

EXHIBIT B MECHANICAL DRAWINGS

GENERAL		VALVES & GAUGES		CONTROLS	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
—	NEW WORK	⊘	BALL VALVE	⊙	TEMPERATURE SENSOR
— (E)	EXISTING WORK TO REMAIN	⊗	SOLENOID CONTROL VALVE	⊖	THERMOSTAT OR THERMOMETER
- - - (D)	EXISTING WORK TO BE REMOVED	⊕	PRESSURE AND TEMP. RELIEF VALVE	⊙	CARBON DIOXIDE SENSOR
- - - - (F)	FUTURE WORK	⊕	BUTTERFLY VALVE	⊙	OCCUPANCY SENSOR
⤴ (ER)	EXISTING RELOCATED	⊕	MOTORIZED BUTTERFLY VALVE	⊙	HUMIDITY SENSOR OR HUMIDISTAT
℄	CENTER LINE	⊗	GATE VALVE	⊙	STATIC PRESSURE SENSOR
⊙	POINT OF CONNECTION OR POINT OF DISCONNECTION	⊗	BALANCING VALVE	⊙	REFRIGERANT SENSOR
1 M-1	DETAIL 1, DRAWING M-1	⊕	ANGLE GATE VALVE	⊙	CARBON MONOXIDE SENSOR
A M-1	SECTION A, DRAWING M-1	⊕	GLOBE VALVE	⊙	HYDROGEN SENSOR
HP 1	EQUIPMENT IDENTIFICATION HEAT PUMP UNIT #1	⊕	ANGLE GLOBE VALVE	⊙	DUCT SMOKE DETECTOR
#	KEYED NOTE	⊕	CHECK VALVE	⊙	TEMPERATURE SENSOR
78°F	78 DEGREES FAHRENHEIT	⊕	2-WAY CONTROL VALVE	⊙	STATIC PRESSURE SENSOR
		⊕	3-WAY CONTROL VALVE	⊙	PRESSURE SENSOR OR SWITCH
		⊕	NON-SLAM WAFER CHECK VALVE	⊙	DIFFERENTIAL PRESSURE SENSOR
		⊕	PRESSURE REDUCING VALVE (PRV)	⊙	AIR FLOW MEASURING STATION
		⊕	DIAPHRAGM VALVE	⊙	HUMIDITY SENSOR
		⊕	LOCK SHIELD VALVE	⊙	FLOW SENSOR OR SWITCH
		⊕	NEEDLE VALVE	⊙	FLOW METER
		⊕	QUICK OPENING VALVE	⊙	CURRENT SENSOR
		⊕	VENTURI FLOW METER	⊙	MOTOR
		⊕	PRESSURE GAUGE	⊙	ACTUATOR
		⊕	PRESS. GAUGE WITH COCK AND SNUBBER	⊙	HYDROGEN MONITOR
		⊕	THERMOMETER	⊙	REFRIGERANT MONITOR
				AI	ANALOG INPUT
				AO	ANALOG OUTPUT
				DI	DIGITAL INPUT
				DO	DIGITAL OUTPUT
				BAS	BUILDING AUTOMATION SYSTEM
				PI	PULSING INPUT
PIPING		HYDRONIC			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION		
→	DIRECTION OF SLOPE	— CHWS —	CHILLED WATER SUPPLY		
→	DIRECTION OF FLOW	— CHWR —	CHILLED WATER RETURN		
—○	PIPE UP (OR UP & DOWN WITH NOTATION)	— HWS —	HEATING WATER SUPPLY		
—○	PIPE DOWN	— HWR —	HEATING WATER RETURN		
—○	PIPE DROP/PIPE RISE	— CWS —	CONDENSER WATER SUPPLY		
—○	TOP CONNECTION - BRANCH LINE	— CWR —	CONDENSER WATER RETURN		
—○	BOTTOM CONNECTION - BRANCH LINE	— C —	COLD WATER		
—X	PIPE ANCHOR				
—○	TEE UP				
—○	TEE DOWN				
—	STRAINER				
—	STRAINER WITH BLOW OFF				
—	INLINE PUMP				
—	BASE MOUNTED PUMP				
—	TEST TAP (PETE'S PLUG)				
—	MANUAL AIR VENT				
—	AUTOMATIC AIR VENT				
—	VACUUM BREAKER				
—	VENT THRU ROOF				
—	PIPE GUIDE				
—	EXPANSION JOINT				
—	FLEXIBLE CONNECTOR				
—	UNION				
—	CAPPED OR PLUGGED TEE				
—	BLIND FLANGE, CAP				
—	CONCENTRIC REDUCER				
—	EXPANSION LOOP				
—	VALVE ON RISE				
—	PIPE SIZE (DIAMETER IN INCHES)				

