

9362.00 - DOC CBC DISTRICT 2 MARSHALLTOWN GEOTHERMAL SYSTEM REPLACEMENT

DEPARTMENT OF CORRECTIONS RESIDENTIAL FACILITY
 1401 S 17TH AVE,
 MARSHALLTOWN, IA 50158

PROJECT LOCATION



SHEET INDEX	
SHEET NUMBER	SHEET TITLE
GENERAL	
G000	COVER SHEET
MECHANICAL	
M100	SITE PLAN
M101	MECHANICAL FLOOR PLANS, DETAILS, AND SCHEDULES
M102	CONTROLS AND DETAILS
ELECTRICAL	
E101	FLOOR PLANS, DETAILS, AND SCHEDULES

A1 SITE LOCATION
 NO SCALE

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

SIGNATURE: *Timothy R. Fehr*
 NAME: TIMOTHY R. FEHR
 DATE: 2/26/24 LICENSE NUMBER: 12877
 MY LICENSE RENEWAL DATE IS: DECEMBER 31, 2025
 PAGES, SHEETS OR DIVISIONS COVERED BY THIS SEAL:
 G SHEETS, M SHEETS

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

SIGNATURE: *Jake J. Henkle*
 NAME: JAKE J. HENKLE
 DATE: 2/26/24 LICENSE NUMBER: 12668
 MY LICENSE RENEWAL DATE IS: DECEMBER 31, 2024
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 E SHEETS

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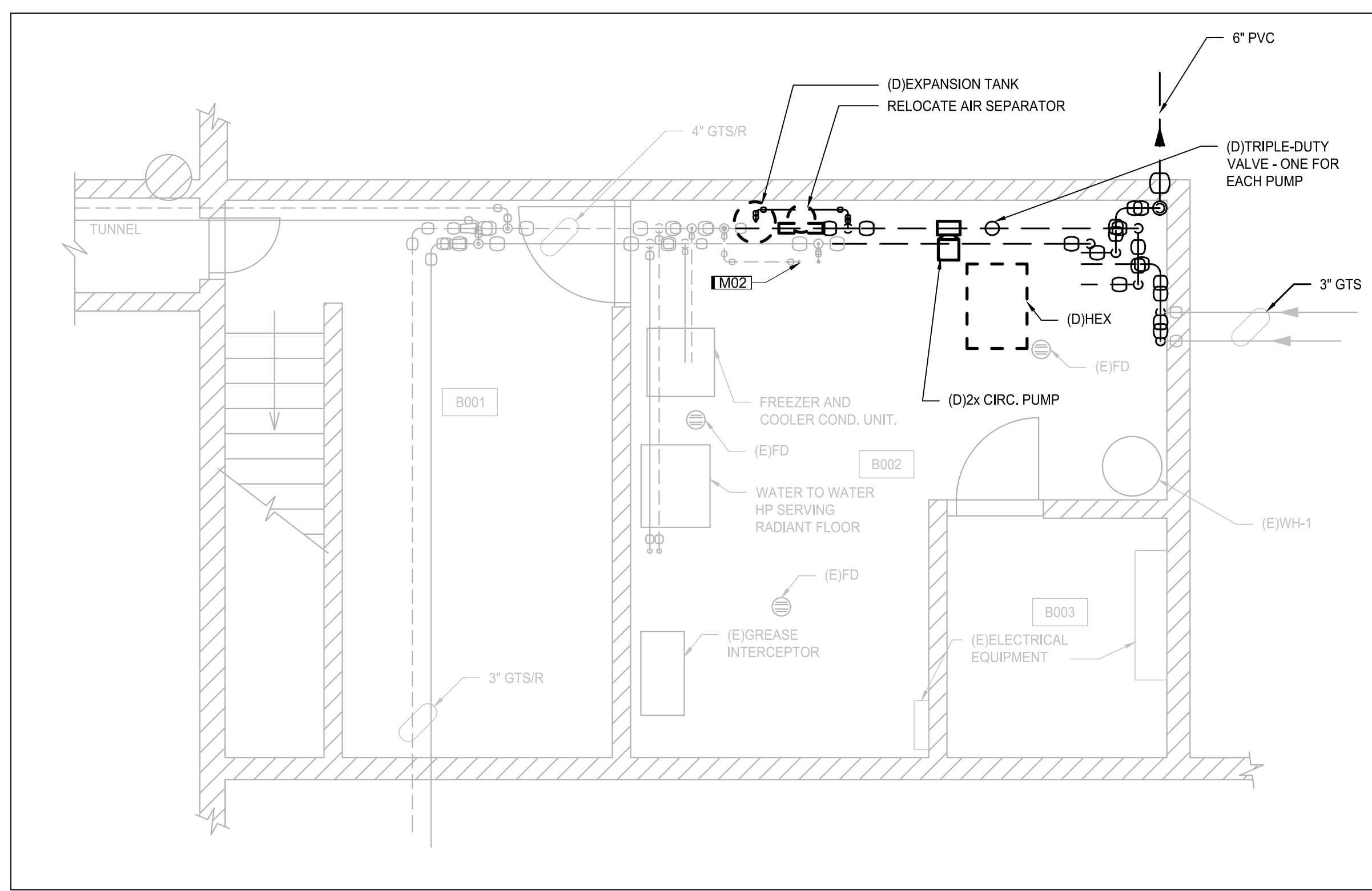
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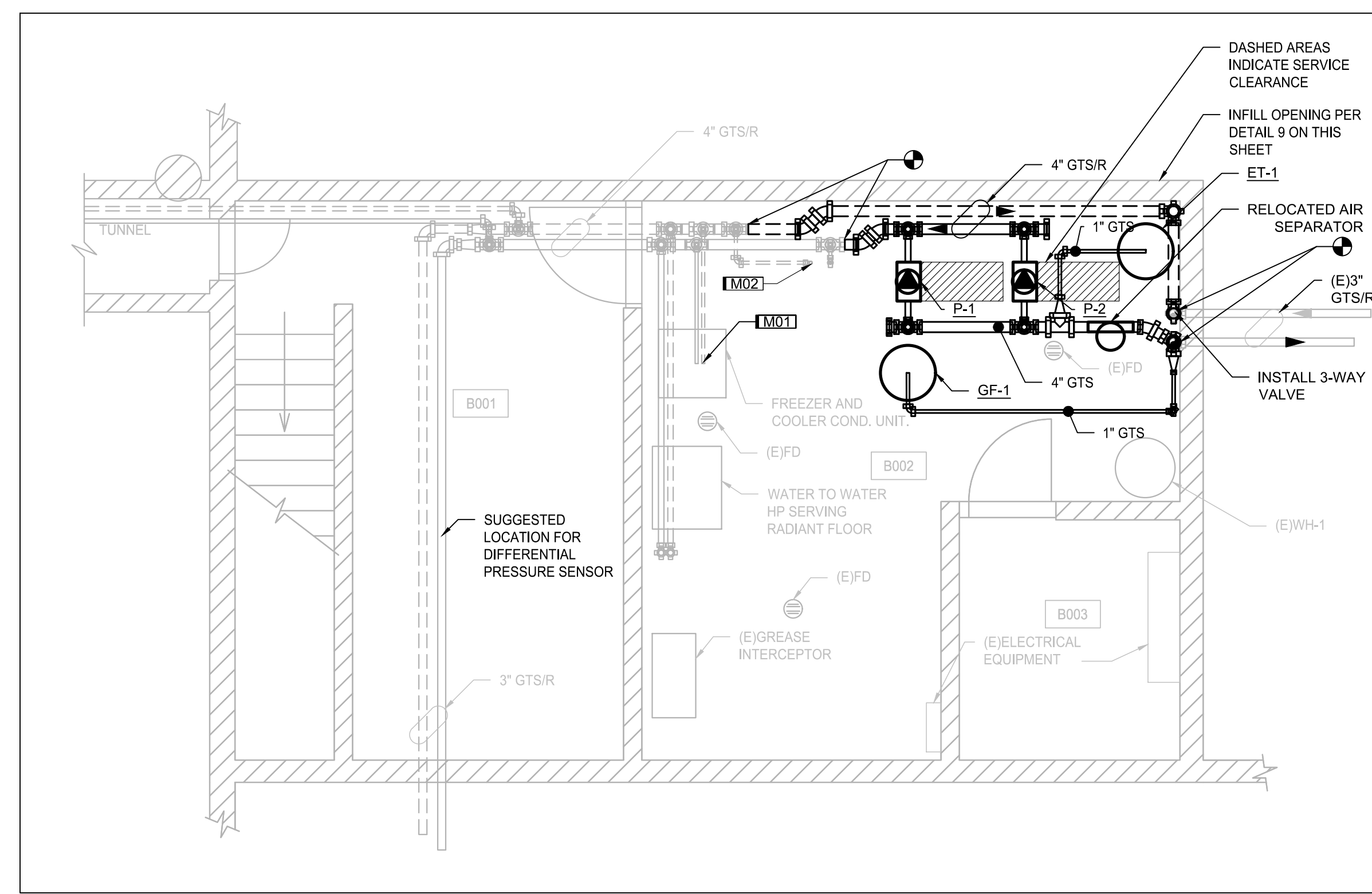
BID DOCUMENTS
 ISSUE DATE: 02/08/24

PROJECT NUMBER: 2112308630

G000



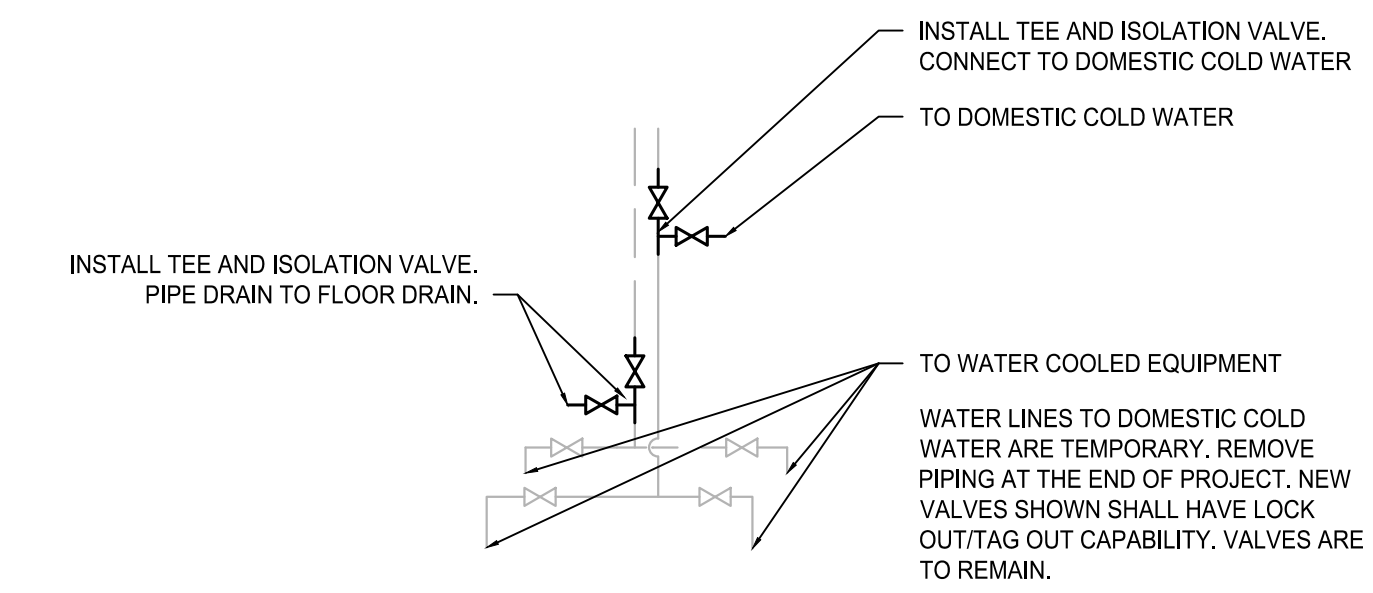
1 BASEMENT MECHANICAL DEMOLITION PLAN
1/4" = 1'-0"



2 BASEMENT MECHANICAL NEW PLAN
1/4" = 1'-0"

NOTE: CONTRACTOR TO FLUSH AND FILL PIPING WITHIN BUILDING. ESTIMATED BUILDING PIPING: 330 GALLONS. PRIOR TO FLUSHING, CONTRACTOR SHALL DISCONNECT THE FLEX HOSES FROM THE EXISTING HEAT PUMPS (APPROXIMATELY 16 TOTAL) AND CONNECT THEM TOGETHER. RECONNECT FLEX HOSES TO THE HEAT PUMPS PRIOR TO FILLING THE SYSTEM. REFER TO SPECIFICATION SECTION 23 2500 FOR CLEANING/FLUSHING/FILLING REQUIREMENTS FOR INTERIOR PIPING.

