Serial Number: IFB-FQ14005/RLJ
Date of IFB Issue: April 30, 2015
Date of Bid Opening: June 3, 2015, 2:00 P.M.

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
600 FIFTH STREET, NW
WASHINGTON, DC 20001

Amendment Date: May 26, 2015

AMENDMENT NO. 1
to
IFB FQ14005/RLJ, Replace Five Chillers
Crystal City, Metro Center and Potomac Avenue Metrorail Stations
DC and VA
TO WHOM IT MAY CONCERN:

The Bidding documents accompanying IFB-FQ14005/RLJ for solicitation of bids for the above services are hereby changed in part as follows:

1. The following pages have been revised.

Delete the following pages			Substitute the accompanying pages		
Volume	Page		Volume	Page	
3	M-0000-012		3	M-0000-012	Revised AM - 1
3	M-0000-014		3	M-0000-014	Revised AM - 1
3	M-0000-016		3	M-0000-016	Revised AM - 1
3	M-0000-023		3	M-0000-023	Revised AM - 1
3	M-0000-024		3	M-0000-024	Revised AM - 1
3	M-0000-025		3	M-0000-025	Revised AM - 1
3	M-0000-026		3	M-0000-026	Revised AM - 1
3	M-0000-027		3	M-0000-027	Revised AM - 1
3	M-0000-008		3	M-0000-008	Revised AM - 1
1	Page 112		1	Page 112	Revised AM - 1
1	Page 116		1	Page 116	Revised AM - 1
1	Page 124		1	Page 124	Revised AM - 1

Washington Metropolitan Area Transit Authority

600 Fifth Street, NW
Washington, D.C. 20001
202/962-1234

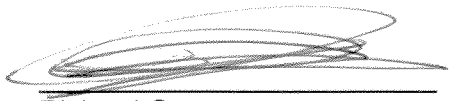
By Metrorail:
Judiciary Square-Red Line
Gallery Place-Chinatown
Red, Green and Yellow Lines

A District of Columbia Maryland and Virginia Transit Partnership

2. Acknowledgment

Bidders are required to acknowledge receipt of this amendment in writing on the Bid Form in the space provided on the Bid Form and on the Bid Envelope.

Failure to acknowledge all amendments may cause the bid to be considered not responsive to the invitation, which would require rejection of the Bid.



Richard Owens
Contracting Officer

End of Amendment

1.75 Availability of Funds For the Next Fiscal Years

Funds are not presently available for performance under this contract beyond the fiscal year which ends June 30, 2015**.** The Authority's obligation for performance of this contract beyond that date is contingent upon the availability of funds from which payment for contract purposes can be made. No legal liability on the part of the Authority for any payment may arise for performance under this contract until funds are made available to the Contracting Officer for performance and until the Contractor receives notice of availability, to be confirmed in writing, by the Contracting Officer. Any option exercised by the Authority which will be performed in whole or in part in a subsequent fiscal year is subject to availability of funds in the subsequent fiscal year and will be governed by the terms of this provision.

1.76 Living Wage

This contract is subject to the Authority's Living Wage Policy and implementing regulations. The Living Wage provision is required in all contracts for services (including construction) awarded in an amount that exceeds $100,000 in a 12-month period.

(a) The Authority Living Wage Rate is adjusted annually by WMATA on or about January 1 based on the average wage rates of local jurisdictions with a living wage policy and may be reduced by the contractor's per-employee cost for health insurance.

a. The Authority Living Wage Rate for calendar year 2014 is ### **$13.48** ### **AM-**1 per hour.

b. The Contractor shall:

(1) Pay, at a minimum, the Authority Living Wage Rate, effective during the time the work is performed, to all employees who perform work under this contract, except as otherwise provided in paragraph (d) below;

(2) Include the Living Wage clause in all subcontracts that exceed $15,000 in a 12-month period awarded under this contract;

(3) Maintain payroll records, in accordance with the retention and examination of records requirements in the General Provisions, and include or cause to be included, the substance of this section, including this paragraph (3), in it subcontracts covered by the Living Wage requirement at all tiers; and

(4) Submit records with each monthly invoice supporting payment of the Living Wage Rate.