HVAC DRAWING LIST		
SHEET NUMBER	SHEET NAME	ISSUED
M0.0	MECHANICAL LEGEND AND ABBREVIATIONS	X
M0.1	SCHEDULES & DIAGRAMS	X
M2.1	LEVEL 1 - HVAC PLAN	X
M3.1	ENLARGED PLANS	X

GENERAL NOTES		
A.	CONTRACT DOCUMENT DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY. DO NOT SCALE FOR MATERIAL QUANTITIES.	
B.	CONTRACTOR SHALL VISIT SITE AND VERIFY ALL EXISTING CONDITIONS AND CONNECTIONS TO EXISTING WORK PRIOR TO BIDDING AND CONSTRUCTION. THE CONTRACTOR SHALL PAY FOR AND REPAIR ALL DAMAGES CAUSED BY FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL SERVICES UNLESS OTHERWISE INDICATED.	
C.	CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED FEES, PERMITS AND INSPECTIONS. OBTAIN ALL FIELD APPROVALS ON WORK FROM REGULATING AGENCIES WHERE REQUIRED.	
D.	PROTECTION OF PUBLIC: THE CONTRACTOR SHALL PROTECT THE PUBLIC FROM INJURY DURING THE WORK BY POSTING WARNING SIGNS, GUARD LIGHTS AND BARRICADES.	
E.	CONTRACTOR TO PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERATIONAL MECHANICAL SYSTEMS, EQUIPMENT AND APPURTENANCES IN THE ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS, CONTRACT DOCUMENTS, SPECIFICATIONS, APPLICABLE CODES AND REGULATIONS.	
F.	ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.	
G.	LOCATE ALL TEMPERATURE, PRESSURE, AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH STRAIGHT SECTION OF PIPE OR DUCT UP-AND-DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER FOR GOOD ACCURACY.	
H.	TESTING, ADJUSTING, AND BALANCING AGENCY SHALL BE A MEMBER OF THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR THE NATIONAL ENVIRONMENTAL	
I.	BALANCING BUREAU (NEBB). TESTING, ADJUSTING, AND BALANCING SHALL BE PERFORMED IN ACCORDANCE WITH THE AABC STANDARDS.	
J.	WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.	
K.	ALL EQUIPMENT, PIPING, DUCTWORK, ETC., SHALL BE SUPPORTED AS DETAILED, SPECIFIED, AND REQUIRED TO PROVIDE A VIBRATION FREE INSTALLATION.	
L.	CONTRACTOR DEMOLITION SHALL NOT DISRUPT OR STOP OWNER OR NEIGHBORING SERVICES.	
M.	THE CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS AND DIMENSIONS, AND VERIFY EXACT LOCATIONS AND ELEVATIONS OF POINTS OF CONNECTION BY MEANS OF PHYSICAL EXCAVATION AND SELECTIVE DEMOLITION BEFORE STARTING WORK. SHOULD A DISCREPANCY APPEAR IN THE CONTRACT DOCUMENTS, OR BETWEEN THE CONTRACT DOCUMENTS AND EXISTING CONDITIONS, NOTIFY THE ENGINEER OF RECORD AT ONCE FOR INSTRUCTION ON HOW TO PROCEED.	
N.	THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACCURATE PLACEMENT OF ALL NEW CONSTRUCTION ON THE SITE.	
O.	COMMISSIONING OF EQUIPMENT SHALL CONFORM WITH THE 2018 WSEC SECTION C408 COMMISSIONING.	
P.	ALL PIPING INSULATION SHALL CONFORM TO THE 2018 WSEC SECTIONS Q CAP ALL PIPE OPENINGS DURING CONSTRUCTION.	
Q.	ALL SEISMIC ATTACHMENT DESIGN & CONSTRUCTION IS DEFERRED TO THE CONTRACTOR. HIRE A STRUCTURAL ENGINEER PERMIT THE DESIGN & SECURE NEW EQUIPMENT TO EXISTING STRUCTURE AS REQUIRED.	

