

GENERAL SYMBOLS

	NORTH ARROW		GRATING COVER (PLAN)
	REVISION INDICATOR: # - REVISION NUMBER X - PART OF ADDENDUM TO CONTRACT FOR INSTANCES WHEN ONLY A PORTION OF DRAWING IS MODIFIED BY ADDENDUM, THE AFFECTED AREA IS "CLOUDED."		CHECKERED PLATE COVER (PLAN)
	COLUMN IDENTIFICATION: # - COLUMN IDENTIFIER		KEY NOTE IDENTIFIER
	STREAM IDENTIFIER		TIE-POINT INDICATOR X: SYSTEM ##: TIE-POINT NUMBER
	ELEVATION DESIGNATION		CONTRACT IDENTIFICATION: -NUMBER IN LEFT BOX INDICATES FURNISHING CONTRACT OR PROCUREMENT PACKAGE. -NUMBER IN RIGHT BOX INDICATES INSTALLING CONTRACT OR PROCUREMENT PACKAGE. -IF NOT INDICATED, FURNISHED AND INSTALLED BY C-01 GENERAL CONSTRUCTION CONTRACT.
	EXISTING OBJECT LINE		OWN OWNER SUPPLIED EQUIPMENT
	OUTLINE OF NEW OR RELOCATED OBJECT		P-01 CHILLER PROCUREMENT P-02 NOT USED P-03 PROCESS AUTOMATION CONTROL SYSTEM P-04 BUILDING AUTOMATION SYSTEM P-05 ELECTRICAL DISTRIBUTION EQUIPMENT PROCUREMENT C-01 GENERAL CONSTRUCTION CONTRACT
	OUTLINE OF FUTURE OBJECT		ITEMS TO BE DEMOLISHED
	CENTER LINE		ITEMS TO BE SALVAGED AND RE-USED
	HIDDEN LINE		DOOR NUMBER
	SURFACE BREAK LINE		
	MATCH LINE		
	GUARDRAIL/HANDRAIL		
	CENTERLINE		
	DIAMETER OR ROUND		
	SQUARE		

SECTION, VIEW, OR DETAIL CALLOUTS

	SECTION MARKER IDENTIFYING PLANE OF CUT
	TYPICAL VIEW DIRECTION
	DETAIL CALLOUT

SECTION OR DETAIL IDENTIFIERS

SECTION TOP IDENTIFIER
BOTTOM IDENTIFIER

DETAIL TOP IDENTIFIER
BOTTOM IDENTIFIER

TOP IDENTIFIER: SECTION OR DETAIL CALLOUT WITH SHEET NUMBER IT IS LOCATED ON

BOTTOM IDENTIFIER: SHEET NUMBERS WHERE DETAIL OR SECTION IS INDICATED

GENERAL NOTES

- ALL WORK SHOWN ON GENERAL SHEETS SHALL BE PROVIDED BY THIS CONTRACT UNLESS OTHERWISE INDICATED.
- THE LEGEND IS GENERAL IN NATURE AND MAY INCLUDE INFORMATION NOT RELEVANT TO THIS PROJECT. REFER TO THE PLANS FOR SPECIFIC SYMBOLS AND ABBREVIATIONS.
- THE ADJACENT FACILITY WILL REMAIN IN OPERATION THROUGHOUT CONSTRUCTION. PERFORM CONSTRUCTION ACTIVITIES TO NOT INTERFERE WITH NORMAL OPERATIONS AND MAINTENANCE ACTIVITIES CONDUCTED BY OWNER.
- DRAWINGS AND SPECIFICATIONS FOR WORK ARE INTENDED TO BE COMPLEMENTARY IN CONVEYING THE SCOPE OF WORK. CONTRACTOR SHALL COMPLETE WORK SHOWN ON ONE (1) DRAWING REGARDLESS OF WHETHER IT IS SHOWN ON OTHER DRAWINGS OR SPECIFICATIONS. SHOULD A CONFLICT BE FOUND, CONTRACTOR SHALL IMMEDIATELY CONTACT OPERATOR'S REPRESENTATIVE.
- IN THE EVENT OF INCONSISTENCIES WITHIN OR BETWEEN THE SPECIFICATIONS AND/OR DRAWINGS, THE CONTRACTOR SHALL PROVIDE THE BETTER QUALITY OR GREATER QUANTITY OF WORK OR COMPLY WITH THE MORE STRINGENT REQUIREMENTS IN ACCORDANCE WITH THE OPERATOR'S REPRESENTATIVE INTERPRETATION.
- DRAWINGS ARE INTENDED TO BE SCHEMATIC IN NATURE IN ORDER TO COMMUNICATE THE SCOPE OF WORK AND SHOW THE GENERAL ARRANGEMENT OF EQUIPMENT AND PIPING. CONTACTOR SHALL MAKE REASONABLE CHANGES IN ARRANGEMENT AND CONFIGURATION OF EQUIPMENT AND PIPING AS DIRECTED BY DESIGN PROFESSIONAL WITHOUT ADDITIONAL COST TO THE OPERATOR.
- ALL CONNECTIONS TO EQUIPMENT, PIPING SYSTEMS, INSTRUMENTATION, AND ALL OTHER ITEMS SHOWN ARE BASED UPON THE DESIGN PROFESSIONALS RECOMMENDED MANUFACTURER AND MODEL. IF CONNECTION SIZES OR TYPES DIFFER FROM THAT SHOWN ON THE CONTRACT DRAWINGS, CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE APPROPRIATE CONNECTIONS. CONNECTIONS PROVIDED SHALL MEET SPECIFICATIONS.

PROJECT ABBREVIATIONS

ACID	SULFURIC ACID	HP	HORSEPOWER	SQ	SQUARE
ADDL	ADDITIONAL	HRS	HOUR	STA	STATION
AFF	ABOVE FINISHED FLOOR	HVAC	HEATING, VENTILATION AND AIR CONDITIONING	STR	STORM SEWER
AHU	AIR HANDLING UNIT	HZ	HERTZ	SW	SOFT WATER
AI	ANALOG INPUT	ID	INSIDE DIAMETER, IDENTIFICATION	T	TANK
BAS	BUILDING AUTOMATION SYSTEM	KV	KILOVOLT	TWB	TOWER WATER BYPASS
BFP	BACK FLOW PREVENTER	KVA	KILOVOLT AMPERE	TWBL	TOWER WATER BLOWDOWN
BOD	BOTTOM OF DUCT	KW	KILOWATT	TWD	TOWER WATER DRAIN
CFM	CUBIC FEET PER MINUTE	LAT	LEAVING AIR TEMPERATURE	TWE	TOWER WATER EQUALIZATION
¢	CENTERLINE	LB	POUND	TWM	TOWER WATER MAKEUP
CH	CHILLER	LCWR	LOOP CHILLED WATER RETURN	TWR	TOWER WATER RETURN
CHWB	CHILLED WATER BYPASS	LCWS	LOOP CHILLED WATER SUPPLY	TWS	TOWER WATER SUPPLY
CHWM	CHILLED WATER MAKEUP	LOR	LOCAL OFF REMOTE	TYP	TYPICAL
CHWR	CHILLED WATER RETURN	LWT	LEAVING WATER TEMPERATURE	UH	UNIT HEATER
CHWS	CHILLED WATER SUPPLY	M	METER	UTIL	UTILITY
CO	CLEANOUT	MAU	MAKEUP AIR UNIT	V	VENT
COD	CENTER OF DUCT	MAX	MAXIMUM	VFD	VARIABLE FREQUENCY DRIVE
COL	COLUMN	MBH	1000 BTU PER HOUR	VP	VACUUM PUMP
COND	CONDENSATE	MCC	MOTOR CONTROL CENTER	VS	VARIABLE SPEED
CT	COOLING TOWER	MS	MEDIUM PRESSURE STEAM	VTR	VENT THROUGH ROOF
CTP	CONDENSATE TRANSFER PUMP	MC	MEDIUM PRESSURE CONDENSATE	W	WATER, WIDTH, WIDE, WATT, POTABLE WATER
DB	DUCT BANK	MIN	MINIMUM, MINUTE	WE	WITH EQUIPMENT
DEG	DEGREES	MISC	MISCELLANEOUS	WTR	WATER
DIA	DIAMETER	MPH	MILES PER HOUR		
DN	DOWN	NC	NORMALLY CLOSED		
DWG	DRAWING	NO	NORMALLY OPEN		
EA	EXHAUST AIR	NPT	NATIONAL PIPE THREAD		
EAT	ENTERING AIR TEMPERATURE	NTS	NOT TO SCALE		
EF	EXHAUST FAN	OFD	OVER FLOW DRAIN		
EL.	ELEVATION	P&ID	PIPING & INSTRUMENTATION DIAGRAM		
EWT	ENTERING WATER TEMPERATURE	PMP	PUMP		
ETC	ET CETERA	PSIG	POUNDS PER SQUARE INCH		
EXST	EXISTING	PSW	PROCESS SOFT WATER		
F	FAHRENHEIT	PW	PROCESS WATER (NON-POTABLE)		
FACP	FIRE ALARM CONTROL PANEL	RA	RETURN AIR		
FC	FAIL CLOSED	RAD	RADIAL		
FCU	FAN COIL UNIT	RD	ROOF DRAIN		
FD	FLOOR DRAIN, FIRE DAMPER	REC	RECEIVER		
FL	FAIL LAST	RO	REVERSE OSMOSIS		
FLA	FULL LOAD AMPS	ROF	RO FLUSH		
FPM	FEET PER MINUTE	RP	RESERVOIR PUMP		
FO	FAIL OPEN	S	SOUTH		
GPM	GALLONS PER MINUTE	SAN	SANITARY SEWER		
H	HEIGHT	SP	SPRINKLER		

ADD ALTERNATES

1. ADD ALTERNATE 1 - LOOP PUMP LP-02.

SCOPE INCLUDES: LOOP PUMP LP-02, PUMP VFD AND DISCONNECTS, PIPE SUPPORTS, AND 12" CHWS PIPING FROM VALVE 02-HV-401-1 TO VALVE 02-HV-407-2 INCLUDING INDICATED VALVES, DRAINS, VENTS, AND INSTRUMENTATION SHOWN ON DRAWING M-602. REFER TO THE FOLLOWING PLAN AND SECTION SHEETS FOR ADDITIONAL ADD ALTERNATE 1 INFORMATION:

G-002	MP-132	EO-012
GA-132	MP-142	EP-122
GA-142	MP-221	EP-132
GA-221	MP-223	EP-142
GA-223	MP-224	EP-221
GA-224	MP-621	EP-611
GA-225	MS-132	EP-612
S-200	MS-142	EP-613
	MS-621	EC-011
	MI-132	EC-601
	MI-142	
	MI-601	
2. ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.

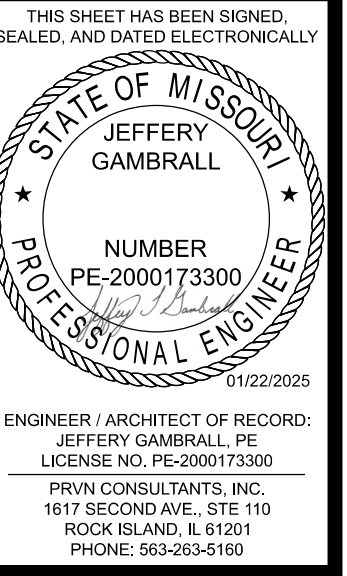
SCOPE INCLUDES: COOLING TOWER CELL CT-02, COOLING TOWER FAN CF-02, FAN VFD AND DISCONNECTS, TOWER WATER PUMP TP-02, PUMP VFD AND DISCONNECTS, PIPE SUPPORTS, 12"/14" TWS PIPING FROM VALVE 02-HV-627-1 TO VALVE 02-HV-627-5 INCLUDING INDICATED VALVES, DRAINS, VENTS, BASKET STRAINER, AND INSTRUMENTATION SHOWN ON DRAWING M-611, 10" TWS FROM CT-02 TO 10"x16" REDUCER, 12"/16" TOWER WATER EQUALIZATION LINE IN ITS ENTIRETY FROM COOLING TOWER CT-01 TO COOLING TOWER CT-02, 10"/14" TWR FROM VALVE 02-HV-537-1 TO COOLING TOWER CT-02, AND 4"/6" TWD PIPING FROM COOLING TOWER CT-02 INCLUDING INDICATED VALVES, DRAINS, VENTS, HEAT TRACE, AND INSTRUMENTATION SHOWN ON DRAWING M-612. REFER TO THE FOLLOWING PLAN AND SECTION SHEETS FOR ADDITIONAL ADD ALTERNATE 2 INFORMATION:

G-002	MP-132	EO-012
GA-100	MP-142	EG-162
GA-132	MP-152	EP-122
GA-142	MP-162	EP-132
GA-162	MP-223	EP-142
GA-223	MP-226	EP-152
GA-225	MP-227	EP-162
GA-226	MP-621	EP-221
GA-227	MS-132	EP-505
S-200	MS-142	EP-602
	MS-152	EP-611
	MS-621	EP-612
	MI-132	EP-613
	MI-142	EC-011
	MI-162	EC-601
	MI-601	
	MI-602	
3. ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.

SCOPE INCLUDES: CHILLER CH-02, COOLING TOWER FAN CF-02, CHILLER PUMP CP-02, PUMP VFD AND DISCONNECTS, PIPE SUPPORTS, 10"/12" CHWR PIPING FROM VALVE 02-HV-317-1 TO CHILLER CH-02 AND 10"/12" CHWS FROM CHILLER CH-02 TO VALVE 02-HV-107-1 INCLUDING INDICATED PUMP, VALVES, DRAINS, VENTS, SUCTION DIFFUSER, AND INSTRUMENTATION SHOWN ON DRAWING M-602, 12"/14" TWS FROM VALVE 02-HV-127-1 TO CHILLER CH-02 AND 12"/14" TWR FROM CHILLER CH-02 TO VALVE 02-HV-137-1 INCLUDING INDICATED VALVES, DRAINS, VENTS, AND INSTRUMENTATION SHOWN ON DRAWING M-611, 3" REFRIGERANT VENT FROM CHILLER CH-02 THROUGH WALL INCLUDING FLEX CONNECTORS, VALVES, AND DRAIN PIPING AS SHOWN ON DRAWING M-641. REFER TO THE FOLLOWING PLAN AND SECTION SHEETS FOR ADDITIONAL ADD ALTERNATE 3 INFORMATION:

G-002	MP-132	EO-012
GA-132	MP-142	EG-132
GA-142	MP-221	EP-122
GA-221	MP-222	EP-132
GA-222	MP-223	EP-142
GA-223	MP-224	EP-221
GA-224	MP-621	EP-602
GA-225	MS-132	EP-611
S-200	MS-142	EP-612
	MS-621	EP-613
	MI-132	EC-011
	MI-142	EC-601
	MI-601	
	MI-602	
4. REFER TO PIPING AND INSTRUMENTATION DIAGRAMS FOR PIPING BOUNDARY LIMITS OF ALTERNATES. ADD ALTERNATE BOXES SHOWN ON PLANS AND SECTIONS FOR REFERENCE.

COOLING TOWER STRUCTURE FOR COOLING TOWER CT-01 AND CT-02 TO BE CONSTRUCTED IN ITS ENTIRETY IN BASE BID.

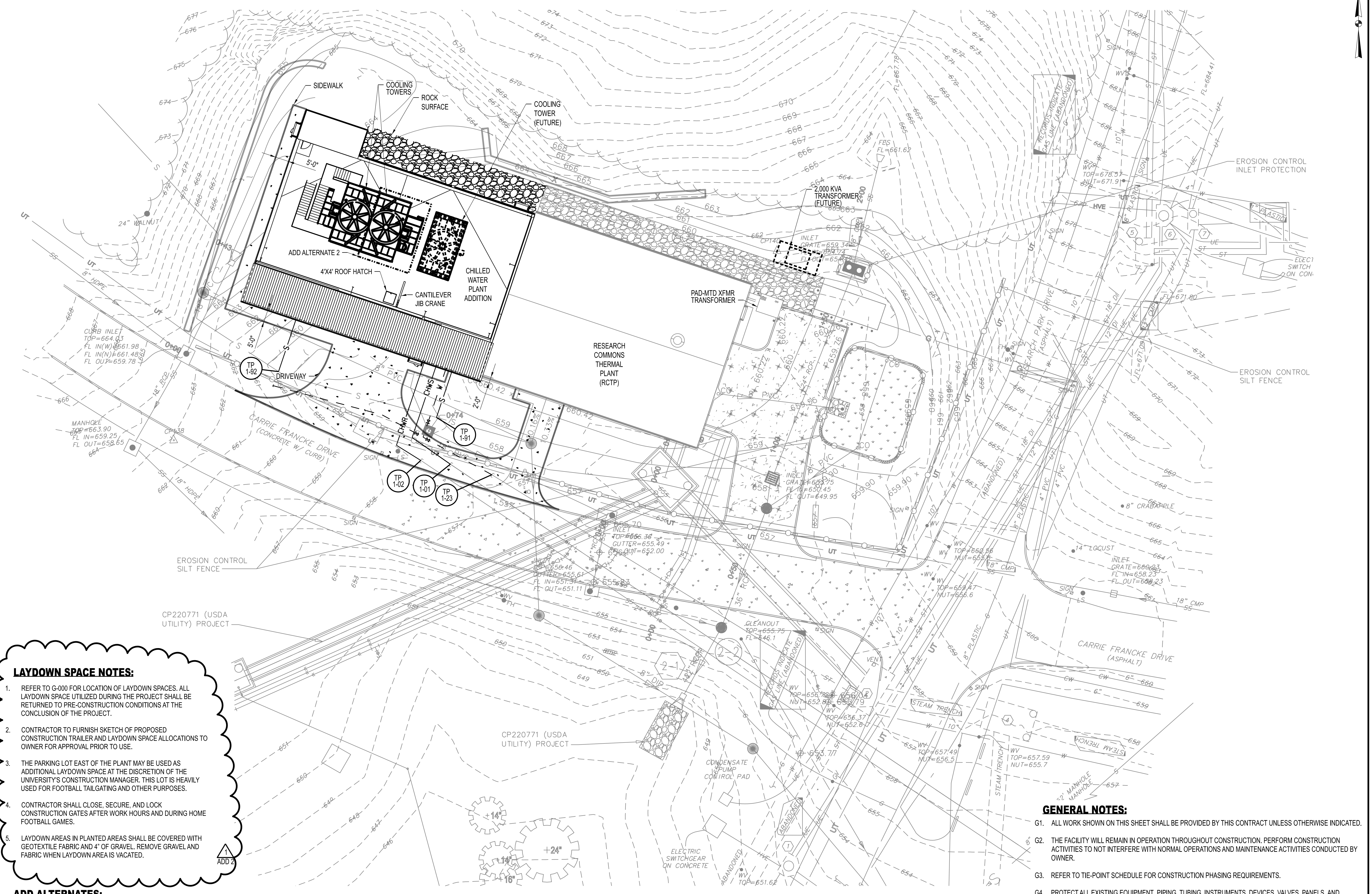
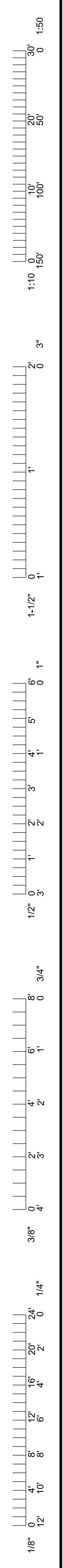


1	10/22/2025	ISSUED FOR ADDENDUM 2	CHECKED BY: JTG
0	12/05/2024	ISSUED FOR BID	DRAWN BY: SMH

PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE 563.263.5160
MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017605

UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
GENERAL LEGEND AND NOTES

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801
CONSULTANT
PROJECT NUMBER
23073
SHEET
G-002



LAYDOWN SPACE NOTES:

- REFER TO G-000 FOR LOCATION OF LAYDOWN SPACES. ALL LAYDOWN SPACE UTILIZED DURING THE PROJECT SHALL BE RETURNED TO PRE-CONSTRUCTION CONDITIONS AT THE CONCLUSION OF THE PROJECT.
- CONTRACTOR TO FURNISH SKETCH OF PROPOSED CONSTRUCTION TRAILER AND LAYDOWN SPACE ALLOCATIONS TO OWNER FOR APPROVAL PRIOR TO USE.
- THE PARKING LOT EAST OF THE PLANT MAY BE USED AS ADDITIONAL LAYDOWN SPACE AT THE DISCRETION OF THE UNIVERSITY'S CONSTRUCTION MANAGER. THIS LOT IS HEAVILY USED FOR FOOTBALL TAILGATING AND OTHER PURPOSES.
- CONTRACTOR SHALL CLOSE, SECURE, AND LOCK CONSTRUCTION GATES AFTER WORK HOURS AND DURING HOME FOOTBALL GAMES.
- LAYDOWN AREAS IN PLANTED AREAS SHALL BE COVERED WITH GEOTEXTILE FABRIC AND 4" OF GRAVEL. REMOVE GRAVEL AND FABRIC WHEN LAYDOWN AREA IS VACATED.

ADD ALTERNATES:

- ADD ALTERNATE 1 - LOOP PUMP LP-02.
- ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
- ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.

GENERAL ARRANGEMENT PLAN - SITE
SCALE: 1/16"=1'-0"

GENERAL NOTES:

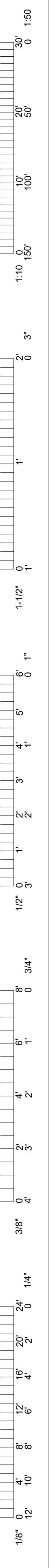
- ALL WORK SHOWN ON THIS SHEET SHALL BE PROVIDED BY THIS CONTRACT UNLESS OTHERWISE INDICATED.
- THE FACILITY WILL REMAIN IN OPERATION THROUGHOUT CONSTRUCTION. PERFORM CONSTRUCTION ACTIVITIES TO NOT INTERFERE WITH NORMAL OPERATIONS AND MAINTENANCE ACTIVITIES CONDUCTED BY OWNER.
- REFER TO TIE-POINT SCHEDULE FOR CONSTRUCTION PHASING REQUIREMENTS.
- PROTECT ALL EXISTING EQUIPMENT, PIPING, TUBING, INSTRUMENTS, DEVICES, VALVES, PANELS, AND ACCESSORIES FROM DAMAGE DURING DEMOLITION AND CONSTRUCTION ACTIVITIES.
- FIELD VERIFY ALL CONNECTION SIZES AND TYPES PRIOR TO DEMOLITION AND CONSTRUCTION ACTIVITIES AS WELL AS SUBMITTAL PREPARATION.
- PROVIDE TEMPORARY CAPS, COVERS, OR BLIND FLANGES TO PROTECT EQUIPMENT AND PIPING FROM ENTRY OF FOREIGN MATERIALS DURING DEMOLITION AND CONSTRUCTION ACTIVITIES.

1	10/22/2025	ISSUED FOR ADDENDUM 2	CHECKED BY: JTG
0	12/05/2024	ISSUED FOR BID	
		DRAWN BY: SMH	

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RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
GENERAL ARRANGEMENT PLAN - SITE

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801
CONSULTANT
PROJECT NUMBER
23073
SHEET
GA-100



GENERAL NOTES

- EXISTING TOPOGRAPHIC CONDITIONS, CONTOURS, AND ELEVATIONS ARE BASED UPON TOPOGRAPHIC SURVEYS PERFORMED BY ENGINEERING SURVEYS AND SERVICES, 1113 FAY STREET, COLUMBIA, MO. (573) 449-2646 DATED MARCH 25, 2021. THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE IN WRITING IF EXISTING CONDITIONS DIFFER FROM THAT SHOWN ON THE PLANS, AND TO WHAT EXTENT THE CONSTRUCTION IS AFFECTED.
- DO NOT SCALE DRAWINGS, USE DIMENSIONS SHOWN. ANY DISCREPANCY SHALL BE REPORTED IMMEDIATELY TO THE OWNER'S REPRESENTATIVE.
- THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS TO ACCOMPLISH THIS WORK. THE COST OF THESE PERMITS SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
- SITE DIMENSIONS ARE TO FACE OF CURB, PROPERTY LINE OR FACE OF BUILDING UNLESS OTHERWISE NOTED. ALL DIMENSIONS AND RADII TO OR FROM CURB LINES ARE TO FACE OF CURB.
- CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL SURVEY OR PROPERTY MARKERS AND MONUMENTS. ANY MARKERS OR MONUMENTS THAT ARE REMOVED OR DISTURBED BY THE CONTRACTOR'S ACTIONS SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE BY A REGISTERED LAND SURVEYOR IN THE STATE OF MISSOURI.
- DO NOT DISTURB ANY UTILITIES UNLESS NOTED OTHERWISE.
- USE OF EXPLOSIVES AND BURNING ON-SITE WILL NOT BE PERMITTED.
- ALL CONSTRUCTION ACTIVITIES TO COMPLY WITH APPLICABLE OSHA REGULATIONS.
- ALL PLANTED AREAS DISTURBED BY CONSTRUCTION SHALL BE RESTORED TO WITHIN 6 INCHES OF FINAL GRADE FOR GRASS AREAS AND 18 INCHES OF FINAL GRADE FOR PLANTERS. 6 INCHES OF TOPSOIL FOR GRASS AREAS AND 18 INCHES OF TOPSOIL FOR PLANTERS, FINAL GRADING, SEEDING AND MULCH WILL BE PROVIDED BY OTHERS.
- CONTRACTOR SHALL CONTROL DUST BY SPRINKLING OF WATER OR ANY OTHER NECESSARY MEANS APPROVED BY THE OWNER'S REPRESENTATIVE.
- LAYDOWN AREAS IN PLANTED AREAS SHALL BE COVERED WITH GEOTEXTILE FABRIC AND 4" OF GRAVEL. REMOVE GRAVEL AND FABRIC WHEN LAYDOWN AREA IS VACATED.
- DO NOT STORE EQUIPMENT OR MATERIAL IN AREA OF TREES. PROTECT TREES FROM DAMAGE UNLESS NOTED OTHERWISE. OWNER WILL TRIM TREES AS REQUIRED PRIOR TO CONSTRUCTION. COORDINATE WITH OWNER'S REPRESENTATIVE.
- INSTALL CONSTRUCTION FENCING AROUND THE DRIP LINES OF ALL TREES IN WORK AREAS.
- COORDINATE CONSTRUCTION FENCE LOCATION WITH OWNER'S REPRESENTATIVE PRIOR TO PROCEEDING.
- THE CONTRACTOR SHALL DESIGN, FURNISH, INSTALL, AND TEST DEWATERING SYSTEMS OF SUFFICIENT SCOPE, SIZE, AND CAPACITY TO CONTROL HYDROSTATIC PRESSURES AND TO CONTROL, REMOVE AND DISPOSE OF GROUND WATER AND SURFACE WATER AND TO PERMIT EXCAVATION AND CONSTRUCTION TO PROCEED ON DRY, STABLE SUBGRADES.
- THE CONTRACTOR SHALL CONTINUOUSLY MONITOR AND MAINTAIN DEWATERING SYSTEMS TO ENSURE STABILITY OF EXCAVATIONS AND CONSTRUCTION SLOPES, THAT EXCAVATIONS DO NOT FLOOD, AND THAT DAMAGE TO SUBGRADES AND PERMANENT STRUCTURES IS PREVENTED.
- PREVENT SURFACE WATER FROM ENTERING EXCAVATIONS BY GRADING, DIKES, BYPASS PUMPS, OR OTHER MEANS APPROVED BY THE OWNER'S REPRESENTATIVE.
- COMPLY WITH GOVERNING EPA AND MISSOURI DNR NOTIFICATION REGULATIONS BEFORE BEGINNING DEWATERING. COMPLY WITH APPLICABLE STORM WATER POLLUTION PREVENTION PLANS AND OTHER REGULATIONS OF AUTHORITIES HAVING JURISDICTION.
- PREVENT GRAVEL, SOIL, SEDIMENT, AND OTHER DEBRIS FROM ENTERING OR CLOGGING COMPLETED FOUNDATION DRAINS.
- CONTRACTOR SHALL PROVIDE ALL TRAFFIC CONTROL DEVICES FOR STREET CLOSURES AND DETOURS IN ACCORDANCE WITH THE TRAFFIC CONTROL PLAN AS APPROVED BY THE AUTHORITIES HAVING JURISDICTION AND OWNER'S REPRESENTATIVE.

SITE DEMOLITION NOTES:

- THE APPROPRIATE UTILITY AGENCY SHALL BE NOTIFIED PRIOR TO THE COMMENCEMENT OF ANY WORK WHICH WILL AFFECT AN EXISTING UTILITY.
- HAUL ROUTE APPROVAL SHALL BE OBTAINED FROM THE OWNER'S REPRESENTATIVE PRIOR TO THE COMMENCEMENT OF HAULING.
- IN REMOVING PAVEMENT, CURB, GUTTER, SIDEWALKS AND OTHER SIMILAR IMPROVEMENTS AND WHERE A PORTION OF SUCH IMPROVEMENTS ARE TO BE LEFT IN PLACE, THEY SHALL BE REMOVED TO AN EXISTING JOINT OR SAWCUT AT LIMITS OF REMOVAL.
- CONTRACTOR SHALL REPLACE ALL PAVEMENT, CURBS, GUTTERS, WALKS, DRAINAGE STRUCTURES, PAVEMENT MARKING, ETC. REMOVED OR DAMAGED DURING CONSTRUCTION. COMPLY WITH CITY OF COLUMBIA AND MU STANDARDS, AS APPLICABLE.
- ALL EXISTING SIGNAGE SHALL BE PROTECTED, OR REMOVED AND REINSTALLED AT ITS ORIGINAL LOCATION UNLESS NOTED OTHERWISE ON THE PLANS. THE OWNER'S REPRESENTATIVE SHALL APPROVE THE FINAL LOCATION OF ALL SIGNAGE. THE CONTRACTOR SHALL REPLACE, AT HIS EXPENSE, ANY SIGNS DAMAGED OR LOST DURING REMOVAL, STORAGE AND RESETTling.
- ANY TRAFFIC CONTROL SIGNS SUCH AS STOP, YIELD, OR SLOW REMOVED AND STORED WHILE A STREET REMAINS OPEN TO TRAFFIC SHALL BE REPLACED WITH SIMILAR TEMPORARY SIGNS IN ACCORDANCE WITH MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.). ALL TRAFFIC CONTROL SHALL COMPLY WITH THE REQUIREMENTS OF THE CITY OF COLUMBIA, MISSOURI, TRAFFIC ENGINEERING DEPARTMENT.
- ALL CONDUIT, WIRES, CABLES, ELECTRICAL BOXES AND DEVICES, DUCTS, FITTINGS, VALVES, AND OTHER DEBRIS RESULTING FROM THE DEMOLITION OF UTILITIES SHALL BE REMOVED AND DISPOSED OF OFF SITE.
- ALL DEBRIS RESULTING FROM THE DEMOLITION OF PAVEMENTS, CURBING, STRUCTURES, FOUNDATIONS AND FOOTINGS SHALL BE REMOVED FROM THE SITE AND LEGALLY DISPOSED OF UNLESS NOTED OTHERWISE IN THE PROJECT SPECIFICATIONS.
- ALL ORGANIC AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED FROM THE SITE.

WATER LINE CONSTRUCTION NOTES

- ALL WATER LINES SHALL BE LAID AT LEAST 10 FEET HORIZONTALLY FROM ANY SANITARY SEWER, STORM SEWER, OR MANHOLE. WHENEVER WATER LINES MUST CROSS SANITARY SEWERS, LATERALS, OR STORM DRAINS, THE WATER LINES SHALL BE LAID TO COMPLY WITH THE REQUIREMENTS OF THE MISSOURI DEPARTMENT OF NATURAL RESOURCES CLEARANCE REQUIREMENTS.
- MAINTAIN MINIMUM 3' CLEAR BETWEEN WATER LINES AND STEAM CHASE, UNO.
- MAINTAIN MINIMUM 2' CLEAR BETWEEN WATER LINES AND ELECTRIC DUCT BANKS, UNO.
- MAINTAIN MINIMUM 2' CLEAR BETWEEN WATER LINES AND TELEPHONE DUCT BANKS, UNO.
- IN AREAS WHERE THE RECOMMENDED SEPARATIONS CANNOT BE OBTAINED, CONTRACTOR SHALL OBTAIN ENGINEER'S DIRECTION PRIOR TO PROCEEDING.

EXCAVATION/GRADING NOTES

- DAMAGE TO OFF-SITE STREETS AND PROPERTIES DUE TO SOIL EROSION OR SILTATION SHALL BE PREVENTED BY ERECTING SILT BARRIERS OR BASINS, OR BY UTILIZING SIMILAR DEVICES TO EFFECT SOIL STABILIZATION. INSPECTION OF AND NECESSARY REPAIRS MADE TO THE EROSION CONTROL MEASURES MUST BE MADE DAILY FOLLOWING PERIODS OF PRECIPITATION, AND/OR AS DIRECTED BY THE OWNER'S REPRESENTATIVE. ADDITIONAL EROSION CONTROL MEASURES SHALL BE INSTALLED BY THE CONTRACTOR IF DIRECTED.
- EROSION, SEDIMENTATION AND WATER POLLUTION CONTROL MEASURES ARE REFERENCED ON PLAN SHEETS C500. EROSION CONTROL DETAILS CAN BE FOUND ON SHEET C-702.
- ALL TRENCHES UNDER NEW PAVEMENT OR SIDEWALKS SHALL BE BACKFILLED TO SUBGRADE ELEVATION WITH COMPACTED CRUSHED LIMESTONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE UNIVERSITY OF MISSOURI.
- ELEVATIONS AND CONTOURS SHOWN ARE TO TOP OF FINISHED GROUND OR PAVED SURFACE, UNLESS NOTED OTHERWISE.
- ALL TRASH, DEBRIS, ORGANIC MATERIAL, REFUSE, FROZEN EARTH, ETC., SHALL BE REMOVED FROM FILL AREAS PRIOR TO THE PLACEMENT OF CONTROLLED FILL.
- CARE SHALL BE EXERCISED IN COMPACTION OF BACKFILL MATERIALS OVER THE TOP OF STRUCTURES OR PIPES IN ORDER TO PREVENT DAMAGE TO THE WATERPROOFING MEMBRANES, JOINTS, SEALS, AND/OR THE PIPES AND STRUCTURES THEMSELVES.
- EXCAVATED MATERIALS SHALL NOT BE STORED ON SITE.
- BACKFILLING AND COMPACTION OF EXCAVATED AREAS SHALL BE CLOSELY MONITORED BY THE OWNER'S REPRESENTATIVE. THE CONTRACTOR SHALL CLOSELY FOLLOW ALL REQUIREMENTS OF THE TECHNICAL SPECIFICATIONS REGARDING PLACING AND COMPACTION BACKFILL.

GENERAL UTILITY NOTES

- THE CONTRACTOR SHALL COORDINATE THROUGH THE OWNER'S REPRESENTATIVE PRIOR TO THE COMMENCEMENT OF ANY WORK WHICH WILL AFFECT ANY EXISTING UTILITY. CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL FEES ASSOCIATED WITH PROVIDING UTILITY SERVICES TO THE BUILDING.
- UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE INFORMATION AND THEREFORE THEIR LOCATIONS SHALL BE CONSIDERED APPROXIMATE ONLY. THE VERIFICATION OF THE LOCATION OF ALL UNDERGROUND UTILITIES, EITHER SHOWN OR NOT SHOWN ON THESE PLANS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THIS WORK SHALL BE COMPLETED PRIOR TO ANY GRADING OR CONSTRUCTION OF THE IMPROVEMENTS. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO PROTECT ALL SUCH UNDERGROUND UTILITIES DURING ALL PHASES OF WORK. ENDS OF REMAINING CONDUITS OR PIPES SHALL BE PLUGGED OR CAPPED.
- LOCATE EXISTING UNDERGROUND UTILITIES AND SEWERS IN THE AREAS OF WORK BEFORE STARTING OPERATIONS. WHEN UTILITIES OR SEWERS ARE TO REMAIN IN PLACE, PROVIDE ADEQUATE MEANS OF PROTECTION DURING OPERATIONS. SHOULD UNCHARTED, OR INCORRECTLY CHARTED, PIPING OR OTHER UTILITIES BE ENCOUNTERED DURING EXCAVATION, CONSULT THE OWNER'S REPRESENTATIVE AND UTILITY OWNER IMMEDIATELY FOR DIRECTIONS. REPAIR DAMAGED UTILITIES TO THE SATISFACTION OF THE UTILITY OWNER. REMOVALS OR RELOCATIONS BY UTILITY COMPANIES ARE TO BE INITIATED AND COORDINATED BY THE CONTRACTOR.
- ALL EXISTING UTILITY ACCESS COVERS SUCH AS MANHOLES, VALVE BOXES, VAULT COVERS, METER COVERS AND OTHER SURFACE APPURTENANCES SHALL BE ADJUSTED TO THE PROPER FINISH GRADE ELEVATION IN ACCORDANCE WITH THE REQUIREMENTS OF THE AFFECTED UTILITY COMPANY.
- FIELD VERIFY UTILITY ELEVATIONS AND SLOPES PRIOR TO CONSTRUCTING NEW CHASES AND MANHOLES.
- DESIGN OF SHORING FOR UTILITY AND SEWER TRENCHES IS THE RESPONSIBILITY OF THE CONTRACTOR.
- CONTRACTOR SHALL NOT BLOCK ACCESS TO ANY MANHOLE OR VALVE BOX. THEY SHALL REMAIN ACCESSIBLE AND NOT COVERED WITH DIRT OR OTHER MATERIALS AT ALL TIMES.
- ALL DUCTILE IRON PIPE (WATER, CWS, CWR, AND SEWER) SHALL HAVE CORROSION PROTECTION AS INDICATED IN SPECIFICATION SECTION 33 11 13.

STREET LIGHT CONSTRUCTION NOTES

- ALL EXISTING STREETLIGHTS WHICH ARE NOT PART OF THE CONSTRUCTION WORK SHALL BE PROTECTED AND REMAIN OPERATIONAL AT ALL TIMES. THE CONTRACTOR SHALL EXERCISE CARE TO INSURE THAT EXISTING CONDUITS, POLES, LIGHT ASSEMBLIES, PULL BOXES, AND OTHER STREET LIGHTING APPURTENANCES ARE NOT DAMAGED OR RENDERED UNSERVICEABLE DURING CONSTRUCTION.

SEWER CONSTRUCTION NOTES

- ELEVATION OF EXISTING SEWERS ARE FROM AVAILABLE PLANS, RECORD DRAWINGS AND/OR SURVEYS. ACTUAL ELEVATIONS MAY VARY FROM THOSE SHOWN. THE CONTRACTOR SHALL VERIFY LOCATIONS AND ELEVATIONS OF EXISTING SEWERS PRIOR TO COMMENCING CONSTRUCTION.
- TOPS OF ALL MANHOLES AND INLETS TO REMAIN IN PLACE SHALL BE ADJUSTED TO PROPER FINISH GRADE ELEVATION.

UNIVERSITY OF MISSOURI	TELECOMMUNICATIONS
ENERGY MANAGEMENT OFFICE 417 SOUTH FIFTH STREET COLUMBIA, MISSOURI 65211 CONTACT: 573-882-3094	MEDIACOM 901 N. COLLEGE AVENUE COLUMBIA, MISSOURI 65201 CONTACT: BOB BONER 573-443-1536 NONE WITHIN SURVEYED AREA
WATER CHILLED WATER, SANITARY SEWER, STORM SEWER	MoDOT
GAS AMEREN MISSOURI 2001 MAGUIRE BOULEVARD COLUMBIA, MISSOURI 65201 CONTACT: CHAD WARREN 573-876-3063 8" PLASTIC ALONG THE EAST SIDE OF RESEARCH PARK DRIVE	MoDOT - CENTRAL DISTRICT P.O. BOX 718 1511 MISSOURI BOULEVARD JEFFERSON CITY, MISSOURI 65102 CONTACT: JOHN KUHLMAN 573-522-6806 STORM SEWER ALONG STADIUM BOULEVARD

UTILITY NOTES

ALL UTILITIES ARE UNIVERSITY OF MISSOURI, EXCEPT AS NOTED BELOW. THE LOCATIONS, SIZES, AND MATERIAL TYPES OF UNDERGROUND UTILITIES INDICATED ON THE PLAT, NOT VISIBLE OR APPARENT FROM THE SURFACE, ARE SHOWN IN THEIR APPROXIMATE LOCATIONS FROM A MISSOURI ONE CALL SYSTEM LOCATE, OR UTILITY COMPANY RECORDS AND WERE NOT VERIFIED IN THE FIELD. IRRIGATION LINES WERE NOT LOCATED. UNDERGROUND ELECTRIC LINES TO LIGHTS WERE NOT LOCATED.

ABBREVIATIONS

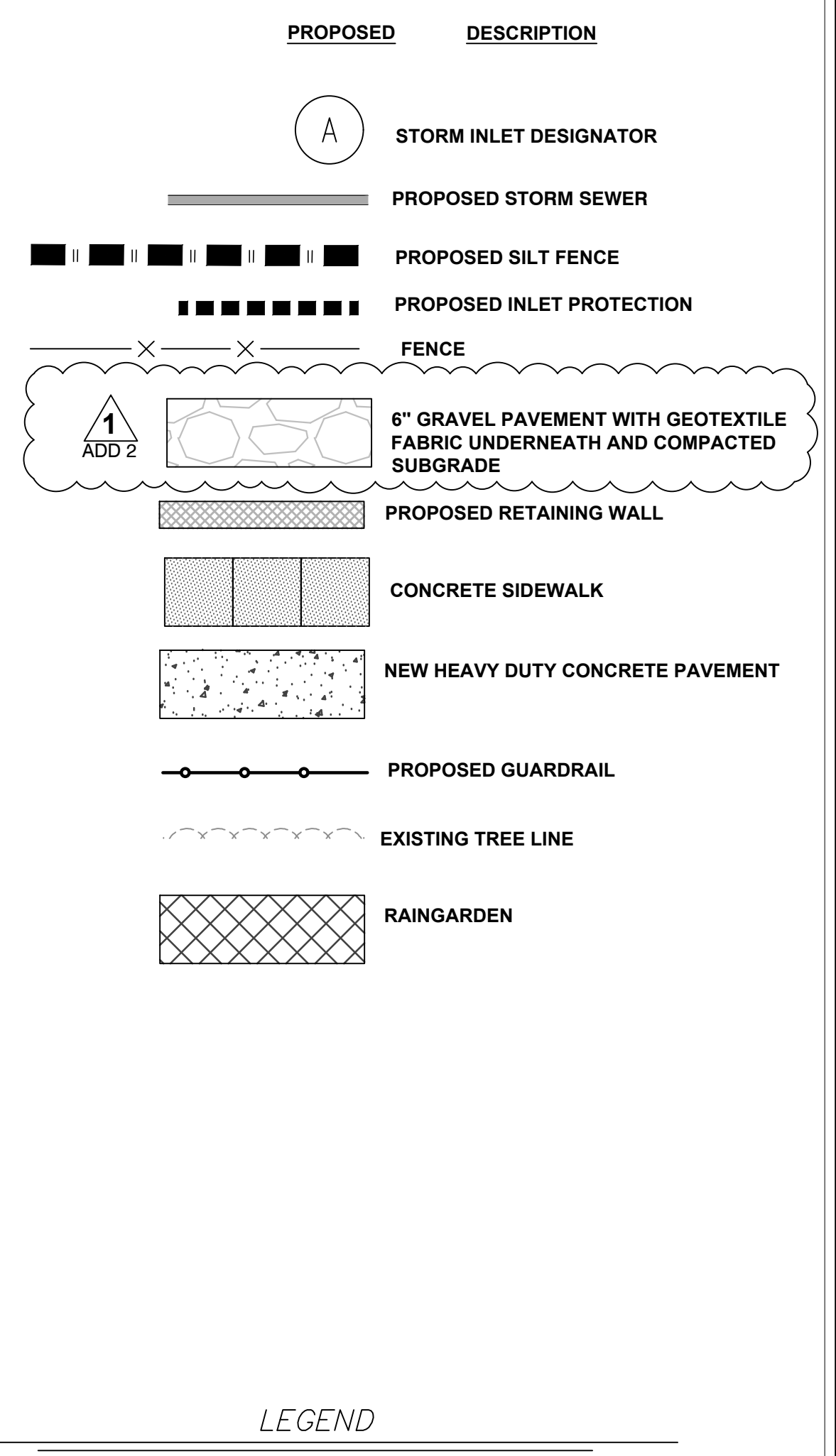
AE	FEMA 1% FLOOD ZONE	OHE	OVERHEAD ELECTRIC
APPX.	APPROXIMATE	PC	PORTLAND CEMENT
ASPH.	ASPHALT	PCC	POINT OF COMPOUND CURVATURE
A.T.G.	ADJUST TO GRADE	PI	POINT OF INTERSECTION
B.C.	BOTTOM OF CURB	PIV	POST INDICATOR VALVE
BLDG.	BUILDING	PL	PROPERTY LINE
BM	BENCHMARK	PL	PROPERTY LINE
C	CURVE	PC	POINT OF CURVATURE
CATV	CABLE TV	PRC	POINT OF REVERSE CURVATURE
CI	CURB INLET	PT	POINT OF TANGENCY
CI	CAST IRON	PVC	POINT OF VERTICAL CURVATURE
CL	CENTERLINE	PVC	POLYVINYL CHLORIDE PIPE
CL	CENTERLINE	PVI	POINT OF VERTICAL INTERSECTION
CWR	CHILLED WATER RETURN	PVMT	PAVEMENT
CWS	CHILLED WATER SUPPLY	PVT	POINT OF VERTICAL TANGENCY
CMP	CORRUGATED METAL PIPE	PUMI	PRIVATE UNDER MSD INSPECTION
CPP	CORRUGATED PLASTIC PIPE	R	RADIUS
C.O.	CLEAN OUT	RCP	REINFORCED CONCRETE PIPE
CONC.	CONCRETE	RD	ROOF DRAIN
CONST.	CONSTRUCTION	REQ'D.	REQUIRED
DI	DUCTILE IRON	RPZ	REDUCED PRESSURE ZONED
E	ELECTRIC	SAN	SANITARY
ELEV	ELEVATION	SD	STORM DRAIN
EX	EXISTING	SF	SQUARE FEET
FC	FACE OF CURB	SPEC	SPECIFICATIONS
FES	FLARED END SECTION	STM	STORM
FH	FIRE HYDRANT	STA.	STATION
FL	FLOWLINE	TBA	TO BE ABANDONED
FL	FLOWLINE	TBM	TEMPORARY BENCHMARK
FO	FIBER OPTIC	TBR	TO BE REMOVED
GV	GATE VALVE	TBR&R	TO BE REMOVED AND REPLACED
HDPE	HIGH DENSITY POLYETHYLENE PIPE	TBR&REL	TO BE REMOVED AND RELOCATED
HP	HIGH POINT	TC	TOP OF CURB
HORIZ	HORIZONTAL	TD	TRENCH DRAIN
IN	INCHES	TP	TELEPHONE PEDESTAL
INV	INVERT	TYP.	TYPICAL
IP	IRON PIPE	UGE	UNDER GROUND ELECTRIC
IR	IRON ROD	UIP	USE IN PLACE
JT	JOINT	UP	UTILITY POLE
LP	LIGHT POLE	VCP	VITRIFIED CLAY PIPE
LP	LOW POINT	VERT.	VERTICAL
LS	LIGHT STANDARD	W	WATER
MAX	MAXIMUM	WM	WATER METER
MH	MANHOLE	WV	WATER VALVE
MIN.	MINIMUM	Ø	DIAMETER
NO.	NUMBER	⊙	AT
N.I.C.	NOT IN CONTRACT		
N.T.S.	NOT TO SCALE		
OC	ON CENTER		
OD	OUTSIDE DIAMETER		

POINT #	NORTH	EAST	ELEVATION	DESCRIPTION
CP1	1128892.59	1686081.39	656.95	MUCP24
CP2	1128835.72	1687836.72	721.32	MUCP25
CP3	1128799.21	1686304.64	653.09	IRON
CP6	1129286.98	1686308.29	709.99	IRON
CP138	1128989.89	1685830.81	662.93	IRON
CP139	1128671.52	1686023.71	641.49	IRON
CP140	1129060.96	1686057.43	661.26	IRON

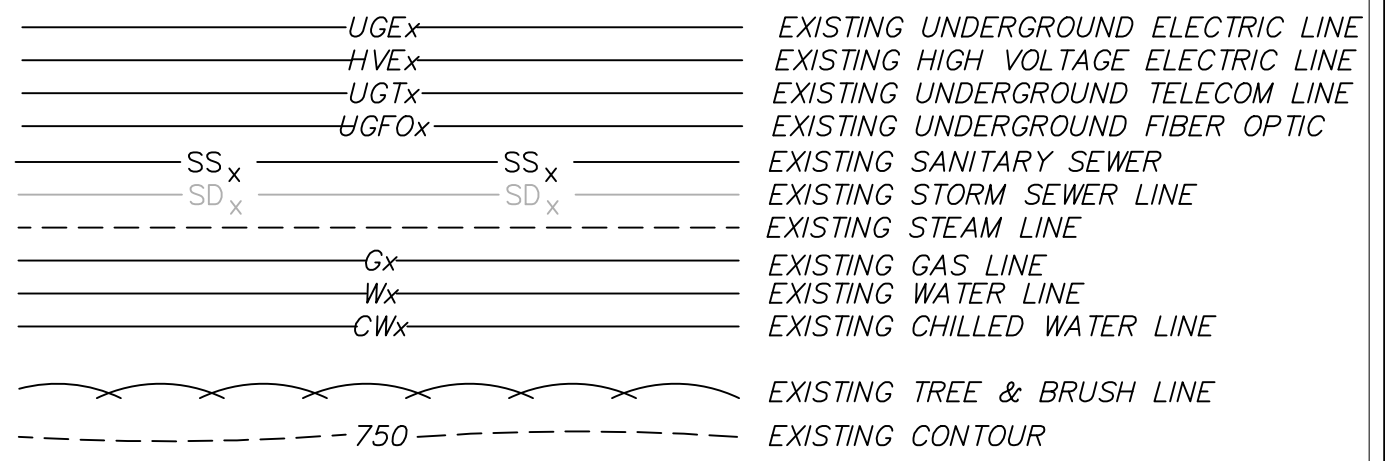
BENCH MARK

- BM - NGS BRASS PLATE STAMPED "UNIVERSITY OF MISSOURI RESET, 2005" IN A CONCRETE HEADWALL FOR A SPOTLIGHT LOCATED 30 FEET SOUTHWEST OF THE WEST COLUMN IN THE FRANCIS QUADRANGLE. ELEVATION = 743.60
- BM - UNIVERSITY OF MISSOURI CONTROL MONUMENT "CPO24", BRASS DISK IN CONCRETE LOCATED ON THE SOUTHWEST CORNER OF STEAM MANHOLE 648 AT THE SOUTHWEST CORNER OF THE INTERSECTION OF RESEARCH PARK DRIVE AND CARRIE FRANCKE DRIVE. ELEVATION = 656.95

CIVIL LEGEND

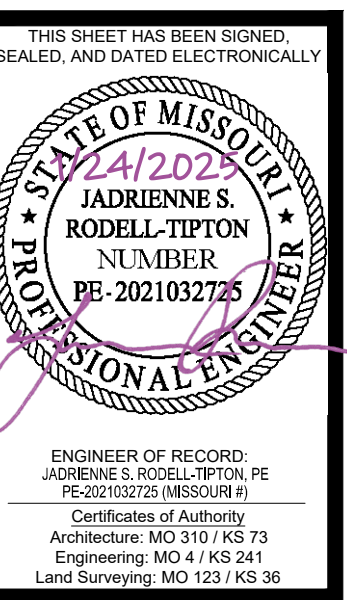


LEGEND

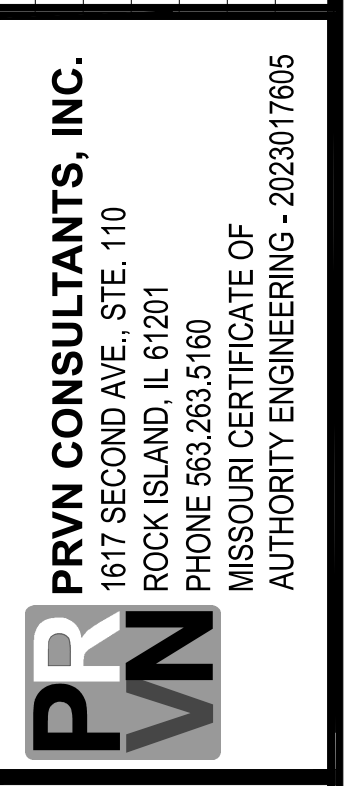


ABBREVIATIONS

△ CP#	CONTROL POINT
CI	CAST IRON PIPE
CMP	CORRUGATED METAL PIPE
CPP	CORRUGATED PLASTIC PIPE
DI	DUCTILE IRON PIPE
EM	ELECTRIC METER
EPB	ELECTRIC PULLBOX
FDC	FIRE DEPARTMENT CONNECTION
FES	FLARED END SECTION
FH	FIRE HYDRANT
FL	FLOW LINE
FPB	FIBER OPTIC PULLBOX
HDPE	HIGH DENSITY POLYETHYLENE PIPE
LS	LIGHT STANDARD
LP	LIGHT POLE
PVC	POLYVINYL CHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
TELECOM	TELECOMMUNICATIONS
TP	TELECOMMUNICATIONS PEDESTAL
TW	TOP OF WALL
URD	UNDERGROUND ROOF DRAIN
VCP	VITRIFIED CLAY PIPE
WM	WATER METER
WV	WATER VALVE



NO.	ISSUED FOR ADDENDUM	ISSUED FOR BID	CHECKED BY
1	01/22/25	12/05/24	JRT
0			AA

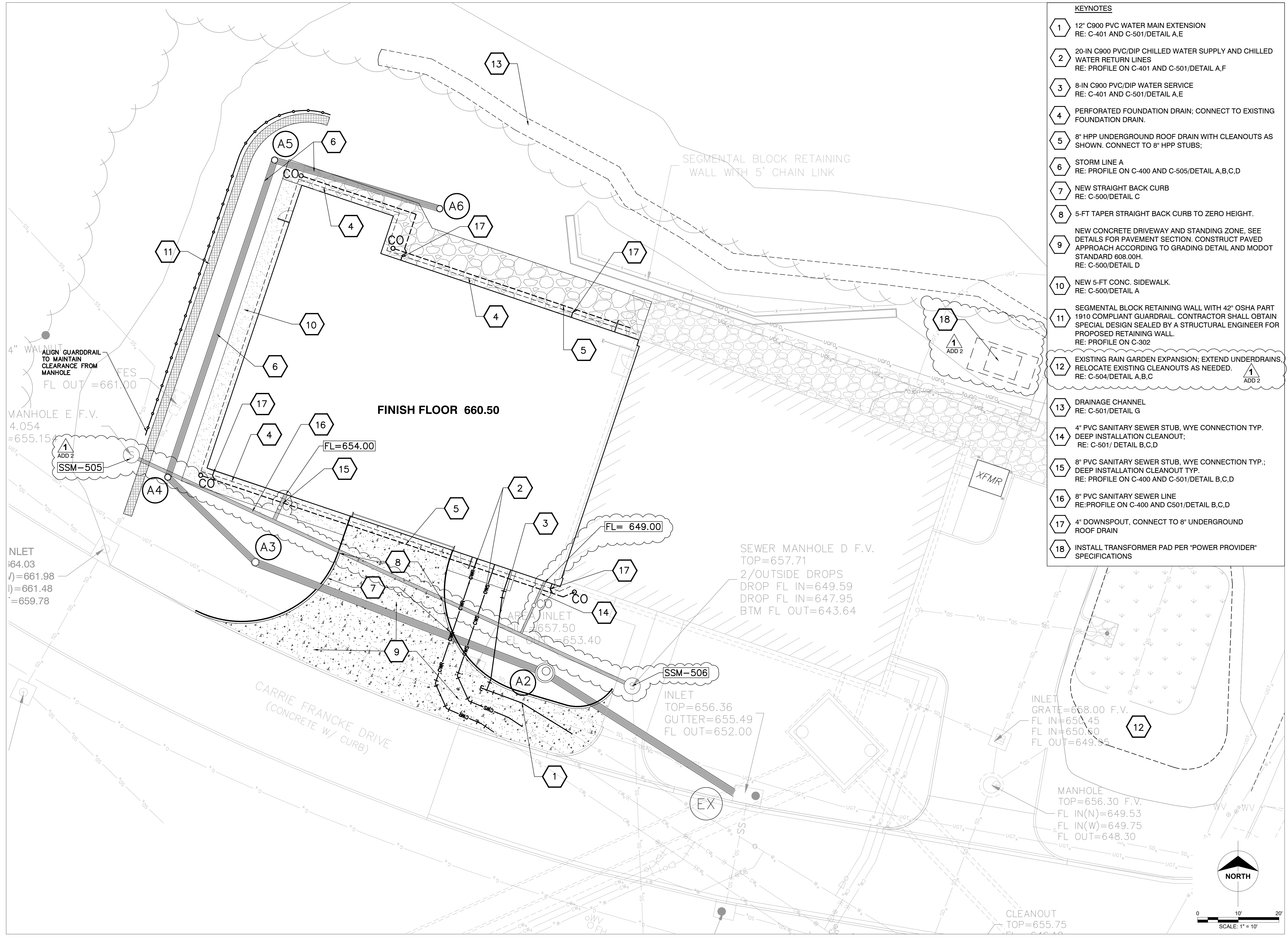
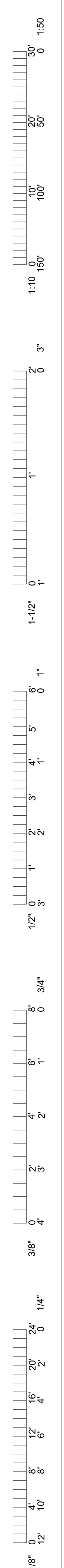


UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
GENERAL NOTES

UNIVERSITY PROJECT NUMBER
CP232801

CONSULTANT PROJECT NUMBER
23-2210

SHEET
C-001



- KEYNOTES**
- 1 12" C900 PVC WATER MAIN EXTENSION
RE: C-401 AND C-501/DETAIL A,E
 - 2 20-IN C900 PVC/DIP CHILLED WATER SUPPLY AND CHILLED WATER RETURN LINES
RE: PROFILE ON C-401 AND C-501/DETAIL A,F
 - 3 8-IN C900 PVC/DIP WATER SERVICE
RE: C-401 AND C-501/DETAIL A,E
 - 4 PERFORATED FOUNDATION DRAIN; CONNECT TO EXISTING FOUNDATION DRAIN.
 - 5 8" HPP UNDERGROUND ROOF DRAIN WITH CLEANOUTS AS SHOWN. CONNECT TO 8" HPP STUBS;
 - 6 STORM LINE A
RE: PROFILE ON C-400 AND C-505/DETAIL A,B,C,D
 - 7 NEW STRAIGHT BACK CURB
RE: C-500/DETAIL C
 - 8 5-FIT TAPER STRAIGHT BACK CURB TO ZERO HEIGHT.
 - 9 NEW CONCRETE DRIVEWAY AND STANDING ZONE. SEE DETAILS FOR PAVEMENT SECTION. CONSTRUCT PAVED APPROACH ACCORDING TO GRADING DETAIL AND MODOT STANDARD 608.00H.
RE: C-500/DETAIL D
 - 10 NEW 5-FT CONC. SIDEWALK.
RE: C-500/DETAIL A
 - 11 SEGMENTAL BLOCK RETAINING WALL WITH 42" OSHA PART 1910 COMPLIANT GUARDRAIL. CONTRACTOR SHALL OBTAIN SPECIAL DESIGN SEALED BY A STRUCTURAL ENGINEER FOR PROPOSED RETAINING WALL.
RE: PROFILE ON C-302
 - 12 EXISTING RAIN GARDEN EXPANSION; EXTEND UNDERDRAINS. RELOCATE EXISTING CLEANOUTS AS NEEDED.
RE: C-504/DETAIL A,B,C
 - 13 DRAINAGE CHANNEL
RE: C-501/DETAIL G
 - 14 4" PVC SANITARY SEWER STUB, WYE CONNECTION TYP. DEEP INSTALLATION CLEANOUT;
RE: C-501/ DETAIL B,C,D
 - 15 8" PVC SANITARY SEWER STUB, WYE CONNECTION TYP.; DEEP INSTALLATION CLEANOUT TYP.
RE: PROFILE ON C-400 AND C-501/DETAIL B,C,D
 - 16 8" PVC SANITARY SEWER LINE
RE: PROFILE ON C-400 AND C501/DETAIL B,C,D
 - 17 4" DOWNSPOUT, CONNECT TO 8" UNDERGROUND ROOF DRAIN
 - 18 INSTALL TRANSFORMER PAD PER "POWER PROVIDER" SPECIFICATIONS

THIS SHEET HAS BEEN SIGNED, SCALED, AND DATED ELECTRONICALLY

ADRIENNE S. RODELL-TIPTON
NO. 2021032725
PROFESSIONAL ENGINEER

ENGINEER OF RECORD
ADRIENNE S. RODELL-TIPTON, PE
Certificates of Authority
Architecture: MO 310 / KS 73
Engineering: MO 414 / KS 241
Land Surveying: MO 123 / KS 36

POWELL CWM
ARCHITECTURE/ENGINEERING/SURVEYING
300 S. S. 10th St., Suite 100
P.O. Box 24800, Des Moines, IA 50324
(515) 248-0100

ISSUED FOR ADDENDUM 2	CHECKED BY: JRT
ISSUED FOR BID	DRAWN BY: AA
01/22/25	2023/07/05

PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE 563.263.5160
MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017605

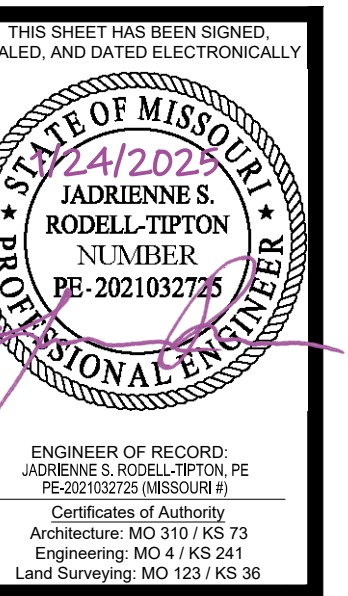
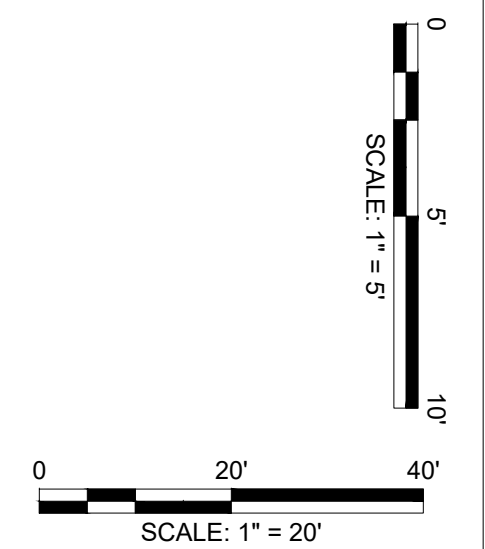
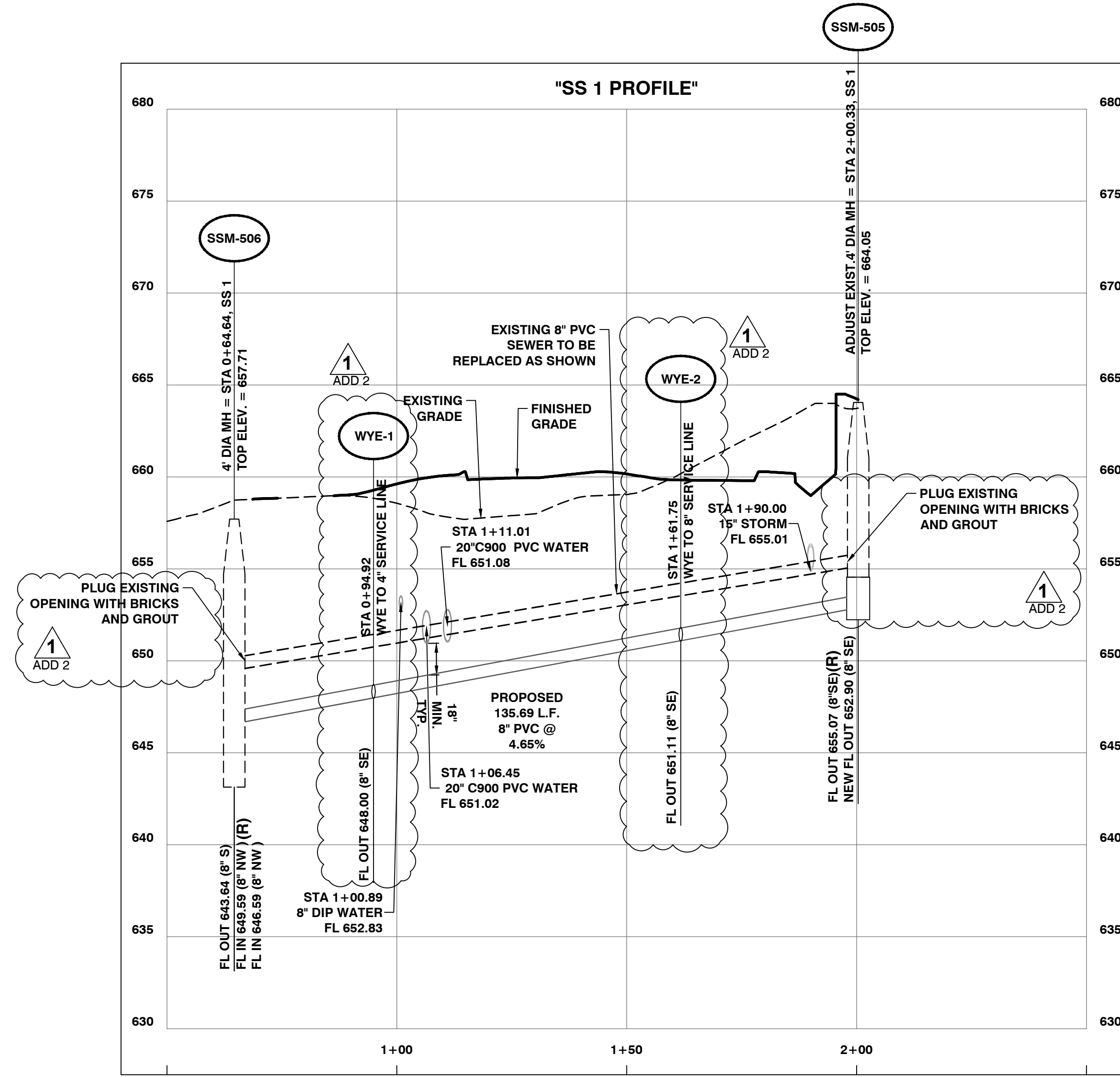
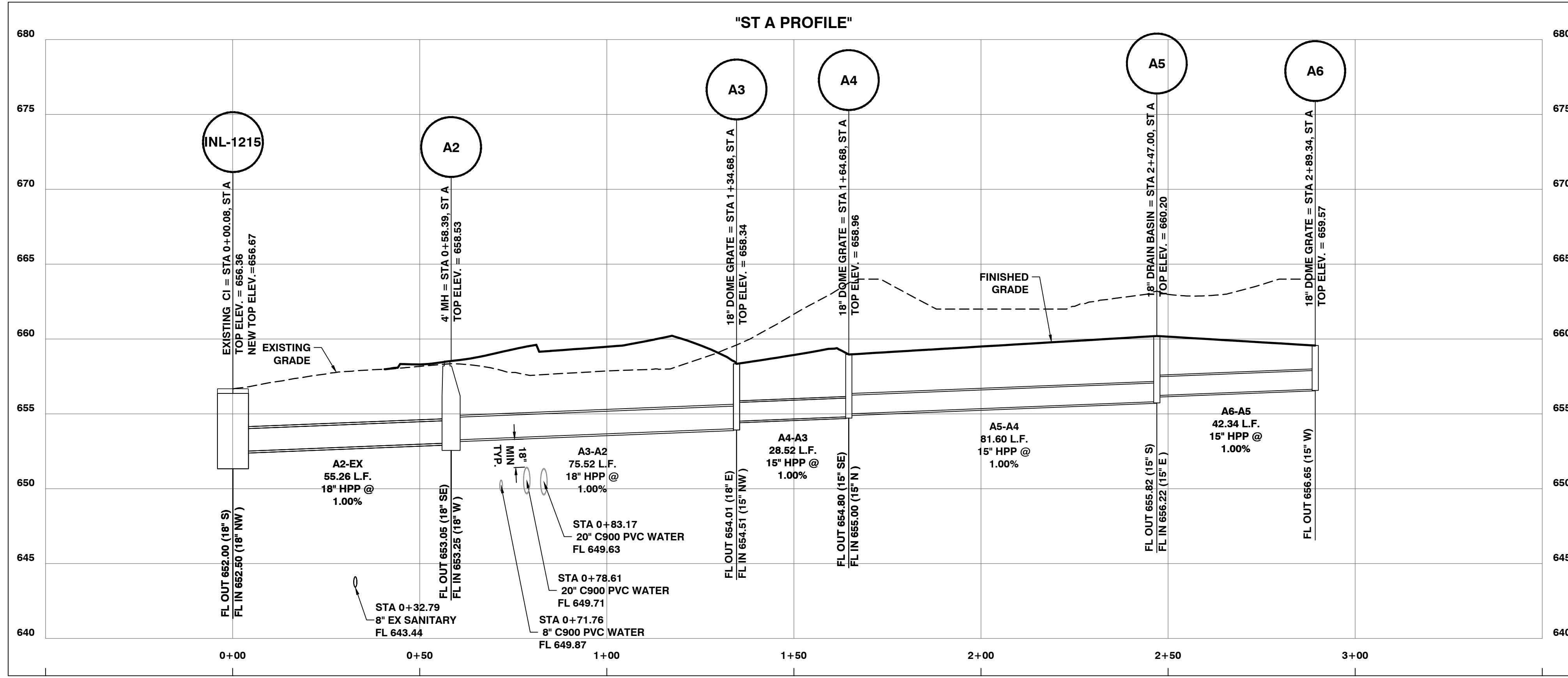
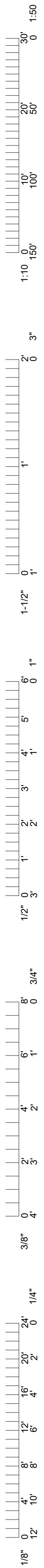
UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
SITE PLAN

UNIVERSITY PROJECT NUMBER
CP232801

CONSULTANT PROJECT NUMBER
23-2210

SHEET
C-200

NORTH
SCALE: 1" = 10'



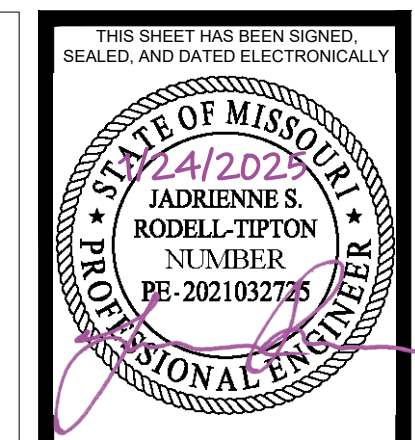
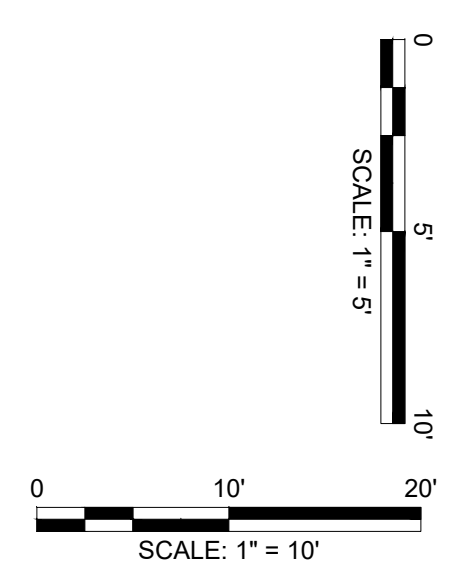
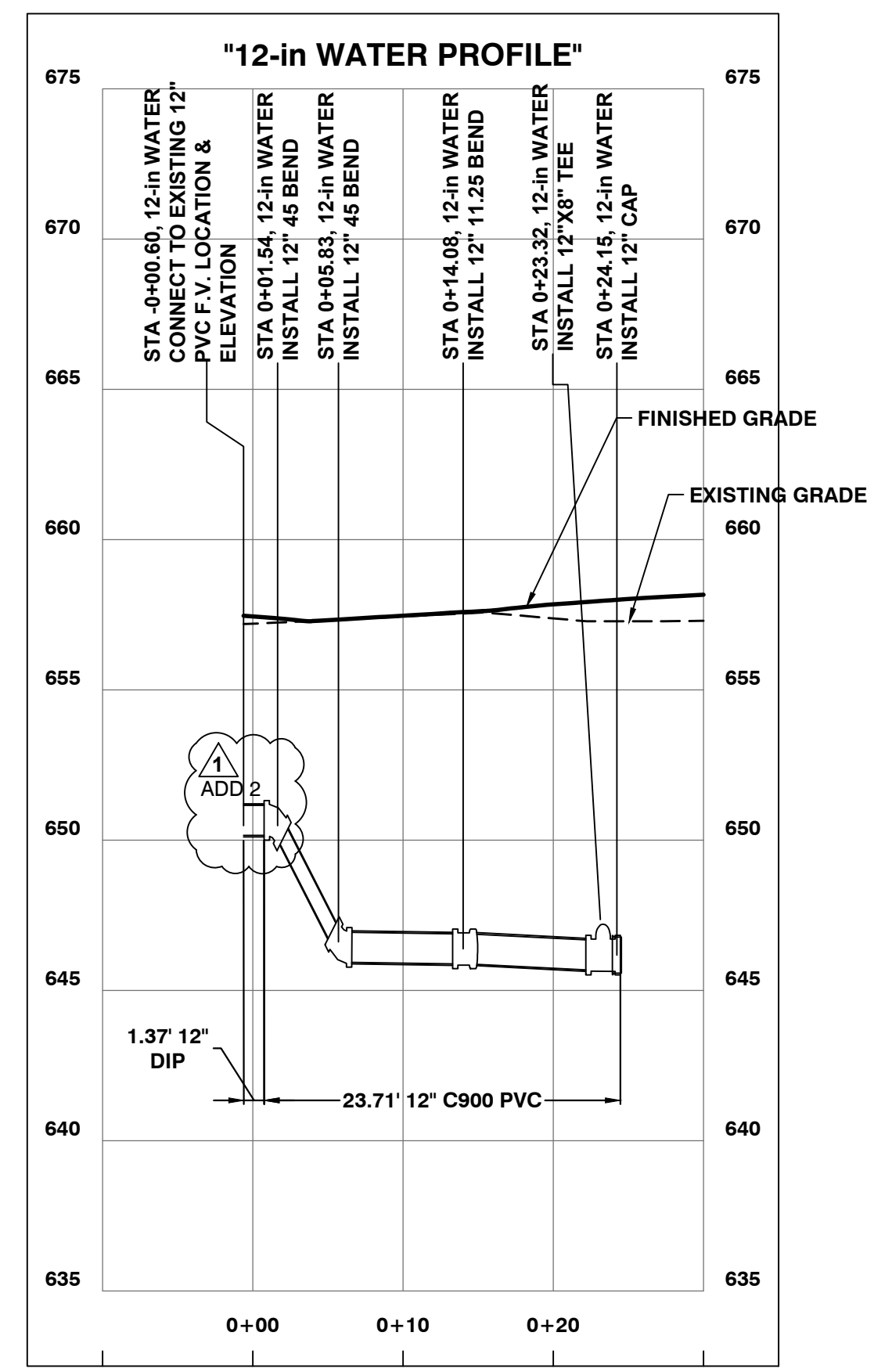
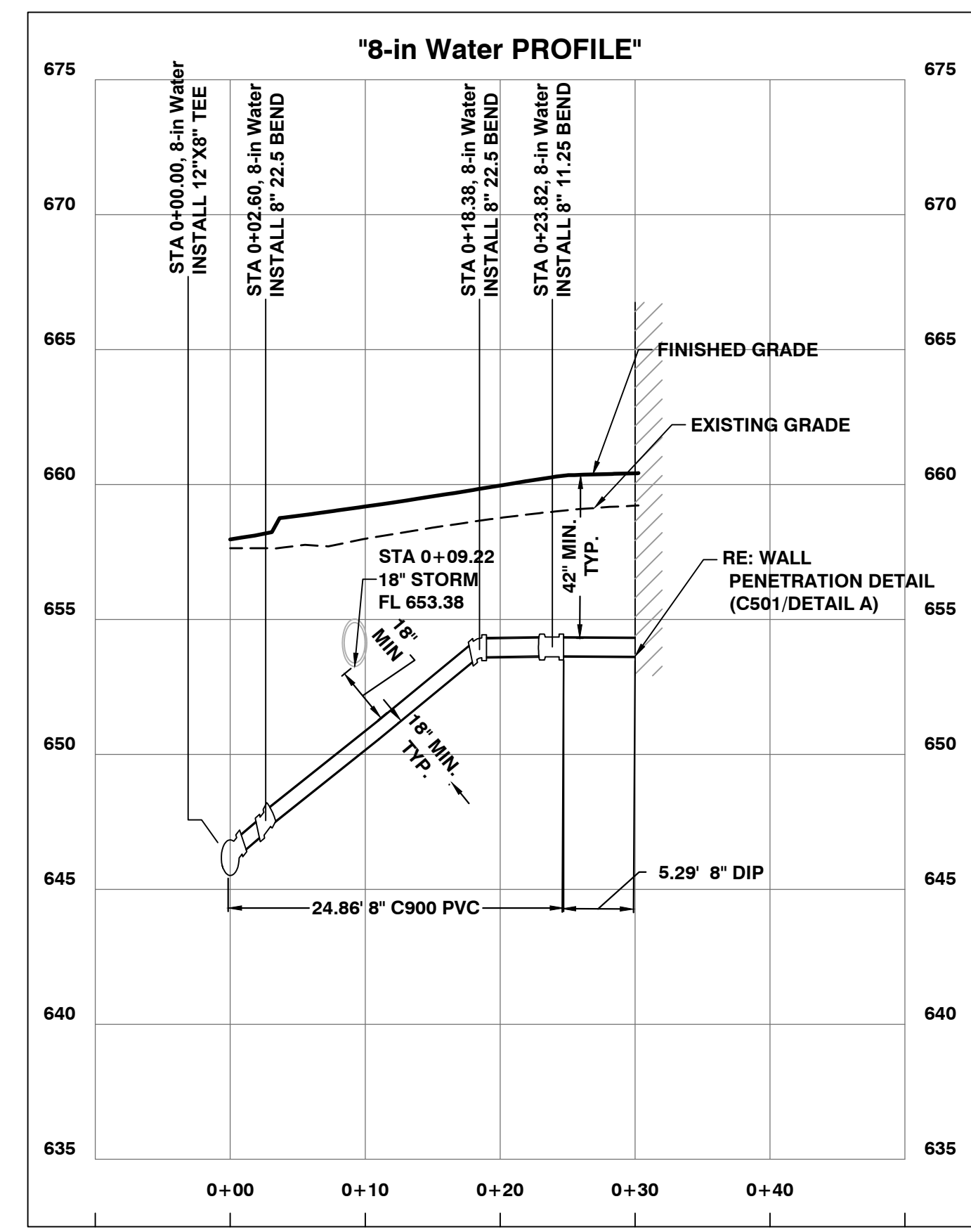
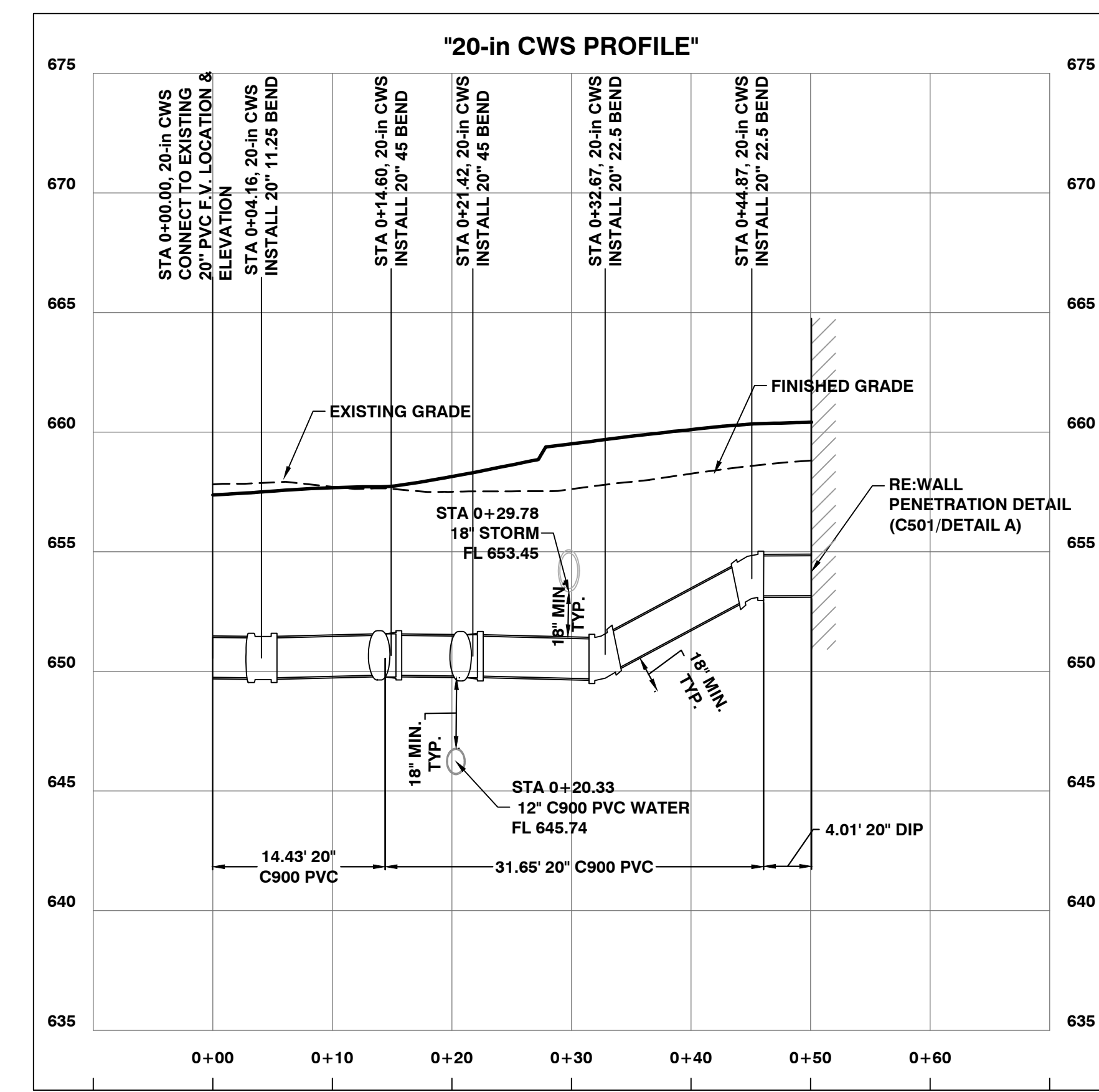
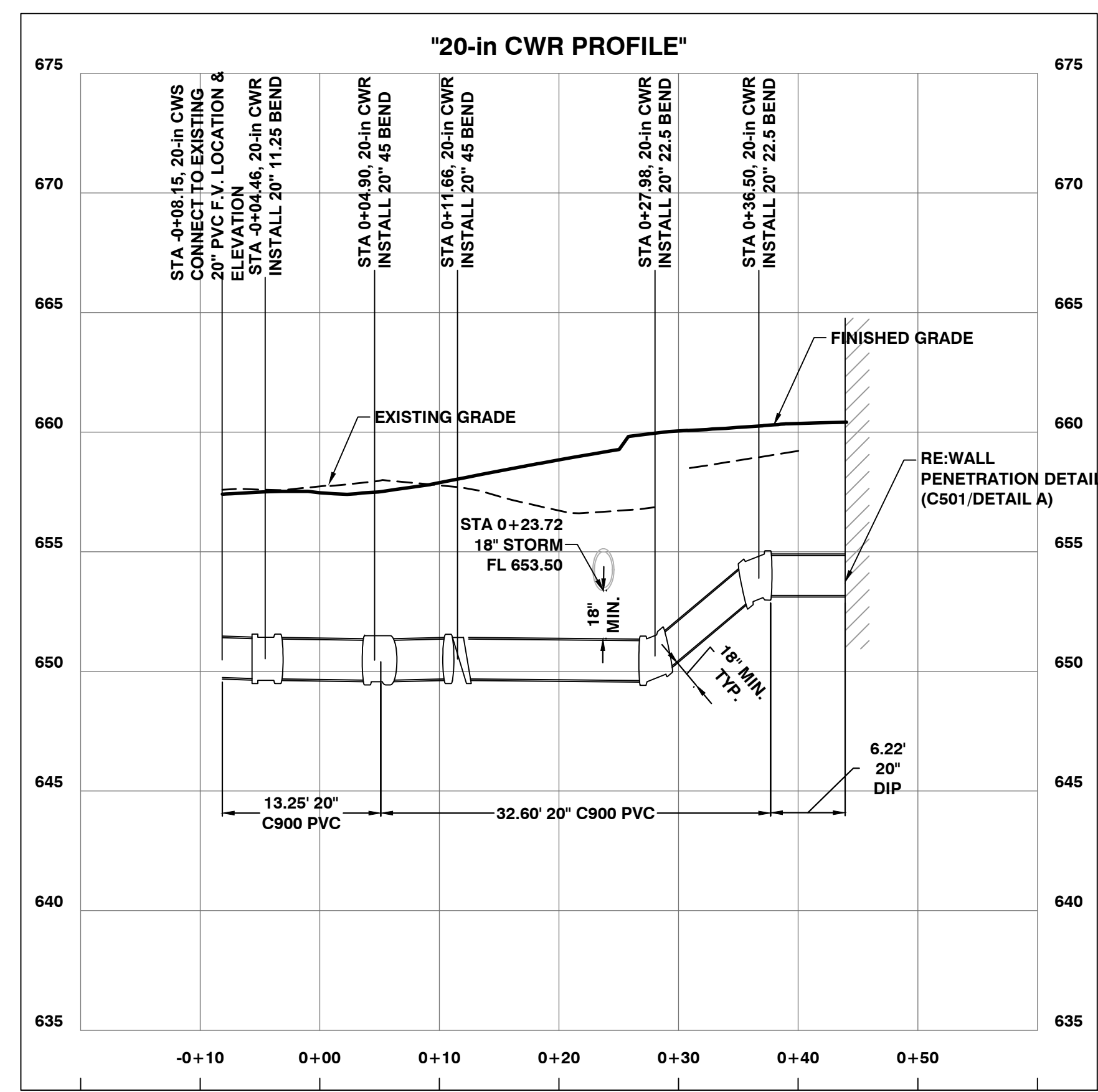
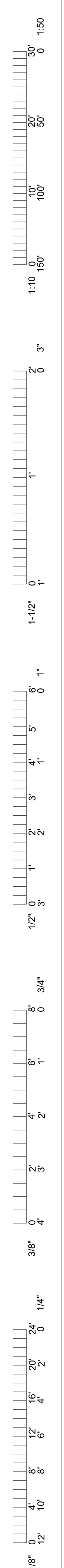
POWELL
C W M
ARCHITECTURE/ENGINEERING/SURVEYING
3000 S. W. 12th Ave., Suite 100
Fort Lauderdale, FL 33311
(954) 440-1000

1	01/22/25	ISSUED FOR ADDENDUM 2	DRAWN BY: AA	CHECKED BY: JRT
0	12/05/24	ISSUED FOR BID		

PRVN CONSULTANTS, INC.
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PHONE 563.263.5160
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UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
UTILITY PROFILES

UNIVERSITY PROJECT
NUMBER
CP232801
CONSULTANT
PROJECT NUMBER
23-2210
SHEET
C-400



ENGINEER OF RECORD
 JOHNIE E. RODELL-TIPTON, PE
 License No. PE-2021032725 (MISSOURI)
 Certificates of Authority
 Architecture: MO 310 / KS 73
 Engineering: MO 418 / KS 342
 Land Surveying: MO 123 / KS 36



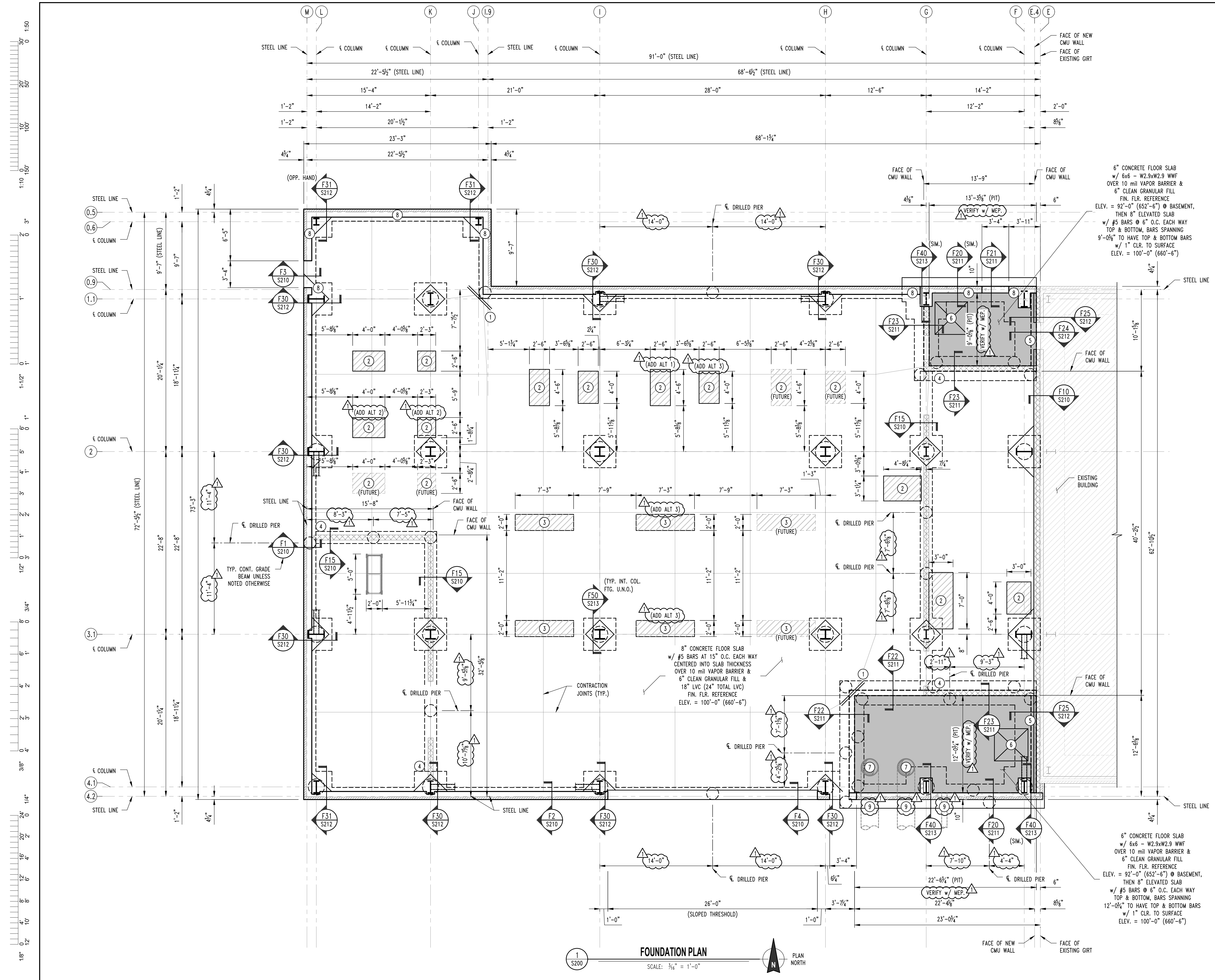
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 CHECKED BY: JRT

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UNIVERSITY OF MISSOURI - COLUMBIA
 RESEARCH COMMONS THERMAL PLANT
 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 UTILITY PROFILES

UNIVERSITY PROJECT NUMBER
CP232801
 CONSULTANT PROJECT NUMBER
23-2210
 SHEET
C-401



- ### FOUNDATION NOTES
- REENTRANT CORNER BARS. REFER TO TYPICAL DETAIL ON SHEET S210.
 - HOUSEKEEPING PAD, REFER TO DETAIL F60 ON SHEET S213. CONFIRM SIZE & LOCATIONS w/ MECHANICAL PRIOR TO INSTALL.
 - HOUSEKEEPING PAD, REFER TO DETAIL F61 ON SHEET S213. CONFIRM SIZE & LOCATIONS w/ MECHANICAL PRIOR TO INSTALL.
 - DOWEL CONT. FOOTING REINF. INTO WALL w/ 6" EPOXY EMBEDMENT.
 - SHORING BY CONTRACTOR MAY BE NECESSARY FOR NEW WALL INSTALL.
 - EQUIPMENT PIT HATCH, CONFIRM SIZE & LOCATIONS w/ MECHANICAL PRIOR TO INSTALL. REFER TO TYPICAL LID OPENING REINFORCING DETAIL ON SHEET S213.
 - VAULT LID PIPE PENETRATIONS, CONFIRM SIZE & LOCATIONS w/ MECHANICAL PRIOR TO INSTALL. REFER TO MECHANICAL FOR LINK SEAL AND PIPE SLEEVE REQUIREMENTS. REFER TO TYPICAL LID OPENING REINFORCING DETAIL ON SHEET S213.
 - FOOTINGS TO EXTEND TO ROCK OR SIT ON LEAN CONCRETE THAT SITS ON ROCK.
 - WALL PIPE PENETRATIONS, CONFIRM SIZE & LOCATIONS w/ MECHANICAL PRIOR TO INSTALL. REFER TO MECHANICAL FOR LINK SEAL AND PIPE SLEEVE REQUIREMENTS. REFER TO TYPICAL WALL OPENING REINFORCING DETAIL ON SHEET S213.

