

M & T BANK STADIUM FIELD HEATING

1101 RUSSELL ST
BALTIMORE, MD 21230



CONTROLS BY:



3410 MOUNTAIN ROAD
PASADENA, MD 21122
(410) 437-3103 office
(410) 437-3136 fax

JOB #	STOK001	DRAWN BY:	DMR
REV:	Submittals	DATE:	1/27/15
REV:	Asbuilts	DATE:	5/26/15
REV:		DATE:	

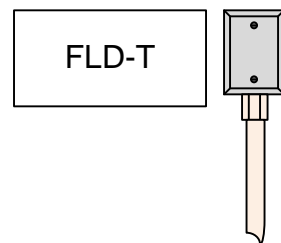
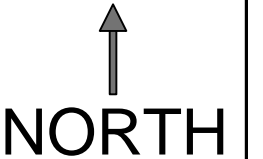
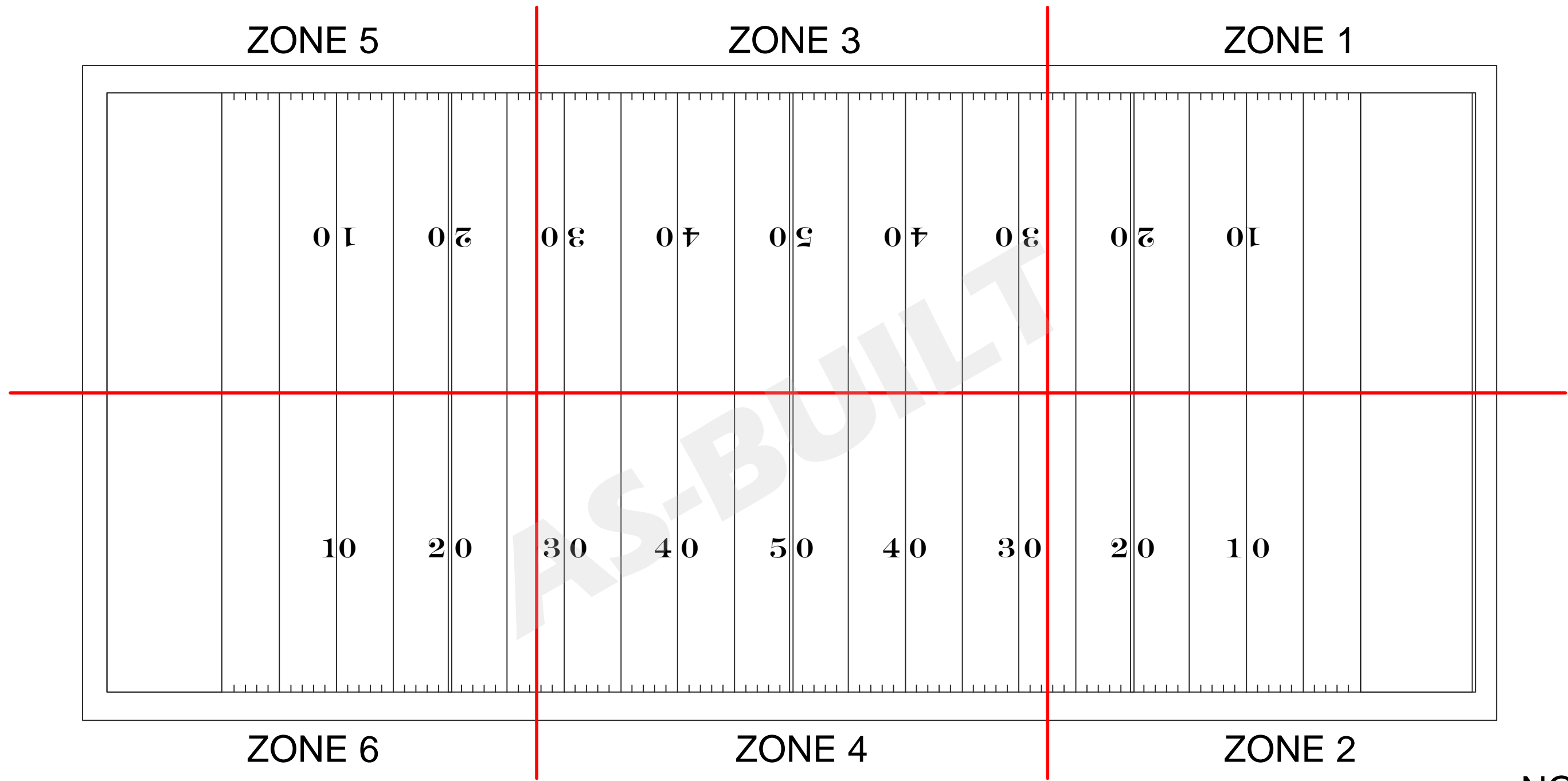
NOTES:

