REPLACE COOLING TOWERS

SAINT LOUIS FORENSIC TREATMENT CENTER - NORTH

SAINT LOUIS, MISSOURI

OWNER: STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR

DEPARTMENT OF
OFFICE OF ADMINISTRATION

PROJECT MANAGEMENT: OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT,
DESIGN AND CONSTRUCTION

DESIGNER: BERNHARD TME
Mechanical / Plumbing / Electrical

PROJECT NUMBER: M2015-01

SITE NUMBER: 7391
ASSET NUMBER: 6517391002

DRAWING SET - SHEET LIST INDEX

STATE OF MISSOURI
MICHAEL L. PARSON, GOVERNOR

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NATHAN SCHLOTZ
NUMBER PE-2012018128
PROFESSIONAL ENGINEER
2/14/23

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

DEPARTMENT OF MENTAL HEALTH

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DESIGNED BY: NJS

SHEET TITLE:

COVER SHEET

SHEET NUMBER:

G-001

SHEET 1 OF 15
FEBRUARY 14, 2023

PLUMBING SYMBOLS

SAN — SANITARY SEWER BELOW GRADE

SAN — SANITARY SEWER ABOVE GRADE

ST — STORM SEWER BELOW GRADE

ST — STORM SEWER ABOVE GRADE

SLOPE IN DIRECTION OF ARROW
(SEE PLANS FOR % OF SLOPE)

V — VENT

CW — COLD WATER

HW — HOT WATER

HWC — HOT WATER CIRCULATING

MECHANICAL SYMBOLS AND ABBREVIATIONS

ABV	ABOVE
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
AP	ACCESS PANEL
APPROX	APPROXIMATE
AS	AIR SEPARATOR
AUTO	AUTOMATIC
AV	AIR VENT
BHP	BRAKE HORSEPOWER
BLDG	BUILDING
BM	BEAM
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BOT	BOTTOM
BSMT	BASEMENT
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
BV	BALANCE VALVE
CF	CHEMICAL FEED
CH	CHILLER
CHV	CHECK VALVE
CLG	CEILING
COM	COMMON
CONC	CONCRETE
COND	CONDENSATE
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
CT	COOLING TOWER
CTE	CONNECT TO EXISTING
CV	CONTROL VALVE
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
DDC	DIRECT DIGITAL CONTROL
DIA	DIAMETER
DIS	DISCHARGE
DN	DOWN
DP	DIFFERENTIAL PRESSURE
DR	DRAIN LINE
DV	DRAIN VALVE
DWG	DRAWING
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRIC CONTRACTOR
EF	EXHAUST FAN
EFF	EFFICIENCY
EQUIP	EQUIPMENT
EWT	ENTERING WATER TEMPERATURE
ET	EXPANSION TANK
EX	EXISTING
EXH	EXHAUST AIR
F	FLANGE CONNECTION
°F	DEGREE FAHRENHEIT
FC	FLEXIBLE CONNECTION
FLR	FLOOR
FRD	FIRE RATED DAMPER

GPM	GALLONS PER MINUTE
GV	GAUGE VALVE
HGR	HANGER
HOA	HAND OFF AUTO
HP	HORSEPOWER
HTG	HEATING
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
HX	HEAT EXCHANGER
ID	INSIDE DIAMETER
LAT	LEAVING AIR TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MBH	BTU x 1000
MPC	MECHANICAL PIPE COUPLING
MECH	MECHANICAL
MIN	MINIMUM
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NOM	NOMINAL
NTS	NOT TO SCALE
OPNG	OPENING
P	PUMP
PD	PRESSURE DROP
PR	PRESSURE REGULATOR
PRV	PRESSURE REDUCING VALVE
R	REDUCER
RA	RETURN AIR
REQ'D	REQUIRED
REV	REVISION
RF	RETURN FAN
RH	RELATIVE HUMIDITY
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RTU	ROOF TOP UNIT
RV	RELIEF VALVE
SEC	SECTION
SP	STATIC PRESSURE
SPEC	SPECIFICATIONS
STR	STRAINER
SUC	SUCTION
SUD	SUCTION DIFFUSER
SV	SERVICE VALVE
T	THERMOSTAT
TB	TESTING AND BALANCING
TH	THERMOMETER
TSP	TOTAL STATIC PRESSURE
TW	THERMOMETER WELL
TYP	TYPICAL
U	UNION
UH	UNIT HEATER
VFD	VARIABLE FREQUENCY DRIVE
WTR	WATER
w/	WITH
W/o	WITHOUT

EXISTING EQUIPMENT, DUCTWORK OR PIPING

EXISTING EQUIPMENT, DUCTWORK OR PIPING TO BE REMOVED

NEW EQUIPMENT, DUCTWORK OR PIPING

CONNECT TO THE EXISTING EQUIPMENT DESIGNATION (CONTRACTOR SHALL FIELD VERIFY SIZE INDICATED)

1 — KEYED NOTE DESIGNATION

7 — DEMOLITION KEYED NOTE DESIGNATION

EQUIPMENT TYPE
EQUIPMENT DESIGNATION
EQUIPMENT NUMBER

CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
DR	GRAVITY DRAIN PIPE
HWS	HEATING WATER SUPPLY
HWR	HEATING WATER RETURN
BV	BALANCE VALVE
CHV	CHECK VALVE
CV	TWO WAY CONTROL VALVE
3-CV	THREE WAY CONTROL VALVE
F	FLANGE CONNECTION OR BLIND FLANGE
FM	PIPE FLOW METER
MC	MECHANICAL PIPE COUPLING
PF	PIPE FLEX CONNECTION
PR	PRESSURE REGULATING VALVE
PRV	PRESSURE REDUCING VALVE
ER	ECCENTRIC PIPE REDUCER
R	PIPE REDUCER
STR	STRAINER
ST	STEAM TRAP
SV	SERVICE VALVE
TV	TRIPLE DUTY VALVE
AV	PIPE AIR VENT
CAP	PIPE CAP
DV	DRAIN VALVE
FL	DIRECTION OF FLOW IN PIPE
GA	GAUGE WITH GAUGE VALVE
GV	GAUGE VALVE
RBPB	REDUCED PRESSURE BACKFLOW PREVENTER
RV	RELIEF VALVE
U	UNION
TH	THERMOMETER
TH	THERMOMETER WELL
DN	PIPE LINE, TURNED DOWN
UP	PIPE LINE, TURNED UP
	PIPE RUNOUT OFF THE BOTTOM
	PIPE RUNOUT OFF THE TOP
	PUMP SYMBOL
	PUMP SYMBOL w/ SUCTION DIFFUSER

GENERAL DEMOLITION AND NEW WORK NOTES:

1. REMOVE EQUIPMENT, PIPING AND DUCTWORK AS INDICATED INCLUDING HANGERS, RODS, BRACKETS, ANCHOR BOLTS, SEISMIC BRACES AND CABLES AND OTHER ASSOCIATED SUPPORTS, BASES, ACCESSORIES AND SPECIALTIES.
2. CAP ALL OPEN ENDS OF EXISTING PIPE THAT REMAIN IN SERVICE. WHERE PIPING IS REMOVED TO EXISTING SERVICE VALVES, CAP SERVICE VALVES USING CAP, PLUGS, OR BLIND FLANGES.
3. PATCH HOLES IN WALLS AND PARTITIONS WHERE PIPING AND DUCTWORK ARE REMOVED. WALL AND PARTITION PATCHES SHALL MATCH EXISTING CONSTRUCTION AND FIRE RATING INCLUDING LEVEL OF SURFACE FINISH. PATCH CLAY TILE AND BRICK WALLS, FULL THICKNESS WITH BRICK AND/OR MASONRY PRODUCTS. PATCHES EXPOSED TO VIEW SHALL BE PAINTED TO MATCH SURROUNDINGS.
4. PATCH HOLES IN FLOOR WHERE PIPING AND DUCTWORK ARE REMOVED. PROVIDE CONCRETE OR GROUT INFILL WITH REINFORCING STEEL. PROVIDE FORMS AS REQUIRED. SURFACE FINISH AND FIRE RATING SHALL MATCH EXISTING SURROUNDINGS.
5. THE PLANS INDICATE, GENERALLY, THE DESIGN AND ARRANGEMENT OF DUCTWORK, PIPING, EQUIPMENT, AND ACCESSORIES, AND ARE DIAGRAMMATIC IN NATURE. THE EXACT LOCATION OF THESE ITEMS IS SUBJECT TO CHANGE DUE TO FIELD CONDITIONS WHICH SHALL BE VERIFIED BY THE CONTRACTOR. IF REQUIRED, THESE CHANGES SHALL BE MADE IN COMPLIANCE WITH THE INTERNATIONAL PLUMBING AND MECHANICAL CODES, AND WITHOUT ADDITIONAL COST TO THE OWNER.
6. EQUIPMENT SHALL BE INSTALLED, AND ADEQUATE CLEARANCES FOR MAINTENANCE AND REPLACEMENT SHALL BE PROVIDED, IN ACCORDANCE WITH THE MANUFACTURERS INSTALLATION INSTRUCTIONS AND RECOMMENDATIONS.
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE SHUT-OFF VALVES REQUIRED FOR TIE-INS AND TO ISOLATE AND DRAIN PIPING TO BE DEMOLISHED. THE SHUT-OFF DATE AND DURATION OF SHUT-OFF PERIOD SHALL BE APPROVED BY OWNER PRIOR TO SHUT OFF.
8. CONTRACTOR SHALL PROTECT ALL EXISTING FLOOR, WALL AND CEILING SURFACES IN AREAS OF WORK AND EQUIPMENT AND PERSONNEL ACCESS. CONTRACTOR SHALL PROVIDE PLASTIC FLOOR PROTECTION FILM AND MASONITE RIGID BOARDS FOR FINISHED FLOOR IN AREAS OF WORK AND ACCESS INCLUDING CORRIDORS AND TOILETS. CONTRACTOR SHALL REPAIR OR REPLACE DAMAGED FLOOR, WALL AND CEILING SURFACES AND BUILDING COMPONENTS.
9. CONTRACTOR SHALL PATCH EXISTING FIRE RESISTIVE MATERIAL WHERE HANGERS, BRACKETS, SUPPORTS, CLIPS, ANCHORS, EQUIPMENT, WALLS, ETC. ARE REMOVED OR INSTALLED AS PART OF THIS PROJECT. FIRE RESISTIVE MATERIAL SHALL BE COMPATIBLE AND OF EQUAL FIRE RATED PROTECTION AND THICKNESS OF EXISTING MATERIAL.
10. MAINTAIN MINIMUM ELECTRICAL CLEARANCES ABOVE AND IN FRONT OF ALL ELECTRICAL PANELS AND EQUIPMENT. SEE ELECTRICAL PLANS.

