

ATU WEST CAMPUS CHILLED WATER LOOP

RUSSELLVILLE, AR

INSIGHT ENGINEERING, PLLC

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Providing bold and creative solutions for the built environment.

SHEET INDEX

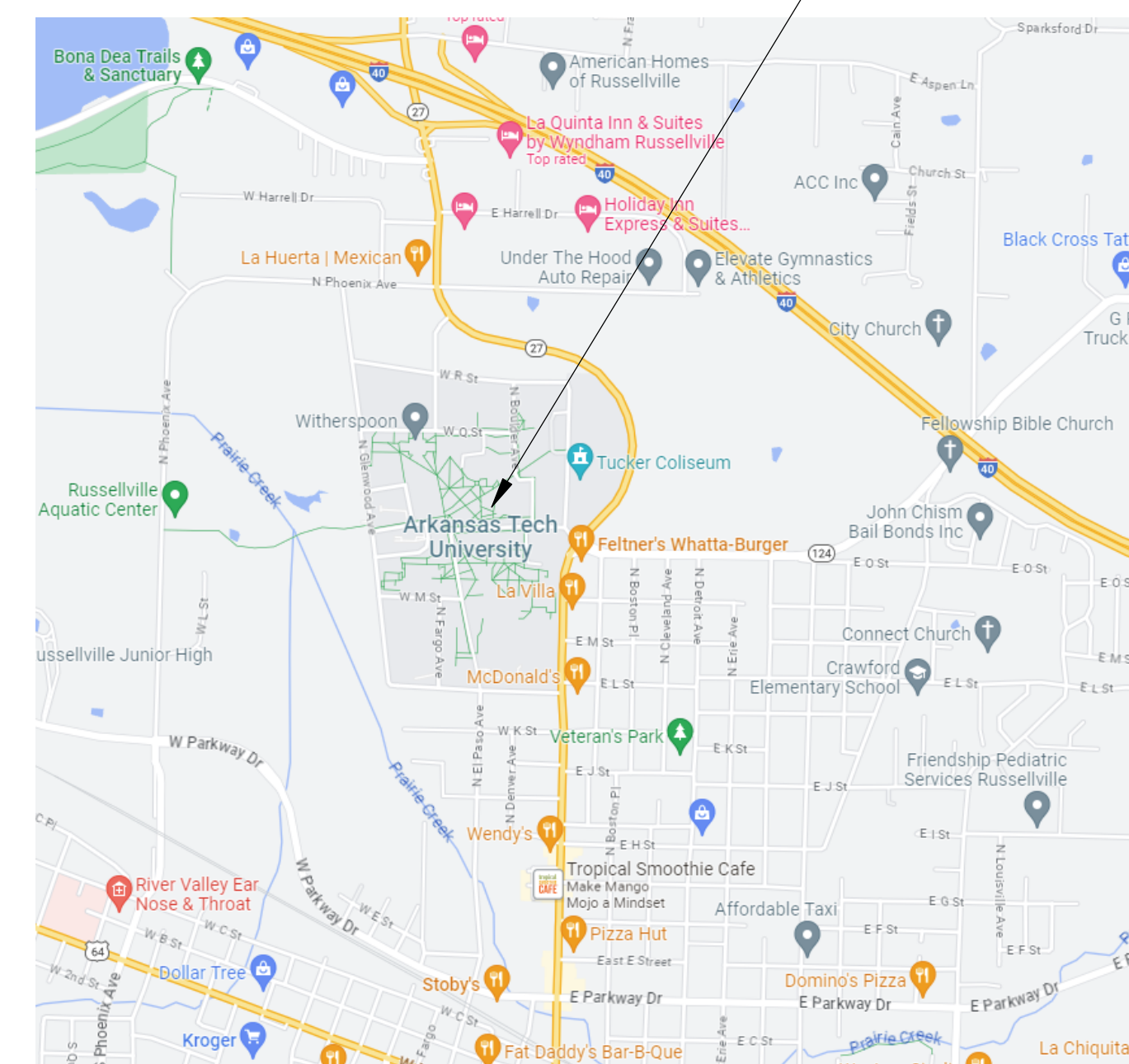
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PROJECT LOCATION:
RUSSELLVILLE, ARKANSAS



ARKANSAS
TECH
UNIVERSITY

PROJECT AREA:
1511 NORTH BOULDER AVE.
RUSSELLVILLE, AR 72801



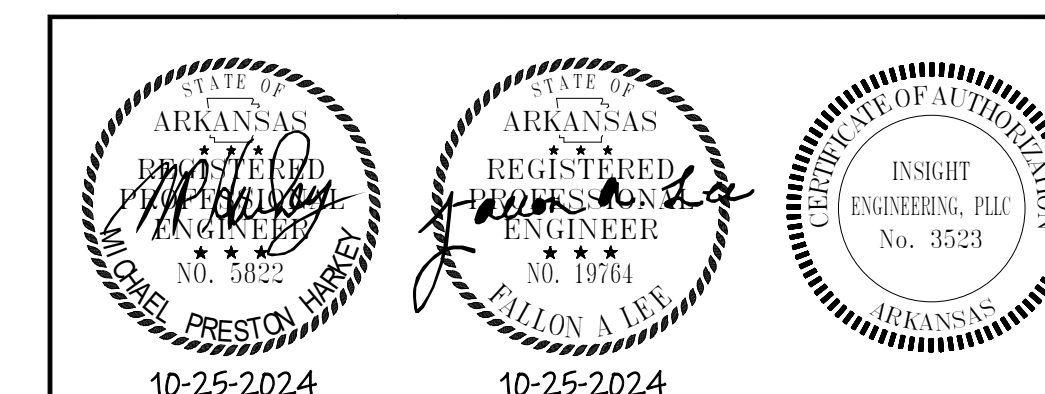
100% CONSTRUCTION DOCUMENTS

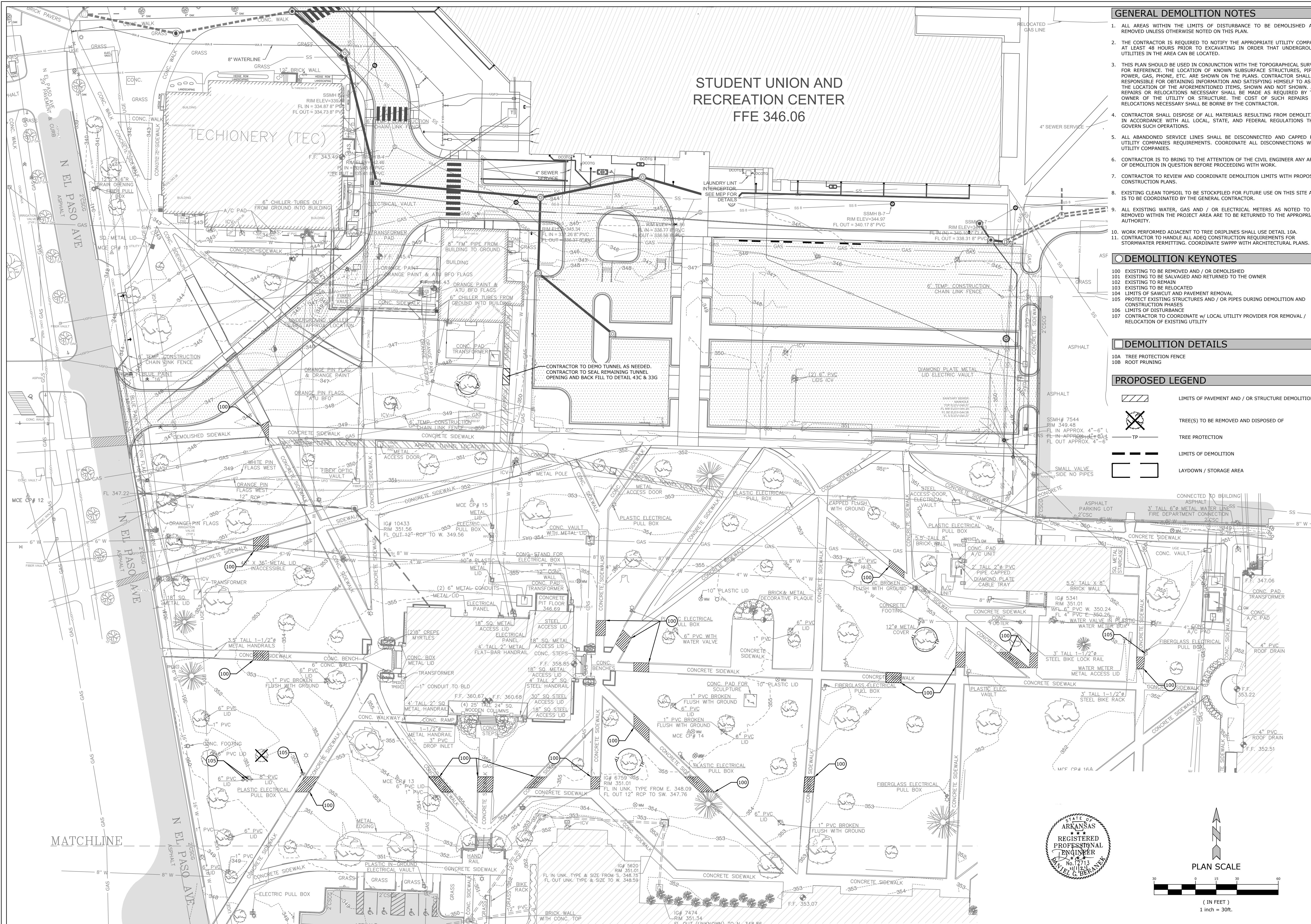
10-25-2024

24-006

SHEET NUMBER:

G001





**STUDENT UNION AND
RECREATION CENTER
FFE 346.06**

GENERAL DEMOLITION NOTES

- ALL AREAS WITHIN THE LIMITS OF DISTURBANCE TO BE DEMOLISHED AND REMOVED UNLESS OTHERWISE NOTED ON THIS PLAN.
- THE CONTRACTOR IS REQUIRED TO NOTIFY THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS PRIOR TO EXCAVATING IN ORDER THAT UNDERGROUND UTILITIES IN THE AREA CAN BE LOCATED.
- THIS PLAN SHOULD BE USED IN CONJUNCTION WITH THE TOPOGRAPHICAL SURVEY FOR REFERENCE. THE LOCATION OF KNOWN SUBSURFACE STRUCTURES, PIPES, POWER, GAS, PHONE, ETC. ARE SHOWN ON THE PLANS. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING INFORMATION AND SATISFYING HIMSELF TO AS TO THE LOCATION OF THE AFORESAID ITEMS, SHOWN AND NOT SHOWN. ALL REPAIRS OR RELOCATIONS NECESSARY SHALL BE MADE AS REQUIRED BY THE OWNER OF THE UTILITY OR STRUCTURE. THE COST OF SUCH REPAIRS OR RELOCATIONS NECESSARY SHALL BE BORNE BY THE CONTRACTOR.
- CONTRACTOR SHALL DISPOSE OF ALL MATERIALS RESULTING FROM DEMOLITION IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS THAT GOVERN SUCH OPERATIONS.
- ALL ABANDONED SERVICE LINES SHALL BE DISCONNECTED AND CAPPED PER UTILITY COMPANIES REQUIREMENTS. COORDINATE ALL DISCONNECTIONS WITH UTILITY COMPANIES.
- CONTRACTOR IS TO BRING TO THE ATTENTION OF THE CIVIL ENGINEER ANY AREA OF DEMOLITION IN QUESTION BEFORE PROCEEDING WITH WORK.
- CONTRACTOR TO REVIEW AND COORDINATE DEMOLITION LIMITS WITH PROPOSED CONSTRUCTION PLANS.
- EXISTING CLEAN TOPSOIL TO BE STOCKPILED FOR FUTURE USE ON THIS SITE AND IS TO BE COORDINATED BY THE GENERAL CONTRACTOR.
- ALL EXISTING WATER, GAS AND / OR ELECTRICAL METERS AS NOTED TO BE REMOVED WITHIN THE PROJECT AREA ARE TO BE RETURNED TO THE APPROPRIATE AUTHORITY.
- WORK PERFORMED ADJACENT TO TREE DRILLINES SHALL USE DETAIL 10A.
- CONTRACTOR TO HANDLE ALL ADEQ CONSTRUCTION REQUIREMENTS FOR STORMWATER PERMITTING. COORDINATE SWPPP WITH ARCHITECTURAL PLANS.

DEMOLITION KEYNOTES

- 100 EXISTING TO BE REMOVED AND / OR DEMOLISHED
- 101 EXISTING TO BE SALVAGED AND RETURNED TO THE OWNER
- 102 EXISTING TO BE REPAIR
- 103 EXISTING TO BE RELOCATED
- 104 LIMITS OF SAWCUT AND PAVEMENT REMOVAL
- 105 PROTECT EXISTING STRUCTURES AND / OR PIPES DURING DEMOLITION AND CONSTRUCTION PHASES
- 106 LIMITS OF DISTURBANCE
- 107 CONTRACTOR TO COORDINATE w/ LOCAL UTILITY PROVIDER FOR REMOVAL / RELOCATION OF EXISTING UTILITY

DEMOLITION DETAILS

- 10A TREE PROTECTION FENCE
- 10B ROOT PRUNING

PROPOSED LEGEND

- LIMITS OF PAVEMENT AND / OR STRUCTURE DEMOLITION
- TREE(S) TO BE REMOVED AND DISPOSED OF
- TREE PROTECTION
- LIMITS OF DEMOLITION
- LAYDOWN / STORAGE AREA



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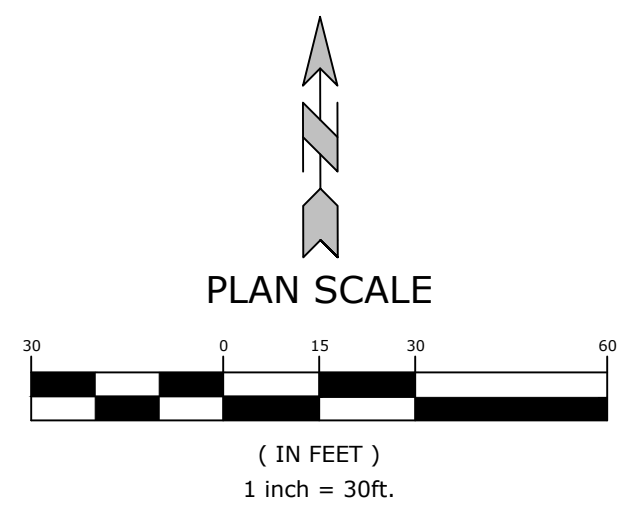
**ATU WEST CAMPUS CHILLED
WATER LOOP**
RUSSELLVILLE, AR

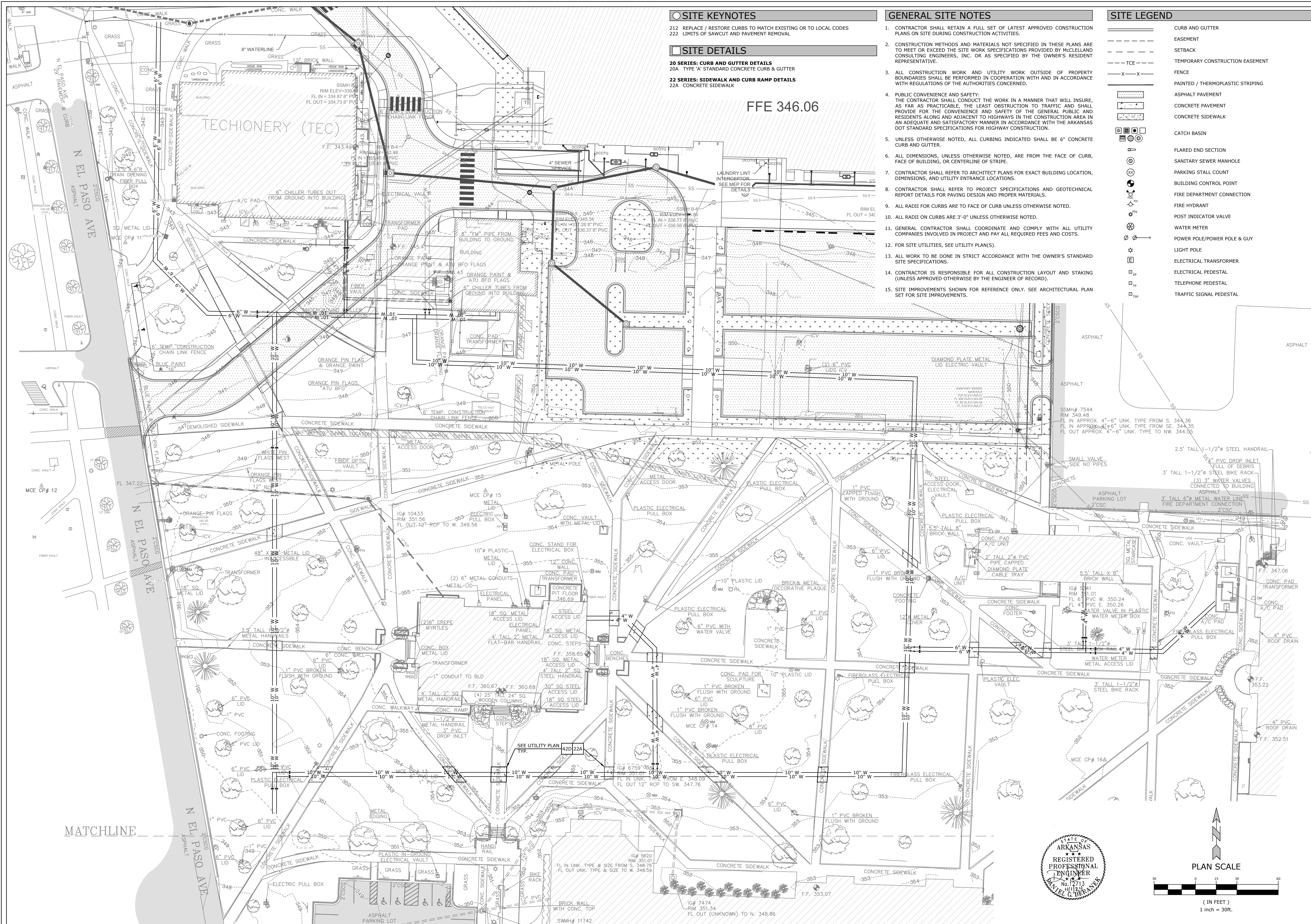
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Project Status	
ISSUE DATE:	10/25/2024
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SHEET TITLE:	DEMOLITION PLAN I

SHEET NUMBER:
C200





SITE KEYNOTES

- 212 REPLACE / RESTORE CURBS TO MATCH EXISTING OR TO LOCAL CODES
- 222 LIMITS OF SAWCUT AND PAVEMENT REMOVAL

SITE DETAILS

- 20 SERIES: CURB AND GUTTER DETAILS**
- 20A TYPE 'A' STANDARD CONCRETE CURB & GUTTER
- 22 SERIES: SIDEWALK AND CURB RAMP DETAILS**
- 22A CONCRETE SIDEWALK

GENERAL SITE NOTES

1. CONTRACTOR SHALL RETAIN A FULL SET OF LATEST APPROVED CONSTRUCTION PLANS ON SITE DURING CONSTRUCTION ACTIVITIES.
2. CONSTRUCTION METHODS AND MATERIALS NOT SPECIFIED IN THESE PLANS ARE TO MEET OR EXCEED THE SITE WORK SPECIFICATIONS PROVIDED BY MCGLELLAND CONSULTING ENGINEERS, INC. OR AS SPECIFIED BY THE OWNER'S RESIDENT REPRESENTATIVE.
3. ALL CONSTRUCTION WORK AND UTILITY WORK OUTSIDE OF PROPERTY BOUNDARIES SHALL BE PERFORMED IN COOPERATION WITH AND IN ACCORDANCE WITH REGULATIONS OF THE AUTHORITIES CONCERNED.
4. PUBLIC CONVENIENCE AND SAFETY: THE CONTRACTOR SHALL CONDUCT THE WORK IN A MANNER THAT WILL INSURE, AS FAR AS PRACTICABLE, THE LEAST OBSTRUCTION TO TRAFFIC AND SHALL PROVIDE FOR THE CONVENIENCE AND SAFETY OF THE GENERAL PUBLIC AND RESIDENTS ALONG AND ADJACENT TO HIGHWAYS IN THE CONSTRUCTION AREA IN AN ADEQUATE AND SATISFACTORY MANNER IN ACCORDANCE WITH THE ARKANSAS DOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.
5. UNLESS OTHERWISE NOTED, ALL CURBING INDICATED SHALL BE 6" CONCRETE CURB AND GUTTER.
6. ALL DIMENSIONS, UNLESS OTHERWISE NOTED, ARE FROM THE FACE OF CURB, FACE OF BUILDING, OR CENTERLINE OF STRIPE.
7. CONTRACTOR SHALL REFER TO ARCHITECT PLANS FOR EXACT BUILDING LOCATION, DIMENSIONS, AND UTILITY ENTRANCE LOCATIONS.
8. CONTRACTOR SHALL REFER TO PROJECT SPECIFICATIONS AND GEOTECHNICAL REPORT DETAILS FOR PAVING DESIGN AND PROPER MATERIALS.
9. ALL RADII FOR CURBS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
10. ALL RADII ON CURBS ARE 3'-0" UNLESS OTHERWISE NOTED.
11. GENERAL CONTRACTOR SHALL COORDINATE AND COMPLY WITH ALL UTILITY COMPANIES INVOLVED IN PROJECT AND PAY ALL REQUIRED FEES AND COSTS.
12. FOR SITE UTILITIES, SEE UTILITY PLAN(S).
13. ALL WORK TO BE DONE IN STRICT ACCORDANCE WITH THE OWNER'S STANDARD SITE SPECIFICATIONS.
14. CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION LAYOUT AND STAKING (UNLESS APPROVED OTHERWISE BY THE ENGINEER OF RECORD).
15. SITE IMPROVEMENTS SHOWN FOR REFERENCE ONLY. SEE ARCHITECTURAL PLAN SET FOR SITE IMPROVEMENTS.

SITE LEGEND

- CURB AND GUTTER
- - - EASEMENT
- - - SETBACK
- - - TEMPORARY CONSTRUCTION EASEMENT
- - - FENCE
- - - PAINTED / THERMOPLASTIC STRIPING
- ▨ ASPHALT PAVEMENT
- ▨ CONCRETE PAVEMENT
- ▨ CONCRETE SIDEWALK
- CATCH BASIN
- FLARED END SECTION
- SANITARY SEWER MANHOLE
- PARKING STALL COUNT
- BUILDING CONTROL POINT
- FIRE DEPARTMENT CONNECTION
- FIRE HYDRANT
- POST INDICATOR VALVE
- WATER METER
- POWER POLE/POWER POLE & GUY
- LIGHT POLE
- ELECTRICAL TRANSFORMER
- ELECTRICAL PEDESTAL
- TELEPHONE PEDESTAL
- TRAFFIC SIGNAL PEDESTAL

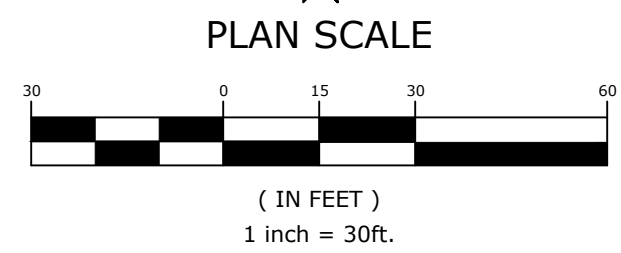
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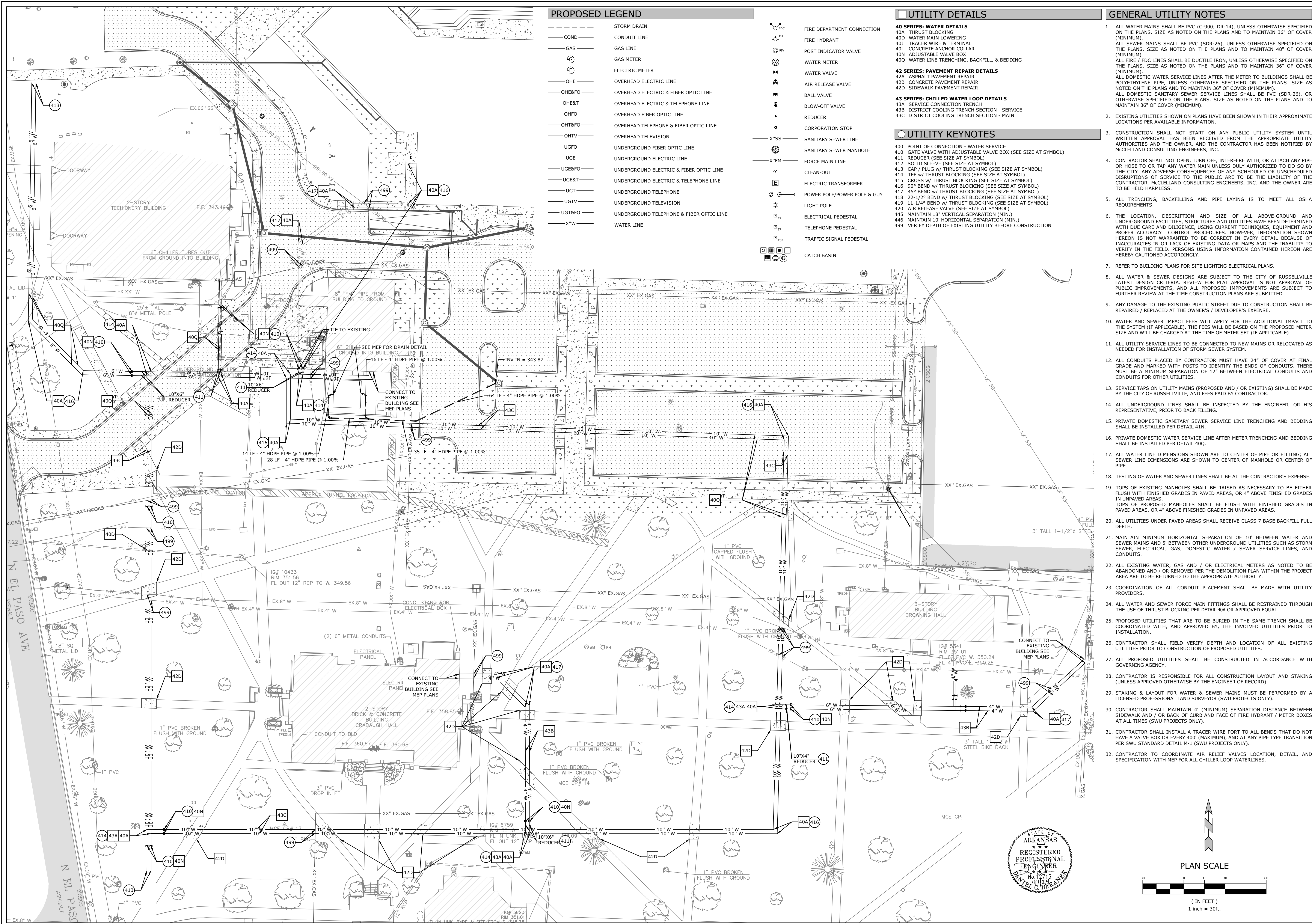


ATU WEST CAMPUS CHILLED WATER LOOP
 RUSSELLVILLE, AR

REVISIONS:		
No.	Description	Date

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SHEET TITLE:	SITE PLAN I
SHEET NUMBER:	C300





PROPOSED LEGEND

---	STORM DRAIN
---	COND
---	CONDUIT LINE
---	GAS LINE
---	GAS METER
---	ELECTRIC METER
---	OHE
---	OVERHEAD ELECTRIC LINE
---	OHE&FO
---	OVERHEAD ELECTRIC & FIBER OPTIC LINE
---	OHE&T
---	OVERHEAD ELECTRIC & TELEPHONE LINE
---	OHFO
---	OVERHEAD FIBER OPTIC LINE
---	OHT&FO
---	OVERHEAD TELEPHONE & FIBER OPTIC LINE
---	OHTV
---	OVERHEAD TELEVISION
---	UGFO
---	UNDERGROUND FIBER OPTIC LINE
---	UGE
---	UNDERGROUND ELECTRIC LINE
---	UGE&FO
---	UNDERGROUND ELECTRIC & FIBER OPTIC LINE
---	UGE&T
---	UNDERGROUND ELECTRIC & TELEPHONE LINE
---	UGT
---	UNDERGROUND TELEPHONE
---	UGTV
---	UNDERGROUND TELEVISION
---	UGT&FO
---	UNDERGROUND TELEPHONE & FIBER OPTIC LINE
---	X"W
---	WATER LINE

UTILITY DETAILS

---	FIRE DEPARTMENT CONNECTION
---	FIRE HYDRANT
---	POST INDICATOR VALVE
---	WATER METER
---	WATER VALVE
---	AIR RELEASE VALVE
---	BALL VALVE
---	BLOW-OFF VALVE
---	REDUCER
---	CORPORATION STOP
---	SANITARY SEWER LINE
---	SANITARY SEWER MANHOLE
---	FORCE MAIN LINE
---	CLEAN-OUT
---	ELECTRIC TRANSFORMER
---	POWER POLE/POWER POLE & GUY
---	LIGHT POLE
---	ELECTRICAL PEDESTAL
---	TELEPHONE PEDESTAL
---	TRAFFIC SIGNAL PEDESTAL
---	CATCH BASIN

UTILITY KEYNOTES

- 400 POINT OF CONNECTION - WATER SERVICE
- 410 GATE VALVE WITH ADJUSTABLE VALVE BOX (SEE SIZE AT SYMBOL)
- 411 REDUCER (SEE SIZE AT SYMBOL)
- 412 SOLID SLEEVE (SEE SIZE AT SYMBOL)
- 413 CAP / PLUG w/ THRUST BLOCKING (SEE SIZE AT SYMBOL)
- 414 TEE w/ THRUST BLOCKING (SEE SIZE AT SYMBOL)
- 415 CROSS w/ THRUST BLOCKING (SEE SIZE AT SYMBOL)
- 416 90° BEND w/ THRUST BLOCKING (SEE SIZE AT SYMBOL)
- 417 45° BEND w/ THRUST BLOCKING (SEE SIZE AT SYMBOL)
- 418 22-1/2° BEND w/ THRUST BLOCKING (SEE SIZE AT SYMBOL)
- 419 11-1/4° BEND w/ THRUST BLOCKING (SEE SIZE AT SYMBOL)
- 420 AIR RELEASE VALVE (SEE SIZE AT SYMBOL)
- 445 MAINTAIN 18" VERTICAL SEPARATION (MIN.)
- 446 MAINTAIN 18" HORIZONTAL SEPARATION (MIN.)
- 499 VERIFY DEPTH OF EXISTING UTILITY BEFORE CONSTRUCTION