- 1) Panel selector tag will be supplied by EASI engineering
- 2) Ethernet connection to JACE panel for remote connectivity to be installed by others.
- 3) EASI to install heating override switch in panel face




Pg	DRAWING SCHEDULE
1)	TITLE
2)	FIELD ZONES
3)	HEATING FLOW
4)	SEQUENCE AND BOM
5)	POINTS
6)	CONNECTIONS

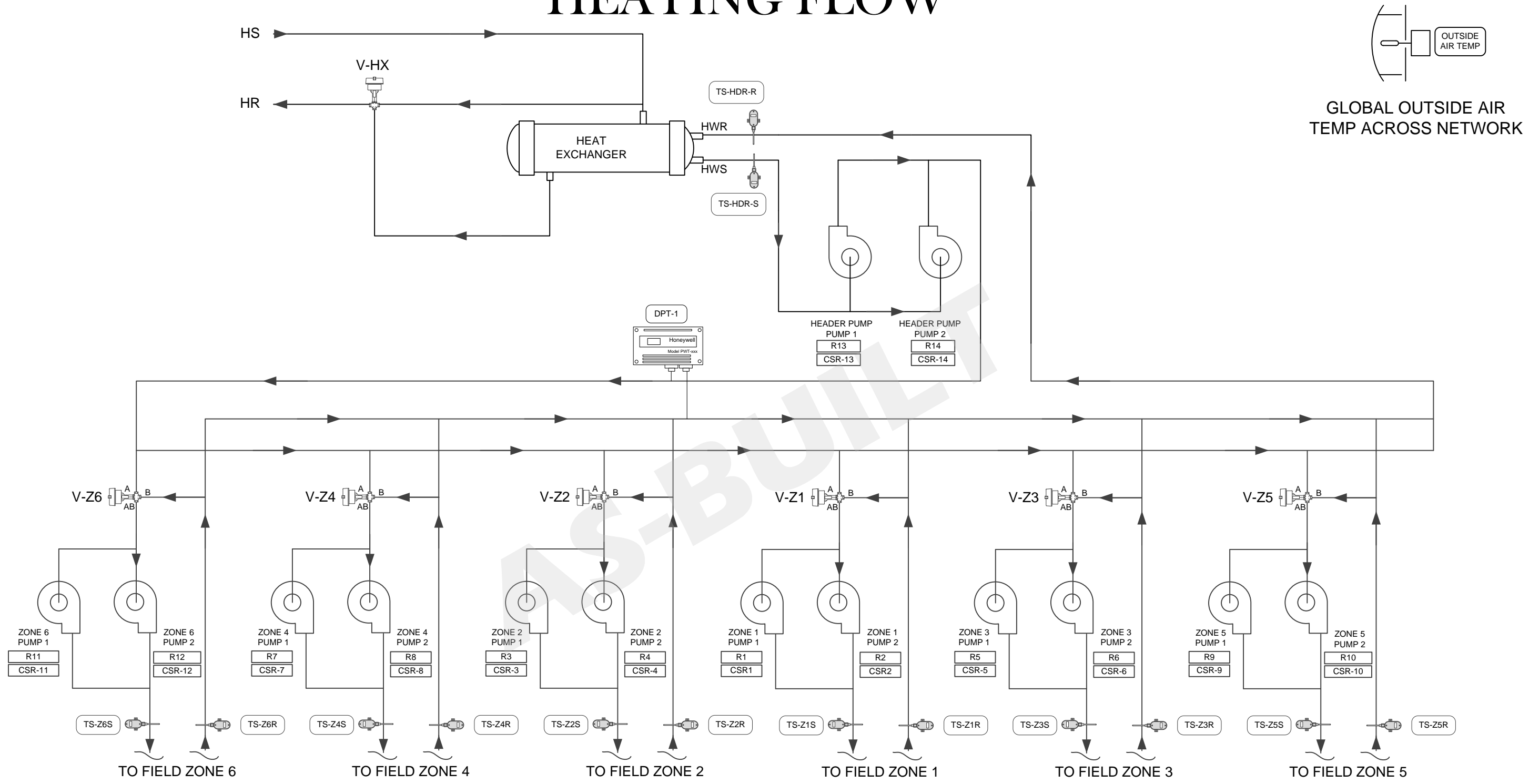
FIELD ZONES



FIELD TEMPERATURE SENSOR


TITLE: FIELD ZONES	 3410 MOUNTAIN ROAD PASADENA, MD 21122 (410) 437-3103 office (410) 437-3136 fax	
PROJECT: M&T BANK FIELD HEATING	DRAWN BY: DMR	
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HEATING FLOW



GLOBAL OUTSIDE AIR
TEMP ACROSS NETWORK

CONTROL RELAYS AND CURRENT SENSORS ARE ETR

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SEQUENCE OF OPERATIONS / BOM

PUMP LEAD-LAG CONTROLS

LEAD PUMP DUTY FOR THE MAIN HEADER AND ZONE PUMPS WILL BE ROTATED TWICE WEEKLY ON A THREE-AND-ONE-HALF DAY SCHEDULE. SHOULD THE CURRENT SWITCH (CS-P) FAIL TO PROVE PUMP OPERATION, THE ASSOCIATED LAG PUMP WILL BE STARTED.