KEYNOTES	
KEY	NOTE
M01	CONNECT WATER COOLED FREEZER AND COOLER TO DOMESTIC WATER DURING CONSTRUCTION. PIPE DRAIN TO (E)FD. RECONNECT TO GEOTHERMAL SYSTEM AFTER SYSTEM IS OPERATIONAL.
M02	GTSR UP TO HEAT PUMP ON FLOOR ABOVE.



11 WATER COOLED EQUIPMENT PIPING DIAGRAM
N.T.S.

MARK	PUMP SCHEDULE		ELECTRICAL		DESIGN BASIS	REMARKS
	GPM	FT HD	V	PH		
P-1	140	180	208	3	TACO KS-2007D	1, 2, 3
P-2	140	180	208	3	TACO KS-2007D	1, 2, 3

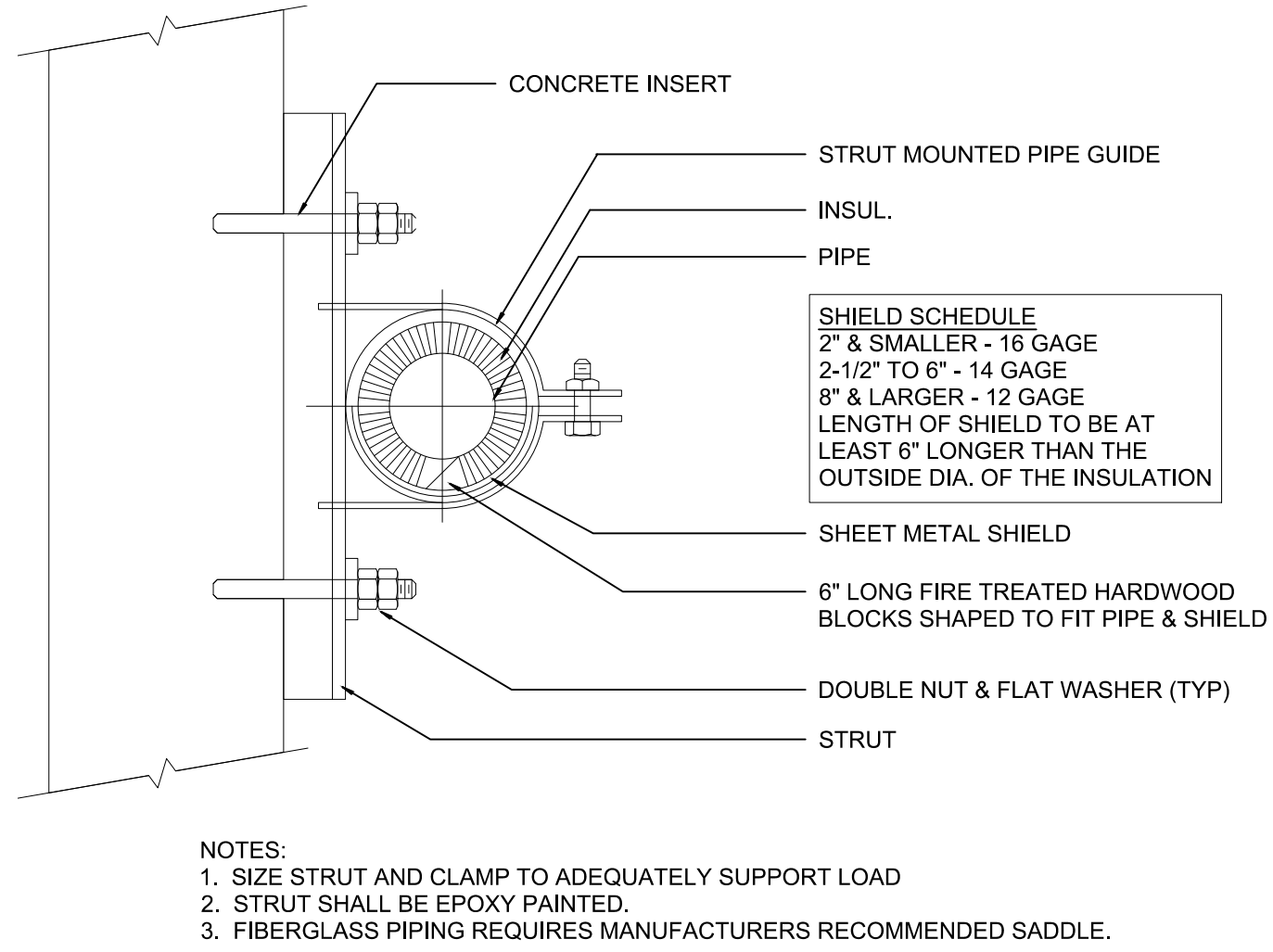
1. 30% PROPYLENE GLYCOL
2. PUMP SIZED FOR 140 GPM, BALANCE PUMP TO 125 GPM.
3. PROVIDE FLOOR MOUNTED STAND.

MARK	TYPE	EXPANSION TANK SCHEDULE		DESIGN BASIS	REMARKS
		TANK CAPACITY (GAL)	ACCEPTANCE CAPACITY (GAL)		
ET-1	BLADDER	67	34	TACO CBX254-125	1

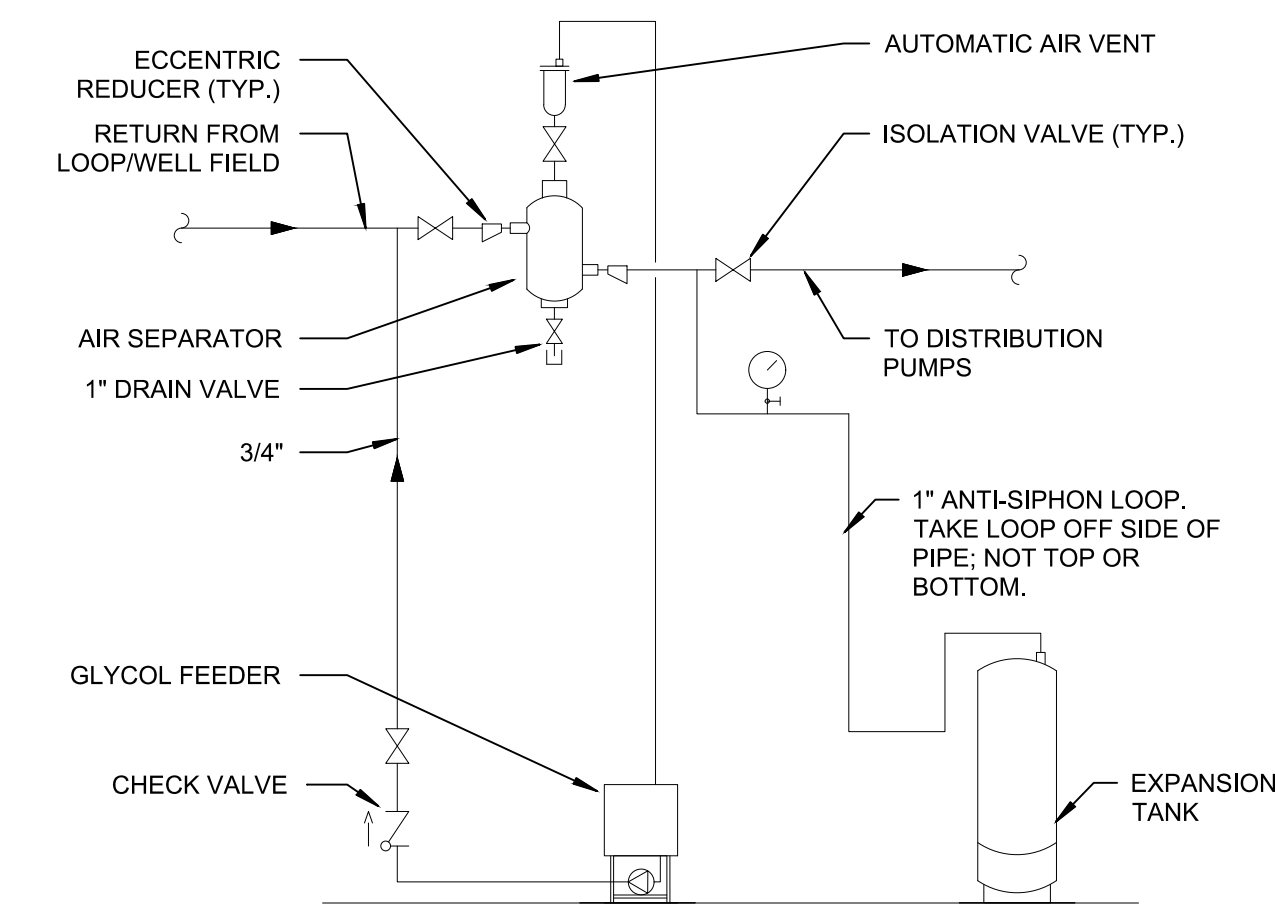
1. 30% PROPYLENE GLYCOL
2. PRECHARGED TO 12 PSI.

MARK	GLYCOL FEEDER SCHEDULE		ELECTRICAL		DESIGN BASIS	REMARKS
	CUT-IN PRESSURE (PSI)	CUT-OUT PRESSURE (PSI)	GPM	HP		
GF-1	10 - 45	20 - 60	1.5	1/3	NEPTUNE G-50-1	1