GENERAL UTILITY NOTES

1. ALL WATER MAINS SHALL BE PVC (C-900; DR-14), UNLESS OTHERWISE SPECIFIED ON THE PLANS. SIZE AS NOTED ON THE PLANS AND TO MAINTAIN 36" OF COVER (MINIMUM). ALL SEWER MAINS SHALL BE PVC (SDR-26), UNLESS OTHERWISE SPECIFIED ON THE PLANS. SIZE AS NOTED ON THE PLANS AND TO MAINTAIN 48" OF COVER (MINIMUM). ALL FIBER / FDC LINES SHALL BE DUCTILE IRON, UNLESS OTHERWISE SPECIFIED ON THE PLANS. SIZE AS NOTED ON THE PLANS AND TO MAINTAIN 36" OF COVER (MINIMUM). ALL DOMESTIC WATER SERVICE LINES AFTER THE METER TO BUILDINGS SHALL BE POLYETHYLENE PIPE, UNLESS OTHERWISE SPECIFIED ON THE PLANS. SIZE AS NOTED ON THE PLANS AND TO MAINTAIN 36" OF COVER (MINIMUM). ALL DOMESTIC SANITARY SEWER SERVICE LINES SHALL BE PVC (SDR-26), OR OTHERWISE SPECIFIED ON THE PLANS. SIZE AS NOTED ON THE PLANS AND TO MAINTAIN 36" OF COVER (MINIMUM).
2. EXISTING UTILITIES SHOWN ON PLANS HAVE BEEN SHOWN IN THEIR APPROXIMATE LOCATIONS PER AVAILABLE INFORMATION.
3. CONSTRUCTION SHALL NOT START ON ANY PUBLIC UTILITY SYSTEM UNTIL WRITTEN APPROVAL HAS BEEN RECEIVED FROM THE APPROPRIATE UTILITY AUTHORITIES AND THE OWNER, AND THE CONTRACTOR HAS BEEN NOTIFIED BY McLELLAN CONSULTING ENGINEERS, INC.
4. CONTRACTOR SHALL NOT OPEN, TURN OFF, INTERFERE WITH, OR ATTACH ANY PIPE OR HOSE TO OR TAP ANY WATER MAIN UNLESS DULY AUTHORIZED TO DO SO BY THE CITY. ANY ADVERSE CONSEQUENCES OF ANY SCHEDULED OR UNSCHEDULED DISRUPTIONS OF SERVICE TO THE PUBLIC ARE TO BE THE LIABILITY OF THE CONTRACTOR. McLELLAN CONSULTING ENGINEERS, INC. AND THE OWNER ARE TO BE HELD HARMLESS.
5. ALL TRENCHING, BACKFILLING AND PIPE LAYING IS TO MEET ALL OSHA REQUIREMENTS.
6. THE LOCATION, DESCRIPTION AND SIZE OF ALL ABOVE-GROUND AND UNDER-GROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN DETERMINED WITH DUE CARE AND DILIGENCE, USING CURRENT TECHNIQUES, EQUIPMENT AND PROPER ACCURACY CONTROL PROCEDURES. HOWEVER, INFORMATION SHOWN HEREON IS NOT WARRANTED TO BE CORRECT IN EVERY DETAIL BECAUSE OF INACCURACIES IN OR LACK OF EXISTING DATA OR MAPS AND THE INABILITY TO VERIFY IN THE FIELD. PERSONS USING INFORMATION CONTAINED HEREON ARE HEREBY CAUTIONED ACCORDINGLY.
7. REFER TO BUILDING PLANS FOR SITE LIGHTING ELECTRICAL PLANS.
8. ALL WATER & SEWER DESIGNS ARE SUBJECT TO THE CITY OF RUSSELLVILLE LATEST DESIGN CRITERIA. REVIEW FOR PLAN APPROVAL IS NOT APPROVAL OF PUBLIC IMPROVEMENTS, AND ALL PROPOSED IMPROVEMENTS ARE SUBJECT TO FURTHER REVIEW AT THE TIME CONSTRUCTION PLANS ARE SUBMITTED.
9. ANY DAMAGE TO THE EXISTING PUBLIC STREET DUE TO CONSTRUCTION SHALL BE REPAIRED / REPLACED AT THE OWNER'S / DEVELOPER'S EXPENSE.
10. WATER AND SEWER IMPACT FEES WILL APPLY FOR THE ADDITIONAL IMPACT TO THE SYSTEM (IF APPLICABLE). THE FEES WILL BE BASED ON THE PROPOSED METER SIZE AND WILL BE CHARGED AT THE TIME OF METER SET (IF APPLICABLE).
11. ALL UTILITY SERVICE LINES TO BE CONNECTED TO NEW MAINS OR RELOCATED AS NEEDED FOR INSTALLATION OF STORM SEWER SYSTEM.
12. ALL CONDUITS PLACED BY CONTRACTOR MUST HAVE 24" OF COVER AT FINAL GRADE AND MARKED WITH POSTS TO IDENTIFY THE ENDS OF CONDUITS. THERE MUST BE A MINIMUM SEPARATION OF 12" BETWEEN ELECTRICAL CONDUITS AND CONDUITS FOR OTHER UTILITIES.
13. SERVICE TAPS ON UTILITY MAINS (PROPOSED AND / OR EXISTING) SHALL BE MADE BY THE CITY OF RUSSELLVILLE, AND FEES PAID BY CONTRACTOR.
14. ALL UNDERGROUND LINES SHALL BE INSPECTED BY THE ENGINEER, OR HIS REPRESENTATIVE, PRIOR TO BACK FILLING.
15. PRIVATE DOMESTIC SANITARY SEWER SERVICE LINE TRENCHING AND BEDDING SHALL BE INSTALLED PER DETAIL 41N.
16. PRIVATE DOMESTIC WATER SERVICE LINE AFTER METER TRENCHING AND BEDDING SHALL BE INSTALLED PER DETAIL 40Q.
17. ALL WATER LINE DIMENSIONS SHOWN ARE TO CENTER OF PIPE OR FITTING; ALL SEWER LINE DIMENSIONS ARE SHOWN TO CENTER OF MANHOLE OR CENTER OF PIPE.
18. TESTING OF WATER AND SEWER LINES SHALL BE AT THE CONTRACTOR'S EXPENSE.
19. TOPS OF EXISTING MANHOLES SHALL BE RAISED AS NECESSARY TO BE EITHER FLUSH WITH FINISHED GRADES IN PAVED AREAS, OR 4" ABOVE FINISHED GRADES IN UNPAVED AREAS. TOPS OF PROPOSED MANHOLES SHALL BE FLUSH WITH FINISHED GRADES IN PAVED AREAS, OR 4" ABOVE FINISHED GRADES IN UNPAVED AREAS.
20. ALL UTILITIES UNDER PAVED AREAS SHALL RECEIVE CLASS 7 BASE BACKFILL FULL DEPTH.
21. MAINTAIN MINIMUM HORIZONTAL SEPARATION OF 10' BETWEEN WATER AND SEWER MAINS AND 5' BETWEEN OTHER UNDERGROUND UTILITIES SUCH AS STORM SEWER, ELECTRICAL, GAS, DOMESTIC WATER / SEWER SERVICE LINES, AND CONDUITS.
22. ALL EXISTING WATER, GAS AND / OR ELECTRICAL METERS AS NOTED TO BE ABANDONED AND / OR REMOVED PER THE DEMOLITION PLAN WITHIN THE PROJECT AREA ARE TO BE RETURNED TO THE APPROPRIATE AUTHORITY.
23. COORDINATION OF ALL CONDUIT PLACEMENT SHALL BE MADE WITH UTILITY PROVIDERS.
24. ALL WATER AND SEWER FORCE MAIN FITTINGS SHALL BE RESTRAINED THROUGH THE USE OF THRUST BLOCKING PER DETAIL 40A OR APPROVED EQUAL.
25. PROPOSED UTILITIES THAT ARE TO BE BURIED IN THE SAME TRENCH SHALL BE COORDINATED WITH, AND APPROVED BY, THE INVOLVED UTILITIES PRIOR TO INSTALLATION.
26. CONTRACTOR SHALL FIELD VERIFY DEPTH AND LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION OF PROPOSED UTILITIES.
27. ALL PROPOSED UTILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH GOVERNING AGENCY.
28. CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION LAYOUT AND STAKING (UNLESS APPROVED OTHERWISE BY THE ENGINEER OF RECORD).
29. STAKING & LAYOUT FOR WATER & SEWER MAINS MUST BE PERFORMED BY A LICENSED PROFESSIONAL LAND SURVEYOR (SWU PROJECTS ONLY).
30. CONTRACTOR SHALL MAINTAIN 4" (MINIMUM) SEPARATION DISTANCE BETWEEN SIDEWALK AND / OR BACK OF CURB AND FACE OF FIRE HYDRANT / METER BOXES AT ALL TIMES (SWU PROJECTS ONLY).
31. CONTRACTOR SHALL INSTALL A TRACER WIRE PORT TO ALL BENDS THAT DO NOT HAVE A VALVE BOX OR EVERY 400' (MAXIMUM), AND AT ANY PIPE TYPE TRANSITION PER SWU STANDARD DETAIL M-1 (SWU PROJECTS ONLY).
32. CONTRACTOR TO COORDINATE AIR RELIEF VALVES LOCATION, DETAIL, AND SPECIFICATION WITH MEP FOR ALL CHILLER LOOP WATERLINES.

Insight
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ATU WEST CAMPUS CHILLED WATER LOOP
RUSSELLVILLE, AR

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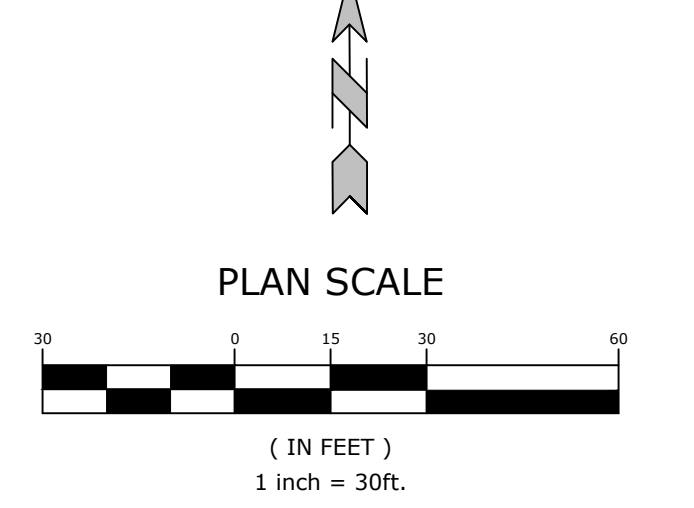
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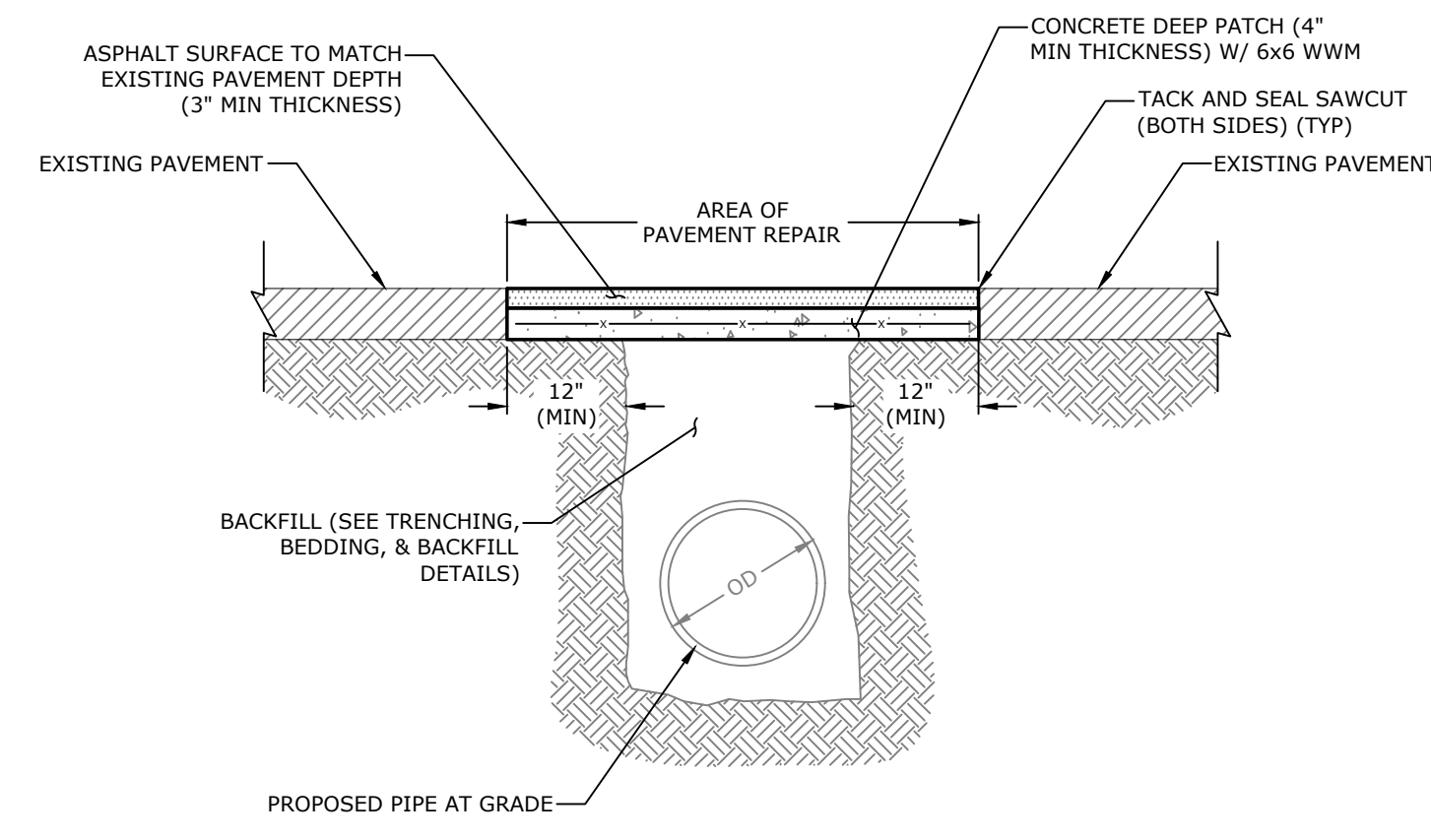
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SHEET NUMBER: **C400**

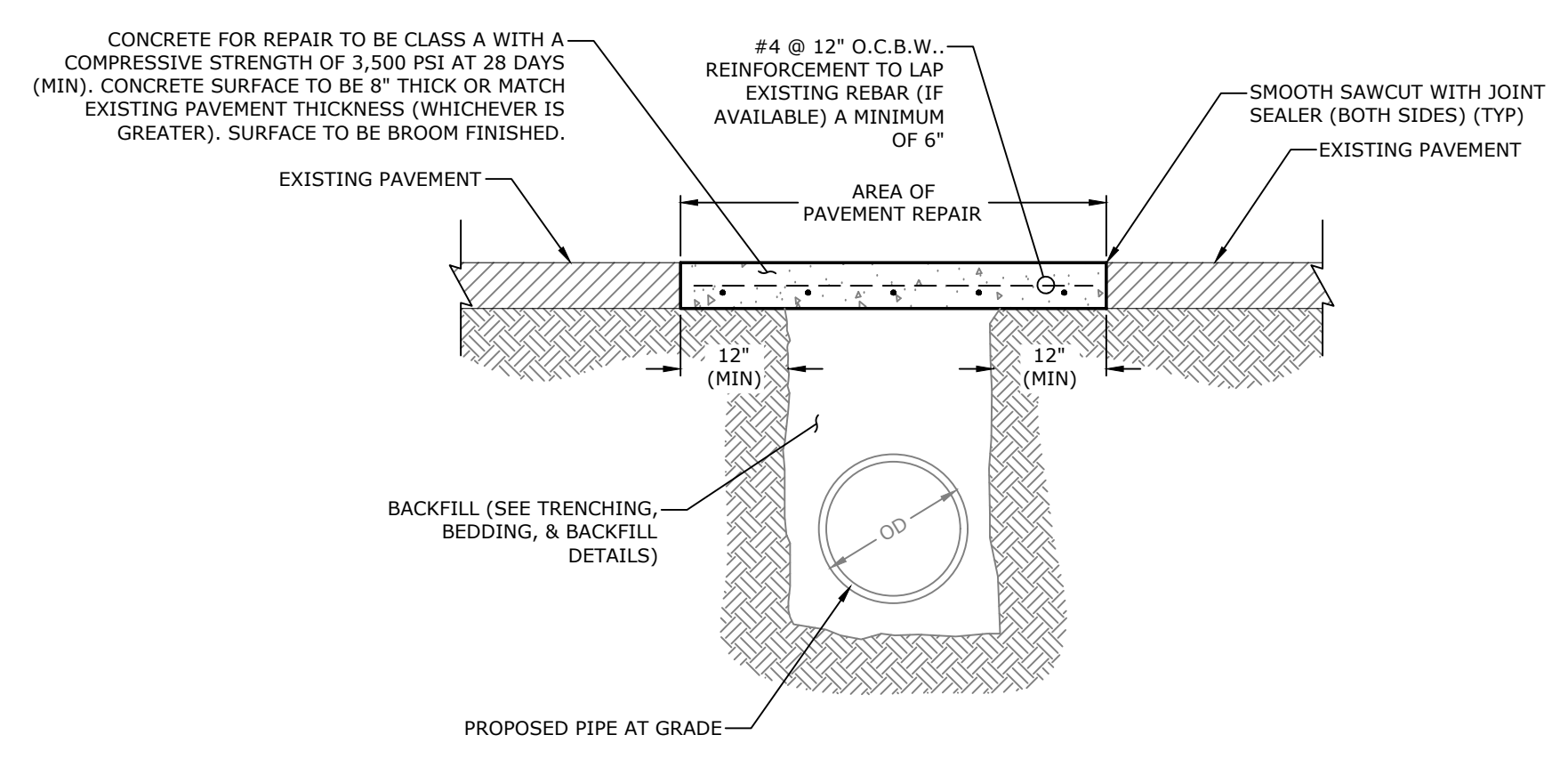




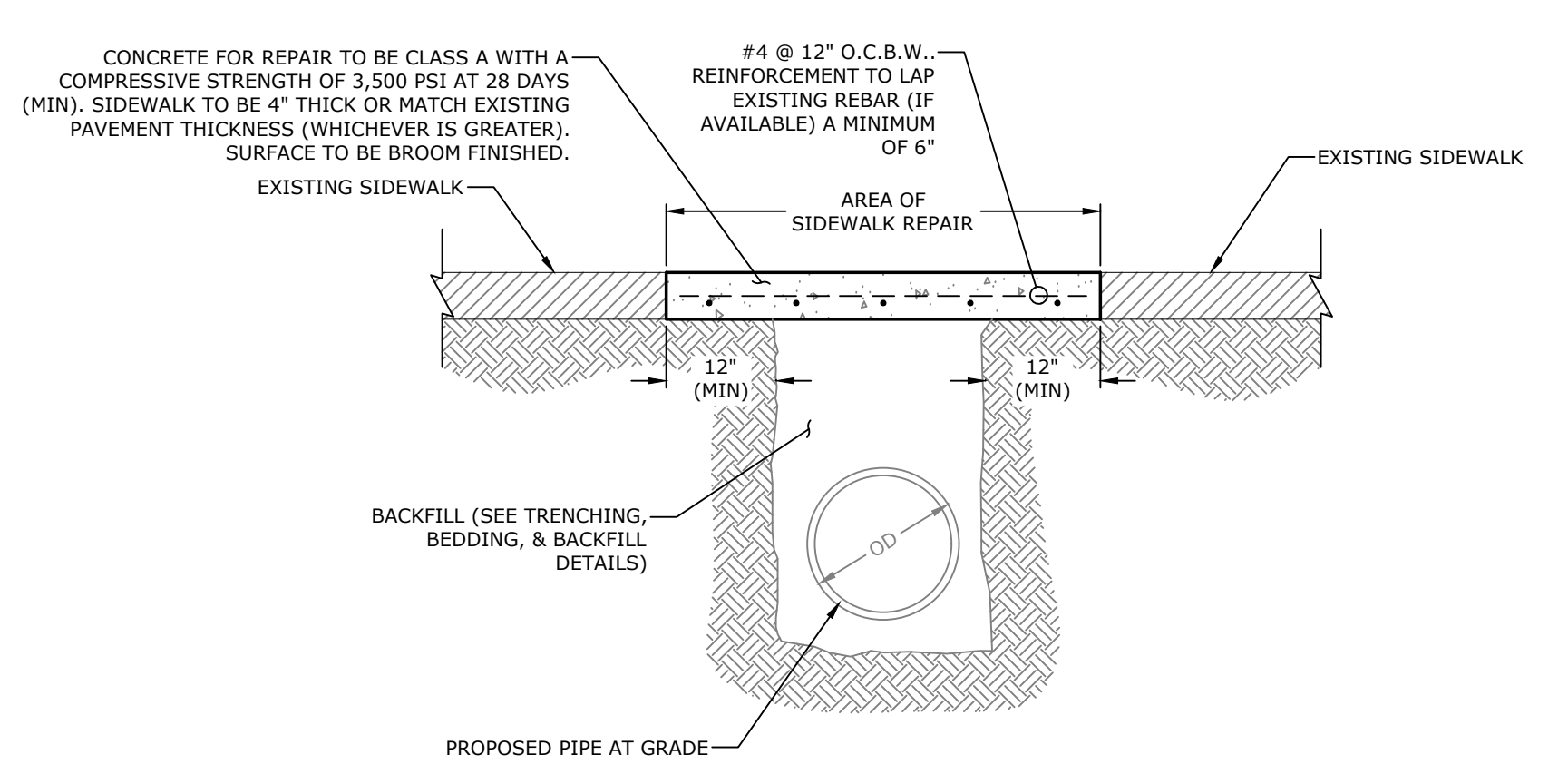
**ATU WEST CAMPUS CHILLED
WATER LOOP**
RUSSELVILLE, AR



42A ASPHALT PAVEMENT REPAIR
NTS

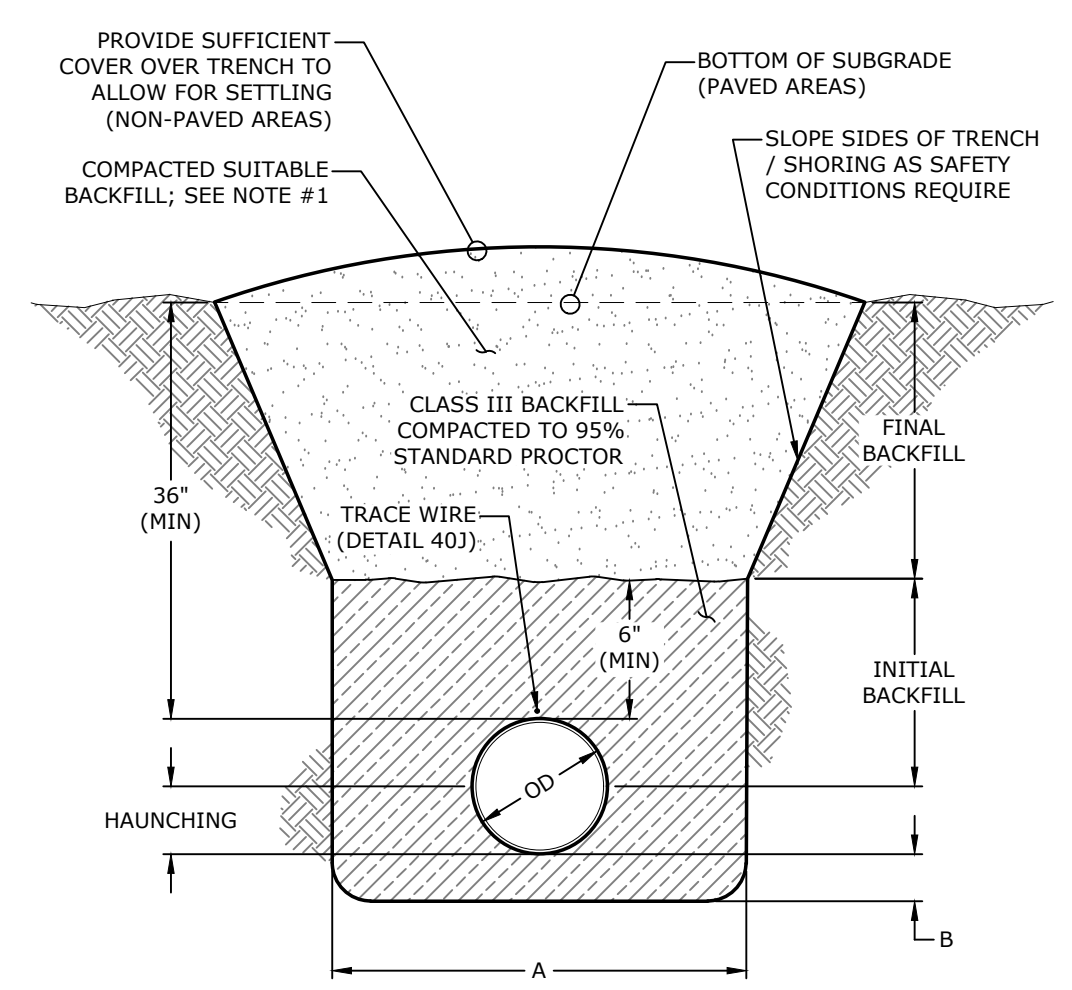


42B CONCRETE PAVEMENT REPAIR
NTS



42D SIDEWALK PAVEMENT REPAIR
NTS

NOTES:
1. FOR AREAS WHERE PIPE IS LOCATED UNDER NON-PAVED AREAS, BACKFILL SHALL BE COMPACTED SUITABLE NATIVE MATERIAL (DO NOT INCORPORATE FROZEN MATERIAL OR SOFT, MUCK, OR HIGHLY COMPRESSIBLE MATERIALS INTO FILL). FOR AREAS WHERE PIPE IS LOCATED UNDER PAVED AREAS, BACKFILL SHALL BE SELECT FILL COMPACTED PER THE GEOTECHNICAL REPORT PROJECT NO. [PROJECT #] PREPARED BY [GEOTECH COMPANY NAME] DATED [REPORT DATE].

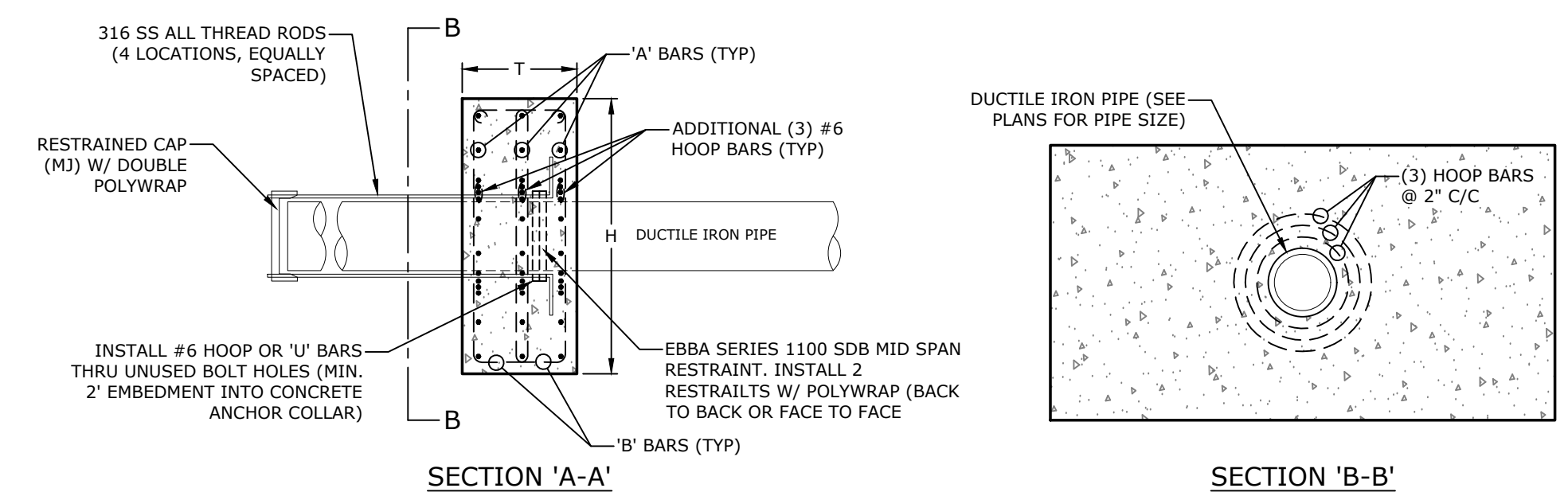
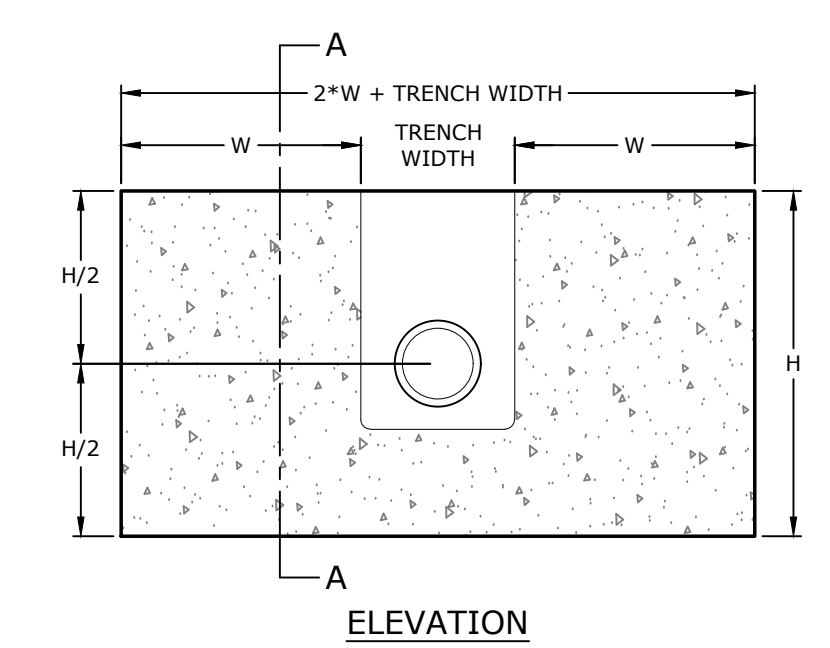


TRENCHING, BACKFILL, & BEDDING TABLE

'A'	OD + 18" (MIN) OD + 24" (MAX)
'B'	.25 x OD (4" MIN)

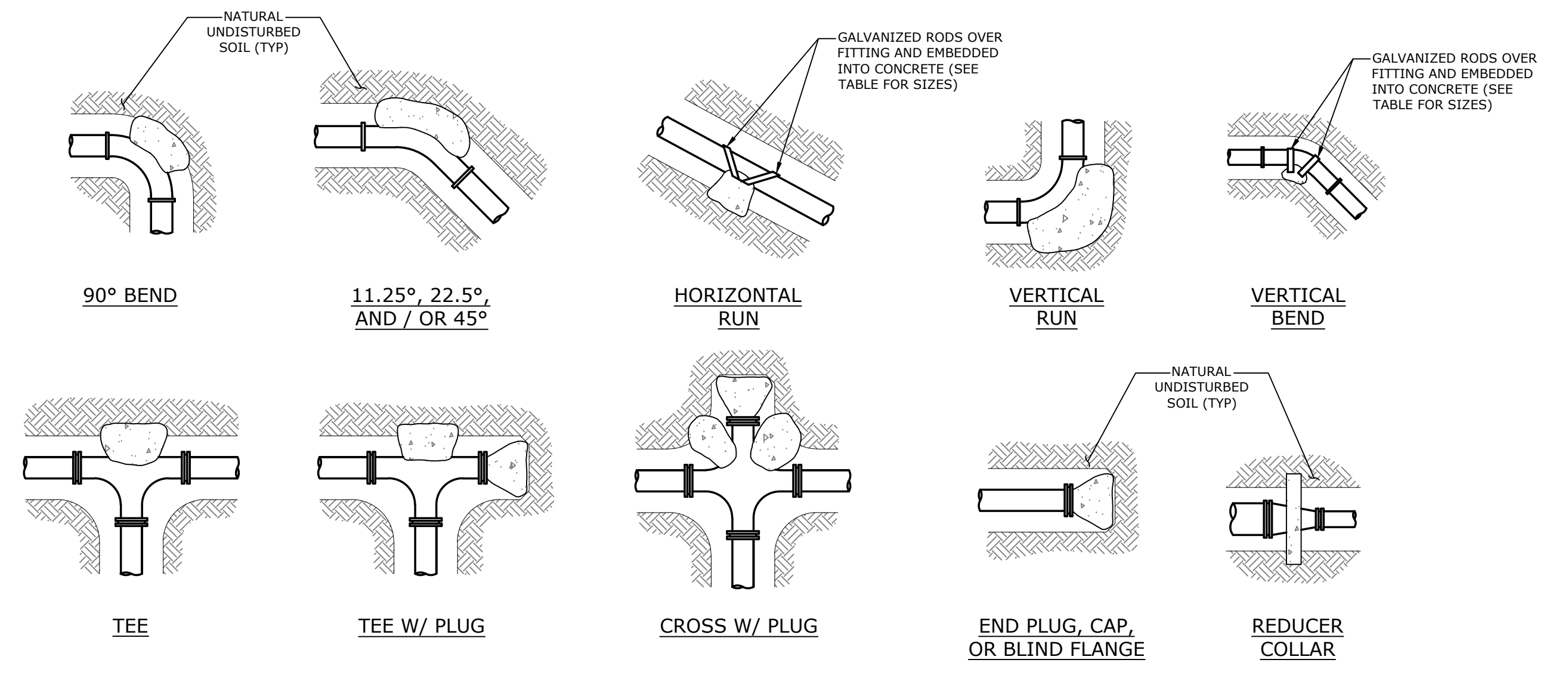
40Q WATER LINE TRENCHING, BACKFILL, & BEDDING
NTS

NOTES:
1. DESIGN BASED ON 150 PSI PIPE PRESSURE & 2,000 PSF SOIL BEARING.
2. ALL CONCRETE USED FOR ANCHOR COLLARS SHALL HAVE A COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS (MIN)



40L CONCRETE ANCHOR COLLAR
NTS

NOTES:
1. CONCRETE FOR THRUST BLOCKS SHALL DEVELOP NOT LESS THAN 2,500 P.S.I. COMPRESSIVE STRENGTH AT 28 DAYS AND BE PLACED AGAINST UNDISTURBED SOIL.
2. ALL BENDS, BOTH HORIZONTAL AND VERTICAL, SHALL BE BACKED WITH CONCRETE. VERTICAL BENDS SHALL BE PLACED ON CONCRETE PADS WHERE BENDS TURN UP, OR LOADED WHERE BENDS TURN DOWN.
3. WRAP PIPE JOINTS IN 8 MIL POLYETHYLENE BEFORE PLACING CONCRETE. USE LONG-RADIUS FITTINGS WHEREVER POSSIBLE.
4. BEARING AREA SHOWN IN TABLE, IS BASED UPON A 2000 LB/SF. SOIL BEARING, AND UPON A PIPELINE PRESSURE OF 250 PSI PLUS WATER HAMMER. AREAS SHOWN SHALL BE ADJUSTED, SHOULD FIELD CONDITIONS VARY.
5. UTILIZE MEGALUG THRUST RESTRAINTS ON MECHANICAL JOINT FITTINGS AND VALVES, IN ADDITION TO THESE THRUST BLOCKS.



