAD AND HARDWARE VERIFY ROUTING IN FIELD W/ OWNER.
 - [2] INSTALL NEWS CAT 6 IN TJB FROM CONTROL ROOM TJB TO FP-2-1 TJB.
 - [A] 2" PVC COATED RIGID STEEL W/ CAT 6 BELDON CABLE SHIELDED. LEAVE 5 FEET FREE LENGTH OF CONDUCTOR EACH END. PROVIDE TERMINATIONS ON ALL ENDS TO COMPLETE CAT 6 INSTALLATIONS.



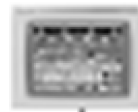
RISER DIAGRAM
NTS

FLOOR LAYOUT
NTS

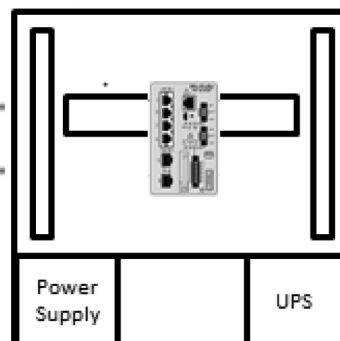


CH2MHILL® ELECTRICAL		5410 5 TH STREET KEY WEST, FLORIDA 33040 PHONE: 305.294.1645 FAX: 305.292.5130		THE RICHARD A. HEYMAN ENVIRONMENTAL POLLUTION CONTROL FACILITY CITY OF KEY WEST KEY WEST, FLORIDA	
FLOOR LAYOUT		REVISION		NO. DATE	
REPLACEMENT OF		CHK		APVD	
EFFLUENT CONTROL PANEL PLC		DR		BY	
VERIFY SCALE		M. FURDOK		A. COLLINS	
BAR IS ONE INCH ON ORIGINAL DRAWINGS.		K. HELDORFER		APVD	
DATE: APRIL 2014		NO. DATE		BY	
PROJ: 351255		DSGN		APVD	
DWG: E1		NO. DATE		BY	
SHEET: 1 of 4		NO. DATE		BY	

Effluent PV+ 6
1000



Effluent Control System



Integrated Zone
Enclosure

PANAL FP-3-1
NEW INTERIOR COMPONETS

BILL OF MATERIAL

Qty	Product Hardware	Description
Effluent Control System		
1	1756-A13	13 Slot ControlLogix Chassis
1	1756-EN2T	EtherNet 10-100M Interface Module (supports 128 TCP/IP connections)
3	1756-IA16	79-132 VAC Input 16 Pts (20 Pin)
2	1756-IF6I	Isolated Analog Input-Current/Voltage 6 Pts (20Pin)
1	1756-L71	ControlLogix5571 Controller With 2 Mbytes Memory
2	1756-N2	Slot Filler
2	1756-OF6CI	Isolated Analog Output - Current 6 Pts (20 Pin)
2	1756-OW16I	N.O. Isolated Relay Output 16 Pts (36 Pin)
1	1756-PA75	85-265 VAC Power Supply (13 Amp @ 5V)
2	1756-TBCH	36 Pin Screw Clamp Block With Standard Housing
7	1756-TBNH	20 Position NEMA Screw Clamp Block
Effluent PV+ 6 1000		
1	2711P-T10C4A8	2711 PanelView Plus 6 Terminal, 1000 Model, Touch Screen, Color, - Ethernet & RS-232, AC Input
Industrial Zone Enclosure & Hardware for Network Switch		
1	IAZ2424C	Industrial Zone Enclosure 28.0"H x 24.0" W x 11.7"D
1	1783-BMS06SL	Stratix 5700 Switch, Managed, 4 Fast Ethernet Copper Ports, 2 Fast Ethernet Fiber SFP Slots, Lite Software
1	1606-XLP15E	1606-XLP15E: Compact Power Supply, 24-28V DC, 15 W, 120/240V AC / 85-375V DC Input Voltage
1	1606-XLS240-UPS	1606-XLS240-UPS: Performance Power Supply w/ UPS, 22.5-30V DC, 240W, 22.5-30V DC Input Voltage
1	1606-XLSBATASSY1	7.5Ah Battery Assembly w/ Mounting Bracket

NOTE:

1. PROVIDE 25% SPARE TERMINALS
2. PROVIDE 3 SPARE ANNALOG OUTPUT / INPUT CARDS AND 3 SPARE SLOTS FOR EACH.
3. PROVIDE 3 DISCRETE SIGNAL CARDS AND SPARE SLOTS.
4. PROVIDE LINE SIDE SURGE ARRESTOR AS RECOMMAND BY CONTROL PANEL VENDOR EDKO OR EQUAL.
5. PROVIDE ONE SPARE SURAGE ARRESTOR.