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DRAWN BY: JBM
CHECKED BY: EGU
DESIGNED BY: NJS

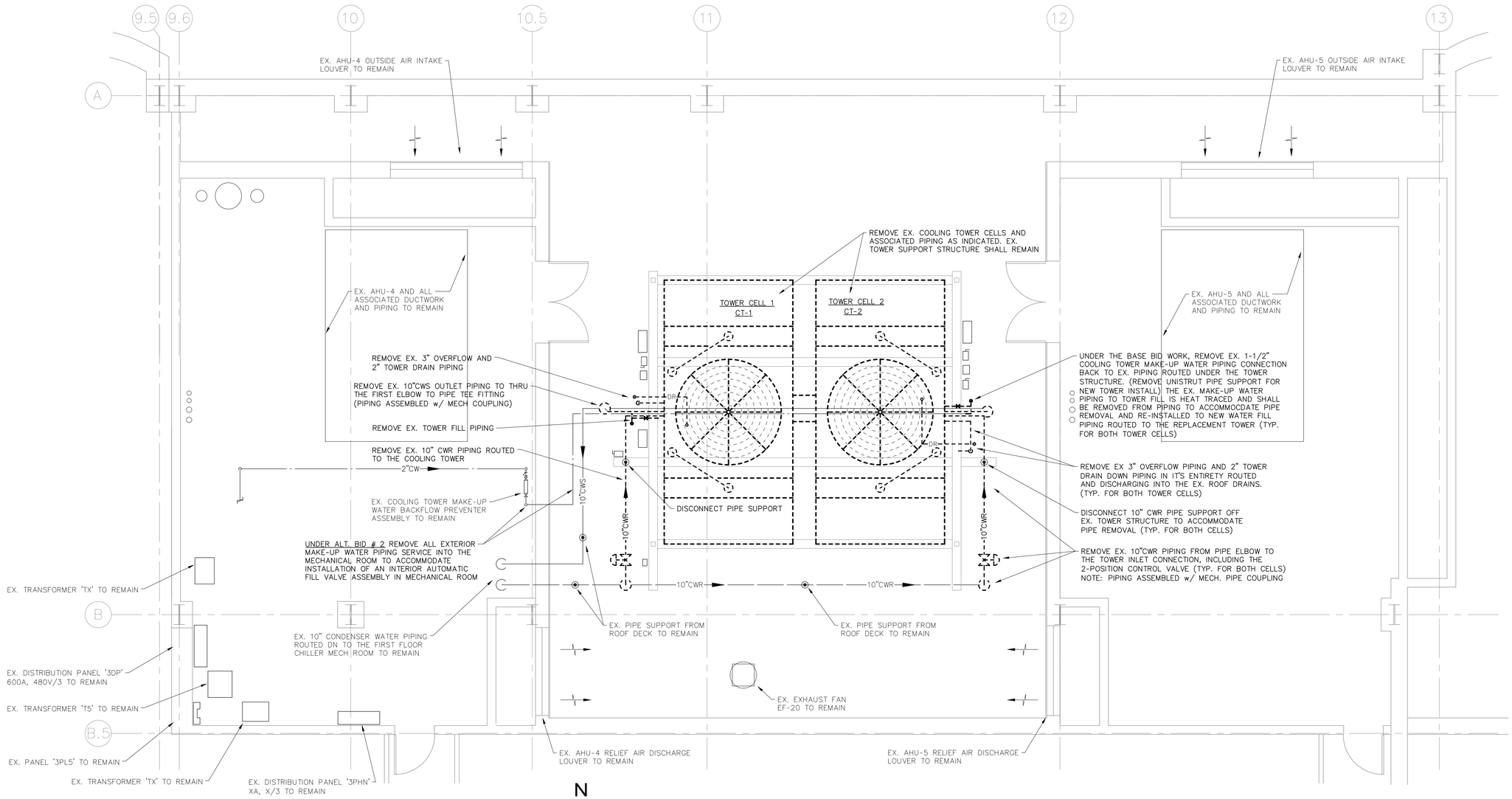
SHEET TITLE:

SYMBOLS AND ABBREVIATIONS

SHEET NUMBER:

M-001

SHEET 2 OF 15
FEBRUARY 14, 2023



PARTIAL ROOF DEMOLITION PLAN

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

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PARTIAL ROOF DEMOLITION PLAN

SHEET NUMBER:

MD-101

SHEET 3 OF 15
FEBRUARY 14, 2023

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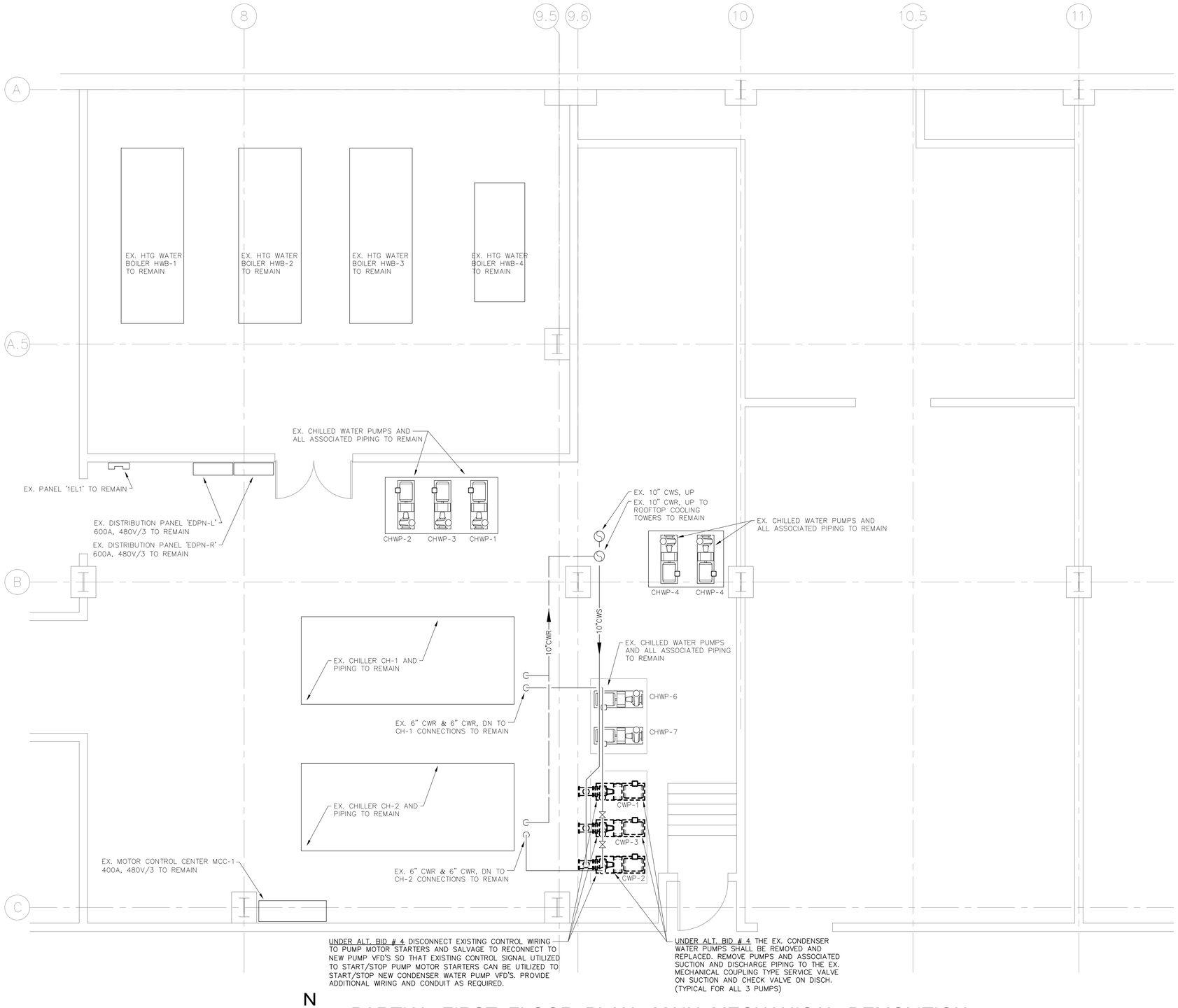

PARTIAL FIRST FLOOR PLAN - MAIN MECHANICAL DEMOLITION

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

MECHANICAL (ALT BID # 4)