MAIN HEADER CONTROLS

UPON A DROP IN OUTDOOR AIR TEMPERATURE TO 75°F (ADJ), OR THERE IS A CALL FOR HEATING FROM ANY ZONE, THE LEAD HEADER PUMP WILL BE STARTED AND RUN CONTINUOUSLY. THE HEAT EXCHANGER VALVE V-HX WILL BE MODULATED TO MAINTAIN A MAIN HEADER SUPPLY TEMPERATURE OF 180°F (ADJ). WHEN THE OUTDOOR AIR TEMPERATURE RISES TO 75°F (ADJ) AND ALL ZONES ARE SATISFIED, THE LEAD HEADER PUMP WILL BE STOPPED AND V-HX WILL BYPASS THE HEAT EXCHANGER

FIELD ZONE CONTROLS

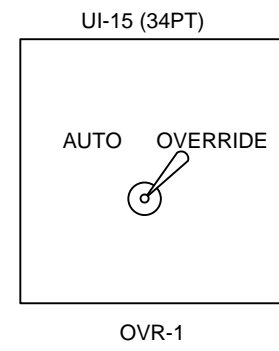
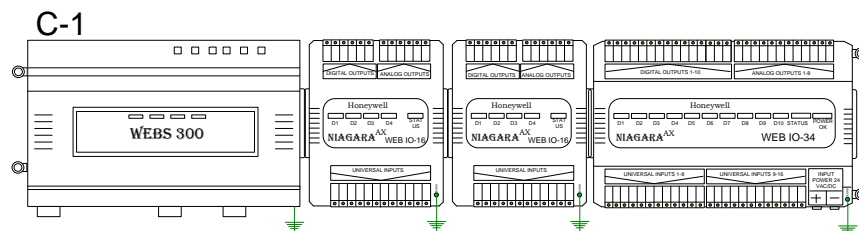
UPON A DROP IN OUTDOOR AIR TEMPERATURE TO 75°F (ADJ) OR IF THERE IS A CALL FOR HEATING FROM THE ZONE, THE LEAD ZONE PUMP WILL BE STARTED AND RUN CONTINUOUSLY. THE ZONE VALVE V-Z_ WILL BE MODULATED TO MAINTAIN A ZONE SUPPLY TEMPERATURE RESET TO OUTDOOR AIR TEMPERATURE (ADJ) AS SHOWN BELOW UNTIL THE ZONE IS SATISFIED.


<u>OUTDOOR TEMP</u>	<u>SUPPLY TEMP</u>
70°F	80°F
0°F	160°F

THE ZONES MAT LEVEL TEMPERATURE (T_-1-4) AVERAGE WILL BE MAINTAINED AT 70°F (ADJ). IF ANY MAT LEVEL TEMPERATURE SENSOR FAILS, IT WILL BE ELIMINATED FROM THE AVERAGE CALCULATION. IN THE UNLIKELY EVENT THAT ALL MAT LEVEL SENSORS SHOULD FAIL, THE ZONE TEMPERATURE WILL BE CONTROLLED TO THE ZONE RETURN WATER TEMPERATURE (TS-Z_R). MONITORING TEMPERATURE SENSORS INE ACH ZONE WILL INCLUDE TWO LOCATED 3" BELOW MAT LEVEL (T_-5,6). ONE AT PIPE LEVEL (T_-7) AND ONE LOCATED 3" BELOW PIPE LEVEL (T_-8) IN THE ROCK SUBSTRATE.

WHEN THE OUTDOR AIR TEMPERATURE RISES TO 75°F (ADJ) AND THE ZONE TEMPERATURE IS SATISFIED, THE ELAD ZONE PUMP WILL BE STOPPED AND V-Z_ WILL BYPASS THE ZONE.

BILL OF MATERIALS				
TAG	QTY	DESCRIPTION	PART #	EQUIP
FLD-T	1	ACI OUTSIDE AIR 10K TEMP SENSOR	A/AN-O-EH	HTG
TS-S/R	14	ACI IMMERSION 10K SENSOR WITH WELL	A/AN-IM-6-GD	HTG
DPT-1	1	HONEYWELL WET DIFF PRESSURE	PWT-100	HTG
W	1	KELE DC POWER SUPPLY	DCP-1.5-W	HTG
C-1	1	HONEYWELL WEB-300	WEB-300-O	HTG
W	1	HONEYWELL 34 POINT EXPANSION MODULE	IO-34-H	HTG
W	2	HONEYWELL 16 POINT EXPANSION MODULE	IO-16-H	HTG
W	1	HONEYWELL 256K MEMORY UPGRADE	NPM-256-MB	HTG
W	2	RIB 100 VA TRANSFORMER	TR100VA001	HTG
W	1	RIB 40 VA TRANSFORMER	TR40VA001	HTG
W	1	UPS WITH INTERFACE MODULE AND ENCLOSURE	PSH-550-UPS-STAT	HTG
OVR-1	1	KELE 2 POSITION SELECTOR SWITCH	M2SS2-30-B-11	HTG
W	1	2 POSITION SELECTOR SWITCH PANEL LABEL	SEE NOTE #1	HTG



