Omaha Public Schools
Department of District Operational Services
Purchasing Division

BID No.: 26-004
Date: July 25, 2025

Addendum No. 2
to
Bid Documents for
OPS North and Northwest High School Cooling Tower Replacement Project

The purpose of this Addendum No. 2 is to modify Bid 26-004, OPS North and Northwest High School Cooling Tower Replacement Project. Except as specifically modified by this Addendum No. 2, the Bid Documents shall remain in effect as originally issued.

The Bid Documents are hereby amended as follows:

1. **Project Construction Drawings: See Revised Project Drawings with the engineer notes.**

IMPORTANT: Applicants should acknowledge the receipt of this Addendum No. 2 by a notation in the Bid submitted by the Bidder in the manner as required by the Bid Documents.

July 25, 2025 ADDENDUM #2

Ref: OPS North and Northwest Cooling Tower Replacement Project

See updated pdf 25023-OPSNorth&NorthwestCoolingTowers_BDH_Addm02-072525.pdf for updated documents.

Addendum #2 changes:

Sheet E0.1 –
Showed Main Switchboard Location and clarified intent to remove portion of feeder conduit for extension into main switchboard. Showed 480V circuit breaker and transformer and added notes requiring field verification of location of 208V panel that is served by that transformer. Revised KN 1 to clarify 120V ckt sizes/configurations. Revised KN 2 to change feeder to (2) sets of 3#4, 1#8 Ground in existing 1-1/2" conduit to coordinate with Factory Provided Panel requiring 80A MOCP.

Sheet E0.2 –
Ground in existing 1-1/2" conduit to coordinate with Factory Provided Panel requiring 80A MOCP.

Sheet E0.3 –
Revised KN 1 to indicate portion of conduit removal to MCC-A. Revised KN2 to clarify removal of VFD's and associated line and load conduit/conductors. Revised KN 5 to indicate removal of 6x6x4 j-box.

Sheet E0.4 –
Identified Location of Panel PP1. Clarified Name of 208V panel as Panel "KP". Revised KN 1 to clarify removal of VFD's and associated line and load conduit/conductors. Revised KN2 to clarify 1-1/2" conduit is existing.

Sheet E1.1 –
Revised KN 1 to clarify 120V ckt sizes/configurations. Revised KN 2 to change feeder to (2) sets of 3#4, 1#8 ground in existing 1-1/2" conduit. Revised KN 3 to indicate providing 1" conduit with 3#4, 1#8 ground from new j-box at cooling tower to new disconnect switch. Revised KN 4 to indicate providing 3/4" conduit with 3#10, 1#10 ground from factory panel to factory provided VFD's, also indicate providing 3/4" conduit with 3#8, 1#10 ground from factory panel to basin heaters. Revised KN 5 to indicate VFD provided with cooling tower. Revised KN 6 to indicate 100A disconnect instead of 200A disconnect. Revised KN 10 to indicate breaker work at the main switchboard and conduit/conductor extension into existing switchboard. Added KN 13 to indicate Field Verification required to locate 120/208V panel for new 120V ckts that are required. Added KN 14 to indicate providing a new 12X12X4 pullbox. Showed location of BMS control panel, and transformer and circuit breaker. Changed 120V ckt routing to homerun to indicate requirement to field verify its routing. Added a disconnect switch at cooling tower for connection to 2nd factory provided panel.Clarified Panel "KP" rating and # of positions available.

Sheet E1.2 –
Clarified Panel "KP" rating and # of positions available. Clarified the existing 1-1/2" conduit is exiting to remain. Revised KN 6 to indicated 120V ckt configurations. Revised KN 2 to indicate providing new 3#1/0, 1#6 ground in existing 1-1/2" conduit. Revised KN3 to indicate VFD provided with cooling tower. Revised KN 4 to indicate providing 1" conduit with 3#6, 1#10 ground from factory provided panel to factory provided VFD's. Also indicated providing 3/4" conduit with 3#8, 1#10 ground from factory provided panel to basin heaters. Added KN 10 to indicate 20A ckt connections to available spaces in Panel "KP".

Sheet E2.1 –
Added sheet - Shows demo and new work one-line diagrams for Work at Switchboard in North Cooling Tower and work in PP1 at Northwest Cooling Tower.

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OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

GENERAL NOTES

1. THE GENERAL CONTRACTOR SHALL VERIFY THE EXISTING/ACTUAL DIMENSIONS AND CONDITIONS SHOWN ON THE PLANS PRIOR TO COMMENCEMENT OF THE WORK. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE INSTALLATION OF NEW WORK WITHIN THESE EXISTING/ACTUAL CONDITIONS. DEVIATIONS IN THE EXISTING/ACTUAL CONDITIONS OR DIMENSIONS INDICATED SHALL BE COORDINATED WITH THE ARCHITECT AND OWNER IN ORDER TO MODIFY THE PLANS ACCORDINGLY.
2. THE DRAWINGS MAY SPECIFY DIMENSIONS, ELEVATIONS AND/OR CONSTRUCTION CONDITIONS TO BE FIELD VERIFIED. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFICATION OF ALL SPECIFIED DIMENSIONS, ELEVATIONS, AND/OR CONSTRUCTION CONDITIONS PRIOR TO PROCEEDING WITH CONSTRUCTION OR FABRICATION OF ANY COMPONENTS RELATED TO SUCH CONDITIONS.
3. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION MEANS AND METHODS.
4. PROVIDE ALL SPECIFIED PRODUCTS/MATERIALS UNLESS OTHERWISE NOTED OR APPROVED BY OWNER, ARCHITECT, OR ENGINEER.

INDEX OF DRAWINGS

STANDARD ABBREVIATIONS

A/C	AIR CONDITIONING
A/E	ARCHITECT/ENGINEER
ADDL	ADDITIONAL
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AFS	ABOVE FINISHED SLAB
AL	ALUMINUM
AMT	AMOUNT
ANOD	ANODIZED
ADDL	ADDITIONAL
ADDM	ADDENDUM
ADJ	ADJUSTABLE
AFF	ABOVE FINISH FLOOR
AFS	ABOVE FINISH SLAB
ALT	ALTERNATE
ARCH	ARCHITECT(URAL)
ACT	ACOUSTIC CEILING TILE
AVE	AVENUE
BFF	BELOW FINISH FLOOR
BLDG	BUILDING
B.O.	BOTTOM OF
BOT	BOTTOM
BRG	BEARING
BSMT	BASEMENT
CIP	CAST IN PLACE
CJ	CONTROL JOINT
CL	CLEAR
CLG	CEILING
CST	CLOSET
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
CONC	CONCRETE
CONF	CONFERENCE
CONT	CONTINUOUS
COORD	COORDINATE
CPT	CARPET
CT	CERAMIC TILE
DBL	DBL
DEMO	DEMOLISH
DEPT	DEPARTMENT
DF	DRINKING FOUNTAIN
DIM	DIMENSION
DIST	DISTANCE
DS	DOWNSPOUT
DW	DISHWASHER
DWG	DRAWING
DWR	DRAWER
E	EAST
EA	EACH
EIFS	EXTERIOR INSULATION & FINISH SYSTEM
EJ	EXPANSION JOINT
ELEC	ELECTRICAL
ELEV	ELEVATOR
EMER	EMERGENCY
ENCL	ENCLOSURE
ENGR	ENGINEER
EPS	EXPANDED POLYSTYRENE
EQ	EQUAL
EXT	EXTERIOR
FE	FIRE EXTINGUISHER
FF&E	FIXTURES, FURNITURE & EQUIPMENT
FFE	FINISH FLOOR ELEVATION
FLG	FLANGE/FLASHING/FLOORING
FLR	FLOOR
FPRG	FIREPROOFING
FT	FT
FTG	FOOTING
FUT	FUTURE
FV	FIELD VERIFY
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GPL	GYPSUM PLASTER
GWB	GYPSUM WALL BOARD
HC	HOLLOW CORE
HD	HARDBOARD
HDBD	HARDWOOD
HDWR	HARDWARE
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HGT	HEIGHT
HVAC	HEATING, VENTILATION, & AIR CONDITIONING
INSUL	INSULATION
INT	INTERIOR
JAN	JANITOR
KIT	KITCHEN
LAB	LABORATORY
LAV	LAVATORY
LVL	LEVEL
LW	LIGHTWEIGHT
M/R	MOISTURE RESISTANT
MAINT	MAINTENANCE
MATL	MATERIAL
MAX	MAXIMUM
MDF	MEDIUM DENSITY FIBERBOARD
MECH	MECHANICAL
MEZZ	MEZZANINE
MFG	MANUFACTURING
MFR	MANUFACTURER
MISC	MISCELLANEOUS
MULT	MULTIPLE
N	NORTH
N/A	NOT APPLICABLE
NIC	NOT IN CONTRACT
NOM	NOMINAL
NTS	NOT TO SCALE
OFCI	OWNER FURNISHED/ CONTRACTOR INSTALLED
OFF	OFFICE
OFOI	OWNER FURNISHED/ OWNER INSTALLED
OH	OVERHEAD
OPP	OPPOSITE
OPT	OPTIONAL
ORIG	ORIGINAL
P	PAINT
PLAM	PLASTIC LAMINATE
PLY	PLYWOOD
POLY	POLYSTYRENE
POLYISO	POLYISOCYANURATE
PR	PAIR
PREFAB	PREFABRICATED
PRELIM	PRELIMINARY
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY
RE:	REFERENCE
REQ'D	REQUIRED
REV	REVERSE/REVISION
RO	ROUGH OPENING
S	SOUTH/STAIN
SC	SOLID CORE
SCHED	SCHEDULE
SCWD	SOLID CORE WOOD
SF	SQUARE FEET
SGL	SINGLE
SIM	SIMILAR
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
ST	STREET
STD	STANDARD
STOR	STORAGE
STRUCT	STRUCTURAL
SUSP	SUSPENDED
T&B	TOP & BOTTOM
T&G	TONGUE & GROOVE
TBD	TO BE DETERMINED
TEMP	TEMPORARY
THRU	THROUGH
TLT	TOILET/TOILET ROOM
T.O.	TOP OF
TYP	TYPICAL
UNFIN	UNFINISHED
UNO	UNLESS NOTED OTHERWISE
UTIL	UTILITY
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VEST	VESTIBULE
W	WEST
W/	WITH
W/O	WITHOUT
W/R	WATER RESISTANT
WC	WATER CLOSET
WHSE	WAREHOUSE
WMT	WALK-OFF MAT

BID NUMBER 26-004

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I, Brian Howell, am the Coordinating Professional on the OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT project.

OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

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7/16/2025

PROJECT: 25023

DATE: 07/16/2025

SHEET G0.0

PLUMBING AND MECHANICAL SYMBOLS LEGEND

(AS APPLICABLE)

PIPING AND SPECIALTIES

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
RD	REFRIGERANT DISCHARGE	PGR	PROPYLENE GLYCOL RETURN		INLINE PUMP
RL	REFRIGERANT LIQUID	PGS	PROPYLENE GLYCOL SUPPLY	MV	AIR VENT - MANUAL
RS	REFRIGERANT SUCTION	FOR	FUEL OIL RETURN	A	AIR VENT - AUTOMATIC
CD	COIL CONDENSATE DRAIN	FOS	FUEL OIL SUPPLY	FS	FLOW SWITCH
LPS (XX)	LOW PRESSURE STEAM (PRESSURE)	FOV	FUEL OIL VENT	PS	PRESSURE SWITCH
MPS (XX)	MEDIUM PRESSURE STEAM (PRESSURE)	CR	CONDENSER WATER RETURN	AS-	AIR SEPARATOR
HPS (XX)	HIGH PRESSURE STEAM (PRESSURE)	CS	CONDENSER WATER SUPPLY		THERMOMETER
LPC	LOW PRESSURE CONDENSATE	HPWR	HEAT PUMP WATER RETURN	TW	THERMOMETER WELL
MPC	MEDIUM PRESSURE CONDENSATE	HPWS	HEAT PUMP WATER SUPPLY		BALL JOINT
HPC	HIGH PRESSURE CONDENSATE	D/R	PITCH OF PIPE, RISE (R) OR DROP (D)	PSD	PUMP SUCTION DIFFUSER
PC	PUMPED CONDENSATE		PIPE ANCHOR - MAIN		FLOAT THERMOSTATIC TRAP
MU	MAKE-UP WATER		PIPE ANCHOR - INTERMEDIATE		FLOWMETER - ORIFICE
HCR	HOT/CHILLED WATER RETURN	H	HANGER - ROD		FLOWMETER - VENTURI
HCS	HOT/CHILLED WATER SUPPLY	H	HANGER - SPRING		DUPLEX STRAINER
HWR	HEATING WATER RETURN		ALIGNMENT GUIDE		
HWS	HEATING WATER SUPPLY		FLEX CONNECTOR		
CWR	CHILLED WATER RETURN		EXPANSION - LOOP		
CWS	CHILLED WATER SUPPLY		EXPANSION - JOINT		
EGR	ETHYLENE GLYCOL RETURN				
EGS	ETHYLENE GLYCOL SUPPLY				

DUCTWORK

RECT. RND. OVAL					
	SUPPLY (SA), OUTSIDE (OA), VENTILATION (VA) AIR DUCT (UP/DOWN/SECTION)	R	ELEVATION CHANGE (RISE OR DROP)	FD	FIRE DAMPER (IN HORIZONTAL DUCT)
	RETURN (RA) AIR DUCT (UP/DOWN/SECTION)		HIGH EFF. TAKE OFF FITTING WITH VOLUME DAMPER	SD	SMOKE DAMPER (IN HORIZONTAL DUCT)
	EXHAUST (EA) AIR DUCT (UP/DOWN/SECTION)	BD	BACKDRAFT DAMPER	FD	FIRE DAMPER (IN VERTICAL DUCT)
10/6 SA	RECTANGLE DUCT (WIDTH/HEIGHT/SYSTEM)		TURNING VANES	SD	SMOKE DAMPER (IN VERTICAL DUCT)
10 Ø SA	ROUND DUCT (DIAMETER/SYSTEM)	VD	VOLUME CONTROL DAMPER	FSD	FIRE/SMOKE DAMPER (IN HORIZONTAL DUCT)
10/6 Ø SA	FLAT OVAL DUCT (WIDTH/HEIGHT/SYSTEM)		VOLUME CONTROL DAMPER	FSD	FIRE/SMOKE DAMPER (IN VERTICAL DUCT)
	FLEXIBLE DUCTWORK		OPPOSED BLADE DAMPER	AD	DUCT ACCESS PANEL
			PARALLEL BLADE DAMPER	RP	RELIEF PANEL
				CAP	DUCT END CAP

H.V.A.C.

	SUPPLY DIFFUSER		VAV TERMINAL UNIT	T	THERMOSTAT
	SUPPLY REGISTER		FAN POWERED VAV TERMINAL UNIT	TG	THERMOSTAT WITH GUARD
	SUPPLY SLOT DIFFUSER			S XX-X	TEMPERATURE SENSOR - XX-X DENOTES SERVED
	RETURN REGISTER		SIDE WALL DIFFUSER	SCO	CARBON MONOXIDE SENSOR
	RETURN GRILLE		ROUND DIFFUSER	SCO2	CARBON DIOXIDE SENSOR
	EXHAUST REGISTER		EXTERIOR LOUVER	SNOX	NITROGEN DIOXIDE SENSOR
	EXHAUST GRILLE	X / CFM	SUPPLY IDENTIFICATION TAG X DENOTES TYPE	SH	HUMIDITY SENSOR
	DUAL DUCT TERMINAL UNIT	X / CFM	RETURN/ EXHAUST/LOUVER IDENTIFICATION TAG X DENOTES TYPE	SP	PRESSURE SENSOR
		M	MOTORIZED ACTUATOR	SG	TEMPERATURE SENSOR WITH GUARD
			PNEUMATIC ACTUATOR	H	HUMIDISTAT
					EMERGENCY SHUTDOWN SWITCH

FITTINGS

SINGLE LINE	DOUBLE LINE		SINGLE LINE	DOUBLE LINE		SINGLE LINE	DOUBLE LINE	
		ELBOW			ELBOW - DOUBLE BRANCH			REDUCER - CONCENTRIC
		LONG RADIUS ELBOW			ELBOW - SIDE OUTLET UP			REDUCER - ECCENTRIC
SR	SR	SHORT RADIUS ELBOW			ELBOW - SIDE OUTLET DOWN			CAPPED CONNECTION
		45° ELBOW			ELBOW - OUTLET DOWN			THREADED CONNECTION
		TEE			ELBOW - OUTLET UP			FLANGED CONNECTION
		CROSS			TEE - OUTLET DOWN			STRAINER
		LATERAL			TEE - OUTLET UP			STRAINER WITH BALL VALVE DRAIN
		TEE - SINGLE SWEEP			TEE - SIDE OUTLET DOWN			STRAINER WITH COUPLER
					TEE - SIDE OUTLET UP			BUSHING
					SIAMESE CONNECTION			FLOW DIRECTION

VALVES

	GATE VALVE		STOP/CHECK GATE VALVE (ARROW IND. FLOW)		MULTIPURPOSE VALVE
	ANGLE GATE VALVE		SPRING GATE CHECK VALVE (ARROW IND. FLOW)	PRV	PRESSURE REDUCING VALVE
	BALL VALVE		SWING GATE CHECK VALVE (ARROW IND. FLOW)	PRV-X	PRESSURE REDUCING PILOT VALVE
L	LOCKABLE BALL VALVE		ANGLE STOP/CHECK VALVE	RPBP	REDUCED PRESS. BACKFLOW ASSY.
	BUTTERFLY VALVE	M	2-WAY ELECTROMOTOR VALVE	DC	DOUBLE CHK VALVE BACKFLOW ASSY.
	GLOBE VALVE	P	2-WAY AIRMOTOR VALVE	DDC	DOUBLE DETECTOR CHECK VALVE
	ANGLE GLOBE VALVE		2-WAY MANUAL VALVE		OUTSIDE STEM & YOKE VALVE
	PLUG VALVE	M	3-WAY ELECTROMOTOR VALVE		QUICK CLOSING FUSIBLE LINK VALVE
	DIAPHRAGM VALVE	P	3-WAY AIRMOTOR VALVE		QUICK OPENING VALVE
	DIAPHRAGM ACTUATED VALVE		3-WAY MANUAL VALVE		PRESSURE GAUGE & BALL VALVE
	VALVE IN VERTICAL LINE		SAFETY PRESSURE RELIEF VALVE		GATE VALVE WITH GLOBE VALVE BY-PASS
	HOSE GATE VALVE		PRESSURE RELIEF VALVE		GLOBE VALVE WITH GLOBE VALVE BY-PASS
	HOSE GLOBE VALVE		TEMPERATURE MIXING VALVE		SPRINKLER - CONCEALED
	HOSE ANGLE VALVE		AUTO FLOW VALVE	R	SPRINKLER - RECESSED
S	SOLENOID VALVE		FLOAT VALVE		SPRINKLER - SIDEWALL
PIV	POST INDICATOR VALVE		LOCK SHIELD		SPRINKLER - UPRIGHT
			CIRCUIT SETTER		SPRINKLER - ZONE CONTROL

MEDICAL PIPING

MA	MEDICAL AIR	N	MEDICAL NITROGEN	VAC	MEDICAL VACUUM
NOX	MEDICAL NITROUS OXIDE	OX	MEDICAL OXYGEN	WAG	WASTE ANESTHETIC GAS DISPOSAL