c. The Contractor shall not split or subdivide a contract, pay an employee through a third party, or treat an employee as a subcontractor or independent contractor to avoid compliance with the Living Wage provisions.

d. Exemptions to the Living Wage provisions include:

(1) Contracts and agreements with higher negotiated wage rates;

(2) Contracts that are subject to higher wage rates required by federal law or collective bargaining agreements (e.g., Davis Bacon);

(3) Contracts or agreements for regulated utilities;

(4) Emergency services to prevent or respond to a disaster or imminent threat to public health and safety; and

b. Phase 2 - October 15, 2016 - May 15, 2017 ###Revised AM-1###
###If WMATA issues Phase II NTP, Notice will be issued NLT August 20, 2016.###

1. Complete chillers at Potomac chiller plant (2).

2. Between NTP and October 15, 2016, the contractor shall perform the following activities

a. Site visits, field measurements, etc.
b. Submittals – All submittals for the work associated with Phase 1
c. If fabrication and delivery occurs prior to commencement of the Construction Period, the General Provisions 1.7 Payments, d. shall be utilized for Stored Material

3. All Phase 2 construction activities must be completed by May 15, 2017

a. Between October 15, 2016 and May 15, 2017 - Contractor shall perform construction activities subject to the limitations contained elsewhere in the contract documents.

c. Delivery

1. Material delivery may be made to a contractor controlled facility in advance of installation at the chiller plant(s). Material shall not be stored in WMATA facility nor the worksite, prior to the installation timeframe.

d. No construction activities shall occur in Metrorail stations.

In the event the signed Contract with required insurance and bonds is not returned to the Authority within ten (10) calendar days after date of award and/or further, if approval has not been obtained within that ten (10)-day period for the Safety Superintendent, the Contracting Officer or other delegated Authority's Representative may issue the NTP and Contract time will start upon its receipt. However, no work at the site shall be performed until the above requirements have been met. When NTP is issued by facsimile, the date of the facsimile transmission shall constitute receipt.

2.1.1 Material delivery may be to a contractor controlled facility in advance of installation at the WMATA metro station(s). The contractor shall store the materials off the worksite. No storage shall be allowed in public areas including the platforms.

2.1.3 Substantial Completion Inspection

The Authority shall conduct Substantial Completion Inspections for each Phase. The Substantial Completion date shall establish the cut-off date for liquidated damages liability.

2.1.6 Work Restrictions ###Revised AM-1####

a. The Contractor shall not schedule any work activities on July 3rd, July 4th, and July 5th of each calendar year. In addition, the Contractor may be denied access on a particular work day because of an operational emergency which would not allow for an escort to be present on the work site; such as other duties required for severe weather conditions. Refer to the General Provisions for "damages for delay and time extensions".

b. It may be necessary to extend Metrorail revenue hours to accommodate special events. Contractor will be kept informed of special events that may impact work hours so that work can be planned accordingly.

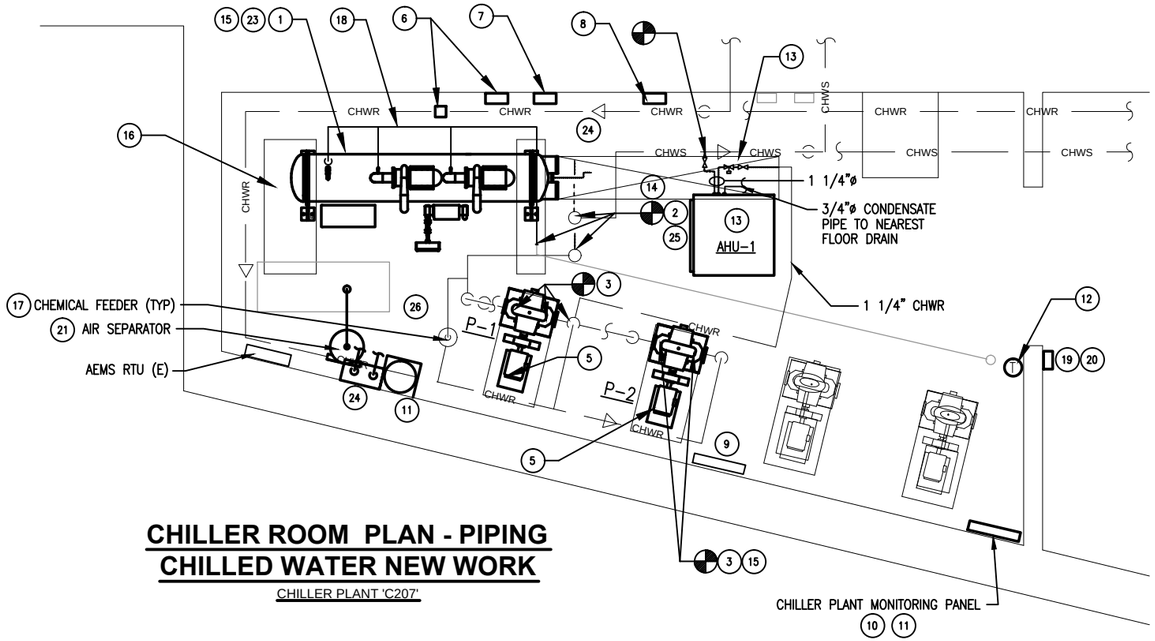
c. WMATA Metrorail hours of operation are published in the web site at www.wmata.com and are subject to change. Currently the hours of operation are as follows:

Day	Opening	Closing
Monday – Thursday	5:00 a.m.	Midnight
Friday	5:00 a.m.	3:00 a.m. Saturday
Saturday	7:00 a.m.	3:00 a.m. Sunday
Sunday	7:00 a.m.	Midnight

*Non-Revenue Hours are; All hours outside of WMATA Metrorail hours of operation as detailed in SP 2.1.6 – Work Restriction.###

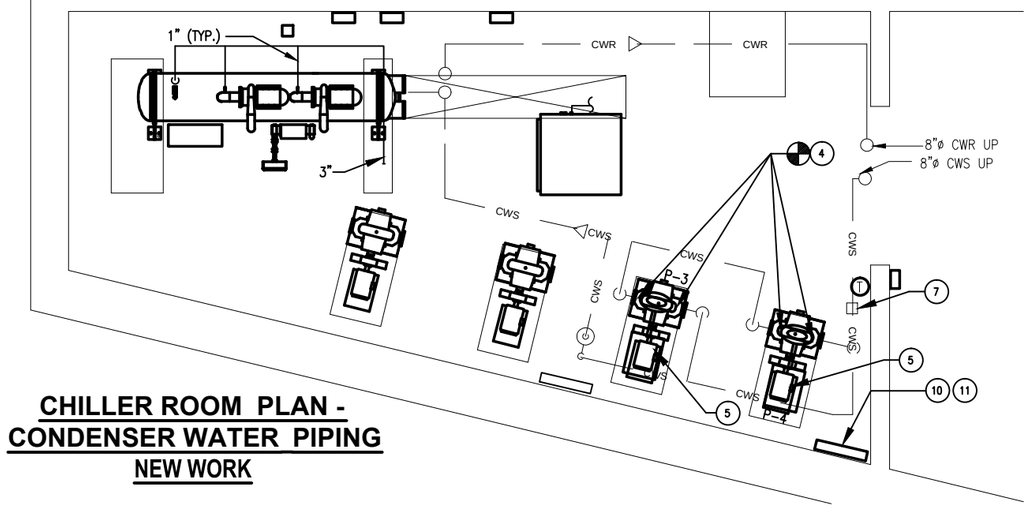
d. Metrorail and work train movements occur 24 hours a day, seven days a week. Not all trains are for revenue operations.

e. Upon issuance of NTP, contract time will start. When NTP is issued by facsimile, the date of the facsimile transmission shall constitute receipt.



CHILLER ROOM PLAN - PIPING
CHILLED WATER NEW WORK

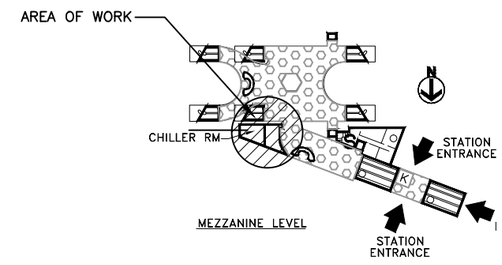
CHILLER PLANT 'C207'



CHILLER ROOM PLAN - CONDENSER WATER PIPING NEW WORK

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.