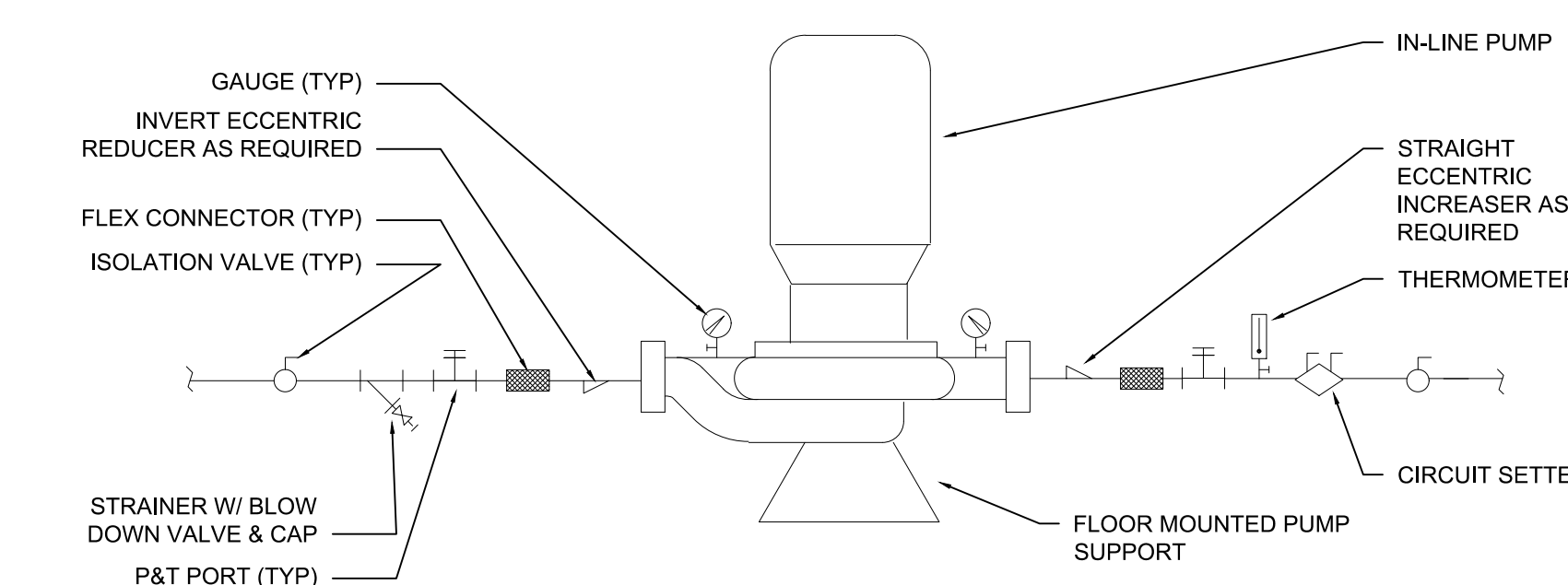
1. 30% PROPYLENE GLYCOL



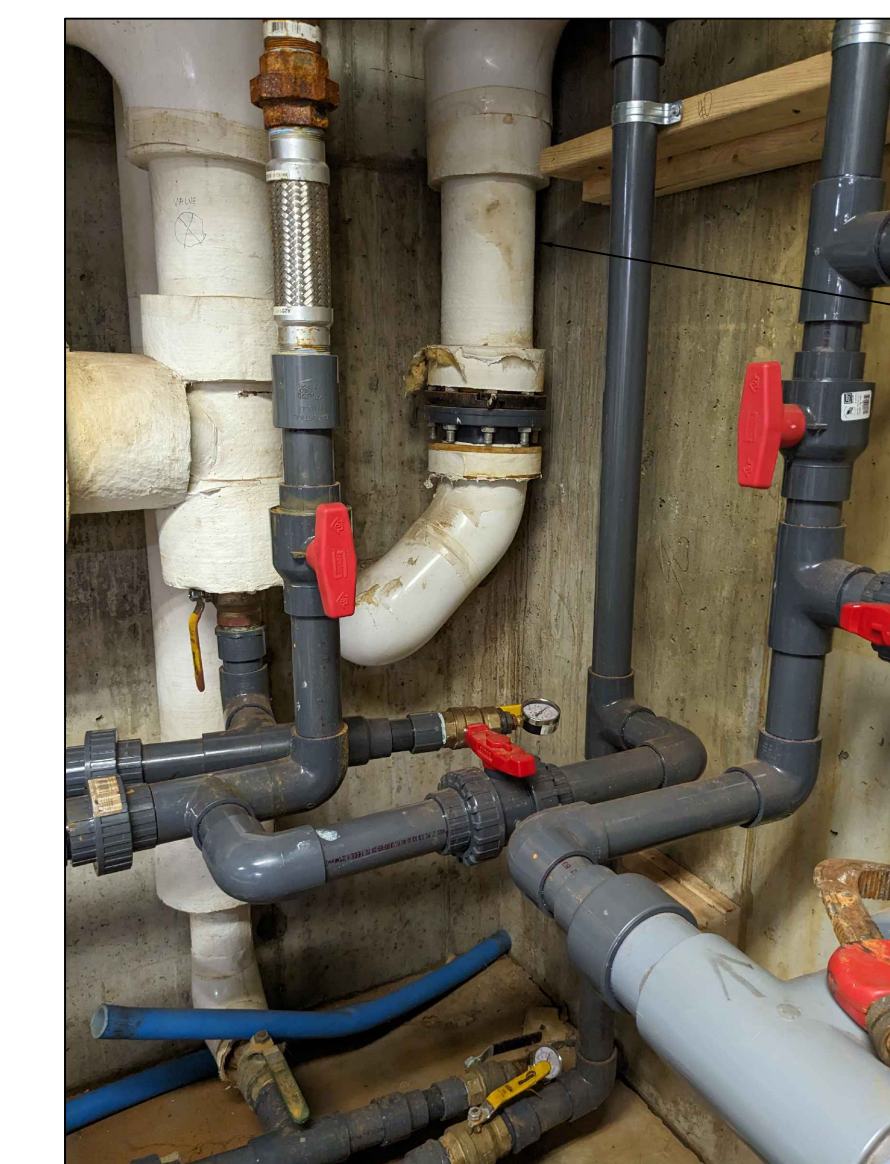
3 WALL MOUNTED TYPE HANGER DETAIL
N.T.S.



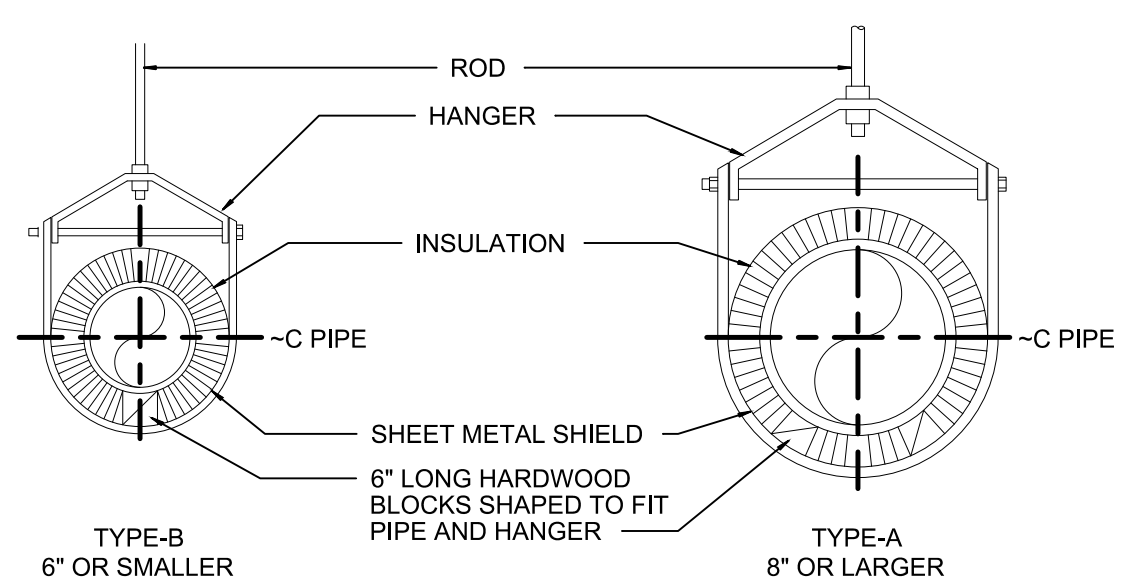
4 AIR SEPARATOR/BLADDER TYPE EXP. TANK W/ GLYCOL FEEDER DETAIL
N.T.S.



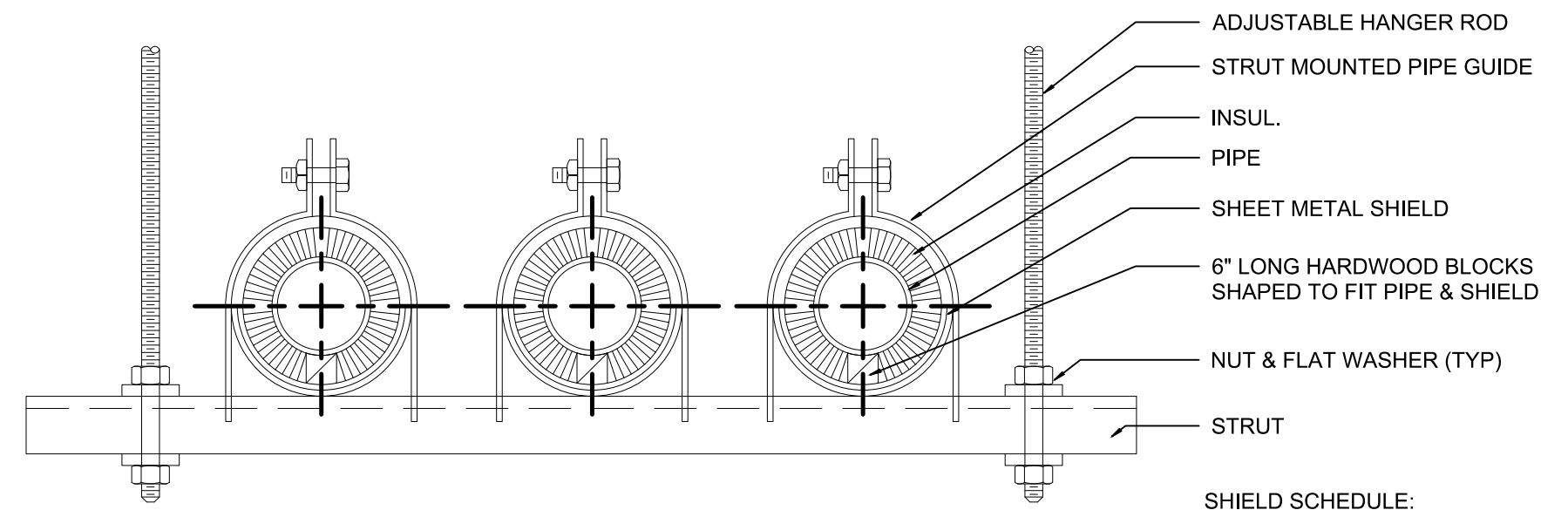
5 PIPING DIAGRAM - IN-LINE PUMP
N.T.S.



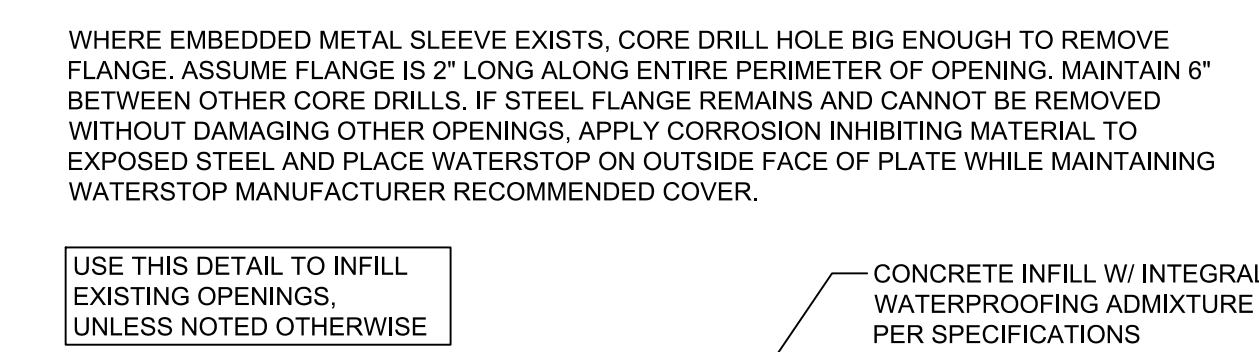
6 EXISTING GEOTHERMAL DISCHARGE PIPE
N.T.S.