PLUMBING

	PIPE REMOVAL	NPCW	NON-POTABLE COLD WATER	P	TRAP PRIMER
DCW	DOMESTIC COLD WATER	NPHW	NON-POTABLE HOT WATER	HB	HOSE BIBB
DHW	DOMESTIC HOT WATER	NPSW	NON-POTABLE SOFT WATER	WH	WALL HYDRANT
RHW	DOMESTIC HOT WATER RECIRC.	PD	PUMPED DISCHARGE	RH	ROOF HYDRANT
DSW	DOMESTIC SOFT WATER	G (XX)	NATURAL GAS (PSIG)	CO	CLEAN OUT
SAN	SANITARY	PG (XX)	PROPANE GAS (PSIG)	FCO	FLOOR CLEAN OUT
ST	STORM	V	VENT	FD	FLOOR DRAIN
SO	STORM OVERFLOW	AW	ACID WASTE	VTR	VENT THRU ROOF (X DENOTES IDENTIFICATION)
GW	GREASE WASTE	AV	ACID VENT	RD	ROOF DRAIN
CA	COMPRESSED AIR	OSW	OIL/SAND	ORD	OVERFLOW ROOF DRAIN
PA	PROCESSED AIR	IR	IRRIGATION	DSN	DOWNSPOUT NOZZLE

MISCELLANEOUS

XX / X	EQUIPMENT IDENTIFICATION TAG (ELECTRICAL CONNECTION REQUIRED)		NEW CONNECTION POINT	WC	WATER CLOSET
X / XX	DETAIL REFERENCE SHEET REFERENCE		POINT OF DISCONNECT	UR	URINAL
		OA	OUTSIDE AIR	L	LAVATORY
X / XX — X / XX	SECTION CUT REFERENCE SHEET REFERENCE	VA	VENTILATION AIR	S	SINK
		EA	EXHAUST AIR	DF	DRINKING FOUNTAIN
	ELECTRICAL PANEL - SHOWN FOR COORDINATION PURPOSES ONLY	RA	RELIEF OR RETURN AIR	EWC	ELECTRIC WATER COOLER
		SA	SUPPLY AIR	SS	SERVICE SINK
	ELECTRICAL PANEL - SHOWN FOR COORDINATION PURPOSES ONLY	MA	MIXED AIR	SH	SHOWER
		RF	RELIEF OR RETURN FAN	DWH	DOMESTIC WATER HEATER
	ELECTRICAL PANEL - SHOWN FOR COORDINATION PURPOSES ONLY	EF	EXHAUST FAN	MSB	MOP SINK BASIN
					DASHED DARK LINEWORK = DEMOLITION
T	ELECTRICAL TRANSFORMER - SHOWN FOR COORDINATION PURPOSES ONLY	DCE	DUST COLLECTION EXHAUST	(E)	LIGHT LINEWORK = EXISTING
		(TYP)	TYPICAL		DARK LINEWORK = NEW

GENERAL MECHANICAL / PLUMBING DEMOLITION NOTES

APPLY TO ALL MECHANICAL AND PLUMBING SHEETS

1. ALL EXISTING ITEMS AND ASSOCIATED PIPING, ACCESSORIES, SUPPORTS AND HANGERS INDICATED BY BOLD, DASHED, HEAVY LINES OR IDENTIFIED BY NOTES, SHALL BE COMPLETELY REMOVED. PRIOR TO PROPER DISPOSAL OF REMOVED ITEMS, OWNER SHALL HAVE FIRST RIGHT OF REFUSAL.
2. DRAWINGS INDICATE APPROXIMATE ROUTING OF PIPING, DUCTWORK AND MAJOR COMPONENTS AND DO NOT INCLUDE ALL OFFSETS, FITTINGS, VALVES, ETC. CONTRACTOR SHALL FIELD VERIFY EXACT SIZE AND ROUTING PRIOR TO REMOVAL OR RELOCATION. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR REMOVAL OF MISCELLANEOUS MECHANICAL ITEMS LOCATED ON OR IN ANY WALLS TO BE REMOVED.
3. EXISTING INSULATION DAMAGED DURING DEMOLITION / CONSTRUCTION ACTIVITIES SHALL BE REPAIRED WITH SIMILAR MATERIALS.
4. ALL OPENINGS THROUGH WALLS AND FLOOR SLABS NOT BEING REUSED SHALL BE PATCHED WITH LIKE MATERIALS AND PAINTED TO MATCH EXISTING.
5. ALL OPENINGS THROUGH ROOF NOT BEING REUSED SHALL BE PATCHED WITH LIKE MATERIALS AND SEALED WATERTIGHT.
6. CONTRACTOR SHALL REMOVE ALL MATERIALS AS REQUIRED AND SHALL GIVE OWNER THE OPPORTUNITY TO INSPECT SUCH MATERIALS FOR POTENTIAL SALVAGE. CONTRACTOR SHALL REMOVE FROM THE SITE ALL MATERIALS DEEMED "NON-SALVAGEABLE" BY THE OWNER. CONTRACTOR SHALL TURN OVER TO OWNER ALL MATERIALS DEEMED "SALVAGEABLE" BY THE OWNER.

GENERAL MECHANICAL NOTES

APPLY TO ALL MECHANICAL SHEETS

A. LIGHT LINE WEIGHT INDICATES EXISTING ITEMS AND ASSOCIATED MATERIALS TO REMAIN. BOLD LINE WEIGHT INDICATES NEW WORK TO BE INSTALLED UNDER THIS CONTRACT.
B. ROUTING INDICATED ON DRAWINGS IS APPROXIMATE AND DOES NOT INCLUDE ALL OFFSETS, FITTINGS, VALVES, ETC. CONTRACTOR TO FIELD VERIFY DUCT SIZE AND SERVICE PRIOR TO FINAL CONNECTION. COORDINATE LOCATION OF HVAC WORK WITH LIGHTING, STRUCTURAL MEMBERS, PIPING SYSTEMS, ETC. PROVIDE OFFSETS AND CLEARANCES OR RELOCATE HVAC WORK AS REQUIRED TO AVOID CONFLICTS WITH WORK OF ALL OTHER TRADES.
C. HVAC WORK SHALL NOT BE LOCATED OVER ELECTRICAL, DATA, OR COMMUNICATION EQUIPMENT ROOMS. HVAC WORK SHALL NOT BE LOCATED ABOVE ELECTRICAL / DATA / COMMUNICATION EQUIPMENT OR PANELS.
D. SUPPORT ALL DUCTWORK, PIPING, EQUIPMENT, ETC. FROM BUILDING STRUCTURE. HOLD PIPING TIGHT TO BOTTOM OF STRUCTURAL MEMBERS OR RUN THROUGH JOIST WEBS IF POSSIBLE. DO NOT USE WIRE OR PERFORATED METAL TO SUPPORT PIPING. DO NOT SUPPORT PIPING FROM OTHER PIPING, DUCTWORK AND/OR ELECTRICAL CONDUITS. DO NOT SUPPORT FROM BOTTOM OF CHORD OF BAR JOIST OR FROM METAL ROOF DECK.
E. ALL DUCT SIZES SHOWN ARE CLEAR AIRWAY DIMENSIONS. INCREASE SHEET METAL SIZE TO ACCOMMODATE DUCT LINER AS REQUIRED.
F. ELBOWS SHALL BE CONSTRUCTED WITH CENTERLINE RADIUS OF NOT LESS THAN 1-1/2 TIMES THE WIDTH OF DUCT. WHERE SPACE CONDITIONS DO NOT PERMIT THIS RADIUS OR WHERE INDICATED ON DRAWINGS SQUARE ELBOWS WITH TURNING VANES SHALL BE USED.
G. SIZE TRANSITIONS WITH A MINIMUM SLOPE OF 1:4.
H. PROVIDE DRAW BANDS AND SEAL END OF DUCT INSULATION ON ALL FLEXIBLE CONNECTIONS. MAXIMUM LENGTH OF FLEXIBLE DUCTS SHALL BE THREE FEET.
I. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY SEALING PENETRATIONS THROUGH A FIRE RATED, SMOKE RATED OR COMBINATION FIRE & SMOKE RATED SEPARATIONS. SEE SPECIFICATIONS FOR FIRE & SMOKE RATED SEALANTS. SEE ARCHITECTURAL PLANS FOR RATED SEPARATIONS.
J. COORDINATE ALL GRILLE, REGISTER AND DIFFUSER LOCATIONS WITH REFLECTED CEILING PLAN, LIGHT FIXTURES, SPRINKLER HEADS, COMMUNICATION/SOUND DEVICES AND FIRE ALARM DEVICES.
K. INSTALL ESCUTCHEON PLATES ON ALL WALL PENETRATIONS SERVING ROUND DUCT WALL PENETRATIONS. FABRICATE ESCUTCHEON PLATES TO TRIM THE OPENING IN THE WALL.
L. INSTALL WALL ANGLE FOR ALL RECTANGULAR DUCT PENETRATIONS THROUGH WALLS.
M. FOR EXPOSED DUCTWORK THOROUGHLY CLEAN, REMOVE ALL SHIPPING LABELS AND OTHER IDENTIFICATION TAGS. DUCTWORK DESIGNATED TO BE PAINTED SHALL HAVE PHOSPHATIZED FINISH. PROVIDE MILL-PHOSPHATIZED FINISH FOR EXPOSED NOT DESIGNATED TO BE PAINTED. COORDINATE WITH ARCHITECTURAL DRAWINGS DUCTWORK DESIGNATED FOR PAINTING AND EXPOSED DUCTWORK REQUIREMENTS.
N. PROVIDE DUCT MOUNTED ACCESS DOOR AT FIRE DAMPER, SMOKE DAMPER OR COMBINATION FIRE/SMOKE DAMPERS TO ALLOW FOR MAINTENANCE AND VISUAL INSPECTION PER NFPA REQUIREMENTS.
O. VOLUME DAMPERS ABOVE INACCESSIBLE CEILINGS SHALL HAVE EXTENSION RODS AND ESCUTCHEON PLATES.
P. LOCATE AND INSTALL EQUIPMENT TO PROVIDE ALL CODE AND MANUFACTURER'S RECOMMENDED CLEARANCES. KEEP HVAC PIPING, DUCTWORK, ETC. OUT OF CLEARANCE AREAS.
Q. ALL OPENINGS IN WALLS AND FLOORS FOR PIPING SHALL BE CORE DRILLED OR SAW CUT, UNLESS OTHERWISE NOTED.
R. ALL HVAC PIPING WORK SHALL BE LOCATED ABOVE CEILINGS, IN A PIPE CHASE, OR OTHER CONCEALED LOCATIONS, UNLESS OTHERWISE NOTED. LOCATE AND ARRANGE VALVES, DRAIN FITTINGS, ETC. TO BE ACCESSIBLE THROUGH LAY-IN CEILINGS, ACCESS PANELS OR ACCESS DOORS. PROVIDE ACCESS PANEL OR ACCESS DOOR FOR ALL VALVES, DRAIN FITTINGS, ETC. AT NON-ACCESSIBLE LOCATIONS.
S. INSTALL SECTIONAL VALVES ON EACH BRANCH AND/OR RISER SERVING TWO OR MORE HYDRONIC TERMINALS OR EQUIPMENT CONNECTIONS. INSTALL VALVES ADJACENT TO MAIN.
T. INSTALL SHUTOFF VALVES ON INLET AND OUTLET OF EACH MECHANICAL EQUIPMENT ITEM AND/OR EACH HYDRONIC TERMINAL.
U. SLOPE HVAC PIPING TO DRAIN VALVES. PROVIDE MANUAL AIR VENTS AT HIGH POINTS AND AT TOP OF RISERS.
V. SEAL ALL HVAC PENETRATIONS. SEAL PENETRATIONS THROUGH RATED WALLS, FLOORS OR CEILINGS WITH MATERIALS APPROPRIATE FOR RATING.
W. PIPING IN EXTERIOR WALLS SHALL BE LOCATED ON THE INTERIOR SIDE OF BUILDING INSULATION AND VAPOR BARRIER.
X. COORDINATE INSTALLATION OF BUILDING INSULATION TO RUN CONTINUOUS BETWEEN PIPING AND EXTERIOR WALL SURFACE.
Y. PVC PIPING SHALL NOT BE INSTALLED IN ANY RETURN AIR PLENUM UNLESS THE PIPING IS INSTALLED IN A PRE-APPROVED RATED ASSEMBLY.
Z. COORDINATE DUCTWORK WITH STRUCTURAL CROSS BRACING. PROVIDE TOP AND BOTTOM BRIDGING BETWEEN JOISTS WHERE DUCTWORK IS TO BE INSTALLED BETWEEN THE JOISTS. COORDINATE WITH ALL TRADES.

GENERAL PLUMBING NOTES

APPLY TO ALL PLUMBING SHEETS

A. LIGHT LINE WEIGHT INDICATES EXISTING ITEMS AND ASSOCIATED MATERIALS TO REMAIN. BOLD LINE WEIGHT INDICATES NEW WORK TO BE INSTALLED UNDER THIS CONTRACT.
B. ROUTING INDICATED ON DRAWINGS IS APPROXIMATE AND DOES NOT INCLUDE ALL OFFSETS, FITTINGS, VALVES, ETC. CONTRACTOR TO FIELD VERIFY PIPE SIZE AND SERVICE PRIOR TO FINAL CONNECTION. COORDINATE LOCATION OF PLUMBING PIPING WORK WITH LIGHTING, STRUCTURAL MEMBERS, HVAC, PIPING SYSTEMS, ETC. PROVIDE OFFSETS AND CLEARANCES OR RELOCATE PLUMBING WORK AS REQUIRED TO AVOID CONFLICTS WITH WORK OF ALL OTHER TRADES.
C. PLUMBING WORK SHALL NOT BE LOCATED OVER ELECTRICAL, DATA OR COMMUNICATION EQUIPMENT ROOMS. PLUMBING WORK SHALL NOT BE LOCATED ABOVE ELECTRICAL / DATA / COMMUNICATION EQUIPMENT OR PANELS.
D. SUPPORT ALL PLUMBING PIPING, EQUIPMENT, ETC. FROM BUILDING STRUCTURE. HOLD PIPING TIGHT TO BOTTOM OF STRUCTURAL MEMBERS OR RUN THROUGH JOIST WEBS IF POSSIBLE. DO NOT USE WIRE OR PERFORATED METAL TO SUPPORT PIPING. DO NOT SUPPORT PIPING FROM OTHER PIPING, DUCTWORK AND/OR ELECTRICAL CONDUITS. DO NOT SUPPORT FROM BOTTOM OF CHORD OF BAR JOIST OR FROM METAL ROOF DECK.
E. ROUTE ABOVE GRADE DRAINAGE PIPING AS HIGH AS POSSIBLE AND COORDINATE WITH OTHER TRADES.
F. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY SEALING PENETRATIONS THROUGH A FIRE RATED, SMOKE RATED OR COMBINATION FIRE & SMOKE RATED SEPARATIONS. SEE SPECIFICATIONS FOR FIRE & SMOKE RATED SEALANTS. SEE ARCHITECTURAL PLANS FOR RATED SEPARATIONS.
G. INSTALL ESCUTCHEON PLATES ON ALL WALL AND FLOOR PENETRATIONS SERVING EXPOSED PLUMBING PIPING WALL PENETRATIONS.
H. ALL OPENINGS IN WALLS AND FLOORS FOR PIPING SHALL BE CORE DRILLED OR SAW CUT, UNLESS OTHERWISE NOTED.
I. LOCATE AND INSTALL EQUIPMENT TO PROVIDE ALL CODE AND MANUFACTURER'S RECOMMENDED CLEARANCES. KEEP HVAC PIPING, DUCTWORK, ETC. OUT OF CLEARANCE AREAS.
J. ALL PLUMBING PIPING WORK SHALL BE LOCATED ABOVE CEILINGS, IN A PIPE CHASE, OR OTHER CONCEALED LOCATIONS, UNLESS OTHERWISE NOTED. LOCATE AND ARRANGE VALVES, DRAIN FITTINGS, ETC. TO BE ACCESSIBLE THROUGH LAY-IN CEILINGS, ACCESS PANELS OR ACCESS DOORS. PROVIDE ACCESS PANEL OR ACCESS DOOR FOR ALL VALVES, DRAIN FITTINGS, ETC. AT NON-ACCESSIBLE LOCATIONS.
K. INSTALL SECTIONAL VALVES ON EACH BRANCH AND/OR RISER SERVING TWO OR MORE PLUMBING FIXTURES OR EQUIPMENT CONNECTIONS. INSTALL VALVES ADJACENT TO MAIN.
L. INSTALL SHUTOFF VALVES ON INLET AND OUTLET OF PLUMBING EQUIPMENT.
M. INSTALL STOPS AT EACH PLUMBING FIXTURE EXCEPT AT FLUSHOMETER LOCATIONS.
N. SEAL ALL PLUMBING PIPING PENETRATIONS. SEAL PENETRATIONS THROUGH RATED WALLS, FLOORS OR CEILINGS WITH MATERIALS APPROPRIATE FOR RATING.
O. PIPING IN EXTERIOR WALLS SHALL BE LOCATED ON THE INTERIOR SIDE OF BUILDING INSULATION AND VAPOR BARRIER.
P. COORDINATE INSTALLATION OF BUILDING INSULATION TO RUN CONTINUOUS BETWEEN PIPING AND EXTERIOR WALL SURFACE.
Q. COORDINATE EXACT LOCATION OF FLOOR DRAINS AND FLOOR SINKS. TOP OF GRATE SHALL BE 1/8" BELOW FINISHED FLOOR ELEVATION.
R. COMPLY WITH LOCAL UTILITY COMPANY RULES AND REGULATIONS FOR ALL GAS METER INSTALLATIONS. COORDINATE EXACT LOCATION OF GAS CONNECTIONS WITH EQUIPMENT SUPPLIED.
S. COPPER PIPING LOCATED ABOVE GRADE SHALL BE TYPE "L"; COPPER PIPING LOCATED BELOW GRADE SHALL BE TYPE "K" AND RUN CONTINUOUS WITHOUT JOINTS BELOW GRADE. TYPE "M" COPPER SHALL NOT BE USED ON PRESSURIZED PIPING SYSTEMS.
T. DRAINAGE PIPING 3 INCHES AND SMALLER SHALL SLOPE NO LESS THAN 1/4 INCH PER FOOT. DRAINAGE PIPING 4 INCHES AND LARGER SHALL SLOPE NO LESS THAN 1/8 INCH PER FOOT.
U. INSTALL WALL CLEAN OUTS (WCO) WHEN LOCATED BEHIND A WATER CLOSET AT 30" A.F.F. OR AT 42" A.F.F. ABOVE CABINETRY ON ALL SANITARY & STORM STACKS.
V. COORDINATE EXACT STORM PIPE CONNECTIONS WITH STORM DRAIN LOCATIONS SHOWN ON ARCHITECTURAL ROOF PLAN.
W. INSTALL VENT-THRU-ROOF (VTR) A MINIMUM OF 10'-0" AWAY FROM ANY OUTSIDE AIR INTAKE.
X. REMOVE, REPAIR AND REPLACE WALLS, FLOORS, ROOFS AND CEILINGS TO MATCH EXISTING, WHERE NECESSARY FOR PIPING AND FIXTURE REMOVAL & INSTALLATION.
Y. KITCHEN EQUIPMENT FURNISHED BY KITCHEN EQUIPMENT CONTRACTOR - PLUMBING CONTRACTOR SHALL ROUGH-IN AND MAKE FINAL CONNECTIONS TO UTILITIES REQUIRED AND PROVIDE PIPING, STOPS, WATER HAMMER ARRESTERS, TRAPS AND FITTINGS FOR EQUIPMENT TO BE IN OPERATIONAL ORDER. COORDINATE WITH KITCHEN EQUIPMENT SUPPLIER FOR CONNECTIONS AND LOCATIONS. SEE KITCHEN EQUIPMENT CONNECTION SCHEDULE FOR RESPONSIBILITY OF WHO FURNISHES VACUUM BREAKERS AND PRESSURE REDUCING VALVES.
Z. PVC PIPING SHALL NOT BE INSTALLED IN ANY RETURN AIR PLENUM UNLESS THE PIPING IS INSTALLED IN A PRE-APPROVED RATED ASSEMBLY.
AA. PROVIDE ACCESSIBLE SHUTOFF VALVE INSIDE THE BUILDING FOR EACH WALL HYDRANT.
BB. CONTRACTOR SHALL COORDINATE ALL CONNECTIONS OF PLUMBING SYSTEMS WITH EXTERIOR SITE UTILITIES AND SERVICES PRIOR TO INSTALLING ANY PIPING ON THE INTERIOR. CONTRACTOR SHALL CONFIRM THAT ALL INTERIOR PIPE INVERTS AND PIPE INVERTS AT THE 5' LINE MATCH EXTERIOR PIPE INVERTS, PRIOR TO INSTALLING ANY INTERIOR PIPING BELOW FLOOR.