MECHANICAL- BASIS OF DESIGN	
A.	THIS PROJECT CONSISTS OF A COOLING TOWER REPLACEMENT FOR AN EXISTING FACILITY LOCATED AT 2121 W CASINO RD, IN EVERETT WASHINGTON. THE TOWER SERVES A WATER SOURCE HEAT PUMP SYSTEM IN THE BUILDING AND IS AT END OF LIFE.
B.	THE DESIGN INCLUDES THE FOLLOWING NOTABLE FEATURES, BUT IS NOT LIMITED TO THIS SCOPE. <ol style="list-style-type: none"> THE REPLACEMENT OF AN EXISTING 1890 MBH COOLING TOWER AND ASSOCIATED VALVES, PUMPS, VFD, CONTROL PANEL AND ACCESSORIES FOR LIKE-FOR-LIKE REPLACEMENTS. CONTROLS: EXISTING DIRECT DIGITAL BUILDING AUTOMATION SYSTEM (BAS) TO OPERATE ALL SYSTEM FUNCTIONS AND SCHEDULES.
C.	CODES AND STANDARDS <ol style="list-style-type: none"> THE COMPLETE INSTALLATION SHALL CONFORM TO ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES, ORDINANCES, UTILITY COMPANY REQUIREMENTS AND REGULATIONS INCLUDING NECESSARY PERMITS AND INSPECTIONS REQUIRED BY THE GOVERNING AUTHORITIES. WASHINGTON BUILDING CODES ENFORCED BY THE AUTHORITY HAVING JURISDICTION (AHJ): <ol style="list-style-type: none"> 2018 INTERNATIONAL BUILDING CODE (IBC) WITH STATE AND LOCAL AMENDMENTS. 2018 INTERNATIONAL MECHANICAL CODE (IMC) WITH STATE AND LOCAL AMENDMENTS. 2018 UNIFORM PLUMBING CODE (UPC) WITH STATE AND LOCAL AMENDMENTS. 2018 INTERNATIONAL FIRE CODE (IFC) WITH STATE AND LOCAL AMENDMENTS. 2020 NATIONAL ELECTRICAL CODE (NEC). 2018 WASHINGTON STATE ENERGY CODE (WAC 51-11, WSEC).



Project
WSIPC Cooling Tower Replacement
2121 W. Casino Road,
Everett, WA



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Revisions		
#	Description	Date

SHEET TITLE:
**MECHANICAL
LEGEND AND
ABBREVIATIONS**

DRAWN BY: Author
CHECKED BY: Checker
SHEET

M0.0
JOB NO. **24US00135**

COOLING TOWER SCHEDULE																		
TAG	MANUFACTURER	MODEL NUMBER	TYPE	NOM. CAP. (MBH)	WATER					ELECTRICAL				UNIT SIZE (L'xW'xH')	OPER. WT. (LBS)	NOTES		
					FLOW (GPM)	AMB WB (°F)	LWT (°F)	EWT (°F)	P.D.+LIFT (FT.WG.)	MAKEUP WATER (GPM)	FAN (HP)	V/PH	VFD (Y/N)				EMERG POWER (Y/N)	SUMP HTR (KW)
CT-1	BAC	VF1-48-31N	CLOSED CIRCUIT	1,890	380	67	85	95	20	9	(1) 25	460/3	Y	N	(1) 3	12'-11" X 4'-9" X 10'-8"	22,220	1 THRU 11

NOTES:

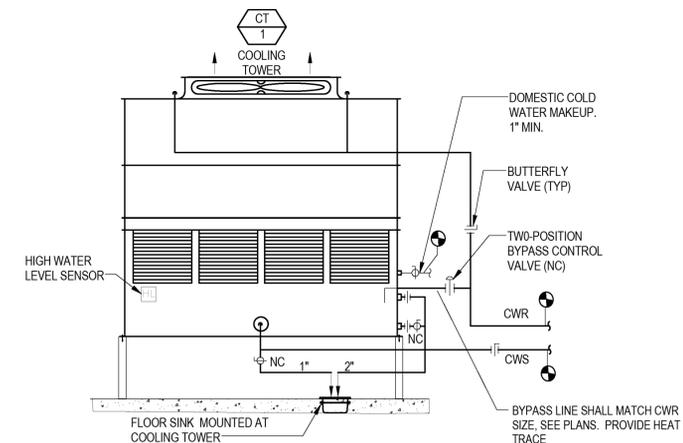
- COORDINATE WITH ELECTRICAL FOR POWER AND DISCONNECT AS REQUIRED.
- VARIABLE FREQUENCY DRIVE (VFD) PROVIDED BY MECHANICAL AND WIRED BY ELECTRICAL.
- VFD TO BE REMOTELY MOUNTED OUTDOORS IN SAME LOCATION AS EXISTING AS INDICATED ON PLANS. ELECTRICAL TO PROVIDE SEPARATE DISCONNECT SWITCH AT TOWER.
- PROVIDE MOTOR SHAFT GROUNDING SYSTEM ON MOTOR CONTROLLED BY VFD.
- PROVIDE SEISMIC RATED CONNECTIONS TO THE EXISTING CONCRETE PAD. BID SHALL INCLUDE ALL REQUIREMENTS FOR THE DESIGN & CONSTRUCTION OF SEISMIC CONNECTIONS. SUBMIT DRAWINGS/CALCULATIONS AS A DIFFERED SUBMITTAL.
- COOLING TOWER PERFORMANCE SHALL BE CTI CERTIFIED.
- SEE SPECIFICATION 236500 FOR TOWER MATERIAL AND CONSTRUCTION REQUIREMENT
- PROVIDE BYPASS WATER PIPE CONNECTION AT THE SUMP LEVEL IN EACH BASIN.
- PROVIDE INDIVIDUAL CELL, SUMP, FAN CONTROLS TO ALLOW FULL INDEPENDENT OPERATION OF EACH CELL.
- CONNECT TO EXISTING WATER TREATMENT SYSTEM.
- PROVIDE ELECTRIC WATER LEVEL CONTROL TO OPERATE SOLENOID MAKEUP WATER VALVE AND PROVIDE HIGH OVERFLOW AND LOW WATER ALARMS TO BAS SYSTEM. COORDINATE WITH ELECTRICAL FOR POWER AND WIRING.

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NOTES:

- CONTRACTOR SHALL BECOME FAMILIAR WITH THE EXISTING BAS CONTROLS LOGIC FOR THE EXISTING TOWER PRIOR TO THE DEMOLITION OF EXISTING TOWER. NOTE CONTROL POINTS & SEQUENCE TO INCLUDE IN THE BAS CONTROL DRAWINGS/DESIGN AS A DIFFERED SUBMITTAL.
- THE NEW TOWER SHALL OPERATE SIMILAR TO EXISTING FOR ENABLE/DISABLE CONTROL, MONITORING & ALARMS. RECONNECT ANY NEW SENSORS PROVIDED ON THIS PROJECT TO EXISTING CONTROL PANELS. INCLUDE NEW WIRING.
- A TOWER FILL BYPASS LINE & (2) NEW VALVES ARE INCLUDED IN THIS SCOPE OF WORK. WHEN OUTDOOR AIR TEMPERATURES ARE BELOW 35F (ADJUSTABLE) & TOWER IS ENABLED, BYPASS FILL/TOWER COIL DIRECT TO BASIN TO PROTECT TOWER ELEMENTS FROM FREEZING. RETURN TO NORMAL OPERATION ABOVE 35F (ADJUSTABLE)

- REFER TO DRAWINGS FOR PIPE SIZES & CONTINUATION. PIPE SIZES SHALL MATCH TOWER CONNECTION SIZES UNLESS NOTED ON FLOOR PLANS.
- PROVIDE DRAIN VALVES AT SYSTEM LOW POINTS OF PIPING
- PROVIDE ELECTRIC HEAT TRACE WIRING AND INSULATE WATER LINES IN FREEZING CLIMATES.
- PROVIDE ELECTRIC HEAT TRACE WIRING AND INSULATE CONDENSER WATER SUPPLY AND RETURN WATER LINES, IN FREEZING CLIMATES WHERE COOLING TOWERS WILL BE OPERATING IN THE WINTER.
- ROUTE BYPASS PIPE THROUGH WATERTIGHT BULKHEAD FITTING ON SIDE OF BASIN AND TERMINATE BELOW OVERFLOW LEVEL.
- PROVIDE HIGH WATER LEVEL SENSOR BELOW OVERFLOW WITH BAS ALARM.

