

# WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY



## REPLACE CHILLERS THROUGHOUT THE METRORAIL SYSTEM

**CONTRACT NO. FQ14005D-13-003**

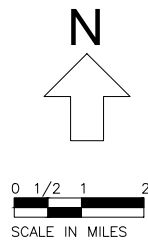
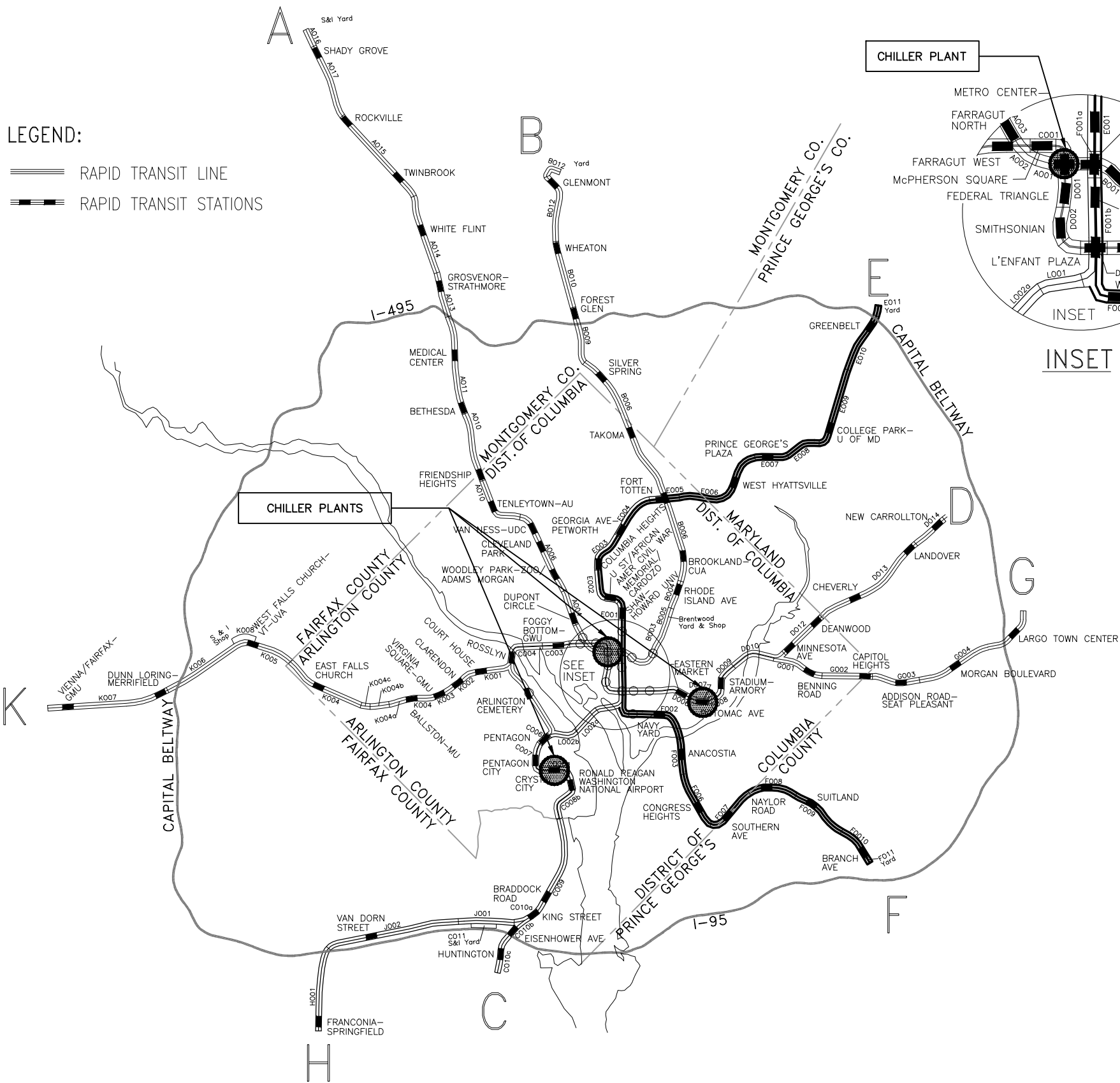
JULY 2014



LEGEND:

===== RAPID TRANSIT LINE

===== RAPID TRANSIT STATIONS



DESIGNED <u>D. ROMNESS</u> 11/13 DATE 11/13 DRAWN <u>W. HAILE-SELASSIE</u> 11/13 DATE 11/13 CHECKED <u>S. NG</u> 11/13 DATE 11/13 APPROVED <u>C. ROSS</u> 11/13 DATE 11/13	REFERENCE DRAWINGS NUMBER DESCRIPTION DATE BY DESCRIPTION	REVISIONS NUMBER DESCRIPTION DATE BY DESCRIPTION	WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM APPROVED _____	GFP A Gannett Fleming/Parsons JOINT VENTURE SUBMITTED _____ PROJECT MANAGER	CONTRACT NO. FQ 14005D-13-03 METRO CENTER, POTOMAC AVE, & CRYSTAL CITY CHILLER REPLACEMENTS VICINITY MAP SCALE NONE DRAWING NO. G-001 M-0000-001
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METRO CENTER AND POTOMAC AVE.  
APPLICABLE CODES - NEW CONSTRUCTION

THE D.C. CONSTRUCTION CODE (2008) CONSIST OF THE BUILDING CODE, RESIDENTIAL CODE, ELECTRICAL CODE, FUEL GAS CODE, MECHANICAL CODE, PLUMBING CODE, PROPERTY MAINTENANCE CODE, FIRE SAFETY CODE, ENERGY CONSERVATION CODE AND EXISTING BUILDING CODE, AS DEFINED IN SECTION 101.2 THROUGH 101.4.8 OF 12A DCMR, AND SHALL INCLUDE, AS TO ANY SPECIFIC APPLICATION, ANY WAIVERS THERETO AUTHORIZED AND DULY GRANTED BY THE CODE OFFICIAL, AS DEFINED IN SECTION 103.1 OF THE BUILDING CODE. THE DISTRICT OF COLUMBIA CONSTRUCTION CODES SUPPLEMENT OF 2008 (THE 'CONSTRUCTION CODES SUPPLEMENT') SHALL CONSIST OF THE ADDITIONS, INSERTIONS, DELETIONS AND CHANGES TO THE 2006 EDITION OF THE INTERNATIONAL CODE PUBLISHED BY THE INTERNATIONAL CODE COUNCIL (ICC) AND TO THE NATIONAL ELECTRICAL CODE (2005) PUBLISHED BY THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) (COLLECTIVELY THE 'INTERNATIONAL CODES') WHICH ARE ADOPTED PURSUANT TO THE PROVISIONS OF THE CONSTRUCTION CODES APPROVAL AND AMENDMENTS ACT OF 1986, EFFECTIVE MARCH 21, 1987 (D.C. LAW 6-216; D.C. OFFICIAL CODE § 6-1401 ET SEQ.).

CRYSTAL CITY  
APPLICABLE CODES - NEW CONSTRUCTION

THE ARLINGTON COUNTY CONSTRUCTION CODE CONSIST OF THE FOLLOWING AS AMENDED BY THE STATE OF VIRGINIA:

2009 INTERNATIONAL BUILDING CODE

2008 NFPA 70 NATIONAL ELECTRICAL CODE

2009 INTERNATIONAL MECHANICAL CODE

2009 INTERNATIONAL PLUMBING CODE

2009 INTERNATIONAL FUEL GAS CODE

2007 NFPA 72 NATIONAL FIRE ALARM AND SIGNALING CODE

2007 NFPA 13 INSTALLATION OF SPRINKLER SYSTEMS


2009 INTERNATIONAL ENERGY CONSERVATION CODE

VIRGINIA ACCESSIBILITY CODE

GENERAL NOTES - NEW CONSTRUCTION

- A. THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF WORK INCLUDED IN THE PROJECT. DO NOT SCALE THE DRAWINGS. THE CONTRACTOR SHALL ESTABLISH FINAL DIMENSIONS FROM THE FIELD MEASUREMENTS PRIOR TO STARTING WORK.
- B. THE WORD "PROVIDE" AS USED IN THE PROJECT SHALL BE DEFINED AS "FURNISH AND INSTALL"
- C. MECHANICAL EQUIPMENT AND PRODUCTS SHALL BE LISTED AND/OR LABELED BY AN APPROVED TESTING OR INSPECTION AGENCY IN ACCORDANCE WITH CODE REQUIREMENTS.
- D. EQUIPMENT AND PRODUCT MANUFACTURERS RECOMMENDATIONS AND INSTRUCTIONS FOR INSTALLATION AND OPERATION SHALL BE FOLLOWED IN PERFORMING WORK.
- E. ALL EQUIPMENT, DUCTWORK, DAMPERS, AND ACCESSORIES SERVING EQUIPMENT SHALL BE INSTALLED TO ALLOW SERVICING AND/OR REMOVAL WITHOUT DISCONNECTING OTHER DUCTWORK, PIPING AND ACCESSORIES.
- F. ALL EQUIPMENT AND PIPING SHALL BE PROPERLY IDENTIFIED IN ACCORDANCE WITH WMATA SPECIFICATION 15075.
- G. NEW MECHANICAL WORK SHALL BE EXTENDED AND CONNECTED TO EXISTING SYSTEMS AS INDICATED. THE CONTRACTOR SHALL VERIFY FIELD CONDITIONS FOR POINTS OF CONNECTION, CAPACITIES AND ELEVATIONS OF EXISTING SYSTEMS, IN ALL AREAS AFFECTED BY THE PROJECT; CUT, PATCH, REPAIR, AND/OR REPLACE ALL MATERIALS REQUIRED TO INCORPORATE WORK.
- H. CONTRACTOR SHALL PROVIDE ALL NECESSARY FOUNDATIONS, SUPPORTS, PADS AND BASES REQUIRED FOR MECHANICAL EQUIPMENT, DUCTS. INSTALL EQUIPMENT, AND DUCTWORK SO AS TO BE FREE FROM NOISE AND VIBRATION.
- I. STRUCTURAL COMPONENTS OF THE BUILDING AND EQUIPMENT SUPPORT SHALL NOT BE CUT, DRILLED, OR MODIFIED IN ANY WAY WITHOUT THE STRUCTURAL ENGINEER'S REVIEW AND PRIOR APPROVAL.
- J. FINISHES DAMAGED AS A RESULT OF NEW WORK SHALL BE REPAIRED TO MATCH APPROPRIATE ADJACENT FINISHES. FILL VOIDS AROUND DUCTWORK PENETRATING WALLS WITH FIRE STOPPING MATERIAL. (THERMAFIBER OR EQUAL AND APPROVED FIRE CAULKING SEALANT)
- K. MECHANICAL WORK SHALL BE COORDINATED WITH THE WORK OF ALL OTHER TRADES PRIOR TO INSTALLATION TO AVOID CONFLICTS AND ALLOCATE SPACE REQUIREMENTS.
- L. UNLESS OTHERWISE INDICATED OR DIRECTED. MATERIALS AND METHODS USED IN THE WORK SHALL BE COMPATIBLE WITH EXISTING BUILDING CONDITIONS AND COMPLY WITH CODE REQUIREMENTS.
- M. ALL WORK SHALL BE PERFORMED IN A NEAT AND WORKMAN-LIKE MANNER BY SKILLED WORKMEN EXPERIENCED IN THEIR TRADE. THE WORK SHALL BE SUBJECT TO THE ACCEPTANCE OF WMATA OR THEIR DULY AUTHORIZED REPRESENTATIVE (AR).
- N. ALL WORK AND ADJACENT AREAS SHALL BE KEPT CLEAN, FREE OF OIL, GREASE AND DEBRIS DURING CONSTRUCTION. ANY GREASE OR OIL SPILLS SHALL BE CLEANED IMMEDIATELY.
- O. COORDINATE WITH THE FOLLOWING VENDOR FOR COOLING TOWER: FAN MOTOR AND DRIVE REPLACEMENT:
- AIR CLEANING TECHNOLOGIES  
44966 FALCON PLACE SUITE 190, STERLING, VA 20166  
ATTN: CHRIS SCHLACK  
TEL. 703-547-1680, CELL 703-728-0599
- P. METRO CENTER CHILLER PLANT REPLACEMENT: CONTRACTOR SHALL PROVIDE DRAWINGS OF HVAC PLAN AND AT LEAST (2) SECTIONS FOR ENGINEER APPROVAL. THE PLAN & SECTIONS SHALL SHOW ALL NEW AND EXISTING EQUIPMENTS, PIPING, DUCTWORKS & CONTROLS.
- Q. PROVIDE GALVANIZED DUCT HARDWARE FOR DUCT SUPPORTS. ATTACHMENT TO CONCRETE STRUCTURE SHALL BE STAINLESS STEEL.
- R. PROVIDE CLEANING AGENT: 'RYDLYME' FOR THE CLEANING OF CONDENSER WATER PIPING SYSTEM AND THE COOLING TOWER.

CONTRACT NO.  
FQ 14005D-13-03

<div>DESIGNED <u>D. ROMNESS</u> 11/13 DATE 11/13</div> <div>DRAWN <u>W. HAILE-SELASSIE</u> 11/13 DATE 11/13</div> <div>CHECKED <u>S. NG</u> 11/13 DATE 11/13</div> <div>APPROVED <u>C .ROSS</u> 11/13 DATE 11/13</div>	REFERENCE DRAWINGS		REVISIONS				WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		METRO CENTER, POTOMAC AVE, & CRYSTAL CITY CHILLER REPLACEMENTS		
	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION		DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM	 <div>A Gannett Fleming/Parsons JOINT VENTURE</div>			
							APPROVED _____		SUBMITTED _____ PROJECT MANAGER		
									SCALE NONE		DRAWING NO. G-002

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CONTRACT NO.  
FQ 14005D-13-03





















DESIGNED <u>D. ROMNESS</u> DATE 11/13 DRAWN <u>W. HAILE-SELASSIE</u> DATE 11/13 CHECKED <u>S. NG</u> DATE 11/13 APPROVED <u>C. ROSS</u> DATE 11/13	REFERENCE DRAWINGS		REVISIONS			WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM APPROVED _____	 A Gannett Fleming/Parsons JOINT VENTURE SUBMITTED _____ PROJECT MANAGER	METRO CENTER, POTOMAC AVE, & CRYSTAL CITY CHILLER REPLACEMENTS		INDEX OF DRAWINGS	
	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION						
			02/15		ADDENDA 1						
						SCALE NONE	DRAWING NO. G-003	M-0000-003			











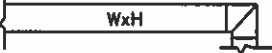








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CHECKED <u>S. NG</u> 11/13 DATE 11/13								OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM				VICINITY MAP							
APPROVED <u>C. ROSS</u> 11/13 DATE 11/13								APPROVED _____				SUBMITTED _____ PROJECT MANAGER		SCALE NONE		DRAWING NO. <b>G-004</b>		<b>M-0000-004</b>	

SYMBOLS

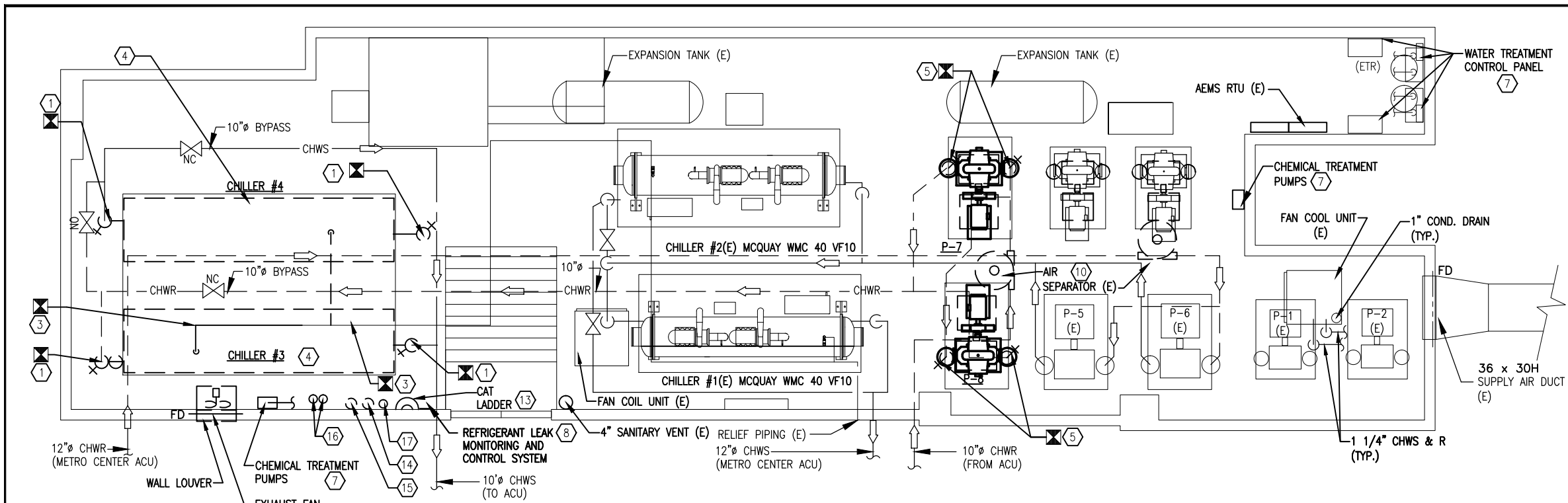
CHILLED WATER SUPPLY		CHWS
CHILLED WATER RETURN		CHWR
CONDENSER WATER SUPPLY		CWS
CONDENSER WATER RETURN		CWR
CONDENSATE DRAIN		CD
WATER MAKE-UP SUPPLY		CW
PIPE RISING		
PIPE TURNING DOWN		
CONTROL VALVE, 3-WAY		
DIRECTION OF FLOW		
STRAINER		
VALVE, GATE (SV)		
UNION		
GLOBE, GATE (GV)		
VALVE ON RISER		
VALVE, CHECK		
FLEXIBLE CONNECTOR (PIPING)		
PUMP, CENTRIFUGAL		
HUMIDISTAT		
THERMOSTAT		

PRESSURE GAUGE	
THERMOMETER	
AIR ENTERS GRILLE OR DUCT	
AIR LEAVES GRILLE OR DUCT	
SECTION, SUPPLY AIR DUCT	
SECTION, DUCT ON SUCTION SIDE OF FAN	
DUCT SIZE, FIRST DIMENSION IS FOR SIDE SHOWN	
DUCT SECTION, FIRST DIMENSION IS FOR DUCT WIDTH	
DUCT TRANSITION	
DUCT TRANSITION	
SQUARE ELBOW WITH TURNING VANES	
TURNING VANES	
FLEXIBLE DUCT AND EQUIPMENT CONNECTOR	
POINT OF CONNECTION TO EXISTING WORK	
POINT OF DISCONNECTION TO EXISTING WORK	

ABBREVIATIONS

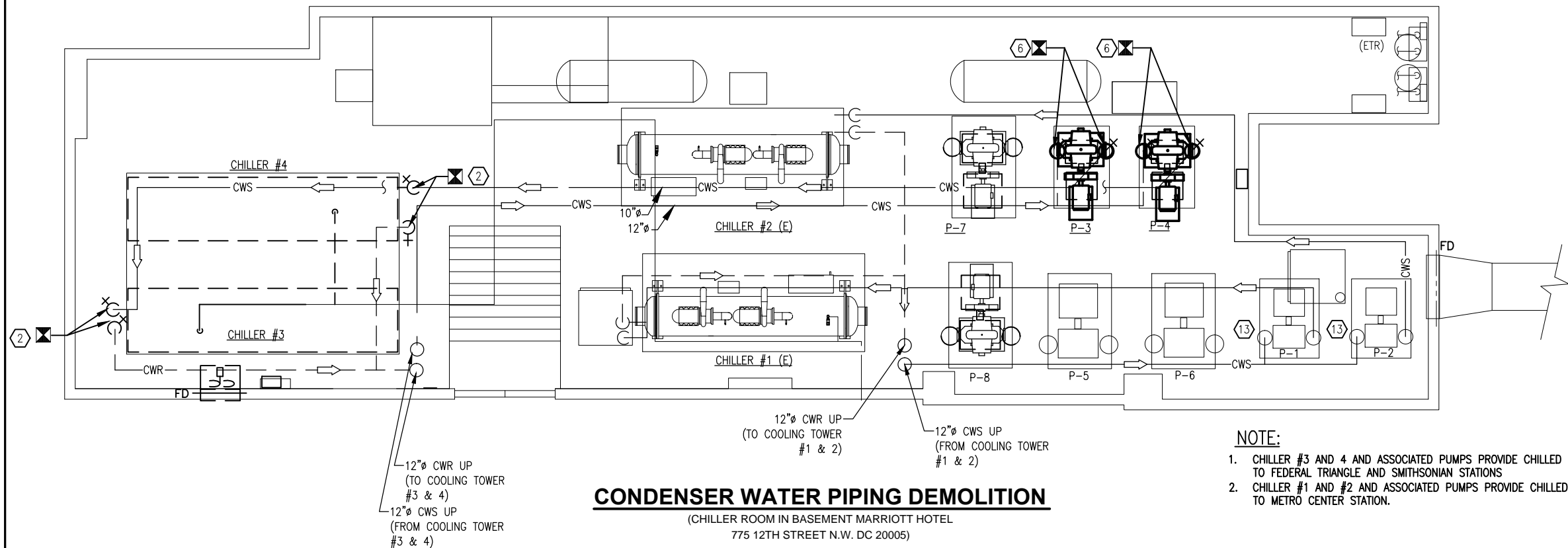
AIR SEPARATOR	AS	NATIONAL ELECTRICAL CODE	NEC
AUTOMATED ENERGY MANAGEMENT SYSTEM	A.E.M.S.	NORMALLY OPEN	NO
AXIAL FAN	AF	NORMALLY CLOSED	NC
ABOVE FINISHED FLOOR	AFF	OUTSIDE AIR	OA
AIR HANDLING UNIT	AHU	PARTS PER MINUTE	PPM
B T U PER HOUR	BTUH	POUNDS PER SQUARE INCH	PSI
CENTRIFUGAL	CENT	PROGRAMMABLE AUTOMATION CONTROLLER	PAC
CENTRIFUGAL FAN	CF	QUANTITY	QTY
CHILLED WATER PUMP	CHP	RATED LOAD AMPS	RLA
CHILLED WATER SUPPLY	CHWS	REMOTE SURVEILLANCE & CONTROL	RS&C
CHILLED WATER RETURN	CHWR	MODBUS REMOTE TERMINAL UNIT	RTU
CIRCULAR SECTION DUCT	Ø	RESISTANCE TEMPERATURE DETECTOR	RTD
CONDENSER WATER SUPPLY	CWS	RETURN AIR	RA
CONDENSER WATER RETURN	CWR	REVOLUTION PER MINUTE	RPM
CONDENSER WATER PUMP	CWP	SUPPLY AIR	SA
DATA TRANSMISSION SYSTEM	DTS	SOLENOID VALVE	SOL
DIAMETER	DIA	SAMPLE PET COCK	SPC
DRAWING	DWG	STRAINER	STN
ENTERING AIR TEMPERATURE	EAT	THICK	THK
ENTERING WATER TEMPERATURE	EWT	THOUSANDS B T U PER HOUR	MBH
ELECTRIC UNIT HEATER	EUH	TYPICAL	TYP
EXHAUST AIR	EA	VARIABLE FREQUENCY DRIVE	VFD
EXHAUST FAN	EF	VOLT-AMPERE	VA
EXISTING	EXIST, (E)	VOLTS ALTERNATING CURRENT	VAC
FAN COIL UNIT	FCU	WITH	W/
FLOW SWITCH / FIRE	FSW / F	WITHOUT	W/O
GALLONS PER MINUTE	GPM		
HORSEPOWER	HP		
HAND-OFF-AUTOMATIC	HOA		
HORIZONTAL MULTISTAGE CENTRIFUGAL PUMP	HSC		
REFRIGERANT GAS LEAK SENSOR	IR		
JOHNSON'S CONTROL	JC		
LEAVING WATER TEMPERATURE	LWT		
LEAVING AIR TEMPERATURE	LAT		
LOCKED ROTOR AMPERES	LRA		
MOTORIZED DAMPER	MD		
MAXIMUM OVER CURRENT PROTECTION	MOCP		
MINIMUM CIRCUIT AMPS	MCA		

DESIGNED D. ROMNESS 11/13	DATE 11/13	REFERENCE DRAWINGS		REVISIONS		WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		METRO CENTER, POTOMAC AVE, & CRYSTAL CITY CHILLER REPLACEMENTS	
DRAWN W. HAILE-SELASSE 11/13	DATE 11/13	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION	DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES	MECHANICAL SYMBOLS AND ABBREVIATIONS	
CHECKED S. NG 11/13	DATE 11/13						OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM	SCALE 1/4"=1'-0" 1 0 1 2 3 4 5	
APPROVED C. ROSS 11/13	DATE 11/13						APPROVED _____	DRAWING NO. M-001	
							SUBMITTED _____	M-0000-005	
							PROJECT MANAGER		



**CHILLED WATER PIPING AND VENTILATION DEMOLITION**

(CHILLER ROOM IN BASEMENT MARRIOTT HOTEL  
775 12TH STREET N.W. DC 20005)



**CONDENSER WATER PIPING DEMOLITION**

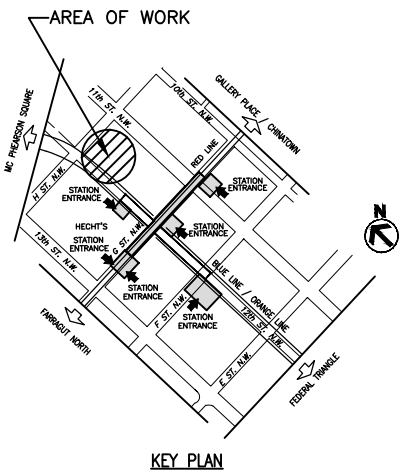
(CHILLER ROOM IN BASEMENT MARRIOTT HOTEL  
775 12TH STREET N.W. DC 20005)

**PLAN NOTES**

- 1 REMOVE AND DISPOSE OF CHILLED WATER PIPING AND VALVES AS INDICATED. LENGTH OF PIPING SHALL NOT BE LESS THAN 10 FEET.
- 2 REMOVE AND DISPOSE OF CONDENSER WATER PIPING AND VALVES AS INDICATED. LENGTH OF PIPING SHALL NOT BE LESS THAN 10 FEET.
- 3 REMOVE AND DISPOSE OF CHILLER RELIEF VENT PIPING.
- 4 REMOVE AND DISPOSE OF CHILLER PROPERLY RECYCLING REFRIGERANT R-134A TO MEET EPA REQUIREMENT.
- 5 REMOVE AND DISPOSE OF CHILLED WATER PUMPS P-7 AND P-8. REMOVAL SHALL INCLUDE PUMP, MOTOR, VIBRATION SUPPORT, IMMEDIATE PIPING, ISOLATION VALVES, STRAINER AND CHECK VALVE WITH ALL INSTRUMENTATION AND CONTROLS. LENGTH OF PIPING SHALL NOT BE LESS THAN 10 FEET.
- 6 REMOVE AND DISPOSE OF CONDENSER WATER PUMPS P-3 AND P-4. REMOVAL SHALL INCLUDE PUMP, MOTOR, VIBRATION SUPPORT, IMMEDIATE PIPING, ISOLATION VALVES, STRAINER, AND CHECK VALVE WITH ALL INSTRUMENTATION AND CONTROLS. LENGTH OF PIPING SHALL NOT BE LESS THAN 10 FEET.
- 7 REVIEW EXACT LOCATION OF CONTROL PANEL AND DEVICES WITH (AR).
- 8 REMOVE AND DISPOSE OF REFRIGERANT LEAK MONITORING AND CONTROL SYSTEM
- 9 REMOVE AND DISPOSE OF EXHAUST FAN, FIRE DAMPER & LOUVER.
- 10 REMOVE (2) AIR-SEPARATORS AND THEIR ASSOCIATED PIPING.
- 11 REMOVE PNEUMATIC CONTROL, TUBING AND CONTROL WIRING FROM CHILLED WATER SYSTEM. TO BE VERIFIED IN FIELD. COORDINATE WITH EXISTING SIEMENS/POWER CONTROL SYSTEM.
- 12 REMOVE STRAINERS AND PORTION OF CONDENSER WATER PIPING FOR PUMP #1 & #2. CLEAN PIPING TO RECEIVE NEW STRAINER, SEE DWG. M-600 (PUMP SCHEDULE , NOTE 4)
- 13 REMOVE EXISTING CAT LADDER, PATCH WALL OPENING & REPAINT TO MATCH EXISTING.
- 14 RELOCATE EXISTING FIRE EXTINGUISHER.
- 15 REMOVE EXISTING CHEMICAL BYPASS FEEDER.
- 16 REROUTE (2) 2-INCH DIA INSULATED PIPE RISERS AS DIRECTED BY AR IN ORDER TO CLEAR PATH FOR NEW EXHAUST DUCT. SEE DWG CHPC1-M-110.
- 17 RELOCATE EXISTING EYE WASHER AND PIPING.

**NOTE:**

1. CHILLER #3 AND 4 AND ASSOCIATED PUMPS PROVIDE CHILLED WATER TO FEDERAL TRIANGLE AND SMITHSONIAN STATIONS
2. CHILLER #1 AND #2 AND ASSOCIATED PUMPS PROVIDE CHILLED WATER TO METRO CENTER STATION.



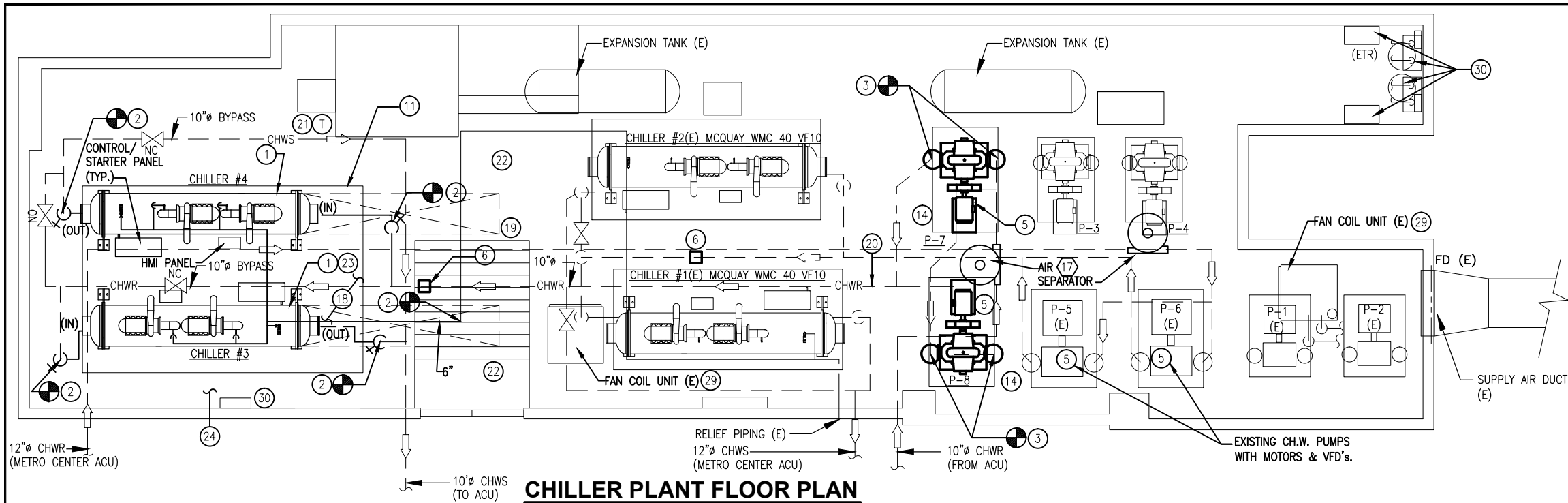
KEY PLAN

CONTRACT NO.  
FQ 14005D-13-03

DESIGNED J. RELUNIA 01/14 DATE 01/14		REFERENCE DRAWINGS		REVISIONS		WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		METRO CENTER, POTOMAC AVE, & CRYSTAL CITY CHILLER REPLACEMENTS	
DRAWN J. RELUNIA 01/14 DATE 01/14		NUMBER DESCRIPTION		DATE BY DESCRIPTION		DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES		METRO CENTER CHILLER PLANT	
CHECKED C. ROSS 01/14 DATE 01/14						OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM		FLOOR PLAN - MECHANICAL DEMOLITION	
APPROVED C. ROSS 01/14 DATE 01/14						APPROVED _____		SUBMITTED _____	
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								DRAWING NO. CHPC1-M-100 M-0000-006	

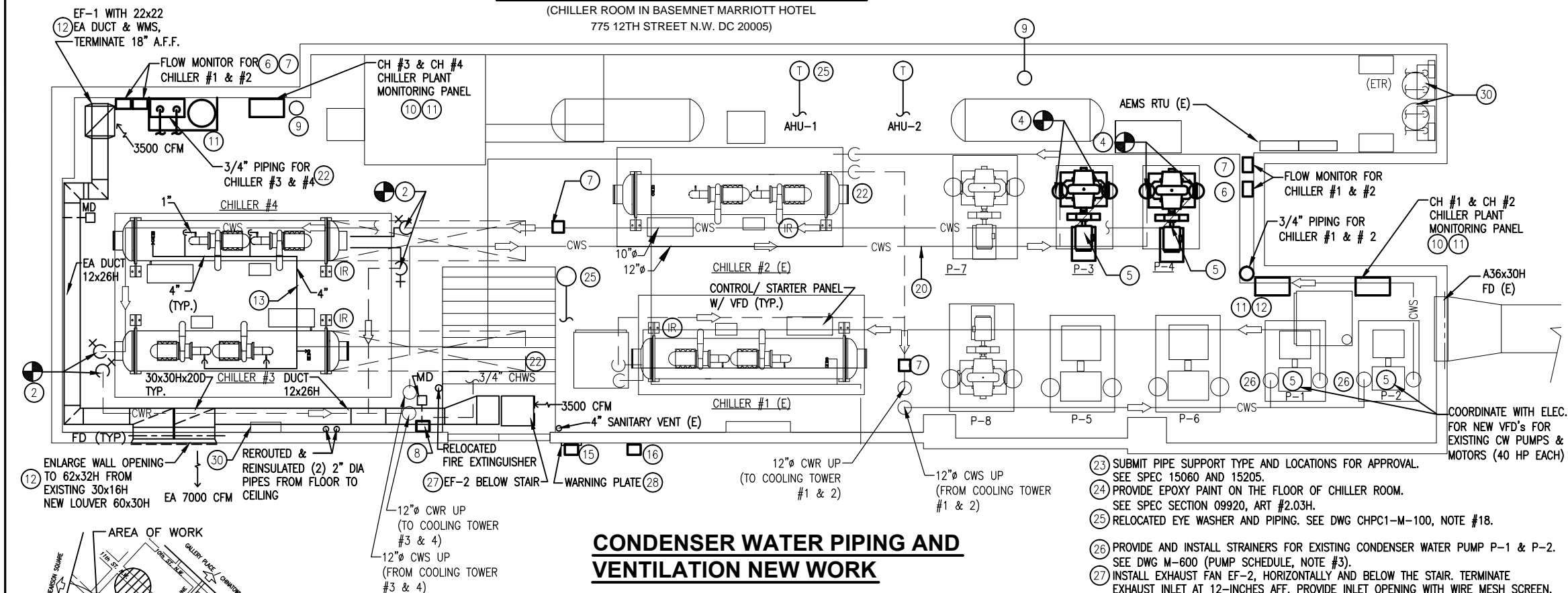






## CHILLER PLANT FLOOR PLAN MECHANICAL PIPING NEW WORK

(CHILLER ROOM IN BASEMNET MARRIOTT HOTEL  
775 12TH STREET N.W. DC 20005)



## CONDENSER WATER PIPING AND VENTILATION NEW WORK

- (23) SUBMIT PIPE SUPPORT TYPE AND LOCATIONS FOR APPROVAL. SEE SPEC 15060 AND 15205.
- (24) PROVIDE EPOXY PAINT ON THE FLOOR OF CHILLER ROOM. SEE SPEC SECTION 09920, ART #2.03H.
- (25) RELOCATED EYE WASHER AND PIPING. SEE DWG CHPC1-M-100, NOTE #18.
- (26) PROVIDE AND INSTALL STRAINERS FOR EXISTING CONDENSER WATER PUMP P-1 & P-2. SEE DWG M-600 (PUMP SCHEDULE, NOTE #3).
- (27) INSTALL EXHAUST FAN EF-2, HORIZONTALLY AND BELOW THE STAIR. TERMINATE EXHAUST INLET AT 12-INCHES AFF. PROVIDE INLET OPENING WITH WIRE MESH SCREEN. PROVIDE WARNING PLATE, WALL MOUNTED, AT 5'-6" AFF TO ADDRESS REFRIGERANT LEAK & MANUAL START/ STOP EXHAUST FANS. SEE DWG M-613 & SPEC SECTION 15075.
- (29) REPLACE AUTOMATIC TEMPERATURE CONTROL FOR EXISTING FAN COIL UNITS. SEE DWG H-606 FOR SEQUENCE OF OPERATION.
- (30) EXISTING WATER TREATMENT TO REMAIN.

## GENERAL NOTE:

1. REFER TO DWG. M-603 FOR PIPE SIZES AND THE ASSOCIATED PUMPS. CHILLER #3 AND #4 PROVIDE CHILLED WATER TO FEDERAL TRIANGLE AND SMITHSONIAN STATIONS.
2. ALL EXISTING PVC PIPE SHALL BE REPLACED WITH COPPER PIPE. SEE SPECS. SECTIONS 15205 & 15186.

## PLAN NOTES

- (1) PROVIDE AND INSTALL CHILLER INCLUDING VIBRATION ISOLATION AND ALL SUPPORTS.
- (2) PROVIDE AND INSTALL PIPING, FITTINGS, VALVES, & INSTRUMENTATION FOR CHILLER AS SHOWN ON DWG. M-500. CONTRACTOR SHALL PROVIDE AND INSTALL SENSORS FOR ALL DATA POINTS NOT INCLUDED BY THE CHILLER MANUFACTURER. SEE DRAWING M-609 & M-610 FOR LIST OF DATA POINTS.
- (3) PROVIDE AND INSTALL CHILLED WATER PUMPS #7 AND #8; INCLUDE PUMP, MOTOR, VIBRATION SUPPORT, IMMEDIATE PIPING, ISOLATION VALVES, FLEXIBLE CONNECTORS, STRAINER AND CHECK VALVE WITH ALL INSTRUMENTATION AND CONTROLS. INSULATE PUMPS & PIPING. SEE SPEC 15080.
- (4) PROVIDE AND INSTALL CONDENSER WATER PUMP #3 AND #4, WHICH INCLUDE PUMP, MOTOR, VIBRATION SUPPORT, IMMEDIATE PIPING, ISOLATION VALVES, FLEXIBLE CONNECTORS, STRAINER AND CHECK VALVE WITH ALL INSTRUMENTATION AND CONTROLS.
- (5) INTEGRATE PUMP VFD DRIVES WITH CHILLER CONTROL PANELS, SEE DWG. M-611. FOR LOCATION OF VFD'S FOR PUMPS SEE DWG CHPC1-E-110.
- (6) PROVIDE AND INSTALL (2) CHILLED WATER FLOW MONITORING SYSTEM. SEE DWG M-616 TO M-618. FOR CHILLER 1 & 2 COORDINATE WITH AUTHORIZED REPRESENTATIVE (AR) FOR THE EXACT LOCATION OF THE PIPING CLAMP. INTEGRATE FLOW MONITORING SYSTEM WITH CHILLER PLANT MONITORING PANEL, SEE DWGS M-614 AND M-618.
- (7) PROVIDE AND INSTALL (2) CONDENSER WATER FLOW MONITORING SYSTEM. SEE DWG M-616 TO M-618. FOR CHILLER 1 & 2 COORDINATE WITH AUTHORIZED REPRESENTATIVE (AR) FOR THE EXACT LOCATION OF THE PIPING CLAMP. INTEGRATE FLOW MONITORING SYSTEM WITH CHILLER PLANT MONITORING PANEL, SEE DWGS M-614 AND M-618.
- (8) PROVIDE AND INSTALL REFRIGERANT LEAK MONITORING AND CONTROL SYSTEM. PROVIDE SENSORS FOR CHILLERS 1 TO 4. INTEGRATE WITH CHILLER PLANT MONITORING PANEL, SEE DWG M-613.
- (9) REPLACE CHEMICAL BYPASS FEEDER (TOTAL 4-SETS) IN CHILLED WATER AND CONDENSER WATER SYSTEMS TOGETHER WITH THEIR ASSOCIATED VALVES AND BRANCH PIPE. VERIFY-IN-FIELD, THE EXACT LOCATION OF FEEDERS. SEE DWG M-600 FOR FEEDER SIZING. 2-SETS FOR CHILLERS #3 & #4, 2-SETS FOR CHILLERS #1 & #2. VERIFY IN-FIELD EXACT LOCATION OF FEEDERS.
- (10) PROVIDE (2) CHILLER PLANT MONITORING PANEL USING AUTOMATION DIRECT PRODUCTIVITY 3000 PAC WITH RS-485 CONNECTIONS. SEE DWGS M-606, M-609 TO M-611. BESIDES CHILLER #3 & 4, ALSO PROVIDE SAME MONITORING PANEL FOR CHILLER #1 & 2.
- (11) PROVIDE AND INSTALL WATER TREATMENT SYSTEMS FOR CHILLED WATER SYSTEM (SEE DWG M-613 TO M-619). PROVIDE HACH SC200 (2) CONTROLLERS, HACH CONDUCTIVITY PROBES, AND HACH PH PROBES. SEE DWGS M-616 TO M-620. IN ADDITION TO CHILLER #3 & 4, ALSO PROVIDE SAME WATER TREATMENT SYSTEMS FOR CHILLER #1 & 2.
- (12) PROVIDE AND INSTALL EF-1 & 2 AND DUCTWORK WITH MD-1 & 2. INTERLOCK FAN WITH IT'S DAMPER (FAN ON DAMPER OPEN) SUBMIT TO WMATA/ STRUCTURAL FOR NEW WALL OPENING REQUIREMENT AND APPROVAL. PROVIDE RUSKIN, THIN LINE STATIONARY LOUVER, MODEL ELF15J, OR APPROVED EQUAL. FACE VELOCITY AT 1100FPM (OVERALL. PRESSURE DROP AT 0.1-INCH W.G. FREE AREA=6.5 SQ. FEET.
- (13) PROVIDE AND INSTALL REFRIGERANT PURGE PIPING. SIZE PER CHILLER MANUFACTURER REQUIREMENT (4" DIA INSULATED, PURGE PIPE & (4) 1" DIA BRANCH PIPES TO COMPRESSORS, EVAPORATOR & CONDENSER VESSELS OF EACH CHILLER. PIPING SHALL BE BLACK STEEL SCHEDULE 40.
- (14) MODIFY CONCRETE PAD TO ACCOMMODATE NEW EQUIPMENT.
- (15) PROVIDE KEY SWITCHES; I.E. (1) SWITCH TO LOCKOUT/ SHUTDOWN CHILLER AND (1) SWITCH TO START/ STOP EXHAUST FANS EF-1 & EF-2. PROVIDE LOCAL SWITCHES NEAR THE EXHAUST FANS FOR TESTING AND RUNNING FOR 1-HOUR. SEE DWG M-613.
- (16) REFRIGERANT GAS LEAK ALARM AND FLASH LIGHT UNIT. EXACT LOCATION, COORDINATE WITH AUTHORIZED REPRESENTATIVE (AR)
- (17) REPLACE (2) AIR SEPARATORS IN KIND. PROVIDE 1" DRAIN VALVE PIPED TO NEAREST FLOOR DRAIN.
- (18) PROVIDE PIPING AND DRAIN AIR VENT OF CHILLED WATER PIPE LOOP TO NEAREST FLOOR DRAIN. EXACT LOCATION SHALL BE VERIFIED IN FIELD.
- (19) TUBE REMOVAL CLEARANCE AREA.
- (20) FIELD VERIFY EXISTING EQUIPMENTS AND PIPES, THEIR SIZES ARE INDICATED IN DWG CHPC1-M-100.
- (21) PROVIDE AND INSTALL SPACE TEMPERATURE RTD SENSORS, INTEGRATE WITH CHILLER PLANT MONITORING PANEL.
- (22) WATER TREATMENT PIPING (3/4"DIA) & SHOP FABRICATED VALVES ASSEMBLY @ 5'-0" AFF. SEE DWGS M-603 & M-613 TO M-615. BESIDES CHILLER #3 & 4, ALSO PROVIDE WATER TREATMENT PIPING FOR CHILLER #1 & #2. FOR CHILLER #1 & #2 UTILIZE EXISTING TAP-OFF FROM CHWS&R MAINS; REPLACE EXISTING PVC-WATER TREATMENT PIPING WITH COPPER PIPE, SEE SPECS SECTION 15186. CONNECT REPLACED PIPING TO NEW WATER TREATMENT/VALVE ASSEMBLY. VERIFY IN-FIELD THE LOCATION OF EXISTING PIPING TAP-OFF.

CONTRACT NO.  
FQ 14005D-13-03

DESIGNED J. RELUNIA 01/14  
DATE 01/14  
DRAWN J. RELUNIA 01/14  
DATE 01/14  
CHECKED C. ROSS 01/14  
DATE 01/14  
APPROVED C. ROSS 01/14  
DATE 01/14

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS	
DATE	DESCRIPTION

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT INFRASTRUCTURE  
AND ENGINEERING SERVICES  
OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM

APPROVED \_\_\_\_\_

**GFP** A Gannett Fleming/Parsons  
JOINT VENTURE

SUBMITTED \_\_\_\_\_  
PROJECT MANAGER

**METRO CENTER, POTOMAC AVE, &  
CRYSTAL CITY CHILLER REPLACEMENTS**  
METRO CENTER CHILLER PLANT  
FLOOR PLAN - MECHANICAL NEW WORK

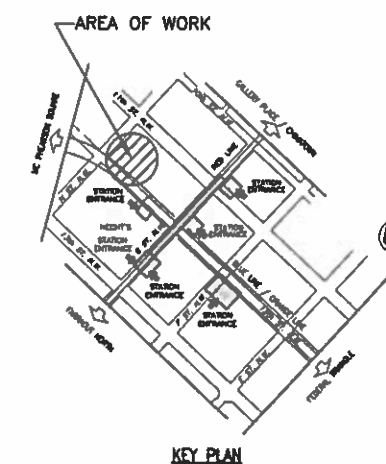
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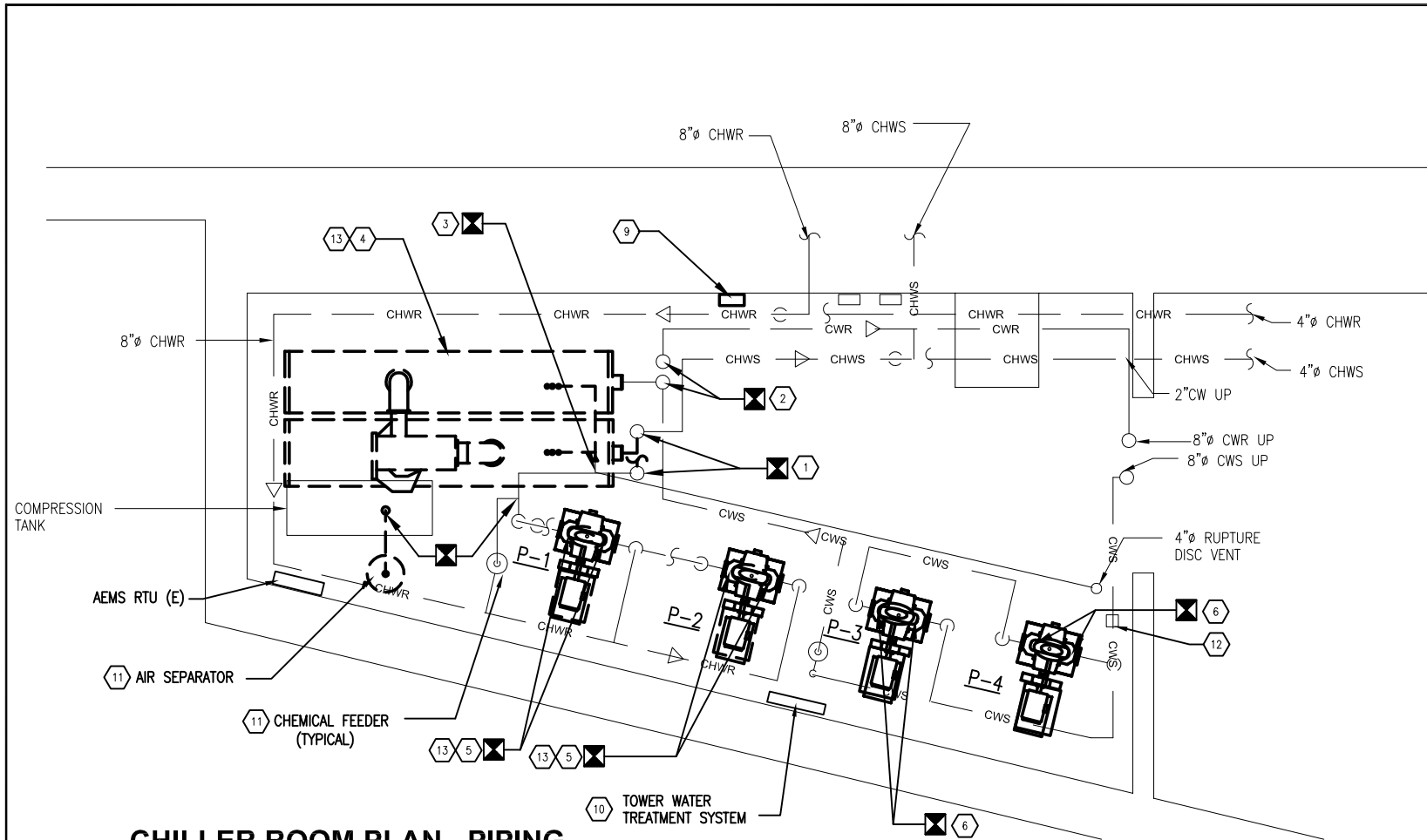




- ① PROVIDE AND INSTALL SIX COOLING TOWER INVERTER-RATED FAN MOTORS INVERTER TYPE TO MATCH VFD CONTROLLER. MODIFY EXISTING COOLING TOWER CONTROL PANEL TO ADOPT VFD CONTROLLER. FOR VFD CONTROLLER & THEIR CABINETS (NEMA 3R) SEE DWGS CHPC1-E-101 & 111.
- ② PROVIDE AND INSTALL NEW TOWER FILL MEDIA.
- ③ REMOVE RUST IN TOWER CASING, PIPING, VALVES, ETC. REPAINT FOR WEATHER PROTECTION, EPOXY RESIN AND PRIMER. SEE SPEC. 09920.
- ④ DRAIN, CLEAN PIPING AND BASIN OF COOLING TOWER, FLUSH AND REFILL WATER. PROVIDE CLEANING AGENT: 'RYDOLME' FOR THE CLEANING OF CONDENSER WATER PIPE SYSTEM AND THE COOLING TOWERS. SEE SPEC 15816.
- ⑤ PROVIDE IDENTIFICATION TAG FOR EQUIPMENT AND PIPING.

