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PROJECT PHASE	
<input type="radio"/>	PRELIMINARY PRICING 06.03.21
<input type="radio"/>	OWNER REVISED SCOPE 10.31.22
<input type="radio"/>	CD PROGRESS SET 05.18.23
<input checked="" type="radio"/>	ISSUE FOR BID
<input type="radio"/>	ISSUE FOR CONSTRUCTION

REVISIONS		
NO.	DESCRIPTION	DATE

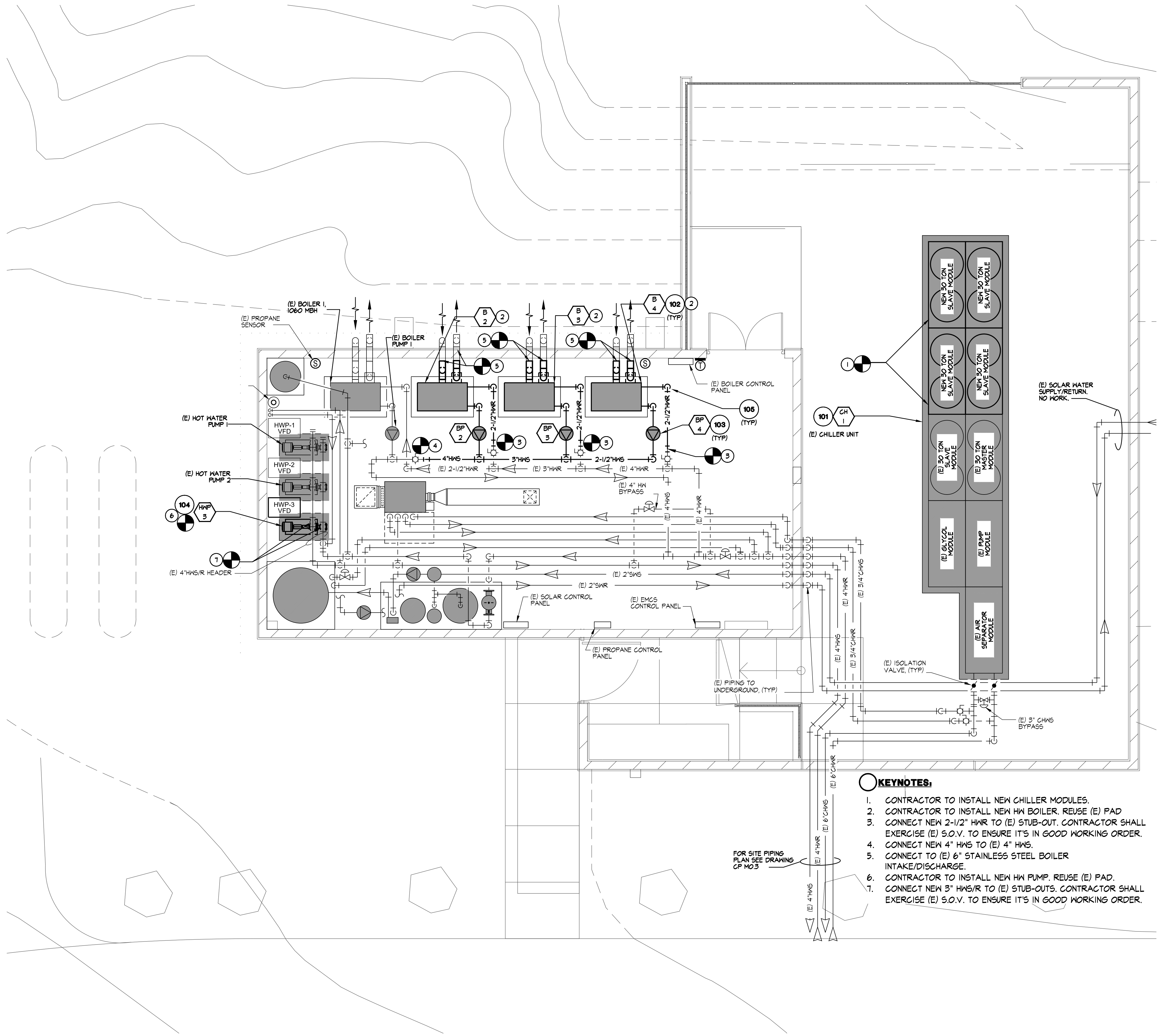
FORT APACHE - BUILDING #116 REHABILITATION

116 Geronimo Street, Fort Apache, AZ 85926

MECHANICAL PIPING CENTRAL PLAN

DRAWN	STAFF
CHECKED	KG
DATE	06.30.2023
SCALE	AS SHOWN
JOB NO.	2101
SHEET	CP M0.1

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 32866
 PAUL ERIC HEIN
 11/28/23
 ARIZONA U.S.A.



MECHANICAL LEGEND		
SYMBOL	ABBREVIATION	ITEM
	T	THERMOSTAT
	S	PROPANE SENSOR
	P.O.C.	POINT OF CONNECTION
	CHWS	CHILLED WATER SUPPLY
	CHWR	CHILLED WATER RETURN
	HWS	HEATING WATER SUPPLY
	HWR	HEATING WATER RETURN
	SWS	SOLAR WATER SUPPLY
	SWR	SOLAR WATER RETURN
	S.O.V.	SHUT OFF VALVE (BALL VALVE)
	(E)	EXISTING
	DN	DOWN
	CLG	CEILING
	ABV	ABOVE
	OH	OVERHEAD
	BLM	BELOW
	AFF	ABOVE FINISHED FLOOR UNLESS NOTED OTHERWISE
	U.N.D.	UNDERGROUND
	WCO	WALL CLEAN-OUT RISER, WASTE/VENT RISER, CAPPED U.S. 45° ELBOW 45° ELBOW DN 45° ELBOW UP TEE DN TEE UP REDUCER UNION W.H.A. WATER HAMMER ARRESTOR

NOTE: SOME OF THE ITEMS MAY NOT APPLY TO THIS PROJECT.

1 MECHANICAL PIPING CENTRAL PLAN
SCALE 1/4" = 1'-0"



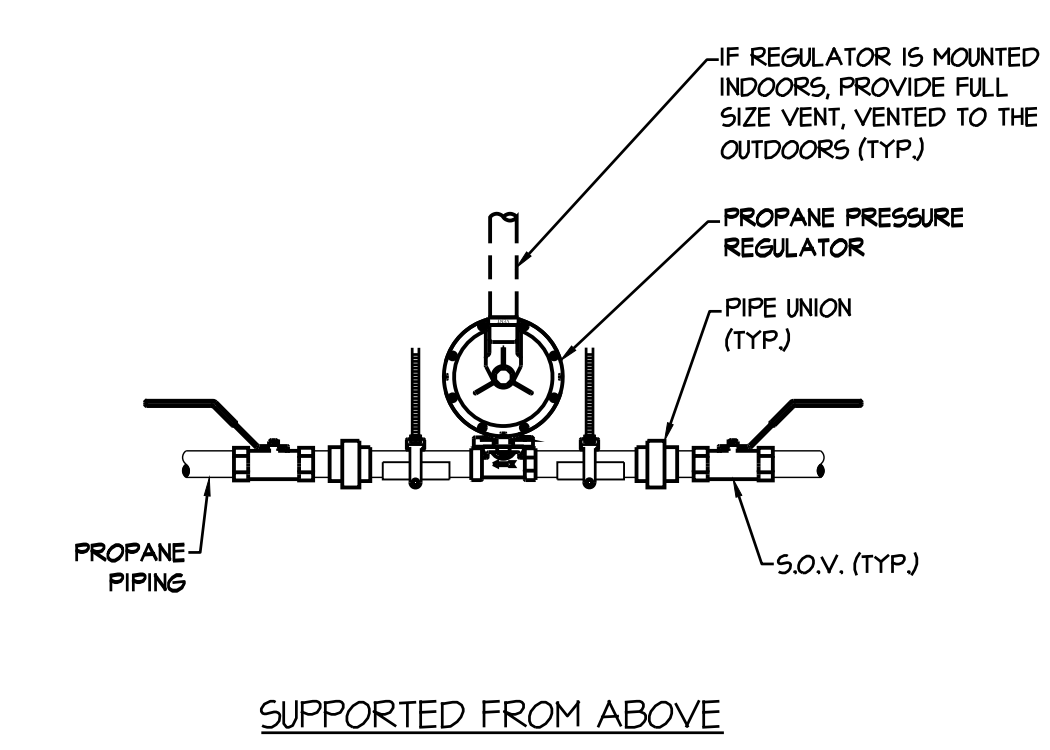
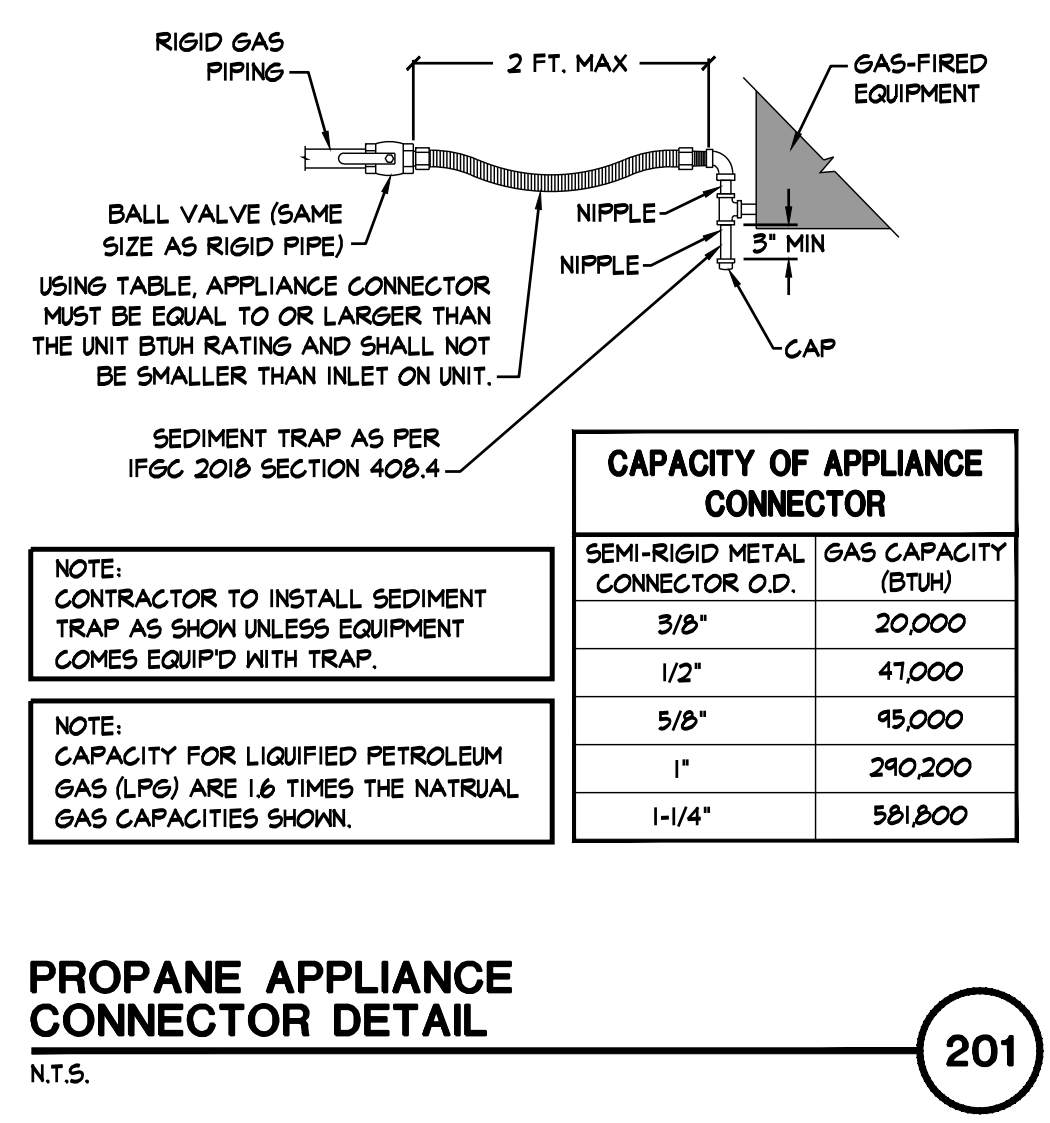
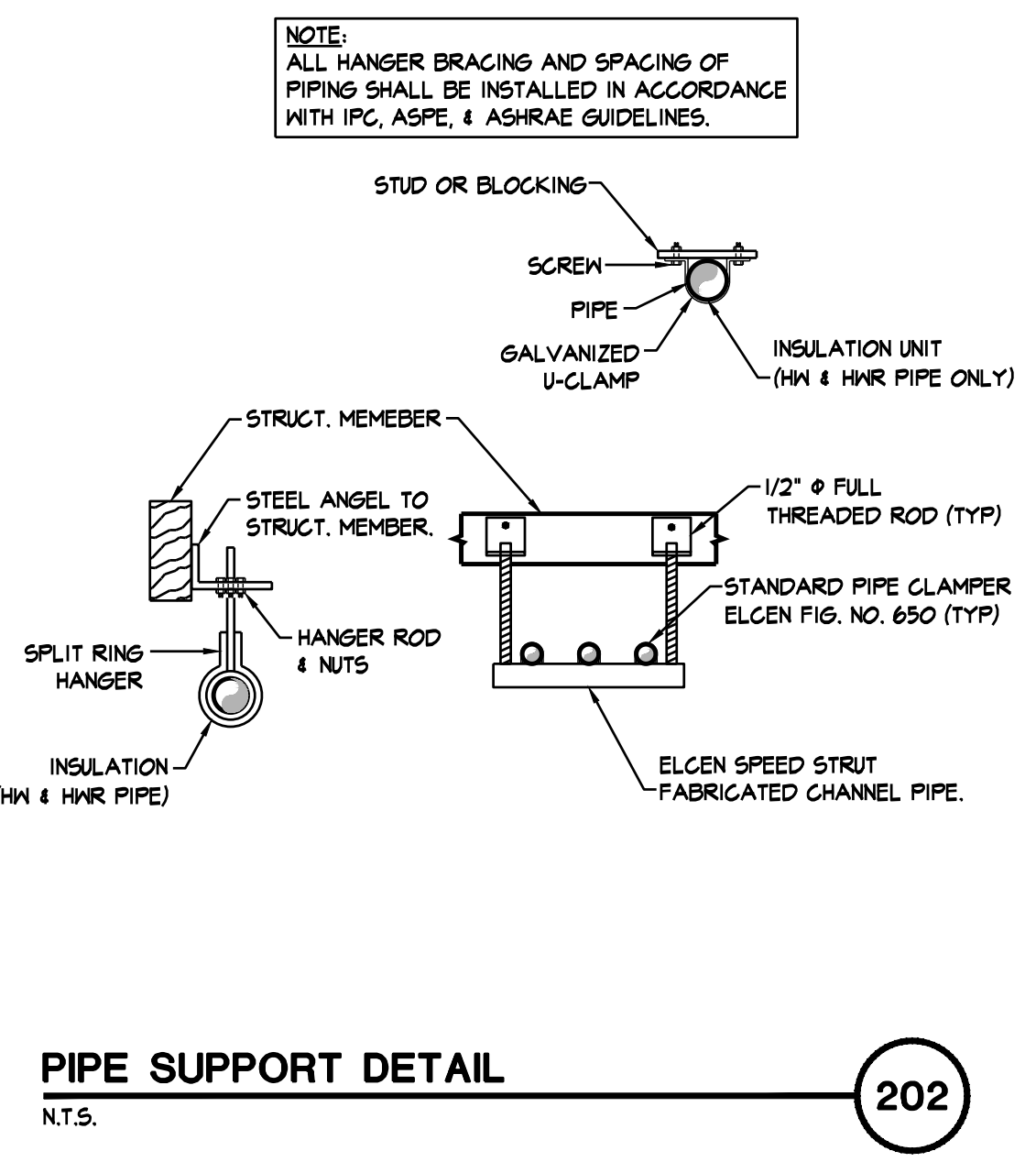
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FORT APACHE - BUILDING #116 REHABILITATION
116 Geronimo Street, Fort Apache, AZ 85926
PROPANE PIPING CENTRAL PLAN