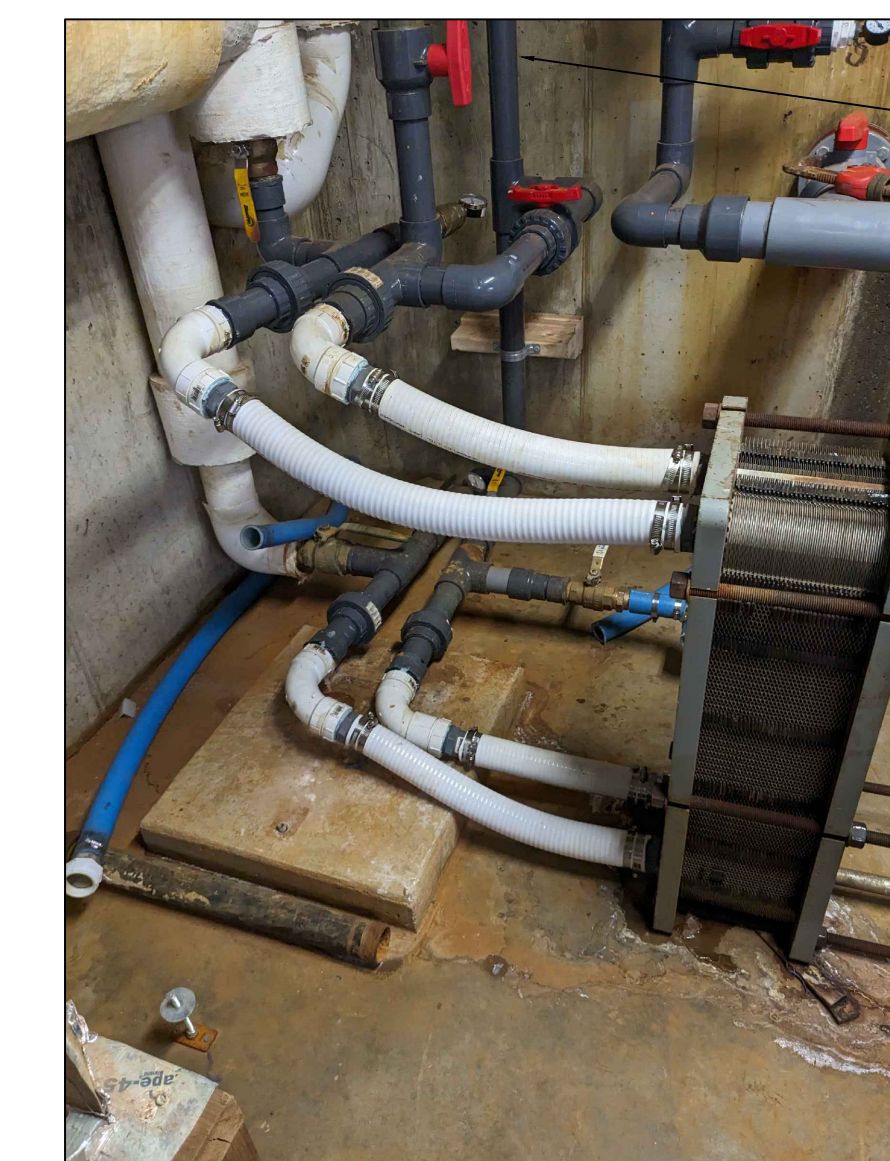
7 INSULATED PIPE HANGER DETAIL
N.T.S.



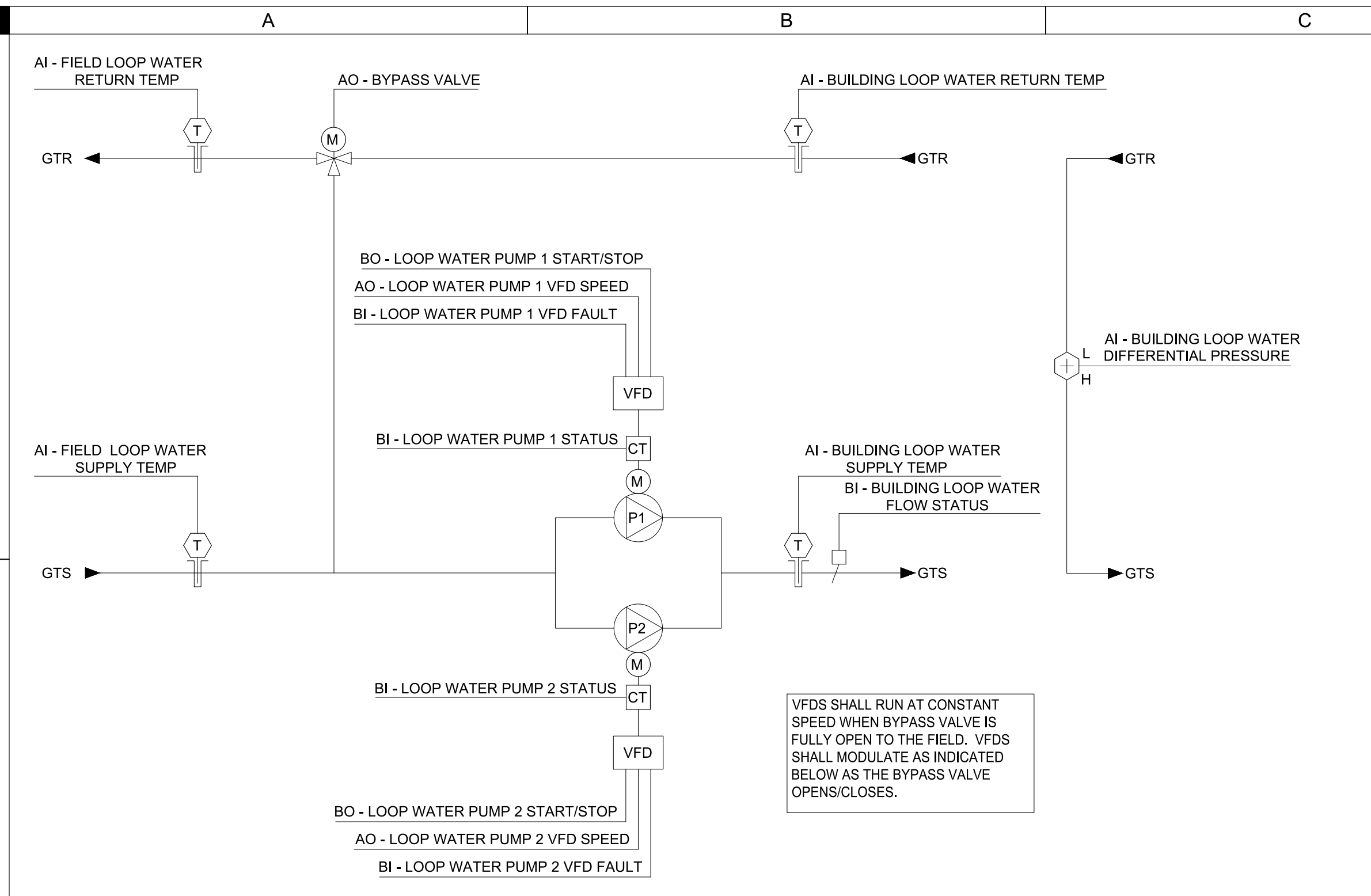
8 TRAPEZE TYPE HANGER DETAIL
N.T.S.



9 INFILL EXISTING OPENING DETAIL
N.T.S.



10 EXISTING HEAT EXCHANGER
N.T.S.



POINTS LIST - GEOTHERMAL - LOOP MONITOR AND PUMPS										
POINT NAME	AI	AO	BI	BO	AV	BV	TREND	ALARM	SHOW ON GRAPHIC	NOTES
BYPASS VALVE POSITION, FEEDBACK	x	x							x	
BUILDING LOOP WATER DIFFERENTIAL PRESSURE	x							x	x	
BUILDING LOOP WATER RETURN TEMP	x							x	x	
BUILDING LOOP WATER SUPPLY TEMP	x							x	x	
FIELD LOOP WATER RETURN TEMP	x							x	x	
FIELD LOOP WATER SUPPLY TEMP	x							x	x	
LOOP WATER PUMP 1 VFD SPEED		x						x	x	
LOOP WATER PUMP 2 VFD SPEED			x					x	x	
LOOP WATER FLOW STATUS			x					x	x	
LOOP WATER PUMP 1 STATUS		x						x	x	
LOOP WATER PUMP 1 VFD FAULT		x						x	x	
LOOP WATER PUMP 2 STATUS			x					x	x	
LOOP WATER PUMP 2 VFD FAULT			x					x	x	
LOOP WATER PUMP 1 START/STOP				x				x	x	
LOOP WATER PUMP 2 START/STOP					x			x	x	
OUTSIDE AIR TEMP						x			x	
HIGH BUILDING LOOP WATER DIFFERENTIAL PRESSURE								x		
HIGH BUILDING LOOP WATER SUPPLY TEMP								x		
HIGH BUILDING LOOP WATER SUPPLY TEMP SHUTDOWN								x		
HIGH FIELD LOOP WATER SUPPLY TEMP								x		
HIGH FIELD LOOP WATER SUPPLY TEMP SHUTDOWN								x		
LOOP WATER PUMP 1 FAILURE								x		
LOOP WATER PUMP 1 RUNNING IN HAND								x		
LOOP WATER PUMP 1 RUNTIME EXCEEDED								x		
LOOP WATER PUMP 2 FAILURE								x		
LOOP WATER PUMP 2 RUNNING IN HAND								x		
LOOP WATER PUMP 2 RUNTIME EXCEEDED								x		
LOW BUILDING LOOP WATER DIFFERENTIAL PRESSURE								x		
LOW BUILDING LOOP WATER SUPPLY TEMP								x		
LOW BUILDING LOOP WATER SUPPLY TEMP SHUTDOWN								x		
LOW FIELD LOOP WATER SUPPLY TEMP								x		
LOW FIELD LOOP WATER SUPPLY TEMP SHUTDOWN								x		
NO BUILDING LOOP FLOW								x		

1. GEOTHERMAL PLANT LOOP MONITOR AND PUMPS (TYPICAL OF 1)

- THE FOLLOWING LOOP WATER CONDITIONS SHALL BE MONITORED:
- BUILDING FLOW STATUS.
 - SUPPLY TEMPERATURE (BUILDING AND FIELD).
 - RETURN TEMPERATURE (BUILDING AND FIELD).
 - BUILDING LOOP DIFFERENTIAL PRESSURE.
- ALARMS SHALL BE PROVIDED AS FOLLOWS:
- NO BUILDING LOOP FLOW.
 - HIGH LOOP WATER SUPPLY TEMP (BUILDING AND FIELD); IF THE LOOP WATER SUPPLY TEMPERATURE IS GREATER THAN 90°F (ADJ.).
 - LOW LOOP WATER SUPPLY TEMP (BUILDING AND FIELD); IF THE LOOP WATER SUPPLY TEMPERATURE IS LESS THAN 60°F (ADJ.).
- LOOP WATER PUMP LEAD/LAG OPERATION:
- THE TWO LOOP WATER PUMPS SHALL OPERATE IN A LEAD/LAG FASHION.
 - THE LEAD PUMP SHALL RUN FIRST.
 - ON FAILURE OF THE LEAD PUMP, THE LAG PUMP SHALL RUN AND THE LEAD PUMP SHALL TURN OFF.
 - ON DECREASING BUILDING LOOP WATER DIFFERENTIAL PRESSURE, THE LAG PUMP SHALL STAGE ON AND RUN IN UNISON WITH THE LEAD PUMP TO MAINTAIN LOOP WATER DIFFERENTIAL PRESSURE SETPOINT.
- THE DESIGNATED LEAD PUMP SHALL ROTATE UPON ONE OF THE FOLLOWING CONDITIONS (USER SELECTABLE):
- MANUALLY THROUGH A SOFTWARE SWITCH
 - IF PUMP RUNTIME (ADJ.) IS EXCEEDED
 - DAILY
 - WEEKLY
 - MONTHLY
- ALARMS SHALL BE PROVIDED AS FOLLOWS:
- LOOP WATER PUMP 1
 - FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
 - RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
 - RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT.
 - VFD FAULT.
 - LOOP WATER PUMP 2
 - FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
 - RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
 - RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT.
 - VFD FAULT.