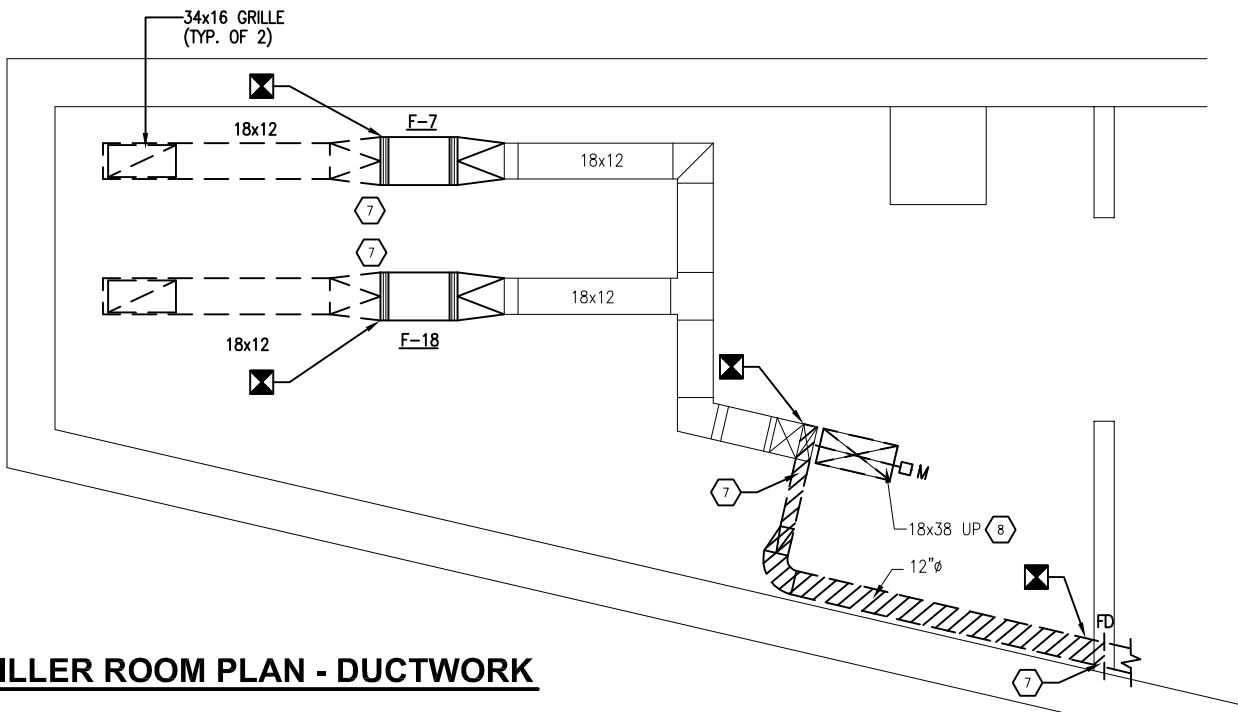


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### CHILLER ROOM PLAN - PIPING

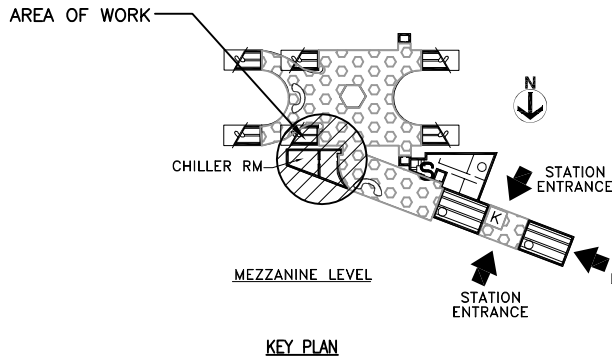
CHILLER PLANT 'C207'



### CHILLER ROOM PLAN - DUCTWORK

### PLAN NOTES

- 1 REMOVE AND DISPOSE OF CHILLED WATER PIPING AND VALVES. LENGTH OF PIPING TO BE REMOVED SHALL NOT BE LESS THAN 8 FEET.
- 2 REMOVE AND DISPOSE OF CONDENSER WATER PIPING AND VALVES. LENGTH OF PIPING TO BE REMOVED SHALL BE NOT LESS THAN 8 FEET.
- 3 REMOVE AND DISPOSE OF CHILLER REFRIGERANT GAS PURGE PIPING.
- 4 REMOVE AND DISPOSE OF CHILLER. REMOVAL SHALL INCLUDE PROPERLY RECYCLING REFRIGERANT R-134A TO MEET EPA REQUIREMENT.
- 5 REMOVE AND DISPOSE OF CHILLED WATER PUMPS P-1 AND P-2. REMOVAL SHALL INCLUDE PUMP, MOTOR, VIBRATION SUPPORT, IMMEDIATE PIPING, ISOLATION VALVES, STRAINER AND CHECK VALVE WITH ALL INSTRUMENTATION AND CONTROLS. LENGTH OF PIPING TO BE REMOVED SHALL BE NOT LESS THAN 10 FEET,
- 6 REMOVE AND DISPOSE OF CONDENSER WATER PUMPS P-3 AND P-4. REMOVAL SHALL INCLUDE PUMP, MOTOR, VIBRATION SUPPORT, IMMEDIATE PIPING, ISOLATION VALVES, STRAINER AND CHECK VALVE WITH ALL INSTRUMENTATION AND CONTROLS. LENGTH OF PIPING TO BE REMOVED SHALL BE NOT LESS THAN 10 FEET.
- 7 REMOVE AND DISPOSE OF EXHAUST FANS F-7 AND F-18. REMOVAL SHALL INCLUDE FAN, MOTOR, SUPPORT, FAN DISCHARGE DUCTWORK, GRILLES, AND ELECTRICAL AND CONTROL WIRING. ALSO REMOVE THE 12" DUCT (ABANDON). PATCH WALL OPENING & PAINT TO MATCH EXISTING. PROVIDE STEEL PLATE TO BLANK OFF WALL & CEILING OPENING. COORDINATE WITH AR FOR THE EXACT DUCT TO BE REMOVED.
- 8 REMOVE AND DISPOSE OF SUPPLY GRILLE AND MOTORIZED DAMPER.
- 9 REMOVE AND DISPOSE OF REFRIGERANT LEAK MONITORING AND CONTROL SYSTEM.
- 10 EXISTING TO REMAIN TOWER WATER TREATMENT SYSTEM. REVIEW EXACT LOCATION OF CONTROL PANEL AND DEVICES WITH (AR).
- 11 REMOVE AIR-SEPARATOR AND CHEMICAL FEEDER.
- 12 REMOVE AND CAP EXISTING CONTROL/ FLOW SENSOR FOR CONDENSER WATER SUPPLY. VERIFY IN-FIELD THE EXACT LOCATION AND COORDINATE WITH AR.
- 13 PROVIDE RIGGING AND REMOVAL OF CHILLER, PUMP, PIPING AND ACCESSORIES VIA THE STATION PLATFORM. COORDINATE WITH AR AND OBTAIN HIS DIRECTION FOR THE AVAILABILITY OF FLAT BED TRAIN-CAR. PROTECT THE PLATFORM DURING RIGGING AND DELIVERY OF EQUIPMENT, TO AVOID DAMAGE.



CONTRACT NO.  
FQ 14005D-13-03

DESIGNED	J. RELUNIA	02/14	REFERENCE DRAWINGS		REVISIONS	
DRAWN	J. RELUNIA	02/14	NUMBER	DESCRIPTION	DATE	BY
CHECKED	C. ROSS	02/14				
APPROVED	C. ROSS	02/14				

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT INFRASTRUCTURE  
AND ENGINEERING SERVICES  
OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM

APPROVED \_\_\_\_\_

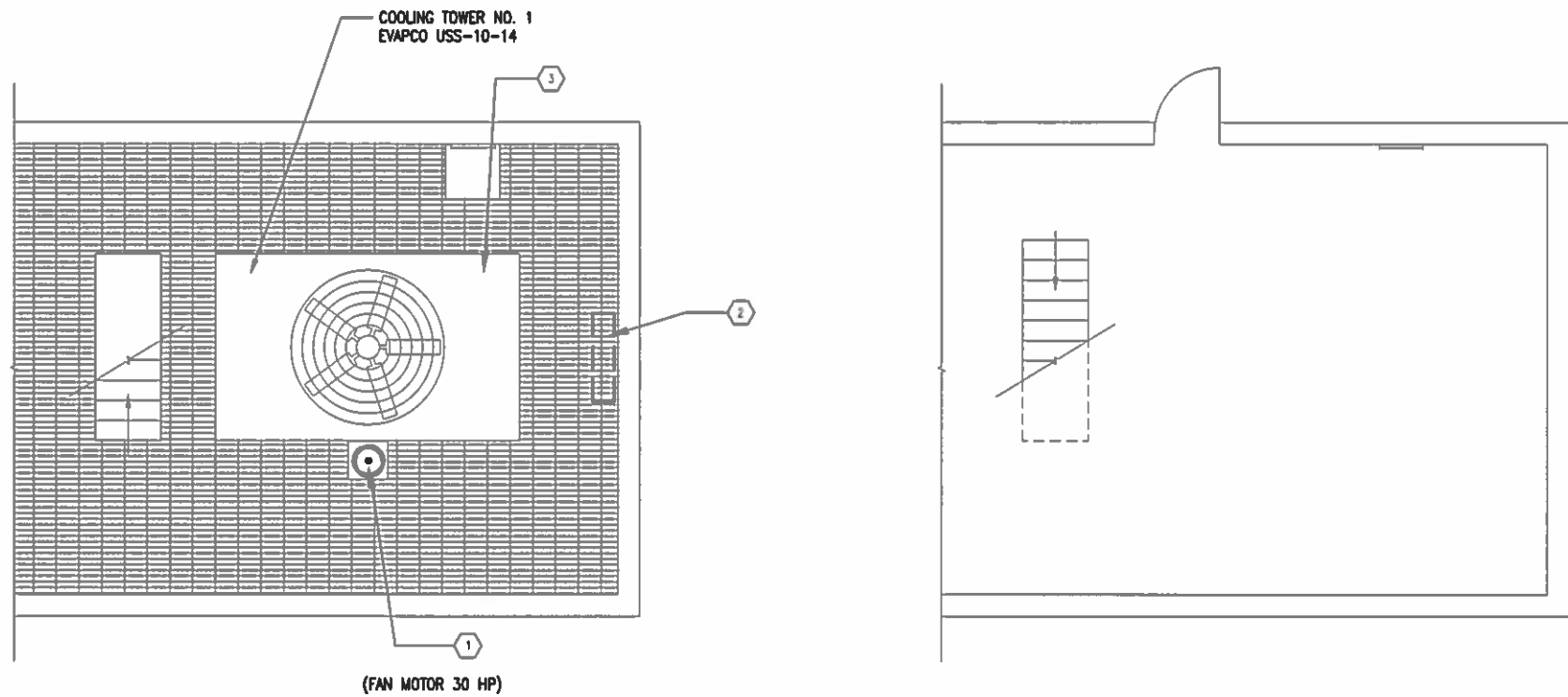
**GFP** A Gannett Fleming/Parsons  
JOINT VENTURE

SUBMITTED \_\_\_\_\_  
PROJECT MANAGER

**METRO CENTER, POTOMAC AVE, &  
CRYSTAL CITY CHILLER REPLACEMENTS**  
CRYSTAL CITY CHILLER PLANT  
FLOOR PLAN – MECHANICAL DEMOLITION

SCALE  
1/4"=1'-0" 1 0 1 2 3 4 5

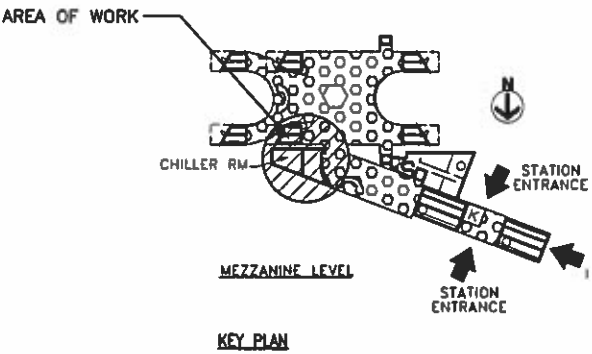
DRAWING NO.  
**CHPC5-M-100 M-0000-010**



**COOLING TOWER PLAN - DEMOLITION**

**PLAN NOTES:**

- ① REMOVE AND SALVAGE ONE COOLING TOWER FAN MOTOR 30 HP AND RELATED STARTERS AND CONTROLS.
- ② REMOVE AND DISPOSE OF ABANDONED TOWER CHEMICAL TREATMENT SYSTEM.
- ③ REMOVE COOLING TOWER FILL.



CONTRACT NO.  
FQ 14005D-13-03

REFERENCE DRAWINGS			REVISIONS		
DESIGNED	DATE	NUMBER	DESCRIPTION	DATE	BY
K. FOWLER	11/13				
DRAWN	DATE				
C. HILL	11/13				
CHECKED	DATE				
J. RELUINA	11/13				
APPROVED	DATE				
K. FOWLER	11/13				

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY  
DEPARTMENT OF TRANSIT INFRASTRUCTURE  
AND ENGINEERING SERVICES  
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APPROVED \_\_\_\_\_

**GFP** A Gannett Fleming/Parsons  
JOINT VENTURE

SUBMITTED \_\_\_\_\_  
PROJECT MANAGER

**METRO CENTER, POTOMAC AVE, &  
CRYSTAL CITY CHILLER REPLACEMENTS**  
CRYSTAL CITY CHILLER PLANT  
COOLING TOWER PLAN - MECHANICAL DEMOLITION

SCALE 1/4"=1'-0" 1 0 1 2 3 4 5

DRAWING NO.  
CHPC5-M-101 M-0000-011

PLAN NOTES

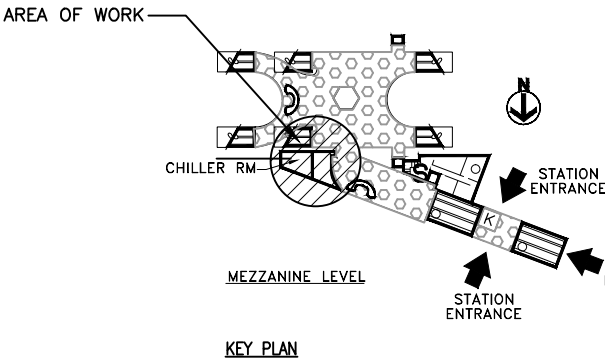
- 1 PROVIDE AND INSTALL CHILLER INCLUDING VIBRATION ISOLATION AND ALL SUPPORTS.
- 2 PROVIDE AND INSTALL PIPING, FITTINGS, VALVES, & INSTRUMENTATION FOR CHILLER AS SHOWN ON DWG. M-501. CONTRACTOR SHALL PROVIDE AND INSTALL SENSORS FOR ALL DATA POINTS NOT INCLUDED BY THE CHILLER MANUFACTURER. SEE DRAWING M-609 & M-610 FOR LIST OF DATA POINTS.
- 3 PROVIDE AND INSTALL CHILLED WATER PUMPS #1 AND #2; INCLUDE PUMP, MOTOR, VIBRATION SUPPORT, IMMEDIATE PIPING, ISOLATION VALVES, FLEXIBLE CONNECTORS, STRAINER AND CHECK VALVE WITH ALL INSTRUMENTATION AND CONTROLS. INSULATE PUMPS & PIPING. SEE SPEC 15080.
- 4 PROVIDE AND INSTALL CONDENSER WATER PUMPS #3 AND #4; INCLUDE PUMP, MOTOR, VIBRATION SUPPORT, IMMEDIATE PIPING, ISOLATION VALVES, FLEXIBLE CONNECTORS, STRAINER AND CHECK VALVE WITH ALL INSTRUMENTATION AND CONTROLS.
- 5 INTEGRATE PUMP VFD DRIVES WITH CHILLER CONTROL PANELS, SEE DWG. M-612. FOR LOCATION OF VFD's FOR PUMPS, SEE DWG CHPC5-E-110.
- 6 PROVIDE AND INSTALL CHILLED WATER FLOW MONITORING SYSTEM. SEE DWGS M-616 TO M-618. INTEGRATE FLOW MONITORING SYSTEM WITH CHILLER PLANT MONITORING PANEL, SEE DWGS M-614 TO M-618.
- 7 PROVIDE AND INSTALL CONDENSER WATER FLOW MONITORING SYSTEM. SEE DWG M-616 TO M-618. INTEGRATE FLOW MONITORING SYSTEM WITH CHILLER PLANT MONITORING PANEL, SEE DWGS M-614 TO M-618.
- 8 PROVIDE AND INSTALL REFRIGERANT LEAK MONITORING AND CONTROL SYSTEM. INTEGRATE WITH F-7 & F-8. INTEGRATE WITH CHILLER PLANT MONITORING PANEL, SEE DWG M-613.
- 9 EXISTING WATER TREATMENT SYSTEM TO REMAIN. REVIEW EXACT LOCATION OF CONTROL PANEL WITH (AR).
- 10 PROVIDE CHILLER PLANT MONITORING PANEL USING AUTOMATION DIRECT PRODUCTIVITY 3000 PAC WITH RS-485 CONNECTIONS. SEE DWGS M-607, M-609, M-610 & M-612.
- 11 PROVIDE AND INSTALL WATER TREATMENT SYSTEM FOR CHILLED WATER SYSTEM, SEE DWGS M-613 TO M-619. PROVIDE HACH SC200 CONTROLLERS, HACH CONDUCTIVITY PROBES, AND HACH PH PROBES. SEE DWGS M-616 TO M-620.
- 12 PROVIDE AND INSTALL SPACE TEMPERATURE RTD SENSORS, INTEGRATE WITH CHILLER PLANT MONITORING PANEL.
- 13 PROVIDE AND INSTALL AIR HANDLING UNIT USING CHILLED WATER LINES. CONTROL WITH NEW SPACE TEMPERATURE SENSOR, INTEGRATE WITH CHILLER PLANT MONITORING PANEL.
- 14 TUBE REMOVAL CLEARANCE AREA.
- 15 PROVIDE RIGGING AND REMOVAL OF CHILLER, PUMP, PIPING AND ACCESSORIES VIA THE STATION PLATFORM. COORDINATE WITH AR AND OBTAIN HIS DIRECTION FOR THE AVAILABILITY OF FLAT BED TRAIN-CAR. PROTECT THE PLATFORM DURING RIGGING AND DELIVERY OF EQUIPMENT, TO AVOID DAMAGE.
- 16 MODIFY CONCRETE PAD TO ACCOMMODATE NEW EQUIPMENT.
- 17 REPLACE CHEMICAL BYPASS FEEDER (TOTAL 2-SETS) IN CHILLED WATER AND CONDENSER WATER SYSTEMS TOGETHER WITH THEIR ASSOCIATED VALVES AND BRANCH PIPE. VERIFY-IN-FIELD THE EXACT LOCATION OF FEEDERS. SEE DWG M-601 FOR FEEDER SIZING. VERIFY - IN FIELD EXACT LOCATION OF FEEDERS.
- 18 PROVIDE AND INSTALL REFRIGERANT GAS PURGE PIPING. REFER TO CHILLER MANUFACTURER FOR PIPING REQUIREMENT. 3" DIA INSULATED, PURGE PIPE AND (4) 1" DIA BRANCH PIPES TO COMPRESSORS, EVAPORATOR AND CONDENSER VESSELS OF EACH CHILLER. PIPING SHALL BE BLACK STEEL, SCHEDULE 40.
- 19 KEY SWITCHES; LOCKOUT/SHUTDOWN CHILLER; OPERATE FANS EF-1. EXACT LOCATION, COORDINATE WITH AUTHORIZED REPRESENTATIVE (AR).
- 20 REFRIGERANT GAS LEAK ALARM AND FLASH LIGHT UNIT. EXACT LOCATION, COORDINATE WITH AUTHORIZED REPRESENTATIVE (AR)
- 21 REPLACE AIR SEPARATOR IN KIND. PROVIDE 1" DRAIN VALVE PIPED TO NEAREST FLOOR DRAIN.
- 22 PROVIDE PIPING AND DRAIN AIR VENT OF CHILLED WATER PIPE LOOP TO NEAREST FLOOR DRAIN. EXACT LOCATION SHALL BE VERIFIED IN FIELD.
- 23 FIELD VERIFY, EXISTING EQUIPMENTS AND PIPES, THEIR SIZES ARE INDICATED IN DWG CHPC5-M-100.
- 24 WATER TREATMENT PIPING (3/4"DIA) & SHOP FABRICATED VALVES ASSEMBLY @ 5'-0" AFF. SEE DWGS M-604 & M-613 TO M-615.
- 25 SUBMIT PIPE SUPPORT TYPE AND LOCATIONS FOR APPROVAL. SEE SPEC 15060 AND 15205
- 26 PROVIDE EPOXY PAINT ON THE FLOOR OF CHILLER ROOM. SEE SPEC SECTIN 09920, ART #2.03H.

CHILLER ROOM PLAN - PIPING  
CHILLED WATER NEW WORK

CHILLER PLANT 'C207'

CHILLER PLANT MONITORING PANEL

CHILLER ROOM PLAN -  
CONDENSER WATER PIPING  
NEW WORK



CONTRACT NO.  
FQ 14005D-13-03

DESIGNED J. RELUNIA 02/14  
DATE 02/14  
DRAWN J. RELUNIA 02/14  
DATE 02/14  
CHECKED C. ROSS 02/14  
DATE 02/14  
APPROVED C. ROSS 02/14  
DATE 02/14

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
NUMBER	DATE	DESCRIPTION

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT INFRASTRUCTURE  
AND ENGINEERING SERVICES  
OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM

APPROVED \_\_\_\_\_

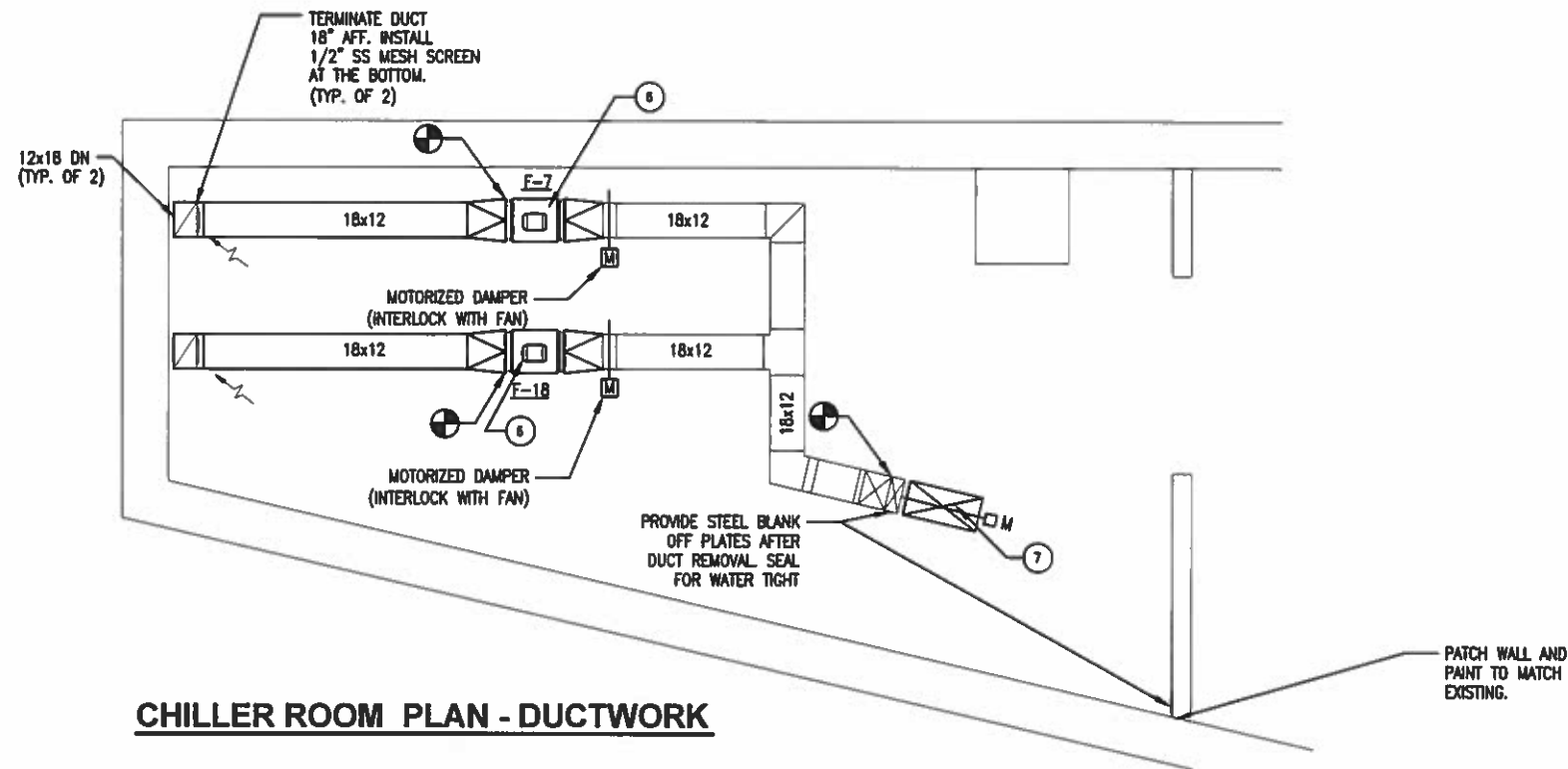
**GFP** A Gannett Fleming/Parsons  
JOINT VENTURE

SUBMITTED \_\_\_\_\_  
PROJECT MANAGER

**METRO CENTER, POTOMAC AVE, &  
CRYSTAL CITY CHILLER REPLACEMENTS**  
CRYSTAL CITY CHILLER PLANT  
FLOOR PLAN - MECHANICAL NEW WORK

SCALE  
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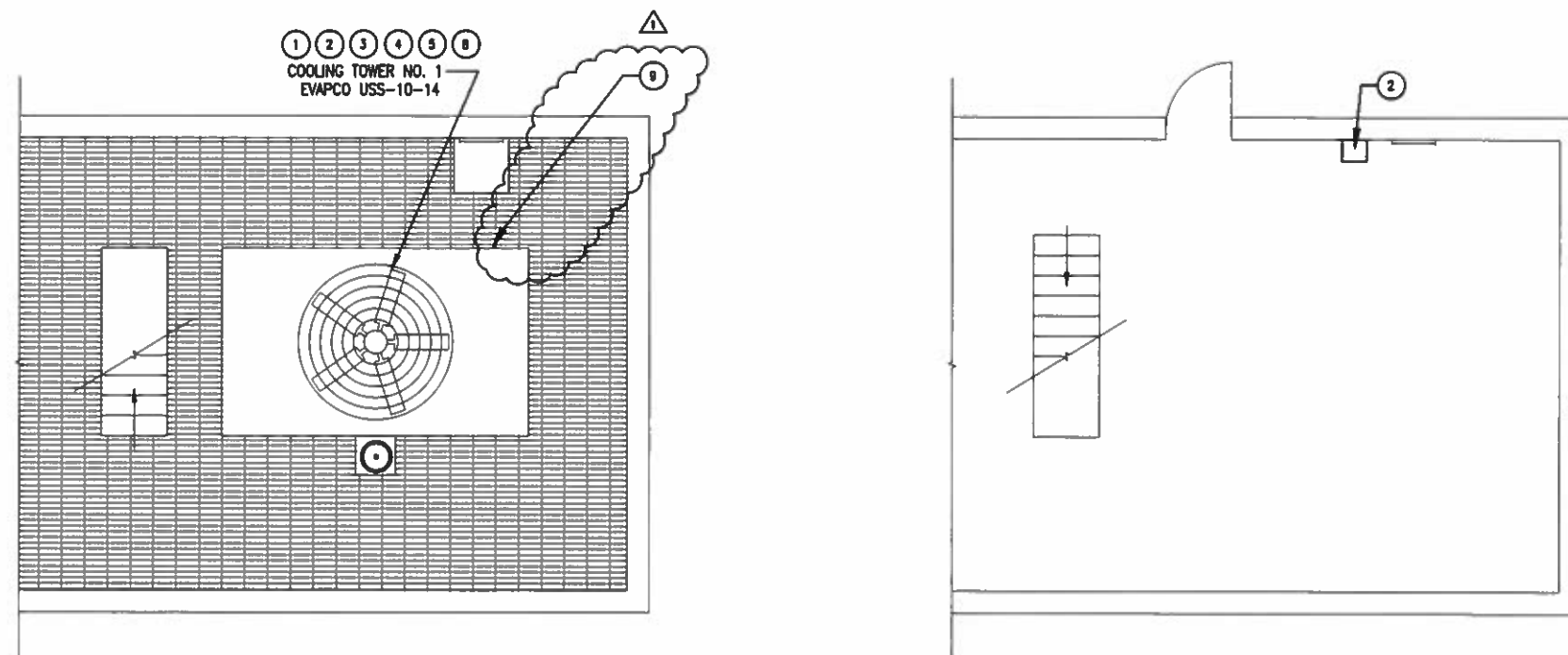
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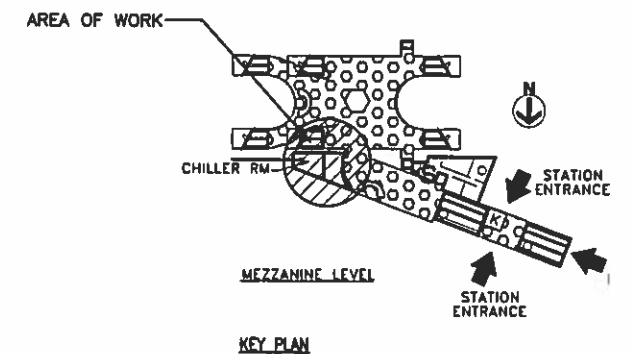
**CHILLER ROOM PLAN - DUCTWORK**

**PLAN NOTES:**

- 1 PROVIDE AND INSTALL NEW TOWER FILL MEDIA.  
ADJUST VIBRATION ISOLATORS IF APPLICABLE FOR BEST VIBRATION ABSORPTION. COORDINATE WITH AR.
- 2 PROVIDE AND INSTALL ONE COOLING TOWER INVERTER-RATED FAN MOTOR (30 HP/ 3PH/60HZ) TO MATCH VFD CONTROLLER. MODIFY EXISTING COOLING TOWER CONTROL PANEL TO ADOPT VFD CONTROLLER. FOR VFD CONTROLLER & ITS CABINET (NEMA 3R) SEE DWGS CHPC5-E-101 & 111.
- 3 REMOVE RUST IN CASING, PIPING, VALVES, ETC. REPAINT FOR WEATHER PROTECTION, EPOXY RESIN AND PRIMER.
- 4 DRAIN, CLEAN PIPING AND BASIN OF COOLING TOWER, FLUSH AND REFILL WATER. PROVIDE CLEANING AGENT: 'RYDLYME' FOR THE CLEANING OF CONDENSER WATER PIPE SYSTEM AND THE COOLING TOWER. SEE SPEC 15816.
- 5 PROVIDE IDENTIFICATION TAG FOR EQUIPMENT AND PIPING.
- 6 PROVIDE AND INSTALL EXHAUST FANS INCLUDING FANS DISCHARGE, DUCTWORK, SUPPORTS, ELECTRICAL AND CONTROL WIRING. COORDINATE WITH AR FOR THE EXACT DUCTWORK TO BE REPLACED.
- 7 PROVIDE AND INSTALL 18x38 MOTORIZED DAMPER AND 20x40 SUPPLY GRILLE.
- 8 PAINT EXISTING STEEL SUPPORT FOR COOLING TOWER. BEFORE PAINTING REMOVE RUST & PROVIDE PRIMER AND FINISH PAINT FOR EXTERIOR/WEATHER. SEE SPEC. SECTION 09920. COORDINATE WITH AR.
- 9 REMOVE RUST AND CLEAN STRUCTURAL BEAMS. AFTER CLEANING STRUCTURAL BEAMS PAINT IN ACCORDANCE WITH SPECIFICATIONS.

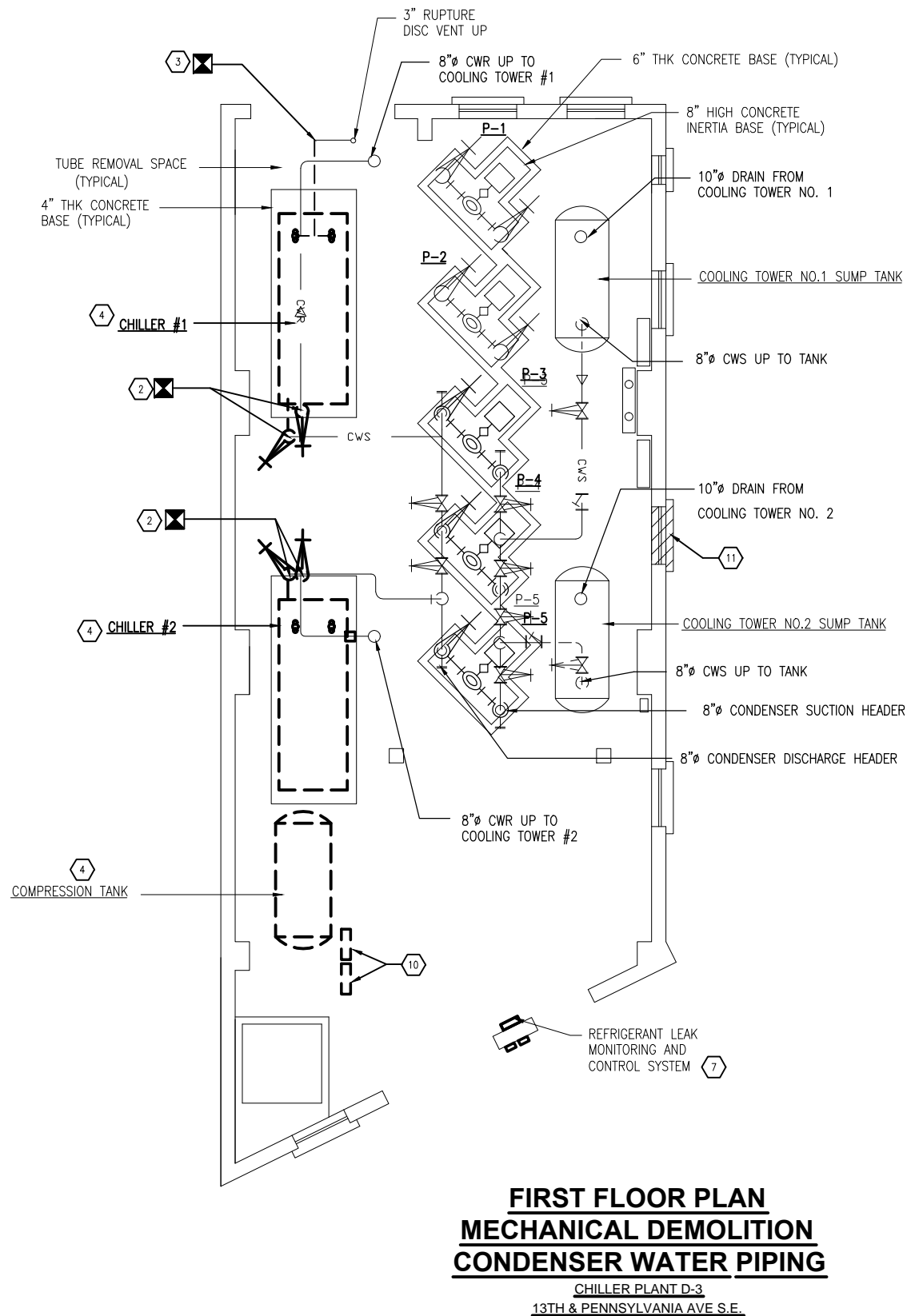
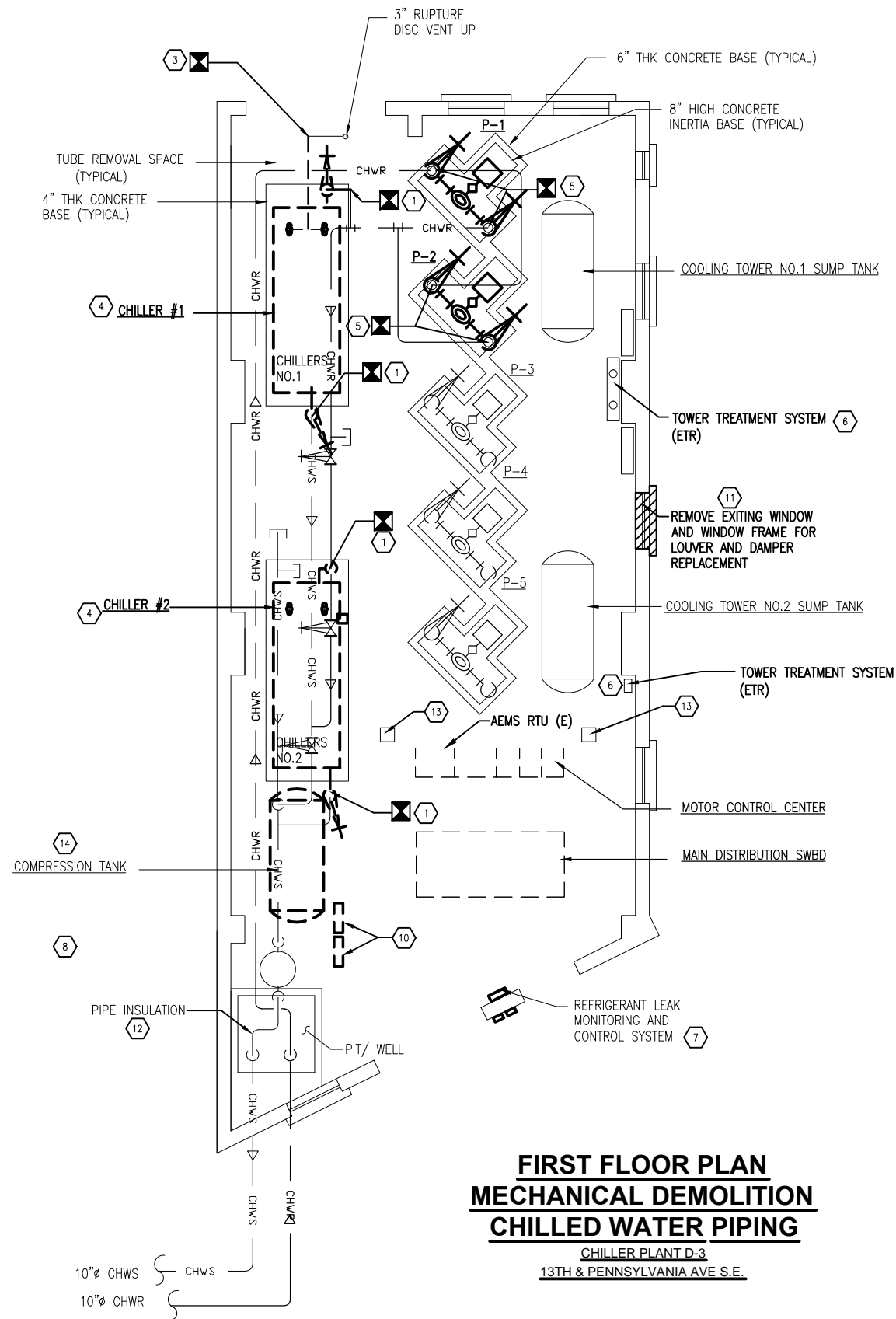


**COOLING TOWER PLAN - NEW WORK**



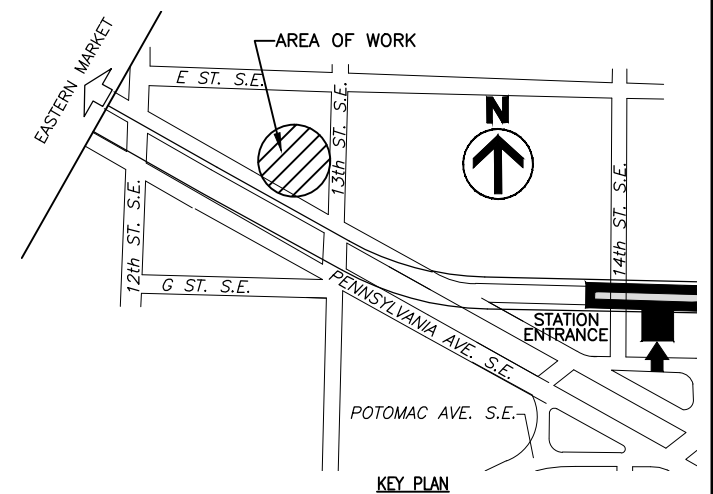
DESIGNED J. RELUMA 02/14 DRAWN J. RELUMA 02/14 CHECKED C. ROSS 02/14 APPROVED C. ROSS 02/14		<table border="1"> <thead> <tr> <th colspan="2">REFERENCE DRAWINGS</th> <th colspan="2">REVISIONS</th> </tr> <tr> <th>NUMBER</th> <th>DESCRIPTION</th> <th>DATE</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>ADDENDUM 1</td> <td>02/15</td> <td></td> </tr> </tbody> </table>		REFERENCE DRAWINGS		REVISIONS		NUMBER	DESCRIPTION	DATE	BY	1	ADDENDUM 1	02/15		WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM APPROVED _____		CHPC5 CHILLER PLANT - CRYSTAL CITY CHILLER REPLACEMENT CRYSTAL CITY CHILLER PLANT COOLING TOWER PLAN - MECHANICAL NEW WORK SCALE 1/4"=1'-0"		CONTRACT NO. FQ 14005D-13-03 DRAWING NO. CHPC5-M-111 M-0000-013	
REFERENCE DRAWINGS		REVISIONS																			
NUMBER	DESCRIPTION	DATE	BY																		
1	ADDENDUM 1	02/15																			





## PLAN NOTES

- 1 REMOVE AND DISPOSE OF CHILLED WATER PIPING. LENGTH OF PIPING TO BE REMOVED SHALL NOT BE LESS THAN 8 FEET. VALVES ASSOCIATED WITH CHILLERS SHALL BE REMOVED AND CLEANED FOR REUSE. COORDINATE WITH AR FOR REUSE OF VALVES.
- 2 REMOVE AND DISPOSE OF CONDENSER WATER PIPING AND VALVES. LENGTH OF PIPING TO BE REMOVED SHALL NOT BE LESS THAN 8 FEET.
- 3 REMOVE AND DISPOSE OF CHILLER REFRIGERANT GAS PURGE PIPING.
- 4 REMOVE AND DISPOSE OF CHILLER. REMOVAL SHALL INCLUDE REFRIGERANT R-134A TO MEET EPA REQUIREMENT.
- 5 REMOVE, CLEAN, SALVAGE OF CHILLED WATER PUMPS P-1 & P-2 AND PROPERLY DELIVER PUMPS TO WMATA. COORDINATE WITH AR FOR EQUIPMENT TO BE SALVAGE AND DELIVERY. REMOVAL SHALL INCLUDE PUMPS, MOTOR, VIBRATION SUPPORT, IMMEDIATE PIPING, ISOLATION VALVES, STRAINERS AND CHECK VALVES WITH ALL INSTRUMENTATION AND CONTROLS. LENGTH OF PIPING TO BE REMOVED SHALL NOT BE LESS THAN 10 FEET.
- 6 EXISTING TOWER TREATMENT SYSTEM TO REMAIN. REVIEW EXACT LOCATION OF CONTROL PANEL & DEVICES WITH (AR).
- 7 REMOVE AND DISPOSE OF REFRIGERANT LEAK MONITORING AND CONTROL SYSTEM.
- 8 REMOVE AIR SEPARATOR AND CHEMICAL FEEDER.
- 9 NOT USED.
- 10 REMOVE EXISTING CHILLER CONTROL PANELS.
- 11 CONTRACTOR SHALL CAREFULLY REMOVE EXISTING WINDOW AND ITS FRAME, PATCH EXISTING WALL IN ORDER TO RECEIVE NEW LOUVER AND MOTORIZED DAMPER.
- 12 REMOVE EXISTING PIPE INSULATION, CLEAN AND REMOVE RUST OFF PIPE SURFACE. CLEAN PIT/ WELL. SEE DWG CHPD3-M-110 FOR REINSULATING EXISTING PIPE.
- 13 COORDINATE REMOVAL AND RIGGING OF EXISTING CHILLERS AND MOTOR CONTROL CENTER WITH THE EXISTING COLUMNS.
- 14 REMOVE EXISTING COMPRESSION TANK.



CONTRACT NO.  
FQ 14005D-13-03

DESIGNED J. RELUNIA 02/14  
DATE 02/14  
DRAWN J. RELUNIA 02/14  
DATE 02/14  
CHECKED C. ROSS 02/14  
DATE 02/14  
APPROVED C. ROSS 02/14  
DATE 02/14

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NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT INFRASTRUCTURE  
AND ENGINEERING SERVICES  
OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM

APPROVED \_\_\_\_\_

**GFP** A Gannett Fleming/Parsons  
JOINT VENTURE

SUBMITTED \_\_\_\_\_  
PROJECT MANAGER

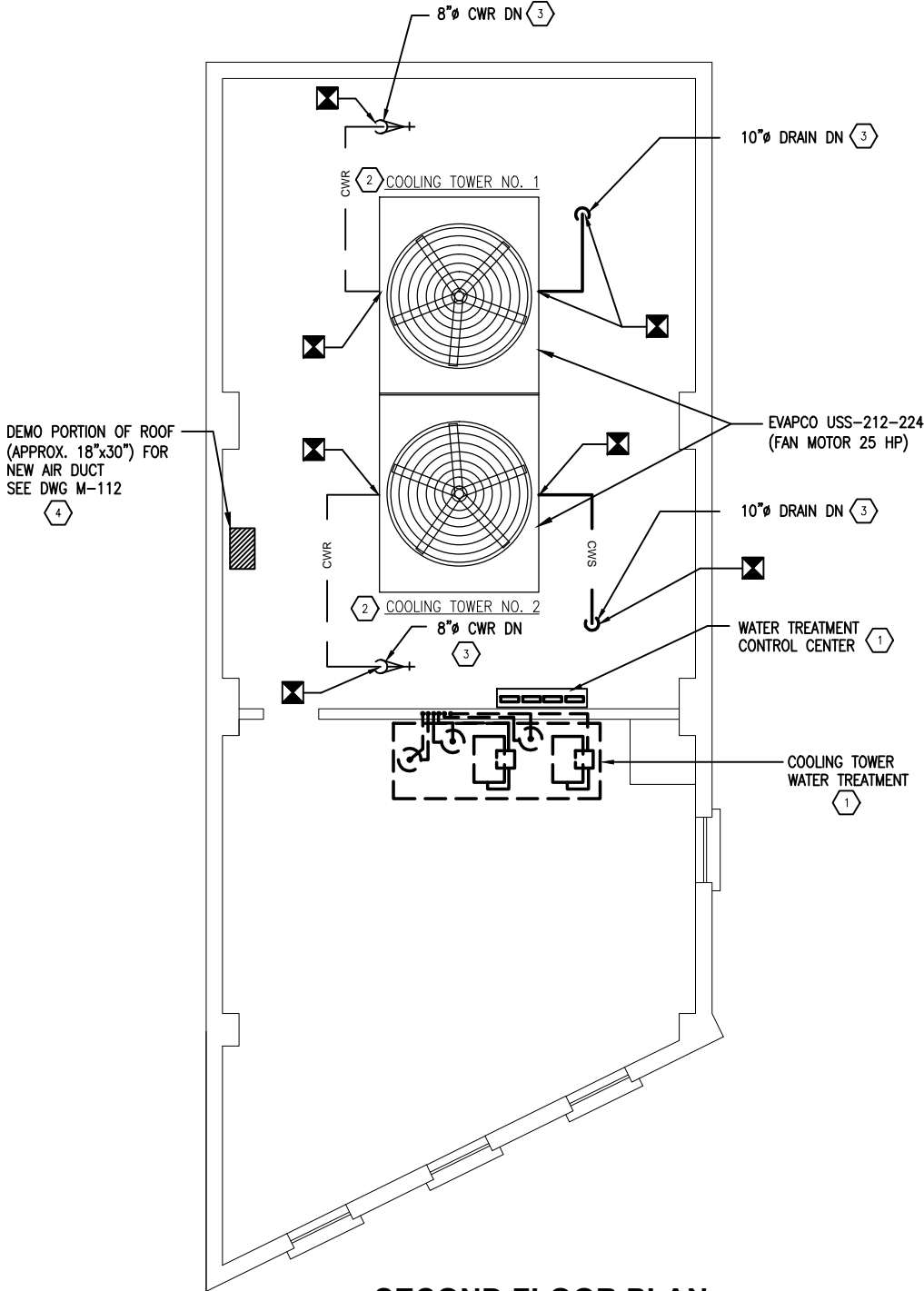
**METRO CENTER, POTOMAC AVE, &  
CRYSTAL CITY CHILLER REPLACEMENTS**  
POTOMAC AVE STATION CHILLER PLANT-FLOOR PLAN  
MECHANICAL DEMOLITION SHEET 1 OF 2

SCALE  
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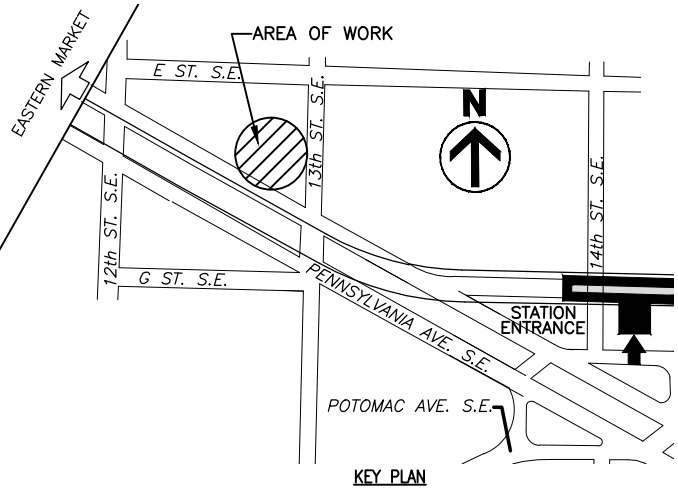
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CHPD3-M-100 M-0000-014

PLAN NOTES

- 1
- TOWER WATER TREATMENT SYSTEMS TO BE REMOVED.
- 2
- OVERHAUL EXISTING COOLING TOWER. CLEAN SUPPORTS, REMOVE MOTOR, BELTS AND FILL.
- 3
- REMOVE AND DISPOSE OF EXTERIOR COOLING TOWER PIPING AND VALVES.
- 4
- CONTRACTOR SHALL SUBMIT ACTUAL OPENING REQUIREMENT FOR WMATA/STRUCTURAL ENGINEER APPROVAL.