6" CONCRETE FLOOR SLAB w/ 6x6 - W2.9xW2.9 WWF OVER 10 mil VAPOR BARRIER & 6" CLEAN GRANULAR FILL FIN. FLR. REFERENCE ELEV. = 92'-0" (652'-6") @ BASEMENT, THEN 8" ELEVATED SLAB w/ #5 BARS @ 6" O.C. EACH WAY TOP & BOTTOM, BARS SPANNING 9'-0" TO HAVE TOP & BOTTOM BARS w/ 1" CLR. TO SURFACE ELEV. = 100'-0" (660'-6")

8" CONCRETE FLOOR SLAB w/ #5 BARS AT 15" O.C. EACH WAY CENTERED INTO SLAB THICKNESS OVER 10 mil VAPOR BARRIER & 6" CLEAN GRANULAR FILL & 18" LVC (24" TOTAL LVC) FIN. FLR. REFERENCE ELEV. = 100'-0" (660'-6")

6" CONCRETE FLOOR SLAB w/ 6x6 - W2.9xW2.9 WWF OVER 10 mil VAPOR BARRIER & 6" CLEAN GRANULAR FILL FIN. FLR. REFERENCE ELEV. = 92'-0" (652'-6") @ BASEMENT, THEN 8" ELEVATED SLAB w/ #5 BARS @ 6" O.C. EACH WAY TOP & BOTTOM, BARS SPANNING 12'-0" TO HAVE TOP & BOTTOM BARS w/ 1" CLR. TO SURFACE ELEV. = 100'-0" (660'-6")

FOUNDATION PLAN
SCALE: 3/16" = 1'-0"
PLAN NORTH



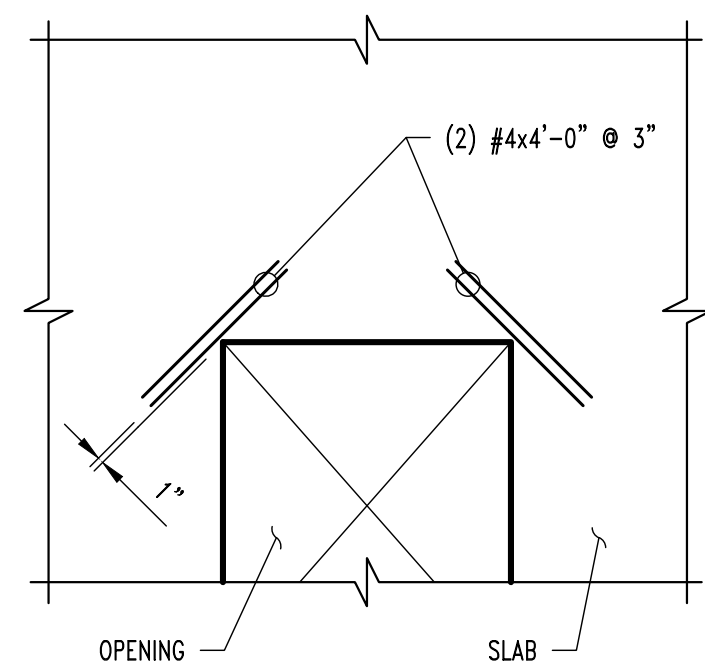
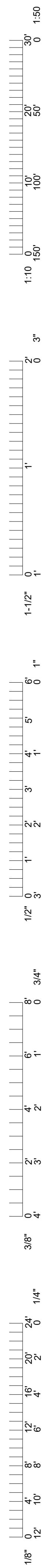
PROCKETT ENGINEERING CONSULTANTS
1000 W. Illinois Ave., Suite 100
Columbia, MO 65201
Phone: (660) 441-2929
www.prockettengineering.com
CREATED: 01/22/2025 10:00 AM

1	01/22/2025	ISSUE FOR ADDENDUM 2	CHECKED BY: GLL
0	12/05/2024	ISSUE FOR BID	DRAWN BY: RCA

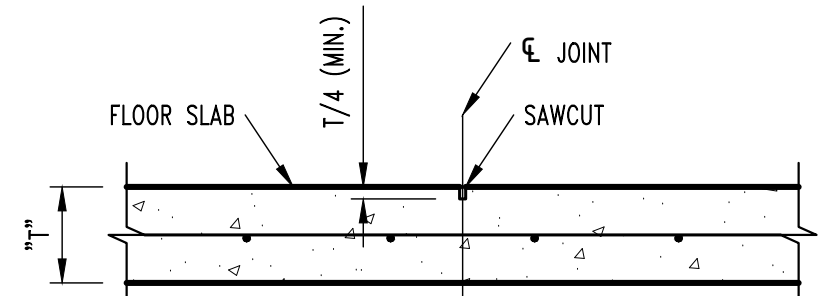
PRN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE 663.263.5160
MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017605

UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
FOUNDATION PLAN

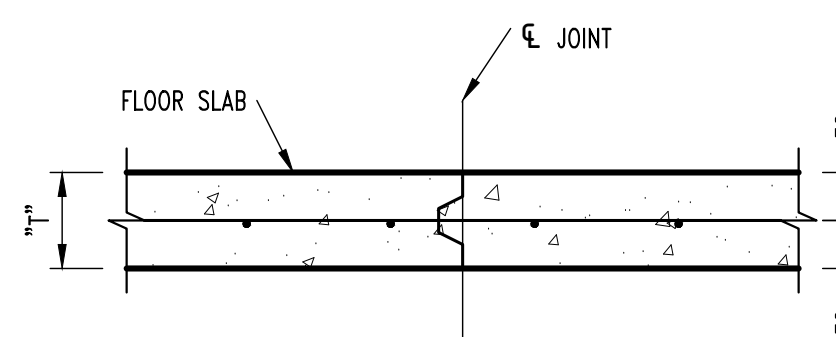
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PROJECT NUMBER
CP232801
CONSULTANT
PROJECT NUMBER
200206
SHEET
S200



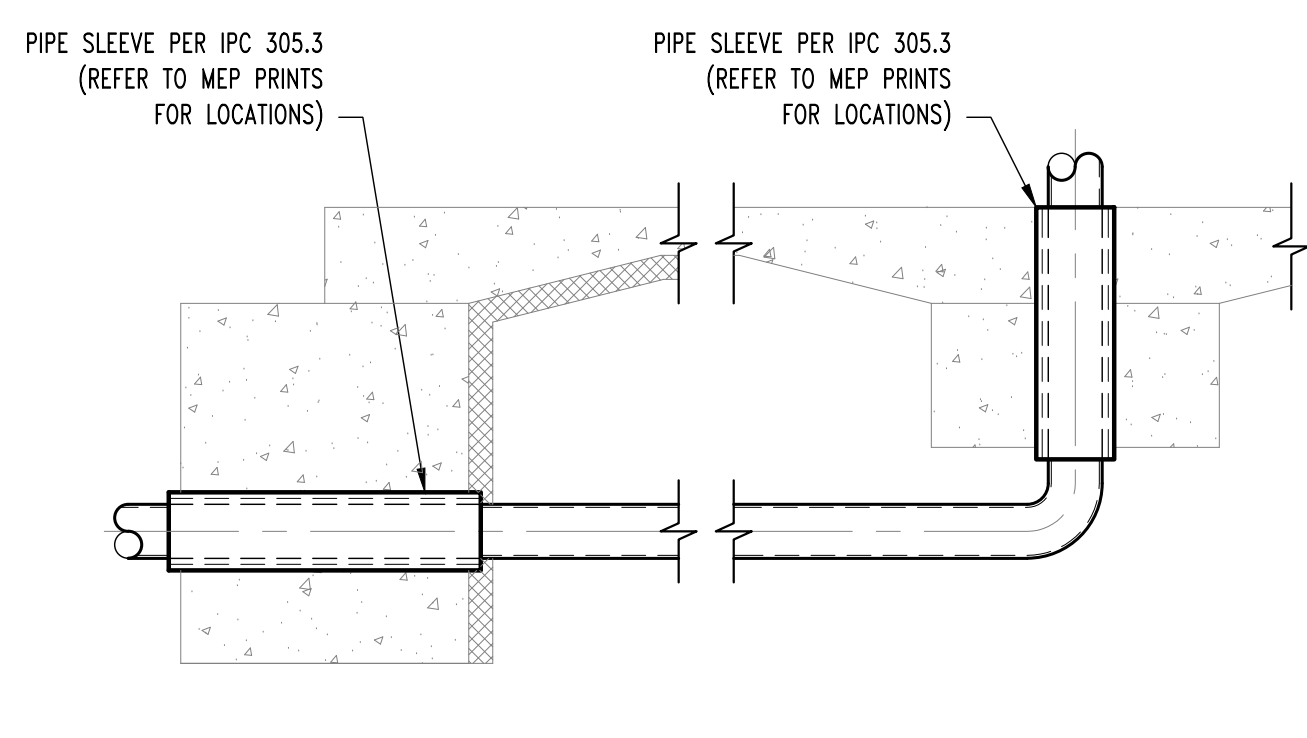
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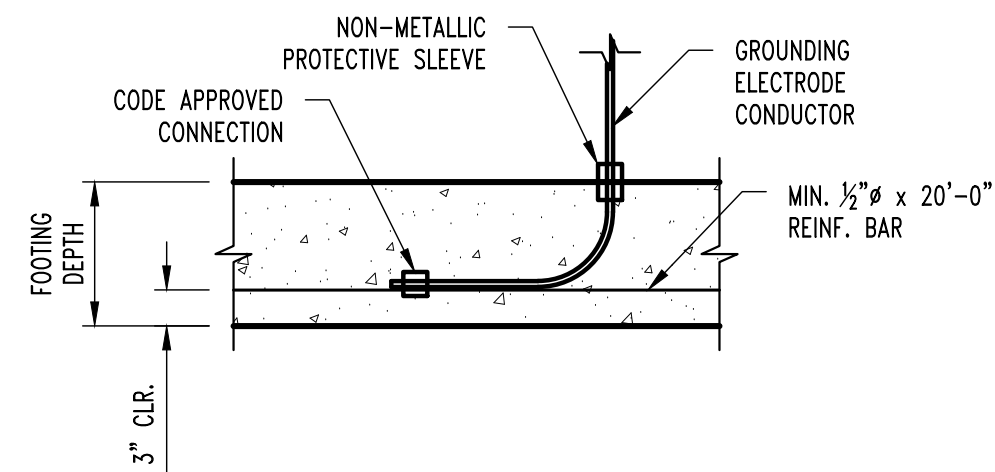
CONTRACTION JOINT



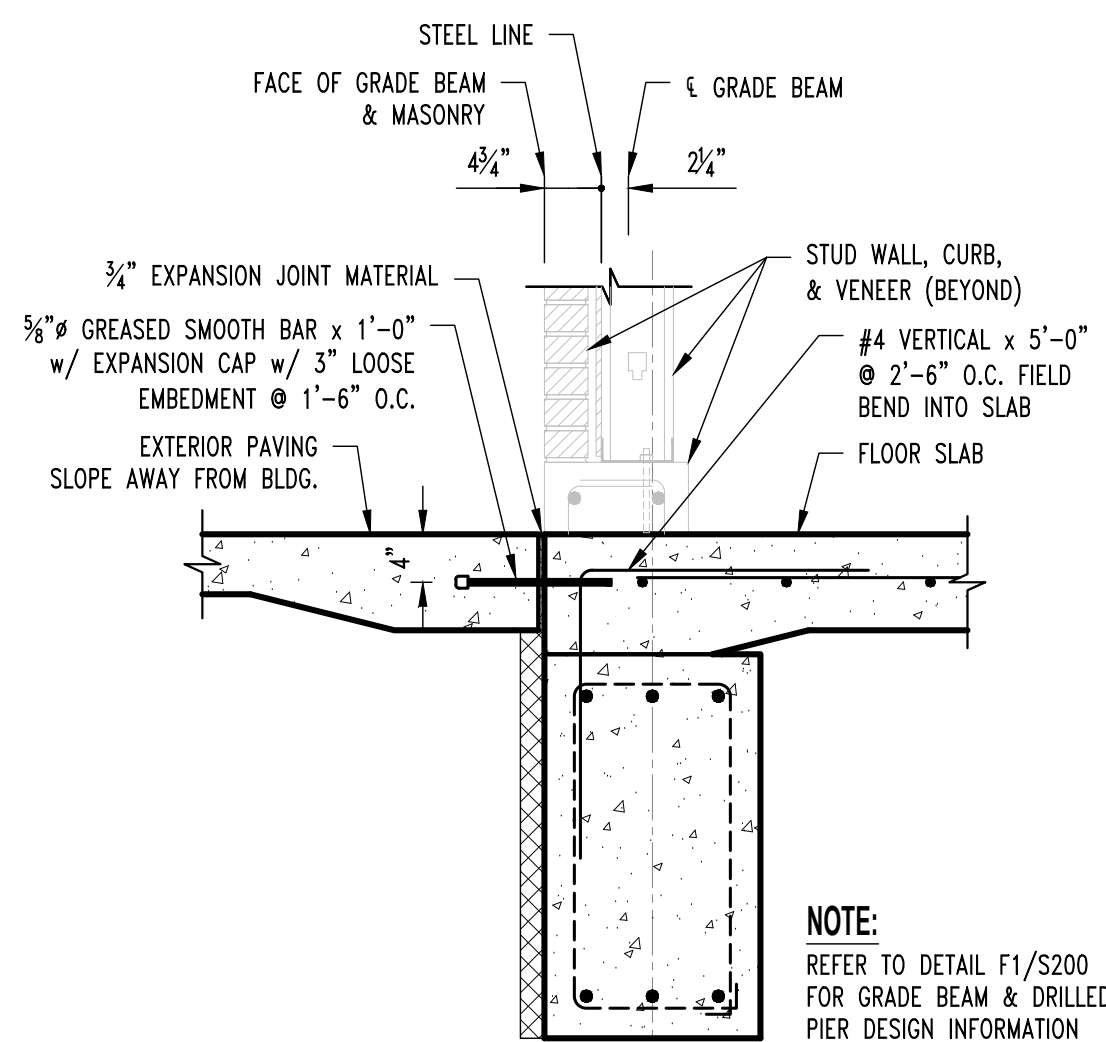
CONSTRUCTION JOINT



TYP. PLUMBING COORDINATION DETAILS



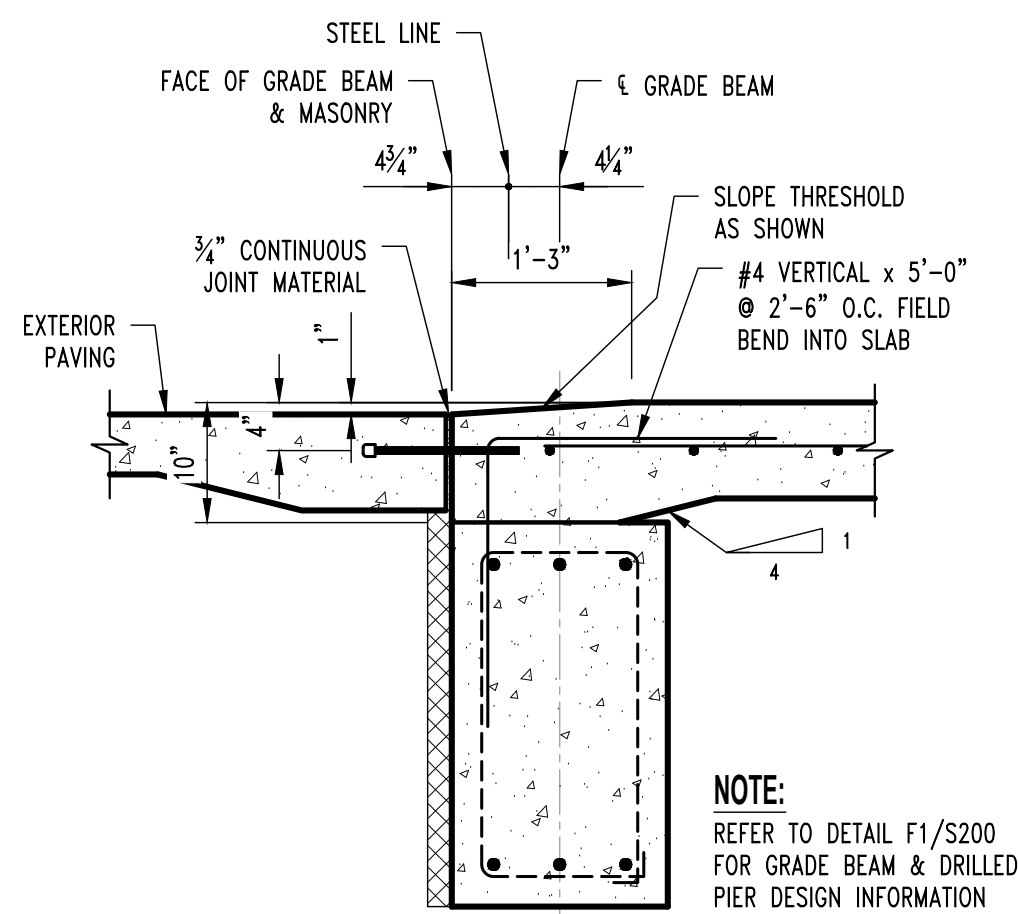
TYP. ELECTRICAL GROUNDING DETAIL @ FOOTING



**THRESHOLD SECTION
(LOCATED @ WALK DOORS ONLY)**

F3
S200

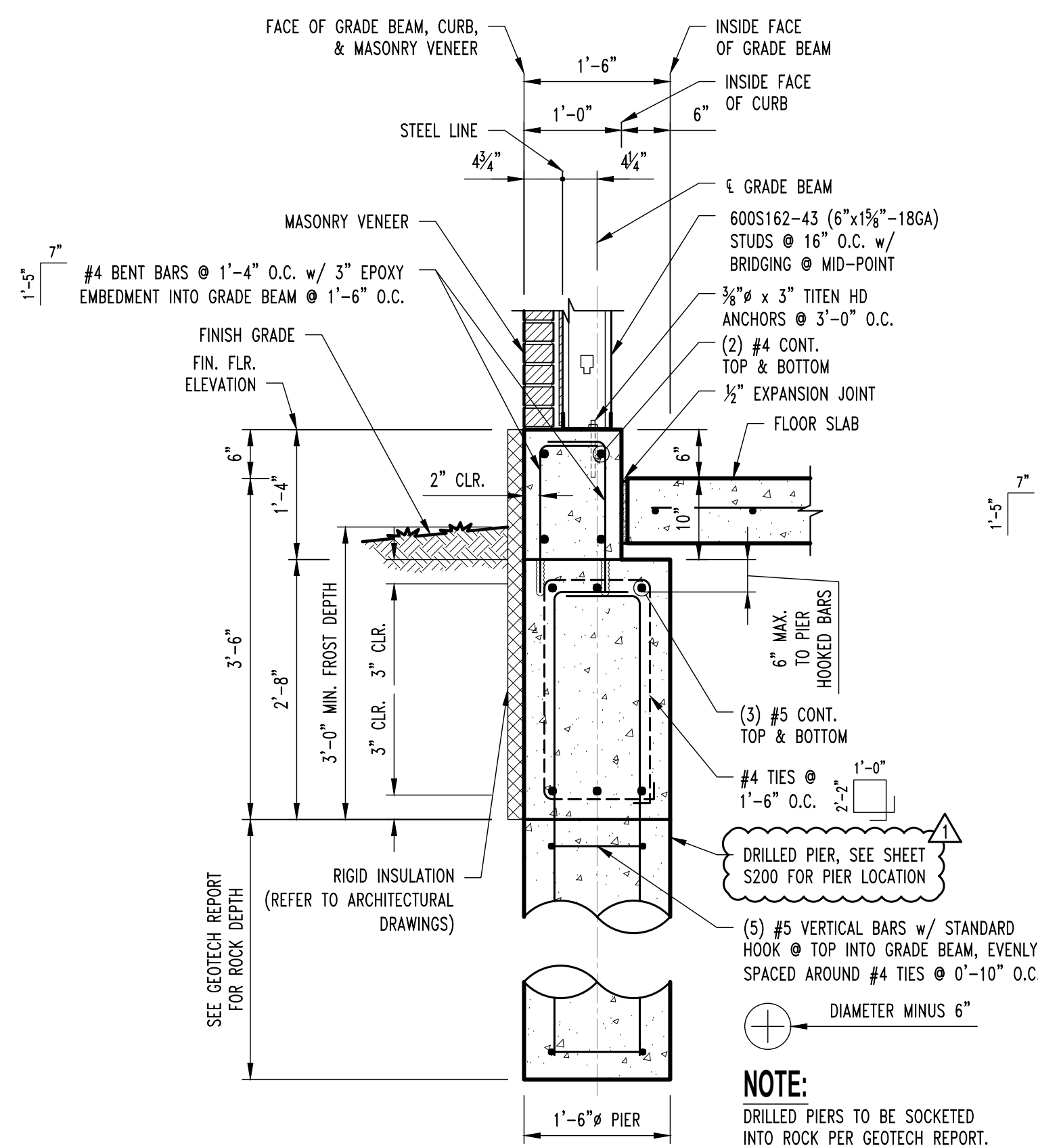
SCALE: 3/4" = 1'-0"



SLOPED THRESHOLD SECTION

F4
S200

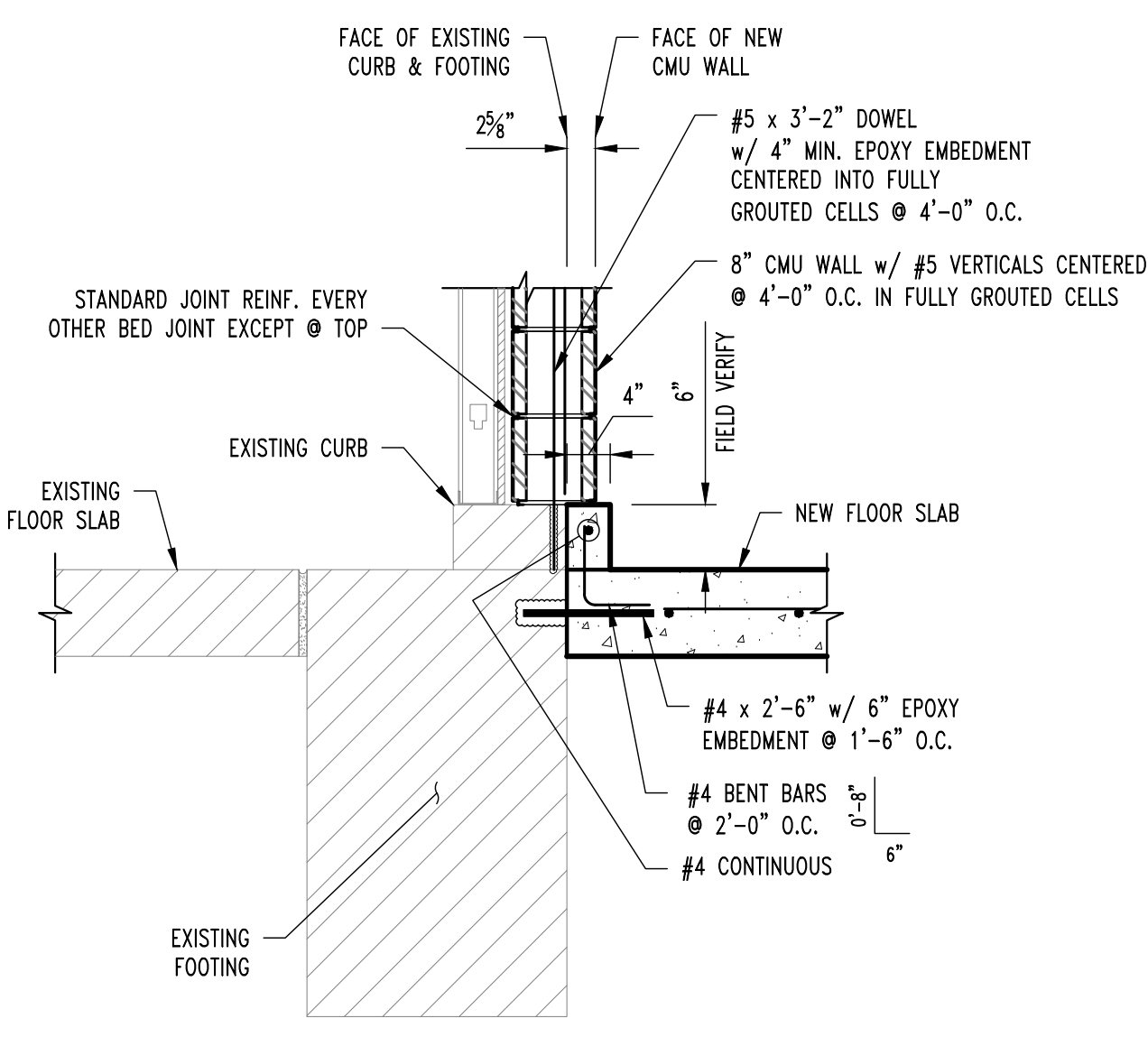
SCALE: 3/4" = 1'-0"



CONT. GRADE BEAM SECTION

F1
S200, S210

SCALE: 3/4" = 1'-0"



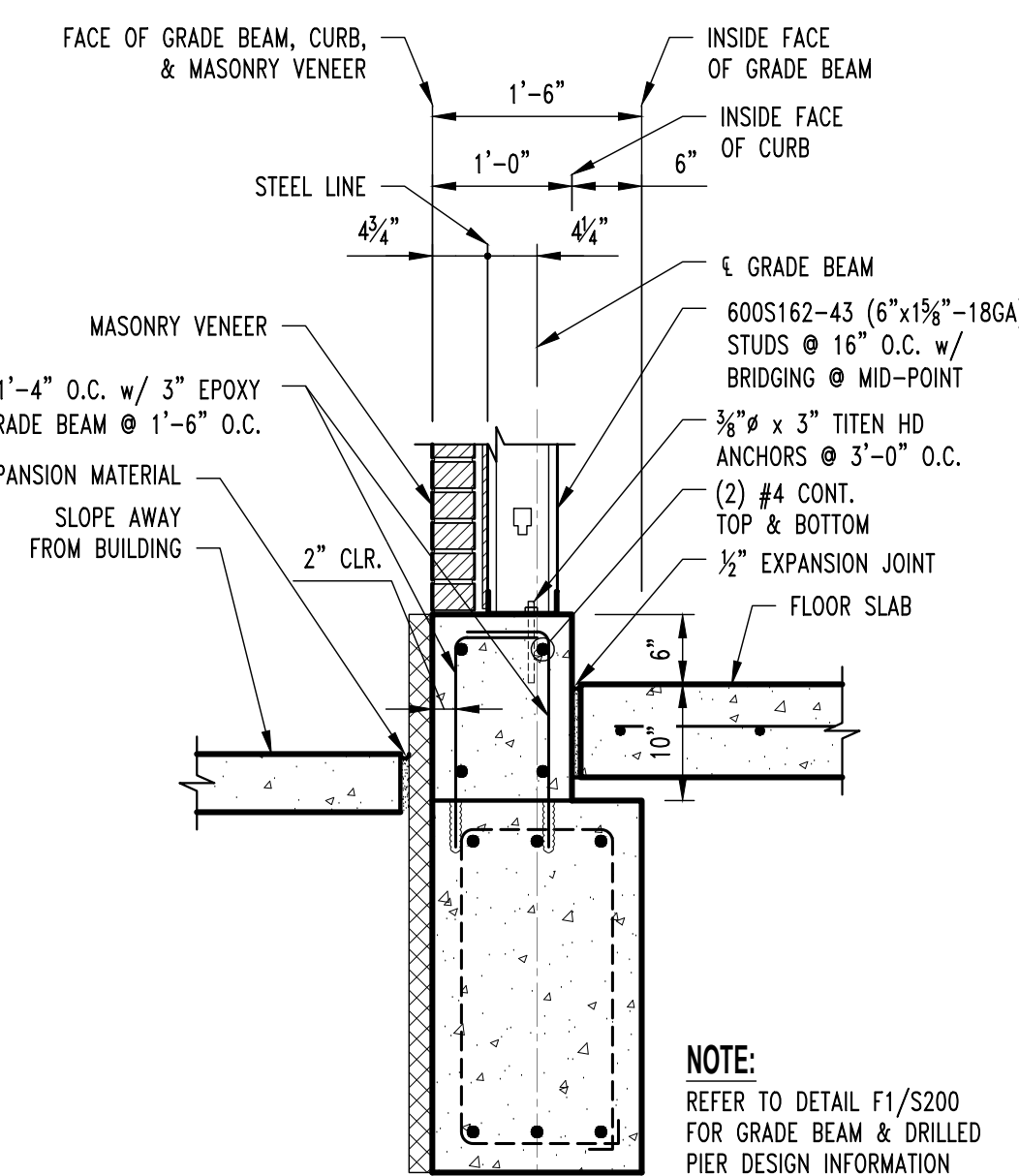
SLAB TO EXISTING SLAB SECTION

F10
S200

SCALE: 3/4" = 1'-0"

PIER SCHEDULE									
PIER LOCATION	PIER DIAMETER	TOP OF PIER ELEVATION (FEET)		EXPECTED TOP OF ROCK ELEVATION (FEET) REFERENCE		PIER VERTICAL REINFORCING			
		FF=100.0/660.5	FF=100.0/660.5	FF=100.0/660.5	FF=100.0/660.5				
L/2	2'-0" DIA	96.5	657.0	94.6	655.1	8 - #5 VERTICAL W STANDARD HOOK AT TOP EVENLY SPACED INSIDE #4 TIES AT 0'-10" O.C.			
L/3.1	2'-0" DIA	96.5	657.0	81.8	642.3	8 - #5 VERTICAL W STANDARD HOOK AT TOP EVENLY SPACED INSIDE #4 TIES AT 0'-10" O.C.			
L/4.1	2'-0" DIA	96.5	657.0	64.2	624.7	8 - #5 VERTICAL W STANDARD HOOK AT TOP EVENLY SPACED INSIDE #4 TIES AT 0'-10" O.C.			
K/1.1	2'-0" DIA	96.5	657.0	94.0	654.5	8 - #5 VERTICAL W STANDARD HOOK AT TOP EVENLY SPACED INSIDE #4 TIES AT 0'-10" O.C.			
K/2.0	2'-6" DIA	96.5	657.0	91.2	651.7	12 - #5 VERTICAL W STANDARD HOOK AT TOP EVENLY SPACED INSIDE #4 TIES AT 0'-10" O.C.			
K/3.1	2'-6" DIA	96.5	657.0	75.3	635.8	12 - #5 VERTICAL W STANDARD HOOK AT TOP EVENLY SPACED INSIDE #4 TIES AT 0'-10" O.C.			
K/4.1	2'-6" DIA	96.5	657.0	55.5	616.0	12 - #5 VERTICAL W STANDARD HOOK AT TOP EVENLY SPACED INSIDE #4 TIES AT 0'-10" O.C.			
I/1.1	2'-6" DIA	96.5	657.0	91.1	651.6	12 - #5 VERTICAL W STANDARD HOOK AT TOP EVENLY SPACED INSIDE #4 TIES AT 0'-10" O.C.			
I/2	2'-6" DIA	96.5	657.0	81.6	642.1	12 - #5 VERTICAL W STANDARD HOOK AT TOP EVENLY SPACED INSIDE #4 TIES AT 0'-10" O.C.			
I/3.1	2'-6" DIA	96.5	657.0	63.8	624.3	12 - #5 VERTICAL W STANDARD HOOK AT TOP EVENLY SPACED INSIDE #4 TIES AT 0'-10" O.C.			
I/4.1	2'-6" DIA	96.5	657.0	50.2	610.7	12 - #5 VERTICAL W STANDARD HOOK AT TOP EVENLY SPACED INSIDE #4 TIES AT 0'-10" O.C.			
H/1.1	2'-6" DIA	96.5	657.0	74.9	635.4	12 - #5 VERTICAL W STANDARD HOOK AT TOP EVENLY SPACED INSIDE #4 TIES AT 0'-10" O.C.			
H/2	2'-6" DIA	96.5	657.0	73.2	633.7	12 - #5 VERTICAL W STANDARD HOOK AT TOP EVENLY SPACED INSIDE #4 TIES AT 0'-10" O.C.			
H/3.1	2'-6" DIA	96.5	657.0	55.7	616.2	12 - #5 VERTICAL W STANDARD HOOK AT TOP EVENLY SPACED INSIDE #4 TIES AT 0'-10" O.C.			
H/4.1	2'-0" DIA	96.5	657.0	43.9	604.4	8 - #5 VERTICAL W STANDARD HOOK AT TOP EVENLY SPACED INSIDE #4 TIES AT 0'-10" O.C.			
G/2	2'-0" DIA	96.5	657.0	77.4	637.9	8 - #5 VERTICAL W STANDARD HOOK AT TOP EVENLY SPACED INSIDE #4 TIES AT 0'-10" O.C.			
G/3.1	2'-0" DIA	96.5	657.0	53.6	614.1	8 - #5 VERTICAL W STANDARD HOOK AT TOP EVENLY SPACED INSIDE #4 TIES AT 0'-10" O.C.			
G/4.1	2'-0" DIA	89.83	650.33	55.4	615.9	8 - #5 VERTICAL W STANDARD HOOK AT TOP EVENLY SPACED INSIDE #4 TIES AT 0'-10" O.C.			
F/2	2'-0" DIA	96.5	657.0	78.9	639.4	8 - #5 VERTICAL W STANDARD HOOK AT TOP EVENLY SPACED INSIDE #4 TIES AT 0'-10" O.C.			
F/3.1	2'-0" DIA	96.5	657.0	65.0	625.5	8 - #5 VERTICAL W STANDARD HOOK AT TOP EVENLY SPACED INSIDE #4 TIES AT 0'-10" O.C.			
F/4.1	2'-0" DIA	89.83	650.33	43.9	604.4	8 - #5 VERTICAL W STANDARD HOOK AT TOP EVENLY SPACED INSIDE #4 TIES AT 0'-10" O.C.			

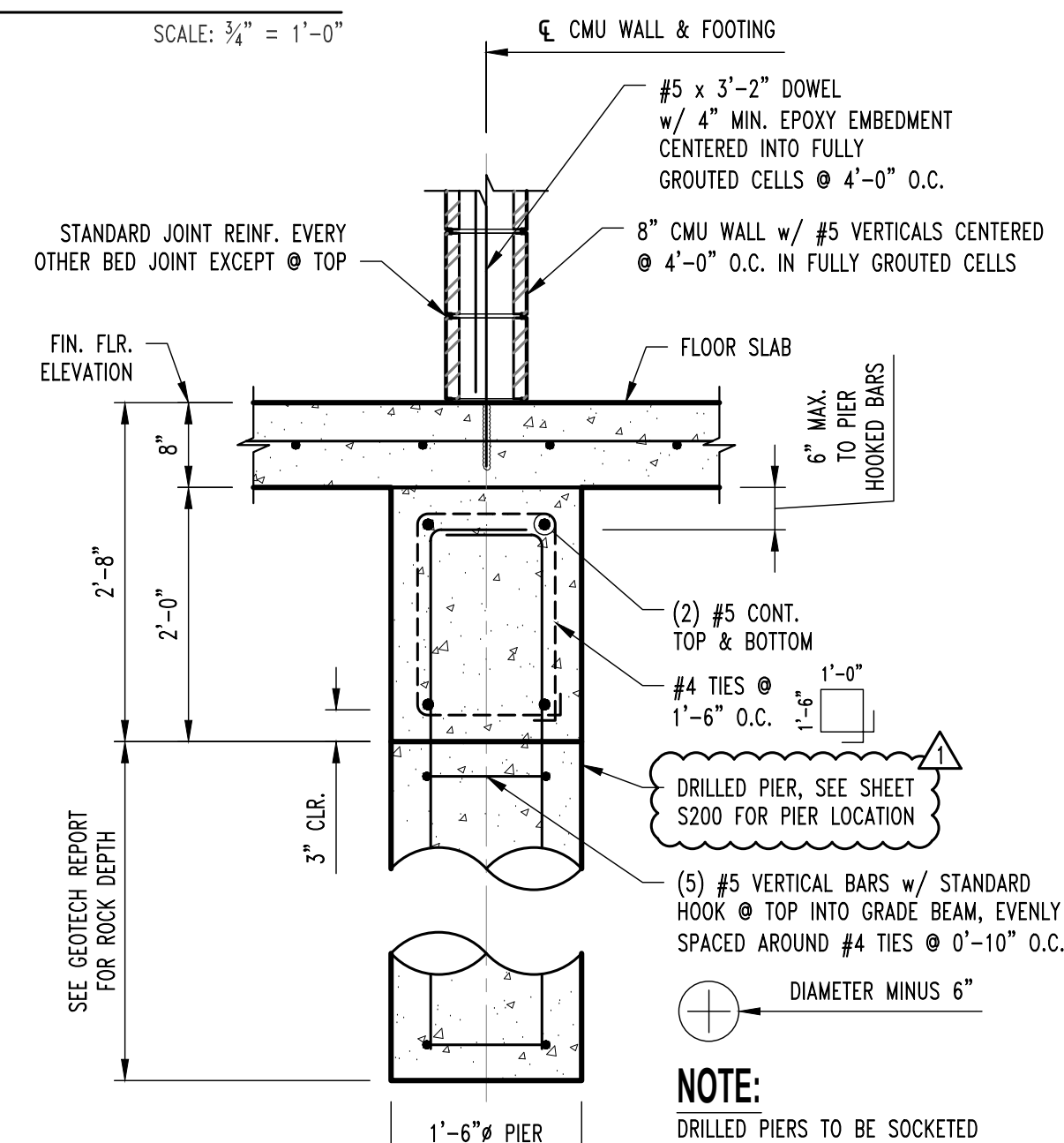
NOTES:
1) PIERS EXTEND INTO ROCK PER GEOTECHNICAL REPORT
2) ALL PIERS NOT SPECIFIED IN THIS SCHEDULE SHALL BE INSTALLED PER THE DETAILS IN THE DRAWINGS TO LIMESTONE ROCK ELEVATION INTERPOLATED FROM THE GEOTECH REPORT.
3) THE ELEVATIONS GIVEN ARE FOR THE CONTRACTOR'S CONVENIENCE, VERIFY ALL ELEVATIONS WITH THE GEOTECHNICAL REPORT



CONT. GRADE BEAM SECTION

F2
S200

SCALE: 3/4" = 1'-0"



CMU WALL CONT. FOOTING SECTION

F15
S200

SCALE: 3/4" = 1'-0"



1 01/22/2025 ISSUE FOR ADDENDUM 2
0 12/05/2024 ISSUE FOR BID

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PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE 663.263.5160
MISSOURI CERTIFICATE OF
AUTHORITY ENGINEERING - 2023017605



UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
FOUNDATION DETAILS

UNIVERSITY OF MISSOURI
PROJECT NUMBER

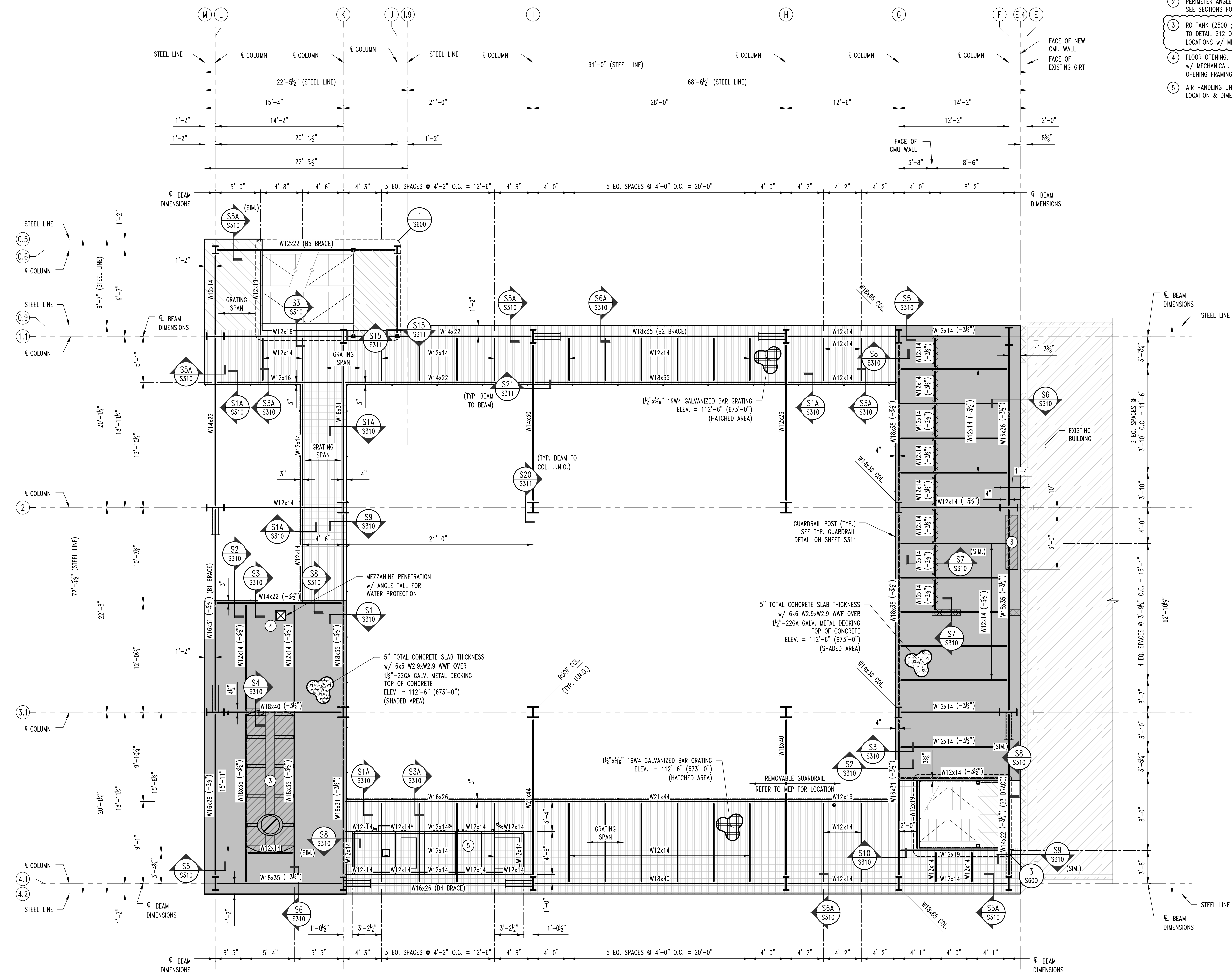
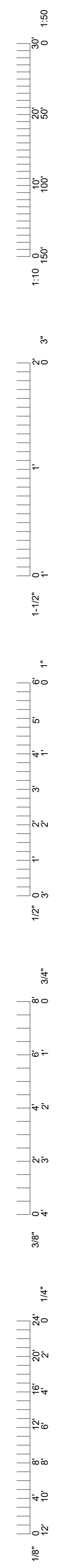
CP232801

CONSULTANT
PROJECT NUMBER

200206

SHEET

S210



- TYPICAL FLOOR FRAMING NOTES**
- TOP OF BEAM ELEVATION = 112'-4 1/2" TYPICAL U.N.O.
 - PERIMETER ANGLE BUTT WELDED CONTINUOUS, SEE SECTIONS FOR SIZES.
 - RO TANK (2500 gal) HOUSEKEEPING PAD, REFER TO DETAIL S12 ON SHEET S311. CONFIRM SIZE & LOCATIONS w/ MECHANICAL PRIOR TO INSTALL.
 - FLOOR OPENING, VERIFY SIZE AND LOCATION w/ MECHANICAL. REFER TO TYPICAL FLOOR OPENING FRAMING DETAIL ON SHEET S312.
 - AIR HANDLING UNIT, REFER TO MEP FOR EXACT LOCATION & DIMENSIONS.

UTILITY PLATFORM FRAMING PLAN
 SCALE: 3/16" = 1'-0"
 PLAN NORTH

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

01/22/2025
 GREGORY L. LINEMAN, P.E.
 LICENSE NO. 200501013
 ARCHITECT OF RECORD
 GREGORY LINEMAN, P.E.
 1000 W. WINDING BAY BUILDING 1
 COLUMBIA, MO 65201
 PHONE: 573.447.5202

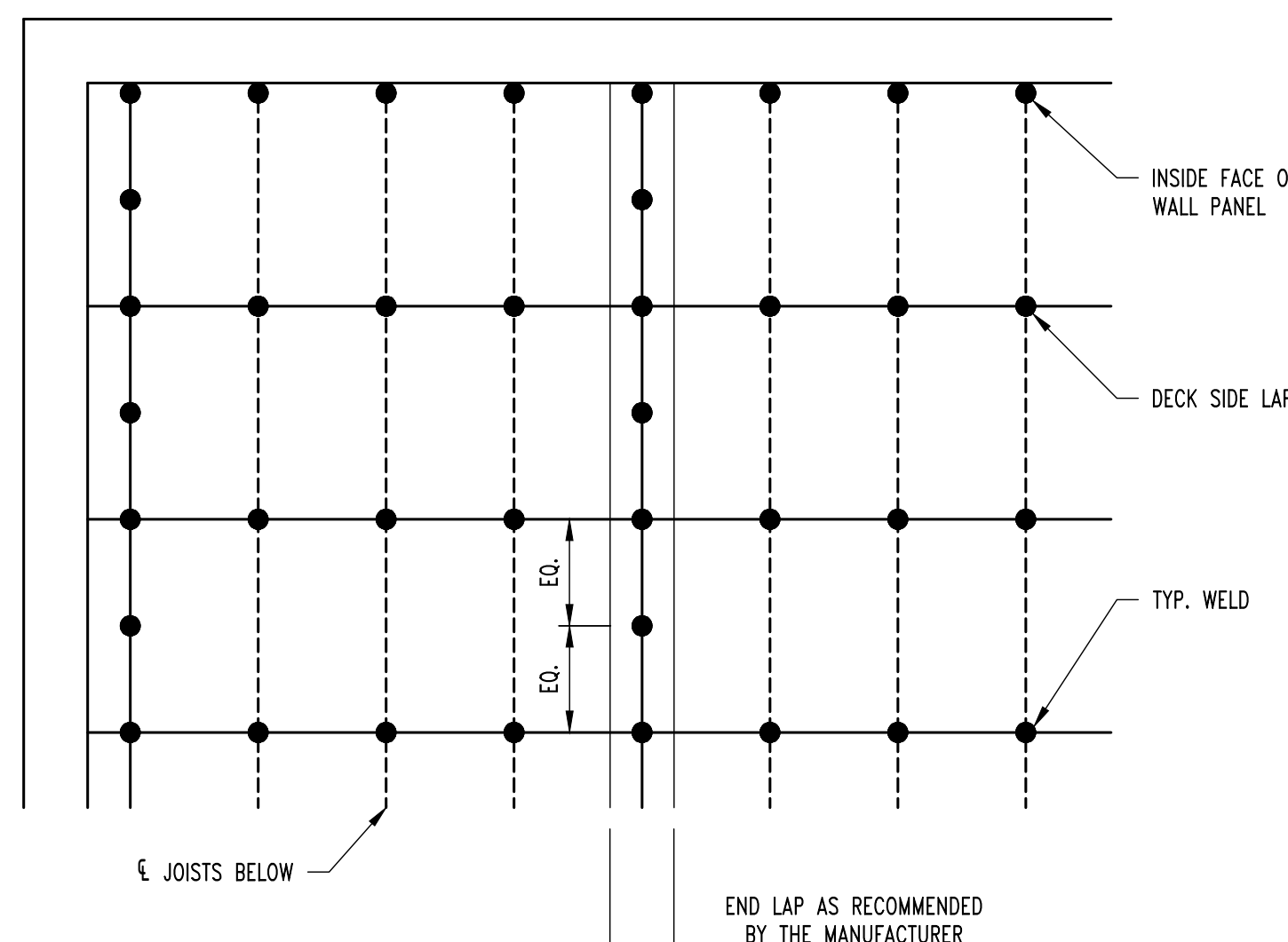
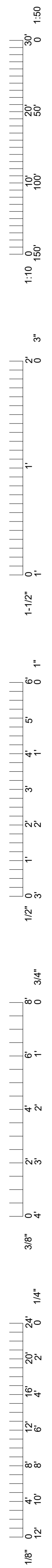
PROCKETT ENGINEERING CONSULTANTS
 1000 W. WINDING BAY, SUITE 100
 COLUMBIA, MO 65201
 (781) 441-2929
 www.procketteengineering.com
 PROCKETT ENGINEERING CONSULTANTS, LLC
 LICENSE NO. 200501013

1	01/22/2025	ISSUE FOR ADDENDUM 2	CHECKED BY: GLL
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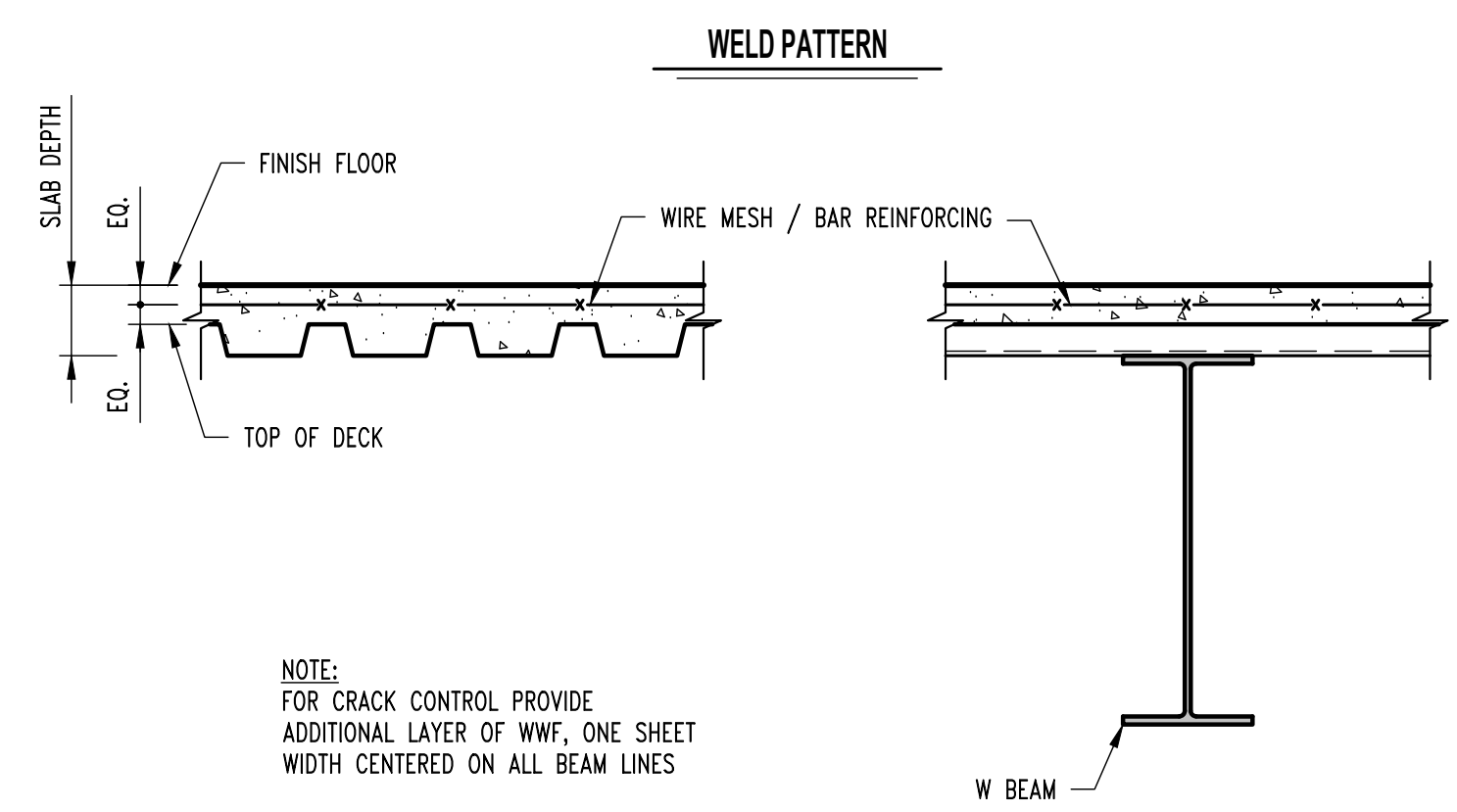
PRVN CONSULTANTS, INC.
 1617 SECOND AVE., STE. 110
 ROCK ISLAND, IL 61201
 PHONE 863.263.5160
 MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017605

UNIVERSITY OF MISSOURI - COLUMBIA
 RESEARCH COMMONS THERMAL PLANT
 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 UTILITY PLATFORM FRAMING PLAN

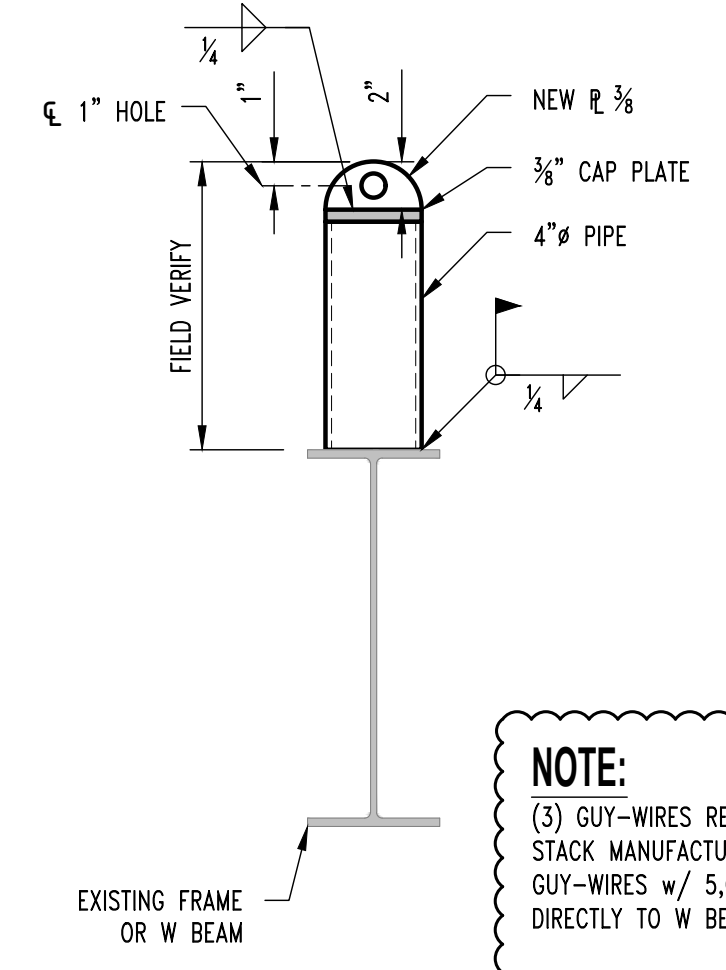
UNIVERSITY OF MISSOURI PROJECT NUMBER	CP232801
CONSULTANT PROJECT NUMBER	200206
SHEET	S300



NOTE:
WELDING WASHERS SHALL BE USED FOR ALL DECK THINNER THAN 22 GA.

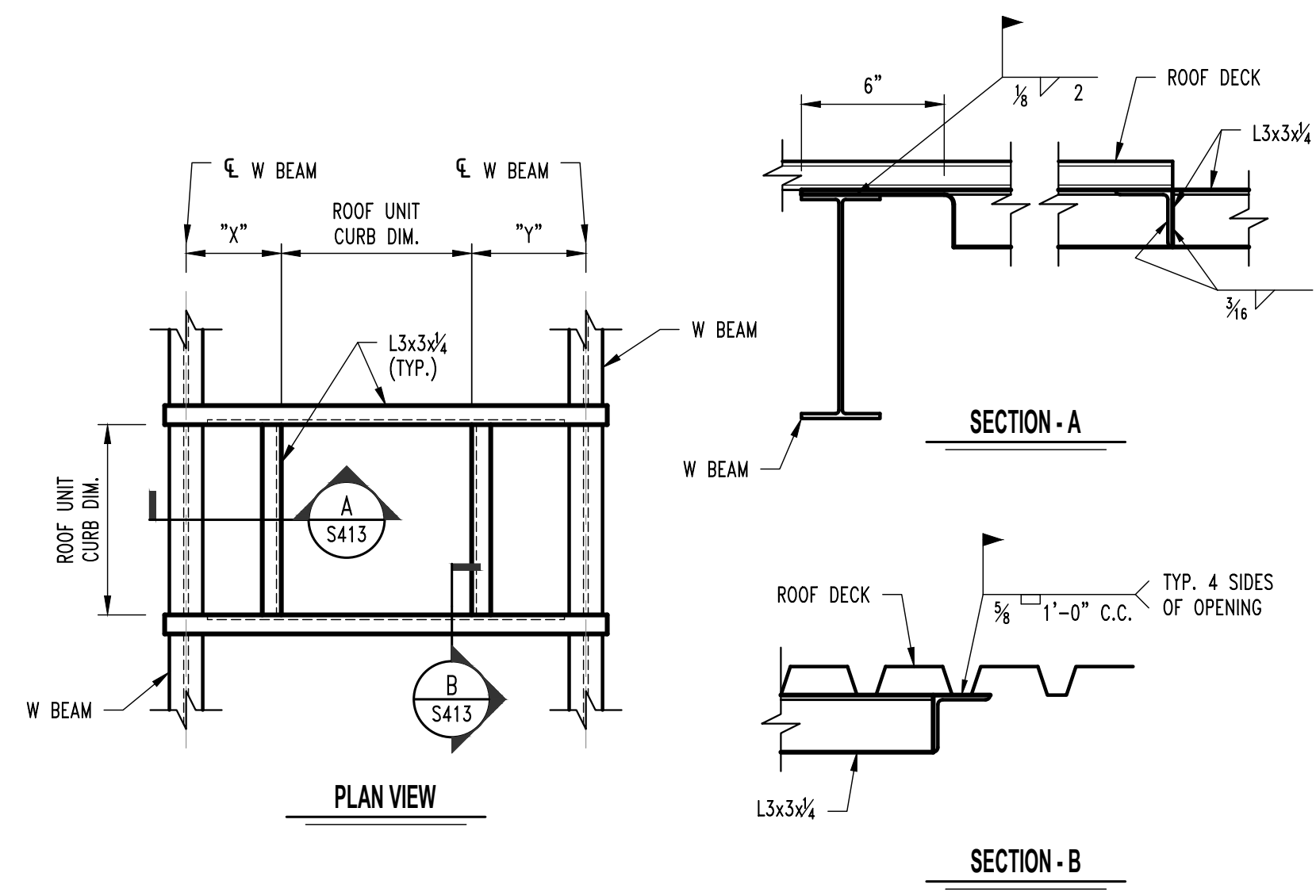


NOTE:
FOR CRACK CONTROL PROVIDE ADDITIONAL LAYER OF WWF, ONE SHEET WIDTH CENTERED ON ALL BEAM LINES

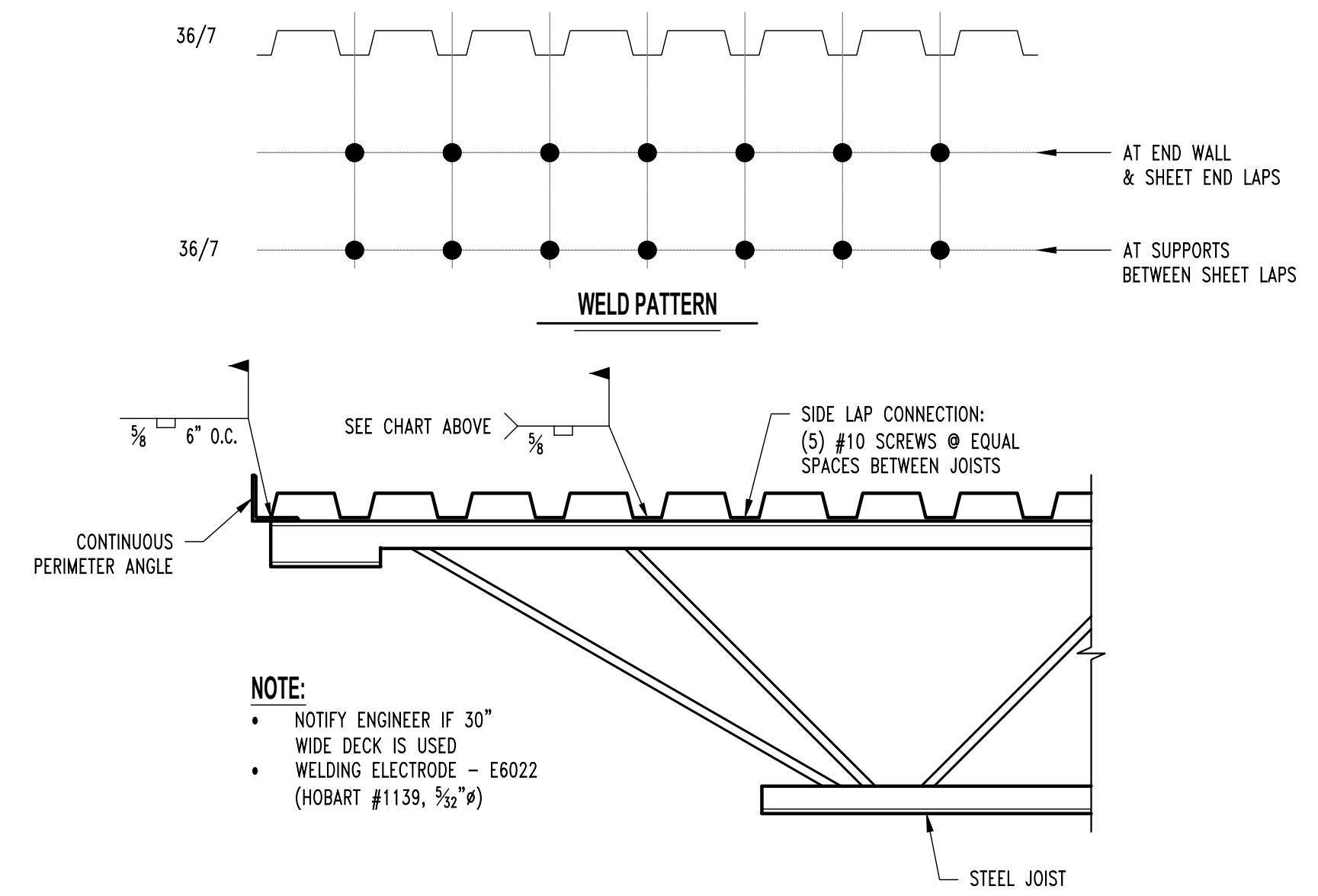


NOTE:
(3) GUY-WIRES REQUIRED FOR STACK, INSTALL PER STACK MANUFACTURERS REQUIREMENTS INCLUDING GUY-WIRES w/ 5,000 lbs CAPACITY. ATTACH SUPPORTS DIRECTLY TO W BEAMS OR BUILDING FRAMES ONLY.

TYP. GUY-WIRE SUPPORT DETAIL @ EXISTING



TYP. ROOF OPENING SUPPORT DETAIL



NOTE:
• NOTIFY ENGINEER IF 30" WIDE DECK IS USED
• WELDING ELECTRODE - E6022 (HOBART #1139, 3/32")

TYP. ROOF DECK CONNECTION

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

GREGORY L. LINNEHAN, P.E.
NO. LICENSE - 200501013
ENGINEER / ARCHITECT OF RECORD
GREGORY LINNEHAN, P.E.
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crockett-engineering.com

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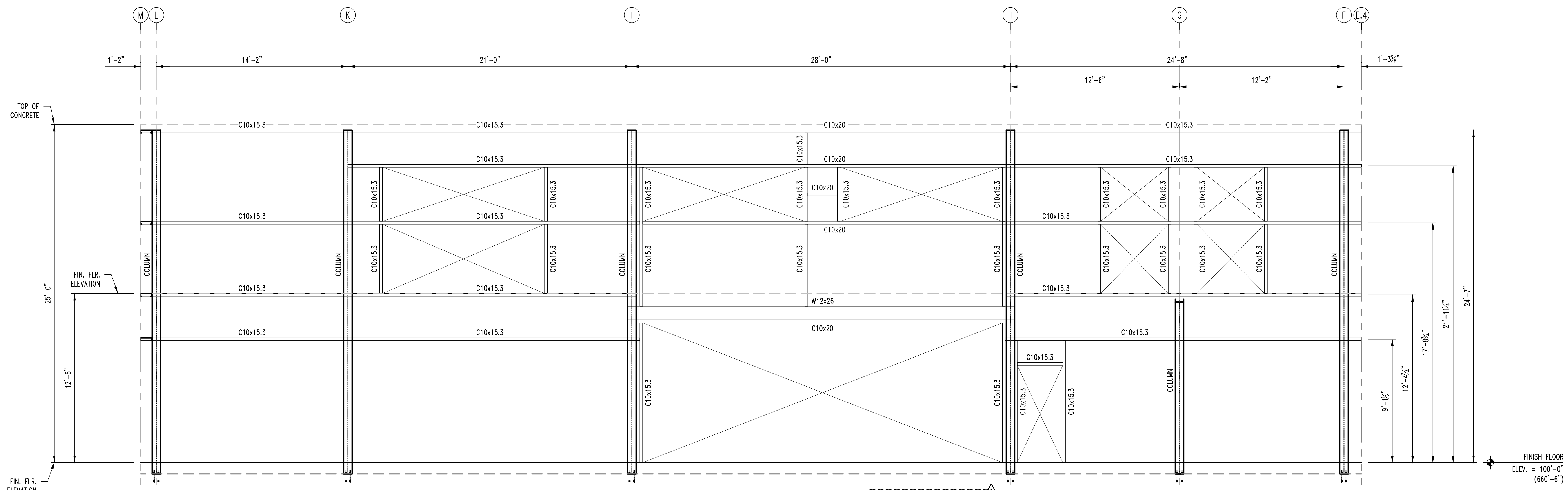
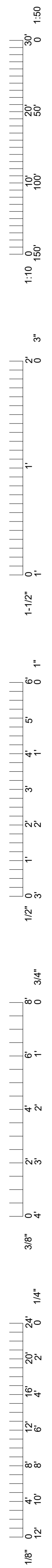
PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
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MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017605

UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
ROOF FRAMING DETAILS

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801

CONSULTANT
PROJECT NUMBER
200206

SHEET
S413

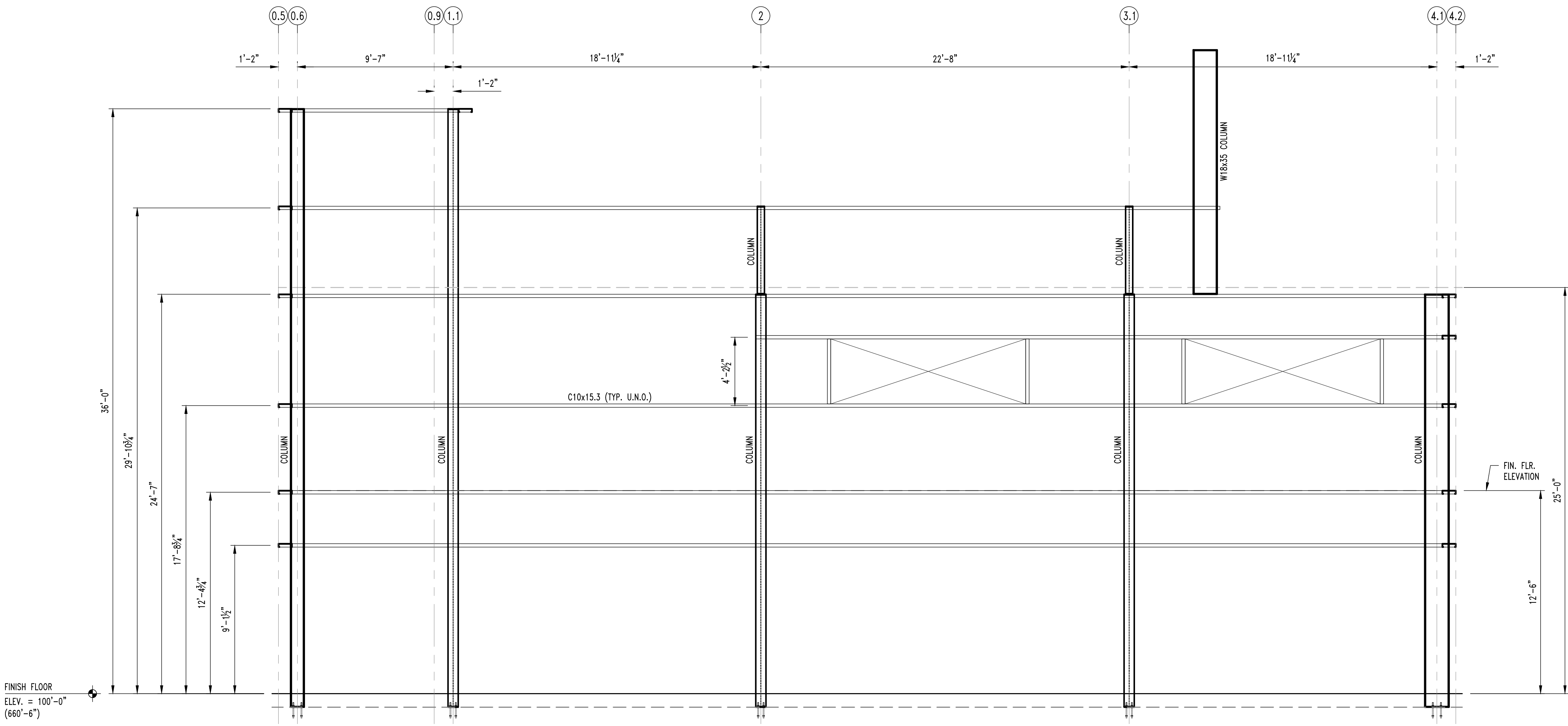


1
S700

SOUTH ELEVATION

SCALE: 1/4" = 1'-0"

NOTE:
COORDINATE ALL OPENINGS w/ ARCH. & MEP. PRIOR TO FABRICATION.



2
S700

WEST ELEVATION

SCALE: 1/4" = 1'-0"

NOTE:
COORDINATE ALL OPENINGS w/ ARCH. & MEP. PRIOR TO FABRICATION.

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

STATE OF MISSOURI
Professional Engineer
Gregory L. Lineman, P.E.
No. 000001013
01/22/2025

GREGORY L. LINEMAN, P.E.
LICENSE NO. 000001013
ENGINEER/ARCHITECT OF RECORD
9822 LINEMAN, P.E.
LICENSE NO. PE 200001013
CROCKETT ENGINEERING CONSULTANTS
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CROCKETT ENGINEERING CONSULTANTS, LLC
MISSOURI PROFESSIONAL ENGINEER LICENSE NO. 000001013

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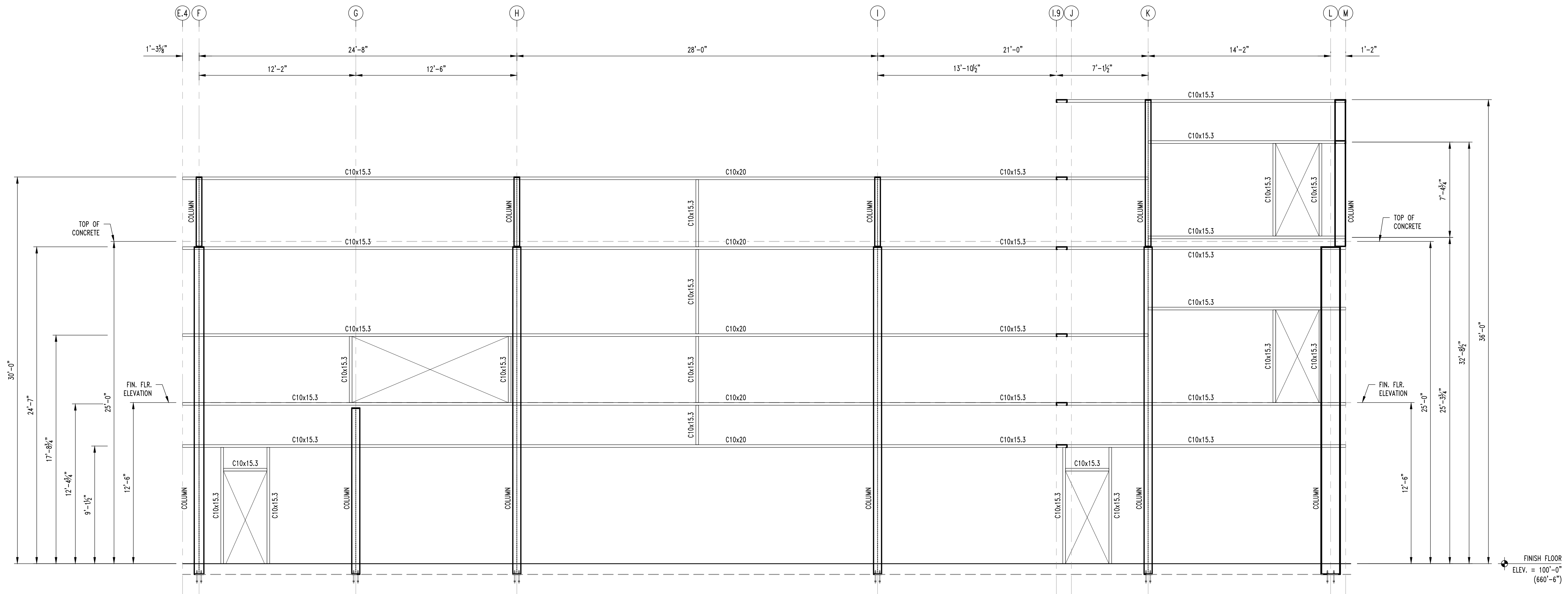
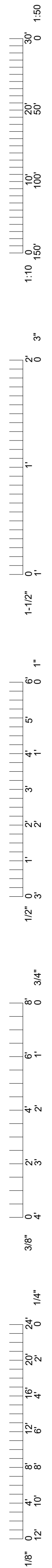
PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE 563.263.5160
MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017605

UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
BUILDING ELEVATIONS

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801

CONSULTANT
PROJECT NUMBER
200206

SHEET
S700



3
S701
NORTH ELEVATION
SCALE: 1/4" = 1'-0"

NOTE:
COORDINATE ALL OPENINGS w/ ARCH.
& MEP. PRIOR TO FABRICATION.