A MODULATING 3-WAY BYPASS CONTROL VALVE (FULL SIZED, BUTTERFLY STYLE, FAIL OPEN TO FIELD), SHALL BE PROVIDED IN THE FULL SIZED LOOP FIELD BYPASS. THE VALVE WILL BE PROGRAMMED TO OPERATE ACCORDING TO THE FOLLOWING SCHEDULE:

BUILDING LOOP RETURN TEMPERATURE	VALVE POSITION (% OPEN TO BYPASS)
≤ 40 F	0%
41 TO 50 F	50%
51 TO 70 F	100%
71 TO 78 F	50%
≥ 80 F	0%

LOOP WATER DIFFERENTIAL PRESSURE CONTROL:
THE CONTROLLER SHALL MEASURE LOOP WATER DIFFERENTIAL PRESSURE AND MODULATE THE LOOP WATER PUMP VFDS IN SEQUENCE TO MAINTAIN ITS LOOP WATER DIFFERENTIAL PRESSURE SETPOINT. THE FOLLOWING SETPOINTS ARE RECOMMENDED VALUES. ALL SETPOINTS SHALL BE FIELD ADJUSTED DURING THE COMMISSIONING PERIOD TO MEET THE REQUIREMENTS OF ACTUAL FIELD CONDITIONS.

THE CONTROLLER SHALL MODULATE LOOP WATER PUMP SPEEDS TO MAINTAIN A LOOP WATER DIFFERENTIAL PRESSURE OF 12LB/IN2 (ADJ.). THE VFD MINIMUM SPEED SHALL NOT DROP BELOW 20% (ADJ.).

ON DROPPING LOOP WATER DIFFERENTIAL PRESSURE, THE VFDS SHALL RUN TO MAINTAIN SETPOINT AS FOLLOWS:

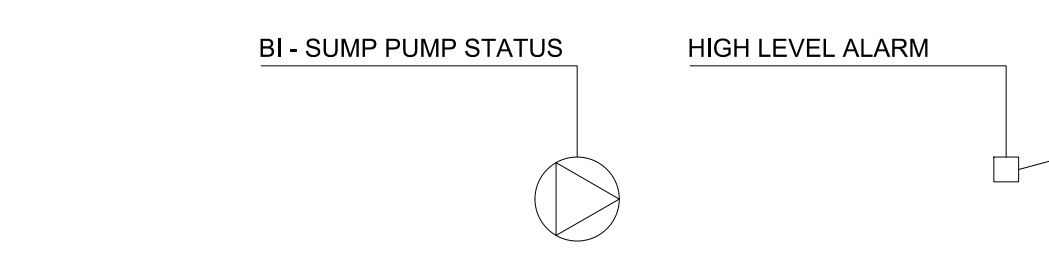
- THE CONTROLLER SHALL MODULATE THE LEAD VFD TO MAINTAIN SETPOINT.
- IF THE LEAD VFD SPEED IS GREATER THAN A SETPOINT OF 90% (ADJ.), THE LAG VFD SHALL STAGE ON.
- THE LAG VFD SHALL RAMP UP TO MATCH THE LEAD VFD SPEED AND THEN RUN IN UNISON WITH THE LEAD VFD TO MAINTAIN SETPOINT.

ON RISING LOOP WATER DIFFERENTIAL PRESSURE, THE VFDS SHALL RUN TO MAINTAIN SETPOINT AS FOLLOWS:

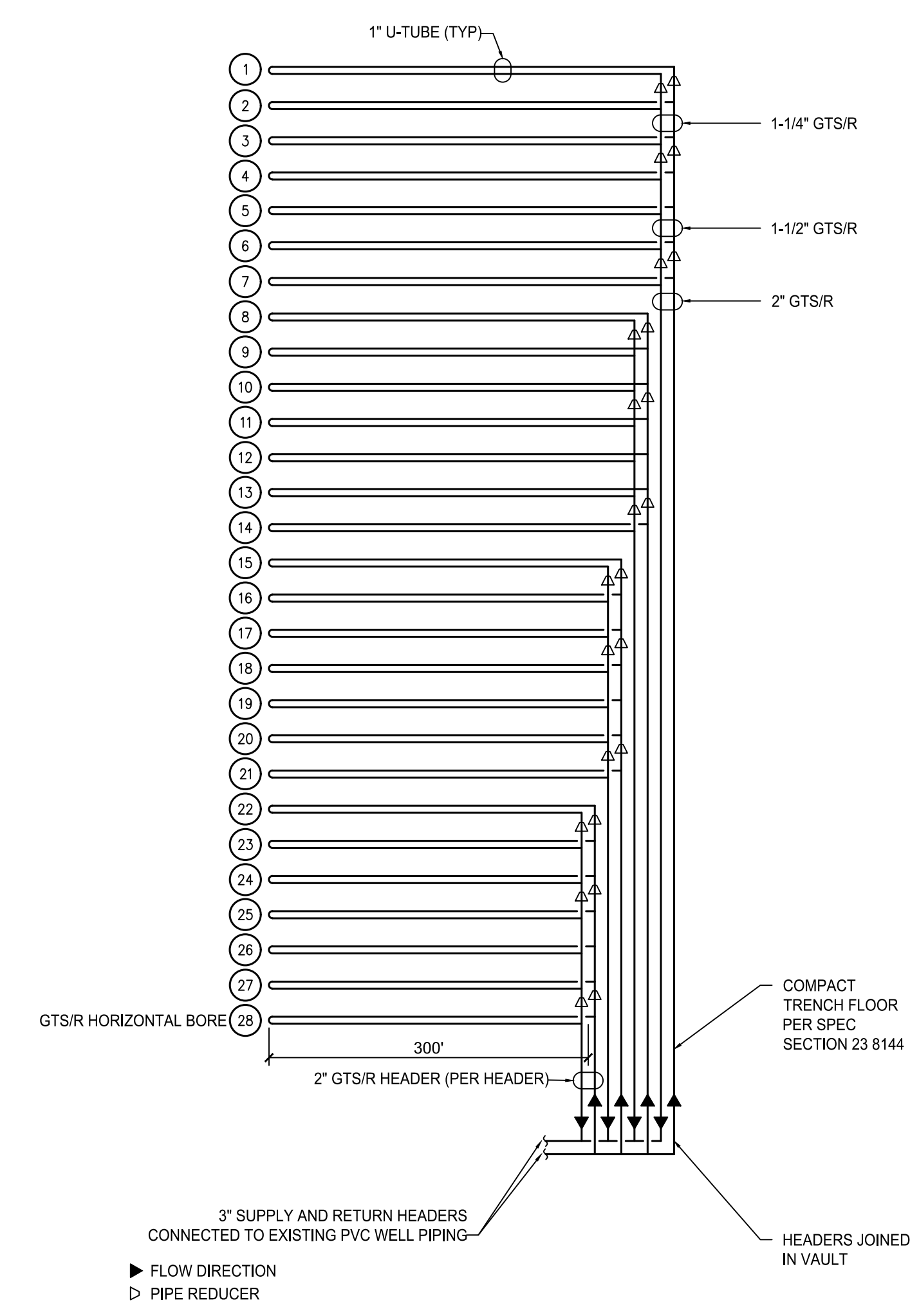
- IF THE VFD SPEEDS THEN DROPS BACK TO 60% (ADJ.) BELOW SETPOINT, THE LAG VFD SHALL STAGE OFF.
- THE LEAD VFD SHALL CONTINUE TO RUN TO MAINTAIN SETPOINT.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

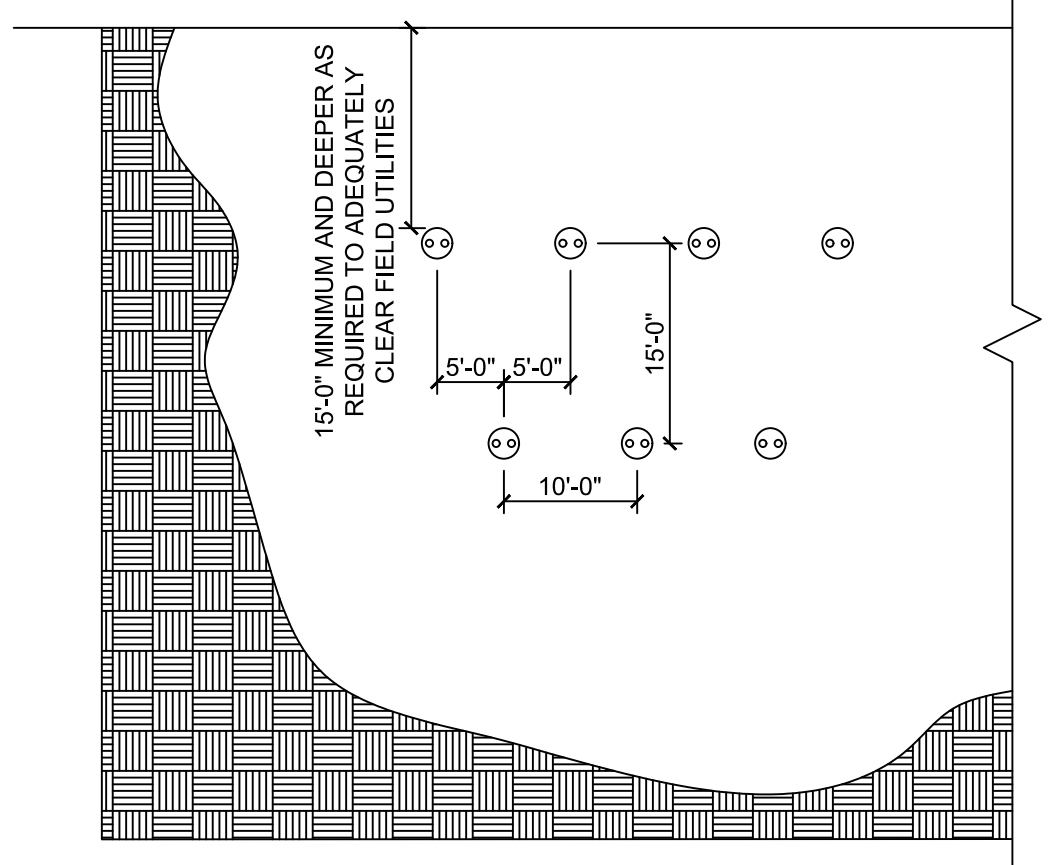
- HIGH LOOP WATER DIFFERENTIAL PRESSURE: IF THE LOOP WATER DIFFERENTIAL PRESSURE IS 25% (ADJ.) GREATER THAN SETPOINT.
- LOW LOOP WATER DIFFERENTIAL PRESSURE: IF THE LOOP WATER DIFFERENTIAL PRESSURE IS 25% (ADJ.) LESS THAN SETPOINT.