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THE RICHARD A. HEYMAN ENVIRONMENTAL
 POLLUTION CONTROL FACILITY
 CITY OF KEY WEST
 KEY WEST, FLORIDA

CH2MHILL
 ELECTRICAL

**DETAILS / BILL OF MATERIAL
 REPLACEMENT OF
 EFFLUENT CONTROL PANEL PLC**

VERIFY SCALE
 BAR IS ONE INCH ON
 ORIGINAL DRAWING.
 DATE APRIL 2014
 PROJ 351255
 DWG E2
 SHEET 2 of 4

LOOP DESCRIPTIONS

Loop One

Effluent Wet Well Level control

Measure level through existing bubbler system control effluent pumps [P-X-X-X] based on set point table as shown on drawings. Display graphically and digitally set points, alarms and levels of effluent wet well and effluent wet well pumps [P-X-X-1,2,3]. Normal operation shall be one selected pump with rotations of pumps to occur at midnight each day. Only one pump shall run in auto for normal operations. However, if primary pump should fail it shall be locked out in alarm condition and next pump in sequence shall start automatically, if in the Auto position. Graphically display speed set points and actual speed of [P-X-1,2,3].

Graphically Display all existing alarm functions for pumps [P-X-1,2,3] including all alarms currently displayed in existing annunciator. Existing Annunciator to remain and shall be interfaces with all loops

X= FP-6-2-1, FP-6-2-2, FP-6-2-3 (future see note 1 on sheet E4).

Loop Two

Deep Injection Wells 1,2

Display Graphically Deep Injection Wells (DIW) one and two functions, alarms analog and discrete signals. Display discrete signals open/ close for all valves DIW 1 & 2 including fail to open or close and fail from existing limit switch. Display shall be included in New Panel View, on new screen in existing SCADA system, and existing annunciator located in FP-3-1.

Display Graphically Deep Injection Wells (DIW) 1 & 2 flow and pressure values, functions, alarms analog and discrete signals. Include in control logic the signals currently in FP-3-1, FP3-1A and existing SCADA system and display graphically and digitally all values in all three locations.

Loop Three

Monitor Wells

Display Graphically and digitlly Monitor well 1 & 2 all monitor well values for upper and lower zones including pressure indication and recording of values for both zones and display graphically in newel View and existing SCADA system.

Loop Four

SCADA interfacing of Wet Well, Deep Injection Well and Monitor Well

All values included in existing system for loops 1,2,3 above, existing FP-3-1, FP-3-1A, existing annunciator in FP-3-1 shall be included and displayed on new graphic screens showing process flow, alarms, values, trending of all values. Screens shall include a overview of the entire system, an individual screen for Effluent Level and Pump Control, Deep Injection Well, Monitor Wells, Alarm status screen and a trending screen based on a 24 hour 7 day value for each system as well as an overall trend for all values for entire system.

* ALL EXISTING I/O TO BE FIELD VERIFIED AND A RECORD DRAWING OF ALL NEW AND EXISTING SHALL BE PROVIDED BY CONTRACTOR.

