REPLACE FLUID COOLER
WHEELER HALL & ADMINISTRATION BUILDING
MISSOURI SCHOOL FOR THE DEAF
FULTON , MISSOURI

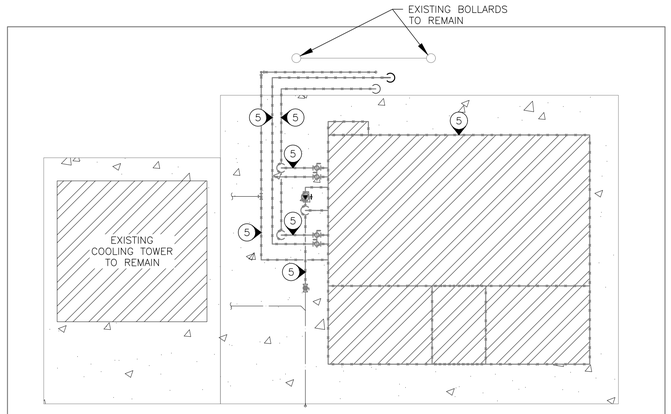
OWNER:	STATE OF MISSOURI MICHAEL L. PARSON, GOVERNOR DEPARTMENT OF ELEMENTARY AND SECONDARY EDUCATION
PROJECT MANAGEMENT:	OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

DESIGNER:	STATE OF MISSOURI - OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT DESIGN AND CONSTRUCTION: 301 W. HIGH STREET, JEFFERSON CITY, MO. 65102
PROJECT NUMBER:	E2304-01
ASSET NUMBER:	5012001008

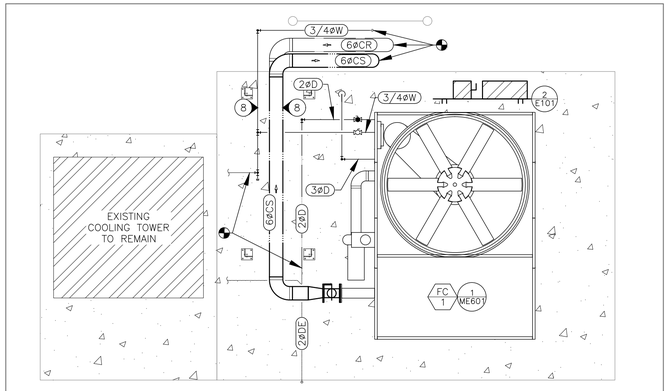
SHEET NUMBER:

G-001

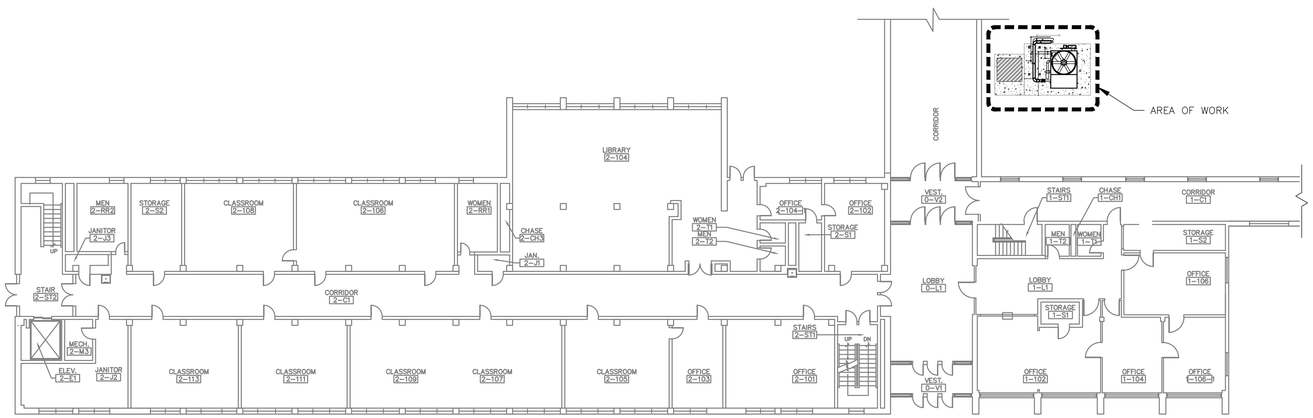
03/23/2023



1 MECHANICAL DEMOLITION PLAN
SCALE: 3/8" = 1'-0"



2 MECHANICAL RENOVATION PLAN
SCALE: 3/8" = 1'-0"

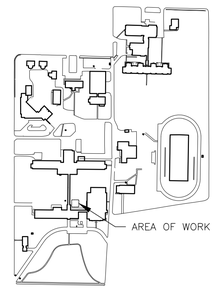


3 WHEELER HALL FIRST FLOOR AREA MAP
SCALE: 1/16" = 1'-0"

NOTES

1. DEMOLITION DRAWINGS AND PLANS ARE FROM FIELD TAKE-OFF AND ORIGINAL DRAWINGS. CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY PRIOR TO BIDDING AND/OR CONSTRUCTION.
2. INSURE DEBRIS IS REMOVED FROM THE CONSTRUCTION AND DEMOLITION AREA AND AIR BORN DEBRIS IS NOT ALLOWED TO TRAVEL TO THE REMAINDER OF THE BUILDING. CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND DISPOSAL OF ALL DEMOLISHED MATERIAL.
3. COORDINATE WITH EXISTING SYSTEMS WHICH SHALL REMAIN IN OPERATION DURING DEMOLITION AND CONSTRUCTION PHASES. INSTALL TEMPORARY CAPS AT TERMINATION POINTS OF EXISTING PIPES TO REMAIN DURING DEMOLITION PHASES.
4. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST VERSION OF THE INTERNATIONAL MECHANICAL CODE, ALL STATE CODES, AND ALL MANUFACTURER INSTALLATION GUIDELINES.
5. REMOVE AND DISPOSE OF EXISTING FLUID COOLER AND ALL ASSOCIATED CONTROLS. REMOVE CONDENSER WATER PIPES AND REMOVE DRAIN AND FILL PIPES AS SHOWN OR AS NEEDED TO COMPLETE THE WORK. EXISTING CONCRETE PAD TO REMAIN FOR USE WITH NEW FLUID COOLER.
6. CLEAN AND FLUSH SYSTEM AFTER FLUID COOLER INSTALLATION IS COMPLETE. CLEANING CHEMICALS SHALL BE A BLEND OF INORGANIC PHOSPHATE, CORROSION INHIBITOR, DISPERSANT, AND OIL EMULSIFIER APPROVED FOR DISPOSAL IN SANITARY SEWER SYSTEM. OBTAIN CLEANING AND FLUSHING PROCEDURES AND CHEMICALS FROM OWNER'S WATER TREATMENT SERVICES COMPANY (WALTER LOUIS FLUID TECHNOLOGIES, 217-223-2017, ROGER SMITH, DENNIS GIER). COORDINATE WATER TREATMENT COMPANY INSPECTION OF PIPING PRIOR TO AND AFTER CHEMICAL CLEANING. CLEAN ALL WATER SYSTEM STRAINERS AFTER CLEANING AND FLUSHING OPERATIONS.
7. FOLLOWING CLEANING AND FLUSHING, THE SYSTEM SHALL BE INSPECTED BY THE WATER TREATMENT COMPANY FOR CLEANLINESS AND THE INITIAL DOSAGE OF PROTECTIVE TREATMENT SHALL BE APPLIED. WATER TREATMENT SHALL BE APPLIED TO THE SYSTEM TO PASSIVATE THE GALVANIZED STEEL HEAT EXHANCER BEFORE FINAL TREATMENT IS COMPLETED. THE FINAL PROTECTIVE TREATMENT CHEMICALS ARE NOT A PART OF THIS CONTRACT AND SHALL BE PROVIDED BY THE OWNER.
8. MAKE UP WATER LINE SHOWN OFFSET FOR CLARITY. REFERENCE DETAIL 1 SHEET ME-601 FOR SUPPORT STRUCTURE REQUIREMENTS.
9. INSULATE MAKE UP WATER PIPE WITH 1 INCH THICK FLEXIBLE ELASTOMERIC CELLULAR INSULATION THAT COMPLIES WITH ASTM C534 GRADE 1, ADHESIVE SHALL COMPLY WITH MIL-A-24179A, TYPE II, CLASS I. FINISH WITH ALUMINUM JACKET THAT COMPLIES WITH ASTM B 209, ALLOY 3003, 3005, 3105, OR 5005, TEMPER H-14.
10. THIRD PARTY, AABC OR NEBB CERTIFIED TESTING, ADJUSTING, AND BALANCING CONTRACTOR SHALL TEST AND BALANCE BUILDING CONDENSER WATER PUMPS TO PROVIDE REQUIRED SYSTEM WATER FLOW RATE AND PREPARE A BALANCE REPORT PER ASHRAE STANDARD 111 OR EQUAL. REPORT SHALL BE SENT TO THE ENGINEER FOR APPROVAL PRIOR TO FINAL COMPLETION. REFER TO DETAIL 1 SHEET E-101 FOR LOCATION OF CONDENSER WATER PUMPS.