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

 01/22/2025
 GREGORY L. LINNEHAN, P.E.
 MISSOURI LICENSE - 200501013
 ENGINEER / ARCHITECT OF RECORD
 GREGORY LINNEHAN, P.E.
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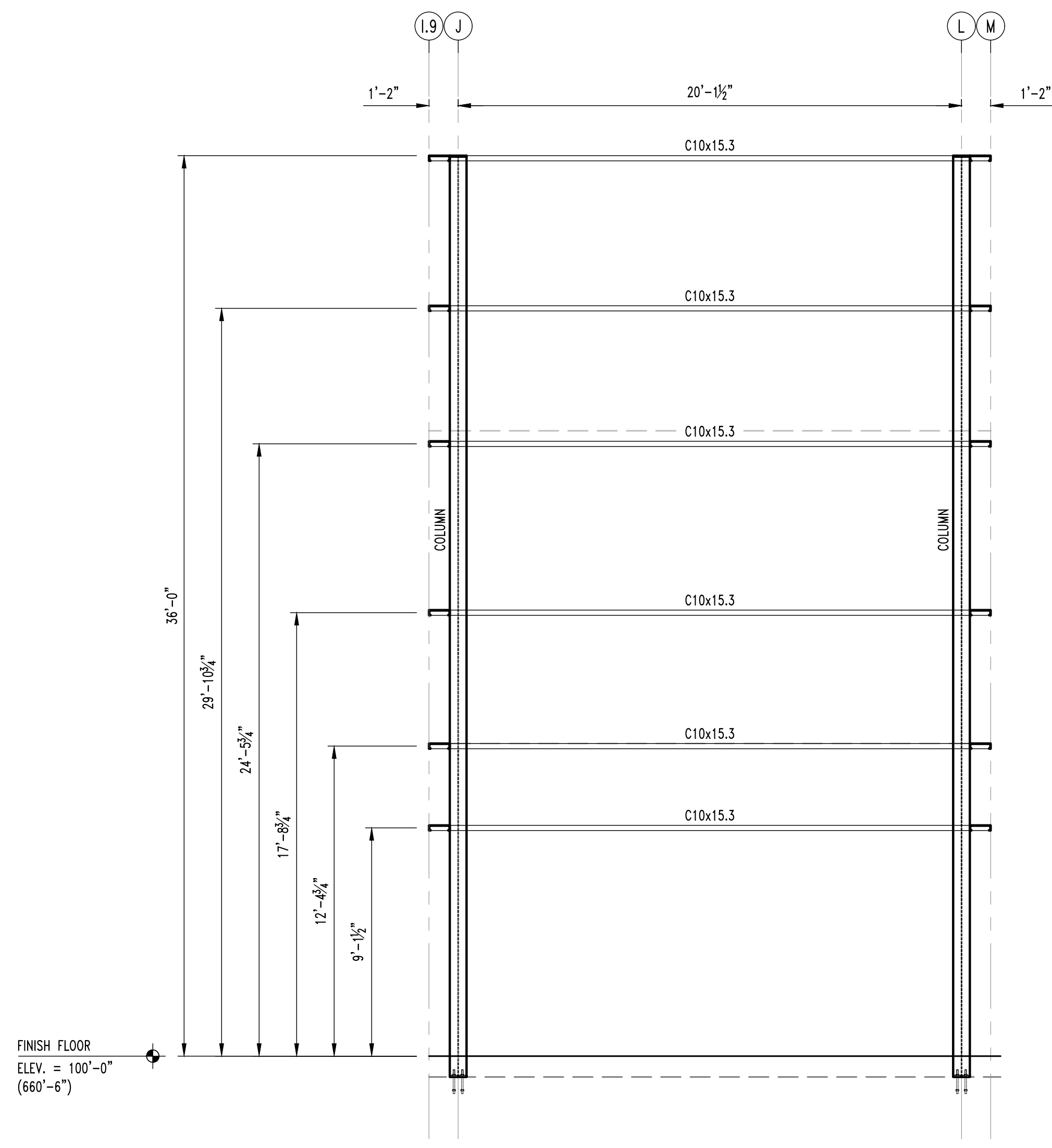
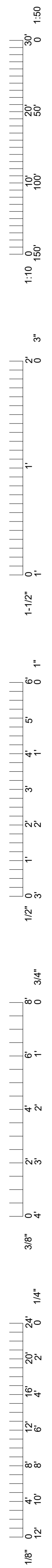
PRVN CONSULTANTS, INC.
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UNIVERSITY OF MISSOURI - COLUMBIA
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 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 BUILDING ELEVATIONS

UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP232801

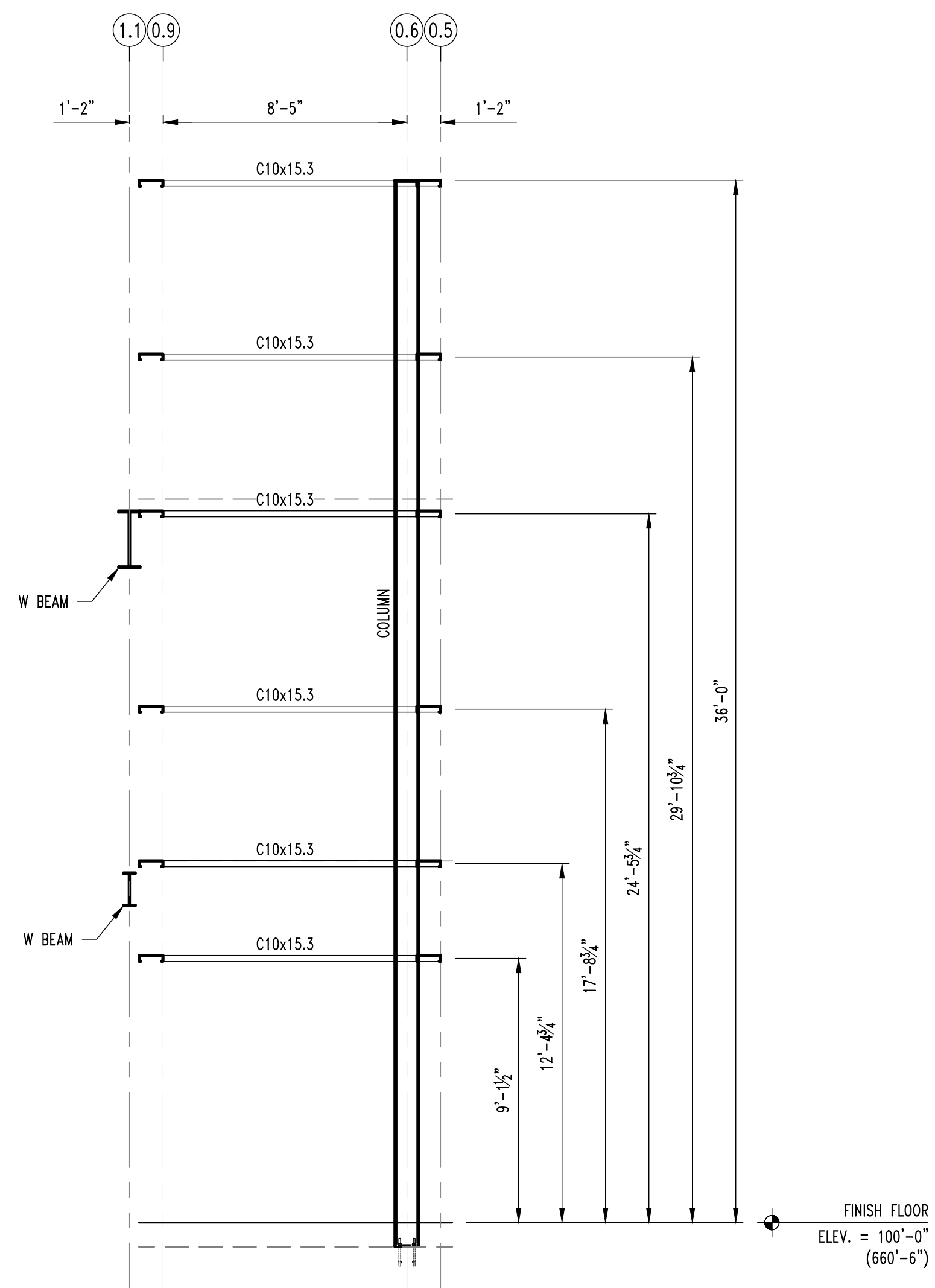
CONSULTANT
 PROJECT NUMBER
200206

SHEET
S701



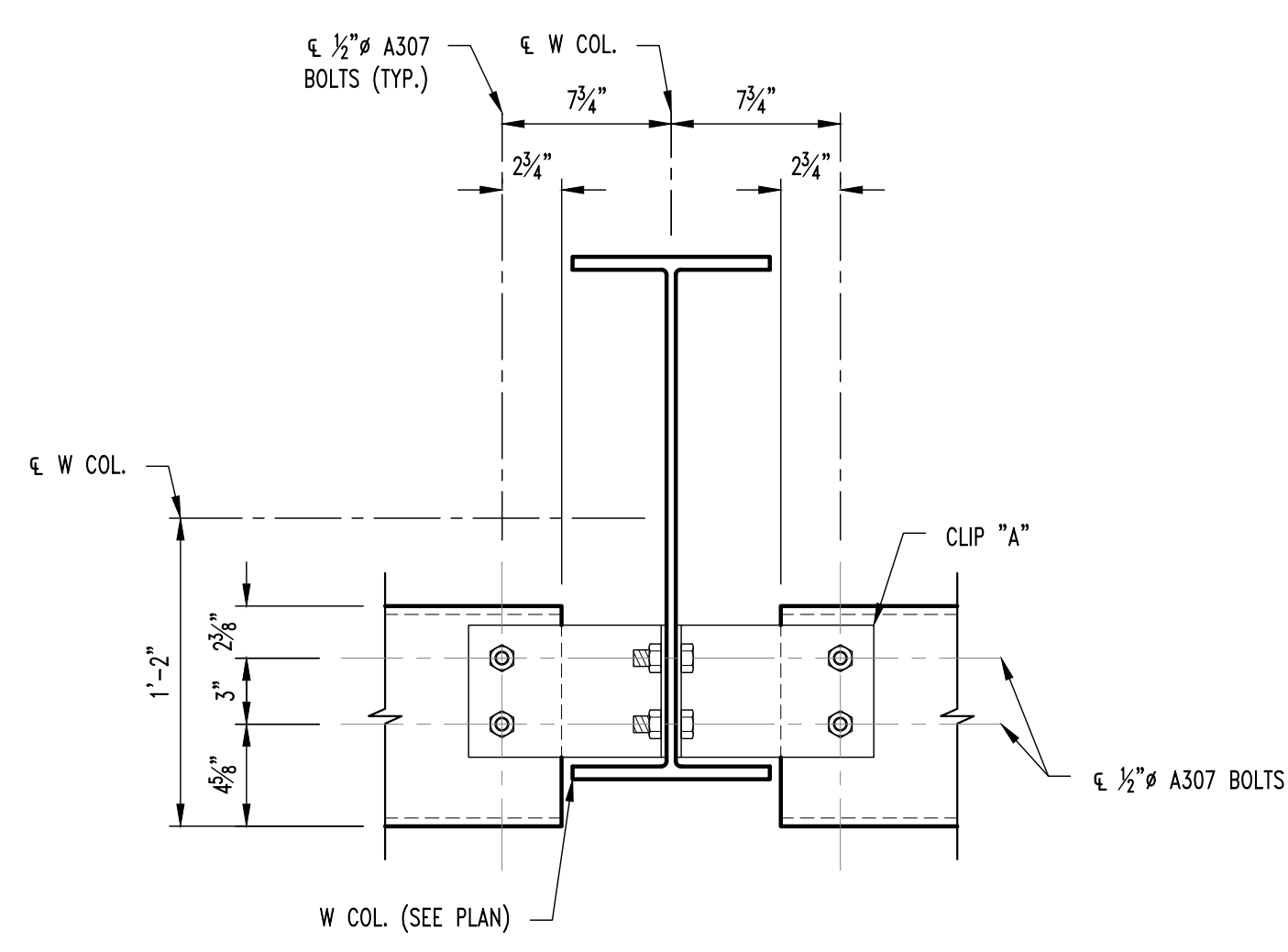
4 NORTH ELEVATION - STAIR TOWER
SCALE: 1/4" = 1'-0"

NOTE:
COORDINATE ALL OPENINGS w/ ARCH.
& MEP. PRIOR TO FABRICATION.

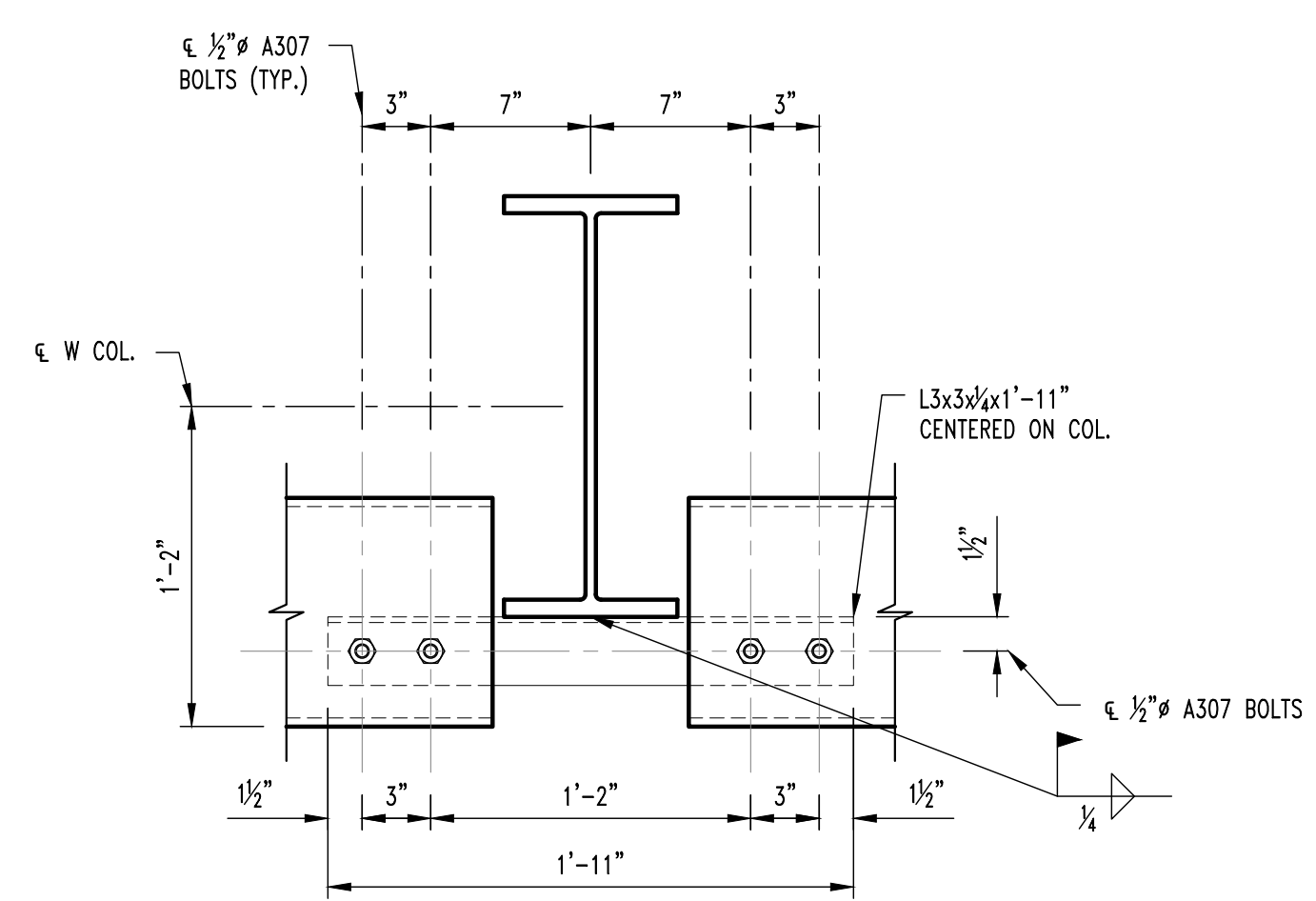


5 EAST ELEVATION - STAIR TOWER
SCALE: 1/4" = 1'-0"

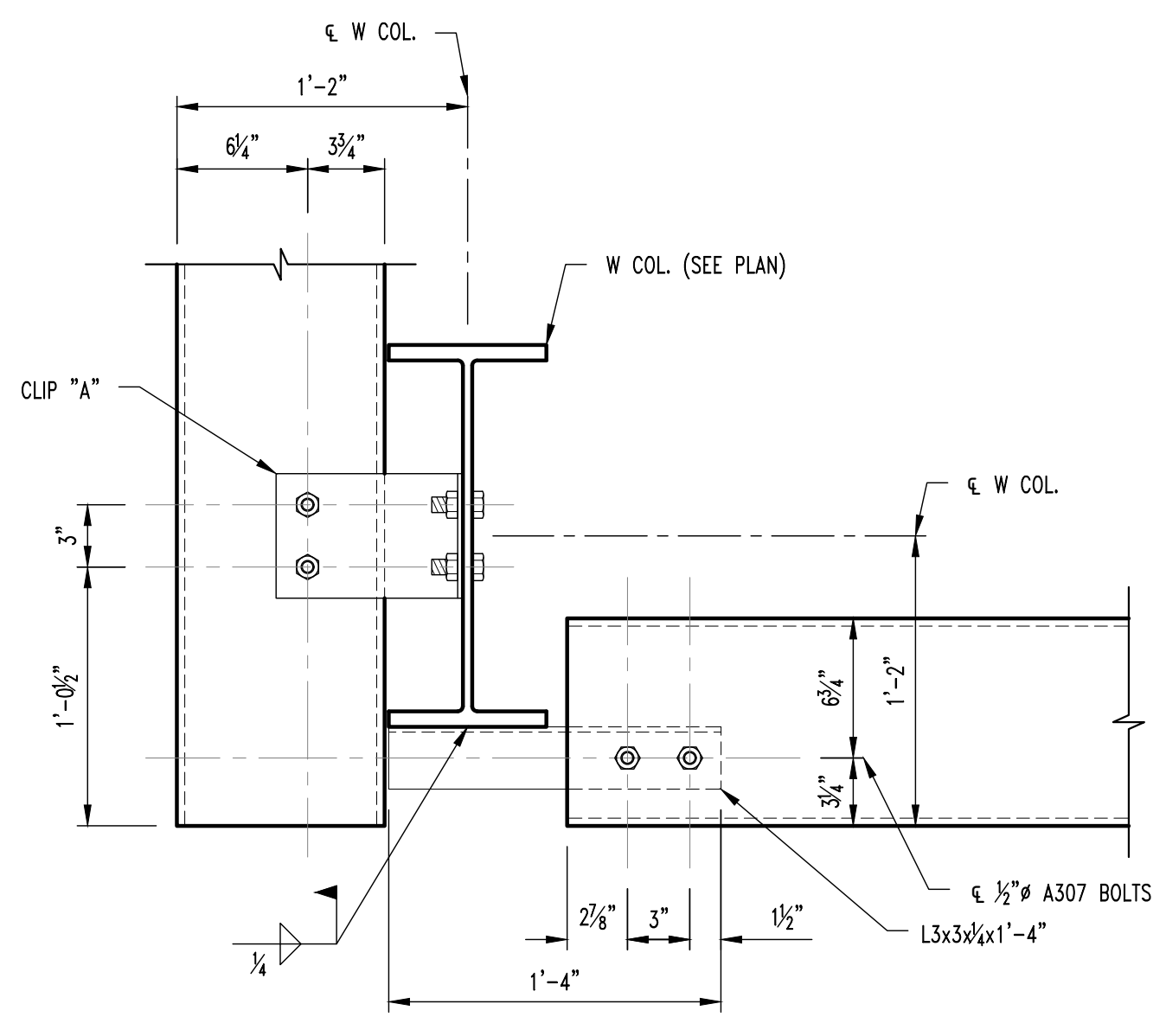
NOTE:
COORDINATE ALL OPENINGS w/ ARCH.
& MEP. PRIOR TO FABRICATION.



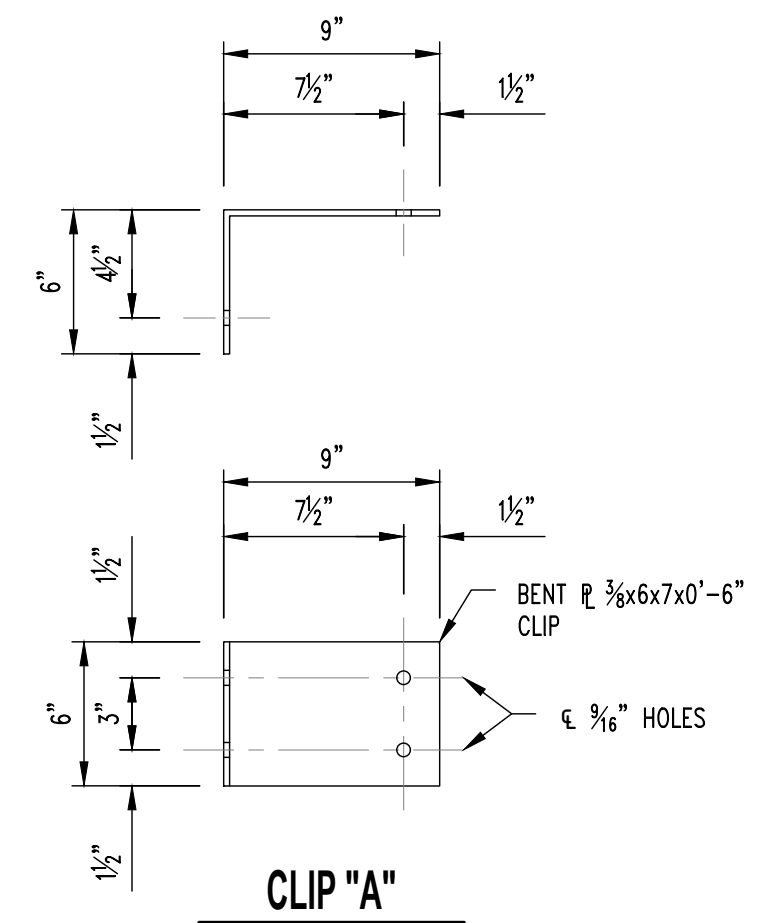
TYP. GIRT TO COLUMN CONNECTION



TYP. GIRT TO COLUMN CONNECTION



TYP. GIRT TO COLUMN CONNECTION @ CORNER



CLIP "A"

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

GREGORY L. LINNEHAN, P.E.
LICENSE NO. 200501013
01/22/2025

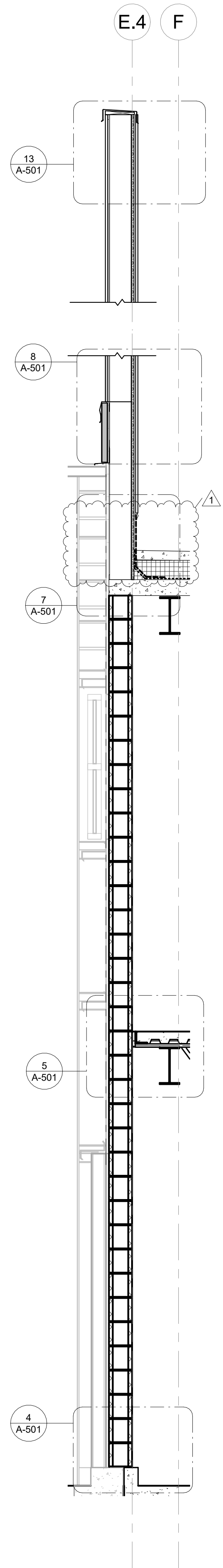
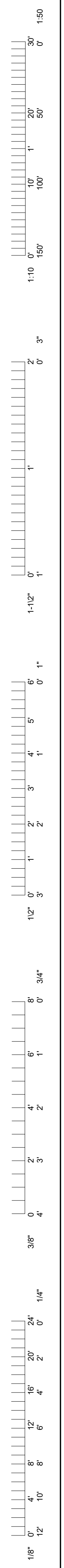
CROCKETT
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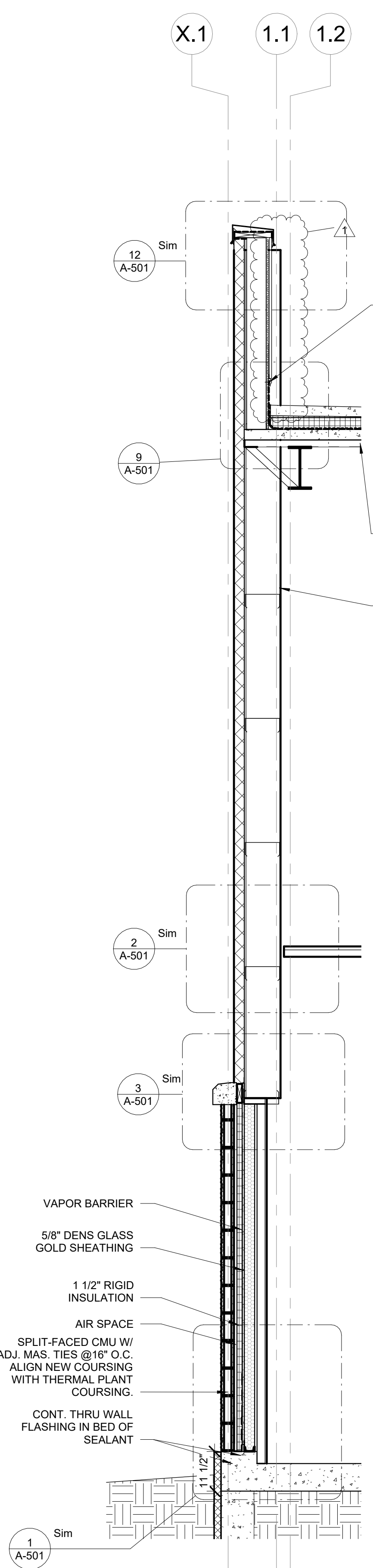
PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE 563.263.5160
MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017605

UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
BUILDING ELEVATIONS

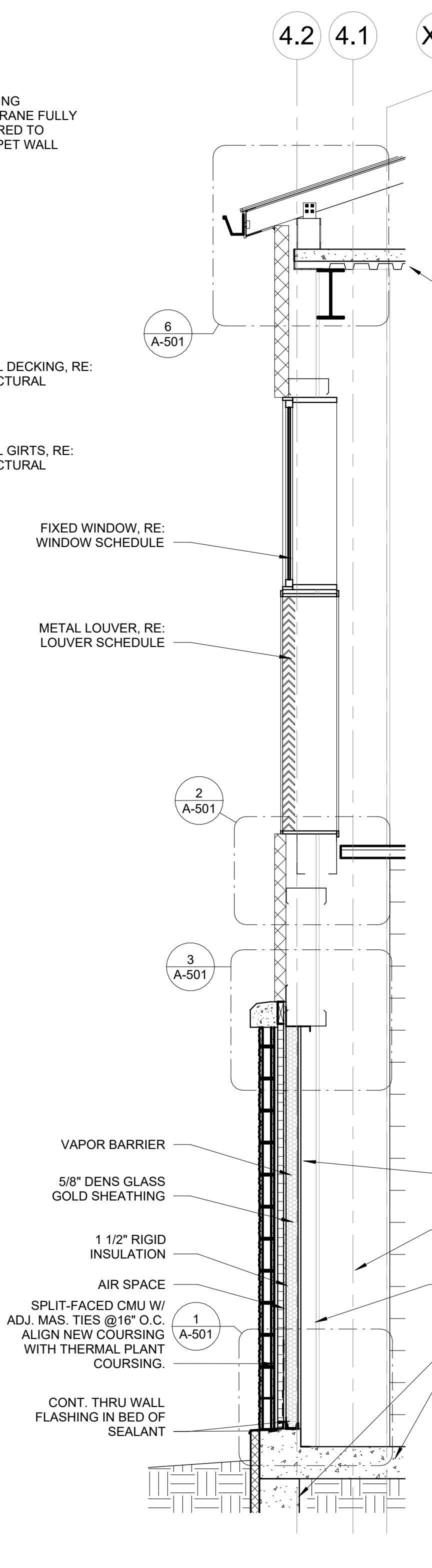
UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801
CONSULTANT
PROJECT NUMBER
200206
SHEET
S702



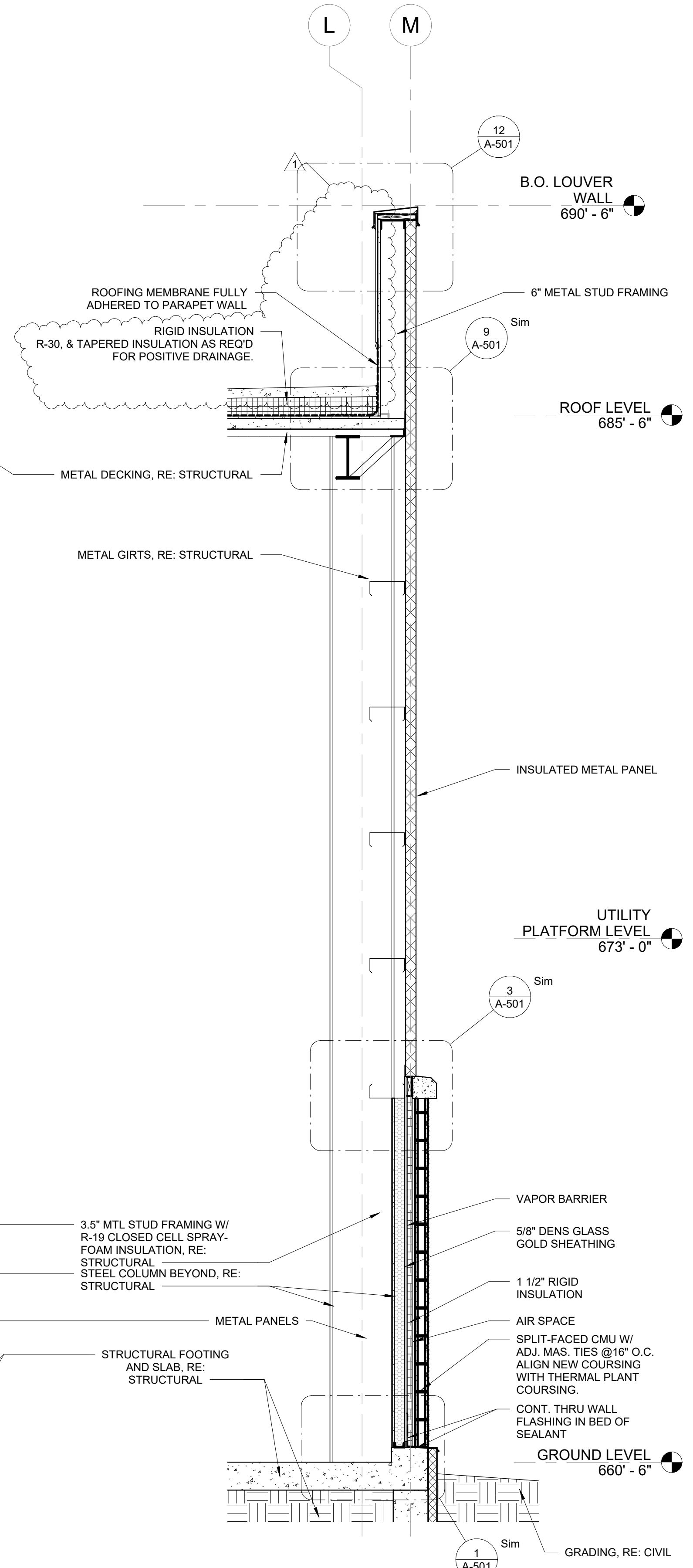
3 | WALL SECTION
1/2" = 1'-0"



4 | WALL SECTION
1/2" = 1'-0"



2 | WALL SECTION
1/2" = 1'-0"



1 | WALL SECTION
1/2" = 1'-0"

ROOFING MEMBRANE FULLY ADHERED TO PARAPET WALL

RIGID INSULATION R-30, & TAPERED INSULATION AS REQ'D FOR POSITIVE DRAINAGE.

METAL DECKING, RE: STRUCTURAL

METAL GIRTS, RE: STRUCTURAL

FIXED WINDOW, RE: WINDOW SCHEDULE

METAL LOUVER, RE: LOUVER SCHEDULE

INSULATED METAL PANEL

UTILITY PLATFORM LEVEL 673' - 0"

GROUND LEVEL 660' - 6"

GRADING, RE: CIVIL

3.5" MTL STUD FRAMING W/ R-19 CLOSED CELL SPRAY-FOAM INSULATION, RE: STRUCTURAL

STEEL COLUMN BEYOND, RE: STRUCTURAL

METAL PANELS

STRUCTURAL FOOTING AND SLAB, RE: STRUCTURAL

ROOF LEVEL 685' - 6"

B.O. LOUVER WALL 690' - 6"

6" METAL STUD FRAMING

VAPOR BARRIER

5/8" DENS GLASS GOLD SHEATHING

1 1/2" RIGID INSULATION

AIR SPACE

SPLIT-FACED CMU W/ ADJ. MAS. TIES @16" O.C. ALIGN NEW COURSING WITH THERMAL PLANT COURSING.

CONT. THRU WALL FLASHING IN BED OF SEALANT

NAME: NATHAN BOEN
LICENSE #: A-201700903
DATE: 11.30.2024

POWELL CWM, Inc.
Certification of Authority
Architecture: MO 310 / KS 73
Engineering: MO 4 / KS 241
Land Surveying: MO 123 / KS 38

POWELL c w m
ARCHITECTURE/ENGINEERING/SURVEYING
3005 S. W. 103rd Ave., Suite 100
Overland Park, MO 66209
(816) 552-4800

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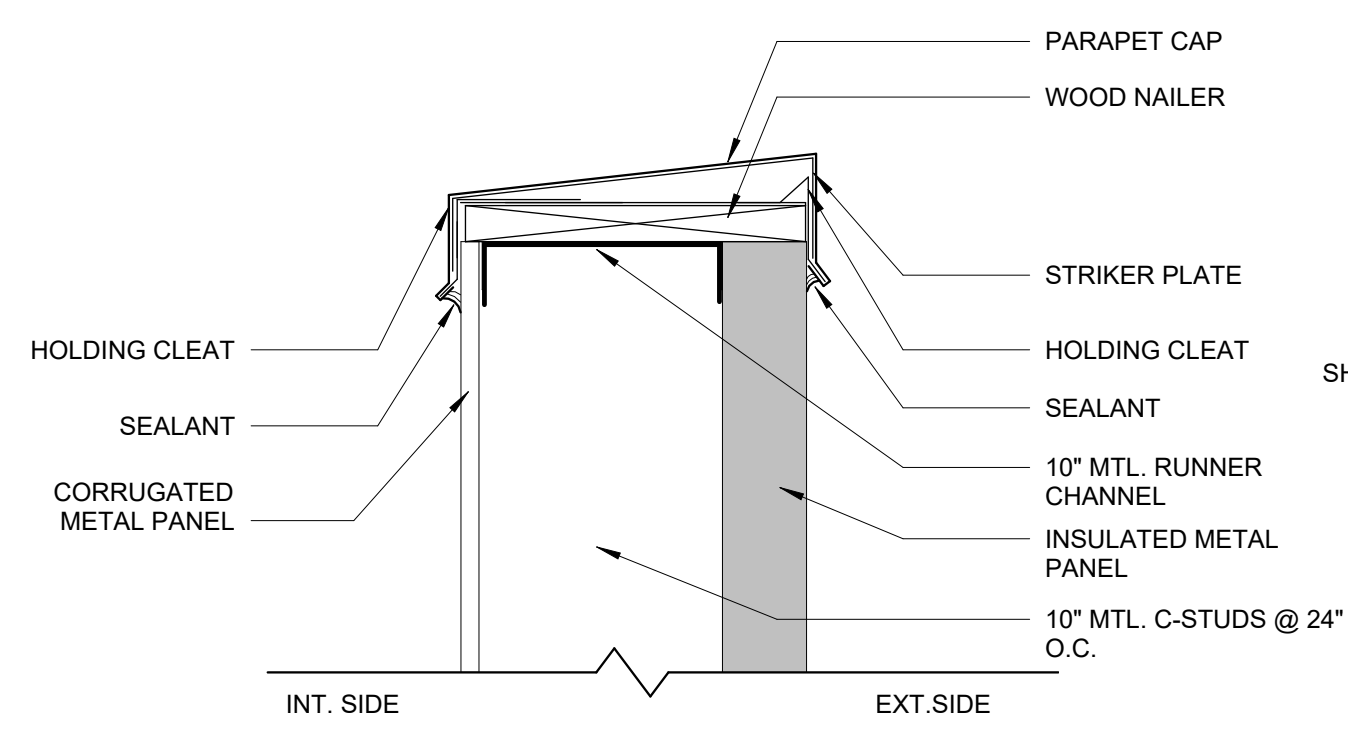
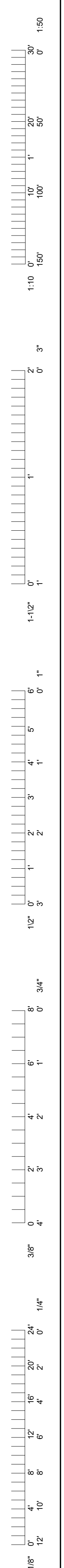
PRV CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE 563.263.5160
MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017605

UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
WALL SECTIONS

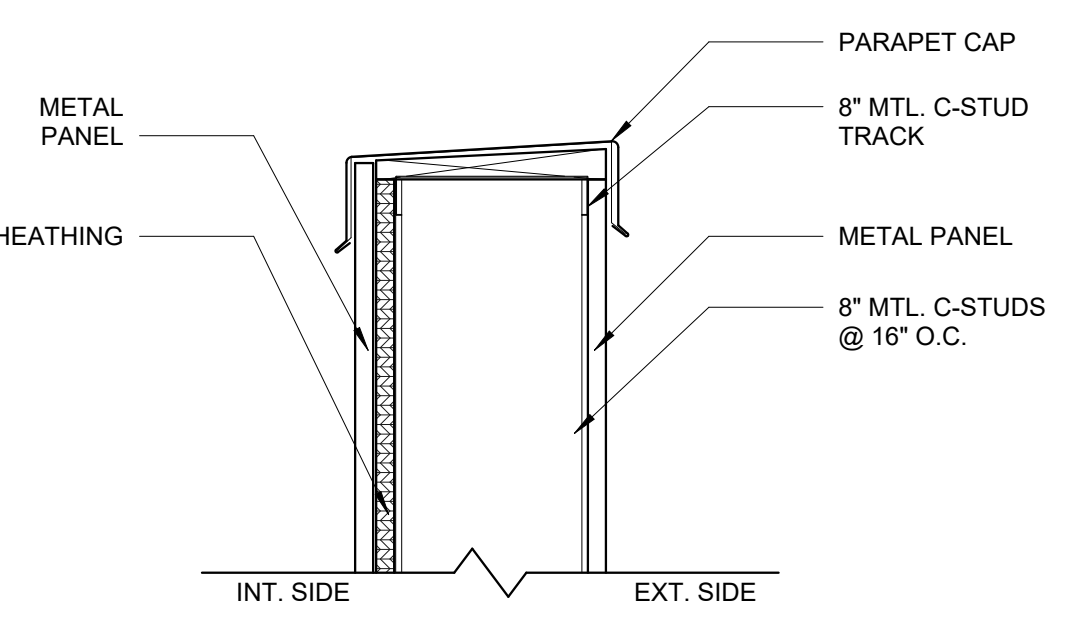
UNIVERSITY PROJECT NUMBER
CP232801

CONSULTANT PROJECT NUMBER
23-2210

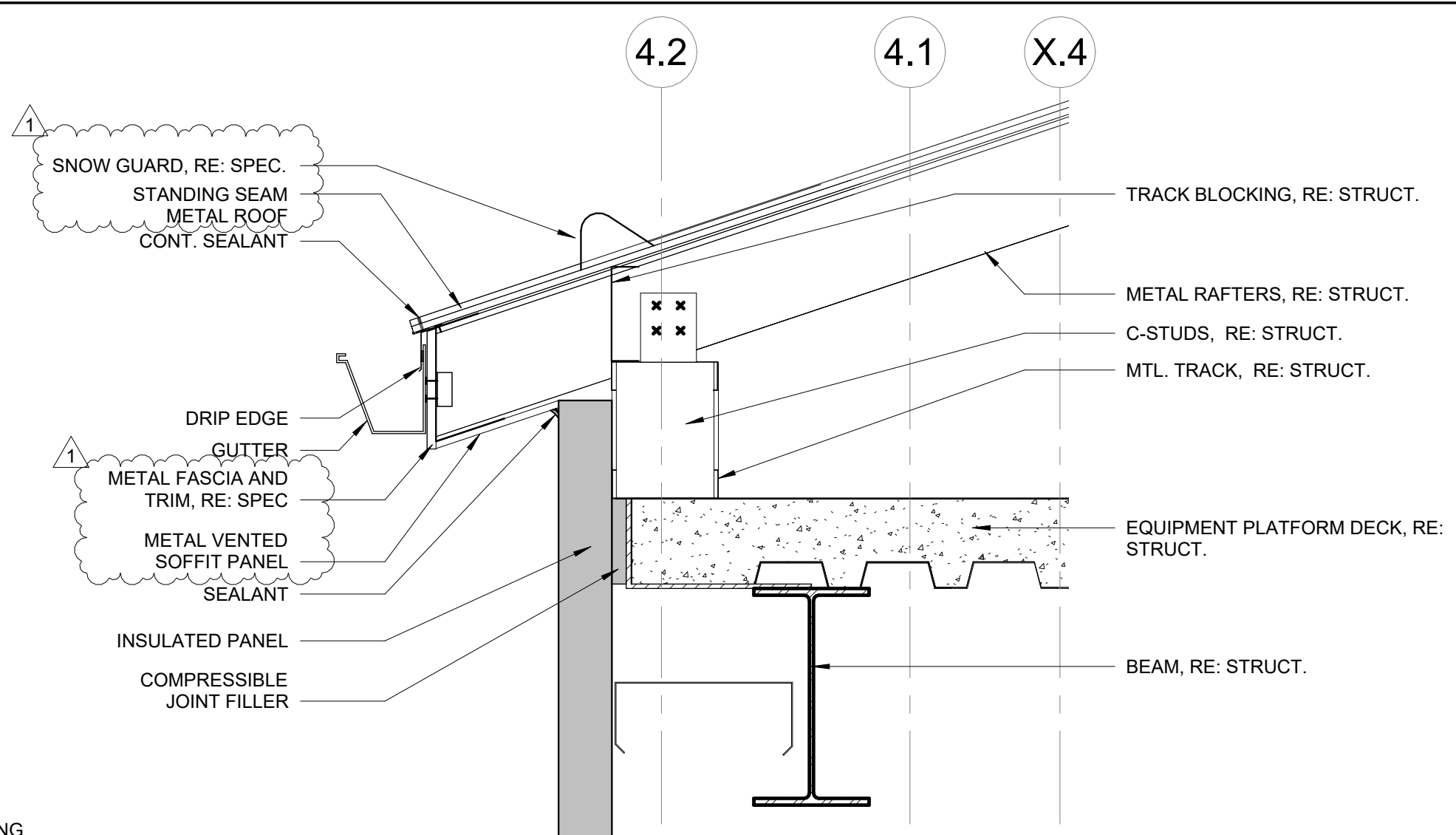
SHEET
A-410



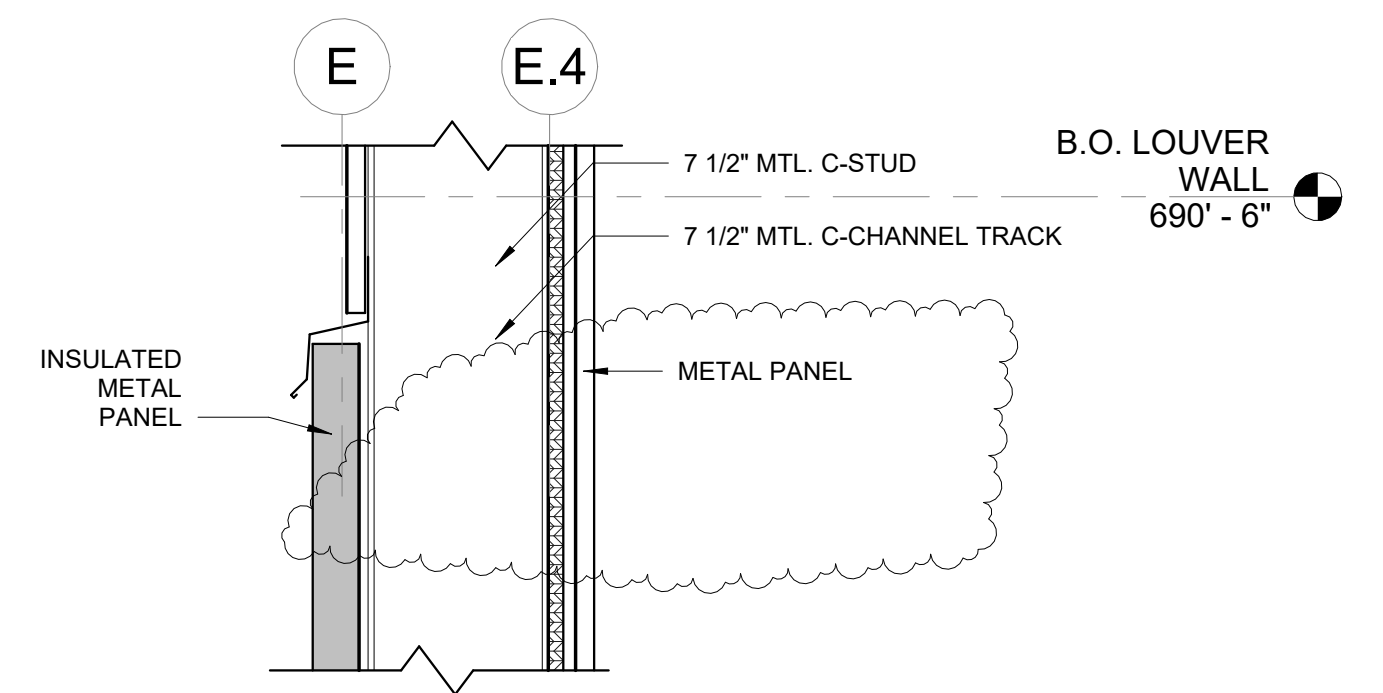
12 METAL WALL DETAIL @ PARAPET
1 1/2" = 1'-0"



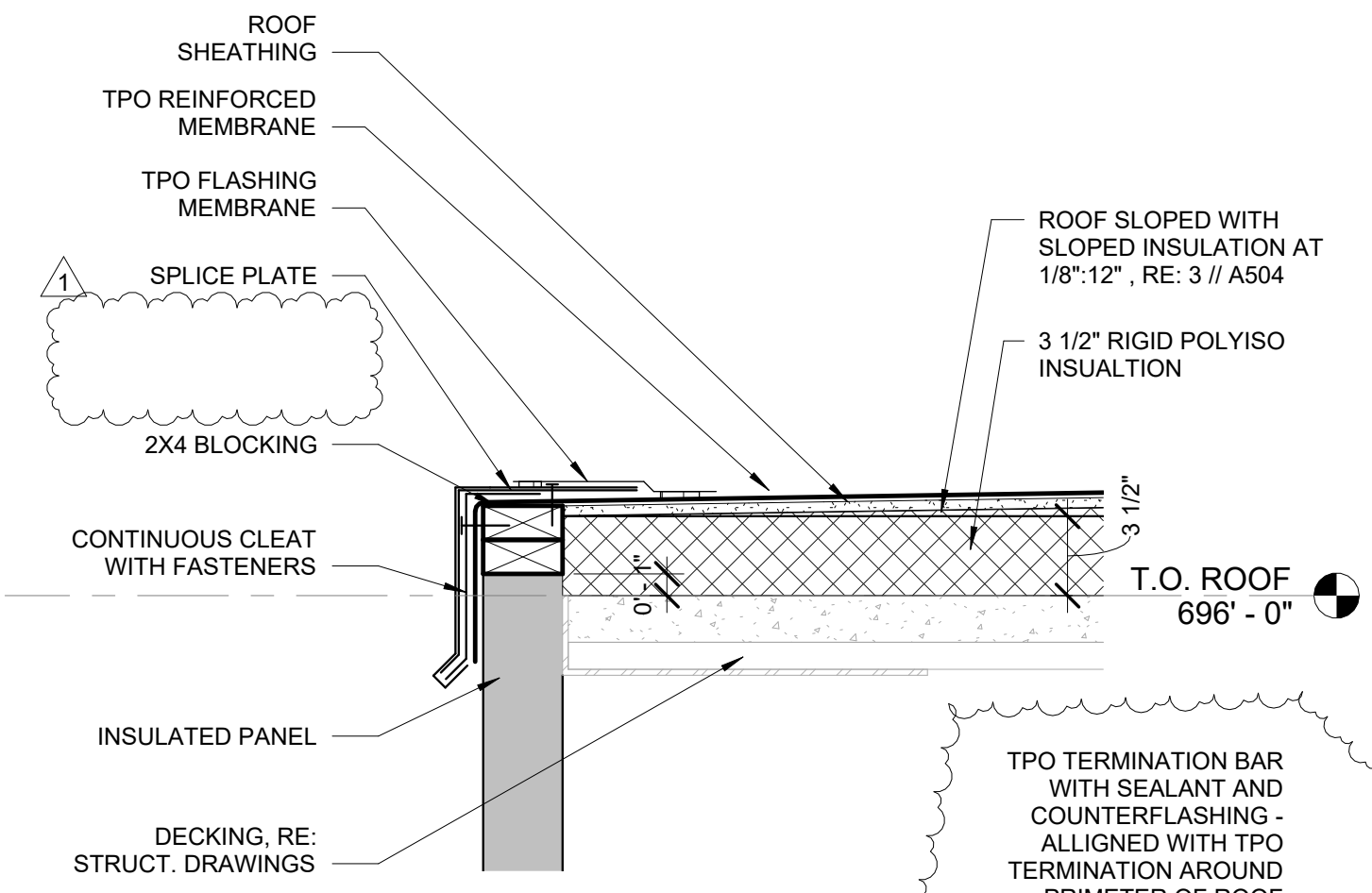
13 LOUVERED WALL DETAIL @ PARAPET
1 1/2" = 1'-0"



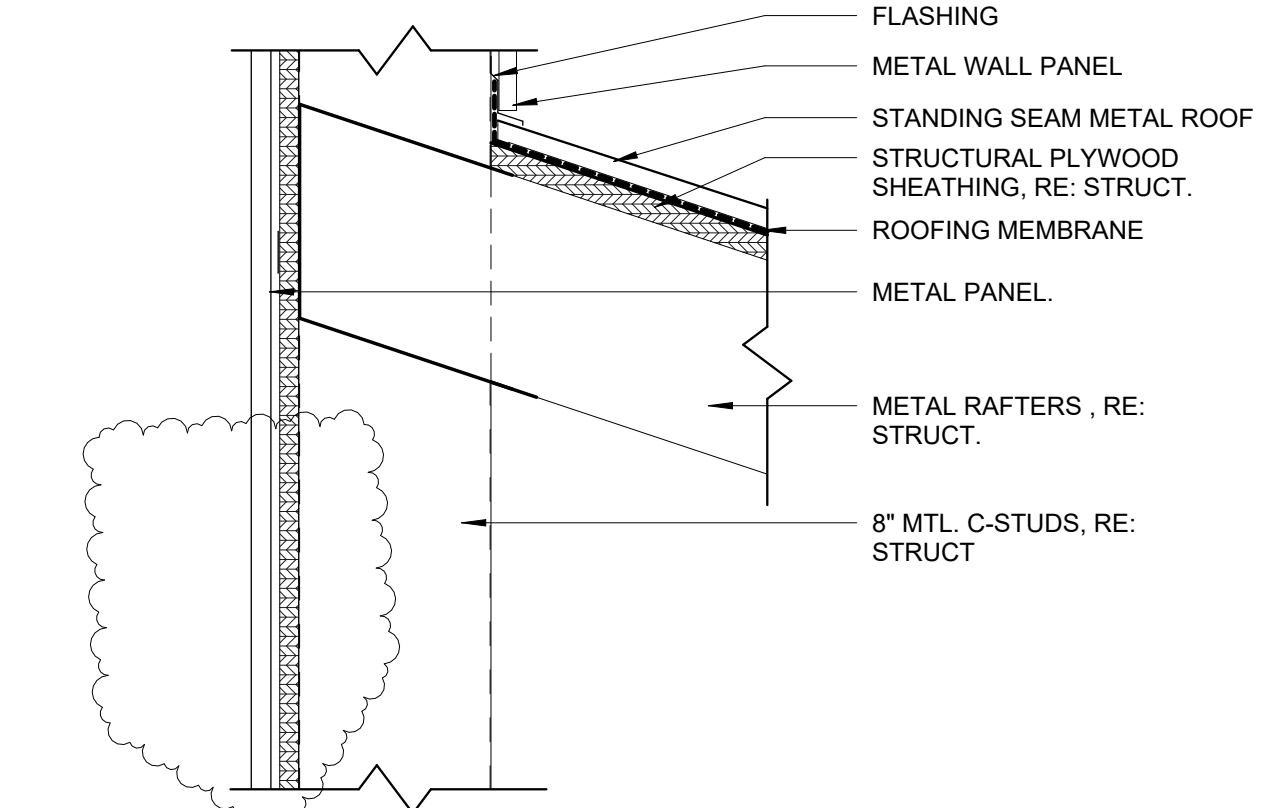
6 METAL WALL DETAIL @ ROOF
1 1/2" = 1'-0"



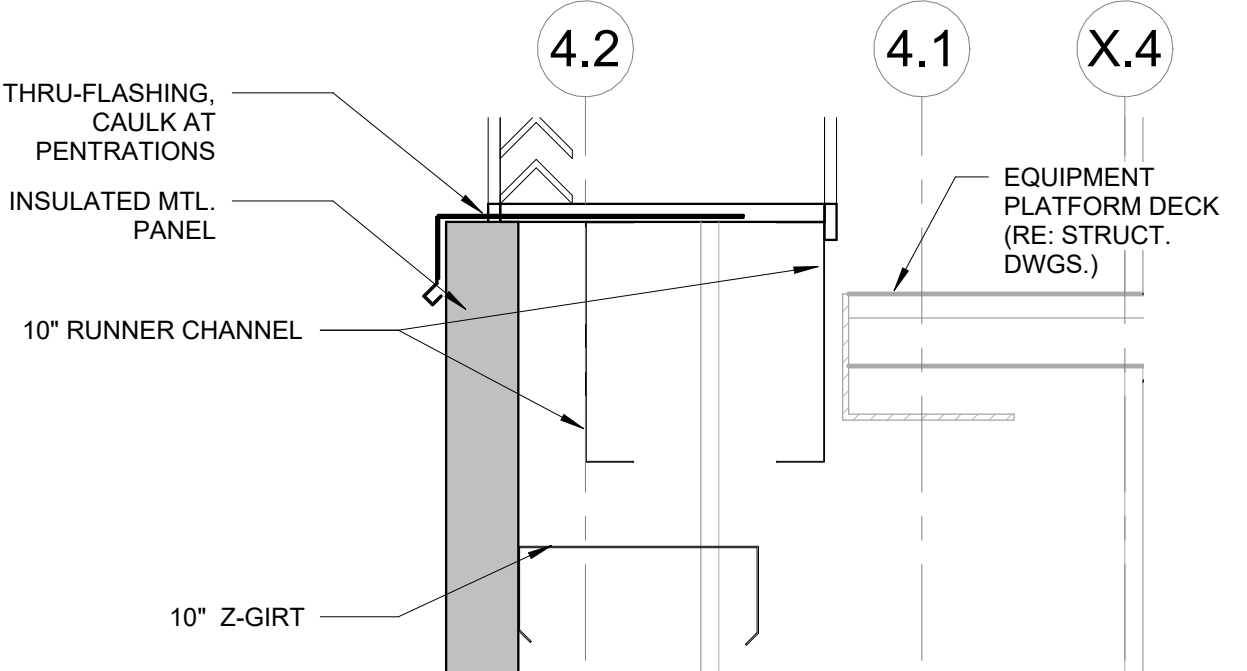
8 CMU WALL DETAIL @ METAL STUDS
1 1/2" = 1'-0"



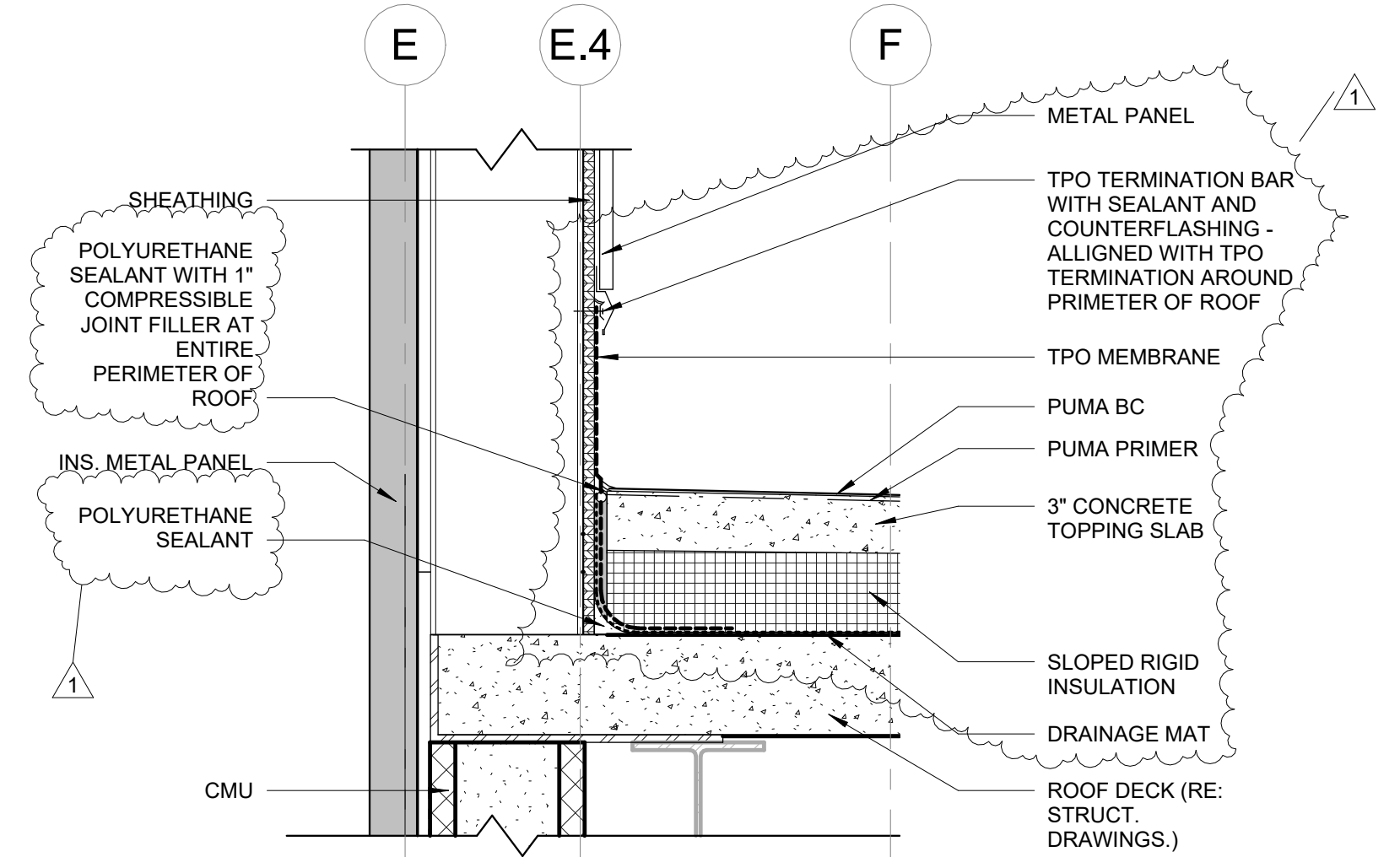
10 STAIRWELL DETAIL @ ROOF
1 1/2" = 1'-0"



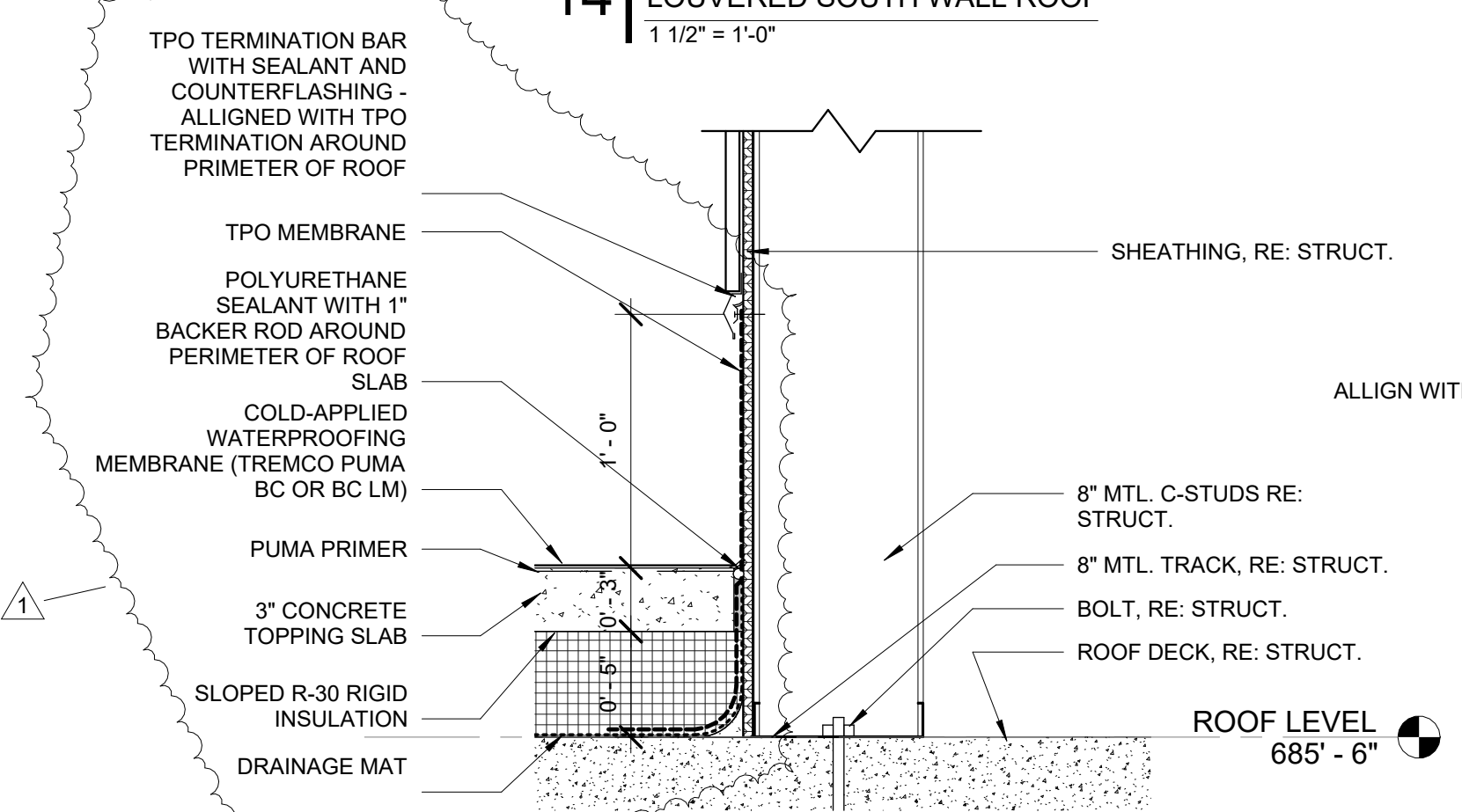
14 LOUVERED SOUTH WALL ROOF
1 1/2" = 1'-0"



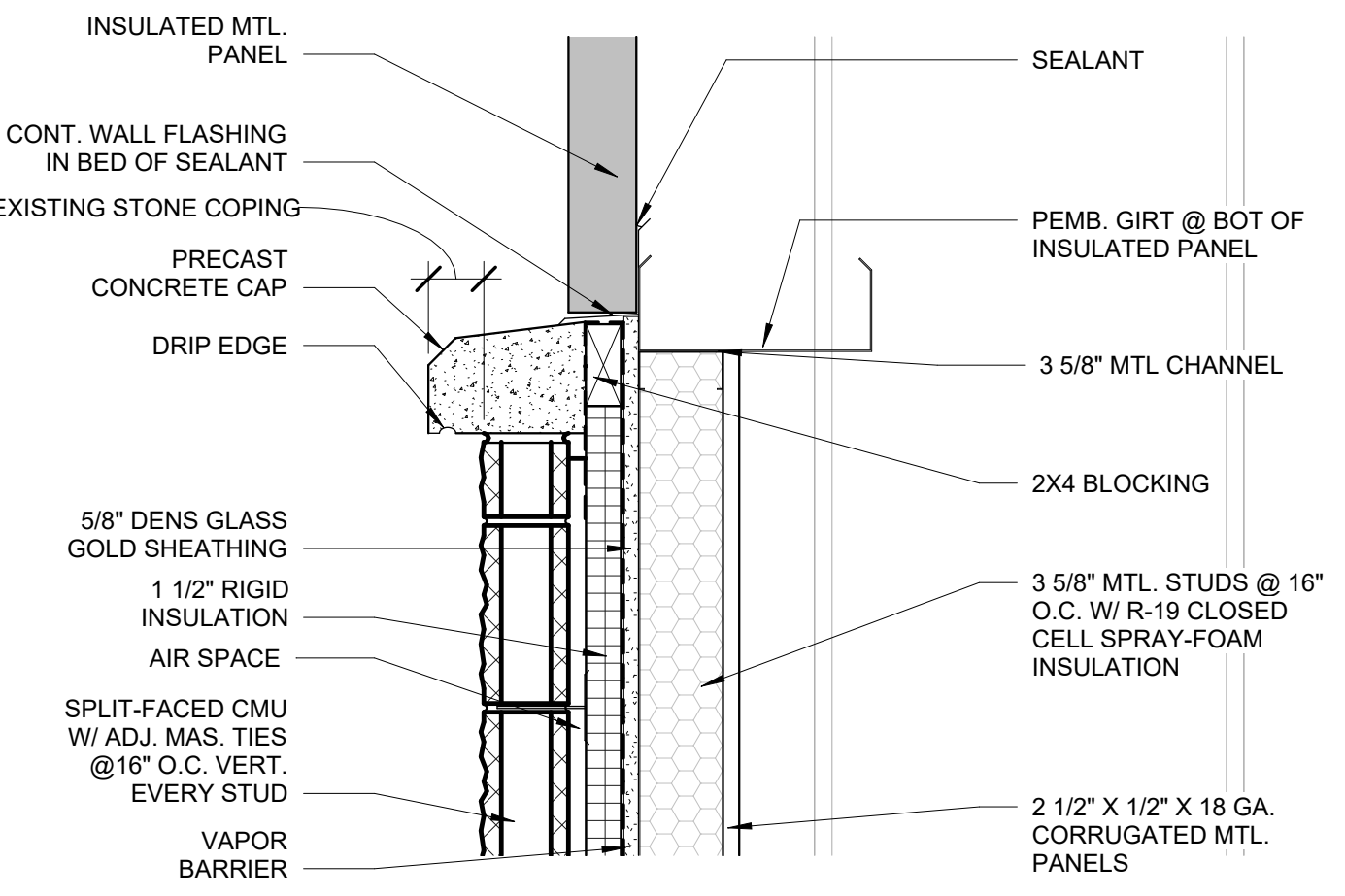
2 METAL WALL DETAIL @ UTILITY PLATFORM
1 1/2" = 1'-0"



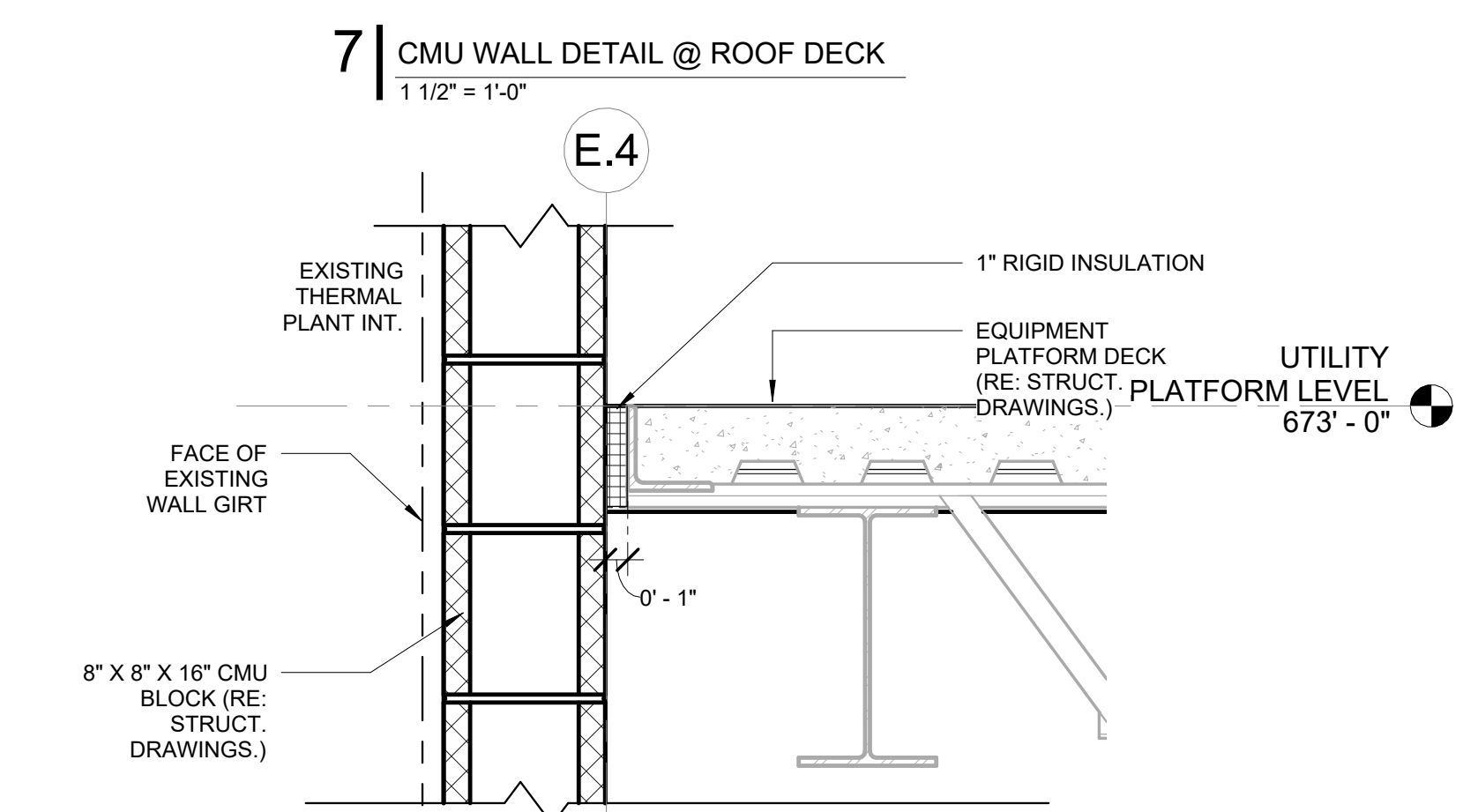
7 CMU WALL DETAIL @ ROOF DECK
1 1/2" = 1'-0"



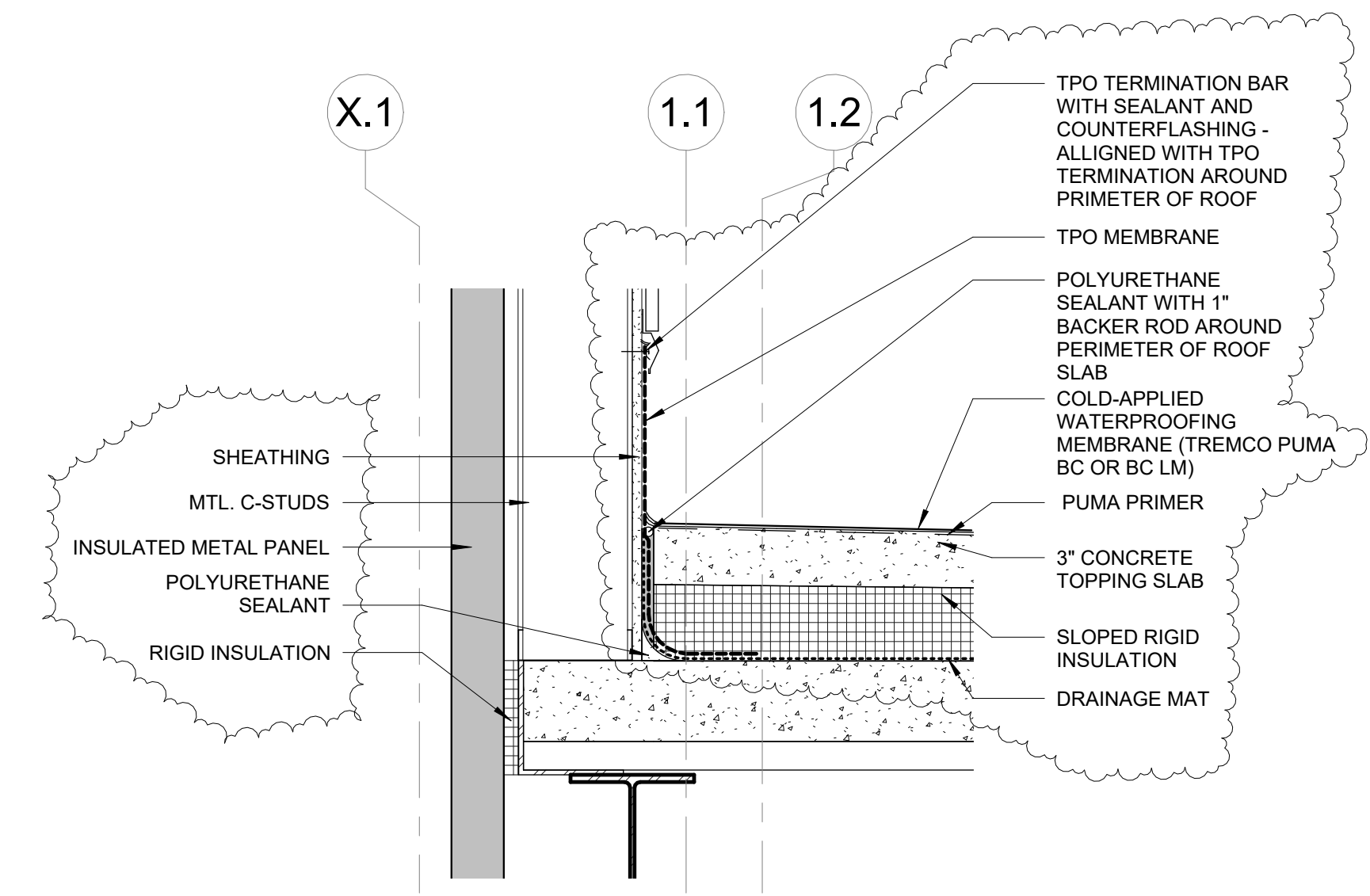
15 LOUVERED SOUTH WALL @ ROOF DECK
1 1/2" = 1'-0"



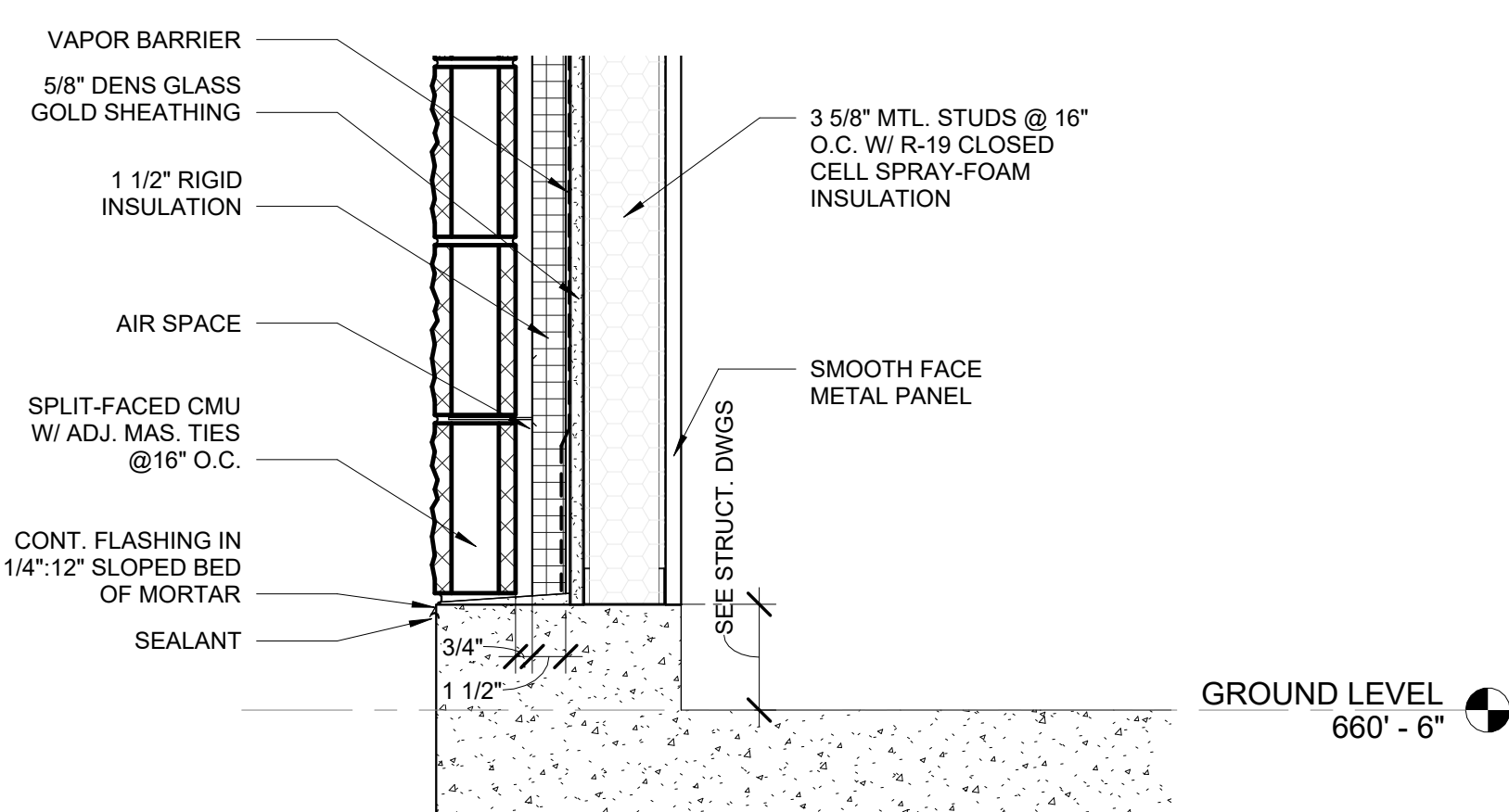
3 METAL WALL DETAIL @ CMU TRANSITION
1 1/2" = 1'-0"



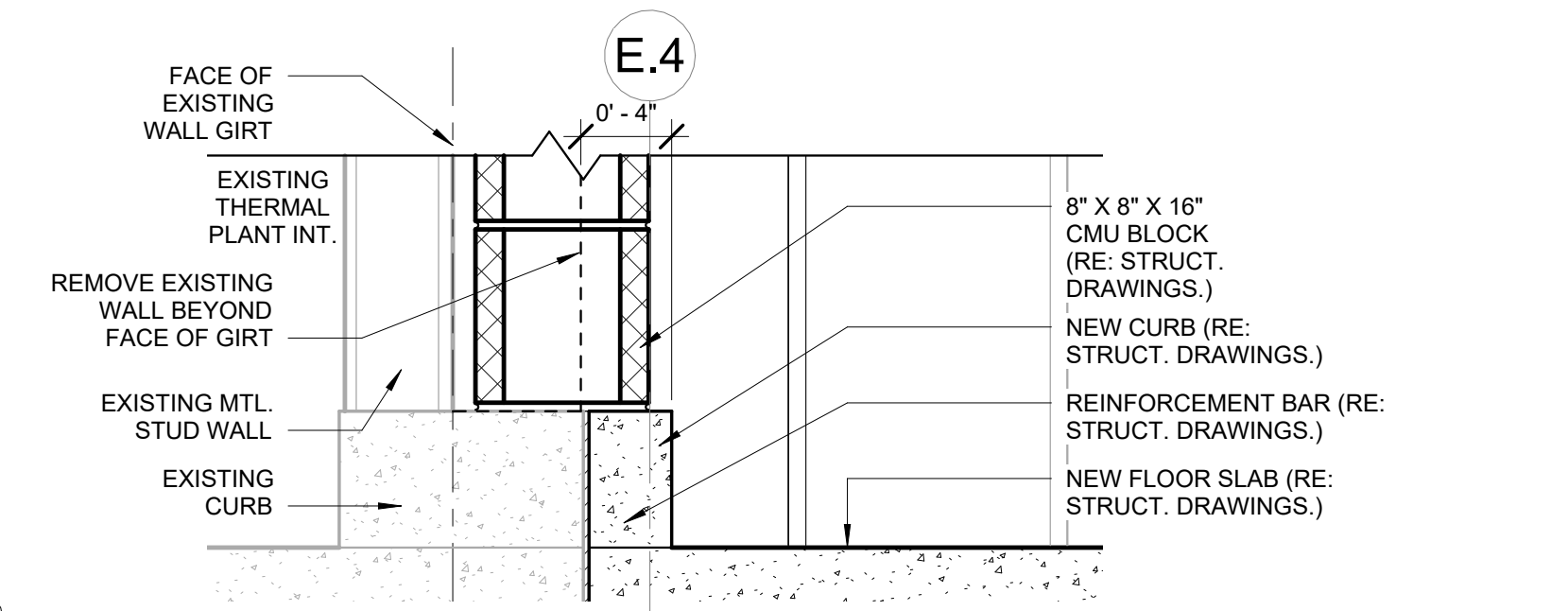
5 CMU WALL DETAIL @ UTILITY PLATFORM
1 1/2" = 1'-0"



9 METAL WALL DETAIL @ ROOF DECK
1 1/2" = 1'-0"



1 METAL WALL DETAIL @ CMU BASE
1 1/2" = 1'-0"



4 CMU WALL DETAIL @ BASE
1 1/2" = 1'-0"

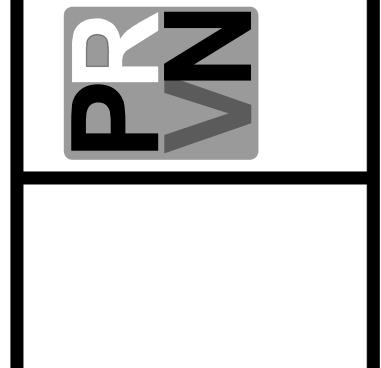


NATHAN KENT BOEN
ARCHITECT
LICENSE # A-201700903
DATE: 11.30.2024

POWELL CWM, Inc.
Certified Authority
Architecture: MD 210 / KS 73
Engineering: MO 4 / MS 241
Land Surveying: MO 123 / KS 38
ARCHITECTURE/ENGINEERING/SURVEYING
C W M
3000 S. W. 10th Street, Suite 100
P.O. Box 1000
Pawnee, MO 64078
(816) 522-4800
www.powellcwm.com