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POINTS

CONTROLLER : NDIO 34 PT			DDC POINT SCHEDULE			SYSTEM / UNIT: FIELD HEATING A		
TERMINAL	TYPE	POINT DESCRIPTION	TAG	WIRE #	CABLE	RANGE	DETAIL	COMMENTS
UI-1	ANALOG	ZONE 1 PUMP 1 STS	CSR-1	1	18-2	CONTACT	#3	ETR
UI-2	ANALOG	ZONE 1 PUMP 2 STS	CSR-2	2	18-2	CONTACT	#3	ETR
UI-3	ANALOG	ZONE 2 PUMP 1 STS	CSR-3	3	18-2	CONTACT	#3	ETR
UI-4	ANALOG	ZONE 2 PUMP 2 STS	CSR-4	4	18-2	CONTACT	#3	ETR
UI-5	ANALOG	ZONE 3 PUMP 1 STS	CSR-5	5	18-2	CONTACT	#3	ETR
UI-6	ANALOG	ZONE 3 PUMP 2 STS	CSR-6	6	18-2	CONTACT	#3	ETR
UI-7	ANALOG	ZONE 4 PUMP 1 STS	CSR-7	7	18-2	CONTACT	#3	ETR
UI-8	ANALOG	ZONE 4 PUMP 2 STS	CSR-8	8	18-2	CONTACT	#3	ETR
UI-9	ANALOG	ZONE 5 PUMP 1 STS	CSR-9	9	18-2	CONTACT	#3	ETR
UI-10	ANALOG	ZONE 5 PUMP 2 STS	CSR-10	10	18-2	CONTACT	#3	ETR
UI-11	ANALOG	ZONE 6 PUMP 1 STS	CSR-11	11	18-2	CONTACT	#3	ETR
UI-12	ANALOG	ZONE 6 PUMP 2 STS	CSR-12	12	18-2	CONTACT	#3	ETR
UI-13	ANALOG	HEADER PUMP 1 STS	CSR-13	13	18-2	CONTACT	#3	ETR
UI-14	ANALOG	HEADER PUMP 2 STS	CSR-14	14	18-2	CONTACT	#3	ETR
UI-15	ANALOG	OVERRIDE SWITCH	OVR-1	15	18-2	CONTACT	#3	ETR
UI-16	ANALOG	POWER FAILURE STATUS	PWR-1	16	18-2	CONTACT	#3	ETR
DO-1	DIGITAL	ZONE 1 PUMP 1 CMD	R1	17	18-2	CONTACT	#4	ETR
DO-2	DIGITAL	ZONE 1 PUMP 2 CMD	R2	18	18-2	CONTACT	#4	ETR
DO-3	DIGITAL	ZONE 2 PUMP 1 CMD	R3	19	18-2	CONTACT	#4	ETR
DO-4	DIGITAL	ZONE 2 PUMP 2 CMD	R4	20	18-2	CONTACT	#4	ETR
DO-5	DIGITAL	ZONE 3 PUMP 1 CMD	R5	21	18-2	CONTACT	#4	ETR
DO-6	DIGITAL	ZONE 3 PUMP 2 CMD	R6	22	18-2	CONTACT	#4	ETR
DO-7	DIGITAL	ZONE 4 PUMP 1 CMD	R7	23	18-2	CONTACT	#4	ETR
DO-8	DIGITAL	ZONE 4 PUMP 2 CMD	R8	24	18-2	CONTACT	#4	ETR
DO-9	DIGITAL	ZONE 5 PUMP 1 CMD	R9	25	18-2	CONTACT	#4	ETR
DO-10	DIGITAL	ZONE 5 PUMP 2 CMD	R10	26	18-2	CONTACT	#4	ETR
AO-1	ANALOG	ZONE 1 CONTROL VALVE CMD	VZ-1	27	FIELD VERIFY	FIELD VERIFY	TBD	
AO-2	ANALOG	ZONE 2 CONTROL VALVE CMD	VZ-2	28	FIELD VERIFY	FIELD VERIFY	TBD	
AO-3	ANALOG	ZONE 3 CONTROL VALVE CMD	VZ-3	29	FIELD VERIFY	FIELD VERIFY	TBD	
AO-4	ANALOG	ZONE 4 CONTROL VALVE CMD	VZ-4	30	FIELD VERIFY	FIELD VERIFY	TBD	
AO-5	ANALOG	ZONE 5 CONTROL VALVE CMD	VZ-5	31	FIELD VERIFY	FIELD VERIFY	TBD	
AO-6	ANALOG	ZONE 6 CONTROL VALVE CMD	VZ-6	32	FIELD VERIFY	FIELD VERIFY	TBD	
AO-7	ANALOG	BY-PASS VLV CMD	V-HX	33	FIELD VERIFY	FIELD VERIFY	TBD	
AO-8	ANALOG			34				