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JOB NO.	2101
SHEET	CP M0.2

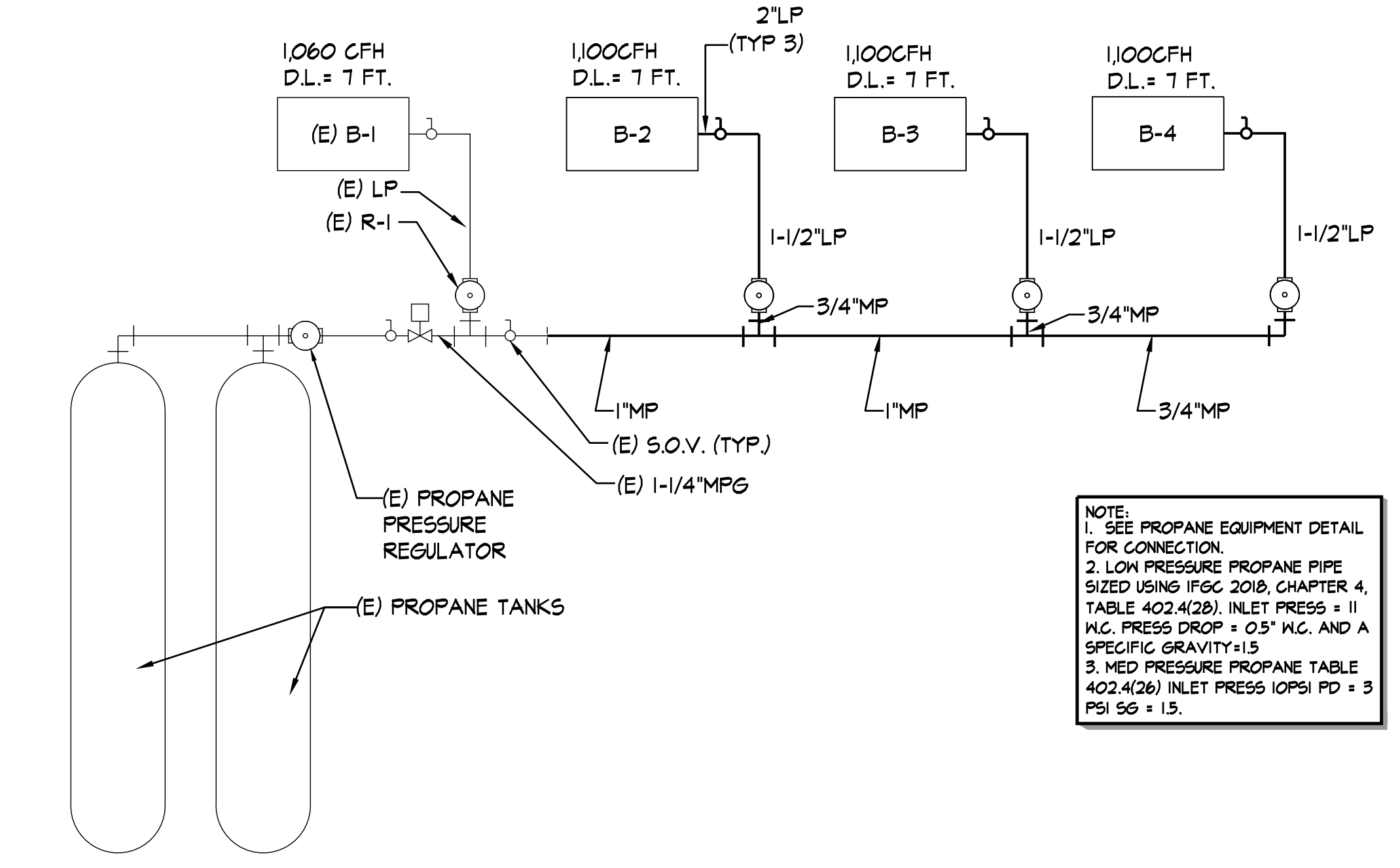
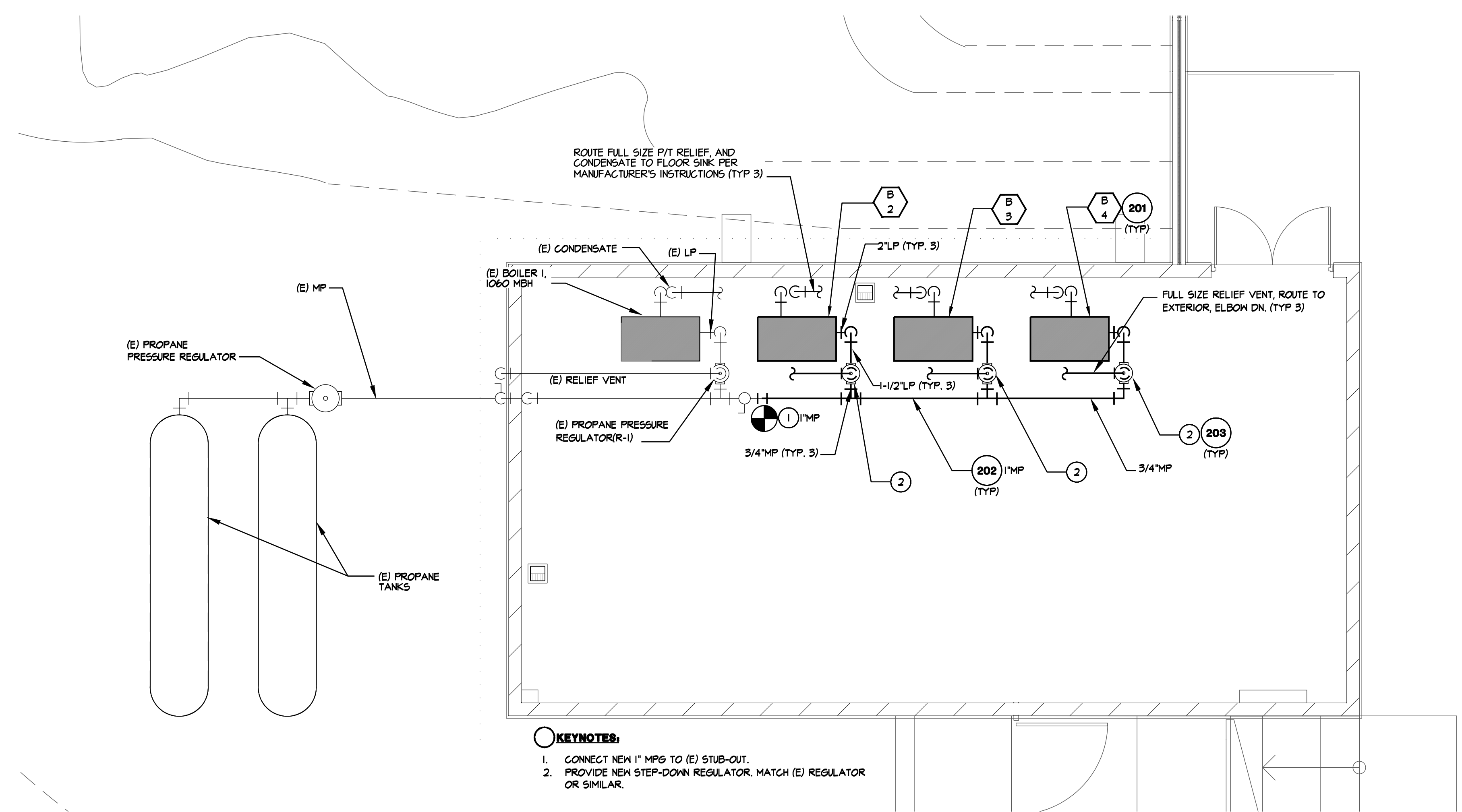
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PIPING SYSTEM	ABBREVIATION	PIPING MATERIAL
PROPANE (ABOVE GRADE)	LP, MP	SCHEDULE 40 BLACK STEEL SCREWED FITTINGS 2-1/2" OR LESS, WELDED JOINTS 3" & LARGER
PROPANE GAS (BELOW GRADE)	LP, MP	MOPE YELLOW GAS PIPING
CONDENSATE DRAIN	CD	TYPE DMV HARD DRAWN COPPER

GENERAL NOTES:
A. REFER TO SPECIFICATIONS FOR FITTINGS, INSTALLATION REQUIREMENTS AND FURTHER INFORMATION.
B. NO PLASTIC (ABS, OR PVC) PIPING TO BE ALLOWED IN RETURN AIR PLENUM.
C. SLOPE ALL CONDENSATE PIPING AT 1/8" IN/FT.
D. ANY PIPING IN FIRE WALLS, IN RETURN AIR PLENUM, OR EXPOSED TO OUTSIDE ELEMENTS SHALL BE CAST IRON OR COPPER.
E. PENETRATIONS THRU WALLS MUST BE SEALED WITH FIRE STOPS CONFORMING TO LATEST I.B.C.

ITEM	EQUIPMENT	QTY	TOTAL LOAD	REQ'D GAS PSI/W.C.
(E) B-1	(E) BOILER	1	1060	10 IN W.C.
B-2	NEW BOILER	1	1100	10 IN W.C.
B-3	NEW BOILER	1	1100	10 IN W.C.
B-4	NEW BOILER	1	1100	10 IN W.C.
TOTAL PROPANE METER LOAD			4360	

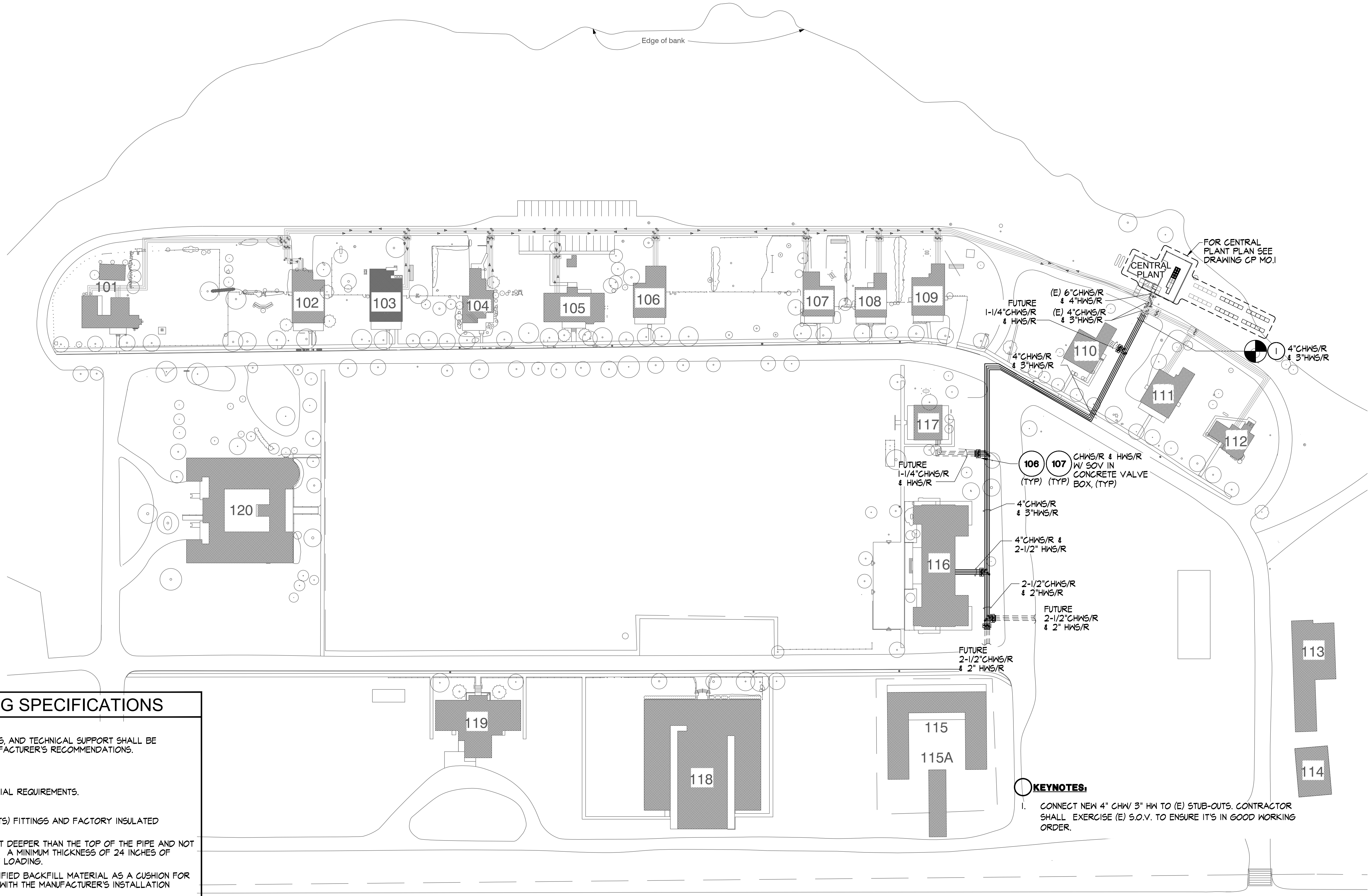


PLUMBING LEGEND + SYMBOLS				
---V	VENT LINE	..... CAP	W	WITH
---(E) V	(E) VENT LINE	..... WCO	WCO	WALL CLEAN-OUT
---LP	LOW PRESSURE PROPANE LINE	..... RISER, WASTE/VENT	O.H.	OVERHEAD
---(E) LP	(E) LOW PRESSURE PROPANE LINE	..... RISER, CAPPED U.G.	U.G.	UNDER GROUND
---MP	MEDIUM PRESSURE PROPANE LINE	..... 90° ELBOW	PTW	PIPE THRU WALL
---(E) MP	(E) MED. PRESSURE PROPANE LINE	..... 45° ELBOW	PTR	PIPE THRU ROOF
---CD	CONDENSATE LINE	..... 90° ELBOW DN	GCO	GRADE CLEANOUT
---(E) CD	(E) CONDENSATE LINE	..... 90° ELBOW UP	FCO	FLOOR CLEANOUT
---S.O.V.	SHUT OFF VALVE (BALL VALVE)	..... TEE	F.E.	INVERT FROM THE MECHANICAL ENGINEER, MUST BE HIGHER IN ELEVATION THAN THE CIVIL ENGINEER'S INVERT IN ORDER TO MAKE CONNECTION.
		..... TEE DN	C.E.	INVERT FROM THE CIVIL ENGINEER, MUST BE LOWER IN ELEVATION THAN THE MECHANICAL ENGINEER'S INVERT IN ORDER TO MAKE CONNECTION.
		..... TEE UP	U.N.O.	UNLESS NOTED OTHERWISE
		..... REDUCER		
		..... UNION		
		..... Y-STRAINER		
		..... HOSE BIBB		
		..... INDIRECT DRAIN		
		..... GATE VALVE		
		..... GLOBE VALVE		
		..... CHECK VALVE		
		..... POINT OF NEW CONNECTION (P.O.C.)		
		..... KEYNOTE TAG		
		..... EQUIPMENT TAG		
		..... DETAIL CALL-OUT		
	 ABOVE		
	 FINISH FLOOR ELEVATION		
	 AIR CONDITIONING		
	 DOWN		
	 (E), EXIST.		
	 VENT THRU ROOF		

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GENERAL NOTE:

- THE MECHANICAL CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF THE SITE PIPING SYSTEM IN COMPLIANCE WITH ALL OF THE MFR'S REQUIREMENTS FOR THE ENGINEERS REVIEW.
- PIPING SHALL BE ROUTED DOWN THE MIDDLE OF THE ROAD, WHERE FEASIBLE.
- UNDERGROUND PIPING CONTRACTOR SHALL CONFORM TO H-20 VEHICLE LIVE LOADS IN ROADWAY. CONTRACTOR SHALL IMMEDIATELY INFORM ARCHITECT IF H-20 VEHICLE LIVE LOAD CANNOT BE ACHIEVED FOR FURTHER INSTRUCTIONS BEFORE CONTINUING WORK.
- CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF ALL EXISTING UNDERGROUND WATER, SEWER AND ELECTRICAL PRIOR TO THE INSTALLATION OF ANY PORTION SITE PIPING SYSTEM.
- ALL UNDER GROUND PIPES SHALL HAVE A 12" LENGTH OF GREEN #18 INSULATED TRACER WIRE SECURELY ATTACHED TO THE PIPES AT 6' O.C.

UNDERGROUND PRE-INSULATED PIPING SPECIFICATIONS

PART 1 - GENERAL

- PRE-INSULATED PIPING - ALL PRE-INSULATED PIPE, FITTINGS, INSULATING MATERIALS, AND TECHNICAL SUPPORT SHALL BE PROVIDED BY THE PRE-INSULATED PIPING SYSTEM MANUFACTURER. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
- THE SYSTEM SHALL BE RHINOFLEX AS MANUFACTURED BY ROVANGO OR EQUAL.

PART 2 - PRODUCTS

- REVIEW PIPE SCHEDULE AND MECHANICAL PIPING NOTES FOR CARRIER PIPE MATERIAL REQUIREMENTS.

PART 3 - EXECUTION

- PRE-FABRICATED SYSTEMS SHALL BE PROVIDED AS SC (STANDARD COMPONENTS) FITTINGS AND FACTORY INSULATED STRAIGHT PIPE SECTIONS FOR FIELD ENGINEERING PER THE CONTRACT DRAWINGS.
- UNDERGROUND SYSTEMS SHALL BE BURIED IN A TRENCH NOT LESS THAN TWO FEET DEEPER THAN THE TOP OF THE PIPE AND NOT LESS THAN EIGHTEEN INCHES WIDER THAN THE COMBINED O.D. OF ALL PIPING SYSTEMS. A MINIMUM THICKNESS OF 24 INCHES OF COMPACTED BACKFILL PLACED OVER THE TOP OF THE PIPE WILL MEET H-20 HIGHWAY LOADING.
- TRENCH BOTTOM SHALL HAVE A MINIMUM OF 6" OF SAND, PEA GRAVEL, OR SPECIFIED BACKFILL MATERIAL AS A CUSHION FOR THE PIPING. ALL FIELD CUTTINGS OF THE PIPE SHALL BE PERFORMED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- ALL PIPING SHALL BE TESTED BY THE INSTALLING CONTRACTOR AS SPECIFIED HEREIN AND APPROVED BY CONSTRUCTION MANAGER AND OWNER BEFORE BEING INSULATED OR OTHERWISE CONCEALED IN ANY WAY. ANY LEAKS SHALL BE REPAIRED BY REPLACING THE DEFECTIVE ELEMENT WITH PROCEDURES EQUIVALENT TO NEIL. PENDING, CAULKING, PARTIAL WELDING OR BRAZING, ETC. SHALL NOT BE ACCEPTED. A HYDROSTATIC PRESSURE TEST OF THE CARRIER PIPE SHALL BE PERFORMED 1.5 TIMES THE NORMAL SYSTEM OPERATING PRESSURE FOR NOT LESS THAN (4) HOURS WITHOUT LOSSES. CARE SHALL BE TAKEN TO INSURE ALL TRAPPED AIR IS REMOVED FROM THE SYSTEM PRIOR TO THE TEST. APPROPRIATE SAFETY PRECAUTIONS SHALL BE TAKEN TO GUARD AGAINST POSSIBLE INJURY TO PERSONNEL IN THE EVENT OF A FAILURE.
- FIELD SERVICE, IF REQUIRED, SHALL BE PROVIDED BY A CERTIFIED MANUFACTURER'S REPRESENTATIVE OR COMPANY FIELD SERVICE TECHNICIAN. THE TECHNICIAN WILL BE AVAILABLE AT THE JOB A MINIMUM OF ONE DAY (OR MORE IF REQUIRED BY JOB SIZE) TO CHECK UNLOADING, STORING, AND HANDLING OF PIPE, PIPE INSTALLATION, PRESSURE TESTING, FIELD JOINT INSULATION, AND BACKFILLING TECHNIQUES.

END SPECIFICATIONS

MECHANICAL PIPE MATERIAL SCHEDULE			
PIPING SYSTEM	ABBREVIATION	PIPING MATERIAL	PIPE INSULATION
CHILLED WATER SUPPLY/RETURN BELOW GROUND	CHWS/R	ROVANGO RHINO-FLEX PRE-INSULATED SDR-11 PIPING OR SIMILAR	PRE-INSULATED FLEXIBLE URETHANE
HEATING WATER SUPPLY/RETURN BELOW GROUND	HTWS/R	ROVANGO RHINO-FLEX PRE-INSULATED PE-X-A PIPING OR SIMILAR	PRE-INSULATED FLEXIBLE URETHANE
CHILLED WATER SUPPLY/RETURN ABOVE GROUND	CHWS/R	SCHEDULE 40 BLACK STEEL	MIN 2" FIBERGLASS WRAP W/ MIN 24 GAUGE ALUMINUM JACKET
HEATING WATER SUPPLY/RETURN ABOVE GROUND	HTWS/R	SCHEDULE 40 BLACK STEEL	MIN 2" FIBERGLASS WRAP W/ MIN 24 GAUGE ALUMINUM JACKET

GENERAL NOTES:
A. REFER TO SPECIFICATIONS AND NOTES FOR FITTINGS, INSTALLATION REQUIREMENTS AND FURTHER INFORMATION.