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PHONE 563.263.5160
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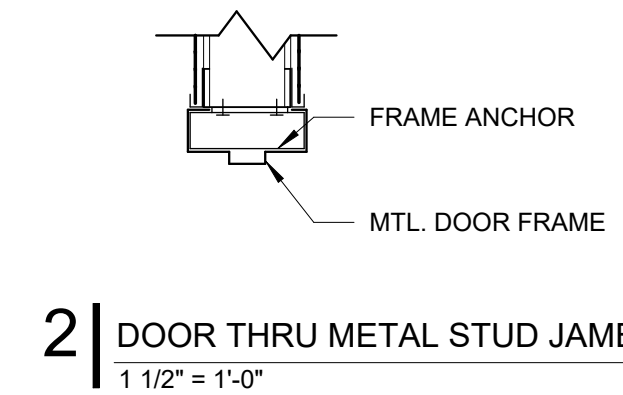
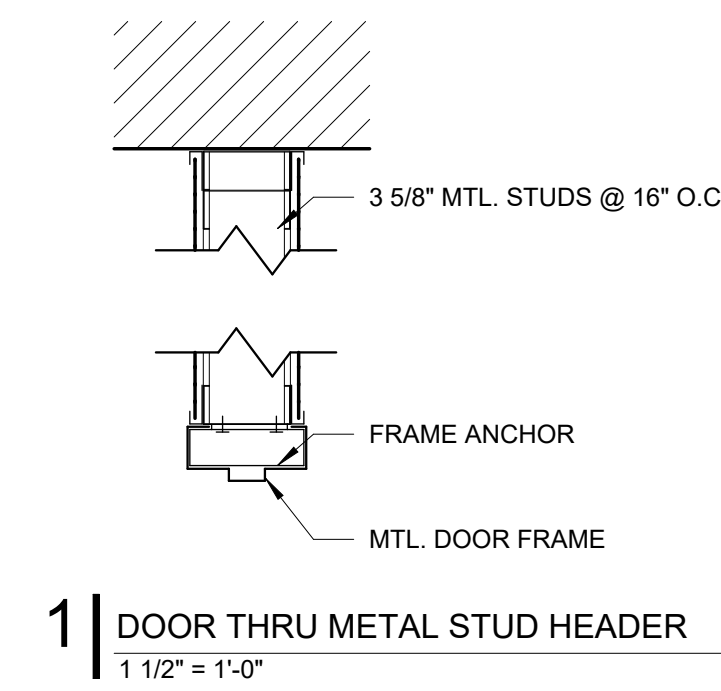
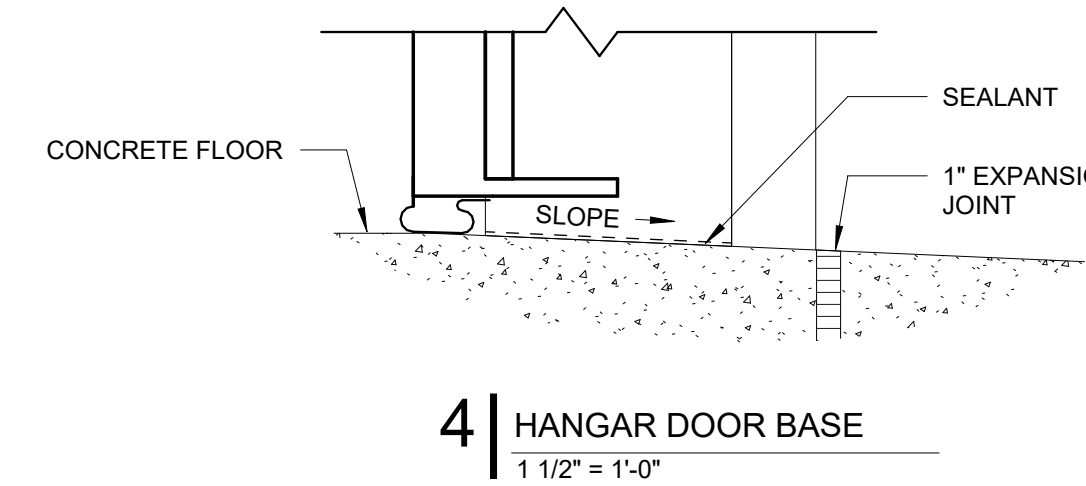
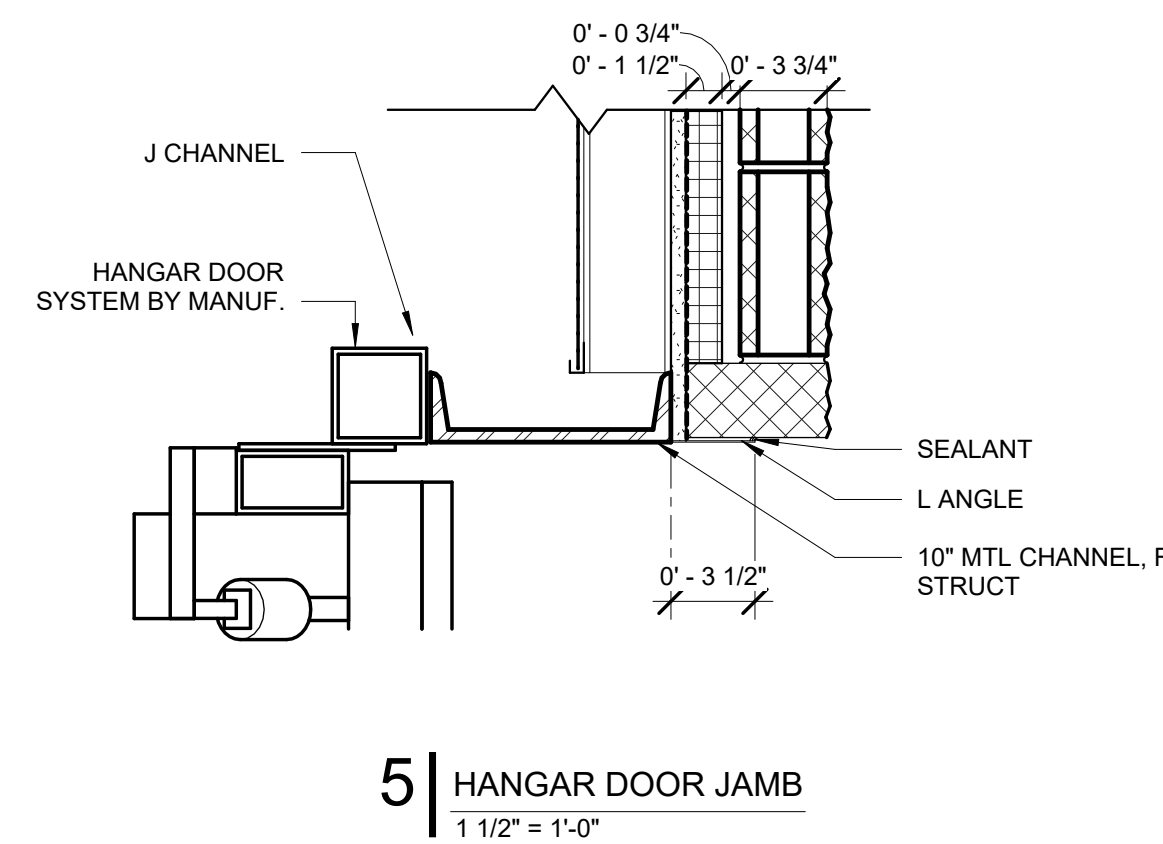
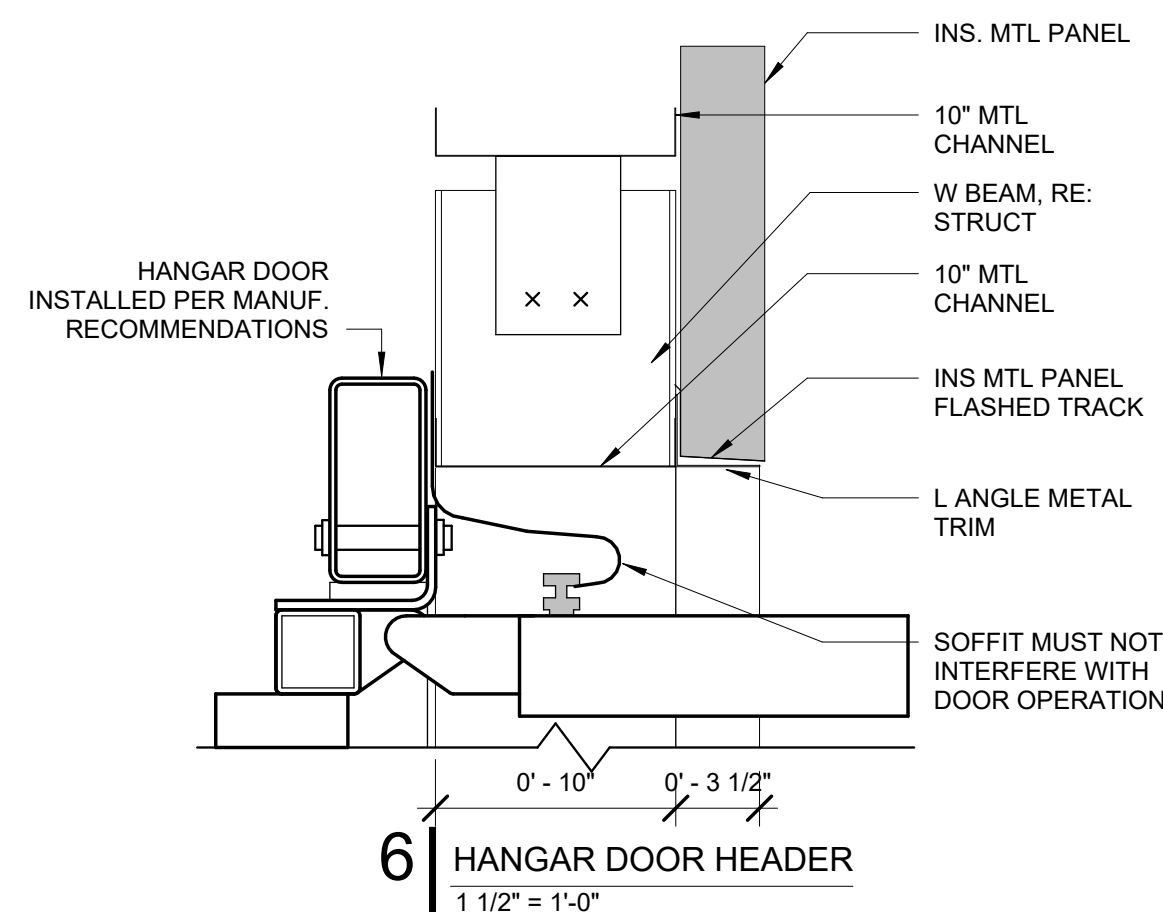
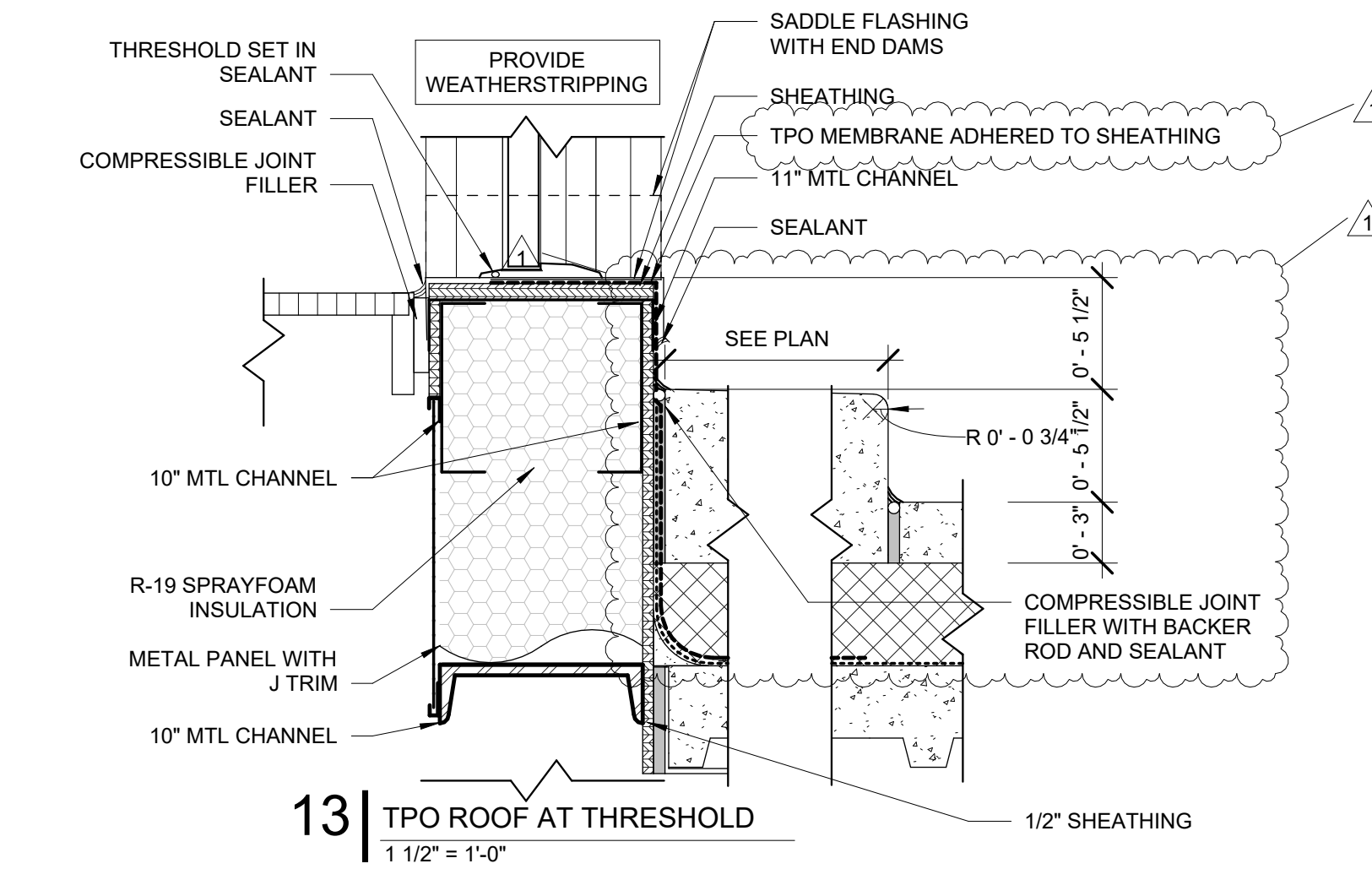
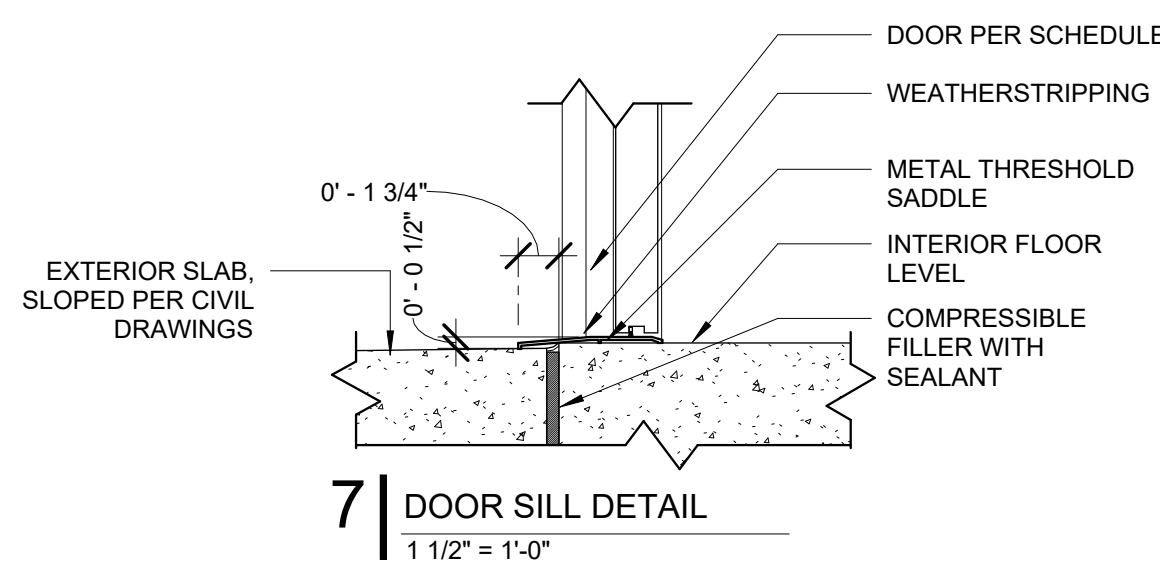
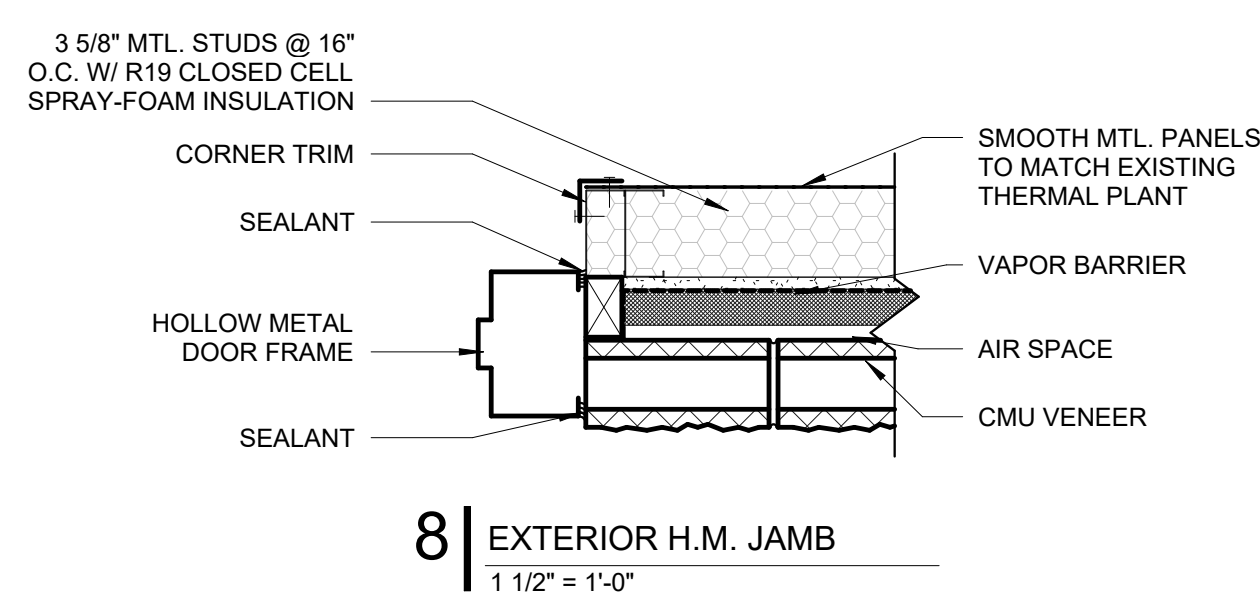
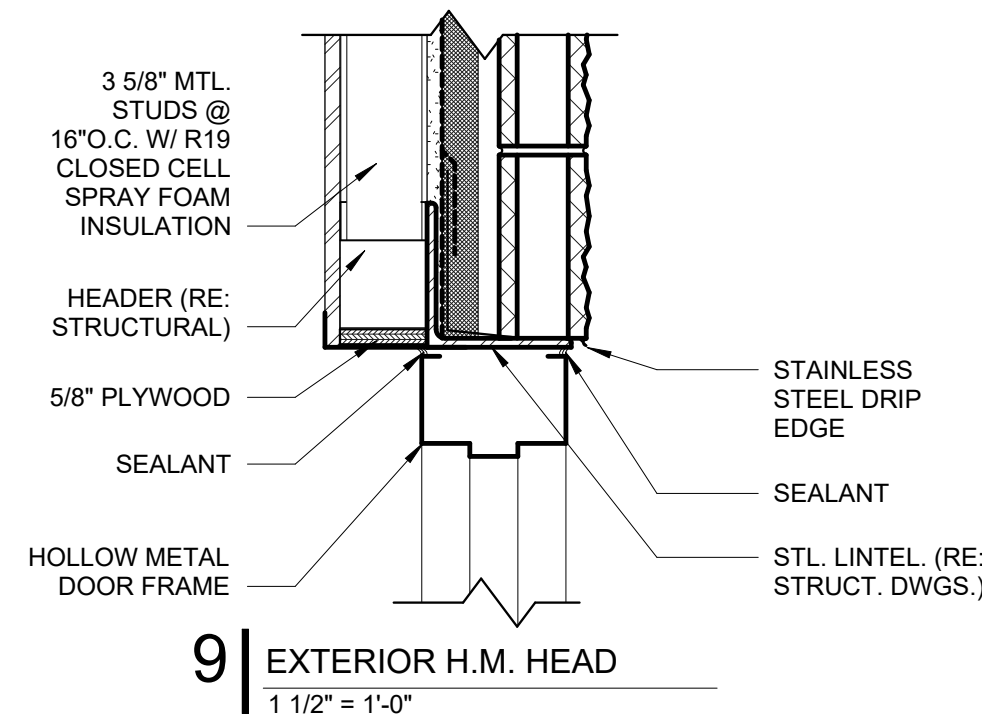
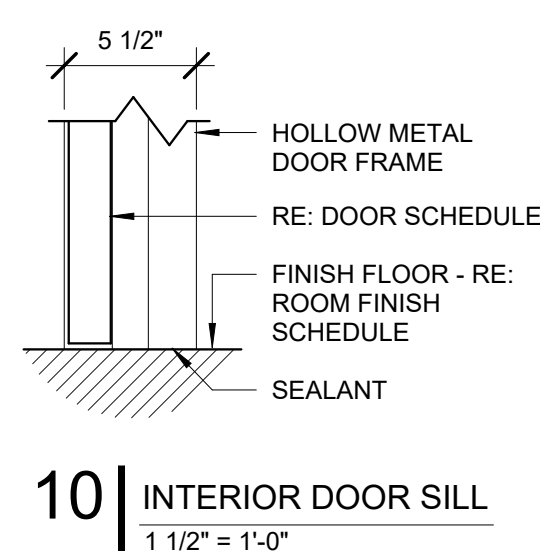
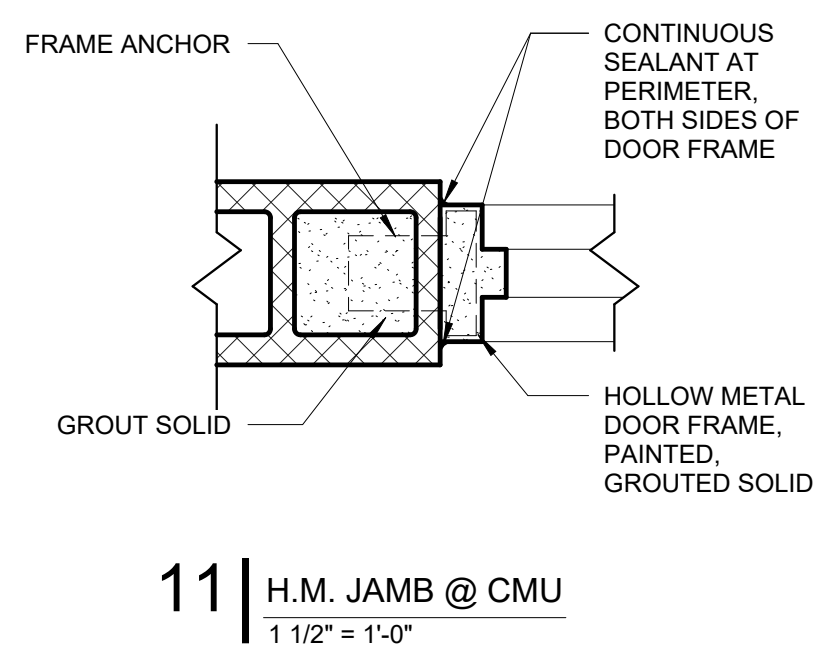
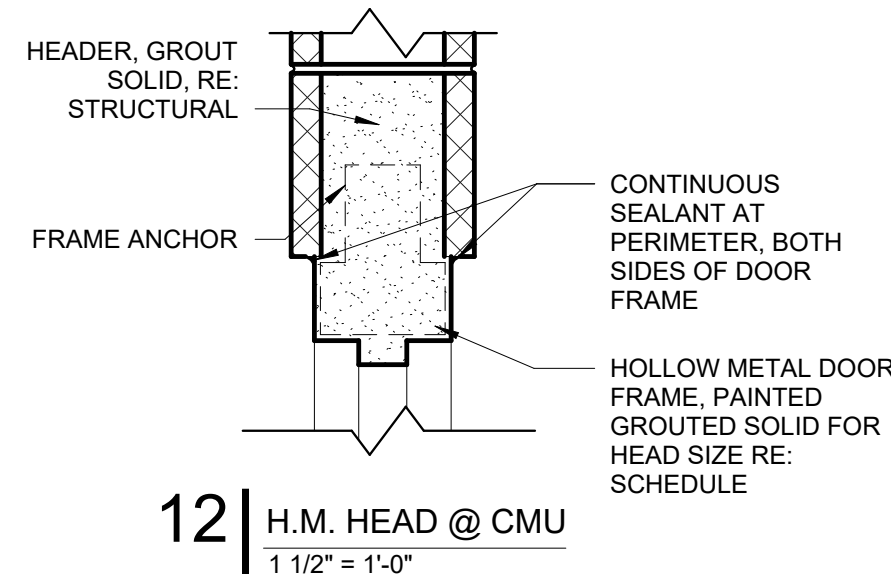
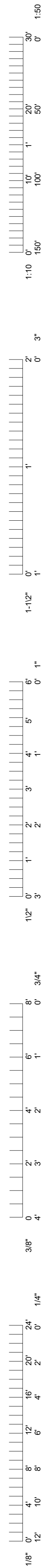
UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203

UNIVERSITY PROJECT NUMBER
CP232801

CONSULTANT PROJECT NUMBER
23-2210

SHEET
A-501

DETAILS



NAME: NATHAN BOEN
LICENSE #: A-2017009093
DATE: 11.30.2024

POWELL CWM, Inc.
Certified of Authority
Architecture: MO 310 / KS 73
Engineering: MO 4 / KS 241
Land Surveying: MO 123 / KS 38

POWELL
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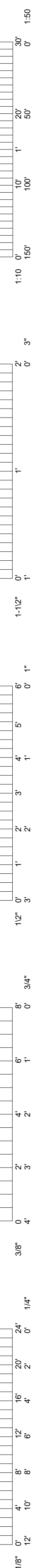
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CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203

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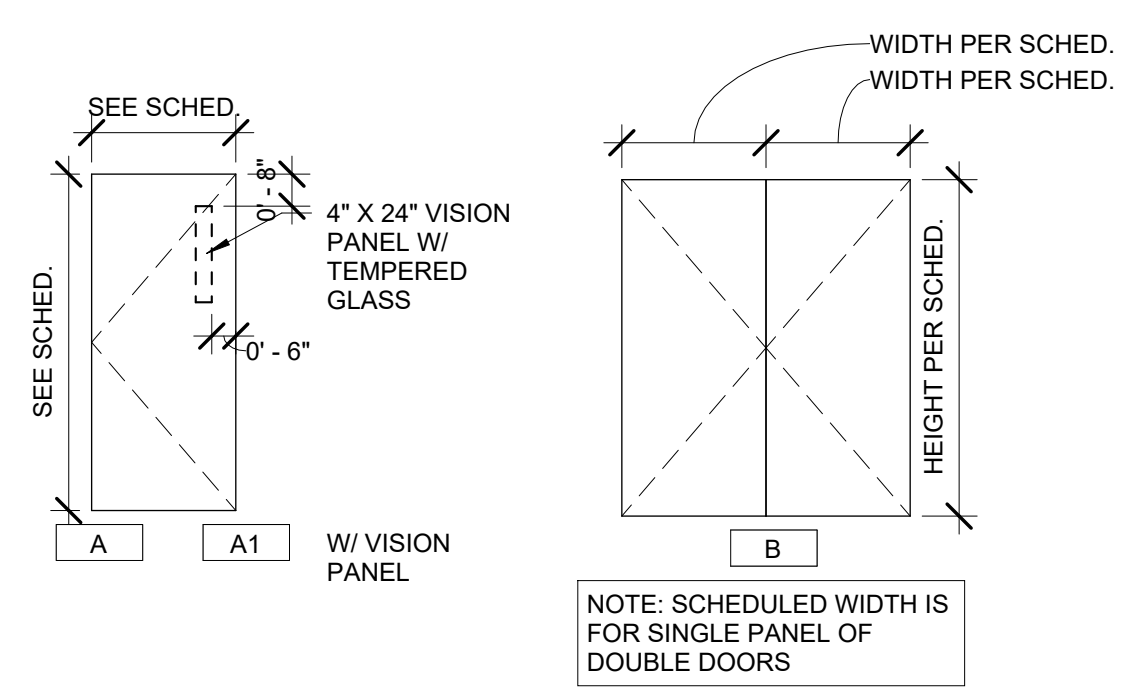
CONSULTANT
PROJECT NUMBER
23-2210

SHEET
A-503

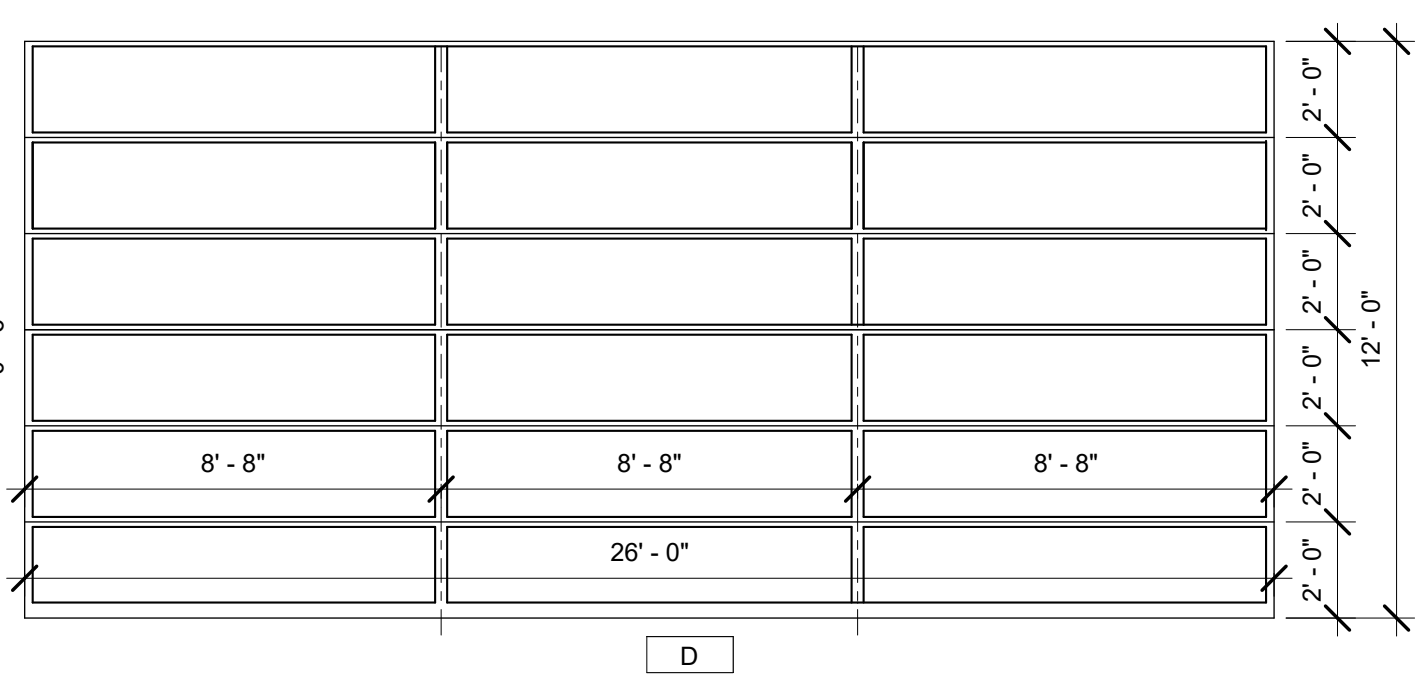
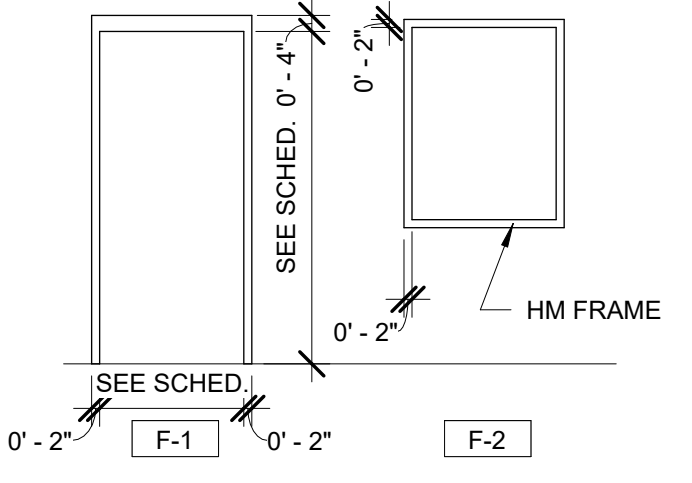
DETAILS



DOOR TYPES



FRAME TYPES



ROOM FINISH SCHEDULE

Number	Name	Floor Finish	Base Finish	WALL FINISH				Ceiling Finish	Area	Comments
				NORTH	EAST	SOUTH	WEST			
114	CHEMICAL STORAGE	RESINOUS FLOORING	4" COVE	PAINT	PAINT	PAINT	PAINT	NONE	437 SF	Epoxy floor coating during construction. Include equipment pads.
113	ELECTRICAL ROOM	RESINOUS FLOORING	4" COVE	PAINT	PAINT	PAINT	PAINT	NONE	516 SF	Epoxy floor coating during construction. Include equipment pads.
212	ELECTRICAL ROOM CONTROL SYSTEM	RESINOUS FLOORING	4" COVE	PAINT	PAINT	PAINT	PAINT	NONE	378 SF	Epoxy floor coating during construction. Include equipment pads.
002	EQUIP PIT	RESINOUS FLOORING	4" COVE	NONE	NONE	NONE	NONE	NONE	260 SF	Epoxy floor coating during construction.
111	MECHANICAL ROOM	RESINOUS FLOORING	4" COVE	PAINT	PAINT	PAINT	PAINT	NONE	4173 SF	Epoxy floor coating during construction. Include equipment pads.
110	STAIRWELL GROUND	RESINOUS FLOORING	4" COVE	PAINT	PAINT	PAINT	PAINT	NONE	197 SF	Epoxy floor coating during construction. Include equipment pads.
310	STAIRWELL ROOF	MTL. GRATING		NONE	NONE	NONE	PAINT	NONE	185 SF	
210	STAIRWELL UTILITY PLATFORM	MTL. GRATING		NONE	NONE	NONE	PAINT	NONE	185 SF	
211	UTILITY PLATFORM	RESINOUS FLOORING	4" COVE	NONE	NONE	NONE	NONE	NONE	2076 SF	Epoxy floor coating during construction.
001	VAULT	RESINOUS FLOORING	4" COVE	NONE	NONE	NONE	NONE	NONE	110 SF	Epoxy floor coating during construction.
112	VESTIBULE	RESINOUS FLOORING	4" COVE	PAINT	PAINT	PAINT	PAINT	NONE	115 SF	Epoxy floor coating during construction.

DOOR ASSEMBLY SCHEDULE

Mark	TYPE	PANEL(S) SIZE		FINISH	FRAME		FIRE RATING (HOURS)	HARDWARE SET #	ASSEMBLY COMMENTS	DETAILS		
		W	H		TYPE	FINISH				HEAD	JAMB	SILL
110A	A	3'-0"	7'-0"		F-1			2		15 / A503	14 / A503	10 / A503
110B	A1	3'-0"	7'-0"		F-1			1B	PROVIDE PANIC RELEASE HARDWARE & POSITION SWITCH	9 / A503	8 / A503	7 / A503
111A	A1	3'-0"	7'-0"		F-1			1A	PROVIDE PANIC RELEASE HARDWARE	9 / A503	8 / A503	7 / A503
111B	C	4'-0"	9'-0"		F-1			3A		12 / A503	11 / A503	10 / A503
111C	C	4'-0"	9'-0"		F-1			3A		12 / A503	11 / A503	10 / A503
111E	D	26'-0"	12'-0"					6	BI-FOLD HANGER DOOR	6 / A503	5 / A503	4 / A503
112A	A	3'-4"	7'-0"		F-1			2		12 / A503	11 / A503	10 / A503
112B	A	3'-0"	7'-0"		F-1			2		12 / A503	11 / A503	10 / A503
112C	A1	3'-0"	7'-0"		F-1			1B		9 / A503	8 / A600	7 / A503
114C	B	7'-0"	9'-0"		F-1		1	4	PROVIDE POSITION SWITCH	12 / A503	11 / A503	10 / A503
210	A	3'-0"	7'-0"		F-1			2		15 / A503	14 / A503	11 / A600
211A	C	4'-0"	7'-0"		F-1			3B		1/A503	2/A503	10 / A503
211B	C	4'-0"	7'-0"		F-1			3B		1/A503	2/A503	10 / A503
310	A	3'-0"	7'-0"		F-1			5	FREE EGRESS FROM ROOF	1/A503	2/A503	3 / A600

TOTAL (REF ONLY): 14

HATCH SCHEDULE

TAG	FH-1	FH-2	RH-1
CONTRACT BOX (FURNISHING INSTALLING)	C-01 C-01	C-01 C-01	C-01 C-01
LOCATION	FLOOR ABOVE EQUIPMENT PIT	FLOOR ABOVE ELECTRICAL VAULT	ROOF
FIRE RATING (HR)	NONE	3	NONE
MATERIAL	ALUMINUM	ALUMINUM	STAINLESS STEEL
SIZE	4' X 4'	4' X 4'	4' X 4'
NUMBER OF DOORS	1	1	1
BASIS OF DESIGN			
MANUFACTURER	BABCOCK DAVIS	BABCOCK DAVIS	BABCOCK DAVIS
MODEL	BFDDP-A-48X48-SFL-SGT	BFDF-P-A-48X48-SWL-3HR-PR	BRHES-48X48-S1T
REMARKS	1	1	2

- NOTES:
 2. PROVIDE WITH GAS-SPRING WITH DAMPER, HOLD OPEN ARM, AND PADLOCK HASP.
 1. PROVIDE WITH SAFETY GRATE, HOLD-OPEN ARM, AND RECESSED PADLOCK HASP.



NAME: NATHAN BOEN
 LICENSE #: A-201700903
 DATE: 11.30.2024



POWELL CWM, Inc.
 Certificate of Authority
 Architecture: MO 310 / KS 73
 Engineering: MO 4 / KS 34
 Land Surveying: MO 123 / KS 38

1 01/22/2025 ISSUE FOR ADDENDUM 2
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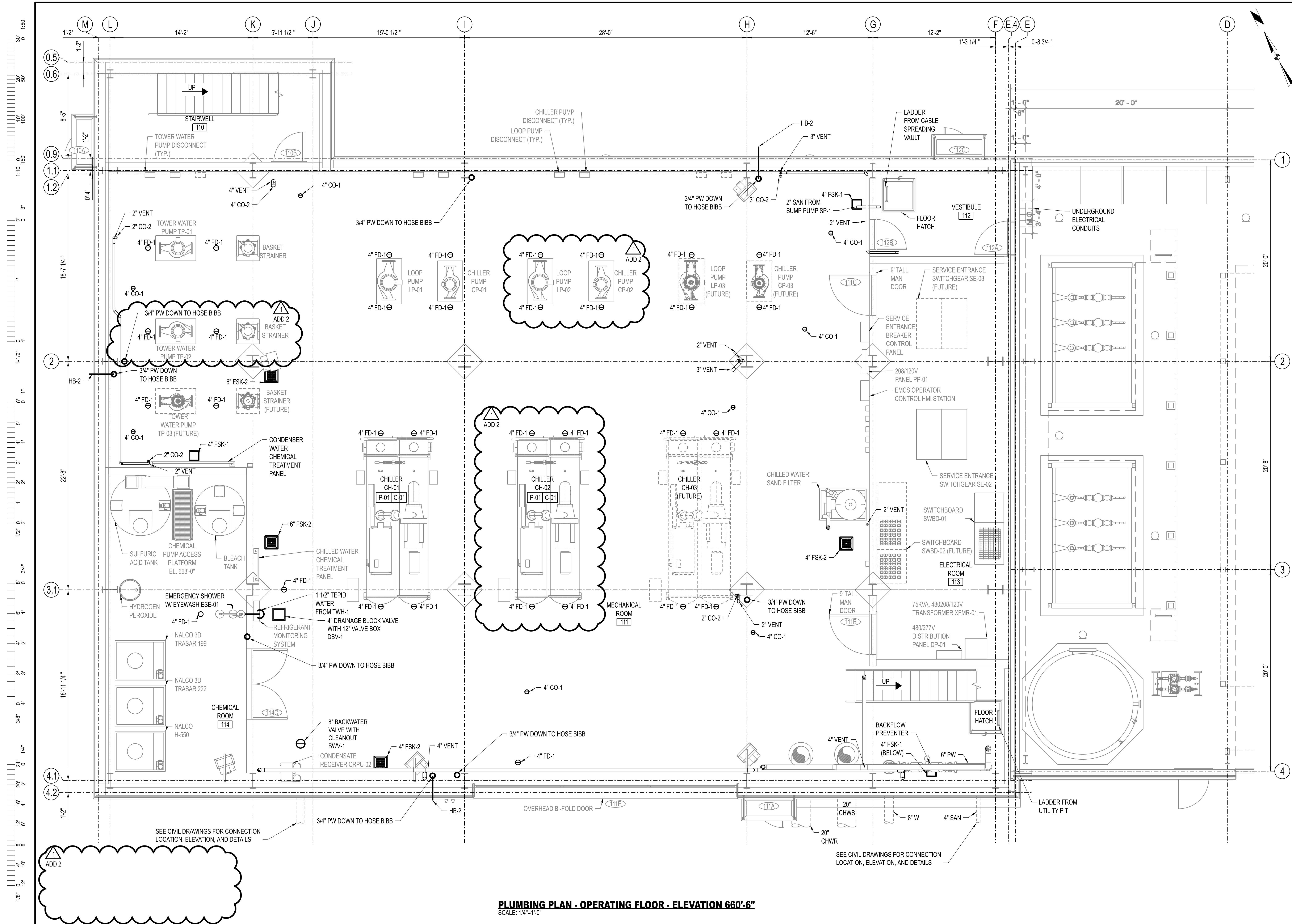


PRN CONSULTANTS, INC.
 1617 SECOND AVE., STE. 110
 ROCK ISLAND, IL 61201
 PHONE 563.263.5160
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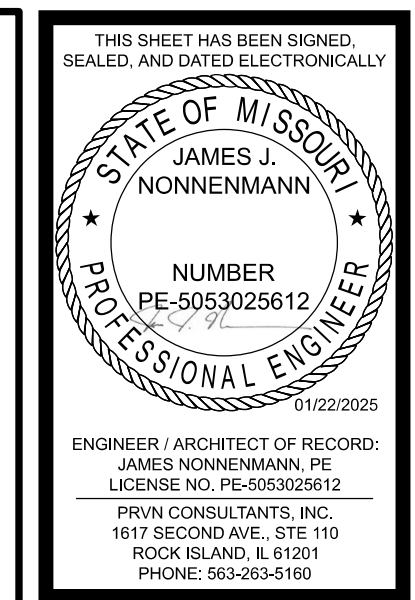
UNIVERSITY PROJECT NUMBER
CP232801

CONSULTANT PROJECT NUMBER
23-2210

SHEET
A-600



PLUMBING PLAN - OPERATING FLOOR - ELEVATION 660'-6"
 SCALE: 1/4"=1'-0"

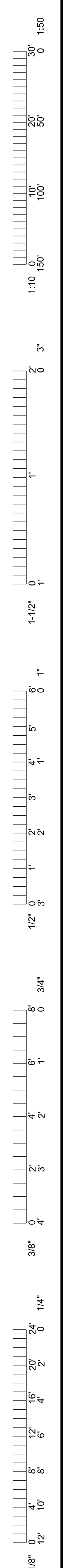
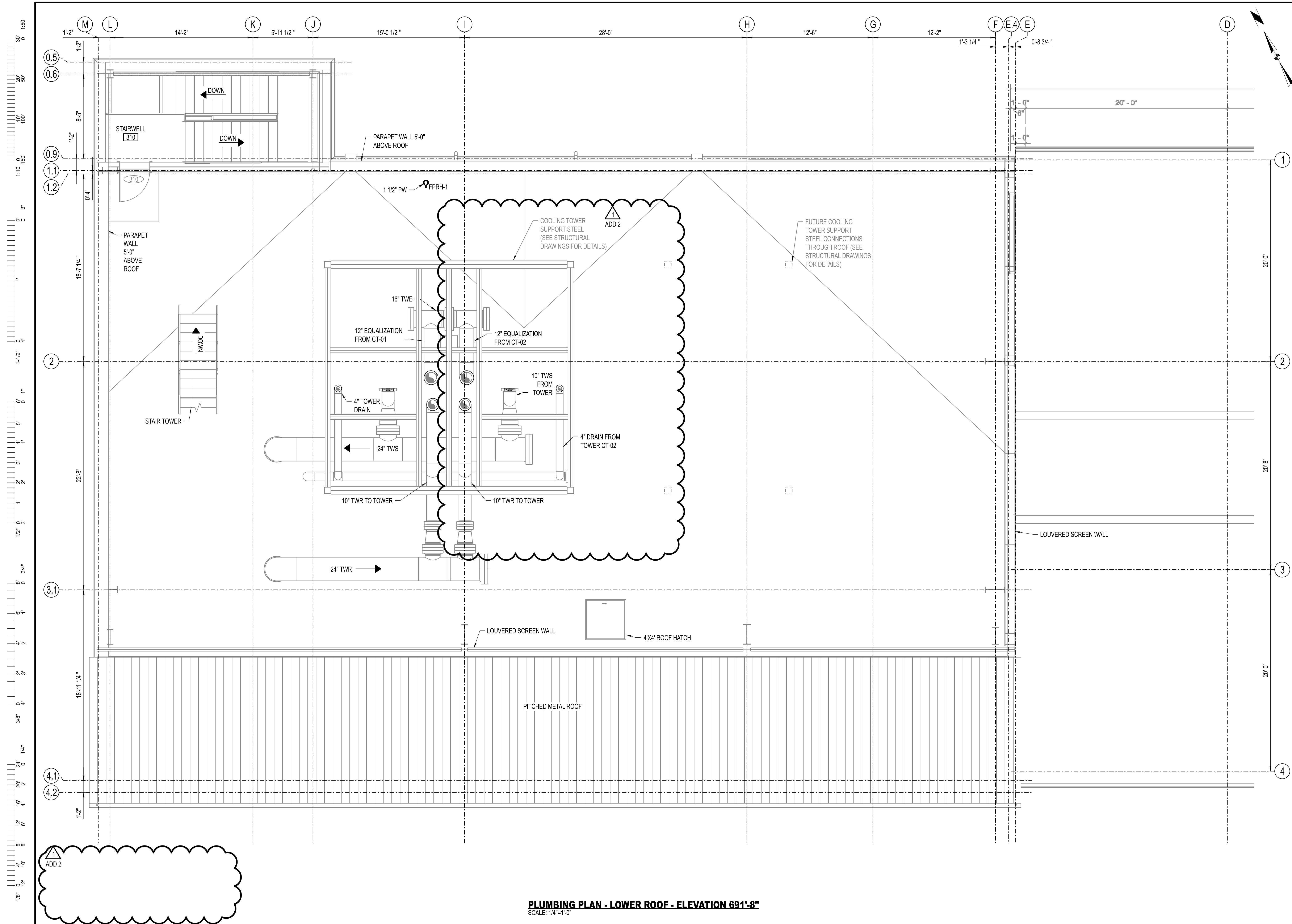


ENGINEER / ARCHITECT OF RECORD:
 JAMES NONNENMANN, PE
 LICENSE NO. PE-5053025612
 PRVN CONSULTANTS, INC.
 1617 SECOND AVE., STE 110
 ROCK ISLAND, IL 61201
 PHONE: 563-263-5160
 FAX: 563-263-5160

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UNIVERSITY OF MISSOURI - COLUMBIA
 RESEARCH COMMONS THERMAL PLANT
 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 PLUMBING PLAN - OPERATING FLOOR

UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP232801
 CONSULTANT
 PROJECT NUMBER
23073
 SHEET
P-132



THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

STATE OF MISSOURI
 JAMES S. NONNENMANN
 PROFESSIONAL ENGINEER
 NUMBER PE-5053025612
 11/22/2025

ENGINEER / ARCHITECT OF RECORD:
 JAMES S. NONNENMANN, PE
 LICENSE NO. PE-5053025612

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 1617 SECOND AVE., STE. 110
 ROCK ISLAND, IL 61201
 PHONE: 563.263.5160
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1	01/22/2025	ISSUED FOR ADDENDUM 2	DRAWN BY: SMH	CHECKED BY: JTG
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 ROCK ISLAND, IL 61201
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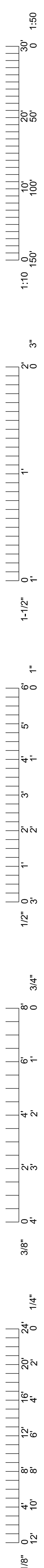
UNIVERSITY OF MISSOURI - COLUMBIA
 RESEARCH COMMONS THERMAL PLANT
 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 PLUMBING PLAN - LOWER ROOF

UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP232801

CONSULTANT
 PROJECT NUMBER
23073

SHEET
P-152

PLUMBING PLAN - LOWER ROOF - ELEVATION 691'-8"
 SCALE: 1/4"=1'-0"



SUMP PUMP SCHEDULE		
NUMBER		SP-1A / SP-1B
NUMBER OF PUMPS		2
PUMP		
CAPACITY	GPM	20
TOTAL DYNAMIC HEAD	FT	16
DISCHARGE SIZE	NPS	1.25
SPEED	RPM	3450
ELECTRICAL		
MOTOR SIZE	HP	3/4
VOLTS		120
PHASE		1
HERTZ		60
PUMP UNIT TOTAL		
FULL-LOAD AMPERES		6.4
BASIS-OF-DESIGN		
MANUFACTURER		MYERS
MODEL NUMBER		DS
REMARKS		
NOTES: 1. PROVIDE 24" DIAMETER X 24" DEEP FIBERGLASS SUMP PIT FOR DUPLEX SUMP PUMPS.		

CLEANOUT SCHEDULE		
NUMBER	CO-1	CO-2
COVER	ADJUSTABLE	N/A
BASIS OF DESIGN		
MANUFACTURER	ZURN	NBCO
MODEL	ZN1400-NH-HD	4814
REMARKS	1	1
NOTES: 1. SIZE AS REQUIRED BY CODE.		

BACKWATER VALVE SCHEDULE			
NUMBER		BWV-1	BWV-2
FLUID TYPE		SAN	SAN
VALVE TYPE		BACKWATER	BACKWATER
LOCATION		OPERATING FLOOR	UTILITY BASEMENT
PIPE SIZE	IN	8"	4"
BASIS OF DESIGN			
MANUFACTURER		ZURN	ZURN
MODEL		Z-1095-81-FC	Z-1095-81-FC
REMARKS		1	1
NOTES: 1. PROVIDE WITH ADJUSTABLE FLOOR CLEANOUT.			

DRAINAGE BLOCK VALVE SCHEDULE		
NUMBER		DBV-1
FLUID TYPE		SAN
VALVE TYPE		BACKWATER
LOCATION		CHEM ROOM
PIPE SIZE	IN	4"
BASIS OF DESIGN		
MANUFACTURER		SPEARS
MODEL		TRUE UNION 2000
REMARKS		1, 2
NOTES: 1. PROVIDE WITH SOCKET ENDS AND EXTENDED OPERATOR. 2. PROVIDE 12"x12" CONCRETE QUAZITE HANDHOLE WITH OPEN BOTTOM, HEAVY DUTY BOX AND COVER WITH NO BOLTS. DESIGN/TEXT LOADS TO BE 15,000 LBS MINIMUM, ANSI TIER 15.		

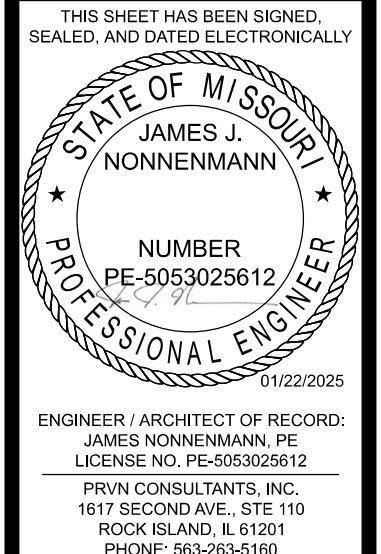
TEPID ELECTRIC WATER HEATER SCHEDULE			
NUMBER			TWH-1
RATING			ANSI Z358.1
DESIGN WORKING PRESSURE	PSIG		150
CAPACITY	GAL		119
DIAMETER	IN		30
TANK MATERIAL			CEMENT-LINED CARBON STEEL
CONNECTIONS			COPPER-SILICON/BRASS
HOT WATER TEMP. SETTING			
	DEG F		190 (MAX)
RECOVERY			
CAPACITY	GAL/HR		15
AT TEMPERATURE RISE	DEG F		50F TO 170F
MIXING VALVE			
TYPE			TRIPLE REDUNDANT THERMOSTATIC PRESSURE BALANCED
PRESSURE	PSID		5
FLOW	GPM		20
POWER - MAXIMUM DEMAND	KW		4.5
ELECTRICAL			
VOLTS			208
PHASE			1
HERTZ			60
FULL-LOAD AMPERES			22
BASIS OF DESIGN			
MANUFACTURER			HUBBELL
MODEL			EMV
REMARKS			1, 2, 3
NOTES: 1. PROVIDE WITH 3" POLYURETHANE FOAM INSULATION AND COMPOSITE JACKET. 2. PROVIDE WITH INTEGRAL TRIPLE REDUNDANT THERMOSTATIC PRESSURE BALANCE MIXING VALVE, LOW WATT DENSITY COPPER SHEATHED IMMERSION HEATING ELEMENTS, ADJUSTABLE IMMERSION TEMPERATURE CONTROLLER, MANUAL RESET, DIAL TEMP AND PRESSURE GAUGES, ASME T&P VALVE, AUTOMATIC AIR VENT, INTEGRAL SEISMIC ATTACHMENTS, LOW TEMP AND HIGH TEMP ALARM CONTACTS, AND 10 YEAR TANK WARRANTY. 3. TANK SHALL BE RATED FOR 23 GPM OF 85F TEPID WATER FOR 15 MINUTES BY BLENDING 170F STORAGE WATER WITH COLD WATER.			

FLOOR DRAIN SCHEDULE			
NUMBER	FD-1	FSK-1	FSK-2
TYPE	ROUND	FLOOR SINK	FLOOR SINK
BASIS OF DESIGN			
MANUFACTURER	ZURN	ZURN	ZURN
MODEL	ZN415B-NH-HD-Y	Z-566	Z-1920
REMARKS	1	1	1
NOTES: 1. SIZE AS INDICATED ON DRAWINGS.			

EMERGENCY PLUMBING FIXTURE SCHEDULE		
NUMBER		ESE-01
FIXTURE DESCRIPTION		
		EMERGENCY SHOWER/EYEWASH (FREESTANDING)
RATING		ANSI Z358.1
CONSTRUCTION		
		STAINLESS STEEL
SHOWER		
WORKING PRESSURE	PSI	30 TO 115
FLOW	GPM	20
HEIGHT	IN	94.75"
EYEWASH		
NUMBER OF SPRAY HEADS		2
WORKING PRESSURE	PSI	30 TO 115
FLOW	GPM	3
FITTINGS		
SIZE	NPT	1.25 (MIN)
BASIS OF DESIGN		
MANUFACTURER		ULINE
MODEL NUMBER		H-10735
REMARKS		1
NOTES: 1. PROVIDE WITH ANTI SCALD PROTECTION VALVE, UNIVERSAL EMERGENCY SIGN, INSPECTION TAG, AND BOWL DUST COVER.		

1
ADD 2

FREEZE PROOF ROOF HYDRANT SCHEDULE	
NUMBER	FPRH-1
DCW INLET SIZE	1-1/2"
BASIS OF DESIGN	
MANUFACTURER	MURDOCK
MODEL	M-150
REMARKS	1, 2
NOTES: 1. PROVIDE WITH VACUUM BREAKER AND THREADED 1-1/2" OUTLET. 2. INSTALL PER DETAIL ON P-501.	



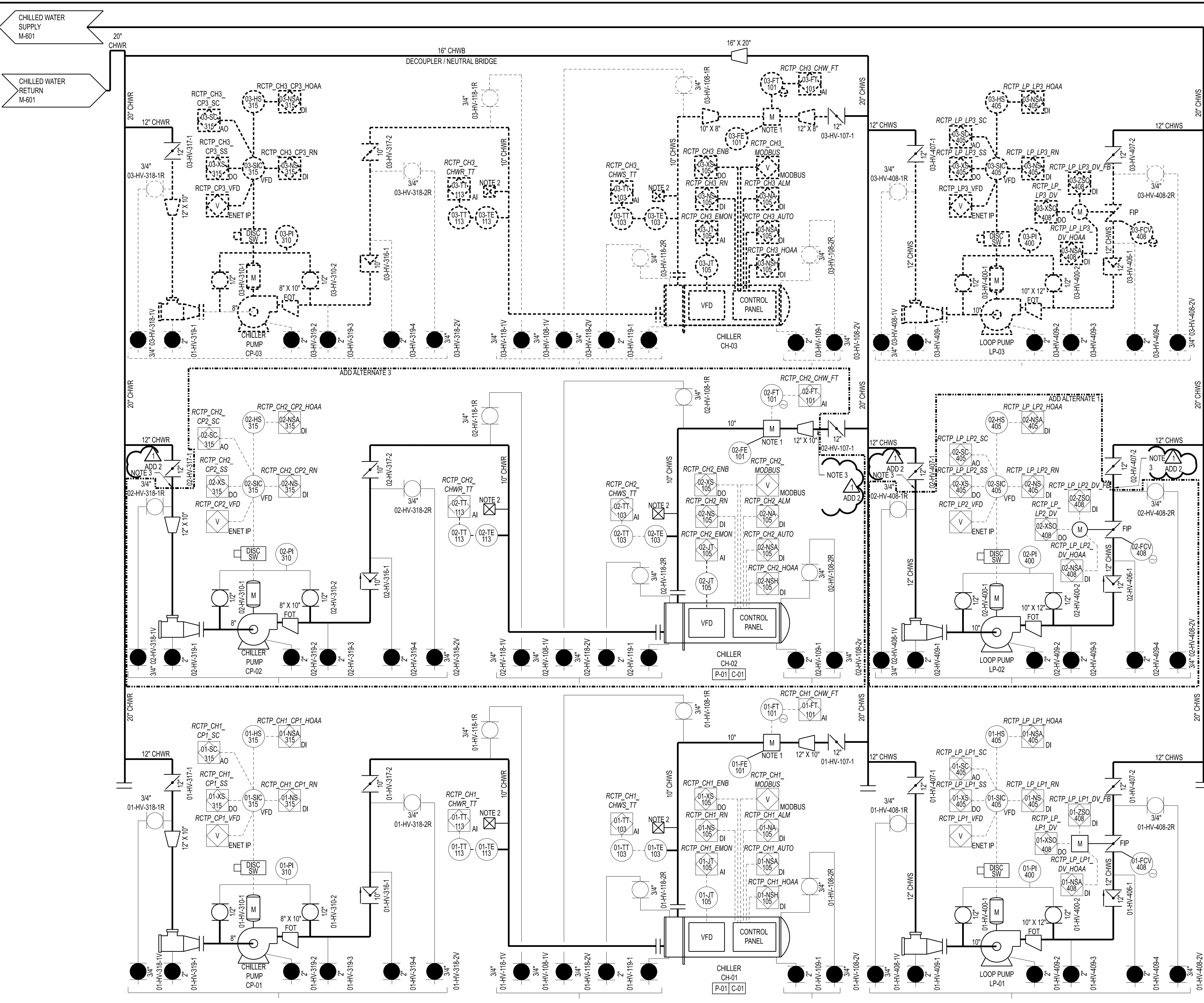
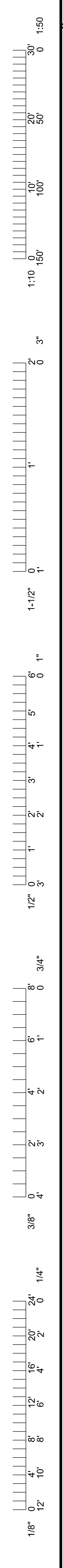
11/22/2025
ENGINEER/ARCHITECT OF RECORD:
JAMES NONNENMANN, PE
LICENSE NO. PE-5053026612
PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE 110
ROCK ISLAND, IL 61201
PHONE: 563-263-5160

1	10/22/2025	ISSUED FOR ADDENDUM 2	CHECKED BY: JTG
0	12/05/2024	ISSUED FOR BID	DRAWN BY: SMH

PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE 563.263.5160
MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017605

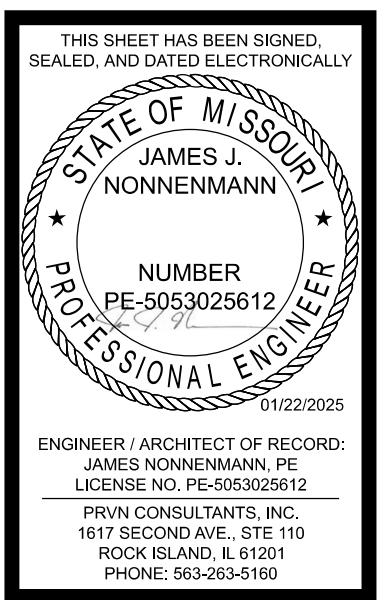
UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
PLUMBING SCHEDULES

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801
CONSULTANT
PROJECT NUMBER
23073
SHEET
P-621



- GENERAL NOTES:**
- G1. ALL WORK SHOWN ON THIS SHEET SHALL BE PROVIDED BY THIS CONTRACT UNLESS OTHERWISE INDICATED.
 - G2. THE ADJACENT FACILITY WILL REMAIN IN OPERATION THROUGHOUT CONSTRUCTION. PERFORM CONSTRUCTION ACTIVITIES TO NOT INTERFERE WITH NORMAL OPERATIONS AND MAINTENANCE ACTIVITIES CONDUCTED BY OWNER.
 - G3. REFER TO TIE-POINT DRAWINGS FOR SCHEDULE AND CONSTRUCTION PHASING REQUIREMENTS. COORDINATE CONNECTIONS TO EXISTING SERVICES WITH OWNER'S REPRESENTATIVE. CRITICAL CONNECTIONS THAT REQUIRE SYSTEM SHUTDOWNS ARE DENOTED ON TIE-POINT DRAWINGS.
 - G4. PROTECT ALL EXISTING EQUIPMENT, PIPING, TUBING, INSTRUMENTS, DEVICES, VALVES, PANELS, AND ACCESSORIES FROM DAMAGE DURING CONSTRUCTION ACTIVITIES.
 - G5. PROVIDE TEMPORARY CAPS, COVERS, OR BLIND FLANGES TO PROTECT EQUIPMENT AND PIPING FROM ENTRY OF FOREIGN MATERIALS DURING CONSTRUCTION ACTIVITIES.
 - G6. FIELD VERIFY ALL CONNECTION SIZES AND TYPES PRIOR TO ISSUING SUBMITTAL DRAWINGS.
 - G7. PROVIDE ALL NECESSARY PIPE, TUBING, FITTINGS, AND ACCESSORIES TO PROPERLY MATCH CONNECTION SIZES AND TYPES.
 - G8. MANUAL VALVES ARE SHOWN EITHER OPEN OR CLOSED POSITION BASED ON NORMAL OPERATION. SEE LEGEND FOR VALVE TYPE SYMBOLS.
 - G9. FIELD LOCATE AND PROVIDE MANUAL AND AUTOMATIC HIGH POINT VENTS AS WELL AS LOW POINT DRAINS.
 - G10. INSTALL MANUAL, SOLENOID, AND MOTOR-OPERATED VALVE ACTUATORS SUCH THAT THEY ARE ACCESSIBLE FOR MAINTENANCE.
 - G11. PROVIDE 1/2" TAPS FOR ALL PRESSURE INSTRUMENTS AND 3/4" TAPS FOR TEMPERATURE INSTRUMENTS, UNLESS OTHERWISE INDICATED.

- DRAWING NOTES:**
1. REFER TO M-501 FOR FLOW METER UP AND DOWNSTREAM REQUIREMENTS.
 2. INSTALL ALL PETE'S PLUGS IN ACCESSIBLE LOCATION.
 3. PROVIDE BLIND FLANGE AT INTERFACE BETWEEN BASE BID AND ADD ALTERNATES IN THE EVENT THAT THE ADD ALTERNATE IS NOT EXECUTED.
- ADD ALTERNATES**
1. ADD ALTERNATE 1 - LOOP PUMP LP-02
 2. ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02
 3. ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.



UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP232801
 CONSULTANT PROJECT NUMBER
23073
 SHEET
M-602

PRVN CONSULTANTS, INC.
 1677 SECOND AVE., STE. 110
 ROCK ISLAND, IL 61201
 PHONE 563.263.5160
 MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017605

UNIVERSITY OF MISSOURI - COLUMBIA
 RESEARCH COMMONS THERMAL PLANT
 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 P & ID - CHILLED WATER - SHEET 2

GENERAL NOTES:

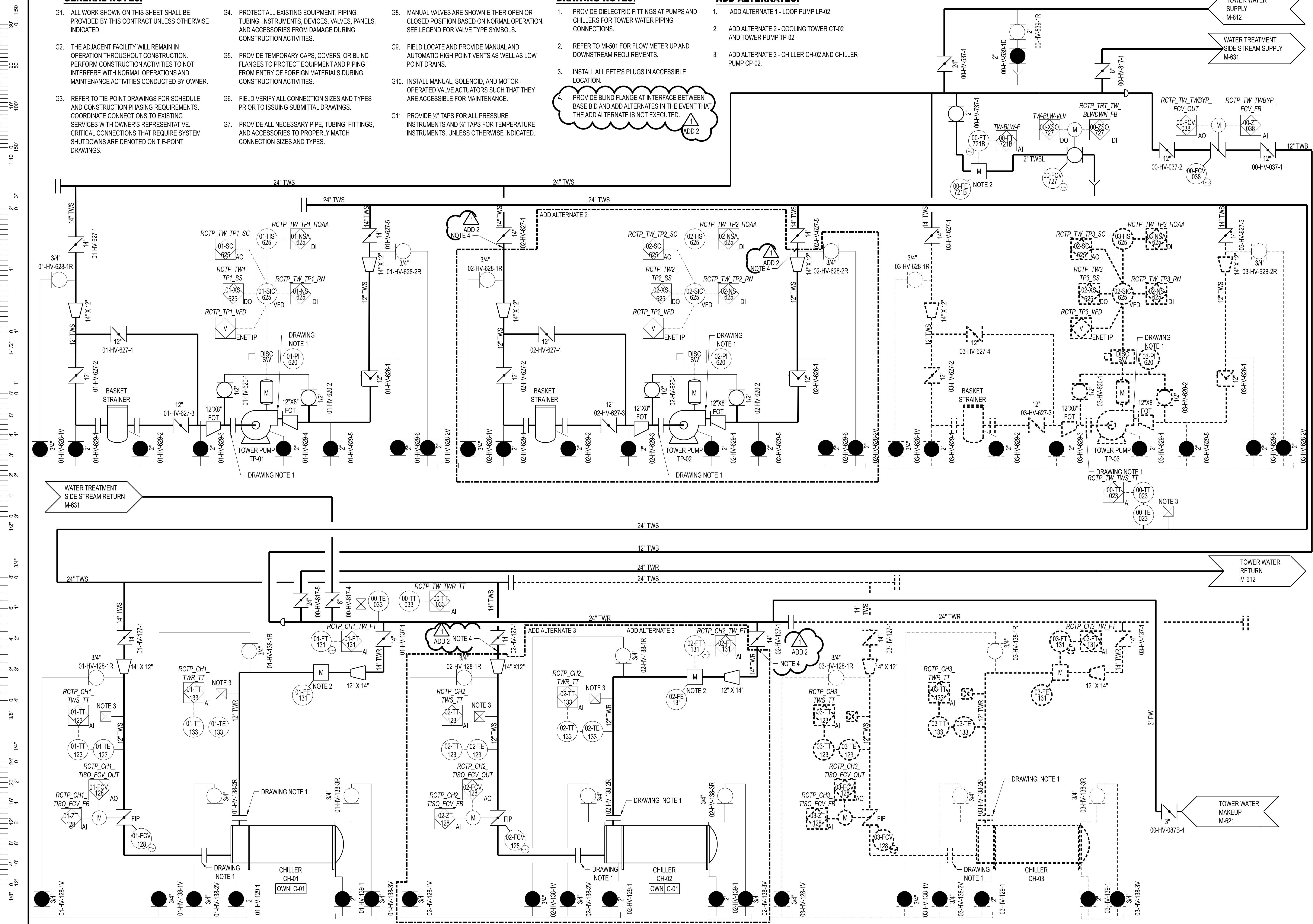
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- G2. THE ADJACENT FACILITY WILL REMAIN IN OPERATION THROUGHOUT CONSTRUCTION. PERFORM CONSTRUCTION ACTIVITIES TO NOT INTERFERE WITH NORMAL OPERATIONS AND MAINTENANCE ACTIVITIES CONDUCTED BY OWNER.
- G3. REFER TO TIE-POINT DRAWINGS FOR SCHEDULE AND CONSTRUCTION PHASING REQUIREMENTS. COORDINATE CONNECTIONS TO EXISTING SERVICES WITH OWNER'S REPRESENTATIVE. CRITICAL CONNECTIONS THAT REQUIRE SYSTEM SHUTDOWNS ARE DENOTED ON TIE-POINT DRAWINGS.
- G4. PROTECT ALL EXISTING EQUIPMENT, PIPING, TUBING, INSTRUMENTS, DEVICES, VALVES, PANELS, AND ACCESSORIES FROM DAMAGE DURING CONSTRUCTION ACTIVITIES.
- G5. PROVIDE TEMPORARY CAPS, COVERS, OR BLIND FLANGES TO PROTECT EQUIPMENT AND PIPING FROM ENTRY OF FOREIGN MATERIALS DURING CONSTRUCTION ACTIVITIES.
- G6. FIELD VERIFY ALL CONNECTION SIZES AND TYPES PRIOR TO ISSUING SUBMITTAL DRAWINGS.
- G7. PROVIDE ALL NECESSARY PIPE, TUBING, FITTINGS, AND ACCESSORIES TO PROPERLY MATCH CONNECTION SIZES AND TYPES.
- G8. MANUAL VALVES ARE SHOWN EITHER OPEN OR CLOSED POSITION BASED ON NORMAL OPERATION. SEE LEGEND FOR VALVE TYPE SYMBOLS.
- G9. FIELD LOCATE AND PROVIDE MANUAL AND AUTOMATIC HIGH POINT VENTS AS WELL AS LOW POINT DRAINS.
- G10. INSTALL MANUAL, SOLENOID, AND MOTOR-OPERATED VALVE ACTUATORS SUCH THAT THEY ARE ACCESSIBLE FOR MAINTENANCE.
- G11. PROVIDE 1/2" TAPS FOR ALL PRESSURE INSTRUMENTS AND 3/4" TAPS FOR TEMPERATURE INSTRUMENTS, UNLESS OTHERWISE INDICATED.

DRAWING NOTES:

- 1. PROVIDE DIELECTRIC FITTINGS AT PUMPS AND CHILLERS FOR TOWER WATER PIPING CONNECTIONS.
- 2. REFER TO MI-501 FOR FLOW METER UP AND DOWNSTREAM REQUIREMENTS.
- 3. INSTALL ALL PETE'S PLUGS IN ACCESSIBLE LOCATION.
- 4. PROVIDE BLIND FLANGE AT INTERFACE BETWEEN BASE BID AND ADD ALTERNATES IN THE EVENT THAT THE ADD ALTERNATE IS NOT EXECUTED.

ADD ALTERNATES:

- 1. ADD ALTERNATE 1 - LOOP PUMP LP-02
- 2. ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02
- 3. ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.



THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

STATE OF MISSOURI
JAMES J. NONNENMANN
PROFESSIONAL ENGINEER
NUMBER PE-505925612
ISSUED 11/22/2025

ENGINEER / ARCHITECT OF RECORD:
JAMES J. NONNENMANN, PE
LICENSE NO. PE-505925612

PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE: 563.263.5160
PHONE: 563.263.5160

1	10/12/2025	ISSUED FOR ADDENDUM 2	CHECKED BY: JTG
0	12/05/2024	ISSUED FOR BID	DRAWN BY: SMH

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ROCK ISLAND, IL 61201
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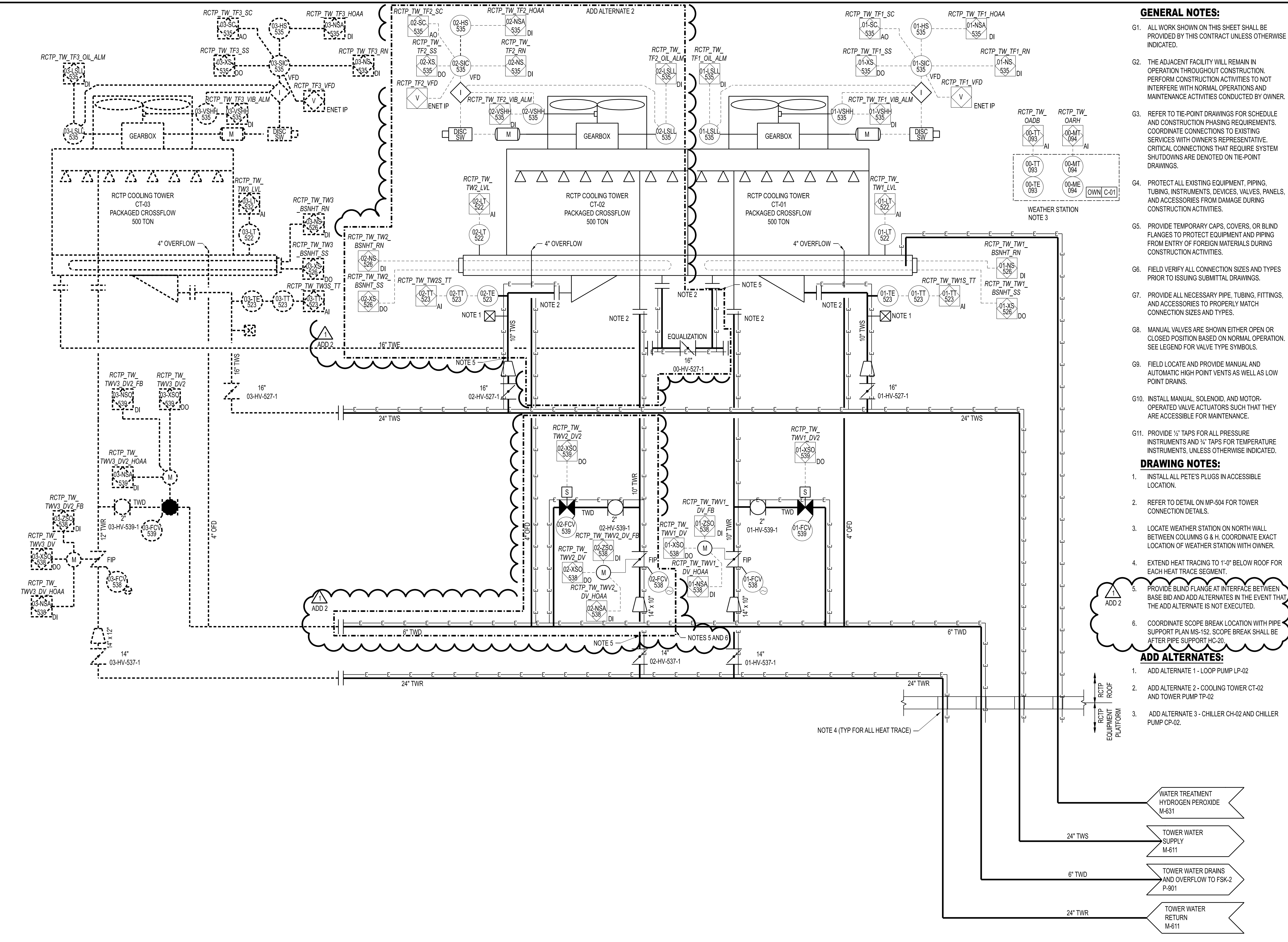
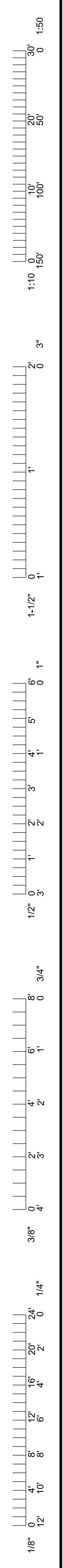
MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017605

UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
P & ID - TOWER WATER - SHEET 1

UNIVERSITY OF MISSOURI PROJECT NUMBER
CP232801

CONSULTANT PROJECT NUMBER
23073

SHEET
M-611



GENERAL NOTES:

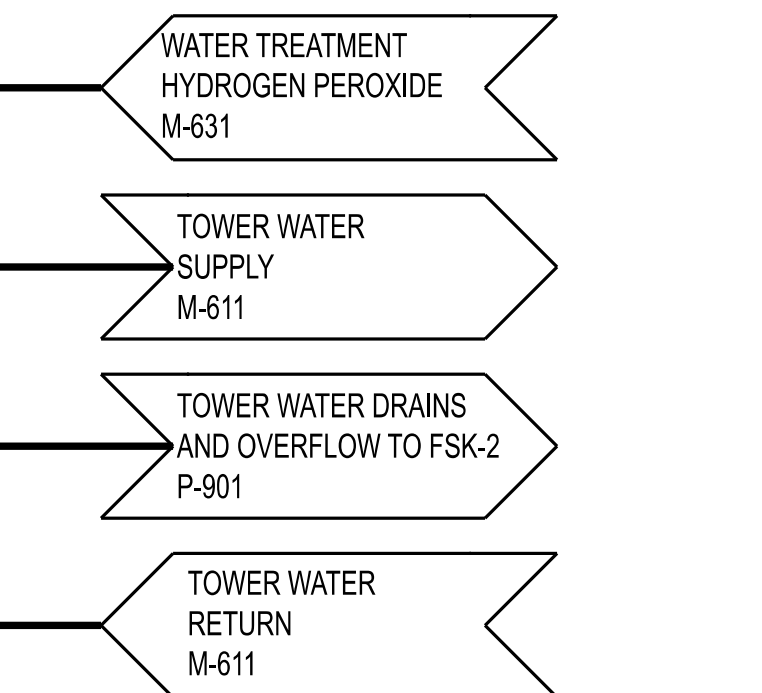
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- G3. REFER TO TIE-POINT DRAWINGS FOR SCHEDULE AND CONSTRUCTION PHASING REQUIREMENTS. COORDINATE CONNECTIONS TO EXISTING SERVICES WITH OWNER'S REPRESENTATIVE. CRITICAL CONNECTIONS THAT REQUIRE SYSTEM SHUTDOWNS ARE DENOTED ON TIE-POINT DRAWINGS.
- G4. PROTECT ALL EXISTING EQUIPMENT, PIPING, TUBING, INSTRUMENTS, DEVICES, VALVES, PANELS, AND ACCESSORIES FROM DAMAGE DURING CONSTRUCTION ACTIVITIES.
- G5. PROVIDE TEMPORARY CAPS, COVERS, OR BLIND FLANGES TO PROTECT EQUIPMENT AND PIPING FROM ENTRY OF FOREIGN MATERIALS DURING CONSTRUCTION ACTIVITIES.
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- G9. FIELD LOCATE AND PROVIDE MANUAL AND AUTOMATIC HIGH POINT VENTS AS WELL AS LOW POINT DRAINS.
- G10. INSTALL MANUAL, SOLENOID, AND MOTOR-OPERATED VALVE ACTUATORS SUCH THAT THEY ARE ACCESSIBLE FOR MAINTENANCE.
- G11. PROVIDE 1/2" TAPS FOR ALL PRESSURE INSTRUMENTS AND 3/4" TAPS FOR TEMPERATURE INSTRUMENTS, UNLESS OTHERWISE INDICATED.

DRAWING NOTES:

1. INSTALL ALL PETE'S PLUGS IN ACCESSIBLE LOCATION.
2. REFER TO DETAIL ON MP-504 FOR TOWER CONNECTION DETAILS.
3. LOCATE WEATHER STATION ON NORTH WALL BETWEEN COLUMNS G & H. COORDINATE EXACT LOCATION OF WEATHER STATION WITH OWNER.
4. EXTEND HEAT TRACING TO 1'-0" BELOW ROOF FOR EACH HEAT TRACE SEGMENT.
5. PROVIDE BLIND FLANGE AT INTERFACE BETWEEN BASE BID AND ADD ALTERNATES IN THE EVENT THAT THE ADD ALTERNATE IS NOT EXECUTED.
6. COORDINATE SCOPE BREAK LOCATION WITH PIPE SUPPORT PLAN MS-152. SCOPE BREAK SHALL BE AFTER PIPE SUPPORT HC-20.

ADD ALTERNATES:

1. ADD ALTERNATE 1 - LOOP PUMP LP-02
2. ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02
3. ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.

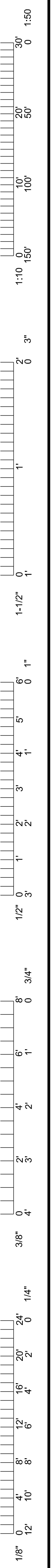


1	10/22/2025	ISSUED FOR ADDENDUM 2	CHECKED BY: JTG
0	12/05/2024	ISSUED FOR BID	DRAWN BY: SMH

PRVN CONSULTANTS, INC.
 1617 SECOND AVE., STE. 110
 ROCK ISLAND, IL 61201
 PHONE 563.263.5160
 MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017805

UNIVERSITY OF MISSOURI - COLUMBIA
 RESEARCH COMMONS THERMAL PLANT
 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 P & ID - TOWER WATER - SHEET 2

UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP232801
 CONSULTANT
 PROJECT NUMBER
23073
 SHEET
M-612

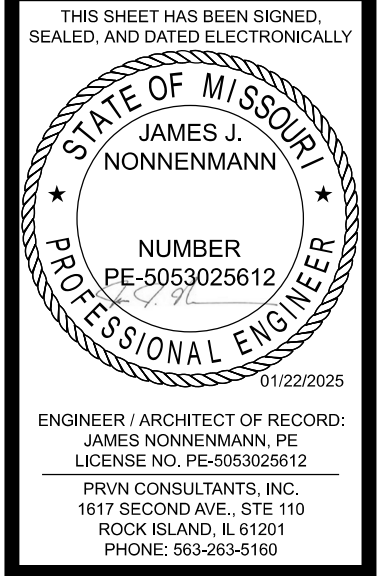
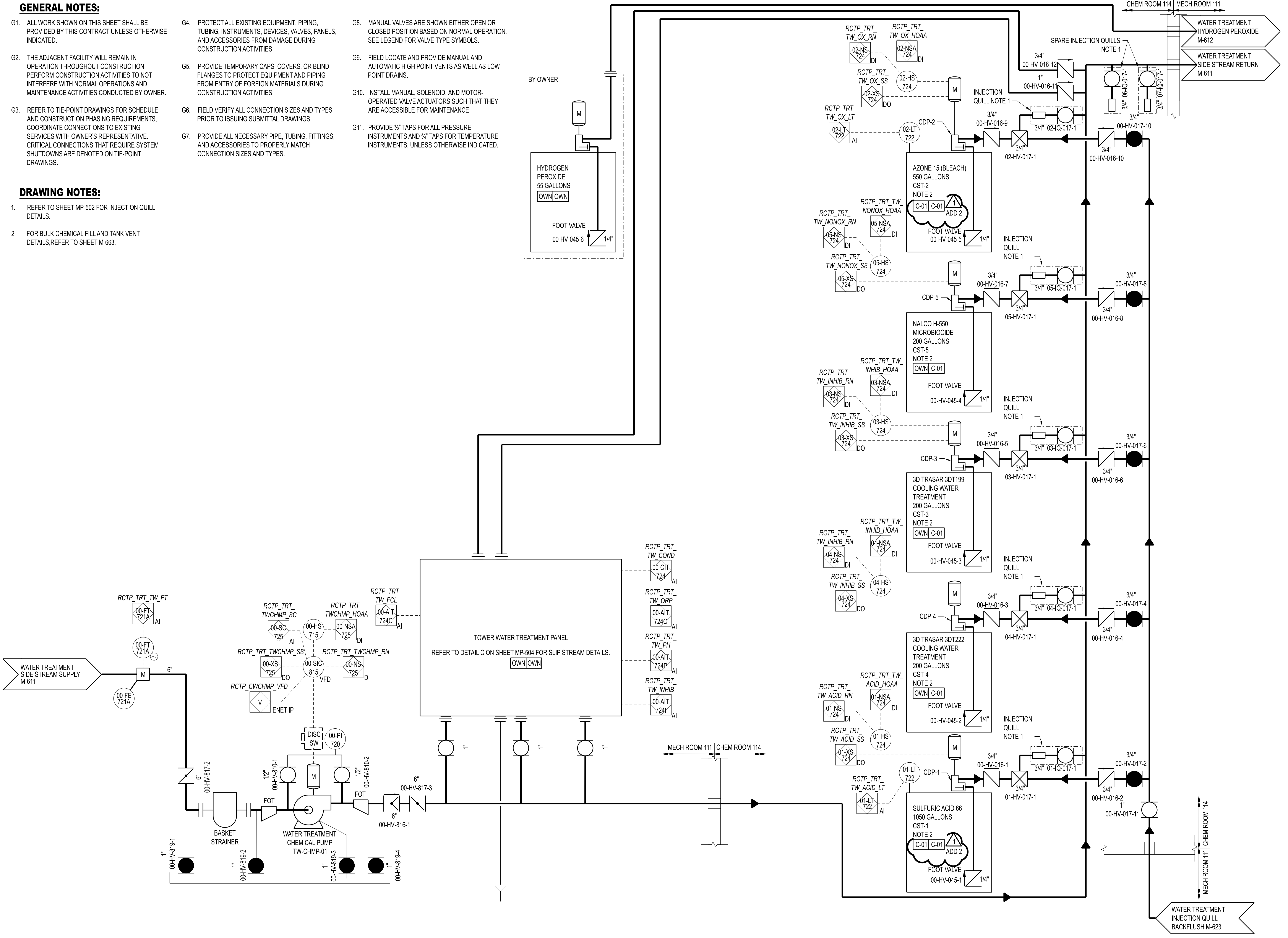


GENERAL NOTES:

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- G11. PROVIDE 1/2" TAPS FOR ALL PRESSURE INSTRUMENTS AND 3/4" TAPS FOR TEMPERATURE INSTRUMENTS, UNLESS OTHERWISE INDICATED.

DRAWING NOTES:

- 1. REFER TO SHEET MP-502 FOR INJECTION QUILL DETAILS.
- 2. FOR BULK CHEMICAL FILL AND TANK VENT DETAILS, REFER TO SHEET M-663.