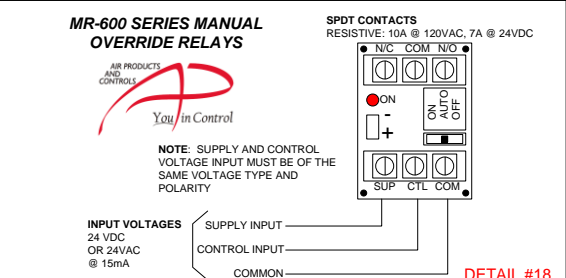
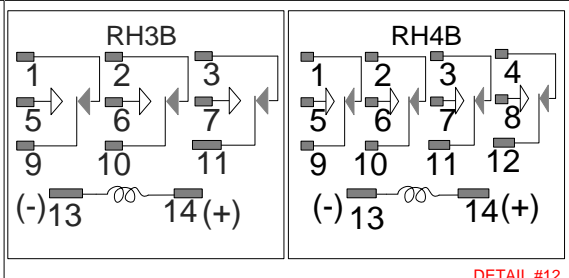
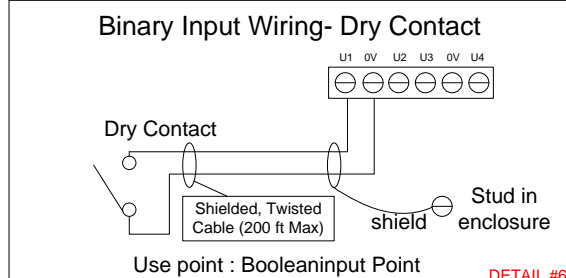
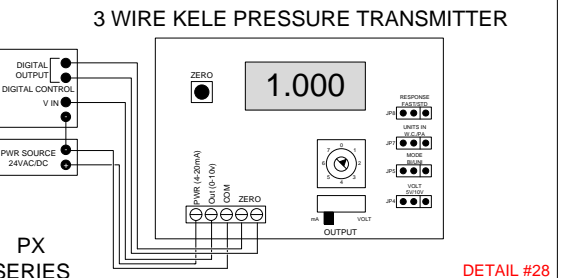
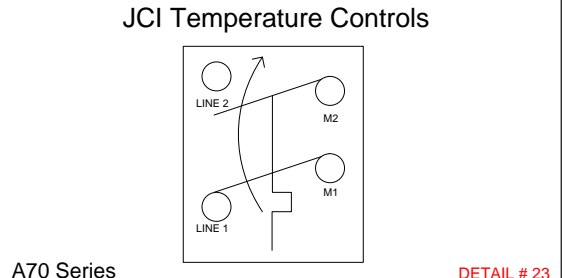
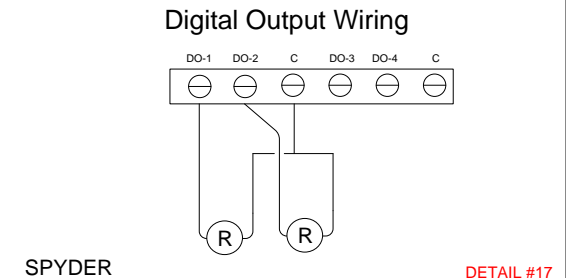
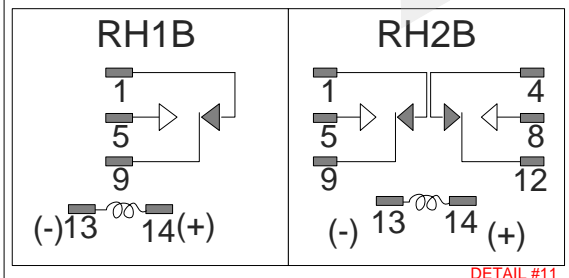
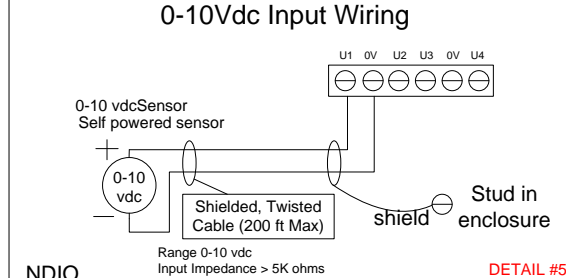
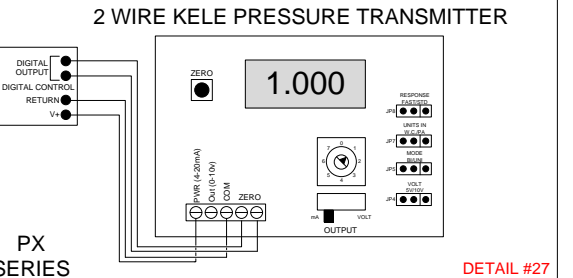
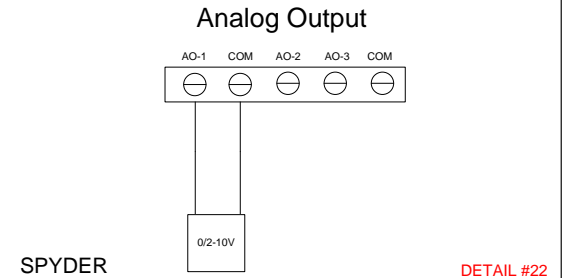
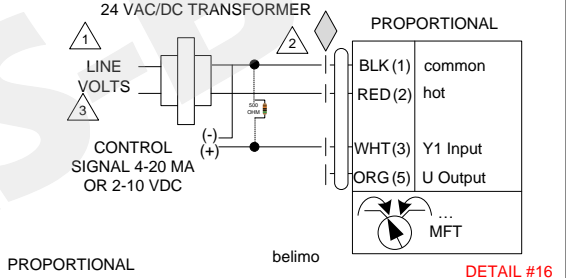
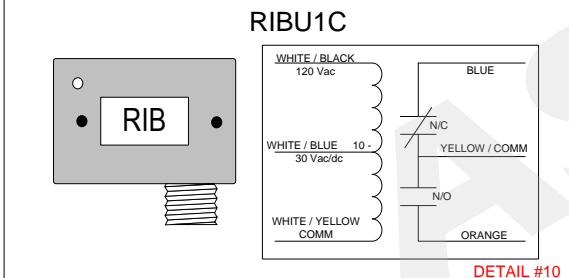
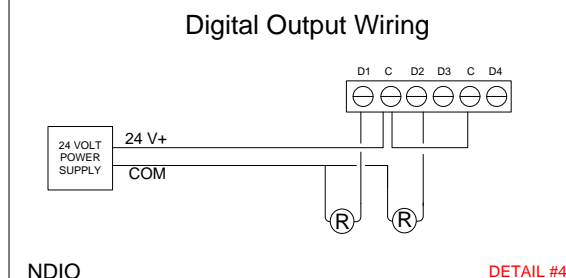
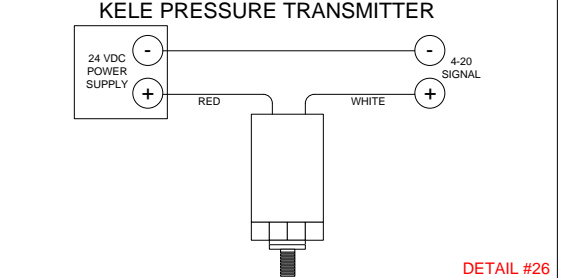
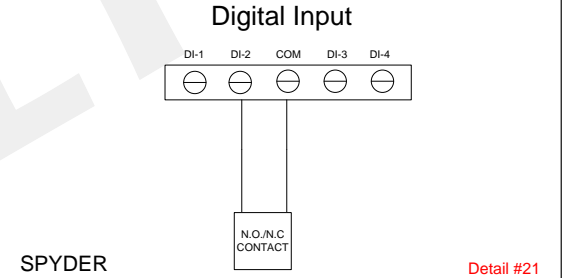