2 CONTROLS DESCRIPTION
NTS

1 COOLING TOWER PIPING DIAGRAM
NTS



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Revisions		
#	Description	Date

SHEET TITLE:
SCHEDULES & DIAGRAMS

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MO.1

JOB NO. **24US00135**

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Tower Replacement**
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Revisions

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SHEET TITLE:
**LEVEL 1 -
HVAC PLAN**

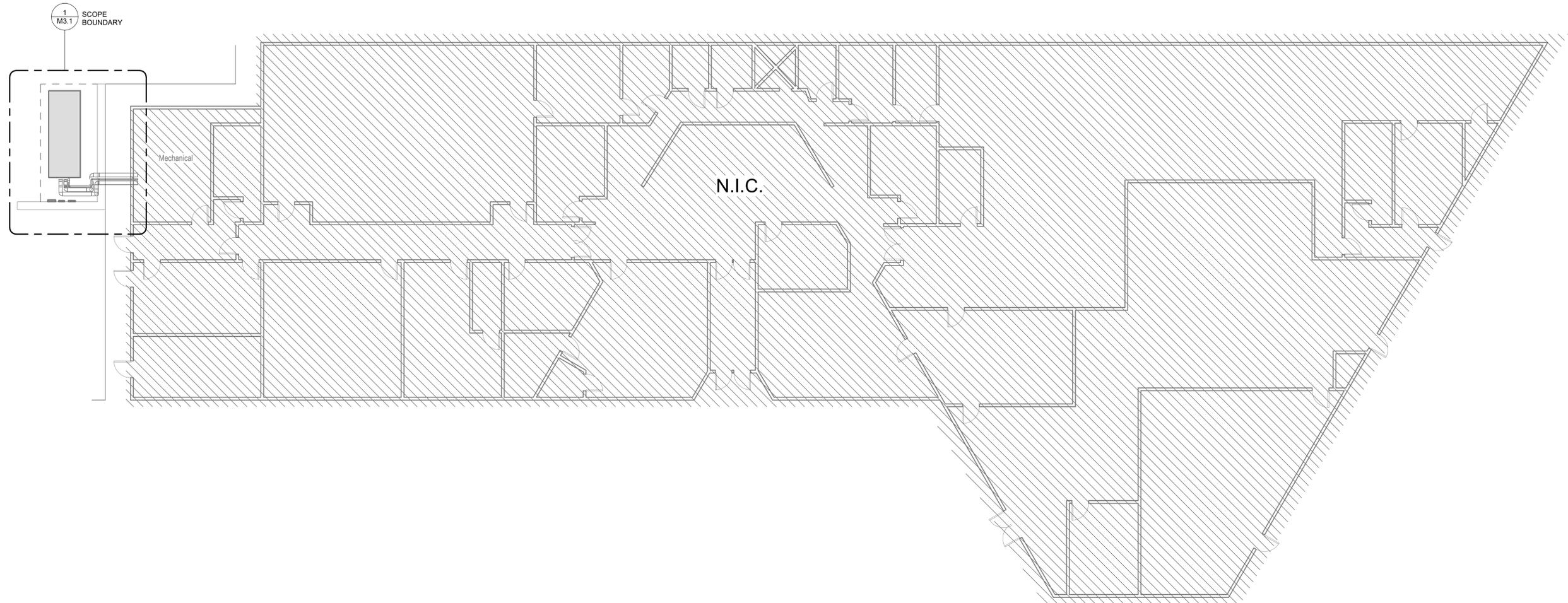
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M2.1

JOB NO. **24US00135**



1 LEVEL 1 - FLOOR PLAN - HVAC
SCALE: 1/8" = 1'-0"



SHEET NOTES

1. DEMOLISH EXISTING COOLING TOWER, SPRAY PUMP, CONTROL PANEL, DISCONNECT, AND VFD. REMOVE FROM SITE AND DISPOSE OF.
2. DEMOLISH PIPING FROM COOLING TOWER UP TO POINT OF CONNECTION (POC) SYMBOL.
3. TEMPORARILY REMOVE & REPLACE CHAIN LINK FENCE SECTIONS AS NEEDED TO REMOVE COOLING TOWER.
4. PROVIDE NEW COOLING TOWER, SPRAY PUMP, FLANGED PIPE FLEX CONNECTOR, CONTROL PANEL, DISCONNECT, AND VFD. PROVIDE HEAT TRACE ON ALL NEW PIPING PROVIDED.
5. EXISTING WATER TREATMENT SYSTEM TO REMAIN, INCLUDING CONTROLS, METERS & PIPING CONNECTIONS.
6. CONTRACTOR TO PROVIDE A FUNCTIONAL TEMPORARY COOLING TOWER SYSTEM WITH TEMPORARY POWER FROM TIME OF THE START OF DEMOLITION UNTIL THE NEW COOLING TOWER CAN BE INSTALLED AND IS FULLY FUNCTIONAL. THE BID SHALL INCLUDE ALL PROVISIONS TO PROVIDE CONTINUOUS COOLING TO THE FACILITY DURING CONSTRUCTION INCLUDING BUT NOT LIMITED TO: PLANNED LOCATION FOR TEMPORARY TOWER, FLEX PIPING EXTENSIONS & POWER CONNECTION FROM EXISTING BUILDING.