SECOND FLOOR PLAN  
MECHANICAL DEMOLITION



CONTRACT NO.  
FQ 14005D-13-03

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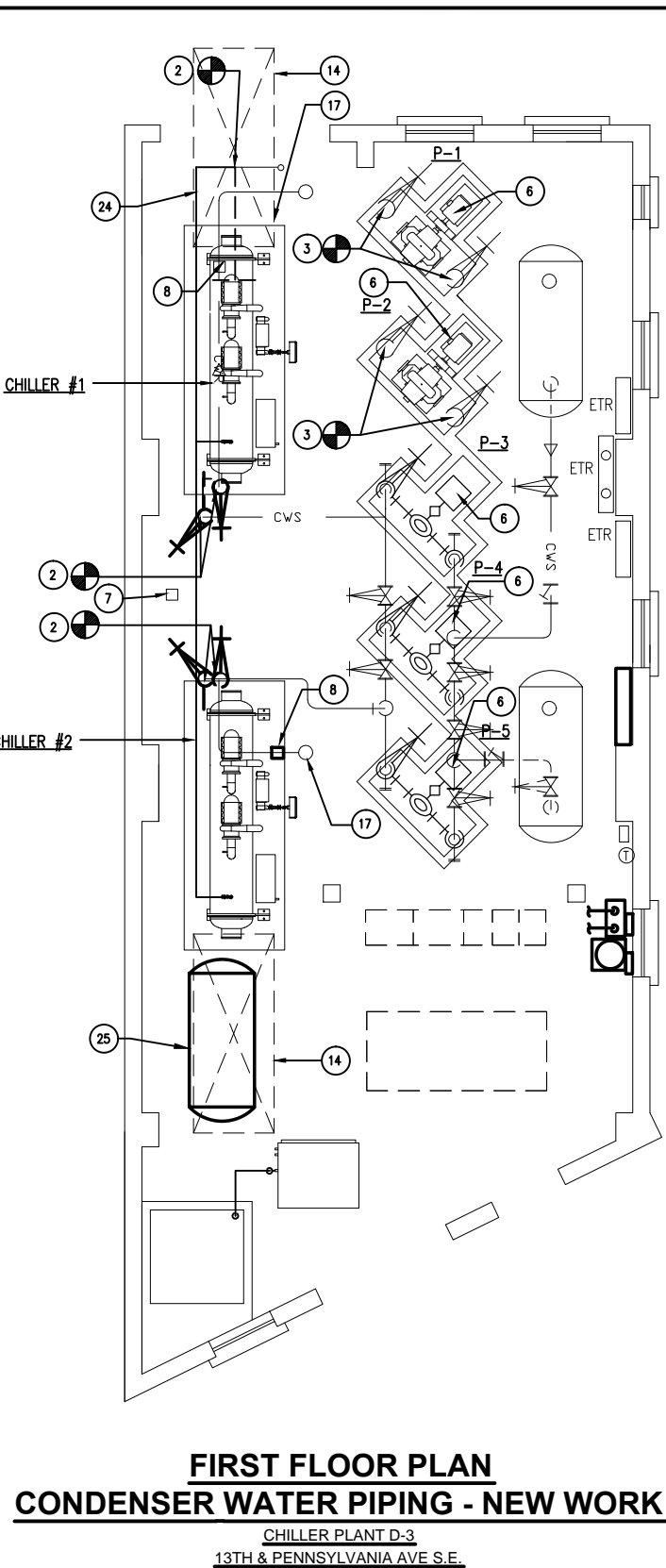
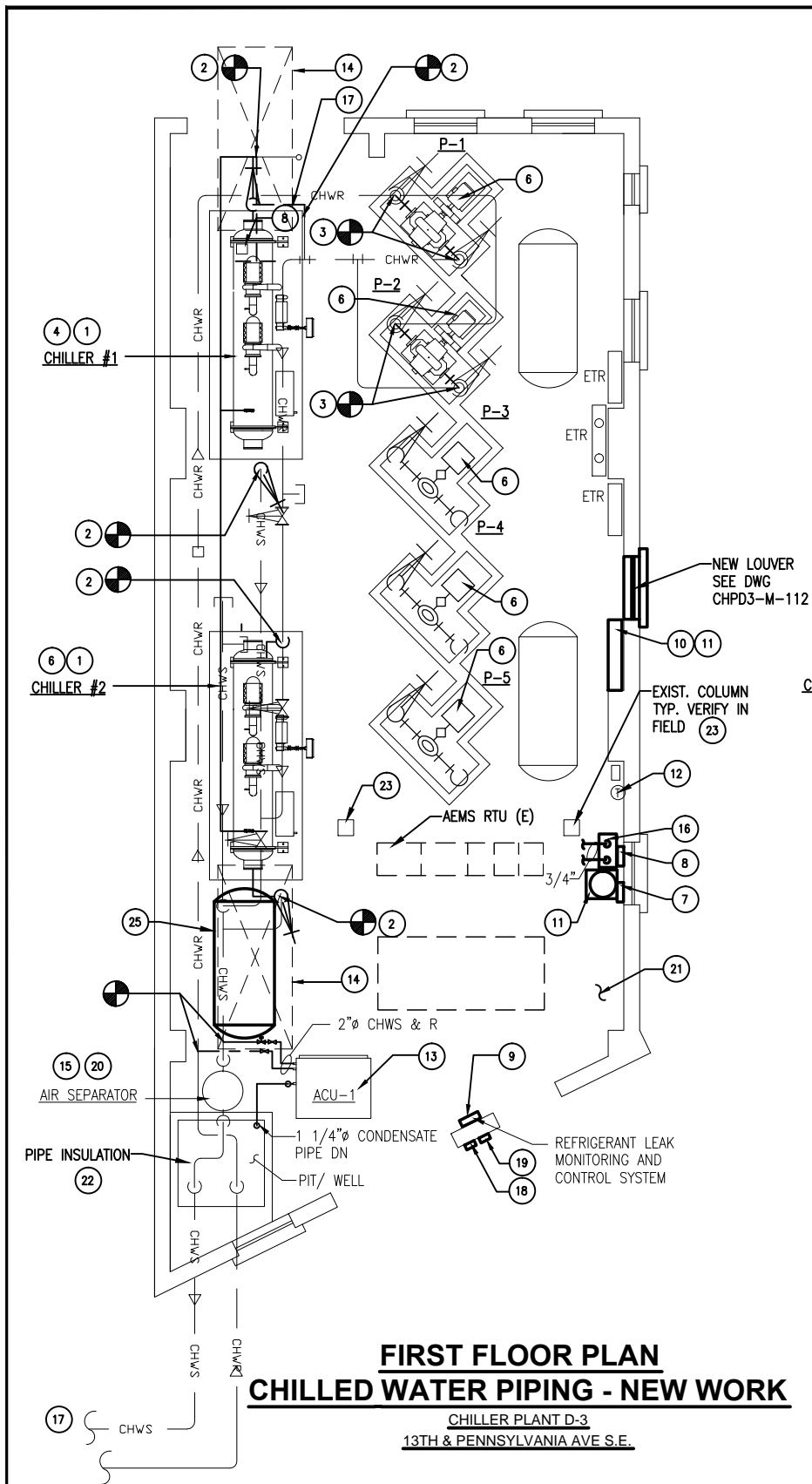
**GFP** A Gannett Fleming/Parsons  
JOINT VENTURE

SUBMITTED \_\_\_\_\_  
PROJECT MANAGER

**METRO CENTER, POTOMAC AVE, &  
CRYSTAL CITY CHILLER REPLACEMENTS**  
POTOMAC AVE STATION CHILLER PLANT-FLOOR PLAN  
MECHANICAL DEMOLITION SHEET 2 OF 2

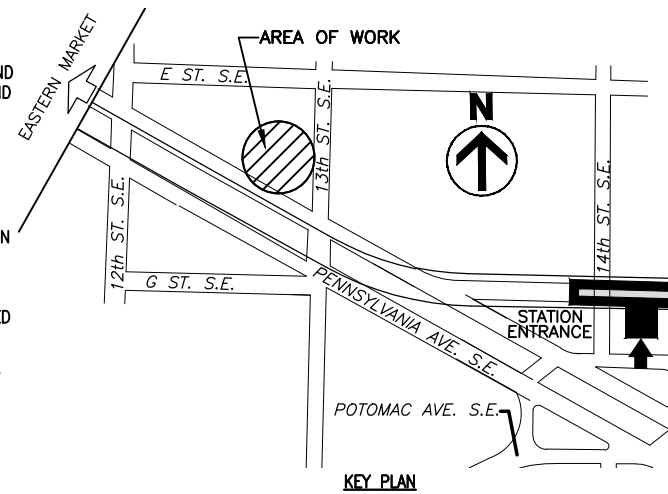
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DRAWING NO.  
CHPD3-M-101 M-0000-015



## PLAN NOTES

- 1 PROVIDE AND INSTALL CHILLER INCLUDING VIBRATION ISOLATION AND ALL SUPPORTS.
- 2 PROVIDE AND INSTALL PIPING, FITTINGS, VALVES, & INSTRUMENTATION FOR CHILLER AS SHOWN ON DWG. M-502. CONTRACTOR SHALL PROVIDE AND INSTALL SENSORS FOR ALL DATA POINTS NOT INCLUDED BY THE CHILLER MANUFACTURER. SEE DRAWING M-609 & M-610 FOR LIST OF DATA POINTS. COORDINATE WITH AR FOR THE REUSE OF VALVES FOR CHILLER IN THIS LOCATION SINCE THE VALVES ARE FOUND SERVICEABLE.
- 3 PROVIDE AND INSTALL CHILLED WATER PUMPS #1 AND #2; INCLUDE PUMP, MOTOR, VIBRATION SUPPORT, IMMEDIATE PIPING, ISOLATION VALVES, FLEXIBLE CONNECTORS, STRAINER AND CHECK VALVE WITH ALL INSTRUMENTATION AND CONTROLS. INSULATE PUMPS & PIPING. SEE SPEC 15080.
- 4 SUBMIT PIPE SUPPORT TYPE AND LOCATIONS FOR APPROVAL. SEE SPEC 15060 AND 15205
- 5 PROVIDE PIPING AND DRAIN AIR VENT OF CHILLED WATER PIPE LOOP TO NEAREST FLOOR DRAIN. EXACT LOCATION SHALL BE VERIFIED IN FIELD.
- 6 INTEGRATE PUMP VFD CONTROLLERS DRIVES WITH CHILLER CONTROL PANELS, SEE DWG. M-611. FOR LOCATION OF VFD's FOR PUMPS, SEE DWG CHPD3-E-110.
- 7 PROVIDE AND INSTALL CHILLED WATER FLOW MONITORING SYSTEM. SEE DWG M-616 TO M-618. INTEGRATE FLOW MONITORING SYSTEM WITH CHILLER PLANT MONITORING PANEL, SEE DWGS M-614 TO M-618.
- 8 PROVIDE AND INSTALL CONDENSER WATER FLOW MONITORING SYSTEM. SEE DWG M-616 TO M-618. INTEGRATE FLOW MONITORING SYSTEM WITH CHILLER PLANT MONITORING PANEL, SEE DWGS M-614 TO M-618.
- 9 PROVIDE AND INSTALL REFRIGERANT LEAK MONITORING AND CONTROL SYSTEM. INTEGRATE WITH EF-1. INTEGRATE WITH CHILLER PLANT MONITORING PANEL, SEE DWG M-613.
- 10 PROVIDE CHILLER PLANT MONITORING PANEL USING AUTOMATION DIRECT PRODUCTIVITY 3000 PAC WITH RS-485 CONNECTIONS. SEE DWGS M-608, M-609 TO M-611.
- 11 PROVIDE AND INSTALL WATER TREATMENT SYSTEMS (SEE DWG M-613 TO M-615). PROVIDE HACH SC200 CONTROLLERS, HACH CONDUCTIVITY PROBES, AND HACH PH PROBES. SEE DWGS M-616 TO M-620. COORDINATE THE EXACT LOCATION OF WATER TREATMENT SYSTEMS AND PANELS SO THAT IT ISN'T BEING OBSTRUCTED BY WINDOW. ALLOW 3- FEET IN FRONT FOR SERVICE. EXACT LOCATION TO BE DIRECTED BY AR.
- 12 PROVIDE AND INSTALL SPACE TEMPERATURE RTD SENSORS, INTEGRATE WITH CHILLER PLANT MONITORING PANEL.
- 13 PROVIDE AND INSTALL REFRIGERANT GAS PURGE PIPING. REFER TO CHILLER MANUFACTURER FOR PIPING REQUIREMENT. 4" DIA INSULATED, PURGE PIPE AND (4) 1" DIA BRANCH PIPES TO COMPRESSORS, EVAPORATOR AND CONDENSER VESSELS OF EACH CHILLER. PIPING SHALL BE BLACK STEEL, SCHEDULE 40.
- 14 TUBE REMOVAL CLEARANCE AREA.
- 15 REPLACE CHEMICAL BYPASS FEEDER (TOTAL 2-SETS) IN CHILLED WATER AND CONDENSER WATER SYSTEMS TOGETHER WITH THEIR ASSOCIATED VALVES AND BRANCH PIPE. VERIFY-IN-FIELD, THE EXACT LOCATION OF FEEDERS. SEE DWG M-602 FOR FEEDER SIZING. VERIFY IN-FIELD EXACT LOCATION OF FEEDERS.
- 16 INSTALL WATER TREATMENT PIPING FOR CHILLED WATER SYSTEM (3/4" DIA) AND SHOP FABRICATED VALVES ASSEMBLY AT 5'-0" AFF. SEE DWGS M-604 & M-613 & M-615. COORDINATE WITH AR AND OBTAIN HIS FINAL DECISION FOR THE EXACT LOCATION TO INSTALL WATER TREATMENT SYSTEM SO THAT IT SHALL NOT CONFLICT WITH THE NEW LOUVER & MOTORIZED DAMPER.
- 17 FIELD VERIFY, EXISTING EQUIPMENTS AND PIPES, THEIR SIZES ARE INDICATED IN DWG CHPD3-M-100.
- 18 KEY SWITCHES; LOCKOUT/SHUTDOWN CHILLER; OPERATE FANS EF-1. EXACT LOCATION, COORDINATE WITH AUTHORIZED REPRESENTATIVE (AR).
- 19 REFRIGERANT GAS LEAK ALARM AND FLASH LIGHT UNIT. EXACT LOCATION, COORDINATE WITH AUTHORIZED REPRESENTATIVE (AR)
- 20 REPLACE AIR SEPARATOR IN KIND. PROVIDE 1" DRAIN VALVE PIPED TO NEAREST FLOOR DRAIN.
- 21 PROVIDE EPOXY PAINT ON THE FLOOR OF CHILLER ROOM. SEE SPEC SECTION 09920, ART #2.03H.
- 22 AFTER REMOVAL OF INSULATION OF EXISTING PIPES IN PIT/ WELL, REPAINT PIPING AND REINSULATE PIPING TO MATCH EXISTING. SEE DWG CHPD3-M-100. ALSO SEE SPEC 15080. COORDINATE WITH AR FOR THE EXACT PIPING TO BE RE-INSULATED AND AS DIRECTED BY THE AR FOR KEEPING THE INSULATED PIPING DRY.
- 23 COORDINATE CHILLER STARTER PANEL & CHILLER INSTALLATION WITH EXISTING COLUMNS. EXACT LOCATION TO INSTALL CHILLER AND RIGGING/ DELIVERY OF CHILLER SHALL BE DIRECTED BY AR.
- 24 PROVIDE AND INSTALL REFRIGERANT GAS PURGE PIPING. REFER TO CHILLER MANUFACTURER FOR PIPING REQUIREMENT. 4" DIA INSULATED, PURGE PIPE AND (4) 1" DIA BRANCH PIPES TO COMPRESSORS, EVAPORATOR AND CONDENSER VESSELS OF EACH CHILLER. PIPING SHALL BE BLACK STEEL, SCHEDULE 40.
- 25 REPLACE COMPRESSION TANK IN KIND. REVIEW EXACT LOCATION OF TANK & ASSOCIATED PIPING WITH (AR)



DESIGNED	J. RELUNIA	02/14
DRAWN	J. RELUNIA	02/14
CHECKED	C. ROSS	02/14
APPROVED	C. ROSS	02/14

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS	
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## WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

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APPROVED \_\_\_\_\_

**GFP** A Gannett Fleming/Parsons  
JOINT VENTURE

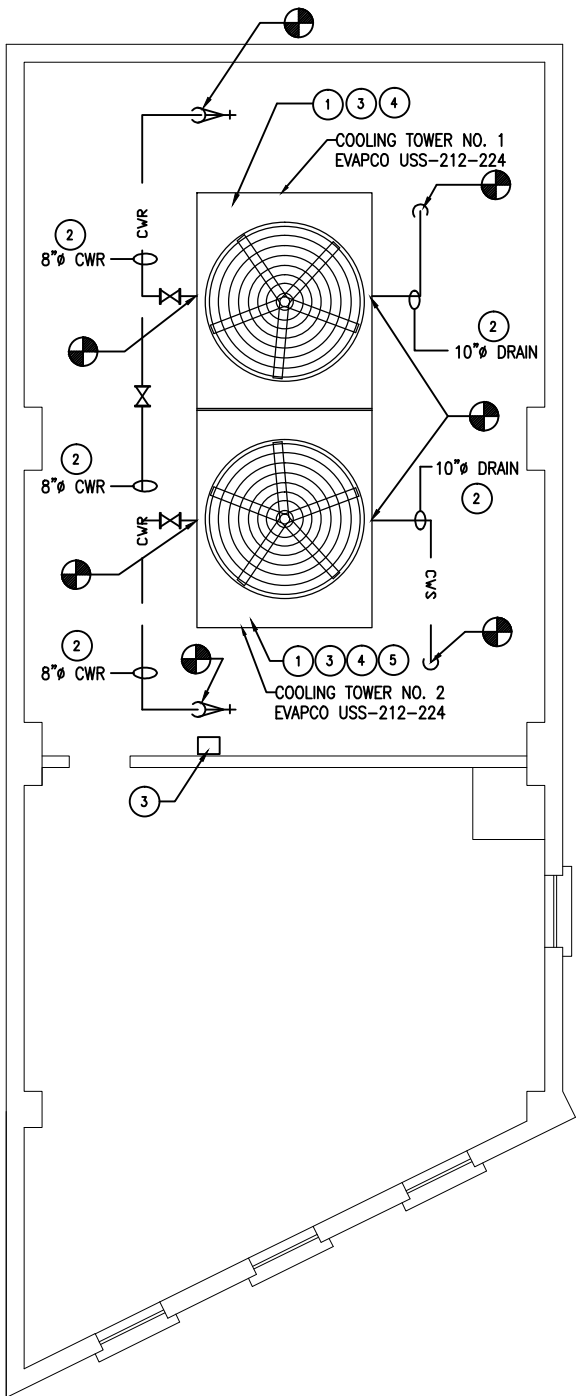
SUBMITTED \_\_\_\_\_  
PROJECT MANAGER

**METRO CENTER, POTOMAC AVE, &  
CRYSTAL CITY CHILLER REPLACEMENTS**  
POTOMAC AVE STATION CHILLER PLANT-FLOOR PLAN  
MECHANICAL NEW WORK SHEET 1 OF 2

SCALE  
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DRAWING NO.  
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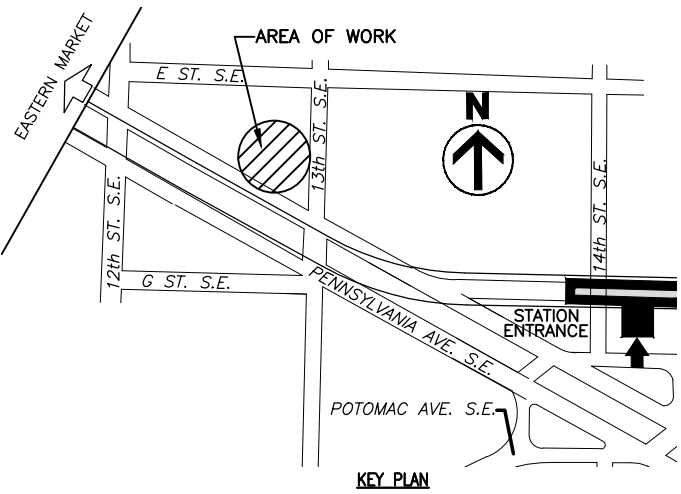
CONTRACT NO.  
FQ 14005D-13-03



**SECOND FLOOR PLAN  
CONDENSER WATER PIPING  
NEW WORK**

**PLAN NOTES**

- 1 PROVIDE AND INSTALL COOLING TOWER WITH NEW FILL.
- 2 PROVIDE AND INSTALL COOLING TOWER'S EXTERIOR PIPING AND VALVES INCLUDING SUPPORT ON ROOF.
- 3 PROVIDE AND INSTALL TWO COOLING TOWERS INVERTER RATED FAN MOTOR (25HP, 460V/3PH/60HZ) TO MATCH VFD CONTROLLER. MODIFY EXISTING COOLING TOWER CONTROL PANEL TO ADOPT VFD CONTROLLER, SEE DWGS CHPD3-E-100 & 110.
- 4 DRAIN, CLEAN PIPING AND BASIN OF COOLING TOWER, FLUSH AND REFILL WATER. PROVIDE CLEANING AGENT: 'RYDLYME' FOR THE CLEANING OF CONDENSER WATER PIPE SYSTEM AND THE COOLING TOWERS. SEE SPEC 15816.
- 5 PAINT EXISTING STEEL SUPPORT FOR COOLING TOWER. BEFORE PAINTING REMOVE RUST & PROVIDE PRIMER AND FINISH PAINT FOR EXTERIOR/WEATHER. SEE SPEC. SECTION 09920. COORDINATE WITH AR.



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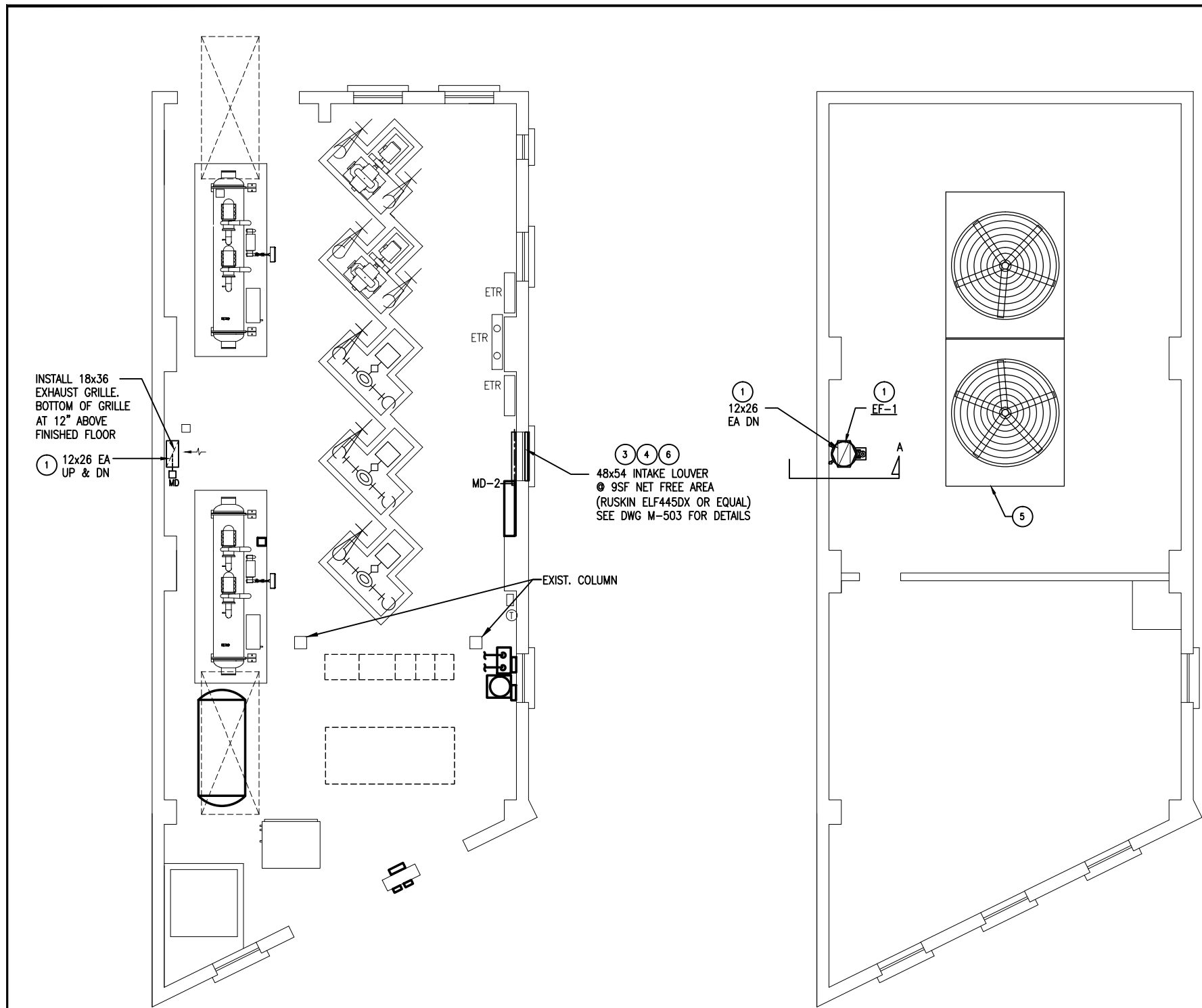
SUBMITTED \_\_\_\_\_  
PROJECT MANAGER

**METRO CENTER, POTOMAC AVE, &  
CRYSTAL CITY CHILLER REPLACEMENTS**  
POTOMAC AVE STATION CHILLER PLANT-FLOOR PLAN  
MECHANICAL NEW WORK SHEET 2 OF 2

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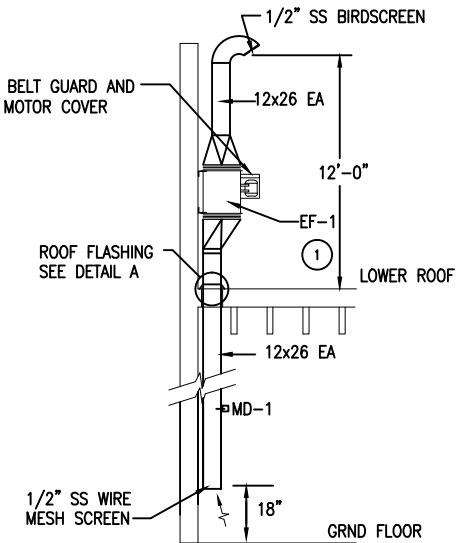
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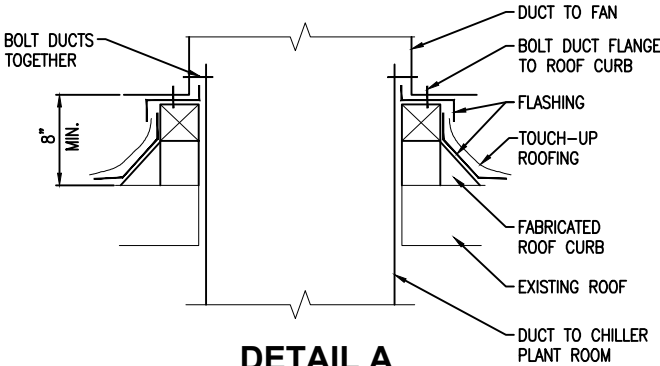


**FIRST FLOOR PLAN  
MECHANICAL DUCTWORK**

**SECOND FLOOR PLAN  
MECHANICAL DUCTWORK**



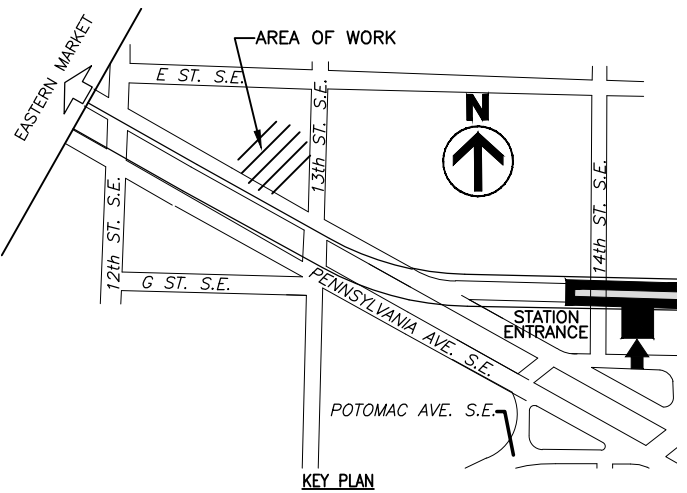
**SECTION A**



**DETAIL A**

**PLAN NOTES**

- 1 PROVIDE AND INSTALL EXHAUST FAN INCLUDING ALL DUCTWORK, SUPPORTS, ELECTRICAL AND CONTROL WIRING (SUITABLE FOR OUTDOOR USE). INTERLOCK WITH REFRIGERANT LEAK MONITORING AND CONTROL SYSTEM. SEE CHPD3-M-110, NOTE 9.
- 2 PROVIDE MOTORIZED DAMPERS MD-1 & MD-2 INTERLOCK WITH EF-1 OPERATION.
- 3 CONTRACTOR SHALL SUBMIT LOUVER CATALOG CUT SHEET AND INSTALLATION DETAILS TO BE INSTALLED IN EXISTING WALL FOR WMATA/ ARCHITECT APPROVAL. ALSO SUBMIT TO WMATA/ STRUCTURAL ENGINEER FOR APPROVAL, INCLUDING THE LOAD OF NEW LOUVER AND MOTORIZED DAMPER, ITS ANCHOR REQUIREMENT. PATCH OPENING & PAINT WALL AS REQUIRED. PROVIDE TEMPORARY PROTECTION FOR WALL OPENING DURING CONSTRUCTION.
- 4 LOUVER SHALL BE STATIONARY DRAINABLE TYPE WITH DRAIN GUTTERS IN EACH BLADE AND DOWNSPOUTS IN JAMBS AND MULLIONS. LOUVER SHALL HAVE A MINIMUM OF 50-PERCENT FREE AREA. LOUVER SHALL BE RUSKIN, MODEL ELF445DX OR APPROVED EQUAL, EXTRUDED ALUMINUM CONSTRUCTION, AS FOLLOW:  
4-INCH DEEP FRAME, DRAINABLE BLADES SHALL BE POSITIONED AT 45 DEGREE ANGLE AND SPACED 4-INCHES CENTER TO CENTER. SCREEN SHALL BE 1/2-INCH STAINLESS STEEL, IN REMOVABLE ALUMINUM FRAME. FINISH COLOR TO MATCH EXISTING WINDOW FRAME.
- 5 PAINT EXISTING STEEL SUPPORT FOR COOLING TOWER. BEFORE PAINTING REMOVE RUST & PROVIDE PRIMER AND FINISH PAINT FOR EXTERIOR/WEATHER. SEE SPEC. SECTION 09920. COORDINATE WITH AR.
- 6 COORDINATE WITH AR AND OBTAIN HIS FINAL DECISION FOR THE EXACT LOCATION TO INSTALL WATER TREATMENT SYSTEM SO THAT IT SHALL NOT CONFLICT WITH THE NEW LOUVER & MOTORIZED DAMPER.



**KEY PLAN**

CONTRACT NO.  
**FQ 14005D-13-03**

	REFERENCE DRAWINGS		REVISIONS		
	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION
DESIGNED	J. RELUNIA	02/14			
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		DATE			

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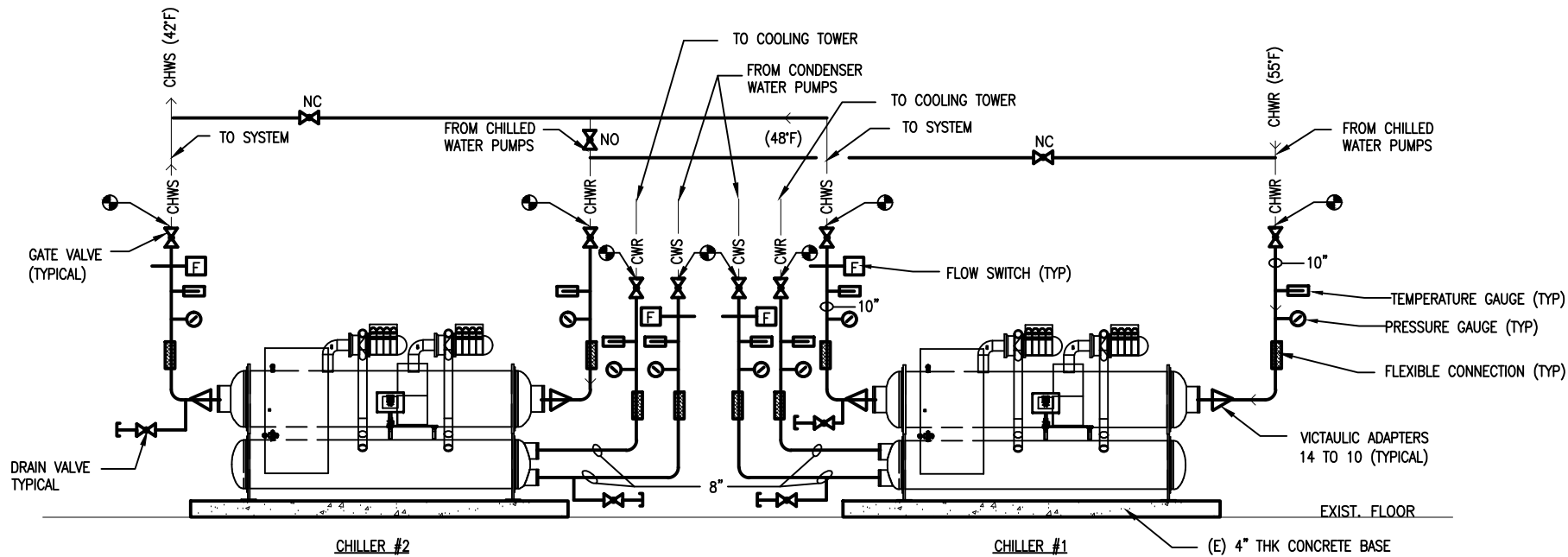
SUBMITTED \_\_\_\_\_  
PROJECT MANAGER

**METRO CENTER, POTOMAC AVE, &  
CRYSTAL CITY CHILLER REPLACEMENTS**  
**POTOMAC AVE STATION CHILLER PLANT-FLOOR PLAN**  
**MECHANICAL NEW DUCTWORK**

SCALE  
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DRAWING NO.  
**CHPD3-M-112 M-0000-018**





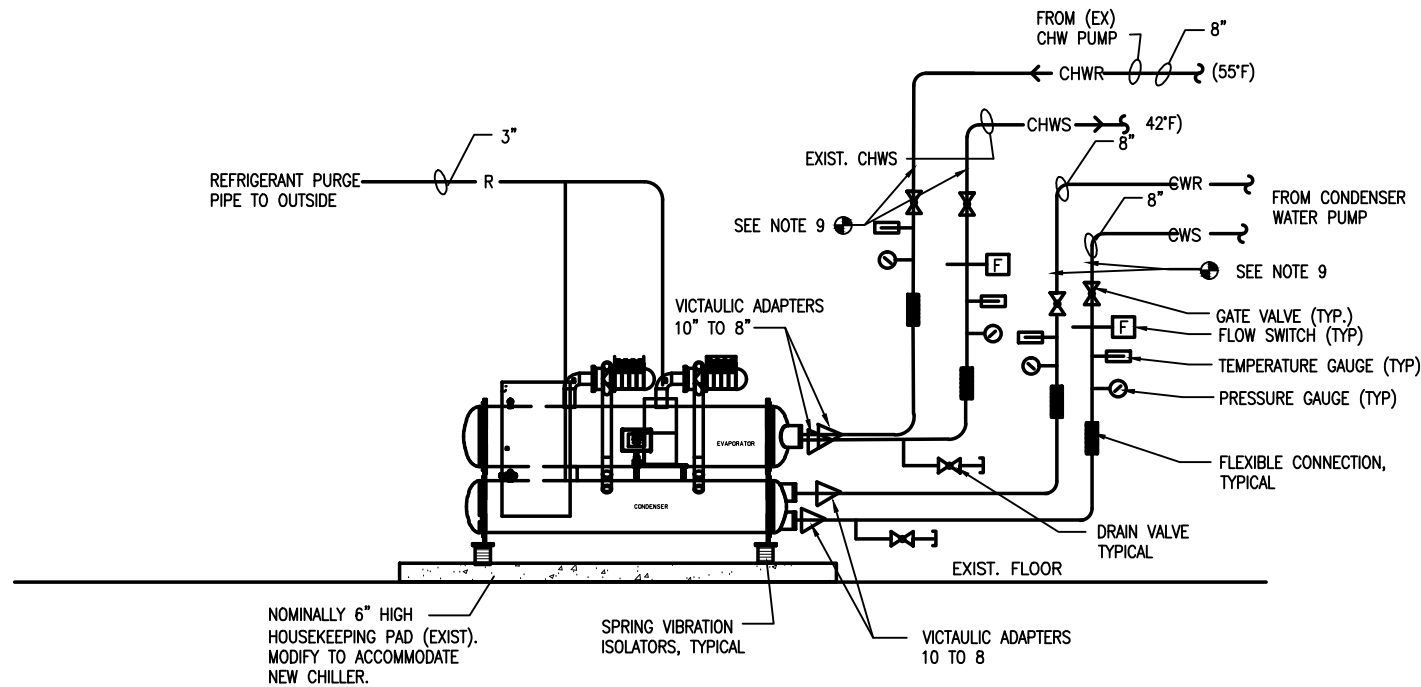
**METRO CENTER CHILLER PIPING DETAILS**  
NTS

**NOTES:**

1. THIS DETAIL IS APPLICABLE TO CHP-C01.
2. REPLACE CHILLED WATER AND CONDENSER WATER SUPPLY AND RETURN PIPE, VALVES, & FITTINGS FROM CHILLER TO AND INCLUDING NEAREST ISOLATION VALVE. GROOVED PIPE AND VICTAULIC COUPLINGS SHALL BE USED.
3. CONNECT CHILLER REFRIGERANT RELIEF VALVES TO NEW REFRIGERANT PURGE PIPE. PROVIDE A PIPING FLEXIBLE CONNECTION CLOSE TO THE CHILLER. PROVIDE A TEE IN THE DISCHARGE PIPING NEAR THE CHILLER WITH A DRAIN VALVE, NIPPLE AND CAP IN THE BOTTOM OF THE TEE.
4. ALL PIPING SHALL BE CONFIGURED TO MINIMIZE INTERFERENCE WITH THE SERVICE AND MAINTENANCE OF THE CHILLER.
5. PROVIDE AND INSTALL TEMPERATURE AND PRESSURE GAUGES WITH SNUBBERS.
6. PROVIDE AND INSTALL FLOW SWITCHES AS INDICATED UNLESS PROVIDED ON THE CHILLER BY MANUFACTURER.
7. PROVIDE AND INSTALL SENSORS FOR ALL DATA POINTS NOT INCLUDED BY CHILLER MANUFACTURER. SEE DRAWINGS M-609 AND M-610 FOR LIST OF DATA POINTS.
8. UTILIZE SUFFICIENT VICTAULIC PIPE COUPLINGS TO ALLOW REMOVAL OF PIPE AND ACCESSORIES TO PERMIT EVAPORATOR AND CONDENSER TUBE REMOVAL.
9. MAINTAIN A TOTAL LENGTH OF NOT LESS THAN 30 FEET OF PIPING TO ACCOMODATE ALL THE VALVES, FLEXIBLE CONNECTIONS AND PIPE FITTINGS. CONTRACTOR SHALL PERFORM ADDITIONAL PIPE CUTTING IF REQUIRED.

CONTRACT NO.  
FQ 14005D-13-03

DESIGNED <u>J. RELUNIA</u> 02/14 DATE 02/14 DRAWN <u>J. RELUNIA</u> 02/14 DATE 02/14 CHECKED <u>C. ROSS</u> 02/14 DATE 02/14 APPROVED <u>C. ROSS</u> 02/14 DATE 02/14			REFERENCE DRAWINGS NUMBER DESCRIPTION          			REVISIONS DATE BY DESCRIPTION          			WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM APPROVED _____		<b>GFP</b> A Gannett Fleming/Parsons JOINT VENTURE SUBMITTED _____ PROJECT MANAGER		<b>METRO CENTER, POTOMAC AVE, &amp; CRYSTAL CITY CHILLER REPLACEMENTS</b> MECHANICAL DETAILS SHEET 1 OF 4 SCALE NONE		DRAWING NO. <b>M-500</b>	<b>M-0000-019</b>	
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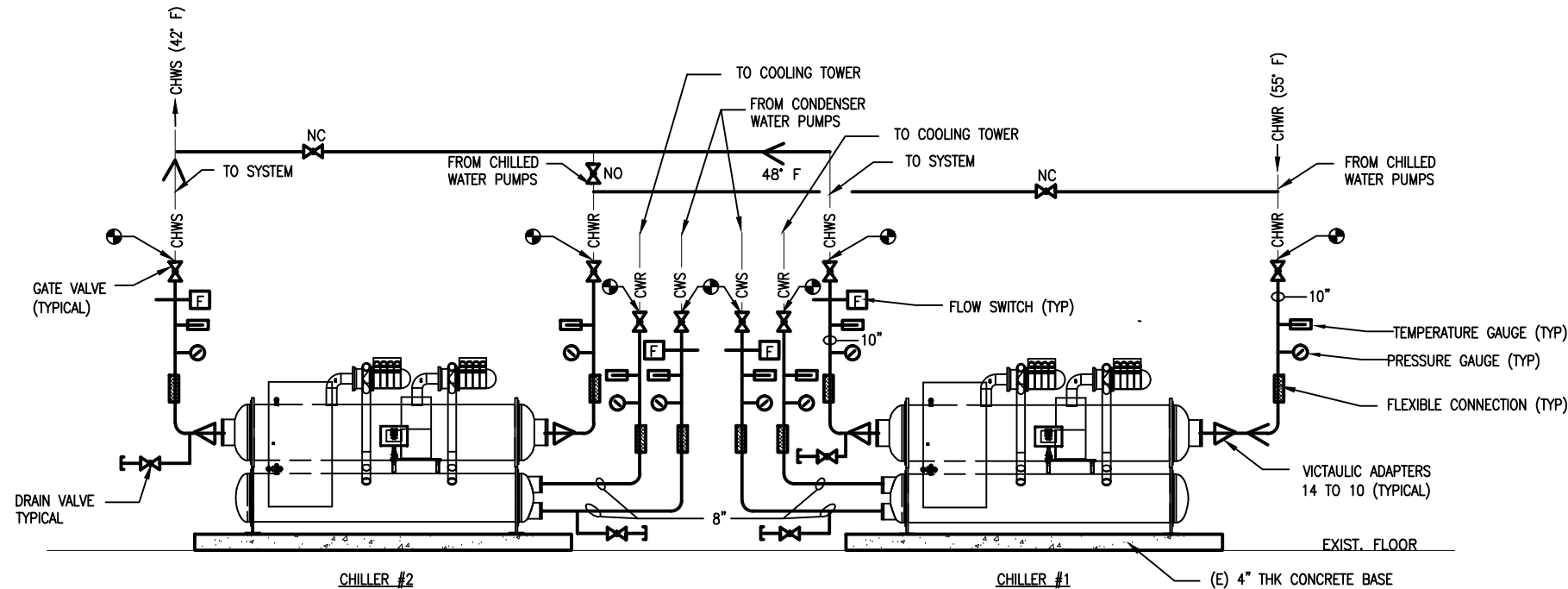


**CRYSTAL CITY CHILLER PIPING DETAILS**  
NTS

1. THIS DETAIL IS APPLICABLE TO CHP-C05.
2. REPLACE CHILLED WATER AND CONDENSER WATER SUPPLY AND RETURN PIPE, VALVES, & FITTINGS FROM CHILLER TO AND INCLUDING NEAREST ISOLATION VALVE. GROOVED PIPE AND VICTAULIC COUPLINGS SHALL BE USED.
3. CONNECT CHILLER REFRIGERANT RELIEF VALVES TO NEW REFRIGERANT PURGE PIPING. PROVIDE A PIPING FLEXIBLE CONNECTION CLOSE TO THE CHILLER. PROVIDE A TEE IN THE DISCHARGE PIPING NEAR THE CHILLER WITH A DRAIN VALVE. NIPPLE AND CAP IN THE BOTTOM OF THE TEE.
4. ALL PIPING SHALL BE CONFIGURED TO MINIMIZE INTERFERENCE WITH THE SERVICE AND MAINTENANCE OF THE CHILLER.
5. PROVIDE AND INSTALL TEMPERATURE AND PRESSURE GAUGES WITH SNUBBERS.
6. PROVIDE AND INSTALL FLOW SWITCHES AS INDICATED UNLESS PROVIDED ON THE CHILLER BY MANUFACTURER.
7. PROVIDE AND INSTALL SENSORS FOR ALL DATA POINTS NOT INCLUDED BY THE CHILLER MANUFACTURER. SEE DRAWINGS M-609 AND M-610 FOR LIST OF DATA POINTS.
8. UTILIZE SUFFICIENT VICTAULIC PIPE COUPLINGS TO ALLOW REMOVAL OF PIPE AND ACCESSORIES TO PERMIT EVAPORATOR AND CONDENSER TUBE REMOVAL.
9. MAINTAIN A TOTAL LENGTH OF NOT LESS THAN 15 FEET OF PIPING TO ACCOMMODATE ALL THE VALVES, FLEX CONNECTIONS, AND PIPE FITTINGS. CONTRACTOR SHALL PERFORM ADDITIONAL PIPE CUTTING IF REQUIRED.

CONTRACT NO.  
FQ 14005D-13-03

DESIGNED J. RELUNIA 02/14 DATE 02/14			REFERENCE DRAWINGS		REVISIONS			WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY  DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM			METRO CENTER, POTOMAC AVE, & CRYSTAL CITY CHILLER REPLACEMENTS MECHANICAL DETAILS SHEET 2 OF 4		
DRAWN J. RELUNIA 02/14 DATE 02/14			NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION						
CHECKED C. ROSS 02/14 DATE 02/14									GFP A Gannett Fleming/Parsons JOINT VENTURE			SCALE 3/16"=1'-0" 1 0 1 3 5 7	
APPROVED C. ROSS 02/14 DATE 02/14												DRAWING NO. M-501	
									APPROVED _____		SUBMITTED _____ PROJECT MANAGER		
											M-0000-020		




**POTOMAC AVENUE CHILLER PIPING DETAILS**  
NTS

**NOTES:**

1. THIS DETAIL IS APPLICABLE TO CHP-D03.
2. REPLACE CHILLED WATER AND CONDENSER WATER SUPPLY AND RETURN PIPE, VALVES, & FITTINGS FROM CHILLER TO AND INCLUDING NEAREST ISOLATION VALVE. GROOVED PIPE AND VICTAULIC COUPLINGS SHALL BE USED.
3. CONNECT CHILLER REFRIGERANT RELIEF VALVES TO NEW VENT PIPING. PROVIDE A PIPING FLEXIBLE CONNECTION CLOSE TO THE CHILLER. PROVIDE A TEE IN THE DISCHARGE PIPING NEAR THE CHILLER WITH A DRAIN VALVE, NIPPLE AND CAP IN THE BOTTOM OF THE TEE.
4. ALL PIPING SHALL BE CONFIGURED TO MINIMIZE INTERFERENCE WITH THE SERVICE AND MAINTENANCE OF THE CHILLER.
5. PROVIDE AND INSTALL TEMPERATURE AND PRESSURE GAUGES, PRESSURE GAUGES SHALL BE LARGE FACE WITH SNUBBERS.
6. PROVIDE AND INSTALL FLOW SWITCHES AS INDICATED UNLESS PROVIDED ON THE CHILLER BY MANUFACTURER.
7. PROVIDE AND INSTALL SENSORS FOR ALL DATA POINTS NOT INCLUDED BY THE CHILLER MANUFACTURER. SEE DRAWINGS M-609 AND M-610 FOR LIST OF DATA POINTS.
8. UTILIZE SUFFICIENT VITAULIC PIPE COUPLINGS TO ALLOW REMOVAL OF PIPE AND ACCESSORIES TO PERMIT EVAPORATOR AND CONDENSER TUBE REMOVAL.
9. MAINTAIN A TOTAL LENGTH OF NOT LESS THAN 30 FEET OF PIPING TO ACCOMMODATE ALL THE VALVES, FLEXIBLE CONNECTIONS, AND PIPE FITTINGS. CONTRACTOR SHALL PERFORM ADDITIONAL PIPE CUTTING IF REQUIRED.

CONTRACT NO.  
FQ 14005D-13-03

DESIGNED <u>J. RELUNIA</u> 02/14 DATE DRAWN <u>J. RELUNIA</u> 02/14 DATE CHECKED <u>C. ROSS</u> 02/14 DATE APPROVED <u>C. ROSS</u> 02/14 DATE			REFERENCE DRAWINGS		REVISIONS				WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY  DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM			 A Gannett Fleming/Parsons JOINT VENTURE			METRO CENTER, POTOMAC AVE, & CRYSTAL CITY CHILLER REPLACEMENTS MECHANICAL DETAILS SHEET 3 OF 4					
			NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION													
									APPROVED _____			SUBMITTED _____ PROJECT MANAGER			SCALE NONE		DRAWING NO. <b>M-502</b>		<b>M-0000-021</b>	

CONTRACT NO.  
FQ 14005D-13-03

CHILLER SCHEDULE																				
PLANT	DESIGNATION	CAPACITY (TONS)	EVAPORATOR (NOTES 9 & 10)				CONDENSER				COMPRESSOR/CHILLER ELECTRICAL							BASIS OF DESIGN	OPT. WEIGHT (LB)	
			GPM (MAX.)	PASSES	EWI °F	LWT °F	GPM	PASSES	EWI °F	LWT °F	VOLT	PH	HZ	RLA	LRA (EA)	QTY	MOC P			MCA
CHP-C01	CHILLER #3	350	1292	1	55	42	1050	2	85	95	460	3	60	286	176	2	450	322	DAIKIN MCQUAY WMC400D	14,000
CHP-C01	CHILLER #4	350	1292	1	55	42	1050	2	85	95	460	3	60	286	176	2	400	322	DAIKIN MCQUAY WMC400D	14,000

NOTES:

1. WATER-COOLED, SEMI-HERMETIC OIL-FREE CENTRIFUGAL COMPRESSOR WATER CHILLER.

2. TWO MAGNETIC BEARING, COMPLETELY OIL-FREE CENTRIFUGAL COMPRESSORS ON EACH CHILLER.

3. INTEGRATED VARIABLE FREQUENCY DRIVE, OPERATING CONTROLS AND EQUIPMENT PROTECTION CONTROLS.

4. CHILLERS SHALL BE CHARGED WITH REFRIGERANT HFC-134A.

5. MOTORS SHALL BE LIQUID REFRIGERANT COOLED WITH INTERNAL THERMAL SENSING DEVICES IN THE STATOR WINDINGS.

6. THE CHILLER SHALL BE EQUIPPED WITH AN INTEGRATED VARIABLE FREQUENCY DRIVE (VFD) TO AUTOMATICALLY REGULATE COMPRESSOR SPEED IN RESPONSE TO COOLING LOAD AND THE COMPRESSOR PRESSURE LIFT REQUIREMENT.

7. CHILLER CONTROLS SHALL COORDINATE COMPRESSOR SPEED AND GUIDE VANE POSITION TO OPTIMIZE CHILLER EFFICIENCY.

8. CHILLER SHALL BE EQUIPPED WITH MICROTECH II CONTROLLER OR EQUIVALENT AND SHALL INCLUDE REMOTE COMMUNICATIONS CARDS WITH MODBUS RTU CAPABILITY SEE DRAWING M-606, M-609, M-610, AND M-611 FOR MONITORING AND CONTROL POINTS.

9. CHILLED WATER FLOW (1,292 GPM) IS SCHEDULED FOR 2-CHILLERS WHICH ARE VALVED FOR SERIES OPERATION. IN ORDER TO PROVIDE EWT=55 DEG F AND LWT=42 DEG F, EACH CHILLER OPERATES APPROXIMATELY 6 DEGREE F (DELTA-T, I.E. EWT - LWT).
10. WHEN 2-CHILLERS ARE VALVED FOR PARALLEL OPERATION, CHILLED WATER FLOW SHALL BE (646 GPM) AND (DELTA-T, I.E. EWT-LWT) SHALL BE APPROXIMATELY 13 DEG F. THIS IS TO MAINTAIN EWT=55 DEG F, AND LWT=42 DEG F. CHILLED WATER AND CONDENSER WATER FLOW RATE ARE MONITORED BY THE FLOW METERS. SEE DWG M-614 AND M-615.