THRUST BLOCKING SCHEDULE

FITTING SIZE	BEARING AREA OF THRUST BLOCKING (SQ. FT.) (HORIZONTAL BENDS)						VOLUME OF THRUST BLOCKING (CU. FT.) (VERTICAL BENDS)							
	TEE, WYE, PLUG, OR CAP	90° BEND, PLUGGED CROSS	TEE PLUGGED ON RUN (A1)	TEE PLUGGED ON RUN (A2)	BEND ANGLES		FITTING SIZE	BEND ANGLES			ROD SIZE	EMBEDMENT	CUBIC YARDS	
2", 3", & 4"	1.80	1.30	1.80	45°	22.5°	11.25°		45°	22.5°	11.25°				
2", 3", & 4"	1.30	1.80	1.30	1.80	1.00	1.0	-	2", 3", & 4"	1.50	0.5	0.3	#6	30"	-
6"	2.80	4.00	2.80	4.00	2.20	1.1	1.0	6"	3.60	1.3	0.5	#6	30"	-
8"	5.00	7.10	5.00	7.10	3.80	2.0	1.0	8"	5.30	2.0	0.8	#6	30"	0.6
10"	7.90	11.10	7.90	11.10	6.00	3.0	1.6	10"	8.00	3.1	1.2	#6	30"	-
12"	11.30	16.00	11.30	16.00	8.70	4.4	2.3	12"	11.30	4.3	1.7	#6	30"	1.3

40A THRUST BLOCKING
NTS

ANCHOR COLLAR SCHEDULE

PIPE SIZE	DIMENSIONS				'M' (SEE SECTION 'A-A')	REINFORCEMENT BARS			
	'W'	'H'	'T'	'M'		'A' BARS	# OF LAYERS	'B' BARS	# OF LAYERS
6"	18"	24"	12"	(2) RETAINER GLANDS (MJ)	#6 @ 6" O.C.	1	#6 @ 6" O.C.	1	
8"	18"	30"	12"	(2) RETAINER GLANDS (MJ)	#6 @ 6" O.C.	1	#6 @ 6" O.C.	1	
12"	24"	48"	18"	(2) RETAINER GLANDS (MJ)	#6 @ 6" O.C.	1	#6 @ 6" O.C.	1	
16"	36"	60"	24"	(2) RETAINER GLANDS (MJ)	#6 @ 6" O.C.	2	#6 @ 6" O.C.	2	
20"	36"	60"	24"	(2) RETAINER GLANDS (MJ)	#6 @ 6" O.C.	2	#6 @ 6" O.C.	2	
24"	42"	72"	24"	(2) RETAINER GLANDS (MJ)	#6 @ 9" O.C.	3	#6 @ 9" O.C.	3	

REVISIONS:

No.	Description	Date

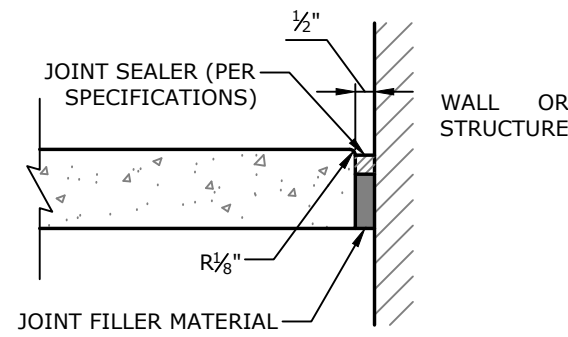
Project Status

ISSUE DATE: 10/25/2024
PROJECT NUMBER: 23-5807
SHEET TITLE: MISCELLANEOUS DETAILS I

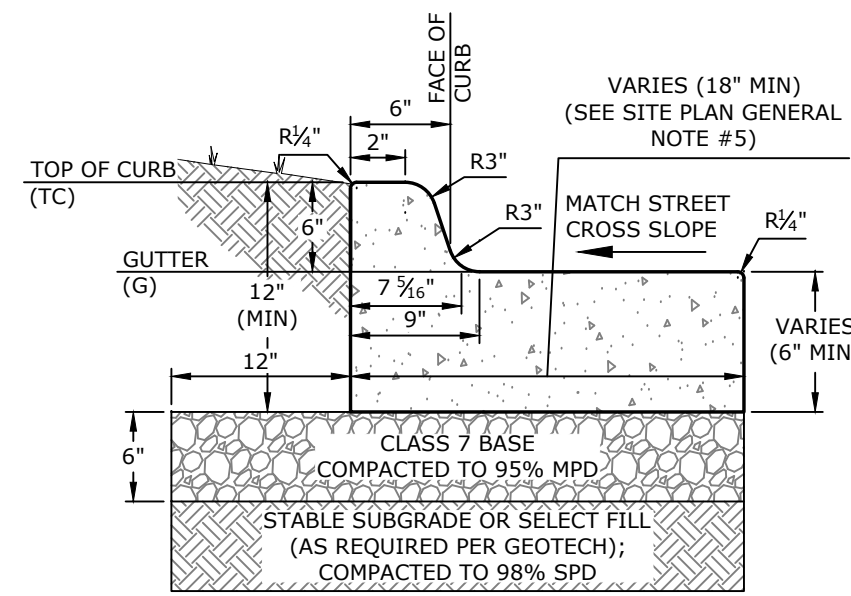
SHEET NUMBER: **C500**



- NOTES:**
1. CONCRETE FOR CURB AND GUTTER TO HAVE A COMPRESSIVE STRENGTH OF 3,500 PSI AT 28 DAYS (MIN).
 2. ALL CURBS AND GUTTER SHALL HAVE A BROOMED FINISH UNLESS OTHERWISE SPECIFIED.
 3. SAW CUT JOINTS AT 15' O.C. SEAL WITH ONE PART COLD APPLIED SILICONE JOINT SEALER OR OTHER APPROVED SEALANT. ALL JOINTS TO BE SEALED PRIOR TO FINAL ASPHALT PLACEMENT.
 4. PROVIDE 1/2" PREFORMED ISOLATION JOINT MATERIAL (ASPHALT IMPREGNATED FIBERBOARD OR OTHER APPROVED MATERIAL) AT STATIONARY STRUCTURES, (DROP INLETS, END OF CURBS, DRIVEWAYS - SEE DETAIL) OR AS DIRECTED BY ENGINEER.
 5. WHEN CURB / GUTTER IS USED IN ROADWAY OR DRIVEWAY, 12" BASE BEHIND CURB SHALL BE REQUIRED. WHEN CURB / GUTTER IS USED IN PARKING LOTS, 12" BASE BEHIND CURB NOT REQUIRED - UNLESS 5:1 OR STEEPER SLOPE AWAY FROM BACK OF CURB IS PRESENT.

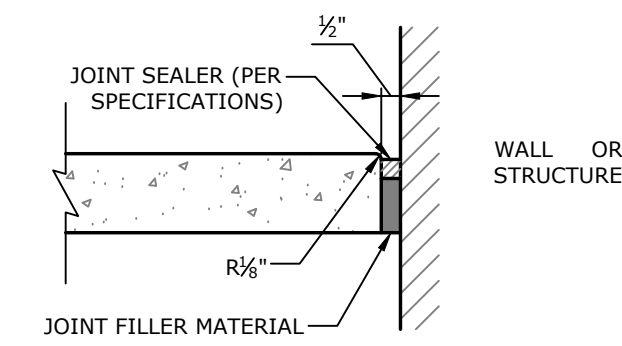


ISOLATION JOINT

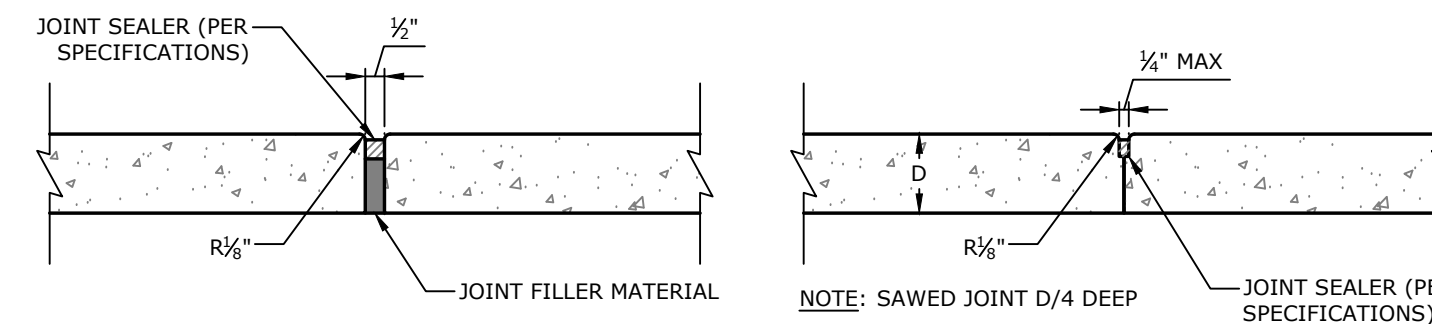


20A TYPE 'A' STANDARD CONCRETE CURB & GUTTER
NTS

- NOTES:**
1. CONCRETE FOR SIDEWALK SHALL HAVE A COMPRESSIVE STRENGTH OF 3,500 PSI AT 28 DAYS (MIN).
 2. ALL SIDEWALKS SHALL HAVE A BROOMED FINISH UNLESS OTHERWISE SPECIFIED.
 3. ALL JOINTING TO BE LOCATED PER SIDEWALK JOINTING TABLE.
 4. ALL CONTROL JOINTING TO BE SAWCUT OR TOOLED JOINTED PER SIDEWALK JOINTING.
 5. CURING COMPOUND IS REQUIRED UNLESS TEMPERATURES STAY BELOW 50° FAHRENHEIT FOR 7 DAYS. CURING COMPOUND MUST BE COLORED WHITE, RED, OR PINK. CLEAR CURING COMPOUND IS UNACCEPTABLE. IF CONCRETE IS NOT CURED WHEN REQUIRED, IT WILL BE CONSIDERED GROUNDS FOR REMOVAL AND REPLACEMENT.



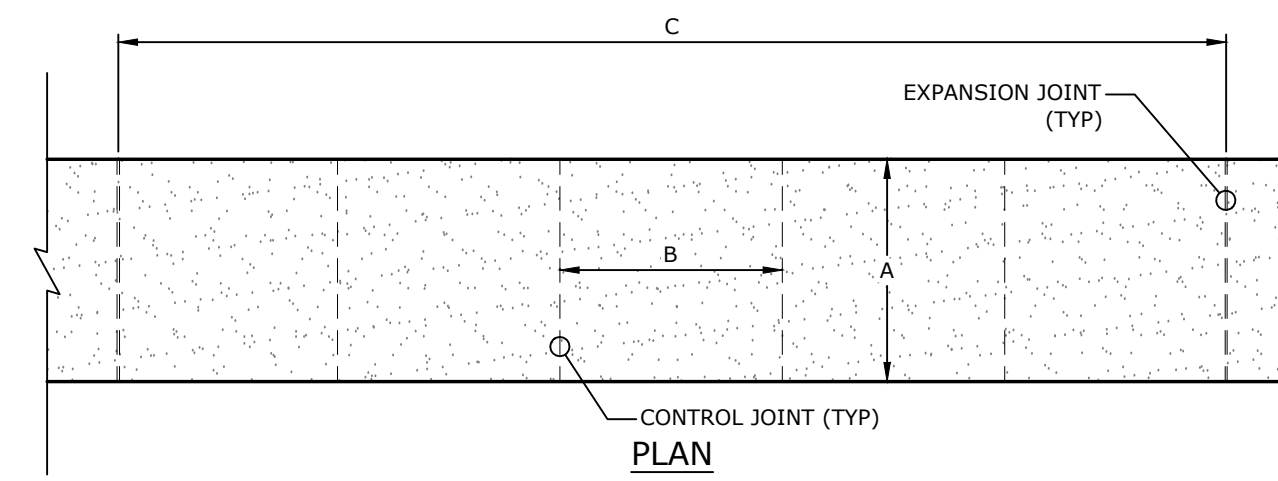
ISOLATION JOINT



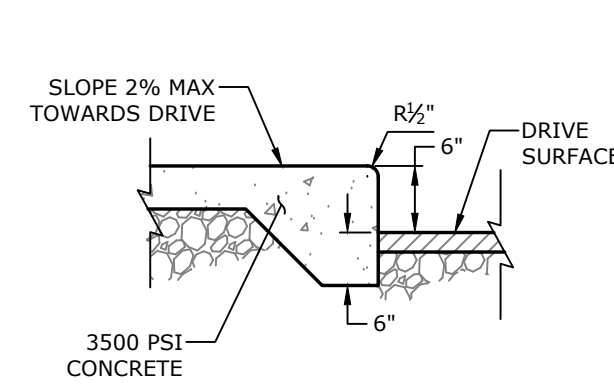
EXPANSION JOINT

CONTROL JOINT (LONGITUDINAL OR TRANSVERSE)

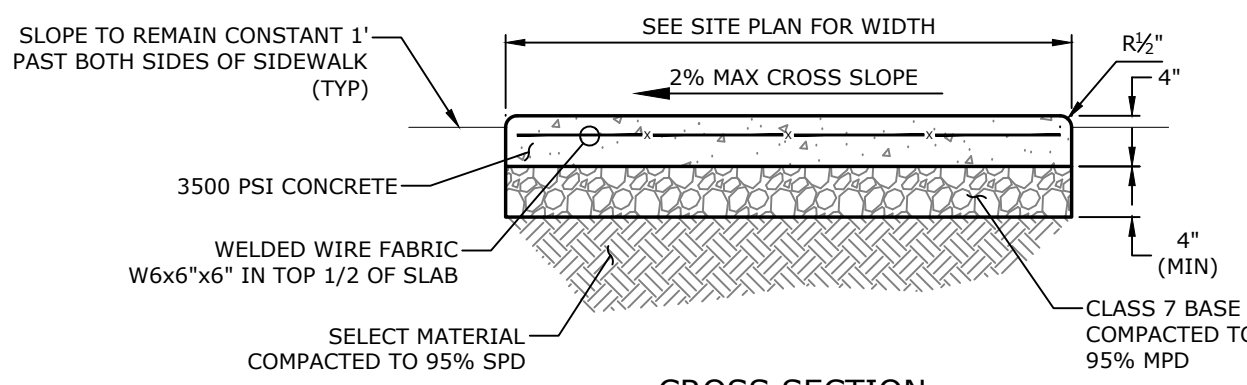
SIDEWALK JOINTING TABLE	
A	SEE SITE PLAN
B	A
C	Bx5



PLAN



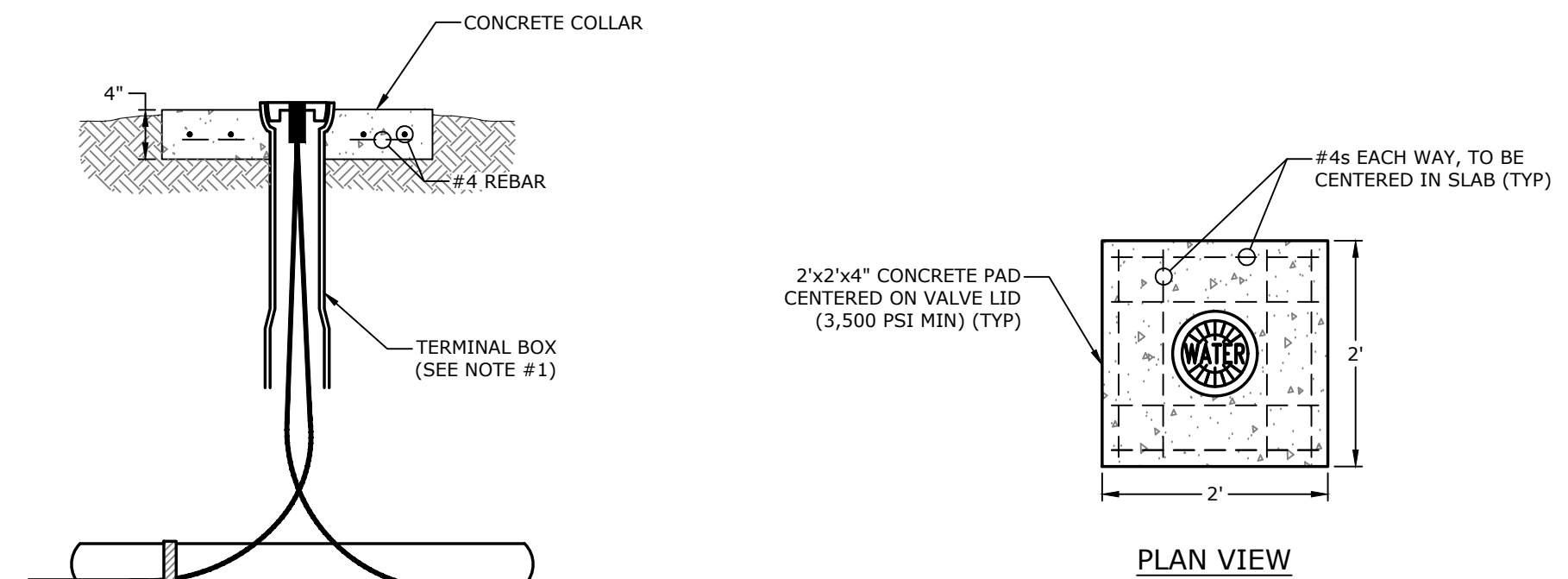
SIDEWALK ADJACENT TO DRIVE SURFACES



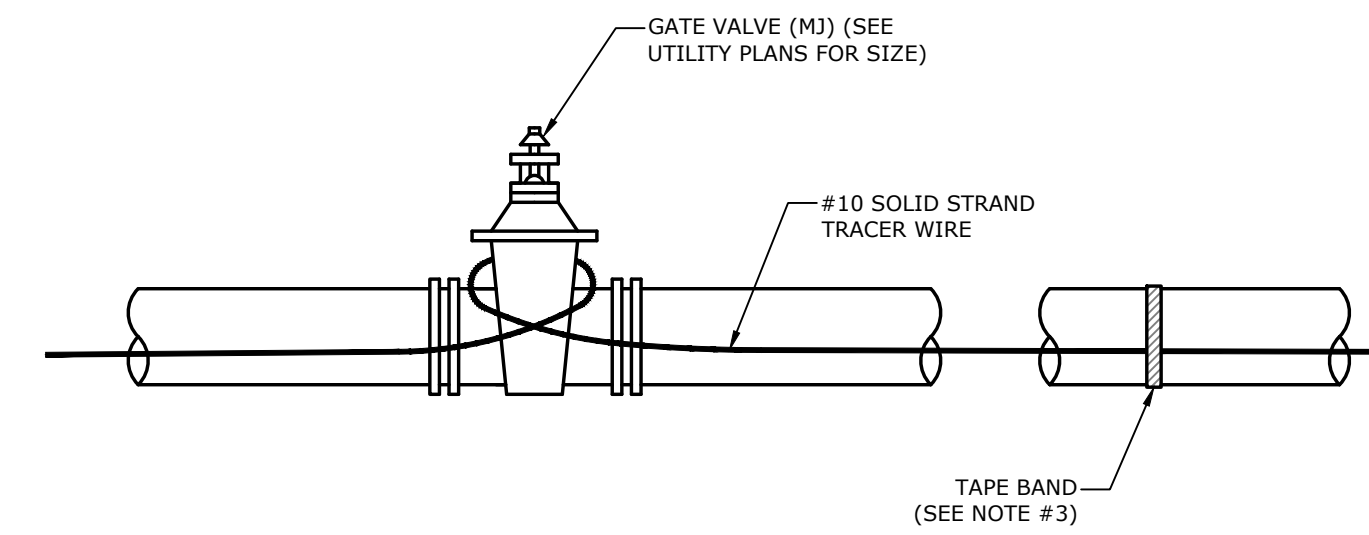
CROSS SECTION

22A CONCRETE SIDEWALK
NTS

- NOTES:**
1. TERMINAL BOXES TO BE EAST JORDAN IRON WORKS 8550 SERIES (OR APPROVED EQUAL); EXTENSIONS TO BE PROVIDED WHERE REQUIRED.
 2. TERMINAL BOXES SHALL BE LOCATED AT APPROXIMATELY 500' INTERVALS (OR AT LOCATIONS DETERMINED BY THE ENGINEER) AND AT EACH END OF THE PIPING INSTALLATION. A CONCRETE COLLAR SHALL BE PLACED ON EACH TERMINAL BOX LOCATED OUTSIDE OF PAVEMENT SURFACES OR SIDEWALKS.
 3. TAPE BANDS SHALL BE PLACED EVERY 10' TO HOLD TRACER WIRE IN PLACE DURING INSTALLATION.
 4. CONTRACTOR SHALL PROVIDE AN INSTRUMENT AND DEMONSTRATE THE ELECTRICAL CONTINUITY OF ALL TRACER WIRES PRIOR TO THE FINAL ACCEPTANCE BY THE OWNER.
 5. TRACER WIRE SHALL BE INSTALLED IN THE LOCATION DIRECTED BY THE ENGINEER, BUT SHALL GENERALLY BE LOCATED IMMEDIATELY ADJACENT TO THE PIPE AND AT THE SAME DEPTH. TRACER WIRE SHALL ALSO BE INSTALLED ON SERVICE LINES BETWEEN THE WATER LINE(S) AND WATER METER(S). TRACER WIRE SHALL EXTEND AT LEAST 1' INTO THE METER BOX(S).
 6. WIRE SHALL BE SPLICED USING 3M DIRECT BURY SPLICE KIT DBR / Y-6 (OR APPROVED EQUAL).

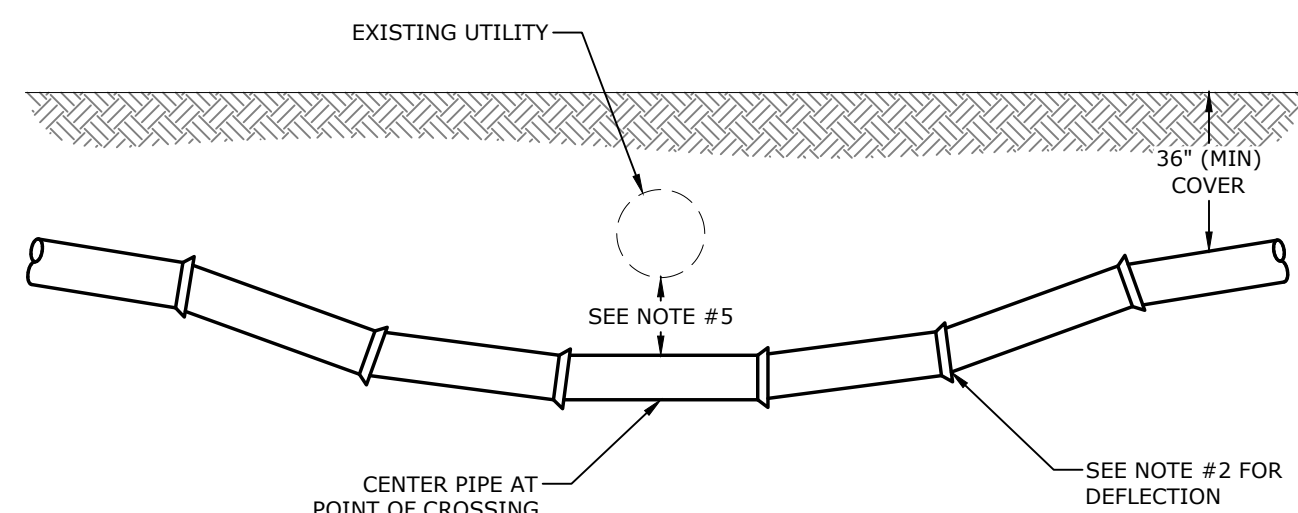


PLAN VIEW

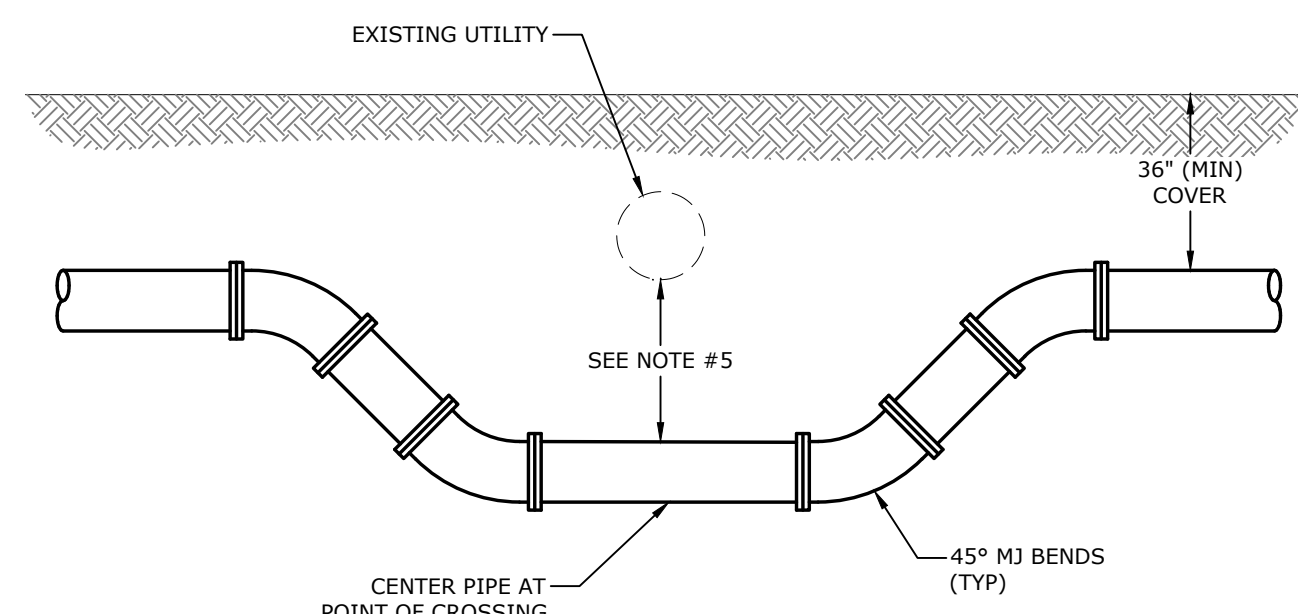


40J TRACER WIRE & TERMINAL
NTS

- NOTES:**
1. DEFLECTION TYPE CROSSINGS ARE THE PREFERRED CROSSING TYPE. SHOULD THIS NOT BE ACHIEVABLE, A FITTING TYPE CROSSING IS ALLOWED.
 2. FOR DEFLECTION TYPE CROSSINGS, CONTRACTOR TO USE 75% OF THE MANUFACTURER'S MAXIMUM JOINT DEFLECTION AT ANY TIME.
 3. ALL TIE RODS ARE TO BE 3/8" GALVANIZED STEEL AND SHALL BE COATED AT LEAST TWICE W/ A COAL TAR ENAMEL AFTER ASSEMBLY.
 4. TIE RODS MAY BE OMITTED WHEN OTHER APPROVED METHODS OF RESTRAINT JOINTING ARE USED.
 5. 18" (MIN) CLEARANCE BETWEEN WATER AND SEWER MAIN CROSSINGS; 12" (MIN) CLEARANCE BETWEEN WATER MAIN & OTHER UTILITY CROSSINGS.
 6. ENCASEMENT OF WATER AND SEWER MAIN CROSSINGS SHALL BE USED IF MINIMUM CLEARANCE CANNOT MAINTAINED (DETAIL 40F).