NOTICE:
DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS AND CLEARANCES FROM ARCHITECTURAL, STRUCTURAL, SHOP AND OTHER APPROPRIATE DRAWINGS OR AT SITE. LAY OUT AND COORDINATE ALL WORK PRIOR TO INSTALLATION TO PROVIDE CLEARANCES REQUIRED FOR OPERATION, MAINTENANCE, AND CODES. VERIFY NON-INTERFERENCE WITH OTHER WORK. DO NOT FABRICATE PRIOR TO VERIFICATION OF CLEARANCES FOR ALL TRADES. THIS NOTICE APPLIES TO ALL MECHANICAL / PLUMBING PLANS.

MECHANICAL

OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

MECHANICAL SYMBOLS LEGEND AND GENERAL NOTES

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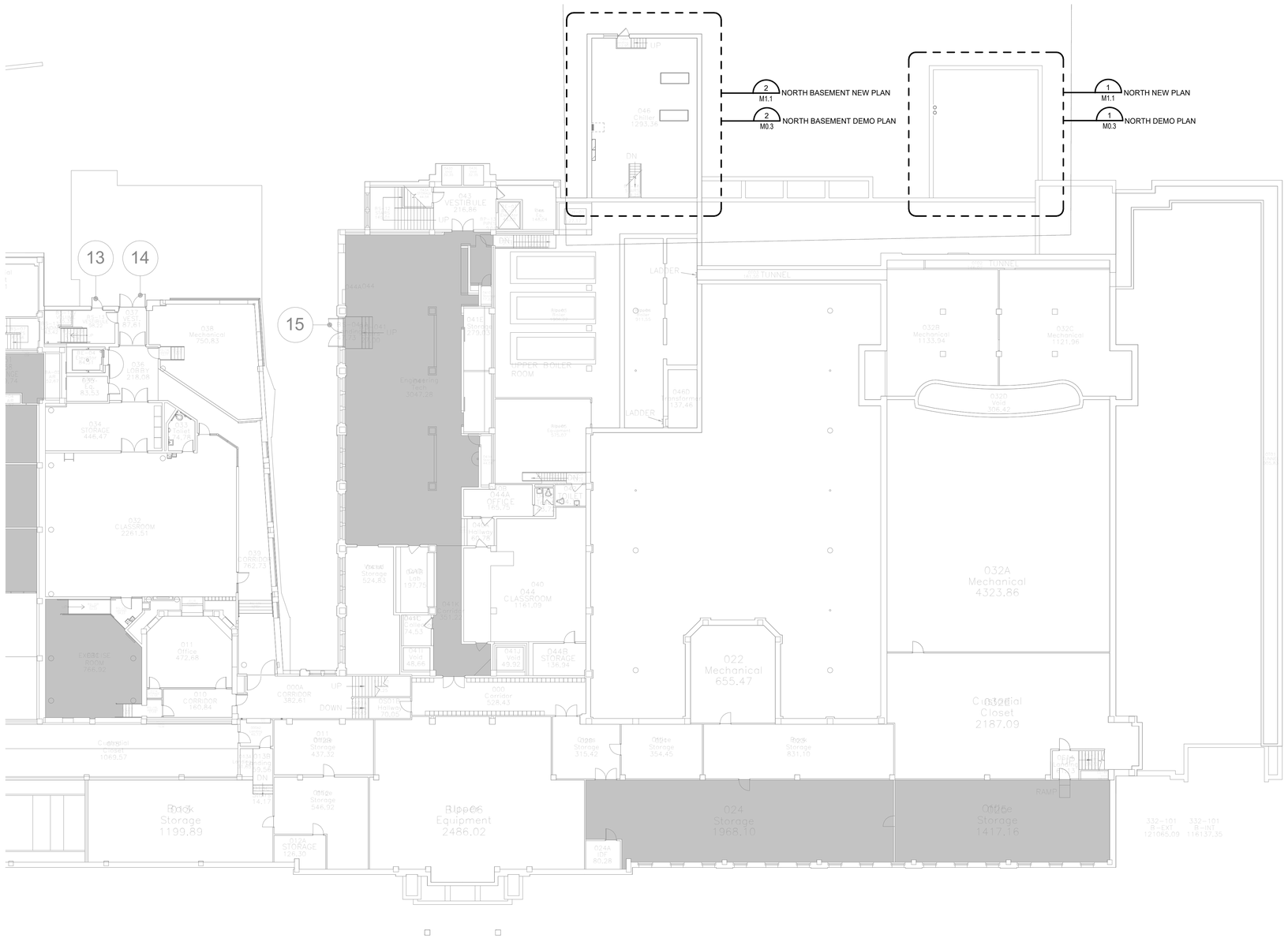
7/16/2025

PROJECT: 25023
DATE: 07/16/2025
SHEET M0.0



NORTH MECHANICAL KEY PLAN

SCALE: 1/16" = 1'-0"

0' 4' 8' 16' 32' 48'

NORTH

OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

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NORTH MECHANICAL KEY PLAN

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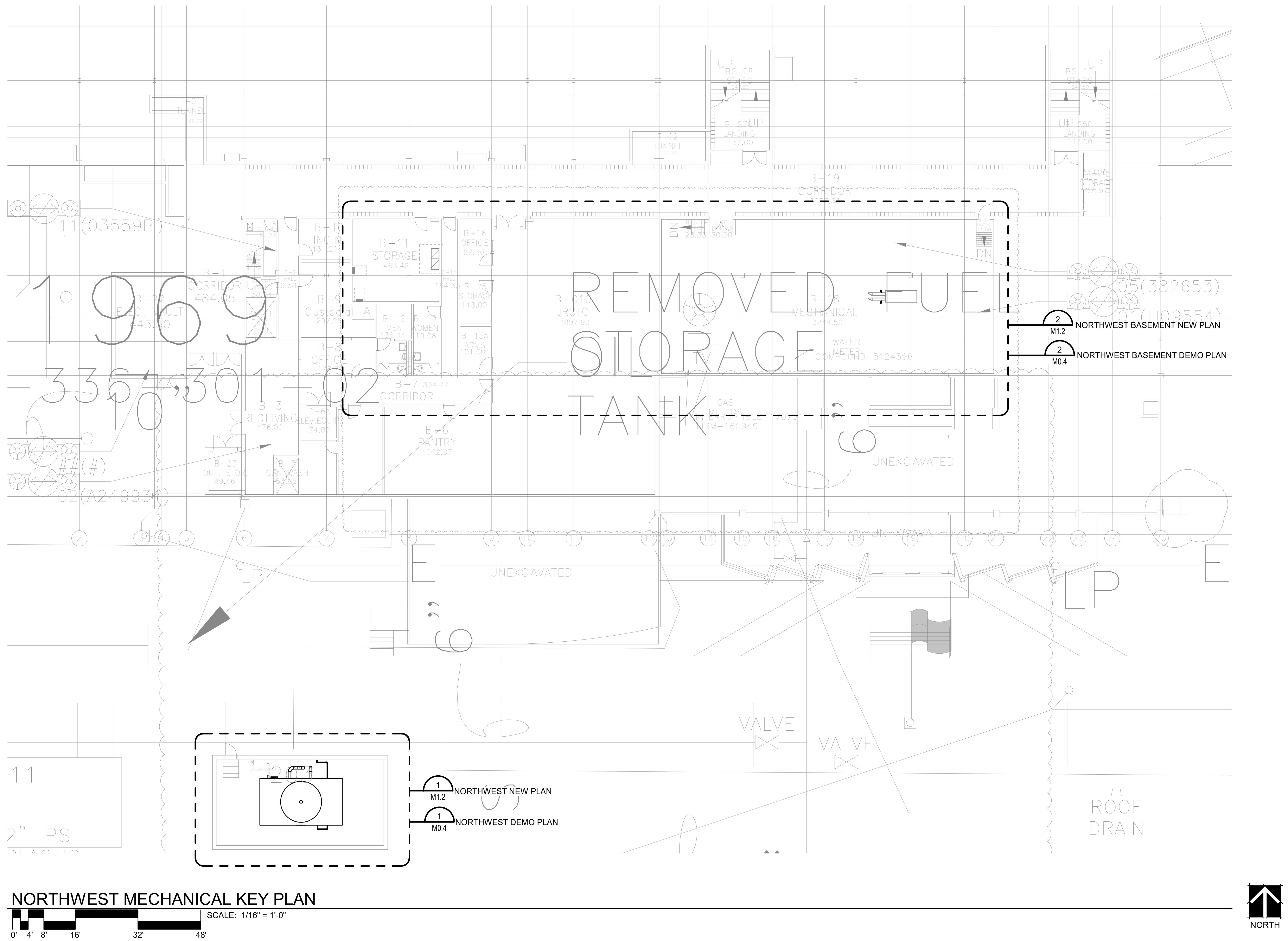

NORTHWEST MECHANICAL KEY PLAN

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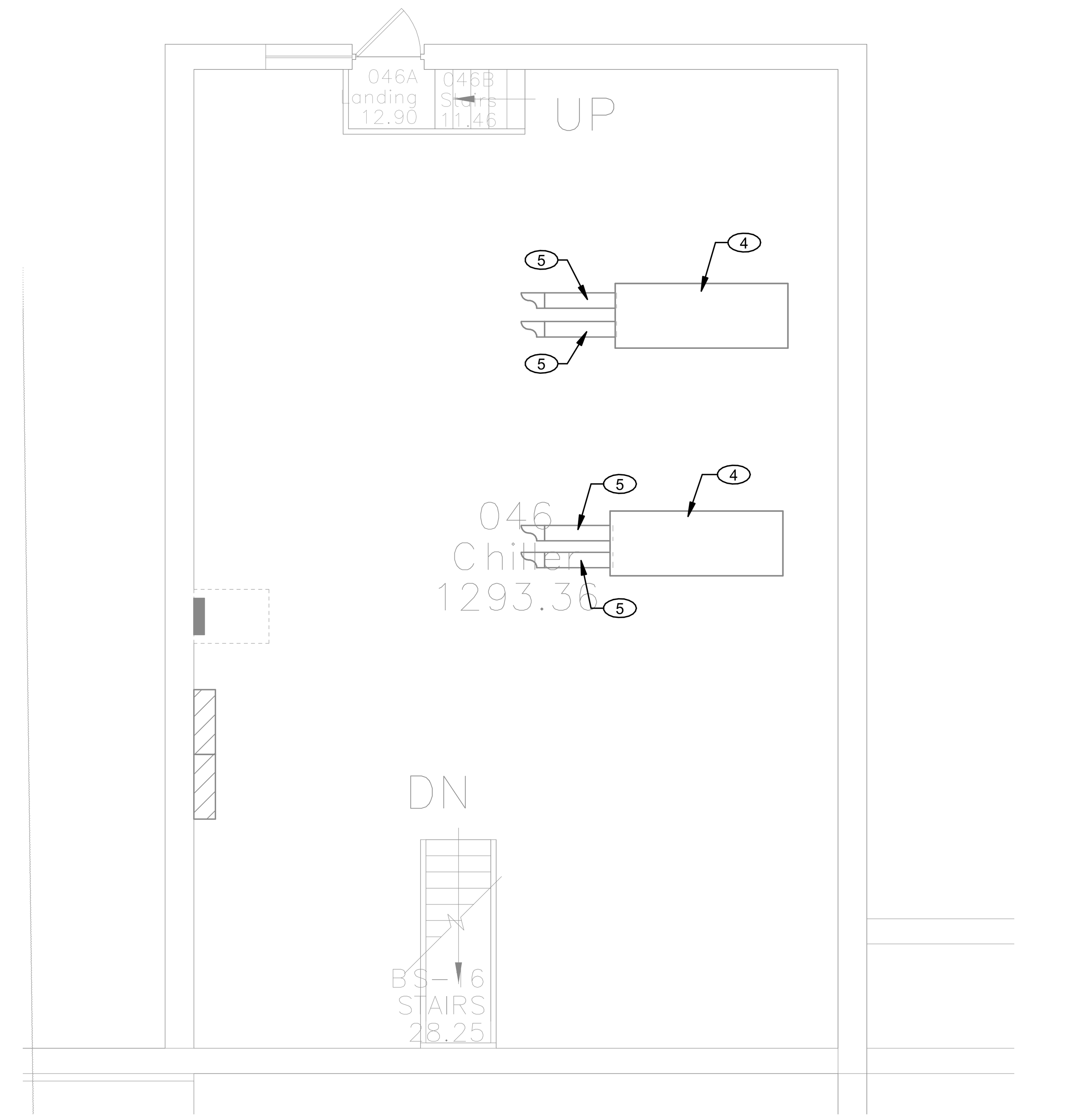
SHEET M0.2

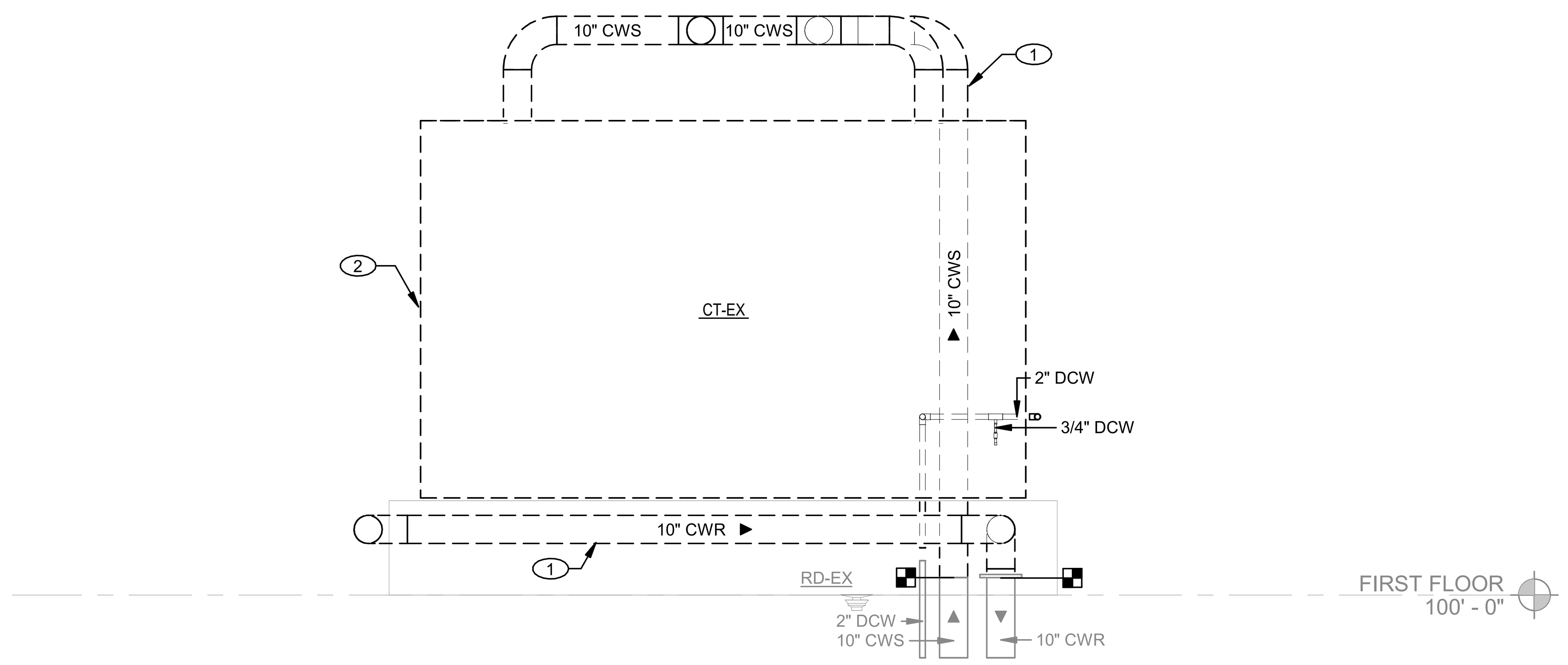


2 M0.3 NORTH BASEMENT MECHANICAL DEMOLITION PLAN

SCALE: 3/16" = 1'-0"

0' 2' 4' 8' 16'

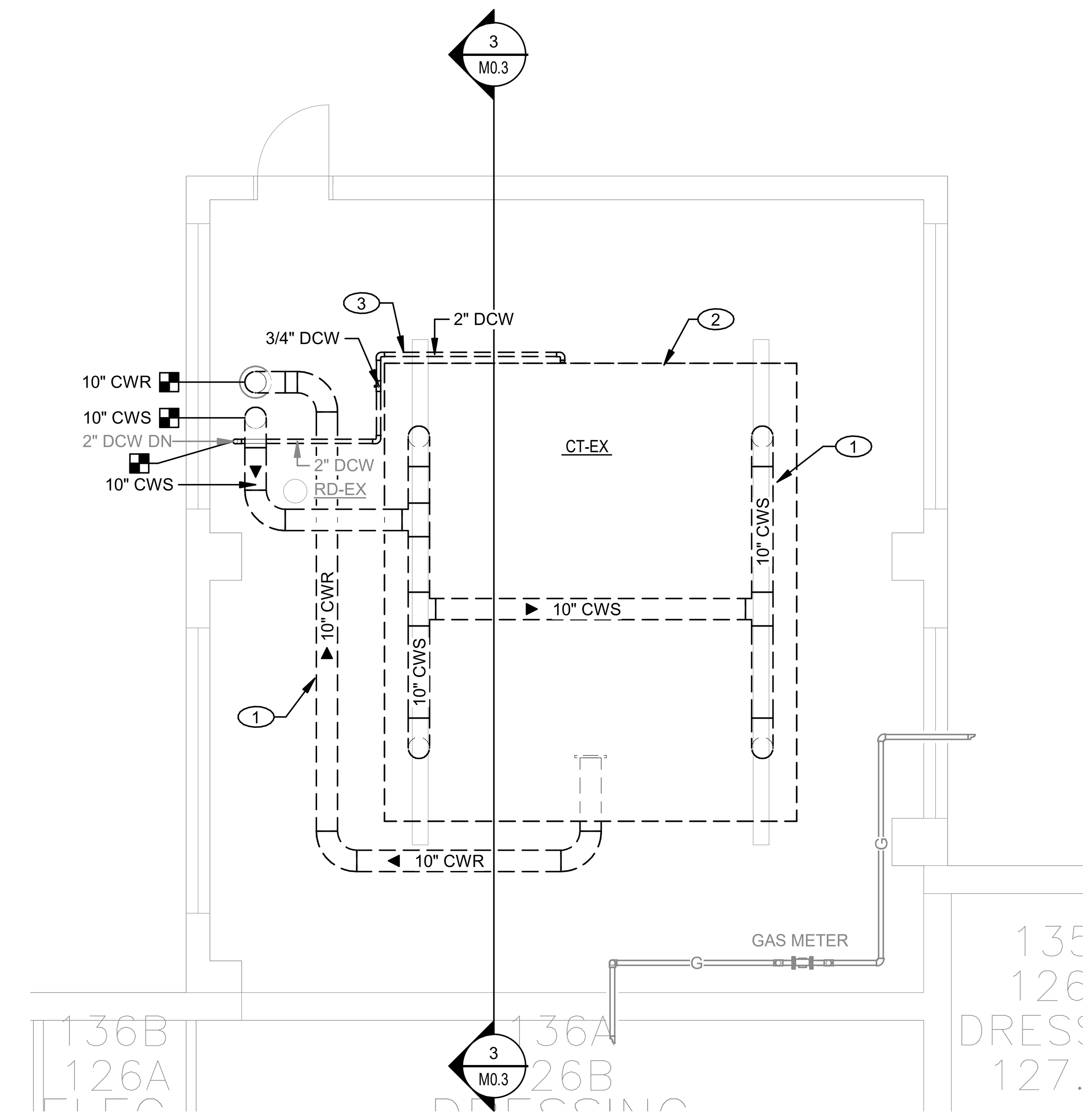
NORTH



3 M0.3 NORTH SCHOOL SECTION AT PIPING DEMOLITION

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

0' 1' 2' 4' 6' 12'