FP-3-1 PLC INPUT / OUTPUT MAP

	Pt. #	Type	Address	Description	Terminal #	Source
DIGITAL OUTPUT CARD # 3	1	DO	0503-01	#1 Pump RUN	31, 32	#1 VFD Panel
	2	DO	0503-02	#2 Pump RUN	33, 34	#2 VFD Panel
	3	DO	0503-03	#1 Limitorque Valve OPEN	35, 36	Limitorque Actuator
	4	DO	0503-04	#1 Limitorque Valve CLOSE	37, 38	Limitorque Actuator
	5	DO	0503-05	#2 Limitorque Valve OPEN	39, 40	Limitorque Actuator
	6	DO	0503-06	#2 Limitorque Valve CLOSE	41, 42	Limitorque Actuator
	7	DO	0503-07	UNUSED IN PLC PROGRAM	43, 44	
	8	DO	0503-08	UNUSED IN PLC PROGRAM	45, 46	
	9	DO	0503-09	UNUSED IN PLC PROGRAM	47, 48	
	10	DO	0503-10	PLC Fail	H1, N1	Relay CR-10 and Yellow Light
	11	DO	0503-11	#1 VFD PLC Fails	2, H2A	Relay CR-2 and Yellow light
	12	DO	0503-12	spare	51, 52	spare
	13	DO	0503-13	#1 Seal Water Solenoid OPEN	53, 54	CR-15
	14	DO	0503-14	#2 Seal Water Solenoid OPEN	55, 56	Solenoid
	15	DO	0503-15	PLC Reset Output	57, 58	
	16	DO	0503-16	#2 VFD PLC Fails	59, 60	Relay CR-6 and Yellow Light
ANALOG INPUT CARD #4	1	AI	504	#1 VFD Speed Input	1	#1 VFD Panel
	2	AI	505	#2 VFD Speed Input	2	#2 VFD Panel
	3	AI	506	#1 Wetwell Level Transmitter	3	Bubbler Panel
	4	AI	507	None	4	
ANALOG INPUT CARD #5	1	AI	508	#2 Wetwell Level Transmitter	1	Bubbler Panel
	2	AI	509	None	2	
	3	AI	510	None	3	
	4	AI	511	None	4	
ANALOG OUTPUT CARD #6	1	AO	512	#1 VFD Speed Input	1	#1 VFD Panel
	2	AO	513	#2 VFD Speed Input	2	#2 VFD Panel
	3	AO	514	Wetwell Level	3	FP-12-1 - to Telemetry RTU
	4	AO	515	VFD Speed Common Output	4	FP-12-1 - to Telemetry RTU
ANALOG	1	A	526	Effluent Flow (deep well Venturi meter)		FP-2-1
	2	A	527	spare		
	3	A	528	spare		
			529	spare		
DIGITAL INPUT CARD # 1	1	DI	0501-01	Master HOA Switch in AUTO	none	FP-3-1 panel
	2	DI	0501-02	Pump #1 HOA Switch in AUTO	10	FP-3-1 panel
	3	DI	0501-03	Pump #2 HOA Switch in AUTO	11	FP-3-1 panel
	4	DI	0501-04	#1 VFO Running	1	VFD Panel
	5	DI	0501-05	#1 FAIL from VFO or PLC logic	2	VFD Panel or PLC
	6	DI	0501-06	#1 Check Valve failed to open	3	VFD Panel
	7	DI	0501-07	#1 Motor Overtemperature	4	VFD Panel
	8	DI	0501-08	#2 VFO Running	5	VFD Panel
	9	DI	0501-09	#2 FAIL from VFO or PLC logic	6	VFD Panel or PLC
	10	DI	0501-10	#2 Check Valve failed to open	7	VFD Panel
	11	DI	0501-11	#2 Motor Overtemperature	8	VFD Panel
	12	DI	0501-12	UNUSED IN PLC PROGRAM	9	Primer Panel
	13	DI	0501-13	#1 Limitorque Open	12	Limitorque Actuator
	14	DI	0501-14	#1 Limitorque Closed	13	Limitorque Actuator
	15	DI	0501-15	#2 Limitorque Open	14	Limitorque Actuator
	16	DI	0501-16	#2 Limitorque Closed	15	Limitorque Actuator
DIGITAL INPUT CARD # 2	1	DI	0502-01	#1 Seal Water ON	16	Pressure Switch
	2	DI	0502-02	#2 Seal Water ON	17	Pressure Switch
	3	DI	0502-03	Alarm Reset Button (normally closed)	none	FP-3-1 panel
	4	DI	0502-04	UNUSED IN PLC PROGRAM	18	Vacuum Primer Panel
	5	DI	0502-05	UNUSED IN PLC PROGRAM	19	FP-2-1?
	6	DI	0502-06	UNUSED IN PLC PROGRAM	20	FP-2-1?
	7	DI	0502-07	UNUSED IN PLC PROGRAM	21	FP-2-1?
	8	DI	0502-08	UNUSED IN PLC PROGRAM	22	Spare
	9	DI	0502-09	UNUSED IN PLC PROGRAM	23	
	10	DI	0502-10	UNUSED IN PLC PROGRAM	24	
	11	DI	0502-11	UNUSED IN PLC PROGRAM	25	
	12	DI	0502-12	UNUSED IN PLC PROGRAM	26	
	13	DI	0502-13	UNUSED IN PLC PROGRAM	27	
	14	DI	0502-14	UNUSED IN PLC PROGRAM	28	
	15	DI	0502-15	Utility Power Available	29	
	16	DI	0502-16	UNUSED IN PLC PROGRAM	30	