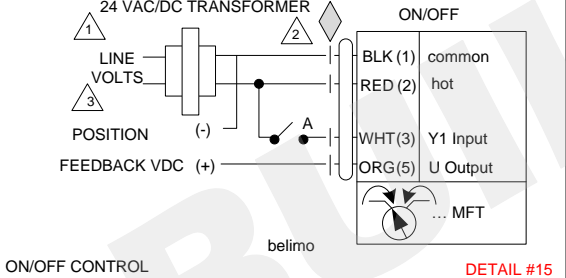
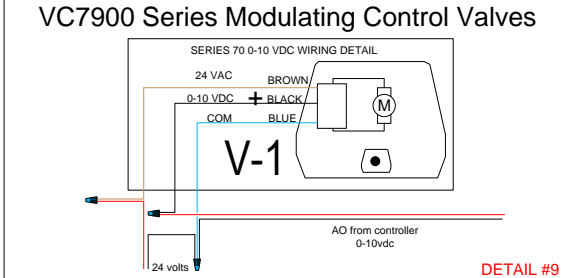
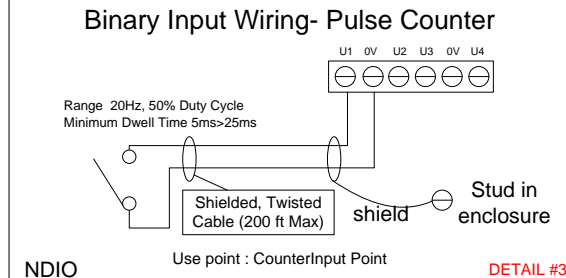
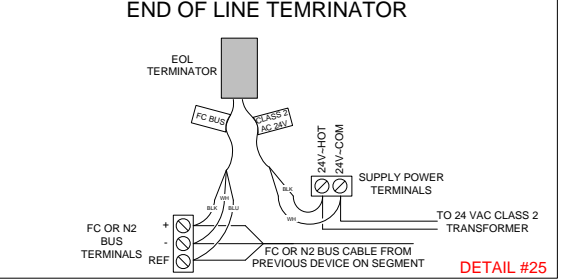
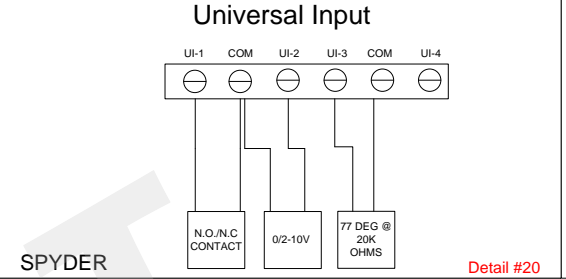
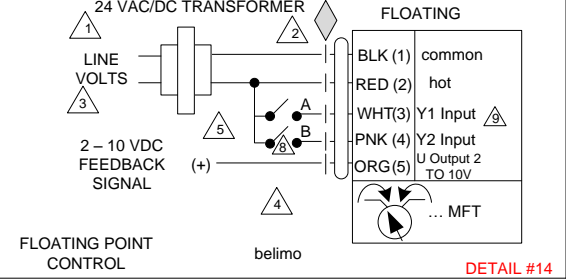
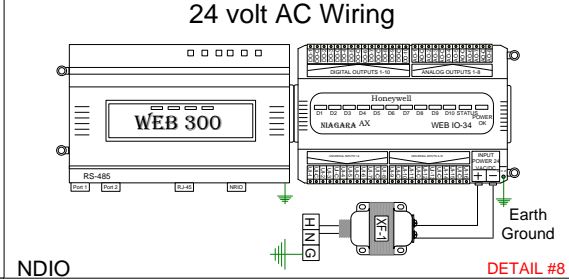
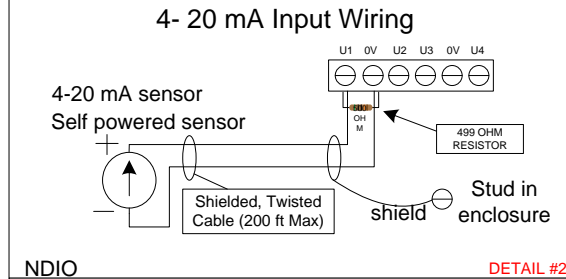
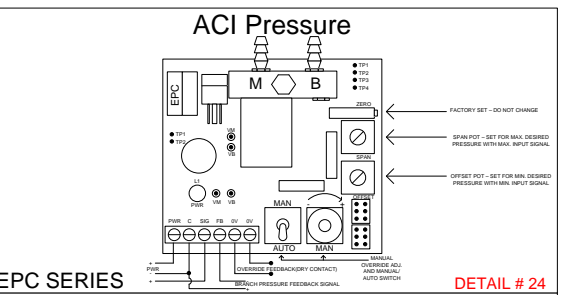
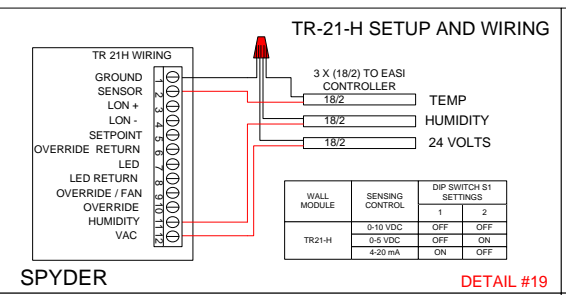
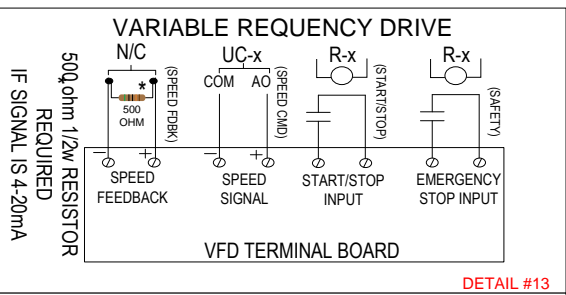
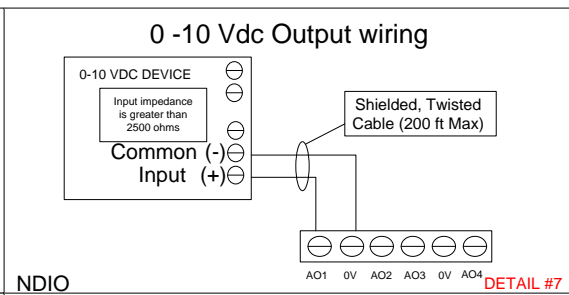
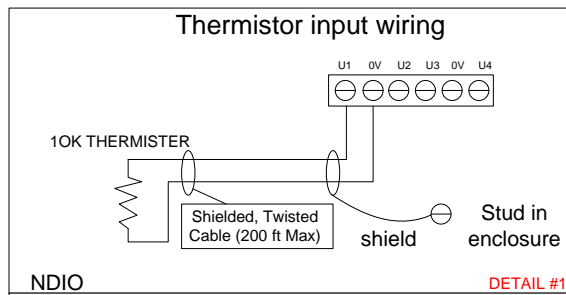
* VALVES AND ACTUATORS SUPPLIED BY OTHERS
 * RELAYS AND CT'S ARE ETR