1 MECHANICAL PIPING SITE PLAN
SCALE 1/84" = 1'-0"

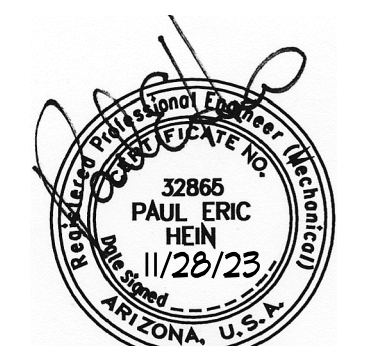
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116 Geronimo Street, Fort Apache, AZ 85926
MECHANICAL PIPING SITE PLAN



DRAWN STAFF
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DATE 06.30.2023
SCALE AS SHOWN
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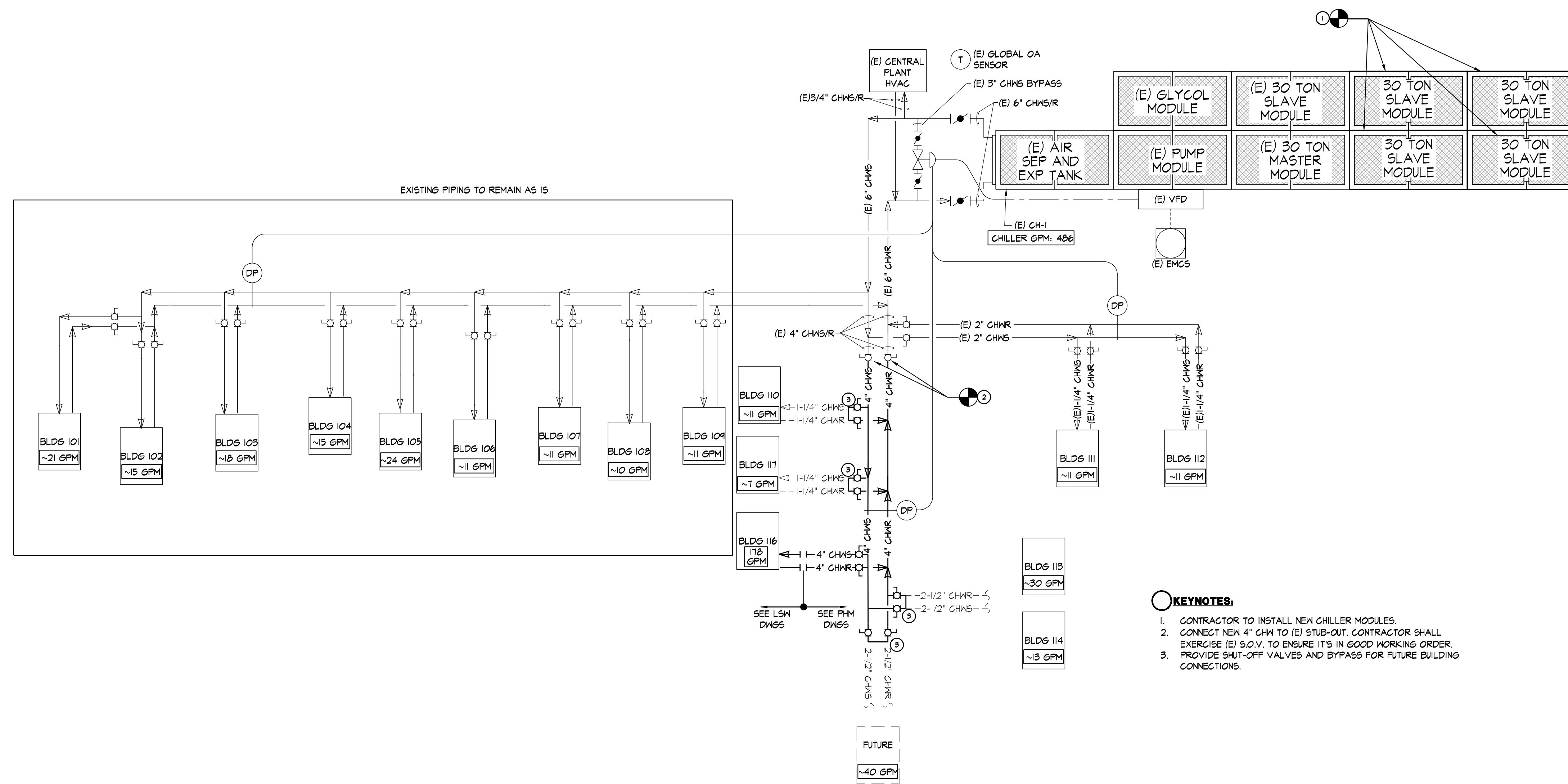
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FORT APACHE - BUILDING #116 REHABILITATION
116 Geronimo Street, Fort Apache, AZ 85926
SITE CHILLED WATER SYSTEM DIAGRAM

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SITE CHILLED WATER SYSTEM DIAGRAM
NTS

1

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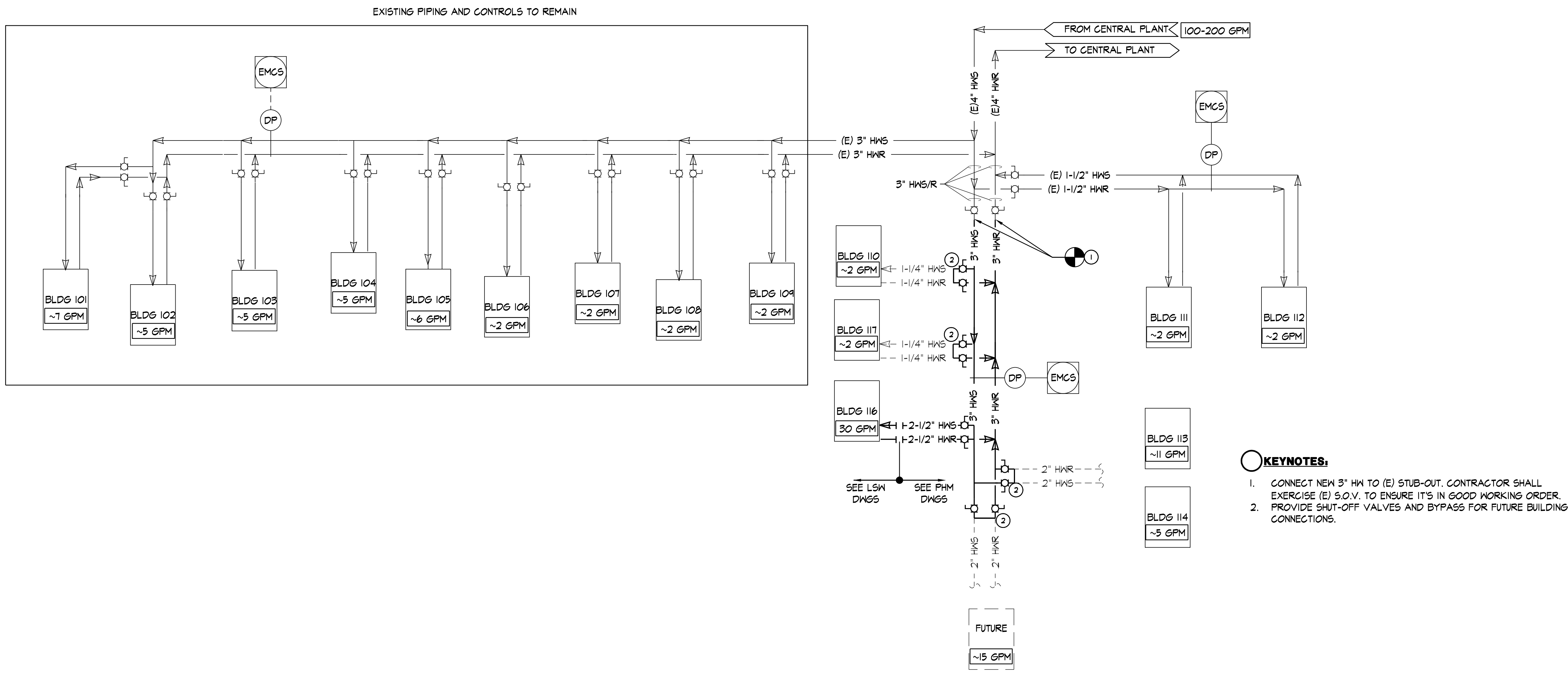
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SITE HEATING WATER SYSTEM DIAGRAM
NT5

1

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SITE HEATING WATER SYSTEM DIAGRAM



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CP M0.5	

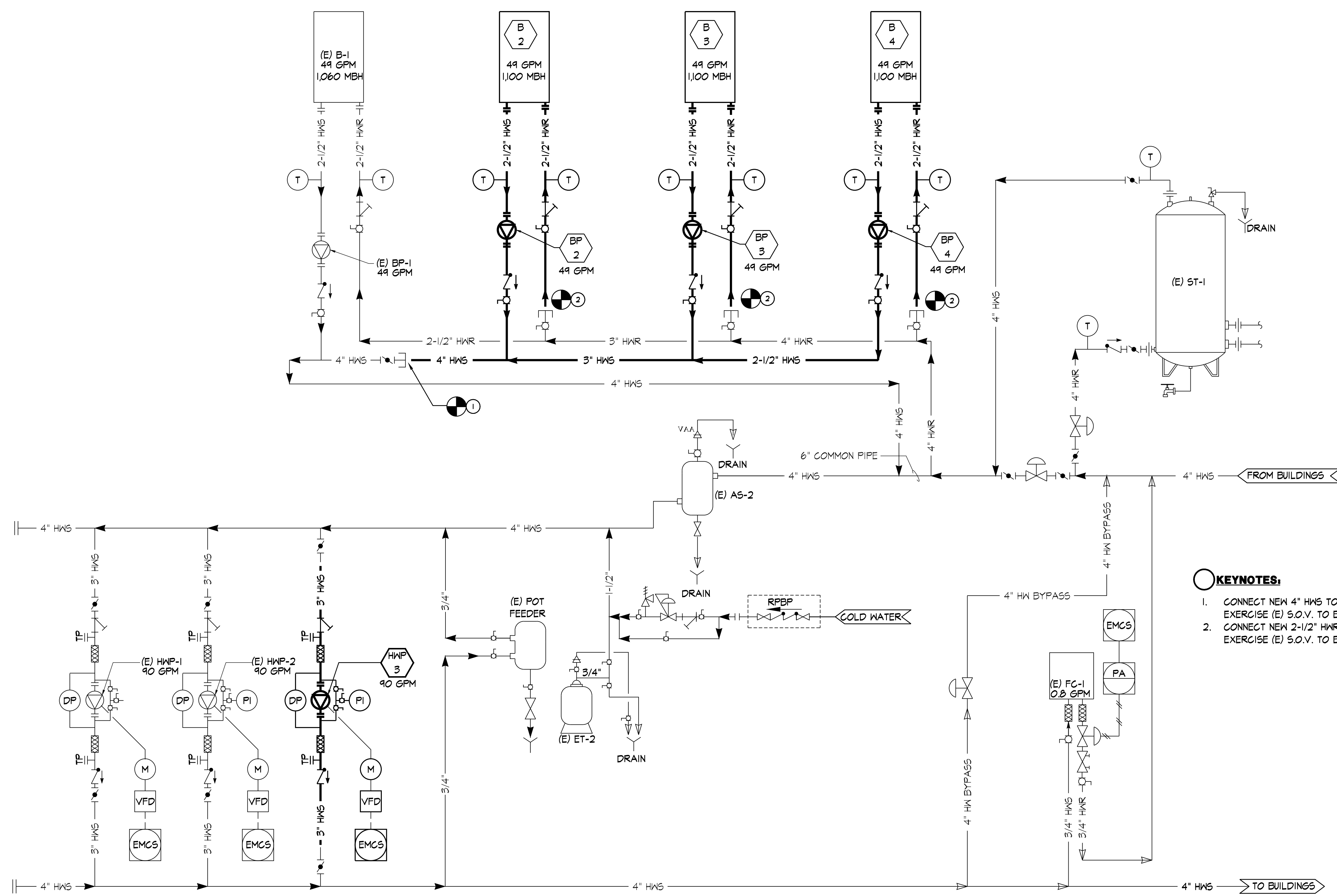
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GLOBAL OA
SENSOR



KEYNOTES:

1. CONNECT NEW 4" HWS TO (E) STUB-OUT. CONTRACTOR SHALL EXERCISE (E) S.O.V. TO ENSURE IT'S IN GOOD WORKING ORDER.
2. CONNECT NEW 2-1/2" HWR TO (E) STUB-OUT. CONTRACTOR SHALL EXERCISE (E) S.O.V. TO ENSURE IT'S IN GOOD WORKING ORDER.

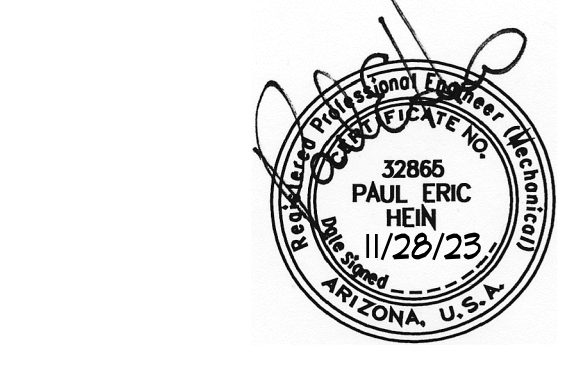
HEATING WATER CENTRAL PLAN DIAGRAM
NTS

1

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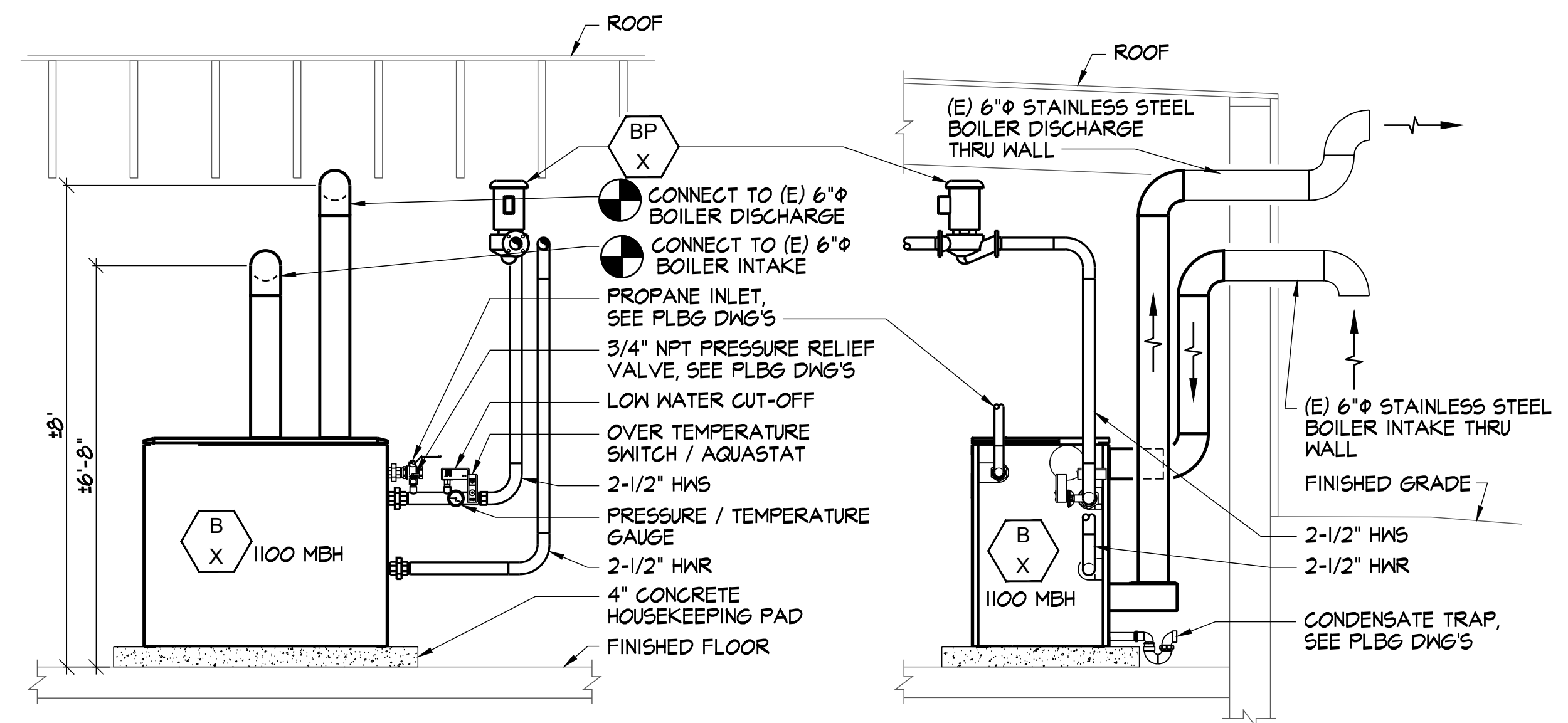
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HEATING WATER CENTRAL PLAN DIAGRAM