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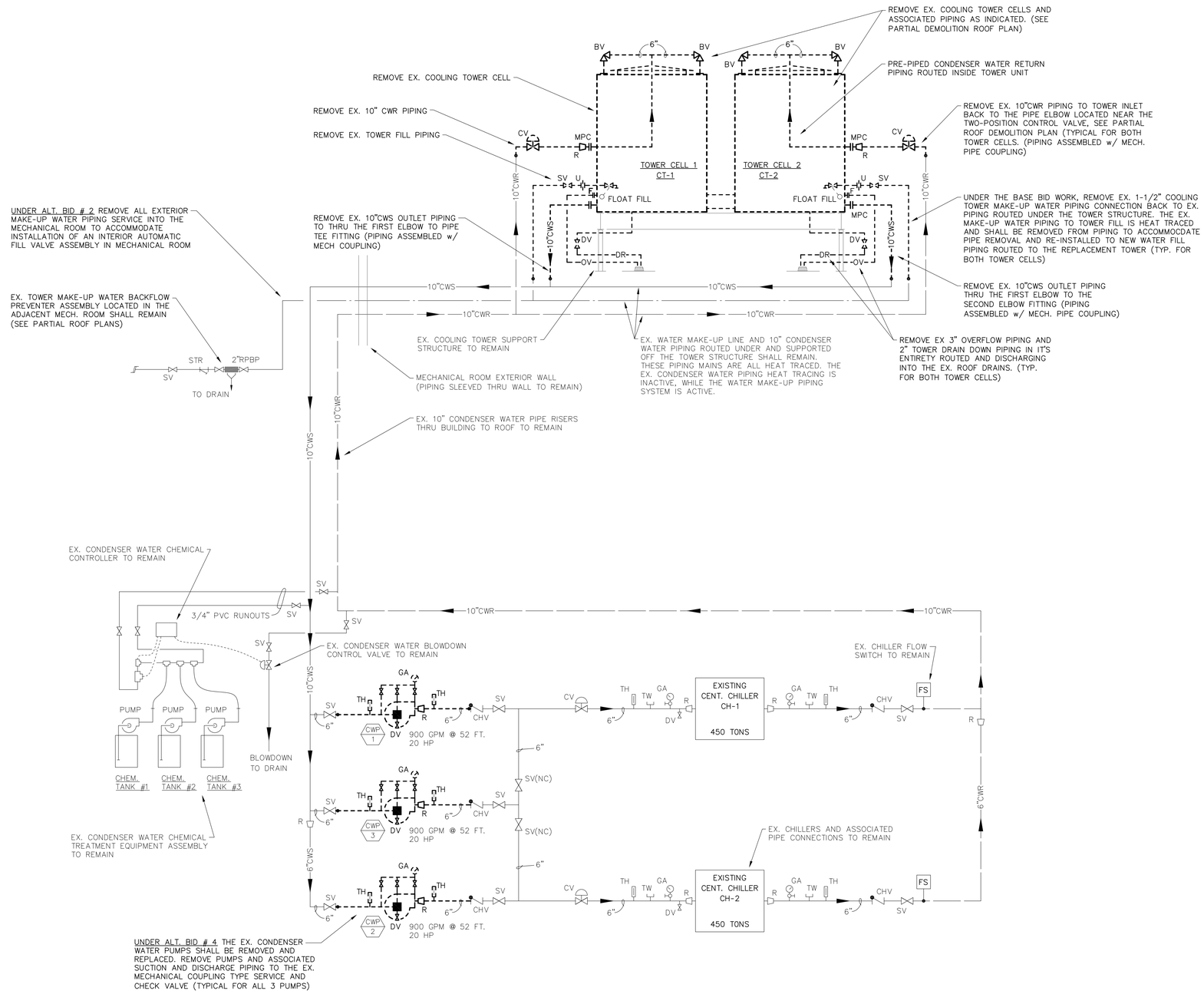
PARTIAL FIRST FLR. PLAN - MAIN EQUIP. ROOM DEMO

SHEET NUMBER:

MD-102

SHEET 4 OF 15
FEBRUARY 14, 2023



EXISTING CONDENSER WATER DEMOLITION FLOW DIAGRAM

NO SCALE

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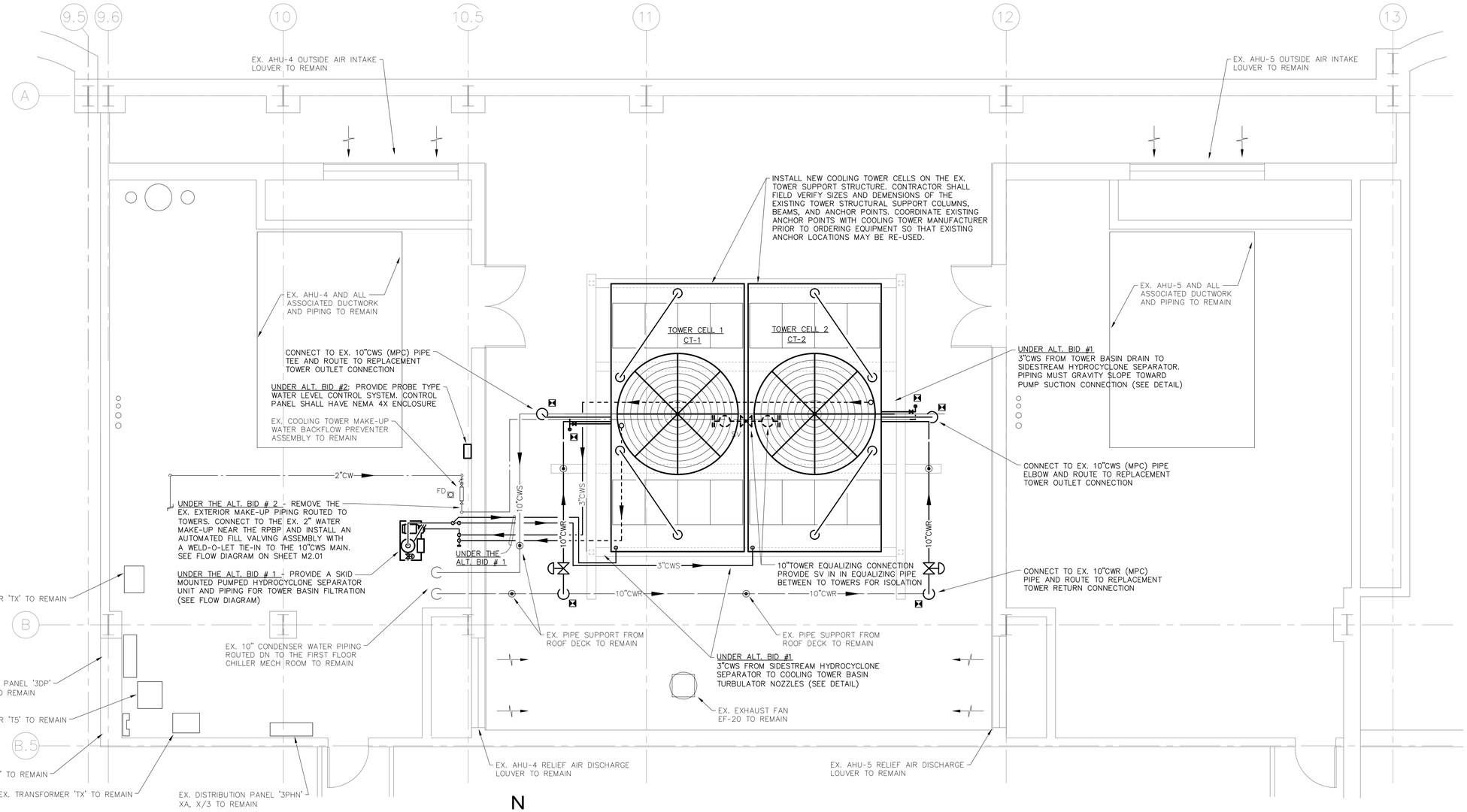
EX. CONDENSER WATER DEMOLITION FLOW DIAGRAM

SHEET NUMBER:

MD-201

SHEET 5 OF 15
FEBRUARY 14, 2023



PARTIAL ROOF PLAN - NEW WORK

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

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PARTIAL ROOF PLAN - NEW WORK

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SHEET 6 OF 15
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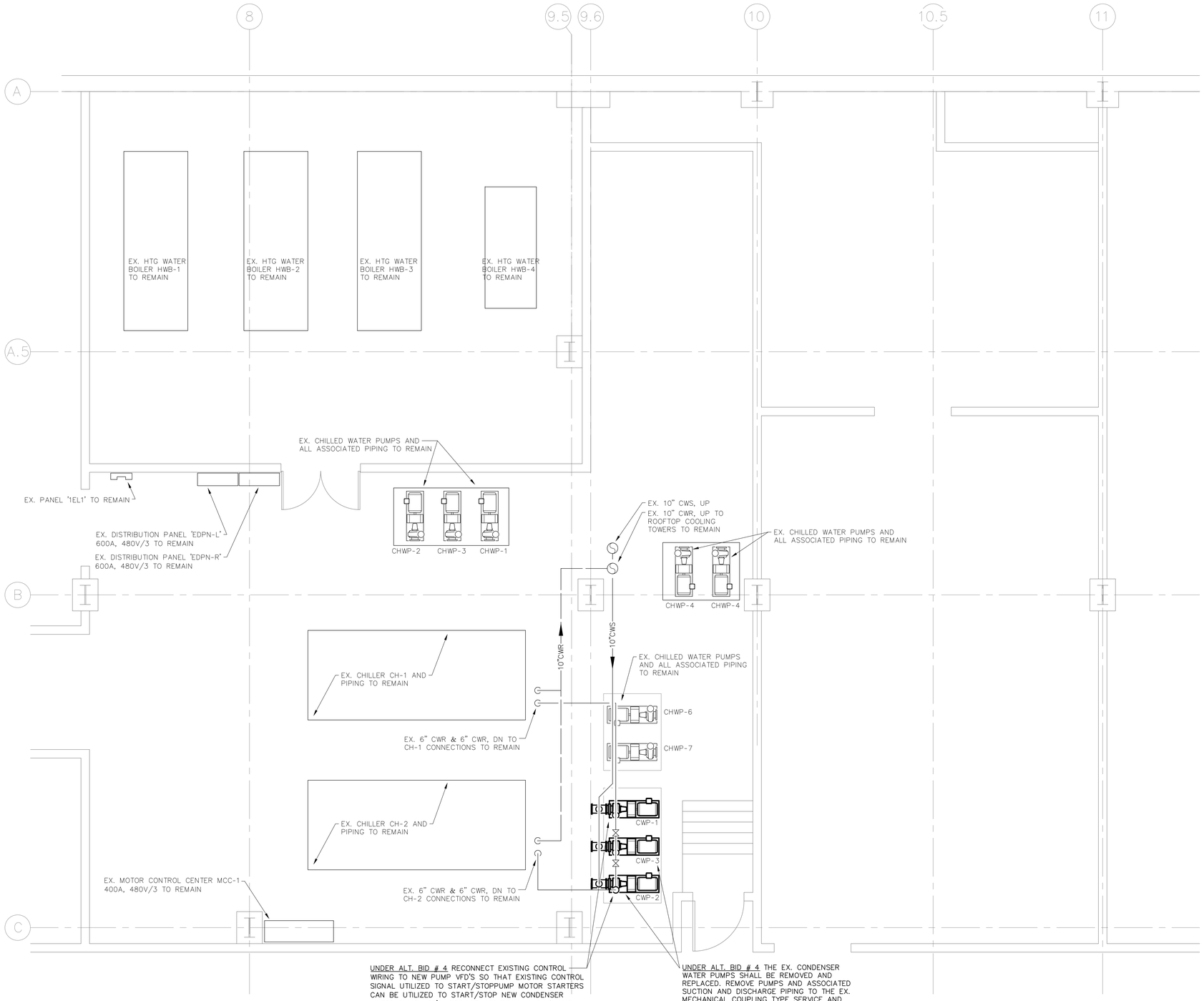

PARTIAL FIRST FLOOR PLAN - MAIN MECHANICAL NEW WORK

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

MECHANICAL (ALT BID # 4)