CONTROLLER : NRIO 16 PT BOARD 1			DDC POINT SCHEDULE			SYSTEM / UNIT: FIELD HEATING B		
TERMINAL	TYPE	POINT DESCRIPTION	TAG	WIRE #	CABLE	RANGE	DETAIL	COMMENTS
UI-1	ANALOG	DIFFEENTIAL PRESSURE	DPT-1	1-1				
UI-2	ANALOG	COMMON HEADER RET TEMP	TS-HDR-R	1-2	18-2	10K@77DEG	#1	
UI-3	ANALOG	COMMON HEADER SUP TEMP	TS-HDR-S	1-3	18-2	10K@77DEG	#1	
UI-4	ANALOG	ZONE 5 SUPPLY TEMP	TS-Z5S	1-4	18-2	10K@77DEG	#1	
UI-5	ANALOG	ZONE 5 RETURN TEMP	TS-Z5R	1-5	18-2	10K@77DEG	#1	
UI-6	ANALOG	ZONE 6 SUPPLY TEMP	TS-Z6S	1-6	18-2	10K@77DEG	#1	
UI-7	ANALOG	ZONE 6 RETURN TEMP	TS-Z6R	1-7	18-2	10K@77DEG	#1	
UI-8	ANALOG	FIELD TEMPERATURE	FLD-1	1-8	18-2	10K@77DEG	#1	
DO-1	DIGITAL	ZONE 6 PUMP 1 CMD	R11	1-9	18-2	CONTACT	#4	
DO-2	DIGITAL	ZONE 6 PUMP 2 CMD	R12	1-10	18-2	CONTACT	#4	
DO-3	DIGITAL	HEADER PUMP 1 CMD	R13	1-11	18-2	CONTACT	#4	ETR
DO-4	DIGITAL	HEADER PUMP 2 CMD	R14	1-12	18-2	CONTACT	#4	ETR
AO-1	ANALOG			1-13				
AO-2	ANALOG			1-14				
AO-3	ANALOG			1-15				
AO-4	ANALOG			1-16				