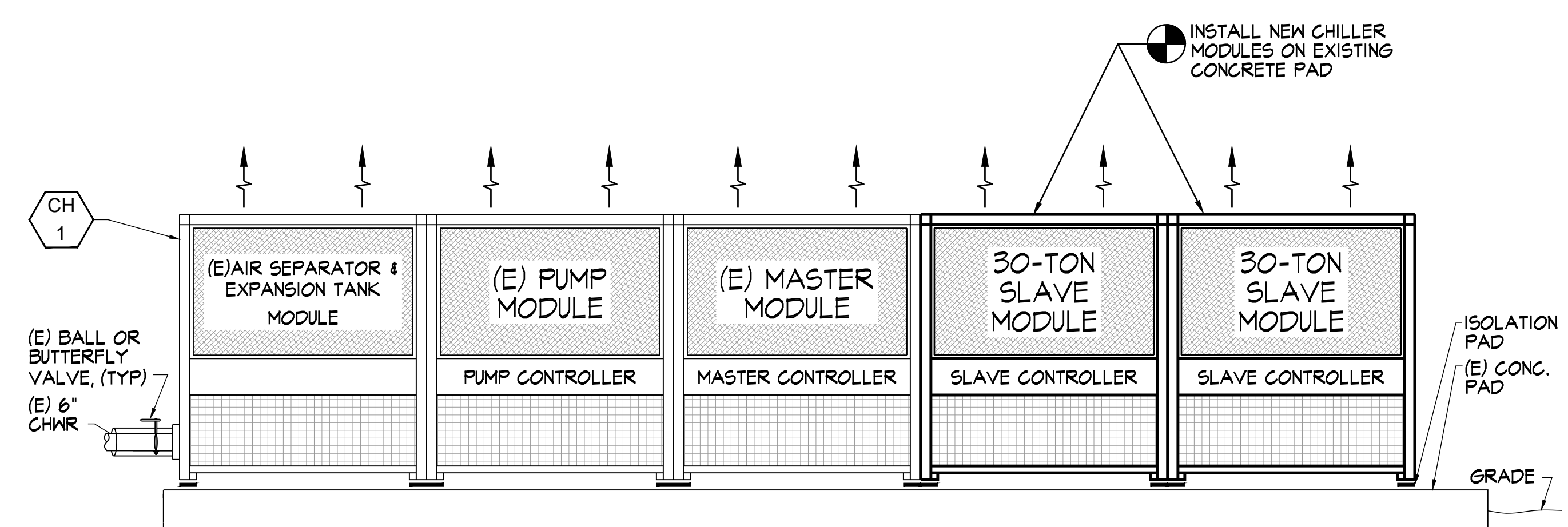
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CP M0.6	

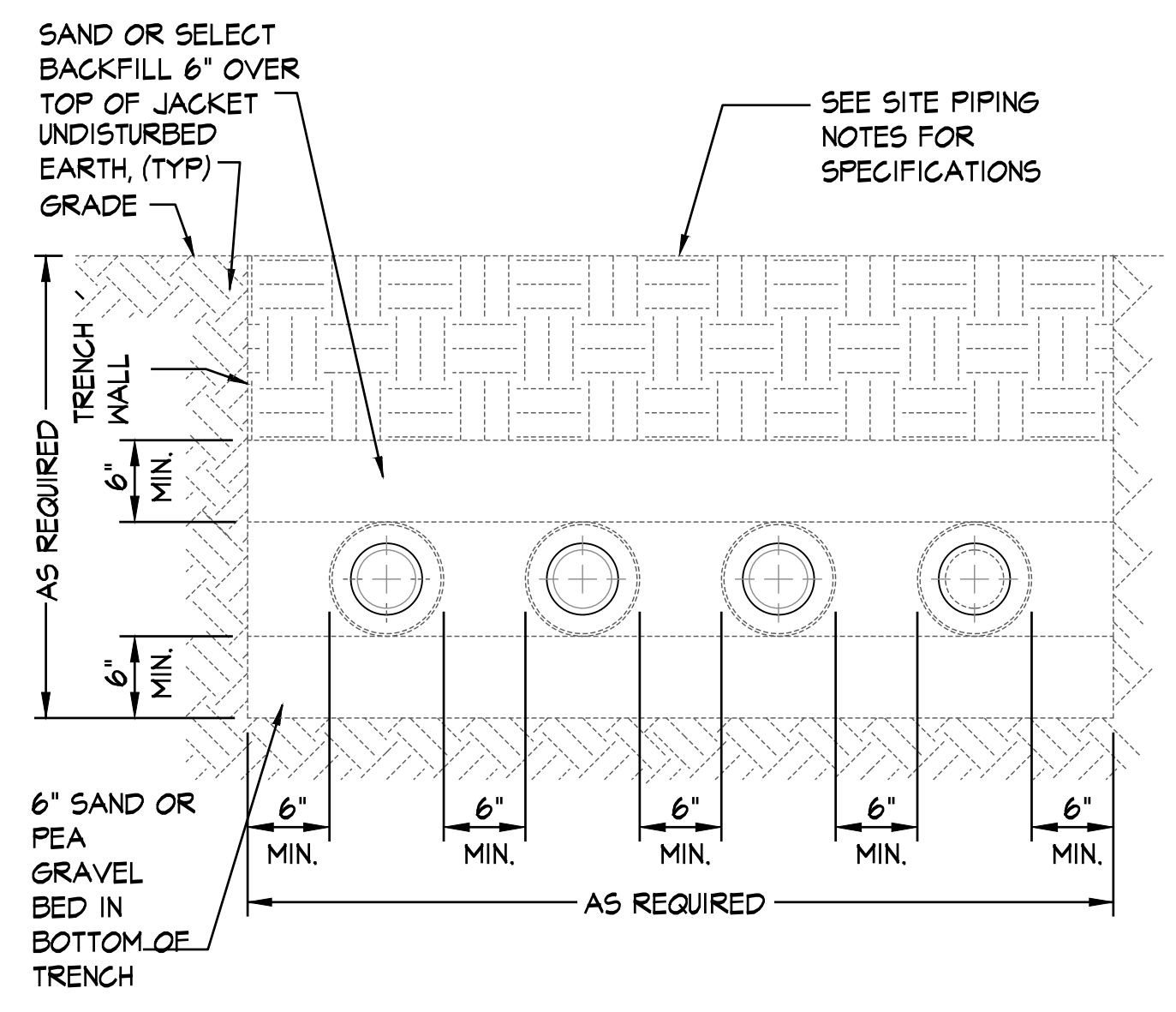
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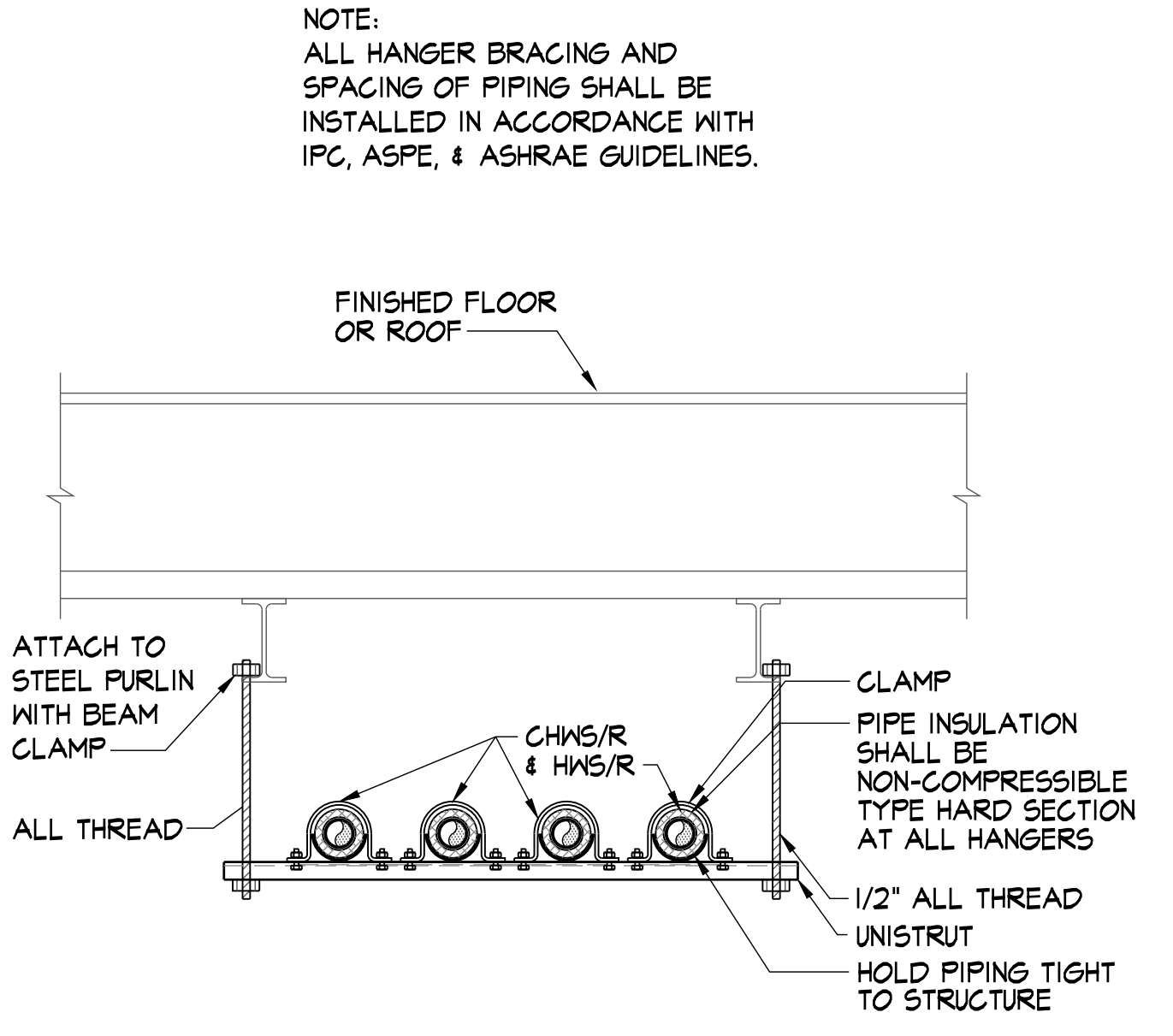
BOILER DETAIL
NTS (102)



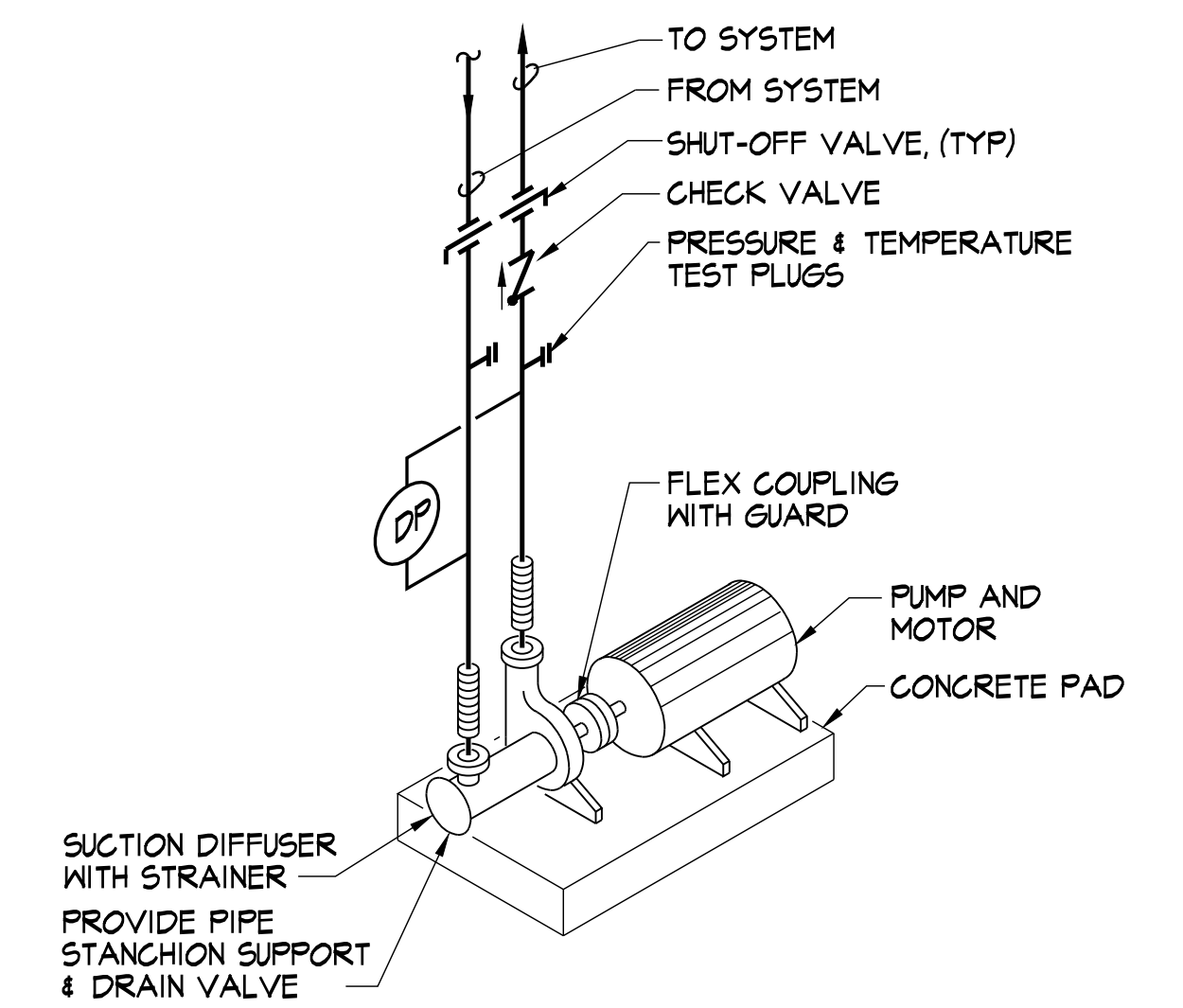
CHILLER DETAIL
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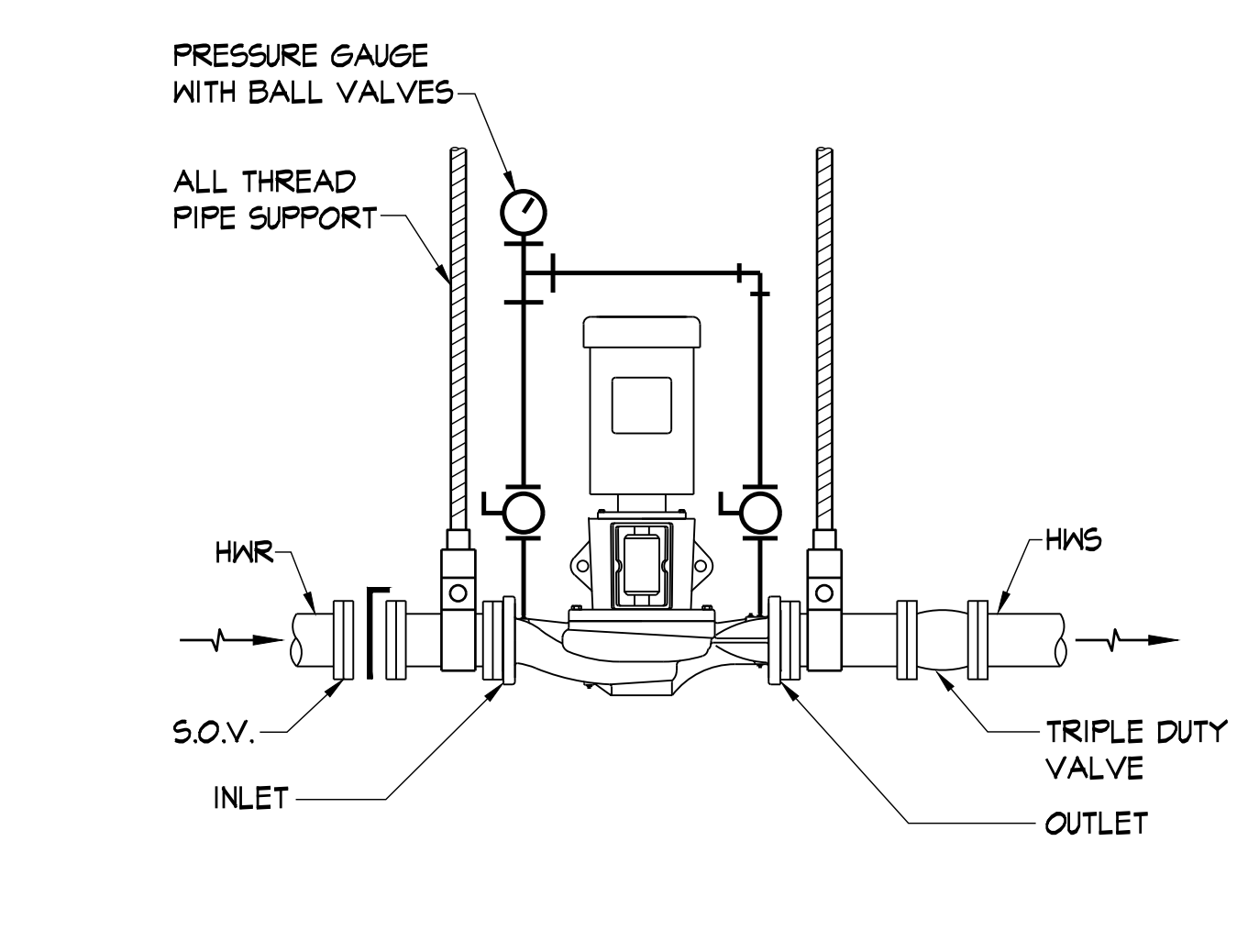
PIPE TRENCH DETAIL
NTS (106)