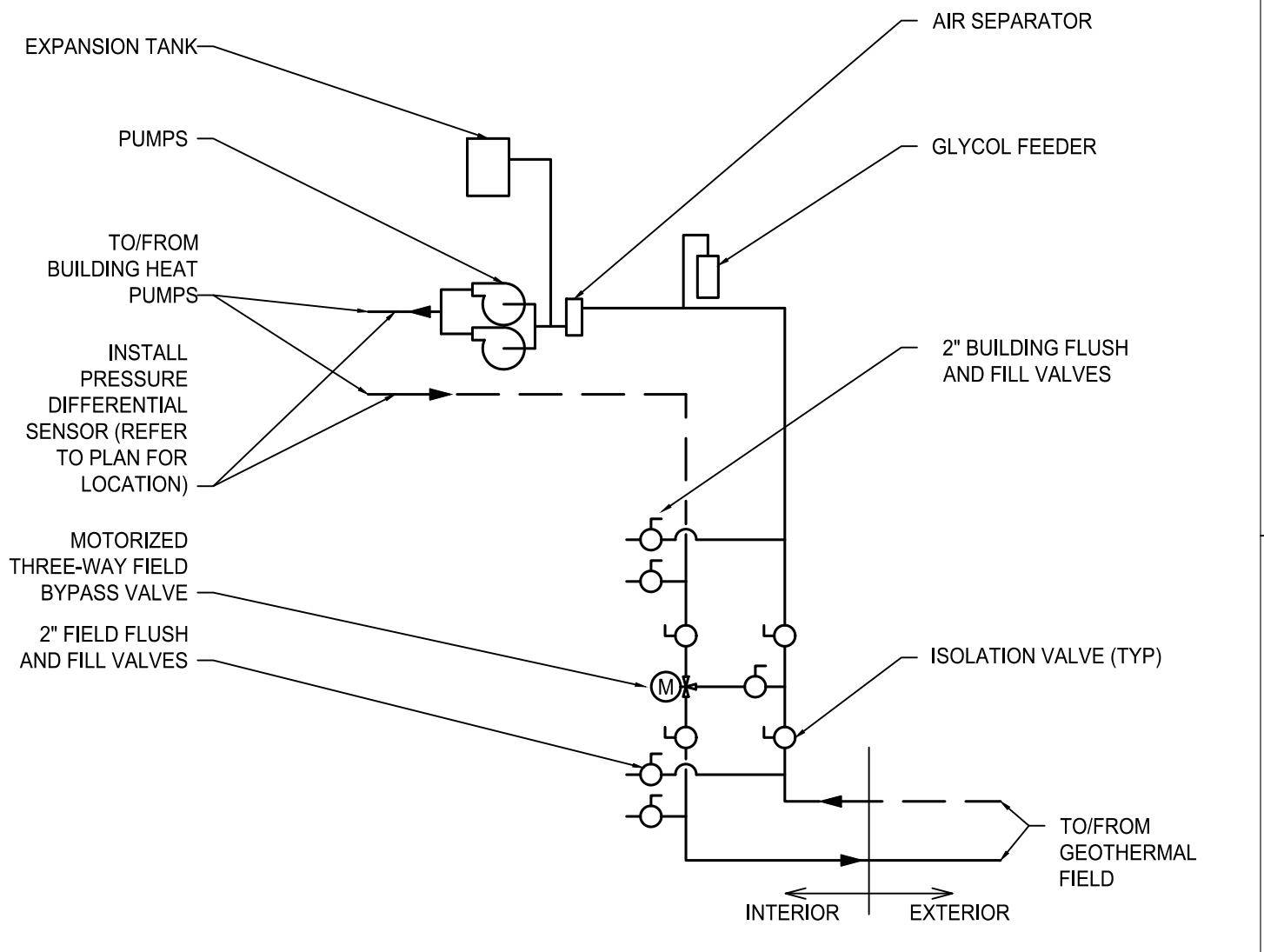
POINTS LIST - SUMP PUMP										
POINT NAME	AI	AO	BI	BO	AV	BV	TREND	ALARM	SHOW ON GRAPHIC	NOTES
SUMP PUMP STATUS			x						x	
HIGH LEVEL ALARM								x		



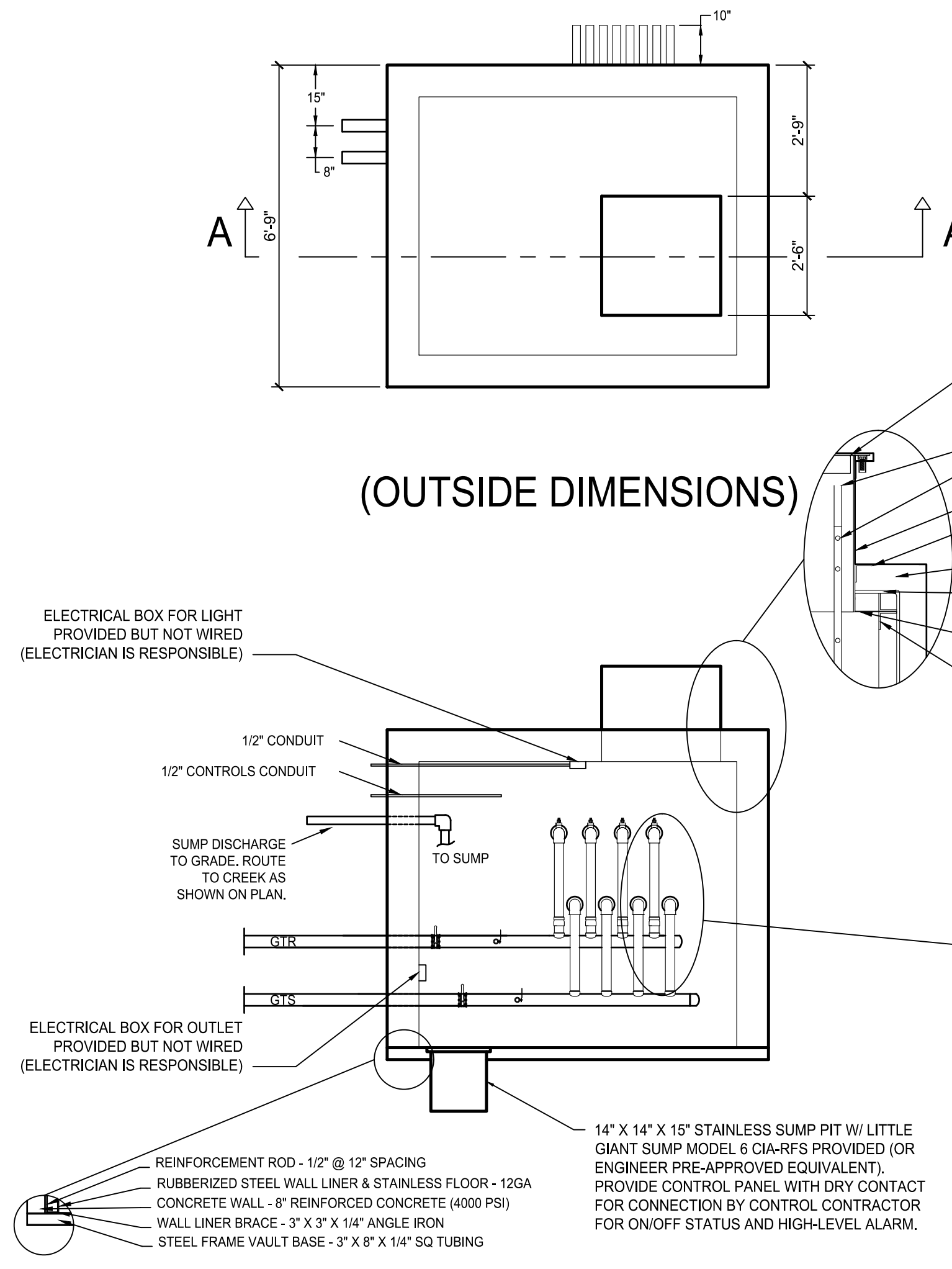
2. HORIZONTAL LOOP FIELD SECTION - 2 TIER
N.T.S.



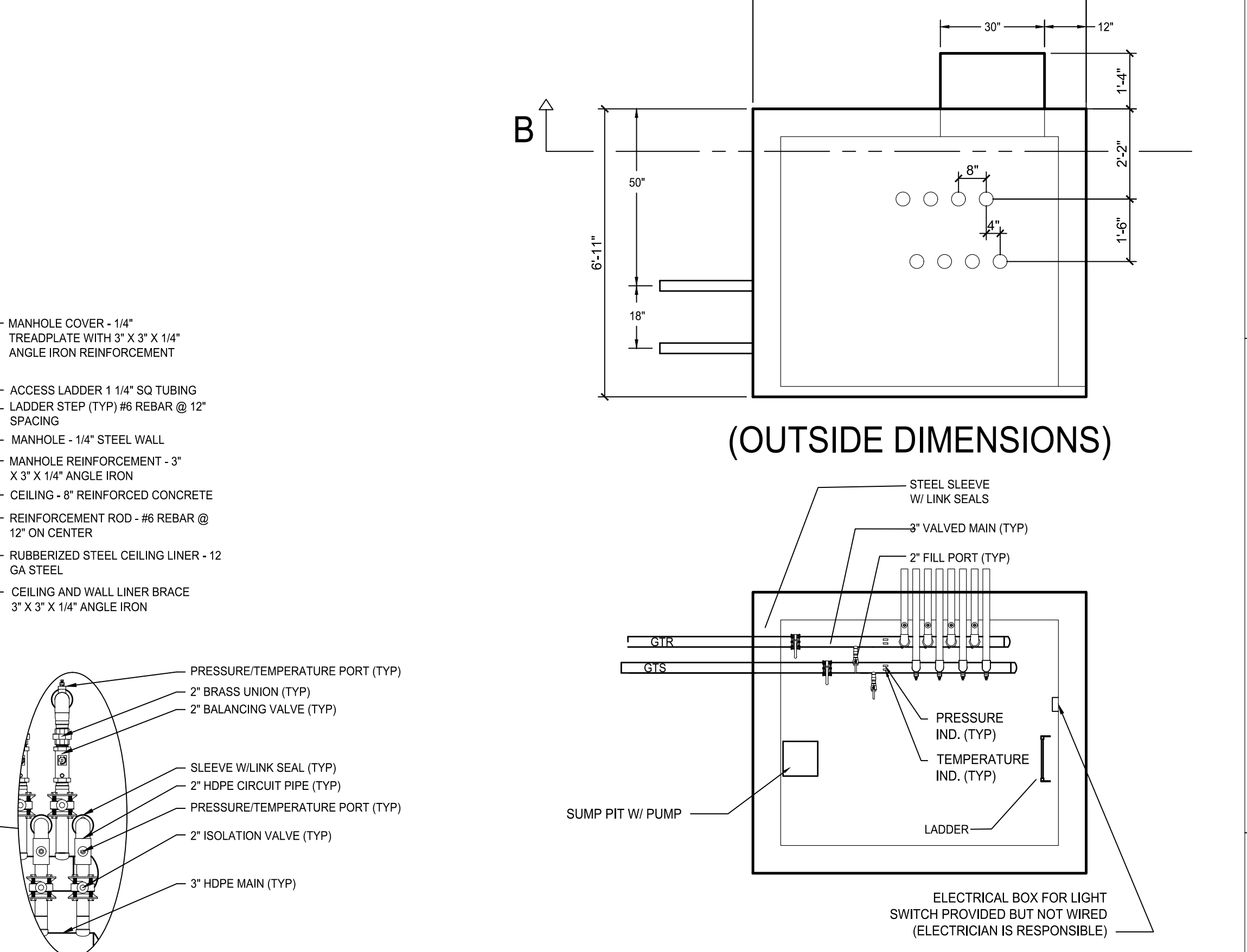
3. HORIZONTAL BORE LAYOUT
N.T.S.