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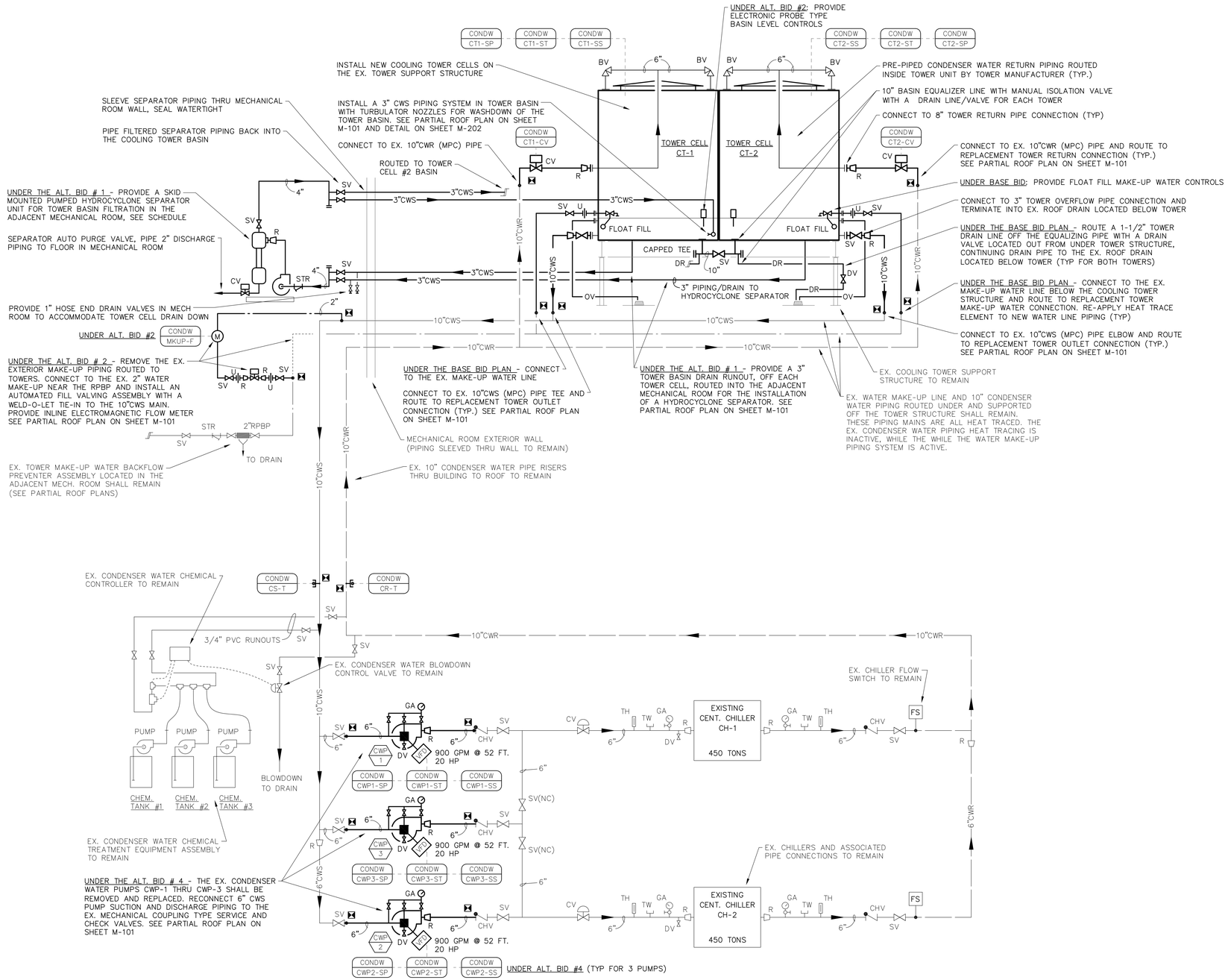
PARTIAL FIRST FLR. PLAN - MAIN EQUIP. ROOM - NEW WORK

SHEET NUMBER:

M-102

SHEET 7 OF 15
FEBRUARY 14, 2023



MODIFIED CONDENSER WATER FLOW DIAGRAM

NO SCALE

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MODIFIED CONDENSER WATER FLOW DIAGRAM

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SHEET 8 OF 15
FEBRUARY 14, 2023

TEMPERATURE CONTROL POINTS LIST SCHEDULES

POINT NAME		POINT DESCRIPTION							ALARM		TREND			FIELD DEVICE DESCRIPTION			
POINT DESIGNATION	CONTROLLER NAME	INPUT OUTPUT TYPE	DESCRIPTION	TYPE	SET POINT	UNITS	MONITOR	ADJUST	NOTIFY	THRESHOLD	TREND	FREQUENCY	ARCHIVE	INSTRUMENT TYPE	SIGNAL	RANGE	NOTES
CT1-SS	CONDW	DO	COOLING TOWER FAN START/STOP COMMAND	COMMAND	-	ON/OFF	X	OVERRIDE	-	-	X	COS	1 WEEK	RELAY	CONTACT	ON/OFF	
CT1-ST	CONDW	DI	COOILING TOWER FAN STATUS	STATUS	-	RUNNING/NOT RUNNING	X	OVERRIDE	X	START=OFF=WHEN CMD=ON	X	COS	1 WEEK	CURRENT SENSING RELAY	CONTACT	OPEN/CLOSED	
CT1-SPD	CONDW	AO	COOLING TOWER FAN SPEED COMMAND	COMMAND	-	% SPEED	X	OVERRIDE	-	-	X	15 MIN.	1 WEEK	DIRECT CONNECTION TO VFD	4-20 MA	0 TO 100%	
CT2-SS	CONDW	DO	COOLING TOWER FAN START/STOP COMMAND	COMMAND	-	ON/OFF	X	OVERRIDE	-	-	X	COS	1 WEEK	RELAY	CONTACT	ON/OFF	
CT2-ST	CONDW	DI	COOILING TOWER FAN STATUS	STATUS	-	RUNNING/NOT RUNNING	X	OVERRIDE	X	START=OFF=WHEN CMD=ON	X	COS	1 WEEK	CURRENT SENSING RELAY	CONTACT	OPEN/CLOSED	
CT2-SPD	CONDW	AO	COOLING TOWER FAN SPEED COMMAND	COMMAND	-	% SPEED	X	OVERRIDE	-	-	X	15 MIN.	1 WEEK	DIRECT CONNECTION TO VFD	4-20 MA	0 TO 100%	
CWP1-SS	CONDW	DO	CONDENSER WATER PUMP CWP-1 START/STOP COMMAND	COMMAND	-	ON/OFF	X	OVERRIDE	-	-	X	COS	1 WEEK	RELAY	CONTACT	ON/OFF	ALTERNATE BID #4
CWP1-ST	CONDW	DI	CONDENSER WATER CWP-1 PUMP STATUS	STATUS	-	RUNNING/NOT RUNNING	X	OVERRIDE	X	START=OFF=WHEN CMD=ON	X	COS	1 WEEK	CURRENT SENSING SWITCH	CONTACT	OPEN/CLOSED	ALTERNATE BID #4
CWP1-SPD	CONDW	AO	CONDENSER WATER PUMP CWP-1 SPEED COMMAND	COMMAND	-	% SPEED	X	OVERRIDE	-	-	X	15 MIN.	1 WEEK	DIRECT CONNECTION TO VFD	4-20 MA	0 TO 100%	ALTERNATE BID #4
CWP2-SS	CONDW	DO	CONDENSER WATER PUMP CWP-2 START/STOP COMMAND	COMMAND	-	ON/OFF	X	OVERRIDE	-	-	X	COS	1 WEEK	RELAY	CONTACT	ON/OFF	ALTERNATE BID #4
CWP2-ST	CONDW	DI	CONDENSER WATER CWP-2 PUMP STATUS	STATUS	-	RUNNING/NOT RUNNING	X	OVERRIDE	X	START=OFF=WHEN CMD=ON	X	COS	1 WEEK	CURRENT SENSING SWITCH	CONTACT	OPEN/CLOSED	ALTERNATE BID #4
CWP2-SPD	CONDW	AO	CONDENSER WATER PUMP CWP-2 SPEED COMMAND	COMMAND	-	% SPEED	X	OVERRIDE	-	-	X	15 MIN.	1 WEEK	DIRECT CONNECTION TO VFD	4-20 MA	0 TO 100%	ALTERNATE BID #4
CWP3-SS	CONDW	DO	CONDENSER WATER PUMP CWP-3 START/STOP COMMAND	COMMAND	-	ON/OFF	X	OVERRIDE	-	-	X	COS	1 WEEK	RELAY	CONTACT	ON/OFF	ALTERNATE BID #4
CWP3-ST	CONDW	DI	CONDENSER WATER CWP-3 PUMP STATUS	STATUS	-	RUNNING/NOT RUNNING	X	OVERRIDE	X	START=OFF=WHEN CMD=ON	X	COS	1 WEEK	CURRENT SENSING SWITCH	CONTACT	OPEN/CLOSED	ALTERNATE BID #4
CWP3-SPD	CONDW	AO	CONDENSER WATER PUMP CWP-3 SPEED COMMAND	COMMAND	-	% SPEED	X	OVERRIDE	-	-	X	15 MIN.	1 WEEK	DIRECT CONNECTION TO VFD	4-20 MA	0 TO 100%	ALTERNATE BID #4
CT-CV	CONDW	DO	COOLING TOWER CT-1 ISOLATION CONTROL VALVE	COMMAND	-	OPEN/CLOSE	X	OVERRIDE	-	-	X	COS	1 WEEK	ELECTRIC CONTROL VALVE ACTUATOR	CONTACT	OPEN/CLOSE	
CT-CV	CONDW	DO	COOLING TOWER CT-2 ISOLATION CONTROL VALVE	COMMAND	-	OPEN/CLOSE	X	OVERRIDE	-	-	X	COS	1 WEEK	ELECTRIC CONTROL VALVE ACTUATOR	CONTACT	OPEN/CLOSE	
CS1-T	CONDW	AI	CONDENSER WATER SUPPLY TEMPERATURE	TEMPERATURE	-	DEGREES F	X	OVERRIDE	-		X	15 MIN.	1 WEEK	RIGID RTD OR THERMISTOR TEMPERATURE SENSOR WITH THERMOWELL	OHMS	-30 TO 250 F	
CR1-T	CONDW	AI	CONDENSER WATER RETURN TEMPERATURE	TEMPERATURE	-	DEGREES F	X	OVERRIDE	-	-	X	15 MIN.	1 WEEK	RIGID RTD OR THERMISTOR TEMPERATURE SENSOR WITH THERMOWELL	OHMS	-30 TO 250 F	
MKUP-F	CONDW	AI	CONDENSER MAKE-UP WATER FLOW	FLOW	-	GPM	X	OVERRIDE	-	-	X	15 MIN.	1 WEEK	ELECTROMAGNETIC FLOW METER WITH TRANSMITTER	4-20MA	0-100 GPM	ALTERNATE BID #2