KEY PLAN

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

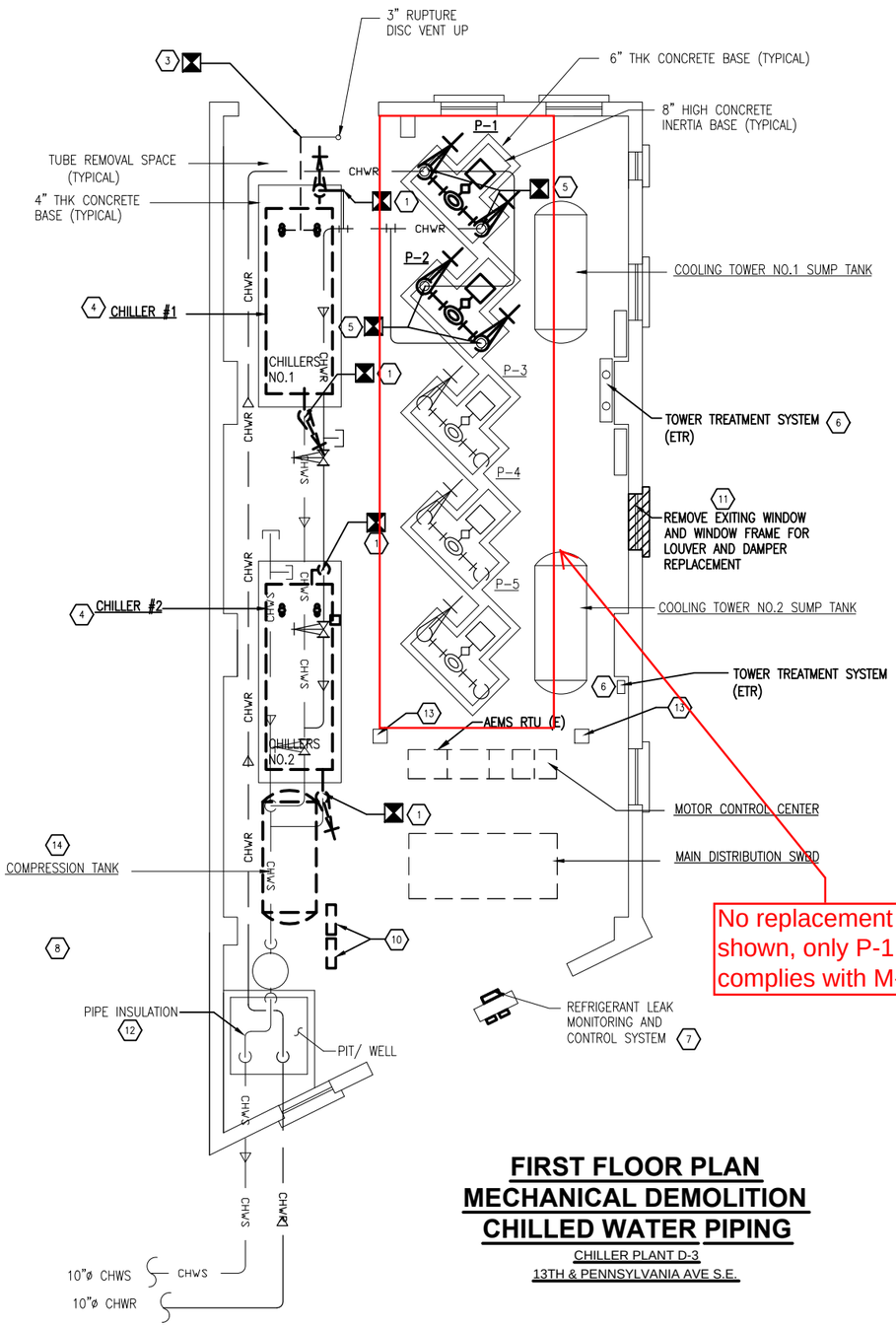
CRYSTAL CITY CHILLER PLANT
FLOOR PLAN - MECHANICAL NEW WORK

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

DRAWING NO. CHPC5-M-110

M-0000-012