UNIVERSITY OF MISSOURI PROJECT NUMBER
CP232801
 CONSULTANT PROJECT NUMBER
23073
 SHEET
M-631

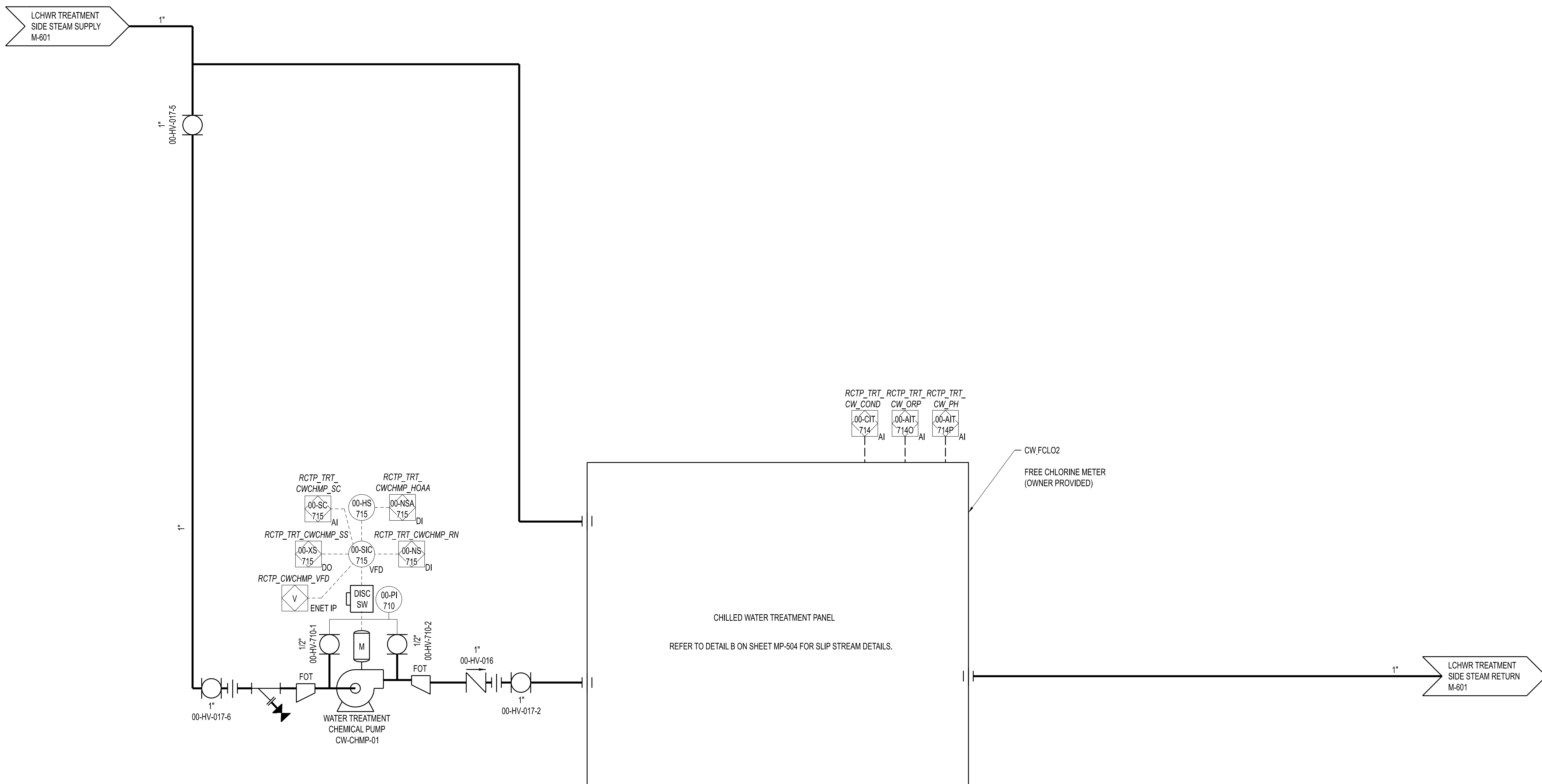
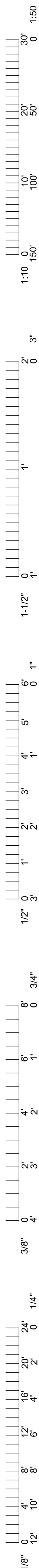
PRVN CONSULTANTS, INC.
 1617 SECOND AVE., STE. 110
 ROCK ISLAND, IL 61201
 PHONE 563.263.5160
 MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017605

UNIVERSITY OF MISSOURI - COLUMBIA
 RESEARCH COMMONS THERMAL PLANT
 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 P & ID - TOWER WATER TREATMENT

UNIVERSITY OF MISSOURI PROJECT NUMBER
CP232801
 CONSULTANT PROJECT NUMBER
23073
 SHEET
M-631

GENERAL NOTES:

- G1. ALL WORK SHOWN ON THIS SHEET SHALL BE PROVIDED BY THIS CONTRACT UNLESS OTHERWISE INDICATED.
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- G3. REFER TO TIE-POINT DRAWINGS FOR SCHEDULE AND CONSTRUCTION PHASING REQUIREMENTS. COORDINATE CONNECTIONS TO EXISTING SERVICES WITH OWNER'S REPRESENTATIVE. CRITICAL CONNECTIONS THAT REQUIRE SYSTEM SHUTDOWNS ARE DENOTED ON TIE-POINT DRAWINGS.
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- G9. FIELD LOCATE AND PROVIDE MANUAL AND AUTOMATIC HIGH POINT VENTS AS WELL AS LOW POINT DRAINS.
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- G11. PROVIDE 1/2" TAPS FOR ALL PRESSURE INSTRUMENTS AND 3/4" TAPS FOR TEMPERATURE INSTRUMENTS, UNLESS OTHERWISE INDICATED.



THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

STATE OF MISSOURI
 JAMES J. NONNENMANN
 PROFESSIONAL ENGINEER
 NUMBER PE-5053025612
 11/22/2025

ENGINEER / ARCHITECT OF RECORD:
 JAMES NONNENMANN, PE
 LICENSE NO. PE-5053025612

PRVN CONSULTANTS, INC.
 1617 SECOND AVE., STE. 110
 ROCK ISLAND, IL 61201
 PHONE: 563.263.5160

0	12/05/2024	ISSUED FOR BID	SMH	CHECKED BY: JTG
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PRVN CONSULTANTS, INC.
 1617 SECOND AVE., STE. 110
 ROCK ISLAND, IL 61201
 PHONE: 563.263.5160

PRVN

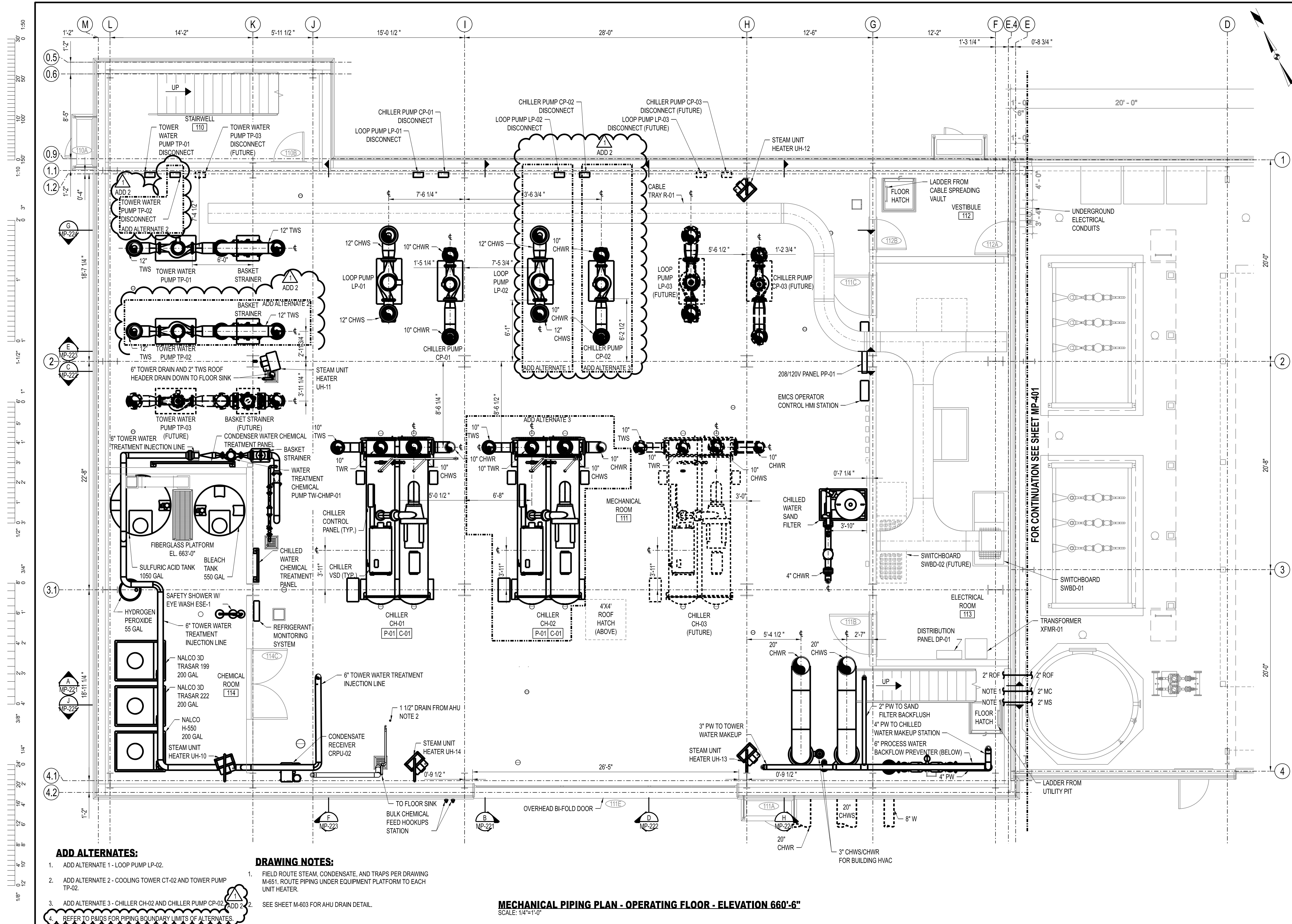
MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017805

UNIVERSITY OF MISSOURI - COLUMBIA
 RESEARCH COMMONS THERMAL PLANT
 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 P & ID - CHILLED WATER TREATMENT

UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP232801

CONSULTANT
 PROJECT NUMBER
23073

SHEET
M-632



ADD ALTERNATES:

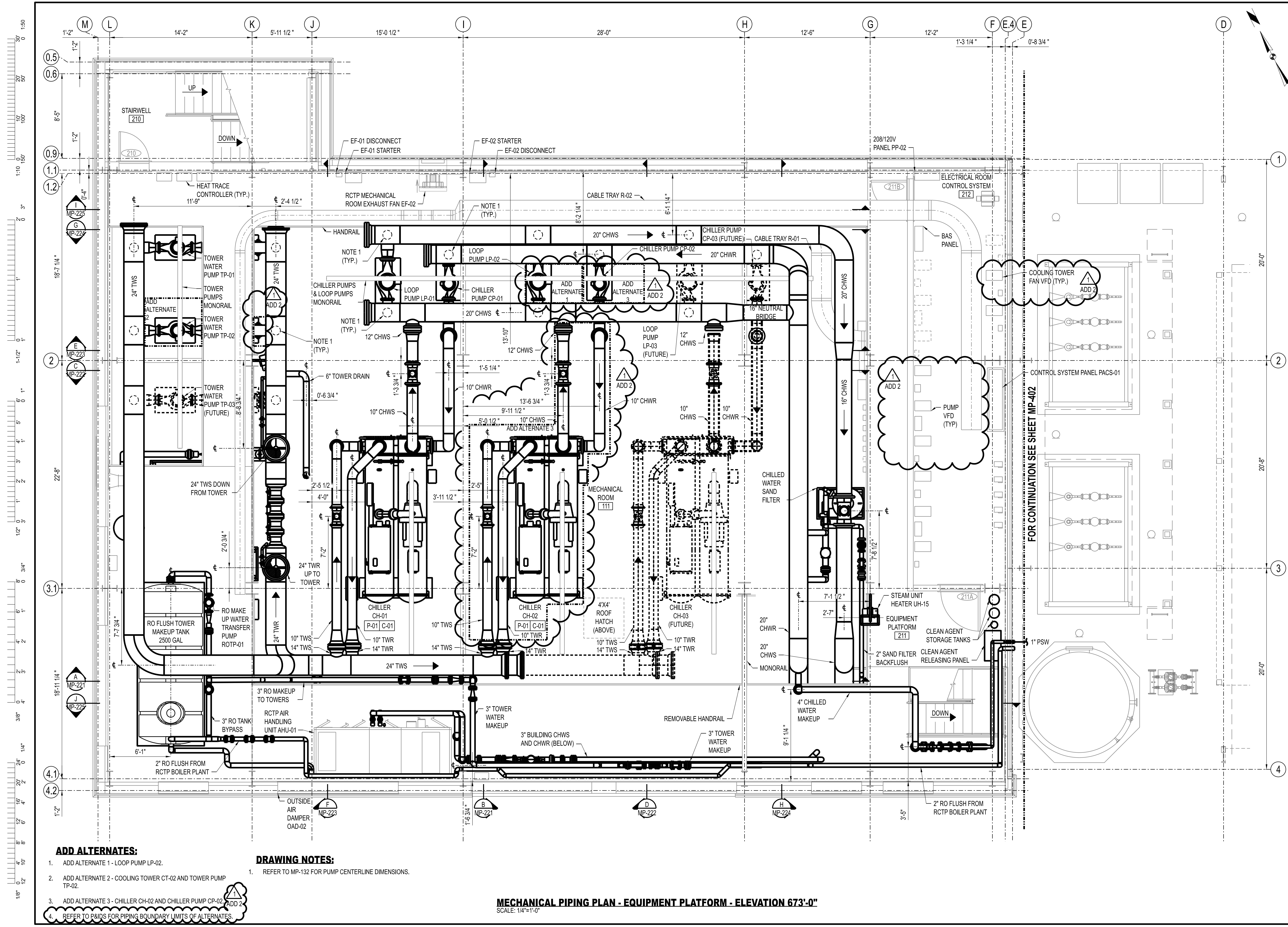
1. ADD ALTERNATE 1 - LOOP PUMP LP-02.
2. ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
3. ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.
4. REFER TO P&IDS FOR PIPING BOUNDARY UNITS OF ALTERNATES.

DRAWING NOTES:

1. FIELD ROUTE STEAM, CONDENSATE, AND TRAPS PER DRAWING M-651. ROUTE PIPING UNDER EQUIPMENT PLATFORM TO EACH UNIT HEATER.
2. SEE SHEET M-603 FOR AHU DRAIN DETAIL.

MECHANICAL PIPING PLAN - OPERATING FLOOR - ELEVATION 660'-6"

SCALE: 1/4"=1'-0"



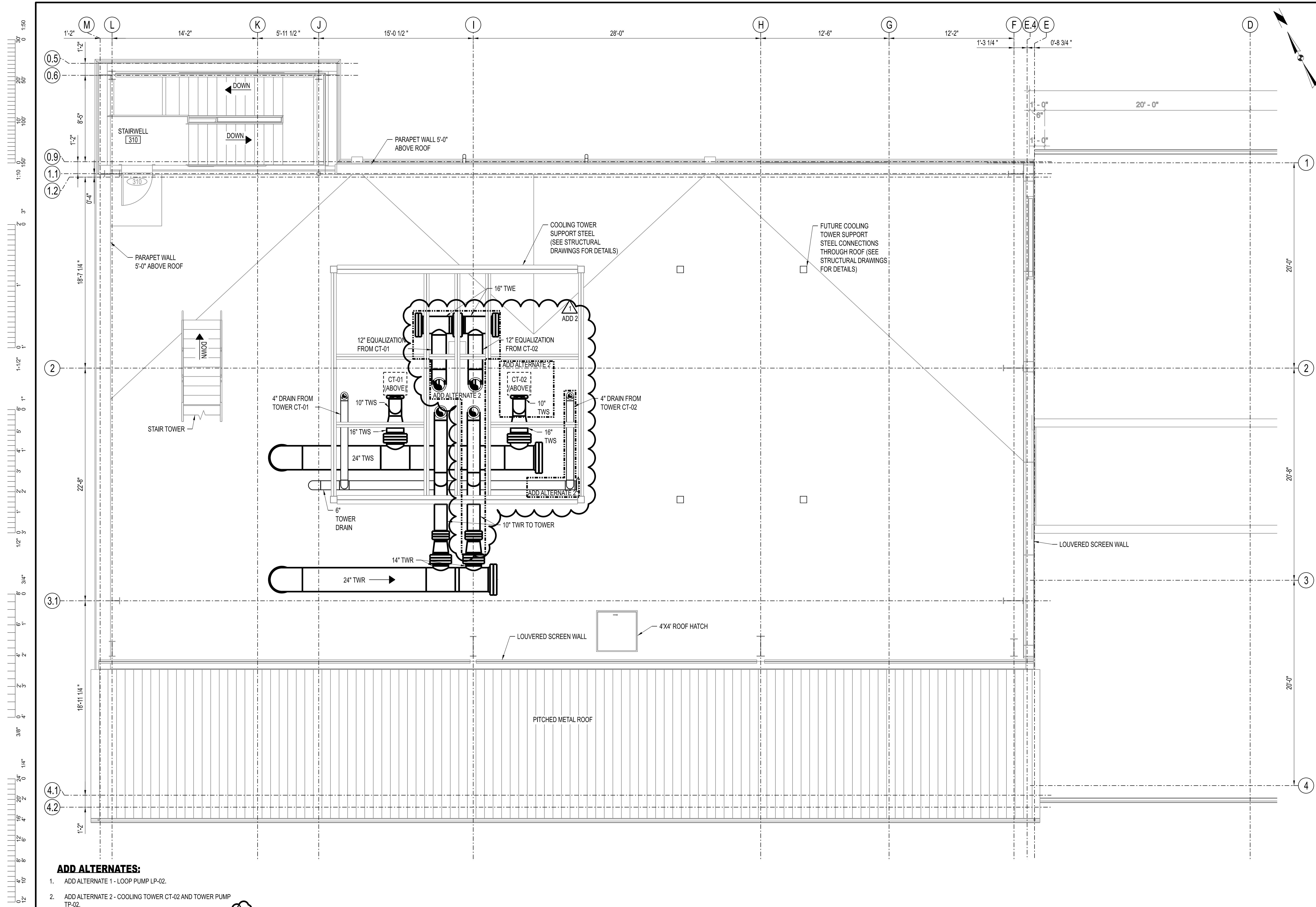
ADD ALTERNATES:

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2. ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
3. ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.
4. REFER TO P&IDS FOR PIPING BOUNDARY LIMITS OF ALTERNATES.

DRAWING NOTES:

1. REFER TO MP-132 FOR PUMP CENTERLINE DIMENSIONS.

MECHANICAL PIPING PLAN - EQUIPMENT PLATFORM - ELEVATION 673'-0"
 SCALE: 1/4"=1'-0"



ADD ALTERNATES:

1. ADD ALTERNATE 1 - LOOP PUMP LP-02.
2. ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
3. ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02. ADD 2
4. REFER TO R&IDS FOR PIPING BOUNDARY LIMITS OF ALTERNATES.

MECHANICAL PIPING PLAN - LOWER ROOF - ELEVATION 691'-8"

SCALE: 1/4"=1'-0"

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

ENGINEER / ARCHITECT OF RECORD:
 JAMES NONNENMANN, PE
 LICENSE NO. PE-5053025612
 PRVN CONSULTANTS, INC.
 1617 SECOND AVE., STE. 110
 ROCK ISLAND, IL 61201
 PHONE: 563-263-5160

1	01/22/2025	ISSUED FOR ADDENDUM 2	CHECKED BY: JTG
0	12/05/2024	ISSUED FOR BID	DRAWN BY: SMH

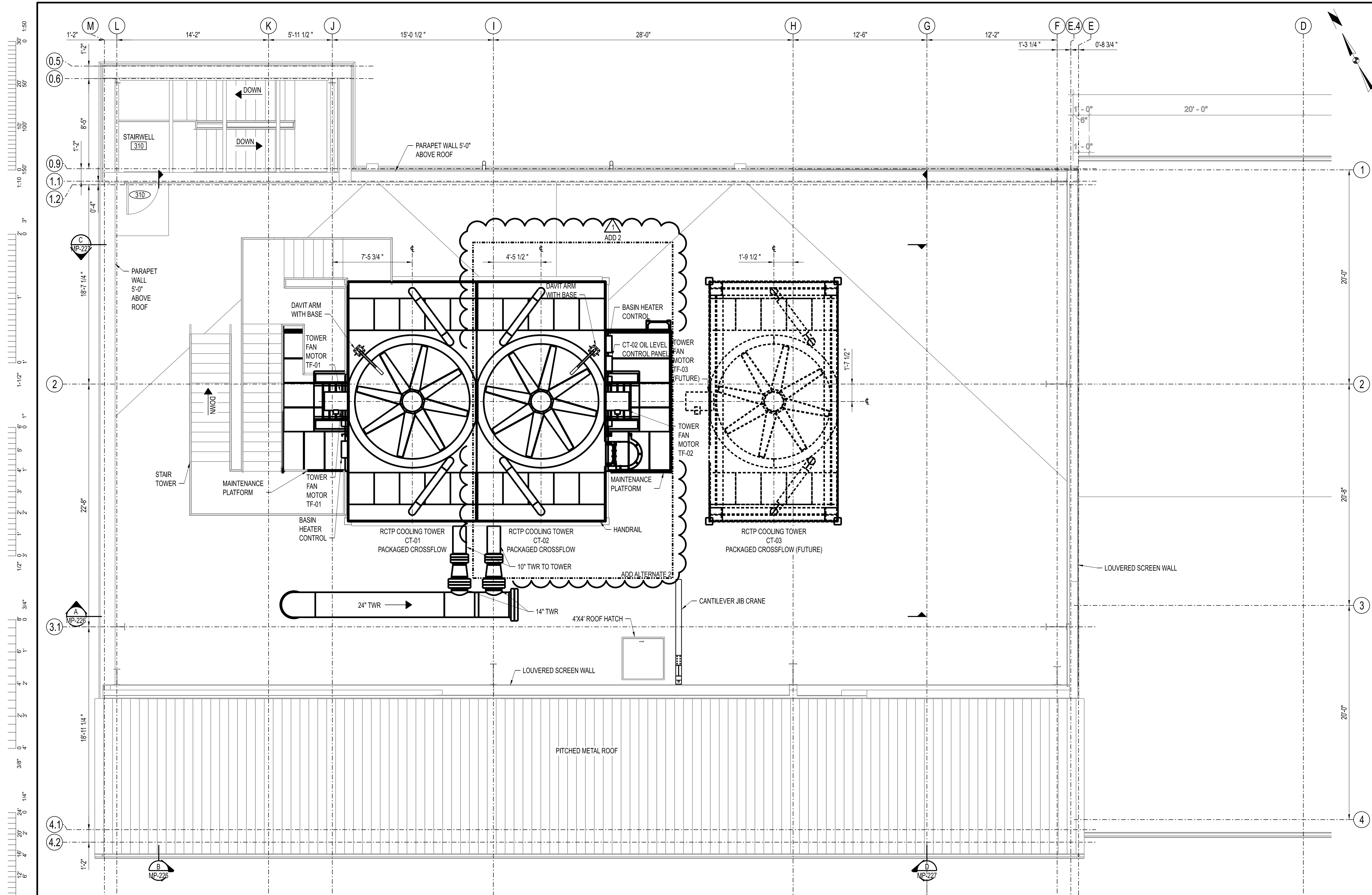
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 MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017805

UNIVERSITY OF MISSOURI - COLUMBIA
 RESEARCH COMMONS THERMAL PLANT
 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 MECHANICAL PIPING PLAN - LOWER ROOF

UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP232801

CONSULTANT
 PROJECT NUMBER
23073

SHEET
MP-152



ADD ALTERNATES:

1. ADD ALTERNATE 1 - LOOP PUMP LP-02.
2. ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
3. ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02. ADD 2
4. REFER TO R&IDS FOR PIPING BOUNDARY LIMITS OF ALTERNATES.

MECHANICAL PIPING PLAN - UPPER ROOF - ELEVATION 712'-6"
SCALE: 1/4"=1'-0"

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

STATE OF MISSOURI
JAMES S. NONNENMANN
PROFESSIONAL ENGINEER
NUMBER PE-5053025612
11/22/2025

ENGINEER / ARCHITECT OF RECORD:
JAMES S. NONNENMANN, PE
LICENSE NO. PE-5053025612
PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE: 563-263-5160

1	10/22/2025	ISSUED FOR ADDENDUM 2	CHECKED BY: JTG
0	12/05/2024	ISSUED FOR BID	DRAWN BY: SMH

PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE 563.263.5160
MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017805

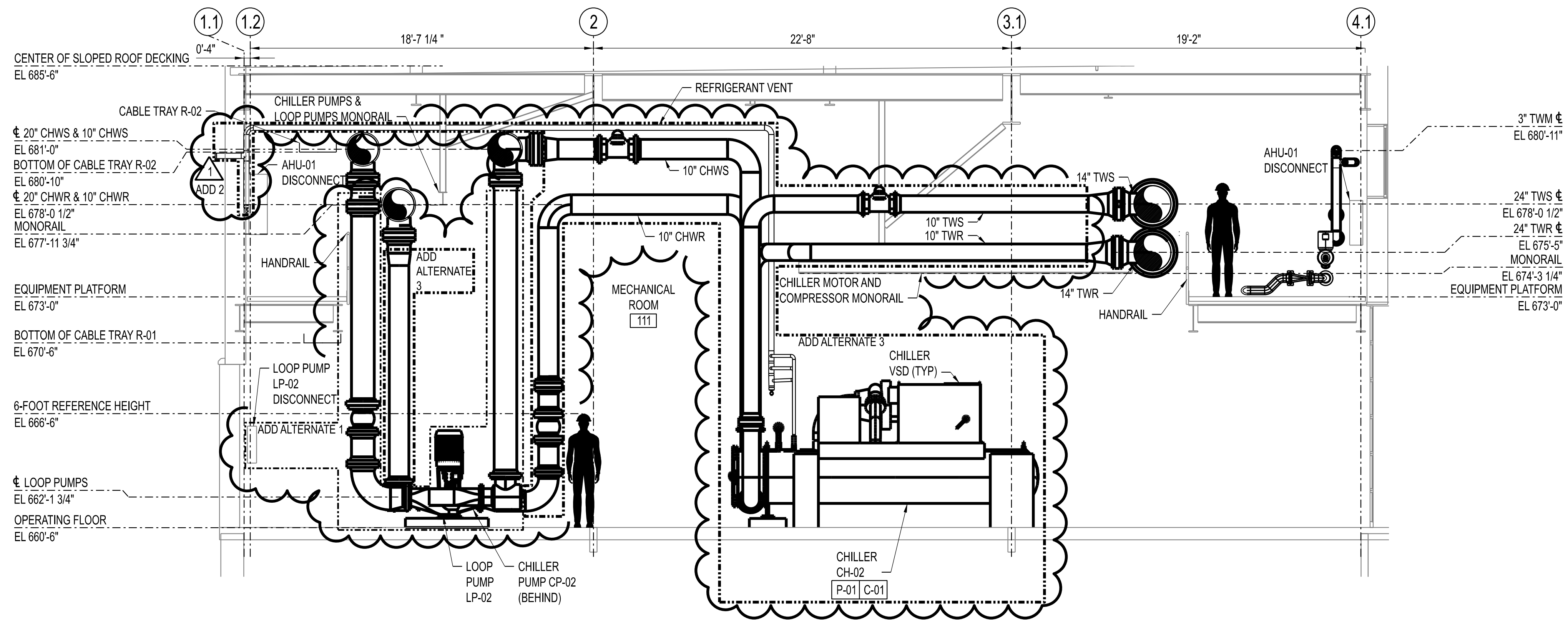
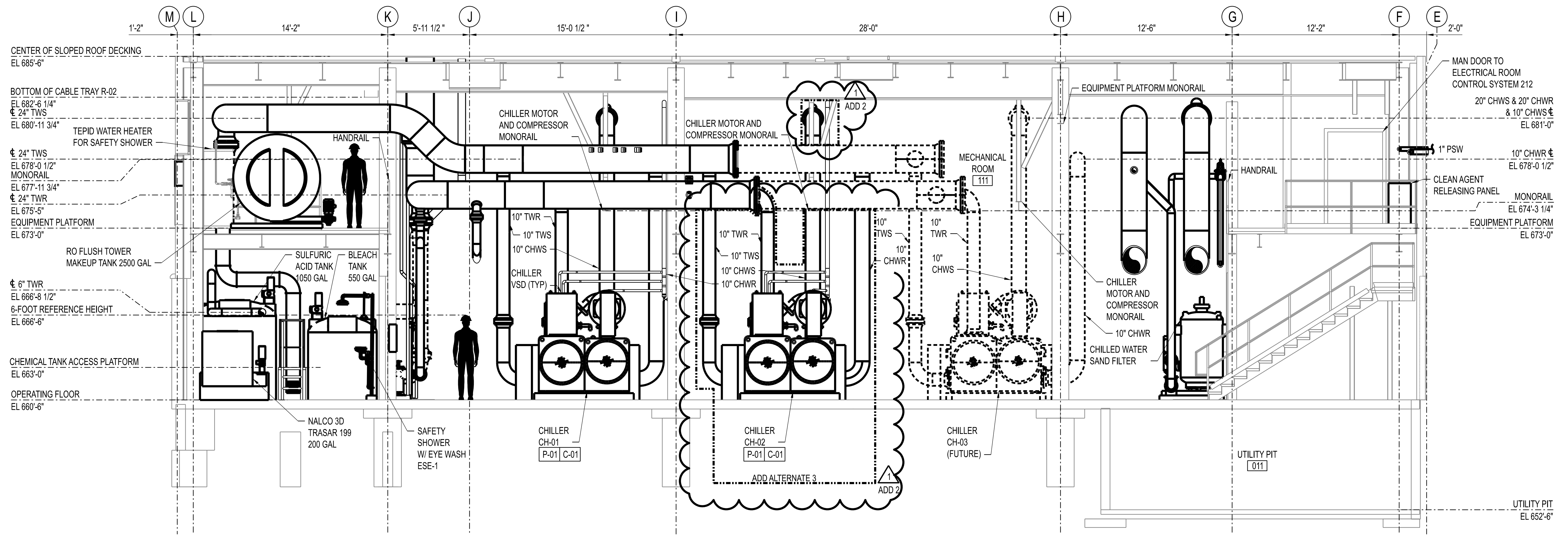
UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
MECHANICAL PIPING PLAN - UPPER ROOF

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801

CONSULTANT
PROJECT NUMBER
23073

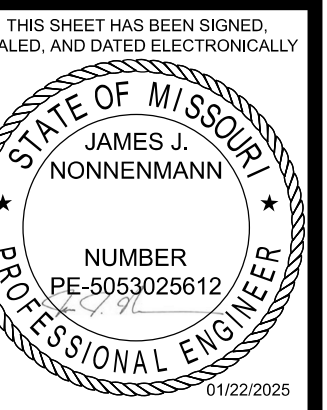
SHEET
MP-162

1:50
0
50
100
150
3'
0
6
1'
0
1-1/2'
0
1'
0
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18"



ADD ALTERNATES:

1. ADD ALTERNATE 1 - LOOP PUMP LP-02.
2. ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
3. ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.
4. REFER TO R&IDS FOR PIPING BOUNDARY LIMITS OF ALTERNATES.



STATE OF MISSOURI
JAMES NONNENMANN, P.E.
LICENSE NO. PE-5053025612
NUMBER
PE-5053025612
11/22/2025
ENGINEER / ARCHITECT OF RECORD:
JAMES NONNENMANN, P.E.
LICENSE NO. PE-5053025612
PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE 110
ROCK ISLAND, IL 61201
PHONE: 563-263-5160

1 10/22/2025 ISSUED FOR ADDENDUM 2
0 12/05/2024 ISSUED FOR BID
DRAWN BY: SMH
CHECKED BY: JTG

PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE 563.263.5160
MISSOURI CERTIFICATE OF
AUTHORITY ENGINEERING - 2023017605



UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
MECHANICAL PIPING SECTIONS - SHEET 1

UNIVERSITY OF MISSOURI
PROJECT NUMBER

CP232801

CONSULTANT
PROJECT NUMBER

23073

SHEET

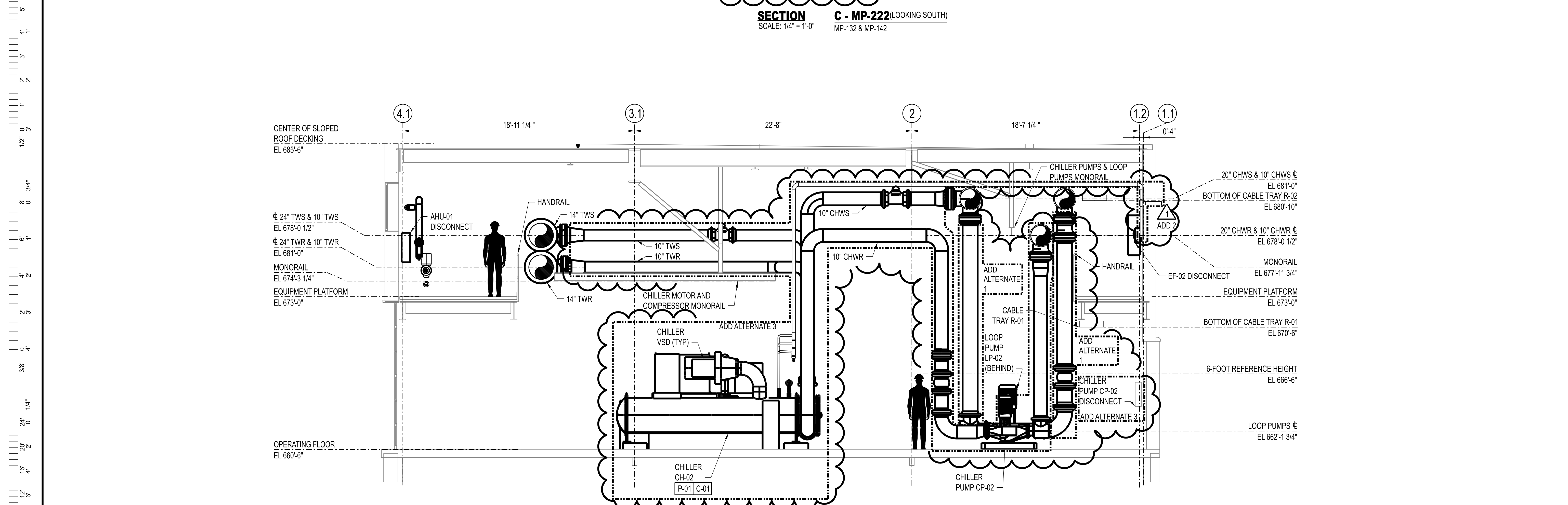
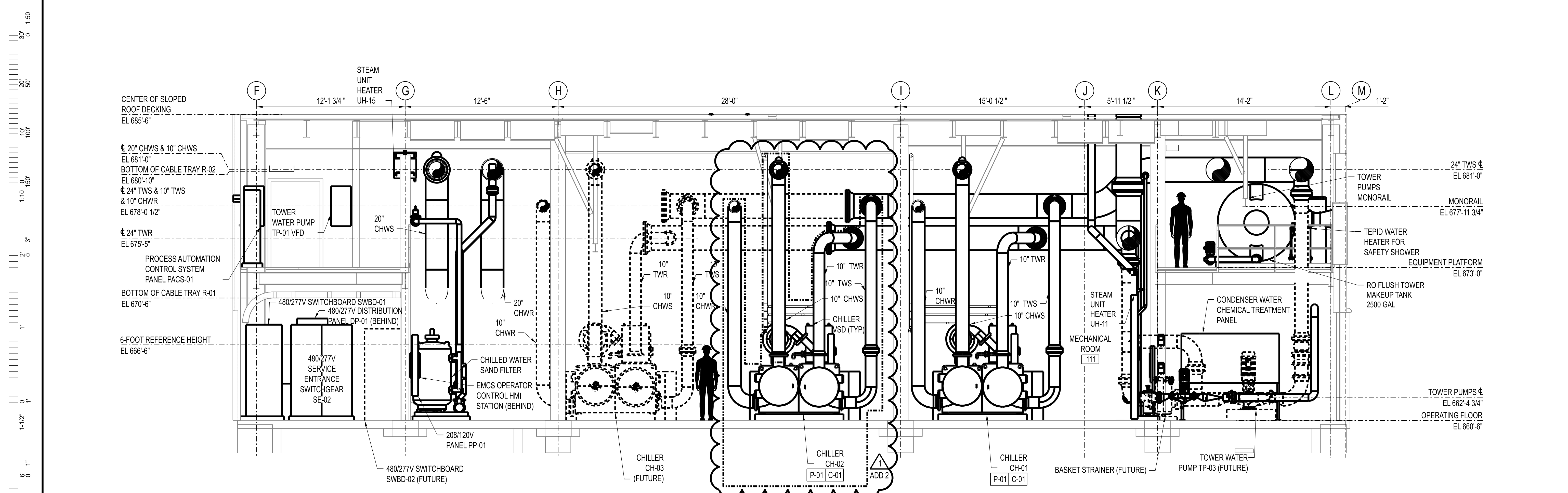
MP-221

1	10/22/2025	ISSUED FOR ADDENDUM 2	CHECKED BY: JTG
0	12/05/2024	ISSUED FOR BID	DRAWN BY: SMH

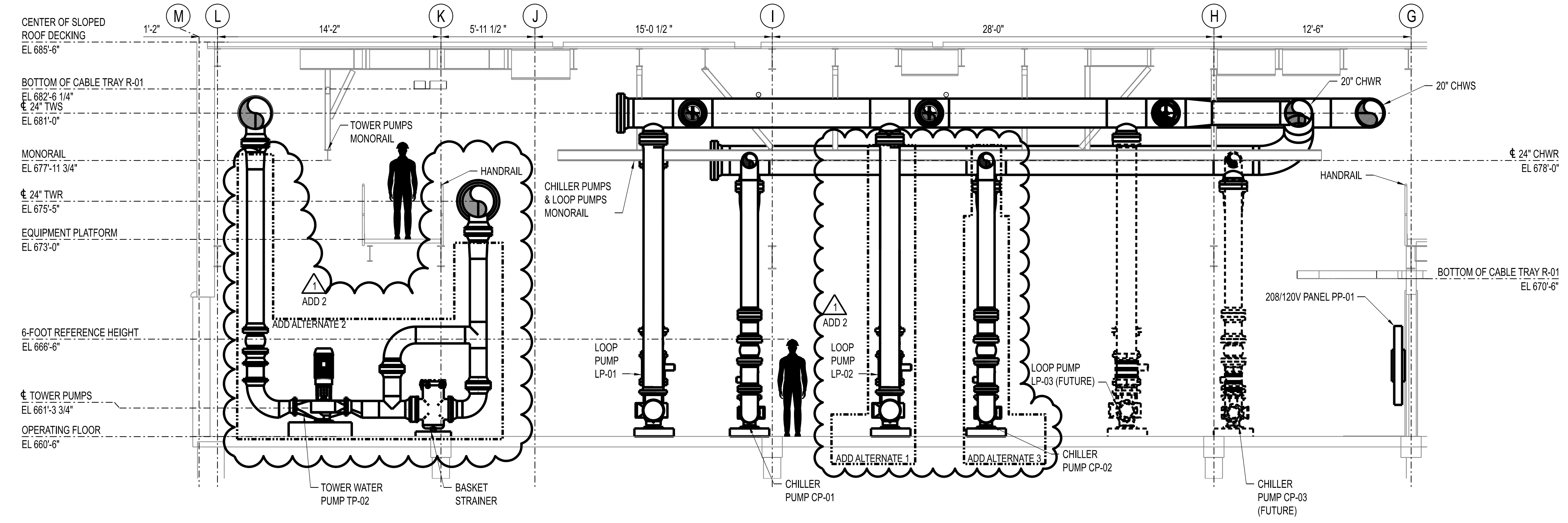
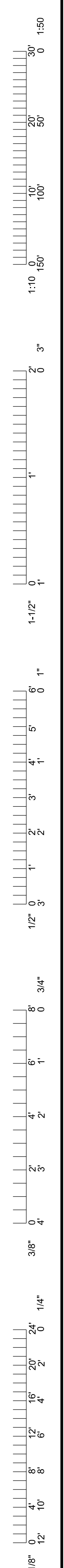
PRVN CONSULTANTS, INC.
 1617 SECOND AVE., STE. 110
 ROCK ISLAND, IL 61201
 PHONE: 563.263.5160
 MISSOURI CERTIFICATE OF
 AUTHORITY ENGINEERING - 2023017805

UNIVERSITY OF MISSOURI - COLUMBIA
 RESEARCH COMMONS THERMAL PLANT
 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 MECHANICAL PIPING SECTIONS - SHEET 2

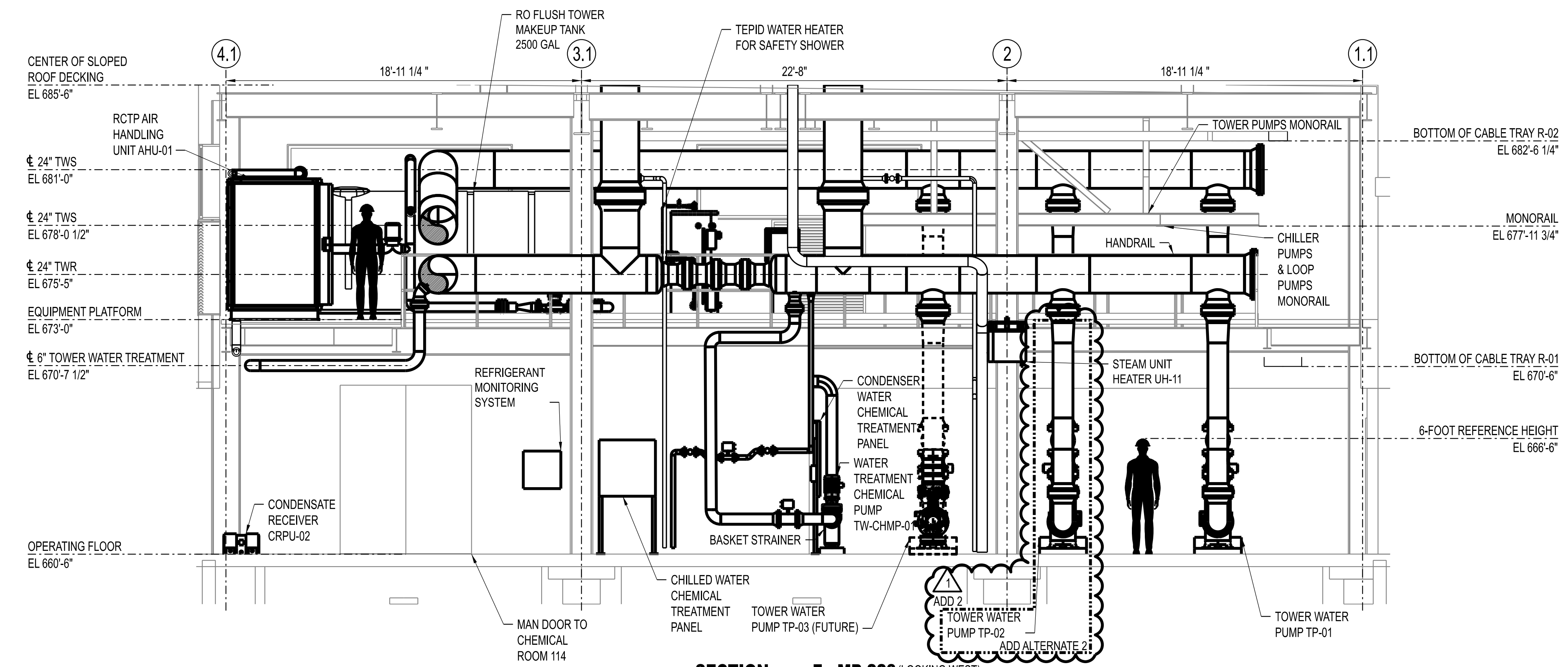
UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP232801
 CONSULTANT
 PROJECT NUMBER
23073
 SHEET
MP-222



- ADD ALTERNATES:**
1. ADD ALTERNATE 1 - LOOP PUMP LP-02.
 2. ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
 3. ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.
 4. REFER TO R&IDS FOR PIPING BOUNDARY LIMITS OF ALTERNATES.



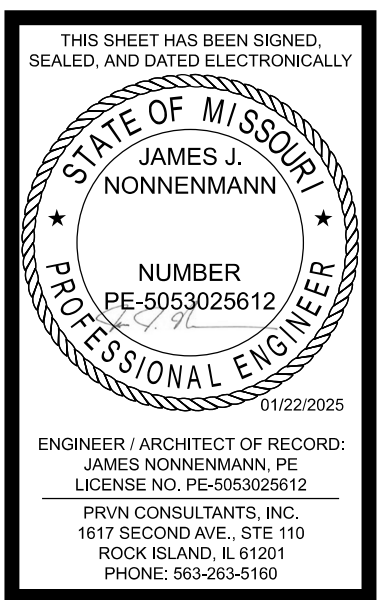
SECTION E - MP-223 (LOOKING NORTH)
SCALE: 1/4" = 1'-0"
MP-132 & MP-142



SECTION F - MP-223 (LOOKING WEST)
SCALE: 1/4" = 1'-0"
MP-132 & MP-142

ADD ALTERNATES:

1. ADD ALTERNATE 1 - LOOP PUMP LP-02.
2. ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
3. ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.
4. REFER TO R&IDS FOR PIPING BOUNDARY LIMITS OF ALTERNATES.



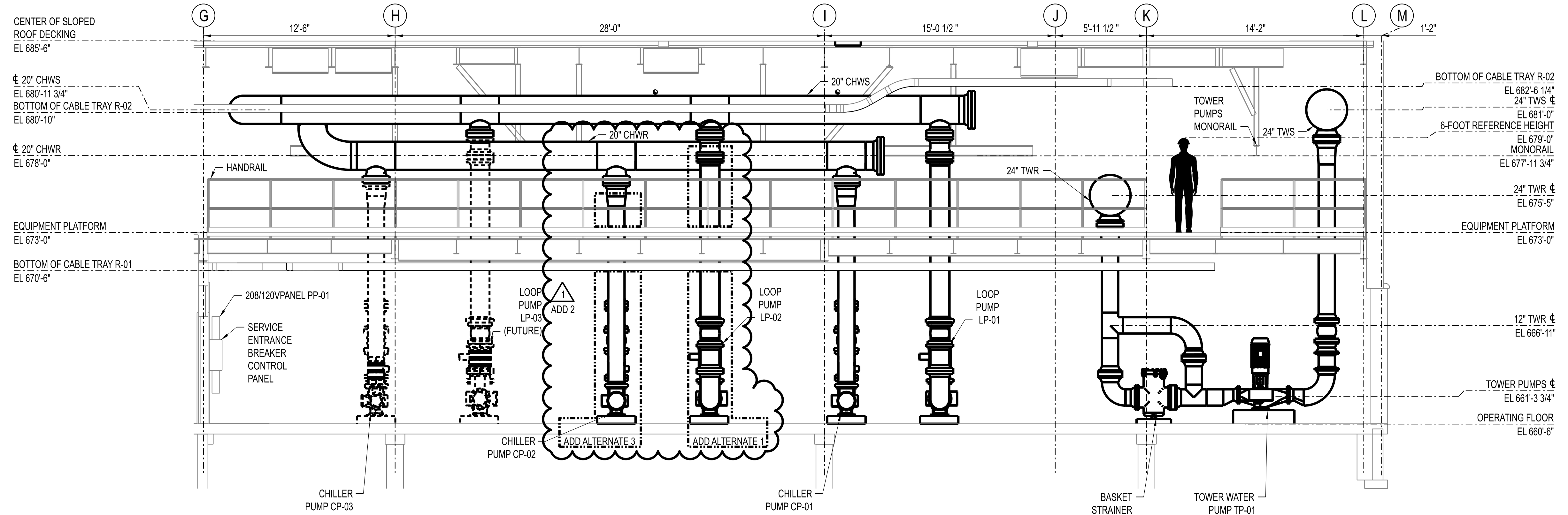
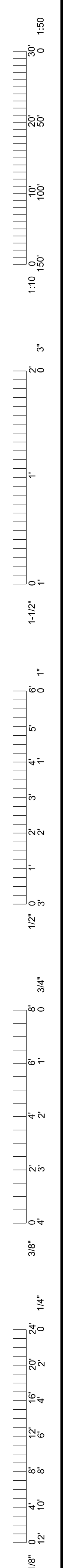
THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.
 ENGINEER / ARCHITECT OF RECORD:
 JAMES NONNENMANN, PE
 LICENSE NO. PE-5053025612
 PRVN CONSULTANTS, INC.
 1617 SECOND AVE., STE. 110
 ROCK ISLAND, IL 61201
 PHONE: 563-263-5160

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0	12/05/2024	ISSUED FOR BID		

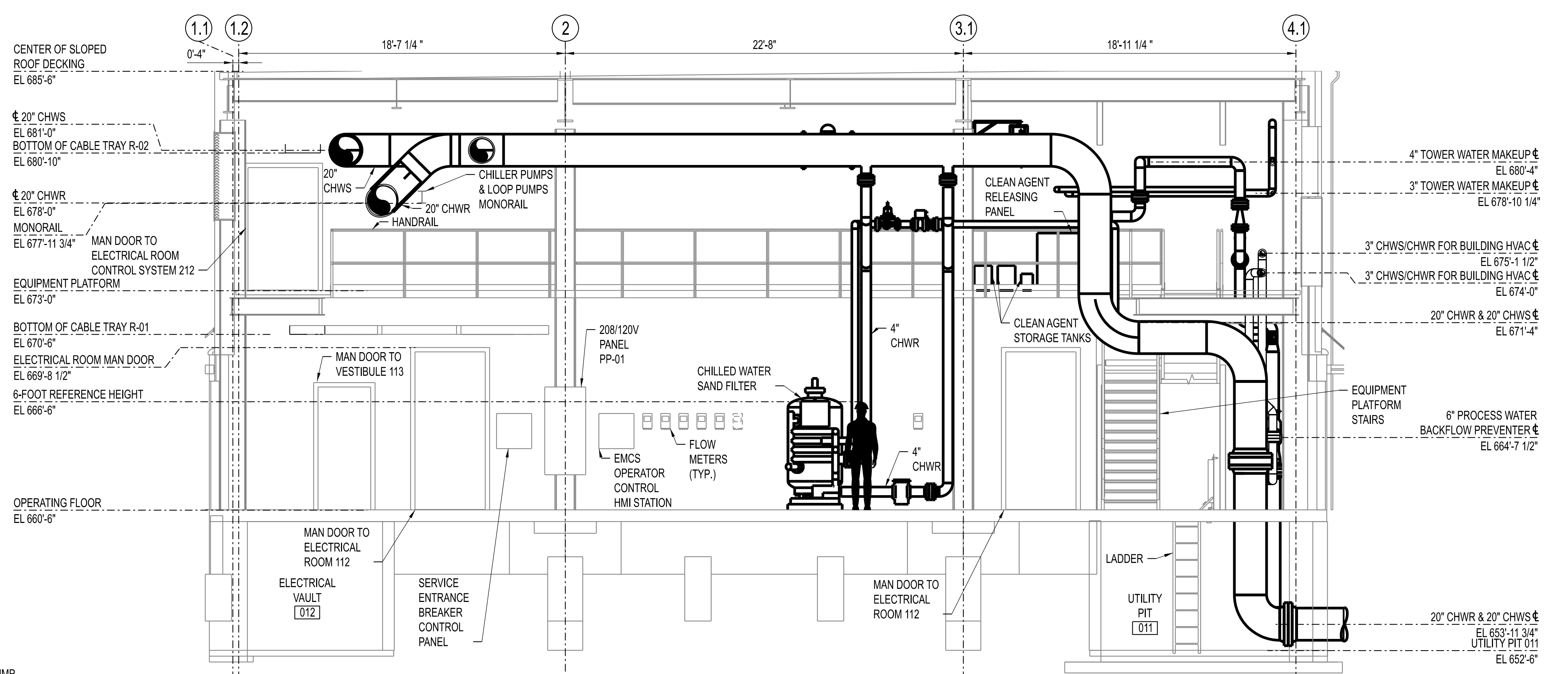
PRVN CONSULTANTS, INC.
 1617 SECOND AVE., STE. 110
 ROCK ISLAND, IL 61201
 PHONE: 563-263-5160
 MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017605

UNIVERSITY OF MISSOURI - COLUMBIA
 RESEARCH COMMONS THERMAL PLANT
 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 MECHANICAL PIPING SECTIONS - SHEET 3

UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP232801
 CONSULTANT
 PROJECT NUMBER
23073
 SHEET
MP-223



SECTION G - MP-224 (LOOKING SOUTH)
SCALE: 1/4" = 1'-0"



SECTION H - MP-224 (LOOKING EAST)
SCALE: 1/4" = 1'-0"

- ADD ALTERNATES:**
1. ADD ALTERNATE 1 - LOOP PUMP LP-02.
 2. ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
 3. ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02. ADD 2.
 4. REFER TO R&IDS FOR PIPING BOUNDARY LIMITS OF ALTERNATES.

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

STATE OF MISSOURI
JAMES J. NONNENMANN
NUMBER PE-5053025612
PROFESSIONAL ENGINEER

11/22/2025

ENGINEER / ARCHITECT OF RECORD:
JAMES J. NONNENMANN, PE
LICENSE NO. PE-5053025612

PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE: 563.263.5160
PHONE: 563.263.5160

1	10/22/2025	ISSUED FOR ADDENDUM 2	CHECKED BY: JTG
0	12/05/2024	ISSUED FOR BID	
		DRAWN BY: SMH	

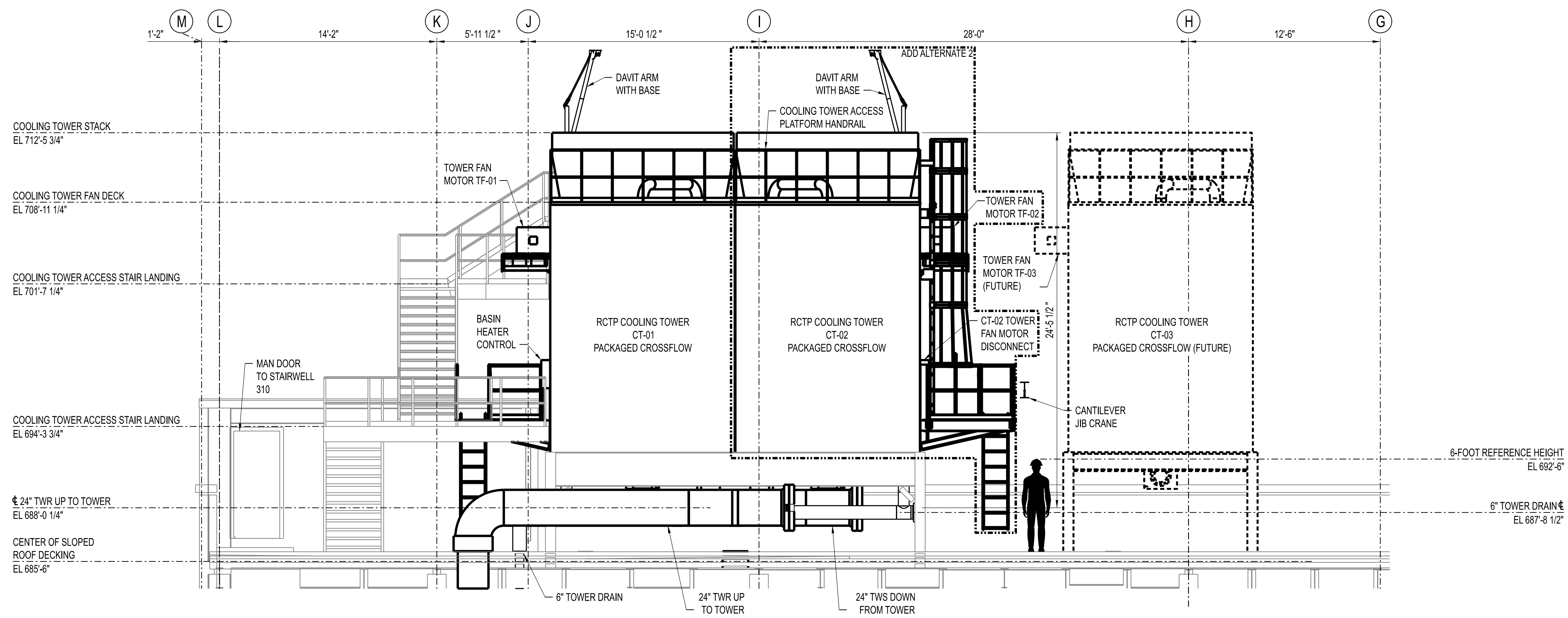
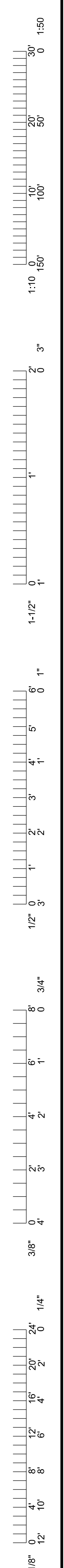
PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE: 563.263.5160
MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017805

UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
MECHANICAL PIPING SECTIONS - SHEET 4

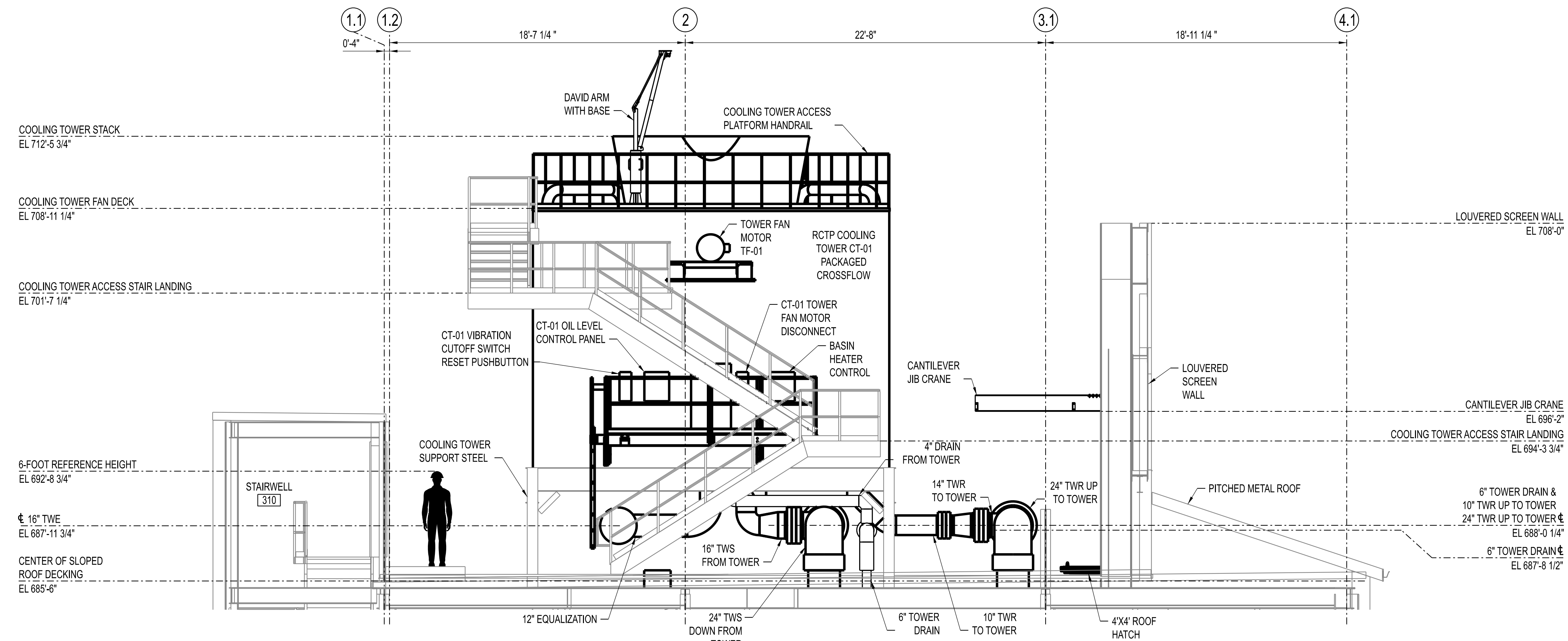
UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801

CONSULTANT
PROJECT NUMBER
23073

SHEET
MP-224



SECTION A - MP-226 (LOOKING NORTH)
SCALE: 1/4" = 1'-0"
MP-152



SECTION B - MP-226 (LOOKING EAST)
SCALE: 1/4" = 1'-0"
MP-152

ADD ALTERNATES:

1. ADD ALTERNATE 1 - LOOP PUMP LP-02.
2. ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
3. ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02. ADD 2
4. REFER TO R&IDS FOR PIPING BOUNDARY LIMITS OF ALTERNATES.

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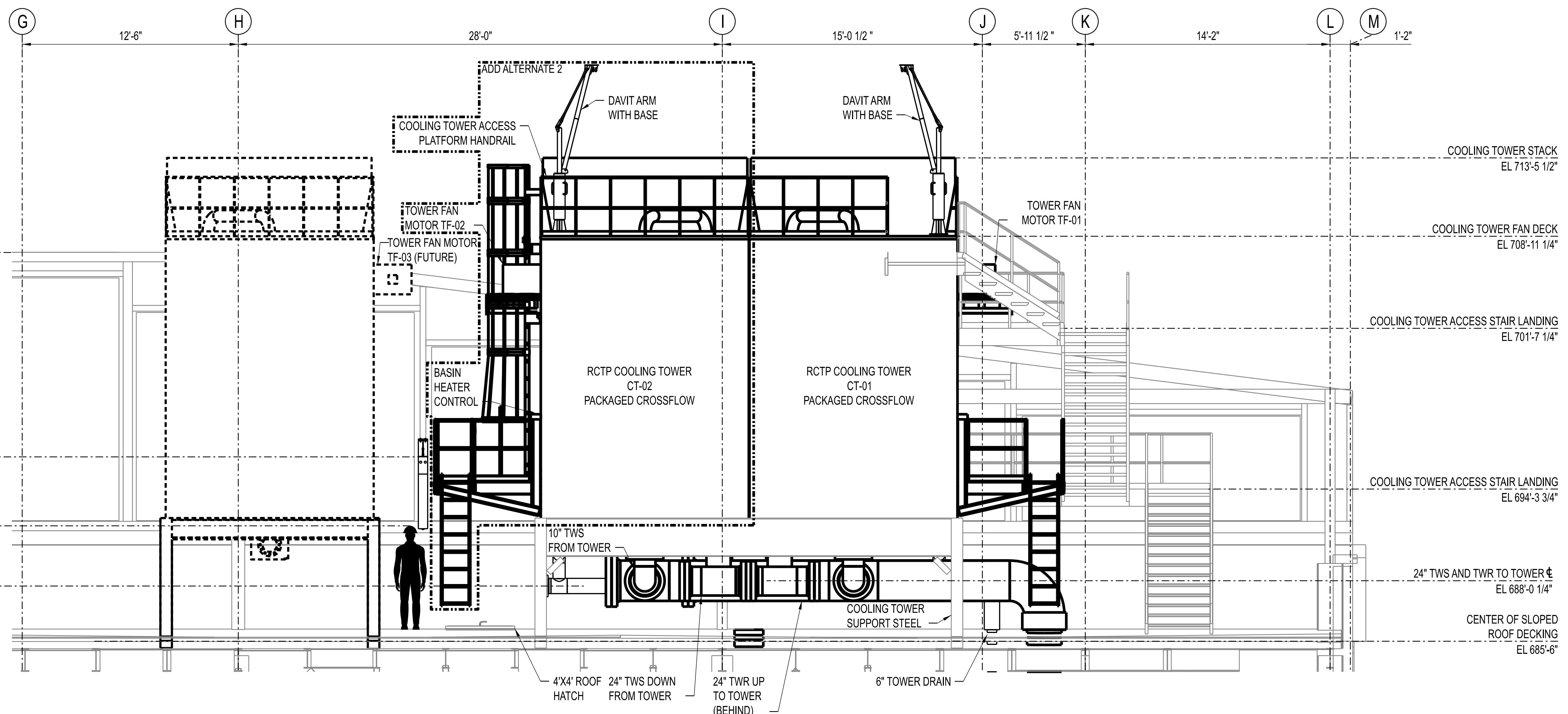
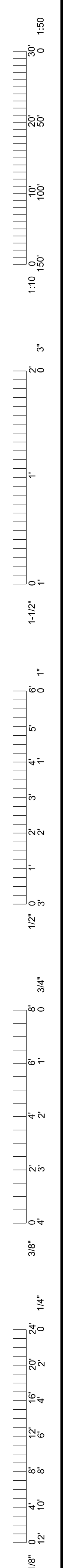
STATE OF MISSOURI
JAMES NONNENMANN
PROFESSIONAL ENGINEER
NUMBER PE-5053025612
11/22/2025
ENGINEER / ARCHITECT OF RECORD:
JAMES NONNENMANN, PE
LICENSE NO. PE-5053025612
PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
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1	01/22/2025	ISSUED FOR ADDENDUM 2	CHECKED BY: JTG
0	12/05/2024	ISSUED FOR BID	DRAWN BY: SMH

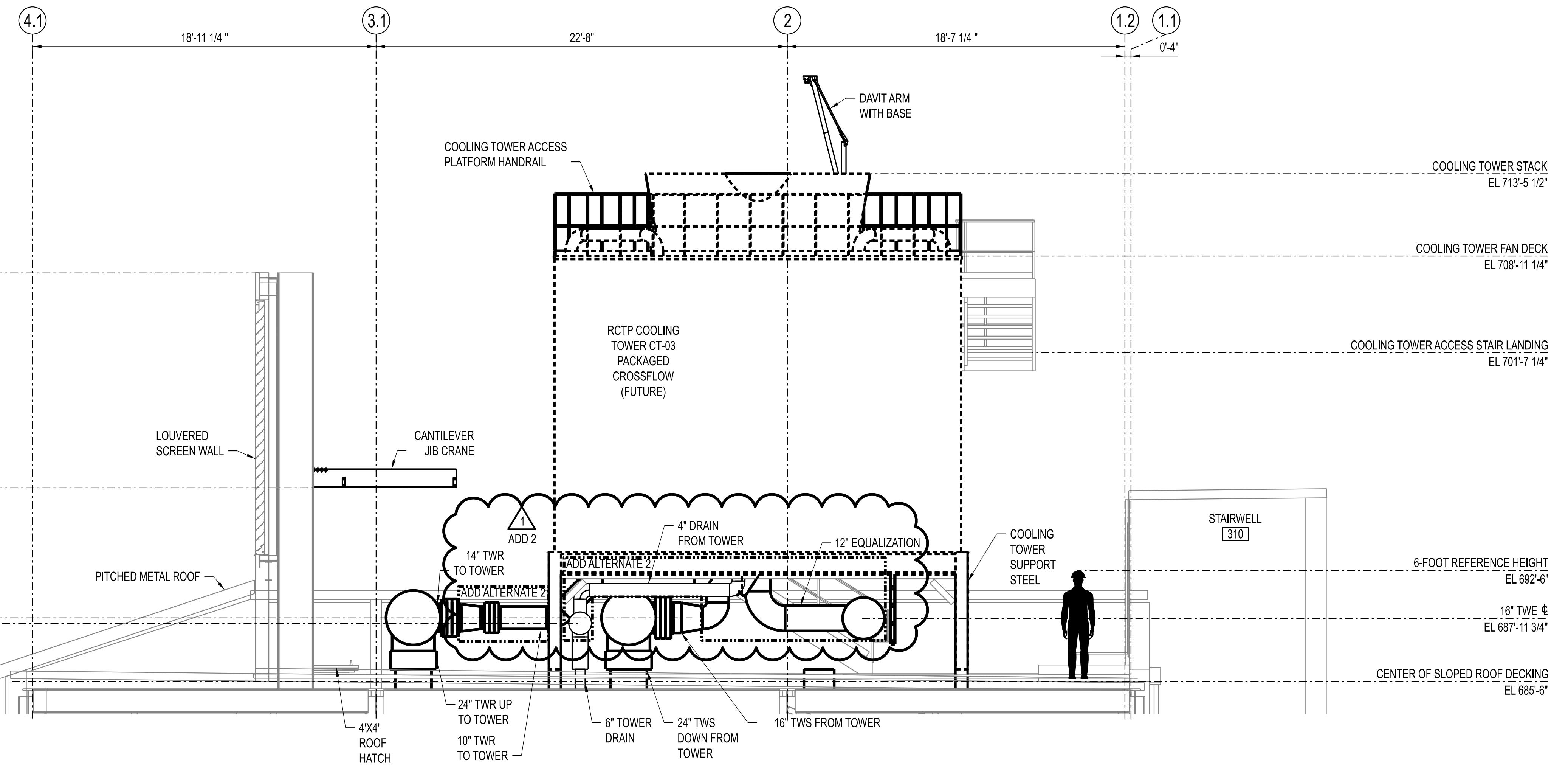
PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE: 563.263.5160
MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017805

UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
MECHANICAL PIPING SECTIONS - SHEET 6

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801
CONSULTANT
PROJECT NUMBER
23073
SHEET
MP-226

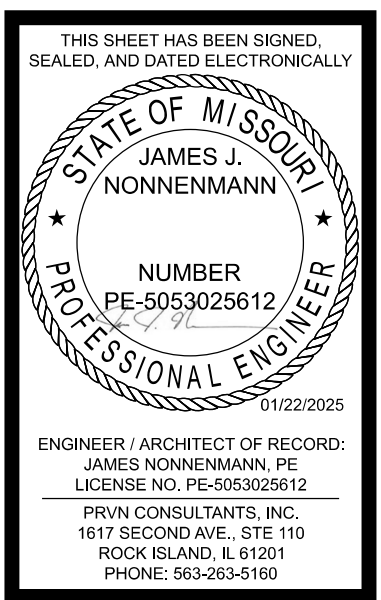


SECTION C - MP-227 (LOOKING SOUTH)
SCALE: 1/4" = 1'-0"
MP-152



SECTION D - MP-227 (LOOKING WEST)
SCALE: 1/4" = 1'-0"
MP-152

- ADD ALTERNATES:**
1. ADD ALTERNATE 1 - LOOP PUMP LP-02.
 2. ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
 3. ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02. ADD 2
 4. REFER TO R&IDS FOR PIPING BOUNDARY LIMITS OF ALTERNATES.



THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

ENGINEER / ARCHITECT OF RECORD:
JAMES NONNENMANN, PE
LICENSE NO. PE-5053025612

PRVN CONSULTANTS, INC.
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ROCK ISLAND, IL 61201
PHONE: 563.263.5160
ISSUED FOR ADDENDUM 2
ISSUED FOR BID

CHECKED BY: JTG
DRAWN BY: SMH

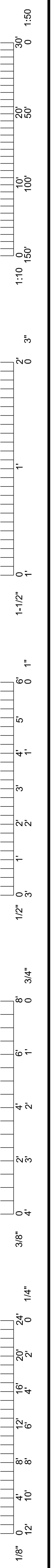
PRVN CONSULTANTS, INC.
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ROCK ISLAND, IL 61201
PHONE: 563.263.5160
MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017805

UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
MECHANICAL PIPING SECTIONS - SHEET 7

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801

CONSULTANT
PROJECT NUMBER
23073

SHEET
MP-227



HYDRONIC PUMP SCHEDULE											
TAG		TP-01	TP-02	CP-01	CP-02	LP-01	LP-02	TW-CHMP-01	CW-CHMP-01	CWBP-01	ROTP-01
CONTRACT BOX (FURNISHING INSTALLING)		[C-01] [C-01]	[C-01] [C-01]	[C-01] [C-01]	[C-01] [C-01]	[C-01] [C-01]	[C-01] [C-01]	[C-01] [C-01]	[C-01] [C-01]	[C-01] [C-01]	[C-01] [C-01]
CONTRACT PACKAGE		BASE BID	ADD ALTERNATE 2	BASE BID	ADD ALTERNATE 3	BASE BID	ADD ALTERNATE 1	BASE BID	BASE BID	BASE BID	BASE BID
LOCATION		OPERATING FLOOR	OPERATING FLOOR	OPERATING FLOOR	OPERATING FLOOR	OPERATING FLOOR	OPERATING FLOOR	OPERATING FLOOR	OPERATING FLOOR	OPERATING FLOOR	EQUIPMENT PLATFORM
TYPE		VERTICAL IN-LINE	VERTICAL IN-LINE	VERTICAL IN-LINE	VERTICAL IN-LINE	VERTICAL IN-LINE	VERTICAL IN-LINE	VERTICAL IN-LINE	VERTICAL IN-LINE	VERTICAL IN-LINE	VERTICAL IN-LINE
SERVICE		TOWER WATER PUMP	TOWER WATER PUMP	CHW CHILLER PUMP	CHW CHILLER PUMP	CHW LOOP PUMP	CHW LOOP PUMP	TW TREATMENT PUMP	CHW TREATMENT PUMP	CHW HVAC BUILDING PUMP	RO TRANSFER PUMP
FLUID TEMPERATURE	DEG F	35-105	35-105	40-100	40-100	40-100	40-100	35-105	40-100	40-100	40-100
CAPACITY	GPM	1800	1800	1000	1000	2400	2400	225	25	80	65
TOTAL DYNAMIC HEAD	FT	55	55	25	25	80	80	40	10	15	40
NPSHR (MAXIMUM)	FT	23.34	23.34	9.43	9.43	21.04	21.04	8.98	3.23	4.11	3.32
SUCTION SIZE	IN	8	8	8	8	10	10	3	1	2	2
DISCHARGE SIZE	IN	8	8	8	8	10	10	3	1	2	2
IMPELLER SIZE	IN	9.66	9.66	9.28	9.28	10.61	10.61	6.88	3.75	7.00	9.70
PUMP EFFICIENCY AT DESIGN (MINIMUM)	%	78.25	78.25	80.33	80.33	79.25	79.25	72.38	52.70	66.20	56.20
MOTOR											
TYPE		TEFC PREMIUM	TEFC PREMIUM	TEFC PREMIUM	TEFC PREMIUM	TEFC PREMIUM	TEFC PREMIUM	TEFC PREMIUM	TEFC PREMIUM	TEFC PREMIUM	TEFC PREMIUM
SPEED	RPM	1800	1800	1800	1800	1800	1800	1800	3600	1200	1200
SIZE	HP	40	40	10	10	75	75	5	1/4	3/4	3
VOLTS	V	460	460	460	460	460	460	460	120	460	460
PHASE	φ	3	3	3	3	3	3	3	1	3	3
HERTZ	HZ	60	60	60	60	60	60	60	60	60	60
DRIVE TYPE		VFD	VFD	VFD	VFD	VFD	VFD	VFD	VFD	VFD	CONSTANT
BASIS OF DESIGN											
MANUFACTURER		ARMSTRONG	ARMSTRONG	ARMSTRONG	ARMSTRONG	ARMSTRONG	ARMSTRONG	ARMSTRONG	BELL AND GOSSETT	BELL AND GOSSETT	ARMSTRONG
MODEL		SERIES 4300	SERIES 4300	SERIES 4300	SERIES 4300	SERIES 4300	SERIES 4300	SERIES 4300	SERIES e-90	SERIES e-80	SERIES 4380
SIZE		8X8X10	8X8X10	8X8X10	8X8X10	10X10X13	10X10X13	3X3X8	1AAB	2X2X7B	2X2X10
UNIT WEIGHT (OPERATING)	LBS	1104	1104	872	872	1858	1858	330	46	160	347
REMARKS		1, 2, 3, 4, 5	1, 2, 3, 4, 5, 6	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 5	1, 2, 3	1, 2, 3	1, 2, 3
NOTES:		1. MOTORS SHALL BE IEEE 841. 2. REFERENCE ELECTRICAL DETAILS FOR STARTER/DISCONNECT RESPONSIBILITY. 3. MOTOR SHALL INCLUDE GROUNDING BRUSH AND CERAMIC INSULATED REAR MOTOR BEARING. 4. INCLUDE FACTORY PROVIDED BASE SUPPORT. STANCHIONS NOT ALLOWED. 5. PROVIDE FLUSH LINE SEPARATOR FOR SEAL FLUSHING. 6. PROVIDE PUMP WITH MIRRORED MOTOR CONNECTION LOCATION.									

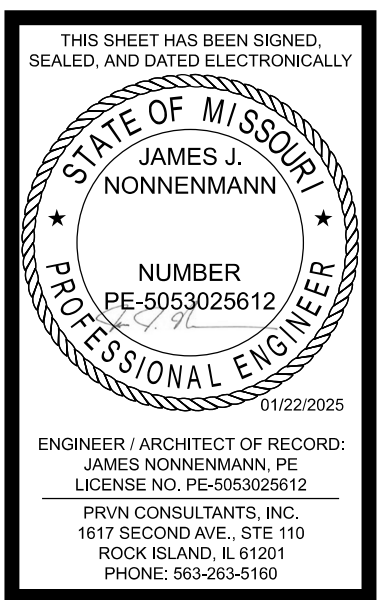
CENTRIFUGAL CHILLER SCHEDULE (OWNER FURNISHED)			
TAG		CH-01	CH-02
CONTRACT BOX (FURNISHING INSTALLING)		[C-01] [C-01]	[C-01] [C-01]
CONTRACT PACKAGE		BASE BID	ADD ALTERNATE 3
CAPACITY	TONS	500	500
FULL-LOAD EFFICIENCY	KW/TON	0.5815	0.5815
PART-LOAD EFFICIENCY - (NPLV)	KW/TON	0.3425	0.3425
EVAPORATOR			
PRESSURE RATING	PSIG	150	150
NO. OF PASSES		2	2
FLUID TYPE		WATER	WATER
DESIGN FLUID FLOW RATE	GPM	997	997
ENTERING-FLUID TEMPERATURE	DEG F	54	54
LEAVING-FLUID TEMPERATURE	DEG F	42	42
FLUID PRESSURE DROP	FT HEAD	9.6	9.6
FOULING FACTOR		0.0001	0.0001
CONDENSER			
PRESSURE RATING	PSIG	150	150
NO. OF PASSES		2	2
FLUID TYPE		WATER	WATER
DESIGN FLUID FLOW RATE	GPM	1412	1412
ENTERING-FLUID TEMPERATURE	DEG F	85	85
LEAVING-FLUID TEMPERATURE	DEG F	95.0	95.0
FLUID PRESSURE DROP	FT HEAD	6.98	6.98
FOULING FACTOR		0.00025	0.00025
REFRIGERANT TYPE		R-513A	R-513A
COMPRESSOR			
NO. OF COMPRESSORS		1	1
MAXIMUM POWER CONSUMPTION	KW	290.8	290.8
MINIMUM CIRCUIT AMPACITY	A	481	481
COMPRESSOR MOTOR CONTROLLER			
MOUNTING		UNIT	UNIT
VOLTS - CONTROL	V	480	480
PHASE - CONTROL	φ	3	3
HERTZ - CONTROL	HZ	60	60
CHILLER ELECTRICAL REQUIREMENTS			
VOLTS - CHILLER	V	480	480
PHASE - CHILLER	φ	3	3
HERTZ - CHILLER	HZ	60	60
BASIS OF DESIGN			
MANUFACTURER		YORK	YORK
MODEL		YMC2	YMC2
UNIT WEIGHT (OPERATING)	LBS	27,575	27,575
REMARKS		1, 2	1, 2
NOTES:		1. REFERENCE ELECTRICAL DETAILS FOR STARTER/DISCONNECT RESPONSIBILITY. 2. CHILLERS ARE OWNER FURNISHED BUT TO BE INSTALLED BY C-01 CONTRACTOR.	

OPEN -CIRCUIT, INDUCED-DRAFT, COOLING TOWER SCHEDULE			
TAG		CT-01	CT-02
CONTRACT BOX (FURNISHING INSTALLING)		[C-01] [C-01]	[C-01] [C-01]
CONTRACT PACKAGE		BASE BID	ADD ALTERNATE 2
AIR-INLET ARRANGEMENT		PER DRAWINGS	PER DRAWINGS
MAXIMUM DRIFT LOSS (% OF DESIGN WATER FLOW)		<0.0010	<0.0010
DESIGN WATER FLOW/CELL	GPM	1800	1800
ENTERING-WATER TEMPERATURE	DEG F	98	98
LEAVING-WATER TEMPERATURE	DEG F	85	85
ENTERING-AIR WET-BULB TEMPERATURE	DEG F	81	81
FAN			
DRIVE		GEAR	GEAR
MOTOR		NEMA	NEMA
TYPE		VARIABLE SPEED	VARIABLE SPEED
SIZE/CELL - FAN	HP	75	75
VOLTS - FAN	V	480	480
PHASE - FAN	φ	3	3
HERTZ - FAN	HZ	60	60
BASIS OF DESIGN			
MANUFACTURER		MARLEY	MARLEY
MODEL		NC8411VAS	NC8411VAS
UNIT WEIGHT (OPERATING)	LBS	41,332	41,332
REMARKS		1, 2, 3, 4, 5	1, 2, 3, 4, 5
NOTES:		1. SEE STRUCTURAL DRAWINGS FOR STRUCTURAL STEEL DESIGNED TO SUPPORT COOLING TOWERS. IF COOLING TOWER IS NOT COMPATIBLE WITH STRUCTURE AS DESIGNED, CONTRACTOR SHALL BE RESPONSIBLE FOR REVISION IN DESIGN AND MODIFICATIONS AS REQUIRED TO INSTALL COOLING 2. MOTOR SHALL BE IEEE 841. 3. REFERENCE ELECTRICAL DETAILS FOR STARTER/DISCONNECT RESPONSIBILITY. 4. COOLING TOWER ANCHORING TO MEET SEISMIC LOAD REQUIREMENTS. REFER TO STRUCTURAL DRAWINGS AND PROJECT MANUAL FOR SEISMIC SIZING REQUIREMENTS. 5. PROVIDE DAVIT CRANE WITH EACH COOLING TOWER SUITABLE FOR REMOVING MECHANICAL EQUIPMENT (MOTOR, ETC) FROM TOWERS AND DROPPING FROM THE NORTH EDGE.	

SAND FILTER SCHEDULE		
TAG		SF-01
CONTRACT BOX (FURNISHING INSTALLING)		[C-01] [C-01]
CONTRACT PACKAGE		BASE BID
TYPE		SAND FILTER
LOCATION		OPERATING FLOOR
PROCESS FLUID		LOOP CHILLED WATER RETURN
MAXIMUM FLUID TEMP.	°F	62
MINIMUM FLUID TEMP.	°F	50
PRESSURE	PSIG	70
PUMP CAPACITY	GPM	112
BACKWASH FLUID		NON-POTABLE PROCESS WATER
MAXIMUM FLUID TEMP.	°F	70
MINIMUM FLUID TEMP.	°F	50
PRESSURE	PSIG	30-60
CAPACITY	GPM	70
FILTER MEDIA		
MEDIA		
RATING		1/4 MICRON
PROCESS INLET	IN	4
PROCESS OUTLET	IN	4
BACKWASH INLET	IN	2
BACKWASH OUTLET	IN	2
PIPING AND FITTINGS		COPPER TYPE L
VESSEL MATERIAL OF CONSTRUCTION		304 STAINLESS STEEL
NUMBER OF VESSELS		1
MAXIMUM OPERATING PRESSURE RATING	PSIG	150 ASME
DIAMETER	IN	36
PUMP MOTOR		
TYPE		TEFC, PREMIUM EFFICIENCY
SPEED	RPM	3600
SIZE	HP	5
VOLTS	V	480
PHASE	φ	3
HERTZ	HZ	60
OPERATION TYPE		AUTOMATIC
CONTROLS PACKAGE		UNITRONICS
BASIS OF DESIGN		
MANUFACTURER		AMERWATER
MODEL		0079-136CLPQ-460
UNIT WEIGHT (OPERATING)	LBS	5530
REMARKS		1
NOTES:		1. SAND FILTER ASSEMBLY TO BE PROVIDED WITH A SINGLE POINT POWER CONNECTION. SYSTEM SHALL INCLUDE MOTOR STARTERS, CONTROL COMPONENTS, AND CONTROL POWER TRANSFORMERS AS NECESSARY.

ADD ALTERNATES:

- ADD ALTERNATE 1 - LOOP PUMP LP-02.
- ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
- ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.



UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801

CONSULTANT
PROJECT NUMBER
23073

SHEET
MP-621

1 10/22/2025 ISSUED FOR ADDENDUM 2
0 12/05/2024 ISSUED FOR BID
DRAWN BY: SMH CHECKED BY: JTG

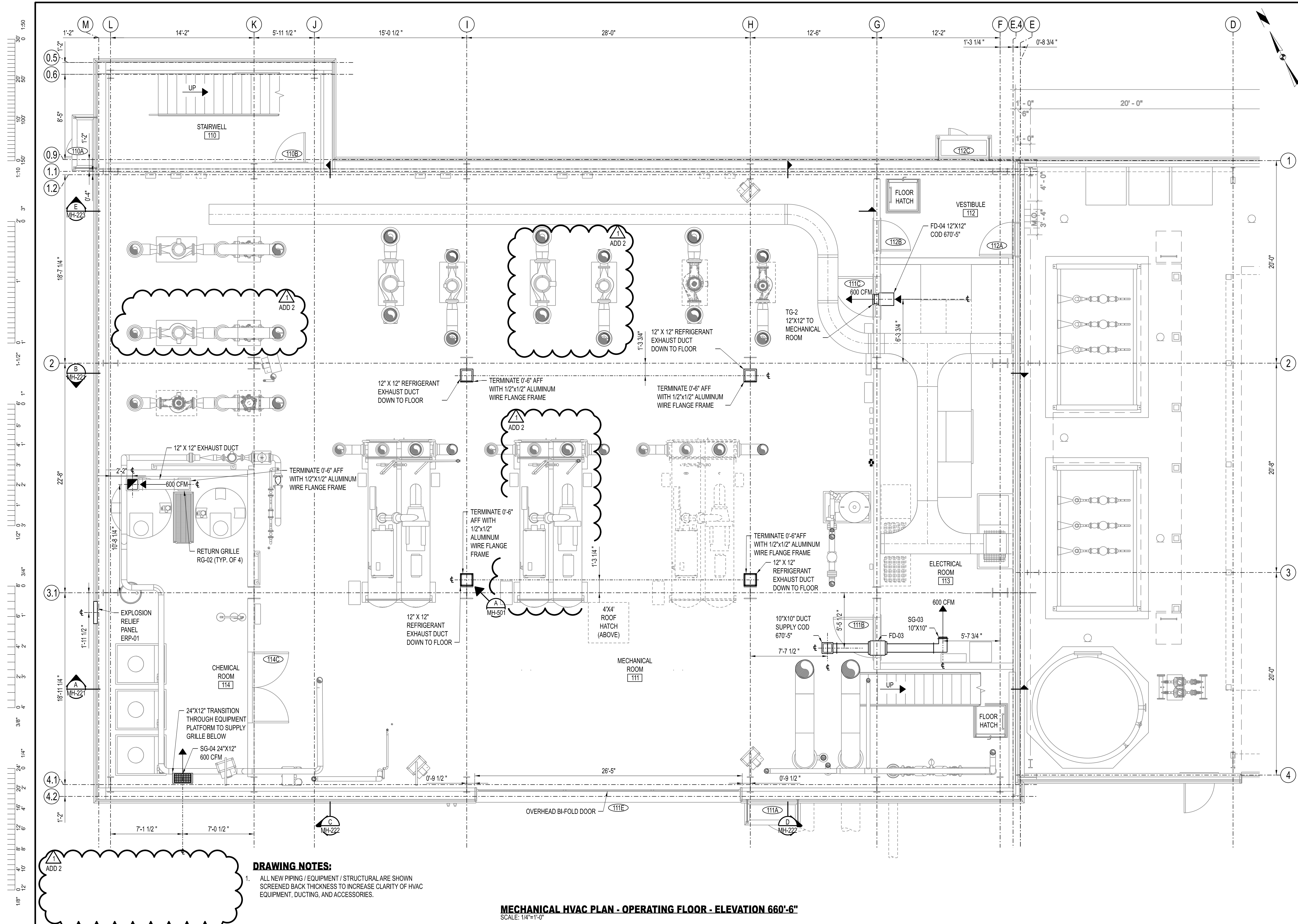
PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE 563.263.5160
MISSOURI CERTIFICATE OF
AUTHORITY ENGINEERING - 2023017805

UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
MECHANICAL SCHEDULES - SHEET 1

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801

CONSULTANT
PROJECT NUMBER
23073

SHEET
MP-621



1
ADD 2

- DRAWING NOTES:**
- ALL NEW PIPING / EQUIPMENT / STRUCTURAL ARE SHOWN SCREENED BACK THICKNESS TO INCREASE CLARITY OF HVAC EQUIPMENT, DUCTING, AND ACCESSORIES.