PUMP SCHEDULE															
ITEM NO.	LOCATION	TYPE	SERVES	GPM	FT HEAD	INLET (IN)	OUTLET (IN)	IMPELLER DIA (IN)	MOTOR					BASIS OF DESIGN	WEIGHT (LB)
									RPM	HP	VOLTS	PH	HZ		
P-7	CHILLED WATER PLANT	HSC CENT	CHILLERS	1292	210	8	6	16	1750	125	460	3	60	WEINMAN 6L1	2,800
P-8	CHILLED WATER PLANT	HSC CENT	CHILLERS	1292	210	8	6	16	1750	125	460	3	60	WEINMAN 6L1	2,800
P-3	CHILLED WATER PLANT	HSC CENT	COOLING TOWER	1050	65	8	6	9	1750	30	460	3	60	WEINMAN 6L2	1,200
P-4	CHILLED WATER PLANT	HSC CENT	COOLING TOWER	1050	65	8	6	9	1750	30	460	3	60	WEINMAN 6L2	1,200

NOTES:

1. REPLACE ALL PUMPS USING INVERTER RATED MOTORS AND NEW VFD CONTROLLERS.

2. REPLACE STRAINERS FOR P-7, P-8, P-3, AND P-4.

3. STRAINERS FOR NEW PUMPS P-3 AND P-4; EXISTING PUMPS P-1 & P-2 SHALL BE SSI FABRICATED, VERTICAL FLANGED (10" DIA) WITH T-BOLT HINGED COVER. PROVIDE (1-1/2" DIA) DRAIN VALVE.

4. PROVIDE AND INSTALL NEPTUNE MADE, BROMINE (CHEMICAL) BYPASS FEEDERS, MODEL BT-15; TOTAL OF 2 SETS AND ALL VALVES AND ACCESSORIES. CAPACITY PER TANK: 15 LBS, I.E. 0.3 CU FT (2.3 GALLON). PROVIDE PIPING KITS: STAINLESS STEEL FITTINGS FOR OPERATION TO 120 PSI AT 100° F. EACH KIT CONTAINS: 2-STRAINERS, 3-BALL VALVES, 2-TEES, 2-90° ELBOWS AND REQUIRED NIPPLES AND PLUGS; RELIEF VALVE AND FUNNELS.

5. COORDINATE WITH ELEC. FOR NEW VFD's FOR EXISTING, CW PUMPS: P-1 & P-2 AND MOTORS (40 HP EACH)

EXHAUST FAN SCHEDULE												
ITEM NO.	TYPE	SERVES	CFM	SP (WG)	DRIVE	MOTOR					BASIS OF DESIGN	WEIGHT (LB)
						RPM	HP	VOLTS	PH	HZ		
EF-1	IN LINE MIXED FLOW	CHILLER ROOM	3500	0.7	DIRECT	1770	3/4	460	3	60	GREENHECK MODEL QEID-15	140
EF-2	IN LINE MIXED FLOW	CHILLER ROOM	3500	0.7	DIRECT	1750	3/4	460	3	60	GREENHECK MODEL QEID-15	140

NOTES:

1. ACCESSORIES SHALL INCLUDE:

A. BACKDRAFT DAMPER

2. FAN EF-1: VERTICAL MOUNT WITH STAND FROM FLOOR.

LEAK DETECTION SYSTEM

1. PROVIDE FOUR IR 134A REFRIGERANT GAS SENSORS FOR LEAK DETECTION (SHERLOCK 60-0054 OR EQUAL): 2-FOR EXISTING CHILLERS SERVING METRO CENTER STATION AND 2-FOR NEW CHILLERS SERVING FEDERAL TRIANGLE AND SMITHSONIAN.

2. PROVIDE GAS LEAK DETECTION SYSTEM (SHERLOCK 402 NEMA 4X OR EQUAL)

2.1 PROVIDE RELAY OUTPUT FOR LEVEL 1 OPERATION OF EXHAUST FAN EF-1

2.2 PROVIDE RELAY OUTPUT FOR LEVEL 2 OPERATION OF EXHAUST FAN EF-1 AND EF-2

2.3 PROVIDE STROBE ALARM OUTPUTS AT LEVEL 1 AND LEVEL 2

2.4 AUDIBLE ALARM OUTPUT

3. PROVIDE COMMUNICATIONS INTERFACE FOR REMOTE MONITORING AND CONTROL GENCOM COMMUNICATIONS WITH DRY CONTACT TO CHILLER PLANT MONITORING PANEL. DWG M-614

4. CONNECT TO PRODUCTIVITY 3000,PAC IN CHILLER PLANT MONITORING PANEL.

FLOW MONITORING SYSTEM

1. NON-INTRUSIVE CLAMP-ON FLOW SENSORS

2. MAINTENANCE-FREE

3. ACCURACY: 1% OF VELOCITY

4. NO DEPENDENCY ON CONDUCTIVITY

5. AUTOMATICALLY ADAPT TO PIPE MATERIAL AND LIQUID PROPERTY VARIATIONS

6. BUILT-IN FLOW TOTALIZERS

7. ISOLATED RS-485 INTERFACE WITH POWER SURGE PROTECTION. SUPPORTS THE MODBUS PROTOCOL

8. ABUNDANT INPUT/OUTPUT, ISOLATED 4-20MA OUTPUT, RELAY, PULSE OUTPUT, ALARM OUTPUT


9. SELF-EXPLANATORY MENU-DRIVEN PROGRAMMING

10. PIPE SIZE RANGE, 8" ~ 10"

11. NEMA 4X (IP65) WEATHER-RESISTANT ENCLOSURE

12. ULTRASONIC FLOWMETER NEMA 4X (WALL MOUNT) SIEMENS SITRANS FUS1010



										CONTRACT NO. FQ 14005D-13-03		
DESIGNED <u>J. RELUNIA</u> DATE 02/14 DRAWN <u>J. RELUNIA</u> DATE 02/14 CHECKED <u>C. ROSS</u> DATE 02/14 APPROVED <u>C. ROSS</u> DATE 02/14	REFERENCE DRAWINGS		REVISIONS			WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY				METRO CENTER, POTOMAC AVE, & CRYSTAL CITY CHILLER REPLACEMENTS METRO CENTER CHILLER PLANT MECHANICAL EQUIPMENT SCHEDULE		
	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION	DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM    SUBMITTED _____ PROJECT MANAGER						
			02/15		ADDENDA 1							
						APPROVED _____				SCALE NONE	DRAWING NO. M-600	M-0000-023



[illegible]

1. WATER-COOLED, SEMI-HERMETIC OIL-FREE CENTRIFUGAL COMPRESSOR WATER CHILLER.
2. TWO MAGNETIC BEARING, COMPLETELY OIL-FREE CENTRIFUGAL COMPRESSORS.
3. INTEGRATED VARIABLE FREQUENCY DRIVE, OPERATING CONTROLS AND EQUIPMENT PROTECTION CONTROLS.
4. CHILLER SHALL BE CHARGED WITH REFRIGERANT HFC-134A.
5. MOTORS SHALL BE LIQUID REFRIGERANT COOLED WITH INTERNAL THERMAL SENSING DEVICES IN THE STATOR WINDINGS.
6. THE CHILLER SHALL BE EQUIPPED WITH AN INTEGRATED VARIABLE FREQUENCY DRIVE (VFD) TO AUTOMATICALLY REGULATE COMPRESSOR SPEED IN RESPONSE TO COOLING LOAD AND THE COMPRESSOR PRESSURE LIFT REQUIREMENT.
7. CHILLER CONTROLS SHALL COORDINATE COMPRESSOR SPEED AND GUIDE VANE POSITION TO OPTIMIZE CHILLER EFFICIENCY.
8. CHILLER SHALL BE EQUIPPED WITH MICROTECH II CONTROLLER OR EQUIVALENT AND SHALL INCLUDE REMOTE COMMUNICATIONS CARDS WITH MODBUS RTU CAPABILITY SEE DRAWING M-607, M-609, M-610, AND M-612 FOR MONITORING AND CONTROL POINTS.

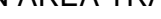
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1. FACTORY-MOUNTED COILS, FILTERS, CONTROLS, MOTORS, DRIVE KITS.
2. ANGLE FILTER BOX WITH 2" MERV 8 FILTER.
3. PIPING PACKAGE WITH SINGLE THREE WAY MODULATING VALVE OPTION.
4. CONTROL PACKAGE - THERMOSTATIC CONTROL OF BLOWER AND MAGNETIC STOP. THERMOSTAT TO OPERATE UNIT TO MAINTAIN SPACE TO 85°.

PUMP SCHEDULE														
ITEM NO.	LOCATION	TYPE	GPM	FT HEAD	INLET (IN)	OUTLET (IN)	IMPELLER DIA (IN)	MOTOR					BASIS OF DESIGN	WEIGHT (LB)
								RPM	HP	VOLTS	PH	HZ		
CHP-1	CHILLED WATER PLANT	HSC CENT	647	72	5	4	9	1750	15	460	3	60	WEINMAN 4L2	840
CHP-2	CHILLED WATER PLANT	HSC CENT	647	72	5	4	9	1750	15	460	3	60	WEINMAN 4L2	840
CWP-1	CHILLED WATER PLANT	HSC CENT	1050	83	6	5	10	1750	30	460	3	60	WEINMAN 5L2	1,200
CWP-2	CHILLED WATER PLANT	HSC CENT	1050	83	6	5	10	1750	30	460	3	60	WEINMAN 5L2	1,200

1. REPLACE ALL PUMPS USING INVERTER RATED MOTORS AND NEW VFD CONTROLLERS.
2. REPLACE STRAINERS FOR CHP-1, CHP-2, CWP-1, AND CWP-2.
3. STRAINERS FOR CWP-1 AND CWP-2 SHALL BE SSI FABRICATED, VERTICAL FLANGED (8" DIA) WITH T-BOLT HINGED COVER. PROVIDE (1-1/2" DIA) DRAIN VALVE.
4. PROVIDE AND INSTALL NEPTUNE MADE, BROMINE (CHEMICAL) BYPASS FEEDERS, MODEL BT-15; TOTAL OF 2 SETS AND ALL VALVES AND ACCESSORIES. CAPACITY PER TANK: 15 LBS, I.E. 0.3 CU FT (2.3 GALLON). PROVIDE PIPING KITS: STAINLESS STEEL FITTINGS FOR OPERATION TO 120 PSI AT 100° F. EACH KIT CONTAINS: 2-STRAINERS, 3-BALL VALVES, 2-TEES, 2-90° ELBOWS AND REQUIRED NIPPLES AND PLUGS; RELIEF VALVE AND FUNNELS.

[illegible]

<div> <div>DESIGNED J. RELUNIA 02/14</div> <div>DATE 02/14</div> </div> <div> <div>DRAWN J. RELUNIA 02/14</div> <div>DATE 02/14</div> </div> <div> <div>CHECKED C. ROSS 02/14</div> <div>DATE 02/14</div> </div> <div> <div>APPROVED C. ROSS 02/14</div> <div>DATE 02/14</div> </div>										<div>REFERENCE DRAWINGS</div> <table border="1"> <thead> <tr> <th>NUMBER</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </tbody> </table>		NUMBER	DESCRIPTION															<div>REVISIONS</div> <table border="1"> <thead> <tr> <th>DATE</th> <th>BY</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>02/15</td> <td> </td> <td>ADDENDA 1</td> </tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>		DATE	BY	DESCRIPTION	02/15		ADDENDA 1																			<div>WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY</div> <div>DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES</div> <div>OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM</div> <div>APPROVED _____</div>		<div>  <div>A Gannett Fleming/Parsons JOINT VENTURE</div> </div> <div>SUBMITTED _____</div> <div>PROJECT MANAGER</div>		<div> <div>METRO CENTER, POTOMAC AVE, &amp; CRYSTAL CITY CHILLER REPLACEMENTS</div> <div>CRYSTAL CITY CHILLER PLANT MECHANICAL EQUIPMENT SCHEDULE</div> </div> <div> <div>SCALE NONE</div> <div>DRAWING NO. M-601</div> <div>M-0000-024</div> </div>		<div>CONTRACT NO. FQ 14005D-13-03</div>	
NUMBER	DESCRIPTION																																																												
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02/15		ADDENDA 1																																																											

CHILLER SCHEDULE																				
PLANT	DESIGNATION	CAPACITY (TONS)	EVAPORATOR (NOTES 9 &10)				CONDENSER				COMPRESSOR/CHILLER ELECTRICAL								BASIS OF DESIGN	OPT. WEIGHT (LB)
			GPM (MAX.)	PASSES	EWI °F	LWT °F	GPM	PASSES	EWI °F	LWT °F	VOLT	PH	HZ	RLA	LRA (EA)	QTY	MOCP	MCA		
CHP-D03	CHILLER #1	350	1292	1	55	42	1092	2	85	94.3	460	3	60	274	176	2	450	322	DAIKIN MCQUAY WMC400	14,000
CHP-D03	CHILLER #2	350	1292	1	55	42	1092	2	85	93.6	460	3	60	274	176	2	450	322	DAIKIN MCQUAY WMC400	14,000

NOTES:

1. WATER-COOLED, SEMI-HERMETIC OIL-FREE CENTRIFUGAL COMPRESSOR WATER CHILLER.

2. TWO MAGNETIC BEARING, COMPLETELY OIL-FREE CENTRIFUGAL COMPRESSORS ON EACH CHILLER.

3. INTEGRATED VARIABLE FREQUENCY DRIVE, OPERATING CONTROLS AND EQUIPMENT PROTECTION CONTROLS.

4. CHILLERS SHALL BE CHARGED WITH REFRIGERANT HFC-134A.

5. MOTORS SHALL BE LIQUID REFRIGERANT COOLED WITH INTERNAL THERMAL SENSING DEVICES IN THE STATOR WINDINGS.

6. THE CHILLER SHALL BE EQUIPPED WITH AN INTEGRATED VARIABLE FREQUENCY DRIVE (VFD) TO AUTOMATICALLY REGULATE COMPRESSOR SPEED IN RESPONSE TO COOLING LOAD AND THE COMPRESSOR PRESSURE LIFT REQUIREMENT.

7. CHILLER CONTROLS SHALL COORDINATE COMPRESSOR SPEED AND GUIDE VANE POSITION TO OPTIMIZE CHILLER EFFICIENCY.

8. CHILLER SHALL BE EQUIPPED WITH MICROTECH II CONTROLLER OR EQUIVALENT AND SHALL INCLUDE REMOTE COMMUNICATIONS CARDS WITH MODBUS OVER ETHERNET CAPABILITY SEE DRAWING M-611 FOR MONITORING AND CONTROL POINTS.

9. CHILLED WATER FLOW (1,292 GPM) IS SCHEDULED FOR 2-CHILLERS WHICH ARE VALVED FOR SERIES OPERATION. IN ORDER TO PROVIDE EWT=55 DEG F AND LWT=42 DEG F, EACH CHILLER OPERATES APPROXIMATELY 6 DEGREE F (DELTA-T, I.E. EWT - LWT).
10. WHEN 2-CHILLERS ARE VALVED FOR PARALLEL OPERATION, CHILLED WATER FLOW SHALL BE (646 GPM) AND (DELTA-T, I.E. EWT-LWT) SHALL BE APPROXIMATELY 13 DEG F. THIS IS TO MAINTAIN EWT=55 DEG F, AND LWT=42 DEG F. CHILLED WATER AND CONDENSER WATER FLOW RATE ARE MONITORED BY THE FLOW METERS. SEE DWG M-614.

LEAK DETECTION SYSTEM

1. PROVIDE TWO IR 134A REFRIGERANT GAS SENSORS FOR LEAK DETECTION (SHERLOCK 60-0054 OR EQUAL)
2. PROVIDE GAS LEAK DETECTION SYSTEM (SHERLOCK 402 NEMA 4X OR EQUAL)

2.1 PROVIDE RELAY OUTPUT FOR LEVEL 1 OPERATION OF EXHAUST FAN EF-1 LOW SPEED

2.2 PROVIDE RELAY OUTPUT FOR LEVEL 2 OPERATION OF EXHAUST FAN EF-1 HIGH SPEED

2.3 PROVIDE STROBE ALARM OUTPUTS AT LEVEL 1 AND LEVEL 2

2.4 AUDIBLE ALARM OUTPUT.
3. PROVIDE COMMUNICATIONS INTERFACE FOR REMOTE MONITORING AND CONTROL GENCOM COMMUNICATIONS WITH DRY CONTACT TO CHILLER PLANS MONITORING PANEL. SEE DWG M-614.
4. CONNECT TO PRODUCTIVITY 3000,PAC IN CHILLER PLANT MONITORING PANEL.

FLOW MONITORING SYSTEM

1. NON-INTRUSIVE CLAMP-ON FLOW SENSORS
2. MAINTENANCE-FREE
3. ACCURACY: 1% OF VELOCITY
4. NO DEPENDENCY ON CONDUCTIVITY
5. AUTOMATICALLY ADAPT TO PIPE MATERIAL AND LIQUID PROPERTY VARIATIONS
6. BUILT-IN FLOW TOTALIZERS
7. ISOLATED RS-485 INTERFACE WITH POWER SURGE PROTECTION. SUPPORTS THE MODBUS PROTOCOL (CONNECT TO PAC,3000 IN CHILLER PLANT MONITORING PANEL.
8. ABUNDANT INPUT/OUTPUT, ISOLATED 4-20MA OUTPUT, RELAY, PULSE OUTPUT, ALARM OUTPUT
9. SELF-EXPLANATORY MENU-DRIVEN PROGRAMMING
10. PIPE SIZE RANGE, 8" ~ 10"
11. NEMA 4X (IP65) WEATHER-RESISTANT ENCLOSURE
12. ULTRASONIC FLOWMETER NEMA 4X (WALL MOUNT) SIEMENS SITRANS FUS1010



AIR HANDLING UNIT SCHEDULE																			
PLANT	DESIGNATION	CAPACITY (TONS)	EVAPORATOR							ELECTRICAL							BASIS OF DESIGN	WEIGHT (LB)	
			GPM	ROWS	EWLT °F	LWT °F	CFM	EAT °F	LAT °F	HP	VOLT	PH	HZ	RLA	LRA	MOCP			MCA
CHP-D03	AHU-1	11	21	6	42	55	2000	90	58	3/4	460	3	60				1.6	MCQUAY MODEL HCBB120	350

NOTES:

1. FACTORY-MOUNTED COILS, FILTERS, CONTROLS, MOTORS, DRIVE KITS.
2. ANGLE FILTER BOX WITH 2" MERV 8 FILTER.
3. PIPING PACKAGE WITH THREE WAY MODULATING VALVE OPTION.
4. CONTROL PACKAGE - THERMOSTATIC CONTROL OF BLOWER AND MAGNETIC STOP. THERMOSTAT TO OPERATE UNIT TO MAINTAIN SPACE TO 85F.

PUMP SCHEDULE															
ITEM NO.	LOCATION	TYPE	GPM	FT HEAD	INLET (IN)	OUTLET (IN)	IMPELLER DIA (IN)	MOTOR					BASIS OF DESIGN		WEIGHT (LB)
								RPM	HP	VOLTS	PH	HZ			
CHP-1	CHILLED WATER PLANT	HSC CENT	1294	210	8	6	16	1750	125	460	3	60	WEINMAN 6L1		2,800
CHP-2	CHILLED WATER PLANT	HSC CENT	1294	210	8	6	16	1750	125	460	3	60	WEINMAN 6L1		2,800
CWP-3	CHILLED WATER PLANT	HSC CENT	1050	65	8	6	8.8	1750	30	460	3	60	WEINMAN 6L2		1,200
CWP-4	CHILLED WATER PLANT	HSC CENT	1050	65	8	6	8.8	1750	30	460	3	60	WEINMAN 6L2		1,200
CWP-5	CHILLED WATER PLANT	HSC CENT	1050	65	8	6	8.8	1750	30	460	3	60	WEINMAN 6L2		1,200

NOTES:

1. REPLACE ALL PUMPS USING INVERTER RATED MOTORS AND NEW VFD CONTROLLERS.
2. REPLACE STRAINERS FOR CHP-1, CHP-2, CWP-3, TO CWP-5.
3. STRAINERS FOR CWP-3 TO CWP-5 SHALL BE SSI FABRICATED, VERTICAL FLANGED (8" DIA) WITH T-BOLT HINGED COVER. PROVIDE (1-1/2" DIA) DRAIN VALVE.
4. PROVIDE AND INSTALL NEPTUNE MADE, BROMINE (CHEMICAL) BYPASS FEEDERS, MODEL BT-15; TOTAL OF 2 SETS AND ALL VALVES AND ACCESSORIES. CAPACITY PER TANK: 15 LBS, I.E. 0.3 CU FT (2.3 GALLON). PROVIDE PIPING KITS: STAINLESS STEEL FITTINGS FOR OPERATION TO 120 PSI AT 100° F. EACH KIT CONTAINS: 2 STRAINERS, 3 BALL VALVES, 2 TEES, 2 90° ELBOWS AND REQUIRED NIPPLES AND PLUGS; RELIEF VALVE AND FUNNELS.
5. CONDENSER WATER PUMPS TO REMAIN. ADD VARIABLE FREQUENCY DRIVE.

EXHAUST FAN SCHEDULE													
ITEM NO.	TYPE	SERVES	CFM		SP (WG)	DRIVE	MOTOR					BASIS OF DESIGN	WEIGHT (LB)
			MIN	MAX			RPM	HP	VOLTS	PH	HZ		
EF-1	INLINE TUBULAR CENT	CHILLER ROOM	1800	3600	1.0	BELT	1725	2.0	460	3	60	GREENHECK MODEL TCB-1-16	200

NOTES:


1. ACCESSORIES SHALL INCLUDE:

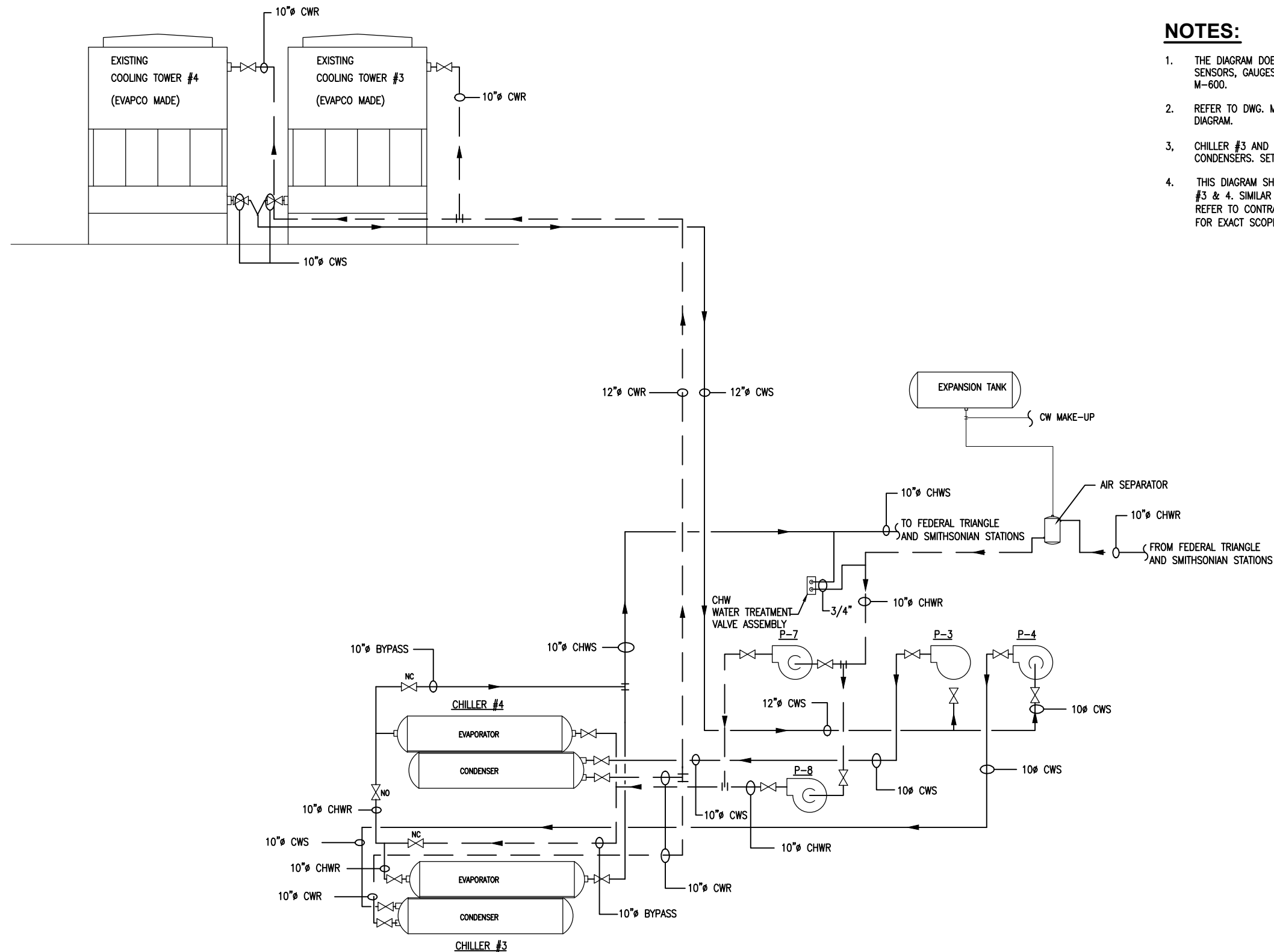
A. MOTOR COVER

B. BELT GUARD

C. VIBRATION ISOLATORS
2. FAN SHALL BE FITTED WITH A TWO SPEED MOTOR.

CONTRACT NO.  
FQ 14005D-13-03

<div>DESIGNED <u>J. RELUNIA</u> 02/14 DATE 02/14</div> <div>DRAWN <u>J. RELUNIA</u> 02/14 DATE 02/14</div> <div>CHECKED <u>C. ROSS</u> 02/14 DATE 02/14</div> <div>APPROVED <u>C. ROSS</u> 02/14 DATE 02/14</div>	REFERENCE DRAWINGS		REVISIONS			<div>WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY</div> <div>DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM</div> <div>APPROVED _____</div>	<div>WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY</div> <div>DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM</div> <div>APPROVED _____</div>		<div>A Gannett Fleming/Parsons JOINT VENTURE</div> <div>SUBMITTED _____ PROJECT MANAGER</div>	METRO CENTER, POTOMAC AVE, & CRYSTAL CITY CHILLER REPLACEMENTS POTOMAC AVENUE CHILLER PLANT MECHANICAL EQUIPMENT SCHEDULE		
	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION		SCALE NONE			DRAWING NO. M-602	M-0000-025	
			02/15		ADDENDA 1							



## NOTES:

1. THE DIAGRAM DOES NOT SHOW ALL VALVES, STRAINERS, FLOW SENSORS, GAUGES, ETC. REFER TO THE EQUIPMENT DETAILS ON DWG. M-600.
2. REFER TO DWG. M-614 FOR THE CHILLER PLANT MONITORING DIAGRAM.
3. CHILLER #3 AND #4 HAVE 1-PASS EVAPORATORS AND 2-PASS CONDENSERS. SET FOR SERIES OPERATION.
4. THIS DIAGRAM SHOWS GENERAL PIPING ARRANGEMENT FOR CHILLER #3 & 4. SIMILAR PIPING ARRANGEMENT FOR CHILLER #1 & 2. REFER TO CONTRACT DOCUMENTS (DRAWINGS & SPECIFICATION FOR EXACT SCOPE OF WORK).

CONTRACT NO.  
FQ 14005D-13-03

DESIGNED J. RELUNIA 02/14  
DATE 02/14  
DRAWN J. RELUNIA 02/14  
DATE 02/14  
CHECKED C. ROSS 02/14  
DATE 02/14  
APPROVED C. ROSS 02/14  
DATE 02/14

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT INFRASTRUCTURE  
AND ENGINEERING SERVICES  
OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM

APPROVED \_\_\_\_\_

**GFP** A Gannett Fleming/Parsons  
JOINT VENTURE

SUBMITTED \_\_\_\_\_  
PROJECT MANAGER

**METRO CENTER, POTOMAC AVE, &  
CRYSTAL CITY CHILLER REPLACEMENTS**  
METRO CENTER CHILLER PLANT  
CHILLED AND CONDENSER WATER FLOW DIAGRAM

SCALE  
NONE

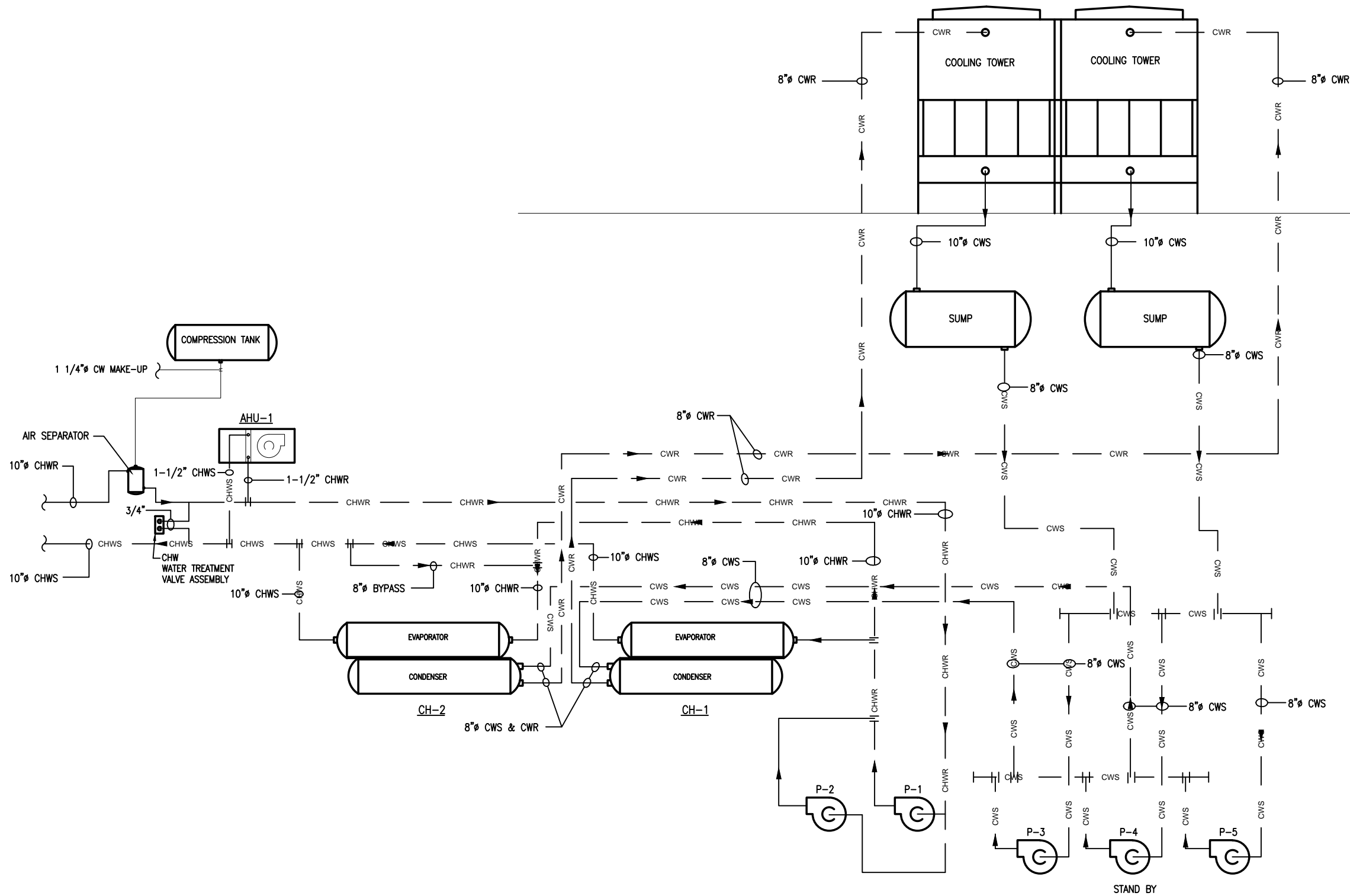
DRAWING NO.  
**M-603**

**M-0000-026**



NOTES:

1. THE DIAGRAM DOES NOT SHOW ALL VALVES, STRAINERS, FLOW SENSORS, GAUGES, ETC. REFER TO THE EQUIPMENT DETAILS ON DWG. M-602.
2. REFER TO DWG M-614 FOR CHILLER PLANT MONITORING DIAGRAM.
3. CHILLER #1 AND #2 HAVE 1-PASS EVAPORATORS AND 2-PASS CONDENSERS. SET FOR SERIES OPERATION.
4. THIS DIAGRAM SHOWS GENERAL PIPING ARRANGEMENT FOR CHILLER. REFER TO CONTRACT DOCUMENTS (DRAWINGS & SPECIFICATION FOR EXACT SCOPE OF WORK).



FLOW DIAGRAM

CONTRACT NO.  
FQ 14005D-13-03

DESIGNED	J. RELUNIA	02/14
DRAWN	J. RELUNIA	02/14
CHECKED	C. ROSS	02/14
APPROVED	C. ROSS	02/14

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT INFRASTRUCTURE  
AND ENGINEERING SERVICES  
OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM

APPROVED \_\_\_\_\_

**GFP** A Gannett Fleming/Parsons  
JOINT VENTURE

SUBMITTED \_\_\_\_\_  
PROJECT MANAGER

**METRO CENTER, POTOMAC AVE, &  
CRYSTAL CITY CHILLER REPLACEMENTS**  
POTOMAC AVENUE CHILLER PLANT  
CHILLED AND CONDENSER WATER FLOW DIAGRAM

SCALE  
NONE

DRAWING NO.  
**M-605**

**M-0000-028**



GENERAL FOR METRO CENTER CHILLER PLANT

THE CHILLER PLANT CONSISTS OF TWO CHILLERS WITH VARIABLE CAPACITY COMPRESSORS, TWO COOLING TOWERS WITH VARIABLE SPEED FANS, TWO CHILLED WATER PUMPS AND TWO CONDENSER WATER PUMPS; TWO EXHAUST FAN IN RESPONSE TO THE REFRIGERANT GAS DETECTION.

THE CHILLER PLANT IS DESIGNED FOR CONSTANT FLOW (GPM) FOR CHILLED WATER AND CONDENSER WATER. THE TWO CHILLERS ARE PIPED FOR SERIES OPERATION BY VALVES. THE VALVES CAN BE RE-ARRANGED FOR CHILLERS OPERATING IN PARALLEL.

THE CHILLER PLANT OPERATION IS PROGRAMMABLE FOR SERIES CHILLERS ARRANGEMENT.

DURING COOLING SEASON; THE CHILLERS OPERATE CONTINUOUSLY FOR DAY AND NIGHT TIME.

THE CHILLED WATER SUPPLY TEMPERATURE SET POINT (42°F) IS SET TO THE CHILLER PLANT DESIGN TEMPERATURE AND THE SETPOINT TEMPERATURE CAN BE MANUALLY RESET BY THE OPERATOR. IT ENTERING CONDENSER WATER TEMPERATURE SHALL BE 85°F.

THE CHILLED WATER SYSTEM ENABLE POINT IS CONTROLLED EITHER MANUALLY BY THE OPERATOR OR PROGRAMMABLE. IF THE CHILLED WATER SYSTEM ENABLE POINT IS ON AND THERE IS A CALL FOR COOLING (I.E. THE CHILLED WATER RETURN TEMPERATURE EXCEEDS 45°F):

1) CHILLED WATER PUMP (P7 OR P8) AND CONDENSER WATER PUMP (P3 OR P4) WHICH ARE MANUALLY SELECTED BY THE PLANT OPERATOR, SHALL START, PUMPS SHALL OPERATE FOR CONSTANT WATER FLOW. THE ASSOCIATED VARIABLE SPEED DRIVES SHALL BE UTILIZED TO ADJUST PUMP SPEED FOR DESIGN FLOW RATE AND SET.

2) CHILLERS #1 & 2 SATRT OR STOP POINT TURNS ON.

3) AFTER CHILLED WATER AND CONDENSER WATER FLOW ARE PROVEN BY THE FLOW SWITCHES, CHILLERS #1 & 2 WHICH ARE PIPED FOR SERIES OPERATION, RUN UNDER THEIR OPERATING AND SAFETY CONTROLS. CHILLERS’ INTEGRATED VARIABLE SPEED DRIVE SHALL ADJUST THEIR CAPAITY IN ORDER TO MAINTAIN THE CHILLER PLANT SUPPLY TEMPERATURE SET POINT. (I.E. COOLING LOAD SHALL BE EQUALLY SPLIT BETWEEN TWO CHILLERS).

4) THE CHILLERS STOP SEQUENCE FIRSTLY STOPS THE CHILLERS. AFTER A TIME DELAY (ADJUSTABLE), THE CONDENSER WATER PUMPS AND THE CHILLED WATER PUMPS SHALL STOP.

COOLING TOWERS IS ENABLED WHEN CONDENSER WATER PUMP IS OPERATING. WHEN THE CONDENSER WATER SUPPLY TEMPERATURE INCREASES FROM THE SET POINT (85°F, ADJUSTABLE); THE RESPECTIVELY COOLING TOWER FAN SHALL START AT LOW SPEED. INCREASE AND DECREASE FAN SPEED IN ORDER TO MAINTAIN THE CONDENSER WATER SUPPLY TEMPERATURE SET POINT.

CONFIRM THE PUMPS DESIRED STATE (I.E. ON OR OFF) FROM THEIR VARIABLE SPEED DRIVES. GENERATE AN ALARM IF STATUS DEVIATES FROM START OR STOP CONTROL.

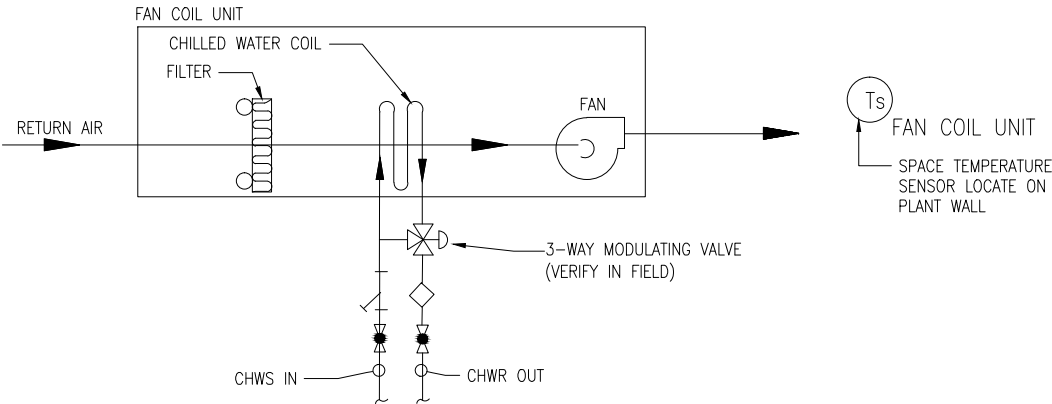
CHILLER EMRGENCY SHUTDOWN:

A KEY SWITCH LOCATED OUTSIDE THE CHILLER PLANT ROOM SHALL SHUT DOWN THE CHILLER WHEN REQUIRE. ANOTHER KEY SWITCH SHALL MANUALLY START THE EXHAUST FAN IN ORDER TO VENTILATE THE CHILLER ROOM IN CASE THE GAS LEAK MONITOR HAS NOT OPERATED THE FAN(S).

SEE DWG #M-609 TO M-610 FOR MONITORING AND CONTROL POINTS OF THE CHILLER PLANT.

DETAILED DATA POINT INFORMATION

LISTED DATA POINTS SHALL BE MONITORED AND CONTROLLED VIA LOCAL CONTROL PANEL AND THROUGH REMOTE COMMUNICATIONS. CONTRACTOR SHALL PROVIDE AND INSTALL SENSORS FOR CHILLER VOLTAGE, CURRENT, AND POWER ON EACH CHILLER AND INTERFACE THEM WITH THE MICROTECH II CONTROLLER, USING SENSORS RECOMMENDED BY MCQUAY CHILLER OR APPROVED EQUAL.



(2) EXISTING FAN COIL UNITS (NTS)

NOTE:  
1. REMOVE EXISTING CONTROL DEVICES AND VALVES.  
PROVIDE NEW AUTOMATIC TEMPERATURE CONTROL DEVICES,  
THERMOSTATS AND CONTROLLERS, ETC.

SEQUENCE OF OPERATIONS:

1. WHEN TEMPERATURE AT SPACE TEMPERATURE SENSOR Ts RISES ABOVE 80°F, THE FAN COIL UNITS SHALL START BY NEW DDC SYSTEM/ PANEL UNDER THIS CONTRACT.THE THREE WAY MODULATING VALVE SHALL OPERATE TO MAINTAIN THE SPACE TEMPERATURE AT 85°F IF THE SPACE TEMPERATURE FALLS BELOW 80°F, THE FAN COIL UNITS SHALL STOP.
2. CONTRACTOR TO PROVIDE MONITORING OF FAN COIL UNITS STATUS AT THE CHILLER PLANT MONITORING PANEL, VIA MODBUS.

CONTRACT NO.  
FQ 14005D-13-03

<div>DESIGNED <u>J. RELUNIA</u> 02/14 DATE 02/14</div> <div>DRAWN <u>J. RELUNIA</u> 02/14 DATE 02/14</div> <div>CHECKED <u>C. ROSS</u> 02/14 DATE 02/14</div> <div>APPROVED <u>C. ROSS</u> 02/14 DATE 02/14</div>	REFERENCE DRAWINGS		REVISIONS			WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		<div>METRO CENTER, POTOMAC AVE, &amp; CRYSTAL CITY CHILLER REPLACEMENTS</div> <div>METRO CENTER CHILLER PLANT EQUIPMENT SEQUENCE OF OPERATION</div>					
	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION	<div>DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES</div> <div>OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM</div> <div>APPROVED _____</div> <div><div><div>GFP</div><div>A Gannett Fleming/Parsons JOINT VENTURE</div></div><div>SUBMITTED _____ PROJECT MANAGER</div></div>							
											SCALE NONE		DRAWING NO. M-606

CHILLED WATER PLANT SEQUENCE OF OPERATION

GENERAL FOR CRYSTAL CITY CHILLER PLANT

THE CHILLER PLANT CONSISTS OF A SINGLE CHILLER WITH VARIABLE CAPACITY COMPRESSORS, A COOLING TOWER WITH VARIABLE SPEED FAN, TWO CHILLED WATER PUMPS AND TWO CONDENSER WATER PUMPS; 2 EXHAUST FANS IN RESPONSE TO THE REFRIGERANT GAS DETECTION.

THE CHILLER PLANT IS DESIGNED FOR CONSTANT FLOW (GPM) FOR CHILLED WATER AND CONDENSER WATER.

THE CHILLER PLANT OPERATION IS PROGRAMMABLE.

DURING COOLING SEASON; THE CHILLER OPERATES CONTINUOUSLY FOR DAY AND NIGHT TIME.

THE CHILLED WATER SUPPLY TEMPERATURE SET POINT (42°F) IS SET TO THE CHILLER PLANT DESIGN TEMPERATURE AND THE SETPOINT TEMPERATURE CAN BE MANUALLY RESET BY THE OPERATOR. IT’S ENTERING CONDENSER WATER TEMPERATURE SHALL BE 85°F.

THE CHILLED WATER SYSTEM ENABLE POINT IS CONTROLLED EITHER MANUALLY BY THE OPERATOR OR PROGRAMMABLE. IF THE CHILLED WATER SYSTEM ENABLE POINT IS ON AND THERE IS A CALL FOR COOLING (I.E. THE CHILLED WATER RETURN TEMPERATURE EXCEEDS 45°F):

- 1) CHILLED WATER PUMP (P-1 OR P-2) AND CONDENSER WATER PUMP (P-3 OR P-4) WHICH ARE MANUALLY SELECTED BY THE PLANT OPERATOR, SHALL START. PUMPS SHALL OPERATE FOR CONSTANT WATER FLOW. THE ASSOCIATED VARIABLE SPEED DRIVES SHALL BE UTILIZED TO ADJUST PUMP SPEED FOR DESIGN FLOW RATE AND SET.
- 2) THE CHILLER START OR STOP POINT TURNS ON.
- 3) AFTER CHILLED WATER AND CONDENSER FLOW ARE PROVEN BY THE FLOW SWITCHES, THE CHILLER OPERATES UNDER ITS OPERATING AND SAFETY CONTROLS. CHILLER’S INTEGRATED VARIABLE SPEED DRIVE SHALL ADJUST ITS CAPACITY IN ORDER TO MAINTAIN THE CHILLER’S CHILLED WATER SUPPLY TEMPERATURE SET POINT.

THE CHILLER STOP SEQUENCE FIRSTLY STOPS THE CHILLER. AFTER A TIME DELAY (ADJUSTABLE), THE CONDENSER WATER PUMP AND THE CHILLED WATER PUMP SHALL STOP.

COOLING TOWER IS ENABLED WHEN CONDENSER WATER PUMP IS OPERATING. WHEN THE CONDENSER WATER SUPPLY TEMPERATURE INCREASES FROM THE SET POINT (85°F, ADJUSTABLE), THE COOLING TOWER FAN STARTS AT LOW SPEED. INCREASE AND DECREASE FAN SPEED IN ORDER TO MAINTAIN THE CONDENSER WATER SUPPLY TEMPERATURE SET POINT.

CONFIRM THE PUMPS DESIRED STATE (I.E. ON OR OFF) FROM THEIR VARIABLE SPEED DRIVES. GENERATE AN ALARM IF STATUS DEVIATES FROM START OR STOP CONTROL.

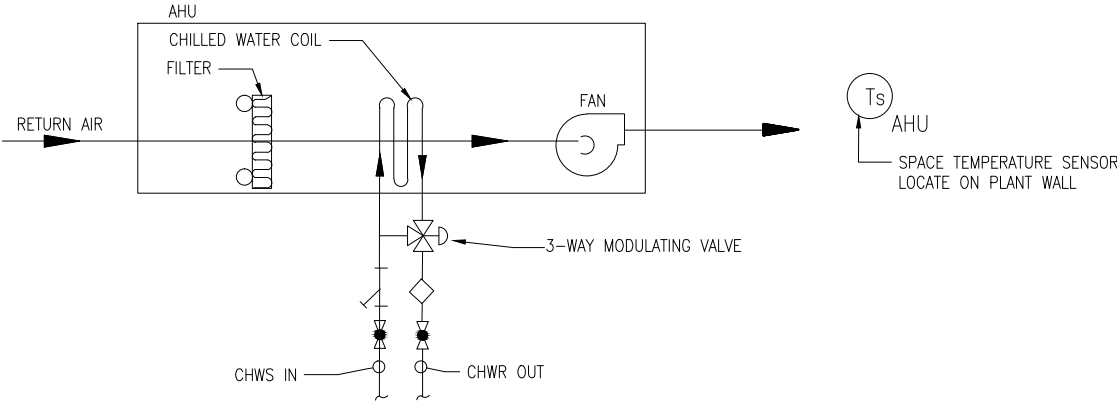
CHILLER EMERGENCY SHUTDOWN:

A KEY SWITCH LOCATED OUTSIDE THE CHILLER PLANT ROOM SHALL SHUT DOWN THE CHILLER WHEN REQUIRE. ANOTHER KEY SWITCH SHALL MANUALLY START THE EXHAUST FAN IN ORDER TO VENTILATE THE CHILLER ROOM IN CASE OF REFRIGERANT GAS LEAK IS DETECTED.

SEE CONTRACT DRAWINGS M-609 & 610 FOR MONITORING AND CONTROL POINTS OF THE CHILLER PLANT.

DETAILED DATA POINT INFORMATION

LISTED DATA POINTS SHALL BE MONITORED AND CONTROLLED VIA LOCAL CONTROL PANEL AND THROUGH REMOTE COMMUNICATIONS. CONTRACTOR SHALL PROVIDE AND INSTALL SENSORS FOR CHILLER VOLTAGE, CURRENT, AND POWER ON EACH CHILLER AND INTERFACE THEM WITH THE MICROTECH II CONTROLLER, USING SENSORS RECOMMENDED BY MCQUAY



AIR HANDLING UNIT

SEQUENCE OF OPERATIONS:

WHEN TEMPERATURE AT SPACE TEMPERATURE SENSOR Ts RISES ABOVE 80°F, THE AIR HANDLING UNIT FAN SHALL START BY NEW DDC SYSTEM/ PANEL UNDER THIS CONTRACT. THE THREE WAY MODULATING VALVE SHALL OPERATE TO MAINTAIN THE SPACE TEMPERATURE AT 85°F. IF THE SPACE TEMPERATURE FALLS BELOW 80°F, THE AIR HANDLING UNIT SHALL STOP. PROVIDE MONITORING OF AIR HANDLING UNIT STATUS AT THE CHILLER PLANT MONITORING PANEL, VIA MODBUS.

CONTRACT NO.  
FQ 14005D-13-03

<div>DESIGNED J. RELUNIA 02/14 DATE 02/14</div> <div>DRAWN J. RELUNIA 02/14 DATE 02/14</div> <div>CHECKED C. ROSS 02/14 DATE 02/14</div> <div>APPROVED C. ROSS 02/14 DATE 02/14</div>	REFERENCE DRAWINGS		REVISIONS			WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		METRO CENTER, POTOMAC AVE, & CRYSTAL CITY CHILLER REPLACEMENTS CRYSTAL CITY CHILLER PLANT EQUIPMENT SEQUENCE OF OPERATIONS		
	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION	DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM				
						<div>A Gannett Fleming/Parsons JOINT VENTURE</div> <div>SUBMITTED _____ PROJECT MANAGER</div>				
						APPROVED _____		SCALE NONE	DRAWING NO. M-607	M-0000-030

GENERAL FOR POTOMAC AVE CHILLER PLANT

THE CHILLER PLANT CONSISTS OF TWO CHILLERS WITH VARIABLE CAPACDITY COMPRESSORS, TWO COOLING TOWERS WITH VARIABLE SPEED FANS, TWO CHILLED WATER PUMPS AND THREE CONDENSER WATER PUMPS (ONE PUMP SHALL BE STAND-BY); ONE EXHAUST FAN IN RESPONSE TO THE REFRIGERANT GAS DETECTION.

THE CHILLER PLANT IS DESIGNED FOR CONSTANT FLOW (GPM) FOR CHILLED WATER AND CONDENSER WATER. THE TWO CHILLERS ARE PIPED FOR SERIES OPERATION BY VALVES. THE VALVES CAN BE RE-ARRANGED FOR CHILLERS OPERATING IN PARALLEL.

THE CHILLER PLANT OPERATION IS PROGRAMMABLE FOR SERIES CHILLERS ARRANGEMENT.

DURING COOLING SEASON; THE CHILLERS OPERATE CONTINUOUSLY FOR DAY AND NIGHT TIME.

THE CHILLED WATER SUPPLY TEMPERATURE SET POINT (42 OF) IS SET TO THE CHILLER PLANT DESIGN TEMPERATURE AND THE SETPOINT TEMPERATURE CAN BE MANUALLY RESET BY THE OPERATOR. IT ENTERING CONDENSER WATER TEMPERATURE SHALL BE 85°F.

THE CHILLED WATER SYSTEM ENABLE POINT IS CONTROLLED EITHER MANUALLY BY THE OPERATOR OR PROGRAMMABLE. IF THE CHILLED WATER SYSTEM ENABLE POINT IS ON AND THERE IS A CALL FOR COOLING (I.E. THE CHILLED WATER RETURN TEMPERATURE EXCEEDS 45°F):

1) CHILLED WATER PUMP (P-1 OR P-2) AND CONDENSER WATER PUMP (P-3 ,P-4 OR P-5) WHICH ARE MANUALLY SELECTED BY THE PLANT OPERATOR, SHALL START, PUMPS SHALL OPERATE FOR CONSTANT WATER FLOW. THE ASSOCIATED VARIABLE SPEED DRIVES SHALL BE UTILIZED TO ADJUST PUMP SPEED FOR DESIGN FLOW RATE AND SET.

