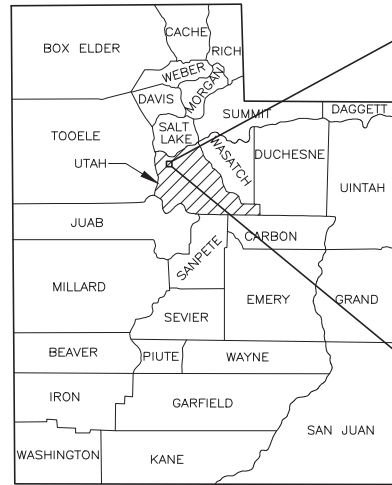




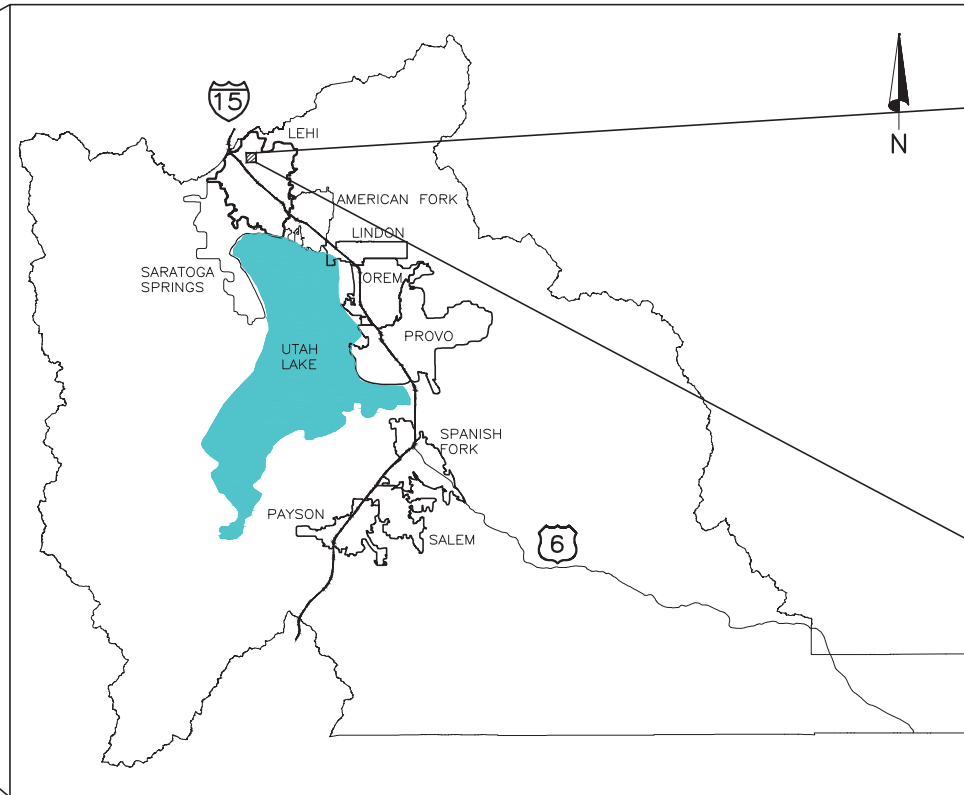
SKYE DEVELOPMENT WATER SYSTEM

LOW HILLS DW & PI PUMP STATION

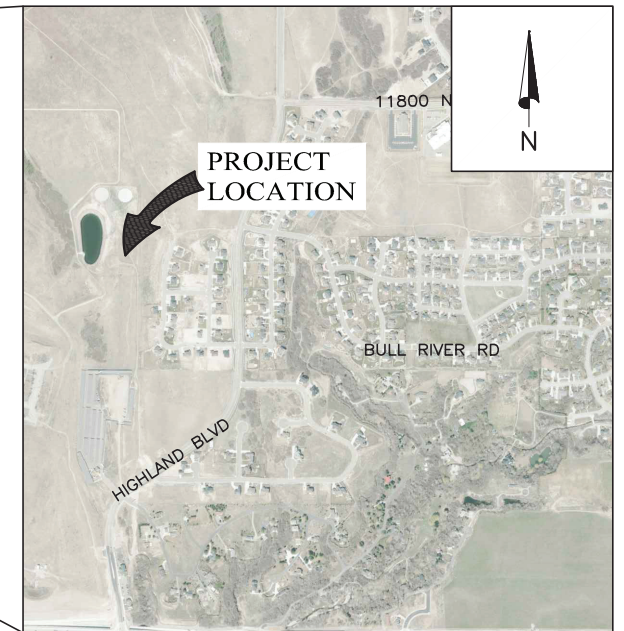
MAY 2024
READY FOR BID



STATE OF UTAH



UTAH COUNTY



PROJECT LOCATION

HANSEN, ALLEN & LUCE DESIGN TEAM

MICHAEL M. CHAMBERS, P.E. – PRINCIPLE IN CHARGE
 GREG S. THOMAS, P.E. – PROJECT MANAGER
 ZACHARY C. STEELE, P.E. – PROJECT ENGINEER

HENNING UNGERMANN, P.E. – STRUCTURAL ENGINEER
 (CALDER RICHARDS CONSULTING ENGINEERS)

BOB HILLYER, P.E. – ELECTRICAL
 (HEATH ENGINEERING COMPANY)

ROBERT J. KESLER, P.E. – HVAC
 (HEATH ENGINEERING COMPANY)

JAY MCQUIVEY, P.E. – GEOTECHNICAL ENGINEER
 (AGEC)

DR HORTON

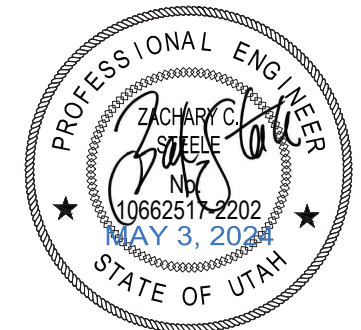
SCOTT BISHOP
 12351 GATEWAY PARK PLACE
 SUITE D-100
 DRAPER, UTAH 84020
 (385) 249-0804

CITY OF LEHI

GREG ALLRED – WATER DEPARTMENT MANAGER