1 M0.3 NORTH MECHANICAL DEMOLITION PLAN

SCALE: 3/16" = 1'-0"

0' 2' 4' 8' 16'

NORTH

MECHANICAL DEMOLITION NOTES:

A. SEE SHEET M0.0 FOR MECHANICAL SYMBOLS LEGEND AND GENERAL PLUMBING DEMOLITION NOTES.

KEYNOTES	
1	REMOVE ALL PIPING FROM TOWER TO FLANGE AT GROUND PENETRATION. LOWER TOWER SUPPLY PIPING CONNECTION POINT AS LOW AS POSSIBLE.
2	REMOVE EXISTING TOWER AND ALL ASSOCIATED COMPONENTS. PREPARE EXISTING CONCRETE SUPPORTS TO ACCEPT NEW STEEL EXTENSION AND NEW TOWER.
3	REMOVE MAKE UP WATER BACK TO ISOLATION VALVE. REMOVE ISOLATION VALVE AND PREPARE PIPING FOR NEW VALVE.
4	EXISTING CHILLER TO REMAIN.
5	PREPARE CONDENSER WATER PIPING AT CHILLER FOR NEW 1" TAP FOR NEW NO SCALE SYSTEM.

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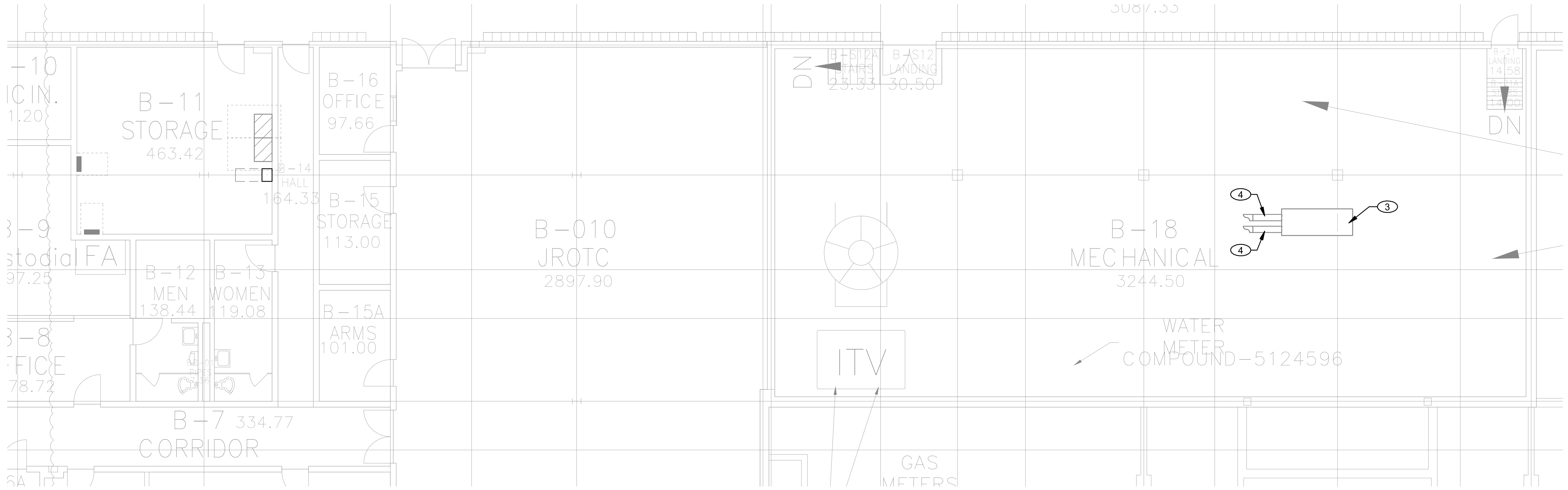
7/16/2025

PROJECT: 25023

DATE: 07/16/2025

SHEET M0.3

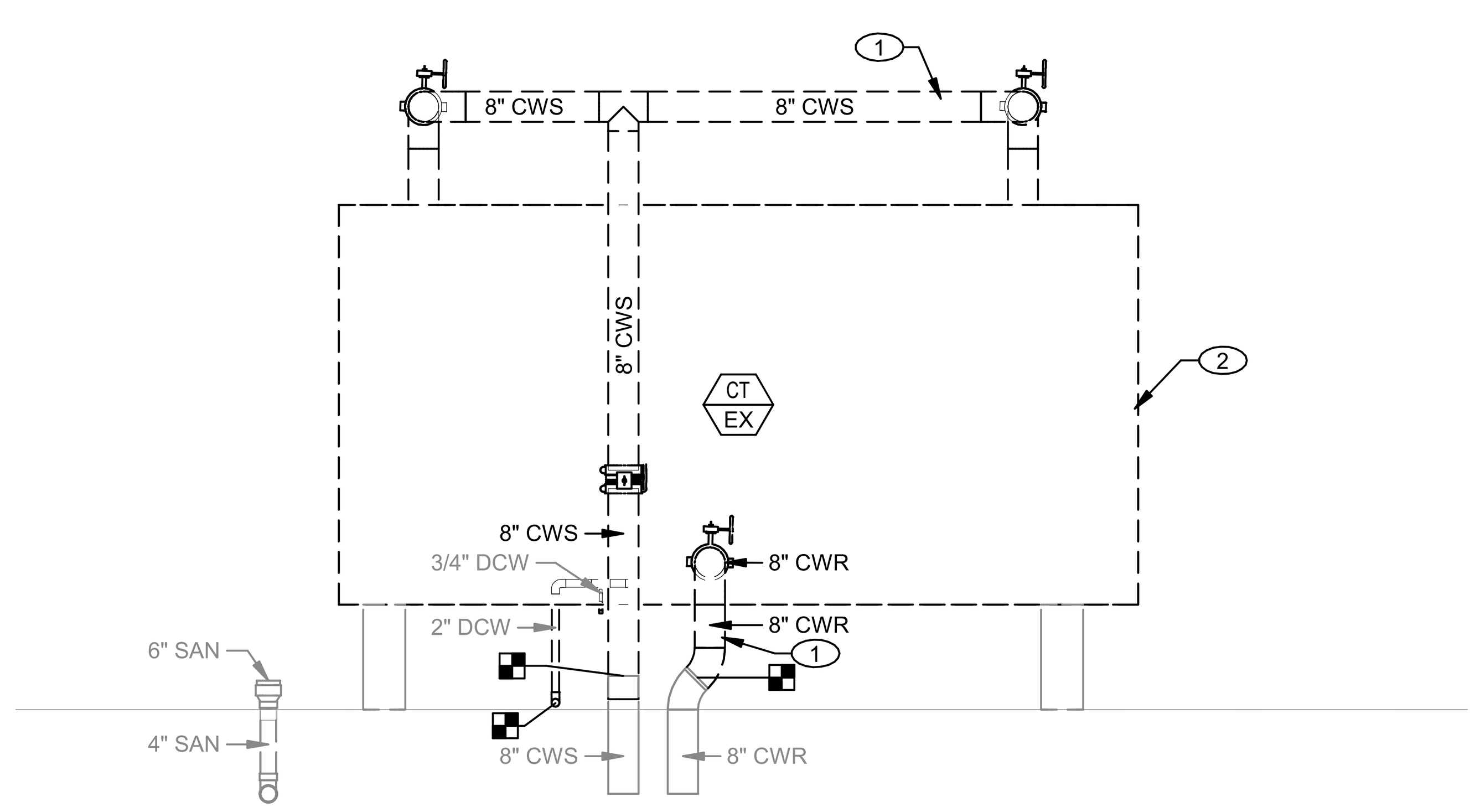


2 M0.4 NORTHWEST BASEMENT MECHANICAL DEMOLITION PLAN

SCALE: 1/8" = 1'-0"

0' 2' 4' 8' 16' 24'

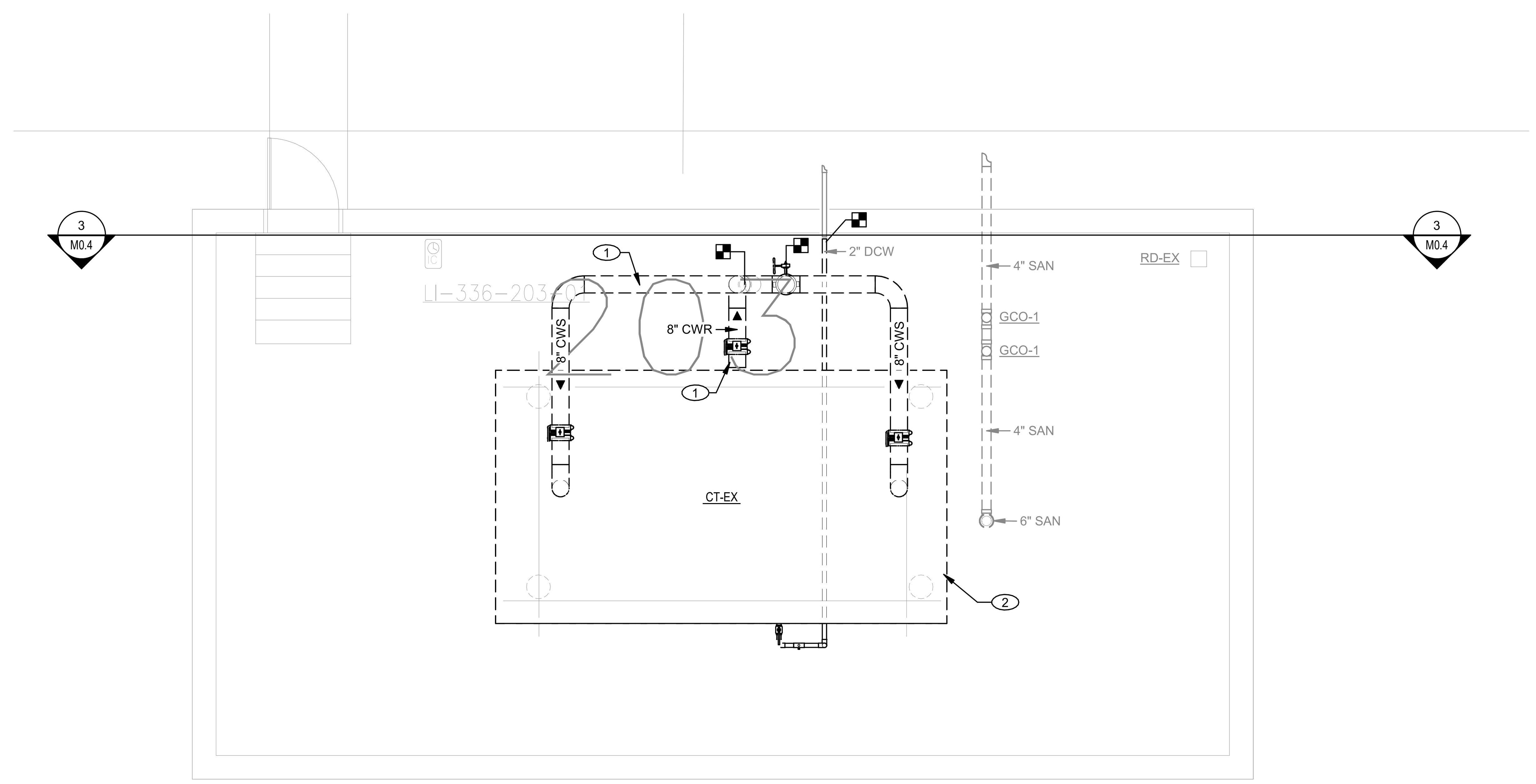
NORTH



3 M0.4 NORTHWEST SECTION AT PIPING DEMOLITION

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

0' 1' 2' 4' 6' 12'



1 M0.4 NORTHWEST MECHANICAL DEMOLITION PLAN

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

0' 1' 2' 4' 6' 12'

NORTH

MECHANICAL DEMOLITION NOTES:

A. SEE SHEET M0.0 FOR MECHANICAL SYMBOLS LEGEND AND GENERAL PLUMBING DEMOLITION NOTES.

KEYNOTES	
1	REMOVE ALL PIPING FROM TOWER TO FLANGE AT GROUND PENETRATION. LOWER TOWER SUPPLY PIPING CONNECTION POINT AS LOW AS POSSIBLE.
2	REMOVE EXISTING TOWER AND ALL ASSOCIATED COMPONENTS. PREPARE EXISTING CONCRETE SUPPORTS TO ACCEPT NEW STEEL EXTENSION AND NEW TOWER.
3	PROVIDE 12" TALL W12X26 GALVANIZED BEAM ON EXISTING SUPPORT STRUCTURE. SECURE BEAM TO SUPPORT AND SECURE TOWER TO BEAM.
4	PREPARE CONDENSER WATER PIPING AT CHILLER FOR NEW 1" TAP FOR NEW NO SCALE SYSTEM.

OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

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NORTHWEST MECHANICAL DEMOLITION PLAN

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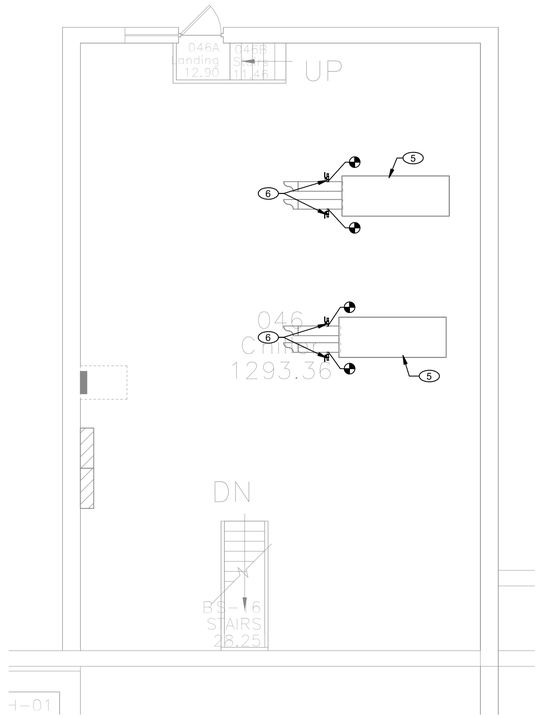
SHEET M0.4

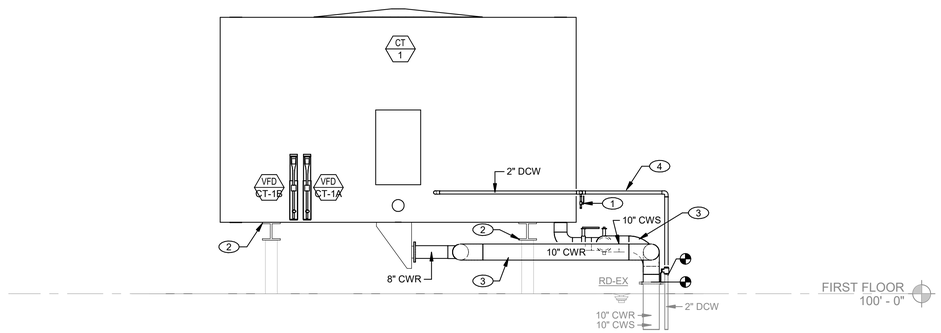


2 M1.1 NORTH BASEMENT MECHANICAL PLAN

SCALE: 3/16" = 1'-0"

0' 2' 4' 8' 16'

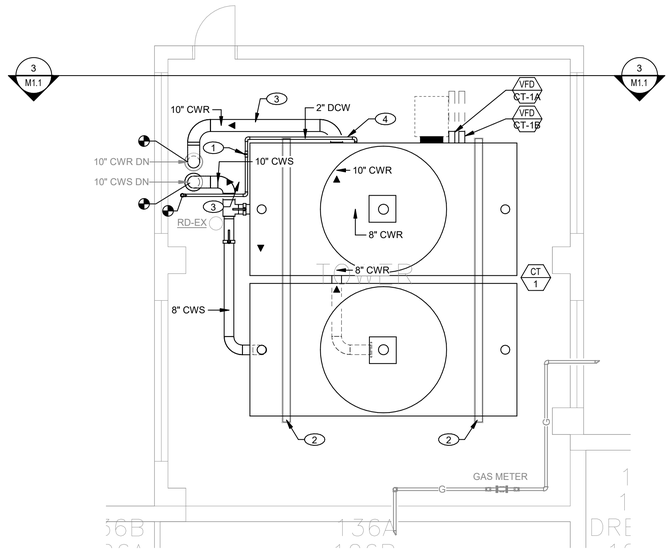
NORTH



3 M1.1 NORTH SCHOOL SECTION AT PIPING

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

0' 1' 2' 4' 6' 12'



1 M1.1 NORTH MECHANICAL PLAN

SCALE: 3/16" = 1'-0"

0' 2' 4' 8' 16'

NORTH

MECHANICAL PIPING NOTES:

A. SEE SHEET M0.0 FOR MECHANICAL SYMBOLS LEGEND AND GENERAL MECHANICAL NOTES.
B. SUPPORT PIPING FROM STRUCTURE AS REQUIRED. SEE PIPE SUPPORT DETAIL FOR ADDITIONAL INFORMATION.