2) CHILLERS #1 & 2 SATRT OR STOP POINT TURNS ON.

3) AFTER CHILLED WATER AND CONDENSER WATER FLOW ARE PROVEN BY THE FLOW SWITCHES, CHILLERS #1 & 2 WHICH ARE PIPED FOR SERIES OPERATION, RUN UNDER THEIR OPERATING AND SAFETY CONTROLS. CHILLERS' INTEGRATED VARIABLE SPEED DRIVE SHALL ADJUST THEIR CAPAITY IN ORDER TO MAINTAIN THE CHILLER PLANT SUPPLY TEMPERATURE SET POINT. (I.E. COOLING LOAD SHALL BE EQUALLY SPLIT BETWEEN TWO CHILLERS).

4) THE CHILLERS STOP SEQUENCE FIRSTLY STOPS THE CHILLERS. AFTER A TIME DELAY (ADJUSTABLE), THE CONDENSER WATER PUMPS AND THE CHILLED WATER PUMPS SHALL STOP.

COOLING TOWERS IS ENABLED WHEN CONDENSER WATER PUMP IS OPERATING. WHEN THE CONDENSER WATER SUPPLY TEMPERATURE INCREASES FROM THE SET POINT (85 OF, ADJUSTABLE); THE RESPECTIVELY COOLING TOWER FAN SHALL START AT LOW SPEED. INCREASE AND DECREASE FAN SPEED IN ORDER TO MAINTAIN THE CONDENSER WATER SUPPLY TEMPERATURE SET POINT.

CONFIRM THE PUMPS DESIRED STATE (I.E. ON OR OFF) FROM THEIR VARIABLE SPEED DRIVES. GENERATE AN ALARM IF STATUS DEVIATES FROM START OR STOP CONTROL.

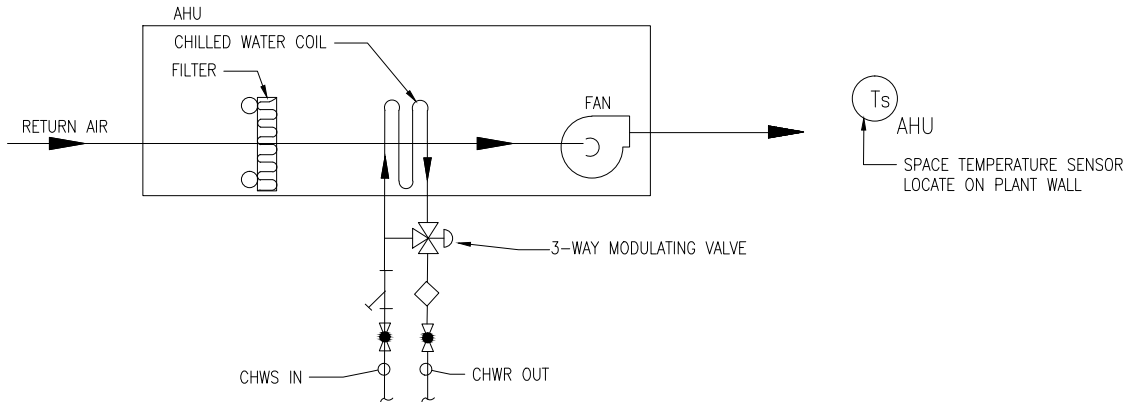
CHILLER EMRGENCY SHUTDOWN:

A KEY SWITCH LOCATED OUTSIDE THE CHILLER PLANT ROOM SHALL SHUT DOWN THE CHILLER WHEN REQUIRE. ANOTHER KEY SWITCH SHALL MANUALLY START THE EXHAUST FAN IN ORDER TO VENTILATE THE CHILLER ROOM IN CASE THE GAS LEAK MONITOR HAS NOT OPERATED THE FAN.

SEE DWG #M-609 TO M-610 FOR MONITORING AND CONTROL POINTS OF THE CHILLER PLANT.

DETAILED DATA POINT INFORMATION

LISTED DATA POINTS SHALL BE MONITORED AND CONTROLLED VIA LOCAL CONTROL PANEL AND THROUGH REMOTE COMMUNICATIONS. CONTRACTOR SHALL PROVIDE AND INSTALL SENSORS FOR CHILLER VOLTAGE, CURRENT, AND POWER ON EACH CHILLER AND INTERFACE THEM WITH THE MICROTECH II CONTROLLER, USING SENSORS RECOMMENDED BY MCQUAY




AIR HANDLING UNIT

SEQUENCE OF OPERATIONS:

WHEN TEMPERATURE AT SPACE TEMPERATURE SENSOR Ts RISES ABOVE 80°F, THE AIR HANDLING UNIT FAN SHALL START BY NEW DDC SYSTEM/ PANEL UNDER THIS CONTRACT. THE THREE WAY MODULATING VALVE SHALL OPERATE TO MAINTAIN THE SPACE TEMPERATURE AT 85°F. IF THE SPACE TEMPERATURE FALLS BELOW 80°F, THE AIR HANDLING UNIT SHALL STOP. PROVIDE MONITORING OF AIR HANDLING UNIT STATUS AT THE CHILLER PLANT MONITORING PANEL, VIA MODBUS.

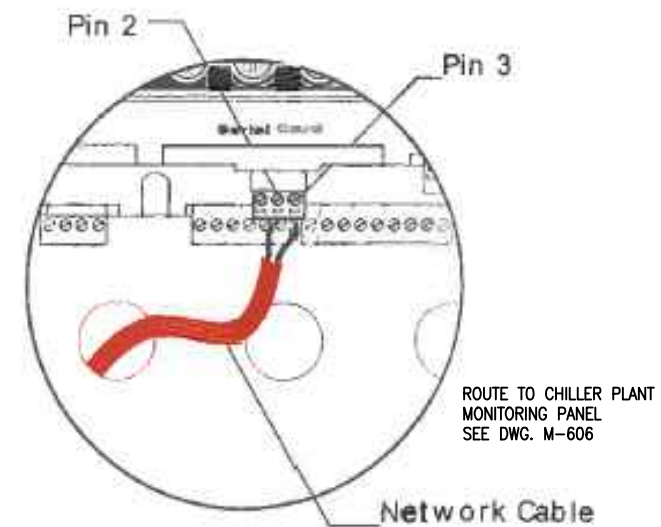
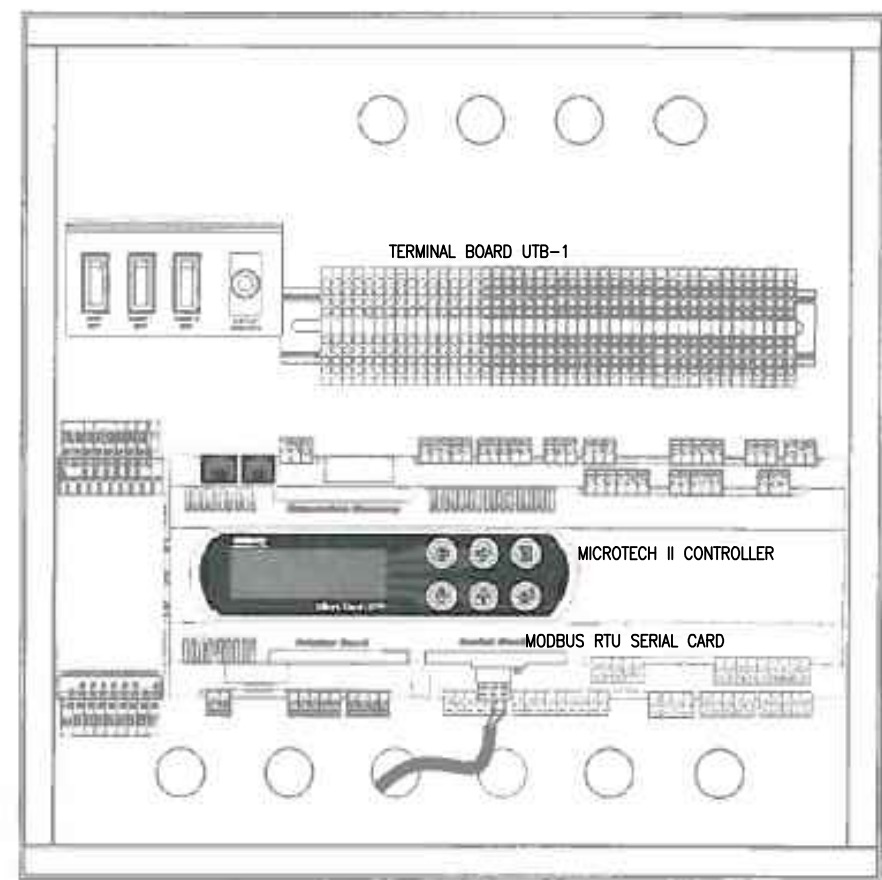
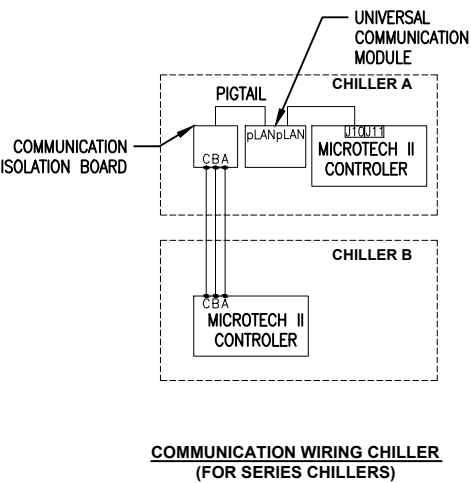
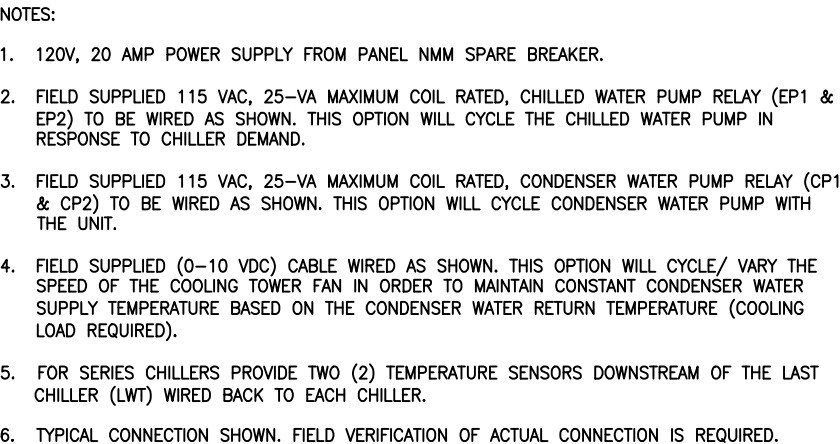
CONTRACT NO.  
FQ 14005D-13-03

DESIGNED J. RELUNIA DATE 02/14 DRAWN J. RELUNIA DATE 02/14 CHECKED C. ROSS DATE 02/14 APPROVED C. ROSS DATE 02/14	REFERENCE DRAWINGS		REVISIONS			WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY  DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM  APPROVED _____  SUBMITTED _____ PROJECT MANAGER	 A Gannett Fleming/Parsons JOINT VENTURE	METRO CENTER, POTOMAC AVE, & CRYSTAL CITY CHILLER REPLACEMENTS POTOMAC AVENUE CHILLER PLANT EQUIPMENT SEQUENCE OF OPERATIONS		
	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION			SCALE NONE	DRAWING NO. M-608	M-0000-031









			REFERENCE DRAWINGS		REVISIONS		
DESIGNED	<u>J. RELUNIA</u>	<u>02/14</u>	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION
		DATE					
DRAWN	<u>J. RELUNIA</u>	<u>02/14</u>					
		DATE					
CHECKED	<u>C. ROSS</u>	<u>02/14</u>					
		DATE					
APPROVED	<u>C. ROSS</u>	<u>02/14</u>					
		DATE					

APPROVED \_\_\_\_\_

SUBMITTED \_\_\_\_\_  
PROJECT MANAGER

SCALE  
NONE

DRAWING NO.  
**M-611**

**M-0000-034**

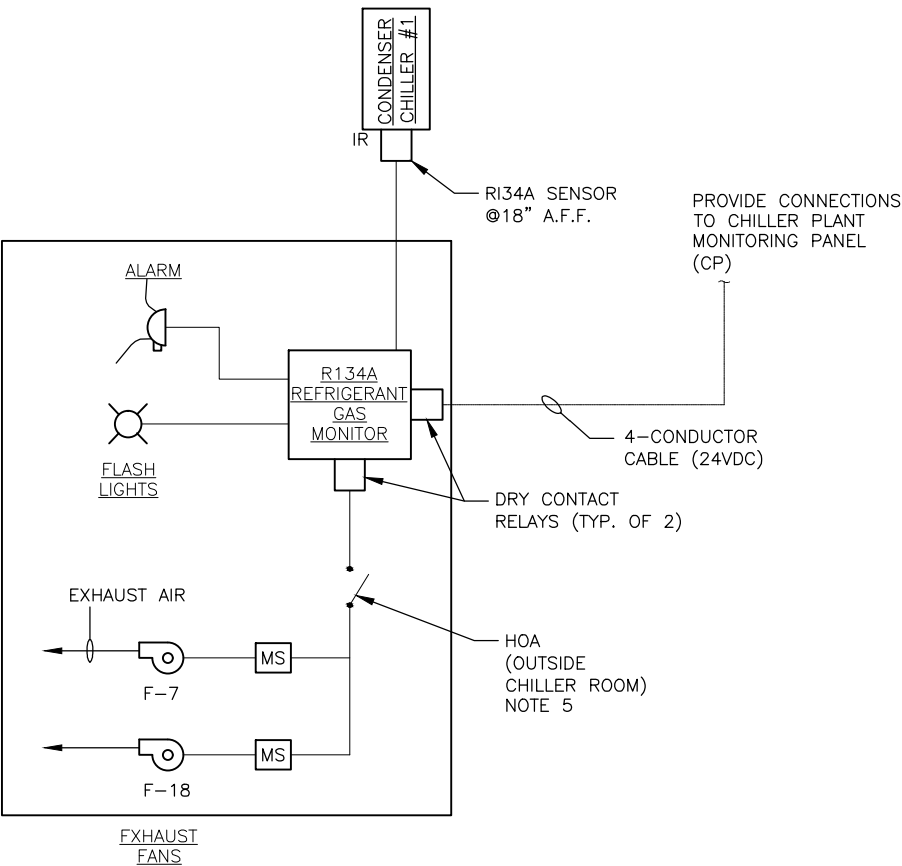
CONTRACT NO.  
FQ 14005D-13-03



MECHANICAL VENTILATION AND REFRIGERANT  
GAS LEAK DETECTION SYTEM

SEQUENCE OF OPERATIONS: CRYSTAL CITY

1. REFRIGERANT SENSOR (IR UNDER THE CHILLER MONITORS FOR REFRIGERANT GAS LEAK (R-134A LEVELS).
2. WHEN REFRIGERANT (250 PPM) 1ST ALARM LEVEL (LOW) IS DETECTED, REFRIGERANT MONITOR, SHERLOCK 402 WILL TRANSMIT ALARM TO THE "CHILLER PLANT MONITORING PANEL" VIA ITS DRY CONTACTS AND RELAYS.
3. AT THE SAME TIME, ITS PAIRED RELAY AND DRY CONTACT WILL ACTIVATE EXHAUST FAN, F-7.
4. ACTIVATE THE WARNING STROBE LIGHT (AMBER).
5. WHEN REFRIGERANT (500 PPM) 2ND ALARM LEVEL (HIGH) IS REACHED, THE REFRIGERANT MONITOR WILL TRANSMIT ALARM TO THE "CHILLER MONITORING PANEL" AGAIN, VIA ITS DRY CONTACTS AND RELAYS.
6. AT THE SAME TIME, ITS PAIRED RELAY AND DRY CONTACT WILL ACTIVATE EXHAUST FANS, F-7 & F-18.
7. THE WARNING STROBE LIGHT CONTINUE TO OPERATE.
8. ACTIVATE THE AUDIBLE HORN.
9. ALARM STATUS IS CONTINUOUSLY COMMUNICATED THROUGH THE REMOTE COMMUNICATION SOFTWARE.



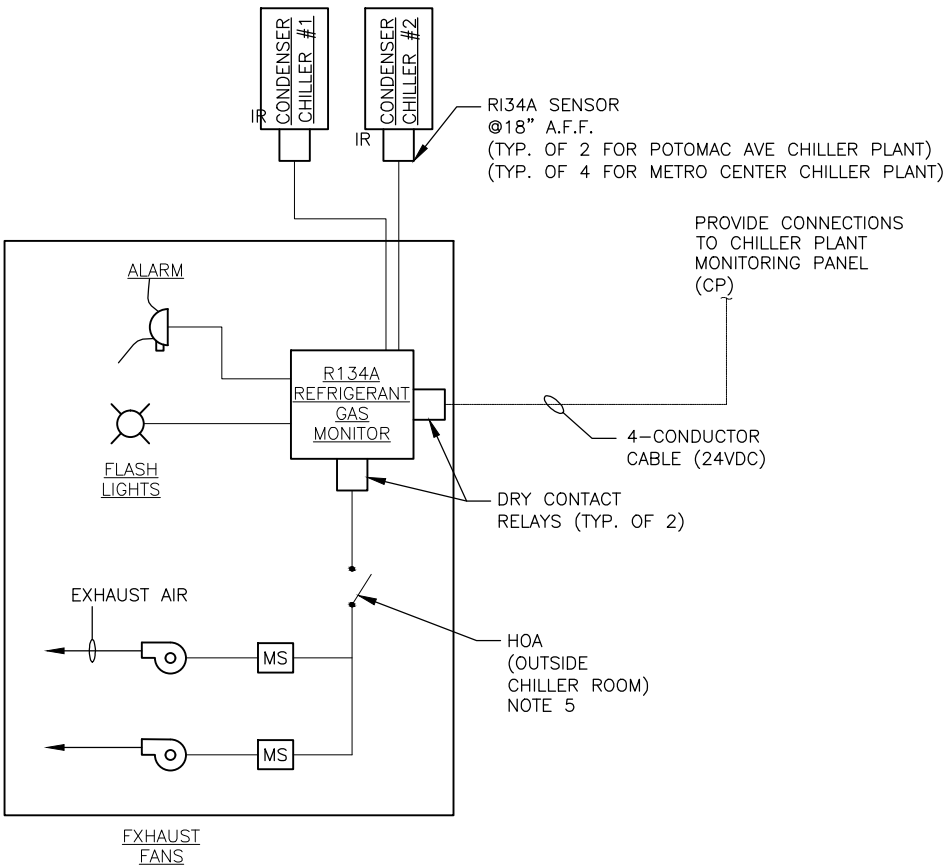
CHILLER ROOM VENTILATION  
CRYSTAL CITY

SEQUENCE OF OPERATIONS: METRO CENTER

1. REFRIGERANT SENSOR (IR) MONITORS THE CHILLER REFRIGERANT LEAK (R-134A LEVELS).
2. WHEN, EITHER REFRIGERANT LEAK AT 250 PPM, 1ST ALARM (LOW) LEVEL OR REFRIGERANT LEAK AT 500 PPM, 2ND ALARM (HIGH) LEVEL IS DETECTED; REFRIGERANT MONITOR, SHERLOCK 402 SHALL TRANSMIT ALARM TO THE 'CHILLER PLANT MONITORING PANEL' VIA ITS DRY CONTACTS AND RELAYS.
3. ACTIVATE THE WARNING STROBE LIGHT (AMBER) AT THE 1ST ALARM (LOW) LEVEL.
4. THE WARNING STROBE LIGHT CONTINUE TO OPERATE AT THE 2ND ALARM (HIGH) LEVEL AND ACTIVE THE AUDIBLE HORN.
5. ALARM STATUS IS CONTINUOUSLY COMMUNICATED THROUGH THE REMOTE COMMUNICATION SOFTWARE.
6. EXHAUST FANS, EF-1 & 2 SHALL MANUALLY START/ STOP WITH THE KEY SWITCH WHICH IS LOCATED OUTSIDE THE CHILLER PLANT ROOM.
7. PROVIDE A LOCAL ON/OFF SWITCH INSIDIE THE CHILLER PLANT ROOM FOR FAN TEST AND INCIDENTAL FAN OPERATION. THE LOCAL ON/OFF SWITCH SHALL INTEGRATE WITH 1-HOUR TIMER (ADJUSTABLE).
8. PROVIDE A SIGNAGE "IF THE AMBER COLOR STROBE LIGHT (REFRIGERANT LEAK) IS INITIATED, CONFIRM THAT PARKING GARAGE EXHAUST FANS ARE OPERATING. TURN ON THE CHILLER PLANT EXHAUST FANS BY THE KEY SWITCH (HERE). LEAVE THIS AREA IMMEDIATELY AND FOR A DURING OF 15-MINUTES."

SEQUENCE OF OPERATIONS: POTOMAC AVE

1. REFRIGERANT SENSOR (IR UNDER THE CHILLER MONITORS FOR REFRIGERANT GAS LEAK (R-134A LEVELS).
2. WHEN REFRIGERANT (250 PPM) 1ST ALARM LEVEL (LOW) IS DETECTED, REFRIGERANT MONITOR, SHERLOCK 402 WILL TRANSMIT ALARM TO THE "CHILLER PLANT MONITORING PANEL" VIA ITS DRY CONTACTS AND RELAYS.
3. AT THE SAME TIME, ITS PAIRED RELAY AND DRY CONTACT WILL ACTIVATE EXHAUST FAN, EF-1 AT LOWW SPEED.
4. ACTIVATE THE WARNING STROBE LIGHT (AMBER).
5. WHEN REFRIGERANT (500 PPM) 2ND ALARM LEVEL (HIGH) IS REACHED, THE REFRIGERANT MONITOR WILL TRANSMIT ALARM TO THE "CHILLER MONITORING PANEL" AGAIN, VIA ITS DRY CONTACTS AND RELAYS.
6. AT THE SAME TIME, ITS PAIRED RELAY AND DRY CONTACT WILL ACTIVATE EXHAUST FAN, EF-1 AT HIGH SPEED.
7. THE WARNING STROBE LIGHT CONTINUE TO OPERATE.
8. ACTIVATE THE AUDIBLE HORN.
9. ALARM STATUS IS CONTINUOUSLY COMMUNICATED THROUGH THE REMOTE COMMUNICATION SOFTWARE.



CHILLER ROOM VENTILATION  
METRO CENTER (2 - EXHAUST FANS)  
POTOMAC AVE (1 - EXHAUST FAN)

NOTES:

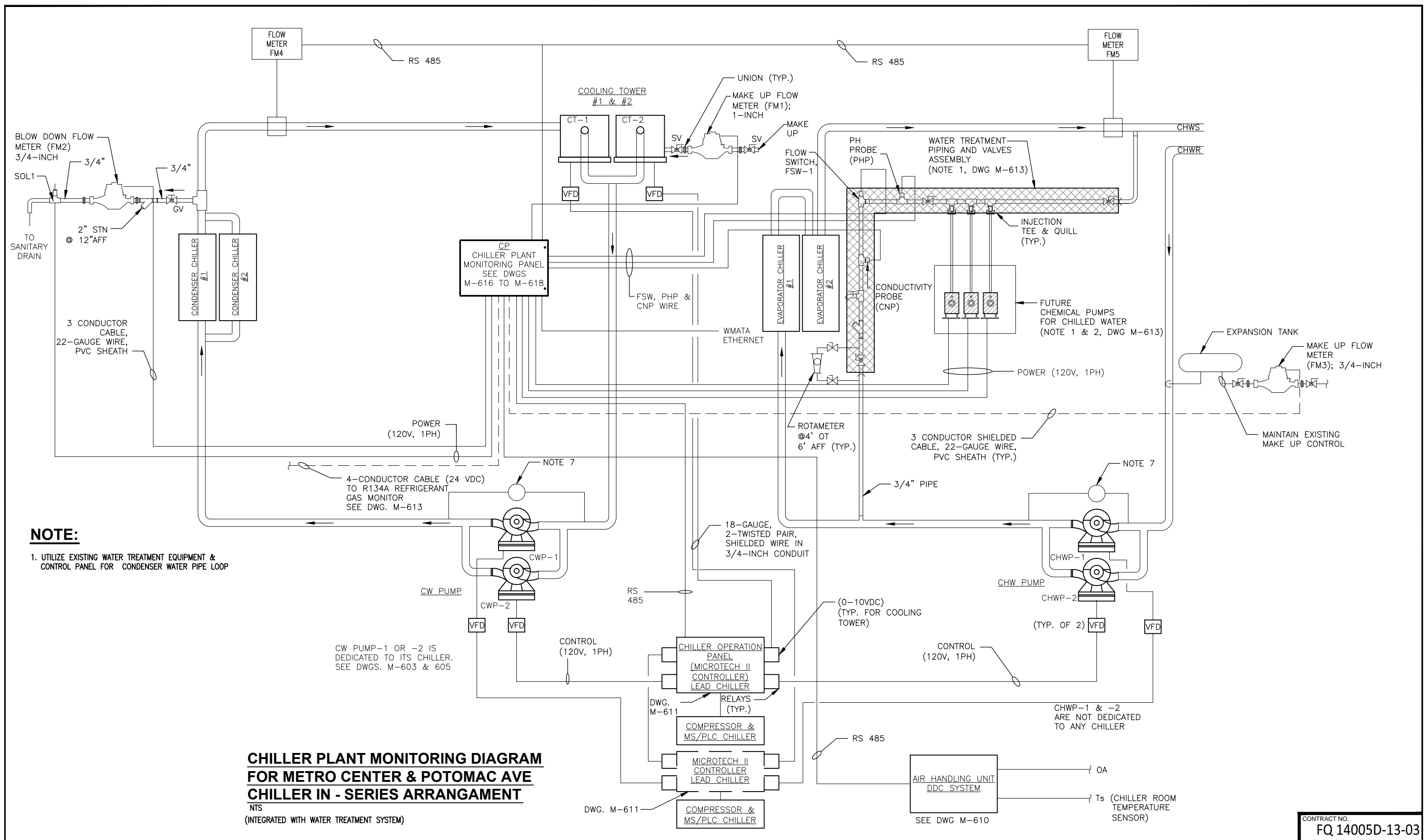
1. CONDENSER & CHILLED WATER LOOPS; PROVIDE POWER (RECEPTACLES & DISCONNECTS), ON/OFF/AUTO & STATUS LIGHTS FOR CHEMICAL PUMPS ON WALL MOUNTED SUPPORT/ STAND. PROVIDE SHOP FABRICATED WATER TREATMENT PIPING AND VALVE ASSEMBLY WITH SUPPORT PLATE. MAINTAIN HEIGHT OF METERS, AND EQUIPMENT AT EYE LEVEL.DWG M-614 & M-615 INDICATE PIPING ARRANGEMENT FOR (1) AND (2) CHILLERS FOR EACH CHILLER PLANT. FOR POTOMAC AVE PROVIDE (2) SETS CONDENSER WATER TREATMENT ASSEMBLY SINCE CHILLERS IN POTOMAC AVE ARE SEPARATELY PIPED TO ITS COOLING TOWER.
2. CHEMICAL PUMPS FOR CHILLED WATER LOOP AND CONDENSER WATER LOOP ARE NOT IN CONTRACT (NIC).
3. CHILLER (OPERATION PANEL MICROTECH II) SEE DWG. M-611 & 612.
4. CHILLER PLANT MONITORING PANEL, SEE DWGS. M-613 TO M-615
5. PROVIDE HOA SWITCH AND MODIFY EXISTING SWITCH OUTSIDE CHILLER ROOM, AS DIRECTED BY AR.
6. TOWER LEVEL CONTROL AND SOLENOID VALVE ARE INTEGRAL PARTS OF THE EXISTING COOLING TOWER.
7. CHEMICAL FEEDER POTS, SEE DWG M-621.

LEGEND:

- GLOBE VALVE (GV)
- BALL VALVE (¼ TURN)  
SHUT OFF TYPE (SV), NORMALLY OPEN,  
UNLESS OTHERWISE NOTED
- STRAINER (STN)
- SAMPLE PET COCK (SPC)
- SOLENOID VALVE (SOL)
- IR REFRIGERANT GAS LEAK SENSOR
- MS MOTOR STARTER (FOR FANS)
- VFD VARIABLE FREQUENCY DRIVE CONTROLLER
- FSW FLOW SWITCH
- CHEMICAL PUMPS
- FLOW METER (FM 1 TO 3)  
PULSE OUTPUT
- ROTAMETER
- FLOW METER (FM 4 & 5)  
ULTRASONIC FLOW METER

CONTRACT NO.  
FQ 14005D-13-03

<div>DESIGNED J. RELUNIA 02/14 DATE</div> <div>DRAWN J. RELUNIA 02/14 DATE</div> <div>CHECKED C. ROSS 02/14 DATE</div> <div>APPROVED C. ROSS 02/14 DATE</div>	REFERENCE DRAWINGS		REVISIONS			WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		<div>METRO CENTER, POTOMAC AVE, &amp; CRYSTAL CITY CHILLER REPLACEMENTS CHILLER PLANT MONITORING DIAGRAM SHEET 1 OF 3</div>		
	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION	DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM				
						APPROVED _____				
						SUBMITTED _____		SCALE NONE	DRAWING NO. M-613	M-0000-036
						PROJECT MANAGER				

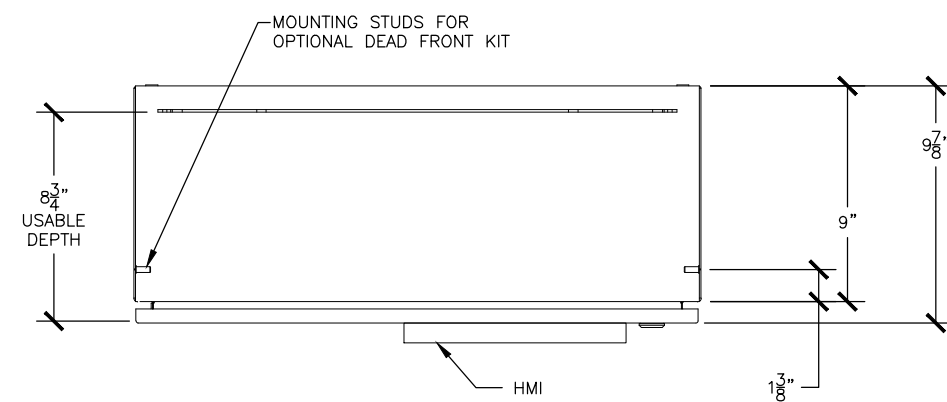


DESIGNED J. RELUNIA 02/14 DATE 02/14		REFERENCE DRAWINGS		REVISIONS		WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		METRO CENTER, POTOMAC AVE, & CRYSTAL CITY CHILLER REPLACEMENTS	
DRAWN J. RELUNIA 02/14 DATE 02/14		NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION	DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM	CHILLER PLANT MONITORING DIAGRAM	
CHECKED C. ROSS 02/14 DATE 02/14								SHEET 2 OF 3	
APPROVED C. ROSS 02/14 DATE 02/14							APPROVED _____	SCALE NONE	DRAWING NO. M-614
							SUBMITTED _____ PROJECT MANAGER		M-0000-037

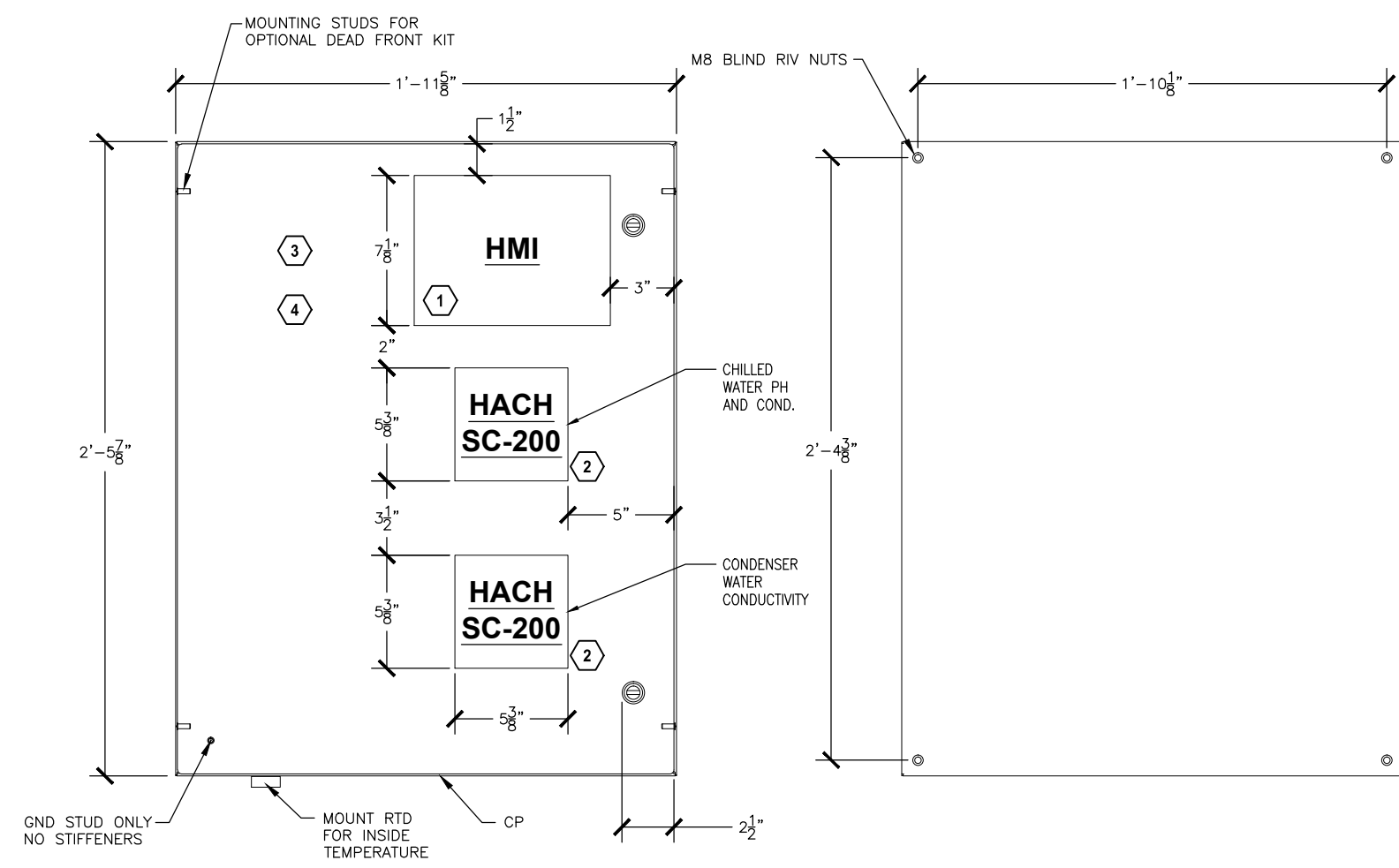




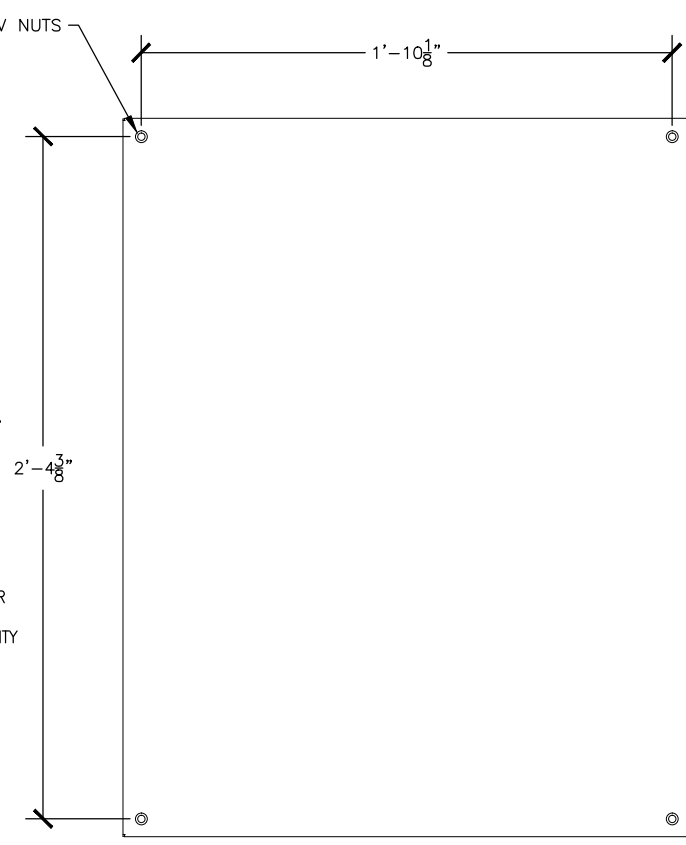




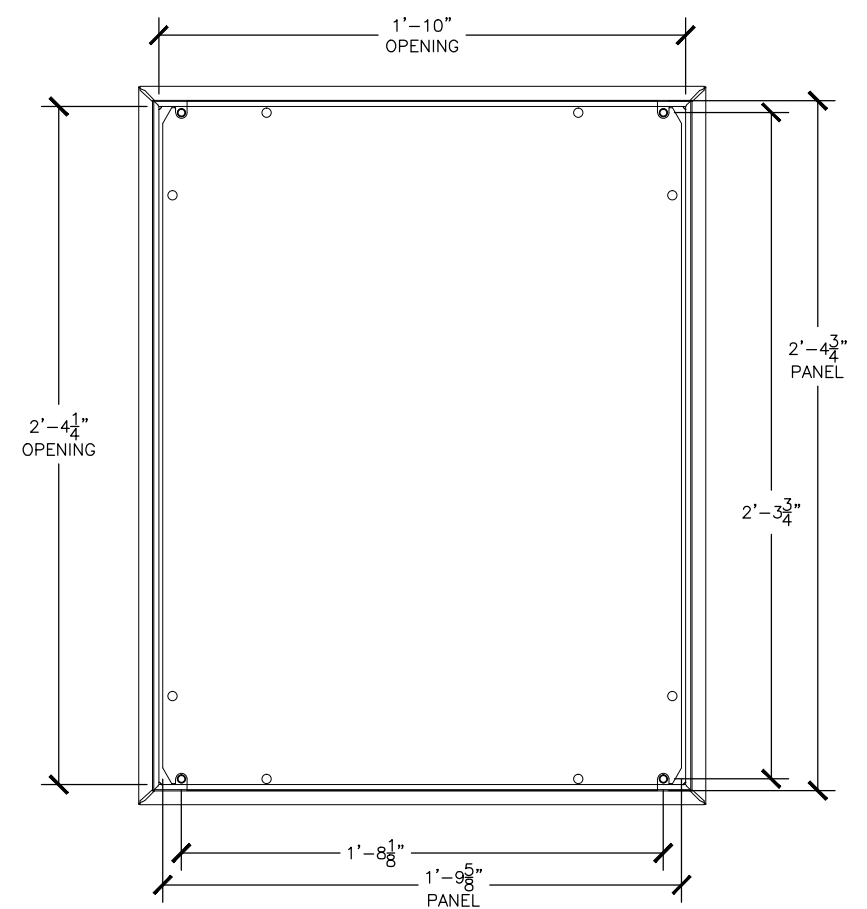
**TOP VIEW**



**FRONT VIEW**



**REAR VIEW**



**OPEN VIEW**


(SEE DWG. M-618)

**NOTES:**

- 1 HMI: HUMAN MACHINE INTERFACE PANEL
- 2 CONDUCTIVITY CONTROLLERS, HACH SC-200 WITH RS485.
- 3 CP: EXTERNAL CABINET LABELING TO BE SCREWED AND GLUED IN PLACE ON WHITE BACKGROUND WITH BLACK ENGRAVED LETTERING. ALL EQUIPMENT AND INTERNAL COMPONENTS SHALL BE IDENTIFIED USING MACHINE PRINTED LABEL ON BACK PLATE, VISIBLE WITH COMPONENT IN PLACE, LETTER TO BE MINIMUM 1/4" TALL.
- 4 COORDINATE WITH AR, SUBMIT DWG PRIOR TO CUT-OUT PROCESS.

**CHILLER PLANT MONITORING PANEL (CP)**

CONTRACT NO.  
FQ 14005D-13-03

DESIGNED J. RELUNIA 02/14 DATE 02/14			REFERENCE DRAWINGS		REVISIONS			WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM		 A Gannett Fleming/Parsons JOINT VENTURE		METRO CENTER, POTOMAC AVE, & CRYSTAL CITY CHILLER REPLACEMENTS SECTIONS AND DETAILS OF CHILLER PLANT MONITORING PANEL SHEET 1 OF 3		
DRAWN J. RELUNIA 02/14 DATE 02/14					NUMBER	DESCRIPTION	DATE									
CHECKED C. ROSS 02/14 DATE 02/14														SCALE NONE		
APPROVED C. ROSS 02/14 DATE 02/14														DRAWING NO. M-616		
														M-0000-039		


CHILLER PLANT CONTROL PANEL EQUIPMENT AND ASSOCIATED FIELD EQUIPMENT					
EQUIPMENT DESIGNATION	DESCRIPTION	BRAND	PART NUMBER	QUANTITIES	DISTRIBUTOR
CP	CHILLER PLANT CONTROL PANEL (NEMA 4X ENCLOSURE)	HOFFMAN	A30H2410SSLP	1	GRAINGER ITEM #5AAF50
	ENCLOSURE PANEL INSERT	HOFFMAN	A30P24G	1	GRAINGER REXEL ITEM #7835102669
	18-8 SS ROUND HEAD PHILLIPS MACHINE SCREW 10/24X3/8		2BB49	AS NEEDED	GRAINGER
	½" CORD CONNECTOR STRAIGHT, BLACK, 25/BOX		2DPE4	AS NEEDED	GRAINGER
	LOCKNUT CONDUIT STEEL ½"		5XC30	AS NEEDED	GRAINGER
	DIN RAIL, 35MMX15MMX1MM, 10/PK	AUTOMATION DIRECT	DN-R35HS1	AS NEEDED	WWW.AUTOMATIONDIRECT.COM
	END BRACKET FOR 35MM RAIL	AUTOMATION DIRECT	DN-EB35	AS NEEDED	WWW.AUTOMATIONDIRECT.COM
	WMRE DUCT 1.5"X1.5" WHT, SLOTTED, 2MM, WITH COVER	AUTOMATION DIRECT	T1-1515W-1	AS NEEDED	WWW.AUTOMATIONDIRECT.COM
CB	CIRCUIT BREAKER, 1P,6A,CURVE DIN RAIL MOUNT	AUTOMATION DIRECT	WMZT1C06	1	WWW.AUTOMATIONDIRECT.COM
FTB	FUSE BLOCK 1.25X1.25 WLED 30A 6AWG 110V	AUTOMATION DIRECT	DN-F6L110	1	WWW.AUTOMATIONDIRECT.COM
	FUSE 2A 250VAC FAST ACTING GLASS	AUTOMATION DIRECT	AGC2	3	WWW.AUTOMATIONDIRECT.COM
TB5	TERMINAL BLOCK GRY, 30A 10AWG 600V	AUTOMATION DIRECT	DN-T10-A	1	WWW.AUTOMATIONDIRECT.COM
TB6	TERMINAL BLOCK BLU, 30A 10AWG 600V	AUTOMATION DIRECT	DN-T10B-A	1	WWW.AUTOMATIONDIRECT.COM
TB2	TERMINAL BLOCK BLK, 30A 10AWG 600V	AUTOMATION DIRECT	DN-T10BLK-A	1	WWW.AUTOMATIONDIRECT.COM
TB3 & 9	TERMINAL BLOCK GRN, 30A 10AWG 600V	AUTOMATION DIRECT	DN-T10GRN-A	2	WWW.AUTOMATIONDIRECT.COM
TB7	TERMINAL BLOCK ORG, 30A 10AWG 600V	AUTOMATION DIRECT	DN-T10ORG-A	1	WWW.AUTOMATIONDIRECT.COM
TB1	TERMINAL BLOCK RED, 30A 10AWG 600V	AUTOMATION DIRECT	DN-T10RED-A	1	WWW.AUTOMATIONDIRECT.COM
TB4	TERMINAL BLOCK WHT, 30A 10AWG 600V	AUTOMATION DIRECT	DN-T10W-A	1	WWW.AUTOMATIONDIRECT.COM
TB8	TERMINAL BLOCK YEL, 30A 10AWG 600V	AUTOMATION DIRECT	DN-T10YEL-A	1	WWW.AUTOMATIONDIRECT.COM
	END COVER FOR DN-T10-A	AUTOMATION DIRECT	DN-EC1210	AS NEEDED	WWW.AUTOMATIONDIRECT.COM
	JMPR 24-POLES EURO F4 YELLOW INSULATION	AUTOMATION DIRECT	DN-24J4Y	AS NEEDED	WWW.AUTOMATIONDIRECT.COM
	WMRE, 16GA, TFFN, BLK, SPOOL STRANDED	AUTOMATION DIRECT	TFFN16BK	AS NEEDED	WWW.AUTOMATIONDIRECT.COM
	WMRE, 16GA, TFFN, RED, SPOOL STRANDED	AUTOMATION DIRECT	TFFN16RD	AS NEEDED	WWW.AUTOMATIONDIRECT.COM
	WMRE, 16GA, TFFN, GRN, SPOOL STRANDED	AUTOMATION DIRECT	TFFN16GN	AS NEEDED	WWW.AUTOMATIONDIRECT.COM
	WMRE, 14GA, TFFN, BLK, SPOOL STRANDED	AUTOMATION DIRECT	TFFN14BK	AS NEEDED	WWW.AUTOMATIONDIRECT.COM
	WMRE, 14GA, TFFN, WHT, SPOOL STRANDED	AUTOMATION DIRECT	TFFN14WH	AS NEEDED	WWW.AUTOMATIONDIRECT.COM
	CABLE TIE MOUNT, 1"X1", NATURAL, NYLON, ADHESIVE	AUTOMATION DIRECT	BM-B0902	AS NEEDED	WWW.AUTOMATIONDIRECT.COM
	CABLE TIE, 18LB, 6" LONG, NATURAL, NYLON 6.6	AUTOMATION DIRECT	BM-B1625	AS NEEDED	WWW.AUTOMATIONDIRECT.COM
	15 PIN VGA CONNECTOR MALE			1	
PS	POWER SUPPLY (CONTROL PANEL)	SOLA	SDN 10-24-100C	1	GRAINGER
	PLC CONTROLLER PARTS				
I/O BASE	8-SLOT I/O BASE, PAC REQ P3-01AC OR P3-01DC	PRODUCTIVITY 3000	P3-088	1	WWW.AUTOMATIONDIRECT.COM
CPS	POWER SUPPLY FOR PLC CONTROLLER (24-28V DC)	PRODUCTIVITY 3000	P3-01DC	1	WWW.AUTOMATIONDIRECT.COM
CPU	PROCESSOR FOR CONTROLLER (266 MHZ) 50MB	PRODUCTIVITY 3000 PAC	P3-550	1	WWW.AUTOMATIONDIRECT.COM
8C0P	8-CH RELAY OUTPUT ISOLATED FOR CONTROLLER	PRODUCTIVITY 3000	P3-08TRS-1	1	WWW.AUTOMATIONDIRECT.COM
16CIP	16-PT INPUT SINK/SOURCE FOR CONTROLLER (12-24VDC)	PRODUCTIVITY 3000	P3-16ND3	1	WWW.AUTOMATIONDIRECT.COM
	TERMINAL BLOCK	PRODUCTIVITY 3000	P3-RTB	2	WWW.AUTOMATIONDIRECT.COM
	HUMAN MACHINE INTERFACE				
HMI	TOUCH PANEL	C-MORE	EA7-T8C-11Y	1	WWW.AUTOMATIONDIRECT.COM
8 RTD	8 - CHANNEL RTD INPUT MODULE	PRODUCTIVITY 3000	P3-08 RTD	1	WWW.AUTOMATIONDIRECT.COM

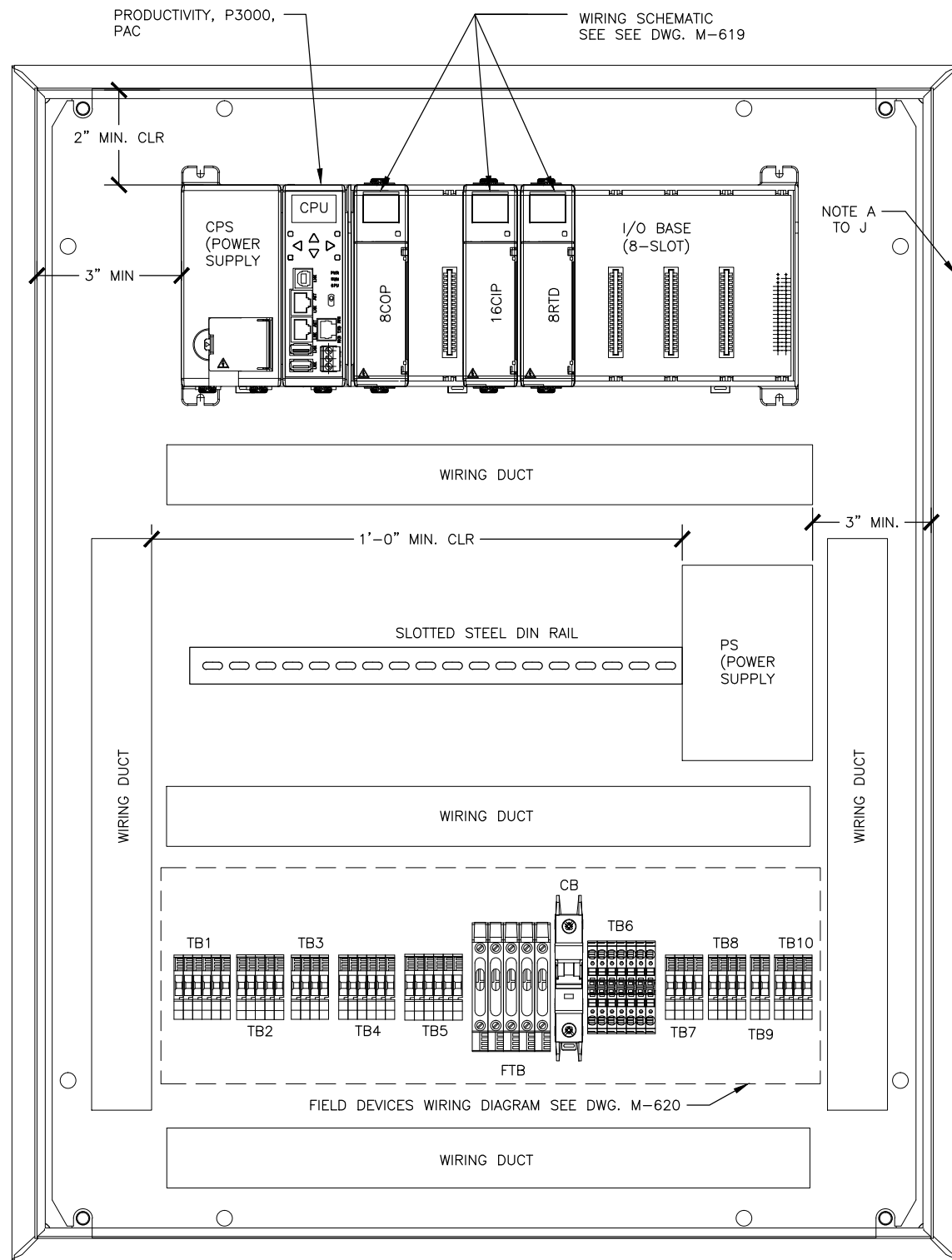
EQUIPMENT DESIGNATION	DESCRIPTION	BRAND	PART NUMBER	QUANTITIES	DISTRIBUTOR
	WATER TREATMENT				
HACH SC-200	PACKAGED CONDUCTIVITY CONTROLLER	HACH - SC200 (NOTE J)	LXV404.99.00522	2	WWW.HACH.COM
	MODBUS NETWORK MODULE FOR CONDUCTIVITY CONTROLLER	HACH	9013200	2	WWW.HACH.COM
CNP	CONDUCTIVITY SENSOR MODULE, DIGITAL CONDUCTIVITY SENSOR PH PROBE (CONVERTIBLE TYPE)	HACH (NOTE K)	901300 3725E2T 3725e2t + dpc	2	WWW.HACH.COM
PHP	PH PROBE, CONVERTIBLE TYPE	HACH, (NOTE L)	DPC1R2A	1	WWW.HACH.COM
FSW-1 & 2	FLOW SWITCH, SHUTTLE TYPE, SPST, NO, 3/4" FNPT, 20VA 120VAC/DC	GEMS SENSORS	F-500 0.25-GPM	2	GRAINGER
FM-1 TO 3	PULSE TYPE FLOW METER			3	
FM-4 & 5	ULTRASONIC FLOWMETER NEMA 4X, (WALL MOUNT)	SIEMENS SITRANS	FUS 1010	1	IVES
	REFRIGERANT GAS MONITORING AND ALARM SYSTEM (NEMA 4X)	SHERLOCK 402		1	GENESIS INTERNATIONAL INC
	INFRA-RED REF GAS SENSOR, IN NEMA 3R - ALUMINUM ENCLOSURE	SHERLOCK SIR	R134A – 60-0054	2	GENESIS INTERNATIONAL INC
	CHILLER OPERATING PANEL;	MICROTECH II & MODBUS MODULE			MCQUAY
	MCQUAY STANDARD CONTROL W/HMI PANEL FOR WMC CHILLER				
RTD 1 & 2	0-10K OHM RTD DEVICE (THERMISTOR)	GREY STONE	TE200 F14	2	GREY STONE ENERGY.COM

NOTE:

1. SEE DWG M-618 FOR NOTE J, K, AND L.

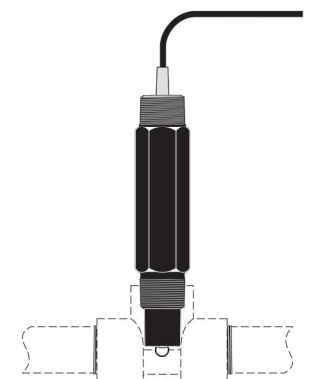
CONTRACT NO.  
FQ 14005D-13-03

DESIGNED <u>J. RELUNIA</u> 02/14 DATE 02/14 DRAWN <u>J. RELUNIA</u> 02/14 DATE 02/14 CHECKED <u>C. ROSS</u> 02/14 DATE 02/14 APPROVED <u>C. ROSS</u> 02/14 DATE 02/14	REFERENCE DRAWINGS		REVISIONS			WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM APPROVED _____	 A Gannett Fleming/Parsons JOINT VENTURE SUBMITTED _____ PROJECT MANAGER	METRO CENTER, POTOMAC AVE, & CRYSTAL CITY CHILLER REPLACEMENTS SECTIONS AND DETAILS OF CHILLER PLANT MONITORING PANEL SHEET 2 OF 3		
	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION					
SCALE NONE		DRAWING NO. M-617		M-0000-040						



**NOTES:**

- A. WIRING NOT SHOWN FOR CLARITY. SEE CONTROL WIRING SCHEMATICS DWG. M-619 & M-620.
- B. ALL WIRES TO BE IDENTIFIED WITH HEAT SHRINK MACHINE LABELED SLEEVES.
- C. CONTROL PANEL WIRE TO BE STRANDED WIRES, EITHER MTW(MACHINE TOOL WIRE) OR THHN (THERMOPLASTIC HIGH HEAT-RESITANT NYLON-COATED).
- D. ALL ANALOG WIRE SHALL BE SHIELDED TWISTED PAIR WITH SINGLE POINT GROUND.
- E. TERMINAL BLOCKS TO BE MOUNTED ON DIN RAILS, WHICH WILL BE MOUNTED TO THE PANEL WITH BRACKET SUPPORTS, ANGLED BRACKET SUPPORTS WILL BE USED FOR TERMINAL BLOCKS REQUIRING FIELD WIRING, 10% SPARE TERMINAL BLOCKS TO BE INSTALLED.
- F. TERMINAL STRIP TO HAVE GROUNDING LUG TO BACK PANEL.
- G. BACK PANEL TO BE GROUNDED TO ENCLOSURE.
- H. ALL CONNECTIONS TO THE PANEL BOARD WILL BE WITH FASTENERS AND THREADED HOLES, PANEL BOARD HOLES TO BE THREADED.
- I. ALL DIMENSIONS SHOWN ARE APPROXIMATE BASED ON ACTUAL LOCATION OF EQUIPMENT.
- J. PACKAGE CONDUCTIVITY SENSOR INPUT MODULE, HACH - SC 200, 2-CHANNEL, DIGITAL & CONDUCTIVITY.
- K. ANALOG CONDUCTIVITY SENSOR INPUT MODULE (1 FOR CHILLED WATER AND 1 FOR CONDENSER WATER LOOP. HACH 901300. DIGITAL, ELECTRODELESS CONDUCTIVITY SENSOR (1 FOR CHILLED WATER AND 1 FOR CONDENSER LOOP). HACH 3725E2T WITH UNION MOUNTING.
- L. PH PROBE, CONVERTIBLE TYPE, WITH DIGITAL GATEWAY, FOR CHILLED WATER LOOP; HACH DPC1R2A, WITH FLOW THROUGH MOUNTING.
- M. PROVIDE COMPACT SIZE POWER SUPPLY (PS).
- N. PROVIDE DOUBLE STACKED DIN RAIL TERMINAL BLOCK (TB1 - TB9) WITH 50 PERCENT SPARE.