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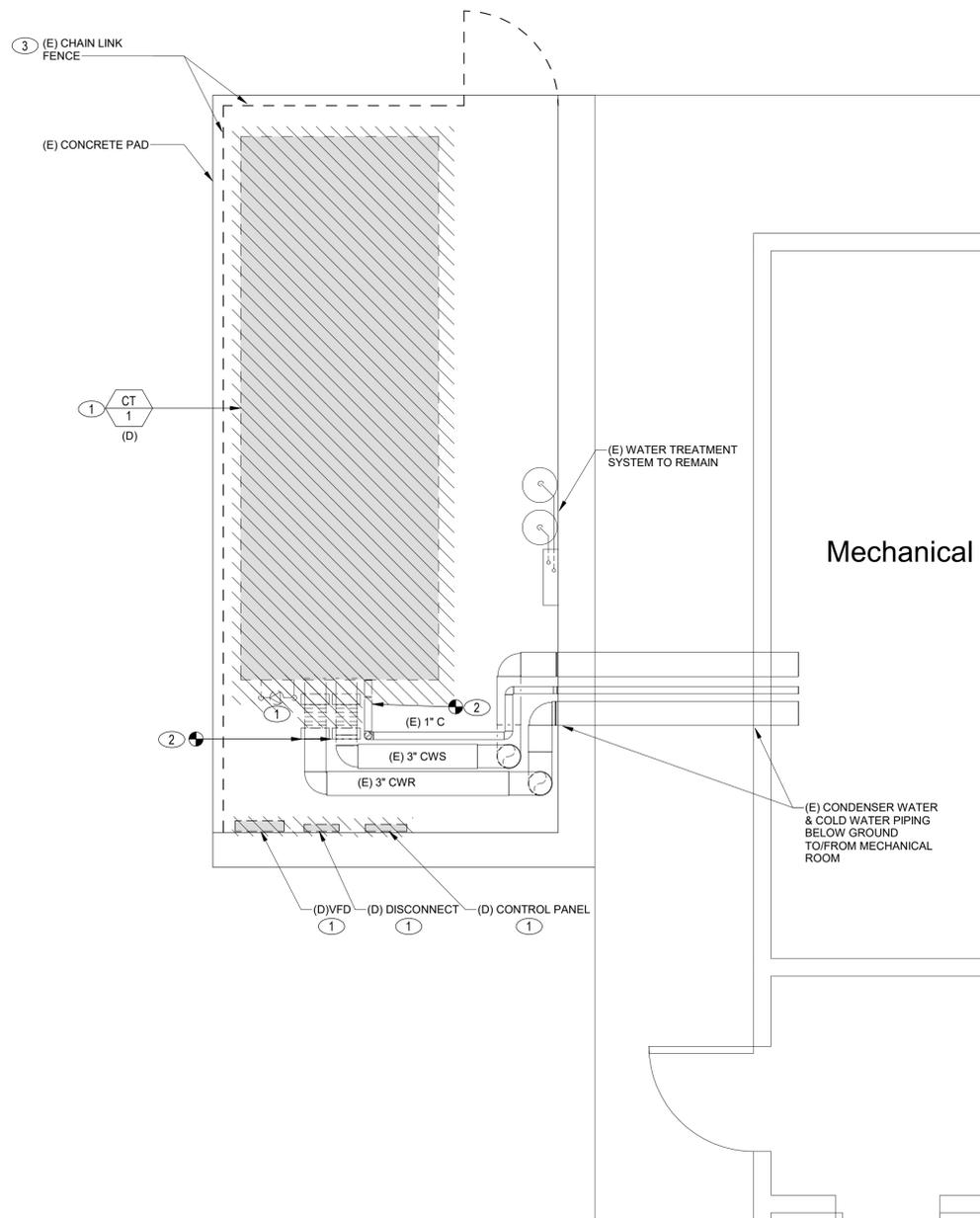
SHEET TITLE:
ENLARGED PLANS