 2538 NORTH 300 WEST
 LEHI, UTAH 84043
 (385) 201-1700



859 W. SOUTH JORDAN PKWY.
 STE. 200
 SOUTH JORDAN, UTAH 84095
 (801) 566-5599



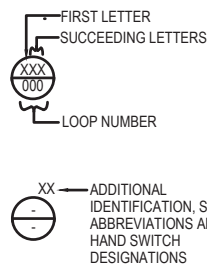
FILE NAME: PROJECTS\432 - DR. HORTON\07.100 - SKYE DEVELOPMENT WATER SYSTEM\CAD\LOW HILL PS\G-1 COVER.DWG
 FILE DATE: 5.2.2024 08:48:17 (DD)

P&ID INTERFACE SYMBOLS

NOTE:
REFER TO ISA INSTRUMENT IDENTIFICATION TABLE FOR DEFINITION OF LETTERS BBB INSIDE THE BUBBLES. CCC REPRESENTS LOOP ID (IF USED). SEE ABBREVIATIONS LIST FOR SUPERSCRIPIT AAA.

AAA PILOT LIGHT	DISCRETE IN
X= LENS COLOR	DISCRETE OUT
R= RED, G= GREEN, A= AMBER, B= BLUE, W= WHITE	ANALOG IN
BBB OR INSTRUMENT	ANALOG OUT
CCC PANEL DEVICE	PULSE INPUT
AAA DEVICE MOUNTED IN SUBPANEL	INTERLOCK DEVICE OR RELAY, X= NOTE REF.
BBB PLC OR REMOTE I/O TERMINAL	DUAL CHANNEL CURRENT ISOLATOR
CCC HMI OR OIT FUNCTION	