4. GEOTHERMAL FLOW DIAGRAM
N.T.S.



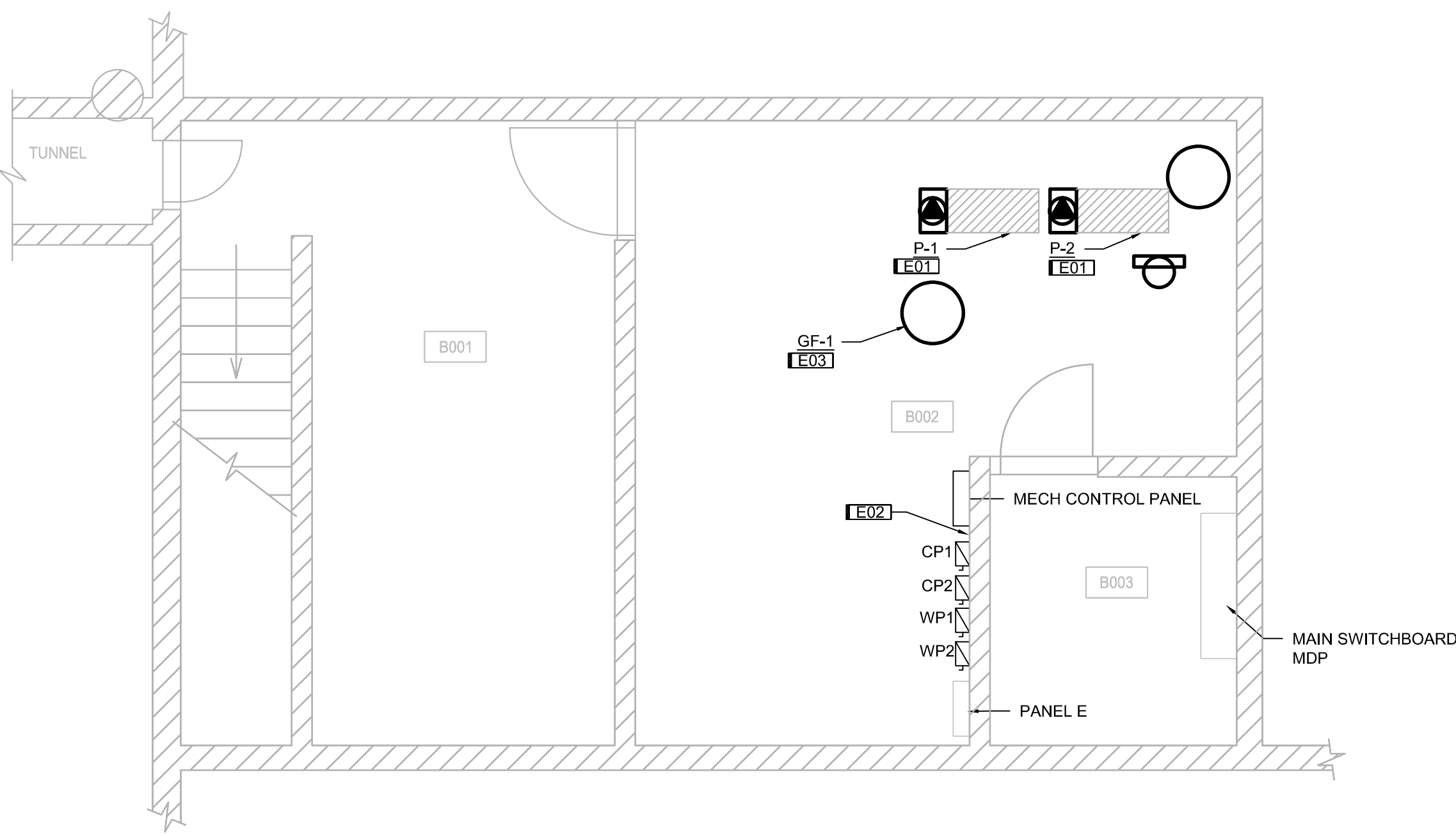
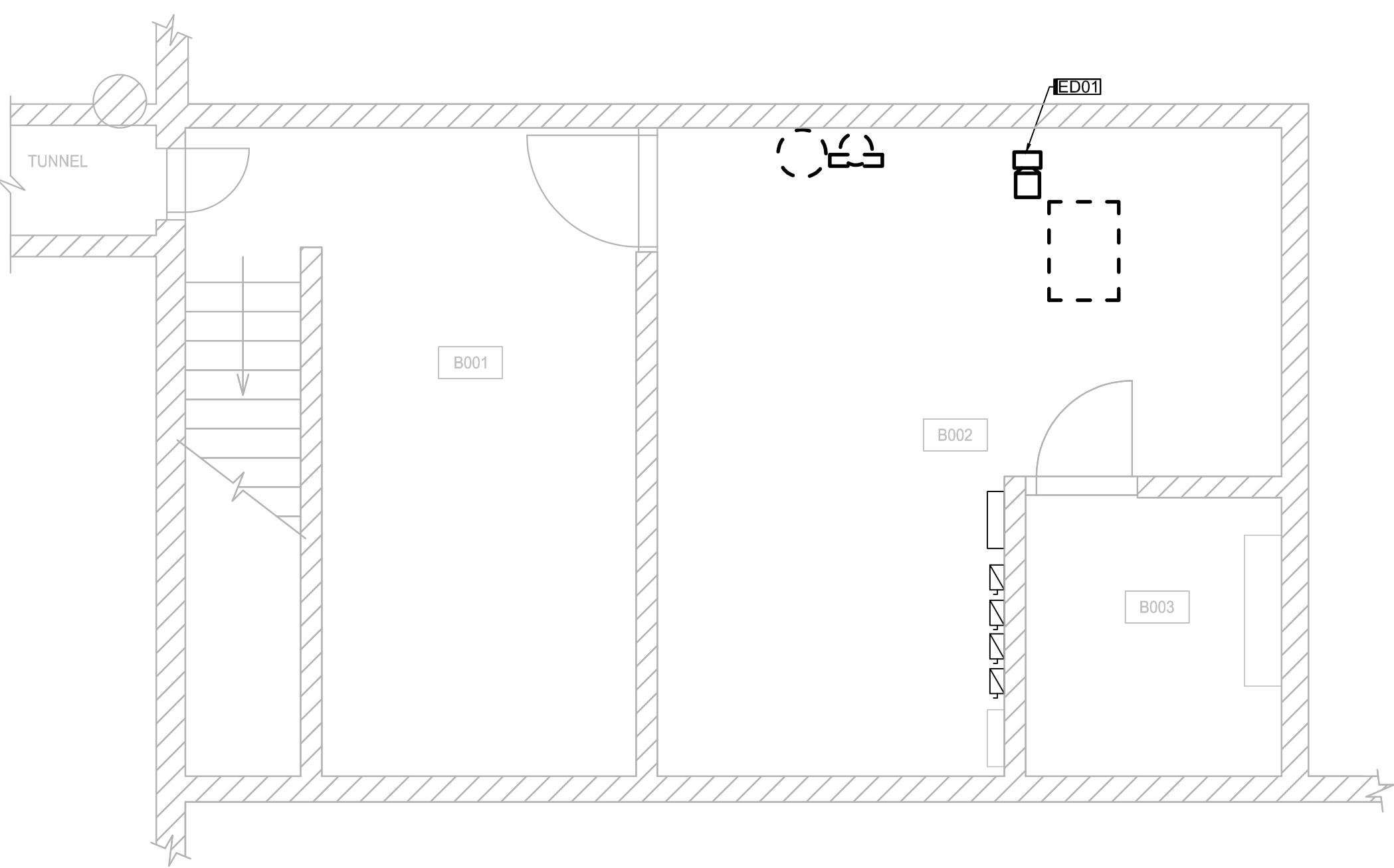
(SECTION A-A DETAIL)



(SECTION B-B DETAIL)

5. GEO VAULT DETAILS
N.T.S.

KEYNOTES	
KEY	NOTE
ED01	DISCONNECT AND REMOVE ASSOCIATED WIRING BACK TO PANEL E. CONDUIT TO BE REUSED IN NEW CONSTRUCTION.
E01	CONNECT NEW WIRING TO PUMPS VIA CIRCUITS E-16, 17, 18 AND E-19, 20, 21 PER UPDATED PANEL SCHEDULE. REPLACE EXISTING SQUARE D BREAKERS WITH 60A/3P CIRCUIT BREAKERS.
E02	LOCATE NEW VFDS FOR CIRC PUMPS ON INDICATED WALL.
E03	CONNECT NEW WIRING TO GLYCOL FEEDER VIA CIRCUIT E-24.



1 1/4" = 1'-0" BASEMENT ELECTRICAL DEMOLITION PLAN

2 1/4" = 1'-0" BASEMENT ELECTRICAL PLAN

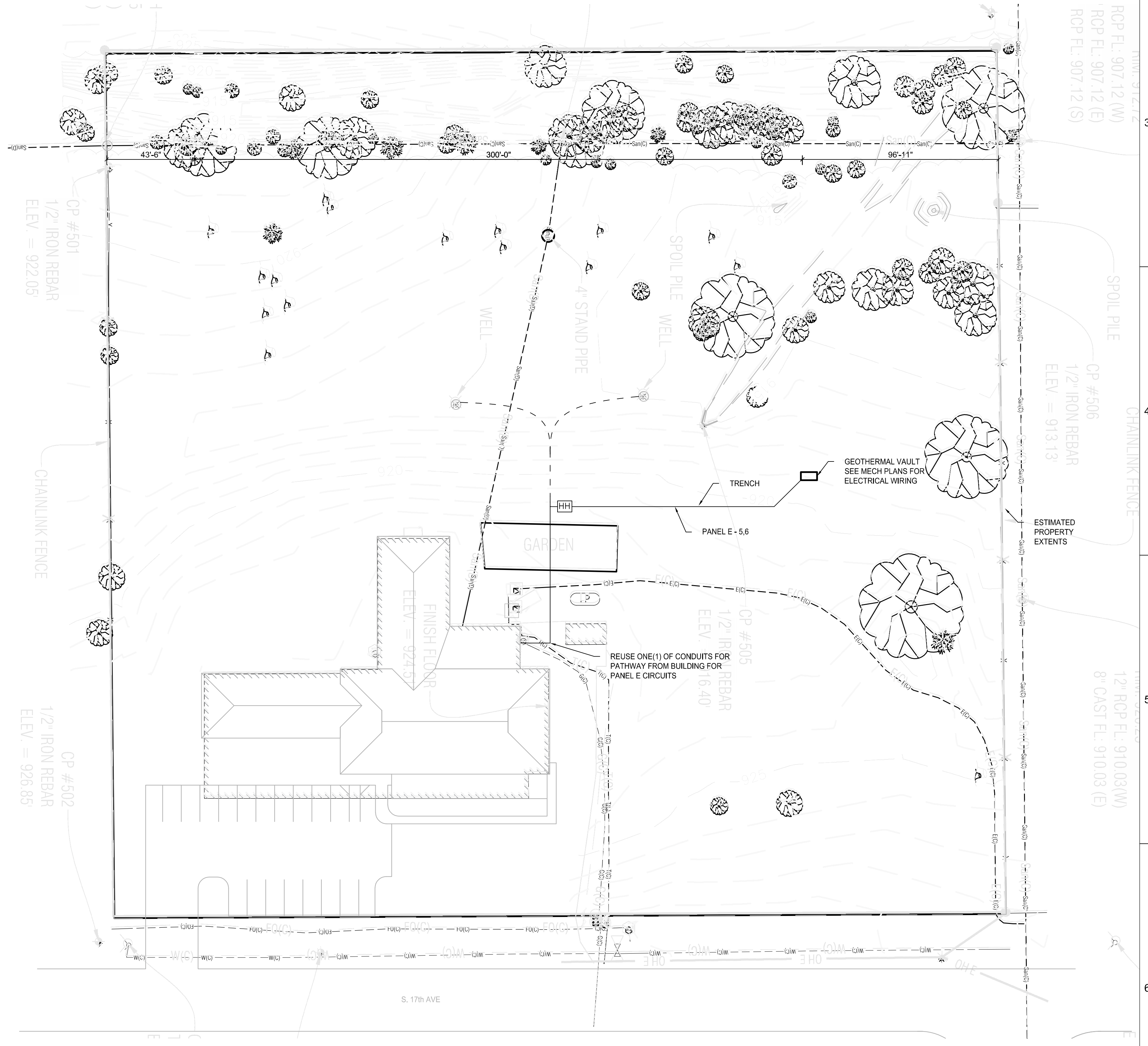
PANELBOARD SCHEDULE - EXISTING						
LOAD DESCRIPTION	QTY	DEVICE	KVA	PH	WVA	LOAD DESCRIPTION
RECEPTS, STORAGE AND MECH	1	20A/1	-	A	-	22 BATTERY CHARGER
LIGHTS	2	20A/1	-	B	-	23 WATER HEATER & CONTROLS
RECEPTS MECH & ELEC	3	20A/1	-	C	-	24 SPARE (GF-1)
AIR COND & FRESH AIR FAN	4	20A/1	-	A	-	25 SHED
SPARE (GEO FIELD)	5	20A/1	-	B	-	26 SPARE
SPARE (GEO FIELD)	6	20A/1	-	C	-	27 SPARE
CONTROL MOTOR STARTERS	7	20A/1	-	A	-	28 SPACE
CONTROL TRANSFORMER: HT/GAR CTRL PANEL	8	20A/2	-	B	-	29 SPARE
...	9	-	-	C	-	30 ...
CIRCULATING PUMP #1 (SPARE)	10	20A/3	-	A	-	31 ...
...	11	-	-	B	-	32 FLOOR HEAT PUMP
...	12	-	-	C	-	33 ...
CIRCULATING PUMP #2 (SPARE)	13	20A/3	-	A	-	34 FLOOR HEAT CIRC PUMP
...	14	-	-	B	-	35 ...
...	15	-	-	C	-	36 ...
SOUTH WELL PUMP (CP #1)	16	(60A/3P)	-	A	-	37 FREEZER COMPRESSOR
...	17	-	-	B	-	38 ...
...	18	-	-	C	-	39 ...
NORTH WELL PUMP (CP #2)	19	(60A/3P)	-	A	-	40 COOLER COMPRESSOR
...	20	-	-	B	-	41 ...
...	21	-	-	C	-	42 ...