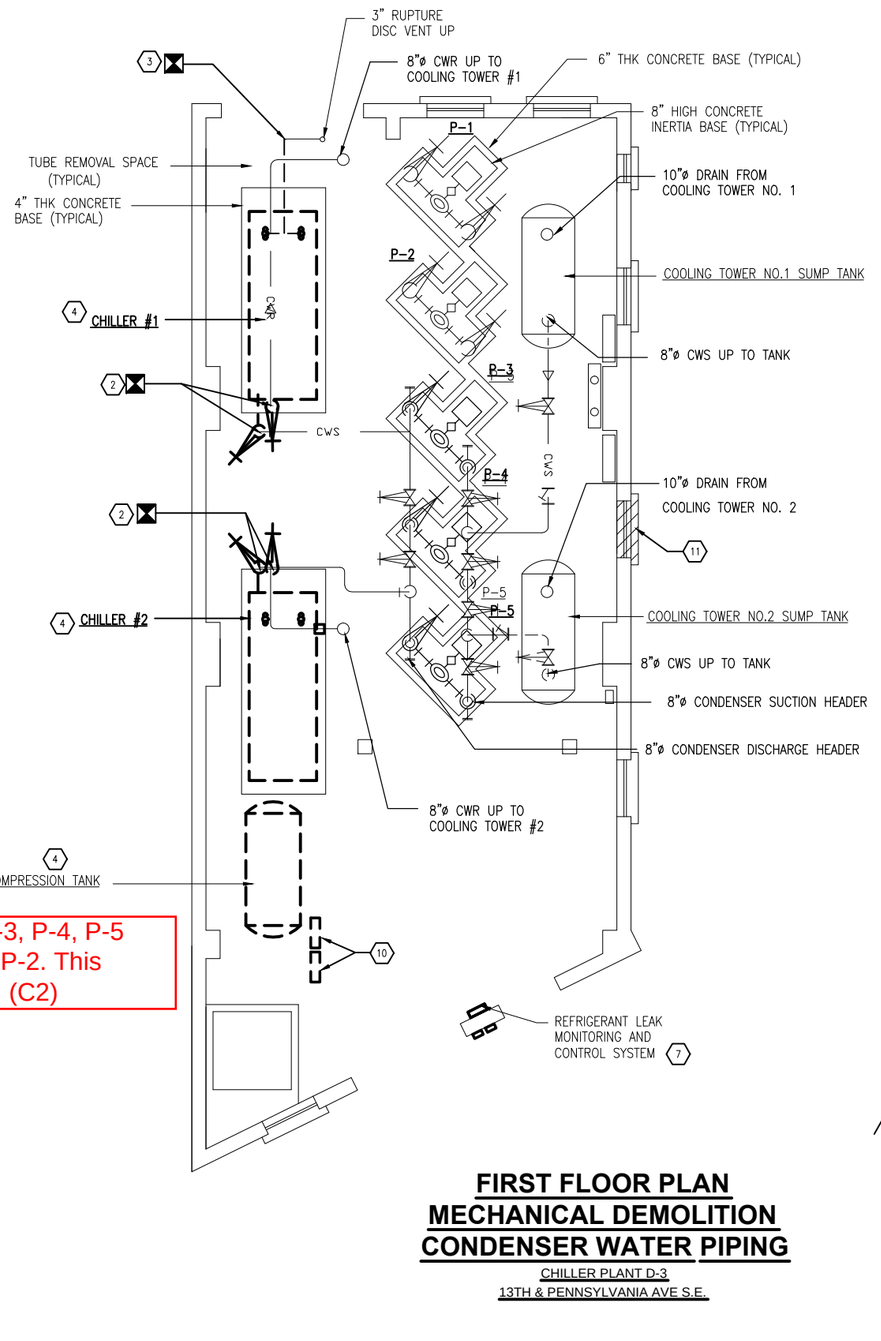
Revised AM=1



No replacement of P-3, P-4, P-5 shown, only P-1 and P-2. This complies with M-602. (C2)

FIRST FLOOR PLAN MECHANICAL DEMOLITION CHILLED WATER PIPING

CHILLER PLANT D-3
13TH & PENNSYLVANIA AVE S.E.