TAG NUMBERS AND ADDITIONAL DESIGNATIONS



ABBREVIATIONS

A AMPERE OR AIR	NADH NICOTINAMIDE ADENINE DINUCLEOTIDE
AC ALTERNATING CURRENT	NIA NOT IN AUTO
AFD ADJUSTABLE FREQUENCY DRIVE	NPW NON-POTABLE WATER
AI ANALOG INPUT	NS NITROGEN SUPPLY
AIC AMPS INTERRUPTING CAPACITY	NTU TURBIDITY
AM AUTO-MANUAL	OC OPEN/CLOSE
ARV AIR RELIEF VALVE	OIT OPERATOR INTERFACE TERMINAL
AO ANALOG OUTPUT	OL OVERLOAD
AS AIR SUPPLY	ORP OXYGEN REDUCTION POTENTIAL
ATS AUTOMATIC TRANSFER SWITCH	OTA OVER TORQUE ALARM
AUTO AUTOMATIC	OTW OVER TORQUE WARNING
BFP BELT FILTER PRESS	P PRESSURE
BR BRINE SOLUTION	PD PLANT DRAIN
BW BACKWASH	PER PERMISSIVE
BWL BOTTOM WATER LEVEL	PLC PROGRAMMABLE LOGIC CONTROLLER
CB CIRCUIT BREAKER	PNL PANEL
CD CYCLONE DRAIN	PO PULSE OUTPUT
CL2 CHLORINE (TYPICAL: USE STANDARD CHEMICAL ELEMENT ABBREVIATION)	POS POSITION
CNDT CONDUCTIVITY	POT POTENTIOMETER
CP-X CONTROL PANEL NO. X	PPH POUNDS PER HOUR
CPM CUSTOMER POWER MONITORING UNIT	PPM PARTS PER MILLION
CON CONTACTOR	PR PAIR
CSI CYCLONE SEPARATOR INFLUENT	PRES PRESSURE
CU COPPER, BARE	PRV PRESSURE REDUCING VALVE
CV CONTROL VALVE	PSI POUNDS PER SQUARE INCH
CW CYCLONE WASTE	PV PROCESS VARIABLE
	PWR POWER
DC DIRECT CURRENT	RAS RETURN ACTIVATED SLUDGE
DCS DISTRIBUTED CONTROL SYSTEM	RAW RAW WATER
DI DISCRETE INPUT	REM REMOTE
DO DISCRETE OUTPUT OR DISSOLVED OXYGEN	RF RADIO FREQUENCY
DP DIFFERENTIAL PRESSURE	RIO REMOTE INPUT/OUTPUT
DSW DRUM SCREEN WASTE	RS RAW SEWAGE, RUNNING STATUS
DWG DRAWING	RSP RAW SEWAGE PUMP
	RST RESET
E VOLTAGE	RTU REMOTE TELEMETRY UNIT
ETM ELAPSED TIME METER	RU (FAST SPEED)
ETMf ELAPSED TIME METER (FAST SPEED)	RU (SLOW SPEED)
ETMs ELAPSED TIME METER (SLOW SPEED)	SB SLUDGE BLANKET
EOL ELECTRONIC OVERLOAD	SCC SCUM SECONDARY CLARIFIER
ES EMERGENCY STOP	SE SEEDY EFFLUENT
EXIST, (E) EXISTING	SEQ SERVICE ENTRANCE EQUIPMENT
	SES SERVICE ENTRANCE SECTION
FA FOUL AIR	SHC SODIUM HYPOCHLORITE
FC FAIL CLOSED	SLC SINGLE LOOP CONTROLLER
FE FINAL EFFLUENT	SLG SLUDGE GATE
FLT FILTER	SO2 SULFUR DIOXIDE
FMR FEEDER MANAGEMENT RELAY	SOV SOLENOID OPERATED VALVE
FR FORWARD-REVERSE	SP SET POINT
FVNR FULL VOLTAGE NON-REVERSING FINISHED WATER	SPC SET POINT CONTROLLER
	SPD SPEED
GAL GALLONS	SPR SPARE
GCP GENERATOR CONTROL PANEL	SSS SOLID STATE STARTER (SOFT START)
GND GROUND	
GPD GALLONS PER DAY	T/M TEMPERATURE AND/OR MOISTURE
GPH GALLONS PER HOUR	TEMP TEMPERATURE
GPM GALLONS PER MINUTE	TSS TOTAL SUSPENDED SOLIDS
	TWL TOP WATER LEVEL
H, HI HIGH	Tu TURBIDITY
H2S HYDROGEN SULFIDE	UG UNDERGROUND
HMI HUMAN MACHINE INTERFACE	UW UTILITY WATER
	V VOLT
I CURRENT	V* VENDOR EQUIPMENT
ICR INTERMITTENT CYCLE	VFD VARIABLE FREQUENCY DRIVE
IO REACTOR INPUT/OUTPUT	VTP VERTICAL TURBINE PUMP
IOE INTERNAL - OFF - EXTERNAL	VIB VIBRATION
IS INTERCHANGE SLUDGE	
	W WATT, WIRE
JB JUNCTION BOX	WAS WASTE ACTIVATED SLUDGE
	WS WASTE SLUDGE
L, LO LOW	
LAN LOCAL AREA NETWORK	
LC LOOP CONTROLLER	
LCP LOCAL CONTROL PANEL	
LEL LOWER EXPLOSIVE LIMIT	
M MOTOR	ES EMERGENCY STOP
MA MANUAL/AUTO, MILLIAMPS	HOA HAND - OFF - AUTO
MC MANUFACTURER CABLE	HOR HAND - OFF - REMOTE
MCC MOTOR CONTROL CENTER	HORA HAND - OFF - REMOTE - AUTO
MCP MOTOR CIRCUIT PROTECTOR	JOA JOG - OFF - AUTO
	JR JOG REVERSE
MFR(S) MAIN CONTROL INSTRUMENT PANEL MANUFACTURER(S)	LOAR LOWER - OFF - AUTO - RAISE
MGD MILLION GALLONS PER DAY	LOS LOCAL - OFF - REMOTE
MGL MILLIGRAMS PER LITER	LR LOCKOUT STOP
MH MANHOLE	LR LOCAL - REMOTE
ML MIXED LIQUOR	OC OPEN - CLOSE
MLR MIXED LIQUOR RECYCLE	OCA OPEN - CLOSE - AUTO
MLSS MIXED LIQUOR SUSPENDED SOLIDS	OO ON - OFF
MO MOISTURE	OOA ON - OFF - AUTO
MOD MODULATED	OSC OPEN - STOP - CLOSE
MOG MOTOR OPERATED GATE	SS START/STOP (MAINTAINED)
MS MOISTURE SWITCH	USD UP/STOP/DOWN
MTU MASTER TELEMETRY UNIT	