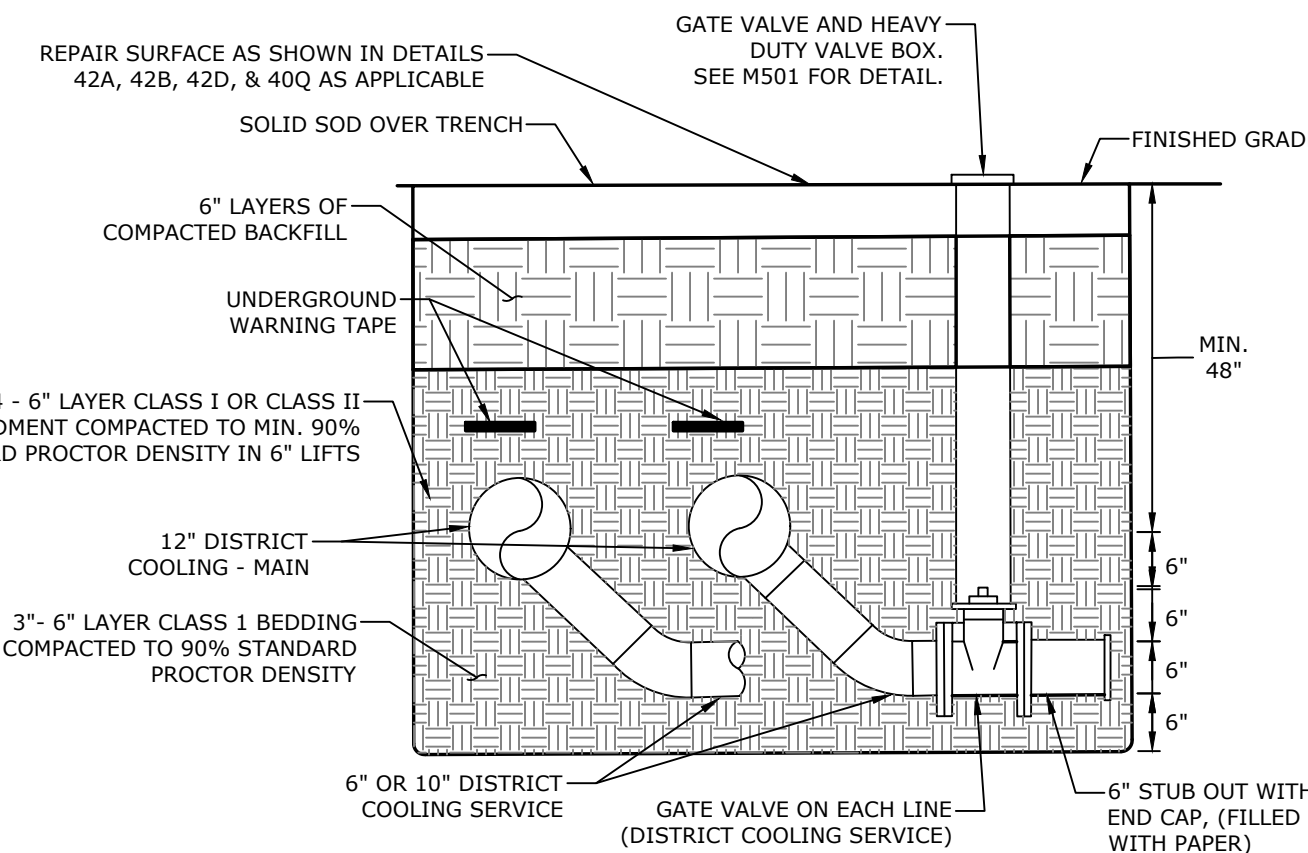


UTILITY CROSSING BY DEFLECTION

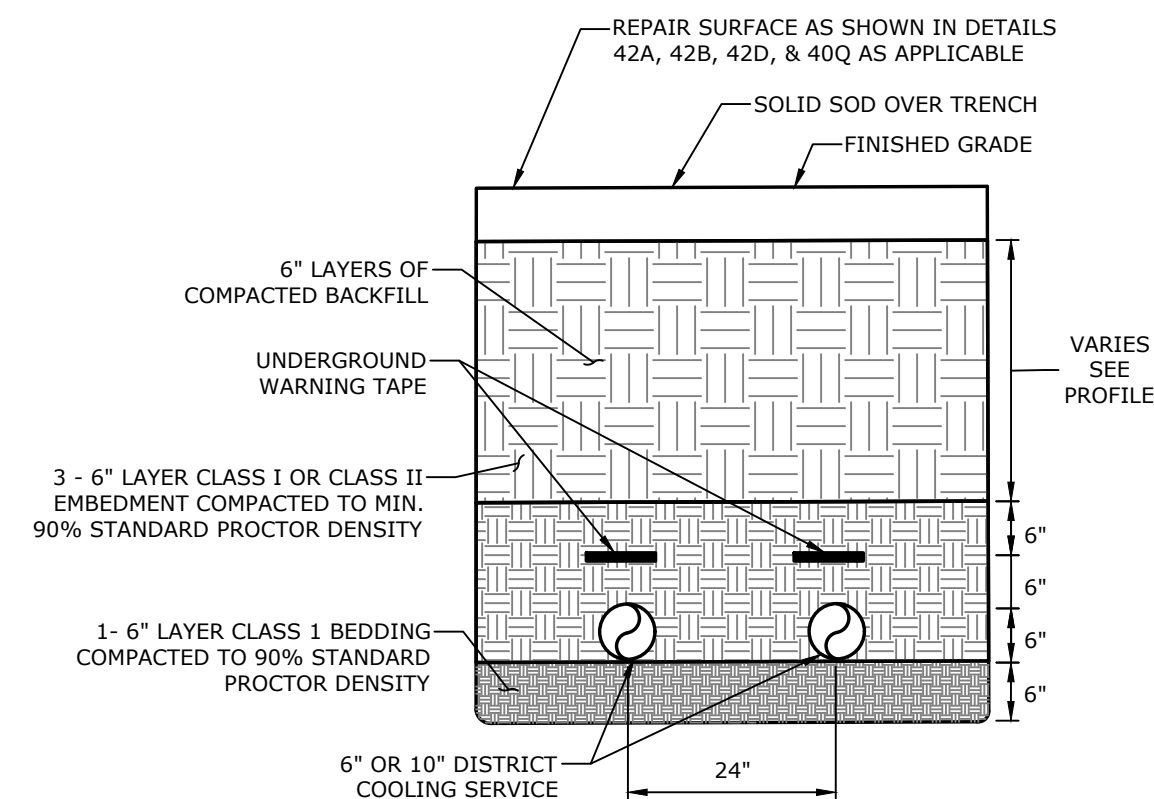


UTILITY CROSSING BY FITTING

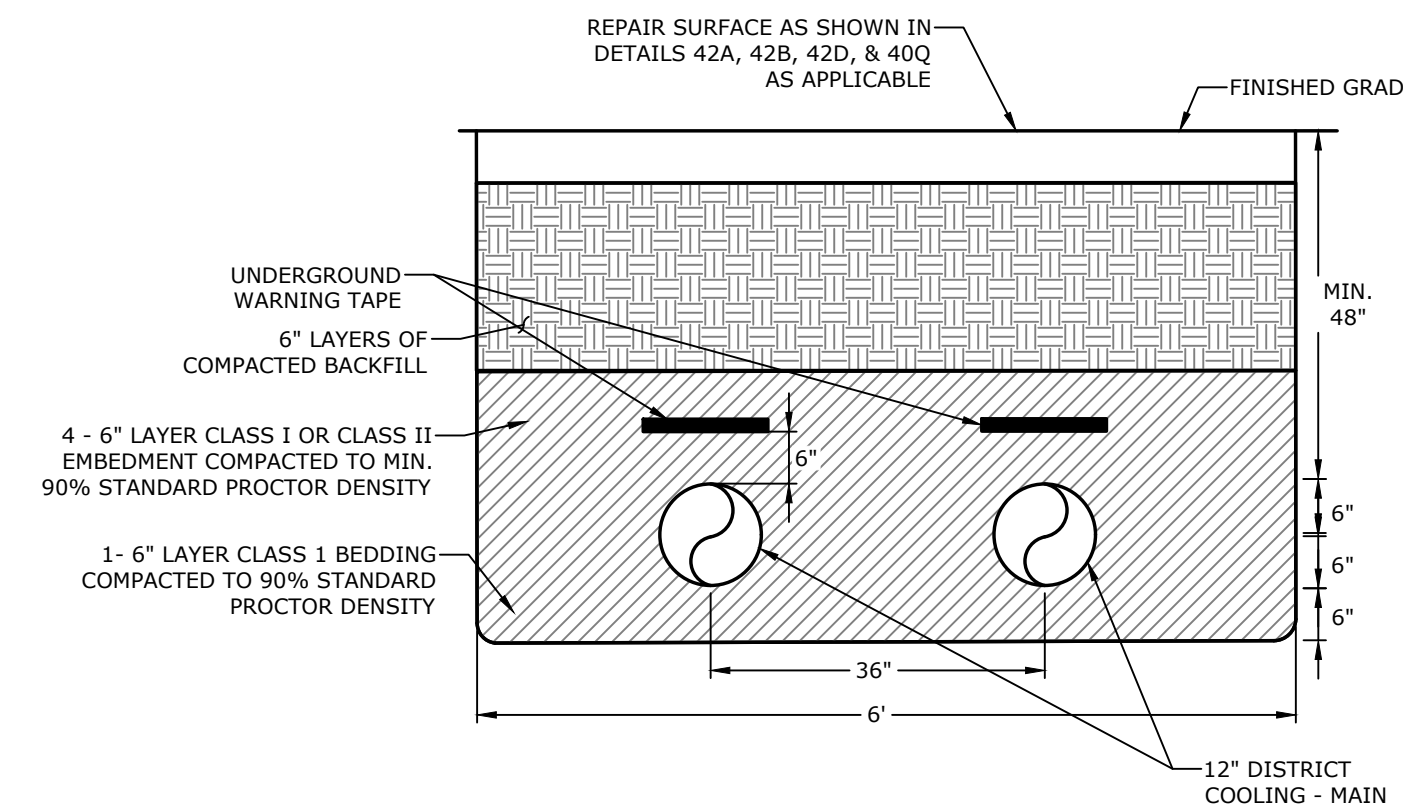
40D WATER MAIN LOWERING
NTS



43A SERVICE CONNECTION TRENCH
NTS



43B DISTRICT COOLING TRENCH SECTION SERVICE
NTS



43C DISTRICT COOLING TRENCH SECTION - MAIN
NTS

REVISIONS:

No.	Description	Date

Project Status

ISSUE DATE: 10/25/2024

PROJECT NUMBER: 23-5807

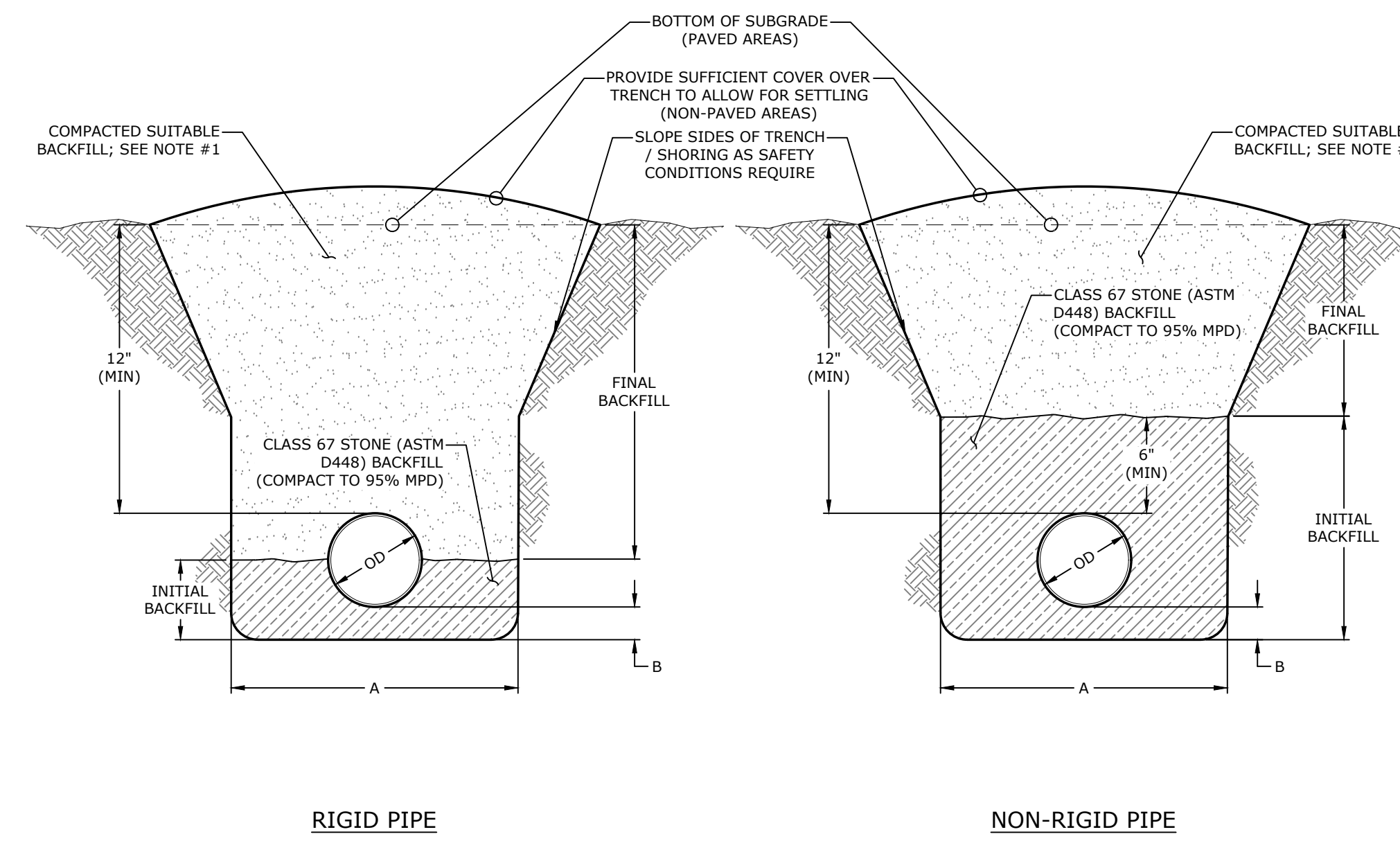
SHEET TITLE: MISCELLANEOUS DETAILS II

SHEET NUMBER:

C501

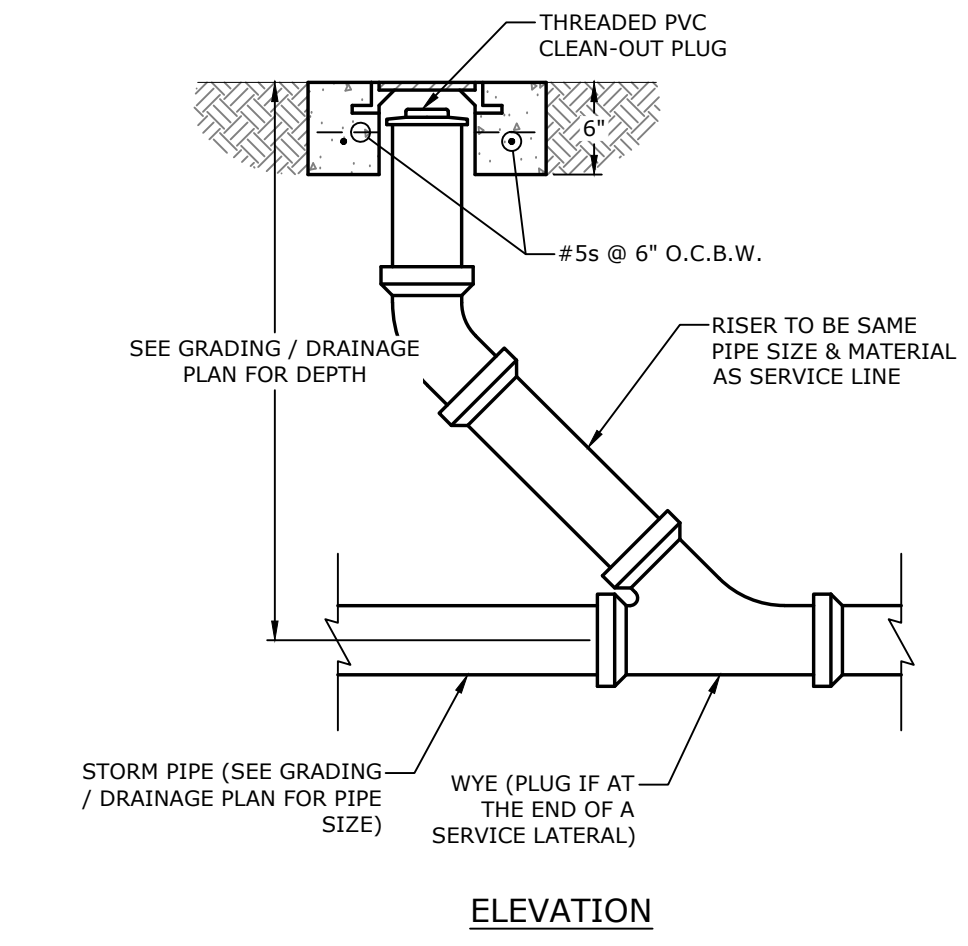
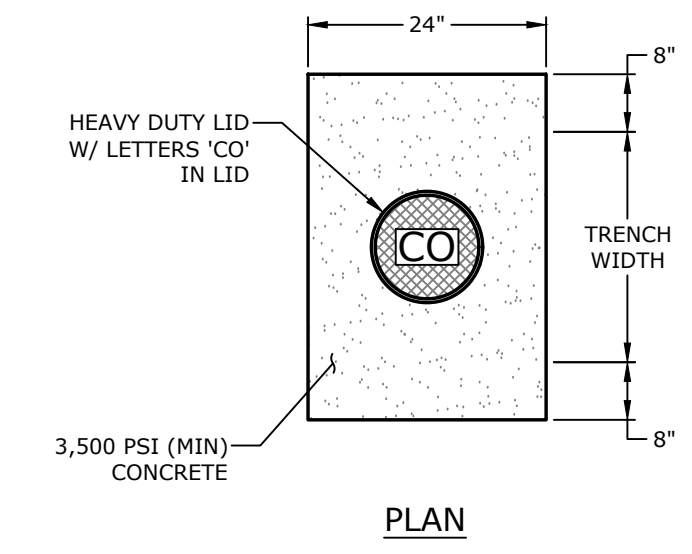


NOTES:
 1. FOR AREAS WHERE PIPE IS LOCATED UNDER NON-PAVED AREAS, BACKFILL SHALL BE COMPACTED SUITABLE NATIVE MATERIAL (DO NOT INCORPORATE FROZEN MATERIAL OR SOFT, MUCK, OR HIGHLY COMPRESSIBLE MATERIALS INTO FILL). FOR AREAS WHERE PIPE IS LOCATED UNDER PAVED AREAS, BACKFILL SHALL BE SELECT FILL COMPACTED TO 95% STANDARD PROCTOR.



TRENCHING, BACKFILL, & BEDDING TABLE	
'A'	OD + 24" (MIN) OD + 36" (MAX)
'B'	.10 x OD (6" MIN)

33G STORM SEWER TRENCHING, BACKFILL, & BEDDING
NTS



33D STORM DRAIN CLEAN-OUT
NTS



ATU WEST CAMPUS CHILLED WATER LOOP
RUSSELVILLE, AR

REVISIONS:

No.	Description	Date

Project Status

ISSUE DATE: 10/25/2024
 PROJECT NUMBER: 23-5807
 SHEET TITLE: MISCELLANEOUS DETAILS III






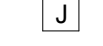
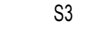
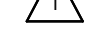
SHEET NUMBER: **C502**

ELECTRICAL GENERAL NOTES

1. CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL INSTALLATION WITH THE WORK OF OTHER TRADES. FIELD MODIFICATIONS NEEDED DUE TO OBSTRUCTIONS OR INTERFERENCES SHALL BE PROVIDED AT NO ADDITIONAL COST.
2. ALL WORK SHALL BE PERFORMED IN A NEAT AND WORKMANLIKE MANNER WITHIN STANDARD OF CARE FOR PROFESSION. ALL LABOR, MATERIAL, TOOLS, PERMITS, INSPECTIONS, TESTING, CERTIFICATION, ETC. REQUIRED FOR A COMPLETE AND SATISFACTORY INSTALLATION TO DESIGN INTENT SHALL BE FURNISHED BY CONTRACTOR. PROVIDE, AT NO ADDITIONAL COST, INCLUDING INCIDENTAL ITEMS NOT SHOWN WHEN REQUIRED FOR TYPICAL COMPLETION OF WORK.
3. DRAWINGS NOT BEARING THE STAMP OR SEAL AND SIGNATURE OF A REGISTERED PROFESSIONAL ENGINEER SHALL NOT BE USED FOR BIDDING OR CONSTRUCTION PURPOSES UNLESS EXPRESSLY APPROVED IN WRITING BY THE ARCHITECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL DRAWINGS AND SPECIFICATIONS BEING USED FOR BIDDING AND CONSTRUCTION PURPOSES ARE OF THE LATEST REVISION AVAILABLE AND ALL ADDENDUM DOCUMENTS HAVE BEEN INCORPORATED EITHER BY REVISION RELEASE OF DRAWINGS/SPECIFICATIONS OR ATTACHMENT OF SKETCHES OR OTHER ADDENDUM INFORMATION.
4. THE CONTRACTOR SHALL FURNISH AND INSTALL NEW PRODUCTS OF ESTABLISHED AND REPUTABLE MANUFACTURERS. NO EQUIPMENT SUBSTITUTIONS SHALL BE MADE THAT WOULD LEAVE INADEQUATE OPERATING OR SERVICE SPACE. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDED INSTALLATION PROCEDURES AND IN AN ARRANGEMENT THAT WILL GIVE THE GREATEST PRACTICAL EASE OF OPERATION AND SERVICE TO THE OWNER.
5. ALL EQUIPMENT WHICH IS INDICATED TO BE FURNISHED AND/OR INSTALLED BY OTHERS OR BY OWNER IS INCLUDED FOR REFERENCE ONLY UNLESS NOTED OTHERWISE. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND VERIFYING INSTALLATION REQUIREMENTS OF THIS EQUIPMENT WITH THE APPLICABLE SUPPLIER OR THE OWNER. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
6. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF ALL APPLICABLE CODES AND REGULATIONS INCLUDING BUT NOT LIMITED TO NATIONAL, CITY, STATE, LOCAL ORDINANCES, AND UTILITY COMPANY REGULATIONS. ALL ELECTRICAL MATERIALS, INSTALLATION PROCEDURES, AND SYSTEM LAYOUTS SHALL BE APPROVED BY ALL APPLICABLE AUTHORITIES HAVING JURISDICTION. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS AND LABOR NECESSARY TO COMPLY WITH THESE RULES, REGULATIONS, AND ORDINANCES. THESE CODES REPRESENT THE MINIMUM ACCEPTABLE REQUIREMENTS. THEREFORE, WHERE DRAWINGS AND/OR SPECIFICATIONS INDICATE MATERIALS OR CONSTRUCTION MORE STRINGENT THAN CODE REQUIREMENTS, THE DRAWINGS AND/OR SPECIFICATIONS SHALL GOVERN.
7. IF COMPLIANCE WITH STANDARDS, CODES, REGULATIONS AND CONTRACT DOCUMENTS ESTABLISH DIFFERENT OR CONFLICTING REQUIREMENTS FOR MINIMUM QUANTITIES OR QUALITY LEVELS, REFER CONFLICTING REQUIREMENTS TO ENGINEER FOR A DECISION BEFORE PROCEEDING.
8. WHERE CONTRACT DOCUMENTS NAME A SINGLE MANUFACTURER AND PRODUCT, PROVIDE THE NAMED PRODUCT THAT COMPLIES WITH REQUIREMENTS. COMPARABLE PRODUCTS OR SUBSTITUTIONS FOR CONTRACTOR'S CONVENIENCE WILL BE CONSIDERED.
9. THE PROJECT CLOSEOUT SUBMITTALS SHALL INCLUDE, BUT NOT LIMITED TO, OPERATION AND MAINTENANCE MANUALS AND RECORD DRAWINGS.
10. THE CONTRACTOR SHALL VISIT THE SITE OF THE BUILDING BEFORE SUBMITTING A PROPOSAL ON THIS WORK AND SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH THE EXISTING CONDITIONS AND OPERATIONS. FAILURE ON THEIR PART TO DO THIS WILL NOT BE CAUSE OF EXTRAS AFTER THE CONTRACT IS SIGNED, BY REASON OF UNFORESEEN CONDITIONS.
11. NO PERSON SHALL PERFORM ELECTRICAL WORK ON THE CONTRACT WITHOUT POSSESSING A MASTER'S OR JOURNEYMAN'S LICENSE FROM THE STATE ELECTRICAL EXAMINERS BOARD. ALL ELECTRICAL WORK AND APPRENTICE ELECTRICIANS SHALL BE SUPERVISED BY A MASTER ELECTRICIAN ON A ONE TO ONE RATIO.
12. PREPARE AND SUBMIT SUBMITTALS TO ARCHITECT.
13. ALL ELECTRICAL EQUIPMENT, SUCH AS SWITCHES, CIRCUIT BREAKERS, ETC. SHALL BE TESTED BY OPERATING THE DEVICE TO VERIFY THAT THE MECHANICAL PORTIONS OF THE DEVICE ARE FUNCTIONING.
14. THE CONTRACTOR SHALL ASSIST ALL OTHER TRADES IN PERFORMING ROTATIONAL TESTS ON ALL MOTORS PROVIDED UNDER THIS CONTRACT.
15. ALL EXPOSED CONDUIT SHALL BE GALVANIZED RIGID STEEL, SIZED AS SCHEDULED.
16. WIRE SIZE PER CODE UNLESS NOTED ELSEWHERE.

WIRE SIZE 120V
 A. #12 LESS THAN 75 FEET
 B. #10 BETWEEN 75-150 FEET
 C. #8 BETWEEN 150-250 FEET
 D. #6 BETWEEN 250-375 FEET

LEGEND

SM	MOTOR RATED SWITCH USED FOR EQUIPMENT DISCONNECTING MEANS. PROVIDE MANUAL MOTOR STARTER WITH THERMAL OVERLOAD RELAYS SIZED PER MOTOR LOAD.
	BRANCH CIRCUIT HOMERUN. PANEL AND CIRCUIT NUMBER INDICATED.
	ELECTRICAL PANEL.
	DISCONNECT SWITCH
	LED STRIP
	HIGH BAY LED FIXTURE
	JBOX
	SINGLE POLE LIGHT SWITCH, 3-WAY LIGHT SWITCH.
	REVISION DELTA.



ATU WEST CAMPUS CHILLED WATER LOOP

RUSSELLVILLE, AR

REVISIONS:

No.	Description	Date

100% CONSTRUCTION DOCUMENTS

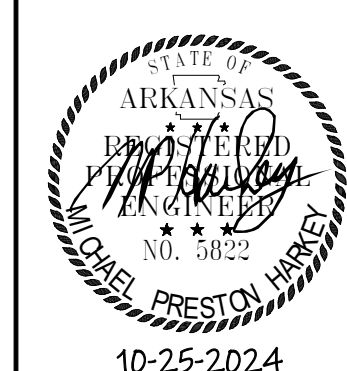
ISSUE DATE: 10-25-2024

PROJECT NUMBER: 24-006

SHEET TITLE:
ELECTRICAL GENERAL NOTES
AND LEGEND

SHEET NUMBER:

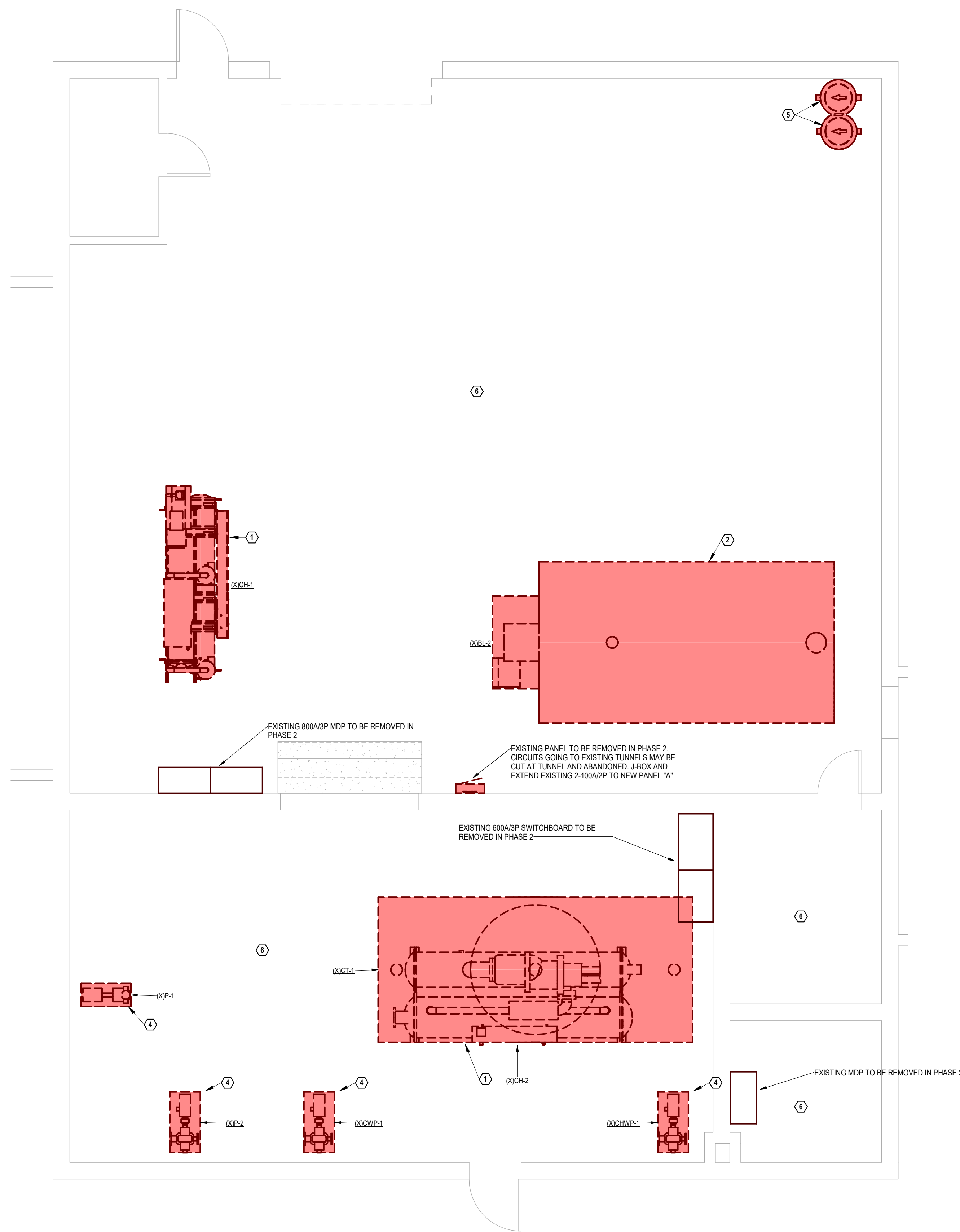
E001



10-25-2024



**ATU WEST CAMPUS CHILLED
WATER LOOP**
RUSSELLVILLE, AR



KEYED NOTES	
①	EXISTING CHILLER TO BE REMOVED IN PHASE 1. REMOVE ALL WIRE, CONDUIT, AND DISCONNECTS/STARTERS/VFDS ASSOCIATED WITH THE UNIT.
②	EXISTING BOILER TO BE REMOVED IN PHASE 1. REMOVE ALL WIRE, CONDUIT, AND DISCONNECTS/STARTERS/VFDS ASSOCIATED WITH THE UNIT.
③	EXISTING COOLING TOWER TO BE REMOVED IN PHASE 2. REMOVE ALL DISCONNECTS/STARTERS/VFDS ASSOCIATED WITH THE UNIT.
④	EXISTING PUMP TO BE REMOVED IN PHASE 2. REMOVE ALL WIRE, CONDUIT, AND DISCONNECTS/STARTERS/VFDS ASSOCIATED WITH THE UNIT.
⑤	EXISTING CHEMICAL FEED PUMP TO BE REMOVED IN PHASE 1. REMOVE ALL WIRE CONDUIT, AND DISCONNECTS/STARTERS/VFDS ASSOCIATED WITH THE UNIT.
⑥	EXISTING LIGHTING, RECEPTACLES, ASSOCIATED CONDUIT, AND WIRE TO BE REMOVED IN PHASE 2.

PHASING SUMMARY	
1.	EXISTING 208/120V ELECTRICAL SERVICE/SWITCHBOARDS/PANELS TO REMAIN UNTIL NEW 480/277V SERVICE/SWITCHBOARDS/PANELS ARE INSTALLED.
2.	EXISTING (XXCT-1, XXCH-2, XXCHWP-1, XXCWP-1, XXP-2, XXP-1, XXCH-1) TO REMAIN IN OPERATION.
3.	480/277V ELECTRICAL SERVICE/SWITCHBOARDS/PANELS TO BE INSTALLED. NEW MECHANICAL EQUIPMENT CONNECTED TO NEW 480/277V SERVICE.
4.	POWER SWITCHOVER COORDINATED WITH OWNER AND MECHANICAL CONTRACTOR.
5.	EXISTING 208/120V ELECTRICAL SERVICE/SWITCHBOARDS/PANELS, LIGHTING, RECEPTACLES, AND REMAINING (XXCT-1, XXCH-2, XXCHWP-1, XXCWP-1, XXP-2, XXP-1, XXCH-1) TO BE DEMOLISHED.