POINTS LIST SYMBOLS AND ABBREVIATIONS

DI	DIGITAL INPUT TO BAS
DO	DIGITAL OUTPUT TO BAS
AI	ANALOG INPUT TO BAS
AO	ANALOG OUTPUT TO BAS
NET	NETWORKED POINTS
HW	HARD WIRED INTERLOCK/SAFETY
COS	CHANGE OF STATE

POINTS LIST NOTES

STATE OF MISSOURI
MICHAEL L. PARSON, GOVERNOR

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2/14/23

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

DEPARTMENT OF MENTAL HEALTH

REPLACE COOLING TOWERS
SAINT LOUIS FORENSIC TREATMENT CENTER - NORTH
SAINT LOUIS, MISSOURI

PROJECT # M2015-01
SITE # 7391
ASSET # 6517391002

REVISION:
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CAD DWG FILE: M2015-01 M-202.DWG
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CHECKED BY: EGU
DESIGNED BY: NJS

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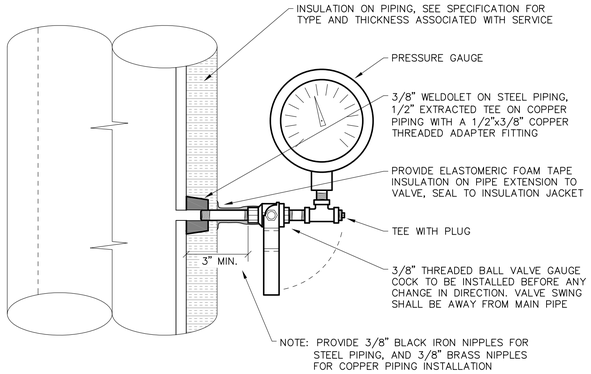
CONDENSER WATER POINTS LIST SCHEDULE

SHEET NUMBER:

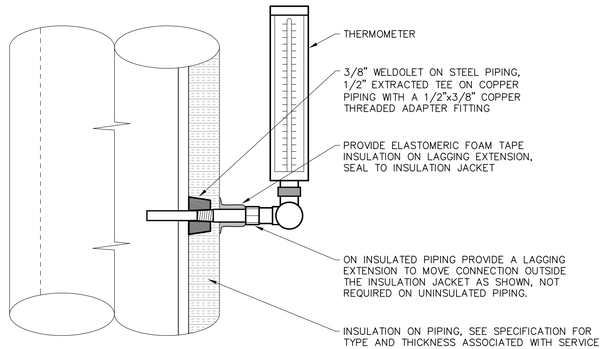
M-202

SHEET 9 OF 15
FEBRUARY 14, 2023



PRESSURE GAUGE INSTALLATION DETAIL

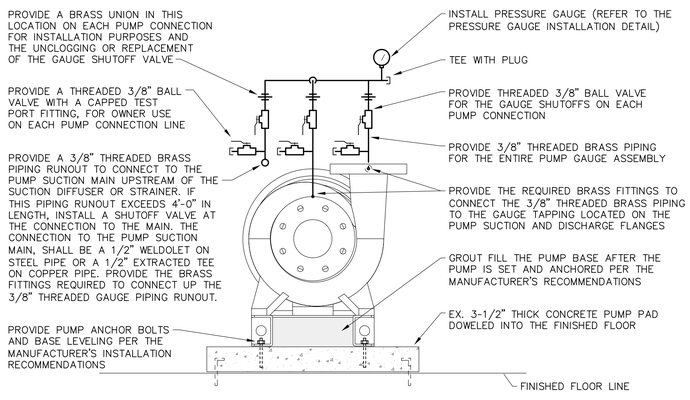
NO SCALE



THERMOMETER INSTALLATION DETAIL

NO SCALE

NOTE: COORDINATE THERMOMETER STEM LENGTH, INSERTION LENGTH AND LAGGING EXTENSION LENGTH WITH PIPE SIZE AND INSULATION REQUIREMENTS



PUMP SETTING INSTALLATION DETAIL

NO SCALE

NOTE: INSTALLATION IS SIMILAR FOR DOUBLE SUCTION PUMPS

COOLING TOWER SCHEDULE

TOWER DESIGNATION	MANUFACTURER / MODEL NUMBER	WATER FLOW (GPM)	BHP	ENTERNG WATER (°F)	LEAVING WATER (°F)	AMBIENT WET BULB (°F)	MAXIMUM STATIC LIFT (FEET)	NOZZLES ΔP (PSI)	MOTOR DATA				REMARKS
									HP	RPM	VOLTS/PH	VFD	
CT-1 & 2	MARLEY NC8405PAN	1800	11.92(x2)	100	85	78	12.3	-	15(x2)	1800	480/3	YES	NOTE 1 & 2

NOTE 1. UNDER BASE BID:PROVIDE TOWERS WITH 304 STAINLESS STEEL HOT & COLD BASINS, GALVANIZED STEEL STRUCTURAL COMPONENTS, FRP CASING PANELS & AIR INLET LOUVERS, PVC FILL & DRIFT ELIMINATORS, AND MECHANICAL FLOAT VALVE FOR BASIN LEVEL (MAKE-UP WATER) CONTROL.
NOTE 2. UNDER ALTERNATE BID #3: ALL STRUCTURAL STEEL COMPONENTS SHALL BE CONSTRUCTED FROM 304 STAINLESS STEEL

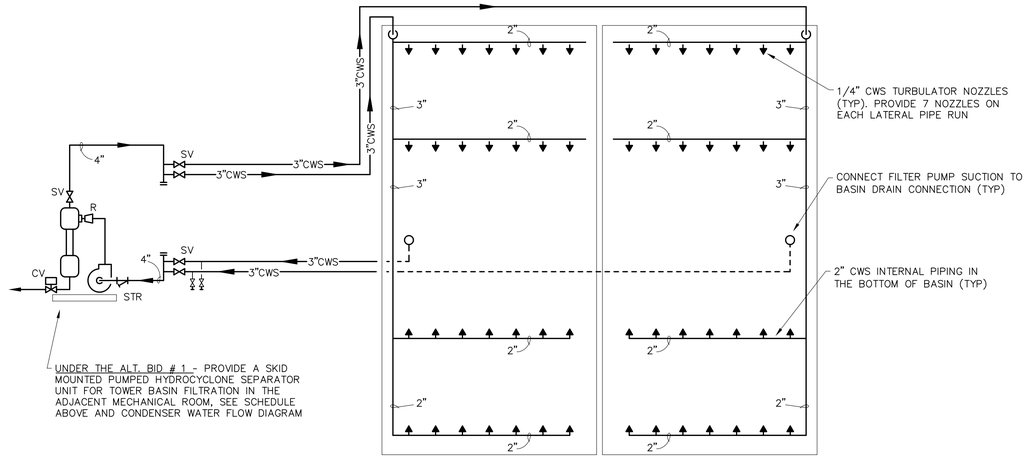
PUMP SCHEDULE (ALT. BID #4)

PUMP DESIGNATION	SERVICE	MANUFACTURER MODEL NUMBER	LOCATION	TYPE	BHP	PUMP DATA				MOTOR DATA				REMARKS
						WATER FLOW (GPM)	HEAD (FEET)	IMPELLER DIA. (IN)	NPSHA (FEET)	HP	RPM	VOLTS/PH	VFD	
CWP-1	CONDENSER WATER PUMP	B & G e-1510 5BD	MECH ROOM	BASE MOUNTED	14.4	900	50	8.375	-	15	1715	480/3	YES	ALT. BID # 4
CWP-2	CONDENSER WATER PUMP	B & G e-1510 5BD	MECH ROOM	BASE MOUNTED	14.4	900	50	8.375	-	15	1715	480/3	YES	ALT. BID # 4
CWP-3	CONDENSER WATER PUMP	B & G e-1510 5BD	MECH ROOM	BASE MOUNTED	14.4	900	50	8.375	-	15	1715	480/3	YES	ALT. BID # 4

SEPARATOR SCHEDULE (ALT. BID #1)

DESIGNATION	SERVICE	MANUFACTURER MODEL NUMBER	LOCATION	TYPE	WATER FLOW (GPM)	PUMP MOTOR DATA				REMARKS
						HP	RPM	VOLTS/PH	VFD	
S-1	CONDENSER WATER SYSTEM	EVOQUA LCS340	MECH ROOM	SIDESTREAM HYDROCYCLONE SEPARATOR	260	7.5	1800	480/3	NO	NOTE 1, 2, & 4

NOTE 1. PROVIDE WITH CONTROL PANEL, SEPARATOR CONTROL VALVE AND AUTO PURGE CONTROL VALVE
NOTE 2. PROVIDE WITH 1/4" TURBULATOR NOZZLES (28 PER BASIN)
NOTE 3. PROVIDE WITH STAINLESS STEEL SKID BASE
NOTE 4. PROVIDE WITH CIRCULATING PUMP.