VALVE SYMBOLS

	GATE VALVE
	MOTOR OPERATED GATE VALVE
	ALTITUDE VALVE
	KNIFE GATE VALVE
	BUTTERFLY VALVE
	MOTOR OPERATED BUTTERFLY VALVE
	GLOBE VALVE
	BALL VALVE
	VEE-BALL VALVE
	PLUG VALVE
	MOTOR OPERATED PLUG VALVE
	SEAT PORT ECCENTRIC PLUG VALVE
	MOTOR OPERATED ECCENTRIC PLUG VALVE
	DIAPHRAGM VALVE
	PINCH VALVE
	MOTOR OPERATED PINCH VALVE
	NEEDLE VALVE
	SWING CHECK VALVE
	SWING CHECK VALVE WITH MANUAL GATE
	SOLENOID VALVE
	ALTITUDE VALVE
	DOUBLE LEAF CHECK VALVE
	BACKFLOW PREVENTER (REDUCED PRESSURE ZONE TYPE)
	BALL CHECK VALVE
	MULTI-PORT VALVES (BALL VALVE SHOWN, FOR OTHER VALVE TYPES, APPROPRIATE VALVE SYMBOL SHOWN.) ARROWS INDICATE FLOW PATTERN. SEAT PORTS ARE IMPLIED BY INDICATED FLOW PATTERN.
	TELESCOPING VALVE
	SAMPLE TAP
	MUD VALVE
	PRESSURE RELIEF VALVE
	AIR AND/OR VACUUM RELEASE VALVE
	REGULATED SIDE PRESSURE CONTROL VALVE
	AIR RELEASE VALVE (ARV) OR COMBINATION AIR-VACUUM RELIEF VALVE (CAV)
	RUPTURE DISK
	MOTOR OPERATED SLEEVE VALVE
	SURGE ANTICIPATOR VALVE
	IPS CORP. STOP
	PVC DIFFUSER W/ IPS CORP. STOP

MISCELLANEOUS MECHANICAL SYMBOLS

	FLOCCULATOR OR SUBMERSIBLE MIXER		MOTOR		FILTER		INLET SILENCER AND FILTER
	AERATOR		DIFFUSERS		CHLORINE TANK		SILENCER
	EXHAUST FAN						