HVAC LEGEND	
	DIRECTION OF FLOW
AA / N	DEVICE SCHEDULE TAG
N / LNNN	DETAIL REFERENCE, NUMBER/SHEET
Øø-CS	PIPE SIZE – SERVICE (INCHES DIAMETER)
	EQUIPMENT/MATERIALS TO BE REMOVED
	HVAC EQUIPMENT
	CONDENSER SUPPLY TO BUILDING (CS)
	CONDENSER RETURN FROM BUILDING (CR)
	MAKE UP WATER PIPE (W)
	MAKE UP WATER PIPE – EXISTING (WE)
	DRAIN PIPE (D)
	DRAIN – EXISTING (DE)
	CONNECTION TO EXISTING EQUIPMENT



4 SITE KEY PLAN
SCALE: N.T.S.

N

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MICHAEL L. PARSON, GOVERNOR

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CAD DWG FILE: M_E2304-01
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CHECKED BY: TLS
DESIGNED BY: TLS

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REPLACE FLUID COOLER MECHANICAL PLAN

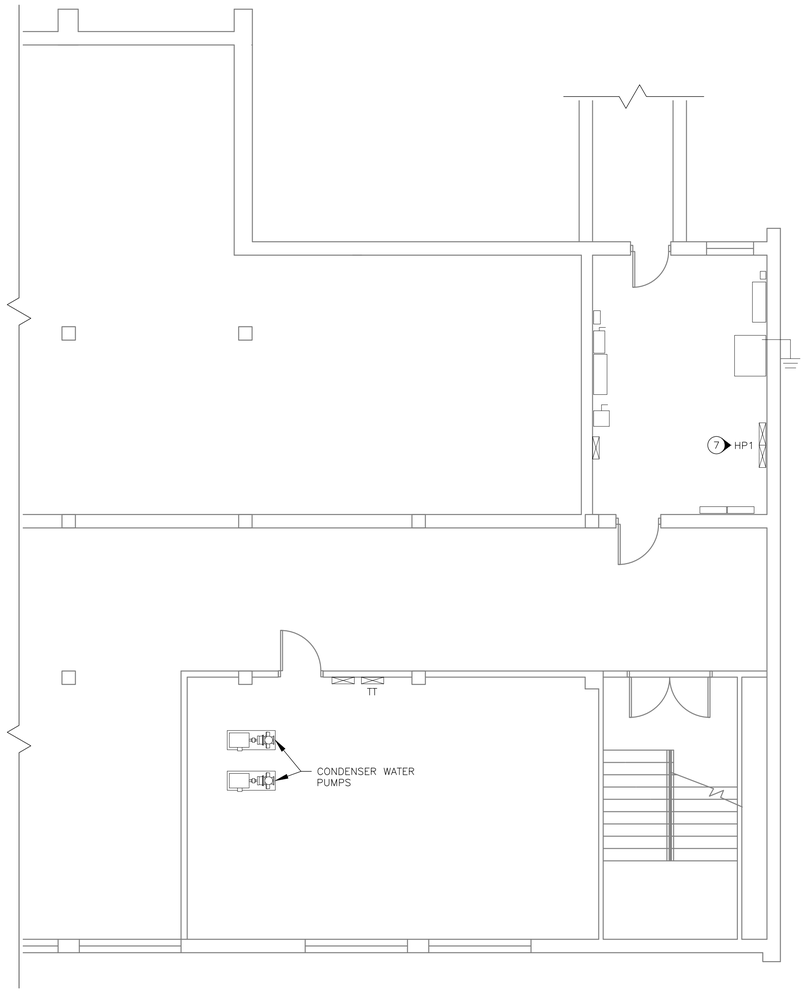
SHEET NUMBER:

M-101

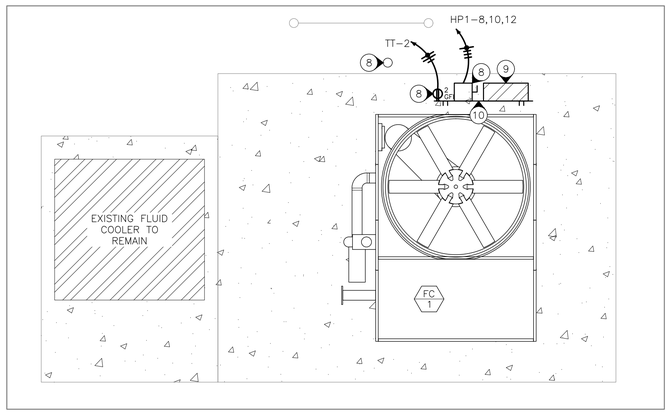
2 OF 4 SHEETS
03/23/2023

NOTES

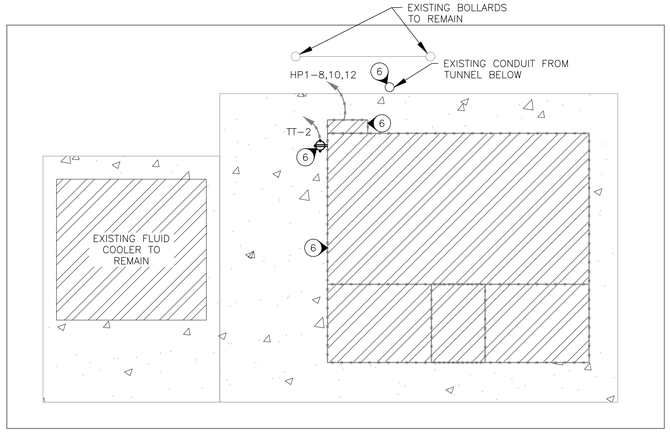
1. DEMOLITION DRAWINGS AND PLANS ARE FROM FIELD TAKE-OFF AND ORIGINAL DRAWINGS. CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY PRIOR TO BIDDING AND/OR CONSTRUCTION.
2. INSURE DEBRIS IS REMOVED FROM THE CONSTRUCTION AND DEMOLITION AREA AND AIR BORN DEBRIS IS NOT ALLOWED TO TRAVEL TO THE REMAINDER OF THE BUILDING. CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND DISPOSAL OF ALL DEMOLISHED MATERIAL.
3. COORDINATE WITH EXISTING SYSTEMS WHICH SHALL REMAIN IN OPERATION DURING DEMOLITION AND CONSTRUCTION
4. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST VERSION OF THE NATIONAL ELECTRIC CODE, ALL STATE CODES, AND ALL MANUFACTURER INSTALLATION GUIDELINES.
5. PROVIDE ALL MATERIALS REQUIRED TO COMPLETE THE ELECTRICAL WORK. ALL EXPOSED LINE VOLTAGE WIRING SHALL BE PULLED IN PROPERLY SIZED CONDUIT WITH APPROVED FITTINGS.
6. MECHANICAL CONTRACTOR SHALL REMOVE AND DISPOSE OF EXISTING FLUID COOLER AND ALL ASSOCIATED CONTROLS. DISCONNECT POWER FROM EQUIPMENT PRIOR TO DEMOLITION. REMOVE WIRE AND CONDUIT FROM UNIT MOUNTED PANEL AND GFI OUTLET BACK TO JUNCTION BOX LOCATED IN TUNNEL ADJACENT TO THE FLUID COOLER CONCRETE PAD.
7. VERIFY BREAKER FOR FLUID COOLER POWER IS ACCEPTABLE FOR USE WITH NEW FLUID COOLER (FC-1). REPLACE BREAKER AS NEEDED.
8. PROVIDE AND INSTALL DISCONNECT FOR NEW FC-1. PROVIDE AND INSTALL NEW WEATHERPROOF GFI CONVENIENCE OUTLET. ROUTE NEW CONDUIT AND FEEDERS FROM JUNCTION BOX IN TUNNEL TO DISCONNECT AND GFI OUTLET. ROUTE FEEDERS FOR GFI OUTLET IN SEPARATE CONDUIT. ROUTE CONTROL WIRING IN SEPARATE CONDUIT. ALL CONDUIT AND FEEDERS SHALL BE RATED FOR DIRECT BURY.
9. PROVIDE VARIABLE FREQUENCY DRIVE ATV212HU75N4 BY SCHNEIDER ELECTRIC OR EQUAL FOR 10 HP 480V/3 PHASE FLUID COOLER FAN MOTOR. MOUNT IN NEMA 3R ENCLOSURE. ENCLOSURE SHALL BE SIZED TO PROVIDE ADEQUATE AIR CIRCULATION FOR VFD PER MANUFACTURER'S INSTRUCTIONS AND TO PROVIDE SPACE FOR 2 HP 480V/3 PHASE PUMP MOTOR CONTACTOR.
10. MOUNT VFD NEMA 4 ENCLOSURE, FC-1 DISCONNECT, AND GFI OUTLET ON FIELD FABRICATED FRAME. FRAME SHALL BE FABRICATED FROM UNISTRUT OR EQUAL AND SHALL BE ANCHORED TO THE CONCRETE PAD USING POST BASES AND APPROPRIATE CONCRETE FASTENERS. MOUNTING TO COOLING TOWER IS NOT ACCEPTABLE.