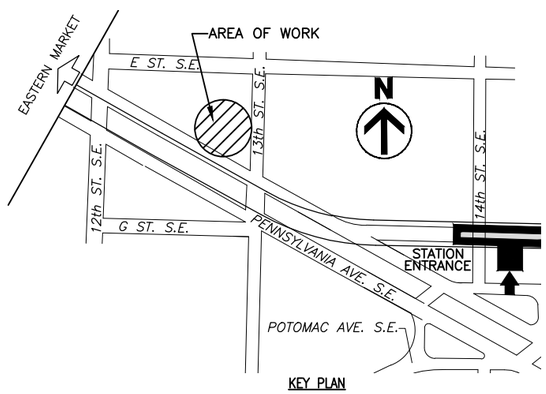


FIRST FLOOR PLAN MECHANICAL DEMOLITION CONDENSER WATER PIPING

CHILLER PLANT D-3
13TH & PENNSYLVANIA AVE S.E.

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. RREMOVE, 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.



KEY PLAN

CONTRACT NO.
FQ 14005D-13-03

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

REFERENCE DRAWINGS

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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

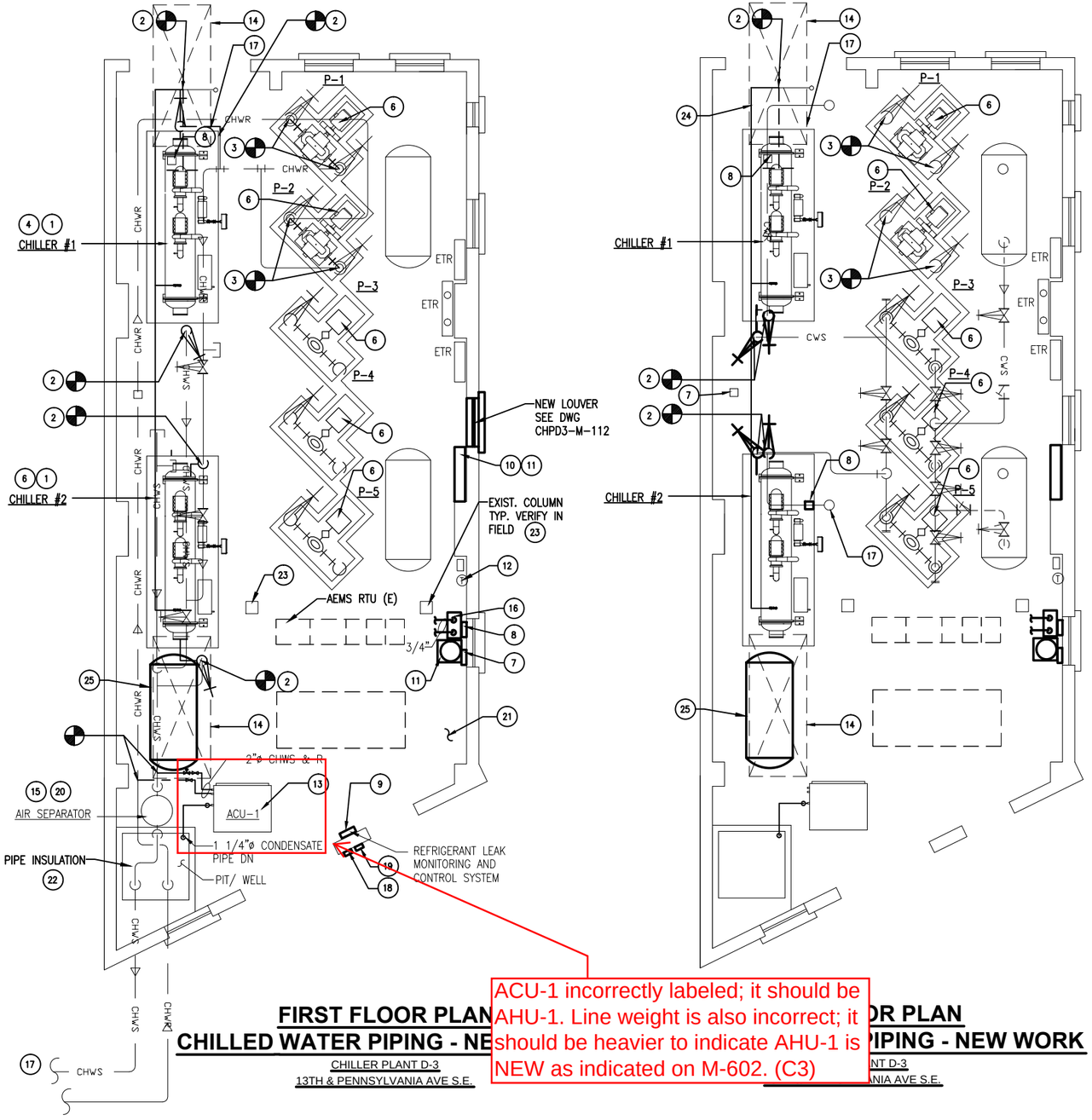
POTOMAC AVE STATION CHILLER PLANT-FLOOR PLAN MECHANICAL DEMOLITION SHEET 1 OF 2

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

DRAWING NO. CHPD3-M-100

M-0000-014

Revised AM-1



FIRST FLOOR PLAN
CHILLED WATER PIPING - NE
CHILLER PLANT D-3
13TH & PENNSYLVANIA AVE S.E.

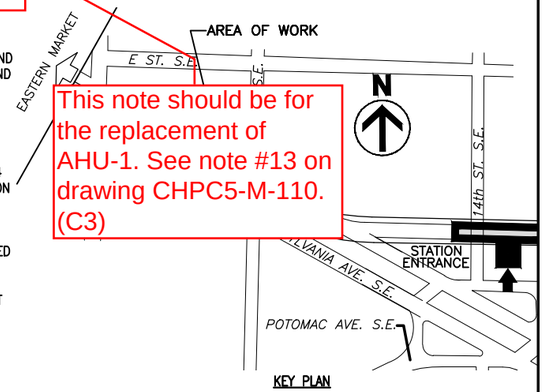
OR PLAN
IPING - NEW WORK
NT D-3
ANIA AVE S.E.

ACU-1 incorrectly labeled; it should be AHU-1. Line weight is also incorrect; it should be heavier to indicate AHU-1 is NEW as indicated on M-602. (C3)

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-515). 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)

This note should be for the replacement of AHU-1. See note #13 on drawing CHPC5-M-110. (C3)



KEY PLAN

CONTRACT NO.
FQ 14005D-13-03

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

METRO CENTER, POTOMAC AVE, & CRYSTAL CITY CHILLER REPLACEMENTS

POTOMAC AVE STATION CHILLER PLANT-FLOOR PLAN