P&ID LINE TYPES

	MAJOR PROCESS PIPING OR FLOW CHANNEL
	SECONDARY PROCESS PIPING
	MISCELLANEOUS PIPING
	EXISTING OR FUTURE MAJOR PROCESS PIPING OR FLOW CHANNEL
	EXISTING OR FUTURE SECONDARY PROCESS PIPING
	EXISTING OR FUTURE MISCELLANEOUS PIPING
	PROCESS LINES CROSSING (NOT CONNECTED)
	FLOW ARROW FOR PROCESS PIPING
	EXISTING PIPING OR EQUIPMENT OR FUTURE PIPING OR EQUIPMENT
	PROCESS OR SIGNAL LINE GOING TO ANOTHER SHEET
	PROCESS OR SIGNAL LINE FROM ANOTHER SHEET (MATCH LETTERS)
	HYDRAULIC SIGNAL
	PNEUMATIC SIGNAL
	DISCRETE SIGNAL
	ANALOG SIGNAL
	PULSE SIGNAL
	INTERNAL SYSTEM SIGNAL LINK (SOFTWARE OR DATA LINK)
	ELECTRICAL DIRECTION ARROW
	SIGNAL CONNECTION POINT
	PACKAGED SYSTEMS
	RTD SIGNAL

PUMP AND COMPRESSOR SYMBOLS

	CENTRIFUGAL PUMP (DRY PIT)		PISTON PUMP
	CENTRIFUGAL WET PIT PUMP		GEAR PUMP OR BLOWER
	PERISTALTIC CHEMICAL FEED PUMP		PROGRESSING CAVITY PUMP
	DIAPHRAGM PUMP		COMPRESSOR (CENTRIFUGAL)
	GEAR PUMP OR BLOWER (POSITIVE DISPLACEMENT)		COMPRESSOR (PISTON)
	METERING PUMP WITH MANUAL STROKE CONTROL		ROTARY LOBE PUMP
	PROGRESSIVE CAVITY PUMP		BLOWER OR FAN (CENTRIFUGAL)
	AIR OPERATED DOUBLE DIAPHRAGM PUMP		VERTICAL TURBINE PUMP

NOTE: XX-AS ADJUSTABLE SPEED
CS-1 CONSTANT SPEED (SINGLE SPEED)
CS-2 CONSTANT SPEED (TWO SPEED)

PROCESS DEVICE SYMBOLS

	SIGHT GLASS		PRESSURE REGULATOR		DIAPHRAGM
	CARTRIDGE FILTER		AIR FILTER		DIAPHRAGM WITH POSITIONER
	STRAINER		PULSATION DAMPENERS		CL2 FLOW METER
	DRAIN		WATER LEVEL		SAMPLER
	CAP OR PLUG		QUICK DISC COUPLING		EJECTOR
	BLIND FLANGE		EXPANSION JOINT		WEIGHT SCALE

GATE SYMBOLS

	SLIDE GATE		BUTTERFLY GATE
	SLUICE GATE		FLAP GATE
	WEIR GATE (DOWNWARD OPENING)		STOP GATE

ACTUATOR SYMBOLS

	PNEUMATIC		ELECTRIC WITH POSITIONER
	PNEUMATIC WITH POSITIONER		ELECTRIC
	HYDRAULIC		SOLENOID

MISCELLANEOUS ELECTRICAL SYMBOLS

	VOLTAGE & POWER SUPPLY PHASE(S) AS NOTED		INTRINSICALLY SAFE RELAY
	PLUG		CONVERTER
	SMOKE DETECTOR		DIESEL GENERATOR
	HEATER		CONDENSER

NOTE: ON LOSS OF PRIMARY POWER (PNEUMATIC OR ELECTRICAL)
FO = FAIL OPEN
FC = FAIL CLOSED
FLP = FAIL LAST POSITION

PRIMARY ELEMENT SYMBOLS

	PARSHALL FLUME		DO SENSOR		BEACON
	ORIFICE PLATE		ORP SENSOR		STOP INDICATING LIGHT
	FLOW TUBE		pH SENSOR		INSERTION TYPE MASS FLOW METER
	ROTAMETER		DO ANALYZER		MASS FLOW METER ANNUBAR TYPE
	ULTRASONIC FLOWMETER		ORP ANALYZER		MASS FLOW METER
	ELECTROMAGNETIC FLOWMETER		pH ANALYZER		FLOAT SWITCH
	PROPELLER METER		HAND SWITCH		ULTRASONIC OR RADAR LEVEL TRANSDUCER
	LEVEL (BUBBLE TUBE)		PRESSURE SENSING DIAPHRAGM SEAL, DISK TYPE		
	LEVEL (CONDUCTIVE)				
	DENSITY METER				
	PRESSURE SENSING ANNULAR RING TYPE SEAL				
	STATIC MIXER				