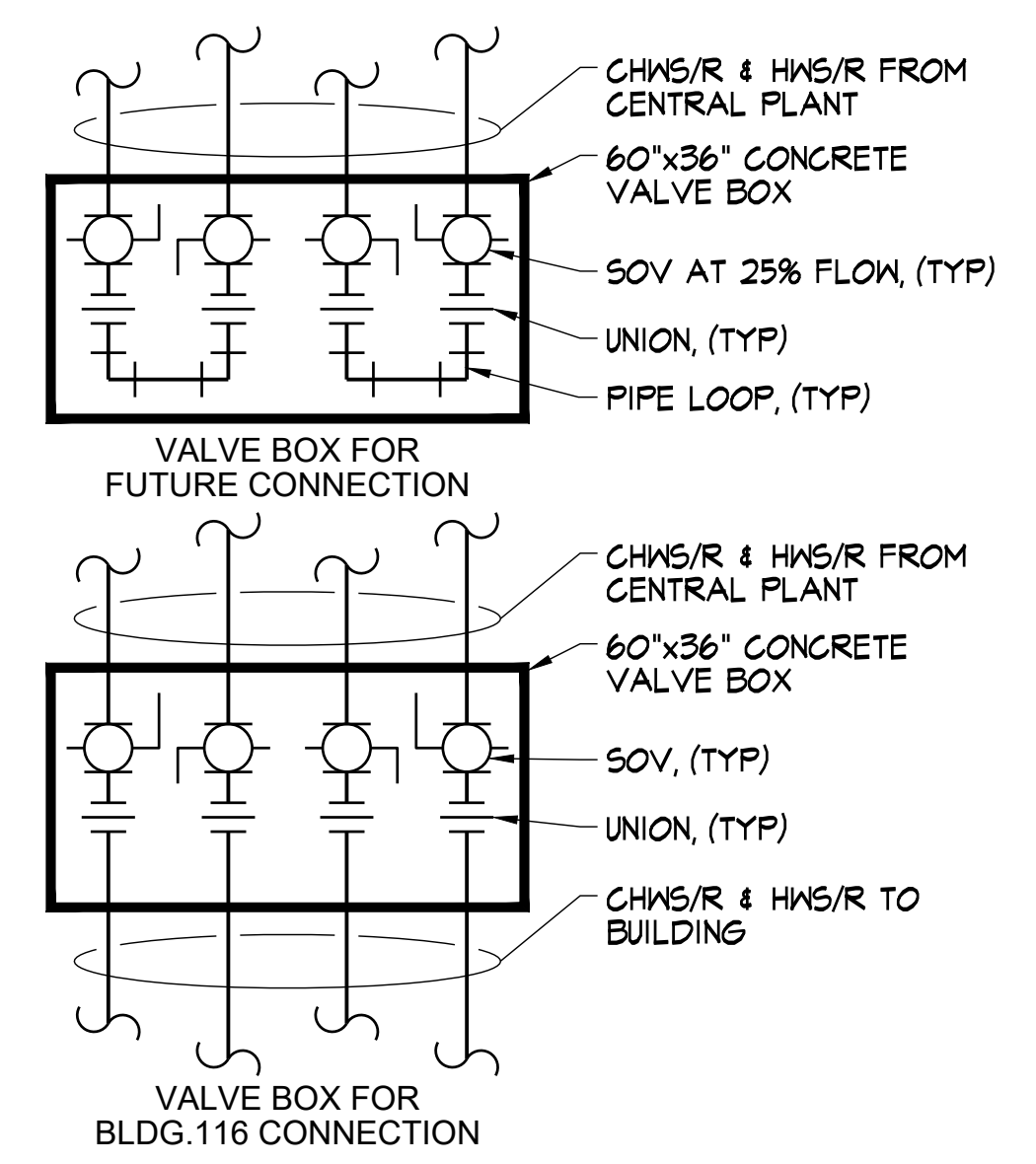
PIPING SUPPOT DETAIL
NTS (105)



HEATING WATER PUMP DETAIL
NTS (104)



INLINE PUMP DETAIL
NTS (103)

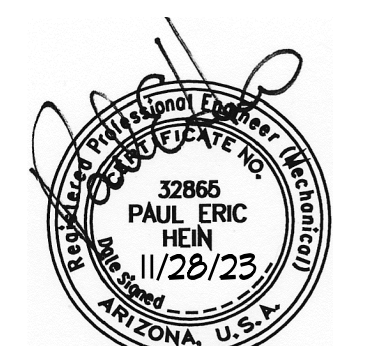


VALVE BOX DETAIL
NTS (107)

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AIR-COOLED CHILLER SCHEDULE

MARK	MFR & MODEL	CHILLER UNIT DATA										COOLER DATA						CONDENSER DATA				ELECTRICAL DATA				APPROX. OPER. WEIGHT LBS.	REMARKS
		NOMINAL TONS @ 92°F EAT	TOTAL COMP. KW	EER	# OF MASTER MODULES	# OF SLAVE MODULES	# OF GLYCOL MODULES	# OF PUMP MODULES/ PUMP EXTERNAL HEAD	# OF AIR SEPARATOR MODULES	WATER DATA		G.P.M. PUMP HP	MAX ΔP FT. HD.	FOULING FACTOR	EAT °F	AIR FLOW CFM PER FAN	# OF FANS	HP PER FAN	CHILLER DATA								
										ENT °F	LVG °F								VOLTS	PHASE	MCA	MOCP					
(E)CH-1	AIRSTACK ASP-30X	120	161.6	197.2	9.9	1	5	1	1/155'	1	54	44	426 GPM 40 HP	16.42	0.0001	92°	11,000	12	2	460	3	415	500	18,000	(1)(2)(3)(4)		

- EQUIPMENT SELECTED @ AN ALTITUDE OF 6400 FEET.
- BAS INTERFACE CONTROLLER COMPATIBLE WITH THE BUILDING'S EMC, CONFIRM WITH CONTROLS CONTRACTOR FOR SYSTEMS PROTOCOL.
- LOW AMBIENT CONTROL DOWN TO 0°F AMBIENT.
- PROVIDE ISOLATION VALVES FOR EACH CHILLER MODULE.

HEATING WATER BOILER SCHEDULE

MARK	SERVICE	MFR & MODEL	EFFICIENCY AT FULL FIRE	FUEL	OPERATING WATER TEMP.		FLOW @ 40°ΔT (GPM)	PRESSURE DROP @ MAX FLOW (FT. HD)	MAX MBH INFLT	MAX MBH OUTFLT	APPROX. MAX ΔX (IN)	TURNDOWN RATIO	BOILER ELECTRICAL DATA		APPROX. OPER. WEIGHT (LBS)		BOILER PUMP ELECTRICAL DATA		REMARKS
					ENT (°F)	LWT (°F)							V/PH/Hz	FLA	HP	V/PH/Hz			
B-2	BLDG. 12B	AERCO MODULEX EXT-1100	95% EFFICIENT	PROPANE	100°	140°	49	2.6	1124	1067	52x31x46	24.5:1	120/1160	6.3	900	1-1/2	120/1160	(2)(3)(4)(5)(6)(7)(8)(9)	
B-3	BLDG. 12B	AERCO MODULEX EXT-1100	95% EFFICIENT	PROPANE	100°	140°	49	2.6	1124	1067	52x31x46	24.5:1	120/1160	6.3	900	1-1/2	120/1160	(2)(3)(4)(5)(6)(7)(8)(9)	
B-4	BLDG. 12B	AERCO MODULEX EXT-1100	95% EFFICIENT	PROPANE	100°	140°	49	2.6	1124	1067	52x31x46	24.5:1	120/1160	6.3	900	1-1/2	120/1160	(2)(3)(4)(5)(6)(7)(8)(9)	

- BASIS OF DESIGN OR EQUAL, CONDENSING 95% EFFICIENT, 24.5:1 TURNDOWN.
- INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
- PROVIDE ALL STANDARD OPTIONS.
- EQUIPMENT SELECTED FOR PROPANE AT AN ELEVATION OF 6400 FEET.
- PROVIDE PRESSURE RELIEF PIPING SIZE EQUAL VALVE OUTLET, DISCHARGE SO AS TO AVOID EXPOSURE OF PERSONS TO HOT LIQUID OR VAPOR.
- PROVIDED AND INSTALL PRESSURE / SAFETY RELIEF VALVE PER SECTION 1006.3 - 1006.7 OF THE 2018 IMC.
- PROVIDED AND INSTALL MANUFACTURER'S BOILER LOW-WATER CUTOFF PER SECTION 1007.2 OF THE 2018 IMC.
- THE INSTALLATION OF THE BOILER SHALL BE APPROVED BY THE STATE BOILER INSPECTOR.
- PROVIDE MULTI-BOILER MODULATING CONTROLLER.

PUMP SCHEDULE

MARK	SERVICE	MFR & MODEL	SIZE WxLxH (IN)	SUCTION DISCHARGE (IN)	TYPE	ROTATION	LIQUID	GPM	TDH FT. KC.	MOTOR DATA										APPROX. WEIGHT (LBS)	REMARKS
										HP	SPEEDS	RPM	V/PH	TYPE							
HWP-3	HEATING WATER	TACO 150TD	15x32x18	2-1/2x1-1/2	END SUCTION	CHW	WATER AT 140°F	90	125	4.9	7.5	VFD	3500	460/3Ø	ODP	260	(5)(6)(7)(8)(9)				
BP-2	BOILER PUMP	TACO 1915	10x18x23	1-1/2x1-1/2	INLINE	CHW	WATER AT 140°F	49	10	1/3	1/2	1	1760	115V/1Ø	ODP	90	(5)(6)				
BP-3	BOILER PUMP	TACO 1915	10x18x23	1-1/2x1-1/2	INLINE	CHW	WATER AT 140°F	49	10	1/3	1/2	1	1760	115V/1Ø	ODP	90	(5)(6)				
BP-4	BOILER PUMP	TACO 1915	10x18x23	1-1/2x1-1/2	INLINE	CHW	WATER AT 140°F	49	10	1/3	1/2	1	1760	115V/1Ø	ODP	90	(5)(6)				

- MOTOR OPERATING BRAKE HORSEPOWER AT SCHEDULED CONDITIONS.
- ROTATION AS VIEWED FROM DRIVE SHAFT SIDE.
- BASIS OF DESIGN OR EQUAL.
- MOTOR TYPE DEFINITIONS: ODP= OPEN DRIP PROOF; TEFC= TOTALLY ENCLOSED FAN COOLED; TEEP= TOTALLY ENCLOSED EXPLOSION PROOF; TEAO= TOTALLY ENCLOSED AIR OVER.
- APPROXIMATE TRIM SIZE TO BE DETERMINED BY MANUFACTURER.
- MOTOR SELECTION NON-OVERLOADING THROUGH ENTIRE CURVE.
- PROVIDE MFR'S SUCTION DIFFUSER.
- GROUT BASE OF PUMP W/ NON-SHRINKABLE CEMENT.
- VFD: ABB VARIABLE FREQUENCY DRIVE WITH DISCONNECT WITH BYPASS.

MECHANICAL PIPING NOTES

- PART I - GENERAL:**
- 1.01 PIPE AND FITTINGS ABOVE GROUND:**
- CHILLED / HEATING WATER SUPPLY AND RETURN SHALL BE SCHEDULE 40 BLACK STEEL PIPE PER ASTM A53 OR A120. FITTINGS SHALL BE MALLEABLE IRON PER ANSI/ASTM B16.3 OR FORGED STEEL WELDING TYPE PER ASTM A234.
- 1.02 JOINTS ABOVE GROUND:**
- CHILLED / HEATING WATER SUPPLY AND RETURN PIPES 2" AND UNDER SHALL HAVE SCREWED JOINTS. PIPES OVER 2" SHALL HAVE WELDED JOINTS PER ANSI/AWS D11.
 - PROVIDE DIELECTRIC UNIONS OR FLANGES WHERE PIPING JOINS OTHER PIPING OF DISSIMILAR METALLURGY.
- 1.03 PIPE HANGERS:**
- ALL PIPING WITHIN THE CONFINES OF THE BUILDING SHALL BE SUPPORTED BY MEANS OF ADJUSTABLE STEEL CLEVIS HANGERS SPACED PER ASHRAE RECOMMENDATIONS AND SUSPENDED FROM THE BUILDING CONSTRUCTION BY ALL-THREAD RODS, STRAP, WIRE, OR CHAIR WIRES ARE NOT PERMITTED. WHERE SUSPENDED FROM STEEL STRUCTURAL MEMBERS, APPROPRIATE CLAMPS SHALL BE USED.
- 1.04 INSULATION ABOVE GROUND:**
- CHILLED / HEATING WATER SUPPLY AND RETURN PIPING SHALL BE INSULATED WITH GLASS FIBER INSULATION PER ANSI/ASTM C541 WITH CONDUCTIVITY BETWEEN 0.21 AND 0.21 BTU-IN/HR-FT²-F.]
 - HEATING WATER PIPES LESS THAN 1/2" DIAMETER SHALL HAVE 1/2" THICK INSULATION. HEATING WATER PIPES EQUAL TO OR GREATER THAN 1/2" DIAMETER SHALL HAVE 2" THICK INSULATION.]
 - CHILLED WATER PIPES LESS THAN 1/2" DIAMETER SHALL HAVE 1" THICK INSULATION. CHILLED WATER PIPING GREATER THAN 1/2" DIAMETER SHALL HAVE 2" THICK INSULATION.]
 - A KRAFT PAPER REINFORCED, FOIL VAPOR BARRIER, WITH SELF-SEALING ADHESIVE JOINTS SHALL COVER INSULATION ON INTERIOR PIPING.
 - A SMOOTH, 0.020" THICK ALUMINUM JACKET SHALL COVER INSULATION ON EXTERIOR PIPING.
- PART II - EXECUTION:**
- 2.01 GENERAL:**
- LOCATIONS INDICATED ON THE DRAWINGS SHOW THE ARRANGEMENT DESIRED FOR THE EQUIPMENT AND SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE. THE WORK SHALL BE LAID OUT ON THE JOB TO SECURE A NEAT ARRANGEMENT, TO SECURE THE BEST CONDITIONS THROUGHOUT, AND TO OVERCOME DIFFICULTIES AND INTERFERENCES WHERE ENCOUNTERED. IF EQUIPMENT PROPOSED IS ARRANGED DIFFERENTLY THAN THAT SHOWN, THIS CONTRACTOR SHALL PROVIDE SHOP DRAWINGS OF ALL ITEMS AFFECTED. EQUIPMENT SHALL BE INSTALLED TO PERMIT ACCESS FOR SERVICE AND MAINTENANCE. ALL EQUIPMENT SHALL BE INSTALLED AS RECOMMENDED BY THE EQUIPMENT MANUFACTURERS.
- 2.02 PIPING:**
- ALL PIPING SHALL BE ACCURATELY CUT AND INSTALLED IN PLACE WITHOUT FORCING. CHANGES IN DIRECTION SHALL BE MADE WITH FITTINGS. BENDINGS OF PIPING EXCEPT ANNEALED COPPER WILL NOT BE ACCEPTED. REDUCING FITTINGS, RATHER THAN BUSHINGS, SHALL BE USED WHERE PIPE SIZES CHANGE.
 - TEE FITTINGS SHALL NOT BE USED FOR CONVERTING OR DIVERGING FLOW. (I.E. TWO FLOWS IN AND ONE FLOW OUT OR ONE FLOW IN AND TWO FLOWS OUT). A BRANCH TEE AND ONE ELBOW SHALL BE USED INSTEAD.
 - ELBOWS, UNLESS OTHERWISE SPECIFIED OR NOTED, SHALL BE OF THE LONG RADIUS TYPE WITH A CENTERLINE RADIUS EQUAL TO 1-1/2 TIMES THE PIPE DIAMETER.
 - PIPING SHALL BE INSTALLED SO AS NOT TO WEAKEN ANY STRUCTURAL ELEMENTS OF THE BUILDING.
- PIPING SHALL BE INSTALLED IN A MANNER WHICH WILL NOT INTERFERE WITH THE WORK OF OTHER TRADES
 - INSTALL PIPING TO ALLOW FREEDOM FOR EXPANSION AND CONTRACTION AND FREEDOM FROM NOISE AND VIBRATION. PROVIDE OFFSETS, LOOPS, SWING JOINTS, OR EXPANSION JOINTS TO ALLOW FOR EXPANSION AND CONTRACTION. PROVIDE ANCHORS AND GUIDES AS REQUIRED, IN CONJUNCTION WITH EXPANSION CONTROL DEVICES OR METHODS, TO RESTRAIN PIPING.
 - CHILLED AND HEATING WATER PIPING SHALL BE RUN TO AVOID AIR POCKETS. ECCENTRIC FITTINGS SHALL BE USED AS REQUIRED TO AVOID AIR TRAPS.]
 - CHILLED AND HEATING WATER BRANCH CONNECTIONS SHALL BE TAKEN OFF BOTTOM OR BELOW CENTERLINE OF MAINS UNLESS OTHERWISE INDICATED.]
 - ISOLATE ALL COPPER FROM CONTACT WITH STEEL, CONCRETE, OR MASONRY.
 - ON INSULATED PIPING WITH VAPOR BARRIER, INSULATE FITTINGS, VALVES, UNIONS, FLANGES, STRAINERS, FLEXIBLE CONNECTIONS, AND EXPANSION JOINTS.
 - TO PREVENT INSULATION FROM SAGGING AT SUPPORT POINTS ON 2" DIAMETER OR LARGER PIPING, PROVIDE INSERTS NOT LESS THAN 6" LONG OF SAME THICKNESS AND CONTOUR AS ADJOINING INSULATION. PLACE INSERTS BETWEEN SUPPORT SHIELD AND PIPING, BUT UNDER THE FINISH JACKET. INSERTS SHALL BE CALCIUM SILICATE OR OTHER HEAVY DENSITY INSULATING MATERIAL SUITABLE FOR THE PLANNED TEMPERATURE RANGE.
 - NEATLY FINISH INSULATION AT SUPPORTS, PROTRUSIONS, AND INTERRUPTIONS.
- 2.03 TESTS AND ADJUSTMENTS**
- ALL SYSTEMS SHALL BE PLACED IN SERVICE AND BE OPERATING PROPERLY FOR A PERIOD OF NOT LESS SEVEN CONSECUTIVE 24-HOUR DAYS BEFORE ACCEPTANCE.
- 2.04 CLEAN-UP:**
- AT ALL TIMES, KEEP THE BUILDING AND PREMISES IN A NEAT MANNER. ALL INSTRUCTIONS ISSUED BY THE ARCHITECT CONCERNING STORAGE OF MATERIALS, PROTECTIVE MEASURES, CLEANING OF DEBRIS ETC. SHALL BE EXPLICITLY FOLLOWED. UPON COMPLETION OF THE WORK, LEAVE AREAS DIRECTLY AFFECTED BY THIS WORK BROOM CLEAN.
- 2.05 RECORD DRAWINGS:**
- MAINTAIN A CLEAN UNDAMAGED SET OF CONTRACT DRAWINGS ON SITE. RECORD ALL CHANGES FROM CONTRACT DRAWINGS INCLUDING "FOUND" CONDITIONS AND SUBMIT TO ARCHITECT RECORD DRAWINGS AT CLOSE OF PROJECT.
- 2.06 OPERATION AND MAINTENANCE MANUAL:**
- FURNISH TO THE ARCHITECT AN ELECTRONIC FILE OF THE OPERATING AND MAINTENANCE MANUALS. MANUALS SHALL CONTAIN MANUFACTURER'S CUT SHEETS OF ALL EQUIPMENT FURNISHED, SPARE PARTS LIST, SEQUENCE OF OPERATION, AND A PREVENTATIVE MAINTENANCE SCHEDULE IDENTIFYING DAILY, WEEKLY, MONTHLY AND SEASONAL MAINTENANCE PROCEDURES AS REQUIRED.
- 2.07 WARRANTIES:**
- GUARANTEE WORK TO BE FREE FROM DEFECTS IN WORKMANSHIP AND MATERIAL FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE. ANY MATERIAL OR EQUIPMENT THAT PROVES DEFECTIVE WITHIN THE PERIOD SHALL BE PROMPTLY REPAIRED OR REPLACED WITHOUT COST TO THE OWNER. THIS SHALL INCLUDE REPLACEMENT OF ANY REFRIGERANT LOST FROM THE SYSTEM. FURNISH A LETTER STATING THAT THE SYSTEM HAS BEEN INSTALLED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND WITH ANY DEVIATIONS DETAILED IN FULL. STANDARD FACTORY WARRANTIES SHALL BE PROVIDED ON ALL EQUIPMENT FURNISHED AND EVIDENCE OF SAME SHALL BE FURNISHED TO THE ARCHITECT IN THE O&M MANUAL.
 - PROVIDE AN ADDITIONAL FOUR-YEAR WARRANTY ON ALL AIR CONDITIONING COMPRESSORS SUPPLIED WITH THIS PROJECT.
- END OF SPECIFICATIONS