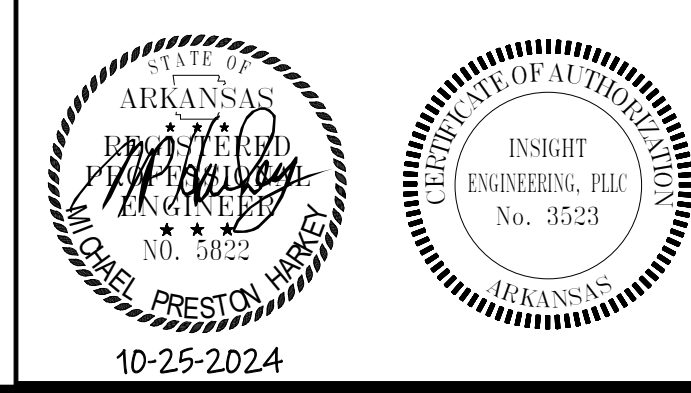
① POWER PLANT BUILDING - MECHANICAL POWER DEMOLITION
1/4" = 1'-0"

REVISIONS:		
No.	Description	Date

100% CONSTRUCTION DOCUMENTS
ISSUE DATE: 10-25-2024
PROJECT NUMBER: 24-006

SHEET TITLE:
ELECTRICAL DEMOLITION PLAN -
POWER PLANT BUILDING

SHEET NUMBER:
E101

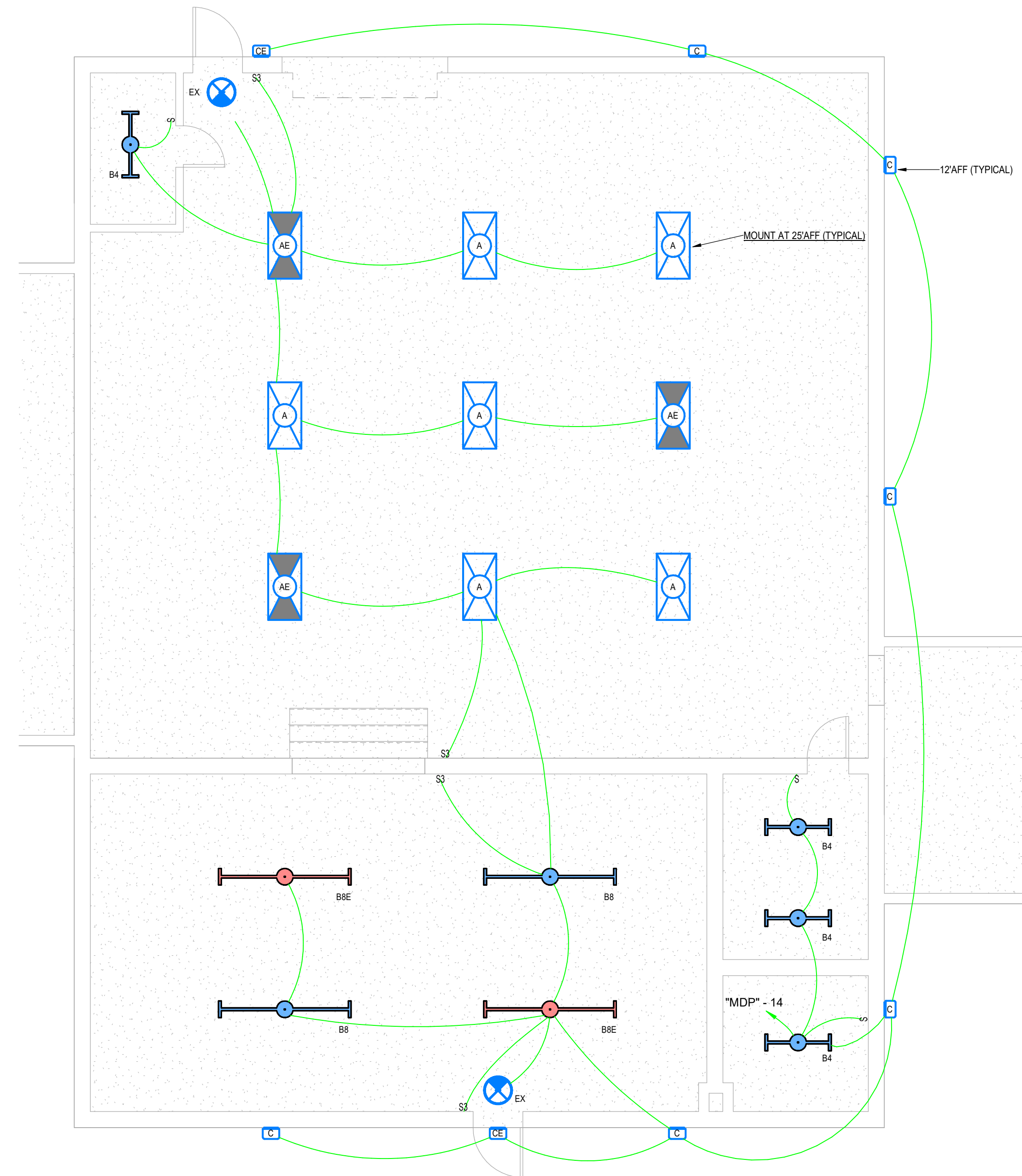


10-25-2024



ATU WEST CAMPUS CHILLED WATER LOOP

RUSSELLVILLE, AR



PHASING SUMMARY	
1.	EXISTING 208/120V ELECTRICAL SERVICE/SWITCHBOARDS/PANELS TO REMAIN UNTIL NEW 480/277V SERVICE/SWITCHBOARDS/PANELS ARE INSTALLED.
2.	EXISTING (X)CT-1, (X)CH-2, (X)CHWP-1, (X)CWP-1, (X)P-2, (X)P-1, (X)CH-1 TO REMAIN IN OPERATION.
3.	480/277V ELECTRICAL SERVICE/SWITCHBOARDS/PANELS TO BE INSTALLED. NEW MECHANICAL EQUIPMENT CONNECTED TO NEW 480/277V SERVICE.
4.	POWER SWITCHOVER COORDINATED WITH OWNER AND MECHANICAL CONTRACTOR.
5.	EXISTING 208/120V ELECTRICAL SERVICE/SWITCHBOARDS/PANELS, LIGHTING, RECEPTACLES, AND REMAINING (X)CT-1, (X)CH-2, (X)CHWP-1, (X)CWP-1, (X)P-2, (X)P-1, (X)CH-1 TO BE DEMOLISHED.

1 POWER PLANT BUILDING - LIGHTING
3/16" = 1'-0"

REVISIONS:		
No.	Description	Date

100% CONSTRUCTION DOCUMENTS

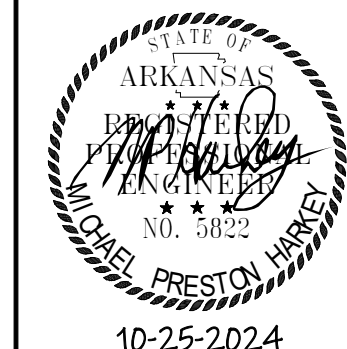
ISSUE DATE: 10-25-2024

PROJECT NUMBER: 24-006

SHEET TITLE:
ELECTRICAL PLAN - POWER PLANT
- LIGHTING

SHEET NUMBER:

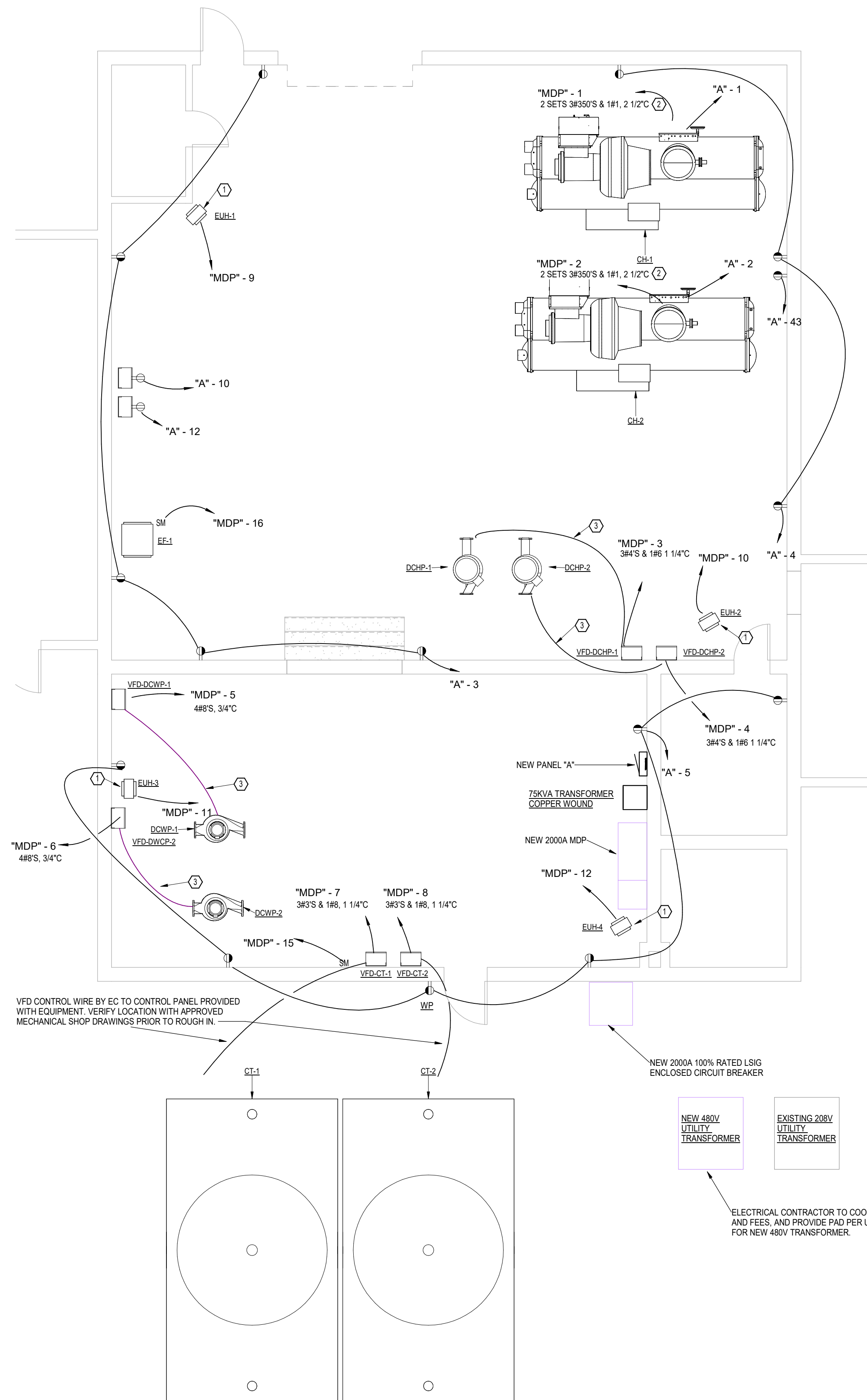
E201



10-25-2024



**ATU WEST CAMPUS CHILLED
WATER LOOP**
RUSSELLVILLE, AR



- KEYED NOTES**
- ① ELECTRIC UNIT HEATER: CONNECT TO UNIT PROVIDED DISCONNECT.
 - ② CONNECT TO UNIT SUPPLIED CIRCUIT BREAKER.
 - ③ VFD CONTROL CABLE PROVIDED AND INSTALLED BY EC. VFD'S BY MECH CONTRACTOR.

- PHASING SUMMARY**
1. EXISTING 208/120V ELECTRICAL SERVICE/SWITCHBOARDS/PANELS TO REMAIN UNTIL NEW 480/277V SERVICE/SWITCHBOARDS/PANELS ARE INSTALLED.
 2. EXISTING (X)CT-1, (X)CH-2, (X)CHWP-1, (X)CWP-1, (X)P-2, (X)P-1, (X)CH-1 TO REMAIN IN OPERATION.
 3. 480/277V ELECTRICAL SERVICE/SWITCHBOARDS/PANELS TO BE INSTALLED. NEW MECHANICAL EQUIPMENT CONNECTED TO NEW 480/277V SERVICE.
 4. POWER SWITCHOVER COORDINATED WITH OWNER AND MECHANICAL CONTRACTOR.
 5. EXISTING 208/120V ELECTRICAL SERVICE/SWITCHBOARDS/PANELS, LIGHTING, RECEPTACLES, AND REMAINING (X)CT-1, (X)CH-2, (X)CHWP-1, (X)CWP-1, (X)P-2, (X)P-1, (X)CH-1 TO BE DEMOLISHED.

REVISIONS:

No.	Description	Date

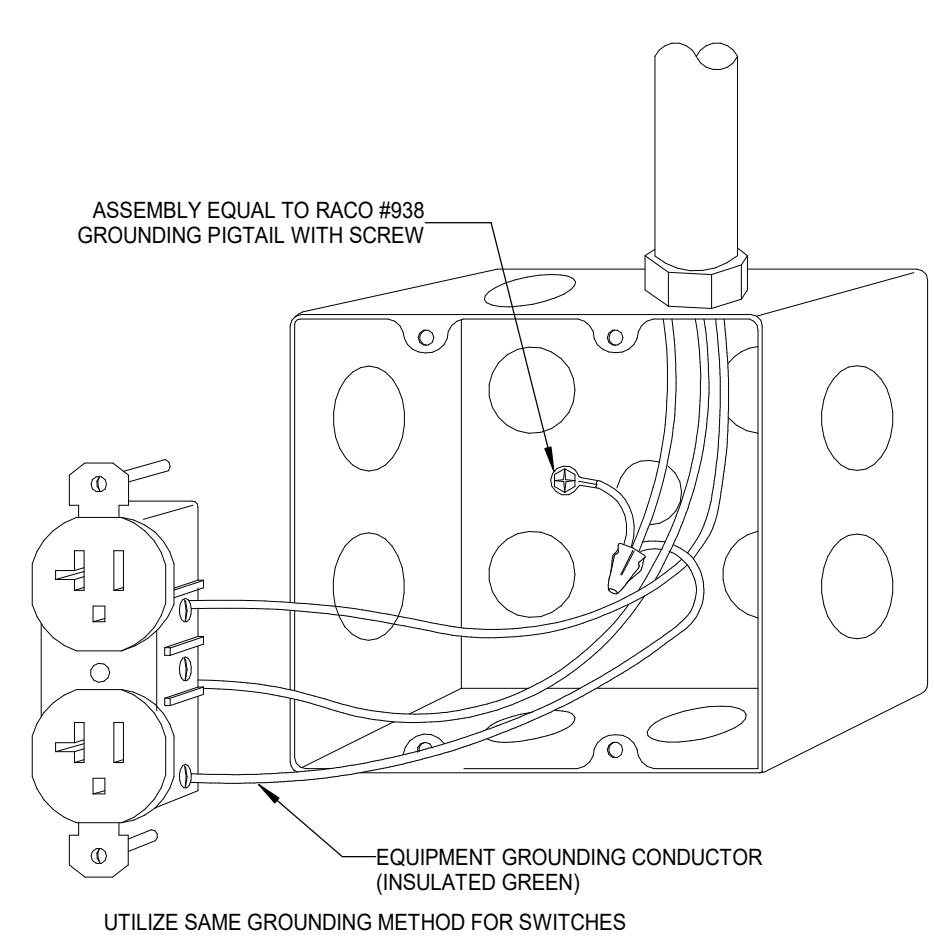
100% CONSTRUCTION DOCUMENTS
 ISSUE DATE: 10-25-2024
 PROJECT NUMBER: 24-006

SHEET TITLE:
 ELECTRICAL PLAN - POWER PLANT
 - MECHANICAL POWER

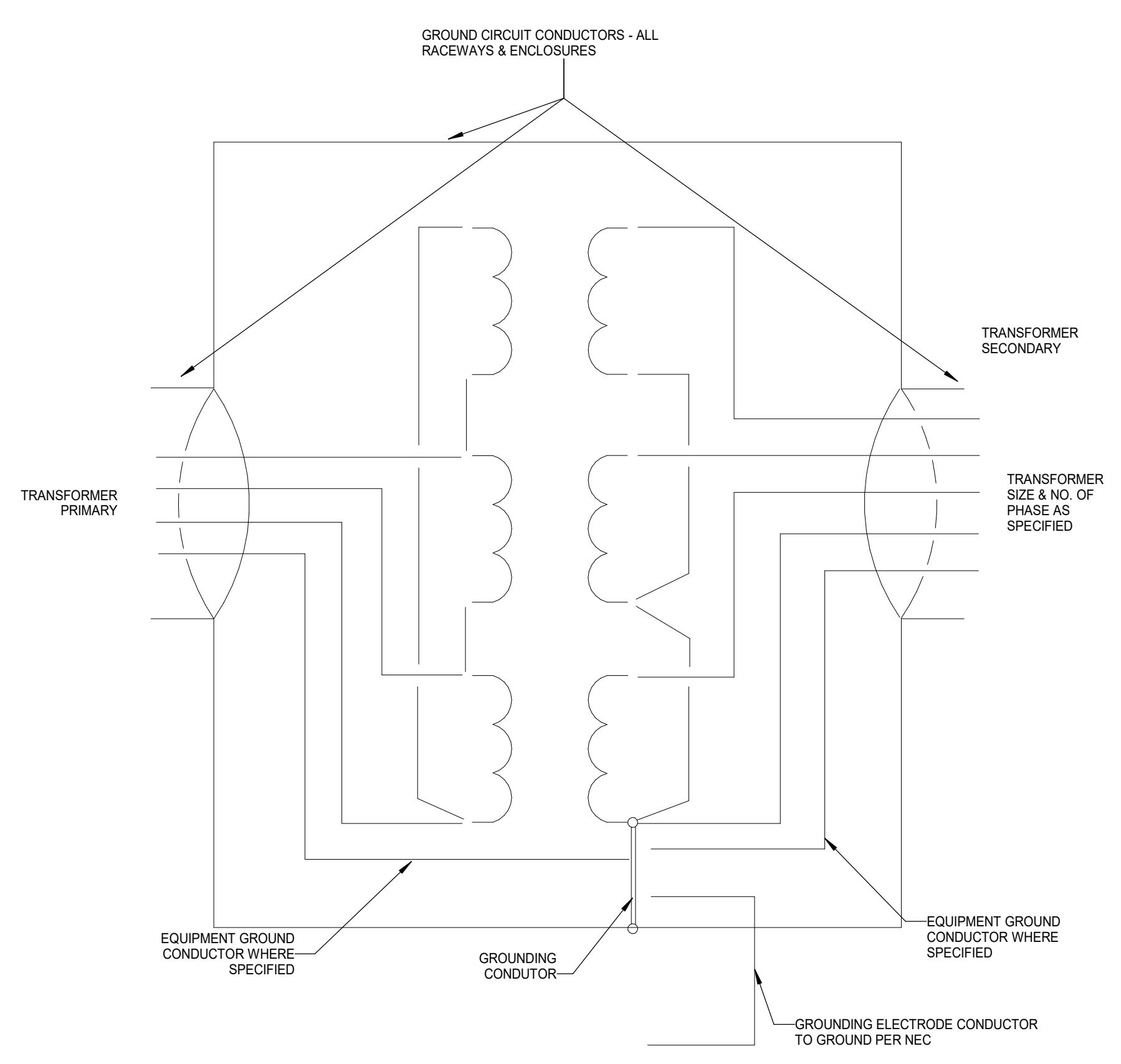
SHEET NUMBER:
E202

1 POWER PLANT BUILDING - MECHANICAL POWER
 3/16" = 1'-0"

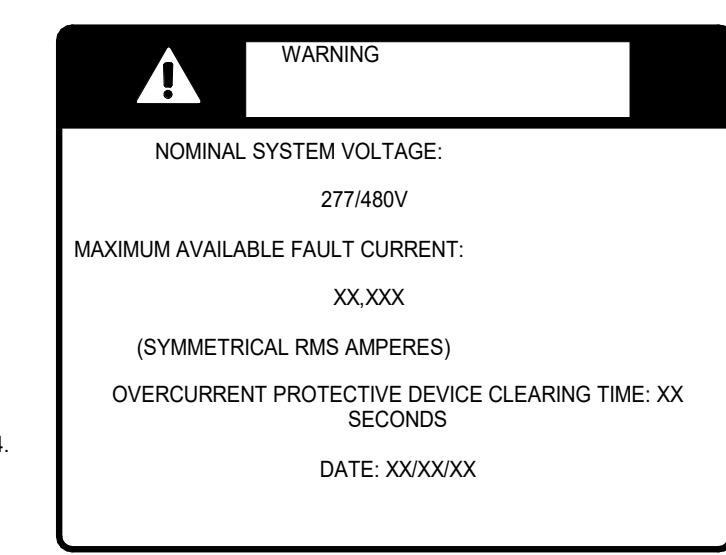
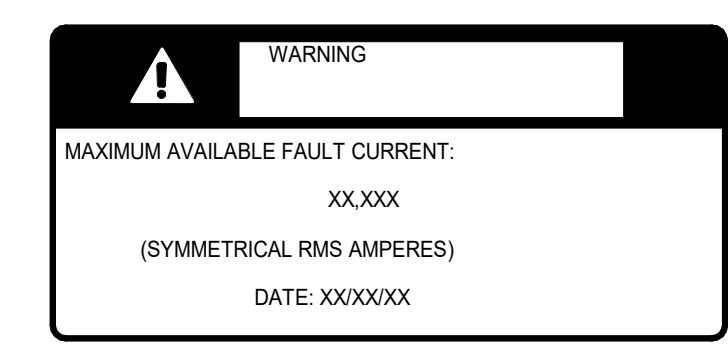
NEW 480V UTILITY TRANSFORMER
 EXISTING 208V UTILITY TRANSFORMER
 ELECTRICAL CONTRACTOR TO COORDINATE PAY ALL COSTS AND FEES, AND PROVIDE PAD PER UTILITY SPECIFICATIONS FOR NEW 480V TRANSFORMER.



1 JUNCTION BOX GROUNDING
NOT TO SCALE:

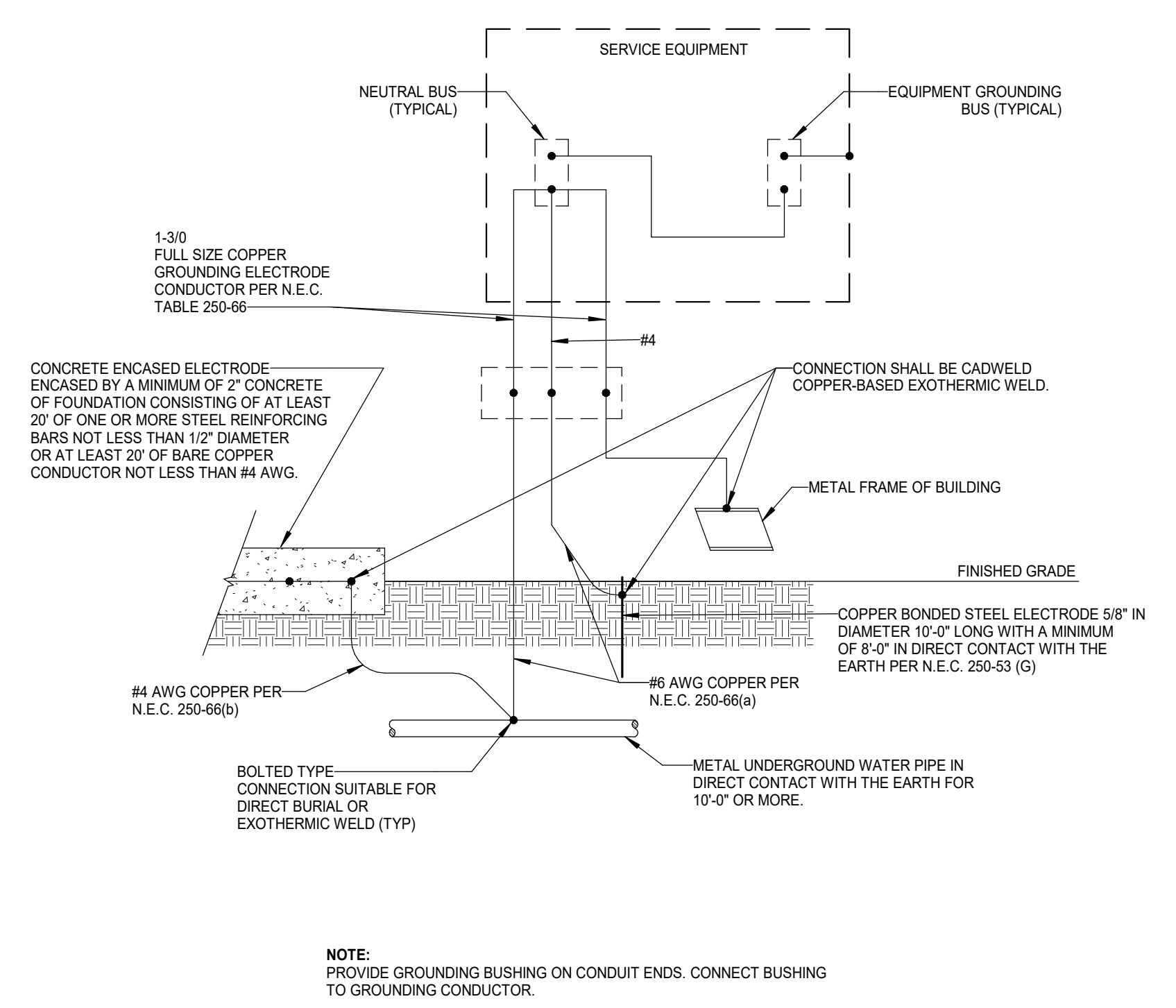


2 DRY TYPE TRANSFORMER GROUNDING
NOT TO SCALE:



- NOTES:**
- LABEL SHALL BE ATTACHED TO ELECTRICAL SERVICE EQUIPMENT PER NEC 110.24.
 - PROVIDE DURABLE WEATHER PROOF LABEL.
 - LABEL SHOWN TO SCALE.
 - ELECTRICAL CONTRACTOR SHALL COORDINATE AVAILABLE FAULT CURRENT WITH UTILITY AND COMPLETE LABEL ACCORDINGLY.

3 ARC FAULT LABEL
NOT TO SCALE:



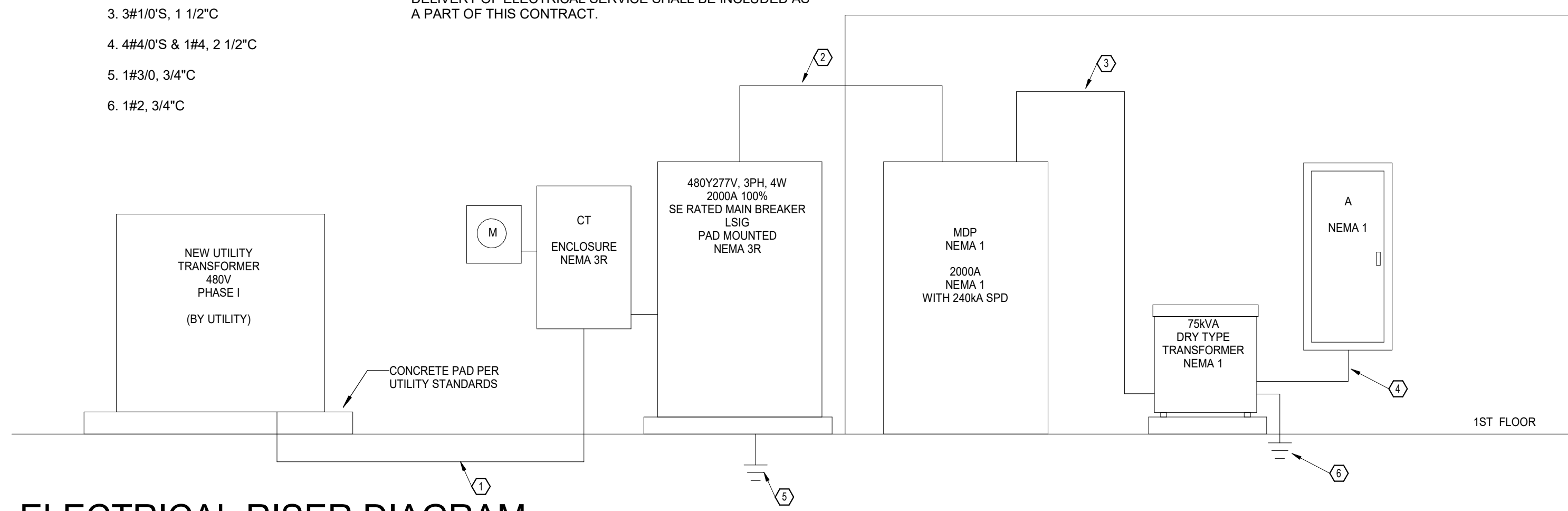
4 GROUNDING ELECTRODE SYSTEM DETAIL
NOT TO SCALE:

KEYED NOTES:

- 5 SETS (4#600'S, 4" C) THWN
- 5 SETS (4#600'S & 1#250, 3 1/2" C)
- 3#1/0'S, 1 1/2" C
- 4#4/0'S & 1#4, 2 1/2" C
- 1#3/0, 3/4" C
- 1#2, 3/4" C

GENERAL NOTE:

ELECTRICAL CONTRACTOR SHALL COORDINATE AND PAY ALL COSTS/FEE'S FOR NEW 480V/3 PHASE SERVICE TO THE BUILDING PRIOR TO BID. ALL COST ASSOCIATED W/ THE DELIVERY OF ELECTRICAL SERVICE SHALL BE INCLUDED AS A PART OF THIS CONTRACT.



5 ELECTRICAL RISER DIAGRAM
NOT TO SCALE:

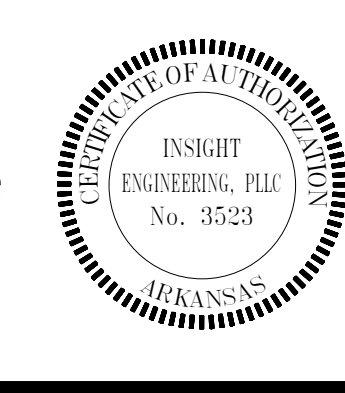
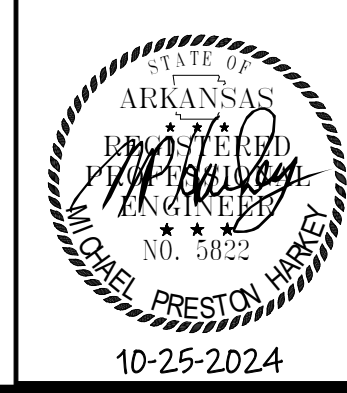
REVISIONS:

No.	Description	Date

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ISSUE DATE: 10-25-2024
PROJECT NUMBER: 24-006

SHEET TITLE:
ELECTRICAL DETAILS AND SCHEDULES

SHEET NUMBER:
E301



10-25-2024



ATU WEST CAMPUS CHILLED WATER LOOP
RUSSELLVILLE, AR

REVISIONS:

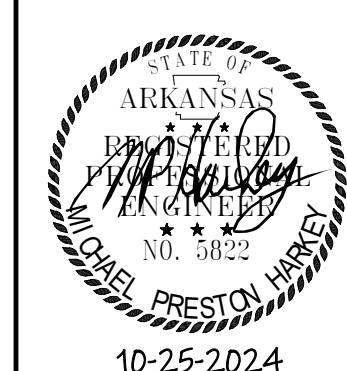
No.	Description	Date

100% CONSTRUCTION DOCUMENTS
ISSUE DATE: 10-25-2024
PROJECT NUMBER: 24-006

SHEET TITLE:
ELECTRICAL DETAILS AND SCHEDULES

SHEET NUMBER:

E302



10-25-2024

Switchboard: "MDP"

Location: Supply From: Mounting: PAD Enclosure: NEMA 1

Volts: 480/277 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 65k
Mains Type: MLO
Mains Rating: 2000 A
MCB Rating: 2000 A

Notes

CKT	Circuit Description	# of Poles	Frame Size	Trip Rating	A	B	C	Remarks
1	CH-1	3	800 A	800 A	147364 VA	147364 VA	147364 VA	
2	CH-2	3	800 A	800 A	147364 VA	147364 VA	147364 VA	
3	DCHP-1	3	200 A	175 A	18005 VA	18005 VA	18005 VA	
4	DCHP-2	3	200 A	175 A	18005 VA	18005 VA	18005 VA	
5	DCWP-1	3	100 A	100 A	11080 VA	11080 VA	11080 VA	
6	DCWP-2	3	100 A	100 A	11080 VA	11080 VA	11080 VA	
7	CT-1	3	150 A	125 A	26350 VA	26350 VA	26350 VA	
8	CT-2	3	150 A	125 A	26350 VA	26350 VA	26350 VA	
9	EUH-1	3	20 A	15 A	1108 VA	1108 VA	1108 VA	
10	EUH-2	3	20 A	15 A	1108 VA	1108 VA	1108 VA	
11	EUH-3	3	20 A	15 A	1108 VA	1108 VA	1108 VA	
12	EUH-4	3	20 A	15 A	1108 VA	1108 VA	1108 VA	
13	75 kVA, TRANSFORMER	3	150 A	150 A	17820 VA	10760 VA	10400 VA	
14	LIGHTING	1	20 A	20 A	901 VA			
15	HEAT TAPE	1	20 A	20 A	4000 VA			
16	EF-1	3	20 A	15 A	388 VA	388 VA	388 VA	
17								
18								
19								
20	TVSS 240kA	3	60 A	60 A	0 VA	0 VA	0 VA	
Total Conn. Load:					433139 VA	421178 VA	420818 VA	
Total Amps:					1564 A	421178 VA	1519 A	

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Lighting	270 VA	100.00%	270 VA	
Other	4631 VA	100.00%	4631 VA	
Power	1265535 VA	100.00%	1265535 VA	
				Total Conn. Load: 1275136 VA
				Total Est. Demand: 1275136 VA
				Total Conn. Current: 1534 A
				Total Est. Demand Current: 1534 A

Branch Panel: "A"

Panel Location: Supply From: 75 kVA, 0 V/480 V, Three... Mounting: SURFACE Enclosure: NEMA 1

Volts: 120/208 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 10KAIC
Bus Rating: 225 A
MCB Rating: 225 MCB