HAND SWITCH DESIGNATIONS

ES EMERGENCY STOP	HOA HAND - OFF - AUTO
HOR HAND - OFF - REMOTE	HORA HAND - OFF - REMOTE - AUTO
JOA JOG - OFF - AUTO	JR JOG REVERSE
LOAR LOWER - OFF - AUTO - RAISE	LOS LOCAL - OFF - REMOTE
LR LOCKOUT STOP	LR LOCAL - REMOTE
OC OPEN - CLOSE	OCA OPEN - CLOSE - AUTO
OO ON - OFF	OOA ON - OFF - AUTO
OSC OPEN - STOP - CLOSE	SS START/STOP (MAINTAINED)
USD UP/STOP/DOWN	

DESIGNED	RJH	3	
DRAFTED	KGM	2	
CHECKED	RJH	1	
DATE	May, 2024	NO.	DATE

REVISIONS	NO.	DATE	BY	APVD.
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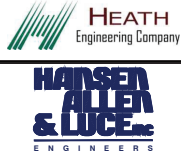
SCALE
NONE



DR HORTON
12351 S GATEWAY PARK PLACE
DRAPER, UTAH 84020

SKYE - LOW HILLS DW & PI PUMP STATION
ELECTRICAL
P&ID SYMBOL LEGEND

SHEET
1-1.1
432.07.100



I:\23132\01 - DWG\ELECTRICAL\23132-I-1.2.dwg, 5/3/2024 3:18:35 PM, Heath Engineering co/GJE

5/3/2024 3:18 PM - I:\23132\01 - DWG\ELECTRICAL\23132-I-1.2.DWG - GORDAN EPPERSON

ISA INSTRUMENT IDENTIFICATION TABLE

	FIRST LETTERS		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYZER		ALARM		AUTO
B	BURNER, COMBUSTION				
C	CONDUCTIVITY			CONTROL	CLOSED
D	DENSITY	DIFFERENTIAL			
E	VOLTAGE		ELEMENT		
F	FLOW	RATIO			
G	GAUGE		GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT		INDICATE		
J	POWER	SCAN			
K	TIME OR TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	MOTION OR MOISTURE				MIDDLE
N	INTRUSION				NORMAL
O	TORQUE		ORIFICE, RESTRICTION		OPEN
P	PRESSURE		POINT CONNECTION		STOP
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD OR PRINT	RESET	RUN OR REMOTE
S	SPEED OR FREQUENCY	SAFETY		SWITCH	START
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION			VALVE, LOUVER	
W	WEIGHT OR FORCE		WELL		
X	MOTOR	X-AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE, OR PRESENCE	Y-AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION	Z-AXIS		DRIVER, ACTUATOR, FINAL CONTROL ELEMENT	



DESIGNED	RJH	3					
DRAFTED	KGM	2					
CHECKED	RJH	1					
DATE	May, 2024	NO.	DATE	REVISIONS	BY	APVD.	