MECHANCAL NEW WORK SHEET 1 OF 2

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

DRAWING NO. CHPD3-M-110

M-0000-016

Revised AM-1

CHILLER SCHEDULE

PLANT	DESIGNATION	CAPACITY (TONS)	EVAPORATOR (NOTES 9 & 10)				CONDENSER				COMPRESSOR/CHILLER ELECTRICAL								BASIS OF DESIGN	OPT. WEIGHT (LB)
			GPM (MAX.)	PASSES	EWT °F	LWT °F	GPM	PASSES	EWT °F	LWT °F	VOLT	PH	HZ	RLA	LRA (EA)	QTY	MOCP	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)

Schedule indicates 8" inlet, 6" outlet. M-603 indicates piping is 10". Will need to use eccentric pipe reducer/increaser at pump inlet/outlet. This info confirms the info on M-601 for Crystal City is correct. (C1)

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. SPIRE METERING TECHNOLOGY ENDUROFLOW SERIES EF10C-A-1-N-0-C MAIN UNIT WITH TWC-8-08.0-I-D-2 AND TWC-8-10.0-I-D-2 TRANSDUCERS OR EQUAL

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

METRO CENTER CHILLER PLANT
MECHANICAL EQUIPMENT SCHEDULE

SCALE: NONE

DRAWING NO.: M-600

M-0000-023

Revised AM-1

CHILLER SCHEDULE

PLANT	DESIGNATION	CAPACITY (TONS)	EVAPORATOR				CONDENSER				COMPRESSOR/CHILLER ELECTRICAL								BASIS OF DESIGN	OPT. WEIGHT (LB)
			GPM	PASSES	EWT °F	LWT °F	GPM	PASSES	EWT °F	LWT °F	VOLT	PH	HZ	RLA	LRA (EA)	QTY	MOCP	MCA		
CHP-C05	CHILLER	350	646.2	2	55	42	1050	2	85	94.3	460	3	60	286	176	2	450	322	DAIKIN MCQUAY WMC 400D	14,000

NOTES:

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.