Notes

CKT	Circuit Description	Trip (A)	Pol es	"A"	"B"	"C"	Pol es	Trip (A)	Circuit Description	CKT		
1	CHILLER CONTROL	20	1	500	500			1	20	CHILLER CONTROL	2	
3	Receptacle	20	1		900	540		1	20	Receptacle	4	
5	Receptacle	20	1				1080	8320	2	100	EXISTING BREAKER	6
7	EXISTING BREAKER	100	2	8320	8320			--	--	--	8	
9	--	--	--		8320	1000		1	20	Receptacle	10	
11	SPARE	20	1				0	1000	1	20	Receptacle	12
13	SPARE	20	1	0	0			1	20	SPARE	14	
15	SPARE	20	1		0	0		1	20	SPARE	16	
17	SPARE	20	1				0	0	1	20	SPARE	18
19	SPARE	20	1	0	0			1	20	SPARE	20	
21	SPARE	20	1		0	0		1	20	SPARE	22	
23	SPARE	20	1				0	0	1	20	SPARE	24
25	SPARE	20	1	0	0			1	20	SPARE	26	
27	SPARE	20	1		0	0		1	20	SPARE	28	
29	SPARE	20	1				0	0	1	20	SPARE	30
31	SPARE	20	1	0	0			1	20	SPARE	32	
33	SPARE	20	1		0	0		1	20	SPARE	34	
35	SPARE	20	1				0	0	1	20	SPARE	36
37	SPARE	20	1	0	0			1	20	SPARE	38	
39	SPARE	20	1		0	0		1	20	SPARE	40	
41	SPARE	20	1				0	0	1	20	SPARE	42
Total Load:				17820 VA	10760 VA	10400 VA						
Total Amps:				149 A	90 A	87 A						

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Power	34280 VA	100.00%	34280 VA	
Receptacle	4700 VA	100.00%	4700 VA	
				Total Conn. Load: 38980 VA
				Total Est. Demand: 38980 VA
				Total Conn. Current: 109 A
				Total Est. Demand Current: 108 A

LIGHT FIXTURE SCHEDULE

TYPE	MANUFACTURER	CATALOG NUMBER	VOLTAGE	LAMP	COLOR	MOUNTING	NOTES
A	ALPHALITE	HBDC-(215/180/135)-8-A-ACC	UNV	LED	35K	AIRCRAFT CABLE	LED HIGH BAY FIXTURE
AE	ALPHALITE	HBDC-(215/180/135)-8-A-ACC-EM25W-HBDC-EM-MK	UNV	LED	35K	AIRCRAFT CABLE	LED HIGH BAY FIXTURE WITH EMERGENCY BATTERY
B4	ALPHALITE	HL-4-H-8-A-ACC	UNV	LED	35K	AIRCRAFT CABLE	LED STRIP
B8	ALPHALITE	HL-8-H-8-A-ACC	UNV	LED	35K	AIRCRAFT CABLE	LED STRIP
C	ALPHALITE	WPA-42B-40K-PS	UNV	LED	40K	WALL	LED WALL PACK
CE	ALPHALITE	WPA-42B-40K-PS-EM700	UNV	LED	40K	WALL	LED WALL PACK WITH EMERGENCY BATTERY
EX	ALPHALITE	NCLB2RW-S0	UNV	LED	NA	WALL	EXIT SIGN WITH EMERGENCY BATTERY

MECHANICAL GENERAL NOTES

- THE FIRST FIGURE OF DUCT SIZE INDICATES DIMENSION OF FACE SHOWN OR INDICATED. DUCT SIZED ARE NET INSIDE DIMENSIONS.
- TOTAL STATIC PRESSURE NOTES IN THE SCHEDULES INCLUDED DUCT SYSTEM, TERMINAL UNITS, FILTERS, COILS, ETC. LOSS FOR FILTERS SHALL BE FOR FILTERS AT 50% LOADING.
- FOR TYPICAL WATER PIPING CONNECTIONS TO EQUIPMENT, SEE STANDARD EQUIPMENT DETAILS.
- ALL DUCT AND PIPE ROUTING AND CONSTRUCTION SHOWN ON THE DRAWINGS IS DIAGRAMMATIC IN NATURE AND MAY NOT BE SHOWN IN EXACT LOCATIONS OR WITH ALL ANCILLARY ITEMS REQUIRED FOR A COMPLETE AND OPERATING SYSTEM. CONTRACTOR SHALL COORDINATE ROUTING OF ALL DUCTWORK AND PIPING PER TYPICAL CONSTRUCTION PRACTICE IN THE MOST EFFICIENT WAY POSSIBLE WHILE ADHERING AS CLOSELY TO THE DRAWINGS AS POSSIBLE.
- CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL INSTALLATION WITH THE WORK OF OTHER TRADES. FIELD MODIFICATIONS SUCH AS OFFSETS IN PIPING OR DUCTWORK NEEDED DUE TO OBSTRUCTIONS OR INTERFERENCES SHALL BE PROVIDED AT NO ADDITIONAL COST.
- ALL WORK SHALL BE PERFORMED IN A NEAT AND WORKMANLIKE MANNER WITHIN STANDARD OF CARE FOR PROFESSION. ALL LABOR, MATERIAL, TOOLS, PERMITS, INSPECTIONS, TESTING, CERTIFICATION, ETC. REQUIRED FOR A COMPLETE AND SATISFACTORY INSTALLATION TO DESIGN INTENT SHALL BE FURNISHED BY CONTRACTOR. PROVIDE AT NO ADDITIONAL COST, INCLUDING INCIDENTAL ITEMS NOT SHOWN WHEN REQUIRED FOR TYPICAL COMPLETION OF WORK.
- DRAWINGS NOT BEARING THE STAMP OR SEAL AND SIGNATURE OF A REGISTERED PROFESSIONAL ENGINEER SHALL NOT BE USED FOR BIDDING OR CONSTRUCTION PURPOSES UNLESS EXPRESSLY APPROVED IN WRITING BY THE ARCHITECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL DRAWINGS AND SPECIFICATIONS BEING USED FOR BIDDING AND CONSTRUCTION PURPOSES ARE OF THE LATEST REVISION AVAILABLE AND ALL ADDENDUM DOCUMENTS HAVE BEEN INCORPORATED EITHER BY REVISION RELEASE OF DRAWINGS/SPECIFICATIONS OR ATTACHMENT OF SKETCHES OR OTHER ADDENDUM INFORMATION.
- THE MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL NEW PRODUCTS OF ESTABLISHED AND REPUTABLE MANUFACTURERS. NO EQUIPMENT SUBSTITUTIONS SHALL BE MADE THAT WOULD LEAVE INADEQUATE OPERATING OR SERVICE SPACE. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDED INSTALLATION PROCEDURES AND IN AN ARRANGEMENT THAT WILL GIVE THE GREATEST PRACTICAL EASE OF OPERATION AND SERVICE TO THE OWNER.
- IT IS THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO PAY FOR ALL NECESSARY PERMITS AND APPROVALS FOR THIS INSTALLATION.
- DUCT CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE SMACNA HVAC DUCT CONSTRUCTION STANDARD CLASS A.
- LOCATE THERMOSTATS AT 48" ABOVE FINISHED FLOOR UNLESS NOTED OTHERWISE. COORDINATE LOCATIONS WITH OTHER EQUIPMENT, FURNITURE, AND DOOR SWINGS.
- ALL EQUIPMENT, DUCTWORK, ETC., SHALL BE SUPPORTED AS DETAILED AND/OR SPECIFIED. PROVIDE ADDITIONAL SUPPORTS AS REQUIRED TO PROVIDE A VIBRATION-FREE, RIGID INSTALLATION.
- DUCTWORK DIMENSIONS SHOWN ON DRAWINGS ARE INSIDE CLEAR DIMENSIONS. DIMENSIONS MAY BE CHANGED SO LONG AS THE NET FREE FACE AREA IS MAINTAINED.
- EXHAUST DUCTS SHALL TERMINATE IN ACCORDANCE WITH ASHRAE 170-2013 AND BE EQUIPPED WITH A BACKDRAFT DAMPER.
- CONTRACTOR SHALL PROVIDE ALL AUTOMATIC TEMPERATURE CONTROLS INCLUDING WIRING, THERMOSTATS AND ALL MISCELLANEOUS APPURTENANCES TO MEET THE INTENT OF THESE DOCUMENTS.
- PENETRATIONS OF WALLS OR FLOORS FOR THE PASSAGE OF PIPING, DUCTWORK, OR OTHER EQUIPMENT SHALL BE PROPERLY SEALED AFTER INSTALLATION OF ITEMS AND EQUIPMENT.
- PIPING, DUCTWORK, LEAK PROTECTION APPARATUS, OR OTHER EQUIPMENT FOREIGN TO ELECTRICAL SWITCHBOARDS, PANELBOARDS, DISTRIBUTION BOARDS, OR MOTOR CONTROL CENTERS SHALL NOT BE INSTALLED WITHIN THE REQUIRED SPACE FOR WORKING CLEARANCES OR DEDICATED SPACES OF THE ELECTRICAL EQUIPMENT, EXTENDING IN FRONT OF AND FROM FLOOR TO STRUCTURAL CEILING WITH A WIDTH AND DEPTH OF THE ELECTRICAL EQUIPMENT IN ACCORDANCE WITH NEC-110.26.

MECHANICAL PROJECT PHASING

- PHASE 1:**
INSTALL ALL EXTERIOR PIPING AND VALVE BOXES, PRIORITIZING PIPING THAT RUNS IN THE VICINITY OF THE STUDENT UNION CONSTRUCTION PROJECT.
DEMOLISH STEAM BOILERS, INCLUDING ALL PIPING AND ACCESSORIES.
DEMOLISH EXISTING CHILLER, (XCH-2 AND ALL ASSOCIATED PIPING AND ACCESSORIES).
INSTALL NEW CHILLERS, COOLING TOWERS, AND CHILLED WATER PUMPS.
- PHASE 2:**
DEMOLISH (XCT-1, (XCH-1 AND ALL REMAINING CHILLED WATER PUMPS AND CONDENSOR WATER PUMPS).
INSTALL PIPING, CONDENSOR WATER PUMPS, AND ACCESSORIES.
UPGRADE ELECTRICAL SERVICE TO BUILDING.
DEMOLISH ALL EXISTING CONTROLS.
INSTALL NEW CONTROLS.
DEMOLISH ABOVE GROUND PIPING AT TECHONERY AND CONNECT NEW LOOP BELOW SLAB.

LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	EXISTING EQUIPMENT TO BE DEMOLISHED		BALL VALVE
	EXISTING EQUIPMENT TO REMAIN		GATE VALVE
	NEW EQUIPMENT		BUTTERFLY VALVE (LEVER HANDLE)
	EXISTING DUCT/PIPING TO BE DEMOLISHED		BUTTERFLY VALVE (GEAR OPERATOR)
	EXISTING DUCT/PIPING TO REMAIN		OS & Y GATE VALVE
	NEW DUCT/PIPING		GLOBE VALVE
	THERMOSTAT WIRE		CHECK VALVE (SWING CHECK)
	THERMOSTAT		CHECK VALVE (BUTTERFLY CHECK)
	THERMOSTAT WITH LOCK COVER		STRAINER W/ DRAIN VALVE
	POINT OF CONNECTION TO EXISTING		UNION
	POINT OF DEMOLITION		CONTROL VALVE (2-WAY) ELECTRIC
	REVISION DELTA		CONTROL VALVE (3-WAY) ELECTRIC
	FLOW ARROW		CONTROL VALVE (2-WAY) PNEUMATIC
	NEW EQUIPMENT		CONTROL VALVE (3-WAY) PNEUMATIC
	EXISTING EQUIPMENT		PLUG VALVE
	NEW CHILLED WATER SUPPLY (CHS) PIPING		FLEXIBLE PIPE CONNECTOR
	NEW CHILLED WATER RETURN (CHR) PIPING		METAL BELLOWS PUMP CONNECTOR
	NEW CONDENSATE DRAIN OR DRAIN (D) PIPING		AIR VENT (A - AUTO, H - HAND)
	EXISTING PIPING		PRESSURE AND TEMPERATURE TAP
			PRESSURE GAUGE
			PRESSURE GAUGE W/ SIPHON
			THERMOMETER
			PIPE ANCHOR
			PIPE GUIDE
			FLANGE
			FLANGE (WELD NECK)
			ELBOW, TURNED UP
			ELBOW, TURNED DOWN
			RISE OR DROP IN PIPE
			TEE, SIDE CONNECTION
			TEE, OUTLET UP
			TEE, OUTLET DOWN
			CAPPED OUTLET
			CAPPED PIPE
			CONCENTRIC REDUCER
			ECCENTRIC REDUCER
			FLOW METER

REVISIONS:

No.	Description	Date

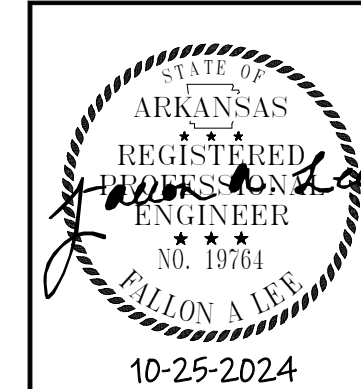
100% CONSTRUCTION DOCUMENTS

ISSUE DATE: 10-25-2024

PROJECT NUMBER: 24-006

SHEET TITLE:
MECHANICAL GENERAL NOTES
AND LEGEND

SHEET NUMBER:
M001

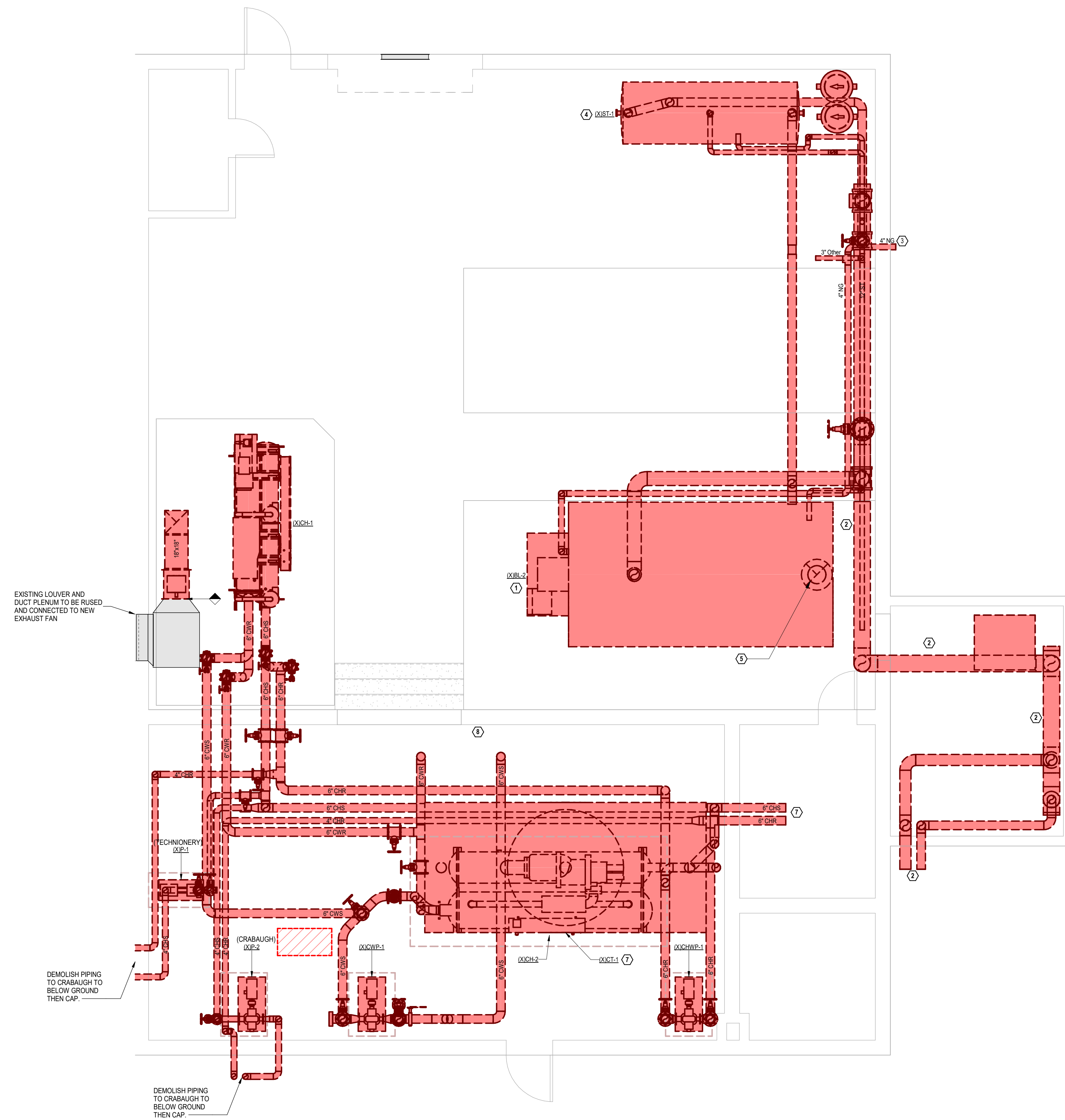


10-25-2024

**ATU WEST CAMPUS CHILLED
WATER LOOP**
RUSSELLVILLE, AR

- GENERAL NOTES**
1. DXCH-1, DXCT-1, DXIP-1, DXIP-2, DXCHWP-1, DXCHWP-1 AND ASSOCIATED PIPING AND ACCESSORIES SHALL BE DEMOLISHED AFTER NEW CHILLED WATER SYSTEM IS INSTALLED AND FULLY FUNCTIONAL.
 2. ALL WALL AND FLOOR PENETRATIONS SHOULD BE SEALED.
 3. CONTRACTOR SHALL VERIFY ALL CONDITIONS PRIOR TO COMMENCING DEMOLITION AND NOTIFY THE ENGINEERS AND OWNER OF ANY MAJOR DISCREPANCIES.

- DEMOLITION KEYED NOTES**
- ① DEMOLISH STEAM BOILER BL-2 AND ASSOCIATED ACCESSORIES.
 - ② DEMOLISH PIPING TO BELOW FLOOR. CAP PIPING.
 - ③ DEMOLISH GAS PIPING BACK TO MAIN. CAP PIPING.
 - ④ DEMOLISH DXIST-1 AND ALL ASSOCIATED PIPING, PUMPS, AND ACCESSORIES.
 - ⑤ DEMOLISH FLUE UP TO ROOF. CAP BELOW ROOF LINE.
 - ⑥ DEMOLISH EXISTING CONDENSER WATER PIPE UP THROUGH ROOF TO COOLING TOWER. SEAL UP ROOF PENETRATION.
 - ⑦ DEMOLISH EXISTING COOLING TOWER AND ACCESSORIES
 - ⑧ 3/4" EXISTING MAKE-UP WATER TO REMAIN.
 - ⑨ DEMOLISH WATER TREATMENT SYSTEM AND ALL ASSOCIATED PIPING AND ACCESSORIES.



1 POWER PLANT BUILDING - HVAC DEMOLITION PLAN
1/4" = 1'-0"

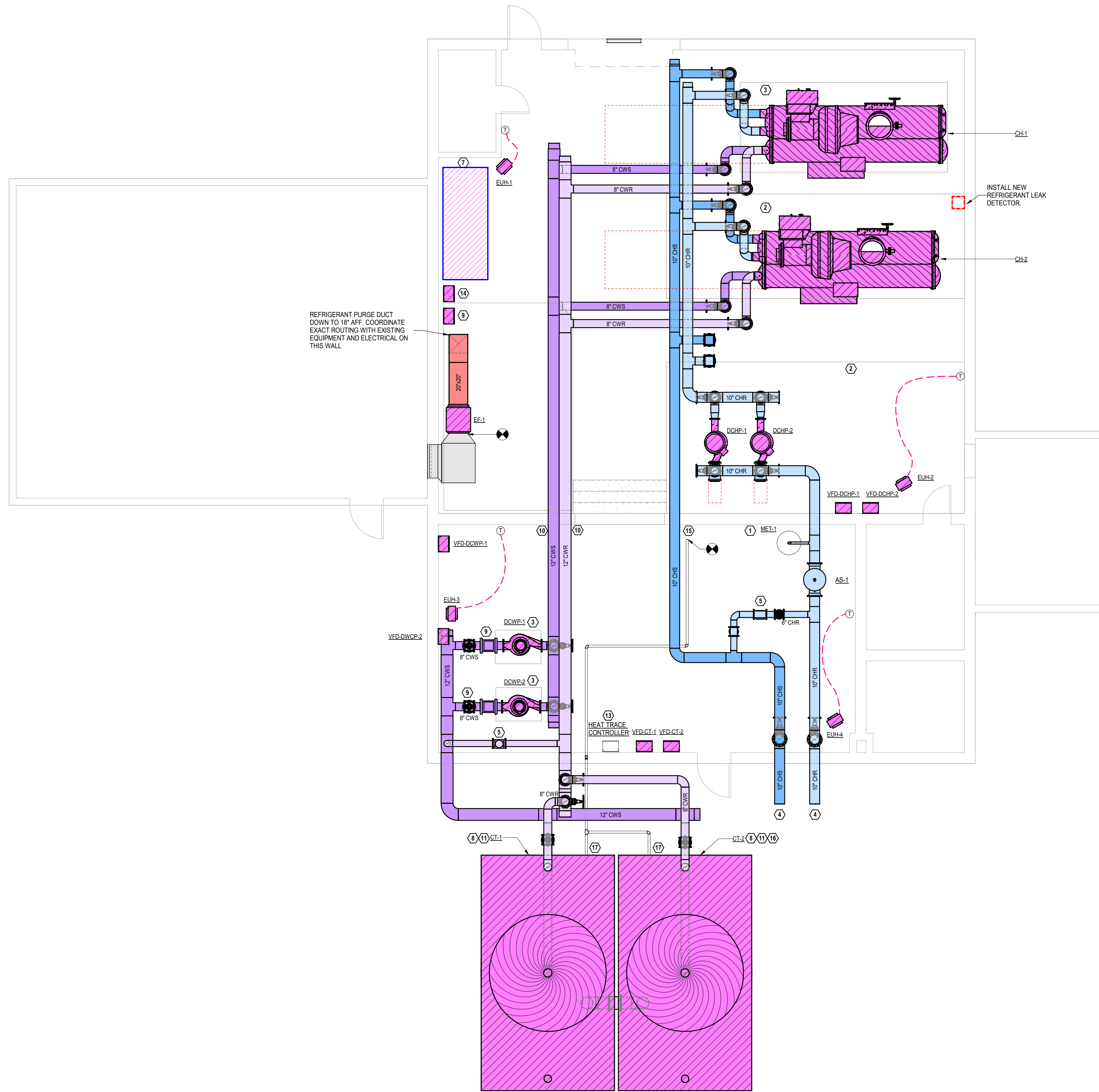
REVISIONS:

No.	Description	Date

100% CONSTRUCTION DOCUMENTS
ISSUE DATE: 10-25-2024
PROJECT NUMBER: 24-006

SHEET TITLE:
MECHANICAL DEMOLITION PLAN -
POWER PLANT BUILDING

SHEET NUMBER:
M101



- GENERAL NOTES**
1. ALL EXPOSED PIPING INSIDE THE BUILDING SHALL BE IN PVC FITTING COVER AND JACKETING SYSTEM EQUAL TO SPEEDLINE 2550 SMOKE-SAFE PVC. ALL PIPING SHALL BE CLEARLY LABELED AND HAVE DIRECTION ARROWS.
 2. ALL WALL AND FLOOR PENETRATIONS SHOULD BE SEALED.
 3. PROVIDE ALUMINUM JACKETING ON ALL EXTERIOR PIPING.
 4. PROVIDE PVC JACKETING ON ALL INTERIOR PIPING. ALL EXPOSED PIPING INSIDE THE BUILDING SHALL BE WRAPPED IN A COLORED PVC FITTING COVER AND JACKETING SYSTEM EQUAL TO SPEEDLINE 2550 SMOKE-SAFE PVC. COLORS SHALL BE SELECTED DURING SUBMITTAL PROCESS. ALL PIPING SHALL BE CLEARLY LABELED AND HAVE DIRECTION ARROWS, AS PER THE SPECIFICATIONS.

- KEYED NOTES**
- (1) CONNECT 1" MAKE-UP WATER LINE FROM EXISTING RPZ.
 - (2) UTILIZE EXISTING CONCRETE EQUIPMENT PAD.
 - (3) PROVIDE 4" CONCRETE EQUIPMENT PAD.
 - (4) ROUTE 10" CHILLED WATER LINES BELOW GRADE. SEE CIVIL FOR LOOP CONTINUATION.
 - (5) BYPASS CONTROL VALVE.
 - (6) BASKET STRAINER.
 - (7) WATER TREATMENT SYSTEM BY CHEM AQUA.
 - (8) COOLING TOWER SUPPORTS BY STRUCTURAL.
 - (9) CHILLER PLANT CONTROLLER.
 - (10) EXPAND OPENING IN WALL TO INCLUDE CONDENSER WATER PIPES.
 - (11) ROUTE COOLING TOWER DRAIN TO AREA DRAIN BELOW TOWER. REFER TO CIVIL.
 - (12) PROVIDE 8 WFT HEAT TRACE EQUAL TO RAYCHEM 8XLE2-CR AT 277V. INSTALL PER MANUFACTURER'S INSTRUCTIONS.
 - (13) PROVIDE HEAT TRACE CONTROLLER EQUAL TO RAYCHEM ACS-30. INSTALL PER MANUFACTURER'S INSTRUCTIONS.
 - (14) PROVIDE REFRIGERANT MONITORING SYSTEM EQUAL TO CHILLGUARD 5000.
 - (15) ROUTE EXISTING 3/4" MAKE UP WATER TO EXPANSION TANK.
 - (16) ROUTE 4" COOLING TOWER DRAIN TO AREA DRAIN BELOW. SEE CIVIL FOR CONTINUATION.
 - (17) PROVIDE 2" MAKE-UP WATER LINE TO BASIN OF COOLING TOWER. TO EACH BASIN. PROVIDE HEAT TRACE EQUAL TO SWIFT ON EXTERIOR MAKE-UP WATER LINE.
 - (18) 12" EQUALIZER PIPING WITH ISOLATION VALVE. PROVIDE 8 WFT HEAT TRACE EQUAL TO RAYCHEM 8XLE2-CR AT 277V. INSTALL PER MANUFACTURER'S INSTRUCTIONS.

ATU WEST CAMPUS CHILLED WATER LOOP
RUSSELLVILLE, AR

REVISIONS:

No.	Description	Date

100% CONSTRUCTION DOCUMENTS
ISSUE DATE: 10-25-2024
PROJECT NUMBER: 24-006

SHEET TITLE:
MECHANICAL PLAN - POWER PLANT BUILDING

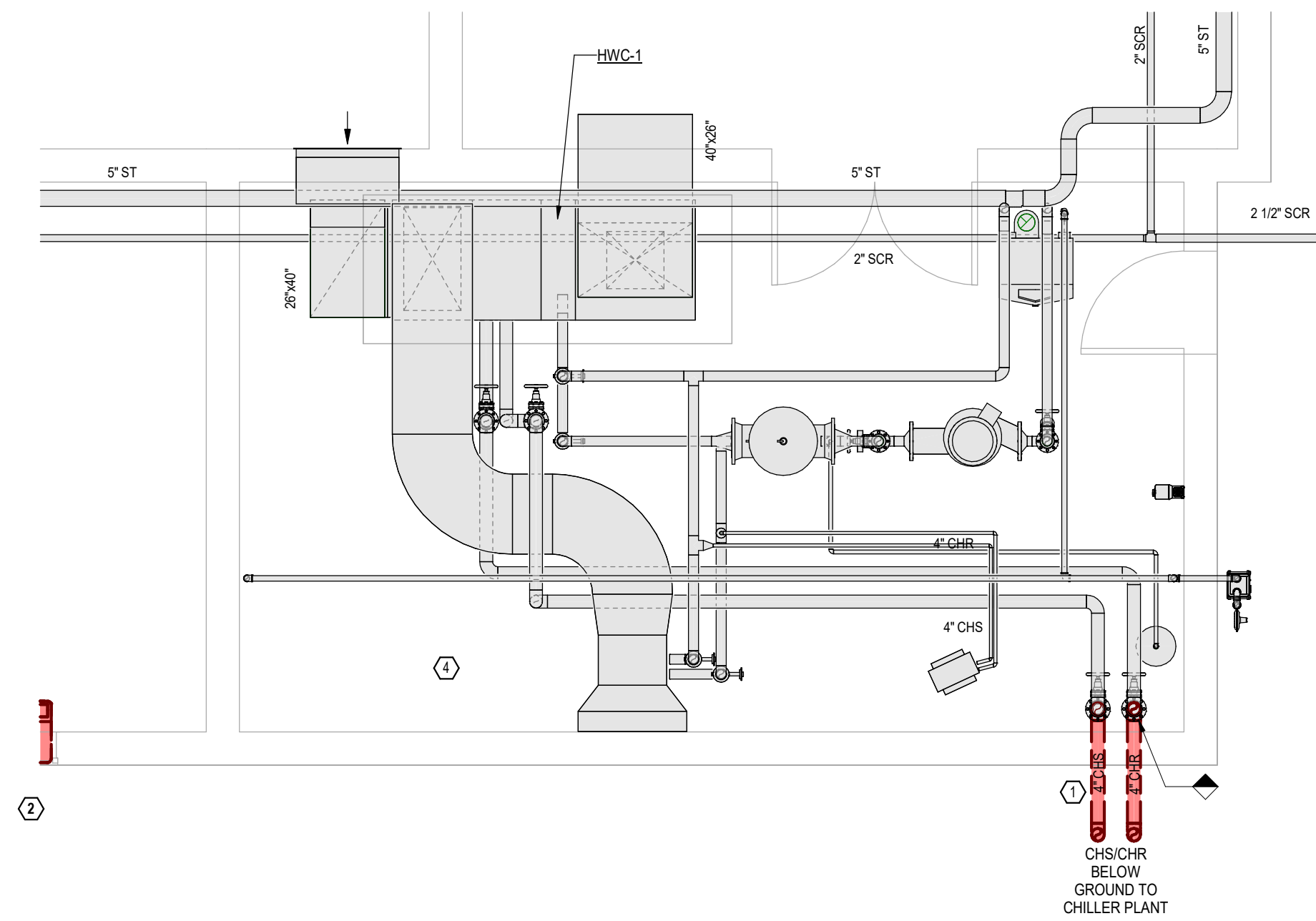
SHEET NUMBER:
M201

1 POWER PLANT BUILDING - HVAC PLAN
3/16" = 1'-0"

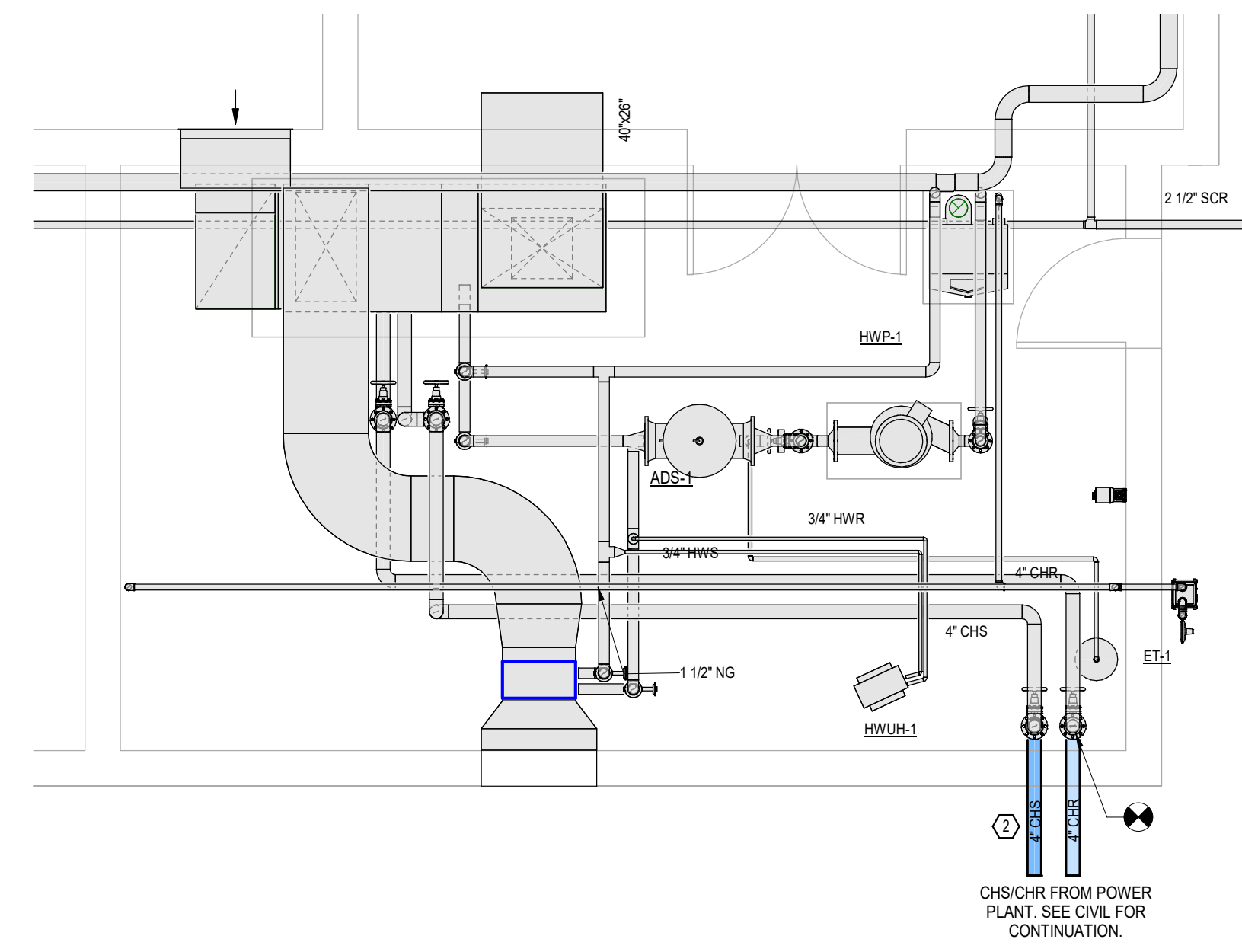
10-25-2024

**ATU WEST CAMPUS CHILLED
WATER LOOP**
RUSSELLVILLE, AR

- KEYED NOTES**
- ① DEMOLISH CHILLED WATER LINES UP TO ISOLATION VALVES. SEAL EXTERIOR BUILDING PENETRATIONS. PREPARE VALVE FOR RECONNECTION.
 - ② INSTALL NEW CHILLED WATER LINES BELOW GRADE INTO BUILDING AND UP TO EXISTING ISOLATION VALVE.