SCALE
NONE



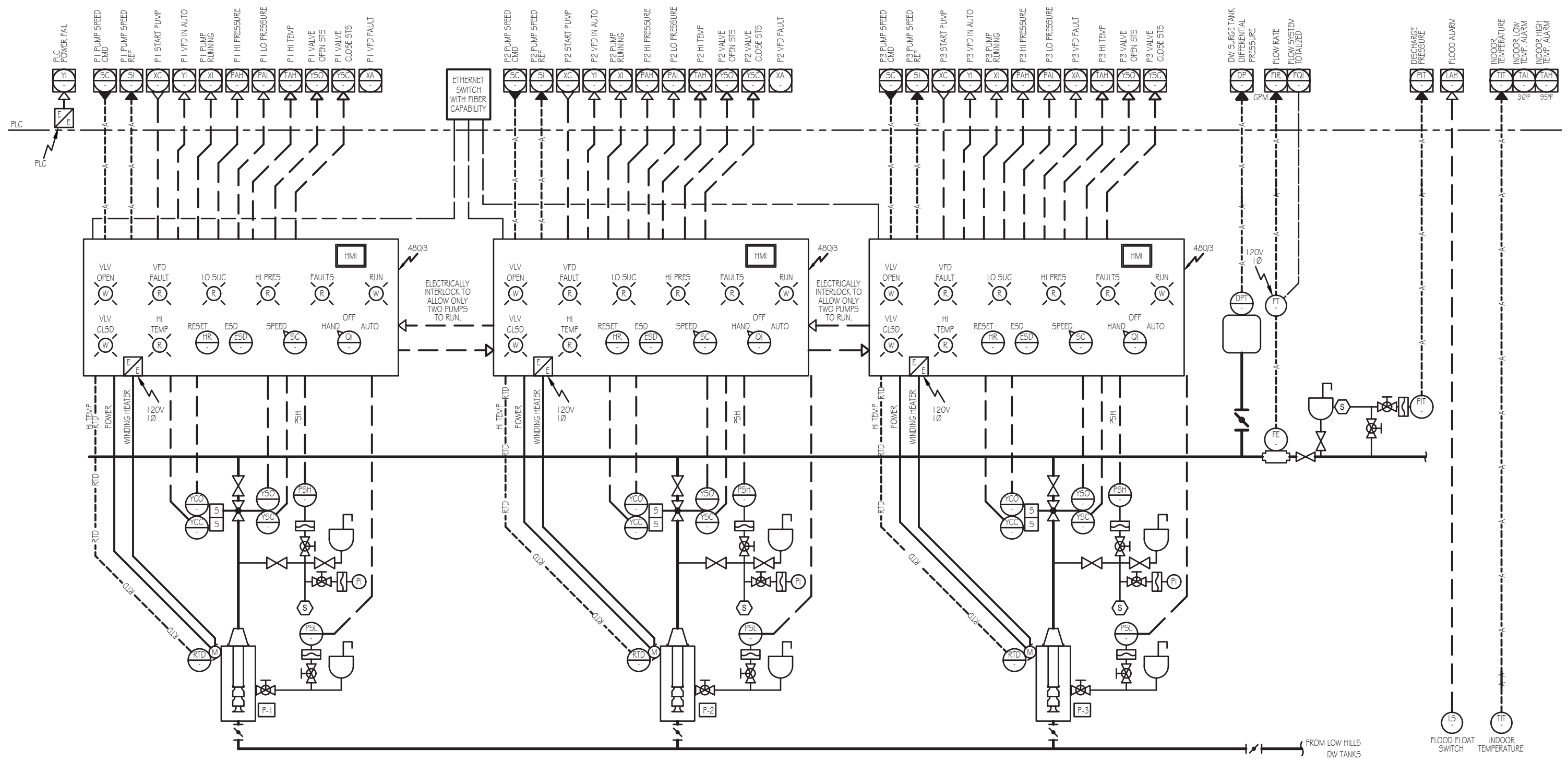
DR HORTON
12351 S GATEWAY PARK PLACE
DRAPER, UTAH 84020

SKYE – LOW HILLS DW & PI PUMP STATION
ELECTRICAL
P&ID IDENTIFICATION

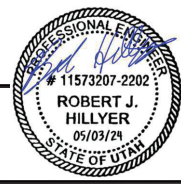
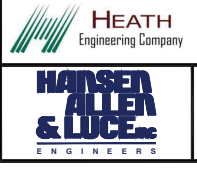
SHEET
I-1.2
432.07.100

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5/3/2024 3:18 PM - I:\23132\01 - DWG\ELECTRICAL\23132-I-6.1.DWG - GORDAN EPPERSON



1 PRESSURIZED DRINKING WATER P&ID
1-601 SCALE: NONE



DESIGNED	RJH	3	
DRAFTED	KGM	2	
CHECKED	RJH	1	
DATE	May, 2024	NO.	DATE

REVISIONS		BY	APVD.