1 WHEELER HALL BASEMENT AREA MAP
SCALE: 3/16" = 1'-0"



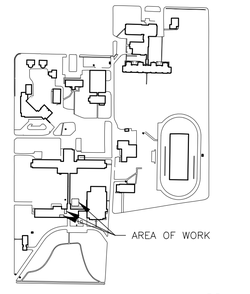
2 ELECTRICAL RENOVATION PLAN
SCALE: 3/8" = 1'-0"



3 ELECTRICAL DEMOLITION PLAN
SCALE: 3/8" = 1'-0"

ELECTRICAL LEGEND

AA / N	DEVICE SCHEDULE TAG
	HOME RUN-SHORT STROKES INDICATE PHASE OR SWITCHED WIRES, LONG STROKE INDICATE NEUTRAL, LONG WITH DOT INDICATE GROUND
22 GFI	SINGLE RECEPTACLE WITH PANEL LOCATION 120V GROUND FAULT TYPE
	NON FUSED DISCONNECT SWITCH



4 SITE KEY PLAN
SCALE: N.T.S.

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CAD DWG FILE: M_E2304-01
DRAWN BY: TLS
CHECKED BY: TLS
DESIGNED BY: TLS

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REPLACE FLUID COOLER ELECTRICAL PLAN

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E-101

3 OF 4 SHEETS
03/23/2023

EVAPORATIVE FLUID COOLER SCHEDULE

			CONDENSING WATER				FAN DATA			PUMP DATA		
MARK	MANUFACTURER	MODEL	FLOWRATE (GPM)	EWT (°F)	LWT (°F)	AMBIENT (db°F/wb°F)	QUANTITY	MOTOR SIZE (HP)	POWER (VOLT/PHASE)	QUANTITY	MOTOR SIZE (HP)	POWER (VOLT/PHASE)
FC-1	BALTIMORE AIRCOIL COMPANY	FXV-0806A-20D-K	293	98.7	90	98/78	1	10	460/3	1	2	460/3