MECHANICAL HVAC PLAN - OPERATING FLOOR - ELEVATION 660'-6"
SCALE: 1/4"=1'-0"

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

STATE OF MISSOURI
JAMES S. NONNENMANN
PROFESSIONAL ENGINEER
NUMBER PE-5053025612
11/22/2025

ENGINEER / ARCHITECT OF RECORD:
JAMES S. NONNENMANN, PE
LICENSE NO. PE-5053025612

PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
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FAX: 563.263.5160

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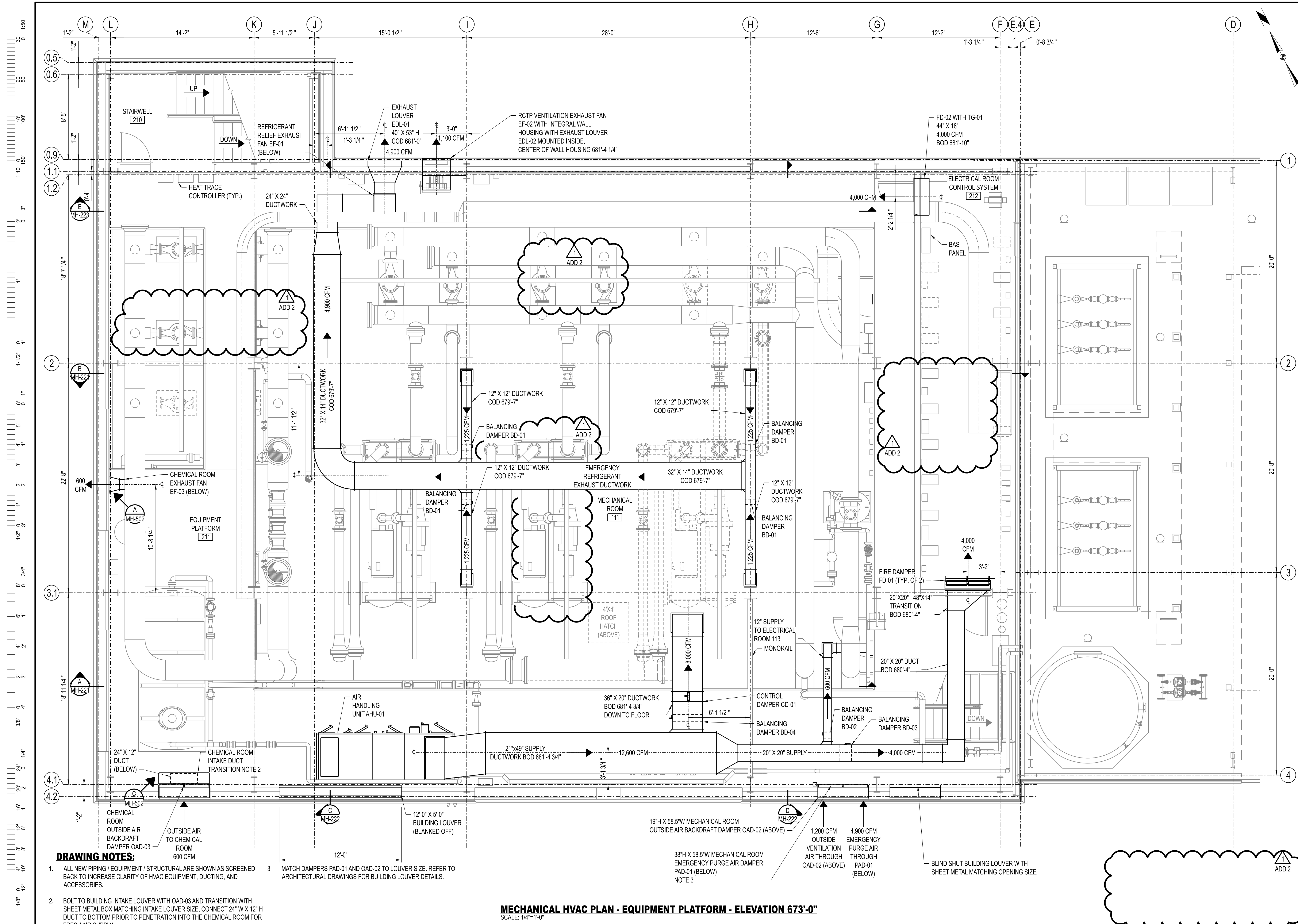
MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017605

UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
MECHANICAL HVAC PLAN - OPERATING FLOOR

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801

CONSULTANT
PROJECT NUMBER
23073

SHEET
MH-132

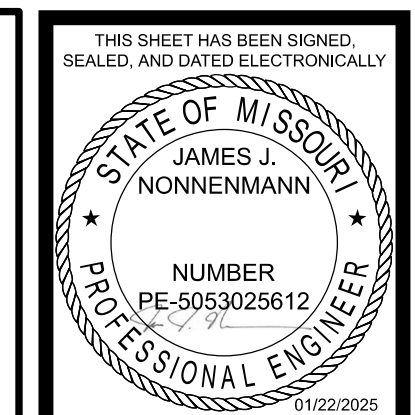


DRAWING NOTES:

- ALL NEW PIPING / EQUIPMENT / STRUCTURAL ARE SHOWN AS SCREENED BACK TO INCREASE CLARITY OF HVAC EQUIPMENT, DUCTING, AND ACCESSORIES.
- BOLT TO BUILDING INTAKE LOUVER WITH OAD-03 AND TRANSITION WITH SHEET METAL BOX MATCHING INTAKE LOUVER SIZE. CONNECT 24" W X 12" H DUCT TO BOTTOM PRIOR TO PENETRATION INTO THE CHEMICAL ROOM FOR FRESH AIR SUPPLY.
- MATCH DAMPERS PAD-01 AND OAD-02 TO LOUVER SIZE. REFER TO ARCHITECTURAL DRAWINGS FOR BUILDING LOUVER DETAILS.

MECHANICAL HVAC PLAN - EQUIPMENT PLATFORM - ELEVATION 673'-0"

SCALE: 1/4"=1'-0"



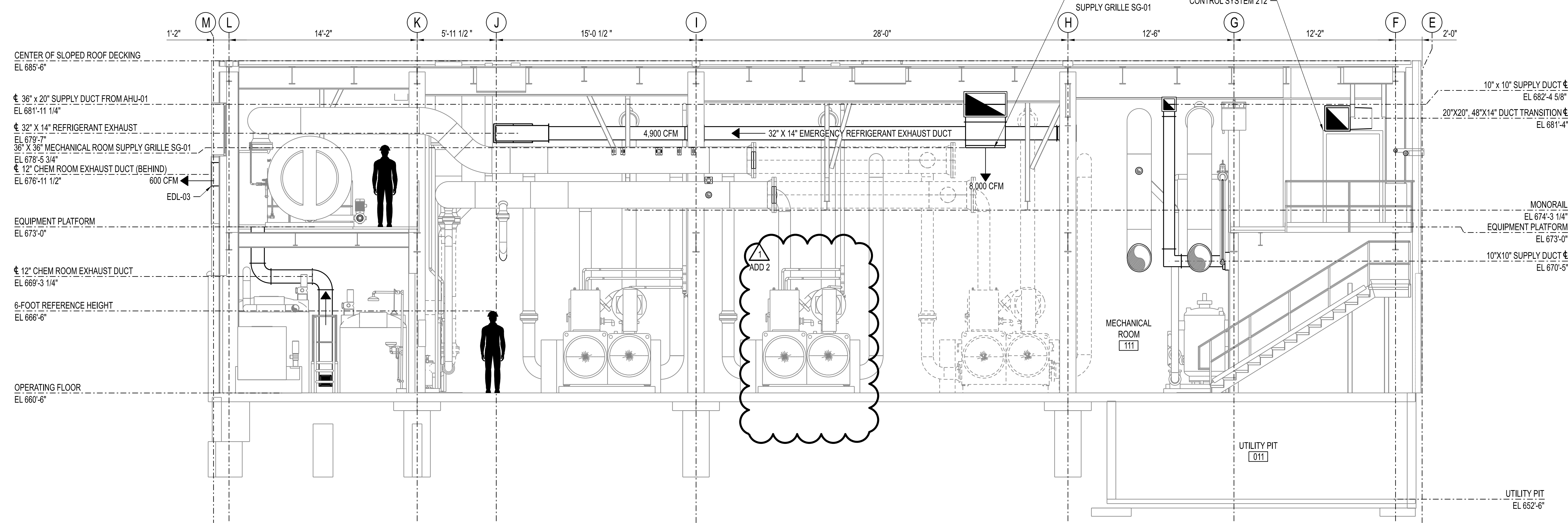
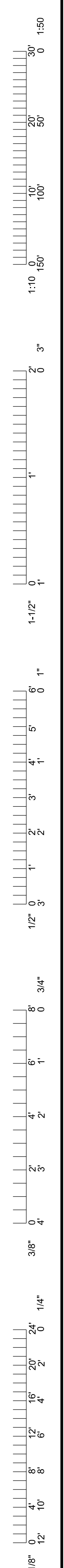
ENGINEER / ARCHITECT OF RECORD:
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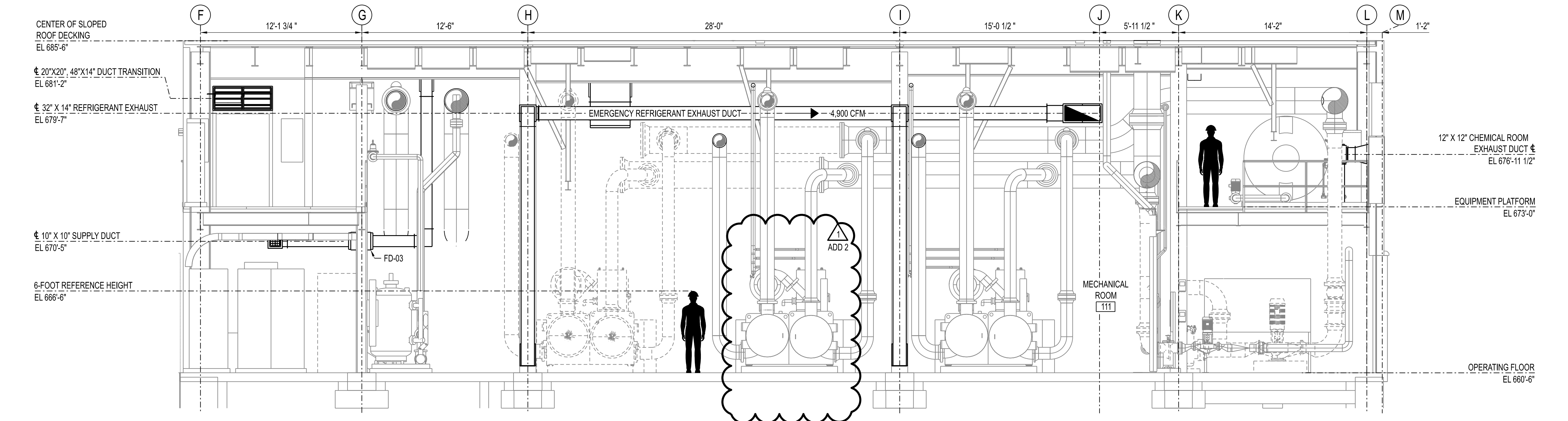
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UNIVERSITY OF MISSOURI - COLUMBIA
 RESEARCH COMMONS THERMAL PLANT
 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 MECHANICAL HVAC PLAN - EQUIPMENT PLATFORM

UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP232801
 CONSULTANT
 PROJECT NUMBER
23073
 SHEET
MH-142



SECTION A - MH-221 (LOOKING NORTH)
SCALE: 1/4" = 1'-0"
MH-132 & MH-142



SECTION B - MH-221 (LOOKING SOUTH)
SCALE: 1/4" = 1'-0"
MH-132 & MH-142

DRAWING NOTES:
1. ALL NEW PIPING / EQUIPMENT / STRUCTURAL ARE SHOWN SCREENED BACK TO INCREASE CLARITY OF HVAC EQUIPMENT, DUCTING, AND ACCESSORIES.

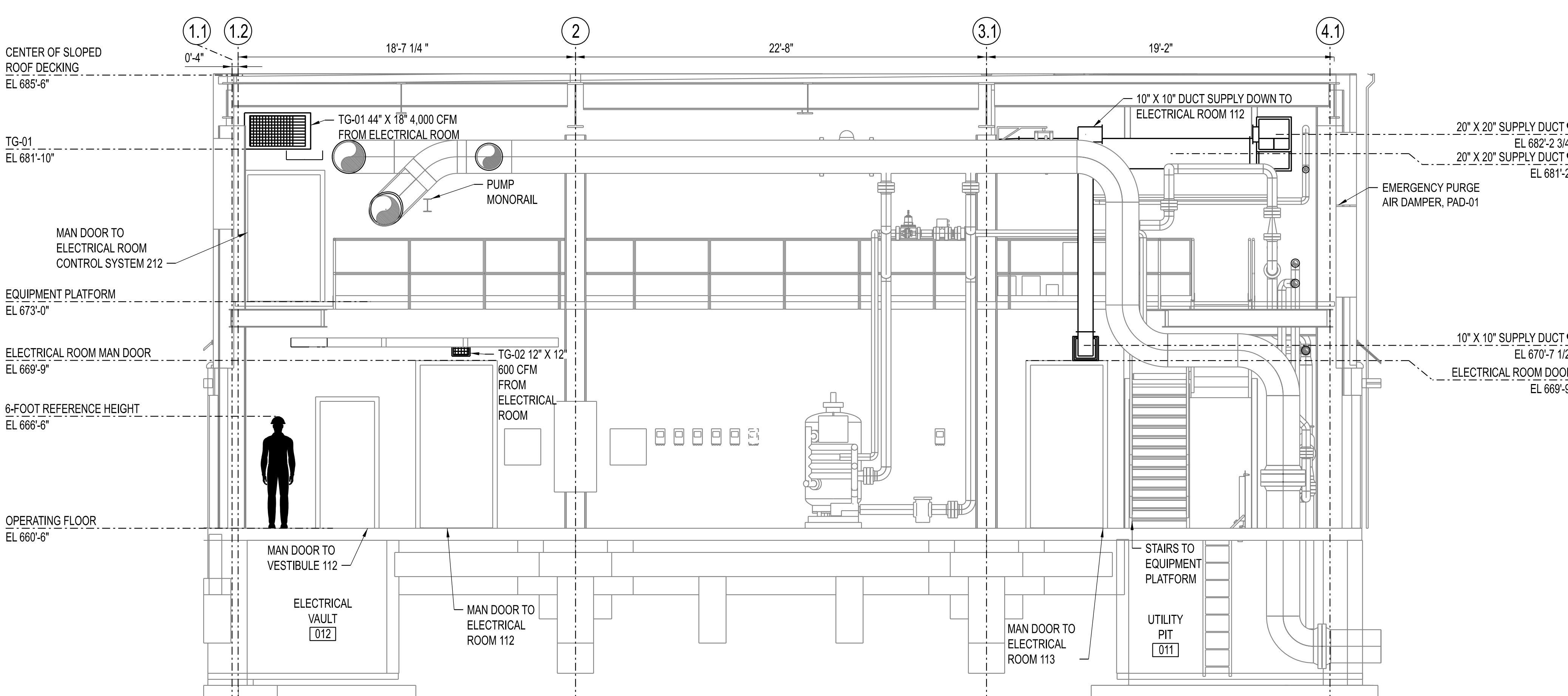
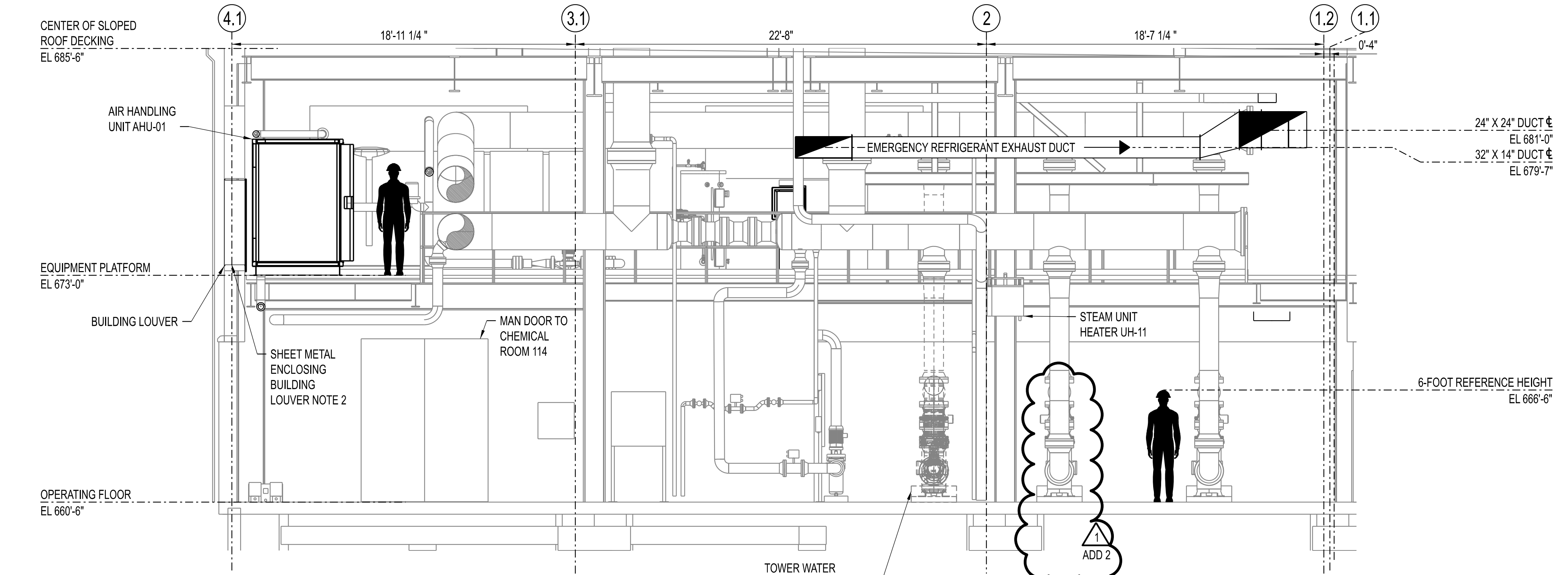
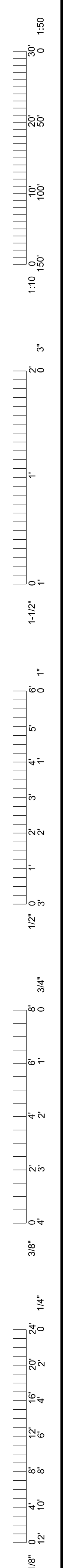
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STATE OF MISSOURI
JAMES S. NONNENMANN
PROFESSIONAL ENGINEER
NUMBER PE-5053025612
11/22/2025
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UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
MECHANICAL HVAC SECTIONS - SHEET 1

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801
CONSULTANT
PROJECT NUMBER
23073
SHEET
MH-221



- DRAWING NOTES:**
- ALL NEW PIPING / EQUIPMENT / STRUCTURAL ARE SHOWN SCREENED BACK TO INCREASE CLARITY OF HVAC EQUIPMENT, DUCTING, AND ACCESSORIES.
 - BOLT SHEET METAL TO BUILDING INTAKE LOUVER TO BLANK OFF LOUVER EXCEPT FOR 24" X 24" OUTSIDE AIR DAMPER OAD-02.

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY

STATE OF MISSOURI
JAMES S. NONNENMANN
PROFESSIONAL ENGINEER
NUMBER PE-5053025612
11/22/2025

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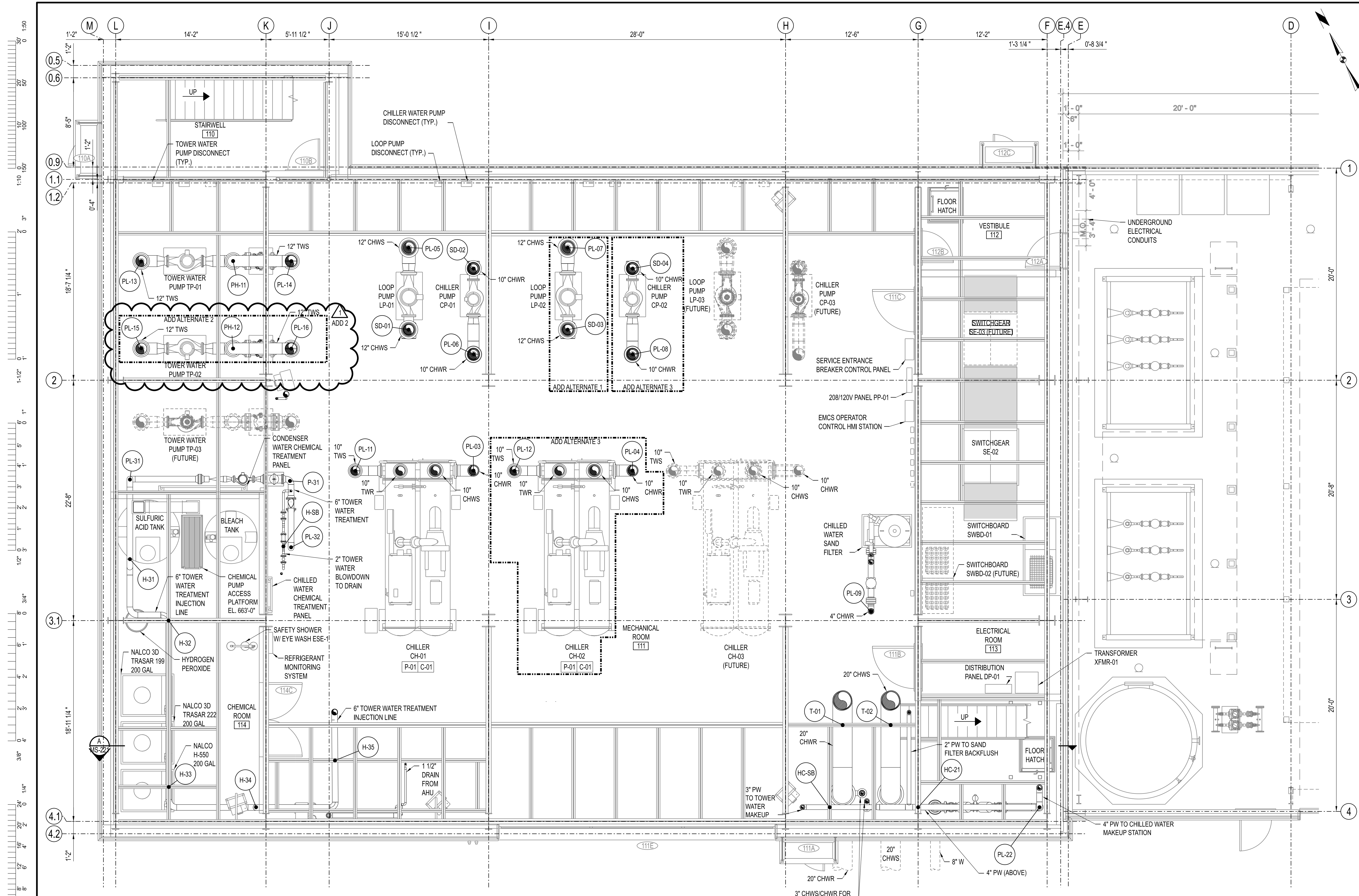
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UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
MECHANICAL HVAC SECTIONS - SHEET 2

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801

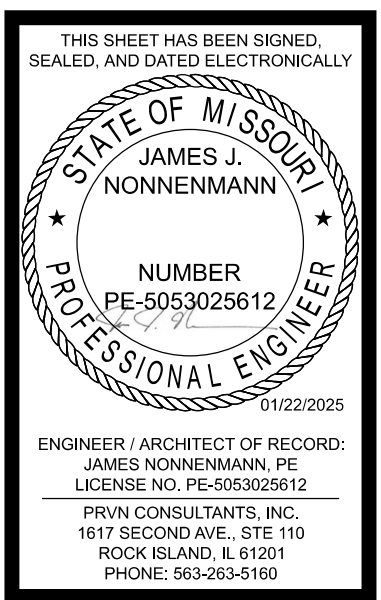
CONSULTANT
PROJECT NUMBER
23073

SHEET
MH-222



- ADD ALTERNATES:**
- ADD ALTERNATE 1 - LOOP PUMP LP-02.
 - ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
 - ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.

MECHANICAL SUPPORT PLAN - OPERATING FLOOR - ELEVATION 660'-6"
 SCALE: 1/4"=1'-0"



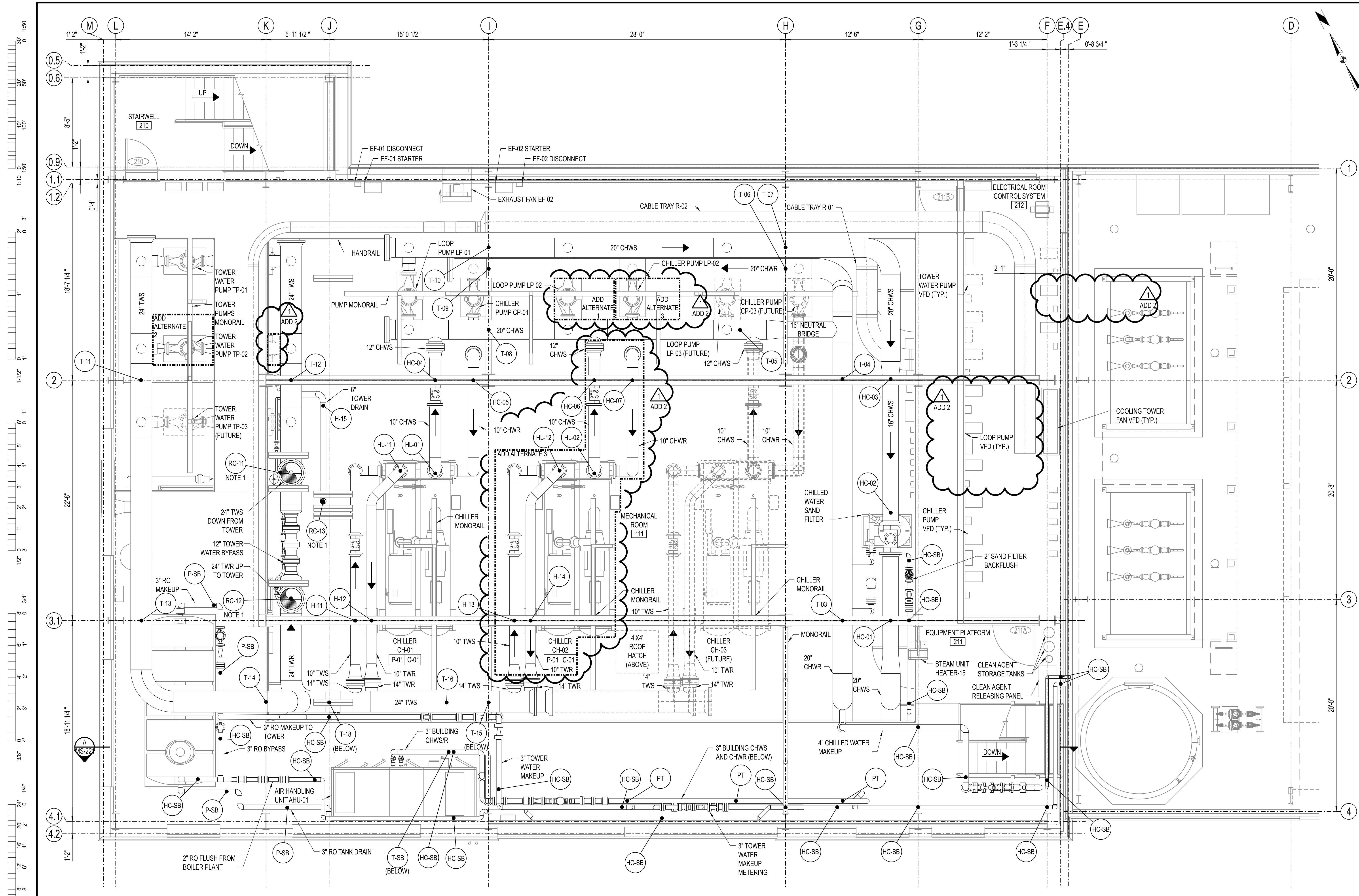
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 PHONE: 563-263-5160
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ISSUED FOR ADDENDUM 2
 1 01/22/2025
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UNIVERSITY OF MISSOURI - COLUMBIA
 RESEARCH COMMONS THERMAL PLANT
 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 MECHANICAL SUPPORT PLAN - OPERATING FLOOR

UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP232801
 CONSULTANT
 PROJECT NUMBER
23073
 SHEET
MS-132



- ADD ALTERNATES:**
- ADD ALTERNATE 1 - LOOP PUMP LP-02.
 - ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
 - ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.

MECHANICAL SUPPORT PLAN - EQUIPMENT PLATFORM - ELEVATION 673'-0"
 SCALE: 1/4"=1'-0"

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STATE OF MISSOURI
 JAMES S. NONNENMANN
 PROFESSIONAL ENGINEER
 NUMBER PE-5053025612
 11/22/2025

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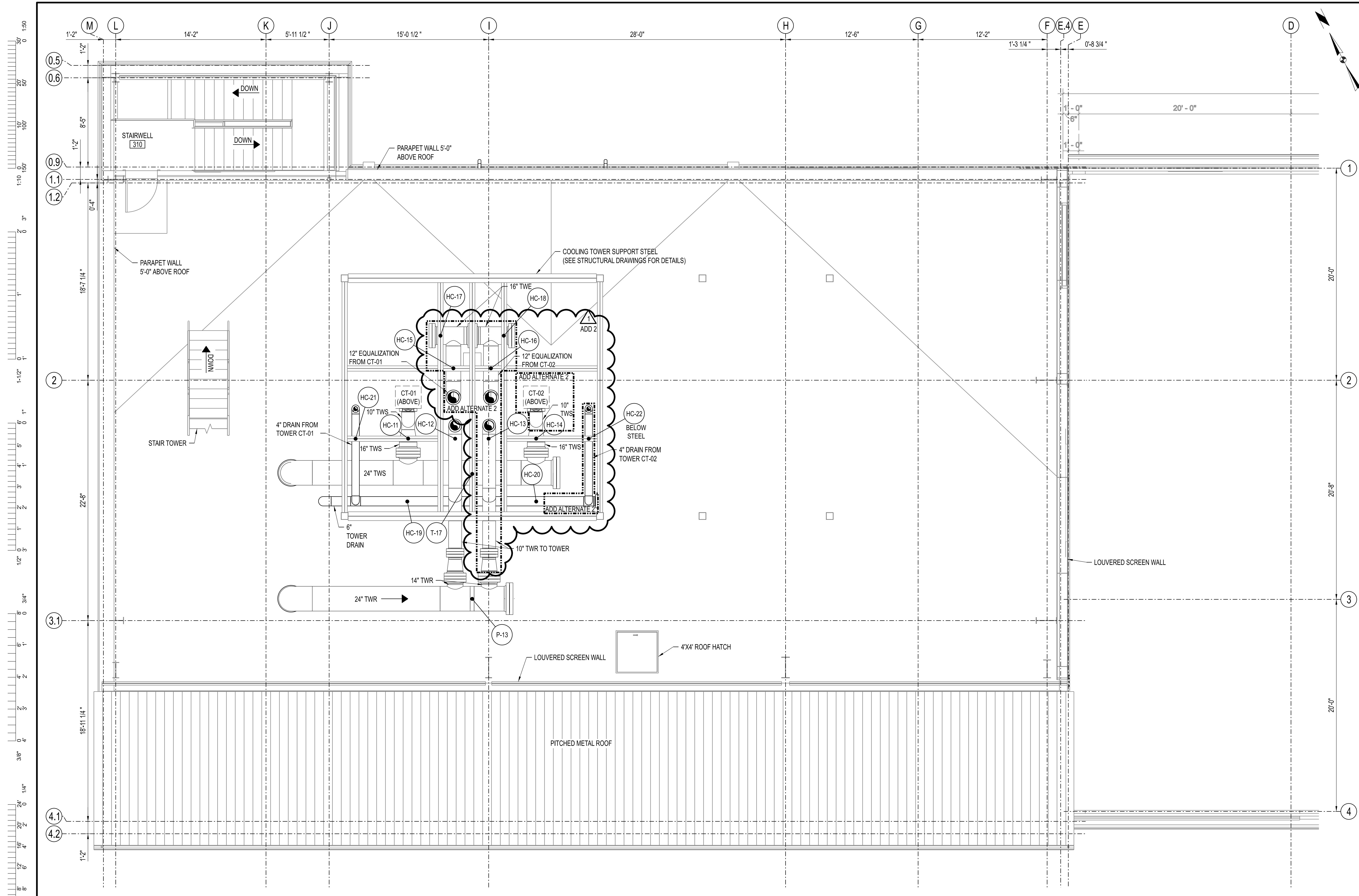
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UNIVERSITY OF MISSOURI - COLUMBIA
 RESEARCH COMMONS THERMAL PLANT
 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 MECHANICAL SUPPORT PLAN - EQUIPMENT PLATFORM

UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP232801

CONSULTANT
 PROJECT NUMBER
23073

SHEET
MS-142



- ADD ALTERNATES:**
1. ADD ALTERNATE 1 - LOOP PUMP LP-02.
 2. ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
 3. ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.

MECHANICAL SUPPORT PLAN - LOWER ROOF - ELEVATION 691'-8"
 SCALE: 1/4"=1'-0"

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

STATE OF MISSOURI
 JAMES S. NONNENMANN
 PROFESSIONAL ENGINEER
 NUMBER PE-5053025612
 11/22/2025

ENGINEER / ARCHITECT OF RECORD:
 JAMES S. NONNENMANN, PE
 LICENSE NO. PE-5053025612

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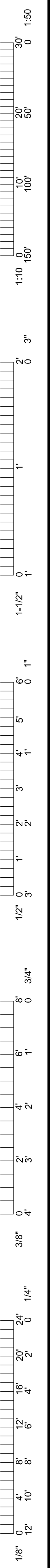
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UNIVERSITY OF MISSOURI - COLUMBIA
 RESEARCH COMMONS THERMAL PLANT
 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 MECHANICAL SUPPORT PLAN - LOWER ROOF

UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP232801

CONSULTANT
 PROJECT NUMBER
23073

SHEET
MS-152



TYPE T SCHEDULE												
DESIGNATION	SERVICE	LOCATION	SEISMIC BRACING REQUIREMENT	FIG. NO.	PIPE SIZE		INSULATION	LOAD LBS	TRAPEZE SIZE	C TO C	MINIMUM ROD IN	A-WELD SIZE (NOTE 1)
					IN	IN						
T-01	CHWR	MECH RM - 111	TRANSVERSE	46	20		1	3600	3	26	5/8	1/4"
T-02	CHWS	MECH RM - 111	TRANSVERSE	46	20		1	4300	4	26	3/4	1/4"
T-03	CHWR	MECH RM - 111	TRANSVERSE	46	20		1	5100	4	26	3/4	1/4"
T-04	CHWR	MECH RM - 111	TRANSVERSE	46	20		1	5100	4	26	3/4	1/4"
T-05	CHWS	MECH RM - 111	NONE	46	20		1	4600	4	26	3/4	1/4"
T-06	CHWR	MECH RM - 111	QUAD	46	20		1	4200	4	26	3/4	1/4"
T-07	CHWS	MECH RM - 111	QUAD	46	20		1	6600	4	26	7/8	1/4"
T-08	CHWS	MECH RM - 111	QUAD	46	20		1	2300	2	26	1/2	3/16"
T-09	CHWR	MECH RM - 111	TRANSVERSE	46	20		1	4100	4	26	5/8	1/4"
T-10	CHWS	MECH RM - 111	TRANSVERSE	46	20		1	2500	2	26	1/2	3/16"
T-11	TWS	MECH RM - 111	TRANSVERSE	46	24		-	8100	5	28	7/8	1/4"
T-12	TWR	MECH RM - 111	TRANSVERSE	46	24		-	3400	3	28	5/8	1/4"
T-13	TWS	MECH RM - 111	TRANSVERSE	46	24		-	7300	5	28	7/8	1/4"
T-14	TWS	MECH RM - 111	NONE	46	24		-	5900	4	28	3/4	1/4"
T-15	TWR	MECH RM - 111	NONE	46	24		-	6700	5	28	7/8	1/4"
T-16	TWS	MECH RM - 111	QUAD	46	24		-	7200	5	28	7/8	1/4"
T-17	TWS	ROOF - 311	NONE	46	24		2	7900	5	36	7/8	1/4"
T-18	TWR	MECH RM - 111	NONE	46	24		-	4100	4	28	5/8	1/4"
T-SB (NOTE 2)	ANY	-	NONE	46	3" AND SMALLER		-	-	1	12	1/2	3/16"

NOTE 1. IF BEAM FLANGE THICKNESS IS GREATER THAN 3/4", MINIMUM WELD SIZE SHALL BE 5/16".
 NOTE 2. FIELD ROUTED AND SMALL BORE PIPING SHALL USE INDICATED SIZES TO MEET THE REQUIREMENTS OF T-SB (SMALL BORE).

ADD 2
 ADD ALT 3
 ADD ALT 1
 ADD ALT 3
 ADD ALT 3
 ADD ALT 2
 ADD ALT 2

TYPE PL SCHEDULE						
DESIGNATION	SERVICE	LOCATION	PIPE SIZE		INSULATION	LOAD LBS
			IN	IN		
PL-01	CHWR	UTILITY PIT - 011	20		1	6300
PL-02	CHWS	UTILITY PIT - 011	20		1	6100
PL-03	CHWR	MECH RM - 111	10		1	2400
PL-04	CHWR	MECH RM - 111	10		1	2400
PL-05	CHWS	MECH RM - 111	12		1	6700
PL-06	CHWR	MECH RM - 111	10		1	2000
PL-07	CHWS	MECH RM - 111	12		1	7900
PL-08	CHWR	MECH RM - 111	10		1	2100
PL-09	CHWR	MECH RM - 111	4		1	500
PL-11	TWS	MECH RM - 111	10		-	3000
PL-12	TWS	MECH RM - 111	10		-	3000
PL-13	TWS	MECH RM - 111	12		-	7400
PL-14	TWS	MECH RM - 111	12		-	6200
PL-15	TWS	MECH RM - 111	12		-	3100
PL-16	TWS	MECH RM - 111	12		-	3500
PL-21	W	UTILITY PIT - 011	8		1	1200
PL-22	W	MECH RM - 111	8		1	1200
PL-31	TW	MECH RM - 111	6		-	800
PL-32	TW	MECH RM - 111	6		-	700
PL-SB	ANY	-	NOTE 1		-	-

NOTE 1. LOADS FOR FIELD ROUTED PIPING AND PIPING NOT LISTED ABOVE NOT CALCULATED. CONTRACTOR TO SIZE BASED ON THE DETAILS ON MS-501 AND MS-502.

ADD 2
 ADD ALT 2

TYPE PH SCHEDULE						
DESIGNATION	SERVICE	LOCATION	PIPE SIZE		INSULATION	LOAD LBS
			IN	IN		
PH-11	TWS	MECH RM - 111	12		-	2800
PH-12	TWS	MECH RM - 111	12		-	3100
PH-13	TWR	ROOF - 311	24		2	7700
PH-SB	ANY	-	NOTE 1		-	-

NOTE 1. LOADS FOR FIELD ROUTED PIPING AND PIPING NOT LISTED ABOVE NOT CALCULATED. CONTRACTOR TO SIZE BASED ON THE DETAILS ON MS-501 AND MS-502.

TYPE PT SCHEDULE						
DESIGNATION	SERVICE	LOCATION	PIPE SIZE		INSULATION	LOAD LBS
			IN	IN		
PT-SB	ANY	-	NOTE 1		-	-

NOTE 1. LOADS FOR FIELD ROUTED PIPING AND PIPING NOT LISTED ABOVE NOT CALCULATED. CONTRACTOR TO SIZE BASED ON THE DETAILS ON MS-501 AND MS-502.

ADD 2
 ADD ALT 1
 ADD ALT 3

TYPE SD SCHEDULE						
DESIGNATION	SERVICE	LOCATION	PIPE SIZE		INSULATION	LOAD LBS
			IN	IN		
SD-01	CHWS	MECH RM - 111	12		1	5700
SD-02	CHWR	MECH RM - 111	10		1	1500
SD-03	CHWS	MECH RM - 111	12		1	6400
SD-04	CHWR	MECH RM - 111	10		1	6200

TYPE RC SCHEDULE						
DESIGNATION	SERVICE	LOCATION	PIPE SIZE		INSULATION	LOAD LBS
			IN	IN		
RC-11	TWS	MECH RM - 111	24		-	11500
RC-12	TWR	MECH RM - 111	24		-	12400
RC-13	TWD	MECH RM - 111	6		-	6000
RC-SB	ANY	-	NOTE 2		-	-

NOTE 1. RISER CLAMP INSTALLED AT ROOF STEEL LEVEL.
 NOTE 2. LOADS FOR FIELD ROUTED PIPING AND PIPING NOT LISTED ABOVE NOT CALCULATED. CONTRACTOR TO SIZE BASED ON THE DETAILS ON MS-501 AND MS-502.

ADD 2
 ADD ALT 3
 ADD ALT 3

TYPE H SCHEDULE									
DESIGNATION	SERVICE	LOCATION	SEISMIC BRACING REQUIREMENT	PIPE SIZE		INSULATION	LOAD LBS	MINIMUM ROD IN	A-WELD SIZE (NOTE 1)
				IN	IN				
H-11	TWS	MECH RM - 111	TRANSVERSE	10		-	1900	3/4	1/4"
H-12	TWR	MECH RM - 111	TRANSVERSE	10		-	1700	3/4	1/4"
H-13	TWS	MECH RM - 111	TRANSVERSE	10		-	1600	3/4	1/4"
H-14	TWR	MECH RM - 111	TRANSVERSE	10		-	1600	3/4	1/4"
H-15	TWD	MECH RM - 111	NONE	6		-	400	5/8	3/16"
H-31	TW	CHEM RM - 114	NONE	6		-	400	5/8	3/16"
H-32	TW	CHEM RM - 114	QUAD	6		-	600	5/8	3/16"
H-33	TW	CHEM RM - 114	NONE	6		-	600	5/8	3/16"
H-34	TW	CHEM RM - 114	QUAD	6		-	500	5/8	3/16"
H-35	TW	MECH RM - 111	NONE	6		-	500	5/8	3/16"
H-SB (NOTE 2)	ANY	-	NONE	3" AND SMALLER		-	-	5/8	3/16"

NOTE 1. IF BEAM FLANGE THICKNESS IS GREATER THAN 3/4", MINIMUM WELD SIZE SHALL BE 5/16".
 NOTE 2. FIELD ROUTED AND SMALL BORE PIPING SHALL USE INDICATED ROD AND WELD SIZE TO MEET THE REQUIREMENTS OF H-SB (SMALL BORE).

ADD 2
 ADD ALT 3
 ADD ALT 3

TYPE HC SCHEDULE									
DESIGNATION	SERVICE	LOCATION	SEISMIC BRACING REQUIREMENT	PIPE SIZE		INSULATION	LOAD LBS	MINIMUM ROD IN	A-WELD SIZE (NOTE 1)
				IN	IN				
HC-01	CHWS	MECH RM - 111	TRANSVERSE	16		1	3300	7/8	1/4"
HC-02	CHWS	MECH RM - 111	NONE	16		1	1600	5/8	1/4"
HC-03	CHWS	MECH RM - 111	TRANSVERSE	16		1	3800	7/8	1/4"
HC-04	CHWS	MECH RM - 111	TRANSVERSE	10		1	1400	5/8	1/4"
HC-05	CHWR	MECH RM - 111	TRANSVERSE	10		1	900	1/2	3/16"
HC-06	CHWS	MECH RM - 111	NONE	10		1	1700	5/8	1/4"
HC-07	CHWR	MECH RM - 111	TRANSVERSE	10		1	900	1/2	3/16"
HC-11	TWS	ROOF - 311	TRANSVERSE	16		2	1000	1/2	3/16"
HC-12	TWR	ROOF - 311	TRANSVERSE	10		2	1200	1/2	3/16"
HC-13	TWR	ROOF - 311	TRANSVERSE	10		2	1200	1/2	3/16"
HC-14	TWS	ROOF - 311	TRANSVERSE	16		2	1600	1/2	3/16"
HC-15	TWE	ROOF - 311	TRANSVERSE	12		2	1000	1/2	3/16"
HC-16	TWE	ROOF - 311	TRANSVERSE	12		2	1000	1/2	3/16"
HC-17	TWE	ROOF - 311	QUAD	16		2	1400	5/8	1/4"
HC-18	TWE	ROOF - 311	TRANSVERSE	16		2	1400	5/8	1/4"
HC-19	TWD	ROOF - 311	QUAD	6		2	1000	1/2	3/16"
HC-20	TWD	ROOF - 311	NONE	6		2	1000	1/2	3/16"
HC-21	TWD	ROOF - 311	TRANSVERSE	6		2	500	1/2	3/16"
HC-22	TWD	ROOF - 311	TRANSVERSE	6		2	500	1/2	3/16"
HC-31	W	MECH RM - 111	NONE	6		1	500	1/2	3/16"
HC-SB (NOTE 2)	ANY	-	NONE	3" AND SMALLER		-	-	5/8	3/16"

NOTE 1. IF BEAM FLANGE THICKNESS IS GREATER THAN 3/4", MINIMUM WELD SIZE SHALL BE 5/16".
 NOTE 2. FIELD ROUTED AND SMALL BORE PIPING SHALL USE INDICATED ROD AND WELD SIZE TO MEET THE REQUIREMENTS OF HC-SB (SMALL BORE).

ADD 2
 ADD ALT 3
 ADD ALT 3

TYPE HL SCHEDULE									
DESIGNATION	SERVICE	LOCATION	SEISMIC BRACING REQUIREMENT	PIPE SIZE		INSULATION	LOAD LBS	MINIMUM ROD IN	A-WELD SIZE (NOTE 1)
				IN	IN				
HL-01	CHWS	MECH RM - 111	TRANSVERSE	10		1	800	5/8	3/16"
HL-02	CHWS	MECH RM - 111	TRANSVERSE	10		1	800	5/8	3/16"
HL-11	TWR	MECH RM - 111	TRANSVERSE	10		-	2400	3/4	1/4"
HL-12	TWR	MECH RM - 111	TRANSVERSE	10		-	2300	3/4	1/4"
HL-SB (NOTE 2)	-	-	NONE	3" AND SMALLER		-	-	5/8	3/16"

NOTE 1. IF BEAM FLANGE THICKNESS IS GREATER THAN 3/4", MINIMUM WELD SIZE SHALL BE 5/16".
 NOTE 2. FIELD ROUTED AND SMALL BORE PIPING SHALL USE INDICATED ROD AND WELD SIZE TO MEET THE REQUIREMENTS OF HL-SB (SMALL BORE).

TYPE P SCHEDULE					
DESIGNATION	SERVICE	LOCATION	PIPE SIZE		LOAD LBS
			IN	IN	
P-21	CHWS	EQUIPMENT PLATFORM - 211	3		200
P-22	CHWR	EQUIPMENT PLATFORM - 211	3		200
P-31	TW	MECH RM - 111	6		800
P-SB	ANY	-	NOTE 1		-

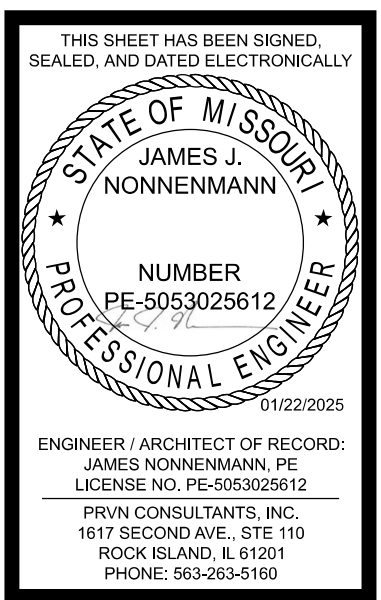
NOTE 1. LOADS FOR FIELD ROUTED PIPING AND PIPING NOT LISTED ABOVE NOT CALCULATED. CONTRACTOR TO SIZE BASED ON THE DETAILS ON MS-501 AND MS-502.

ADD 2

ADD ALTERNATES:

- ADD ALTERNATE 1 - LOOP PUMP LP-02.
- ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
- ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.

ADD ALT # ADD ALTERNATE SCOPE BOX

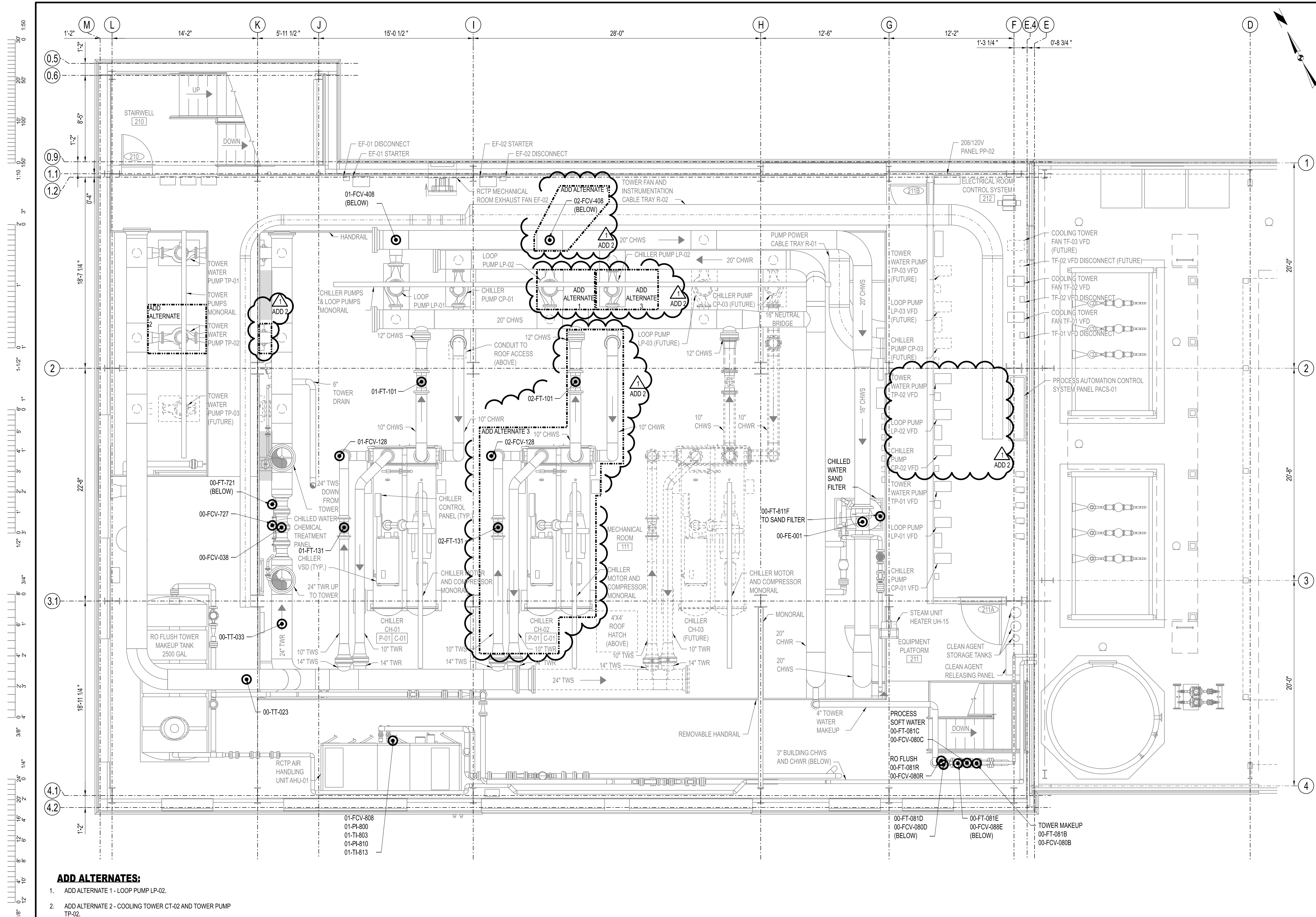


UNIVERSITY OF MISSOURI - COLUMBIA
 RESEARCH COMMONS THERMAL PLANT
 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 MECHANICAL SUPPORT SCHEDULES - SHEET 1

1 01/22/2025 ISSUED FOR ADDENDUM 2
 0 12/05/2024 ISSUED FOR BID
 DRAWN BY: SMH CHECKED BY: JTG

PRVN CONSULTANTS, INC.
 167 SECOND AVE., STE. 110
 ROCK ISLAND, IL 61201
 PHONE 563.283.5160
 MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017805

UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP232801
 CONSULTANT
 PROJECT NUMBER
23073
 SHEET
MS-621



- ADD ALTERNATES:**
1. ADD ALTERNATE 1 - LOOP PUMP LP-02.
 2. ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
 3. ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.

INSTRUMENT PLAN - EQUIPMENT PLATFORM - ELEVATION 673'-0"
 SCALE: 1/4"=1'-0"

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

STATE OF MISSOURI
 JAMES J. NONNENMANN
 PROFESSIONAL ENGINEER
 NUMBER PE-5053025612
 11/22/2025

ENGINEER / ARCHITECT OF RECORD:
 JAMES NONNENMANN, PE
 LICENSE NO. PE-5053025612

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 ROCK ISLAND, IL 61201
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 FAX: 563.263.5160

1	10/22/2025	ISSUED FOR ADDENDUM 2	DRAWN BY: SMH	CHECKED BY: JTG
0	12/05/2024	ISSUED FOR BID		

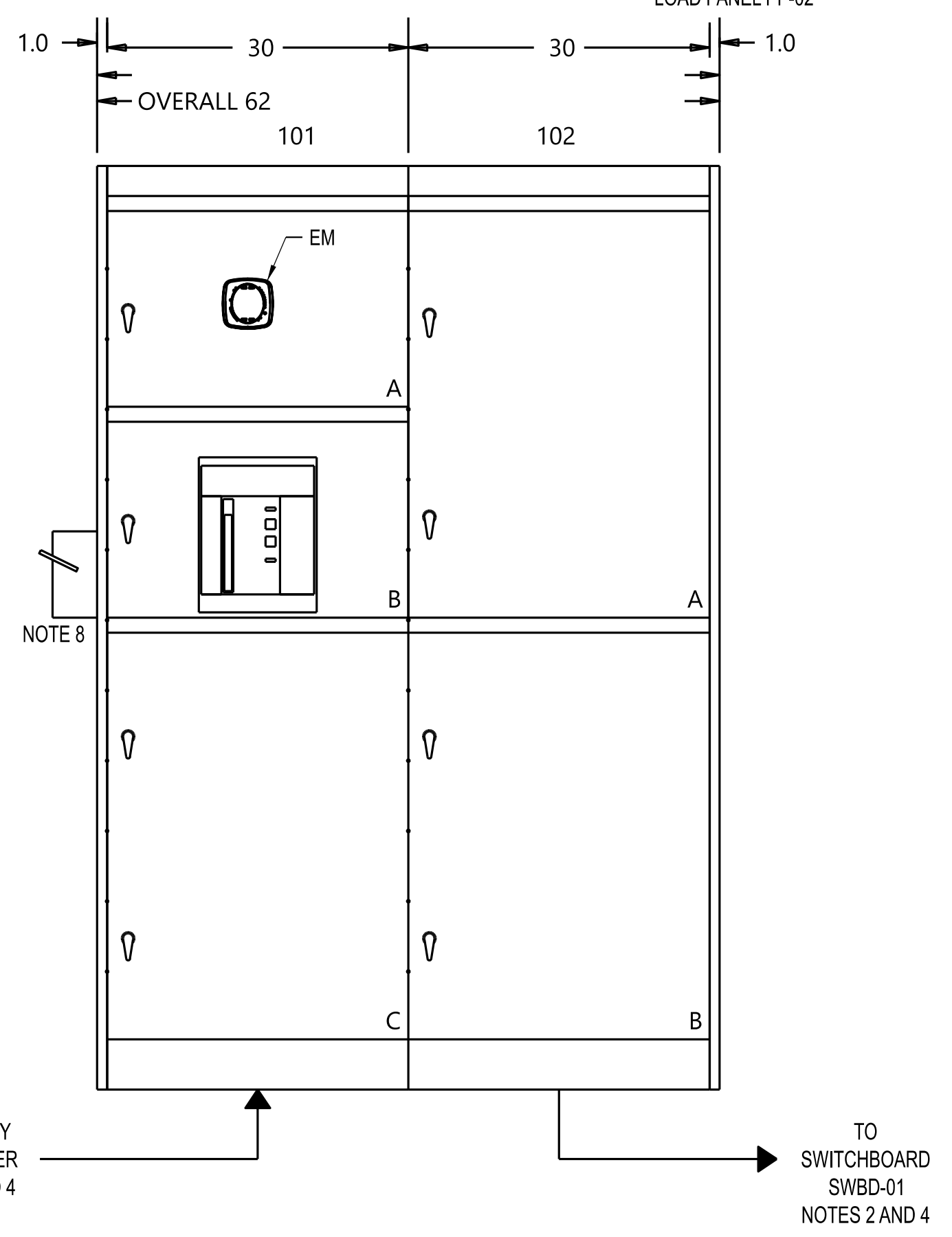
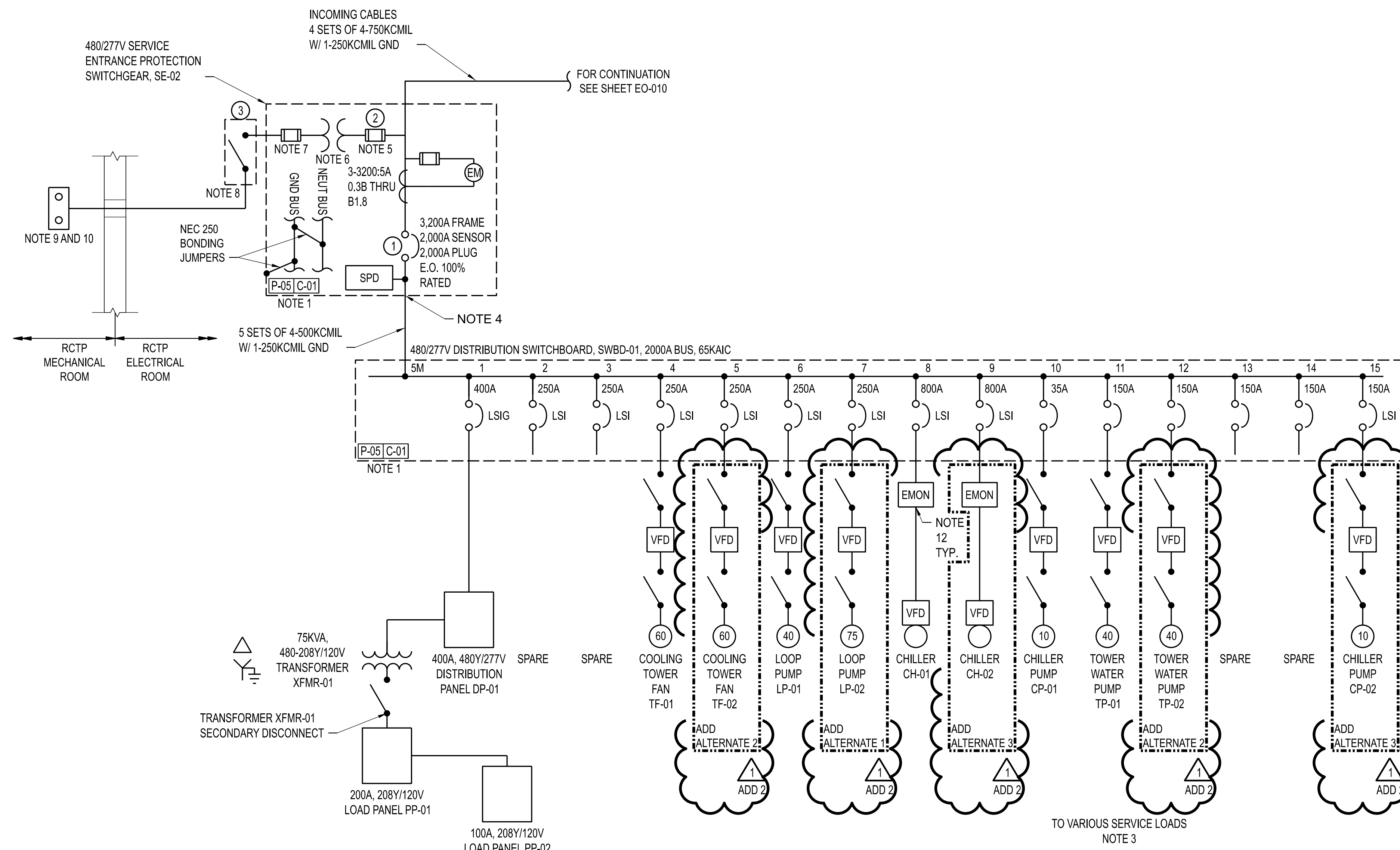
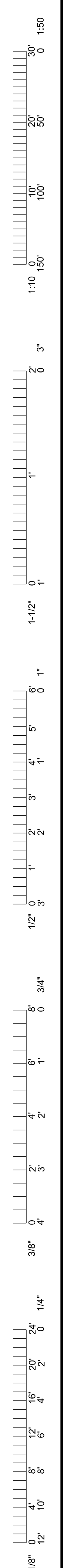
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UNIVERSITY OF MISSOURI - COLUMBIA
 RESEARCH COMMONS THERMAL PLANT
 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 INSTRUMENT PLAN - EQUIPMENT PLATFORM

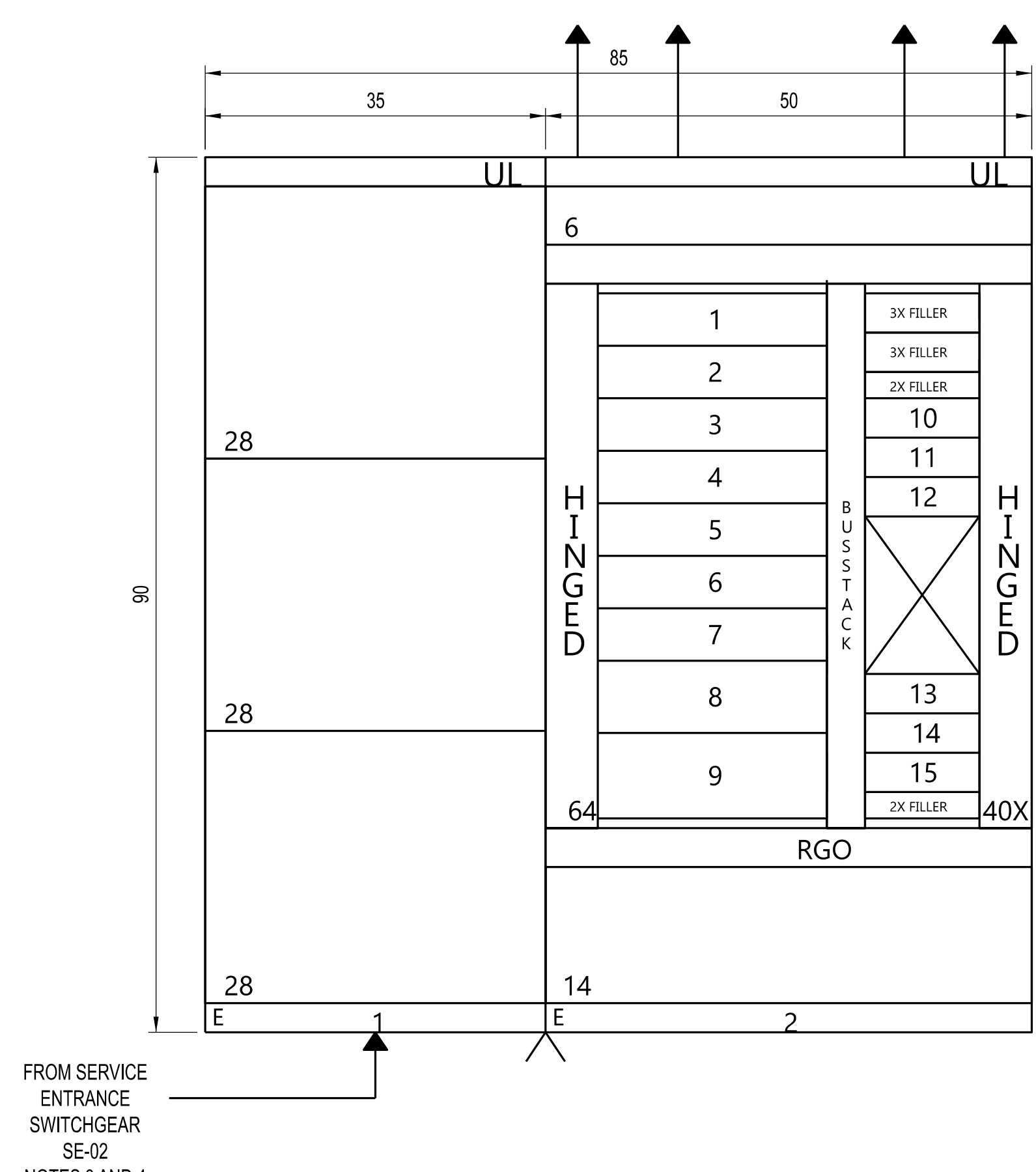
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 PROJECT NUMBER
CP232801

CONSULTANT
 PROJECT NUMBER
23073

SHEET
MI-142



MISSOURI RCTP CWP ADDITION SERVICE ENTRANCE SWITCHGEAR SE-02
SCALE: AS SHOWN



MISSOURI RCTP CWP ADDITION SWITCHBOARD SWBD-01
SCALE: AS SHOWN

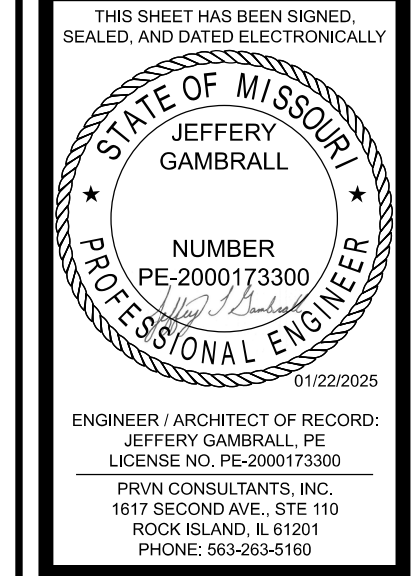
NAMEPLATE SCHEDULE	
LOCATION ON PANEL	NAMEPLATE MESSAGE
①	SERVICE ENTRANCE 1 OF 2 (MAIN)
②	SERVICE ENTRANCE 2 OF 2 (CONTROL POWER)
③	CONTROL POWER DISCONNECT

ADD 2

ADD ALTERNATES:

- ADD ALTERNATE 1 - LOOP PUMP LP-02.
- ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
- ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.

- DRAWING NOTES:**
- SERVICE ENTRANCE SWITCHGEAR SE-02 AND SWITCHBOARD SWBD-02 FURNISHED BY OWNER (PROCUREMENT PACKAGE P-05) AND INSTALLED BY CONTRACTOR.
 - SERVICE ENTRANCE SWITCHGEAR SE-02 SHALL BE BOTTOM ENTRY LINE SIDE CONNECTIONS AND BOTTOM EXIT LOAD SIDE CONNECTIONS.
 - SWITCHBOARD SWBD-01 SHALL BE BOTTOM ENTRY LINE SIDE CONNECTIONS AND TOP EXIT LOAD SIDE CONNECTIONS.
 - CONTRACTOR SHALL PROVIDE O-Z/GEDNEY CONDUIT SEALING BUSHINGS (TYPE CSBG) ON ALL CONDUITS.
 - PROCUREMENT PACKAGE P-05 TO PROVIDE FUSE BLOCK WITH 15 AMP BUSSMANN LPS-RK FUSE.
 - PROCUREMENT PACKAGE P-05 TO PROVIDE 2KVA 480V / 120V CONTROL POWER TRANSFORMER.
 - PROCUREMENT PACKAGE P-05 TO PROVIDE FUSE BLOCK WITH 30 AMP BUSSMANN LPN-RK 30SP FUSE.
 - PROCUREMENT PACKAGE P-05 TO PROVIDE 30A FUSED SWITCH WITH BUSSMANN LPN-RK FUSE.
 - CONTRACTOR SHALL PROVIDE PUSHBUTTON STATION FOR REMOTE OPERATION OF SERVICE ENTRANCE BREAKER. REFER TO ELECTRICAL DETAILS FOR PUSHBUTTON STATION REQUIREMENTS.
 - CONTRACTOR SHALL LOCATE PUSHBUTTON STATIONS OUTSIDE ELECTRICAL ROOM, AS SHOWN ON DRAWINGS, TO MITIGATE INJURY FROM ARC FLASH WHILE OPERATING BREAKER.
 - INSTALL ENGRAVED NAMEPLATE AS SHOWN IN SCHEDULE ONTO SERVICE ENTRANCE PANEL AT LOCATION INDICATED. NAMEPLATE TO BE 1/4" BLACK LETTERS ON WHITE BACKGROUND.
 - PROVIDE LOAD METERING FOR CHILLER POWER FEEDS PER SPECIFICATIONS. CURRENT TRANSMITTERS SHALL BE INSTALLED AROUND LOAD CABLES IN LOWER COMPARTMENT OF SWITCHBOARD SWBD-01. METER POTENTIAL FEEDS SHALL BE SOURCED FROM POWER DISTRIBUTION PANEL DP-01. PROVIDE POTENTIAL TRANSFORMERS IF NECESSARY.



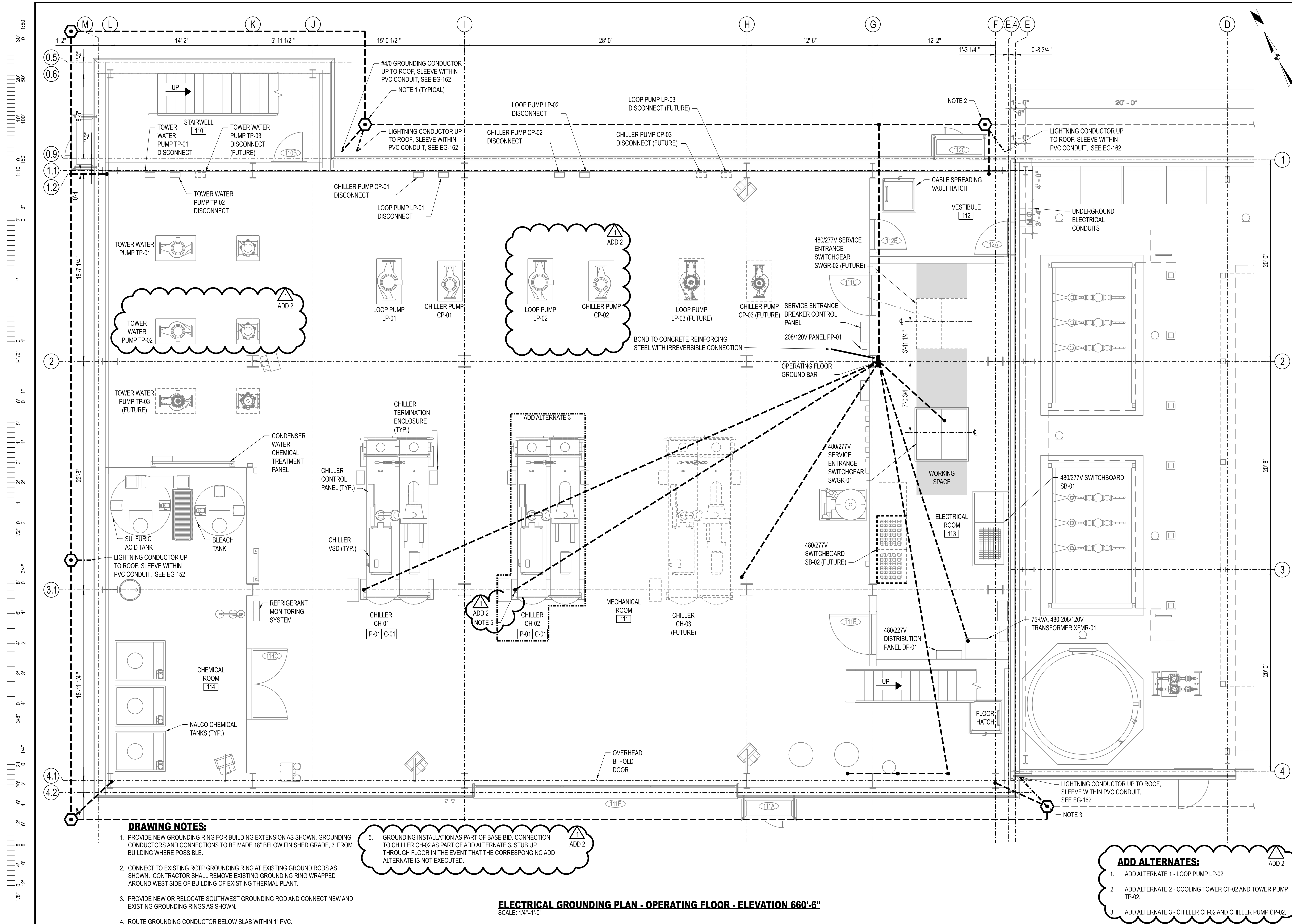
ENGINEER / ARCHITECT OF RECORD:
JEFFERY GAMBRELL, PE
LICENSE NO. PE-2000173300
PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE 110
ROCK ISLAND, IL 61201
PHONE: 563-263-5160

ISSUED FOR ADDENDUM 2
ISSUED FOR BID
DRAWN BY: SMH
CHECKED BY: JTG

PRVN CONSULTANTS, INC.
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PHONE 563.263.5160
MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017605

UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
ELECTRICAL ONE-LINE DIAGRAM

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801
CONSULTANT
PROJECT NUMBER
23073
SHEET
EO-012



DRAWING NOTES:

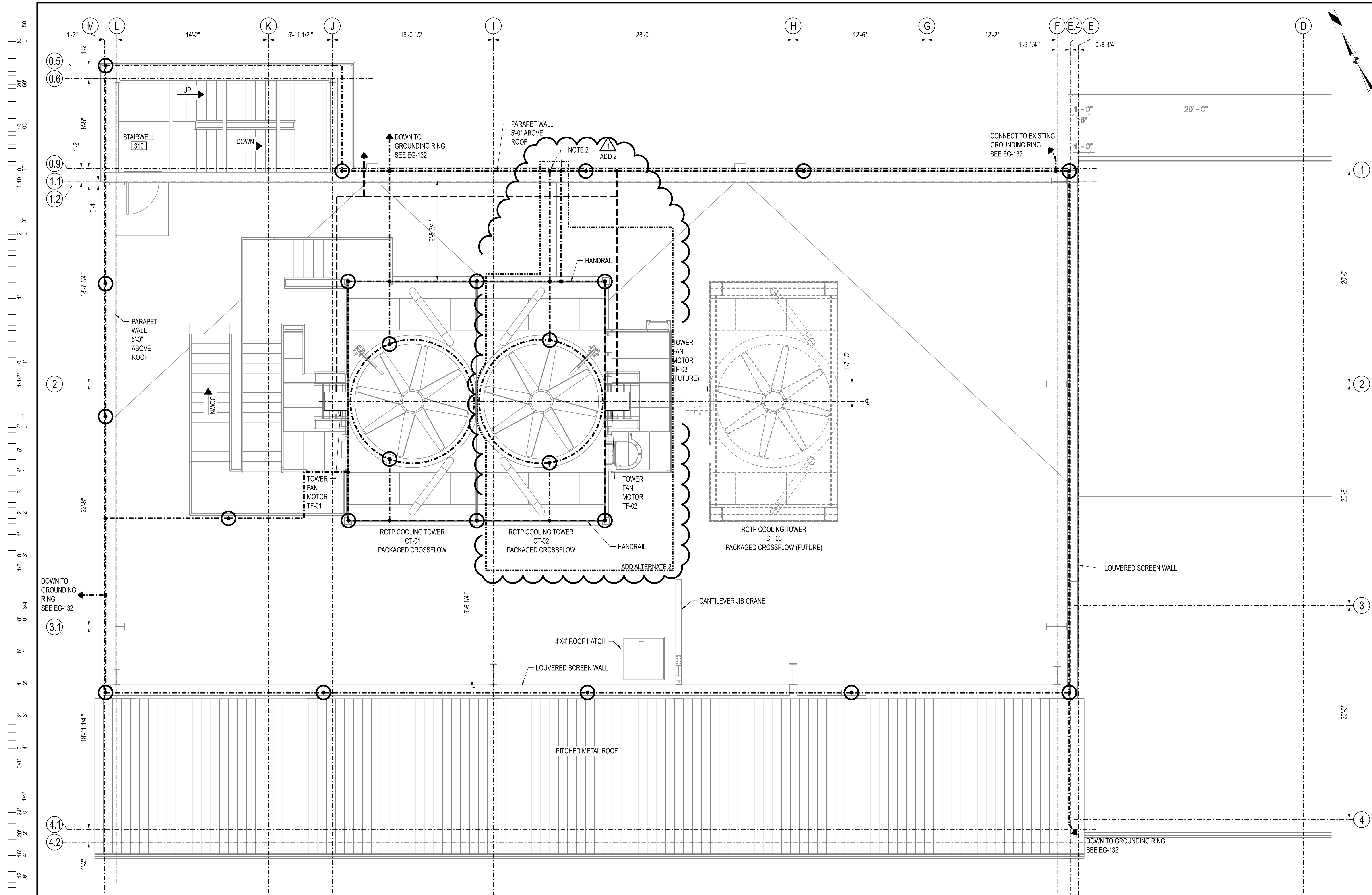
1. PROVIDE NEW GROUNDING RING FOR BUILDING EXTENSION AS SHOWN. GROUNDING CONDUCTORS AND CONNECTIONS TO BE MADE 18" BELOW FINISHED GRADE, 3' FROM BUILDING WHERE POSSIBLE.
2. CONNECT TO EXISTING RCTP GROUNDING RING AT EXISTING GROUND RODS AS SHOWN. CONTRACTOR SHALL REMOVE EXISTING GROUNDING RING WRAPPED AROUND WEST SIDE OF BUILDING OF EXISTING THERMAL PLANT.
3. PROVIDE NEW OR RELOCATE SOUTHWEST GROUNDING ROD AND CONNECT NEW AND EXISTING GROUNDING RINGS AS SHOWN.
4. ROUTE GROUNDING CONDUCTOR BELOW SLAB WITHIN 1" PVC.

5. GROUNDING INSTALLATION AS PART OF BASE BID. CONNECTION TO CHILLER CH-02 AS PART OF ADD ALTERNATE 3. STUB UP THROUGH FLOOR IN THE EVENT THAT THE CORRESPONDING ADD ALTERNATE IS NOT EXECUTED.

ELECTRICAL GROUNDING PLAN - OPERATING FLOOR - ELEVATION 660'-6"
SCALE: 1/4"=1'-0"

ADD ALTERNATES:

1. ADD ALTERNATE 1 - LOOP PUMP LP-02.
2. ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
3. ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.



THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

STATE OF MISSOURI
JEFFERY GAMBELL
PROFESSIONAL ENGINEER
NUMBER PE-2000173300
11/22/2025

ENGINEER / ARCHITECT OF RECORD:
JEFFERY GAMBELL, PE
LICENSE NO. PE-2000173300
PRVN CONSULTANTS, INC.
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ROCK ISLAND, IL 61201
PHONE: 563-263-5160

ISSUED FOR ADDENDUM 2
1 10/22/2025
ISSUED FOR BID
0 12/05/2024

DRAWN BY: SMH
CHECKED BY: JTG

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1617 SECOND AVE., STE. 110
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MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017805

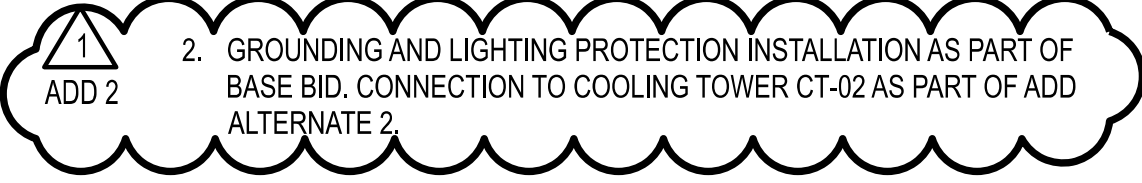
UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
ELECTRICAL GROUNDING PLAN - UPPER ROOF

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801

CONSULTANT
PROJECT NUMBER
23073

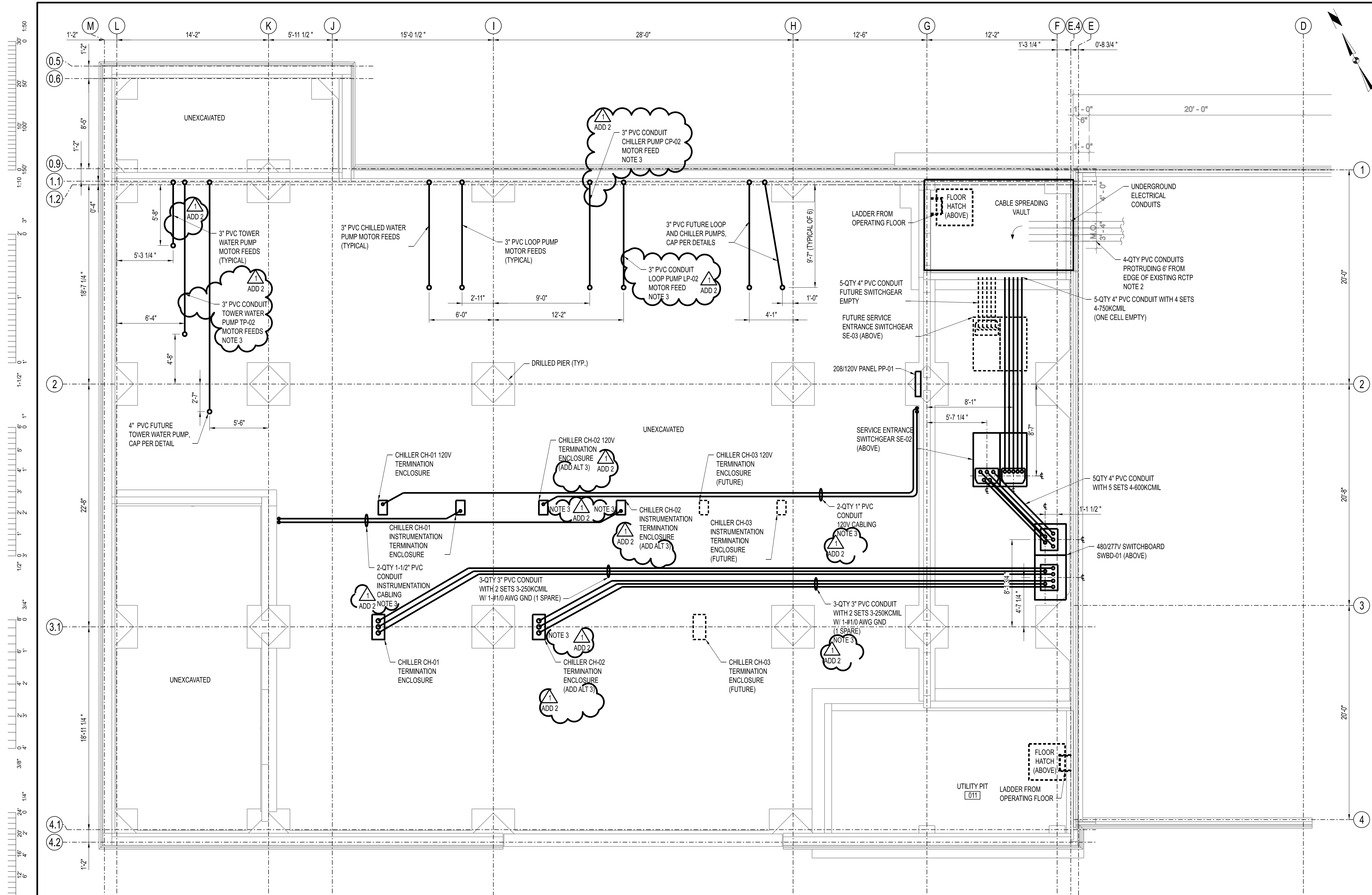
SHEET
EG-162

- DRAWING NOTES:**
- ALL GROUNDING AND LIGHTNING PROTECTION CONDUCTOR DOWNCOMERS TO BE INSTALLED WITHIN SCHEDULE 80 PVC DOWN SIDE OF TOWER.
 - GROUNDING AND LIGHTNING PROTECTION INSTALLATION AS PART OF BASE BID. CONNECTION TO COOLING TOWER CT-02 AS PART OF ADD ALTERNATE 2.