MECHANICAL AND PLUMBING NOTES

- PART I - GENERAL:**
- ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH ALL CODES, LAWS, RULES AND REGULATIONS OF ALL NATIONAL, STATE, COUNTY, AND LOCAL AUTHORITIES HAVING JURISDICTION OVER THE PREMISES. THIS SHOULD INCLUDE, BUT NOT BE LIMITED TO, THE INTERNATIONAL MECHANICAL CODE (IMC 2018), INTERNATIONAL PLUMBING CODE (IPC 2018), INTERNATIONAL BUILDING CODE (IBC 2018), INTERNATIONAL ENERGY CONSERVATION CODE (IECC 2018) AND THE NATIONAL FIRE PROTECTION ASSOCIATION. IN CASE OF DIFFERENCES, THE MOST RESTRICTIVE OF SAID REGULATIONS SHALL GOVERN. HOWEVER, THIS SHALL NOT BE CONSTRUED TO RELIEVE THIS CONTRACTOR FROM COMPLYING WITH REQUIREMENTS OF THE PLANS AND SPECIFICATIONS WHICH MAY BE IN EXCESS OF CODE REQUIREMENTS.
 - FURNISH AND INSTALL ALL EQUIPMENT AND MATERIAL AS SHOWN. THIS SHALL INCLUDE ALL ITEMS NECESSARY TO COMPLETE THE INSTALLATION WHETHER SPECIFICALLY MENTIONED OR NOT.
 - MECHANICAL AND PLUMBING DRAWINGS ARE DIAGRAMMATIC AND INTENDED TO SHOW THE APPROXIMATE LOCATION OF EQUIPMENT AND PIPING. DIMENSIONS GIVEN IN FIGURE ON THE PLANS SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONS. ALL DIMENSIONS, WHETHER GIVEN IN FIGURES OR SCALED, SHALL BE VERIFIED IN THE FIELD.
 - BEFORE SUBMITTING A BID, CAREFULLY STUDY ALL CONSTRUCTION DOCUMENTS. CAREFULLY EXAMINE THE PREMISES, ANY EXISTING CONDITIONS, INCLUDING INVERTS TO ENSURE PROPER SLOPE MAY BE OBTAINED AND ANY EXISTING WORK. DETERMINE IN ADVANCE, THE METHODS OF INSTALLING AND CONNECTING THE EQUIPMENT, THE MEANS TO BE PROVIDED FOR GETTING THE EQUIPMENT INTO PLACE AND BE THOROUGHLY FAMILIAR WITH ALL OF THE REQUIREMENTS OF THE CONTRACT.
 - BY THE ACT OF SUBMITTING A PROPOSAL FOR THE WORK REQUIRED AND INCLUDED IN THE CONTRACT, THE CONTRACTOR SHALL BE DEEMED TO HAVE MADE SUCH STUDY AND EXAMINATION AND TO BE FAMILIAR WITH AND ACCEPT ALL CONDITIONS OF THE SITE.
 - MAKE ARRANGEMENTS FOR AND PAY FOR ALL FEES, PERMITS, LICENSES, CONNECTION CHARGES AND INSPECTIONS REQUIRED FOR PLUMBING WORK. PERFORM REQUIRED TESTS AND SECURE REQUIRED INSPECTIONS PRIOR TO BACK-FILLING.
 - CONTRACTOR SHALL FURNISH ANY MISCELLANEOUS ITEMS NORMALLY USED, SPECIFICALLY MENTIONED OR NOT, TO RENDER A COMPLETE INSTALLATION.
 - ALL EQUIPMENT SHALL BE INSTALLED PER THE MANUFACTURER'S REQUIREMENTS. THE MECHANICAL SYSTEMS HAVE BEEN DESIGNED AROUND THE MAKES AND SIZES OF EQUIPMENT NAMED IN THE EQUIPMENT SCHEDULES AND SHOWN ON THE DRAWINGS. OTHER MAKES OF EQUIPMENT NAMED IN THIS SPECIFICATION SHOWN ON THE DRAWINGS, OR APPROVED BY THE ARCHITECT, MAY BE FURNISHED AT THIS CONTRACTOR'S OPTION. IT IS, HOWEVER, THIS CONTRACTOR'S RESPONSIBILITY TO BE SURE THAT SUCH EQUIPMENT HAS EQUIVALENT CAPACITY, THE SAME ELECTRICAL CHARACTERISTICS, SUBSTANTIALLY THE SAME PHYSICAL DIMENSIONS AND CAN BE INSTALLED IN THE SPACE AVAILABLE WITH AMPLE WORKING SPACE AROUND IT. ANY ADDITIONAL COSTS RESULTING FROM EQUIPMENT OR MATERIAL SUBSTITUTION SHALL BE BORNE BY THIS CONTRACTOR.
 - THE FOLLOWING IS A LIST OF ADDITIONAL EQUIPMENT APPROVED FOR USE ON THIS PROJECT SUBJECT TO SECTION 1.06 ABOVE:
 - CHILLERS: AIRSTACK
 - BOILERS: AERCO OR SIMILAR
 - THE CONTRACTOR SHALL SUBMIT AN ELECTRONIC COPY OF SHOP DRAWINGS ON THE FOLLOWING ITEMS:
 - CHILLERS
 - BOILERS
 - CONTRACTOR SHALL GUARANTEE ALL PARTS AND LABOR FOR ONE (1) YEAR FROM DATE OF FINAL ACCEPTANCE.
- PART II - EXECUTION:**
- PROVIDE ALL OPENINGS THROUGH THE WALLS OR ROOF.
 - ELECTRICAL HIGH VOLTAGE POWER WIRING, CONDUIT, DISCONNECT SWITCHES, FUSES, ETC., SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
 - FURNISH AND INSTALL THE EQUIPMENT AND MATERIAL OF THE SIZE, QUALITY, CAPACITY AND PERFORMANCE INDICATED. THE EQUIPMENT SHALL BE NEW WITH THE MAKE, MODEL NUMBER, SIZE OR CAPACITY STAMPED ON IT OR ON A NAMEPLATE AFFIXED THERETO.
 - PROVIDE DIELECTRIC UNIONS OR FLANGES WHERE PIPING JOINS OTHER PIPING OF DISSIMILAR METALLURGY.
 - ALL PIPING INSIDE THE BUILDING SHALL BE SUPPORTED BY ADJUSTABLE STEEL CLEVIS HANGERS SPACED PER ASHRAE RECOMMENDATIONS AND SUSPENDED FROM THE BUILDING CONSTRUCTION BY ALL-THREAD RODS, STRAP, WIRE, OR CHAIR WIRES ARE NOT PERMITTED. WHERE SUSPENDED FROM STEEL STRUCTURAL MEMBERS, APPROPRIATE CLAMPS SHALL BE USED.
 - EQUIPMENT SHALL BE INSTALLED TO PERMIT ACCESS FOR SERVICE AND MAINTENANCE. ALL EQUIPMENT SHALL BE INSTALLED AS RECOMMENDED BY THE EQUIPMENT MANUFACTURERS. LABEL ALL MECHANICAL EQUIPMENT WITH EQUIPMENT TAGS. EQUIPMENT NUMBERS SHALL BATCH TAG NUMBERS ON PLANS AND SCHEDULES.
 - ISOLATE ALL COPPER FROM CONTACT WITH STEEL, CONCRETE, OR MASONRY.
 - THE CONTRACTOR IS RESPONSIBLE FOR HIRING A COMMISSIONING AGENT TO MEET THE REQUIREMENTS OF IECC SECTION 400B SYSTEM COMMISSIONING. THE COMMISSIONING AGENT MAY BE A THIRD PARTY OR THE PROJECT REGISTERED DESIGN PROFESSIONAL. THE DOCUMENTS DESCRIBED IN SECTION 400B SHALL BE PROVIDED TO THE BUILDING OWNER WITHIN 90 DAYS OF THE CERTIFICATE OF OCCUPANCY.
 - ALL OVERHEAD PIPING TO BE SUSPENDED FROM STRUCTURE ABOVE WITH PIPE HANGERS. PIPING ON ROOF TO BE SUPPORTED WITH SUPPORTS AS MANUFACTURED BY G-FORT (1-866-444-0004) PROVIDE SNAY BRACING ON ALL OVERHEAD WATER PIPING AS REQUIRED.
 - PROVIDE DIELECTRIC UNIONS AT CONNECTION TO A/C UNITS, 4 WATER HEATER.
 - PROVIDE PROPANE SHUT-OFF VALVE AND UNION OR S.O.V. AND SEMI-RIGID PROPANE APPLIANCE CONNECTOR AT EACH FIXTURE.
 - CONTRACTOR SHALL COORDINATE WITH PROPANE CO. REGARDING PROPANE METER SIZING/ REGARDLESS IF METER IS EXISTING OR NEW.
 - ALL WASTE, VENT, DRAINAGE AND WATER PIPING SHALL BE TESTED PER I.P.C. BEFORE BEING CONCEALED IN ANY WAY. ALL JOINTS SHALL BE MADE DRIFTIGHT BEFORE BEING CONCEALED.
 - THE CONTRACTOR SHALL FURNISH TO THE ARCHITECT AN ELECTRONIC FILE OF THE OPERATING AND MAINTENANCE MANUALS AND AN ELECTRONIC COPY OF SHOP DRAWINGS FOR ALL PLUMBING EQUIPMENT, FIXTURES AND PIPING MATERIALS USED ON THIS PROJECT. MANUALS SHALL CONTAIN MANUFACTURER'S CUT SHEETS, SPARE PARTS LIST, SEQUENCE OF OPERATION, AND A PREVENTATIVE MAINTENANCE SCHEDULE.
 - GUARANTEE WORK TO BE FREE FROM DEFECTS IN WORKMANSHIP AND MATERIAL FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE. PROVIDE AN ADDITIONAL FOUR-YEAR WARRANTY ON ALL AIR CONDITIONING COMPRESSORS.
- END OF SPECIFICATIONS

PROJECT PHASE

<input type="radio"/>	PRELIMINARY PRICING	06.03.21
<input type="radio"/>	OWNER - REVISED SCOPE	10.31.22
<input type="radio"/>	CD PROGRESS SET	05.18.23
<input checked="" type="radio"/>	ISSUE FOR BID	
<input type="radio"/>	ISSUE FOR CONSTRUCTION	

REVISIONS

NO.	DESCRIPTION	DATE

FORT APACHE - BUILDING #116 REHABILITATION
 116 Geronimo Street, Fort Apache, AZ 85926
MECHANICAL SCHEDULES

PROJECT NO. 23211 P: (520) 731-2060
www.phmech.com F: (520) 731-2061
PHB

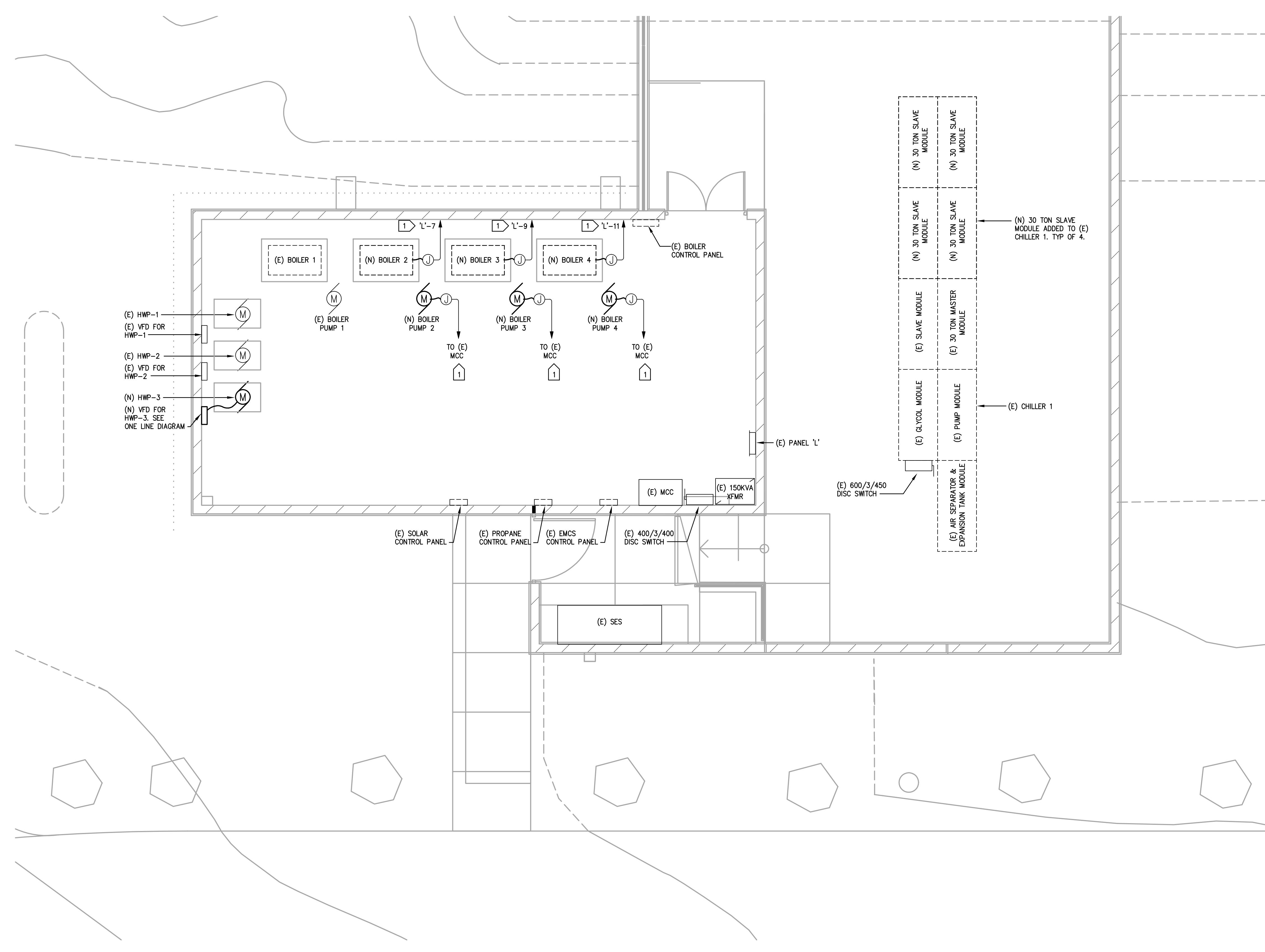
DRAWN	STAFF
CHECKED	KG
DATE	06.30.2023
SCALE	AS SHOWN
JOB NO.	2101
SHEET	
CP M0.8	



SWABACK
Architects + Planners
7550 E McDonald Drive
Scottsdale, Arizona 85250
480.367.2100 | www.swaback.com

KEYED NOTES – THIS SHEET

1 PROVIDE (N) CONDUCTORS IN (E) CDT

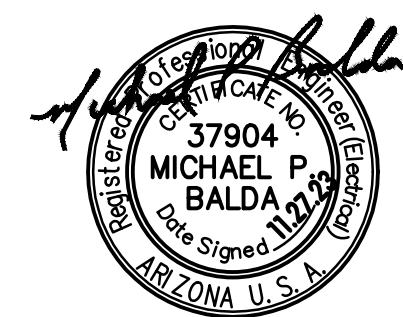


1 CENTRAL PLANT ELECTRICAL FLOOR PLAN
SCALE: 1/4" = 1'-0" NORTH

PROJECT PHASE	
<input type="radio"/>	PRELIMINARY PRICING 06.02.21
<input type="radio"/>	OWNER - REVISED SCOPE 10.31.22
<input type="radio"/>	CD PROGRESS SET 05.18.23
<input type="radio"/>	ISSUE FOR BID
<input type="radio"/>	ISSUE FOR CONSTRUCTION

REVISIONS		
NO.	DESCRIPTION	DATE

FORT APACHE - BUILDING #116 REHABILITATION
116 Geronimo Street, Fort Apache, AZ 85926
CENTRAL PLANT ELECTRICAL FLOOR PLAN



BALDA
ELECTRICAL CONSULTING, INC.
9626 E. Vicks Place
Tucson, Arizona 85748
Office: (520) 886-3131
Fax: (520) 886-3939
Project: 23046

DRAWN	MPB
CHECKED	MPB
DATE	06.30.2023
SCALE	AS NOTED
JOB NO.	2101
SHEET	CP E0.1

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8/9/2023 8:31:44 AM

PROJECT PHASE		
○	PRELIMINARY PRICING	06.02.21
○	OWNER - REVISED SCOPE	10.31.22
○	CD PROGRESS SET	05.18.23
●	ISSUE FOR BID	
○	ISSUE FOR CONSTRUCTION	