*PROVIDE NEW 60A/3P CIRCUIT BREAKER IN INDICATED SPACES.

ELECTRICAL GENERAL CONSTRUCTION NOTES:

- ALL WORK SHALL BE IN CONFORMANCE WITH THE NATIONAL ELECTRICAL CODE - LATEST EDITION ADOPTED BY THE STATE, THE STATE AMENDMENTS, LOCAL MUNICIPAL CODES AND ORDINANCES, AND THE AUTHORITY HAVING JURISDICTION. THE COMPLETE INSTALLATION SHALL BE IN ACCORDANCE WITH THE ADAAG (AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES).
- IT IS THE INTENT OF THESE DOCUMENTS TO COMPLY WITH THE APPLICABLE CODES, WHERE DISCREPANCIES OCCUR, NOTIFY THE ENGINEER/ARCHITECT IN WRITING FOR INTERPRETATION. CORRECT ANY INSTALLATION THAT FAILS TO COMPLY WITH THE CODES AND STANDARDS AT NO ADDITIONAL COST TO THE OWNER.
- CONTRACTOR SHALL PROVIDE ALL WORK NECESSARY INCLUDING ALL LABOR, MATERIALS, PERMITS, TAXES, FEES, INSPECTIONS, HARDWARE, AND COST FOR INSTALLATION FOR A COMPLETE AND OPERATIONAL SYSTEM.
- ALL MATERIALS FURNISHED BY THE CONTRACTOR SHALL BE NEW, COMPLETE WITH MANUFACTURER'S GUARANTEE OR WARRANTY AND SHALL BE LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL).
- COORDINATE ELECTRICAL INSTALLATION WITH ALL TRADES PRIOR TO INSTALLATION. IF ELECTRICAL WORK INSTALLED INTERFERES WITH OTHER TRADES AFTER INSTALLATION, THE CONTRACTOR SHALL MAKE ALL NECESSARY CHANGES TO CORRECT THE CONDITION AT NO ADDITIONAL COST TO THE OWNER.
- DEVICES, OUTLETS, AND JUNCTION BOXES SHOWN ON DRAWINGS ARE DIAGRAMMATIC. COORDINATE EXACT PLACEMENT OF ALL DEVICES WITH OWNER AND OTHER TRADES PRIOR TO INSTALLATION. VERIFY DOOR SWING PRIOR TO INSTALLATION OF ALL SWITCH BOXES. ADJUSTMENT OF LOCATION PRIOR TO INSTALLATION, SHALL BE DONE WITH NO ADDITIONAL COST TO THE OWNER.
- DRAWINGS ARE DIAGRAMMATIC. ALL DIMENSIONS SHOWN ARE APPROXIMATE. CONTRACTOR SHALL VERIFY ALL FURNITURE, MODULAR FURNITURE, AND EQUIPMENT LOCATIONS WITH ARCHITECTURAL PLANS, ELEVATIONS AND REVIEWED SHOP DRAWINGS. PRIOR TO MAKING THE ACTUAL ELECTRICAL INSTALLATION THE CONTRACTOR SHALL ADJUST CONNECTION LOCATIONS TO ACCOMMODATE FURNITURE AND/OR EQUIPMENT.
- ALL ELECTRICAL PANELS WITH ANY BRANCH CIRCUIT/LOAD REVISIONS (DEMOLITION OR NEW WORK) SHALL HAVE A NEW TYPED UPDATED CIRCUIT DIRECTORY CARD INSTALLED INSIDE THE DOOR OF THE ELECTRICAL PANEL. THE CONTRACTOR SHALL VERIFY THAT ALL UNUSED CIRCUIT BREAKERS ARE TURNED "OFF" AND PROPERLY INDICATED AS "SPARE" ON THE NEW CIRCUIT DIRECTORY CARD. THE CONTRACTOR SHALL INSTALL FILLER PLATES WHERE BREAKERS ARE REMOVED AS PART OF THIS PROJECT OR HAVE BEEN REMOVED PREVIOUSLY.
- WHERE CONDUIT IS SURFACE MOUNTED TO A WALL AND RUN VERTICALLY DOWN TO A SWITCH/OUTLET BOX, UTILIZE 2-HOLE CONDUIT STRAPS.
- TO REDUCE NOISE BETWEEN WALLS, CONTRACTOR SHALL AVOID INSTALLING POWER OR DATA OUTLETS LOCATED BACK TO BACK, WHERE OUTLETS ARE REQUIRED TO BE LOCATED BACK TO BACK, CONTRACTOR SHALL PROVIDE SOUND PROOFING MATERIAL BETWEEN DEVICE BOXES.
- PENETRATIONS THROUGH FIRE RATED WALLS BY DIVISION 26 CONTRACTOR SHALL BE SEALED WITH APPROPRIATE FIRE PROOFING MATERIAL TO RESTORE FIRE RATING. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATED WALLS.
- THE CONTRACTOR SHALL KEEP THE WORK AREA CLEAN OF ALL DEBRIS ON A DAILY BASIS. ALL NEW MATERIALS AWAITING INSTALLATION SHALL BE KEPT IN AREAS DESIGNATED BY THE OWNER.
- THESE DRAWINGS SHALL NOT BE SCALED TO OBTAIN DIMENSIONS. REFER TO DIMENSIONED ARCHITECTURAL FLOOR PLANS. IF THE DIMENSIONS CANNOT BE DETERMINED BY THE INFORMATION GIVEN, CONTRACTOR SHALL CONTACT THE ENGINEER FOR ADDITIONAL INFORMATION.
- PERIODIC SITE OBSERVATION BY THE ENGINEER IS SOLELY FOR THE PURPOSE OF DETERMINING IF THE WORK OF THE CONTRACTOR IS PROCEEDING IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, THIS LIMITED SITE OBSERVATION SHOULD NOT BE CONSTRUED AS EXHAUSTIVE OR CONTINUOUS TO CHECK THE QUALITY OR QUANTITY OF THE WORK, BUT RATHER PERIODIC IN AN EFFORT TO GUARD THE OWNER AGAINST DEFECTS OR DEFICIENCIES IN THE WORK OF THE CONTRACTOR.
- THE INFORMATION CONTAINED ON THE ELECTRICAL DRAWINGS IS IN ITSELF INCOMPLETE AND VOID UNLESS USED IN CONJUNCTION WITH ALL OTHER DISCIPLINE DRAWINGS, THE SPECIFICATIONS, TRADE PRACTICES, OR APPLICABLE STANDARDS, CODES, ETC., AND SHALL BE CONSIDERED THE CONTRACT DOCUMENTS AND WITH ALL THEREIN BY REFERENCE, WHICH THE CONTRACTOR CERTIFIES KNOWLEDGE OF BY SIGNING THE CONTRACT.
- CONTRACTOR IS TO ASSUME FULL RESPONSIBILITY, UNRELIEVED BY REVIEW OF SHOP DRAWINGS OR PERIODIC OBSERVATION OF CONSTRUCTION, FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS, FOR DIMENSIONS TO BE CONFIRMED AND CORRELATED ON THE JOB SITE AND BETWEEN INDIVIDUAL DRAWINGS OR SETS OF DRAWINGS FOR FABRICATION PROCESSES AND CONSTRUCTION TECHNIQUES (INCLUDING EXCAVATION, SHORING, SCAFFOLDING, BRACING, ERECTION, FORM WORK, ETC.), FOR COORDINATION OF THE VARIOUS TRADES, AND FOR SAFE CONDITIONS ON THE JOB SITE.

4 1" = 30'-0" ELECTRICAL SITE PLAN



MOTOR AND EQUIPMENT SCHEDULE										
DESIGNATION	LOAD	VOLTS	CIRCUIT	DISCONNECT DEVICE/ FUSE SIZE AT MOTOR LOCATION	WIRE SIZE	CONDUIT SIZE	DISC BY	MS BY	CONTROLS	REMARKS
P-1	10 HP	208/3P	E-19, 20, 21	60A/50A	3 #8 AWG + 1 #10 AWG GND	3/4"	E	E	VFD	E
P-2	10 HP	208/3P	E-16, 17, 18	60A/50A	3 #8 AWG + 1 #10 AWG GND	3/4"	E	E	VFD	E
GEO VAULT	--	120/1P	E-5, 6	--	4 #8 AWG + 1 #10 AWG GND	EXIST + 1/2"	-	-	-	-
GF-1	1/3 HP	120/1P	E-24	--	2 #12 AWG + 1 #10 AWG GND	3/4"	-	-	-	M

- NOTES:**
- LOAD: A = AMPERES; FHP = FRACTIONAL HORSEPOWER; HP = HORSEPOWER; KW = KILOWATTS; W = WATTS.
 - OVERCURRENT PROTECTION: 3P-60 = 3 POLE, 60 AMPERE CIRCUIT BREAKER; 60AF = 60 AMPERE FUSED; 100A NF = 100 AMPERES NON-FUSED.
 - RESPONSIBILITY: E = ELECTRICAL CONTRACTOR; EX = EXISTING; G = GENERAL CONTRACTOR; INT = INTEGRAL WITH EQUIPMENT; M = MECHANICAL CONTRACTOR; O = OWNER FURNISH AND INSTALL.
 - CONTROLS: A = ANULSTAT; ATC = INTEGRAL AUTOMATIC TEMPERATURE CONTROL; CP = COORD AND P/LOG; F = FLOAT SWITCH; FACP = FIRE ALARM CONTROL PANEL; H = HANDSTAT; MAN = MANUAL; MS = AUXILIARY CONTACT ON MOTOR STARTER; PBS = PUSHBUTTON STATION; PS = PRESSURE SWITCH; STP = MANUAL MOTOR STARTER WITH THERMAL PROTECTION AND PILOT; SWL = SWITCH WITH LIGHTING; T = THERMOSTAT; TS = TWO-SPEED STARTER W HANDS-OFF-AUTO; VSD = VARIABLE SPEED DRIVE WITH WINDS-UP-AUTO.

DRAWN	JHI
APPROVED	JHI
ISSUED	ISSUE FOR BID
DATE	02/09/24
PROJECT	211220830
FIELD	