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CHECKED BY: MA
SHEET

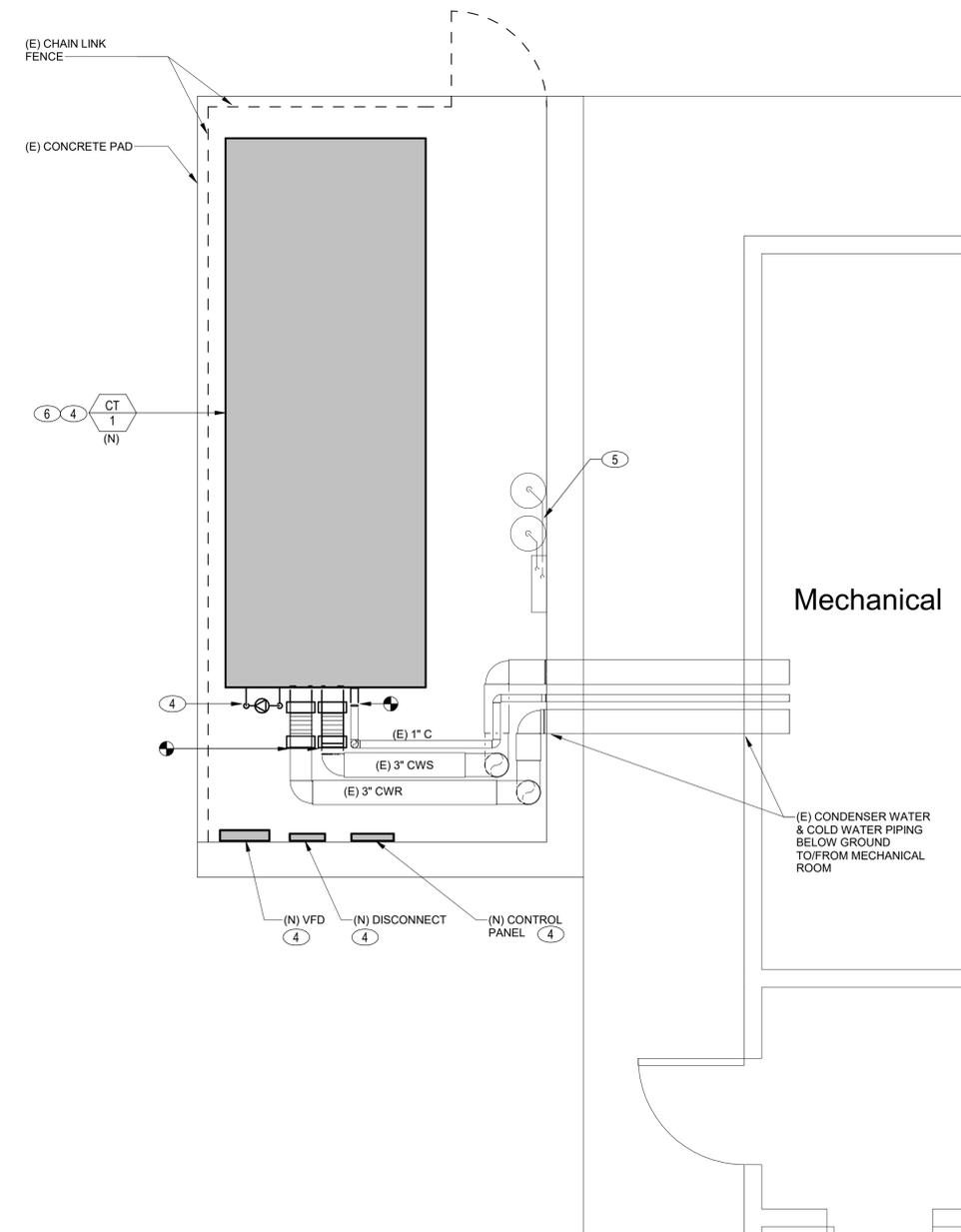
M3.1

JOB NO. **24US00135**

Construction Documents 2/19/2024



1 LEVEL 1 - ENLARGED MECHANICAL DEMOLITION PLAN - HVAC
SCALE: 1/2" = 1'-0"



2 LEVEL 1 - ENLARGED MECHANICAL PLAN - HVAC
SCALE: 1/2" = 1'-0"