KEYNOTES	
1	PROVIDE 3/4" THREADED HOSE CONNECTION WITH BALL VALVE FOR ISOLATION.
2	PROVIDE 12" TALL W12X26 GALVANIZED BEAM ON EXISTING SUPPORT STRUCTURE. SECURE BEAM TO SUPPORT AND SECURE TOWER TO BEAM.
3	PROVIDE HEAT TRACE ON COOLING TOWER SUPPLY AND RETURN PIPING. HEAT TRACE SHALL BE 8 W/FT AND BE DESIGNED TO MAINTAIN THE PIPE AT 38 DEG F WITH AN OUTDOOR TEMPERATURE OF 10 DEG F. INSULATE CONDENSER WATER PIPING OVER THE HEAT TRACE WITH A MINIMUM OF 1-1/2" FIBERGLASS INSULATION AND ALUMINUM JACKETING. PROVIDE HEAT TRACE CONTROL SYSTEM TO AUTOMATICALLY MAINTAIN DESIRED TEMPERATURE. INSTALL HEAT TRACE PER MANUFACTURER RECOMMENDATIONS.
4	PROVIDE HEAT TRACE ON MAKE UP WATER PIPING. HEAT TRACE SHALL BE 6 W/FT AND BE DESIGNED TO MAINTAIN THE PIPE AT 38 DEG F WITH AN OUTDOOR TEMPERATURE OF 10 DEG F. INSULATE MAKE UP WATER PIPING OVER THE HEAT TRACE WITH A MINIMUM OF 1-1/2" FIBERGLASS INSULATION AND ALUMINUM JACKETING. PROVIDE HEAT TRACE CONTROL SYSTEM TO AUTOMATICALLY MAINTAIN DESIRED TEMPERATURE. INSTALL HEAT TRACE PER MANUFACTURER RECOMMENDATIONS.
5	EXISTING CHILLER TO REMAIN.
6	PROVIDE 1" TAP AND BALL VALVE FOR CONNECTION OF NO SCALE SYSTEM. COORDINATE INSTALLATION WITH INSTALLING CONTRACTOR FOR THAT SYSTEM.

OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

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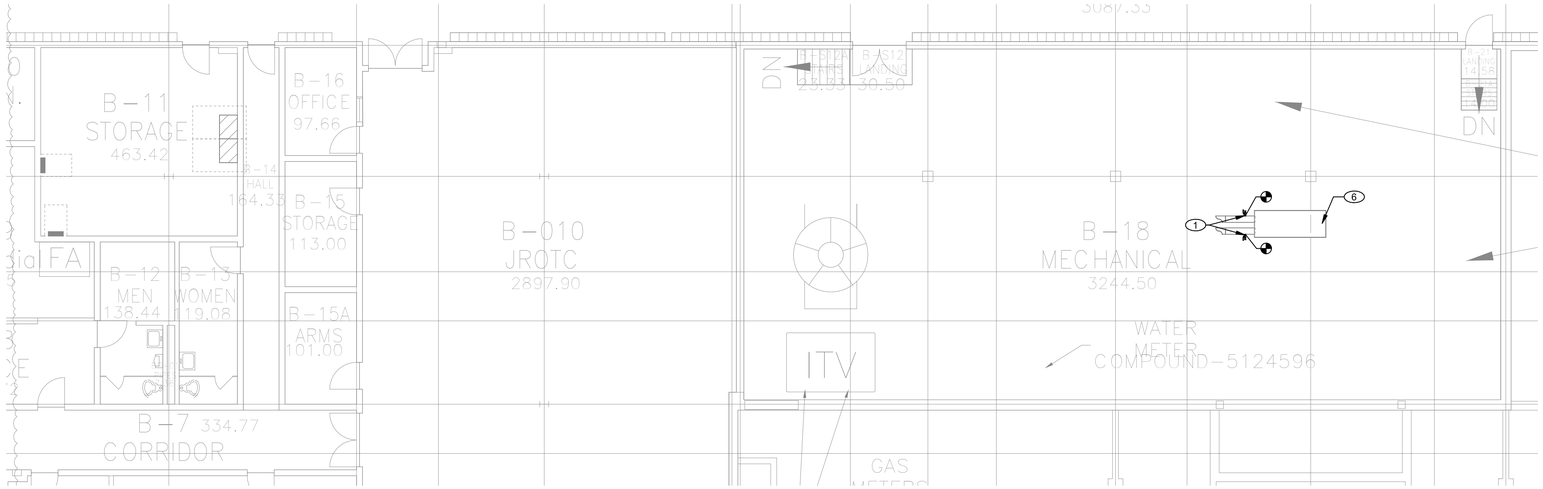
7/16/2025

PROJECT: 25023
DATE: 07/16/2025
SHEET M1.1

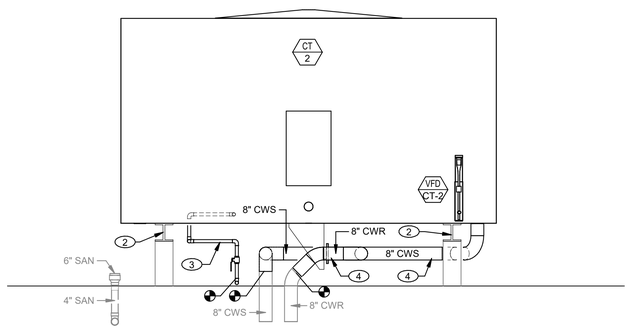


2 M1.2 NORTHWEST BASEMENT MECHANICAL PLAN

SCALE: 1/8" = 1'-0"

0' 2' 4' 8' 16' 24'

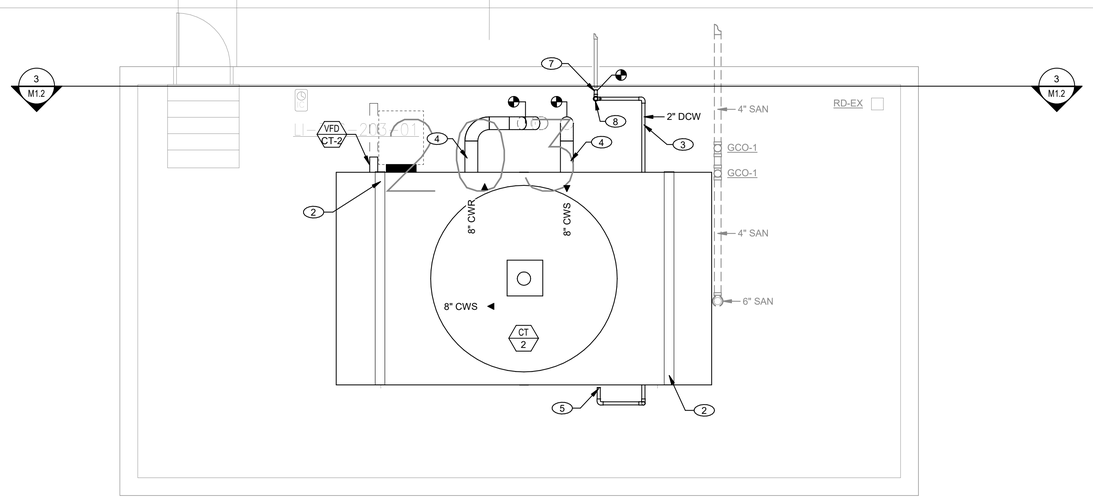
NORTH



3 M1.2 NORTHWEST SECTION AT PIPING

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

0' 1' 2' 4' 6' 12'



1 M1.2 NORTHWEST MECHANICAL PLAN

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

0' 1' 2' 4' 6' 12'

NORTH

MECHANICAL PIPING NOTES:

A. SEE SHEET M0.0 FOR MECHANICAL SYMBOLS LEGEND AND GENERAL MECHANICAL NOTES.
B. SUPPORT PIPING FROM STRUCTURE AS REQUIRED. SEE PIPE SUPPORT DETAIL FOR ADDITIONAL INFORMATION.

KEYNOTES	
1	PROVIDE 1" TAP AND BALL VALVE FOR CONNECTION OF NO SCALE SYSTEM. COORDINATE INSTALLATION WITH INSTALLING CONTRACTOR FOR THAT SYSTEM.
2	PROVIDE 12" TALL W12X26 GALVANIZED BEAM ON EXISTING SUPPORT STRUCTURE. SECURE BEAM TO SUPPORT AND SECURE TOWER TO BEAM.
3	PROVIDE HEAT TRACE ON MAKE UP WATER PIPING. HEAT TRACE SHALL BE 6 W/FT AND BE DESIGNED TO MAINTAIN THE PIPE AT 38 DEG F WITH AN OUTDOOR TEMPERATURE OF 10 DEG F. INSULATE MAKE UP WATER PIPING OVER THE HEAT TRACE WITH A MINIMUM OF 1-1/2" FIBERGLASS INSULATION AND ALUMINUM JACKETING. PROVIDE HEAT TRACE CONTROL SYSTEM TO AUTOMATICALLY MAINTAIN DESIRED TEMPERATURE. INSTALL HEAT TRACE PER MANUFACTURER RECOMMENDATIONS.
4	PROVIDE HEAT TRACE ON COOLING TOWER SUPPLY AND RETURN PIPING. HEAT TRACE SHALL BE 8 W/FT AND BE DESIGNED TO MAINTAIN THE PIPE AT 38 DEG F WITH AN OUTDOOR TEMPERATURE OF 10 DEG F. INSULATE CONDENSER WATER PIPING OVER THE HEAT TRACE WITH A MINIMUM OF 1-1/2" FIBERGLASS INSULATION AND ALUMINUM JACKETING. PROVIDE HEAT TRACE CONTROL SYSTEM TO AUTOMATICALLY MAINTAIN DESIRED TEMPERATURE. INSTALL HEAT TRACE PER MANUFACTURER RECOMMENDATIONS.
5	COORDINATE EXACT MAKE UP WATER CONNECTION LOCATION WITH COOLING TOWER MANUFACTURER DRAWINGS.
6	EXISTING CHILLER TO REMAIN.
7	MODIFY EXISTING DOMESTIC COLD WATER TAP IN TOWER ENCLOSURE TO CLEANLY COME OUT OF THE GROUND. TURN PIPE UP AT WALL. INSULATE AND HEAT TRACE TO AT LEAST 10" BELOW GRADE.
8	INSTALL ISOLATION VALVE IN VERTICAL PIPING.

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7/16/2025

PROJECT: 25023
DATE: 07/16/2025

SHEET M1.2

COOLING TOWER

MARK	SERVES	TOWER CONFIGURATION	NUMBER OF CELLS	CAPACITY (TONS)	AMBIENT TEMP DB/WB (°F)	MAX FLOWRATE (GPM)	EWT (° F)	LWT (°F)	PRESS DROP (FT)	INLET CONNECTION (IN)	INLET HEIGHT (IN)	OUTLET CONNECTION (IN)	FAN DATA					ELECTRICAL			BASIN HEAT	OPERATING WEIGHT (LBS)	MANUFACTURER & MODEL NO.	REMARKS
													NO.	TYPE	FAN SPEED (RPM)	AIRFLOW (CFM)	HP	V	PH	SCCR (A)	CAPACITY			
CT-1	NORTH	CROSSFLOW	2	1000	95/78	2400	95/78	85	10	(2) @ 8"	BOTTOM	(2) @ 8"	2	GEAR	330	102,030	15 EA.	480	3	5000	18 KW PER CELL	19,180 EACH	MARLEY NC8405PAN	1-9
CT-2	NORTH WEST	CROSSFLOW	1	700	95/78	1700	95/78	85	10	10"	BOTTOM	10"	1	GEAR	347	165,300	40	480	3	5000	24 KW	24,420	MARLEY NC8407TAN	1-9

REMARKS:

1. 301L STAINLESS STEEL COLLECTION AND DISTRIBUTION BASINS, GALVANIZED STEEL STRUCTURE AND CASING, GEAR DRIVE WITH MOTOR MOUNTED OUTSIDE THE AIRSTREAM, EXTENDED LUBE LINE, ENHANCED ACCOUSTICAL PERFORMANCE QUIET FAN
2. 15 MIL PVC FILL WITH INTEGRAL LOUVERS AND DRIFT ELIMINATORS, GALVANIZED AIR INLET SCREENS, ONE 8" BOTTOM HOT WATER INLETS WITH INTEGRAL PVC PIPING FOR BALANCED DISTRIBUTION PER CELL, FLOAT TYPE MAKEUP VALVE
3. ACCESS DOOR PLATFORM ON BOTH CASED FACES, FAN DECK LADDER WITH SAFETY CAGE ON BOTH CASED FACES, LADDER EXTENTIONS TO GRADE, FAN DECK GUARDRAIL, FIBERGLASS VELOCITY RECOVERY STACK, AND STAINLESS STEEL PLENUM WALKWAY
4. REMOTE VARIABLE FREQUENCY DRIVE WITH DISCONNECT, SHAFT GROUNDING RING, AND EXTERNALLY MOUNTED MANUAL RESET VIBRATION SWITCH
5. 8" DEPRESSED SIDE SUMP OUTLET WITH TRASH SCREEN AND ANTI VORTEX PLATE PER CELL, OUTLET ON BOTTOM OF TOWER. STEEL SUMP SIDE OUTLET WITH SCREEN.
6. TOWER TO INCLUDE SINGLE POINT POWER CONTROL PANEL FOR FAN AND HEATER POWER. VFD TO BE MOUNTED REMOTE TO PANEL.
7. CTI CERTIFIED PER STD-201
8. ALTERNATE TOWER MANUFACTURERS ARE ALLOWED. CONTRACTOR RESPONSIBLE FOR ANY MODIFICATIONS FOR ALTERNATE TOWER SELECTIONS.
9. 5-YEAR WHOLE UNIT PARTS ONLY WARRANTY

NORTH AND NORTHWEST TOWER CONTROL SEQUNCE

GENERAL: COOLING TOWER SEQUENCE OF OPERATION IS NOT INTENDED TO MODFIY OR OVERRIDE THE EXISTING CHILLER SEQUENCE OF OPERATION. EXISTING CHILLER CONTROL POINTS LISTED IN THIS SEQUENCE ARE APPROXIMATE.

COOLING TOWER ENABLE: UPON CHILLER ENABLE SIGNAL THE BMS SHALL ENABLE COOLING TOWER SYSTEM AND CLOSE THE COOLING TOWER BYPASS VALVE.

COOLING TOWER OPERATION: BMS SHALL MONITOR THE CONDENSER WATER SUPPLY TEMPERATURE. UPON RISE IN SUPPLY TEMPERATURE ABOVE 75 DEG F THE COOLING TOWER FAN SHALL START. BMS SHALL MODULATE THE COOLING TOWER FAN VFD TO MAINTAIN CONDENSER WATER SETPOINT.

CONDENSER WATER SETPOINT: CONDENSER WATER SETPOINT SHALL BE SET BY THE BMS. BMS SHALL MONITOR THE OUTDOOR WET BULB TEMPERATURE AND SET THE CONDENSER WATER SUPPLY TEMPERATURE TO 7 DEG F HIGHER THAN THE ACTUAL OUTDOOR WETBULB TEMPERATURE.

FAULT DETECTION: BMS SHALL MONITOR THE COOLING TOWER STATUS AND FAN VIBRATION. UPON LOSS OF STATUS BMS SHALL SIGNAL AN ALARM. UPON DETECTION OF FAN VIBRATION THE BMS SHALL DISABLE THE COOLING TOWER AND SIGNAL AN ALARM AT THE BMS TERMINAL.

VARIABLE FREQUENCY DRIVE SCHEDULE

MARK	SERVES	LOCATED	MOTOR SIZE (HP)	ELECTRICAL			MANUFACTURER & MODEL NO.	REMARKS
				A	V	PH		
VFD-CT-1A	COOLING TOWER CT-1	ON TOWER	15	21.0	480.0	3	YASKAWA	1
VFD-CT-1B	COOLING TOWER CT-1	ON TOWER	15	21.0	480.0	3	YASKAWA	1
VFD-CT-2	COOLING TOWER CT-2	ON TOWER	40	52.0	480.0	3	YASKAWA	1

REMARKS:

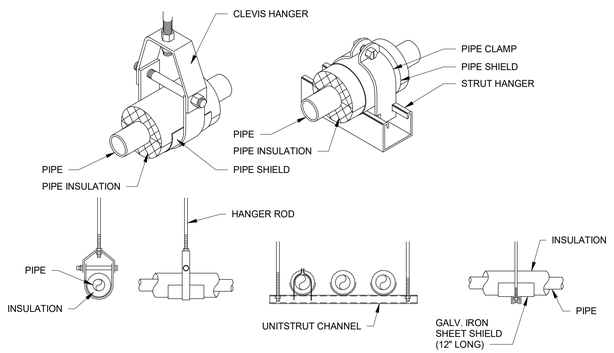
1. VFD TO BE RATED FOR OUTDOOR OPERATION.

PIPING APPLICATION SCHEDULE

SYSTEM DESCRIPTION	SIZE	MATERIAL	JOINTS	INSULATION		NOTES
				TYPE	THICKNESS	
DOMESTIC COLD WATER - OUTDOOR W/ HEAT TRACE	ALL	COPPER (TYPE L)	SOLDER	FIBERGLASS WITH ALUMINUM JACKET	1"	A
CONDENSER WATER OUTDOOR W/ HEAT TRACE	ALL	CPVC	SOLVENT	FIBERGLASS WITH ALUMINUM JACKET	1-1/2"	A

NOTES:

A) PROVIDE ALUMINUM JACKETED INSULATION WHEN LOCATED OUTDOORS



NOTES:

1. ATTACH SUPPORTS FOR ALL PIPING SUSPENDED FROM THE STEEL STRUCTURE TO THE TOP CORD OF JOISTS OF BEAMS.
2. PROVIDE COPPER OR PLASTIC COATED HANGERS FOR NON-INSULATED COPPER PIPE.
3. PROVIDE AND INSTALL B-LINE OR ACCEPTABLE INSULATED GALVANIZED STEEL JACKET AND HANGER, STRUT MOUNTED CLAMP AND PIPE SUPPORT LOCATIONS.

1 / M7.1 PIPE SUPPORT DETAIL
NOT TO SCALE

OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

MECHANICAL DETAILS AND SCHEDULES

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7/16/2025

PROJECT: 25023
DATE: 07/16/2025
SHEET M7.1

ELECTRICAL SYMBOLS LEGEND

(AS APPLICABLE)

SWITCHING

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
Sa	SINGLE POLE SWITCH - LETTER INDICATES SWITCH LEG	SM	MOMENTARY CONTACT SWITCH
S2	DOUBLE POLE SWITCH	SK	KEY OPERATED SWITCH
S3	THREE-WAY SWITCH	SP	PILOT LIGHT SWITCH
S4	FOUR-WAY SWITCH	ST	TIMER SWITCH
SD	DIMMER SWITCH	SS	SENSOR SWITCH - WALL MOUNTED: SEE LIGHTING CONTROL SCHEME NARRATIVE FOR TYPE
SH	HORSEPOWER RATED SWITCH	S,#	SENSOR - CEILING MOUNTED: SEE LIGHTING CONTROL SCHEME NARRATIVE FOR TYPE
SF	FUSED SWITCH	S,#	SENSOR - WALL MOUNTED: SEE LIGHTING CONTROL SCHEME NARRATIVE FOR TYPE
STE	THERMAL ELEMENT	DS,#	DAYLIGHTING SENSOR - CEILING MOUNTED
(a)	LIGHTING CONTROL STATION - LETTER INDICATES TYPE		

NUMBER INDICATES ZONE OF LUMINAIRES TO BE CONTROLLED BY SENSOR(S). NO NUMBER INDICATES ALL ROOM LUMINAIRES TO BE CONTROLLED BY SENSOR(S).