CONTROLLER : NRIO 16 PT BOARD 2			DDC POINT SCHEDULE			SYSTEM / UNIT: FIELD HEATING C		
TERMINAL	TYPE	POINT DESCRIPTION	TAG	WIRE #	CABLE	RANGE	DETAIL	COMMENTS
UI-1	ANALOG	ZONE 1 SUPPLY TEMP	TS-Z1S	2-1	18-2	10K@77DEG	#1	
UI-2	ANALOG	ZONE 1 RETURN TEMP	TS-Z1R	2-2	18-2	10K@77DEG	#1	
UI-3	ANALOG	ZONE 2 SUPPLY TEMP	TS-Z2S	2-3	18-2	10K@77DEG	#1	
UI-4	ANALOG	ZONE 2 RETURN TEMP	TS-Z2R	2-4	18-2	10K@77DEG	#1	
UI-5	ANALOG	ZONE 3 SUPPLY TEMP	TS-Z3S	2-5	18-2	10K@77DEG	#1	
UI-6	ANALOG	ZONE 3 RETURN TEMP	TS-Z3R	2-6	18-2	10K@77DEG	#1	
UI-7	ANALOG	ZONE 4 SUPPLY TEMP	TS-Z4S	2-7	18-2	10K@77DEG	#1	
UI-8	ANALOG	ZONE 4 RETURN TEMP	TS-Z4R	2-8	18-2	10K@77DEG	#1	
Do-1	DIGITAL			2-9				
Do-2	DIGITAL			2-10				
Do-3	DIGITAL			2-11				
DO-4	DIGITAL			2-12				
AO-1	ANALOG			2-13				
AO-2	ANALOG			2-14				
AO-3	ANALOG			2-15				
AO-4	ANALOG			2-16				

TITLE :		POINTS			3410 MOUNTAIN ROAD PASADENA, MD 21122 (410) 437-3103 office (410) 437-3136 fax	
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CONNECTIONS



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