ELECTRICAL GROUNDING PLAN - UPPER ROOF - ELEVATION 712'-6"
SCALE: 1/4"=1'-0"

- ADD ALTERNATES:**
- ADD ALTERNATE 1 - LOOP PUMP LP-02.
 - ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
 - ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.



DRAWING NOTES:

- UNDERGROUND CONDUITS ROUTES ARE SHOWN DIAGRAMMATICALLY. FIELD VERIFY AND COORDINATE FINAL LOCATIONS WITH STRUCTURAL AND MECHANICAL CONTRACTOR.
- EXISTING BUILDING TRANSFORMER SECONDARY CONDUITS EXTEND 6" FROM EDGE OF EXISTING BUILDING. ONCE CABLE SPREADING VAULT HAS BEEN CONSTRUCTED, CONDUITS CAN BE SHORTENED BEFORE CABLES ARE PULLED.

3. PVC CONDUIT INSTALLATION AS PART OF BASE BID. CABLING FOR EQUIPMENT TO BE INCLUDED AS PART OF CORRESPONDING ADD ALTERNATE. PROVIDE CAP PER DETAILS IN THE EVENT THAT THE CORRESPONDING ADD ALTERNATE IS NOT EXECUTED.

ELECTRICAL POWER PLAN - UTILITY PIT - ELEVATION 652'-6"
SCALE: 1/4"=1'-0"

ADD ALTERNATES:

- ADD ALTERNATE 1 - LOOP PUMP LP-02.
- ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
- ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.



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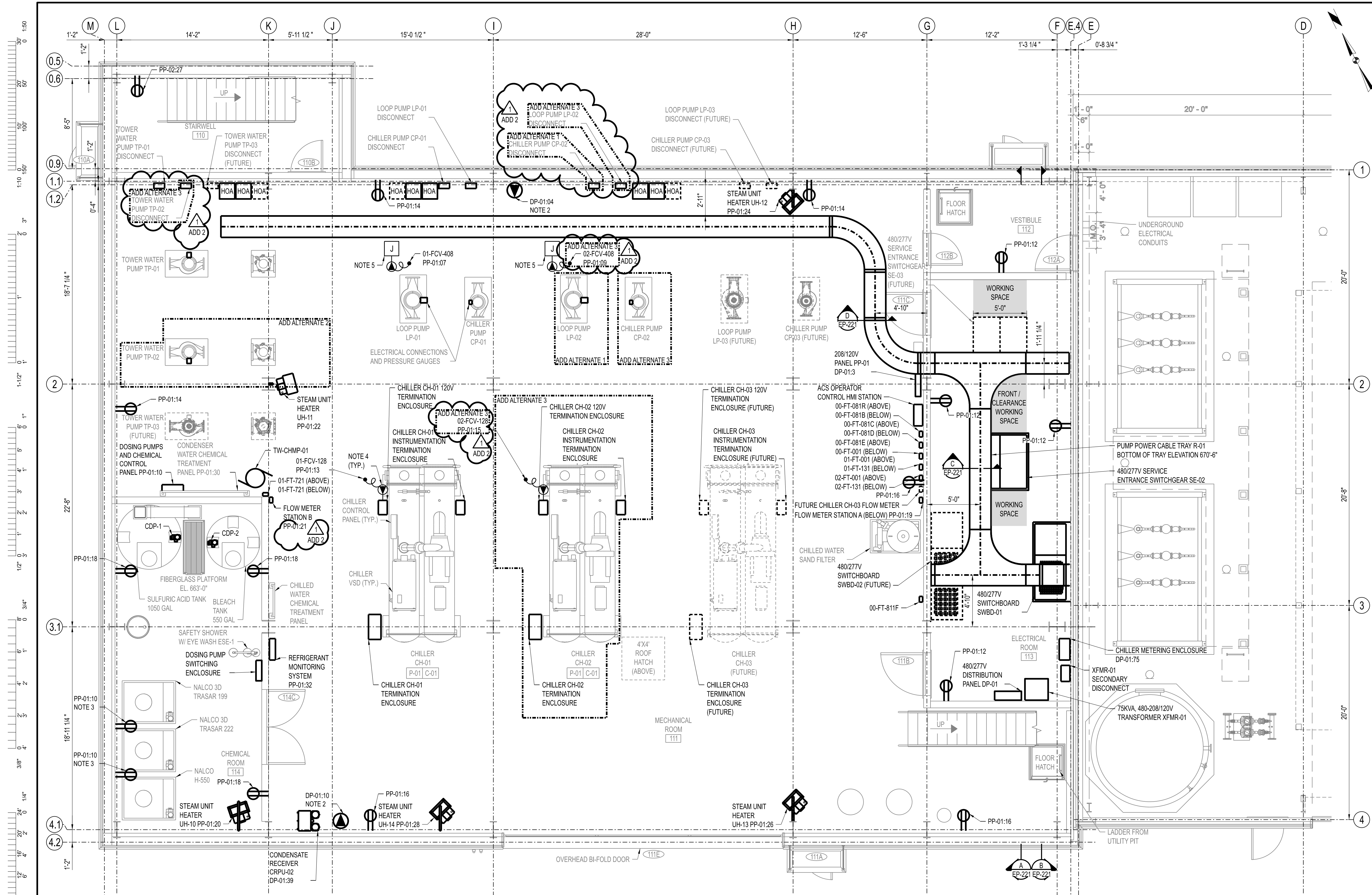
SHEET
EP-122

UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
ELECTRICAL POWER PLAN - UTILITY PIT

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MISSOURI CERTIFICATE OF
AUTHORITY ENGINEERING - 2023017805

1 01/22/2025 ISSUED FOR ADDENDUM 2
0 12/05/2024 ISSUED FOR BID
DRAWN BY: SMH CHECKED BY: JTG

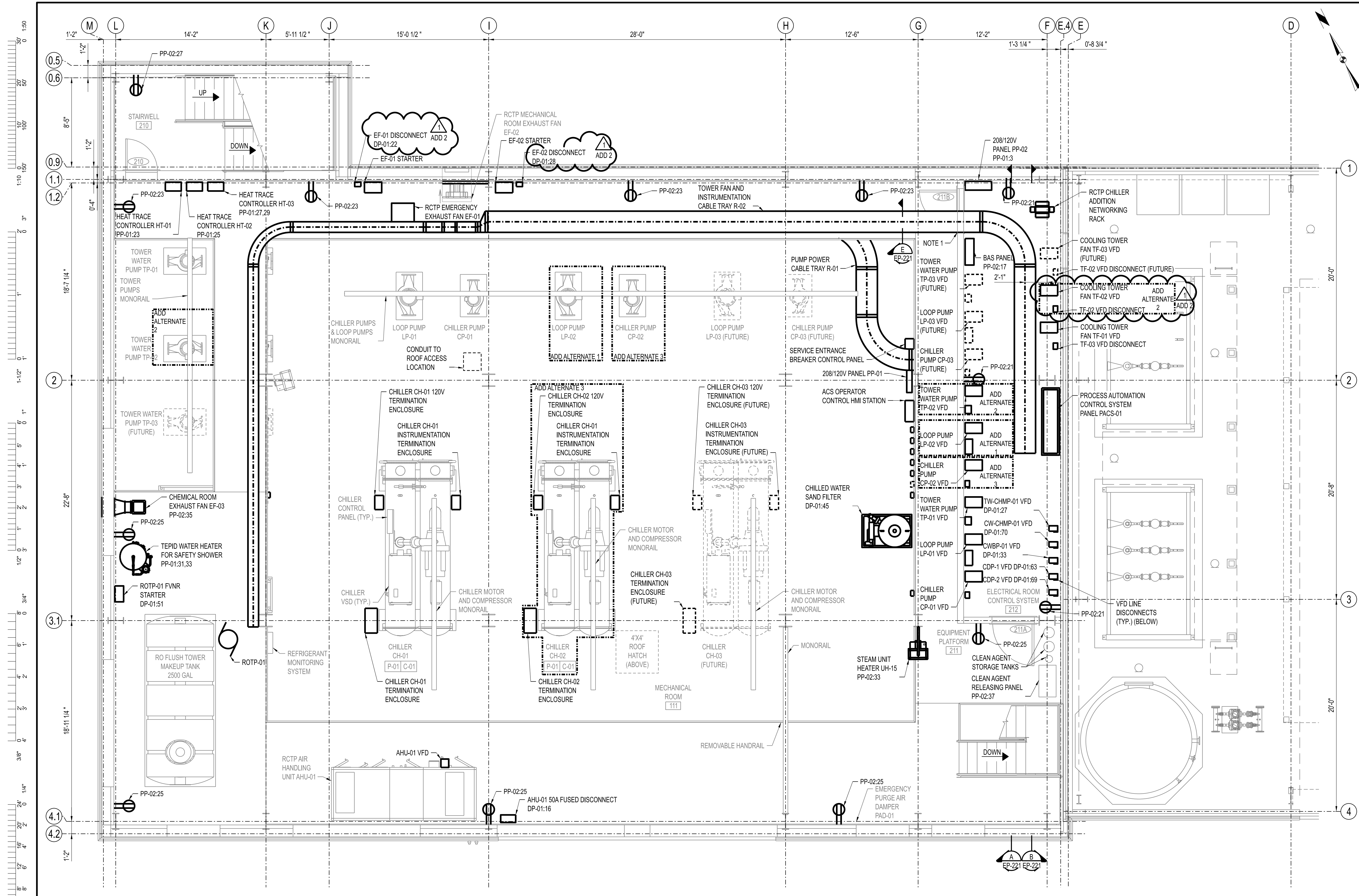
THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.
JEFFERY GAMBRELL
PROFESSIONAL ENGINEER
NUMBER PE-2000173300
11/22/2025
ENGINEER / ARCHITECT OF RECORD:
JEFFERY GAMBRELL, PE
LICENSE NO. PE-2000173300
PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE: 563-263-5160



- DRAWING NOTES:**
- REFER TO E-001 FOR LEGEND SHEET AND GENERAL NOTES.
 - PROVIDE TWO 100A, 480V WELDING RECEPTACLES PER SPECIFICATION SECTION 26 51 00.
 - DOSING PUMP OUTLETS TO BE SWITCHED BY PACS, SEE DETAIL EP-1.
 - PROVIDE SPECIALTY PIN AND SLEEVE, DISCONNECT RATED RECEPTACLES WITH SO CORD FOR POWER CONNECTION TO VALVES. SEE ELECTRICAL DETAILS AND SPECIFICATION SECTION 26 51 00.
 - PROVIDE JUNCTION BOX FOR CONNECTION TO CHILLED WATER VALVE RECEPTACLES. SEE ELECTRICAL DETAILS.

- ADD ALTERNATES:**
- ADD ALTERNATE 1 - LOOP PUMP LP-02.
 - ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
 - ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.

ELECTRICAL POWER PLAN - OPERATING FLOOR - ELEVATION 660'-6"
SCALE: 1/4"=1'-0"



DRAWING NOTES:

1. CABLE TRAY AND CONDUIT PENETRATIONS FROM ELECTRICAL ROOM SHALL BE INSTALLED WITH FIRE STOP MEASURES AND SEALED ACCORDINGLY.

ADD ALTERNATES:

1. ADD ALTERNATE 1 - LOOP PUMP LP-02.
2. ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
3. ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.

ELECTRICAL POWER PLAN - EQUIPMENT PLATFORM - ELEVATION 673'-0"
SCALE: 1/4"=1'-0"

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

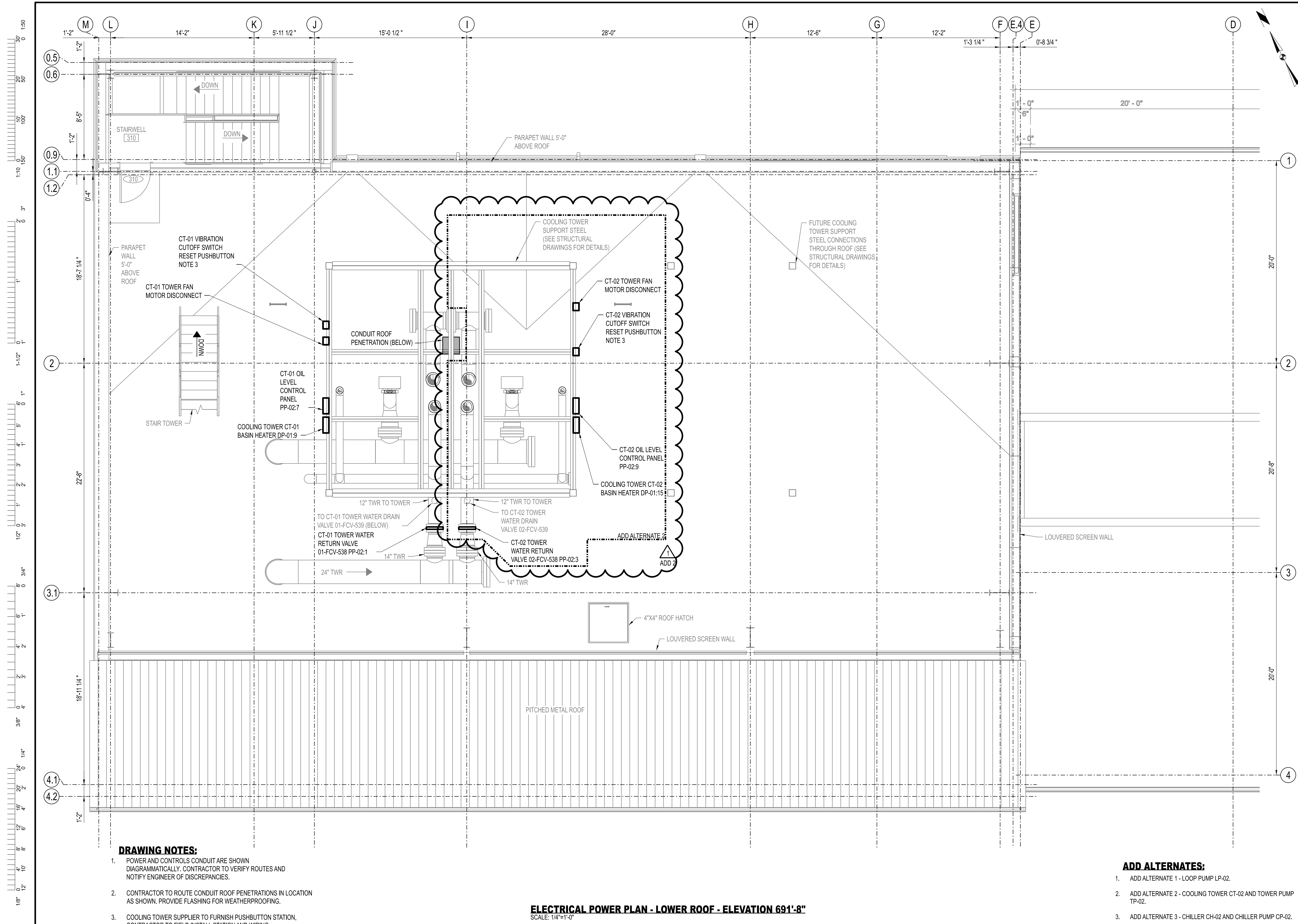
JEFFERY GAMBRELL
NUMBER PE-2000173300
PROFESSIONAL ENGINEER
11/22/2025
ENGINEER / ARCHITECT OF RECORD:
JEFFERY GAMBRELL, PE
LICENSE NO. PE-2000173300
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1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE: 563-263-5160

1	10/22/2025	ISSUED FOR ADDENDUM 2	CHECKED BY: JTG
0	12/05/2024	ISSUED FOR BID	DRAWN BY: SMH

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MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017605

UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
ELECTRICAL POWER PLAN - EQUIPMENT PLATFORM

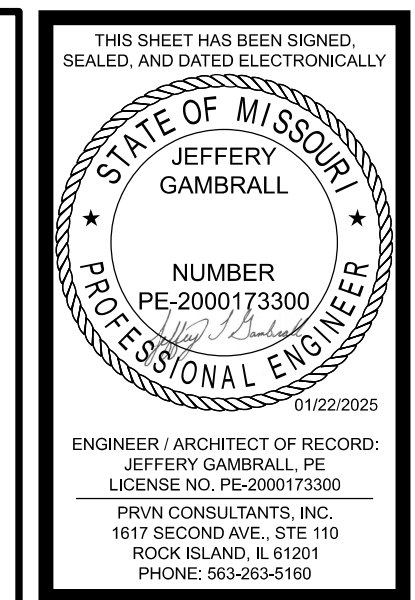
UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801
CONSULTANT
PROJECT NUMBER
23073
SHEET
EP-142



- DRAWING NOTES:**
1. POWER AND CONTROLS CONDUIT ARE SHOWN DIAGRAMMATICALLY. CONTRACTOR TO VERIFY ROUTES AND NOTIFY ENGINEER OF DISCREPANCIES.
 2. CONTRACTOR TO ROUTE CONDUIT ROOF PENETRATIONS IN LOCATION AS SHOWN. PROVIDE FLASHING FOR WEATHERPROOFING.
 3. COOLING TOWER SUPPLIER TO FURNISH PUSHBUTTON STATION, CONTRACTOR TO FIELD INSTALL STATION AND WIRING.

ELECTRICAL POWER PLAN - LOWER ROOF - ELEVATION 691'-8"
 SCALE: 1/4"=1'-0"

- ADD ALTERNATES:**
1. ADD ALTERNATE 1 - LOOP PUMP LP-02.
 2. ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
 3. ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.

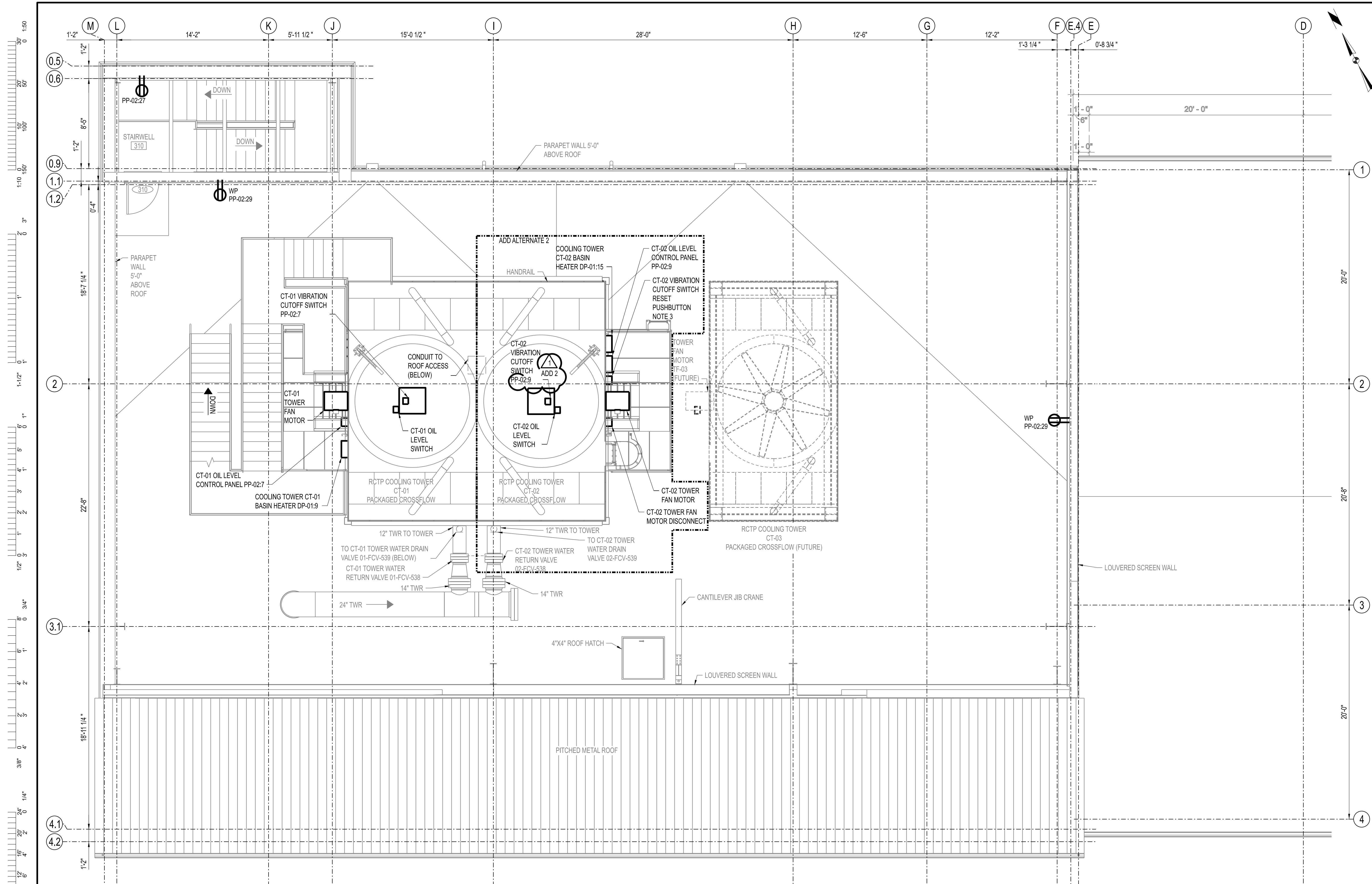


1	01/22/2025	ISSUED FOR ADDENDUM 2	CHECKED BY: JTG
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 1617 SECOND AVE., STE. 110
 ROCK ISLAND, IL 61201
 PHONE 563.263.5160
 MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017805

UNIVERSITY OF MISSOURI - COLUMBIA
 RESEARCH COMMONS THERMAL PLANT
 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 ELECTRICAL POWER PLAN - LOWER ROOF

UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP232801
 CONSULTANT
 PROJECT NUMBER
23073
 SHEET
EP-152



DRAWING NOTES:

1. POWER AND CONTROLS CONDUIT ARE SHOWN DIAGRAMMATICALLY. CONTRACTOR TO VERIFY ROUTES AND NOTIFY ENGINEER OF DISCREPANCIES.
2. CONTRACTOR TO ROUTE CONDUIT ROOF PENETRATIONS IN LOCATION AS SHOWN. PROVIDE FLASHING FOR WEATHERPROOFING.
3. COOLING TOWER SUPPLIER TO FURNISH PUSHBUTTON STATION, CONTRACTOR TO FIELD INSTALL STATION AND WIRING.
4. ALL CONDUITS INSTALLED ABOVE THE TOWER DECK SHALL BE MOUNTED TO THE TOWER DECK TO ALLOW 360° ACCESS AROUND THE FAN STACK.
5. INSTALL STRUT SUPPORT TO EXTERIOR FACE OF TOWER FOR VERTICAL CONDUIT SUPPORT IN ACCORDANCE WITH TOWER MANUFACTURER REQUIREMENTS.

ELECTRICAL POWER PLAN - UPPER ROOF - ELEVATION 712'-6"

SCALE: 1/4"=1'-0"

ADD ALTERNATES:

1. ADD ALTERNATE 1 - LOOP PUMP LP-02.
2. ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
3. ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.

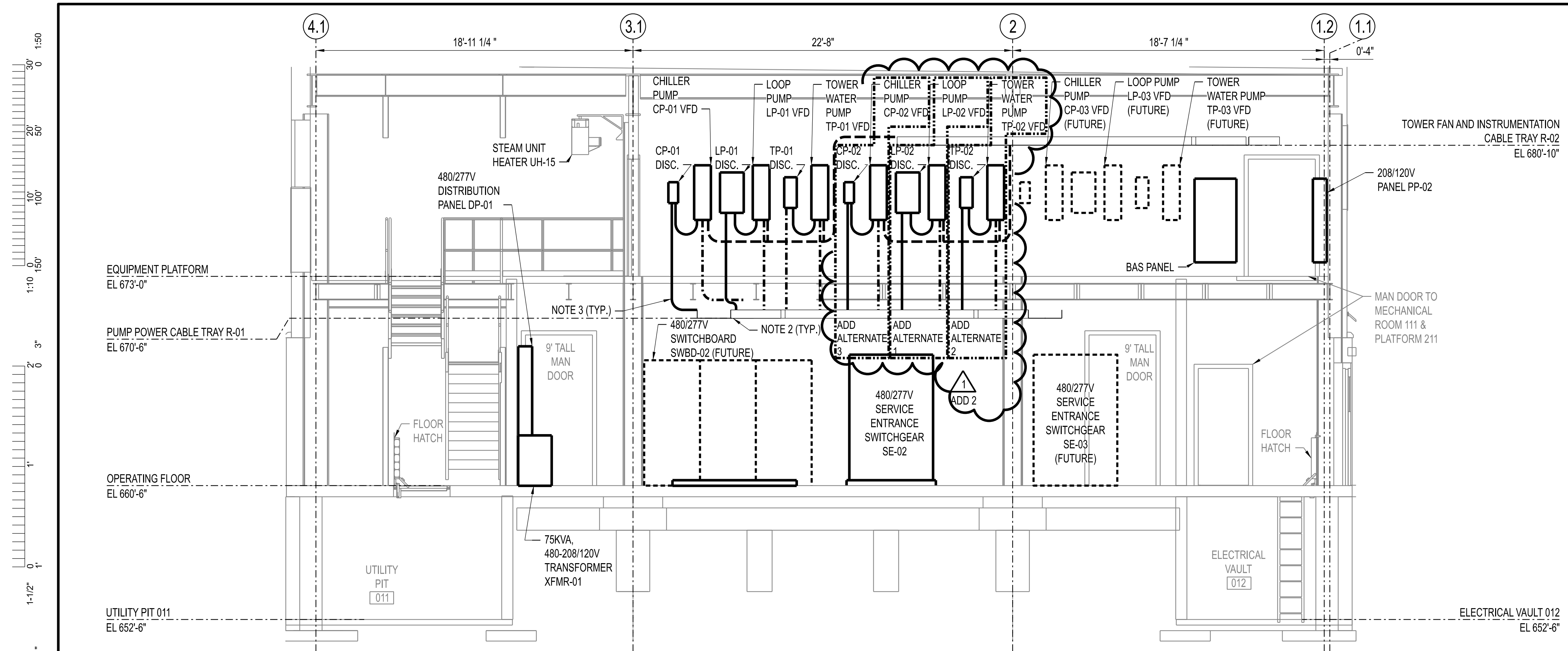


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0	12/05/2024	ISSUED FOR BID	DRAWN BY: SMH

PRVN CONSULTANTS, INC.
 1617 SECOND AVE., STE. 110
 ROCK ISLAND, IL 61201
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 MISSOURI CERTIFICATE OF
 AUTHORITY ENGINEERING - 2023017805

UNIVERSITY OF MISSOURI - COLUMBIA
 RESEARCH COMMONS THERMAL PLANT
 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 ELECTRICAL POWER PLAN - UPPER ROOF

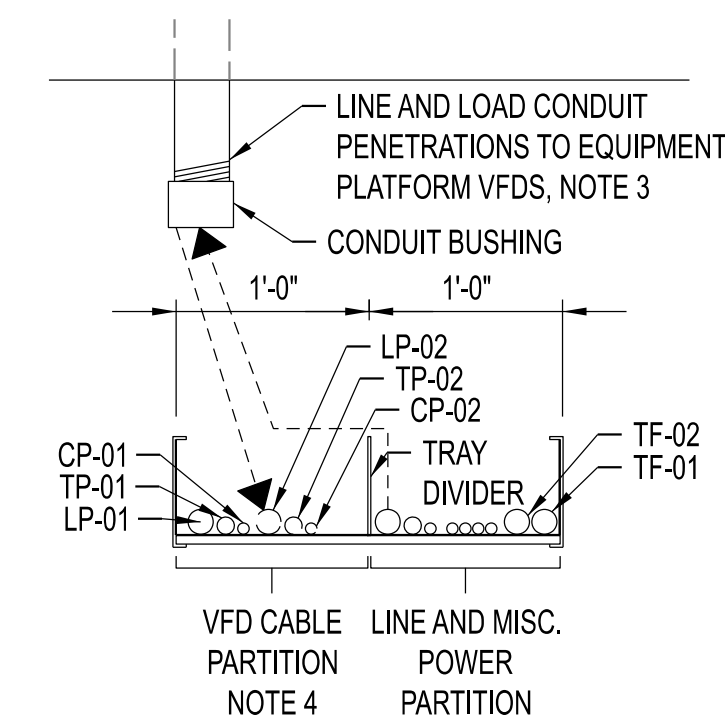
UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP232801
 CONSULTANT
 PROJECT NUMBER
23073
 SHEET
EP-162



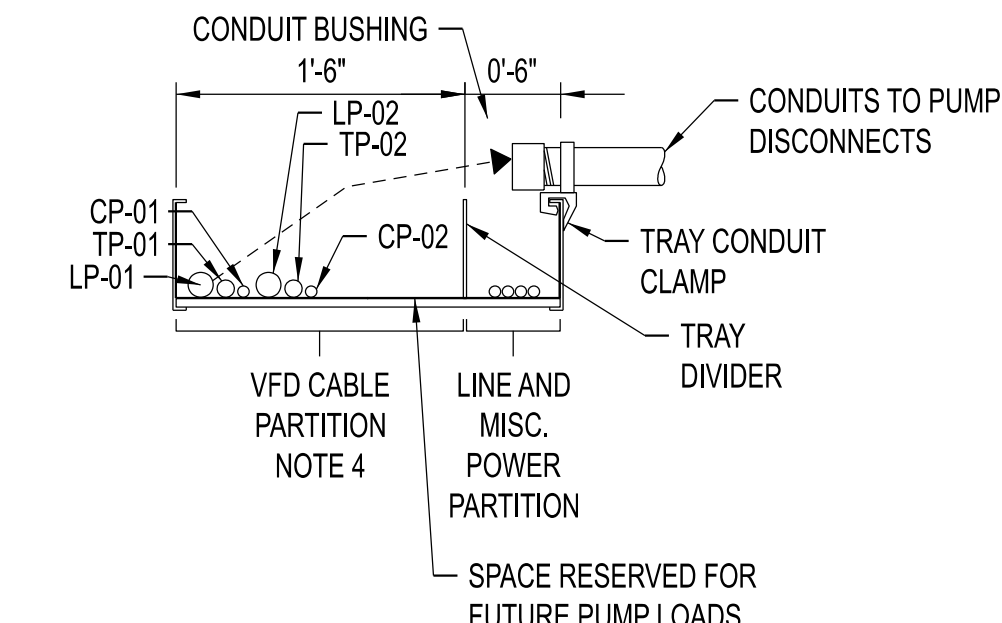
LEGEND:

- POWER CABLE AND CONDUIT
- - - VFD CABLE AND CONDUIT
- - - 24VDC CONTROL CABLE AND CONDUIT

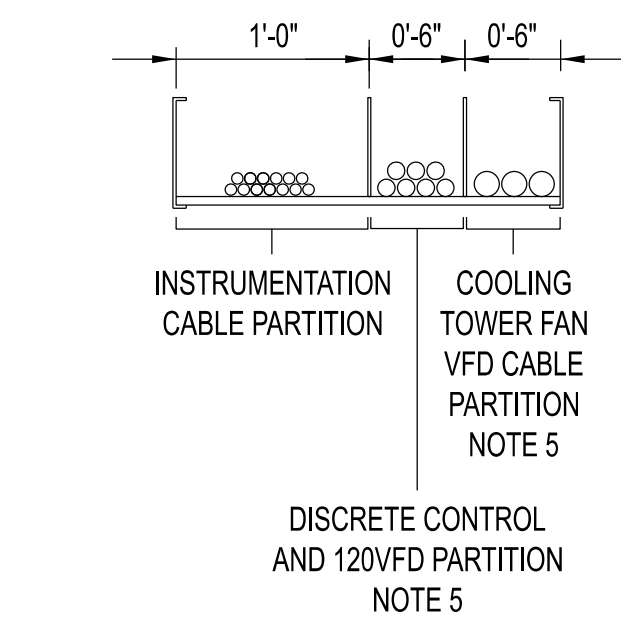
- NOTES:**
- ALL CONDUIT ROUTES ARE SHOWN DIAGRAMMATICALLY. CONTRACTOR SHALL FIELD VERIFY ROUTES AND ADJUST AS NECESSARY. VFD LOAD CABLES SHALL NEVER BE ROUTED WITHIN SAME CONDUIT AS LINE CABLES OR OTHER VFD LOAD CABLES.
 - MOTOR LOAD CABLES SHALL ENTER CABLE TRAY DOWNSTREAM OF VFD LINE CABLES. CABLE TRAY SHALL BE DIVIDED TO SEPARATE LOAD AND LINE CABLES.
 - ALL PENETRATIONS BETWEEN ROOMS SHALL BE INSTALLED WITH FIRE STOPS AND SEALED PROPERLY.
 - PROVIDE CABLE TRAY DIVIDER IN R-01 TRAY TO SEGREGATE VFD-TYPE CABLES FROM LINE AND MISCELLANEOUS POWER CABLES. SECURE CABLES UNIFORMLY TO RUNGS OF TRAY.
 - PROVIDE CABLE TRAY DIVIDER IN R-02 TRAY TO SEGREGATE POWER SIGNALS, 24VDC INSTRUMENTATION SIGNALS, AND VFD CABLES.



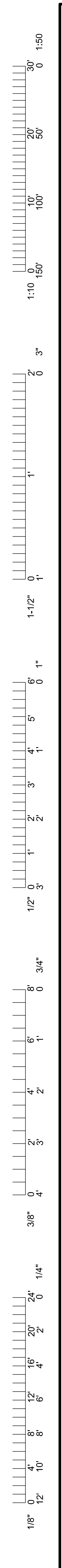
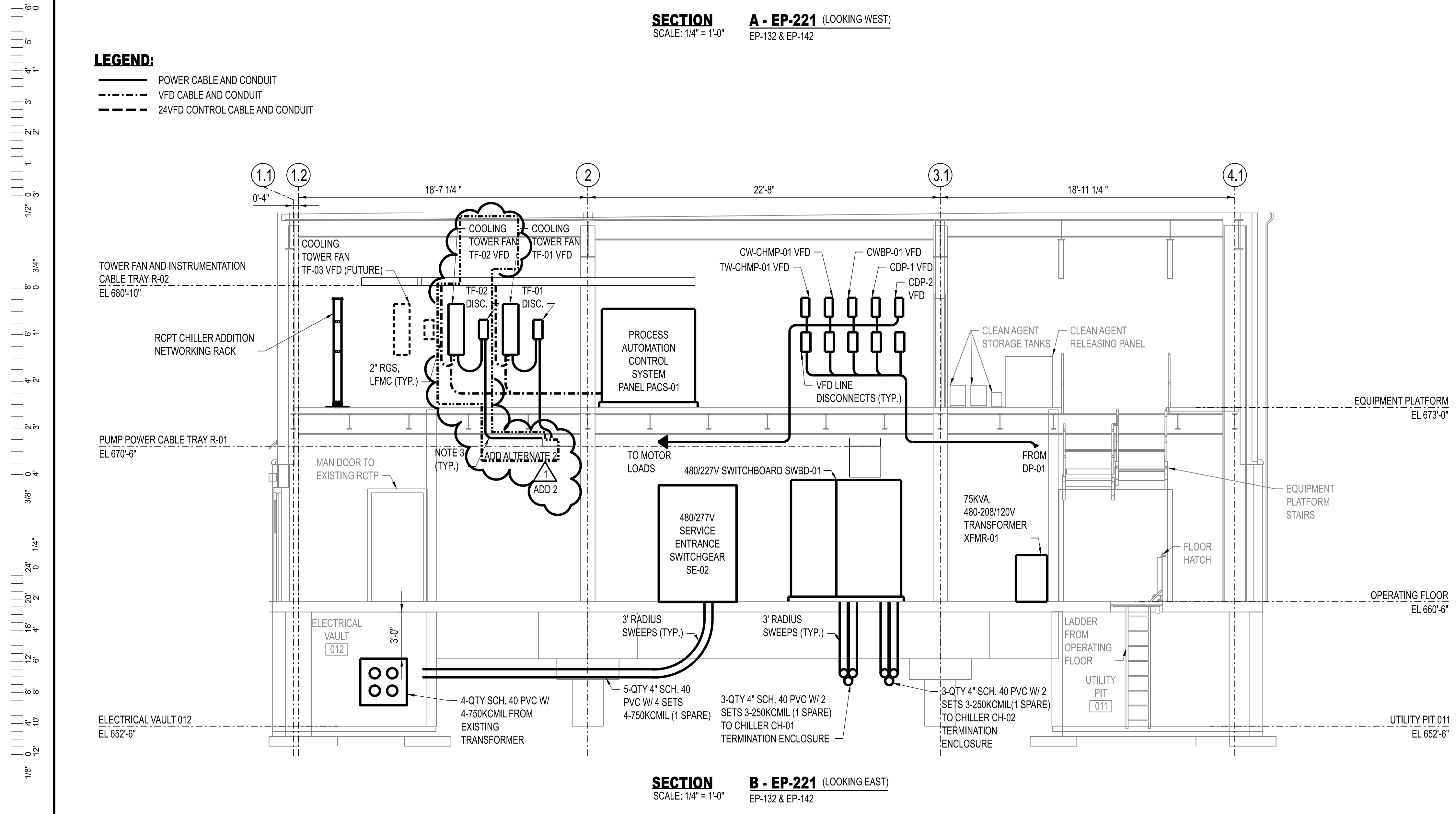
SECTION C - EP-221 (LOOKING NORTH)
SCALE: 1" = 1'-0"



SECTION D - EP-221 (LOOKING NORTH)
SCALE: 1" = 1'-0"



SECTION E - EP-221 (LOOKING WEST)
SCALE: 1" = 1'-0"



THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

STATE OF MISSOURI
JEFFERY GAMBELL
PROFESSIONAL ENGINEER
NUMBER PE-2000173300
11/22/2025

ENGINEER / ARCHITECT OF RECORD:
JEFFERY GAMBELL, PE
LICENSE NO. PE-2000173300

PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE: 563.263.5160
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MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017805

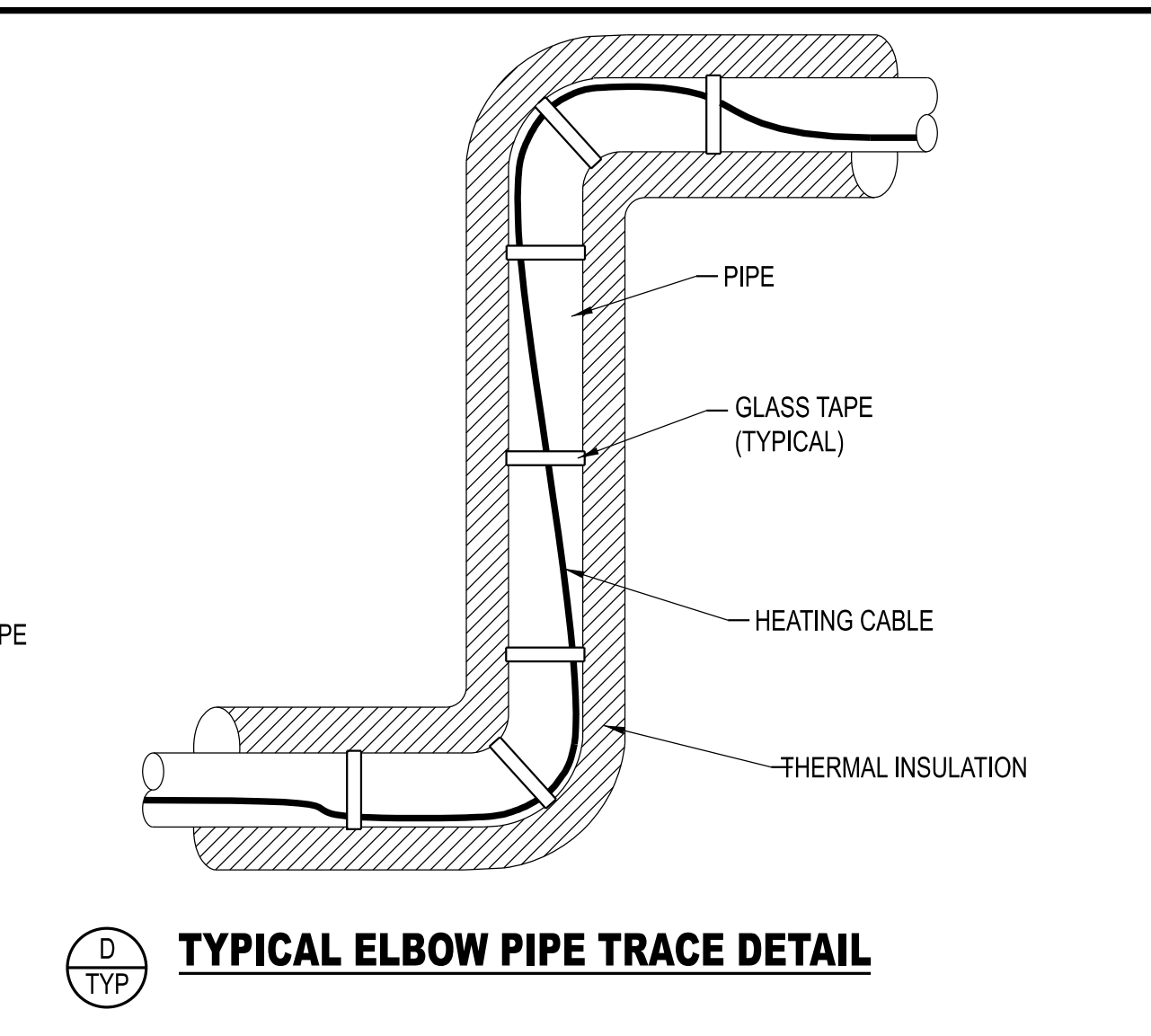
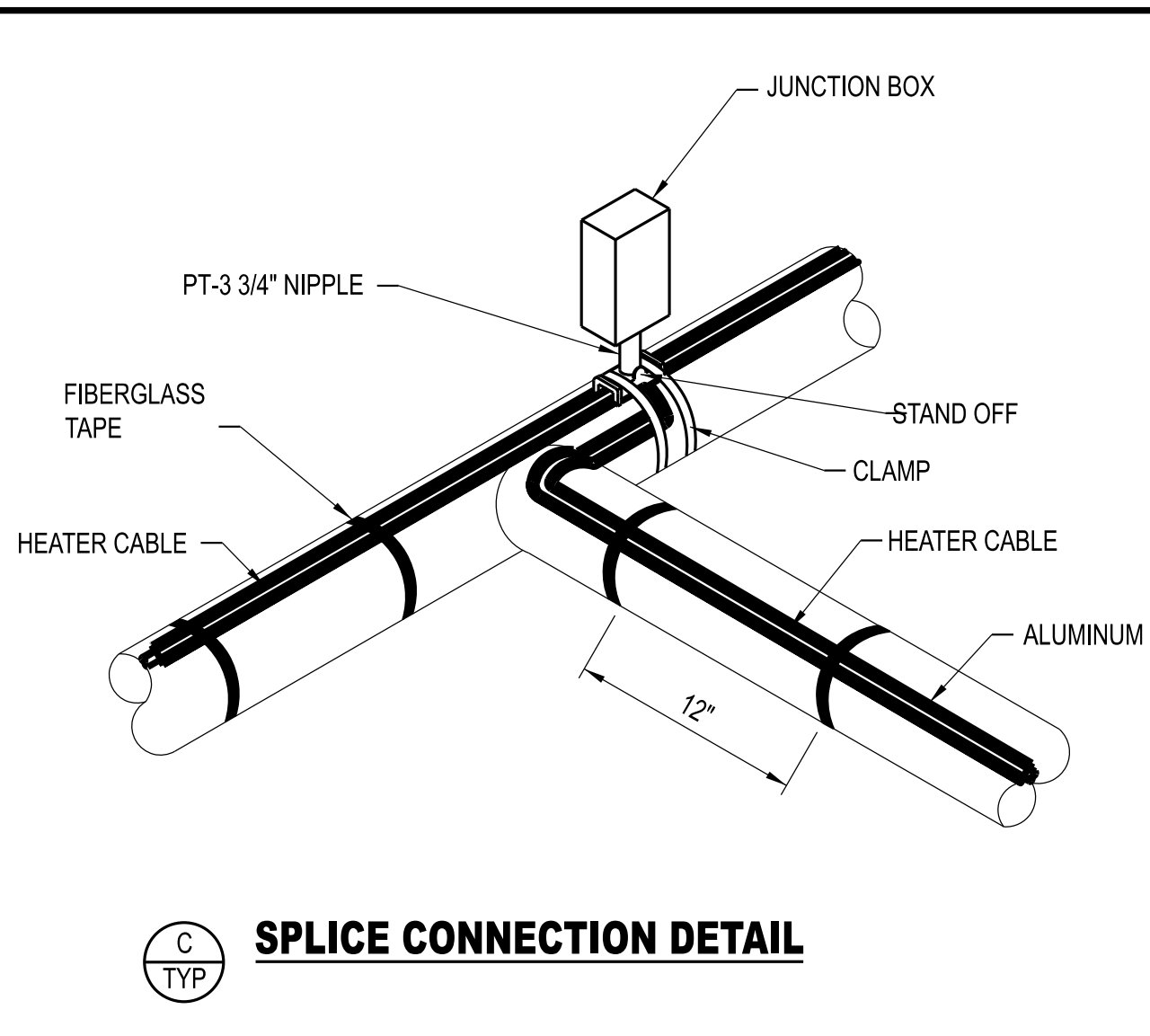
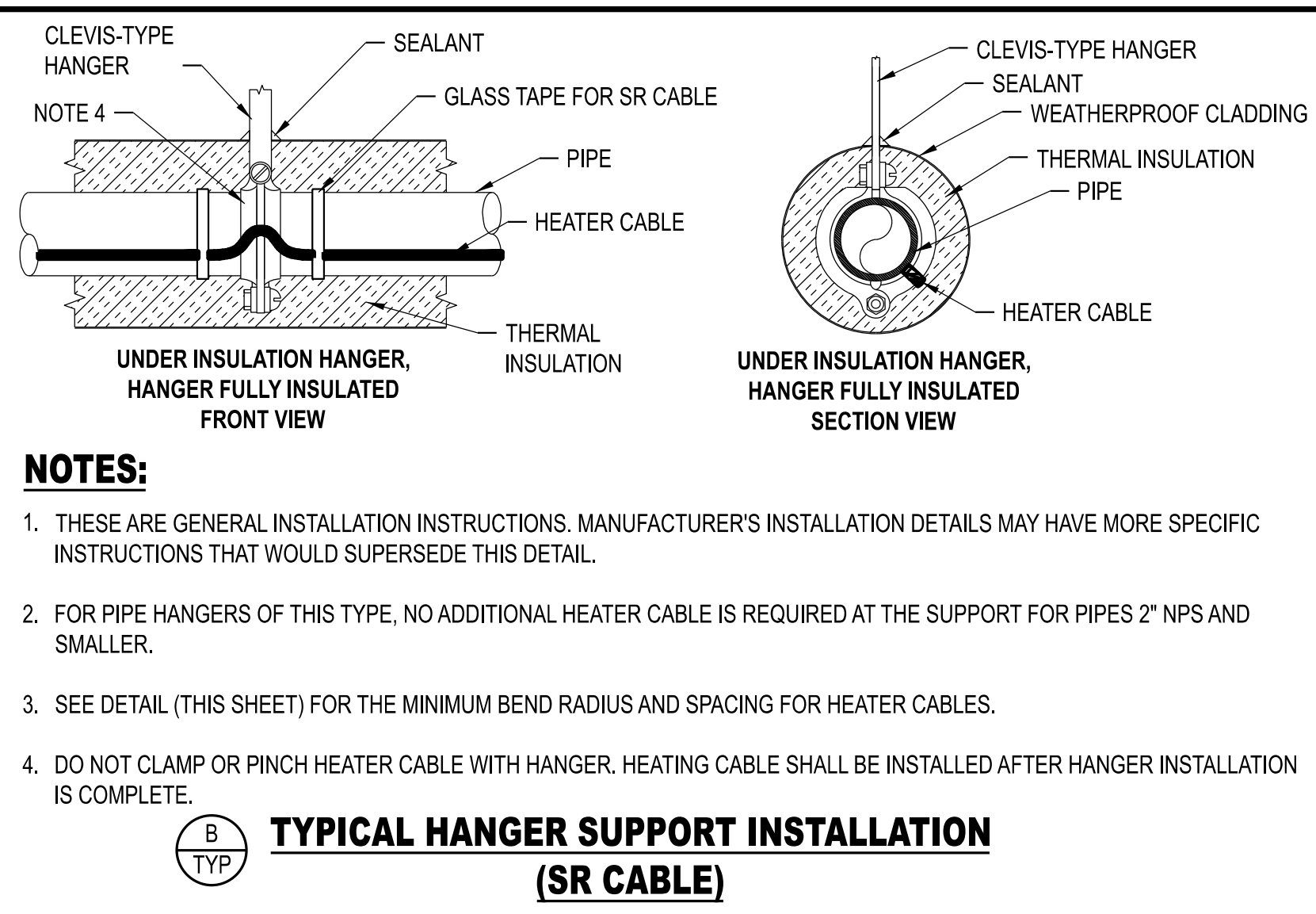
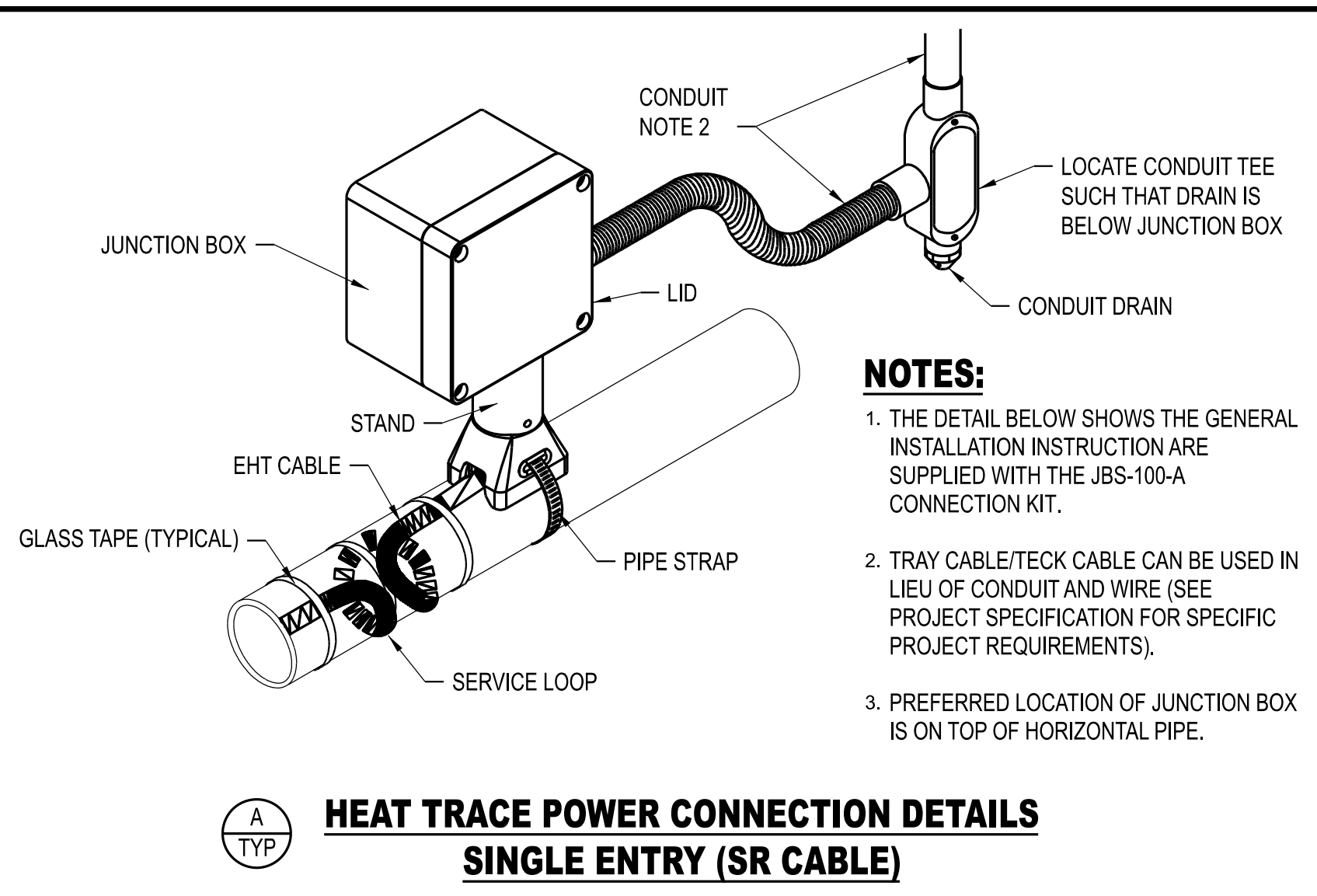
UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
ELECTRICAL SECTIONS - SHEET 1

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801

CONSULTANT
PROJECT NUMBER
23073

SHEET
EP-221

1:50
30'
20'
10'
0
1:10
150'
3"
1-1/2"
1"
6"
1"
5"
4"
3"
2"
1"
1/2"
3/4"
6"
1"
2"
3"
4"
3/8"
24"
20"
16"
12"
10"
8"
6"
4"
2"
1/8"



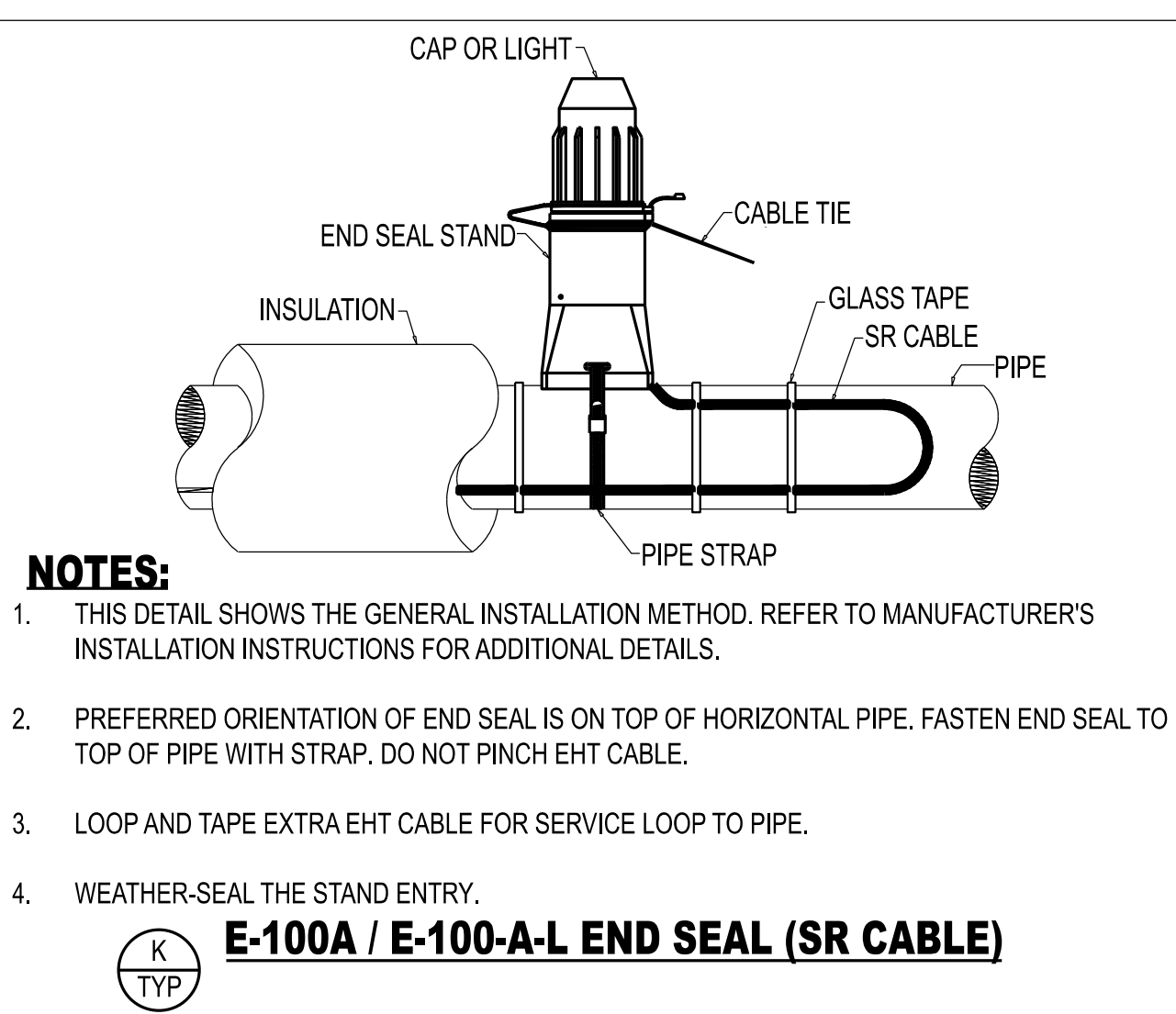
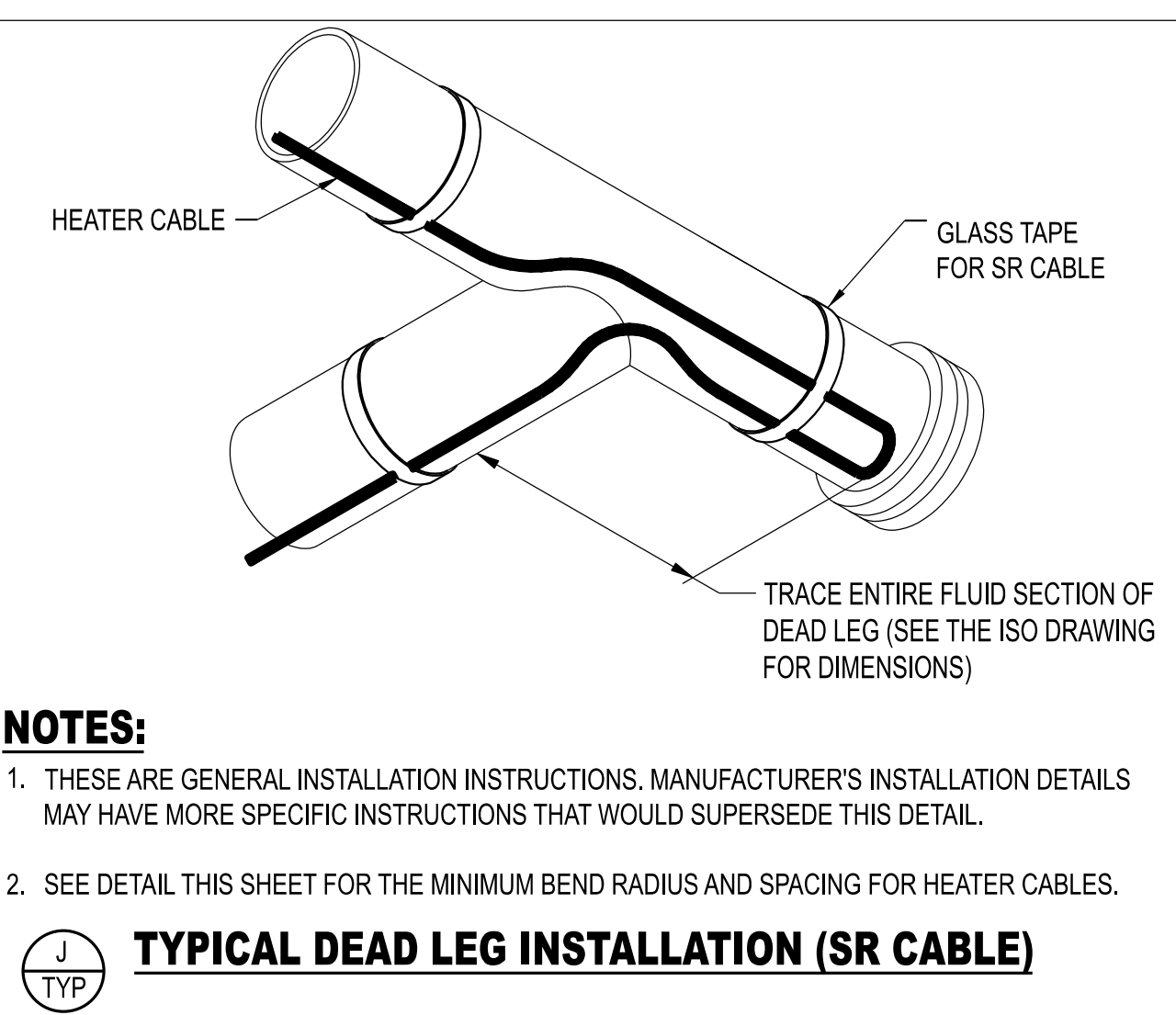
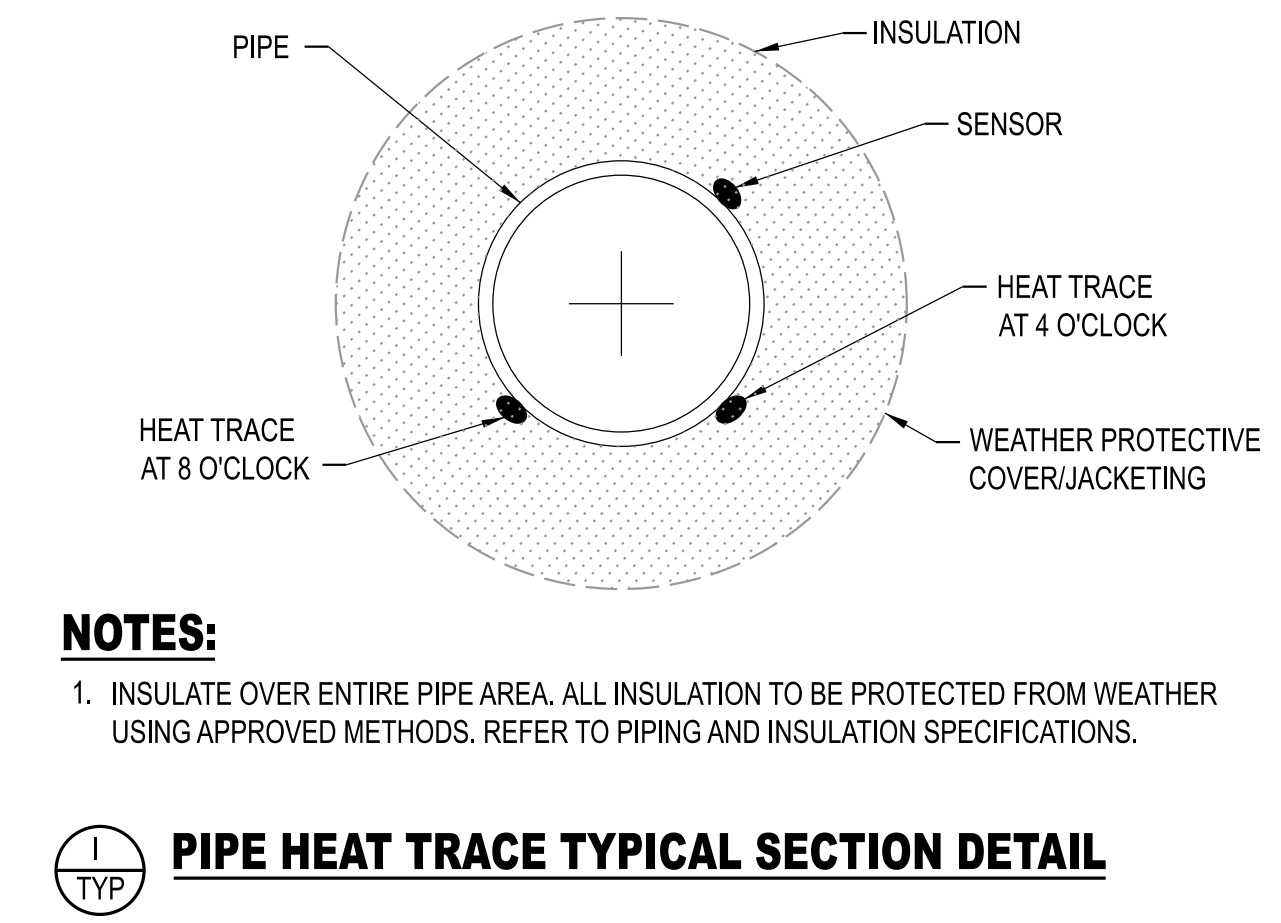
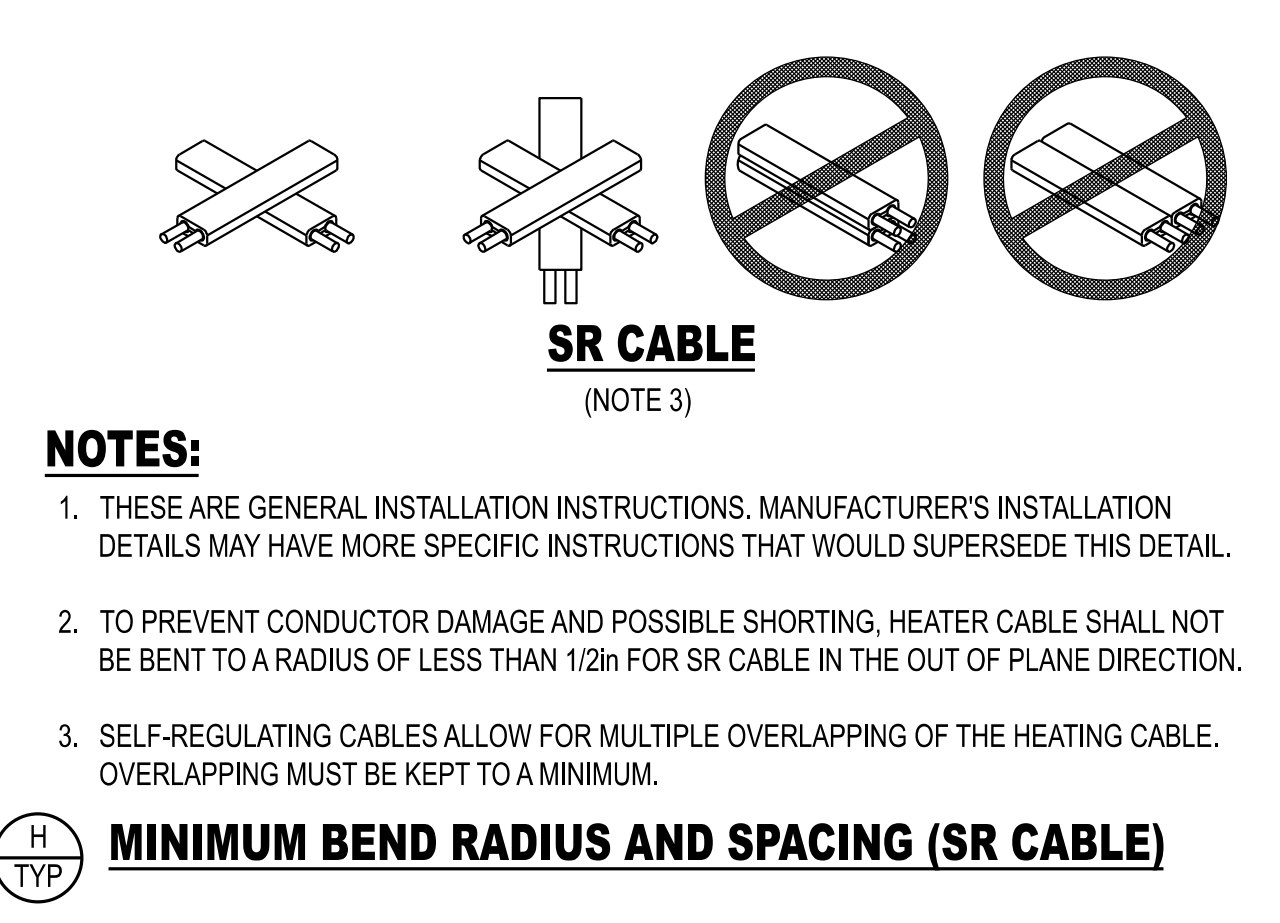
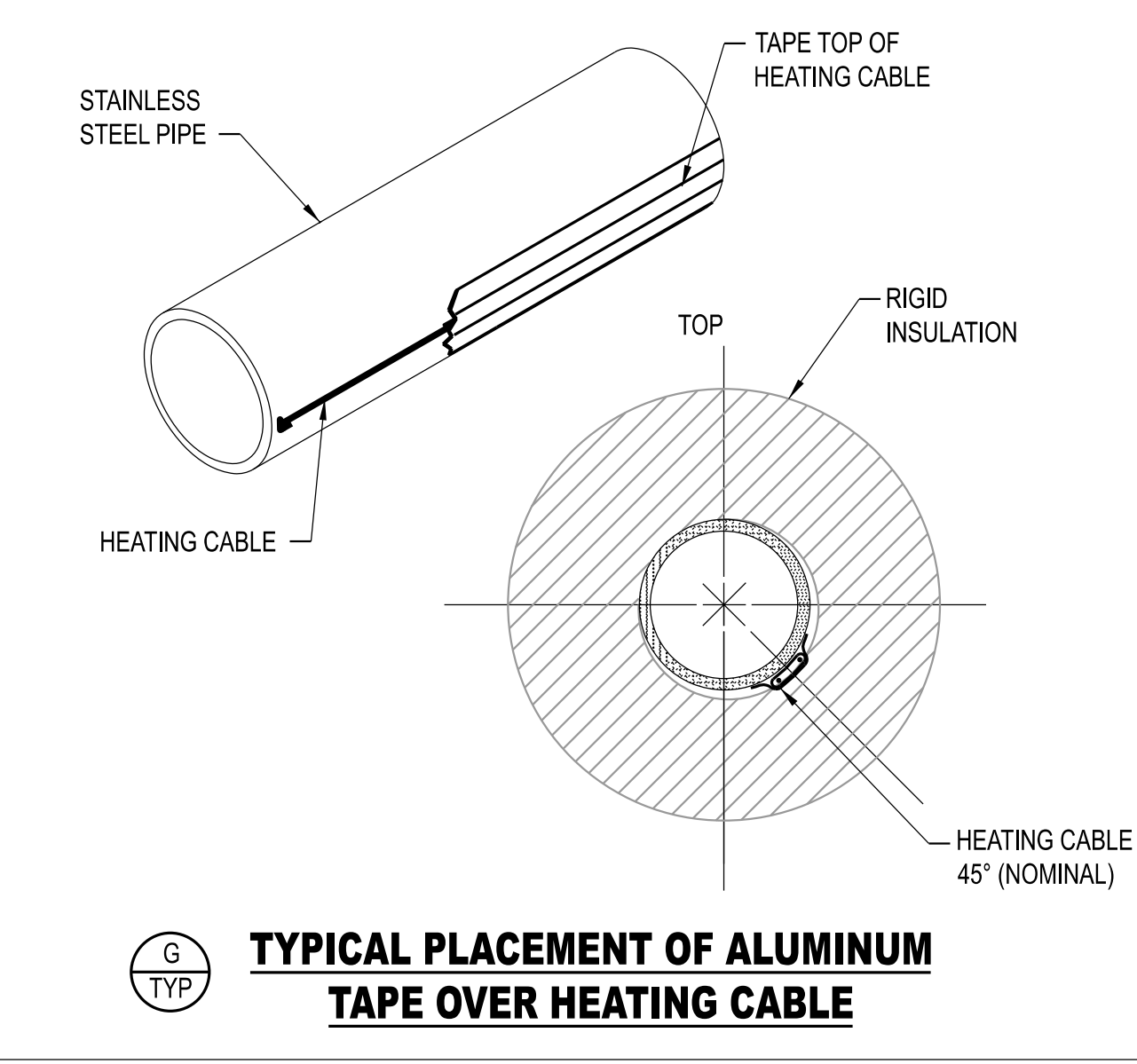
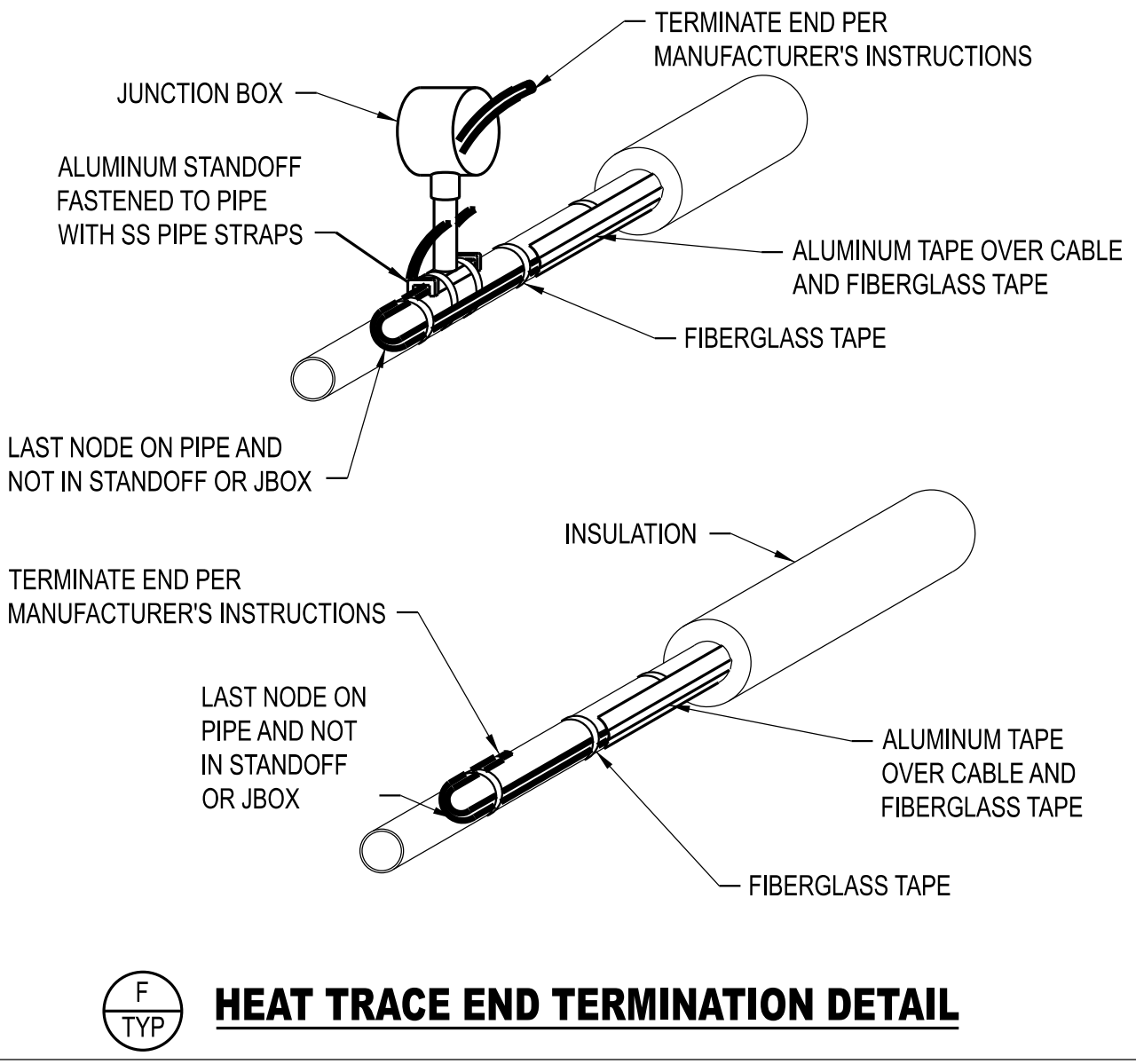
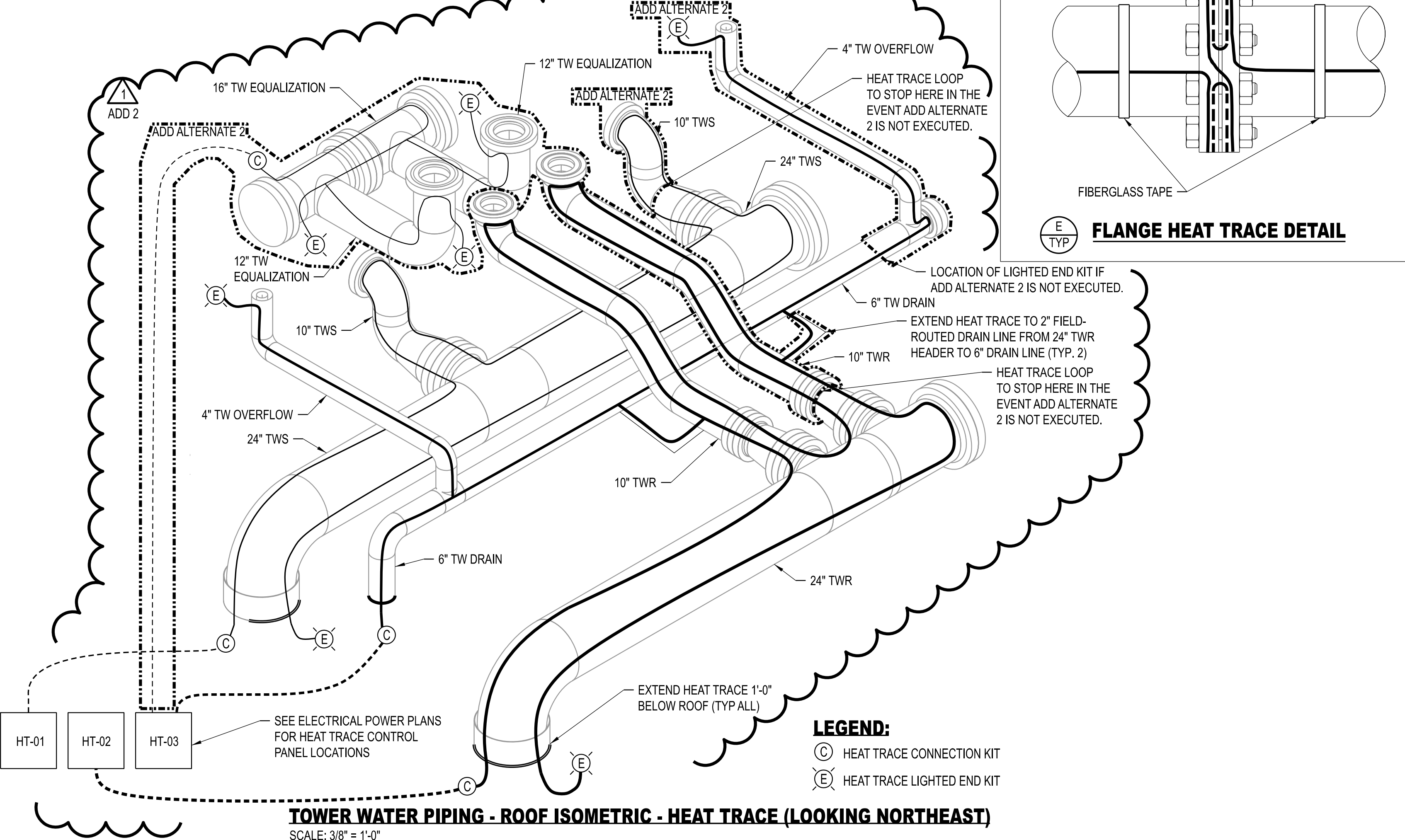
HEAT TRACE SYSTEM NOTES:

- HEAT TRACE SHOWN DIAGRAMMATICALLY. CONTRACTOR TO ROUTE PER MANUFACTURER'S RECOMMENDATIONS AND NOTIFY ENGINEER OF DISCREPANCIES.
- PROVIDE HEAT TRACE CONTROLLER AMBIENT TEMPERATURE PROBE WITH SUFFICIENT LENGTH TO GO UP THROUGH THE ROOF AND MEASURE AMBIENT TEMPERATURE AT THE ROOF LEVEL.
- CONFIRM AND ADJUST HEAT TRACE CONTROLLER SUPPLY POWER SUPPLY FEEDER BREAKER AND CABLES BASED ON FINAL PIPING LAYOUT.
- PROVIDE HEAT TRACE CONTROLLER FIELD SERVICE TECHNICIAN TO PROGRAM AND PROPERLY CONFIGURE THE HEAT TRACE CONTROLLER ALARMS. FIELD TEST THE HEAT TRACE AND VALIDATE THE INSTALLATION.
- PROVIDED ALL LIGHTED END KITS FOR EACH HEAT TRACE SEGMENT. NON-LIGHTED END KITS NOT ACCEPTABLE.
- ALL DIMENSIONS ARE APPROXIMATE AND ARE FOR HEAT TRACE ESTIMATION ONLY. FOR ACTUAL PIPING LENGTHS SEE THE MECHANICAL PIPING PLANS AND SECTIONS.
- ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL CABLE TERMINATIONS, END KITS, AND POWER CONNECTIONS TO POWER SOURCE.
- ALL HEAT TRACE CONNECTION AND LIGHTED END KITS SHALL BE INSTALLED IN ACCESSIBLE LOCATIONS TO THE GREATEST EXTENT POSSIBLE.
- HEAT TRACE SPIRAL WRAPPING AND INSTALLATION DETAILS FOR VALVES AND INSTRUMENTS NOT SHOWN. FOR CONCEPTUAL LAYOUT ONLY. CONTRACTOR SHALL FIELD COORDINATE EXACT LENGTHS AND PROVIDE A COMPLETE FREEZE PROTECTION HEAT TRACE SYSTEM FOR WATER FILLED LINES.

HEAT TRACE SCHEDULE											
CONTROLLER / PANEL NAME	CIRCUIT DESCRIPTION	PIPE SIZE	PIPE INSULATION	CIRCUIT LENGTH (FT)	CIRCUIT SELECTED WATTS/FT	CIRCUIT WATTS	VOLTAG E	CIRCUIT AMPS	BREAKER SIZE (AMPS)	HEATER	CONTROLLER FED FROM
HT-01	TOWER WATER SUPPLY (TWS)	24\"/>									

NOTES:

- CONTRACTOR TO VERIFY HEAT TRACE CABLING LENGTHS PRIOR TO INSTALLATION.
- REFER TO PROJECT MANUAL SECTION 23 05 33 FOR HEAT TRACE SPECIFICATIONS.



THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

STATE OF MISSOURI
JEFFERY GAMBELL
PROFESSIONAL ENGINEER
NUMBER PE-2000173300
11/22/2025

ENGINEER / ARCHITECT OF RECORD:
JEFFERY GAMBELL, PE
LICENSE NO. PE-2000173300
PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE 110
ROCK ISLAND, IL 61201
PHONE: 563-263-5160

ISSUED FOR ADDENDUM 2
ISSUED FOR BID
DRAWN BY: SMH
CHECKED BY: JTG

PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE 563.263.5160
MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017805

UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
ELECTRICAL POWER DETAILS - SHEET 5 - HEAT TRACE

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801
CONSULTANT
PROJECT NUMBER
23073
SHEET
EP-505

Vertical scale markings on the left side of the page, ranging from 0 to 150 feet. The scale is marked in increments of 10 feet, with smaller markings in between.

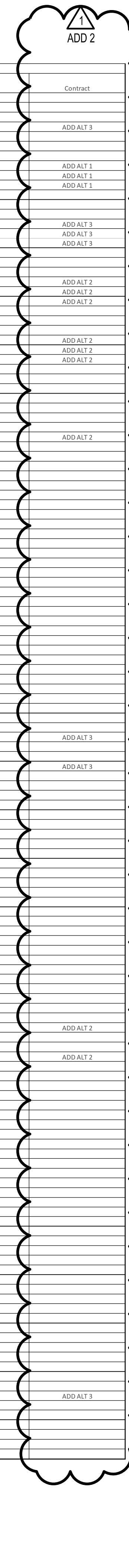
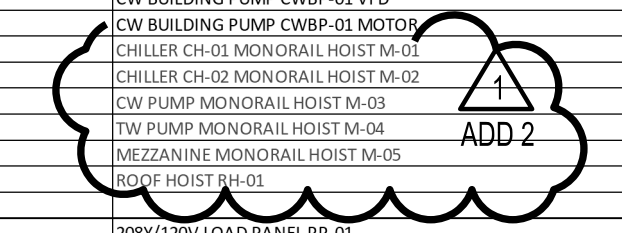
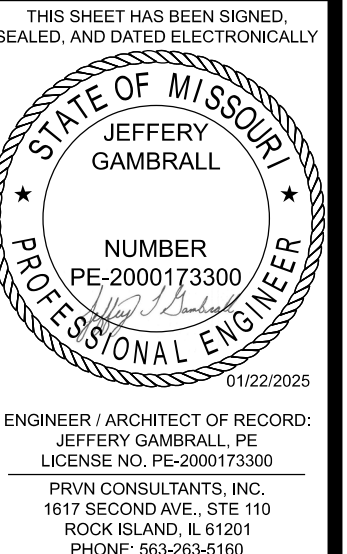


Table with columns: Revision, Cable Number, Cable Description, From, To, Comments, Contract. The table lists various electrical components, cable specifications, and their connections across multiple revisions.