**PH PROBE**

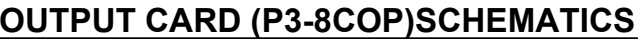
(FLOW-THROUGH MOUNTING)

**CHILLER PLANT MONITORING  
PANEL OPENING VIEW**

(CP, NEMA 4X ENCLOSURE)  
NOTE: SEE DWG. M-616 FOR EXTERNAL VIEWS

DESIGNED <u>J. RELUNIA</u> 02/14 DATE 02/14		DRAWN <u>J. RELUNIA</u> 02/14 DATE 02/14		CHECKED <u>C. ROSS</u> 02/14 DATE 02/14		APPROVED <u>C. ROSS</u> 02/14 DATE 02/14		REFERENCE DRAWINGS			REVISIONS			WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY				METRO CENTER, POTOMAC AVE, & CRYSTAL CITY CHILLER REPLACEMENTS			
								NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION	DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES		 A Gannett Fleming/Parsons JOINT VENTURE		SECTIONS AND DETAILS OF CHILLER PLANT		MONITORING PANEL SHEET 3 OF 3		
													OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM								
													APPROVED _____		SUBMITTED _____		SCALE NONE		DRAWING NO. M-618		
															PROJECT MANAGER				M-0000-041		



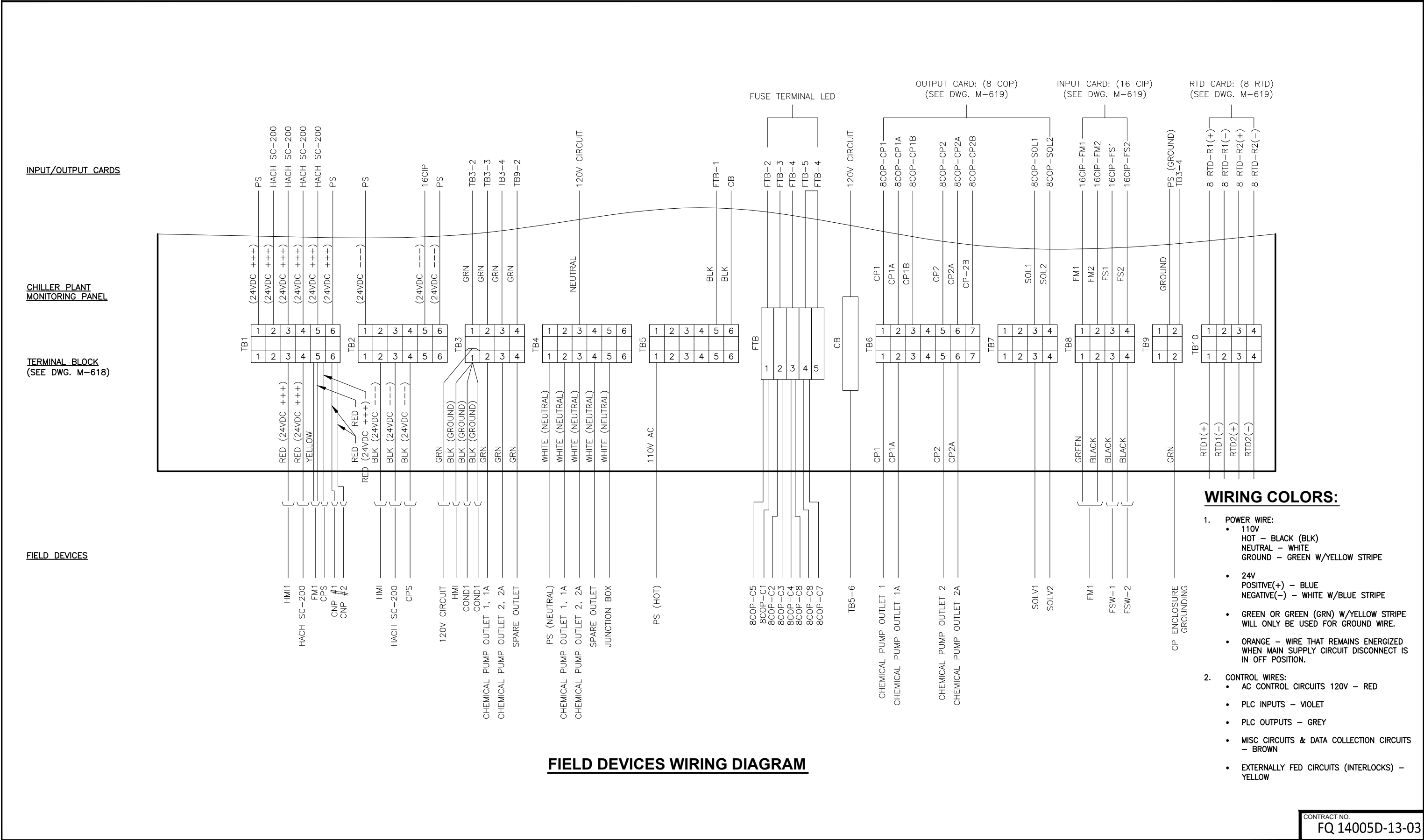


1. POWER WIRE:
  - 110V
    - HOT - BLACK
    - NEUTRAL - WHITE
    - GROUND - GREEN W/YELLOW STRIPE
  - 24V
    - POSITIVE(+) - BLUE
    - NEGATIVE(-) - WHITE W/BBLUE STRIPE
  - GREEN OR GREEN W/YELLOW STRIPE WILL ONLY BE USED FOR GROUND WIRE.
  - ORANGE - WIRE THAT REMAINS ENERGIZED WHEN MAIN SUPPLY CIRCUIT DISCONNECT IS IN OFF POSITION.
2. CONTROL WIRES:
  - AC CONTROL CIRCUITS 120V - RED
  - PLC INPUTS - VIOLET
  - PLC OUTPUTS - GREY
  - MISC CIRCUITS & DATA COLLECTION CIRCUITS - BROWN
  - EXTERNALLY FED CIRCUITS (INTERLOCKS) - YELLOW

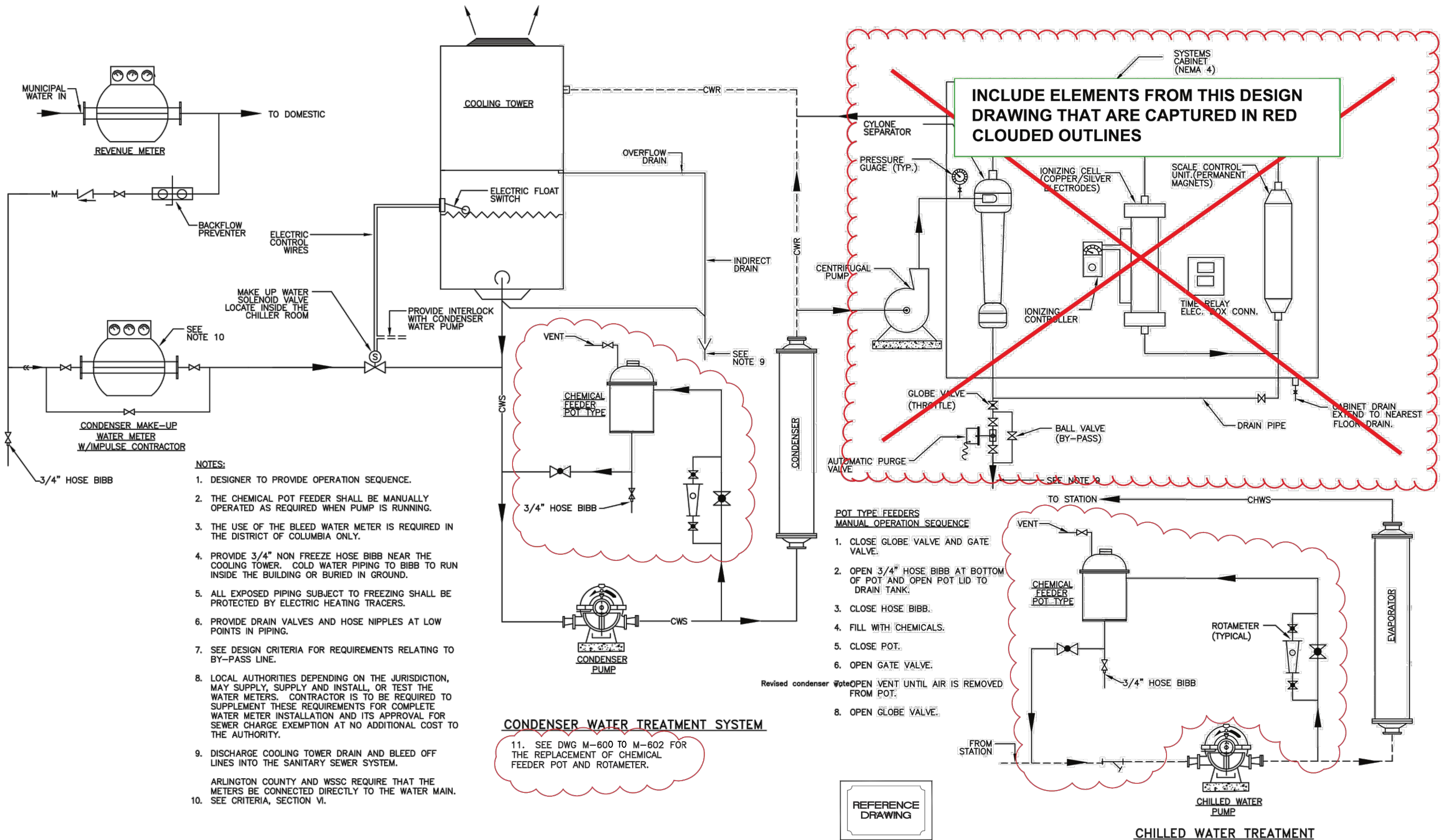
CONNECTOR PIN #	SIGNAL	SENSOR WIRE
1	SENSE	GREEN
2	SIGNAL GROUP/TEMP -	YELLOW
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	SHIELD	CLEAR
10	TEMP +	RED
11	DRIVE 1	WHITE
12	DRIVE 2	BLUE

INDUCTIVE CONDUCTIVITY SENSOR, ( NETWORK MODULE) WIRING TABLE, HACH 9013200				
CONNECTOR	CONNECTOR BLOCK PIN #	SIGNAL	DESCRIPTION	FUNCTION
J1	9	-	-	-
	8	-	-	-
	7	-	-	-
	6	GROUND OUT	SIGNAL COMMON (MULTI-DROP NETWORK)	RS485
	5	B (-) OUT	OUTPUT FROM THE MODULE (MULTI-DROP NETWORK)	RS485
	4	A (+) OUT	OUTPUT FROM THE MODULE (MULTI-DROP NETWORK)	RS485
	3	GROUND IN	SIGNAL COMMON	RS485
	2	B (-) IN	INPUT INTO THE MODULE	RS485
	1	B (-) IN	INPUT INTO THE MODULE	RS485

DESIGNED <u>J. RELUNIA</u> <u>02/14</u> DATE			REFERENCE DRAWINGS NUMBER DESCRIPTION		REVISIONS DATE BY DESCRIPTION			WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM		METRO CENTER, POTOMAC AVE, & CRYSTAL CITY CHILLER REPLACEMENTS INTERCONNECTION DIAGRAM OF WATER TREATMENT SYSTEM	
DRAWN <u>J. RELUNIA</u> <u>02/14</u> DATE								SUBMITTED _____ PROJECT MANAGER		SCALE NONE	
CHECKED <u>C. ROSS</u> <u>02/14</u> DATE										DRAWING NO. <b>M-619</b>	
APPROVED <u>C. ROSS</u> <u>02/14</u> DATE										<b>M-0000-042</b>	







DESIGNED	J. RELUNIA	02/14
DRAWN	J. RELUNIA	02/14
CHECKED	C. ROSS	02/14
APPROVED	C. ROSS	02/14

NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION

# WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT INFRASTRUCTURE  
AND ENGINEERING SERVICES  
OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM

APPROVED \_\_\_\_\_

**GFP** A Gannett Fleming/Parsons  
JOINT VENTURE

SUBMITTED \_\_\_\_\_  
PROJECT MANAGER

# METRO CENTER, POTOMAC AVE, & CRYSTAL CITY CHILLER REPLACEMENTS WATER TREATMENT CONDENSING AND CHILLED WATER SYSTEM

SCALE  
NONE

DRAWING NO.  
**M-621**















**M-0000-044**

CONTRACT NO.  
FQ 14005D-13-03

ABBREVIATIONS

AC	ALTERNATING CURRENT
AIC	AMPERE INTERRUPTING CAPACITY
A, AMP	AMPERE
AF	AMPERE FRAME
AFF	ABOVE FINISH FLOOR
AHU	AIR HANDLING UNIT
AR	AUTHORITY REPRESENTATIVE
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
BLDG	BUILDING
CB	CIRCUIT BREAKER
C, CND	CONDUIT
CTL	CONTROL
CT	CURRENT TRANSFORMERS
CHW	CHILLED WATER PUMP
CWP	CONDENSER WATER PUMP
DF	DEMAND FACTOR
DWG	DRAWING
ECB	ENCLOSED CIRCUIT BREAKER
EF	EXHAUST FAN
ELEC	ELECTRICAL
EM	EMERGENCY
ETR	EXISTING TO REMAIN
EXIST	EXISTING
FT	FEET/FOOT
FRE	FIBERGLASS REINFORCED EPOXY
FVNR	FULL VOLTAGE NON–REVERSING
FSS	FUSED SAFETY SWITCH
G, GND	GROUND GEN GENERATOR
GFP	GROUND FAULT PROTECTION
GRS	GALVANIZED RIGID STEEL
HP	HORSE POWER, HEAT PUMP
JB	JUNCTION BOX
KCMIL	THOUSAND CIRCULAR–MIL
KVA	KILO–VOLT AMPERE
LTG	LIGHTING
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MFR	MANUFACTURER MECH MECHANICAL
MH	MOUNTING HEIGHT, METAL HALIDE OR MAN HOLE
MLO	MAIN LUG ONLY
MTD	MOUNTED
MTR	MOTOR
MCB	MAIN CIRCUIT BREAKER
NEUT	NEUTRAL
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NFSS	NON–FUSED SAFETY SWITCH
#, NO.	NUMBER
P	POLE
PNL	PANEL
PT	POTENTIAL TRANSFORMER
PWR	POWER
RM	ROOM
TYP	TYPICAL
UF	UTILITY FAN
UL	UNDERWRITERS LABORATORIES
V	VOLT
W	WIRE
Ø,PH	PHASE

SYMBOLS LIST

	P10–1 OR P10–1,3 OR P10–1,3,5	NEW CONDUIT HOMERUN TO POWER SOURCE, LETTERS AND NUMERALS INDICATE PANEL AND CIRCUIT NUMBERS. INSTALL GROUND WIRE IN ALL CONDUITS. ONE NO. IS SINGLE PHASE CIRCUIT, TWO NO. IS SINGLE PHASE, TWO POLE CIRCUIT, THREE NO. IS THREE PHASE CIRCUIT.
		QUADRAPLEX RECEPTACLE
		DISCONNECT SWITCH RATING AS SHOWN OR REQUIRED MH +5'–0" AFF
		MOTOR STARTER
		COMBINATION STARTER/DISCONNECT SWITCH RATINGS AS SHOWN OR REQUIRED. MH +5'–0" AFF
		MOTOR CONNECTIONS
		PANELBOARD 208V (NEW OR EXIST. AS NOTED)
		PANELBOARD 480V (NEW OR EXIST. AS NOTED)
		TRANSFORMER
	OR 	JUNCTION BOX
		VARIABLE FREQUENCY DRIVE (VFD)
		KEYED NOTE FOR DEMOLITION PLAN
		KEYED NOTE FOR NEW WORK PLAN

GENERAL NOTES

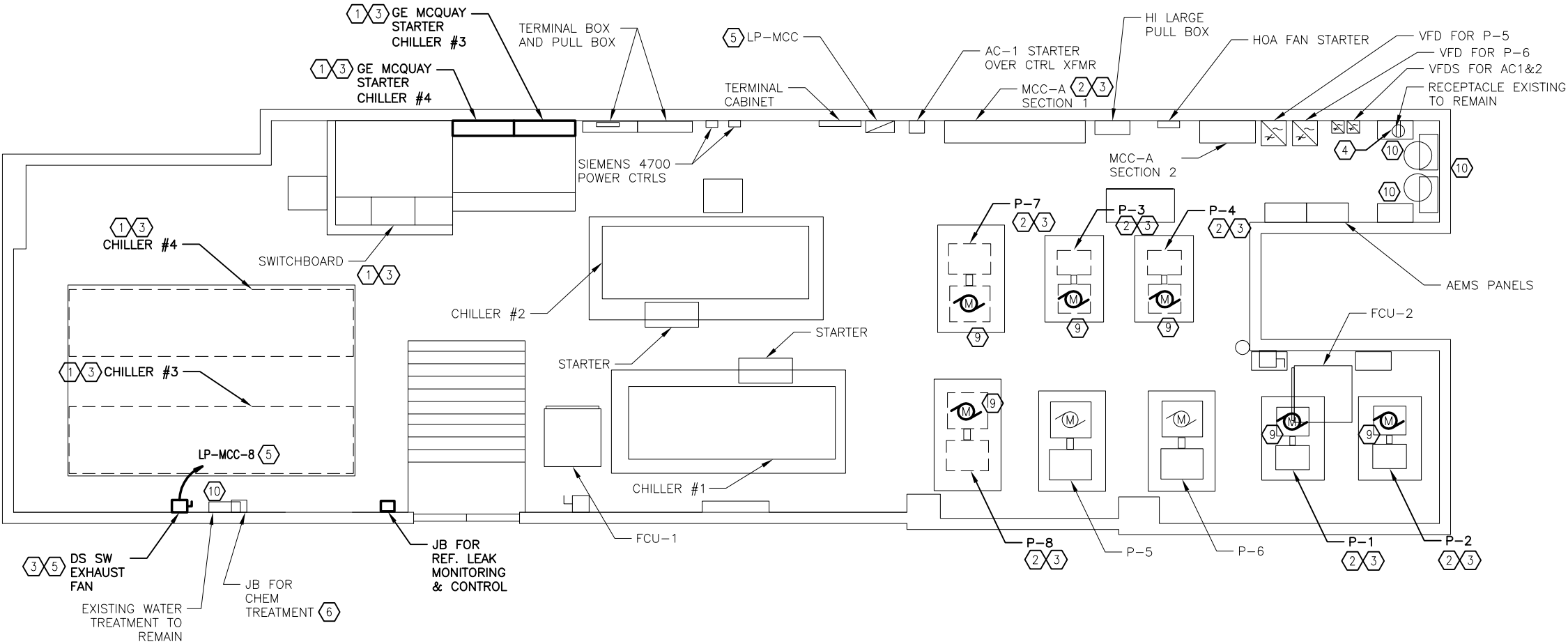
- REFER TO DRAWING NO. G–003 & G–004 FOR INDEX OF DRAWINGS.
- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD AND SHALL REPORT DISCREPANCIES, IF ANY, TO THE AUTHORITY REPRESENTATIVE (AR) FOR CLARIFICATION, PRIOR TO STARTING ANY WORK. THE DRAWINGS ARE INTENDED TO INDICATE THE EXTENT OF THE WORK DIAGRAMMATICALLY ONLY.
- THE CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE THEMSELVES WITH ALL VISIBLE EXISTING CONDITIONS, IN PARTICULAR ACCESSIBILITY INTO EACH OF THE EQUIPMENT ROOMS FOR THE REMOVAL AND DELIVERY OF EQUIPMENT.
- EXACT LOCATION OF ALL EQUIPMENT AND ACCESSORIES SHALL BE VERIFIED IN THE FIELD.
- IDENTIFY ALL ITEMS TO BE DEMOLISHED. DEMOLISHED ITEMS SHALL BE REMOVED AND PROPERLY DISPOSED OFF SITE. NO ITEMS SHALL BE CAP AND ABANDON ON SITE.
- ALL SURFACES DAMAGED IN THE COURSE OF THE WORK SHALL BE RESTORED TO THE ORIGINAL CONDITION TO THE COMPLETE SATISFACTION OF THE AR.
- ALL WORK SHALL BE COORDINATED WITH EXISTING SERVICES AND OTHER TRADES DURING INSTALLATION.
- ALL EXISTING LIGHTING FIXTURES THAT ARE IN THE WAY OF THE DEMO WORK SHALL BE REMOVED AND REINSTALLED AFTER NEW WORK IS DONE. THIS NOTE IS ALSO APPLICABLE TO OTHER EQUIPMENT THAT POSES AN OBSTRUCTION.
- SCALE ON THE DRAWINGS IS APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE FOR ALL FIELD MEASUREMENTS.
- THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING ELECTRICAL AND MECHANICAL WORK, PROVIDE CLEARANCE FOR MAINTENANCE BETWEEN EXISTING EQUIPMENT AND NEW WORK ALSO, COORDINATE WITH THE ELECTRICAL DRAWINGS.
- THE EQUIPMENT NAMES/NUMBERS FOR THIS DESIGN ARE THE SAME AS THE ORIGINAL EQUIPMENT NUMBERS. THIS IS DONE TO AVOID ANY CONFUSION FOR THE MAINTENANCE AND THE FILING SYSTEM, IN FUTURE.
- PERFORM WORK AND PROVIDE MATERIALS AND EQUIPMENT AS SHOWN ON DRAWINGS. COORDINATE ELECTRICAL WORK WITH WORK OF OTHER TRADES.
- MATERIAL AND EQUIPMENT SHALL BE NEW AND UL APPROVED AND SHALL MEET NEMA, ANSI, IEEE & NEC REQUIREMENTS FOR INTENDED SERVICE. MATERIAL AND INSTALLATION SHALL MEET REQUIREMENTS OF NATIONAL AND LOCAL ELECTRICAL CODES.
- MAINTAIN RECORD DRAWINGS ON SITE. RECORD SET MUST BE COMPLETE AND CURRENT AND AVAILABLE FOR INSPECTION WHEN REQUISITIONS FOR PAYMENT ARE SUBMITTED.
- GUARANTEE WORK IN WRITING FOR TWO YEAR FROM DATE OF FINAL ACCEPTANCE. REPAIR OR REPLACE DEFECTIVE MATERIALS OR INSTALLATION AT NO COST TO THE AUTHORITY. CORRECT DAMAGE CAUSED IN MAKING NECESSARY REPAIRS AND REPLACEMENTS UNDER GUARANTEE AT NO COST TO THE AUTHORITY.
- STATEMENT OF GUARANTEE REQUIREMENTS SHALL NOT BE INTERPRETED TO LIMIT AUTHORITY’S RIGHTS UNDER LAW AND THIS CONTRACT.
- DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS.
- TEMPORARY LIGHT AND POWER SHALL BE PROVIDED ON SITE BY THE CONTRACTOR.
- SUBMIT SHOP DRAWINGS AND PRODUCT DATA WITHIN 30 DAYS AFTER AWARD OF CONTRACT. CHECK, STAMP AND MARK SUBMITTALS WITH PROJECT NAMES BEFORE TRANSMITTING TO ENGINEER. INDICATE DEVIATIONS FROM CONTRACT DOCUMENTS. SHOP DRAWINGS SHALL BE PROVIDED FOR ALL EQUIPMENT SHOWN ON THE DRAWINGS.
- DEVIATION FROM CONTRACT DOCUMENTS, OR PROPOSED SUBSTITUTION OF MATERIALS OR EQUIPMENT FOR THOSE SPECIFIED, SHALL BE REQUESTED IN SEPARATE LETTER, WHETHER DEVIATIONS ARE DUE TO FIELD CONDITIONS, STANDARD SHOP PRACTICE, OR OTHER CAUSE.
- ALL WIRING SHALL BE RUN CONCEALED IN FINISHED AREAS AND EXPOSED IN UNFINISHED AREAS.
- ALL GROUNDING SHALL BE PERFORMED IN ACCORDANCE WITH THE NATIONAL AND LOCAL ELECTRICAL CODES.
- NEW CIRCUIT BREAKER RATING SHALL BE COMPARABLE WITH EXISTING PANELBOARD CIRCUIT BREAKERS AND AIC RATINGS.
- AT LOCATIONS WHERE NEW CONDUITS AND CABLES EXIT MECHANICAL AND/OR AC SWITCHBOARD ROOMS FOR 120–VOLT BRANCH CIRCUITS, GROUNDING CIRCUITS TO CONNECT TO AN EXTERIOR SOURCE, THE CONTRACTOR SHALL PROVIDE DRILLED HOLES IN CONCRETE FLOORS AND WALLS AS REQUIRED. EXISTING CONDUIT SLEEVES MAY BE USED FOR THIS PURPOSE IF AVAILABLE.
- CONDUIT SIZE AND CABLE SIZE/TYPE INDICATED ON DRAWINGS ARE APPLICABLE TO ENTIRE LENGTH OF BRANCH CIRCUIT UNLESS OTHERWISE NOTED.
- EXISTING CONDUITS ASSOCIATED WITH NEW ACU/FAN WORK THAT ARE NOT REUSED SHALL BE REMOVED, PROVIDED THAT THEY DO NOT CONTAIN ACTIVE CIRCUITS/WIRING FOR PROJECT WORK AND/OR EXISTING ADJACENT EQUIPMENT THAT IS NOT IN CONTRACT.
- EXPOSED CONDUITS SHALL BE GALVANIZED RIGID STEEL TYPE.
- ALL WIRING SHALL BE UL LISTED TYPE RHW–2 OR XHHW–2.

CONTRACT NO.  
FQ 14005D-13-03

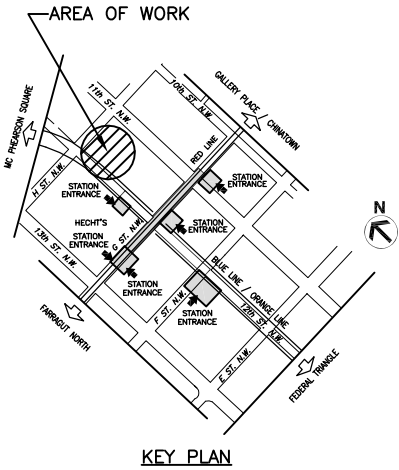
<div>DESIGNED <u>S. KAMAL</u> 11/13 DATE 11/13</div> <div>DRAWN <u>C. HILL</u> 11/13 DATE 11/13</div> <div>CHECKED <u>S. KAMAL</u> 11/13 DATE 11/13</div> <div>APPROVED <u>A. FISHEL</u> 11/13 DATE 11/13</div>	REFERENCE DRAWINGS		REVISIONS			<div>WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY</div> <div>DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM</div> <div>APPROVED _____</div>	WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		CHPC01 CHILLER PLANT - METRO CENTER CHILLER REPLACEMENT		
	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION		ELECTRICAL SYMBOLS, ABBRIVIATIONS AND GENERAL NOTES				
							SUBMITTED _____ PROJECT MANAGER		SCALE NONE		
									DRAWING NO. E-001		
									M-0000-045		

PLAN NOTES:

- 1 REMOVE & DISPOSE OF CHILLER STARTING EQUIPMENT ALONG WITH ASSOCIATED CONDUIT AND WIRING BETWEEN SWITCHGEAR & STARTERS AND BETWEEN STARTER & CHILLER.
- 2 REMOVE AND DISPOSE OF MOTOR STARTERS ALONG WITH ASSOCIATED CONDUIT AND WIRING BETWEEN MCC-A SECTION 1 AND CHILLED WATER PUMPS & CONDENSING WATER PUMPS. FOR DEMOLITION ONE LINE DIAGRAM SEE DWG CHPC1-E-600.
- 3 FOR EQUIPMENT TO BE DEMOLISHED: ALL EXISTING CONDUIT AND WIRING SHALL BE REMOVED. PERMISSION TO USE EXISTING CONDUIT (WIRES REMOVED) SHALL BE REQUESTED FROM AR.
- 4 POWER CONNECTION BETWEEN RECEPTACLE AND WATER TREATMENT CONTROL PANEL, ETR.
- 5 REMOVE AND DISPOSE OF DISCONNECT SWITCH FOR EXHAUST FAN AND ASSOCIATED WIRING.
- 6 POWER CONNECTION BETWEEN JUNCTION BOX AND CHEMICAL TREATMENT EQUIPMENT, ETR.
- 7 NOT USED.
- 8 SEE DRAWING CHPC1-E-600 FOR DEMOLITION ONE LINE DIAGRAM.
- 9 PUMP SHALL BE DEMOLISHED BY MECHANICAL CONTRACTOR.
- 10 EXISTING WATER TREATMENT ETR, SEE MECHANICAL DRAWINGS.



CHILLER PLANT FLOOR PLAN  
ELECTRICAL DEMOLITION WORK



DESIGNED	S. KAMAL	11/13
DRAWN	C. HILL	11/13
CHECKED	S. KAMAL	11/13
APPROVED	A. FISHEL	11/13

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT INFRASTRUCTURE  
AND ENGINEERING SERVICES  
OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM

APPROVED \_\_\_\_\_

**GFP** A Gannett Fleming/Parsons  
JOINT VENTURE

SUBMITTED \_\_\_\_\_  
PROJECT MANAGER

CHPC01 CHILLER PLANT - METRO CENTER  
CHILLER REPLACEMENT  
CHILLER PLANT FLOOR PLAN  
ELECTRICAL DEMOLITION

SCALE  
1/4"=1'-0"

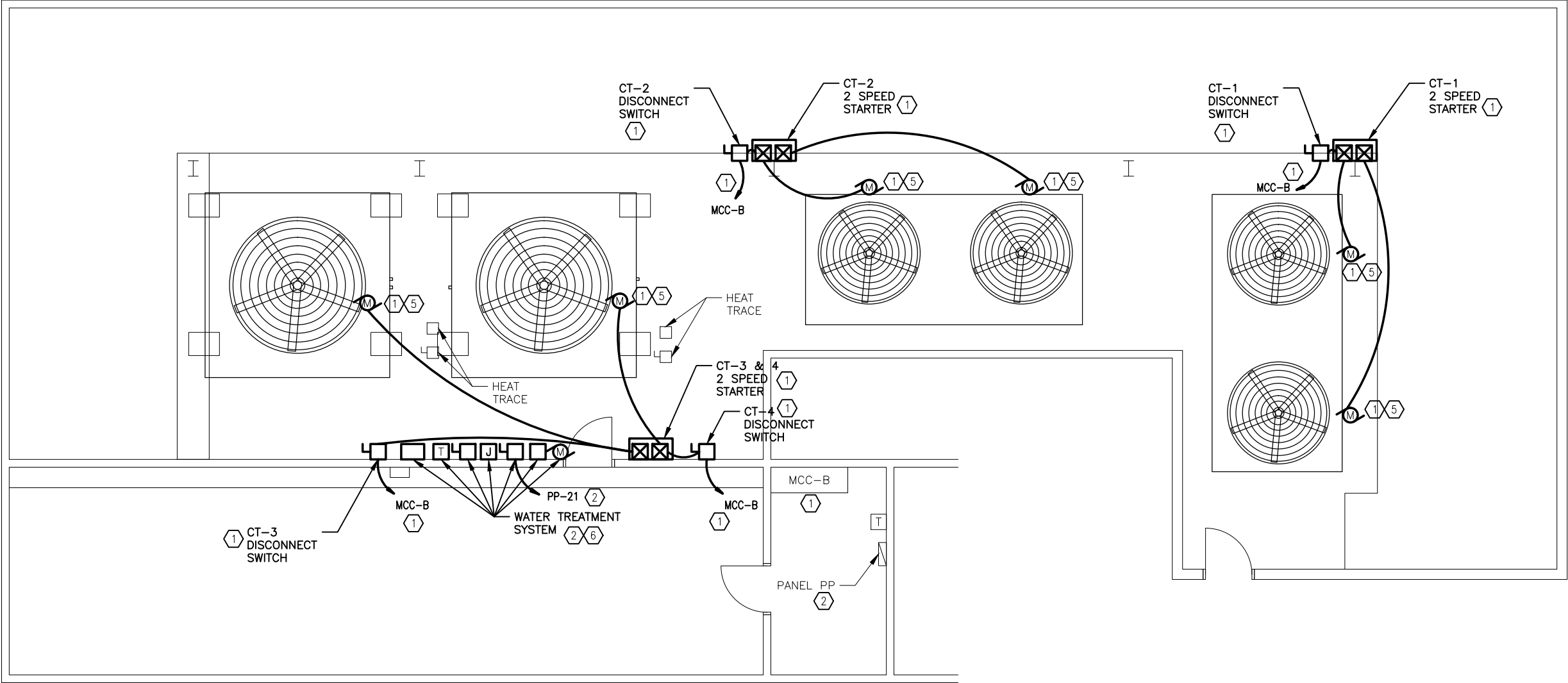
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CHPC1-E-100  
M-0000-046

CONTRACT NO.  
FQ 14005D-13-03

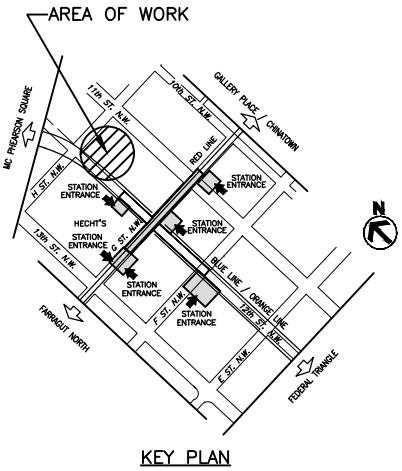


PLAN NOTES:

- 1 REMOVE AND DISPOSE OF COOLING TOWER MOTOR STARTERS AND DISCONNECT SWITCHES ALONG WITH ASSOCIATED CONDUIT AND WIRING.
- 2 REMOVE AND DISPOSE OF ASSOCIATED ELECTRICAL EQUIPMENT, CONDUIT AND WIRING FOR THE WATER TREATMENT SYSTEM.
- 3 SEE DRAWING CHPC1-E-600 FOR DEMOLITION ONE LINE DIAGRAM.
- 4 FOR EQUIPMENT TO BE DEMOLISHED:  
ALL EXISTING CONDUIT AND WIRING SHALL BE REMOVED.  
PERMISSION TO USE EXISTING CONDUIT (WIRES REMOVED) SHALL BE REQUESTED FROM AR.
- 5 MOTOR SHALL BE DEMOLISHED BY MECHANICAL CONTRACTOR.
- 6 WATER TREATMENT SYSTEM SHALL BE DEMOLISHED BY MECHANICAL CONTRACTOR.



COOLING TOWERS FLOOR PLAN  
ELECTRICAL DEMOLITION WORK



CONTRACT NO.  
FQ 14005D-13-03

DESIGNED S. KAMAL 11/13  
DATE 11/13  
DRAWN C. HILL 11/13  
DATE 11/13  
CHECKED S. KAMAL 11/13  
DATE 11/13  
APPROVED A. FISHEL 11/13  
DATE 11/13

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT INFRASTRUCTURE  
AND ENGINEERING SERVICES  
OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM

APPROVED \_\_\_\_\_

**GFP** A Gannett Fleming/Parsons  
JOINT VENTURE

SUBMITTED \_\_\_\_\_  
PROJECT MANAGER

**CHPC01 CHILLER PLANT - METRO CENTER  
CHILLER REPLACEMENT  
COOLING TOWERS FLOOR PLAN  
ELECTRICAL DEMOLITION**

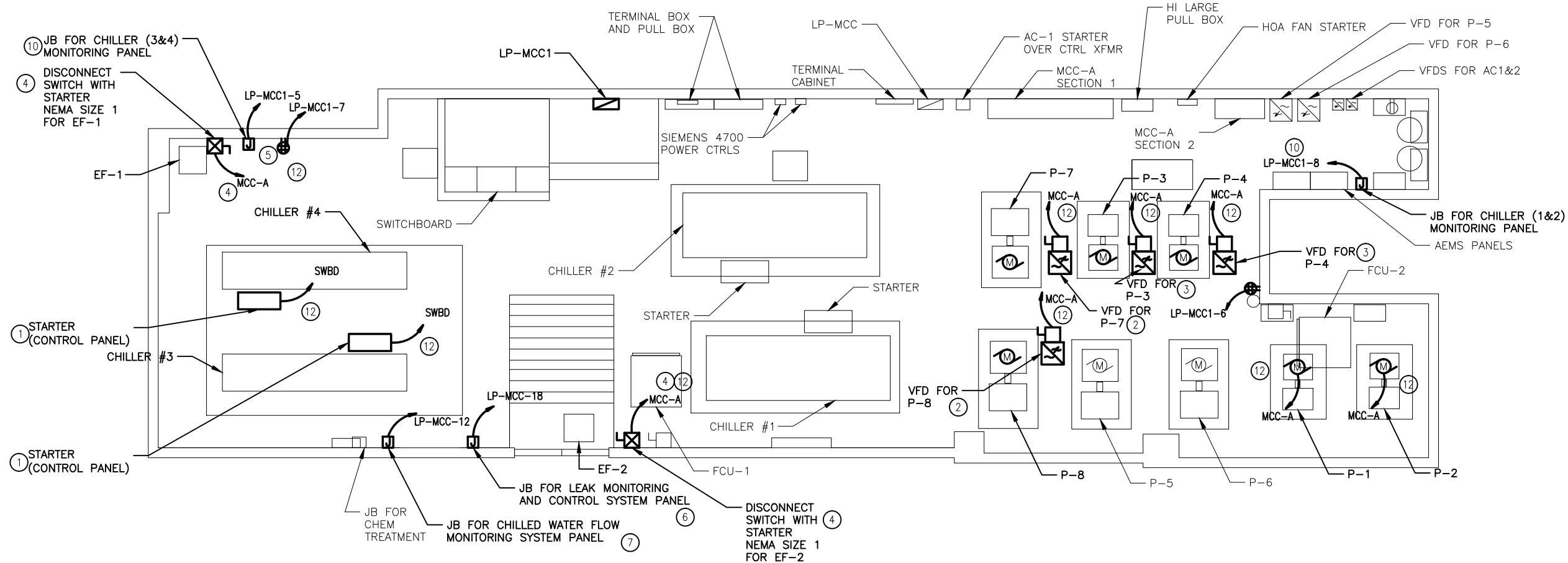
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DRAWING NO.  
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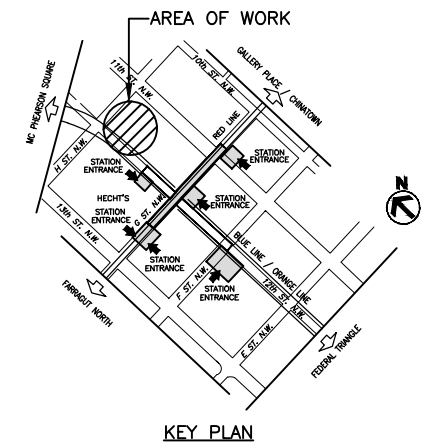
**M-0000-047**

**PLAN NOTES:**

- ① PROVIDE CONDUIT & WIRING FOR CHILLER UNIT MOUNTED STARTER TO SWBD. STARTER SHALL BE PROVIDED WITH CONTROL PANEL BY MECHANICAL.
- ② P-7 AND P-8 VFDS: INSTALL AND CONNECT VFDS PROVIDED UNDER MECHANICAL WORK. PROVIDE NON-FUSED SAFETY DISCONNECT SWITCH. SEE SINGLE LINE DIAGRAM (DWG. CHPC1-E-601) FOR DISCONNECT SWITCH SPECIFICATION. ENABLE CONTROL FROM CHILLER CONTROL PANEL AND COORDINATE WITH MECHANICAL CONTRACTOR FOR REQUIRED CONTROL WIRING.
- ③ P-3 AND P-4 VFDS: INSTALL AND CONNECT VFDS PROVIDED UNDER MECHANICAL WORK. PROVIDE NON-FUSED SAFETY DISCONNECT SWITCH. SEE SINGLE LINE DIAGRAM (DWG. CHPC1-E-601) FOR DISCONNECT SWITCH SPECIFICATION. ENABLE CONTROL FROM CHILLER CONTROL PANEL AND COORDINATE WITH MECHANICAL CONTRACTOR FOR REQUIRED CONTROL WIRING.
- ④ SEE SINGLE LINE DIAGRAM (DWG. CHPC1-E-601) FOR MOTOR STARTER SPECIFICATION.
- ⑤ PROVIDE CONDUIT AND WIRING FOR NEW WATER TREATMENT SYSTEM FROM PANEL LP-MCC1.
- ⑥ CONNECT LEAK MONITORING AND CONTROL SYSTEM PANEL FROM EXISTING JB.
- ⑦ CONNECT CHILLED WATER FLOW METER MONITORING SYSTEM PANEL FROM EXISTING JB.
- ⑧ ROUTING OF NEW CONDUITS SHALL BE COORDINATED WITH EXISTING INSTALLATIONS AND SITE CONDITION.
- ⑨ FOR CONNECTION DETAILS SEE ONE LINE DIAGRAMS ON DRAWINGS CHPC1-E-600 AND CHPC1-E-601.
- ⑩ PROVIDE CONDUIT AND WIRING TO JUNCTION BOX AND CONNECT CHILLER PLANT MONITORING PANEL.
- ⑪ FOR PANEL SCHEDULES SEE DRAWING CHPC1-E-603.
- ⑫ SEE SINGLE LINE DIAGRAM (DWG. CHPC1-E-601) FOR WIRING INFORMATION.



## CHILLER PLANT FLOOR PLAN ELECTRICAL NEW WORK



CONTRACT NO.  
FQ 14005D-13-03

			REFERENCE DRAWINGS		REVISIONS		
DESIGNED	<u>S. KAMAL</u>	11/13	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION
DRAWN	<u>C. HILL</u>	11/13					
CHECKED	<u>S. KAMAL</u>	11/13					
APPROVED	<u>A. FISHEL</u>	11/13					
		DATE					

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT INFRASTRUCTURE  
AND ENGINEERING SERVICES  
OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM

APPROVED \_\_\_\_\_

SUBMITTED \_\_\_\_\_  
PROJECT MANAGER

**CHPC01 CHILLER PLANT - METRO CENTER**  
**CHILLER REPLACEMENT**  
 CHILLER PLANT FLOOR PLAN  
 ELECTRICAL NEW WORK

SCALE  
1/4"=1'-0"

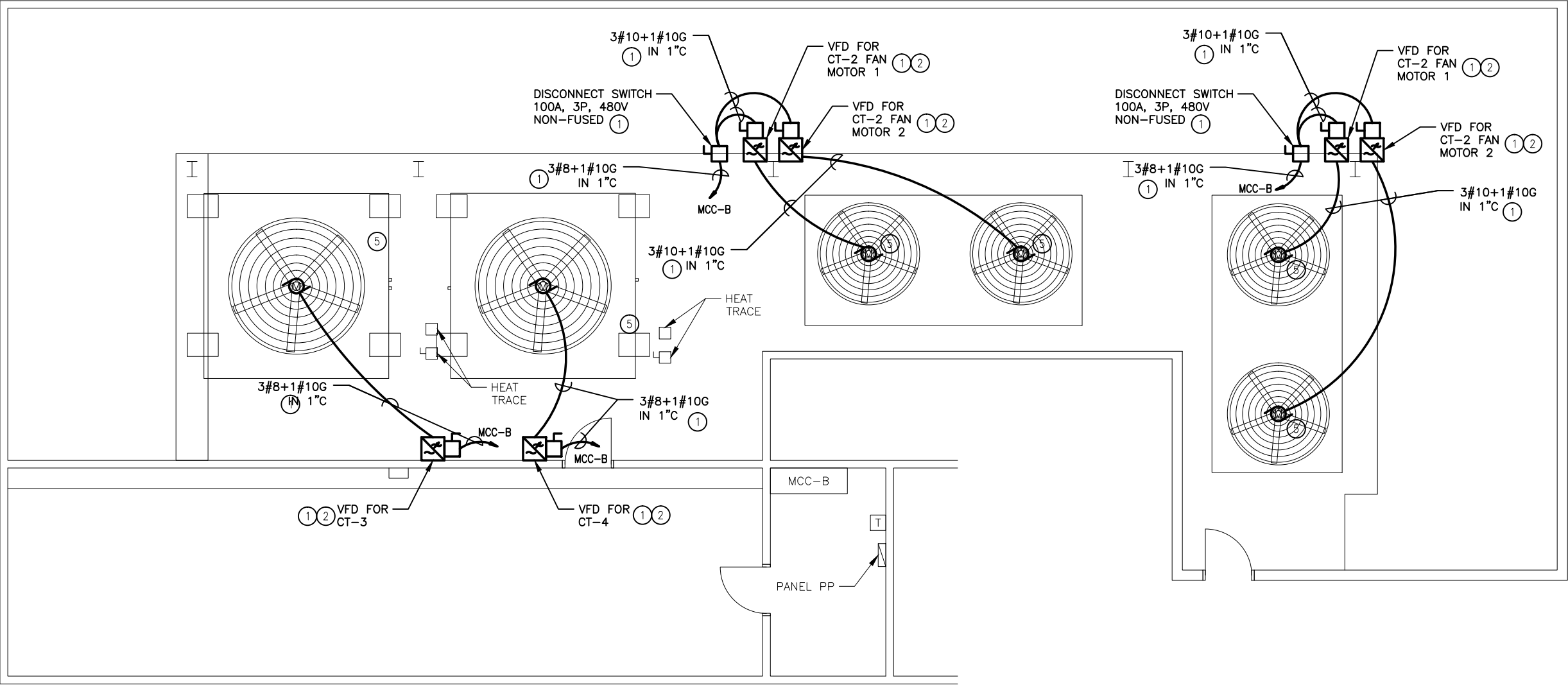
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**M-0000-048**

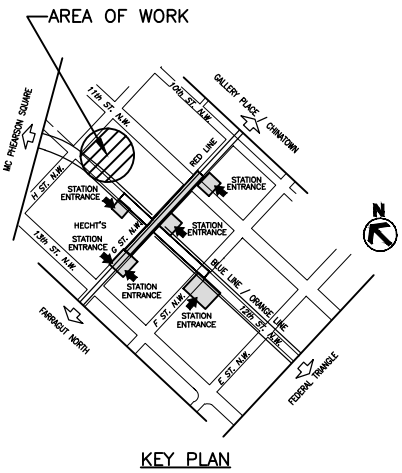


PLAN NOTES:

- 1 PROVIDE VFD DRIVE WITH DISCONNECT, CONDUIT, WIRING AND CONTROLS FOR COOLING TOWER FAN MOTORS. ENABLE CONTROL FROM CHILLER.
- 2 PROVIDE NEMA/UL 3R ENCLOSURE FOR VFD DRIVE WITH THERMOSTATICALLY CONTROLLED HEATING AND COOLING.
- 3 ROUTING OF NEW CONDUITS SHALL BE COORDINATED WITH EXISTING INSTALLATIONS AND SITE CONDITION.
- 4 FOR CONNECTION DETAILS SEE ONE LINE DIAGRAMS ON DRAWINGS CHPC1-E-600 AND CHPC1-E-601.
- 5 MOTOR SHALL BE PROVIDED AND INSTALLED BY MECHANICAL CONTRACTOR.