① **FIRST FLOOR TECHNIONERY - HVAC DEMOLITION PLAN**
1/4" = 1'-0"



② **FLOOR PLAN - TECHNIONERY HVAC PLAN**
1/4" = 1'-0"

REVISIONS:

No.	Description	Date

100% CONSTRUCTION DOCUMENTS

ISSUE DATE: 10-25-2024

PROJECT NUMBER: 24-006

SHEET TITLE:
MECHANICAL PLANS -
TECHIONERY BUILDING

SHEET NUMBER:
M202



ATU WEST CAMPUS CHILLED
WATER LOOP

RUSSELLVILLE, AR

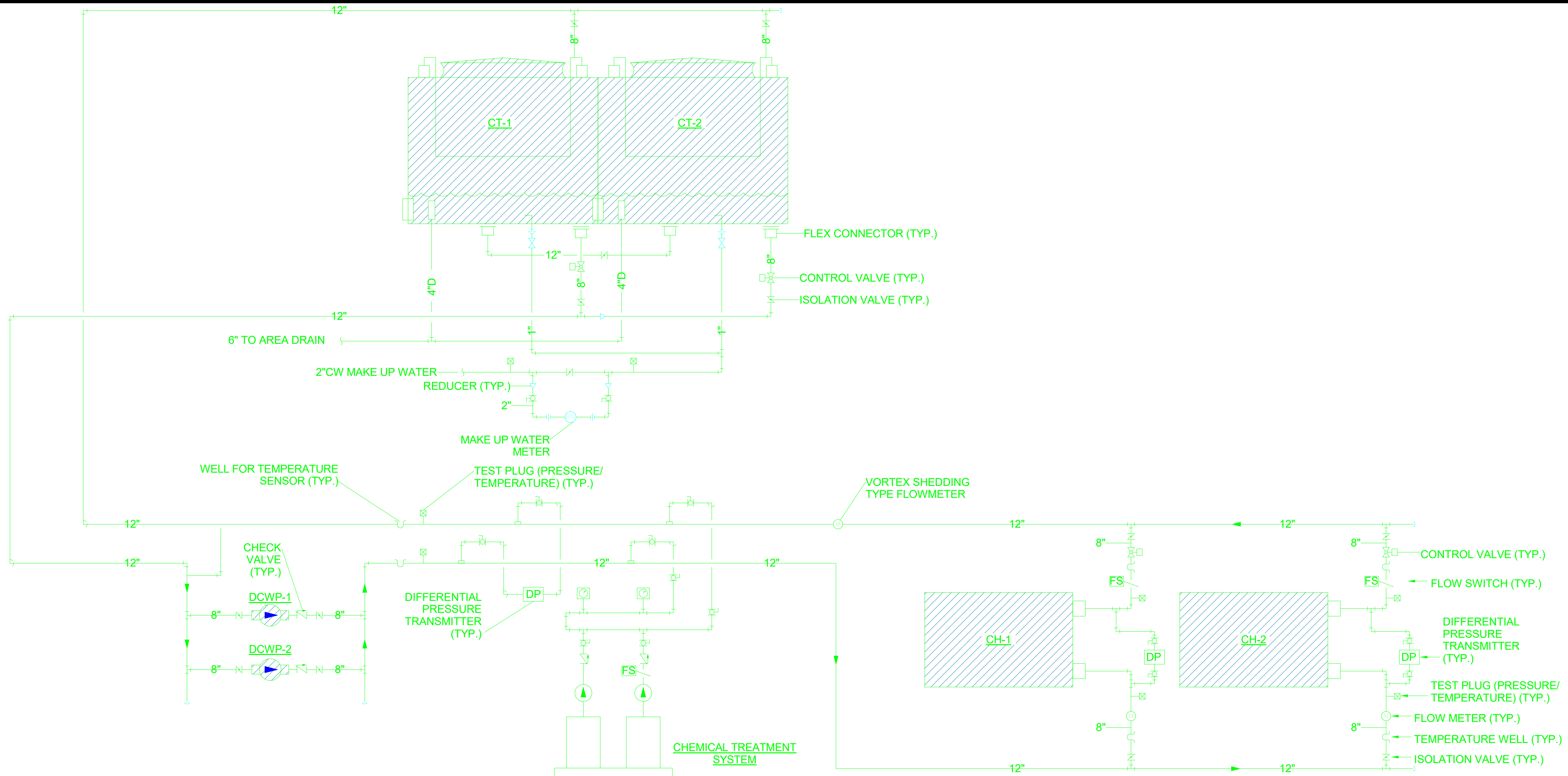
REVISIONS:

No.	Description	Date

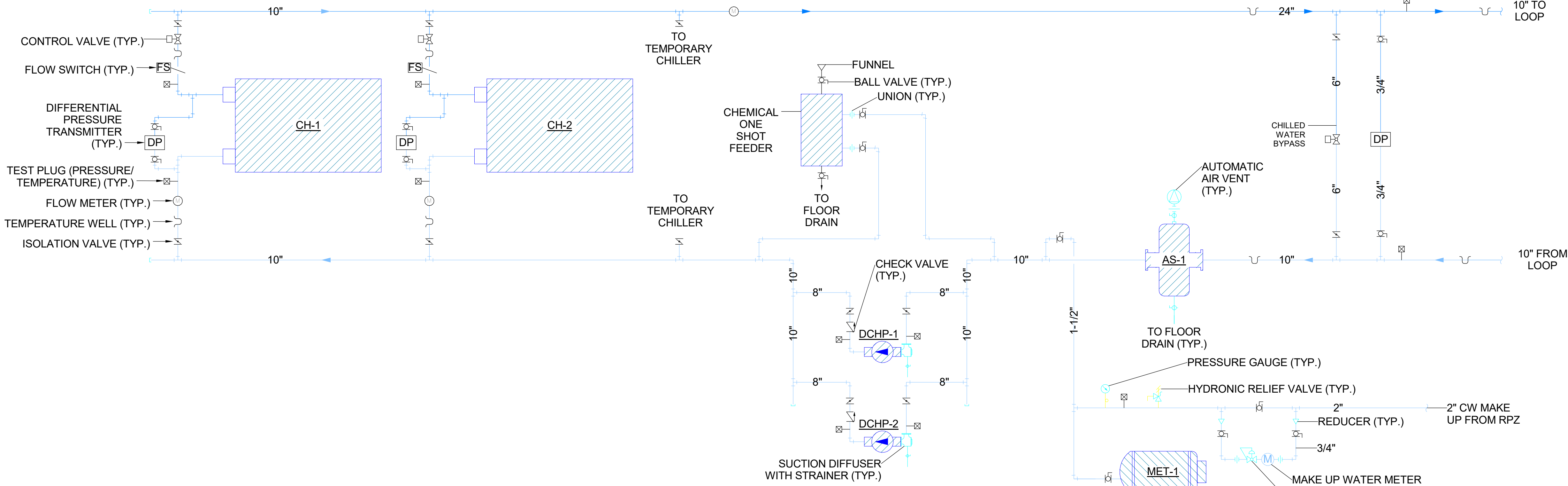
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ISSUE DATE: 10-25-2024
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MECHANICAL DETAILS

SHEET NUMBER:
M302



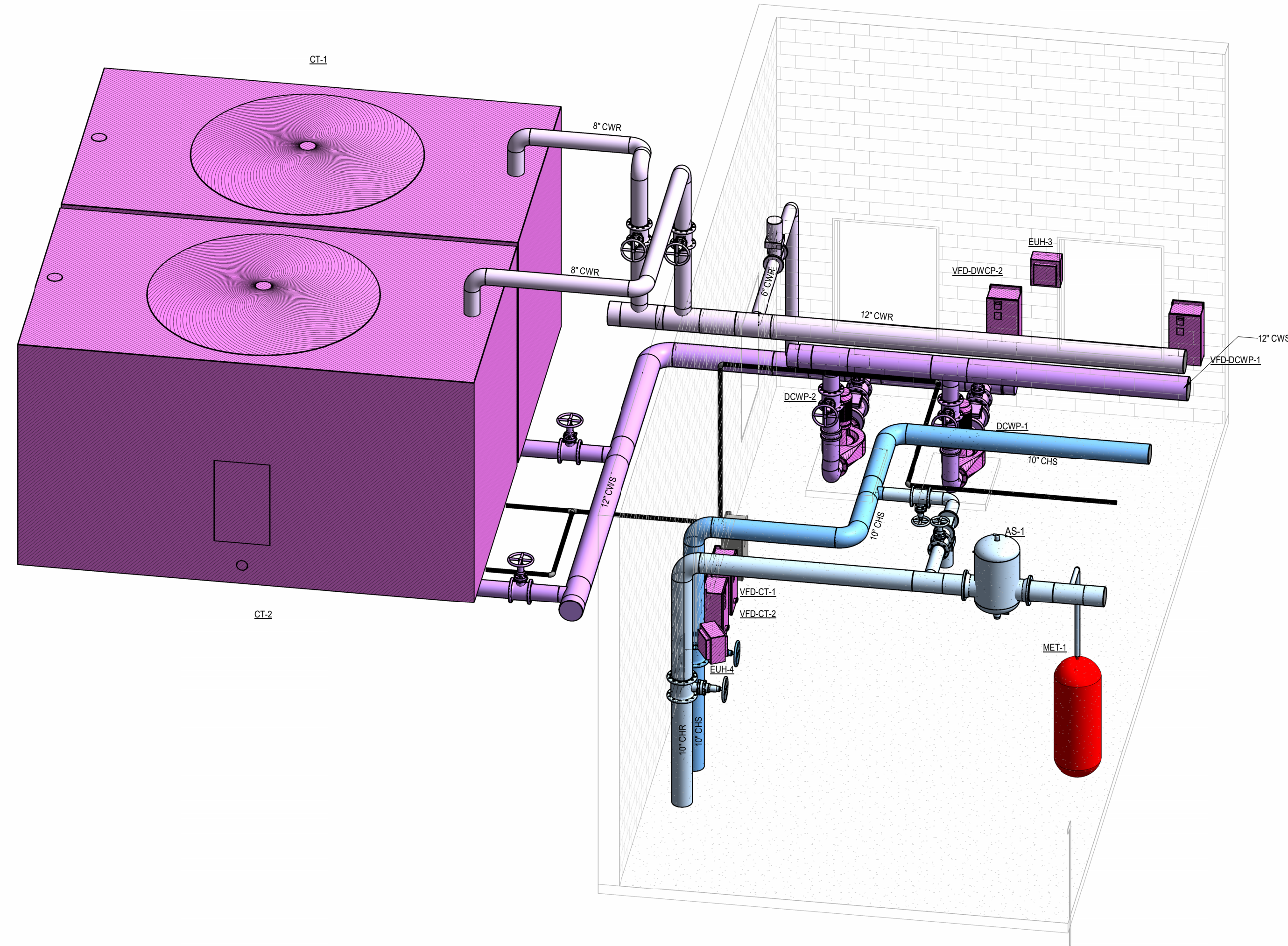
1 CONDENSER WATER PIPING DIAGRAM DETAIL
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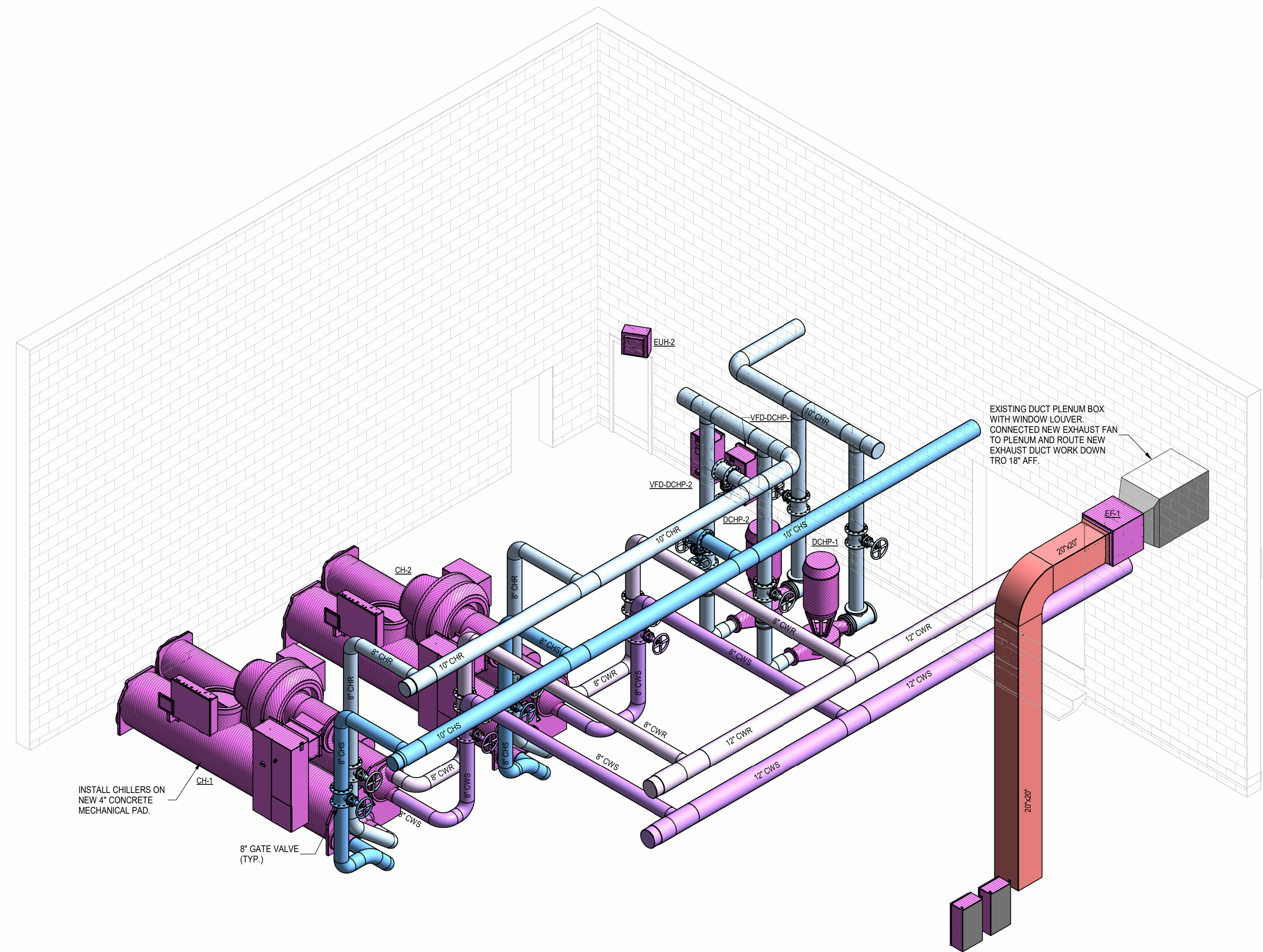
2 CHILLED WATER PIPING DIAGRAM DETAIL
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10-25-2024

**ATU WEST CAMPUS CHILLED
WATER LOOP**
RUSSELLVILLE, AR



1 ISOMETRIC COOLING TOWER VIEW
NOT TO SCALE:



2 ISOMETRIC CHILLER ROOM VIEW
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REVISIONS:

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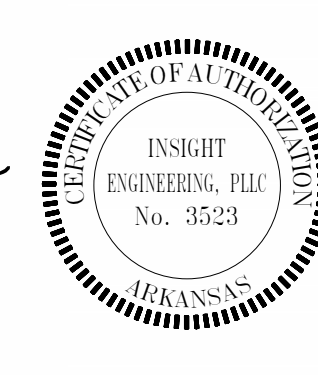
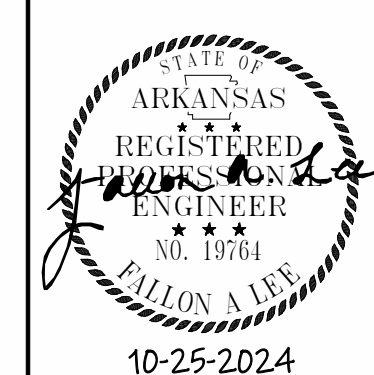
ISSUE DATE: 10-25-2024

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MECHANICAL DETAILS

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M303



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**ATU WEST CAMPUS CHILLED
WATER LOOP**
RUSSELLVILLE, AR

PUMPS														
DESIGNATION	SERVES	REFERENCE PRODUCT		TYPE	ACTUAL FLOW RATE (GPM)	TOTAL HEAD (FT. WATER)	ROTATION (RPM)	IMPELLER DIAMETER (INCHES)	EFFICIENCY (%)	MOTOR SIZE		ELECTRICAL		REMARKS
		MANUFACTURER	MODEL							BHP	MHP	VOLTS	PHASE	
DCHP-1 & 2	DISTRICT CHILLED WATER LOOP	ARMSTRONG	4300-5x5x13	VERTICAL INLINE	860	150	1,247	13.2	80	40.7	50	480	3	PROVIDE SUCTION GUIDE, INTELLIGENT VARIABLE SPEED PUMP WITH SENSORLESS INTEGRATED CONTROL AND BACNET COMPATIBILITY.
DCWP-1 & 2	COOLING TOWER	ARMSTRONG	4300-5x8x13	VERTICAL INLINE	1,500	60	806	13.2	86	24.8	30	480	3	PROVIDE SUCTION GUIDE, INTELLIGENT VARIABLE SPEED PUMP WITH SENSORLESS INTEGRATED CONTROL AND BACNET COMPATIBILITY.

COOLING TOWERS															
DESIGNATION	REFERENCE PRODUCT		NO. OF CELLS	DESIGN CONDITIONS			FANS				BASIN HEATER		OPERATING WEIGHT (LBS)	REMARKS	
	MANUFACTURER	MODEL		DESIGN WET BULB (°F)	EWL / LWT (°F)	FLOW RATE (GPM)	NO.	FAN HP (EACH)	RPM	AIRFLOW (CFM)	VOLTS / PH	KW			VOLTS / PH
CT-1	MARLEY	NC8407TAN2	1	80	95.0 / 85.0	1,500	1	40	1,800	165,300	480 / 3	(2) 15	480 / 3	53,374	PROVIDE MECHANICAL VIBRATION SWITCH, COOLING TOWER CONTROL PANEL, ALUMINUM LADDER WITH STEP PLATFORM AND RAILING, & FLOAT SWITCH. PROVIDE SINGLE POINT POWER OPTION PACKAGE WITH INTEGRAL VFD, AND INTERNAL MECHANICAL PLATFORM
CT-2	MARLEY	NC8407TAN2	1	80	95.0 / 85.0	1,500	1	40	1,800	165,300	480 / 3	(2) 15	480 / 3	53,374	PROVIDE MECHANICAL VIBRATION SWITCH, COOLING TOWER CONTROL PANEL, ALUMINUM LADDER WITH STEP PLATFORM AND RAILING, & FLOAT SWITCH. PROVIDE SINGLE POINT POWER OPTION PACKAGE WITH INTEGRAL VFD, AND INTERNAL MECHANICAL PLATFORM

CHILLERS - WATER COOLED																			
DESIGNATION	REFERENCE PRODUCT		TOTAL CAPACITY (TONS)	EVAPORATOR					CONDENSER					ELECTRICAL			FULL LOAD EFF. KW/TON	REFRIGERANT	WEIGHT
	MANUFACTURER	MODEL		WATER FLOW RATE (GPM)	EWL / LWT (°F)	PD (FT. HD.)	NO. OF PASSES	FOULING FACTOR	WATER FLOW RATE (GPM)	EWL / LWT (°F)	PD (FT. HD.)	NO. OF PASSES	FOULING FACTOR	MCA	MOCP	VOLTS / PH.			
CH-1	TRANE	CVHF	500	853	56 / 42	10.6	2	0.0001	1,410	95 / 85	35.3	2	0.00025	532	800	460 / 3	0.585	R-514A	20,498
CH-2	TRANE	CVHF	500	853	56 / 42	10.6	2	0.0001	1,410	95 / 85	35.3	2	0.00025	532	800	460 / 3	0.585	R-514A	20,498

VARIABLE FREQUENCY DRIVES						
DESIGNATION	MANUFACTURER	SERVES	RATED HP	VOLTS	PHASE	REMARKS
VFD-DCHP-1	ABB	DCHP-1	50	480	3	PROVIDE WITH INPUT LINE REACTORS.
VFD-DCHP-2	ABB	DCHP-2	50	480	3	PROVIDE WITH INPUT LINE REACTORS.
VFD-DCWP-1	ABB	DCWP-1	30	480	3	PROVIDE WITH INPUT LINE REACTORS.
VFD-DCWP-2	ABB	DCWP-2	30	480	3	PROVIDE WITH INPUT LINE REACTORS.
VFD-CT-1	ABB	CT-1 FAN	40	480	3	PROVIDE WITH INPUT LINE REACTORS.
VFD-CT-2	ABB	CT-2 FAN	40	480	3	PROVIDE WITH INPUT LINE REACTORS.

AIR SEPARATORS											
DESIGNATION	REFERENCE PRODUCT		SERVES	PIPE CONNECTION SIZE (INCHES)	MAXIMUM HEIGHT (INCHES)	MAXIMUM FLOW RATE (GPM)	WATER VOLUME (GALLONS)	MAXIMUM WORKING PRESSURE (PSI)	MAX VELOCITY (FT/SEC)	MAX WEIGHT (LBS.)	REMARKS
	MANUFACTURER	MODEL									
AS-1	SPIROTHERM	VSR 1200	CHILLERS	12	56.3	1700	93	2.0	10.0	1050	PROVIDE DRAIN PORT WITH BALL VALVE.

EXPANSION TANKS													
DESIGNATION	REFERENCE PRODUCT		SERVES	TYPE	TANK VOLUME (GALLONS)	MAXIMUM ACCEPTANCE (GALLONS)	MINIMUM TEMP. (°F)	MAXIMUM TEMP. (°F)	INITIAL TANK AIR PRESSURE (PSIG)	MAXIMUM PRESSURE (PSIG)	TANK DIAMETER (INCHES)	TANK LENGTH (INCHES)	REMARKS
	MANUFACTURER	MODEL											
ET-1	ELBI	WTL-600	CHILLERS	BLADDER	160	160	40	95	15	150	25.6	85.0	CARBON STEEL SHEEL WITH PRECHARGED BLADDER.

EXHAUST FANS														
DESIGNATION	REFERENCE PRODUCT		TYPE	AIRFLOW RATE (CFM)	ESP (IN. WC)	ROTATION (RPM)	DRIVE	SONES	ELECTRICAL					REMARKS
	MANUFACTURER	MODEL							MCA	MOCP	MHP	VOLTS	PHASE	
EF-1	GREENHECK	SQ-160	INLINE	2,900	0.12	1140	DIRECT	9.0	1.4	15.0	1/2	480	3	PROVIDE BACKDRAFT DAMPER.

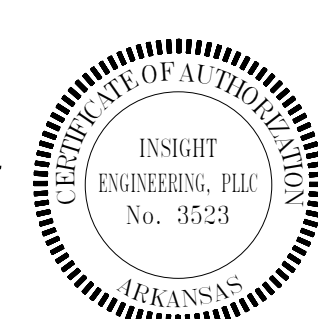
UNIT HEATERS - ELECTRIC									
DESIGNATION	REFERENCE PRODUCT	SERVES	HEATING CAPACITY (KW)	HEATING CAPACITY (MBH)	AIR FLOW RATE (CFM)	ELECTRICAL			REMARKS
						VOLTS	PHASE	AMPS	
UH-1 THRU 4	MARKEL HLA 12-480360-3.0-24	POWER PLANT	3	10.2	580	460	3	4	PROVIDE WITH DISCONNECT, WALL MOUNTED BRACKET, AND REMOTE MOUNTED THERMOSTAT.

REVISIONS:		
No.	Description	Date

100% CONSTRUCTION DOCUMENTS
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MECHANICAL SCHEDULES

SHEET NUMBER:
M401



10-25-2024

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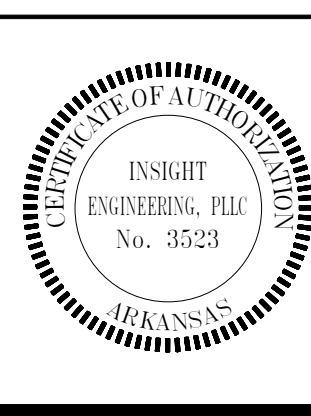
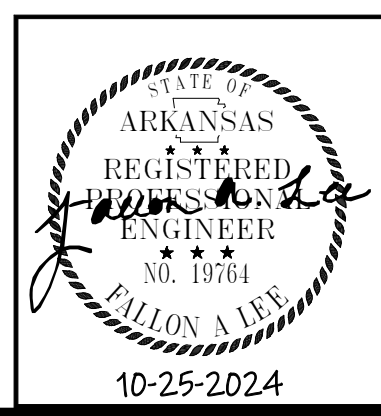
ISSUE DATE: 10-25-2024

PROJECT NUMBER: 24-006

SHEET TITLE:
MECHANICAL CONTROLS WEST LOOP

SHEET NUMBER:

M501



10-25-2024

SEQUENCE OF OPERATION: WEST LOOP COOLING PLANT

SYSTEM GENERAL DESCRIPTION:
THE COOLING PLANT CONTROL SYSTEM SHALL MONITOR AND CONTROL THE SYSTEM'S CHILLER(S), PUMP(S), COOLING TOWER(S) AND CONTROL VALVES AS SHOWN ON THE COOLING PLANT FLOW DIAGRAM AND AS DETAILED IN THE SEQUENCE OF OPERATION LISTED BELOW.
THE COOLING PLANT SYSTEM CONSISTS OF WATER-COOLED CHILLER(S) WITH ITS PIPING CONFIGURATION ARRANGED AS A VARIABLE PRIMARY LOOP SUPPLYING CHILLED WATER TO THE DISTRICT LOOP.

THE MANIFOLDED CHILLED WATER DISTRIBUTION PUMPS ARE CONFIGURED AS LEAD / LAG CONTROL. THE MANIFOLDED CONDENSER WATER PUMP(S) ARE CONFIGURED AS LEAD / LAG CONTROL AND ARE ABLE TO SUPPLY CONDENSER WATER FLOW BETWEEN ANY COOLING TOWER AND ANY CHILLER THAT HAS BEEN ENABLED FOR OPERATION BY THE SYSTEM.

COOLING PLANT SYSTEM ENABLE/DISABLE:
THE COOLING PLANT SYSTEM SHALL BE ENABLED/DISABLED BY THE COOLING PLANT CONTROLLER AS REQUESTED BY THE BUILDING AUTOMATION SYSTEM (BAS) OPERATOR INTERFACE PANEL OR THE BAS TIME OF DAY SCHEDULE. THE COOLING PLANT CONTROL SYSTEM WILL START AND STOP THE CHILLED WATER PUMPS AND CHILLERS BASED UPON SYSTEM LOAD.

WHEN THE COOLING PLANT SYSTEM IS ENABLED THE SYSTEM SHALL SEND AN ENABLE SIGNAL TO THE LEAD CHILLER. UPON RECEIVING THE ENABLE SIGNAL THE CHILLER SHALL SEND A CHILLED WATER PUMP REQUEST SIGNAL TO THE CONTROL SYSTEM TO ENABLE THE CHILLED WATER PUMPING SEQUENCE.

WHEN THE COOLING PLANT SYSTEM IS ENABLED, THE SYSTEM SHALL RESPOND TO A CHILLED WATER PUMP REQUEST FROM ANY SYSTEM CHILLER. THE SYSTEM SHALL COMMAND THE ASSOCIATED CHILLED WATER ISOLATION VALVE OPEN AND ENABLE THE LEAD CHILLED WATER PUMP TO START. AS ADDITIONAL CHILLERS MAKE CHILLED WATER PUMP REQUESTS, OPEN THE ASSOCIATED CHILLED WATER ISOLATION VALVE AND ENABLE THE NEXT (LAG) CHILLED WATER LAG PUMP TO START.

WHEN THE COOLING PLANT SYSTEM IS ENABLED, THE SYSTEM CONTROLLER SHALL ALSO ENABLE THE CONDENSER WATER SYSTEM TO MAINTAIN THE CONDENSER WATER TEMPERATURE TO ITS SETPOINT. REFER TO CONDENSER WATER AND COOLING TOWER SEQUENCES OF THIS DOCUMENT FOR DETAILED OPERATION OF THESE SYSTEMS.

THE COOLING PLANT IS DISABLED WHEN ALL CHILLERS ARE DISABLED AND THERE IS NOT AN ACTIVE CHILLED WATER PUMP REQUEST. WHEN THE PLANT IS DISABLED, THE CHILLED WATER PUMPS SHALL BE COMMANDED OFF AND THE CHILLER ISOLATION VALVES SHALL BE CLOSED.

CHILLER STAGING:
CHILLERS WILL OPERATE IN A LEAD/LAG SEQUENCE, SO THAT THE LAST CHILLER ENABLED IS THE FIRST TO BE DISABLED. THE COOLING PLANT SYSTEM SHALL INITIATE THE START OF THE NEXT CHILLER IN THE SEQUENCE WHENEVER THE CHILLED WATER LOAD, AS DETERMINED BY THE SYSTEM SUPPLY WATER TEMPERATURE, IS NOT MET FOR 20 MINUTES (ADJ.). THE SYSTEM SHALL INITIATE THE SHUT DOWN OF THE NEXT CHILLER IN THE SEQUENCE WHENEVER EXCESS CHILLED WATER CAPACITY EXISTS, AS DETERMINED BY PERCENT RUN LOAD AMPS, FOR 20 MINUTES (ADJ.). CHILLER LEAD/LAG SEQUENCE ORDER WILL BE BASED ON A ROUND ROBIN LOGIC. (ROUND ROBIN LOGIC EXAMPLE: 1-2-3, THEN 2-3-1, THEN 3-1-2, THEN 1-2-3, ETC.)
THE CHILLER SEQUENCE ORDER CAN BE ROTATED ON A SCHEDULE. CHILLER ROTATIONS WILL BE PROGRAMMED TO OCCUR AT ONE OF THE FOLLOWING OPERATOR-DEFINED INTERVALS:

RUN HOURS: CHILLERS ROTATE TO ATTEMPT TO EVEN OUT THE AMOUNT OF TIME EACH CHILLER RUNS. WHEN ANY CHILLER REACHES THE USER-DEFINED RUN HOURS SETPOINT (WHICH IS MEASURED ONLY FROM THE LAST ROTATION), THE SYSTEM CONTROLLER CAN RE-SEQUENCE THE CHILLERS, IF NECESSARY, TO PUT THE CHILLER WITH THE LEAST TOTAL RUN HOURS INTO A HIGHER-USE POSITION IN THE SEQUENCE.