REVISIONS		
NO.	DESCRIPTION	DATE

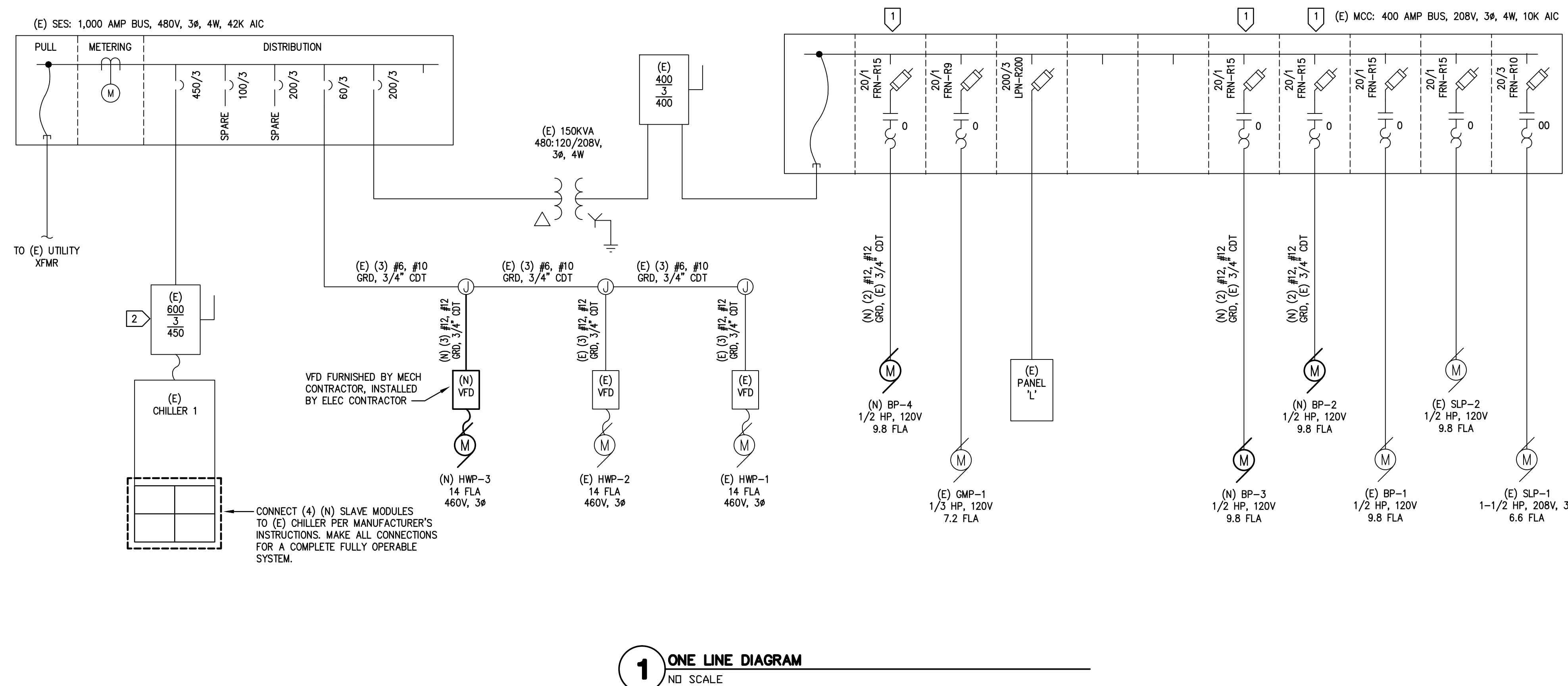
FORT APACHE - BUILDING #116 REHABILITATION
116 Geronimo Street, Fort Apache, AZ 85926
ELECTRICAL DETAILS, SPECS, LEGEND

DRAWN MPB
CHECKED MPB
DATE 06.30.2023
SCALE AS NOTED
JOB NO. 2101
SHEET CP E0.2

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(E) PANEL 'L' SCHEDULE														
TYPE	EXIST	3	P	4	W	120/208	VOLT	MOUNT	SURF	FEED	400 AMP	MCB	EXIST	AIC
EQUIPMENT	C/B	CKT	PH A	PH B	PH C	CKT	C/B	EQUIPMENT						
(E) EXTERIOR LTG	20/1	1	672	1080		2	20/1	(E) RECEPTS						
(E) INTERIOR LTG	20/1	3	1020	900		4	20/1	(E) RECEPTS						
(E) BOILER 1	20/1	5		504	1200	6	20/1	(E) SOLAR CONTROL PANEL						
(N) BOILER 2 (NOTE 1)	20/1	7	504	1200		8	20/1	(E) EMCS CONTROL PANEL						
(N) BOILER 3 (NOTE 1)	20/1	9	504	864		10	20/1	(E) FAN COIL UNIT						
(N) BOILER 4 (NOTE 1)	20/1	11	504	864		12	20/1	(E) PROPANE CONTROL PANEL						
(E) BOILER CONTROL PANEL	20/1	13	1200			14		SPACE						
SPACE		15				16		SPACE						
SPACE		17				18		SPACE						
SPACE		19				20		SPACE						
SPACE		21				22		SPACE						
SPACE		23				24		SPACE						
SPACE		25				26		SPACE						
SPACE		27				28		SPACE						
SPACE		29				30		SPACE						
SPACE		31				32		SPACE						
SPACE		33				34		SPACE						
SPACE		35				36		SPACE						
SPACE		37				38		SPACE						
SPACE		39				40		SPACE						
SPACE		41				42		SPACE						
* CONTINUOUS LOAD							672	1,020	0					
NON-CONTINUOUS LOAD							3,984	2,268	3,168					
25% OF CONTINUOUS LOAD							168	255	0					
25% OF LARGEST MOTOR							0	0	0					
TOTAL LOAD PER PHASE (KVA)							4,824	3,543	3,168					
TOTAL LOAD PER PHASE (AMPS)							40	30	26					

1. UTILIZE (E) SPARE BREAKER TO SUPPLY (N) LOAD



1 ONE LINE DIAGRAM
NO SCALE

ELECTRICAL SPECIFICATIONS

- #### GENERAL
- THE CONTRACTOR SHALL FURNISH ALL MATERIALS, LABOR, TRANSPORTATION, TOOLS, PERMITS, FEES AND INCIDENTALS NECESSARY FOR THE INSTALLATION OF A COMPLETE ELECTRICAL SYSTEM IN CLASS 'A' WORKING ORDER.
 - ALL WORK SHALL BE IN COMPLIANCE WITH THE 2017 EDITION OF THE NATIONAL ELECTRICAL CODE (NEC) AND ALL LOCAL CODES AND ORDINANCES.
 - THESE DRAWINGS ARE SCHEMATIC IN NATURE. CONTRACTOR SHALL PROVIDE ALL BOXES, FITTINGS, ETC. AS REQUIRED FOR A COMPLETE INSTALLATION EVEN IF THOSE ITEMS ARE NOT CALLED OUT ON THE CONSTRUCTION DOCUMENTS.
 - CONTRACTOR SHALL FURNISH SIX COPIES OF THE MANUFACTURER'S LITERATURE AND DRAWINGS DESCRIBING ALL PROPOSED EQUIPMENT AND MATERIALS INDICATED IN THE DRAWINGS AND SPECIFICATIONS. SUBMITTALS SHALL INCLUDE DETAILED SPECIFICATIONS AND CONSTRUCTION DATA.
 - EQUIPMENT MANUFACTURER'S AND CATALOGUE NUMBERS CALLED OUT ON THESE DRAWINGS ARE INTENDED TO ESTABLISH A STANDARD OF QUALITY AND SHALL NOT BE CONSTRUED AS LIMITING COMPETITION. EQUAL PRODUCTS BY OTHER MANUFACTURER'S ARE ACCEPTABLE.
 - ALL MATERIAL FURNISHED BY THE CONTRACTOR SHALL BE NEW UNLESS OTHERWISE NOTED.
 - PROVIDE ENGRAVED PHENOLIC NAMEPLATES ON ALL PANELBOARDS, DISCONNECTS, ETC. NAMEPLATES SHALL BE 1/4" HIGH AND SHALL BE FASTENED TO THE EQUIPMENT WITH RIVETS OR SCREWS.
 - CONTRACTOR SHALL FURNISH A CLEAN SET OF DRAWINGS ON WHICH VARIATIONS TO THE ORIGINAL CONSTRUCTION DOCUMENTS ARE LEGIBLY RECORDED AND DESIGNATED AS "AS-BUILT" UPON COMPLETION AND ACCEPTANCE OF WORK.
 - CONTRACTOR SHALL GUARANTEE ALL LABOR AND MATERIALS FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE BY THE OWNER. ALL WORK/MATERIALS FOUND TO BE DEFECTIVE WITHIN THIS PERIOD SHALL BE REPLACED AT NO ADDITIONAL COST TO THE OWNER. THIS SHALL NOT INCLUDE DAMAGE DUE TO FIRE, STORMS, VANDALISM, OR OTHER FACTORS BEYOND THE CONTROL OF THE CONTRACTOR.
- #### BASIC MATERIALS
- CONDUIT
 - ELECTRICAL METALLIC CONDUIT (EMT) CONDUIT WITH COMPRESSION COUPLINGS AND FITTINGS MAY BE USED INDOORS OR OUTDOORS IN NON-HAZARDOUS AREAS AND IN AREAS NOT SUBJECT TO PHYSICAL DAMAGE, SET SCREW TYPE CONNECTORS ARE NOT ACCEPTABLE.
 - RIGID GALVANIZED STEEL (RGS) CONDUIT WITH THREADED COUPLINGS AND FITTINGS SHALL BE USED INDOORS OR OUTDOORS IN HAZARDOUS AREAS AND IN LOCATIONS SUBJECT TO PHYSICAL DAMAGE.
 - LIQUID TIGHT FLEXIBLE METAL CONDUIT SHALL BE USED IN OUTDOOR OR WET LOCATIONS, AND FLEXIBLE METAL CONDUIT SHALL BE USED INDOORS IN DRY LOCATIONS TO EXTEND CONDUIT CONNECTIONS TO MOTORS, LIGHT FIXTURES, ETC. MAXIMUM LENGTH SHALL NOT EXCEED 72" FOR RECESSED LIGHT FIXTURES, OR 24" FOR ALL OTHER APPLICATIONS.
 - MINIMUM SIZE CONDUIT SHALL BE 3/4" UNLESS OTHERWISE NOTED.
 - CONDUITS SHALL BE CONCEALED IN ALL FINISHED PARTS OF THE BUILDING. CONDUITS SHALL BE ROUTED PARALLEL TO THE BUILDING LINES - DIAGONAL RUNS ARE NOT ACCEPTABLE. SECURE CONDUITS TO BUILDING STRUCTURES AT INTERVALS OF NOT MORE THAN 8 FEET
 - CONDUCTORS
 - CONDUCTORS LOCATED INDOORS IN DRY LOCATIONS SHALL BE COPPER TYPE THHN/THWN.
 - CONDUCTORS LOCATED OUTDOORS OR IN WET LOCATIONS SHALL BE COPPER TYPE XHHW.
 - CONDUCTORS #10 AWG AND SMALLER SHALL BE SOLID. CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED.
 - MINIMUM CONDUCTOR SIZE FOR POWER AND LIGHTING CIRCUITS SHALL BE #12 AWG. MINIMUM CONDUCTOR SIZE FOR CONTROL AND SIGNALING CIRCUITS SHALL BE #14 AWG.
 - CONDUCTORS FOR USE ON 120/208V SYSTEMS SHALL BE COLOR CODED BLACK, RED, BLUE AND WHITE FOR PHASES A, B, C, AND NEUTRAL RESPECTIVELY.
 - CONDUCTORS FOR USE ON 277/480V SYSTEMS SHALL BE COLOR CODED BROWN, ORANGE, YELLOW, AND GRAY FOR PHASES A, B, C, AND NEUTRAL RESPECTIVELY.
 - FUSES
 - FUSES SHALL BE "BUSSMAN LOW PEAK" OR APPROVED EQUAL.
 - FUSES RATED 1/10 AMP TO 600 AMPS SHALL BE UL CLASS R DUAL ELEMENT, CURRENT LIMITING, EQUAL TO BUSSMAN LPS-RK (600V) OR LFN-RK (250V).
 - FURNISH OWNER WITH ONE SPARE SET OF THREE OF EACH SIZE AND TYPE OF FUSE USED ON THIS PROJECT.
 - JUNCTION, PULL AND DEVICE BOXES.
 - JUNCTION AND PULL BOXES SHALL BE OF CODE GALVANIZED STEEL.
 - DEVICE BOXES AND GENERAL PURPOSE JUNCTION BOXES SHALL BE ONE PIECE GALVANIZED PRESSED STEEL, KNOCK-OUT TYPE WITH SIMILAR COVER, MINIMUM SIZE SHALL BE 4" SQUARE.
 - DEVICE BOXES IN EXTERIOR LOCATIONS SHALL BE CAST IRON WITH GASKETED COVER, GROUSE HINDS FD OR EQUAL.
 - GROUNDING
 - PROVIDE INSULATED EQUIPMENT GROUNDING CONDUCTOR IN ALL RACEWAYS. GROUNDING CONDUCTOR SHALL BE SIZED PER NEC 250-122.

LEGEND

- #### LIGHTING FIXTURES:
- ▲ FIXTURE TYPE DESIGNATION
NL → NL INDICATES NIGHT LIGHT
a, b, g → SWITCH REFERENCE
- #### LIGHT FIXTURES ON NORMAL LIGHTING CIRCUIT:
- 2'x4' 2'x2' 4' STRIP WALL LTG DN LTG
- #### LIGHT FIXTURES WITH BATTERY BACK UP
- WALL LTG DN LTG
- EXIT LIGHT FIXTURE WITH DIRECTIONAL ARROW(S)
SHADED AREA INDICATES ILLUMINATED FACE(S)
- WALL MOUNTED EMERGENCY LIGHTING UNIT
- #### SWITCHES:
- S SINGLE POLE SWITCH 42" (U.O.N.)
S3 THREE WAY SWITCH 42" (U.O.N.)
S4 FOUR WAY SWITCH 42" (U.O.N.)
SM MOTOR STARTER 42" (U.O.N.)
- #### RACEWAY:
- HOME RUN WITH (2) #12, #12 GRD
INDICATES PANEL IDENTIFICATION AND CIRCUIT NO.
- INDICATES UNSWITCHED CIRCUIT LEG
- #### POWER DEVICES:
- RECEPTACLE (DUPEX) 18" (U.O.N.)
RECEPTACLE (QUADRAPLEX) 18" (U.O.N.)
RECEPTACLE (DUPEX) MOUNTED 6" ABOVE COUNTER
- FLOORBOX
JUNCTION BOX
KEYED NOTE - SEE NOTE SCHEDULE ON SAME DRAWING
- #### SPECIAL SYSTEMS DEVICES:
- TELEPHONE/DATA OUTLET AT 18" AFF. PROVIDE TWO GANG BACKBOX WITH MUDRING AND 3/4" CDT STUBBED UP TO ACCESSIBLE CEILING SPACE. PROVIDE BUSHINGS ON CDT ENDS. PROVIDE PULLSTRING IN CDT.
- TELEPHONE/DATA OUTLET MOUNTED 6" ABOVE COUNTER. PROVIDE TWO GANG BACKBOX WITH MUDRING AND 3/4" CDT STUBBED UP TO ACCESSIBLE CEILING SPACE. PROVIDE BUSHINGS ON CDT ENDS. PROVIDE PULLSTRING IN CDT.
- WALL MOUNTED TELEPHONE AT 42" AFF

ABBREVIATIONS

- AF AMPERE FRAME
AFF ABOVE FINISHED FLOOR
AT AMPERE TRIP
BC BARE COPPER
BRKR BREAKER
CDT CLOSED CIRCUIT T.V.
C/B CIRCUIT BREAKER
CCTV CIRCUIT
CLG CEILING
DB DIRECT BURIAL
DISC DISCONNECT
(E), EX EXISTING
EC EMPTY CONDUIT
EXP, XP EXPLOSION PROOF
EMERG EMERGENCY
ELEC ELECTRIC
EWC ELECTRIC WATER COOLER
FA FIRE ALARM
FACP FIRE ALARM CONTROL PANEL
FCU FAN COIL UNIT
FIXT FIXTURE
FLUOR FLUORESCENT
GRD GROUND
GEN GENERATOR
G, GFI GROUND FAULT INTERRUPTER
HQA HAND OFF AUTOMATIC
HH HANDLE
HP HORSE POWER
HV HIGH VOLTAGE
INCAN INCANDESCENT
JUNCTION BOX
KW KILO WATT
KVA KILLO VOLT-AMPERE
LTG LIGHTING
LV LOW VOLTAGE
MCB MAIN CIRCUIT BREAKER
MCC MOTOR CONTROL CENTER
MDP MAIN DISTRIBUTION PANEL
MLO MAIN LUGS ONLY
MH MANHOLE
MTD MOUNTED
(N) NEW
PHASE
P PULLBOX
PNL PANEL
PWR POWER
RECEPTACLE
TEL TELEPHONE
TV TELEVISION
VA VOLT-AMPERE
V VOLTAGE
W WATT
W/ WITH
WP WEATHER PROOF
XFMR TRANSFORMER

KEYED NOTES - THIS SHEET

- 1 UTILIZE (E) SPARE STARTER TO FEED (N) BOILER PUMP LOAD. PROVIDE (N) FUSING IN STARTER AS CALLED OUT ON DRAWINGS. PROVIDE (N) NAMEPLATE ON MCC BUCKET IDENTIFYING LOAD SERVED BY THAT PARTICULAR BUCKET. (N) NAMEPLATE SHALL MATCH (E) NAMEPLATES ON MCC.
- 2 PROVIDE (N) 450 AMP FUSES IN (E) DISCONNECT SWITCH.