COOLING TOWER BASIN TURBULATOR PIPING DETAIL

NO SCALE

STATE OF MISSOURI
MICHAEL L. PARSON, GOVERNOR

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SCHEDULES AND DETAILS

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M-203

SHEET 10 OF 15
FEBRUARY 14, 2023

ABBREVIATIONS

A

A, AMPS	AMPERES
A/C	AIR CONDITIONING
AC	ALTERNATING CURRENT
ADJ	ADJUSTABLE
AF	AMPERE FUSE
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
AIC	AMPERE INTERRUPTING CURRENT
AL	ALUMINUM
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ARCH	ARCHITECT, ARCHITECTURAL
AUX	AUXILIARY
AWG	AMERICAN WIRE GAUGE

B

BFC	BELOW FINISHED CEILING
BFG	BELOW FINISHED GRADE (EARTH)
BFS	BELOW FLOOR SLAB
BKR	BREAKER
BLDG	BUILDING

C

C	CONDUIT
CATV	CABLE TELEVISION SYSTEM
CCTV	CLOSED CIRCUIT TELEVISION
C.I.	CUBIC INCHES
CKT	CIRCUIT
CL	CENTERLINE
CLG	CEILING
COORD	COORDINATE
CSA	COLOR SELECTED BY ARCHITECT
CU, C/U	COPPER, CONDENSING UNIT

D

DC	DIRECT CURRENT
DDC	HVAC DIGITAL CONTROL PANEL
DEMO, DEMO'D	DEMOLISH, DEMOLISHED
DIA	DIAMETER
DISC. SW., D/S	DISCONNECT SWITCH
DN	DOWN
DWG	DRAWING

E

EA	EACH
EC	ELECTRICAL CONTRACTOR
EF, EXH FAN	EXHAUST FAN
ELEC	ELECTRICAL
EM	EMERGENCY FIXTURE
ENCL	ENCLOSURE
EPO	EMERGENCY POWER OFF
EQUIP	EQUIPMENT
ETR	EXISTING EQUIPMENT TO REMAIN
EWC	ELECTRICAL WATER COOLER

F

FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FD	FIRE DAMPER
FEP	HVAC FIELD EQUIP RELAY PANEL
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FM	FACTORY MUTUAL

G

G, GND, GRD	GROUND
GA	GAUGE
GALV	GALVANIZED
GENSET	GENERATOR SET
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFI	GROUND FAULT INTERRUPTER

H

HP	HORSEPOWER
HR, HRS	HOUR, HOURS
HSD	HOUSE SIDE OPTICS
HTR	HEATER
HVAC	HEATING, VENTILATION, AND AIR CONDITIONING
HZ	HERTZ

I

ID	INSIDE DIAMETER
IEEE	INSTITUTE OF ELECTRICAL AND ELECTRONICS
IES	ILLUMINATING ENGINEERING SOCIETY
IG	ISOLATED GROUND

J

J-BOX	JUNCTION BOX

K

KAIC	1000 AMPS INTERUPTING CURRENT
KCML	1000 CIRCULAR MILS
KO	KNOCKOUT
KV	KILOVOLT
KVA	KILOVOLT-AMPERE
KW	KILOWATT
KWH	KILOWATT-HOUR

L

LF	LINEAR FEET
LRA	LOCKED ROTOR AMPS
LV	LOW VOLTAGE

M

MAX	MAXIMUM
MCA	MINUMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MD	MOTORIZED DAMPER
MDP	MAIN DISTRIBUTION PANEL
MECH	MECHANICAL
MFGR, MANUF.	MANUFACTURER
MLO	MAIN LUGS ONLY
MIN	MINUTE, MINIMUM
MOCP, MOCPD	MAX. OVERCURRENT PROTECTIVE DEVICE MOUNTED
MTD	

N

N.	NEUTRAL
N.C.	NORMALLY CLOSED
N.L.	NIGHT LIGHT (FIXTURE ON 24 HRS)
N.T.S	NOT TO SCALE
N/A	NOT APPLICABLE
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRIC MANUFACTURER'S ASSOCIATION
N/F	NON-FUSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT

O

O.C.	ON CENTER
OD	OUTSIDE DIAMETER

P

PF	POWER FACTOR
PH, Ø	PHASE
PLBG	PLUMBING
PNL	PANEL
PVC	POLYVINYL CHLORIDE

Q

QTY	QUANTITY

R

RCP	REFLECTED CEILING PLAN
RE:, REF	REFERENCE, REFER
REQD	REQUIRED
REV	REVISED, REVISION, REVISE
RGS	RIGID GALVANIZED STEEL
RLA	RUNNING LOAD AMPS
RM	ROOM
RTU	ROOF TOP UNIT

S

SDBC	SOFT-DRAWN BARE COPPER
SE	SERVICE ENTRANCE
SECT	SECTION
SHT	SHEET
SIM	SIMILAR
SPEC	SPECIFICATIONS
SQ. FT., S.F.	SQUARE FEET
SS	STAINLESS STEEL
STD	STANDARD
SURF	SURFACE
SUSP	SUSPEND
SW	SWITCH

T

TELECOM	TELECOMMUNICATIONS
TGB	TELECOM GROUNDING BUSBAR
TGMB	TELECOM GROUNDING MAIN BUSBAR
THD	TOTAL HARMONIC DISTORTION
THRU	THROUGH
TYP	TYPICAL

U

U/F	UNDERFLOOR
U/G	UNDERGROUND
UGE	UNDERGROUND ELECTRIC
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES, INC.
UON, UNO	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTIBLE POWER SUPPLY

V

V	VOLT
VA	VOLT-AMPERE
VFD	VARIABLE FREQUENCY DRIVE

W

W	WATT, WIDTH
W/	WITH
W/O	WITHOUT
WH	WATER HEATER
WP	WEATHER-PROOF

X

XFMR	TRANSFORMER
XSTG	EXISTING

NOTE: REFER TO INDUSTRY STANDARDS, APPLICABLE CODES, AND PLAN DOCUMENTS OF ALL DISCIPLINES FOR MORE INFORMATION ON ABBREVIATIONS AND NOMENCLATURE.

GENERAL NOTES

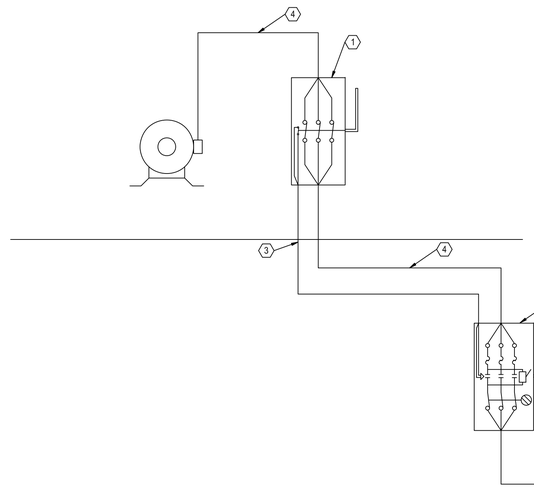
1. EACH CIRCUIT SHALL HAVE AN EQUIPMENT GROUNDING CONDUCTOR, AND MULTI-WIRE CIRCUITS OF DIFFERENT PHASES MAY SHARE EQUIPMENT GROUND CONDUCTOR. EQUIPMENT GROUND CONDUCTOR SIZE SHALL NOT BE LESS THAN #12 AWG OR AS INDICATED ON THE DRAWINGS.
2. ALL CONDUCTORS #10 AND SMALLER SHALL BE SOLID COPPER, AND ALL CONDUCTORS #8 AND LARGER SHALL BE STRANDED COPPER USING BOLTED LUGS AT TERMINALS.
3. MINIMUM CONDUIT SIZE SHALL BE 3/4" UNLESS OTHERWISE NOTED.
4. ALL WIRING DEVICES SHALL BE INSTALLED PLUMB, SQUARE, AND TRUE; AND ALL DEVICES INSTALLED AT A SINGLE LOCATION SHALL BE ALIGNED.
5. MINIMUM WIRE SIZE SHALL BE #12 AWG UNLESS OTHERWISE SPECIFIED.
6. ALL WORK SHALL COMPLY WITH THE 2020 EDITION OF THE NATIONAL ELECTRICAL CODE. CONTRACTOR SHALL REFER TO THE EQUIPMENT DRAWINGS AND DETAILS FOR EXACT LOCATIONS OF ALL WIRING DEVICES.
7. ALL CONDUIT SHALL BE INSTALLED AS HIGH AS POSSIBLE (MOUNT TO BOTTOM OF STRUCTURE) TO AVOID CONFLICTS WITH DUCTWORK AND PIPING. THE ELECTRICAL CONTRACTOR SHALL COORDINATE INSTALLATION WITH THE MECHANICAL CONTRACTOR.
8. ON THREE PHASE, FOUR WIRE SYSTEMS, DO NOT USE A COMMON NEUTRAL.MORE THAN THREE CIRCUITS IN ANY ONE CONDUIT IS NOT ALLOWED WITHOUT WRITTEN PERMISSION FROM THE ENGINEER.

GENERAL DEMOLITION NOTES

1. ALL EXISTING BRANCH CIRCUITS NOT USED SHALL BE REMOVED BACK TO PANEL. THE CIRCUIT BREAKERS SHALL BE LABELED AS SPARE, AND EXISTING CONDUIT SHALL REMAIN FROM PANEL TO ABOVE ACCESSIBLE CEILING SPACE.
2. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION IN AREAS OF RENOVATION. ALL WIRING DEVICES, LIGHT FIXTURES, WIRE, AND CONDUIT THAT IS TO BE REMOVED SHALL BE STORED, AS DIRECTED BY THE OWNER, OR RELOCATED, AS SHOWN ON THE NEW FLOOR PLANS. APPROPRIATE MEASURES SHALL BE TAKEN TO ASSURE CONTINUITY OF EXISTING CIRCUITS WHERE REQUIRED. ALL OUTAGES WHICH MAY RESULT SHALL BE COORDINATED WITH THE OWNER PRIOR TO THE WORK.
3. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR UPDATING SCHEDULES IN ALL ELECTRICAL PANELS THAT ARE AFFECTED BY THIS WORK. UPDATED SCHEDULES ARE TO BE TYPEWRITTEN.
4. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR MARKING ALL SWITCHES, RECEPTACLES, AND FIXED EQUIPMENT WITH THE BRANCH CIRCUIT PANEL NAME AND NUMBER SERVING EACH DEVICE.

SYMBOLS SCHEDULE

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	BRANCH CIRCUIT HOMERUN - PANEL & CIRCUIT NUMBER INDICATED	GFI/WP	DUPLEX RECEPTACLE - GROUND FAULT INTERRUPTING AND WEATHER-PROOF TYPES AS INDICATED ON PLANS		NONFUSED DISCONNECT SWITCH - SIZE NOTED ON PLAN
	EMERGENCY CIRCUIT IN CONDUIT	J	FLOOR MOUNTED JUNCTION BOX		COMBINATION MOTOR STARTER AND DISCONNECT SWITCH
	SURFACE MOUNTED PANEL BOARD	J	CEILING MOUNTED JUNCTION BOX		FUSED DISCONNECT
	FLOOR MOUNTED TRANSFORMER		ELECTRIC MOTOR SYMBOL		



1 VFD DISCONNECT DETAIL
SCALE: NONE

GENERAL:
THIS DETAIL APPLIES TO ALL INSTALLATIONS THAT REQUIRE A VFD WHERE THE VFD IS LOCATED OUT OF SIGHT FROM THE MOTOR THAT IT CONTROLS. OCCURANCES ARE NOTED WITH KEYED NOTES ON THE DRAWINGS.