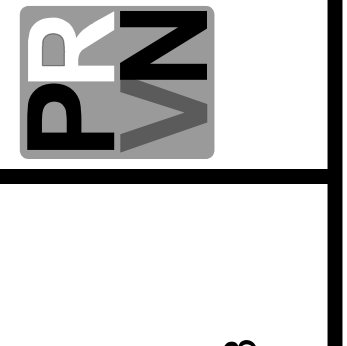
ELECTRICAL SCHEDULE - POWER AND GROUND CABLES



ENGINEER/ARCHITECT OF RECORD: JEFFERY GAMBRELL, PE. LICENSE NO. PE-2000173300. PRVN CONSULTANTS, INC. 1677 SECOND AVE., STE. 110. ROCK ISLAND, IL 61201. PHONE: 563-263-5160.

Table with columns: ISSUED FOR ADDENDUM 2, ISSUED FOR BID, DRAWN BY: SMH, CHECKED BY: JTG. Row 1: 1, 01/22/2025. Row 2: 0, 12/05/2024.

PRVN CONSULTANTS, INC. 1677 SECOND AVE., STE. 110. ROCK ISLAND, IL 61201. PHONE: 563-263-5160. MISSOURI CERTIFICATION OF AUTHORITY ENGINEERING - 2023017805.



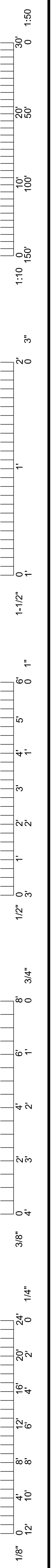
UNIVERSITY OF MISSOURI - COLUMBIA RESEARCH COMMONS THERMAL PLANT CHILLED WATER PRODUCTION ADDITION 1400 CARRIE FRANCKE DRIVE COLUMBIA, BOONE COUNTY, MISSOURI 65203 ELECTRICAL POWER CABLE SCHEDULES

UNIVERSITY OF MISSOURI PROJECT NUMBER

CP232801

CONSULTANT PROJECT NUMBER 23073

SHEET EP-611



ENGINEER / ARCHITECT OF RECORD:
JEFFERY GAMBRELL, PE
LICENSE NO. PE-2000173300
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1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
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MISSOURI CERTIFICATE OF
AUTHORITY ENGINEERING - 2023017605

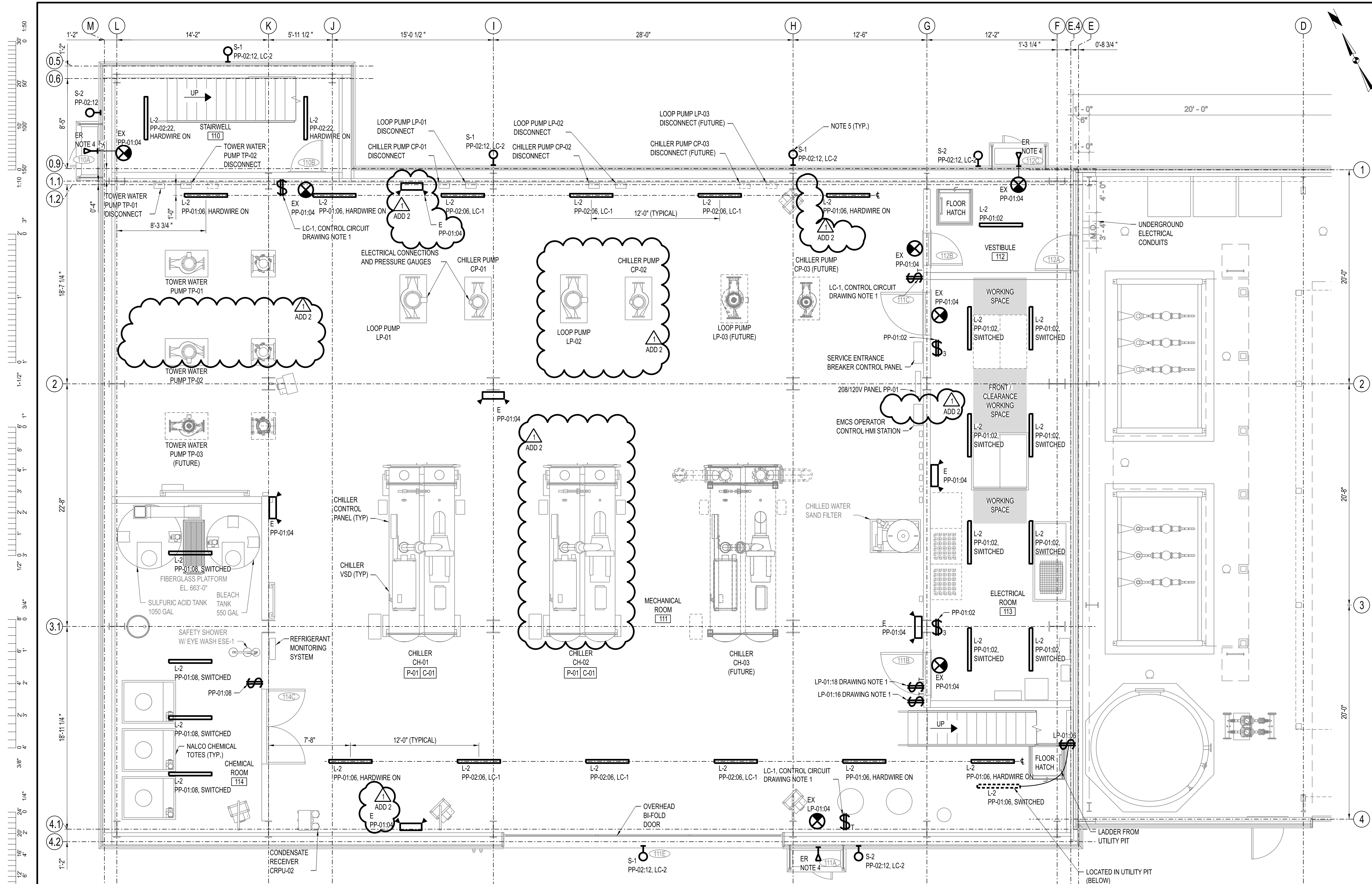
UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
ELECTRICAL CONTROL CABLE SCHEDULES

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801
CONSULTANT
PROJECT NUMBER
23073
SHEET
EP-612

ADD 2

Revision	Cable Number	Cable Description	From	To	Comments	Contract
0	C101	7C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	CHILLED WATER SAND/FILTER SF-01 CONTROL PANEL	STATUS: RUN, BYPASS. COMMAND: RUN, BACKWASH	
0	C102	5C-#14AWG	CHILLER PUMP CP-02 VFD	CHILLER PUMP CP-02 HAND-OFF-AUTO SWITCH		ADD ALT 3
0	C103	5C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	CHILLER PUMP CP-02 VFD	STATUS: RUN, REMOTE. COMMAND: RUN	ADD ALT 3
0	C104	5C-#14AWG	CHILLER CH-02 VFD	CHILLER CH-02 HAND-OFF-AUTO SWITCH		ADD ALT 3
0	C105	7C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	CHILLER CH-02 VFD	STATUS: RUN, ALARM, REMOTE, HAND. COMMAND: ENABLE	ADD ALT 3
0	C106	5C-#14AWG	LOOP PUMP LP-02 VFD	LOOP PUMP LP-02 HAND-OFF-AUTO SWITCH		ADD ALT 1
0	C107	5C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	LOOP PUMP LP-02 VFD	STATUS: RUN, REMOTE. COMMAND: RUN	ADD ALT 1
0	C108	5C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	CHILLED WATER SUPPLY LOOP PUMP LP-02 FLOW CONTROL VALVE 02-FCV-408	STATUS: OPEN, REMOTE. COMMAND: OPEN	ADD ALT 1
0	C109	5C-#14AWG	CHILLER PUMP CP-01 VFD	CHILLER PUMP CP-01 HAND-OFF-AUTO SWITCH		
0	C110	5C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	CHILLER PUMP CP-01 VFD	STATUS: RUN, REMOTE. COMMAND: RUN	
0	C111	5C-#14AWG	CHILLER CH-01 VFD	CHILLER CH-01 HAND-OFF-AUTO SWITCH		
0	C112	7C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	CHILLER CH-01 VFD	STATUS: RUN, ALARM, REMOTE, HAND. COMMAND: ENABLE	
0	C113	5C-#14AWG	CHILLED WATER SUPPLY LOOP PUMP LP-01 VFD	LOOP PUMP LP-01 HAND-OFF-AUTO SWITCH		
0	C114	5C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	LOOP PUMP LP-01 VFD	STATUS: RUN, REMOTE. COMMAND: RUN	
0	C115	5C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	CHILLED WATER SUPPLY LOOP PUMP LP-01 FLOW CONTROL VALVE 01-FCV-408	STATUS: OPEN, REMOTE. COMMAND: OPEN	
0	C116	5C-#14AWG	CHILLED WATER BUILDING PUMP CWBP-01 VFD	CHILLED WATER BUILDING PUMP CWBP-01 HAND-OFF-AUTO SWITCH		
0	C117	5C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	CHILLED WATER BUILDING PUMP CWBP-01 VFD	STATUS: RUN, REMOTE. COMMAND: RUN	
0	C118	5C-#14AWG	TOWER PUMP TP-01 VFD	TOWER PUMP TP-01 HAND-OFF-AUTO SWITCH		
0	C119	5C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	TOWER PUMP TP-01 VFD		ADD ALT 2
0	C120	5C-#14AWG	TOWER WATER SUPPLY TOWER PUMP TP-02 VFD	TOWER PUMP TP-02 HAND-OFF-AUTO SWITCH		ADD ALT 2
0	C121	5C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	TOWER PUMP TP-02 VFD	STATUS: RUN. COMMAND: RUN	ADD ALT 2
0	C122	4C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	TOWER WATER BLOWDOWN FLOW CONTROL VALVE 00-FCV-727	STATUS: OPEN. COMMAND: OPEN	
0	C123	5C-#14AWG	COOLING TOWER CT-02 VFD	COOLING TOWER CT-02 HAND-OFF-AUTO SWITCH		ADD ALT 2
0	C124	7C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	COOLING TOWER CT-02 VFD	STATUS: RUN, REMOTE, VIBRATION HIGH/HIGH, OIL LOW/LOW. COMMAND: RUN.	ADD ALT 2
0	C125	2C-#14AWG	COOLING TOWER CT-02 VIBRATION SWITCH	COOLING TOWER CT-02 VIBRATION SWITCH		ADD ALT 2
0	C126	2C-#14AWG	COOLING TOWER CT-02 VFD	COOLING TOWER CT-02 OIL LEVEL SWITCH		ADD ALT 2
0	C127	5C-#14AWG	COOLING TOWER CT-01 VFD	COOLING TOWER CT-01 HAND-OFF-AUTO SWITCH		
0	C128	7C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	COOLING TOWER CT-01 VFD	STATUS: RUN, REMOTE, VIBRATION HIGH/HIGH, OIL LOW/LOW. COMMAND: RUN.	
0	C129	2C-#14AWG	COOLING TOWER CT-01 VFD	COOLING TOWER CT-01 VIBRATION SWITCH		
0	C130	2C-#14AWG	COOLING TOWER CT-01 VFD	COOLING TOWER CT-01 OIL LEVEL SWITCH		
0	C131	4C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	COOLING TOWER CT-01 BASIN HEATER	STATUS: RUN. COMMAND: RUN	
0	C132	4C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	COOLING TOWER CT-02 BASIN HEATER	STATUS: RUN. COMMAND: RUN	ADD ALT 2
0	C133	2C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	TOWER WATER DRAIN COOLING TOWER CT-01 FLOW CONTROL VALVE 01-FCV-539	COMMAND: OPEN.	
1	C134	2C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	TOWER WATER DRAIN COOLING TOWER CT-02 FLOW CONTROL VALVE 02-FCV-539	COMMAND: OPEN.	ADD ALT 2
1	C135	5C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	TOWER WATER RETURN COOLING TOWER CT-01 FLOW CONTROL VALVE 01-FCV-538	STATUS: OPEN, REMOTE. COMMAND: OPEN.	
1	C136	5C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	TOWER WATER RETURN COOLING TOWER CT-02 FLOW CONTROL VALVE 02-FCV-538	STATUS: OPEN, REMOTE. COMMAND: OPEN.	ADD ALT 2
0	C137	5C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	REVERSE DRAINAGE LEVEL CONTROL VALVE 00-LCV-087	STATUS: OPEN, REMOTE. COMMAND: OPEN	
0	C138	5C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	RO TRANSFER PUMP ROPT-01	STATUS: RUN, REMOTE. COMMAND: RUN.	
0	C139	5C-#14AWG	TOWER WATER TREATMENT CHEMICAL PUMP TW-CHMP-01	TOWER WATER TREATMENT CHEMICAL PUMP TW-CHMP-01 HAND-OFF-AUTO SWITCH		
0	C140	5C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	TOWER WATER TREATMENT CHEMICAL PUMP TW-CHMP-01 VFD	STATUS: RUN, REMOTE. COMMAND: RUN	
0	C141	2C-#14AWG	DOSING PUMPS AND CHEMICAL CONTROL PANEL	TRASAR INHIBITOR PUMP		
0	C142	5C-#14AWG	DOSING PUMPS AND CHEMICAL CONTROL PANEL	ACID PUMP HAND-OFF-AUTO SWITCH		
0	C143	5C-#14AWG	DOSING PUMPS AND CHEMICAL CONTROL PANEL	ACID PUMP VFD		
0	C144	5C-#14AWG	DOSING PUMPS AND CHEMICAL CONTROL PANEL	INHIBITOR PUMPS HAND-OFF-AUTO SWITCH		
0	C145	2C-#14AWG	DOSING PUMPS AND CHEMICAL CONTROL PANEL	INHIBITOR PUMPS CURRENT SWITCH		
0	C146	5C-#14AWG	DOSING PUMPS AND CHEMICAL CONTROL PANEL	OXIDIZER PUMP HAND-OFF-AUTO SWITCH		
0	C147	5C-#14AWG	DOSING PUMPS AND CHEMICAL CONTROL PANEL	OXIDIZER PUMP VFD		
0	C148	5C-#14AWG	DOSING PUMPS AND CHEMICAL CONTROL PANEL	NONOX PUMP HAND-OFF-AUTO SWITCH		
0	C149	5C-#14AWG	DOSING PUMPS AND CHEMICAL CONTROL PANEL	NONOX PUMP CURRENT SWITCH		
0	C150	5C-#14AWG	DOSING PUMPS AND CHEMICAL CONTROL PANEL	BLOWDOWN VALVE HAND-OFF-AUTO SWITCH		
0	C151	2C-#14AWG	DOSING PUMPS AND CHEMICAL CONTROL PANEL	BLOWDOWN VALVE		
0	C152	5C-#14AWG	WATER TREATMENT CHEMICAL PUMP CW-CHMP-01 VFD	WATER TREATMENT CHEMICAL PUMP CW-CHMP-01 HAND-OFF-AUTO SWITCH		
0	C153	5C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	WATER TREATMENT CHEMICAL PUMP CW-CHMP-01 VFD	STATUS: RUN, REMOTE. COMMAND: RUN	
0	C154	5C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	REFRIGERANT MONITOR	STATUS: SPILL, LEAK, EVACUATE, FAULT	
0	C155	2C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	PURGE AIR DAMPER PAD-01	STATUS: OPEN.	
0	C156	5C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	EXHAUST FAN EF-01	STATUS: RUN, REMOTE. COMMAND: RUN	
0	C157	2C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	BI-FOLD DOOR 111E	11-25C-910	
0	C158	2C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	FRONT DOOR 111A	11-25C-910	
0	C159	2C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	EXTERIOR STAIRWELL DOOR 110B	11-25C-910	
0	C160	2C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	EXTERIOR VESTIBULE DOOR 112C	12-25C-910	
0	C161	2C-#14AWG	PROCESS AUTOMATION CONTROL PANEL	ROOF STAIRWELL DOOR 31D	10-25C-910	
0	C162	2C-#14AWG	BAS CONTROL PANEL	UNIT HEATER UH-10	COMMAND: RUN	
0	C163	2C-#14AWG	BAS CONTROL PANEL	UNIT HEATER UH-11	COMMAND: RUN	
0	C164	2C-#14AWG	BAS CONTROL PANEL	UNIT HEATER UH-13	COMMAND: RUN	
0	C165	2C-#14AWG	BAS CONTROL PANEL	UNIT HEATER UH-15	COMMAND: RUN	
0	C166	2C-#18AWG	RCTP CHW ADDITION DOOR CONTROL PANEL	RCTP BUILDING DOOR 112 CONTACT SWITCH		
0	C167	2C-#18AWG	RCTP CHW ADDITION DOOR CONTROL PANEL	RCTP BUILDING DOOR 310 CONTACT SWITCH		
0	C168	2C-#18AWG	RCTP CHW ADDITION DOOR CONTROL PANEL	RCTP BUILDING DOOR 110 CONTACT SWITCH		
0	C169	2C-#18AWG	RCTP CHW ADDITION DOOR CONTROL PANEL	RCTP BUILDING DOOR 110H CONTACT SWITCH		
0	C170	2C-#18AWG	RCTP CHW ADDITION DOOR CONTROL PANEL	RCTP BUILDING DOOR 111 CONTACT SWITCH		
0	C171	6C-#18AWG	THERMAL PLANT DOOR CONTROL PANEL	RCTP BUILDING EXTERNAL CARD READER		
0	C172	2C-#18AWG	THERMAL PLANT DOOR CONTROL PANEL	RCTP BUILDING DOOR 111 CONTACT SWITCH		
0	C173	2C-#18AWG	THERMAL PLANT DOOR CONTROL PANEL	RCTP BUILDING DOOR 111 STRIKE LOCKING DEVICE		
1	C174	2C-#14AWG	REFRIGERANT CONTROL PANEL	EMERGENCY EXHAUST FAN EF-01		
0	C175	2C-#14AWG	REFRIGERANT CONTROL PANEL	HORN STROBE		
0	COM101	CAT6 BELDEN 7927A	RCTP PC EQUIP RACK - NETWORK SWITCH	PROCESS AUTOMATION CONTROL CABINET	UTILITY IT NETWORK CONNECTION	
0	COM102	CAT6 BELDEN 7927A	RCTP PC EQUIP RACK - NETWORK SWITCH	PROCESS AUTOMATION CONTROL HMI	UTILITY IT NETWORK CONNECTION	
0	COM103	CAT6 BELDEN 7927A	RCTP PC EQUIP RACK - NETWORK SWITCH	CHILLER PUMP CP-01 VFD	OT NETWORK	ADD ALT 3
0	COM104	CAT6 BELDEN 7927A	RCTP PC EQUIP RACK - NETWORK SWITCH	LOOP PUMP LP-02 VFD	OT NETWORK	ADD ALT 1
0	COM105	CAT6 BELDEN 7927A	RCTP PC EQUIP RACK - NETWORK SWITCH	TOWER PUMP TP-01 VFD	OT NETWORK	ADD ALT 2
0	COM106	CAT6 BELDEN 7927A	RCTP PC EQUIP RACK - NETWORK SWITCH	CHILLER PUMP CP-02 VFD	OT NETWORK	ADD ALT 3
0	COM107	CAT6 BELDEN 7927A	RCTP PC EQUIP RACK - NETWORK SWITCH	LOOP PUMP LP-02 VFD	OT NETWORK	ADD ALT 1
0	COM108	CAT6 BELDEN 7927A	RCTP PC EQUIP RACK - NETWORK SWITCH	TOWER PUMP TP-02 VFD	OT NETWORK	ADD ALT 2
0	COM109	CAT6 BELDEN 7927A	RCTP PC EQUIP RACK - NETWORK SWITCH	COOLING TOWER FAN CT-02 VFD	OT NETWORK	ADD ALT 2
0	COM110	CAT6 BELDEN 7927A	RCTP PC EQUIP RACK - NETWORK SWITCH	COOLING TOWER FAN CT-01 VFD	OT NETWORK	
0	COM111	1-TRIAD	PROCESS AUTOMATION CONTROL CABINET	CHILLER CH-01 CONTROL PANEL	MODBUS RTU	ADD ALT 3
0	COM112	1-TRIAD	CHILLER CH-01 CONTROL PANEL	CHILLER CH-02 CONTROL PANEL	MODBUS RTU	
0	COM113	CAT6 BELDEN 7927A	BAS CONTROL PANEL	RCTP BUILDING FRONT DOOR SECURITY CAMERA		
0	COM114	CAT6 BELDEN 7927A	RCTP BUILDING FRONT DOOR SECURITY CAMERA	RCTP BUILDING ROOF SECURITY CAMERA		
0	COM115	1-TRIAD	BAS CONTROL PANEL (THERMAL PLANT)	BAS CONTROL PANEL (RCTP BUILDING)	RS-485 FC BUS CONNECTION - SEE ELECTRICAL HVAC DETAILS	
0	COM116	1-TRIAD	RCTP THERMAL PLANT DCP CONTROL ENCLOSURE	RCTP CHW ADDITION DOOR CONTROL PANEL	RS-485 DCP EXTENSION	

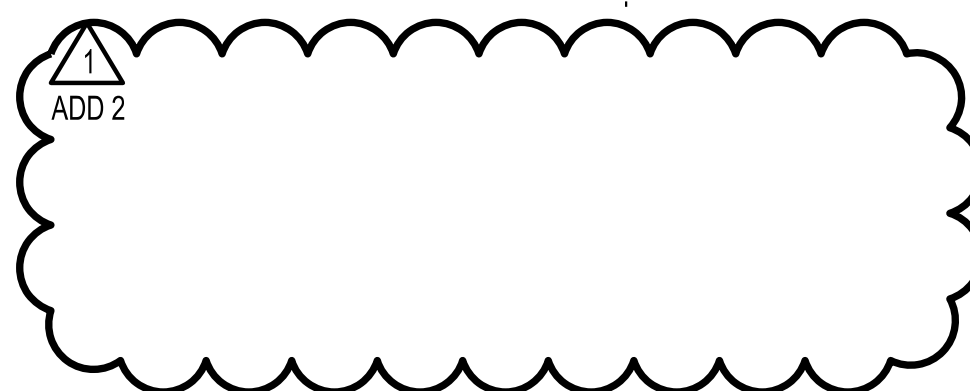
ELECTRICAL SCHEDULE - CONTROL AND COMMUNICATION CABLES

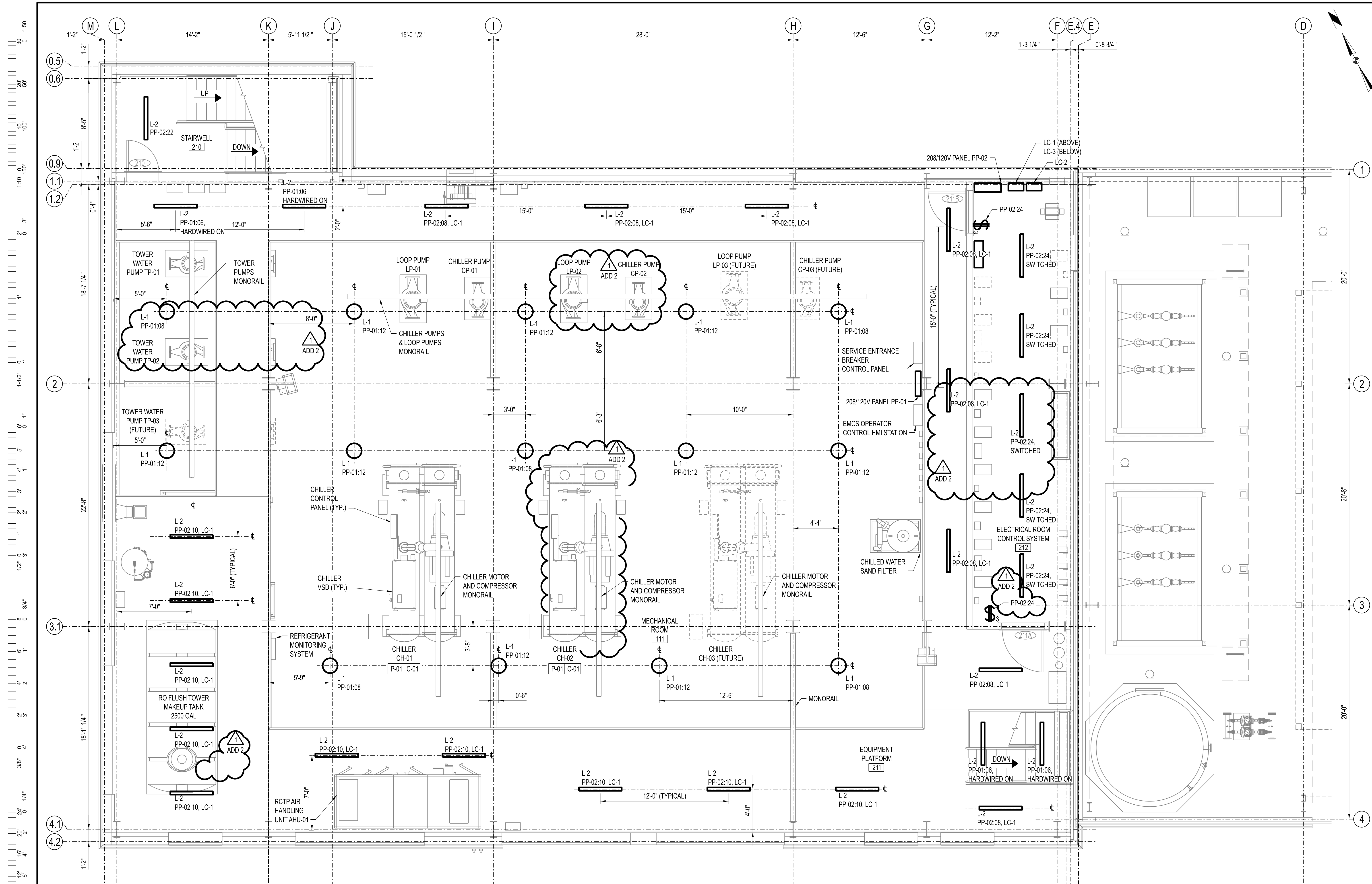


- DRAWING NOTES:**
- REFER TO E-001 FOR LEGEND SHEET AND GENERAL NOTES.
 - PROVIDE TIME-ON DELAY SWITCHES AND LIGHTING CONTACTORS PER SPECIFICATION SECTION 26 51 00 AND LIGHTING DETAIL DRAWINGS.
 - REFER TO LIGHTING SCHEDULE FOR TYPICAL FIXTURE ELEVATIONS UNLESS INDICATED OTHERWISE. COORDINATE FINAL FIXTURE LOCATION WITH OWNER TO AVOID REWORK.
 - CONNECT REMOTE HEAD UNIT OR EXIT SIGN TO WALL PACK UNIT WHERE SHOWN. WALL PACKS ARE RATED FOR NO MORE THAN TWO (2) REMOTE UNITS PER BATTERY PACK.
 - PLANT EXTERIOR LIGHTING SHALL MATCH THE ELEVATION OF EXISTING THERMAL PLANT LIGHTING FIXTURES. LIGHTING SHALL BE INTEGRATED WITH EXISTING PHOTOCELL. SEE DETAILS.

ELECTRICAL LIGHTING PLAN - OPERATING FLOOR (UNDER EQUIPMENT PLATFORM) - ELEVATION 660'-6"

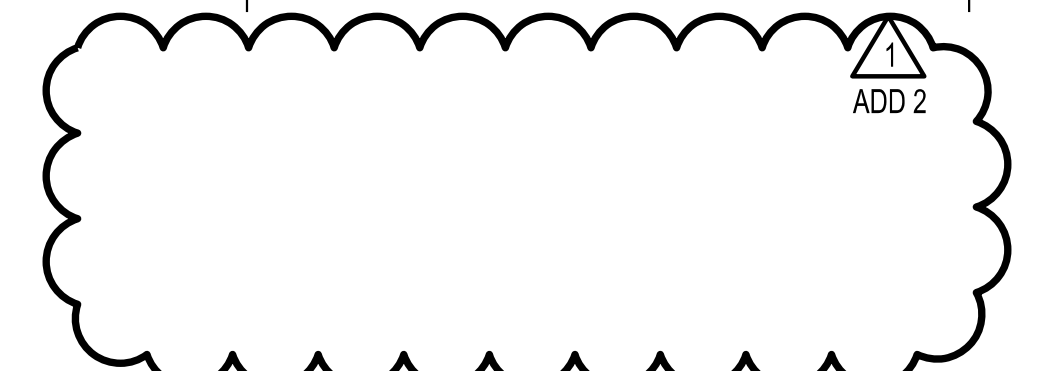
SCALE: 1/4"=1'-0"





DRAWING NOTES:

1. REFER TO E-001 FOR LEGEND SHEET AND GENERAL NOTES.
2. REFER TO LIGHTING SCHEDULE FOR TYPICAL FIXTURE ELEVATIONS UNLESS INDICATED OTHERWISE. COORDINATE FINAL FIXTURE LOCATION WITH OWNER TO AVOID REWORK.



ELECTRICAL LIGHTING PLAN - EQUIPMENT PLATFORM - ELEVATION 673'-0"

SCALE: 1/4"=1'-0"



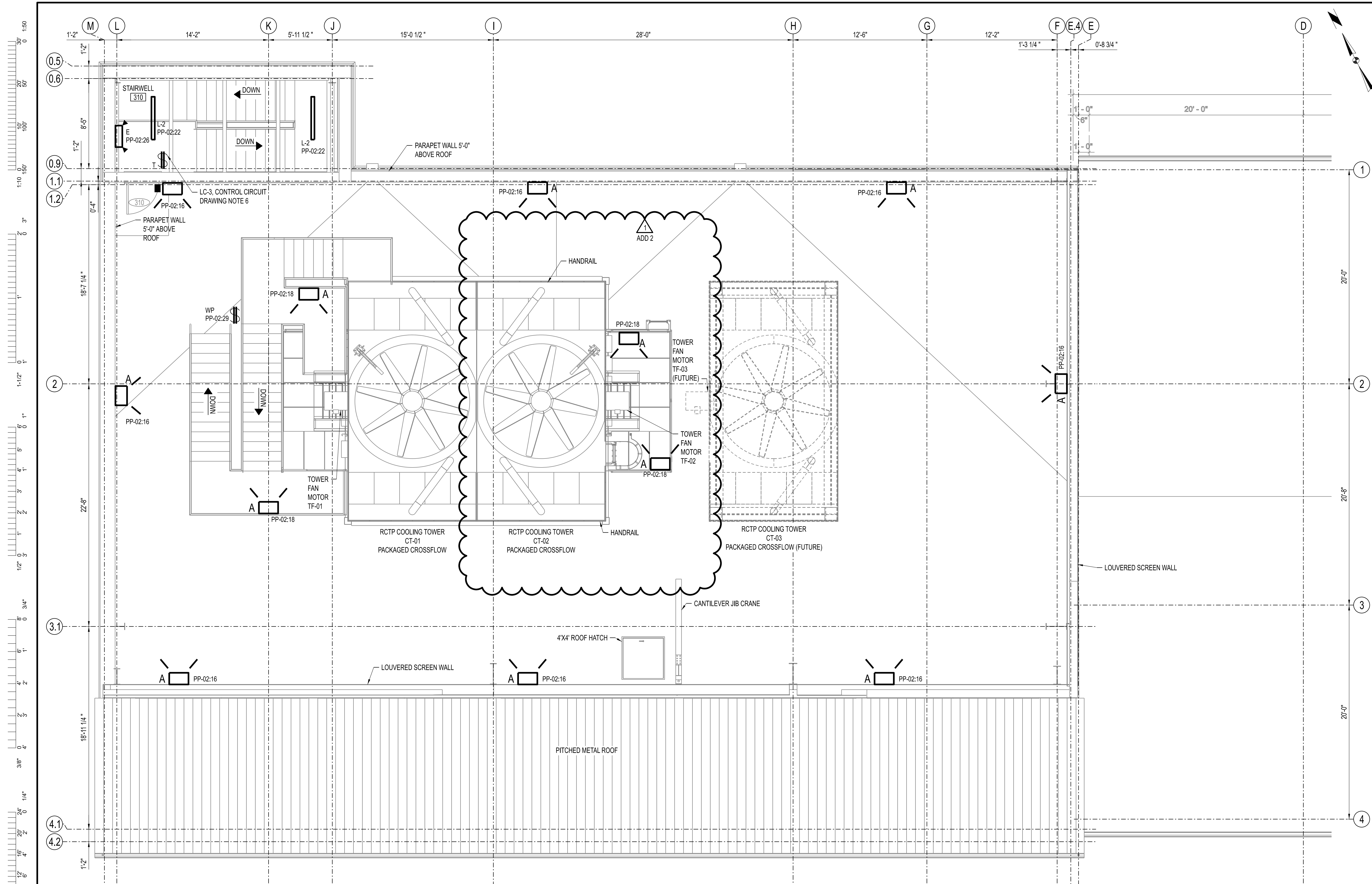
ENGINEER / ARCHITECT OF RECORD:
JEFFERY GAMBRELL, PE
LICENSE NO. PE-2000173300
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PHONE: 563-263-5160

1 10/22/2025 ISSUED FOR ADDENDUM 2
0 12/05/2024 ISSUED FOR BID
DRAWN BY: SMH CHECKED BY: JTG

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MISSOURI CERTIFICATE OF
AUTHORITY ENGINEERING - 2023017605

UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
ELECTRICAL LIGHTING PLAN - EQUIPMENT PLATFORM

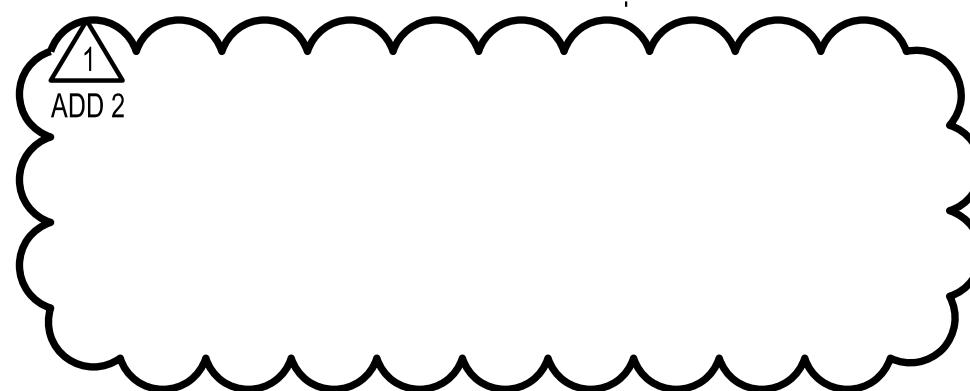
UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801
CONSULTANT
PROJECT NUMBER
23073
SHEET
EL-142



DRAWING NOTES:

- CONDUITS EXTERNAL TO THE FACILITY SHALL BE RIGID ALUMINUM.
- PROVIDE 20A COUNTDOWN TIMER SWITCHES FOR CIRCUITS AS SHOWN. LEVITON PART NUMBER DT212-LW OR EQUAL. TIMER SETTINGS SHALL BE OFF-2H-4H-8H-12H.
- REFER TO E-001 FOR LEGEND SHEET AND GENERAL NOTES.
- REFER TO LIGHTING SCHEDULE FOR TYPICAL FIXTURE ELEVATIONS UNLESS INDICATED OTHERWISE. COORDINATE FINAL FIXTURE LOCATION WITH OWNER TO AVOID REWORK.
- OUTDOOR CONDUIT AND RACEWAY SHALL BE RIGID ALUMINUM.
- PROVIDE TIME-ON DELAY SWITCHES AND LIGHTING CONTACTORS PER SPECIFICATION SECTION 26 51 00 AND LIGHTING DETAIL DRAWINGS.

ELECTRICAL LIGHTING PLAN - UPPER ROOF - ELEVATION 712'-6"
SCALE: 1/4"=1'-0"



ENGINEER / ARCHITECT OF RECORD:
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PHONE: 563-263-5160

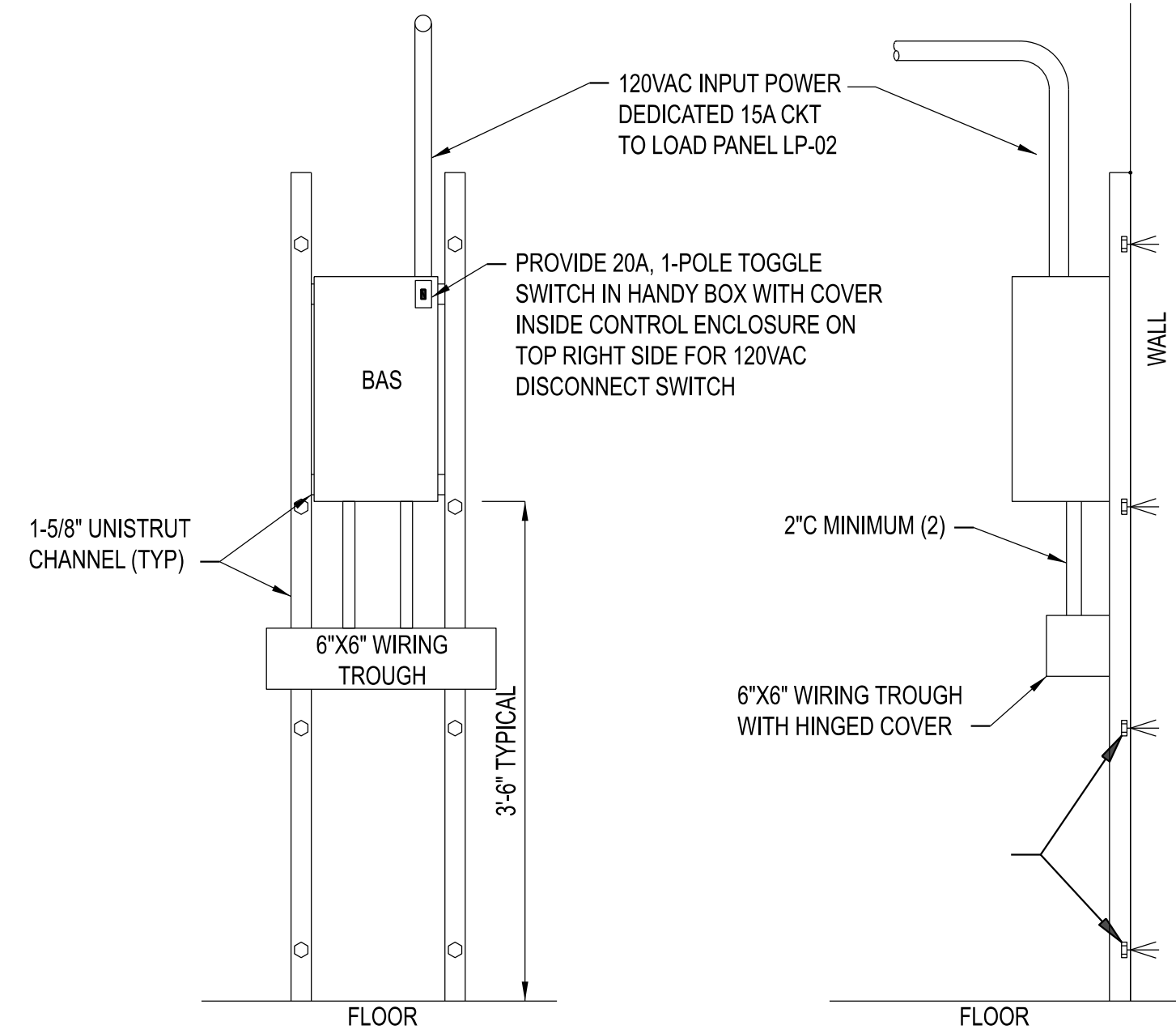
1	10/22/2025	ISSUED FOR ADDENDUM 2	DRAWN BY: SMH	CHECKED BY: JTG
0	12/05/24	ISSUED FOR BID		

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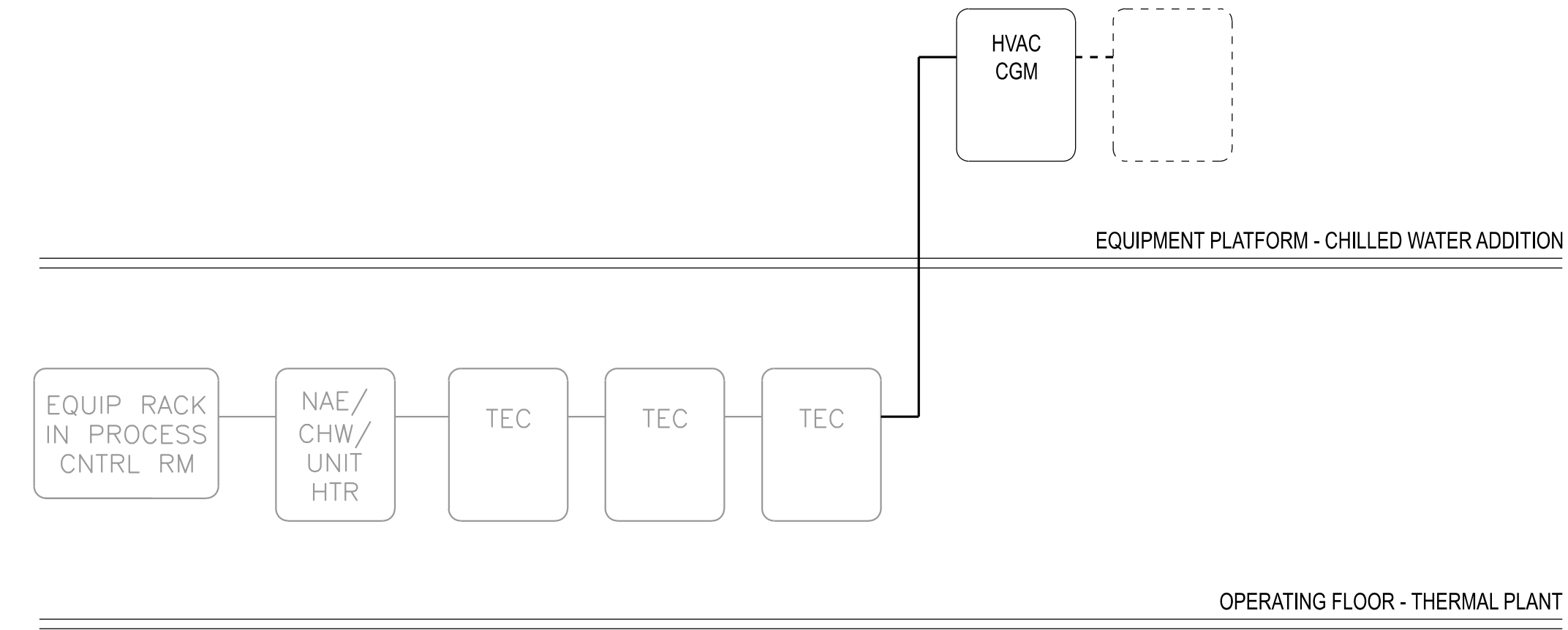
UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
ELECTRICAL LIGHTING PLAN - UPPER ROOF

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801
CONSULTANT
PROJECT NUMBER
23073
SHEET
EL-162

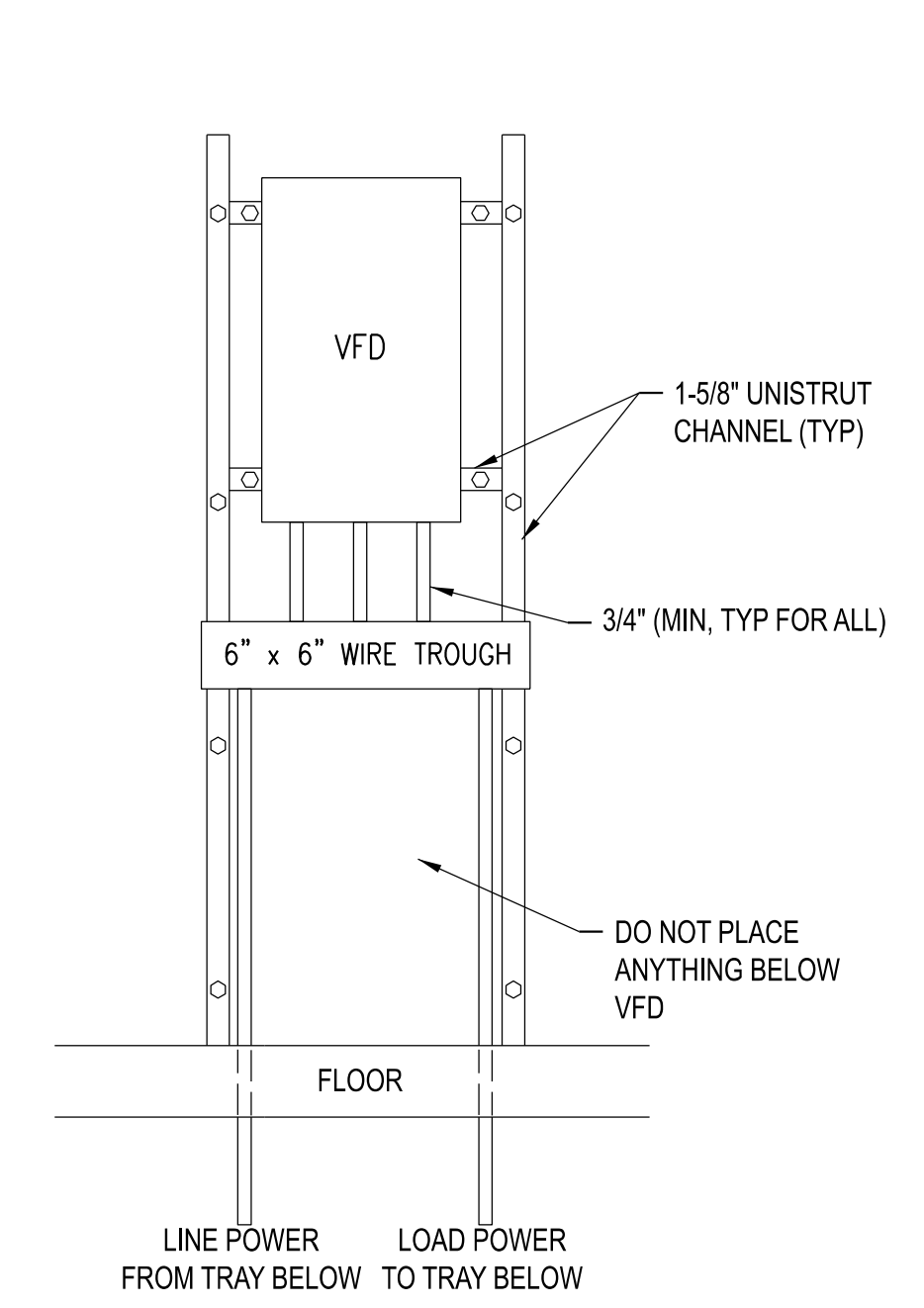
1:50
1:10
3"
1"
1-1/2"
1"
1/2"
3/4"
3/8"
1/4"
1/8"



A
TYP **BAS PANEL MOUNTING DETAIL**

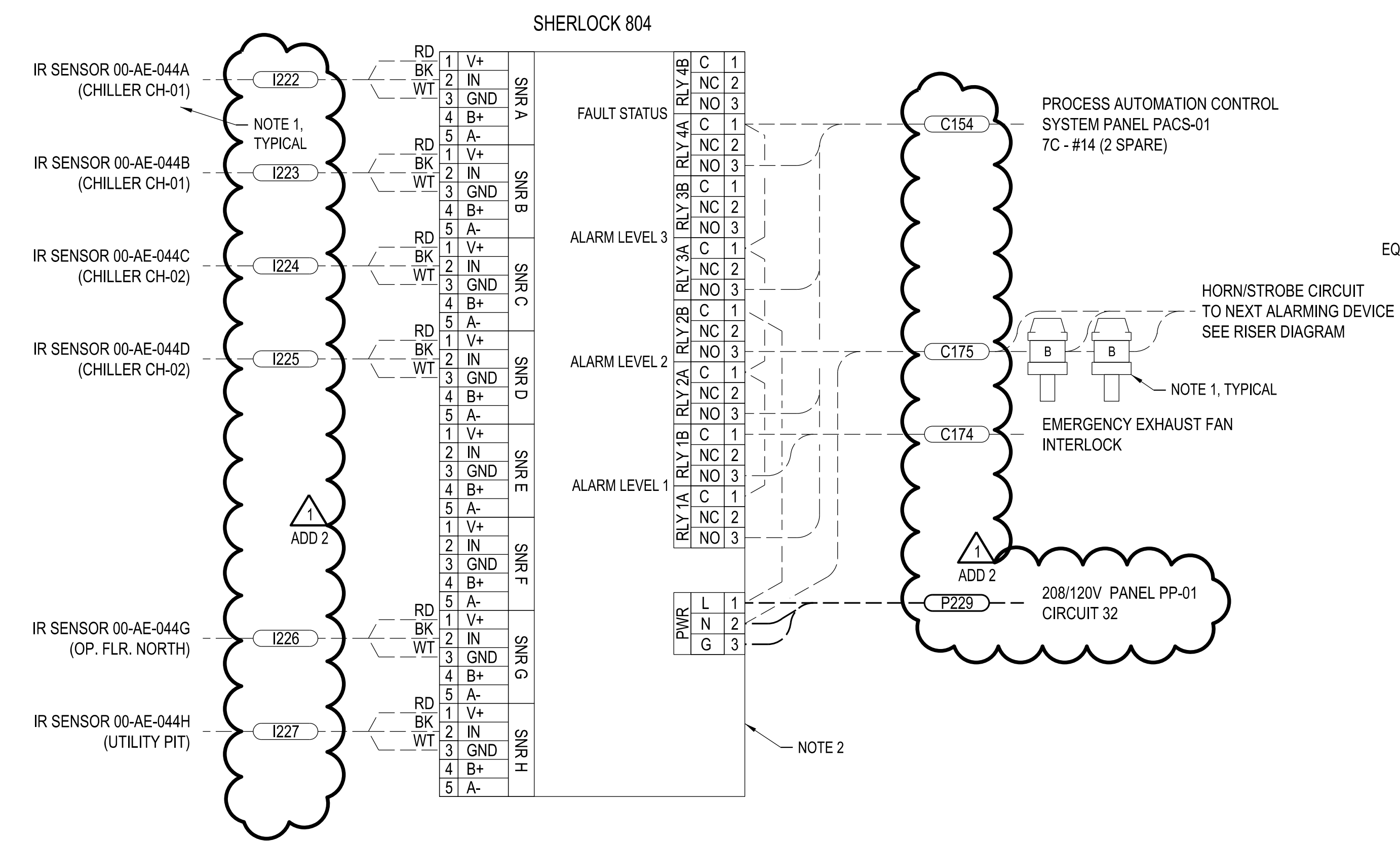


B
TYP **FC BUS SCHEMATIC DIAGRAM**

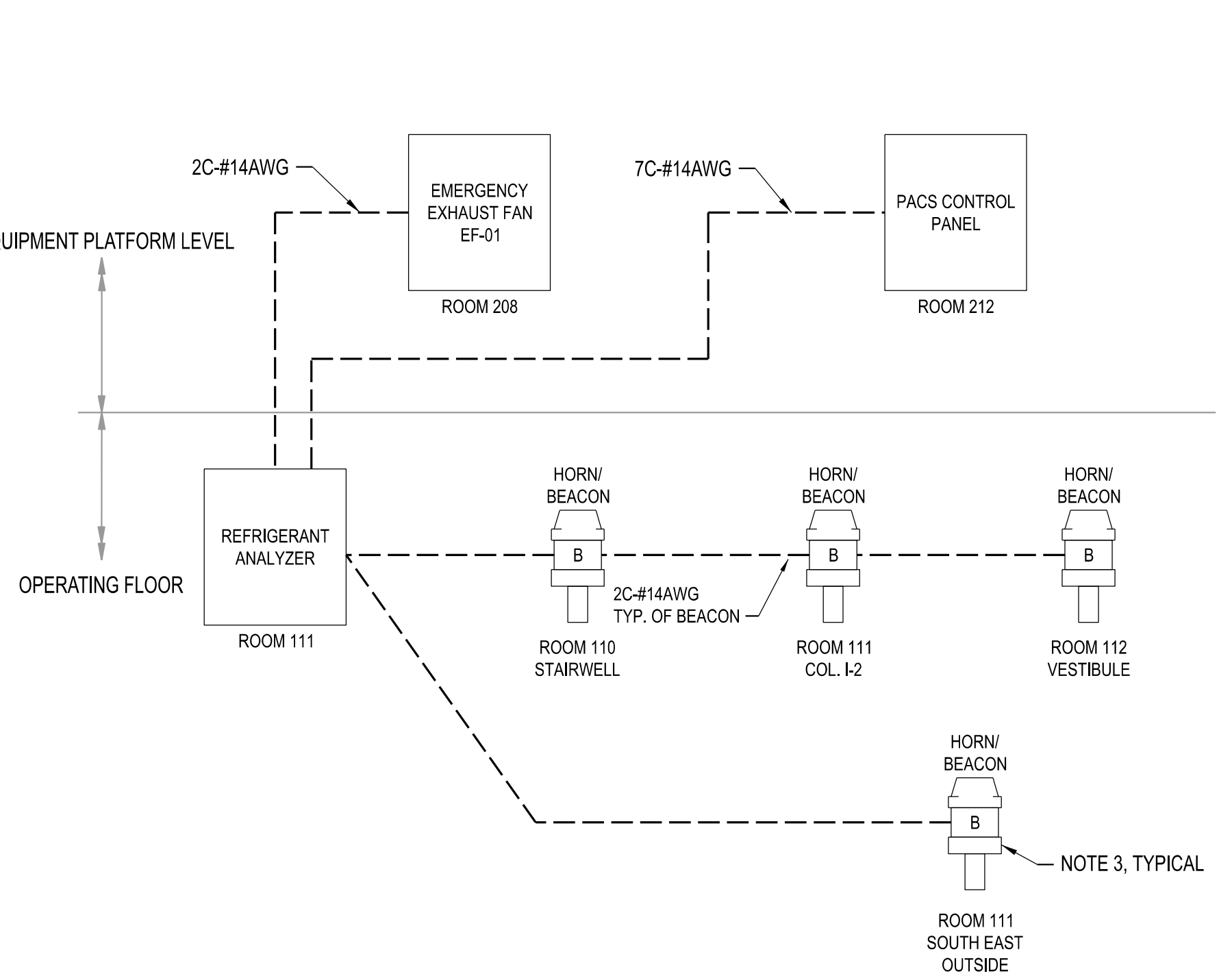


C
TYP **HVAC VFD MOUNTING DETAIL**

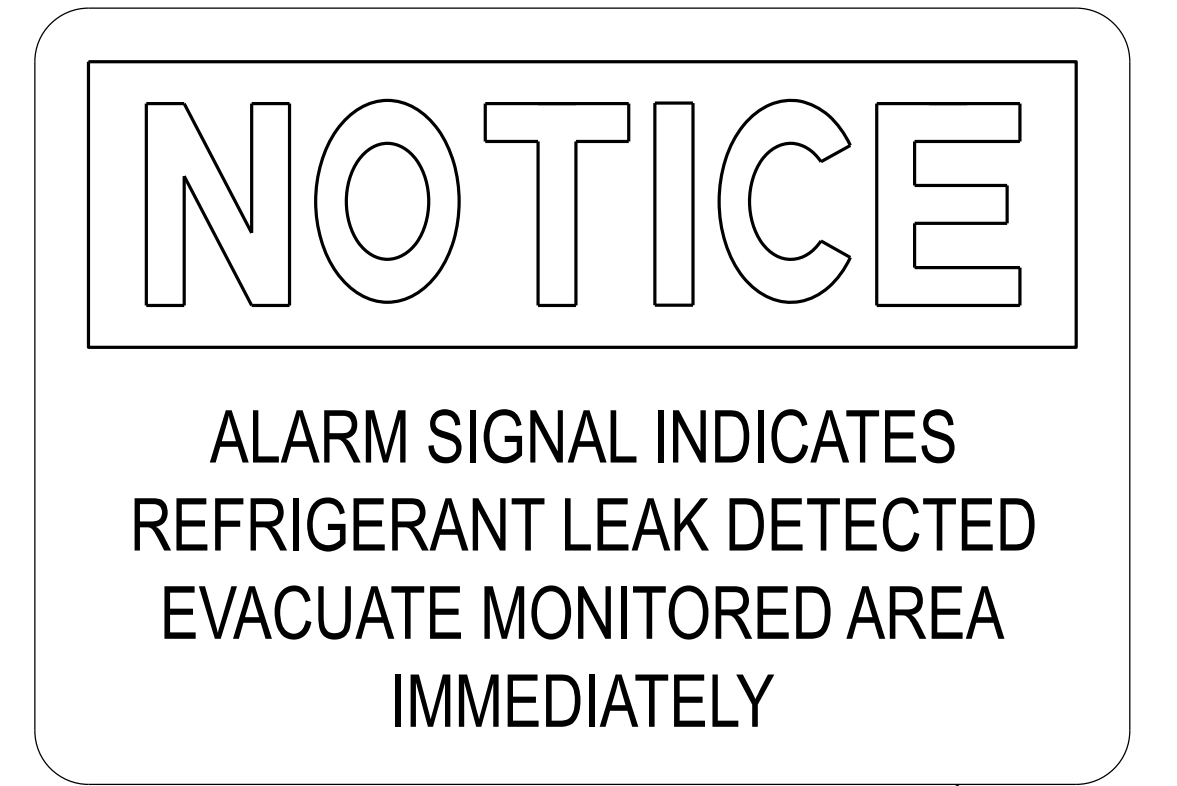
- NOTES**
- VARIABLE FREQUENCY DRIVE (VFD) TO BE FURNISHED AND INSTALLED BY CONTRACTOR.
 - KEEP ALL CONTROL WIRING AND POWER WIRING IN SEPARATE CONDUIT.
 - POWER TO DRIVE AND LEADS TO MOTOR MUST BE IN SEPARATE CONDUIT.



D
TYP **REFRIGERANT ANALYZER WIRING**



REFRIGERANT BEACON RISER DIAGRAM



TYPICAL WARNING ALARM SIGNAGE

- NOTES**
- REFER TO INSTRUMENTATION PLANS FOR LOCATING SENSORS AND BEACONS.
 - CONTRACTOR SHALL PROVIDE SHERLOCK 804 REFRIGERANT ANALYZING CONTROLLER WITH OPTIONS SHOWN. PROVIDE INFRARED R-513A SENSORS (60-0542) AS INDICATED.
 - CONTRACTOR SHALL PROVIDE BEACON/HORN COMBINATION UNITS AND ALL REQUIRED MOUNTING ACCESSORY FOR WALL MOUNTING IN THE UPRIGHT POSITION. PROVIDE ALLEN BRADLEY PART NUMBERS OR APPROVED EQUIVALENT:
BEACON: 855R-10HMF6
AUDIBLE BASE: 855R-BSA10
BRACKET: 855R-ABVA
 - PROVIDE UV, CHEMICAL, ABRASION, AND MOISTURE RESISTANT OSHA SAFETY SIGNAGE AT EACH BEACON INSTALLATION LOCATION. SIGN SHALL BE 14" X 10" MINIMUM AND CENTER LINE INSTALLED 60" ABOVE FINISHED FLOOR. BEACON SHALL BE MOUNTED DIRECTLY ABOVE OR NEXT TO SIGNAGE.

D
TYP **REFRIGERANT ANALYZER CONTROLLER WIRING AND RISER DIAGRAM**

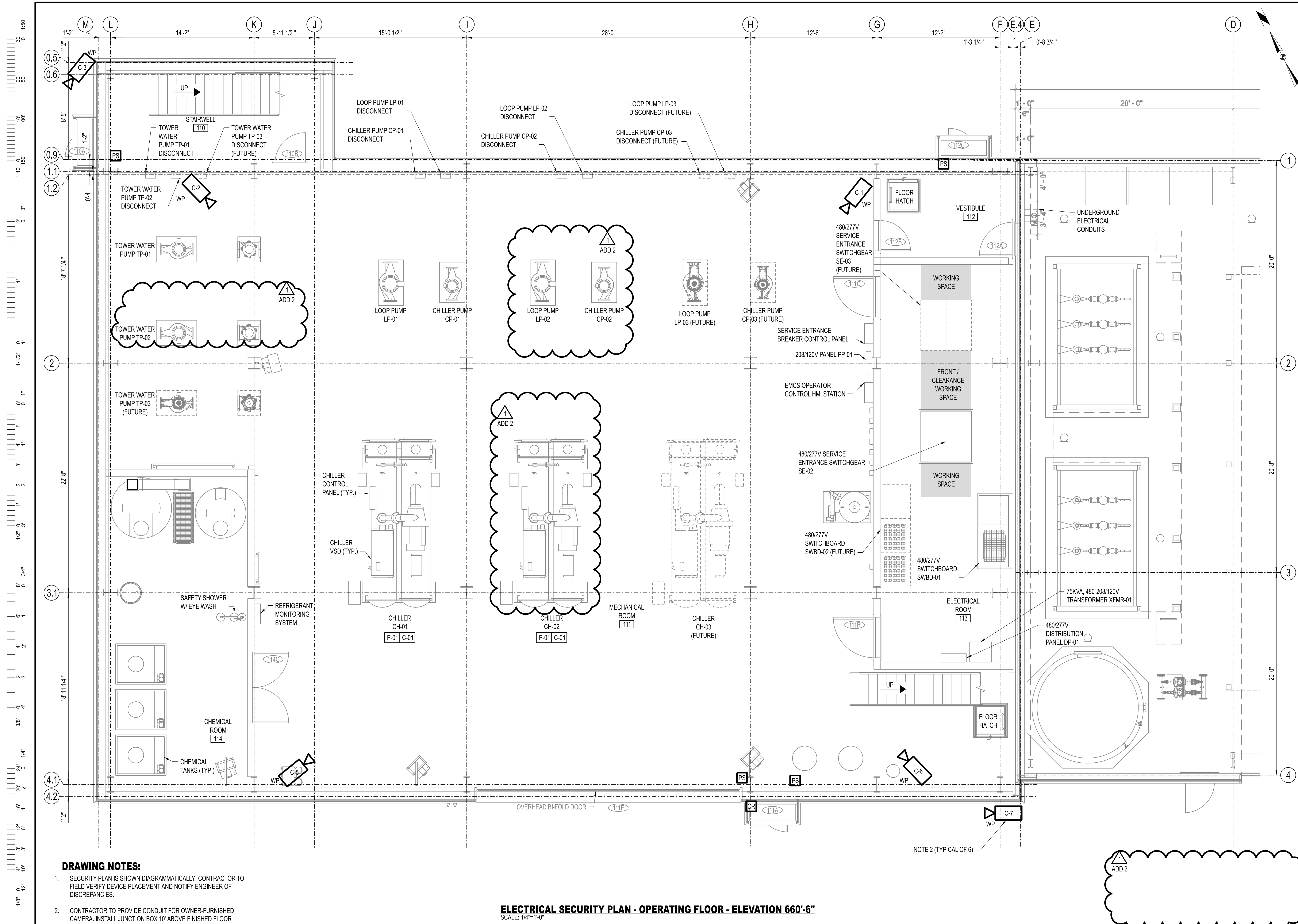
THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.
STATE OF MISSOURI
JEFFERY GAMBELL
PROFESSIONAL ENGINEER
NUMBER PE-2000173300
11/22/2025
ENGINEER / ARCHITECT OF RECORD:
JEFFERY GAMBELL, PE
LICENSE NO. PE-2000173300
PRVN CONSULTANTS, INC.
1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE: 563-263-5160

ISSUED FOR ADDENDUM 2
ISSUED FOR BID
DRAWN BY: SMH
CHECKED BY: JTG

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1617 SECOND AVE., STE. 110
ROCK ISLAND, IL 61201
PHONE 563.263.5160
MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017805

UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
ELECTRICAL HVAC DETAILS - BAS

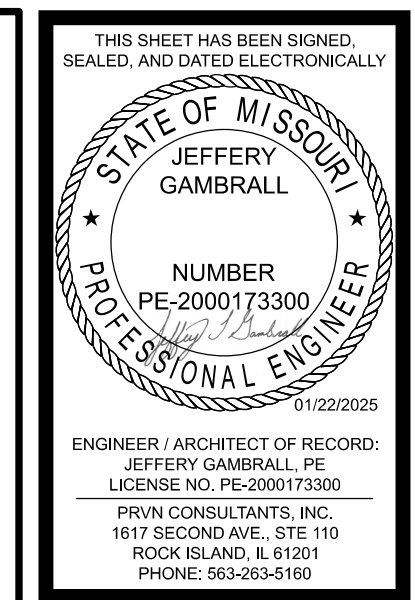
UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801
CONSULTANT
PROJECT NUMBER
23073
SHEET
EH-501



- DRAWING NOTES:**
- SECURITY PLAN IS SHOWN DIAGRAMMATICALLY. CONTRACTOR TO FIELD VERIFY DEVICE PLACEMENT AND NOTIFY ENGINEER OF DISCREPANCIES.
 - CONTRACTOR TO PROVIDE CONDUIT FOR OWNER-FURNISHED CAMERA. INSTALL JUNCTION BOX 10' ABOVE FINISHED FLOOR UNLESS OTHERWISE INDICATED.

ELECTRICAL SECURITY PLAN - OPERATING FLOOR - ELEVATION 660'-6"
 SCALE: 1/4"=1'-0"

ADD 2

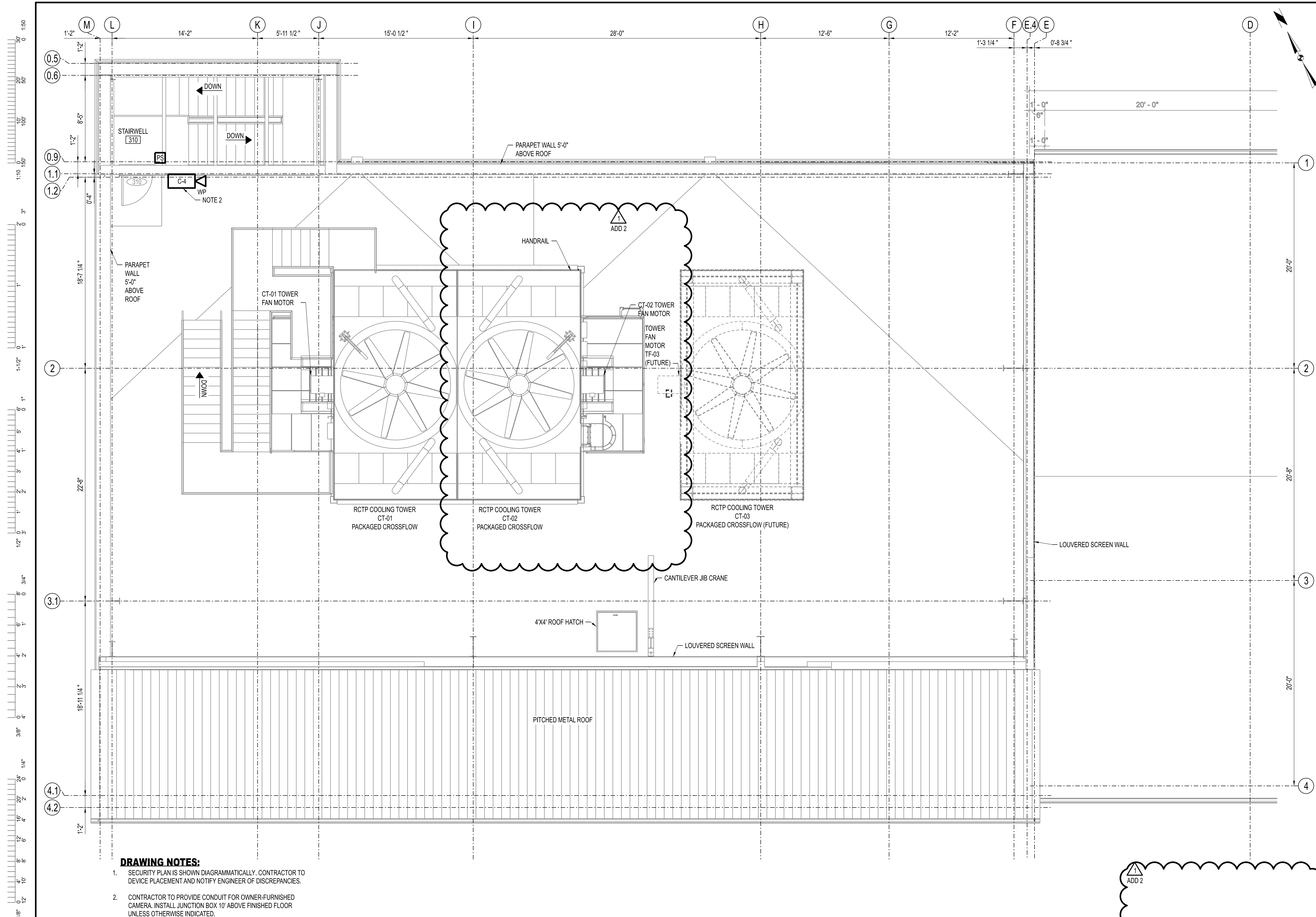


1	10/22/2025	ISSUED FOR ADDENDUM 2	DRAWN BY: SMH	CHECKED BY: JTG
0	12/05/2024	ISSUED FOR BID		

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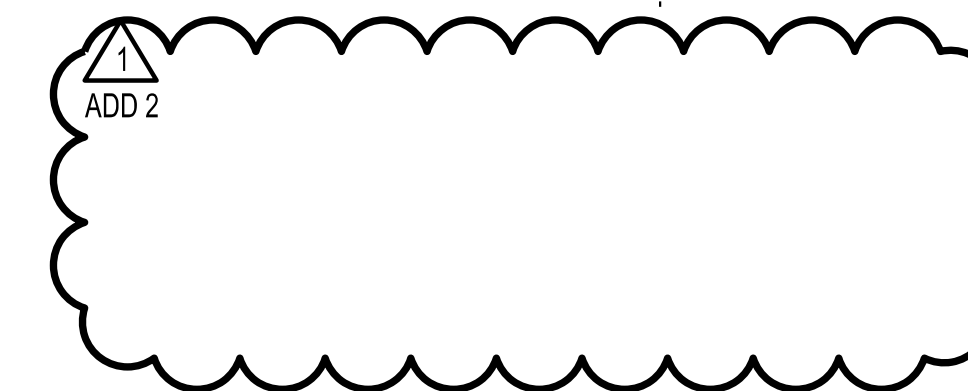
UNIVERSITY OF MISSOURI - COLUMBIA
 RESEARCH COMMONS THERMAL PLANT
 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 ELECTRICAL SECURITY PLAN - OPERATING FLOOR

UNIVERSITY OF MISSOURI
 PROJECT NUMBER
CP232801
 CONSULTANT
 PROJECT NUMBER
23073
 SHEET
EI-132



- DRAWING NOTES:**
1. SECURITY PLAN IS SHOWN DIAGRAMMATICALLY. CONTRACTOR TO DEVICE PLACEMENT AND NOTIFY ENGINEER OF DISCREPANCIES.
 2. CONTRACTOR TO PROVIDE CONDUIT FOR OWNER-FURNISHED CAMERA. INSTALL JUNCTION BOX 10' ABOVE FINISHED FLOOR UNLESS OTHERWISE INDICATED.

ELECTRICAL SECURITY PLAN - UPPER ROOF - ELEVATION 712'-6"
 SCALE: 1/4"=1'-0"



THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY.

STATE OF MISSOURI
 JEFFERY GAMBELL
 PROFESSIONAL ENGINEER
 NUMBER PE-2000173300
 11/22/2025

ENGINEER / ARCHITECT OF RECORD:
 JEFFERY GAMBELL, PE
 LICENSE NO. PE-2000173300

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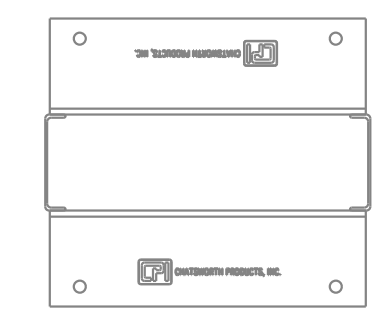
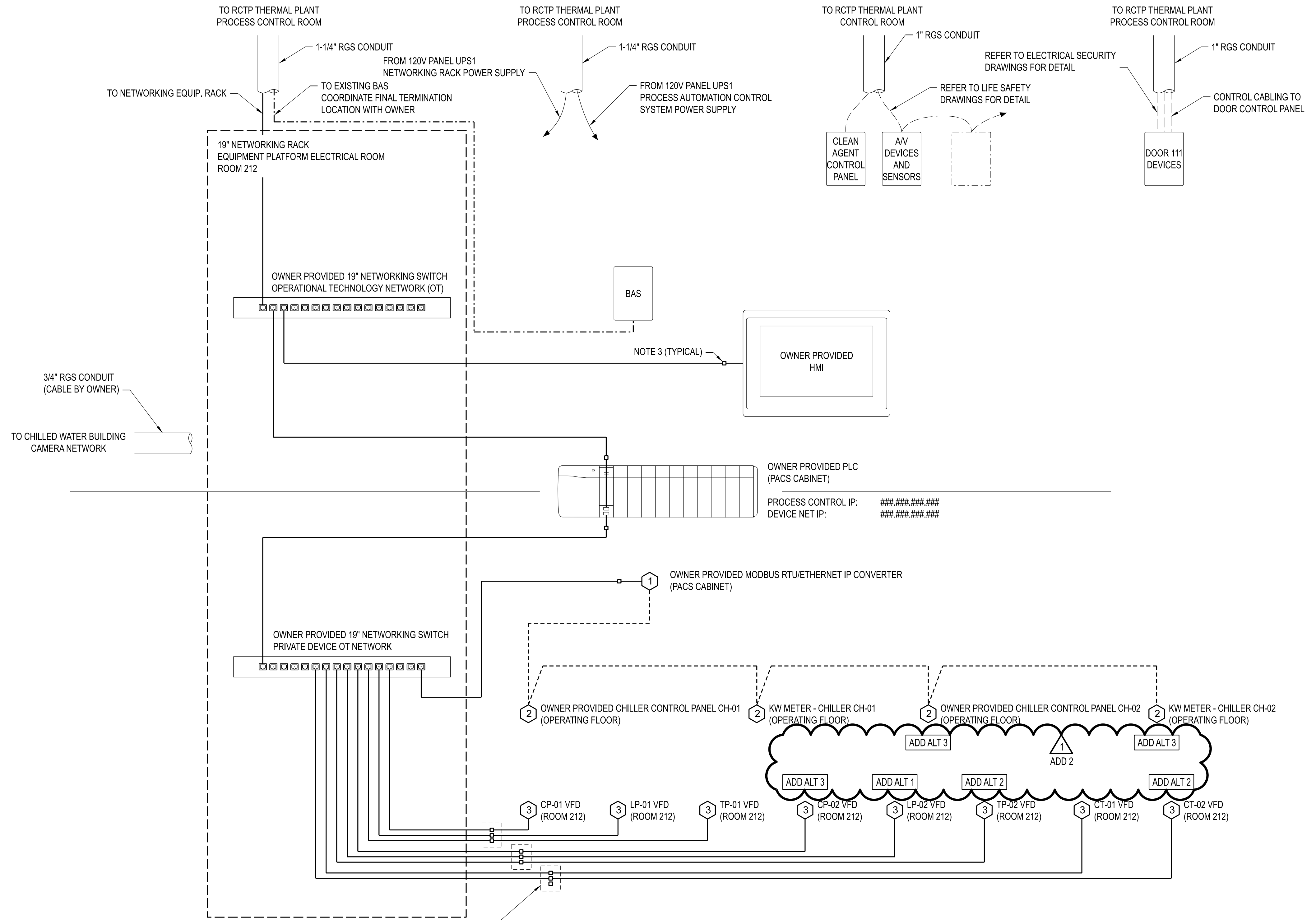
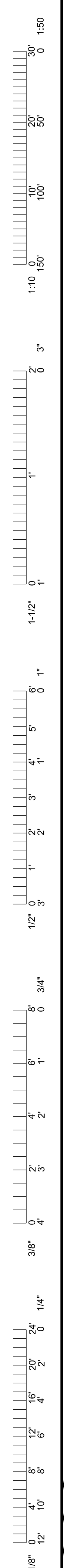
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 MISSOURI CERTIFICATE OF AUTHORITY ENGINEERING - 2023017805

UNIVERSITY OF MISSOURI - COLUMBIA
 RESEARCH COMMONS THERMAL PLANT
 CHILLED WATER PRODUCTION ADDITION
 1400 CARRIE FRANCKE DRIVE
 COLUMBIA, BOONE COUNTY, MISSOURI 65203
 ELECTRICAL SECURITY PLAN - UPPER ROOF

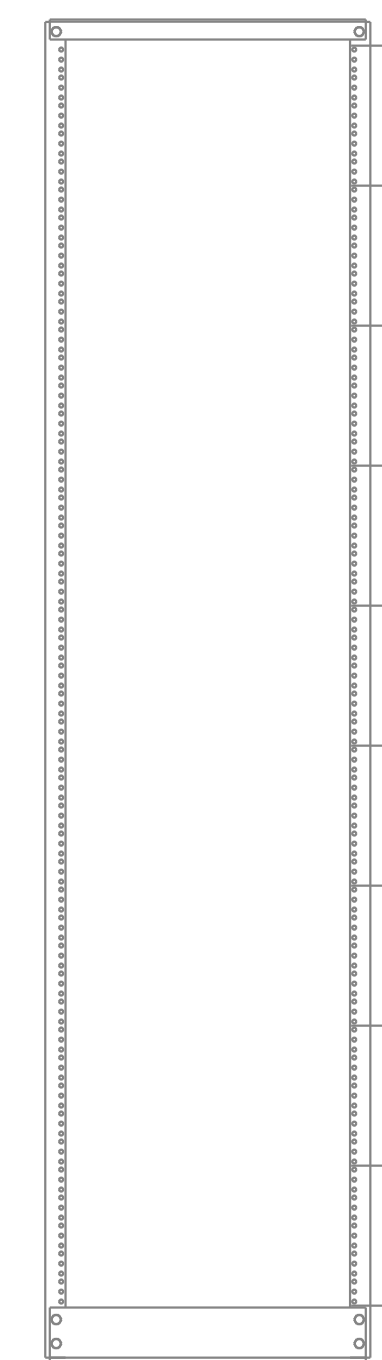
UNIVERSITY OF MISSOURI
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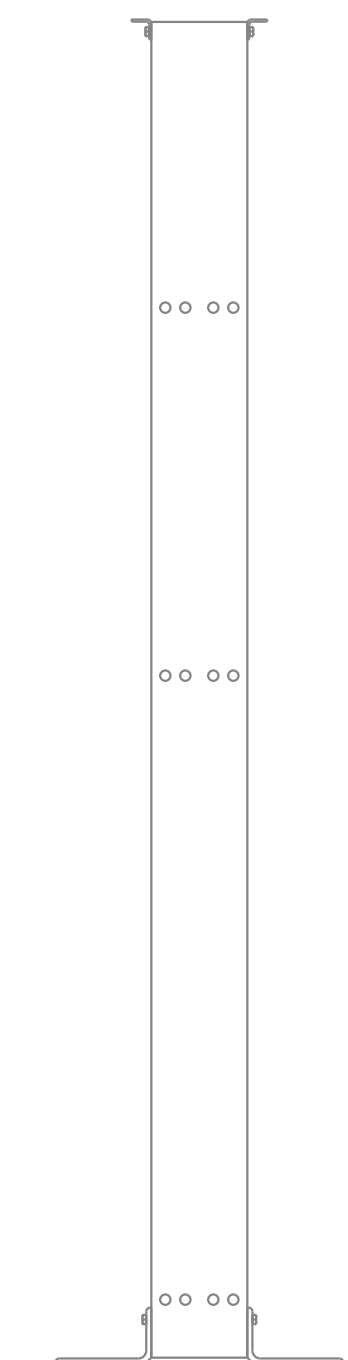
SHEET
EI-162



TOP



FRONT

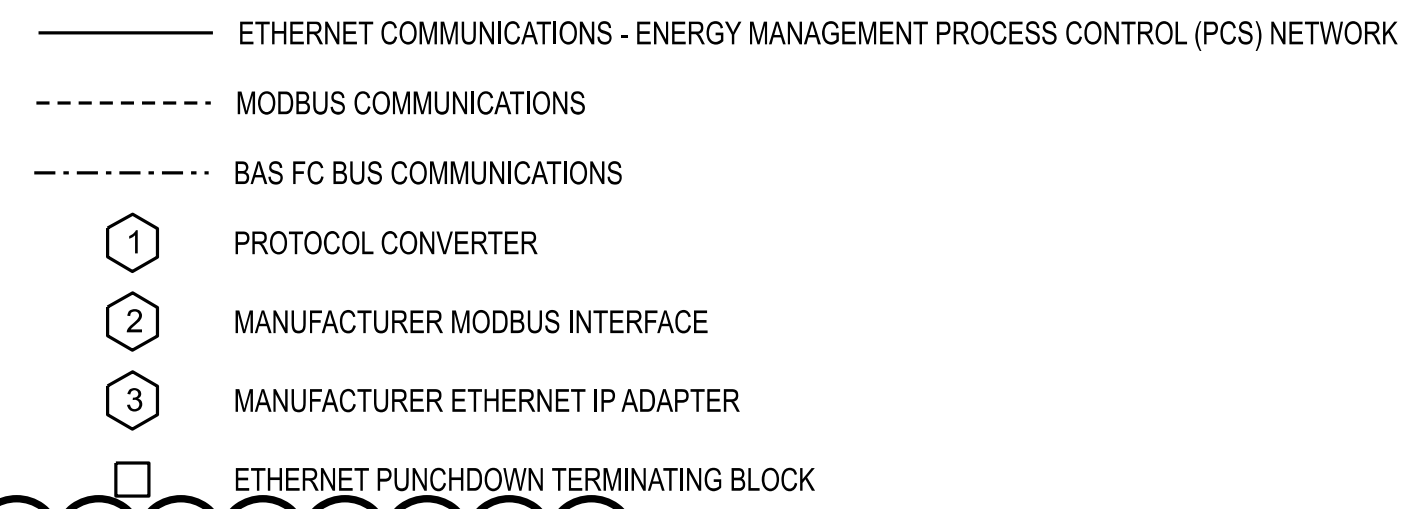


SIDE

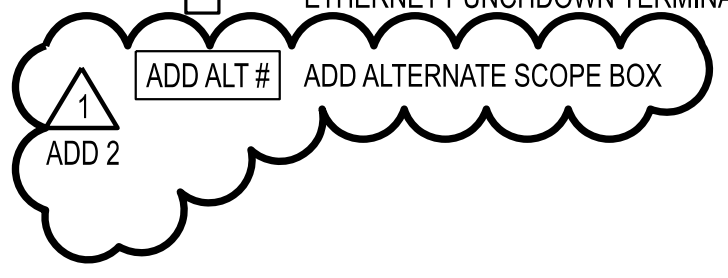
RCTP CHILLED WATER PRODUCTION NETWORKING RACK DETAIL
SCALE: 1" = 1'-0"

- NOTES:**
- PROVIDE NETWORKING RACK FOR RCTP CHILLED WATER BUILDING EXPANSION. PROVIDE TWO (2) SIDE-MOUNTED CABLING SECTIONS. TOTAL WIDTH SHALL BE 32". CHATSWORTH PRODUCT NUMBERS: HARDWARE RACK: 66353-703 CABLING SECTIONS: 30165-703
 - NETWORKING SWITCHES SHALL BE PROVIDED BY OWNER.
 - NETWORKING ETHERNET CABLE TO BE CONNECTED TO OWNER PROVIDED NETWORKING EQUIPMENT BY OWNER. CONTRACTOR TO PROVIDE DIN RAIL RJ45 PUNCHDOWN COUPLERS FOR FINAL CONNECTION TO FIELD DEVICES. SEE ELECTRICAL CONTROLS DETAILS FOR ADDITIONAL INFORMATION. WIEDMULLER PRODUCT NUMBER (OR EQUIVALENT): COUPLER: IE-TQ-RJ45-FJ-A

**CHILLED WATER PRODUCTION
RESEARCH COMMONS THERMAL PLANT
CHILLER SYSTEM PROCESS CONTROL NETWORK DIAGRAM**



- ADD ALTERNATES:**
- ADD ALTERNATE 1 - LOOP PUMP LP-02.
 - ADD ALTERNATE 2 - COOLING TOWER CT-02 AND TOWER PUMP TP-02.
 - ADD ALTERNATE 3 - CHILLER CH-02 AND CHILLER PUMP CP-02.



THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY

STATE OF MISSOURI
JEFFERY GAMBELL
PROFESSIONAL ENGINEER
NUMBER PE-2000173300
11/22/2025

ENGINEER / ARCHITECT OF RECORD:
JEFFERY GAMBELL, PE
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PHONE: 563.263.5160

1	01/22/2025	ISSUED FOR ADDENDUM 2	CHECKED BY: JTG
0	12/05/2024	ISSUED FOR BID	DRAWN BY: SMH

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UNIVERSITY OF MISSOURI - COLUMBIA
RESEARCH COMMONS THERMAL PLANT
CHILLED WATER PRODUCTION ADDITION
1400 CARRIE FRANCKE DRIVE
COLUMBIA, BOONE COUNTY, MISSOURI 65203
CHILLER SYSTEM EMCS NETWORK DIAGRAM

UNIVERSITY OF MISSOURI
PROJECT NUMBER
CP232801

CONSULTANT
PROJECT NUMBER
23073

SHEET
EC-011