LIGHTING

LABEL INFORMATION ○ A, # — LETTER INDICATES LUMINAIRE MARK, NUMBER INDICATES ZONE IDENTIFIER, NO NUMBER INDICATES SINGLE ZONE

	LUMINAIRE		WALL MOUNTED LUMINAIRE
	LUMINAIRE - LAMPS SWITCHED SEPARATE		WALL MOUNTED LUMINAIRE - NIGHT LIGHT
	LUMINAIRE WITH AUXILIARY LIGHT		WALL MOUNTED LUMINAIRE - EMERGENCY
	LUMINAIRE - EMERGENCY		EXIT SIGN - WALL/CEILING MOUNTED
	LUMINAIRE - NIGHT LIGHT		EXIT SIGN/EMERGENCY LUMINAIRE COMBINATION WALL/CEILING MOUNTED
	WALL MOUNTED LUMINAIRE		PHOTOCELL, DAYLIGHT SENSOR
	WALL MOUNTED LUMINAIRE - EMERGENCY		EXTERIOR LUMINAIRE - POLE MOUNTED
	WALL MOUNTED LUMINAIRE - NIGHT LIGHT		EXTERIOR LUMINAIRE - POLE MOUNTED
	STRIP LUMINAIRE		EXTERIOR LUMINAIRE - POLE MOUNTED
	STRIP LUMINAIRE - EMERGENCY		EXTERIOR LUMINAIRE - POLE MOUNTED
	STRIP LUMINAIRE - NIGHT LIGHT		FLOOD LIGHT LUMINAIRE
	LUMINAIRE		EMERGENCY BATTERY PACK
	LUMINAIRE - NIGHT LIGHT		EMERGENCY LUMINAIRE REMOTE HEADS
	LUMINAIRE - EMERGENCY		TRACK LUMINAIRE

POWER DEVICES

	SINGLE RECEPTACLE		LIGHTING & APPLIANCE PANELBOARD
	DUPLEX RECEPTACLE		POWER DISTRIBUTION EQUIPMENT
	FOUR-PLEX RECEPTACLE - TWO DUPLEX RECEPTACLES	T	TRANSFORMER
	RANGE RECEPTACLE		ENCLOSED CIRCUIT BREAKER
	SPECIAL RECEPTACLE		CABINET (TYPE INDICATED)
G	DUPLEX RECEPTACLE - GROUND-FAULT CIRCUIT-INTERRUPTER		MOTOR STARTER, LIGHTING CONTACTOR
IG	DUPLEX RECEPTACLE - ISOLATED GROUND		SAFETY SWITCH
WR	DUPLEX RECEPTACLE - WEATHER-RESISTANT GROUND-FAULT CIRCUIT-INTERRUPTER		COMBINATION MOTOR STARTER & SAFETY SWITCH
A	DUPLEX RECEPTACLE - ON APPLIANCE CIRCUIT		MOTOR
T	DUPLEX RECEPTACLE - TAMPER-RESISTANT	J	CORD DROP (J-BOX AT CEILING)
F	DUPLEX RECEPTACLE - ARC-FAULT RATED		CORD DROP (SPECIAL RECEPTACLE AT CEILING)
M	DUPLEX RECEPTACLE - MOUNTED IN MILLWORK		MULTI-OUTLET ASSEMBLY
B	DUPLEX RECEPTACLE - MOUNTED BELOW COUNTER		FLUSH FLOOR BOX
	DUPLEX RECEPTACLE - CEILING MOUNTED		FLUSH POKE-THRU
	DUPLEX RECEPTACLE - BOTTOM HALF SWITCHED		DAMPER
	SPLIT-WIRE RECEPTACLE	S	SOLENOID
J	JUNCTION BOX		

RACEWAYS

	HOME RUN TO PANEL	T	TELEPHONE CONDUIT
N	UNSWITCHED LIGHTING CIRCUIT		CONDUIT UP
N	MASTER SATELLITE FIXTURE CONNECTION		CONDUIT DOWN
E	EMERGENCY CIRCUIT		CONDUIT SEAL
NL	NIGHT LIGHTING CIRCUIT		CABLE TRAY
S	SOUND SYSTEM RACEWAY	#"	CONDUIT SLEEVE (NUMBER INDICATES SIZE)

MISCELLANEOUS

XX / X	EQUIPMENT IDENTIFICATION TAG	WP	WEATHER-PROOF
X / XXX	DETAIL REFERENCE / SHEET REFERENCE	WG	WIRE GUARD
FACP	FIRE ALARM CONTROL PANEL	XP	EXPLOSION PROOF
FAAP	FIRE ALARM ANNUNCIATOR PANEL	30/3/10/3R	RATED AMPACITY/NO. POLES/FUSING REQ'D/NEMA ENCL. NO.
HOA	HAND-OFF-AUTO	PX	PROJECTOR INPUT STATION - LETTER INDICATES TYPE
CCT.	CIRCUIT		PROJECTOR CONTROL STATION
PART. CCT.	PARTIAL CIRCUIT		LIGHT LINEWORK = EXISTING
NF	NON-FUSED		DARK/DASHED LINEWORK = DEMOLITION
			DARK LINEWORK = NEW

COMMUNICATIONS

W	TELEPHONE OUTLET - WALL MOUNTED		TELEPHONE CABINET
#	TELEPHONE OUTLET BOX	C	CLOCK HANGER OUTLET
#	DATA OUTLET BOX	C	CLOCK - WALL MOUNTED
#	PHONE OUTLET BOX - CEILING MOUNTED	C 2	CLOCK - CEILING MOUNTED (DOUBLE FACE)
#	DATA OUTLET BOX - CEILING MOUNTED	C S	CLASSROOM CLOCK & SPEAKER
WAP	WIRELESS ACCESS POINT - CEILING MOUNTED	P	PROGRAM BELL
	COMBINATION TELEPHONE/DATA OUTLET BOX - ONE JACK EACH		INTERCOM CALL SWITCH
	DATA OUTLET BOX - BLANK PLATE, 1" CONDUIT	X	INTERCOM ADMINISTRATION STATION (LETTER INDICATES TYPE)
M #	MICROPHONE OUTLET (NUMBER INDICATES QUANTITY)	X	INTERCOM CLASSROOM/STAFF STATION (LETTER INDICATES TYPE)
M #	MICROPHONE OUTLET - WALL MOUNTED (NUMBER INDICATES QUANTITY)	X	AUDIO/VISUAL AUXILIARY OUTLET (LETTER INDICATES TYPE)
L #	LINE INPUT OUTLET (NUMBER INDICATES QUANTITY)	A	T.V. ANTENNA OUTLET
L #	LINE INPUT OUTLET - WALL MOUNTED (NUMBER INDICATES QUANTITY)	V	INTERCOM/PAGING VOLUME CONTROL
S	INTERCOM/PAGING SPEAKER - CEILING MOUNTED	V	SOUND SYSTEM VOLUME CONTROL
S	INTERCOM/PAGING SPEAKER - WALL MOUNTED		GROUND BAR
S	INTERCOM/PAGING SPEAKER HORN - WALL MOUNTED		
S	SOUND SYSTEM SPEAKER - CEILING MOUNTED		
S	SOUND SYSTEM SPEAKER - WALL MOUNTED		

NUMBER BY SYMBOL INDICATES QUANTITY OF JACKS. ZERO INDICATES EMPTY OUTLET BOX , BLANK PLATE AND CONDUIT.

NOTE: SYMBOLS SHOWN "STACKED" ON THE FLOOR PLANS INDICATE THAT THE DEVICES ARE TO BE LOCATED IN THE SAME OUTLET BOX AND FACEPLATE. (I.E. 1 / 2)

FIRE ALARM

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
HD R/T	HEAT DETECTOR - COMBINATION	F	FIRE ALARM HORN - CEILING MOUNTED
HD F	HEAT DETECTOR - FIXED TEMPERATURE		FIRE ALARM VISUAL SIGNAL - CEILING MOUNTED
HD EV	HEAT DETECTOR - FIXED TEMPERATURE (CONNECTED TO ELEVATOR RECALL)		FIRE ALARM COMBINATION HORN/VISUAL - CEILING MOUNTED
SD	SMOKE DETECTOR	F	FIRE ALARM SPEAKER - CEILING MOUNTED
SD DM	SMOKE DETECTOR - DUCT MOUNTED		FIRE ALARM COMBINATION SPEAKER/VISUAL - CEILING MOUNTED
SD EV	SMOKE DETECTOR (CONNECTED TO ELEVATOR RECALL)		FLOW SWITCH
F	FIRE ALARM MANUAL STATION		TAMPER SWITCH
F	FIRE ALARM HORN - WALL MOUNTED		DUCT DETECTOR REMOTE ALARM INDICATOR
	FIRE ALARM VISUAL SIGNAL - WALL MOUNTED	R	FAN SHUT-DOWN RELAY
	FIRE ALARM COMBINATION HORN/VISUAL - WALL MOUNTED		MAGNETIC DOOR HOLDER
F	FIRE ALARM SPEAKER - WALL MOUNTED	SBD	SMOKE BEAM DETECTOR
	FIRE ALARM COMBINATION SPEAKER/VISUAL - WALL MOUNTED	R	SMOKE BEAM REFLECTOR
F	FIRE ALARM BELL - WALL MOUNTED		

SECURITY

	PUSHBUTTON STATION		MOTION DETECTOR
	PUSHBUTTON STATION, 'P' INDICATES PILOT	KP	KEYPAD
	DOOR MONITOR SWITCH	ES	ELECTRIC STRIKE
	DOOR SWITCH	CR	CARD READER
	DOOR BELL CHIME/BUZZER	PS	POWER SUPPLY
	DOOR CONTACT		SECURITY CAMERA

NURSE CALL

E	NURSE CALL DOME LIGHT EMERGENCY CALLS ONLY	N2	DOUBLE BED NURSE CALL STATION (2 CORD SETS)
N	NURSE CALL DOME LIGHT EMERGENCY/NORMAL CALLS	NC	NURSE CALL ANNUNCIATOR & POWER SUPPLY
E	EMERGENCY CALL SWITCH	ND	NURSE CALL DUTY STATION
B	CODE BLUE STATION	NS	NURSE CALL STAFF STATION
N	SINGLE BED NURSE CALL STATION (1 CORD SET)		

GENERAL ELECTRICAL DEMOLITION NOTES

APPLY TO ALL ELECTRICAL SHEETS

A. COMPLETELY REMOVE ALL ELECTRICAL WIRING, CONDUIT, SWITCHES, DISCONNECTS, LUMINAIRES, AND ASSOCIATED ANCILLARY EQUIPMENT INDICATED BY BOLD, DASHED LINES OR IDENTIFIED BY NOTES. ITEMS INDICATED FOR REMOVAL ARE ONLY SUGGESTIVE OF THE AMOUNT OF DEMOLITION WORK INVOLVED. PERFORM A SITE INVESTIGATION TO AID IN DETERMINING THE COMPLETE EXTENT OF DEMOLITION WORK.

B. COORDINATE AND SCHEDULE ALL NECESSARY POWER OUTAGES WITH THE OWNER'S REPRESENTATIVE PRIOR TO PROCEEDING WITH SUCH WORK SO OPERATIONS IN ADJACENT OCCUPIED PORTIONS OF THE BUILDING ARE NOT INTERRUPTED OR RESTRICTED WITHOUT PRIOR APPROVAL.

C. REMOVE ALL EXISTING BRANCH CIRCUITS INDICATED AS COMPLETELY AS POSSIBLE. REMOVE EXISTING CONDUCTORS COMPLETELY FROM THEIR RACEWAYS AND DO NOT REUSE EXCEPT WHERE SPECIFICALLY INDICATED. WHERE AN EXISTING DEVICE IS REMOVED FROM AN EXISTING CIRCUIT, PROVIDE NEW WIRING AND MAINTAIN CONTINUITY OF EXISTING CIRCUIT.

D. REMOVE EXISTING SURFACE MOUNTED BOXES, CONDUIT, SURFACE METAL RACEWAY, WIREWAY, ETC. INDICATED AS COMPLETELY AS POSSIBLE. PATCH ABANDONED PENETRATIONS FROM REMOVED FASTENERS. ABANDON IN PLACE NON-ACCESSIBLE BOXES SHOWN REMOVED AND COVER WITH STAINLESS STEEL COVER PLATES. ABANDON IN PLACE NON-ACCESSIBLE CONDUIT SHOWN REMOVED AND CAP OFF IN A SUITABLE MANNER PER LOCAL INSPECTOR'S REQUIREMENTS. CHISEL RACEWAYS STUBBED FROM A CONCRETE FLOOR OR WALL 2 INCHES BELOW ADJACENT SURFACE, GROUT, AND SCREED.

E. COORDINATE REUSED EXISTING BOX AND CONDUIT LOCATIONS WITH NEW WORK LOCATIONS.

F. REMOVE ELECTRICAL WORK AT ALL MECHANICAL EQUIPMENT SHOWN REMOVED. COORDINATE EQUIPMENT REMOVAL LOCATIONS WITH MECHANICAL DRAWINGS.

GENERAL ELECTRICAL NOTES

APPLY TO ALL ELECTRICAL SHEETS

A. MOUNTING HEIGHTS INDICATED ARE TO CENTER OF ROUGH-IN ABOVE FINISHED FLOOR (AFF).

B. INSTALL ALL CONDUCTORS IN CONTINUOUS RACEWAY. PROVIDE INSULATED EQUIPMENT GROUNDING CONDUCTOR.

C. PROVIDE DEDICATED NEUTRAL CONDUCTOR FOR EACH BRANCH CIRCUIT PHASE CONDUCTOR. EXCEPTION: WHERE AN EQUIPMENT MANUFACTURER REQUIRES A MULTIWIRE BRANCH CIRCUIT FOR ONLY ONE UTILIZATION EQUIPMENT AND WHERE ALL UNGROUNDED CONDUCTORS OF THAT CIRCUIT ARE OPENED SIMULTANEOUSLY BY THE BRANCH CIRCUIT OVERCURRENT DEVICE.

D. CONCEAL ALL CONDUITS IN NEW WALLS, EXISTING STUD WALLS, OR ABOVE SUSPENDED CEILINGS.

E. WHERE CONDUIT CANNOT BE CONCEALED IN EXISTING WALL OR CEILING CAVITIES, INSTALL CONDUCTORS IN SURFACE METAL RACEWAYS; SURFACE CONDUIT OR METAL SURFACE RACEWAY AT ENGINEER'S DISCRETION.

F. PAINT SURFACE CONDUIT IN FINISHED AREAS, WHEN ALLOWED, TO MATCH SURROUNDING SURFACES. COORDINATE FINISHES WITH ARCHITECT.

G. METAL SURFACE RACEWAYS SHALL BE WIREMOLD #V500, #V700, OR #V2400 SERIES WITH FACTORY IVORY FINISH OR APPROVED EQUIVALENT. METAL SURFACE RACEWAYS FOR TELEVISION CABLE SHALL BE WIREMOLD #V700 OR LARGER. METAL SURFACE RACEWAYS FOR TELECOMMUNICATIONS CABLES SHALL BE #V2400 OR LARGER. COMPLY WITH EIA/TIA STANDARDS FOR CABLE BENDING RADIUS.

H. INSTALL EXPOSED OR CONCEALED RACEWAY NEAR METAL CORRUGATED SHEET ROOF DECKING SO NEAREST OUTER RACEWAY SURFACE IS NOT LESS THAN 6 INCHES FROM THE NEAREST SURFACE OF THE ROOF DECKING. EXCEPTION: RIGID METAL CONDUIT AND INTERMEDIATE METAL CONDUIT SHALL NOT BE REQUIRED TO MAINTAIN THIS CLEARANCE.

I. PATCH, PAINT, REPAIR OR REPLACE ALL WALLS, CEILINGS, OR OTHER BUILDING ELEMENTS DISTURBED DURING INSTALLATION OF ELECTRICAL WORK.

J. USE ROOM NUMBERS ASSIGNED BY OWNER AND NOT ROOM NUMBERS LISTED ON DRAWINGS FOR LABELING OF PANELBOARD DIRECTORIES, FIRE ALARM PANEL PROGRAMMING, ETC. INCLUDE A DESCRIPTION OF LOAD SUCH AS LIGHTS, RECEPTACLES, MECHANICAL UNIT LOCATIONS, ETC. ON TYPED PANELBOARD DIRECTORIES.

K. REFER TO MECHANICAL/ELECTRICAL COORDINATION SCHEDULE SHEET FOR ADDITIONAL REQUIREMENTS ON DISCONNECTS, MOTOR STARTERS, ETC.

NOTICE:
DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS AND CLEARANCES FROM ARCHITECTURAL, STRUCTURAL, SHOP AND OTHER APPROPRIATE DRAWINGS OR AT SITE. LAY OUT AND COORDINATE ALL WORK PRIOR TO INSTALLATION TO PROVIDE CLEARANCES REQUIRED FOR OPERATION, MAINTENANCE, AND CODES. VERIFY NON-INTERFERENCE WITH OTHER WORK. DO NOT FABRICATE PRIOR TO VERIFICATION OF CLEARANCES FOR ALL TRADES. THIS NOTICE APPLIES TO ALL ELECTRICAL PLANS.

ELECTRICAL

OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

ELECTRICAL SYMBOLS LEGEND AND GENERAL NOTES

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7/16/2025

PROJECT: 25023

DATE: 07/16/2025

SHEET E0.0

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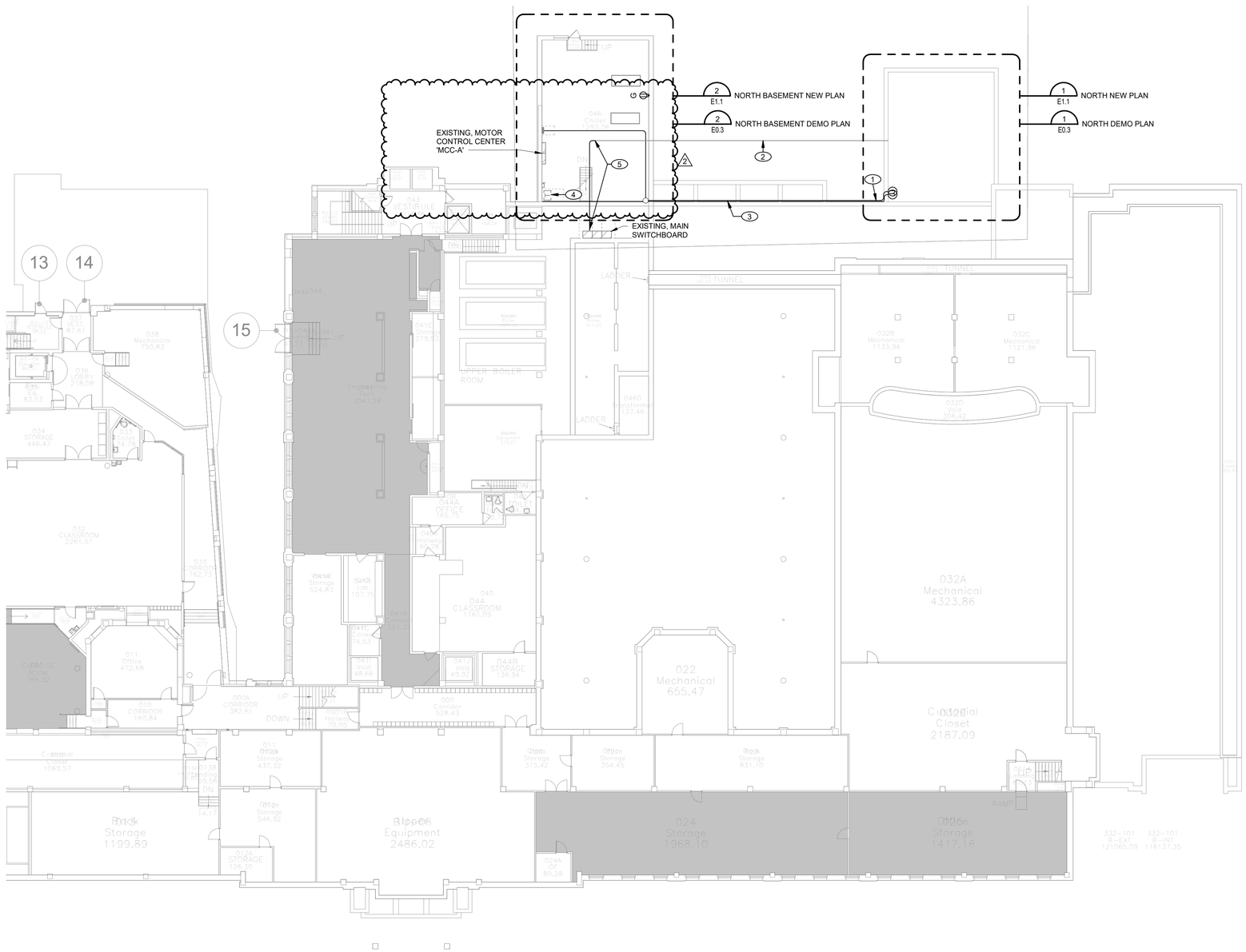

NORTH ELECTRICAL KEY PLAN

SCALE: 1/16" = 1'-0"

0' 4' 8' 16' 32' 48'

	KEYNOTES
1	PROVIDE (2) 3/4" CONDUITS WITH 2-#12, 1-#12 GRND FROM AVAILABLE (2) 20A, 1P SPACES OR SPARES IN EXISTING 208Y/120V PANEL IN BASEMENT TO COOLING TOWER.
2	EXISTING 1 1/2" EMT CONDUIT FROM BASEMENT TO COOLING TOWER LOCATION. REMOVE EXISTING CONDUCTORS AND REPLACE WITH NEW (2) SETS OF 3-#4, 1-#8 GRND IN EXISTING 1 1/2" CONDUIT.
3	ROUTE CONDUITS UP EXTERIOR WALL AND ACROSS BUILDING ON ROOFTOP.
4	FIELD VERIFY 120/208V PANEL THAT IS SERVED BY INDICATED 480V-208Y/120V TRANSFORMER.
5	REMOVE PORTION OF EXISTING 1-1/2" EMT CONDUIT TO THIS POINT AND EXTEND TO EXISTING SWITCHBOARD.