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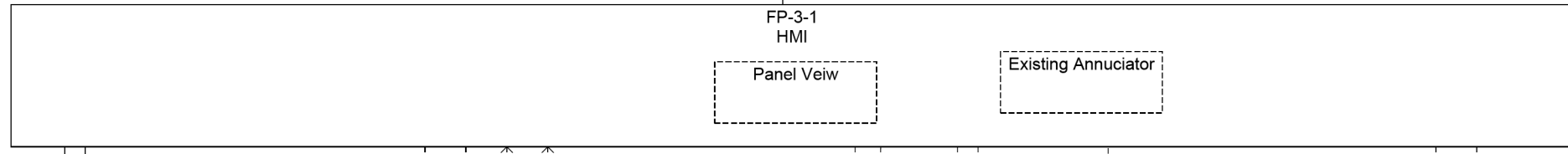
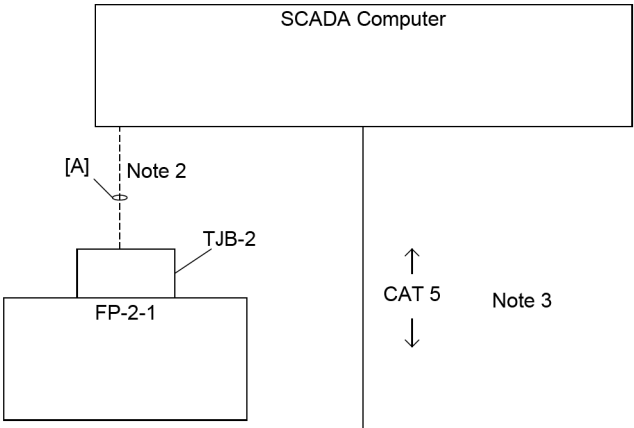
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CITY OF KEY WEST
KEY WEST, FLORIDA

LOOP DESC. & I/O DIRECTORY
REPLACEMENT OF
EFFLUENT CONTROL PANEL PLC

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.	
DATE	APRIL 2014
PROJ	351255
DWG	E3
SHEET	3 of 4