NOTES

MANUFACTURER LISTED IS BASIS OF DESIGN. REFERENCE SPECIFICATIONS FOR ADDITIONAL APPROVED MANUFACTURERS
CTI CERTIFIED THERMAL PERFORMANCE, STRUCTURE DESIGNED PER IBC AND ASCE/SEI 7
STAINLESS STEEL FRAME AND BASIN CONSTRUCTION, HOT-DIPPED GALVANIZED COIL, PVC FILL AND DRIFT ELIMINATORS, PVC SPRAY BRANCHES, INTERNAL WALKWAY AND LADDER
TOTALLY ENCLOSED, AIR OVER (TEAO), PREMIUM EFFICIENCY (INVERTER DUTY) FAN MOTOR WITH SPACE HEATER
INTEGRAL PUMP WITH END MAKE-UP, DRAIN, AND OVERFLOW CONNECTIONS
MECHANICAL FLOAT VALVE ASSEMBLY WITH HIGH AND LOW LEVEL ALARM FLOAT SWITCHES FOR BAS ALARM OUTPUT
ALTERNATE 1: PROVIDE TYPE 304 STAINLESS STEEL, FULL CIRCUIT COIL

CONTROL NOTES

THIS FACILITY HAS AN EXISTING SCNEIDER ELECTRIC BUILDING AUTOMATION SYSTEM. INTEGRATION OF FLUID COOLER CONTROL SHALL BE PROVIDED BY C&C GROUP:

BRIAN SCHEPERS
2414 HYDE PARK RD.
JEFFERSON CITY, MO 65109
573.632.4247

CONTROLS CONTRACTOR IS RESPONSIBLE FOR PROVIDING AND INSTALLING ALL CONTROLLERS, CONTROL WIRING, AND SENSORS EXCEPT SENSORS NOTED TO BE PROVIDED BY FLUID COOLER MANUFACTURER.

CONTROLS CONTRACTOR SHALL PROVIDE ALL PROGRAMMING AND GRAPHICS REQUIRED TO INTEGRATE NEW EQUIPMENT INTO THE EXISTING CONTROLS SYSTEM.

THE ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL FLUID COOLER FAN VARIABLE FREQUENCY DRIVE AND ALL REQUIRED FLUID COOLER ELECTRICAL POWER CONNECTIONS.

SEQUENCE OF OPERATION

FLUID COOLER (FC-1) SHALL BE ENABLED AND FC-1 PUMP SHALL OPERATE BASED ON THE FOLLOWING CRITERIA:

1. BUILDING CONDENSER WATER LOOP PUMP IS OPERATING.
2. THE CONDENSER WATER SUPPLY TEMPERATURE IS 90°F OR GREATER (ADJUSTABLE).

WHEN FC-1 IS ENABLED, THE FLUID COOLER FAN VARIABLE FREQUENCY DRIVE SHALL BE CONTROLLED BY THE BUILDING AUTOMATION SYSTEM:

1. FAN SHALL OPERATE AT MINIMUM SPEED WHEN THE CONDENSER WATER SUPPLY TEMPERATURE IS 90°F (ADJUSTABLE)
2. FAN SHALL OPERATE AT MAXIMUM SPEED WHEN THE CONDENSER WATER SUPPLY TEMPERATURE IS 95°F (ADJUSTABLE).
3. FAN SPEED SHALL MODULATE LINEARLY BETWEEN THE MINIMUM AND MAXIMUM TEMPERATURE SETPOINTS.
4. FAN SHALL BE DISABLED WHEN THE CONDENSER WATER SUPPLY TEMPERATURE IS LESS THAN 90°F.