COOLING TOWERS FLOOR PLAN  
ELECTRICAL NEW WORK



CONTRACT NO.  
FQ 14005D-13-03

DESIGNED S. KAMAL 11/13  
DATE 11/13  
DRAWN C. HILL 11/13  
DATE 11/13  
CHECKED S. KAMAL 11/13  
DATE 11/13  
APPROVED A. FISHEL 11/13  
DATE 11/13

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT INFRASTRUCTURE  
AND ENGINEERING SERVICES  
OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM

APPROVED \_\_\_\_\_

**GFP** A Gannett Fleming/Parsons  
JOINT VENTURE

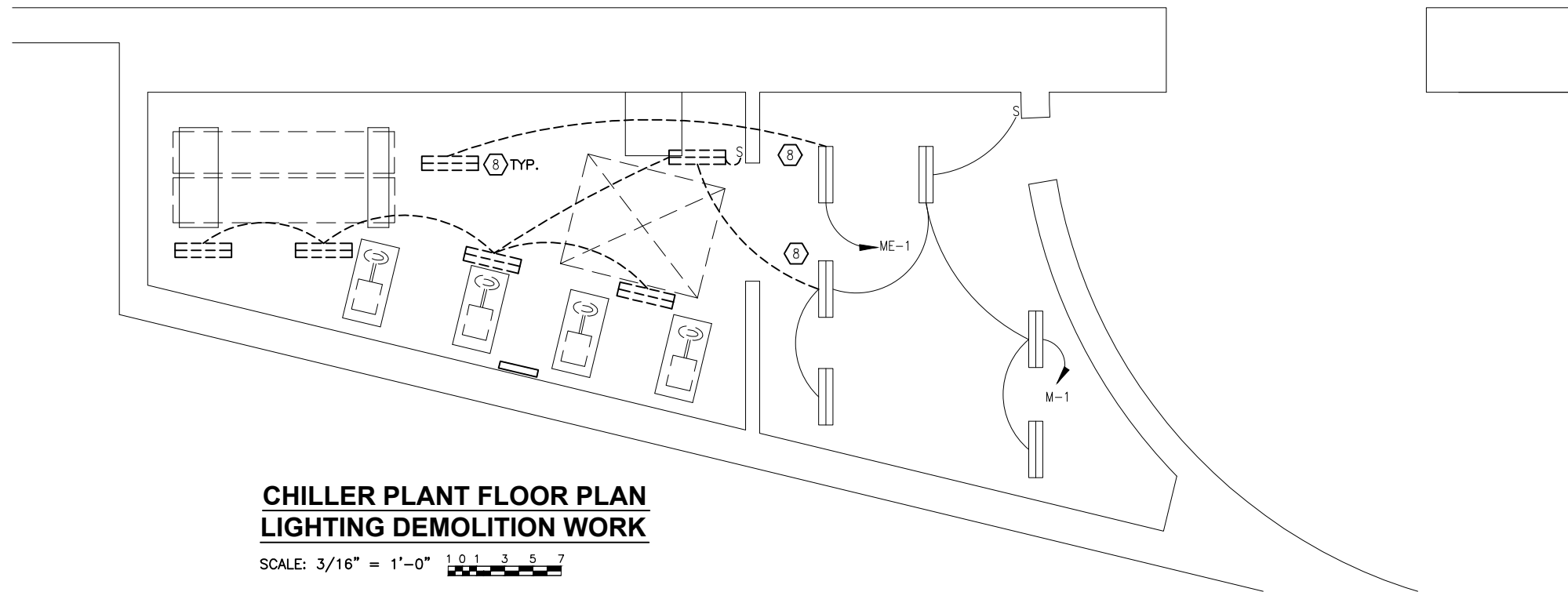
SUBMITTED \_\_\_\_\_  
PROJECT MANAGER

**CHPC01 CHILLER PLANT - METRO CENTER  
CHILLER REPLACEMENT  
COOLING TOWERS FLOOR PLAN  
ELECTRICAL NEW WORK**

SCALE  
1/4"=1'-0" 1 0 1 2 3 4 5

DRAWING NO.  
**CHPC1-E-111**

**M-0000-049**

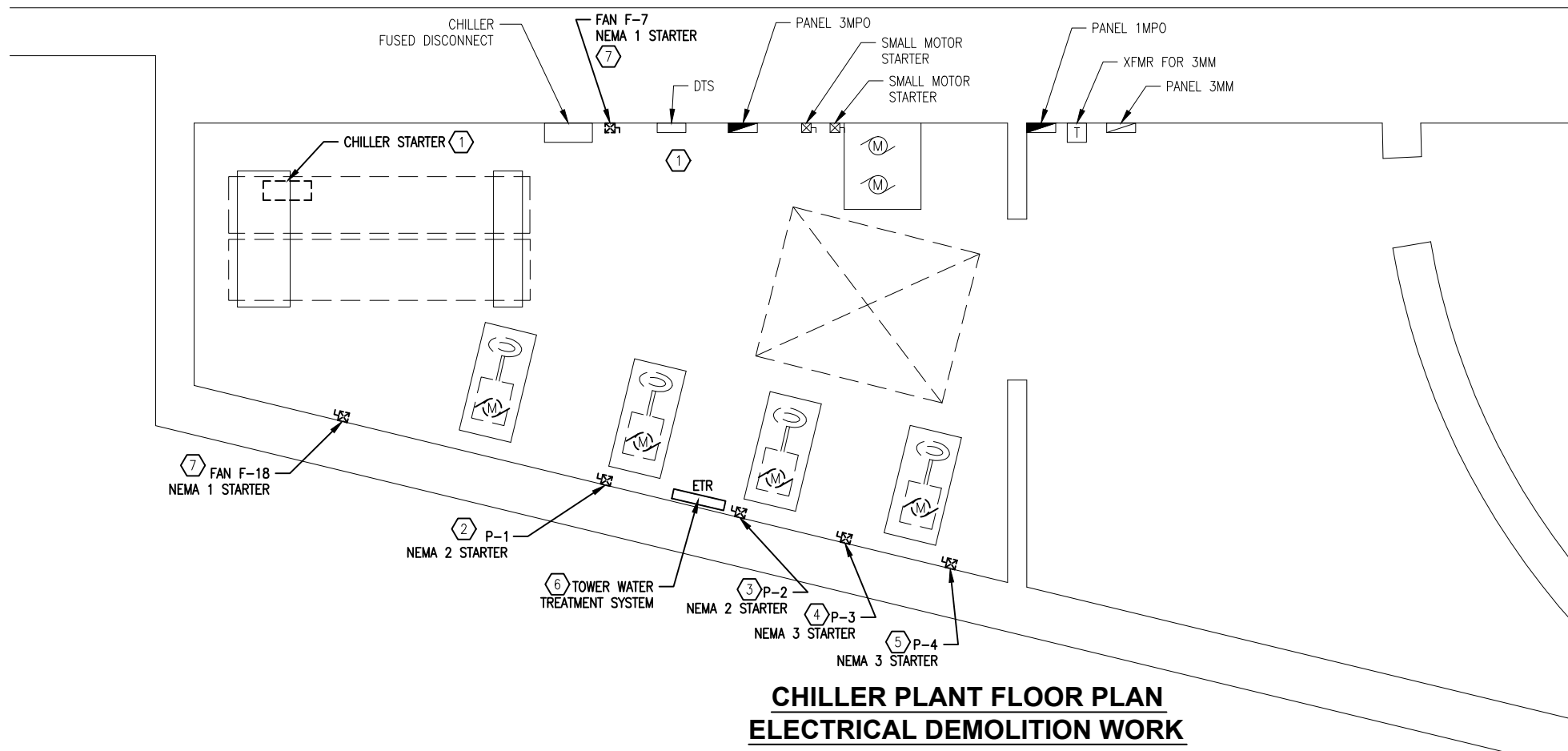


### CHILLER PLANT FLOOR PLAN LIGHTING DEMOLITION WORK

SCALE: 3/16" = 1'-0" 1 0 1 3 5 7

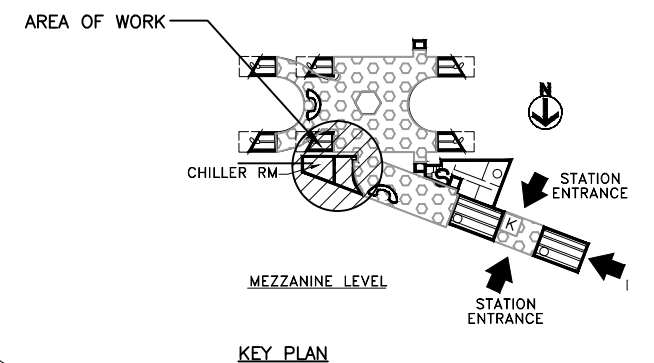
#### PLAN NOTES:

- 1 REMOVE & DISPOSE OF CHILLER STARTING EQUIPMENT ALONG WITH ASSOCIATED WIRING BETWEEN DISCONNECT SWITCH AND STARTER.
- 2 REMOVE AND DISPOSE OF CHILLED WATER PUMP #1 STARTER AND DISCONNECT ALONG WITH ASSOCIATED WIRING.
- 3 REMOVE AND DISPOSE OF CHILLED WATER PUMP #2 STARTER AND DISCONNECT ALONG WITH ASSOCIATED WIRING.
- 4 REMOVE AND DISPOSE OF CONDENSER WATER PUMP #1 STARTER AND DISCONNECT ALONG WITH ASSOCIATED WIRING.
- 5 REMOVE AND DISPOSE OF CONDENSER WATER PUMP #2 STARTER AND DISCONNECT ALONG WITH ASSOCIATED WIRING.
- 6 EXISTING TO REMAIN.
- 7 REMOVE AND DISPOSE OF FAN STARTER AND DISCONNECT ALONG WITH ASSOCIATED WIRING.
- 8 REMOVE AND DISPOSE OF LIGHT FIXTURES ALONG WITH ASSOCIATED WIRING BACK TO NEAREST LIGHT OUTSIDE CHILLER ROOM.
- 9 FOR EQUIPMENT TO BE DEMOLISHED:  
ALL EXISTING CONDUIT AND CONDUCTORS SHALL BE REMOVED. PERMISSION TO USE EXISTING CONDUIT (CONDUCTORS REMOVED) SHALL BE REQUESTED FROM AR.



### CHILLER PLANT FLOOR PLAN ELECTRICAL DEMOLITION WORK

SCALE: 1/4" = 1'-0" 1 0 1 2 3 4 5



CONTRACT NO.  
FQ 14005D-13-03

DESIGNED S. KAMAL 11/13  
DATE  
DRAWN C. HILL 11/13  
DATE  
CHECKED A. FISHEL 11/13  
DATE  
APPROVED K. FOWLER 11/13  
DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT INFRASTRUCTURE  
AND ENGINEERING SERVICES  
OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM

APPROVED \_\_\_\_\_

**GFP** A Gannett Fleming/Parsons  
JOINT VENTURE

SUBMITTED \_\_\_\_\_  
PROJECT MANAGER

**CHPC5 CHILLER PLANT - CRYSTAL CITY  
CHILLER REPLACEMENT  
CHILLER PLANT FLOOR PLAN  
ELECTRICAL DEMOLITION**

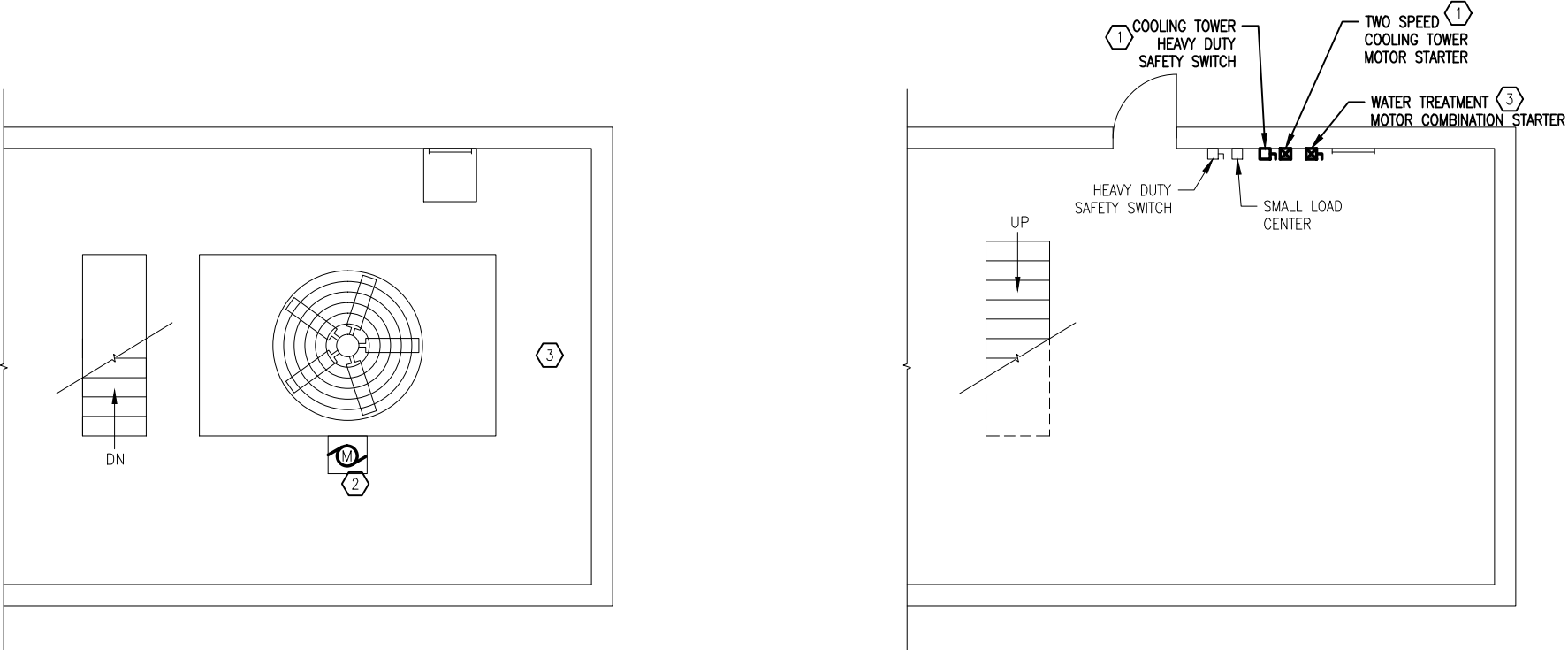
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AS NOTED

DRAWING NO.  
**CHPC5-E-100**

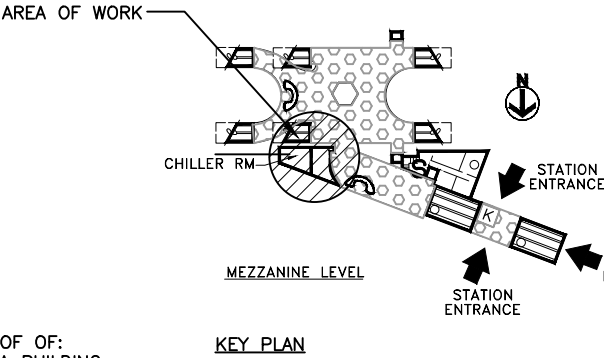
**M-0000-050**

PLAN NOTES:

- 1 REMOVE & DISPOSE OF COOLING TOWER STARTING/DISCONNECTING EQUIPMENT ALONG WITH ASSOCIATED CONDUIT AND WIRING.
- 2 REMOVE & DISPOSE OF TWO SPEED COOLING TOWER FAN MOTOR – BY MECHANICAL CONTRACTOR.
- 3 REMOVE & DISPOSE OF WATER TREATMENT MOTOR AND STARTING EQUIPMENT.
- 4 FOR EQUIPMENT TO BE DEMOLISHED: ALL EXISTING CONDUIT AND CONDUCTORS SHALL BE REMOVED. PERMISSION TO USE EXISTING CONDUIT (CONDUCTORS REMOVED) SHALL BE REQUESTED FROM AR.



COOLING TOWER FLOOR PLANS  
ELECTRICAL DEMOLITION WORK



LOCATION ON ROOF OF:  
JEFFERSON PLAZA BUILDING  
1755 JEFFERSON DAVIS HWY  
ARLINGTON, VA 22202

CONTRACT NO.  
FQ 14005D-13-03

DESIGNED S. KAMAL 11/13  
DATE 11/13  
DRAWN C. HILL 11/13  
DATE 11/13  
CHECKED A. FISHEL 11/13  
DATE 11/13  
APPROVED K. FOWLER 11/13  
DATE 11/13

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT INFRASTRUCTURE  
AND ENGINEERING SERVICES  
OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM

APPROVED \_\_\_\_\_

**GFP** A Gannett Fleming/Parsons  
JOINT VENTURE

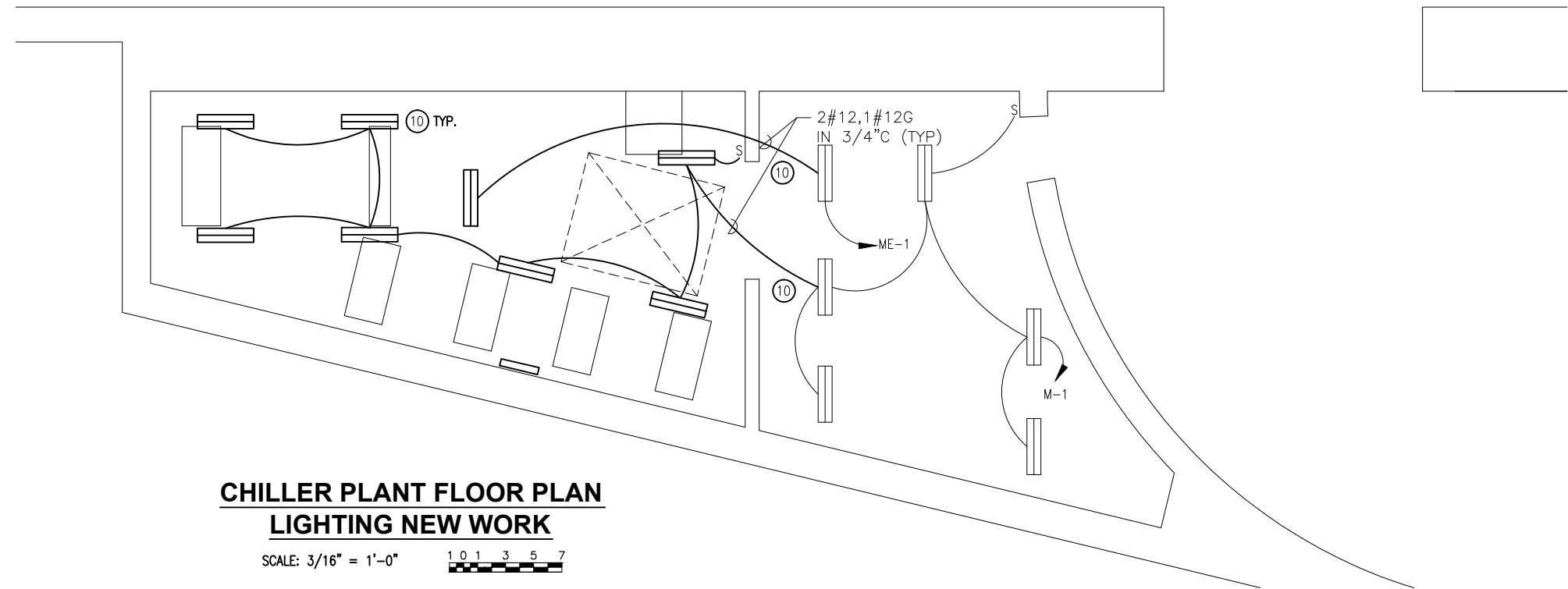
SUBMITTED \_\_\_\_\_  
PROJECT MANAGER

CHPC5 CHILLER PLANT - CRYSTAL CITY  
CHILLER REPLACEMENT  
COOLING TOWER PLAN  
ELECTRICAL DEMOLITION

SCALE  
1/4"=1'-0" 1 0 1 2 3 4 5

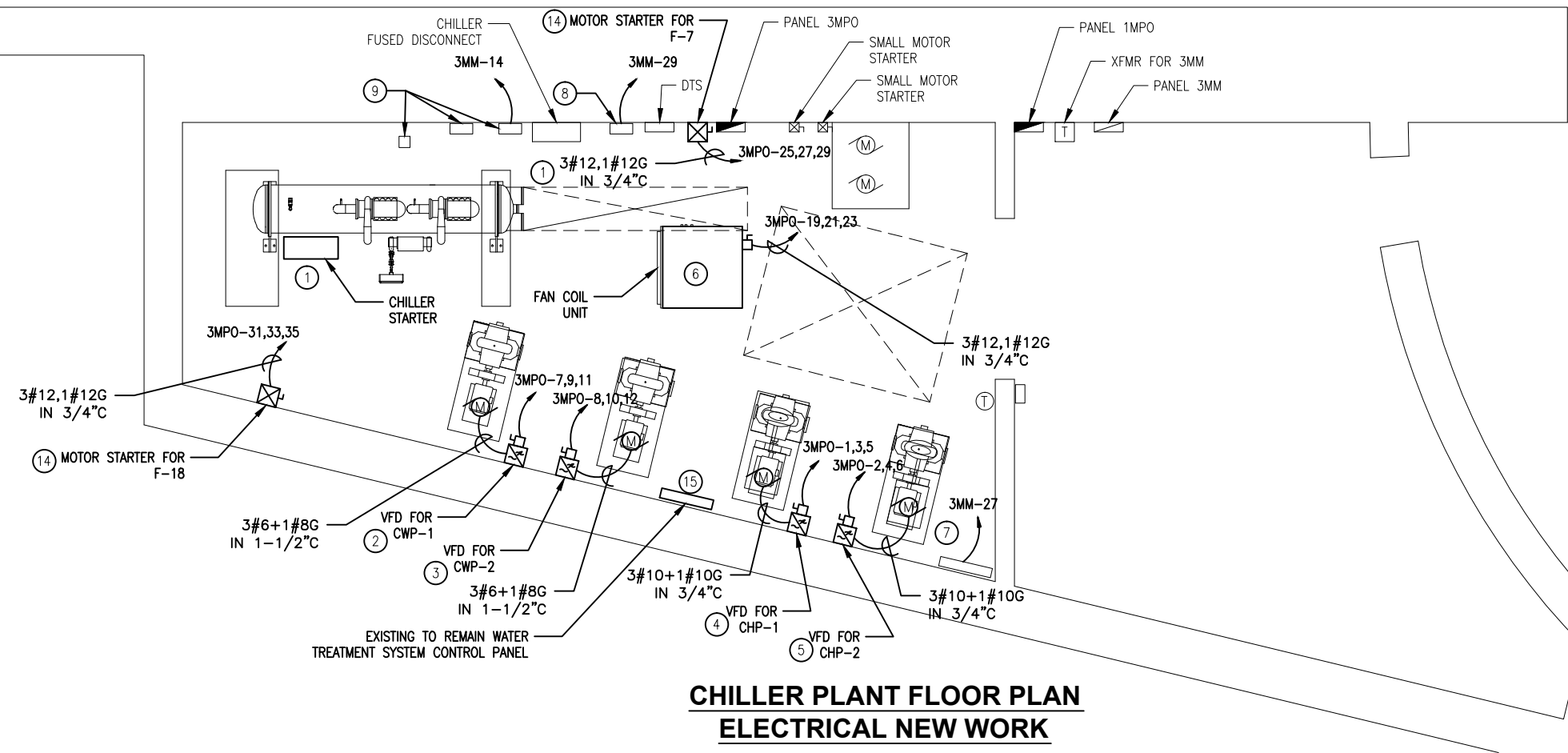
DRAWING NO.  
CHPC5-E-101

M-0000-051



**CHILLER PLANT FLOOR PLAN  
LIGHTING NEW WORK**

SCALE: 3/16" = 1'-0" 1 0 1 3 5 7

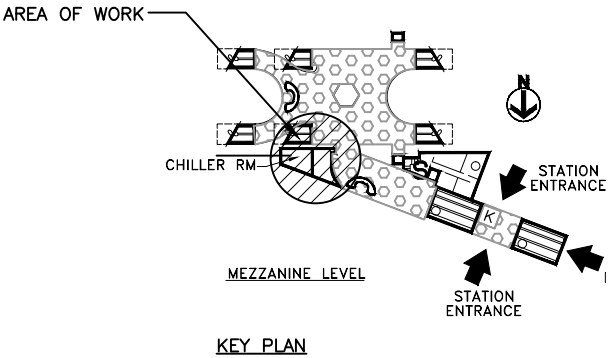


**CHILLER PLANT FLOOR PLAN  
ELECTRICAL NEW WORK**

SCALE: 1/4" = 1'-0" 1 0 1 2 3 4 5

**PLAN NOTES:**

- 1 PROVIDE CONDUIT & WIRING FROM CHILLER UNIT MOUNTED STARTER TO EXISTING CHILLER FUSED DISCONNECT.
- 2 PROVIDE VFD DRIVE WITH DISCONNECT SWITCH FOR CHILLED WATER PUMP #1, CONDUIT, WIRING, AND CONTROLS. ENABLE CONTROL FROM CHILLER.
- 3 PROVIDE VFD DRIVE WITH DISCONNECT SWITCH FOR CHILLED WATER PUMP #2, CONDUIT, WIRING, AND CONTROLS. ENABLE CONTROL FROM CHILLER.
- 4 PROVIDE VFD DRIVE WITH DISCONNECT SWITCH FOR CONDENSER WATER PUMP #1, CONDUIT, WIRING, AND CONTROLS. ENABLE CONTROL FROM CHILLER.
- 5 PROVIDE VFD DRIVE WITH DISCONNECT SWITCH FOR CONDENSER WATER PUMP #2, CONDUIT, WIRING, AND CONTROLS. ENABLE CONTROL FROM CHILLER.
- 6 PROVIDE DISCONNECT SWITCH 30A, 460V, 3 PH NEMA TYPE 3R NON-FUSIBLE, POWER AND CONTROL CONDUIT & WIRING FOR FAN COIL UNIT.
- 7 PROVIDE CONDUIT AND WIRING FOR NEW CHILLER PLANT CONTROL PANEL. CONNECT TO SPARE CIRCUIT IN PANEL 3MM. ALSO PROVIDE RECEPTACLE FOR WATER TREATMENT PUMPS. CONNECT TO SPARE CIRCUIT IN PANEL 3MM. FOR PANEL SCHEDULE SEE DRAWING CHPC5-E-603.
- 8 PROVIDE CONDUIT AND WIRING FROM SPARE 20A, 1P BREAKER IN PANEL 3MM FOR LEAK DETECTION SYSTEM CONTROL PANEL.
- 9 PROVIDE CONDUIT AND WIRING FROM SPARE 20A, 1P BREAKER IN PANEL 3MM FOR FLOW METER CONTROL PANELS.
- 10 PROVIDE LIGHT FIXTURES, CONDUIT AND WIRING. CONNECT TO EXISTING CIRCUIT. NEW LIGHTING FIXTURES SHALL BE HEAVY-DUTY INDUSTRIAL, LITHONIA MODEL# AF-232-277-GEB OR APPROVED EQUAL.
- 11 ROUTING OF NEW CONDUITS SHALL BE COORDINATED WITH EXISTING INSTALLATIONS AND SITE CONDITION.
- 12 FOR CONNECTION DETAILS SEE ONE LINE DIAGRAMS ON DRAWINGS CHPC5-E-600 AND CHPC5-E-601.
- 13 FOR PANEL SCHEDULES SEE DRAWING CHPC5-E-603.
- 14 MOTOR STARTER: PROVIDE A NEMA SIZE 1, 480V/3P COMBINATION MAGNETIC MOTOR CONTROLLER AND NON-FUSED DISCONNECT SWITCH WITH 120V COIL, (2) NO/NC AUXILIARY CONTACTS, ELECTRONIC OVERLOAD RELAY, IN A NEMA 4X ENCLOSURE WITH A HINGED DOOR. PROVIDE DOOR MOUNTED START/STOP MOMENTARY PUSHBUTTON SWITCHES AND A GREEN RUNNING LIGHT. COORDINATE REQUIRED CONTROLS WITH MECHANICAL CONTRACTOR AND MODIFY AS REQUIRED. SET OVERLOAD RELAY ACCORDING TO MOTOR NAMEPLATE FULL LOAD AMPS.
- 15 EXISTING WATER TREATMENT SYSTEM TO REMAIN.

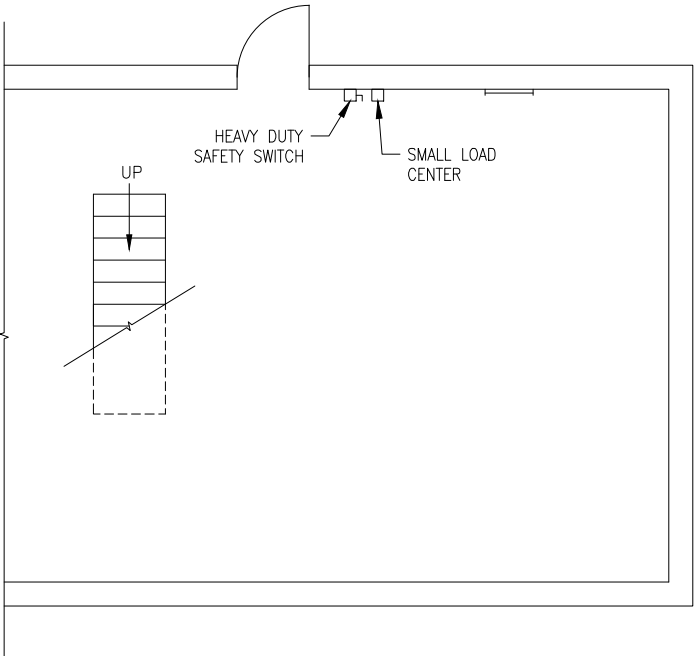
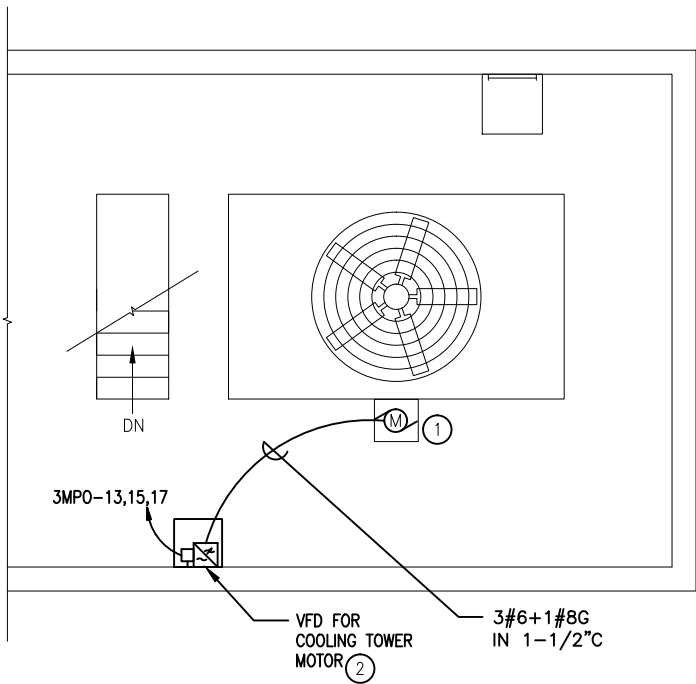


CONTRACT NO.  
FQ 14005D-13-03

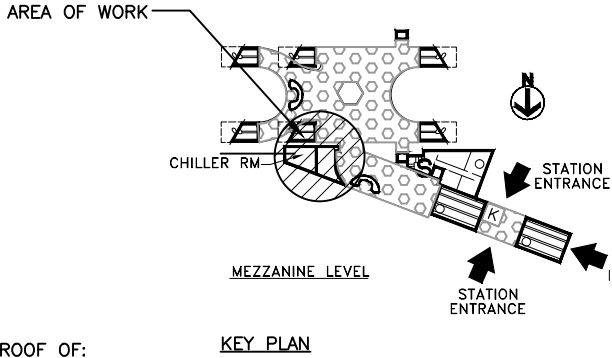
DESIGNED <u>S. KAMAL</u> 11/13 DATE 11/13		REFERENCE DRAWINGS		REVISIONS		WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		CHPC5 CHILLER PLANT - CRYSTAL CITY CHILLER REPLACEMENT	
DRAWN <u>C. HILL</u> 11/13 DATE 11/13		NUMBER DESCRIPTION		DATE BY DESCRIPTION		DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES		CHILLER PLANT FLOOR PLAN	
CHECKED <u>A. FISHEL</u> 11/13 DATE 11/13						OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM		ELECTRICAL NEW WORK	
APPROVED <u>K. FOWLER</u> 11/13 DATE 11/13						APPROVED _____		SUBMITTED _____	
						PROJECT MANAGER		SCALE AS NOTED	
								DRAWING NO. CHPC5-E-110	
								M-0000-052	

PLAN NOTES:

- ①
- NEW INVERTER RATED COOLING TOWER FAN MOTOR SHALL BE PROVIDED BY MECHANICAL.
- ②
- PROVIDE VFD DRIVE WITH DISCONNECT SWITCH FOR COOLING TOWER MOTOR, CONDUIT, WIRING AND CONTROLS. ENABLE CONTROL FROM CHILLER. PROVIDE NEMA 3R ENCLOSURE WITH THERMOSTATICALLY CONTROLLED HEATING AND COOLING.



CHILLER PLANT FLOOR PLAN  
ELECTRICAL NEW WORK

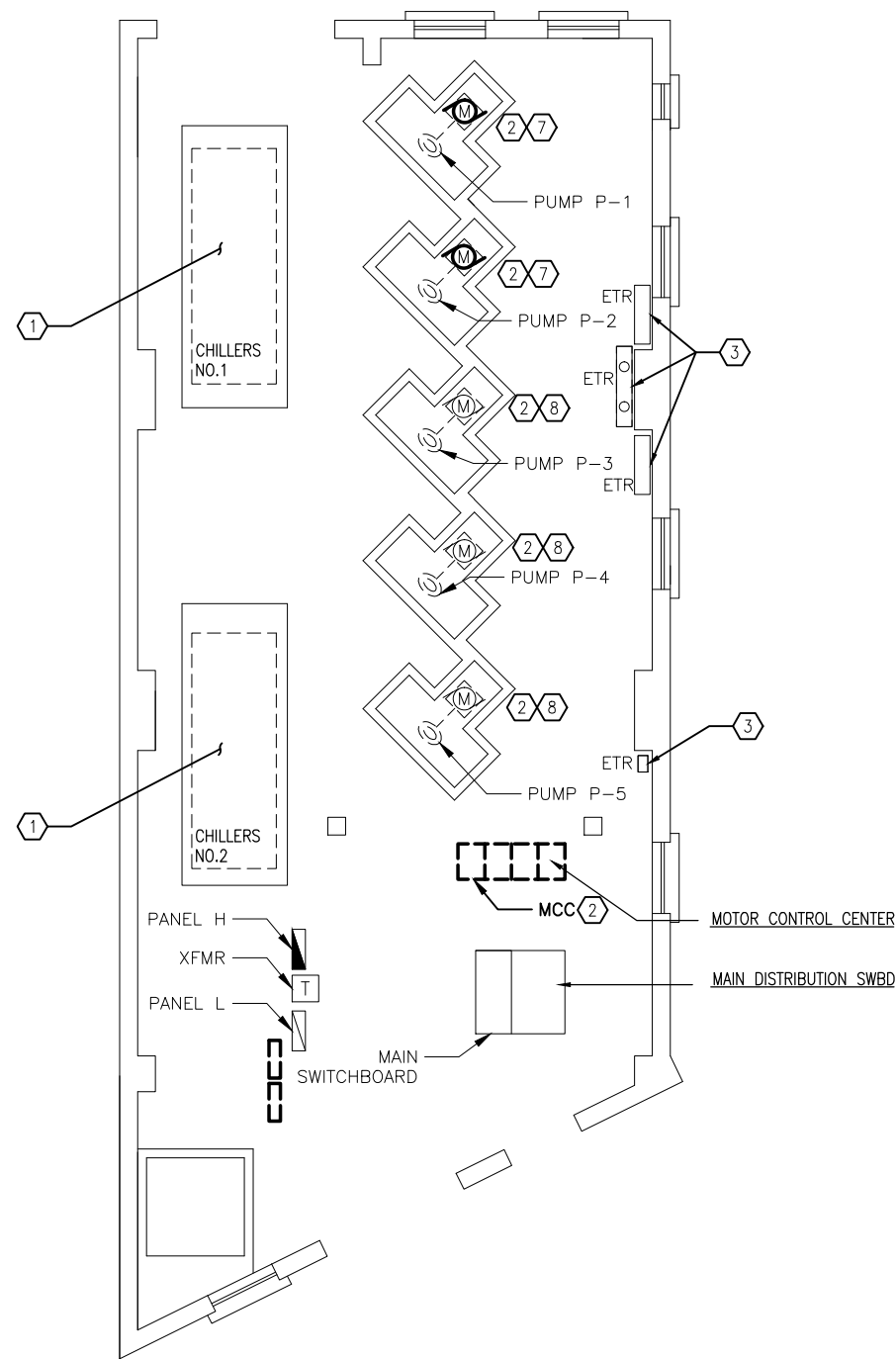


LOCATION ON ROOF OF:  
JEFFERSON PLAZA BUILDING  
1755 JEFFERSON DAVIS HWY  
ARLINGTON, VA 22202

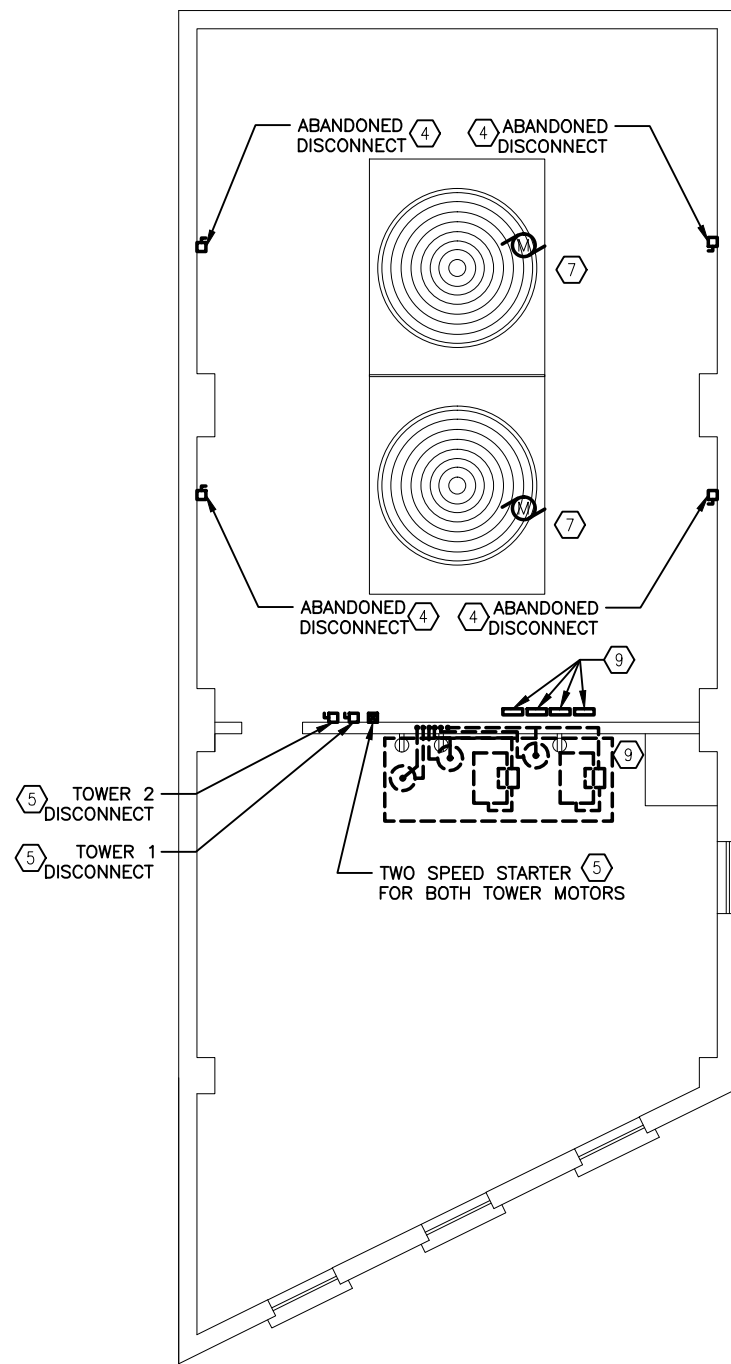
CONTRACT NO.  
FQ 14005D-13-03

<div>DESIGNED</div> <div>S. KAMAL</div> <div>11/13</div> <div>DATE</div> <div>11/13</div> <div>DATE</div> <div>11/13</div> <div>DATE</div> <div>11/13</div> <div>DATE</div> <div>11/13</div> <div>DATE</div>	REFERENCE DRAWINGS		REVISIONS			<div>WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY</div> <div>DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES</div> <div>OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM</div> <div>APPROVED _____</div>	<div>CHPC5 CHILLER PLANT - CRYSTAL CITY</div> <div>CHILLER REPLACEMENT</div> <div>COOLING TOWER PLAN</div> <div>ELECTRICAL NEW WORK</div> <div>SCALE 1/4"=1'-0"</div> <div><div>1012345</div></div> <div>DRAWING NO. CHPC5-E-111</div> <div>M-0000-053</div>
	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION		
SUBMITTED _____		PROJECT MANAGER					





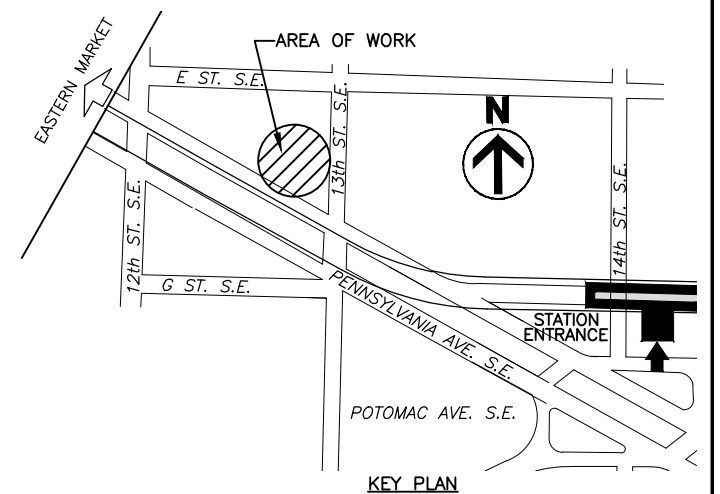
**CHILLER PLANT FIRST FLOOR PLAN  
ELECTRICAL DEMOLITION WORK**



**CHILLER PLANT 2ND FLOOR AND ROOF PLANS  
ELECTRICAL DEMOLITION WORK**

**PLAN NOTES:**

- 1 REMOVE & DISPOSE OF CHILLER STARTING EQUIPMENT ALONG WITH ASSOCIATED CONDUIT AND WIRING FROM MCC.
- 2 REMOVE AND DISPOSE OF MCC ALONG WITH ASSOCIATED STARTERS, DISCONNECTS, CONDUIT AND WIRING, INCLUDING ALL CONDUIT AND WIRING TO PUMP MOTORS.
- 3 EXISTING WATER TREATMENT TO REMAIN.
- 4 REMOVE AND DISPOSE OF ABANDONED EQUIPMENT ALONG WITH ASSOCIATED WIRING.
- 5 REMOVE AND DISPOSE OF COOLING TOWER MOTOR STARTERS AND DISCONNECTS ALONG WITH ASSOCIATED CONDUIT AND WIRING.
- 6 FOR EQUIPMENT TO BE DEMOLISHED:  
ALL EXISTING CONDUIT AND WIRING SHALL BE REMOVED.  
PERMISSION TO USE EXISTING CONDUIT (WIRES REMOVED) SHALL BE REQUESTED FROM AR.
- 7 MOTOR SHALL BE DEMOLISHED BY MECHANICAL.
- 8 EXISTING PUMP TO REMAIN.
- 9 REMOVE EXISTING WATER TREATMENT SYSTEM.