Preliminary

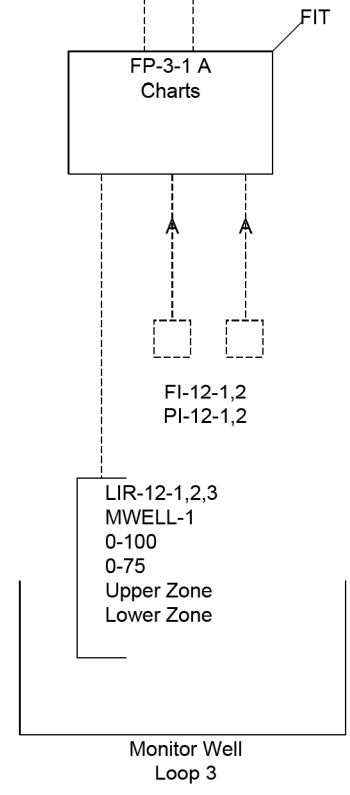
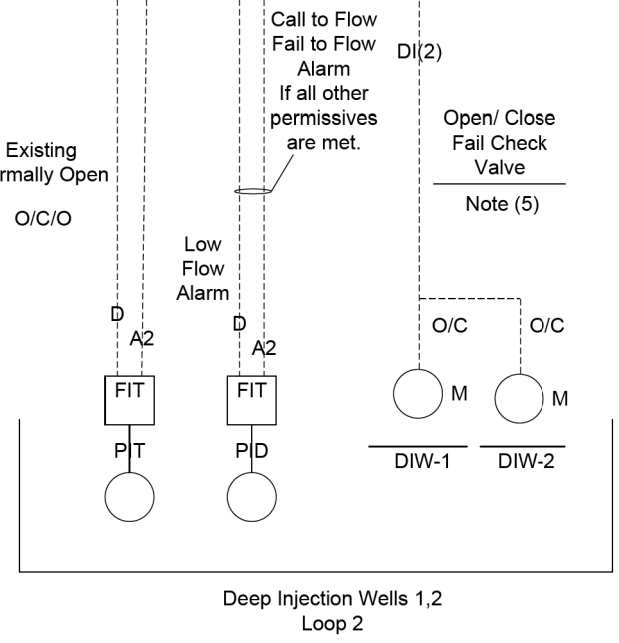
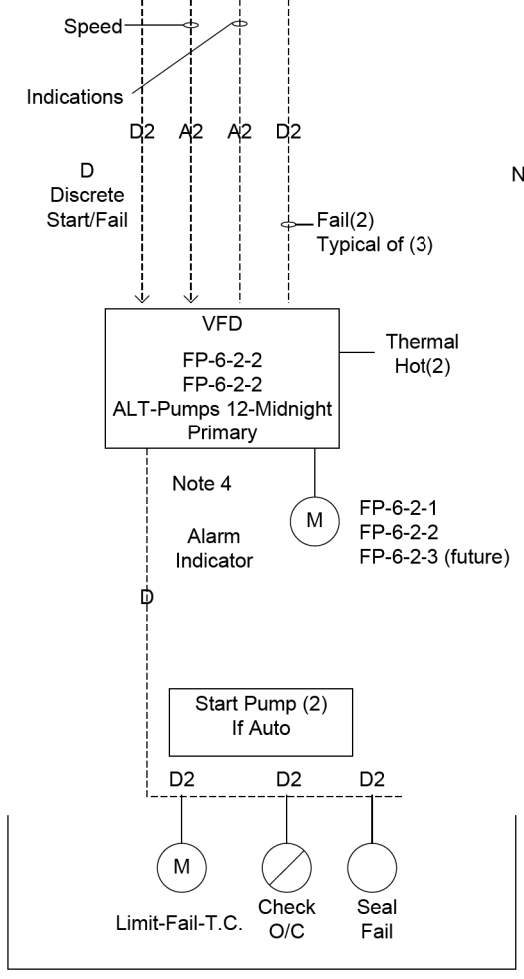
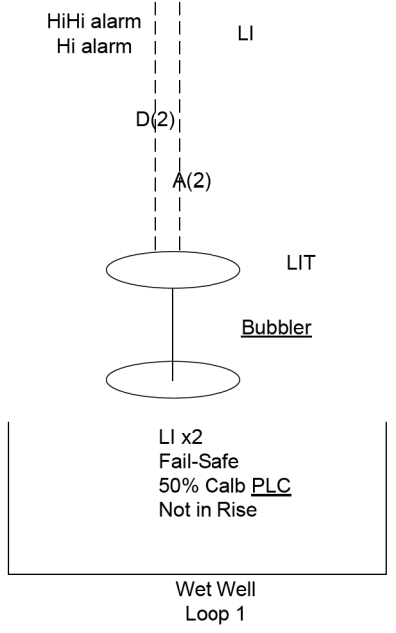


Pump Level /Speed Set Points		
Level	Depth (ft)	Speed (%)
6 th Level	9.00	100
5 th Level	8.60	90
4 th Level	8.40	83
3 rd Level	8.20	80
2 nd Level	7.95	76
1 st Level	7.75	68

Minimum Speed 66 %
 Pump Start 8.50 ft
 Pump Stop 6.50 ft

Alarms	
Alarm	Set Point (ft)
Lo	4.00
Lo Lo	3.00
Hi	10.50
Hi Hi	10.60

TYPICAL OF (3) NOTE 1



NOTE:
 1. PUMPS FP-6-2-1, FP-6-2-2 ARE EXISTING. FP-6-2-3 IS FUTURE, PROVIDE ALL LOGIC IN TRIPPLICATE WITH FUTURE FP-6-2-3 OUT OF SEQUENCES BUT READY TO ENABLE.

CH2MHILL
 ELECTRICAL
I/C FLOW DIAGRAM
 REPLACEMENT OF
 EFFLUENT CONTROL PANEL PLC

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 KEY WEST, FLORIDA

NO.	DATE	DR	REVISION	CHK	BY	APVD

M. FURDOCK
 K. HELDORFER
 A. COLLINS

VERIFY SCALE
 BAR IS ONE INCH ON ORIGINAL DRAWING, 0 1"

DATE: APRIL 2014
 PROJ: 351255
 DWG: E4
 SHEET: 4 of 4

FILENAME: 422099-ANSI_D.dgn PLOT DATE: \$PLOTDATE PLOT TIME: \$PLOTTIME

Preliminary