SCALE
NONE



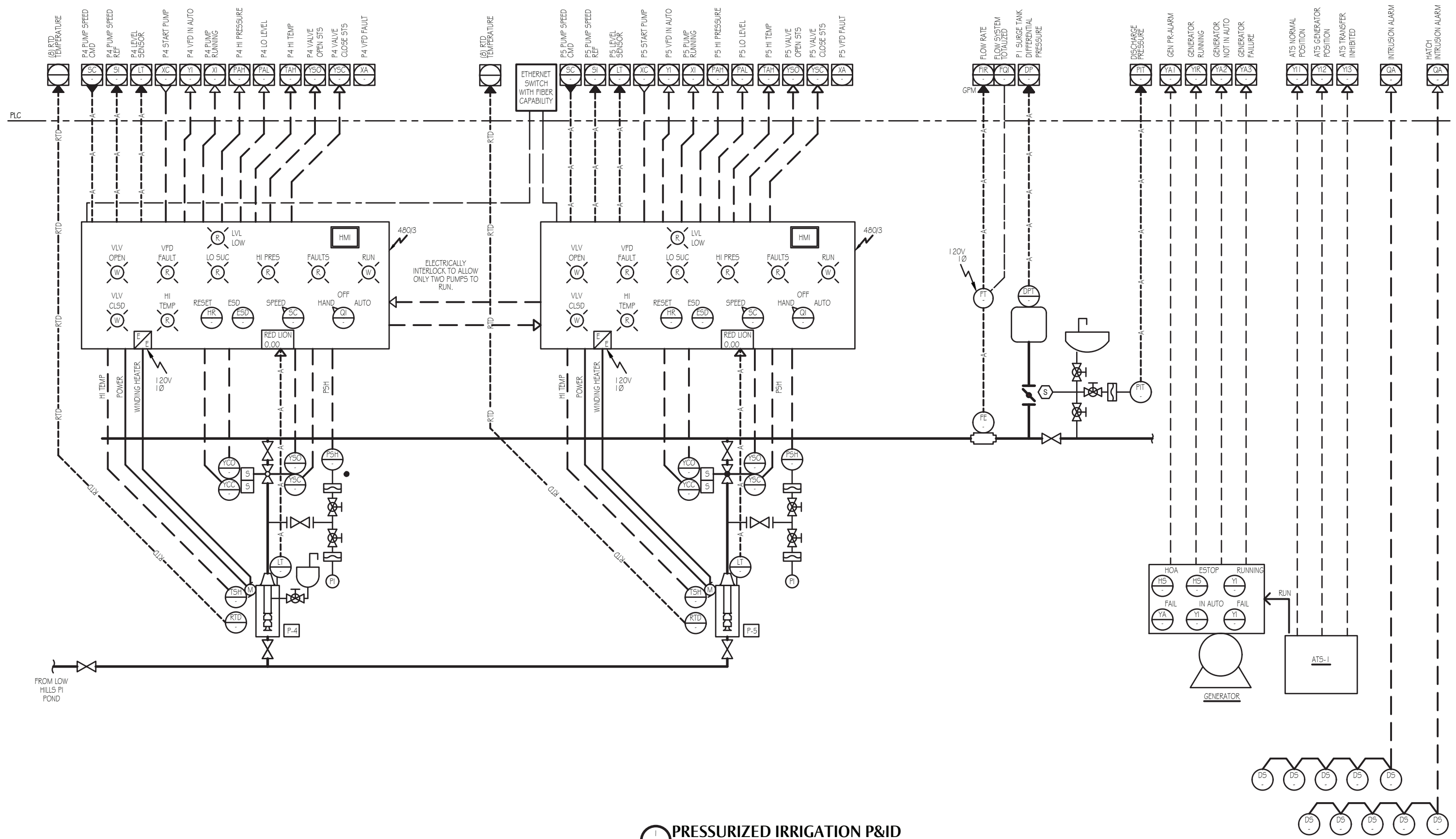
DR HORTON
12351 S GATEWAY PARK PLACE
DRAPER, UTAH 84020

SKYE - LOW HILLS DW & PI PUMP STATION
ELECTRICAL
P&ID DW ONE-LINE DIAGRAM

SHEET
1-6.1
432.07.100

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5/3/2024 3:18 PM - I:2313201 - DWG/ELECTRICAL SHEET 23132-I-6.2.DWG - GORDAN EPPERSON



1-602 PRESSURIZED IRRIGATION P&ID
SCALE: NONE

HEATH
Engineering Company

HANSEN
ALLER & LUCE
ENGINEERS

PROFESSIONAL ENGINEER
11573207-2202
ROBERT J. HILLIER
05/03/24
STATE OF UTAH

DESIGNED	RJH	3			
DRAFTED	KGM	2			
CHECKED	RJH	1			
DATE	May, 2024	NO.	NO.	DATE	BY

SCALE: NONE

D-R HORTON
America's Builder

DR HORTON
12351 S GATEWAY PARK PLACE
DRAPER, UTAH 84020

SKYE - LOW HILLS DW & PI PUMP STATION
ELECTRICAL
P&ID PI ONE-LINE DIAGRAM

SHEET
1-6.2
432.07.100