2	ADDENDUM #2	07/25/2025

OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

NORTH ELECTRICAL KEY PLAN

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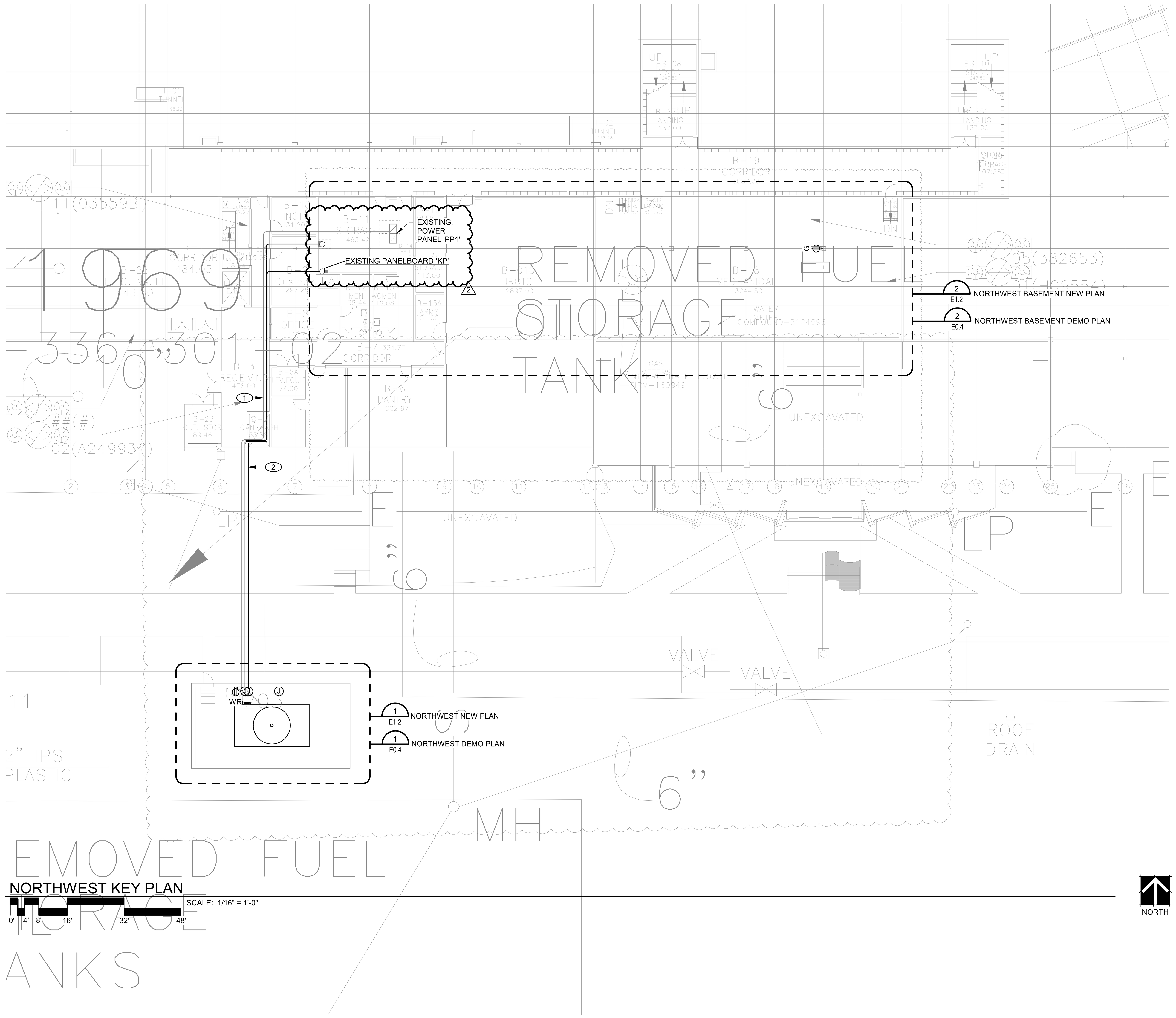
BRIAN D. HOWELL
E-15785
7/16/2025

PROJECT: 25023
DATE: 07/16/2025
SHEET E0.1

KEYNOTES

1	EXISTING 1 1/2" EMT CONDUIT FROM BASEMENT TO COOLING TOWER LOCATION. REMOVE EXISTING CONDUCTORS AND PROVIDE WITH NEW (3) #1/0 AWG, CU, THWN, (1) #6 AWG GRND IN EXISTING 1 1/2" CONDUIT.
2	PROVIDE (2) 3/4" CONDUITS WITH 2-#12, 1-#12 GRND FROM AVAILABLE (2) 20A, 1P SPACES OR SPARES IN EXISTING 208Y/120V PANEL IN BASEMENT TO COOLING TOWER.



NORTHWEST KEY PLAN

SCALE: 1/16" = 1'-0"

0' 4' 8' 16' 32' 48'

NORTH

2 ADDENDUM #2 07/25/2025

OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

NORTHWEST ELECTRICAL KEY PLAN

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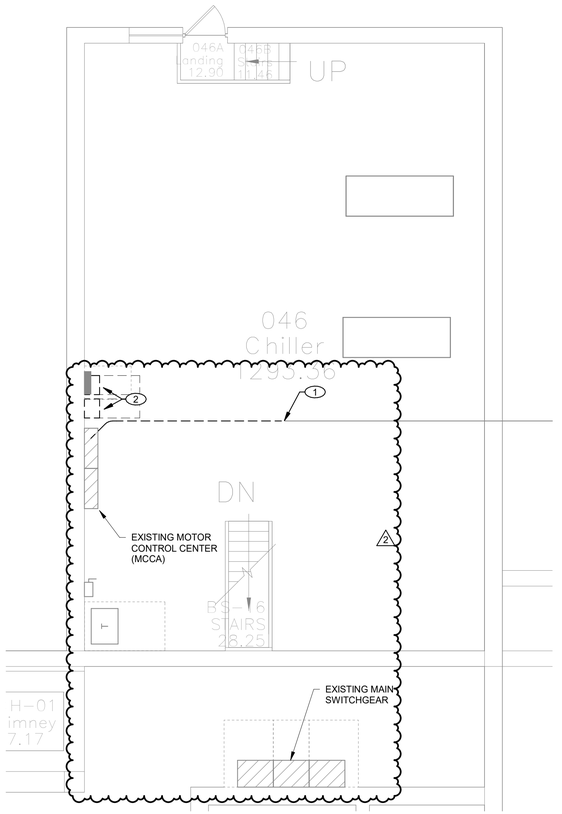
PROFESSIONAL MECHANICAL ENGINEER BRIAN D. HOWELL E-15785 STATE OF NEBRASKA

7/16/2025

PROJECT: 25023

DATE: 07/16/2025

SHEET E0.2

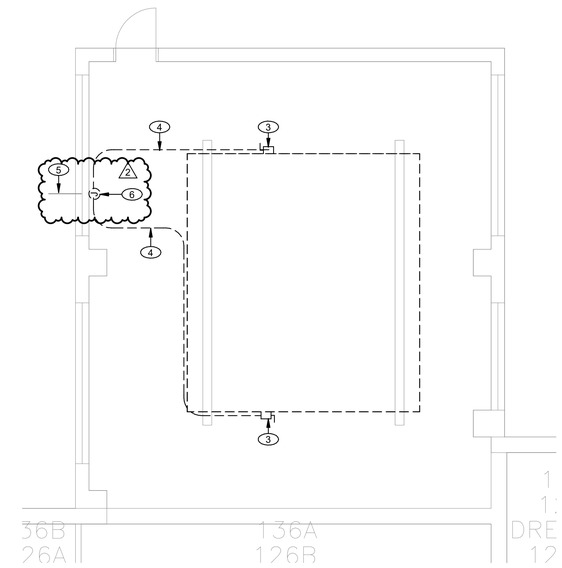


2 E0.3 NORTH BASEMENT ELECTRICAL DEMOLITION PLAN

SCALE: 3/16" = 1'-0"

0' 2' 4' 8' 16'

NORTH



1 E0.3 NORTH ELECTRICAL DEMOLITION PLAN

SCALE: 3/16" = 1'-0"

0' 2' 4' 8' 16'

NORTH

ELECTRICAL DEMOLITION NOTES:

A. SEE SHEET E0.0 FOR ELECTRICAL SYMBOLS LEGEND AND GENERAL ELECTRICAL DEMOLITION NOTES.

KEYNOTES (2)

1	EXISTING 1 1/2" EMT CONDUIT FROM BASEMENT TO COOLING TOWER LOCATION. REMOVE EXISTING CONDUCTORS AND REMOVE PORTION OF 1 1/2" CONDUIT FROM POINT INDICATED TO MCC-A.
2	REMOVE VFD'S. REMOVED ASSOCIATED LINE AND LOAD SIDE CONDUIT AND CONDUCTORS.
3	REMOVE EXISTING 60A DISCONNECT.
4	REMOVE EXISTING 1" CONDUIT AND CONDUCTORS.
5	EXISTING 1 1/2" EMT CONDUIT FROM BASEMENT TO COOLING TOWER LOCATION. REMOVE EXISTING CONDUCTORS AND REPLACE WITH NEW (2) SETS OF 3-#4, 1-#6 GRND IN EXISTING 1 1/2" CONDUIT.
6	REMOVE 6X6X4 JUNCTION BOX

2	ADDENDUM #2	07/25/2025

OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

NORTH ELECTRICAL DEMOLITION PLAN

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PROJECT: 25023

DATE: 07/16/2025

SHEET E0.3

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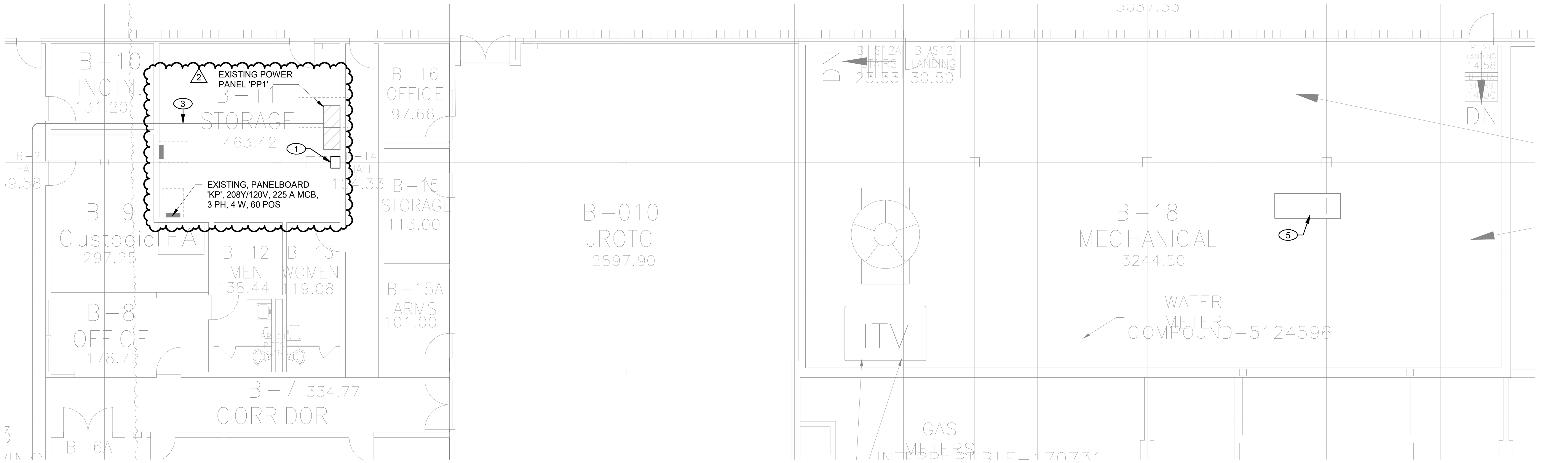
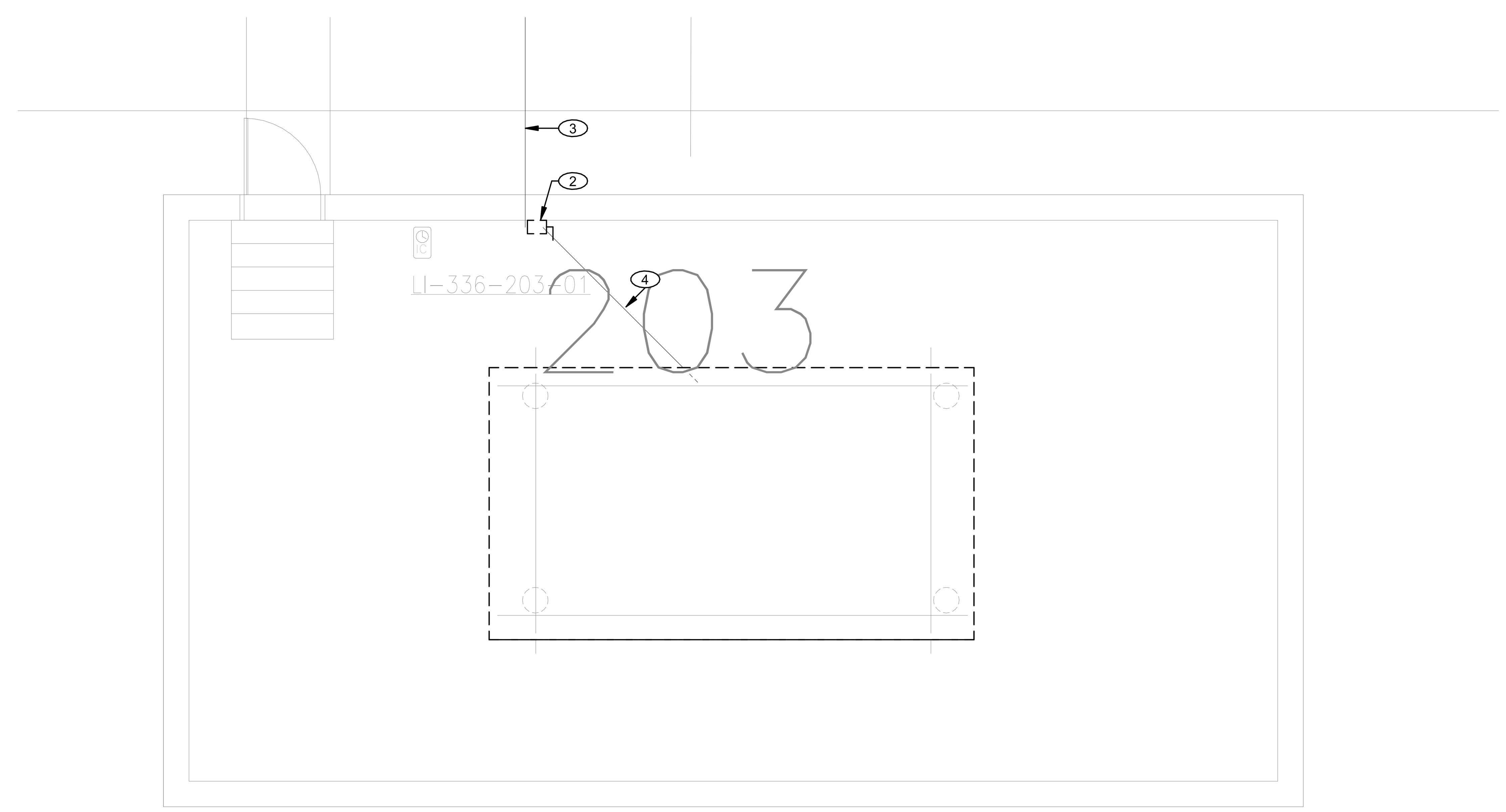


2 / E0.4 NORTHWEST BASEMENT ELECTRICAL DEMOLITION PLAN

SCALE: 1/8" = 1'-0"

0' 2' 4' 8' 16' 24'

NORTH



1 / E0.4 NORTHWEST ELECTRICAL DEMOLITION PLAN

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

0' 1' 2' 4' 6' 12'

NORTH

ELECTRICAL DEMOLITION NOTES:

A. SEE SHEET E0.0 FOR ELECTRICAL SYMBOLS LEGEND AND GENERAL ELECTRICAL DEMOLITION NOTES.

KEYNOTES (2)

1	REMOVE VFD'S. REMOVED ASSOCIATED LINE AND LOAD SIDE CONDUIT AND CONDUCTORS.
2	REMOVE EXISTING 60A DISCONNECT.
3	EXISTING 1 1/2" EMT CONDUIT FROM BASEMENT TO COOLING TOWER LOCATION. REMOVE EXISTING CONDUCTORS AND PROVIDE WITH NEW (3) #1/0 AWG, CU, THWN, (1) #6 AWG GRND IN EXISTING 1 1/2" CONDUIT.
4	EXISTING 1 1/2" EMT CONDUIT FROM EXISTING DISCONNECT TO EXISTING COOLING TOWER LOCATION. REMOVE EXISTING CONDUCTORS AND REPLACE WITH NEW (3) #1/0 AWG, CU, THWN, (1) #6 AWG, CU, THWN, GRND. REUSE EXISTING CONDUIT TO PROVIDE POWER TO NEW COOLING TOWER.
5	EXISTING CHILLER TO REMAIN.