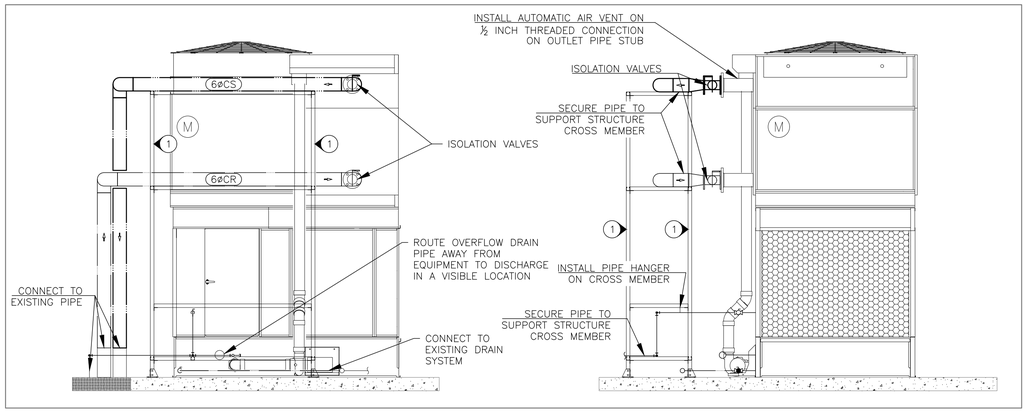
WHEN THE CONDENSER WATER SUPPLY TEMPERATURE IS LOWER THAN 80°F, THE PUMP SHALL BE DISABLED.

THE MAKE-UP WATER VALVE IS A FLOAT TYPE ASSEMBLY AND SHALL BE OPERATED BASED ON UNSKINKABLE FLOAT LOCATION. THE BAS SHALL MONITOR AND ALARM HIGH AND LOW WATER LEVELS. SENSORS PROVIDED BY MANUFACTURER.

THE BAS SHALL MONITOR AND ALARM BASIN FREEZE CONDITIONS. IF THE BASIN TEMPERATURE IS 40°F OR LESS, THE BAS SHALL PROVIDE AN ALARM. THE ALARM SHALL BE DISABLED WHEN THE BASIN IS DRAINED. SENSOR PROVIDED BY CONTROLS MANUFACTURER.

BUILDING AUTOMATION SYSTEM - POINTS LIST

	BAS DISPLAY	BAS ADJUSTABLE	ALARM	TREND
FAN ENABLE	X			
FAN STATUS	X		X	
FAN SPEED COMMAND	X			X
PUMP ENABLE	X			
PUMP STATUS	X		X	X
ENTERING WATER TEMPERATURE	X			X
LEAVING WATER TEMPERATURE	X			X
LEAVING WATER TEMPERATURE MAXIMUM SETPOINT	X	X		
LEAVING WATER TEMPERATURE MINIMUM SETPOINT	X	X		
BASIN WATER TEMPERATURE FREEZE ALARM	X		X	
TOWER FILL HIGH	X		X	
TOWER FILL LOW	X		X	



1 PIPE CONNECTIONS ELEVATION
SCALE: 3/8" = 1'-0"

PIPE CONNECTION NOTES

1. PIPE SUPPORT STRUCTURE SHOWN FOR REFERENCE ONLY. STACK MAKE UP WATER, CONDENSER SUPPLY, AND CONDENSER RETURN PIPES IN THE SAME VERTICAL PLANE AND MOUNT TO SUPPORT STRUCTURE. STRUCTURE SHALL BE FABRICATED WITH UNISTRUT OR EQUAL AND SHALL BE ANCHORED TO THE CONCRETE PAD USING POST BASES AND APPROPRIATE CONCRETE FASTENERS. PROVIDE AND INSTALL STRUCTURE THAT WILL SUPPORT THE WEIGHT OF THE PIPES AND WILL RESIST WIND DRIVEN MOVEMENT. ALL MATERIALS OF CONSTRUCTION SHALL BE CORROSION RESISTANT AND FOR USE OUTDOORS. PROVIDE SUPPORT STRUCTURE DESIGN SUBMITTAL PRIOR TO CONSTRUCTION. REFER TO SECTION 230529 HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT.

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DEVICE SCHEDULES AND CONTROLS

SHEET NUMBER:
ME-601

4 OF 4 SHEETS
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