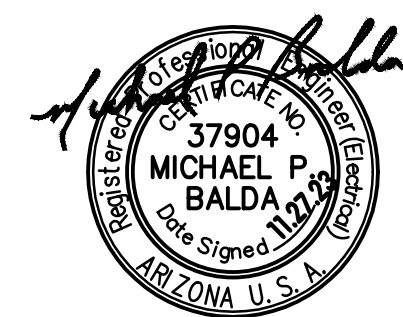
LOAD CALCS

(E) MCC:	
BP-1	9.8 AMPS
BP-2	9.8 AMPS
BP-3	9.8 AMPS
BP-4	9.8 AMPS
GMP-1	7.2 AMPS
SLP-1	6.5 AMPS
SLP-2	9.8 AMPS
PANEL 'L'	40 AMPS
TOTAL MCC LOAD	102.8 AMPS

(E) MCC IS RATED 400 AMPS, 120/208V, 3φ, 4W
102.8 AMPS AT 120/208V 3φ = 45 AMPS AT 277/480V 3φ

(E) SES/SERVICE:	
MCC	45 AMPS
HWP-1	14 AMPS
HWP-2	14 AMPS
HWP-3	14 AMPS
CHILLER	410 AMPS
TOTAL LOAD ON SES/SERVICE	497 AMPS

(E) SES/SERVICE IS RATED 1,000 AMPS, 277/480V, 3φ, 4W



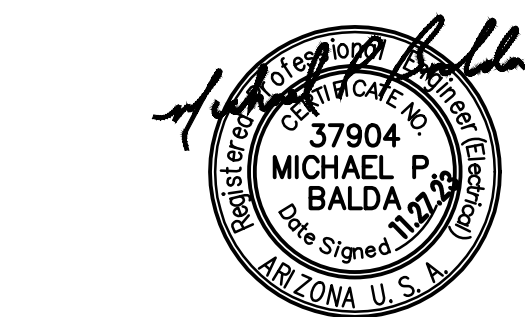
BALDA
ELECTRICAL CONSULTING, INC.
2626 E. Vicks Place
Tucson, Arizona 85748
Office (520) 886-8131
Fax (520) 886-3939
Project: 23046

PROJECT PHASE	
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<input type="radio"/>	OWNER - REVISED SCOPE 10.31.22
<input type="radio"/>	CD PROGRESS SET 05.18.23
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<input type="radio"/>	ISSUE FOR CONSTRUCTION

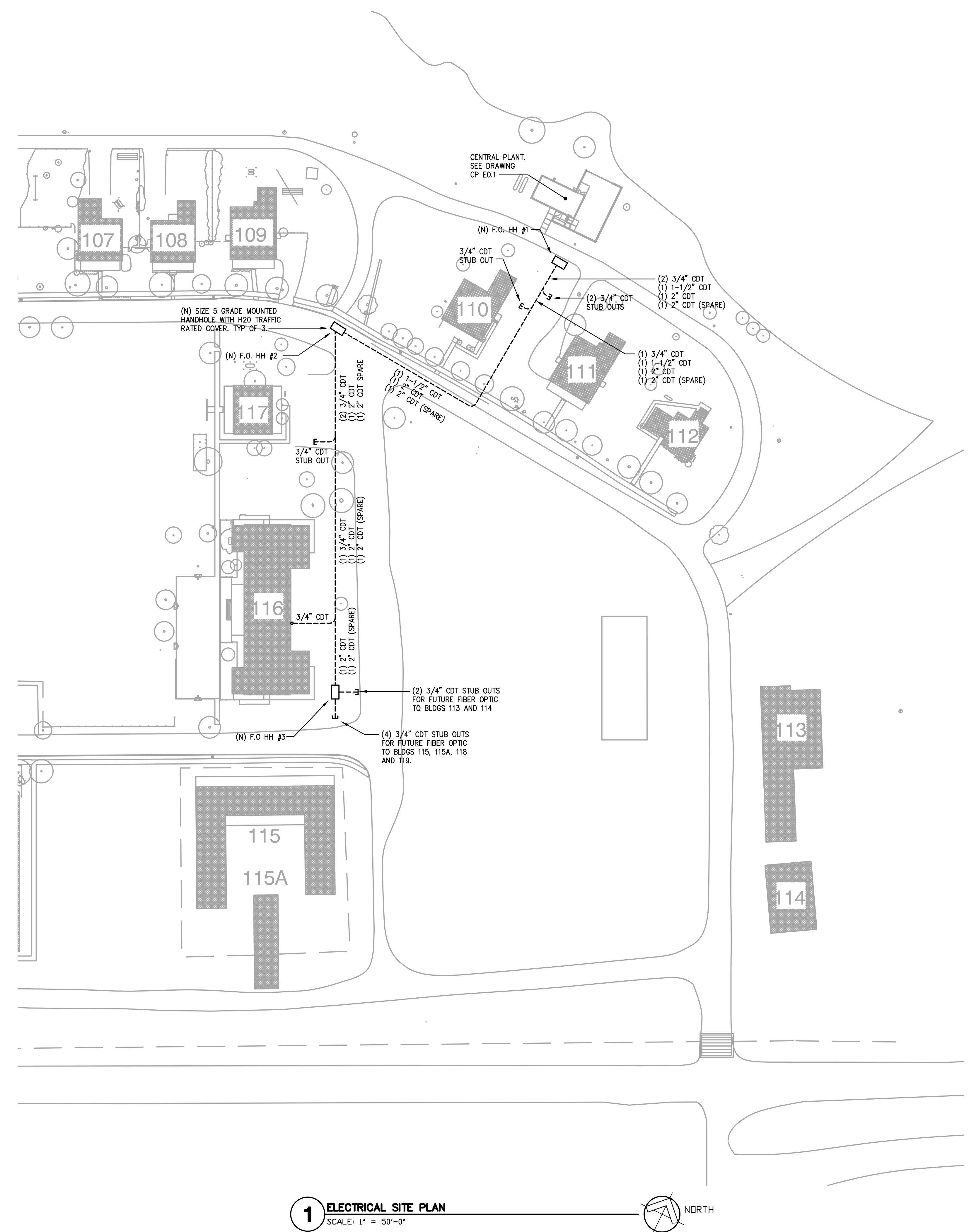
REVISIONS		
NO.	DESCRIPTION	DATE

FORT APACHE - BUILDING #116 REHABILITATION
116 Geronimo Street, Fort Apache, AZ 85926
ELECTRICAL SITE PLAN

DRAWN	MPB
CHECKED	MPB
DATE	06.30.2023
SCALE	AS NOTED
JOB NO.	2101
SHEET	CP SE0.1



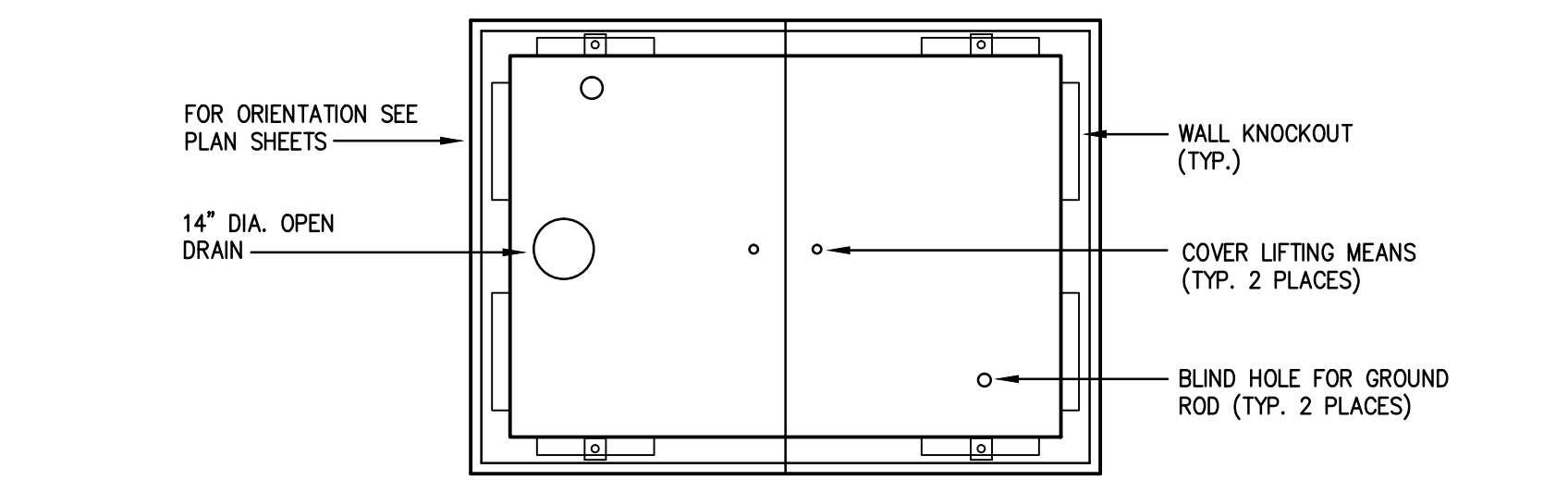
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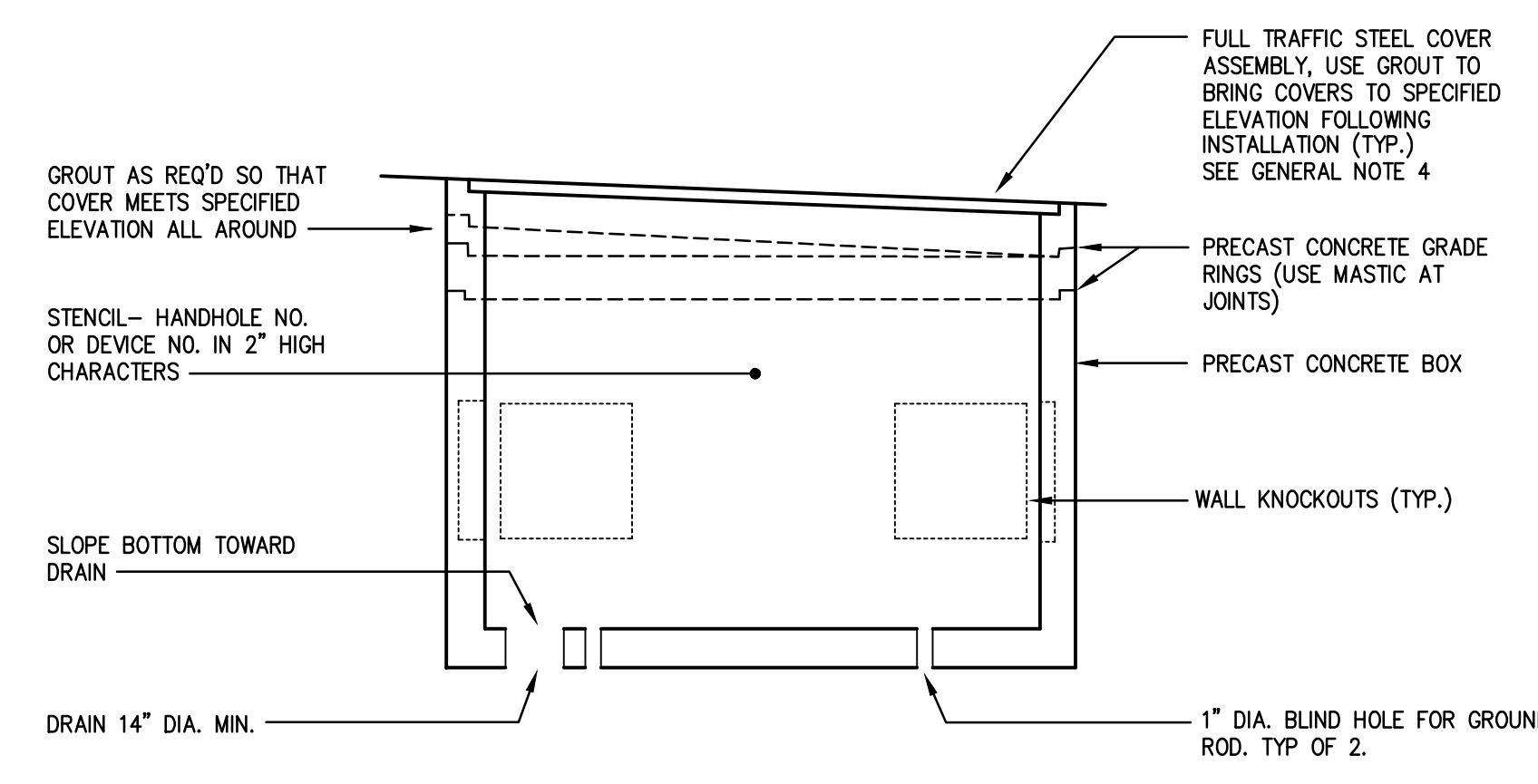
1 ELECTRICAL SITE PLAN
SCALE: 1" = 50'-0"

HANDHOLE GENERAL NOTES

- INSIDE BOX DIMENSIONS = 3' WIDE X 5' LONG X 3'-6" DEEP.
- ALL BOXES AND COVERS SHALL BE FULL TRAFFIC RATED AND MUST MEET THE REQUIREMENTS OF THE LATEST AASHTO H20-44 HIGHWAY LOADING SPECIFICATIONS.
- ALL DUCTS OR CONDUITS ENTERING THE BOX MUST DO SO THROUGH THE KNOCKOUTS. THE MAIN WALL OF THE BOX SHALL NOT BE BROKEN OUT TO PROVIDE ACCESS FOR DUCTS OR CONDUITS.
- DUCTS AND CONDUITS SHALL NOT EXTEND MORE THAN 1/2" INTO BOX.
- POSITION BOX BODY SUCH THAT CONDUITS MAY ENTER BOX WITHOUT BENDS.
- PROVIDE MIN. 6" OF CRUSHED ROCK UNDER THE HANDHOLE STRUCTURE. EXTEND CRUSHED ROCK 6" BEYOND OUTSIDE PERIMETER OF STRUCTURE.
- BOXES INSTALLED IN PAVED AREAS AND/OR ROADWAYS SHALL BE SET 1/2" TO 3/4" BELOW FINISHED GRADE ELEVATION OF ASPHALT PAVING/ROADWAY SURFACE TO AVOID INTERFERING WITH SNOW FLOWS.
- BOXES INSTALLED OUTSIDE OF ASPHALT PAVING/ROADWAYS SHALL BE INSTALLED 2"-3" ABOVE THE NATURAL GROUND LEVEL. SHAPE THE FILL BACK TO NATURAL GROUND LEVEL IN A 6.5' RADIUS AROUND THE HANDHOLE COVER.
- PERMANENTLY IDENTIFY BOX COVERS WITH RAISED LETTERS AS TO TYPE CIRCUIT WITHIN AND THE HANDHOLE NUMBER. EXAMPLE: F.O. HH #1.
- BREAK OUT HANDHOLE SUMPS AND DRAINS SO WATER CAN DRAIN OUT.
- PAINT BOX LIDS BROWN WHEN BOX IS LOCATED OFF OF PAVEMENT/ROADWAY.
- PROVIDE GRADE RINGS AS REQUIRED TO MEET DEPTH AND GRADE REQUIREMENTS.
- GROUT IN BETWEEN BODY AND TOP SECTION AND AROUND DUCT ENTRANCES AS REQUIRED.
- COVER SHALL BE SECURED TO BOX BODY VIA (4) STAINLESS STEEL PENTAHEAD BOLTS.



PLAN

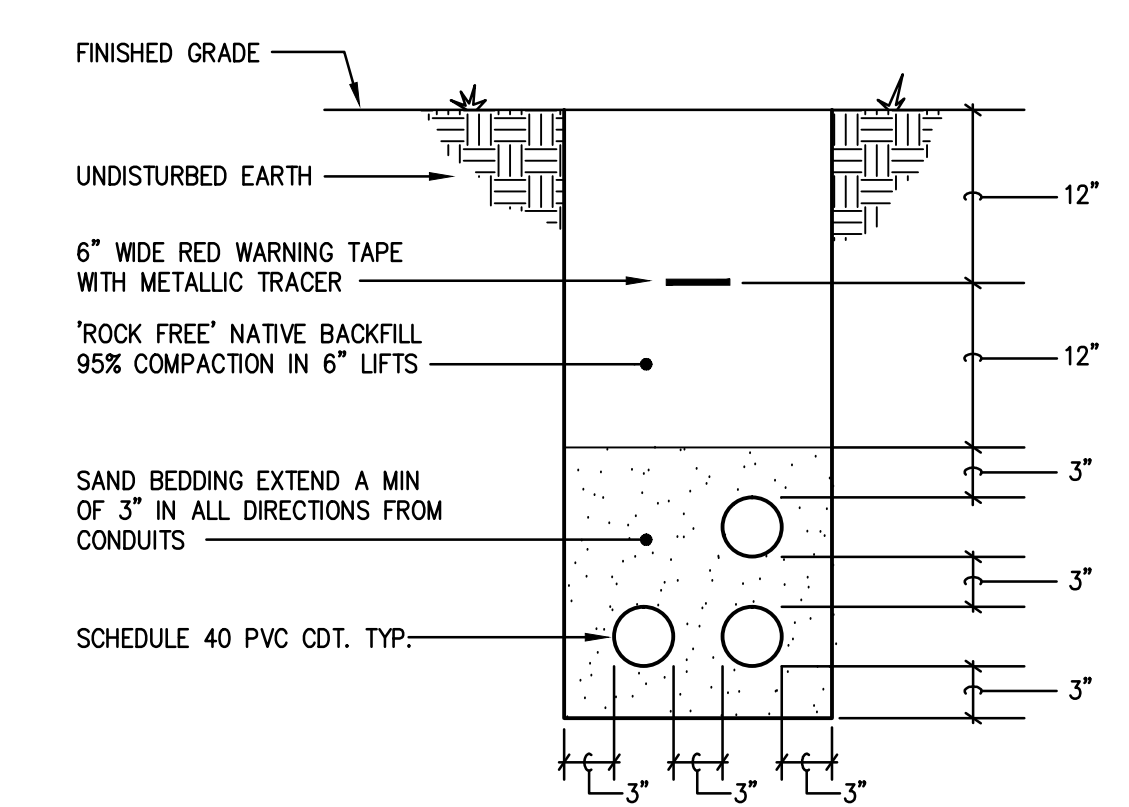


ELEVATION

2 TYPE 5 HANDHOLE DETAIL
NO SCALE

TRENCH DETAIL/UNDERGROUND FIBER OPTIC CONDUIT NOTES

- FIBER OPTIC CONDUIT SIZES/INSTALLATION ASSUMES EACH STRUCTURE WILL RECEIVE (1) 24 STRAND, MULTI MODE, INDOOR/OUTDOOR FIBER OPTIC CABLE WITH AN OUTER DIAMETER OF APPROXIMATELY 0.3 INCHES.
- UNDERGROUND FIBER OPTIC CONDUIT SHALL BE SCHEDULE 40 PVC CONDUIT
- MINIMUM BEND RADIUS FOR UNDERGROUND FIBER OPTIC CONDUIT = 8"
- MAXIMUM CONDUIT FILL = 50%
- MAXIMUM OF 360° OF CONDUIT BENDS BETWEEN PULL POINTS
- FIBER OPTIC CONDUIT SHALL BE INSTALLED WITH THE CLEARANCES AND BEDDING AS SHOWN ON THE DRAWINGS.
- FIBER OPTIC CONDUIT SHALL SHARE COMMON TRENCH WITH UNDERGROUND HEATING/COOLING WATER PIPING.
- TAKE STEPS TO PREVENT THE INGRESS OF WATER, DIRT, SAND, AND OTHER FOREIGN MATERIAL INTO THE CONDUIT DURING AND AFTER CONSTRUCTION.
- PROVIDE PULLSTRING IN ALL FIBER OPTIC CONDUITS.
- PROVIDE WARNING TAPE WITH METALLIC TRACER DIRECTLY ABOVE ALL UNDERGROUND FIBER OPTIC CONDUIT RUNS. WARNING TAPE SHALL BE INSTALLED 12" BELOW GRADE.
- PROVIDE ALL FITTINGS AND INCIDENTAL MATERIALS NECESSARY TO CONSTRUCT A COMPLETE INSTALLATION. USE APPROVED METHODS FOR CONNECTING INDIVIDUAL LENGTHS.
- PROVIDE SPARE 2" CONDUIT BETWEEN HANDHOLES.



3 TRENCH DETAIL
NO SCALE