CHILLER ISOLATION VALVES:
CHILLER ISOLATION VALVES SHALL PREVENT THE FLOW OF FLUID THROUGH NON-OPERATING CHILLERS. WHEN THE SYSTEM RECEIVES A CHILLER WATER PUMP REQUEST FROM A CHILLER, THE CHILLER ISOLATION VALVE WILL BE CONTROLLED TO 100% OPEN. CHILLER ISOLATION VALVE STROKE TIME SHALL BE (60-120) SECONDS (ADJ.) TO REDUCE OPERATING CHILLER FLOW TRANSIENTS. WHEN THE VALVE IS CONFIRMED TO BE 100% OPEN THE SYSTEM WILL START THE RESPECTIVE CHILLED WATER AND CONDENSER WATER PUMPS. IF THE CHILLER'S ISOLATION VALVE IS NOT CONFIRMED OPEN AFTER (VALVE STROKE TIME PLUS 60 SEC) 180 SECONDS (ADJ.), THE SYSTEM SHALL ANNUNCIATE A CHILLER ISOLATION VALVE FAILURE ALARM TO THE BAS OPERATOR INTERFACE.

CHILLED WATER PUMP COMMANDS:
WHEN THE COOLING PLANT SYSTEM IS ENABLED, THE SYSTEM SHALL RESPOND TO A CHILLED WATER PUMP REQUEST FROM A CHILLER. THE SYSTEM SHALL START A CHILLED WATER PUMP THROUGH A CONTACT CLOSURE OF THE PUMPS VARIABLE SPEED DRIVE RUN-ENABLE CONTACTS. THE SYSTEM SHALL DETECT THE CHILLED WATER PUMP RUN STATUS BY A VARIABLE SPEED DRIVE CURRENT SWITCH. THE MANIFOLDED CHILLED WATER PUMPS WILL OPERATE IN A LEAD/LAG SEQUENCE THAT SHALL BE ROTATED ON A WEEKLY SCHEDULE. THE ROTATION SEQUENCE SHALL BE BASED ON CALCULATED RUN TIME WITH THE PUMP HAVING THE LEAST RUN TIME DESIGNATED AS LEAD. THE PUMP WITH THE NEXT LOWEST RUN TIME WILL BE THE SECOND IN THE SEQUENCE (OR LAG PUMP) AND SO ON. FROM THE BAS OPERATOR INTERFACE, AN OPERATOR SHALL BE ABLE TO MANUALLY CHANGE THE LEAD/LAG SEQUENCE OR REQUEST ANY PUMP TO BE UNAVAILABLE WHICH WOULD REMOVE IT FROM THE ROTATION SEQUENCE.

IF THE CHILLED WATER SYSTEM DIFFERENTIAL PRESSURE FALLS 0.5 PSIG (ADJ.) BELOW SETPOINT AND THE LEAD PUMP IS AT 100% (ADJ.) FOR MORE THAN 5 MINUTES (ADJ.), THE NEXT PUMP IN THE SEQUENCE SHALL START. IF THE PUMP SPEED CONTROL OUTPUT IS BELOW 65% (ADJ.) FOR MORE THAN 5 MINUTES (ADJ.), THE LAST OPERATING PUMP IN THE SEQUENCE SHALL BE DISABLED.

CHILLED WATER PUMP SPEED:
THE SYSTEM SHALL MONITOR THE CHILLED WATER SYSTEM DIFFERENTIAL PRESSURE SENSOR. WHEN THE PUMP VARIABLE SPEED DRIVE IS ENABLED, THE SYSTEM SHALL CONTROL THE ANALOG SPEED SIGNAL THAT IS SENT TO THE PUMP VARIABLE SPEED DRIVE TO MAINTAIN THE CHILLED WATER DIFFERENTIAL PRESSURE TO ITS SETPOINT OF 15 PSIG (ADJ.).

CHILLED WATER PUMP FAILURE:
IF THE LEAD START/STOP RELAY IS ENABLED AND THE PUMP'S RUNNING STATUS IS OFF FOR MORE THAN 30 SECONDS (ADJ.), THE SYSTEM SHALL ANNUNCIATE A CHILLED WATER PUMP FAILURE ALARM TO THE BAS AND START THE NEXT PUMP IN THE SEQUENCE. ONCE THE PROBLEM HAS BEEN CORRECTED, THE OPERATOR SHALL BE ABLE TO CLEAR THE ALARM FAILURE FROM THE BAS OPERATOR INTERFACE OR BY MANUALLY OVERRIDING THE PUMP ON. THIS SHALL RE-ENABLE THE LEAD/STANDBY SEQUENCE.

CHILLED WATER MINIMUM FLOW BYPASS VALVE:
THE SYSTEM SHALL MONITOR THE EVAPORATOR DIFFERENTIAL PRESSURE OF THE CHILLER. WHEN THE PRESSURE OF THE OPERATING CHILLER INDICATES A LOW PRESSURE (FLOW), THE SYSTEM SHALL CONTROL THE ANALOG SIGNAL THAT IS SENT TO THE CHILLED WATER BYPASS VALVE TO MAINTAIN THE MINIMUM PRESSURE (FLOW) FOR ALL OPERATING CHILLERS.

OPTIMIZED DISTRIBUTION PUMP DIFFERENTIAL PRESSURE CONTROL:
THE SYSTEM SHALL MONITOR THE CHILLED WATER SYSTEM DIFFERENTIAL PRESSURE SENSOR. THE SYSTEM SHALL CONTROL THE CHILLED WATER PUMP(S) VARIABLE SPEED DRIVE TO MAINTAIN THE CHILLED WATER SYSTEM DIFFERENTIAL PRESSURE TO ITS SETPOINT. THE BAS SHALL MONITOR THE POSITION OF ALL CHILLED WATER CONTROL VALVES SERVED BY THE COOLING PLANT. AT CHILLED WATER SYSTEM STARTUP, THE CHILLED WATER SYSTEM PRESSURE SETPOINT WILL BE SET TO THE SYSTEM DESIGN VALUE OF 15 PSI (ADJ.). IN ALL CASES THE DISTRIBUTION PUMP(S) DIFFERENTIAL PRESSURE SETPOINT SHALL BE BOUND BETWEEN A MINIMUM OF 15 PSI (ADJ.) AND A MAXIMUM OF THE SYSTEM DESIGN VALUE.

CONDENSER WATER SYSTEM ENABLE/DISABLE:
THE CONDENSER WATER SYSTEM SHALL BE ENABLED FROM THE COOLING PLANT SYSTEM CONTROLLER OR FROM AN OPTIONAL HIGHER LEVEL BUILDING AUTOMATION SYSTEM (BAS) BASED ON COOLING PLANT STATUS. WHEN ENABLED, THE COOLING PLANT SYSTEM WILL CONTROL THE CONDENSER WATER TEMPERATURE TO ITS SETPOINT (ADJ.) BY CONTROLLING THE TOWER FAN VARIABLE SPEED DRIVE ENABLE/DISABLE AND SPEED CONTROL INPUTS AND THE TOWER BYPASS VALVE POSITION. THE COOLING PLANT SYSTEM AND OPTIONAL HIGHER LEVEL BAS ALSO CONTROL THE CHILLER CONDENSER FLOW BASED ON A DIFFERENTIAL PRESSURE SETPOINT (ADJ.) BY CONTROLLING THE CONDENSER WATER PUMP VARIABLE SPEED DRIVE ENABLE/DISABLE AND SPEED CONTROL INPUTS. WHEN THE CONDENSER WATER SYSTEM IS DISABLED, THE CONDENSER WATER PUMP(S) AND COOLING TOWER FANS SHALL BE COMMANDED OFF. WHEN THE CONDENSER WATER PUMPS ARE CONFIRMED OFF THE LAG TOWER ISOLATION VALVES SHALL BE CLOSED. THE ISOLATION VALVES FOR THE FIRST TOWER IN THE SEQUENCE SHALL BE AN EXCEPTION TO THIS. IT SHALL REMAIN OPEN SO THAT THE PUMP(S) CAN START IMMEDIATELY WHEN THE PLANT IS ENABLED.

CONDENSER WATER PUMP COMMANDS:
THE SYSTEM SHALL START A CONDENSER WATER PUMP THROUGH A CONTACT CLOSURE OF THE PUMPS VARIABLE SPEED DRIVE RUN-ENABLE CONTACTS. THE SYSTEM SHALL DETECT CONDENSER WATER PUMP RUN STATUS BY A VARIABLE SPEED DRIVE CURRENT SWITCH. THE CONDENSER WATER PUMP(S) LEAD/LAG SEQUENCE SHALL BE ROTATED ON A WEEKLY SCHEDULE. THE ROTATION SEQUENCE SHALL BE BASED ON CALCULATED RUN TIME WITH THE PUMP HAVING THE LEAST RUN TIME DESIGNATED AS LEAD. THE PUMP WITH THE NEXT LOWEST RUN TIME WILL BE THE SECOND IN THE SEQUENCE (OR LAG PUMP) AND SO ON. FROM THE BAS OPERATOR INTERFACE, AN OPERATOR SHALL BE ABLE TO MANUALLY CHANGE THE LEAD/LAG SEQUENCE OR REQUEST ANY PUMP TO BE UNAVAILABLE WHICH WOULD REMOVE IT FROM THE ROTATION SEQUENCE.

IF THE CONDENSER WATER SYSTEM DIFFERENTIAL PRESSURE FALLS 0.5 PSIG (ADJ.) BELOW SETPOINT AND THE LEAD PUMP IS AT 100% (ADJ.) FOR MORE THAN 5 MINUTES (ADJ.), THE NEXT PUMP IN THE SEQUENCE SHALL START. IF THE PUMP SPEED CONTROL OUTPUT IS BELOW 65% (ADJ.) FOR MORE THAN 5 MINUTES (ADJ.), THE LAST OPERATING PUMP IN THE SEQUENCE SHALL BE DISABLED.

CONDENSER PUMP SPEED:
THE SYSTEM SHALL MONITOR THE CHILLERS CONDENSER DIFFERENTIAL PRESSURE SENSOR(S). WHEN THE PUMP VARIABLE SPEED DRIVE IS ENABLED, THE SYSTEM SHALL CONTROL THE ANALOG SPEED SIGNAL THAT IS SENT TO THE PUMP VARIABLE SPEED DRIVE TO MAINTAIN THE ENABLED CHILLER(S) CONDENSER WATER DIFFERENTIAL PRESSURE TO ITS SETPOINT (ADJ.).

CONDENSER PUMP FAILURE:
IF THE LEAD PUMP START/STOP RELAY IS ENABLED AND THE CURRENT SWITCH STATUS IS OFF FOR MORE THAN 30 SECONDS (ADJ.), THE SYSTEM SHALL ANNUNCIATE A CONDENSER WATER PUMP FAILURE ALARM TO THE BAS THE LAG PUMP SHALL BE COMMANDED ON. ONCE THE PROBLEM HAS BEEN CORRECTED, THE OPERATOR SHALL BE ABLE TO CLEAR THE ALARM FAILURE FROM THE BAS OPERATOR INTERFACE OR BY MANUALLY OVERRIDING THE PUMP ON.

COOLING TOWER ISOLATION VALVES:
COOLING TOWERS SHALL OPERATE WITH CONDENSER WATER PUMPS. WITH OPERATION OF A PUMP, THE SELECTED TOWER ISOLATION VALVE SHALL BE CONTROLLED TO ALLOW TOWER TEMPERATURE CONTROL TO FUNCTION.

COOLING TOWER BYPASS CONTROL:
WHEN THE CONDENSER WATER SYSTEM IS ENABLED, THE COOLING TOWER SHALL MAINTAIN THE CHILLER ENTERING CONDENSER WATER TEMPERATURE BY FIRST MODULATING THE NORMALLY OPEN BYPASS VALVE. WHEN THE VALVE IS IN FULL TOWER BYPASS AND THE ENTERING CONDENSER WATER TEMPERATURE IS GREATER THAN THE ENTERING CONDENSER WATER TEMPERATURE SETPOINT MINUS 2 DEG. F (ADJ.), THE BYPASS VALVE SHALL BEGIN TO CLOSE SENDING WATER TO THE COOLING TOWER. THE BYPASS VALVE SHALL CONTINUE TO MODULATE CLOSED TO MAINTAIN THE ENTERING CONDENSER WATER TEMPERATURE TO ITS SETPOINT WITHOUT THE TOWER FANS. WHEN THE BYPASS VALVE IS FULLY CLOSED AND THE ENTERING CONDENSER WATER TEMPERATURE REACHES CONDENSER WATER TEMPERATURE SETPOINT PLUS 2 DEG. F (ADJ.), THE CONDENSER WATER TEMPERATURE SHALL BE MAINTAINED BY OPERATING THE COOLING TOWER FANS TO MAINTAIN THE ENTERING CONDENSER WATER TEMPERATURE TO ITS SETPOINT.

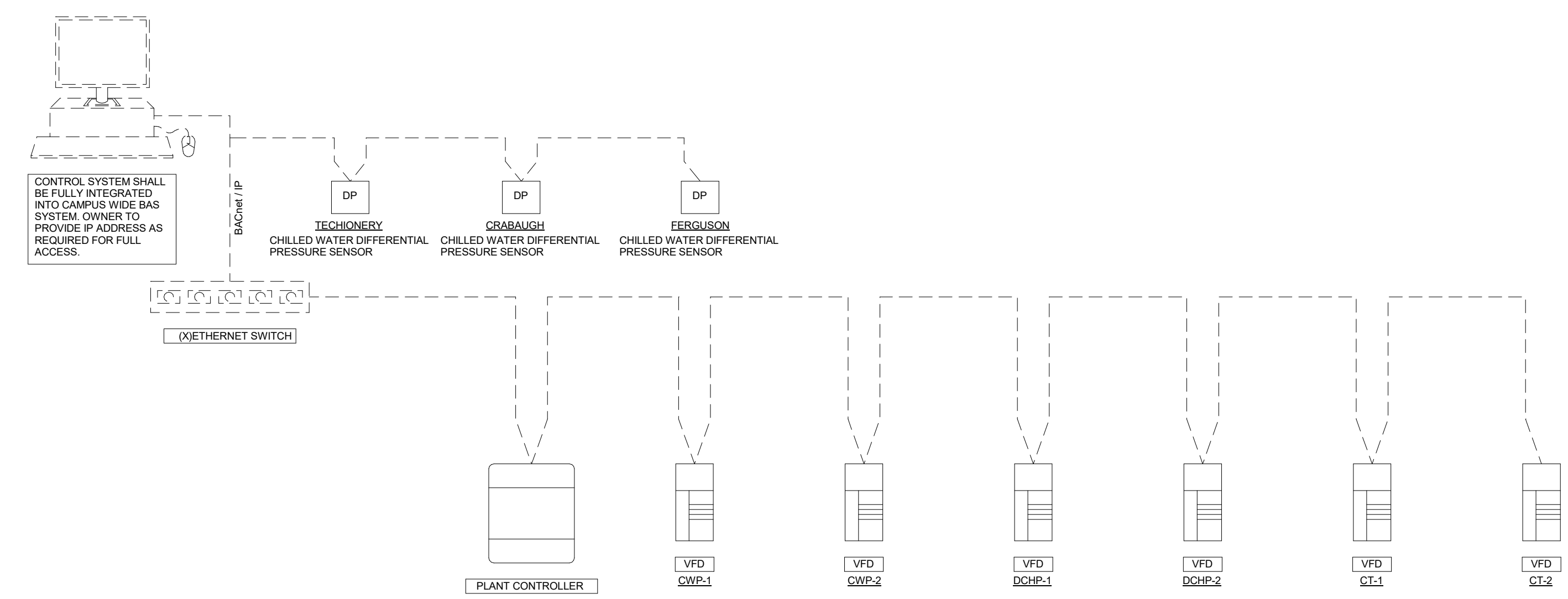
COOLING TOWER FAN START/STOP:
THE SYSTEM SHALL COMMAND A TOWER FAN ON THROUGH A CONTACT CLOSURE OF THE FANS VARIABLE SPEED DRIVE RUN-ENABLE CONTACTS. THE SYSTEM SHALL DETECT TOWER FAN STATUS BY A VARIABLE SPEED DRIVE CURRENT SWITCH.

COOLING TOWER CONTROL:
COOLING TOWER STAGING SEQUENCE SHALL BE ROTATED ON A WEEKLY SCHEDULE. THE ROTATION SEQUENCE SHALL BE BASED ON CALCULATED RUN TIME WITH THE TOWER HAVING THE LEAST RUN TIME DESIGNATED AS LEAD. THE TOWER WITH THE NEXT LOWEST RUN TIME WILL BE THE SECOND IN THE SEQUENCE (OR LAG TOWER) AND SO ON. FROM THE BAS OPERATOR INTERFACE, AN OPERATOR SHALL BE ABLE TO MANUALLY CHANGE THE STAGING AN OPERATOR SHALL BE ABLE TO MANUALLY CHANGE THE LEAD/LAG SEQUENCE OR REQUEST ANY TOWER TO BE UNAVAILABLE WHICH WOULD REMOVE IT FROM THE ROTATION SEQUENCE.

WHEN A CHILLER IS OPERATING AND THE COOLING TOWER LEAVING WATER TEMPERATURE RISES TO 2 DEG. F (ADJ.) ABOVE THE CONDENSER WATER TEMPERATURE SETPOINT 80 DEG. F (ADJ.), THE LEAD COOLING TOWER FAN SHALL BE COMMANDED ON AT MINIMUM SPEED AND THE COOLING PLANT SYSTEM CONTROLLER SHALL MODULATE THE TOWER FAN SPEED TO MAINTAIN THE CONDENSER WATER TO ITS SETPOINT. WHEN THE OPERATING FAN IS RUNNING AT MINIMUM SPEED, AND THE COOLING TOWER LEAVING WATER TEMPERATURE FALLS TO 5 DEG. F (ADJ.) BELOW CONDENSER WATER TEMPERATURE SETPOINT THE COOLING TOWER FAN SHALL BE COMMANDED OFF. COOLING TOWER FANS SHALL HAVE 3 MINUTE (ADJ.) MINIMUM ON AND OFF AND SPEED CHANGE DELAYS.

COOLING TOWER FAILURE:
IF THE LEAD TOWER FAN START/STOP RELAY IS ENABLED AND THE CURRENT SWITCH STATUS IS OFF FOR MORE THAN 15 SECONDS (ADJ.) OR WHENEVER THE TOWER VIBRATION SWITCH IS ACTIVATED THE SYSTEM SHALL ANNUNCIATE A TOWER FAN FAILURE ALARM TO THE BAS OPERATOR INTERFACE. WHEN A TOWER FAN FAILURE EXISTS THE SYSTEM SHALL START THE NEXT (LAG) TOWER IN THE SEQUENCE AND DISABLE THE LEAD/LAG AUTOMATION. THE CURRENTLY RUNNING TOWER CELL SHALL BECOME THE LEAD CELL. ONCE THE FAILURE HAS BEEN CORRECTED, THE OPERATOR SHALL BE ABLE TO CLEAR THE ALARM FAILURE FROM THE FROM THE BAS OPERATOR INTERFACE, BY MANUALLY OVERRIDING THE FAN ON. THIS ACTION SHALL RE-ENABLE THE LEAD/LAG SEQUENCE.

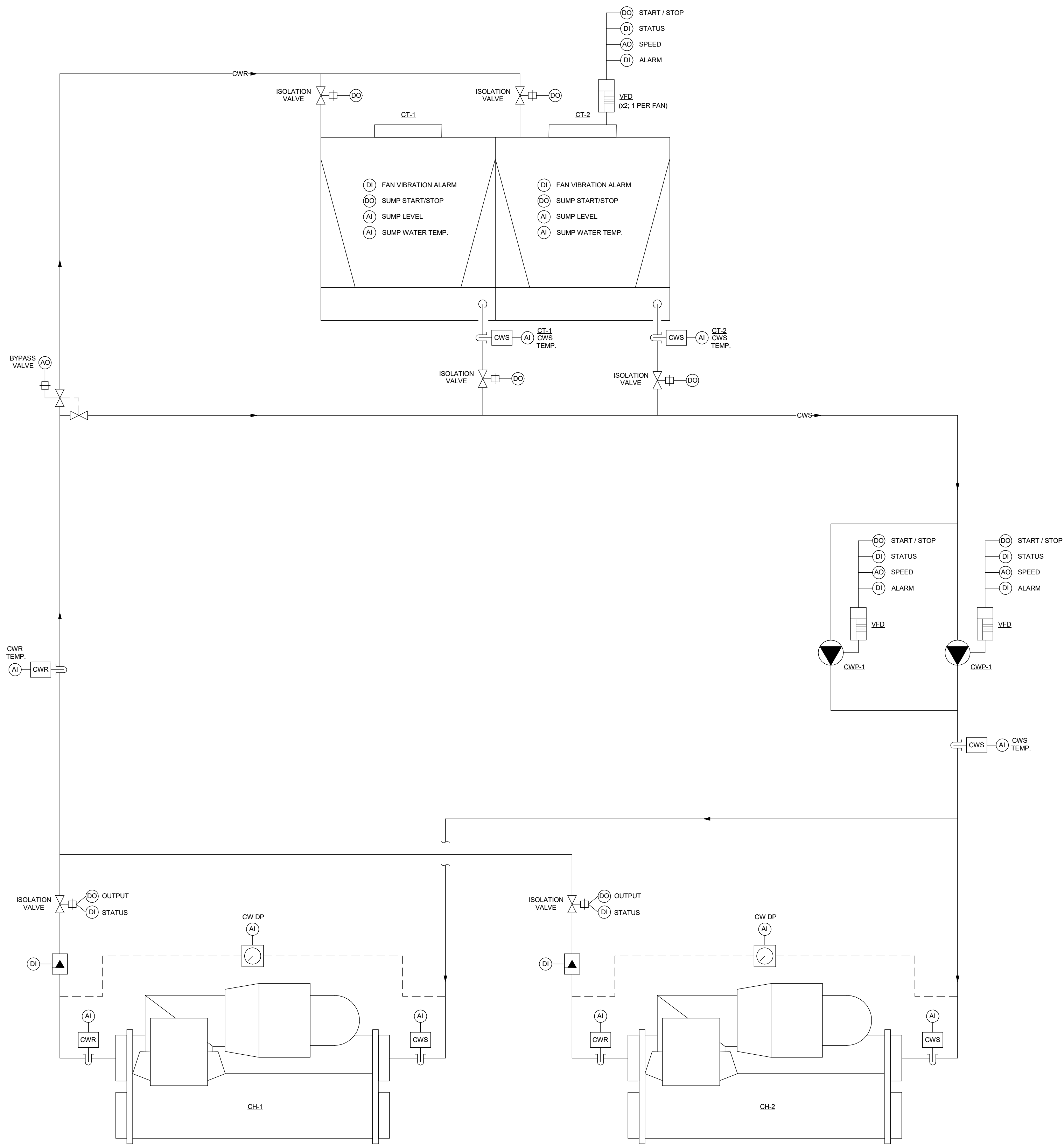
COOLING TOWER SUMP HEAT CONTROL:
THE SUMP HEAT SHALL ONLY BE ENABLED WHEN TOWER'S CONDENSER WATER SYSTEM FLOW IS DISABLED AND THE OUTDOOR TEMPERATURE IS BELOW 38 DEG. F (ADJ.). WHEN ENABLED, COOLING TOWER SUMP HEATERS SHALL BE CONTROLLED TO MAINTAIN A SUMP TEMPERATURE OF 45 DEG. F (ADJ.). A MULTIPLE POSITION COOLING TOWER SUMP LEVEL SENSOR SHALL PROVIDE HIGH WATER ALARM AND LOW WATER ALARM INFORMATION TO THE BAS OPERATOR INTERFACE.



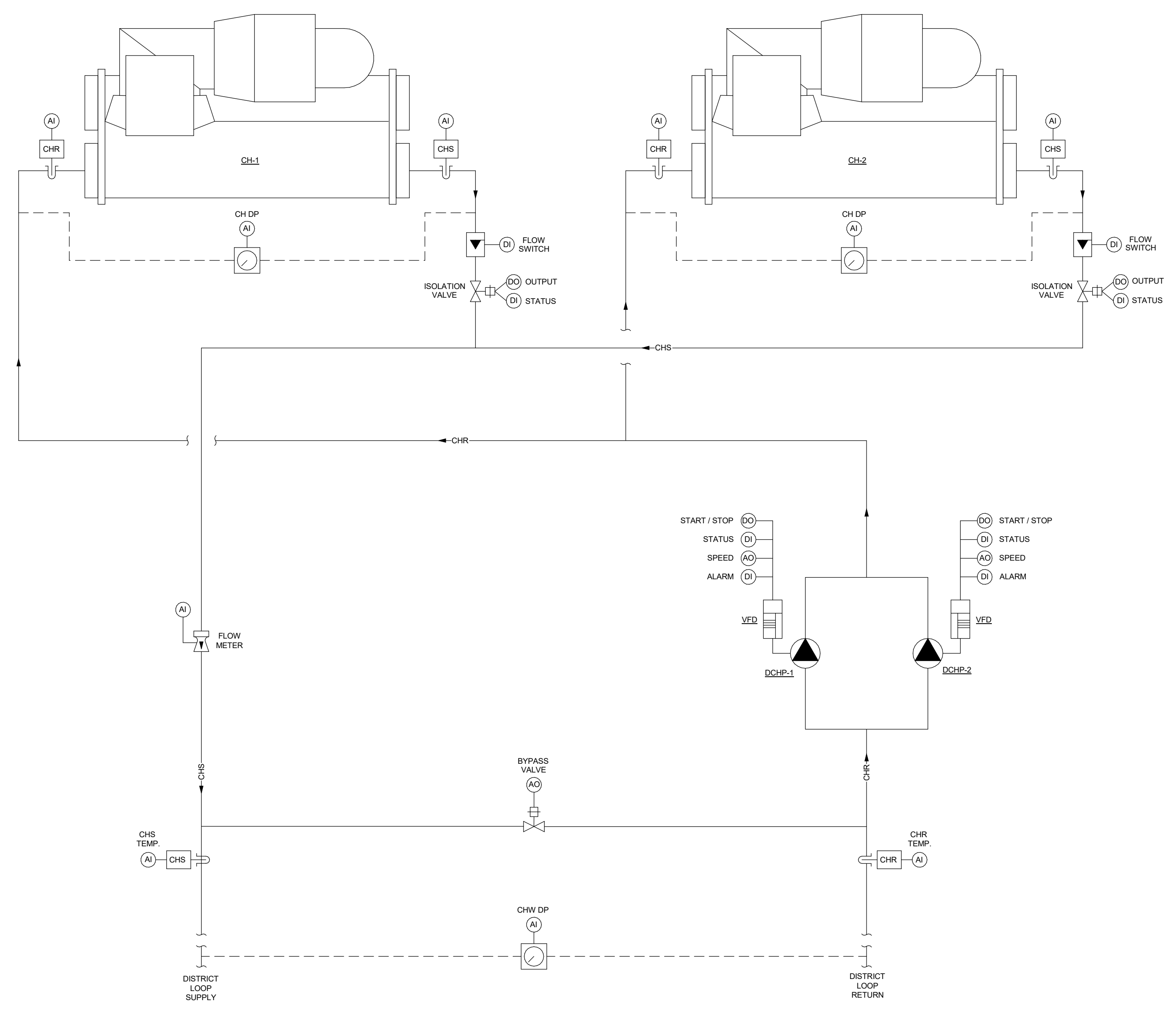
1 WEST LOOP BAS ARCHITECTURE
NOT TO SCALE:



**ATU WEST CAMPUS CHILLED
WATER LOOP**
RUSSELLVILLE, AR



CONDENSING WATER DIAGRAM



CHILLED WATER DIAGRAM

1 WEST LOOP CHILLED WATER CONTROL DIAGRAM
NOT TO SCALE:

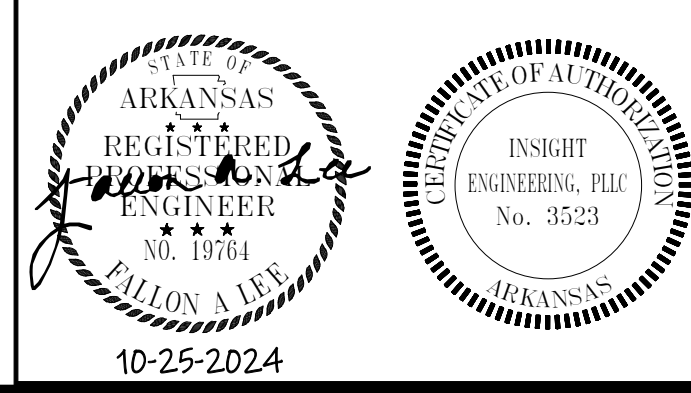
REVISIONS:

No.	Description	Date

100% CONSTRUCTION DOCUMENTS
ISSUE DATE: 10-25-2024
PROJECT NUMBER: 24-006

SHEET TITLE:
MECHANICAL CONTROLS WEST LOOP

SHEET NUMBER:
M502



10-25-2024

DESIGN PARAMETERS

Discrepancies - When discrepancies exist between the Design Drawings (including this sheet) and the Specifications, the more stringent of the two determined by the engineer shall govern.

- 1. Design Codes - (All latest editions unless noted):
A. International Building Code (IBC 2021)
B. American Society of Civil Engineers (ASCE 7-16)
Minimum Design Loads for Buildings and Other Structures
2. Foundation
A. A geotechnical report was not provided for this location. The assumed design allowable bearing capacity of footings is 2,000 psf.

CAST IN PLACE CONCRETE

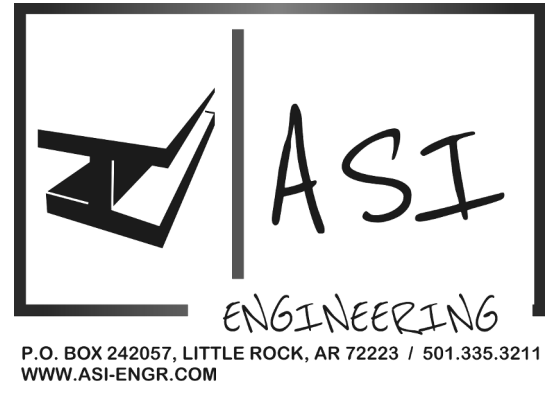
- 1. Minimum Concrete Compressive Strengths:
A. All Concrete f'c = 4,000 psi at 28 days. Max w/c=0.45
2. Before concrete is placed reinforcement shall be secured against displacement within tolerances permitted in section 26.6.2 of ACI code.
3. Where lap splices are required of deformed bars and not specifically indicated on drawings, splices shall be class B splice.

STRUCTURAL STEEL

- 1. Steel shape and plate materials:
• W Shapes - ASTM A992 or A572 Grade 50
• Pipes - A53 - Grade B 35 ksi
• Round HSS - A500 Grade C 46 ksi
• Rectangular HSS - A500 Grade C 50 ksi
• Built-Up shapes - A572 Grade 50
• Plate - A572 Grade 50
• All Others - A36 or A572 Grade 50
2. The fabrication and erection of structural steel shall comply with "The Code of Standard Practice for Steel Buildings and Bridges" as published by AISC.

STRUCTURAL ABBREVIATIONS

Table with 3 columns: Abbreviation, Full Name, and another Abbreviation. Includes ADD (ADDENDUM), ALT (ALTERNATE), AB (ANCHOR BOLT), ANG (ANGLE), ARCH (ARCHITECT), etc.



I hereby certify that these plans and specifications have been prepared by me, or under my supervision. I further certify that to the best of my knowledge these plans and specifications are as required by law and in compliance with the Arkansas Fire Prevention Code for the State of Arkansas.

Date: October 25, 2024

Signature of Casey Daniel, P.E., S.E., Arkansas Registration No. 12371

GENERAL INFORMATION

- 1. All columns shall be centered on grid lines unless noted otherwise.
2. All column footings shall be centered on columns unless noted otherwise.
3. All wall footings shall be centered on walls unless noted otherwise.
4. Unless otherwise noted or detailed, concrete pads for mechanical equipment shall be 4" thick (minimum) and reinforced with #3 @ 12" OC each way centered.

ATU WEST CAMPUS CHILLED WATER LOOP
RUSSELLVILLE, AR

REVISIONS table with columns: No., Description, Date.

100% CONSTRUCTION DOCUMENTS
ISSUE DATE: 10-25-2024
PROJECT NUMBER: 003-001
SHEET TITLE: GENERAL NOTES
SHEET NUMBER: S001