1. DISCONNECT WITH LATE MAKE AUXILLARY SAFETY INTERLOCK CONTACTS.
   1. EC SHALL INSTALL WITHIN LINE OF SITE OF MOTOR.
   2. COORDINATE FINAL LOCATION AND INSTALLATION METHOD WITH DIV. 23 PRIOR TO INSTALLATION.
2. REMOTE VFD WITH LOCKABLE DISCONNECT, MANUAL BYPASS AND SAFETY INTERLOCK INPUT. (FURNISHED BY DIV. 23.)
   1. COORDINATE FINAL LOCATION AND INSTALLATION METHOD WITH DIV. 23 PRIOR TO INSTALLATION.
3. CONTROL WIRING
   1. EC SHALL INSTALL IN 3/4" CONDUIT. REFER TO PROJECT SPECIFICATIONS FOR CONTROL WIRE SIZE.
   2. PROVIDE LIQUID TIGHT CONDUIT AS REQUIRED BY ENVIRONMENTAL CONDITIONS.
   3. TERMINATIONS TO BE MADE BY CONTROLS CONTRACTOR.
4. POWER WIRING
   1. EC SHALL REFER TO DRAWINGS FOR CONDUIT AND WIRE SIZE.
   2. PROVIDE LIQUID TIGHT CONDUIT AS REQUIRED BY ENVIRONMENTAL CONDITIONS.

STATE OF MISSOURI
MICHAEL L. PARSON, GOVERNOR

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DEPARTMENT OF MENTAL HEALTH

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SAINT LOUIS FORENSIC TREATMENT CENTER - NORTH
SAINT LOUIS, MISSOURI

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SITE #	7391
ASSET #	6517391002

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DRAWN BY: VUP
CHECKED BY: VUP
DESIGNED BY: GDL

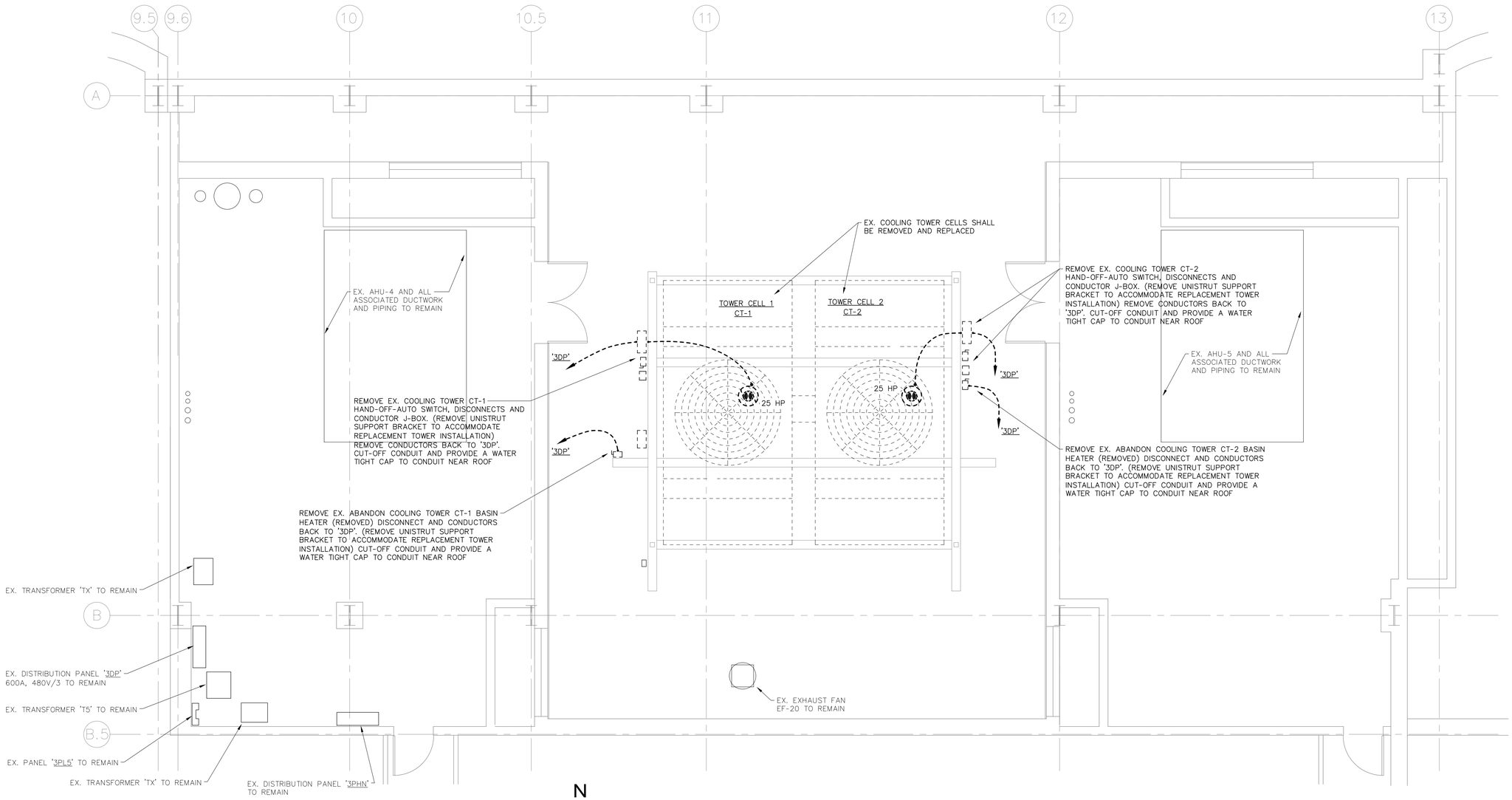
SHEET TITLE:

SYMBOLS, ABBREVIATIONS AND DETAILS

SHEET NUMBER:

E-001

SHEET 11 OF 15
FEBRUARY 14, 2023



N

PARTIAL ROOF DEMOLITION PLAN

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

STATE OF MISSOURI
MICHAEL L. PARSON, GOVERNOR

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CHECKED BY: VUP
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PARTIAL ROOF DEMOLITION PLAN

SHEET NUMBER:

ED-101

SHEET 12 OF 15
FEBRUARY 14, 2023

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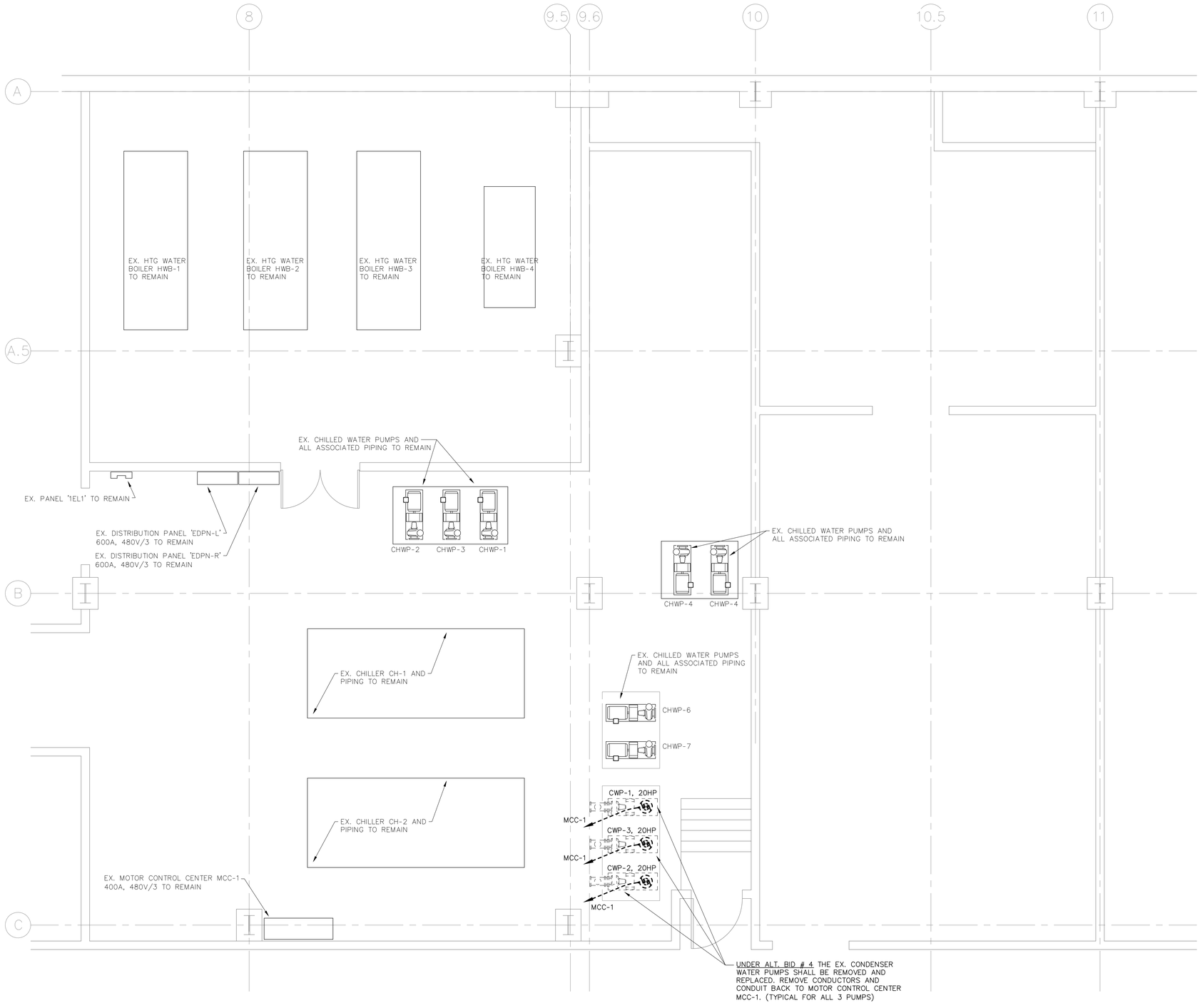

N

PARTIAL FIRST FLOOR PLAN - MAIN MECHANICAL DEMOLITION

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

ELECTRICAL (ALT BID # 4)