CONTRACT NO.  
FQ 14005D-13-03

DESIGNED S. KAMAL 11/13  
DATE 11/13  
DRAWN C. HILL 11/13  
DATE 11/13  
CHECKED A. FISHEL 11/13  
DATE 11/13  
APPROVED K. FOWLER 11/13  
DATE 11/13

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT INFRASTRUCTURE  
AND ENGINEERING SERVICES  
OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM

APPROVED \_\_\_\_\_

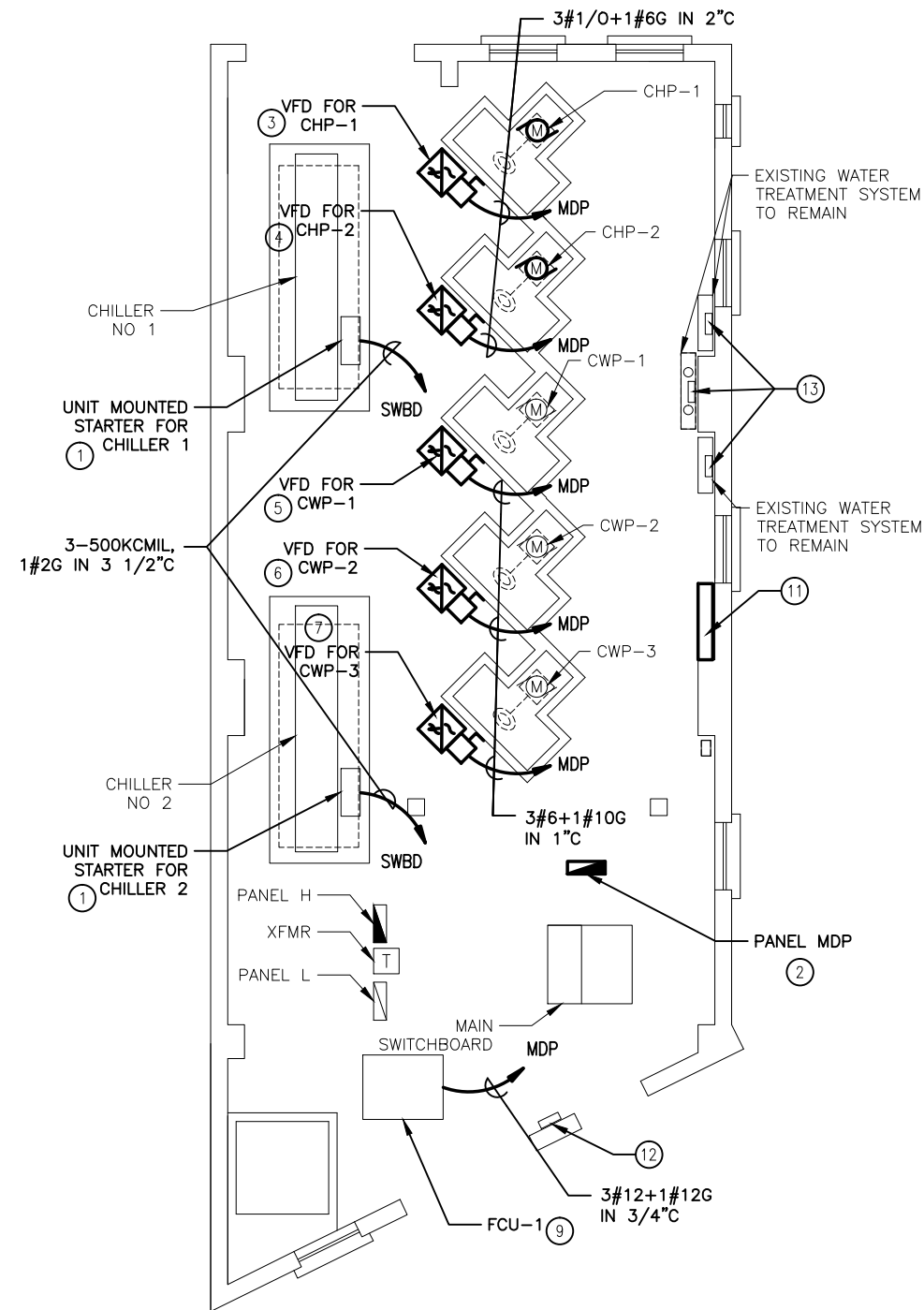
**GFP** A Gannett Fleming/Parsons  
JOINT VENTURE

SUBMITTED \_\_\_\_\_  
PROJECT MANAGER

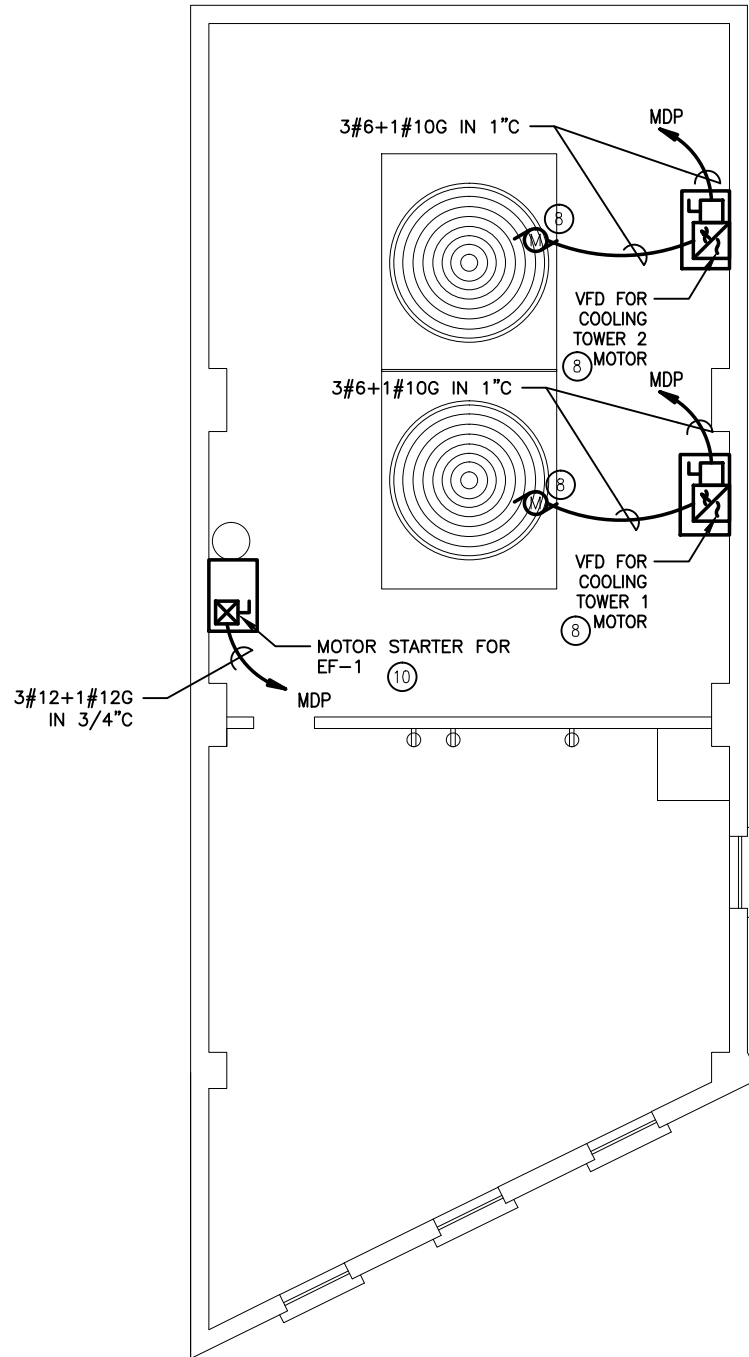
**CHPD3 CHILLER PLANT - POTOMAC AVENUE  
CHILLER REPLACEMENT  
CHILLER PLANT FLOOR PLANS  
ELECTRICAL DEMOLITION**

SCALE  
3/16"=1'-0" 1 0 1 3 5 7

DRAWING NO.  
**CHPD3-E-100 M-0000-054**



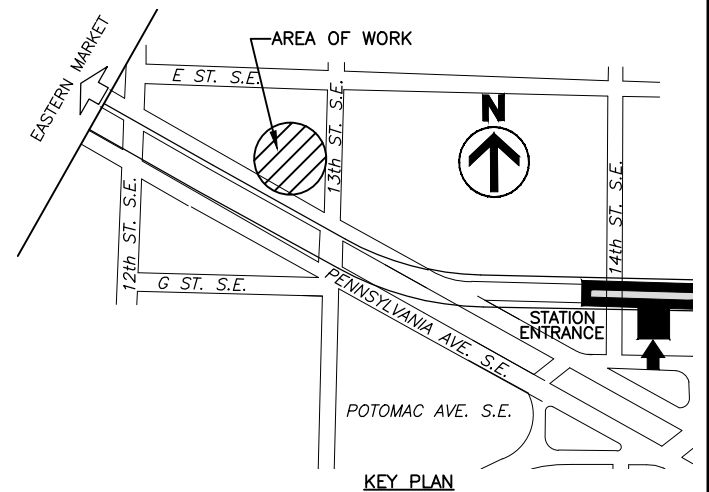
**CHILLER PLANT FIRST FLOOR PLAN  
ELECTRICAL NEW WORK**



**CHILLER PLANT SECOND FLOOR AND ROOF PLANS  
ELECTRICAL NEW WORK**

**PLAN NOTES:**

- ① PROVIDE CONDUIT & WIRING FROM CHILLER UNIT MOUNTED STARTER TO SWBD. STARTER SHALL BE PROVIDED WITH CONTROL PANEL BY MECHANICAL.
- ② INSTALL NEW PANEL MDP AND CONNECT ALL PUMPS AND DEVICES ALONG WITH ALL ASSOCIATED WIRING. SEE CHPD3-E-601 FOR DETAILS.
- ③ PROVIDE VFD DRIVE WITH DISCONNECT FOR CHILLED WATER PUMP #1 (CHP-1), CONDUIT, WIRING AND CONTROLS. ENABLE CONTROL FROM CHILLER.
- ④ PROVIDE VFD DRIVE WITH DISCONNECT FOR CHILLED WATER PUMP #2 (CHP-2), CONDUIT, WIRING AND CONTROLS. ENABLE CONTROL FROM CHILLER.
- ⑤ PROVIDE VFD DRIVE WITH DISCONNECT FOR CONDENSER WATER PUMP #1 (CWP-1), CONDUIT, WIRING AND CONTROLS. ENABLE CONTROL FROM CHILLER.
- ⑥ PROVIDE VFD DRIVE WITH DISCONNECT FOR CONDENSER WATER PUMP #2 (CWP-2), CONDUIT, WIRING AND CONTROLS. ENABLE CONTROL FROM CHILLER.
- ⑦ PROVIDE VFD DRIVE WITH DISCONNECT FOR CONDENSER WATER PUMP #3 (CWP-3), CONDUIT, WIRING AND CONTROLS. ENABLE CONTROL FROM CHILLER.
- ⑧ PROVIDE VFD DRIVE WITH DISCONNECT FOR EACH COOLING TOWER FAN MOTOR, CONDUIT, WIRING AND CONTROLS. ENABLE CONTROL FROM CHILLER. PROVIDE NEMA 3R ENCLOSURE WITH THERMOSTATICALLY CONTROLLED HEATING AND COOLING.
- ⑨ PROVIDE DISCONNECT SWITCH 20A, 460V, 3 PH NEMA TYPE 3R NON-FUSIBLE, POWER AND CONTROL CONDUIT & WIRING FOR FAN COIL UNIT.
- ⑩ EF-1 MOTOR STARTER: PROVIDE A NEMA SIZE 1, 480V/3P COMBINATION MAGNETIC MOTOR CONTROLLER AND NON-FUSED DISCONNECT SWITCH WITH 120V COIL, (2) NO/NC AUXILIARY CONTACTS, ELECTRONIC OVERLOAD RELAY, IN A NEMA 4X ENCLOSURE WITH A HINGED DOOR. PROVIDE DOOR MOUNTED START/STOP MOMENTARY PUSHBUTTON SWITCHES AND A GREEN RUNNING LIGHT. COORDINATE REQUIRED CONTROLS WITH MECHANICAL CONTRACTOR AND MODIFY AS REQUIRED. SET OVERLOAD RELAY ACCORDING TO MOTOR NAMEPLATE FULL LOAD AMPS. PROVIDE CONDUIT, WIRING AND CONTROLS. ENABLE CONTROL FROM CHILLER. PROVIDE NEMA 3R ENCLOSURE WITH THERMOSTATICALLY CONTROLLED HEATING AND COOLING.
- ⑪ PROVIDE CONDUIT AND WIRING FOR NEW CHILLER PLANT CONTROL PANEL. CONNECT TO SPARE CIRCUIT IN PANEL L. ALSO PROVIDE A RECEPTACLE FOR WATER TREATMENT PUMPS AND CONNECT TO SPARE CIRCUIT IN PANEL L. FOR PANEL SCHEDULE SEE DRAWING CHPD3-E-603.
- ⑫ PROVIDE CONDUIT AND WIRING FROM SPARE 20A, 1P BREAKER IN PANEL L FOR LEAK DETECTION SYSTEM CONTROL PANEL.
- ⑬ PROVIDE CONDUIT AND WIRING FROM SPARE 20A, 1P BREAKER IN PANEL L FOR FLOW METER CONTROL PANELS.
- ⑭ ROUTING OF NEW CONDUITS SHALL BE COORDINATED WITH EXISTING INSTALLATIONS AND SITE CONDITION.
- ⑮ FOR CONNECTION DETAILS SEE ONE LINE DIAGRAMS ON DRAWINGS CHPD3-E-600 AND CHPD3-E-601.



CONTRACT NO.  
FQ 14005D-13-03

DESIGNED S. KAMAL 11/13  
DATE  
DRAWN C. HILL 11/13  
DATE  
CHECKED A. FISHEL 11/13  
DATE  
APPROVED K. FOWLER 11/13  
DATE

REFERENCE DRAWINGS	
NUMBER	DESCRIPTION

REVISIONS		
DATE	BY	DESCRIPTION

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF TRANSIT INFRASTRUCTURE  
AND ENGINEERING SERVICES  
OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM

APPROVED \_\_\_\_\_

**GFP** A Gannett Fleming/Parsons  
JOINT VENTURE

SUBMITTED \_\_\_\_\_  
PROJECT MANAGER

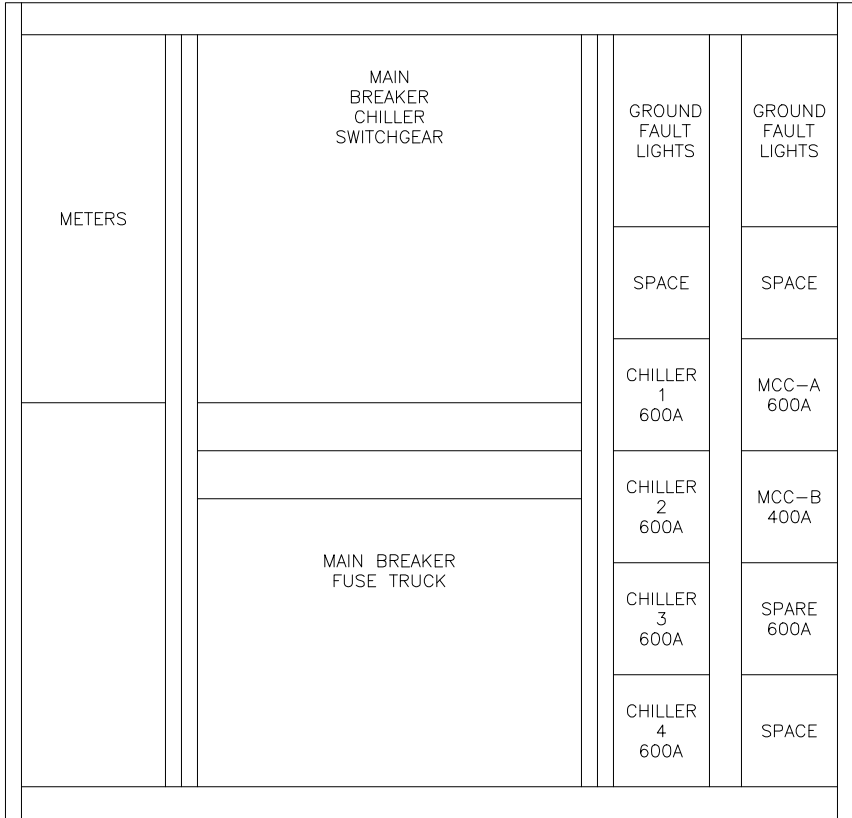
**CHPD3 CHILLER PLANT - POTOMAC AVENUE  
CHILLER REPLACEMENT  
CHILLER PLANT FLOOR PLAN  
ELECTRICAL NEW WORK**

SCALE  
3/16"=1'-0" 1 0 1 3 5 7

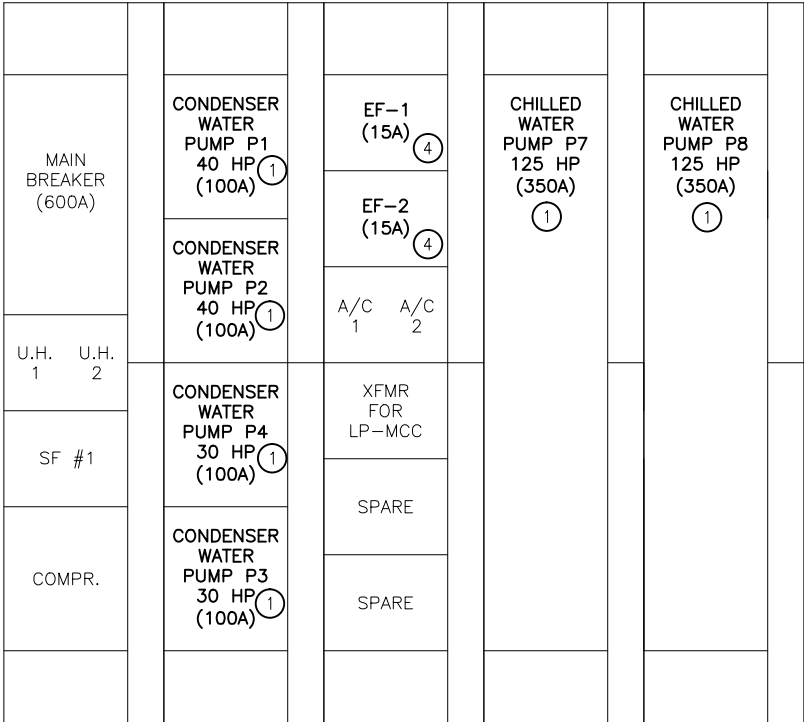
DRAWING NO.  
**CHPD3-E-110 M-0000-055**

NOTES:

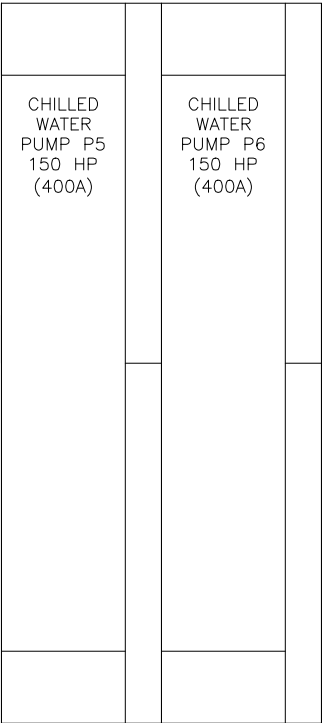
- ① REPLACE EXISTING BREAKER/STARTER WITH NEW BREAKER.
- ② REPLACE EXISTING BREAKER WITH NEW BREAKER.
- ③ DISCONNECT FROM THE WATER TREATMENT PUMPS AND REMOVE WIRING.
- ④ PROVIDE AND INSTALL NEW 15A, 3P BREAKER FOR EXHAUST FAN IN SPARE COMPARTMENT.
- ⑤ FOR CONNECTION DETAILS SEE ONE LINE DIAGRAMS ON DRAWINGS CHPC1-E-600 AND CHPC1-E-601.



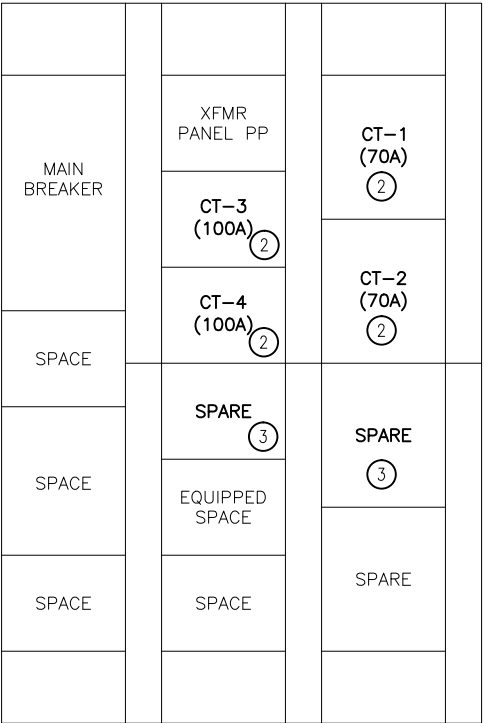
SWITCHBOARD



MCC-A SECTION 1

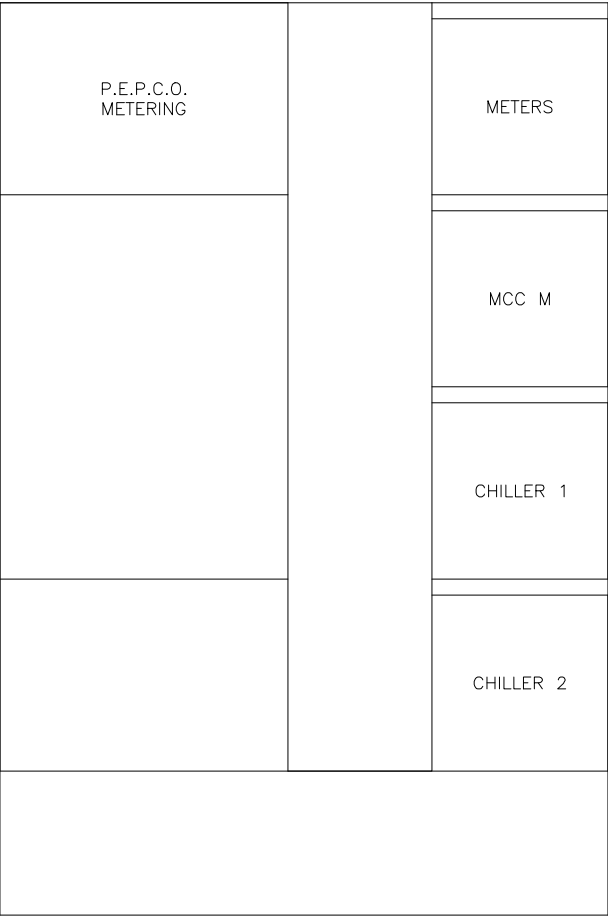


MCC-A SECTION 2



MCC-B

**NOTE:**  
1. THIS DRAWING IS FOR INFORMATION ONLY



**SWITCHBOARD**

CONTRACT NO.  
FQ 14005D-13-03

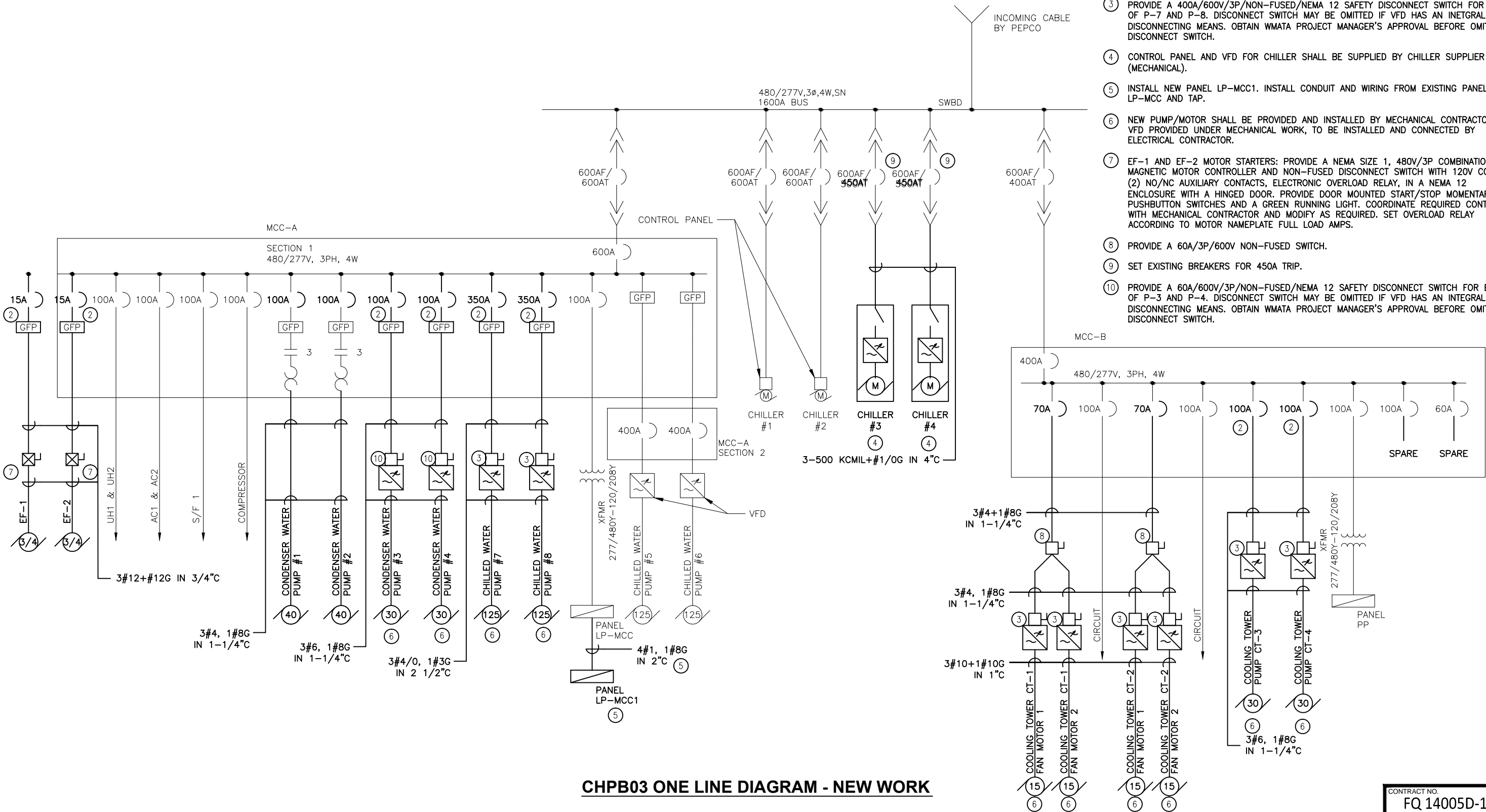
DESIGNED <u>S. KAMAL</u> 11/13 DATE 11/13		DRAWN <u>C. HILL</u> 11/13 DATE 11/13		CHECKED <u>A. FISHEL</u> 11/13 DATE 11/13		APPROVED <u>K. FOWLER</u> 11/13 DATE 11/13		REFERENCE DRAWINGS		REVISIONS		WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		CHPD3 CHILLER PLANT - POTOMAC AVENUE CHILLER REPLACEMENT SWITCHBOARD DETAILS	
NUMBER		DESCRIPTION		DATE		BY		DESCRIPTION				DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM		GFP A Gannett Fleming/Parsons JOINT VENTURE	
												APPROVED _____		SUBMITTED _____ PROJECT MANAGER	
														SCALE NONE	
														DRAWING NO. CHPD3-E-300 M-0000-057	





NOTES:

- 1 SEE EQUIPMENT SCHEDULES ON DWG CHPD3-E-602.
- 2 PROVIDE AND INSTALL NEW BREAKER WITH/WITHOUT GROUND FAULT PROTECTION AS SHOWN.
- 3 PROVIDE A 400A/600V/3P/NON-FUSED/NEMA 12 SAFETY DISCONNECT SWITCH FOR EACH OF P-7 AND P-8. DISCONNECT SWITCH MAY BE OMITTED IF VFD HAS AN INETGRAL DISCONNECTING MEANS. OBTAIN WMATA PROJECT MANAGER'S APPROVAL BEFORE OMITTING DISCONNECT SWITCH.
- 4 CONTROL PANEL AND VFD FOR CHILLER SHALL BE SUPPLIED BY CHILLER SUPPLIER (MECHANICAL).
- 5 INSTALL NEW PANEL LP-MCC1. INSTALL CONDUIT AND WIRING FROM EXISTING PANEL LP-MCC AND TAP.
- 6 NEW PUMP/MOTOR SHALL BE PROVIDED AND INSTALLED BY MECHANICAL CONTRACTOR. VFD PROVIDED UNDER MECHANICAL WORK, TO BE INSTALLED AND CONNECTED BY ELECTRICAL CONTRACTOR.
- 7 EF-1 AND EF-2 MOTOR STARTERS: PROVIDE A NEMA SIZE 1, 480V/3P COMBINATION MAGNETIC MOTOR CONTROLLER AND NON-FUSED DISCONNECT SWITCH WITH 120V COIL, (2) NO/NC AUXILIARY CONTACTS, ELECTRONIC OVERLOAD RELAY, IN A NEMA 12 ENCLOSURE WITH A HINGED DOOR. PROVIDE DOOR MOUNTED START/STOP MOMENTARY PUSHBUTTON SWITCHES AND A GREEN RUNNING LIGHT. COORDINATE REQUIRED CONTROLS WITH MECHANICAL CONTRACTOR AND MODIFY AS REQUIRED. SET OVERLOAD RELAY ACCORDING TO MOTOR NAMEPLATE FULL LOAD AMPS.
- 8 PROVIDE A 60A/3P/600V NON-FUSED SWITCH.
- 9 SET EXISTING BREAKERS FOR 450A TRIP.
- 10 PROVIDE A 60A/600V/3P/NON-FUSED/NEMA 12 SAFETY DISCONNECT SWITCH FOR EACH OF P-3 AND P-4. DISCONNECT SWITCH MAY BE OMITTED IF VFD HAS AN INTEGRAL DISCONNECTING MEANS. OBTAIN WMATA PROJECT MANAGER'S APPROVAL BEFORE OMITTING DISCONNECT SWITCH.



CHPB03 ONE LINE DIAGRAM - NEW WORK

DESIGNED S. KAMAL 11/13 DRAWN C. HILL 11/13 CHECKED S. KAMAL 11/13 APPROVED A. FISHEL 11/13			REFERENCE DRAWINGS			REVISIONS			WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY			CHPC01 CHILLER PLANT - METRO CENTER CHILLER REPLACEMENT ELECTRICAL ONE LINE DIAGRAM NEW WORK		
			NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION		DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM			GFP A Gannett Fleming/Parsons JOINT VENTURE		
									APPROVED _____			SUBMITTED _____ PROJECT MANAGER		
												SCALE NONE		
												DRAWING NO. CHPC1-E-601		
												M-0000-059		

VFD SCHEDULE

VFD MODEL	ENCLOSURE TYPE	VFD FOR	HP	VOLTS	PHASE	Hz
ABB ACH550-PDR-180A-4	NEMA/UL TYPE 12	CHP-7	125	460	3	60
ABB ACH550-PDR-180A-4	NEMA/UL TYPE 12	CHP-8	125	460	3	60
ABB ACH550-PDR-72A-4	NEMA/UL TYPE 12	CWP-1	40	480	3	60
ABB ACH550-PDR-72A-4	NEMA/UL TYPE 12	CWP-2	40	480	3	60
ABB ACH550-PDR-059A-4	NEMA/UL TYPE 12	CWP-3	30	460	3	60
ABB ACH550-PDR-059A-4	NEMA/UL TYPE 12	CWP-4	30	460	3	60
ABB ACH550-PDR-031A-4	NEMA/UL TYPE 3R (NOTE 1)	CT-1 MOTOR-1	15	460	3	60
ABB ACH550-PDR-031A-4	NEMA/UL TYPE 3R (NOTE 1)	CT-1 MOTOR-2	15	460	3	60
ABB ACH550-PDR-031A-4	NEMA/UL TYPE 3R (NOTE 1)	CT-2 MOTOR-1	15	460	3	60
ABB ACH550-PDR-031A-4	NEMA/UL TYPE 3R (NOTE 1)	CT-2 MOTOR-2	15	460	3	60
ABB ACH550-PDR-045A-4	NEMA/UL TYPE 3R (NOTE 1)	CT-3	30	460	3	60
ABB ACH550-PDR-045A-4	NEMA/UL TYPE 3R (NOTE 1)	CT-4	30	460	3	60

\* ALL ENCLOSURES SHALL BE SUPPLIED BY VFD MANUFACTURER

NOTES:

1. PROVIDE NEMA/UL TYPE 3R ENCLOSURE FOR VFD DRIVE WITH THERMOSTATICALLY CONTROLLED HEATING AND COOLING.
2. FLA VALUES SHOWN ARE BASED ON NEC TABLE 430.250.

EQUIPMENT

ITEM	CAPACITY	VOLTS	PHASE	Hz	HP	FLA (NOTE 2)	RLA	COMPRESSOR LRA	QTY	MOCp	MCA
CHILLER #3	—	460	3	60	—	—	286	176	2	450	322
CHILLER #4	—	460	3	60	—	—	286	176	2	450	322
CHP-7	—	460	3	60	125	156	—	—	—	—	—
CHP-8	—	460	3	60	125	156	—	—	—	—	—
CWP-1	—	460	3	60	40	52	—	—	—	—	—
CWP-2	—	460	3	60	40	52	—	—	—	—	—
CWP-3	—	460	3	60	30	40	—	—	—	—	—
CWP-4	—	460	3	60	30	40	—	—	—	—	—
CT-1	—	460	3	60	2 X 15	42	—	—	—	—	—
CT-2	—	460	3	60	2 X 15	42	—	—	—	—	—
CT-3	—	460	3	60	30	40	—	—	—	—	—
CT-4	—	460	3	60	30	40	—	—	—	—	—
EF-1	—	480	3	60	3/4	1.6	—	—	—	—	—
EF-2	—	480	3	60	3/4	1.6	—	—	—	—	—

CONTRACT NO.  
FQ 14005D-13-03

<div>DESIGNED <u>S. KAMAL</u> 11/13 DATE 11/13</div> <div>DRAWN <u>C. HILL</u> 11/13 DATE 11/13</div> <div>CHECKED <u>S. KAMAL</u> 11/13 DATE 11/13</div> <div>APPROVED <u>A. FISHEL</u> 11/13 DATE 11/13</div>	REFERENCE DRAWINGS		REVISIONS				WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY	<div>DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM</div>	<div>A Gannett Fleming/Parsons JOINT VENTURE</div>	<div>CHPC01 CHILLER PLANT - METRO CENTER CHILLER REPLACEMENT ELECTRICAL EQUIPMENT SCHEDULES</div>
	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION					
APPROVED _____					SUBMITTED _____ PROJECT MANAGER					
SCALE NONE					DRAWING NO. CHPC1-E-602		M-0000-060			

EXISTING PANEL: "LP-MCC"  LIGHTING AND APPLIANCE PANEL			LOCATION:		METRO CENTER CHILLER PLANT												
			SERVICE:		120 / 208 V, 3 PH					FULL NEUTRAL, NON-IG							
			FRAME:		100 AMPS					MAIN BREAKER:					100 AMPS		
			MOUNTING:		SURFACE												
			INTERRUPTING CURRENT:		10,000 AMPS												
Wiring Size		Load Description	Load kVA	Brkr P	Brkr Trip	Ckt No	KVA			Ckt No	Brkr Trip	P	Load kVA	Load Description	Wiring Size		
Cond.	Wire						A	B	C						Wire	Cond.	
		SPACE		1	1	1	0.0				2	100	3	0.00	MAIN	EXISTING	EXIST.
EXIST.	EXISTING	CHILLER	0.00	1	15	3		0.0			4						
EXIST.	EXISTING	CHILLER	0.00	1	15	5			0.0		6						
EXIST.	EXISTING	CHILLER	0.00	1	20	7	0.0				8	20	1	0.00	SPARE(NOTE 1)	EXISTING	EXIST.
EXIST.	EXISTING	SUMP	0.00	1	20	9		0.0			10	20	1	0.00	FA CONTROL PANEL	EXISTING	EXIST.
EXIST.	EXISTING	LIGHTS	0.00	1	20	11			0.0		12	20	1	0.00	CH. WTR. FLOW MONITOR PNL	EXISTING	EXIST.
EXIST.	EXISTING	CHILLER 3	0.00	1	20	13	0.0				14	20	1	0.00	SWBD HTIRS	EXISTING	EXIST.
EXIST.	EXISTING	CHILLER 4	0.00	1	20	15		0.0			16	20	1	0.00	AEMS UNIT IHTR CONTROLS	EXISTING	EXIST.
EXIST.	EXISTING	REC	0.00	1	20	17				0.0	18	20	1	0.00	LEAK. MONITORING AND CTRL.	EXISTING	EXIST.
Subtotal Load Per Phase, KVA							0.0	0.0	0.0								
Total connected load, KVA							0.0										

NOTE:

1. REMOVE EXISTING WIRING BETWEEN  
PANEL AND EXHAUST FAN EF-1

PANEL: "LP-MCC1"				LOCATION: METRO CENTER CHILLER PLANT												
LIGHTING AND APPLIANCE PANEL				SERVICE: 120 / 208 V, 3 PH				FULL NEUTRAL, NON-IG				FRAME: 100 AMPS MAIN BREAKER: 50 AMPS				
				MOUNTING: SURFACE												
				INTERRUPTING CURRENT: 10,000 AMPS												
Wiring Size		Load Description	Load kVA	Brkr P	Ckt Trip	Ckt No	KVA			Ckt No	Brkr Trip	P	Load kVA	Load Description	Wiring Size	
Cond.	Wire						A	B	C						Wire	Cond.
		SPARE		1	20	1	0.0			2	20	1		SPARE		
		SPARE		1	20	3		0.6		4	20	1	0.60	4 REC WATER TREATMENT SYS.	2#12+1#12G	3/4"
3/4"	2#12+1#12G	CHILLER MONITORING PNL.	1.00	1	20	5		1.6		6	20	1	0.60	4 REC WATER TREATMENT SYS.	2#12+1#12G	3/4"
3/4"	2#12+1#12G	4 REC WATER TREATMENT SYS.	0.60	1	20	7	1.6			8	20	1	1.00	CHILLER MONITORING PNL.	2#12+1#12G	3/4"
3/4"	2#12+1#12G	4 REC WATER TREATMENT SYS.	0.60	1	20	9		0.6		10	20	1		SPARE		
		SPARE		1	20	11			0.0	12	20	1		SPARE		
		SPARE		1	20	13	0.0			14	20	1		SPARE		
		SPARE		1	20	15		0.0		16	20	1		SPARE		
		SPARE		1	20	17			0.0	18	20	1		SPARE		
Subtotal Load Per Phase, KVA							1.6	1.2	1.6							
Total connected load, KVA							4.4									
Total Connected Lighting Load, kVA -			0.00	Maximum Demand @			100%	-	0.0	KVA						
Total Connected Receptacle Load, kVA -			2.40	Maximum Demand per NEC			-	2.4	KVA			Total Maximum Demand: 3.8 KVA				
Total Connected Shop Equipment Load, kVA -			0.00	Maximum Demand @			40%	-	0.0	KVA			with 20% spare: 4.6 KVA			
Total Connected Mech. Load, kVA -			2.00	Maximum Demand @			70%	-	1.4	KVA			Minimum Protection: 16 A			
Total Connected A/C (summer), kVA -			0.00	Maximum Demand @			70%	-	0.0	KVA			Selected Main Circuit Bkr: 50 A			
Total Connected Heating (winter), kVA -			0.00	Maximum Demand @			70%	-	0.0	KVA			Panel Feeder: 4-#8+10G in 1 1/4" C			
Total Connected 24-Hr A/C, kVA -			0.00	Maximum Demand @			100%	-	0.0	KVA			Panel Feeder Voltage Drop: 0.00 %			
Total Connected Kitchen Load, kVA -			0.00	Maximum Demand @			65%	-	0.0	KVA						
Total Laundry Equipment, kVA -			0.00	Maximum Demand @			100%	-	0.0	KVA						
Total Miscellaneous, kVA -			0.00	Maximum Demand @			100%	-	0.0	KVA						
Total Elevators, kVA -			0.00	Maximum Demand @			50%	-	0.0	KVA						
Total Escalators, kVA -			0.00	Maximum Demand @			80%	-	0.0	KVA						
Sub Panel Load (Included in Totals Above) -			0.00	(Includes sub-panel loads)			Winter Demand	-	3.8	KVA						
							Summer Demand	-	3.8	KVA						

										CONTRACT NO. FQ 14005D-13-03			
DESIGNED <u>S. KAMAL</u>		11/13	REFERENCE DRAWINGS		REVISIONS			WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY			CHPC01 CHILLER PLANT - METRO CENTER CHILLER REPLACEMENT		
DATE		11/13	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION	DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES			ELECTRICAL PANEL SCHEDULES		
DRAWN <u>C. HILL</u>		11/13						OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM			SCALE NONE		
DATE		11/13						APPROVED _____			SUBMITTED _____		DRAWING NO.
CHECKED <u>S. KAMAL</u>		11/13									PROJECT MANAGER		CHPC1-E-603
DATE		11/13											M-0000-061
APPROVED <u>A. FISHEL</u>		11/13											
DATE		11/13											









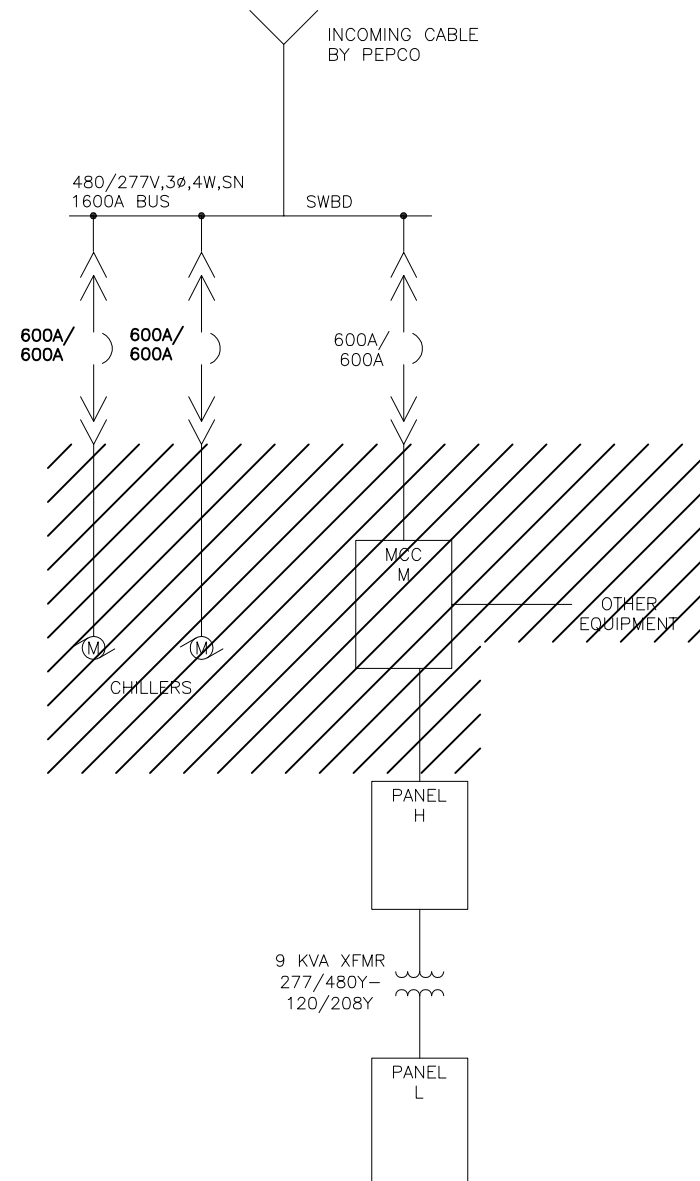
\* PROVIDE NEW MOTOR RATED CIRCUIT BREAKER AND PROVIDE NEW WIRING  
\*\* PROVIDE NEW WIRING TO SPARE CIRCUIT BREAKER

\* CONNECT WIRING TO EXISTING SPARE CIRCUIT BREAKER

SUBMITTED \_\_\_\_\_  
PROJECT MANAGER


**NOTE:**

CHILLERS AND PUMP MOTORS TO BE DEMOLISHED  
BY OTHERS. SEE MECHANICAL DWGS FOR DETAILS.



### CHPD03 ONE LINE DIAGRAM - DEMOLITION

CONTRACT NO.  
FQ 14005D-13-03

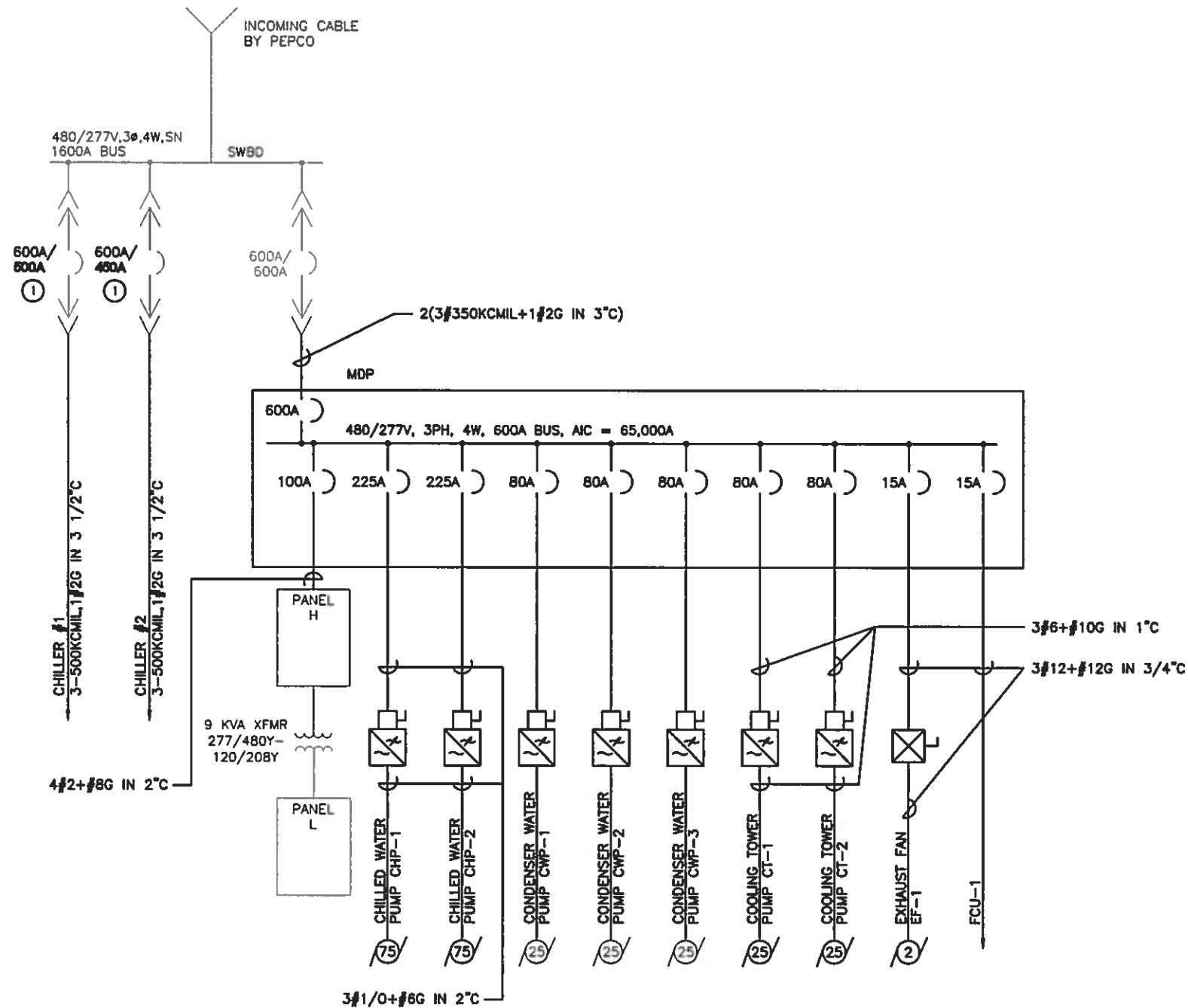
DESIGNED	<u>S. KAMAL</u>	11/13	REFERENCE DRAWINGS			REVISIONS			WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY			CHPD3 CHILLER PLANT - POTOMAC AVENUE CHILLER REPLACEMENT		
DRAWN	<u>C. HILL</u>	DATE	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION	DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES			 A Gannett Fleming/Parsons JOINT VENTURE	ONE LINE DIAGRAM DEMOLITION		
CHECKED	<u>A. FISHEL</u>	11/13						OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM				SCALE	DRAWING NO.	
APPROVED	<u>K. FOWLER</u>	DATE						APPROVED				NONE	CHPD3-E-600	M-0000-066
		11/13						SUBMITTED						
		DATE						PROJECT MANAGER						

**NOTE:**

SEE EQUIPMENT SCHEDULES ON DWG CHPD3-E-603 FOR WIRE AND CONDUIT SIZES.

**DRAWING NOTES:**

- ① SET CB ADJUSTABLE TRIP AS SHOWN



**CHPD03 ONE LINE DIAGRAM - NEW WORK**

CONTRACT NO.  
FQ 14005D-13-03

DESIGNED <u>S. KAWAL</u> DATE <u>11/13</u>	REFERENCE DRAWINGS		REVISIONS		WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM		<b>CHPD3 CHILLER PLANT - POTOMAC AVENUE CHILLER REPLACEMENT ONE LINE DIAGRAM NEW WORK</b>		SCALE NONE	DRAWING NO. <b>CHPD3-E-601</b>	<b>M-0000-067</b>
	DRAWN <u>C. HILL</u> DATE <u>11/13</u>	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION					
CHECKED <u>A. FISHEL</u> DATE <u>11/13</u>							<b>GFP</b> A Bennett Fleming/Parsons JOINT VENTURE				
APPROVED <u>K. FOWLER</u> DATE <u>11/13</u>											
							APPROVED _____	SUBMITTED _____ PROJECT MANAGER			

VFD SCHEDULE

VFD MODEL	ENCLOSURE TYPE*	VFD FOR	HP	VOLTS	PHASE	Hz
ABB ACH550-PDR-125A-4	NEMA/UL TYPE 12	CHP-1	100	460	3	60
ABB ACH550-PDR-125A-4	NEMA/UL TYPE 12	CHP-2	100	460	3	60
ABB ACH550-PDR-045A-4	NEMA/UL TYPE 12	CWP-1	30	460	3	60
ABB ACH550-PDR-045A-4	NEMA/UL TYPE 12	CWP-2	30	460	3	60
ABB ACH550-PDR-045A-4	NEMA/UL TYPE 12	CWP-3	30	460	3	60
ABB ACH550-PDR-045A-4	NEMA/UL TYPE 3R (NOTE 1)	CT-1	30	460	3	60
ABB ACH550-PDR-045A-4	NEMA/UL TYPE 3R (NOTE 1)	CT-2	30	460	3	60
ABB ACH550-PDR-06A9-4	NEMA/UL TYPE 3R (NOTE 1)	EF-1	3	460	3	60

\* ALL ENCLOSURES SHALL BE SUPPLIED BY THE VFD MANUFACTURER.

EQUIPMENT

ITEM	CAPACITY	VOLTS	PHASE	Hz	HP	FLA	RLA	COMPRESSOR LRA	QTY	MOCP	MCA
CHILLER #1	350 TON	460	3	60	—	—	274	176	2	500	353
CHILLER #2	336 TON	460	3	60	—	—	274	176	2	450	317
FCU-1	11 TON	460	3	60	3/4	—	—	—	—	—	1.6
CHP-1	—	460	3	60	75	96	—	—	—	—	—
CHP-2	—	460	3	60	75	96	—	—	—	—	—
CWP-1	—	460	3	60	25	34	—	—	—	—	—
CWP-2	—	460	3	60	25	34	—	—	—	—	—
CWP-3	—	460	3	60	25	34	—	—	—	—	—
CT-1	—	460	3	60	25	34	—	—	—	—	—
CT-2	—	460	3	60	25	34	—	—	—	—	—
EF-1	—	460	3	60	2	3.4	—	—	—	—	—

NOTE:

1. PROVIDE NEMA/UL TYPE 3R ENCLOSURE FOR VFD DRIVE WITH THERMOSTATICALLY CONTROLLED HEATING AND COOLING

CONTRACT NO.  
FQ 14005D-13-03

<div>DESIGNED <u>S. KAMAL</u> 11/13 DATE 11/13 DRAWN <u>C. HILL</u> 11/13 DATE 11/13 CHECKED <u>A. FISHEL</u> 11/13 DATE 11/13 APPROVED <u>K. FOWLER</u> 11/13 DATE 11/13</div>	REFERENCE DRAWINGS		REVISIONS				WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY	<div>CHPD3 CHILLER PLANT - POTOMAC AVENUE CHILLER REPLACEMENT ELECTRICAL EQUIPMENT SCHEDULES</div>	
	NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION				
DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM					<div>A Gannett Fleming/Parsons JOINT VENTURE</div>		SCALE NONE	DRAWING NO. CHPD3-E-602	M-0000-068
APPROVED _____					SUBMITTED _____ PROJECT MANAGER				



EXISTING PANEL: "L" LIGHTING AND APPLIANCE PANEL				LOCATION: CHILLER PLANT - GROUND FLOOR SERVICE: 120 / 208 V, 3 PH FULL NEUTRAL, EG FRAME: 100 AMPS MAIN LUGS ONLY MOUNTING: SURFACE INTERRUPTING CURRENT: 10,000 AMPERES												
Wiring Size		Load Description	Load kVA	P	Brkr Trip	Ckt No	KVA			Ckt No	Brkr Trip	P	Load kVA	Load Description	Wiring Size	
Cond.	Wire						A	B	C						Wire	Cond.
		MAIN		3	60	1	0.0			2	20	1		ROOF EX FAN		EXISTING
						3		0.0		4	20	1		MAKE UP HEATER		EXISTING
						5		0.0		6	20	1		CHEM STAT.		EXISTING
EXISTING		FREON SENSOR		1	20	7	0.0			8	20	1		REC		EXISTING
EXISTING		WALL RECEPT.		1	20	9		0.0		10	20	1		UNKNOWN CIRCUIT		EXISTING
EXISTING		AEMS RTU		1	20	11		0.0		12	20	1		UNKNOWN CIRCUIT		EXISTING
EXISTING		UNKNOWN CIRCUIT		1	20	13	0.0			14	20	1		UNKNOWN CIRCUIT		EXISTING
EXISTING		AEMS CNTL		1	20	15		0.0		16	20	1		UNKNOWN CIRCUIT		EXISTING
EXISTING		UNKNOWN CIRCUIT		1	20	17		0.0		18	20	1		UNKNOWN CIRCUIT		EXISTING
EXISTING		UNKNOWN CIRCUIT		1	20	19	0.0			20	20	1		UNKNOWN CIRCUIT		EXISTING
EXISTING		UNKNOWN CIRCUIT		2	20	21		0.0		22	20	1		RECEPT. IN CHILLER 1		EXISTING
						23		0.0		24	20	1		RECEPT. IN CHILLER 2		EXISTING
Subtotal Load Per Phase, KVA							0.0	0.0	0.0							
Total connected load, KVA								9.0								

FOR INFORMATION ONLY.

EXISTING PANEL: "H" EQUIPMENT PANEL			LOCATION: CHILLER PLANT - GROUND FLOOR SERVICE: 277 / 480 V, 3 PH FULL NEUTRAL, EG FRAME: 100 AMPS MAIN LUGS ONLY MOUNTING: SURFACE INTERRUPTING CURRENT: 14,000 AMPERES														
Wiring Size		Load kVA	P	Brkr Trip	Ckt No	KVA			Ckt No	Brkr Trip	P	Load kVA	Load Description	Wiring Size			
Cond.	Wire					A	B	C						Wire	Cond.		
	EXISTING		1	20	1	0.0			2	20	1		UNKNOWN CIRCUIT		EXISTING		
			1		3		0.0		4	20	1		UNKNOWN CIRCUIT		EXISTING		
	EXISTING		1	20	5			0.0	6	20	1		UNKNOWN CIRCUIT		EXISTING		
	EXISTING		3	20	7	0.0			8	20	3		UNKNOWN CIRCUIT		EXISTING		
					9		0.0		10								
					11			0.0	12								
	EXISTING	PANEL L	9.00	3	20	13	3.0		14		1		SPACE				
					15		3.0		16		1		SPACE				
					17			3.0	18		1		SPACE				
		SPACE		1	19	0.0			20		1		SPACE				
		SPACE		1	21		0.0		22		1		SPACE				
		SPACE		1	23			0.0	24		1		SPACE				
Subtotal Load Per Phase, KVA						3.0	3.0	3.0									
Total connected load, KVA							55.0										

FOR INFORMATION ONLY.

										CONTRACT NO. FQ 14005D-13-03									
DESIGNED <u>S. KAMAL</u>		11/13 DATE		REFERENCE DRAWINGS			REVISIONS			WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM		CHPD3 CHILLER PLANT - POTOMAC AVENUE CHILLER REPLACEMENT ELECTRICAL PANEL SCHEDULES							
DRAWN <u>C. HILL</u>		11/13 DATE		NUMBER	DESCRIPTION		DATE	BY	DESCRIPTION										
CHECKED <u>A. FISHEL</u>		11/13 DATE																	
APPROVED <u>K. FOWLER</u>		11/13 DATE																	
										APPROVED _____		SUBMITTED _____		PROJECT MANAGER					
												SCALE NONE		DRAWING NO. CHPD3-E-603					
														M-0000-069					