2 ADDENDUM #2 07/25/2025

OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

NORTHWEST ELECTRICAL DEMOLITION PLAN

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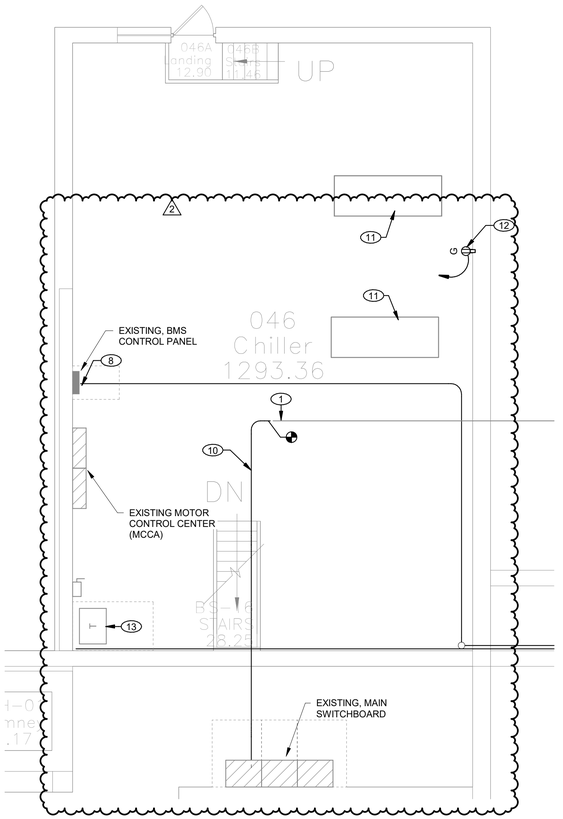
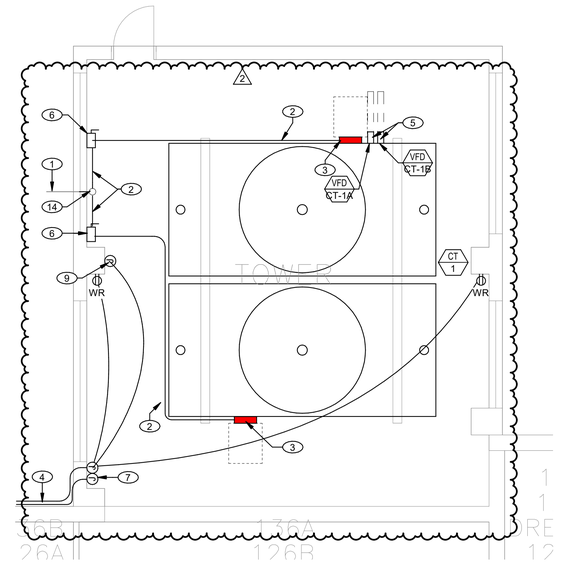
PROFESSIONAL MECHANICAL ENGINEER
BRIAN D. HOWELL
E-15785
STATE OF NEBRASKA
7/16/2025

PROJECT: 25023
DATE: 07/16/2025
SHEET E0.4



2 NORTH BASEMENT ELECTRICAL PLAN
E1.1 SCALE: 3/16" = 1'-0"
0' 2' 4' 8' 16'
NORTH



1 NORTH ELECTRICAL PLAN
E1.1 SCALE: 3/16" = 1'-0"
0' 2' 4' 8' 16'
NORTH

ELECTRICAL POWER NOTES:

A. SEE SHEET E0.0 FOR ELECTRICAL SYMBOLS LEGEND AND GENERAL ELECTRICAL NOTES.
B. SEE MECHANICAL AND ELECTRICAL SCHEDULE ON M7.1 FOR ADDITIONAL INFORMATION ON MECHANICAL EQUIPMENT REQUIRING POWER.

2 KEYNOTES

1	EXISTING 1 1/2" EMT CONDUIT FROM BASEMENT TO COOLING TOWER LOCATION. REMOVE EXISTING CONDUCTORS AND REPLACE WITH NEW (2) SETS OF 3-#4, 1-#8 GRND IN EXISTING 1 1/2" CONDUIT.
2	PROVIDE 1" CONDUIT WITH 3-#4 AWG, 1-#8 AWG, GRND FROM NEW J-BOX TO NEW DISCONNECT SWITCH. PROVIDE 3-#4, 1-#8 GRND IN 1" CONDUIT FROM NEW DISCONNECT TO FACTORY PROVIDED AND INSTALLED PANEL.
3	FACTORY PROVIDED AND INSTALLED PANEL. VERIFY LOCATION. PROVIDE 1" CONDUIT FROM FACTORY PANEL TO VFD'S AND VFD'S TO FAN CONNECTIONS. PROVIDE 3/4" FROM FACTORY PROVIDED PANEL TO FACTORY PROVIDED BASIN HEATERS. PROVIDE 3-#8, 1-#10 GRND.
4	PROVIDE (2) 3/4" CONDUITS WITH 2-#12, 1-#12 GRND FROM AVAILABLE (2) 20A, 1P SPACES OR SPARES IN EXISTING 208Y/120V PANEL IN BASEMENT TO COOLING TOWER.
5	VARIABLE FREQ DRIVES PROVIDED WITH COOLING TOWER.
6	PROVIDE NEW NEMA 3R, 100A, 480V, 3P, NON-FUSED DISCONNECT. EXTEND CONDUIT FROM DISCONNECT TO TOWER SINGLE POINT CONNECTION PANEL.
7	PROVIDE J-BOX FOR CONNECTION OF COOLING TOWER CONTROL CIRCUIT.
8	TERMINATE CONDUIT AT CONTROL BOX LOCATION.
9	PROVIDE 120V JUNCTION BOX FOR CONNECTION OF HEAT TRACE FOR PIPING. COORDINATE WITH MECHANICAL.
10	EXTEND EXISTING 1-1/2" EMT CONDUIT FROM POINT INDICATED TO EXISTING SWITCHBOARD IN SUB BASEMENT. ROUTE (2) SETS OF 3-#4, 1-#8 GROUND IN 1-1/2" CONDUIT TO (2) 100A SPARE BREAKERS IN SWITCHBOARD. REPLACE 100A THERMAL PLUG WITH 80A THERMAL PLUG.
11	EXISTING CHILLER TO REMAIN.
12	PROVIDE GFI RECEPTACLE FOR NEW SCALE FREE SYSTEM. COORDINATE LOCATION WITH SCALE FREE SYSTEM INSTALLING CONTRACTOR. CIRCUIT GFI TO NEAREST 120V NON-OVERLOADED CIRCUIT.
13	FIELD VERIFY 120/208V PANEL THAT IS SERVED BY INDICATED 480V/208Y/120V TRANSFORMER.
14	PROVIDE NEW NEMA 3R 12"X12"X4 J-BOX

2	ADDENDUM #2	07/25/2025

OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

NORTH ELECTRICAL PLAN

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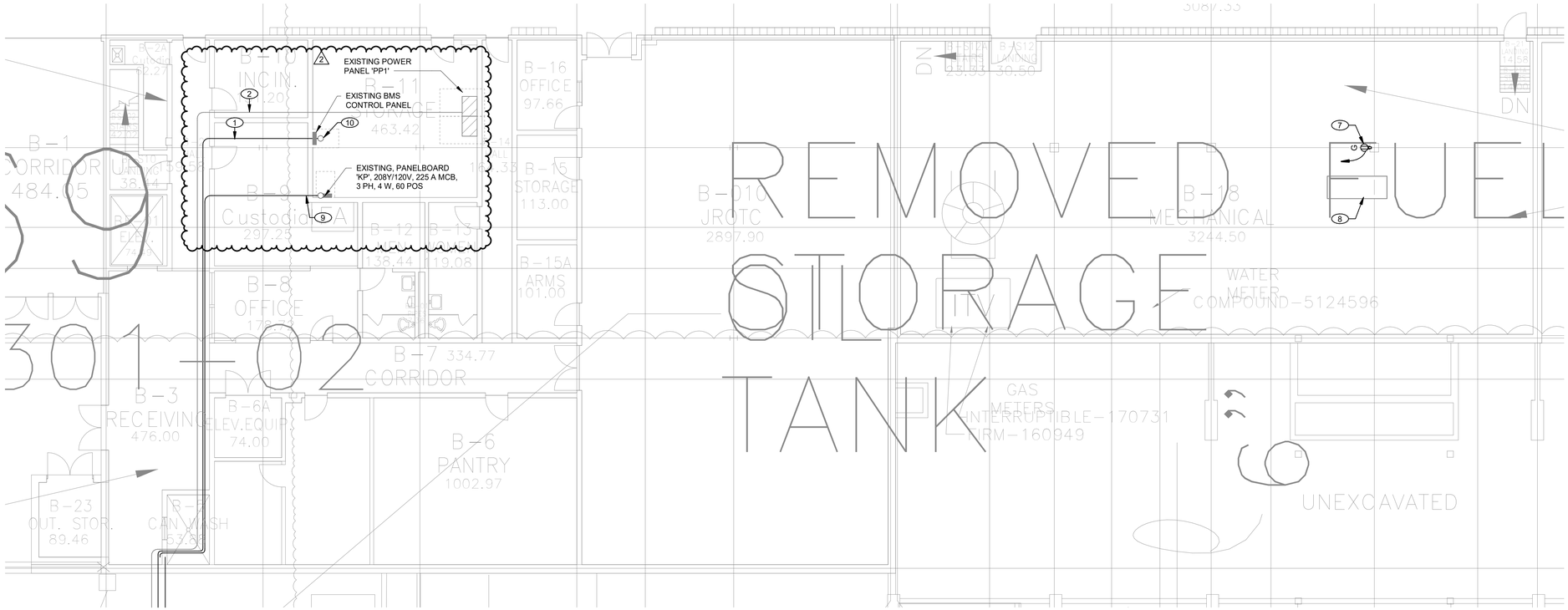
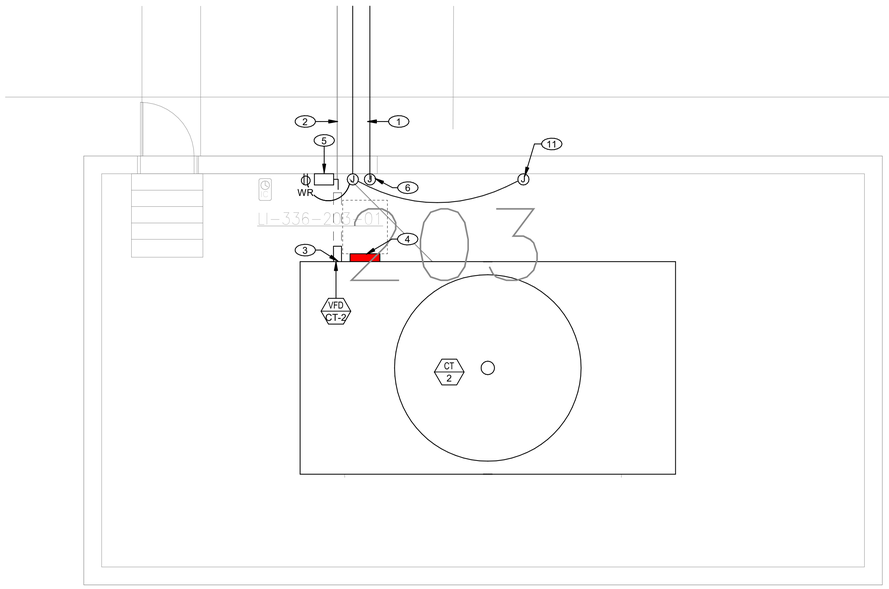
7/16/2025

PROJECT: 25023
DATE: 07/16/2025
SHEET E1.1



2 NORTHWEST BASEMENT ELECTRICAL PLAN
E1.2
SCALE: 1/8" = 1'-0"
0' 2' 4' 8' 16' 24'

NORTH



1 NORTHWEST ELECTRICAL PLAN
E1.2
SCALE: 1/4" = 1'-0"
0' 1' 2' 4' 6' 12'

NORTH

ELECTRICAL POWER NOTES:

A. SEE SHEET E0.0 FOR ELECTRICAL SYMBOLS LEGEND AND GENERAL ELECTRICAL NOTES.
B. SEE MECHANICAL AND ELECTRICAL SCHEDULE ON M7.1 FOR ADDITIONAL INFORMATION ON MECHANICAL EQUIPMENT REQUIRING POWER.

2 KEYNOTES

1	PROVIDE (2) 3/4" CONDUITS WITH 2-#12, 1-#12 GRND FROM AVAILABLE (2) 20A, 1P SPACES OR SPARES IN EXISTING 208Y/120V PANEL 'KP' IN BASEMENT.
2	EXISTING 1 1/2" EMT CONDUIT FROM BASEMENT TO COOLING TOWER LOCATION. REMOVE EXISTING CONDUCTORS AND PROVIDE WITH NEW (3) #1/0 AWG, CU, THWN, (1) #6 AWG GRND IN EXISTING 1 1/2" CONDUIT.
3	VARIABLE FREQ DRIVES PROVIDED WITH COOLING TOWER.
4	FACTORY PROVIDED AND INSTALLED PANEL. VERIFY LOCATION. PROVIDE 1" CONDUIT FROM FACTORY PANEL TO VFD'S AND VFD'S TO FAN CONNECTIONS. PROVIDE 3/4" FROM FACTORY PROVIDED PANEL TO FACTORY PROVIDED BASIN HEATERS. PROVIDE 3-#8, 1-#10 GRND.
5	PROVIDE NEW NEMA 3R, 200A, 480V, 3P, NON-FUSED DISCONNECT. EXTEND CONDUIT FROM DISCONNECT TO TOWER SINGLE POINT CONNECTION PANEL.
6	PROVIDE J-BOX FOR CONNECTION OF COOLING TOWER CONTROL CIRCUIT.
7	PROVIDE GFI RECEPTACLE FOR NEW SCALE FREE SYSTEM. COORDINATE LOCATION WITH SCALE FREE SYSTEM INSTALLING CONTRACTOR. CIRCUIT GFI TO NEAREST 120V NON-OVERLOADED CIRCUIT.
8	EXISTING CHILLER TO REMAIN.
9	TERMINATE CONDUIT IN 208/120 PANEL WITH 20A SPARE. PROVIDE 120V, 20A 1P BREAKERS AS REQUIRED IN AVAILABLE SPACES IN PANEL.
10	TERMINATE CONDUIT AT CONTROL BOX LOCATION.
11	PROVIDE 120V JUNCTION BOX FOR CONNECTION OF HEAT TRACE FOR PIPING. COORDINATE WITH MECHANICAL.

2 ADDENDUM #2 07/25/2025

OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

NORTHWEST ELECTRICAL PLAN

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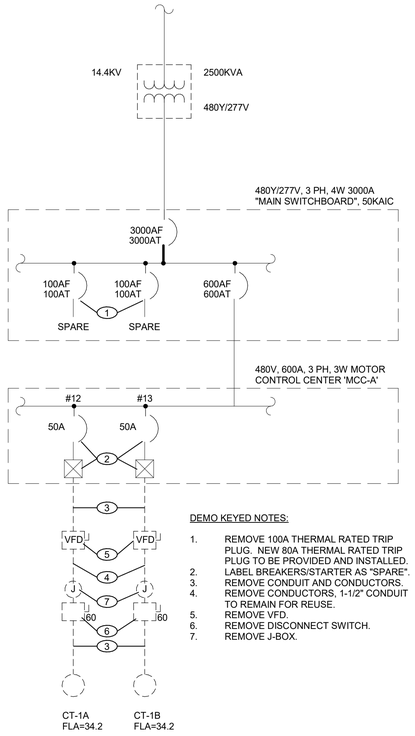
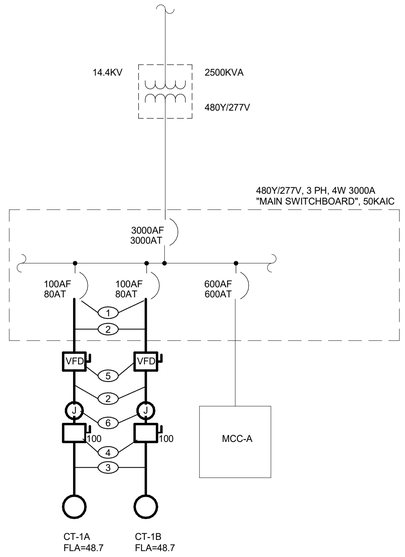
PROJECT: 25023
DATE: 07/16/2025
SHEET E1.2



DEMO KEYED NOTES:

1. REMOVE 100A THERMAL RATED TRIP PLUG. NEW 80A THERMAL RATED TRIP PLUG TO BE PROVIDED AND INSTALLED.
2. LABEL BREAKERS/STARTER AS "SPARE".
3. REMOVE CONDUIT AND CONDUCTORS.
4. REMOVE CONDUCTORS, 1-1/2" CONDUIT TO REMAIN FOR REUSE.
5. REMOVE VFD.
6. REMOVE DISCONNECT SWITCH.
7. REMOVE J-BOX.

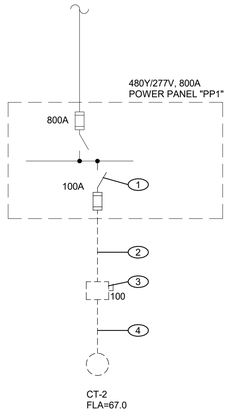
NORTH COOLING TOWER
DEMO ONE-LINE DIAGRAM



KEYED NOTES:

1. PROVIDE NEW 80A THERMAL RATED PLUG.
2. PROVIDE (2) SETS OF 3-#4, 1-#8 GROUND IN EXISTING AND NEW 1-1/2" CONDUIT.
3. PROVIDE 1" CONDUIT WITH 3-#4, 1-#8 GROUND.
4. PROVIDE 480V, 100A, NEMA 3R NON-FUSED DISCONNECT SWITCH.
5. VFD PROVIDED WITH COOLING TOWER.
6. PROVIDE NEMA 3R 12"X12"X4" J-BOX.

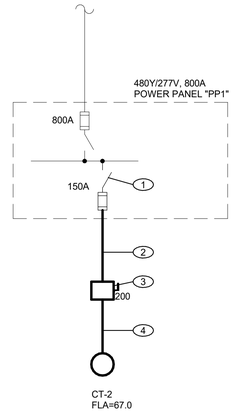
NORTH COOLING TOWER
NEW WORK ONE-LINE DIAGRAM



DEMO KEYED NOTES:

1. REMOVE 100A FUSED SWITCH AND PROVIDE BLANK COVER.
2. REMOVE CONDUCTORS, EXISTING 1-1/2" EMT CONDUIT TO REMAIN.
3. REMOVE DISCONNECT SWITCH.
4. REMOVE CONDUIT AND CONDUCTORS.

NORTHWEST COOLING TOWER
DEMO ONE-LINE DIAGRAM



KEYED NOTES:

1. PROVIDE 480V, 200A SWITCH WITH 150A FUSES.
2. PROVIDE 3-#1/0, 1-#6 GROUND IN EXISTING 1-1/2" CONDUIT.
3. PROVIDE 480V, 200A, NEMA 3R NON-FUSED DISCONNECT SWITCH.
4. PROVIDE 3-#1/0, 1-#6 GROUND IN 1-1/2" CONDUIT.

NORTHWEST COOLING TOWER
DEMO ONE-LINE DIAGRAM

ONE LINE DIAGRAM

NOT TO SCALE

2	ADDENDUM #2	07/25/2025

OPS NORTH & NORTHWEST COOLING TOWER REPLACEMENT

OMAHA, NE

ELECTRICAL ONE-LINE DIAGRAMS

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