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DESIGNED BY: GDL

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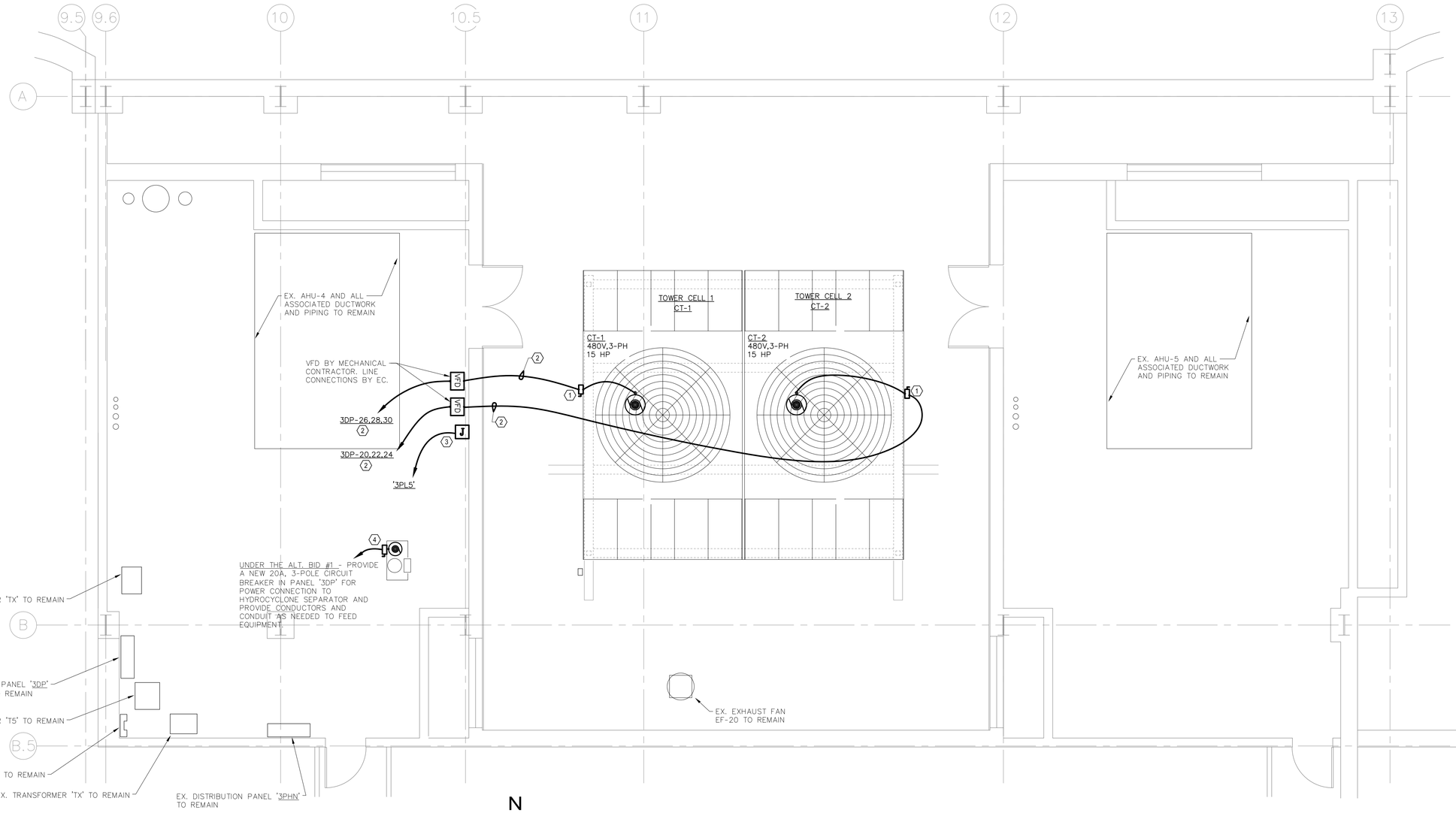
PARTIAL FIRST FLR. PLAN - MAIN EQUIP. ROOM DEMO

SHEET NUMBER:

ED-102

SHEET 13 OF 15
FEBRUARY 14, 2023



N

PARTIAL ROOF PLAN - NEW WORK

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

KEYED NOTES:

1. PROVIDE A 600V, 60A, 3P, NEMA-3X, HEAVY DUTY REMOTE NON-FUSED DISCONNECT SWITCH. REFER TO REMOTE VFD/DISCONNECT DETAIL 01 ON SHEET E-001. COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR
2. REPLACE THE EXISTING 70A BREAKER FEEDING THE EXISTING COOLING TOWERS WITH A NEW 50A, 3P BREAKER. PROVIDE (3)#10, (1)#10G, CONDUCTORS IN EXISTING CONDUIT. EXTEND CONDUIT AS NEEDED TO CONNECT TO NEW TOWERS. REFER TO DETAIL 01 ON SHEET E-001.
3. UNDER ALT. BID #2 PROVIDE 120V/1PH, POWER CONNECTION TO ELECTRONIC WATER CONTROL SYSTEM. CONNECT TO THE NEXT AVAILABLE CIRCUIT IN PANEL '3PL5' WITH 1-POLE, 20A CIRCUIT BREAKER.
4. UNDER ALT. BID#1 PROVIDE A 30A, 3P, NEMA-1, HEAVY DUTY NON-FUSED DISCONNECT SWITCH. COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR.

STATE OF MISSOURI
MICHAEL L. PARSON, GOVERNOR

These design drawings have been altered to indicate as-built information supplied by the construction contractor. The Engineer-of-Record is not responsible for the accuracy of said information. A record of as-designed drawings are maintained by the Owner.

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PROFESSIONAL ENGINEER
2/14/23

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

DEPARTMENT OF MENTAL HEALTH

REPLACE COOLING TOWERS
SAINT LOUIS FORENSIC TREATMENT CENTER - NORTH
SAINT LOUIS, MISSOURI

PROJECT # M2015-01
SITE # 7391
ASSET # 6517391002

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: 02/14/2023

CAD DWG FILE: M2015-01 E-101.DWG
DRAWN BY: JBM
CHECKED BY: VUP
DESIGNED BY: GDL

SHEET TITLE:

PARTIAL ROOF PLAN - NEW WORK

SHEET NUMBER:

E-101

SHEET 14 OF 15
FEBRUARY 14, 2023

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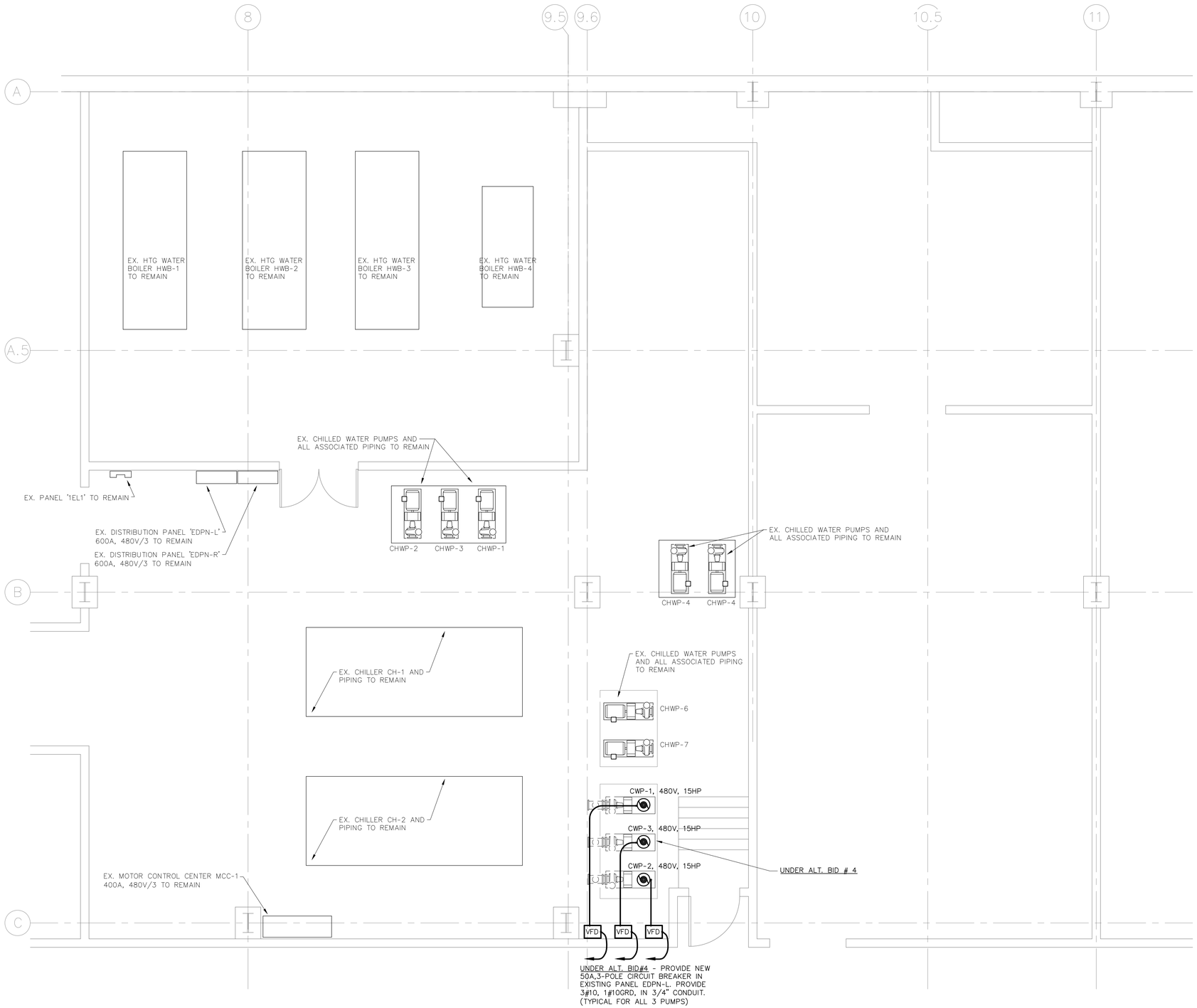

N

PARTIAL FIRST FLOOR PLAN - MAIN MECHANICAL NEW WORK

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

ELECTRICAL (ALT BID # 4)

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MICHAEL L. PARSON, GOVERNOR

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ISSUE DATE: 02/14/2023

CAD DWG FILE: M2015-01 E-102.DWG
DRAWN BY: JBM
CHECKED BY: VUP
DESIGNED BY: GDL

SHEET TITLE:

PARTIAL FIRST FLR. PLAN - MAIN EQUIP. ROOM NEW WORK

SHEET NUMBER:

E-102

SHEET 15 OF 15
FEBRUARY 14, 2023