AIR HANDLING UNIT SCHEDULE

PLANT	DESIGNATION	CAPACITY (TONS)	EVAPORATOR							ELECTRICAL								BASIS OF DESIGN	WEIGHT (LB)
			GPM	ROWS	EWT °F	LWT °F	CFM	EAT °F	LAT °F	HP	VOLT	PH	HZ	RLA	LRA	MOCP	MCA		
CHP-C05	AHU-1	5	9.4	6	42	55	1600	85	57	1/2	115	1	60				1.9	MCQUAY MODEL HHBB116	350

NOTES:

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 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	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

NOTES:

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.

This info is correct, see comment on M-600. Contractor will need to use eccentric reducer/increaser at pump inlet/ outlet. (C1)

EXHAUST FAN SCHEDULE

ITEM				M	SP (WG)	DRIVE	MOTOR					BASIS OF DESIGN	WEIGHT (LB)
							RPM	HP	VOLTS	PH	HZ		
F-7				0	1.0	BELT	1935	1.0	460	3	60	GREENHECK MODEL TCB-1-13	200
F-18				0	1.0	BELT	1935	1.0	460	3	60	GREENHECK MODEL TCB-1-13	200

LEAK DETECTION SYSTEM

1. PROVIDE ONE IR134A REFRIGERANT GAS SENSOR 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 F-7 (NORMAL)
   - 2.2 PROVIDE RELAY OUTPUT FOR LEVEL 2 OPERATION OF EXHAUST FAN F-7 & F-18 (EMERGENCY)
   - 2.3 PROVIDE STROBE ALARM OUTPUTS AT LEVEL 1 AND LEVEL 2
   - 2.4 PROVIDE 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-615.
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. SPIRE METERING TECHNOLOGY ENDUROFLOW SERIES EF10C-A-1-N-0-C MAIN UNIT WITH TWC-8-08.0-I-D-2 AND TWC-8-10.0-I-D-2 TRANSDUCERS OR EQUAL

CONTRACT NO.
FQ 14005D-13-03

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

METRO CENTER, POTOMAC AVE, & CRYSTAL CITY CHILLER REPLACEMENTS

CRYSTAL CITY CHILLER PLANT
MECHANICAL EQUIPMENT SCHEDULE

SCALE NONE

DRAWING NO. M-601

M-0000-024

Revised AM-1

CHILLER SCHEDULE

PLANT	DESIGNATION	CAPACITY (TONS)	EVAPORATOR (NOTES 9 &10)				CONDENSER				COMPRESSOR/CHILLER ELECTRICAL								BASIS OF DESIGN	OPT. WEIGHT (LB)
			GPM (MAX.)	PASSES	EWT °F	LWT °F	GPM	PASSES	EWT °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.

AIR HANDLING UNIT SCHEDULE

PLANT	DESIGNATION	CAPACITY (TONS)	EVAPORATOR							ELECTRICAL								BASIS OF DESIGN	WEIGHT (LB)
			GPM	ROWS	EWT °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.

Line weight indicate AHU-1 is NEW at Potomac Ave. (C3)

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 V 2 TEES, 2 90° ELBOWS AND REQUIRED NIPPLES AND PLUGS; RELIEF VALVE AND FUNNELS.
5. CONDENSER WATER PUMPS TO REMAIN. ADD VARIABLE FREQUENCY DRIVE.

Only replacing strainers for these - comment 1 above is referring to all *indicated* pumps to have replacement inverter rated motors and new VFD controllers. (C2)

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:

SHALL INCLUDE:
OVER
RD
ISOLATORS

2. FAN SHALL BE FITTED WITH A TWO SPEED MOTOR.

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. SPIRE METERING TECHNOLOGY ENDUROFLOW SERIES EF10C–A–1–N–0–C MAIN UNIT WITH TWC–8–08.0–I–D–2 AND TWC–8–10.0–I–D–2 TRANSDUCERS OR EQUAL

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

REFERENCE DRAWINGS

NUMBER	DESCRIPTION

REVISIONS

DATE	BY	DESCRIPTION

POLITAN 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

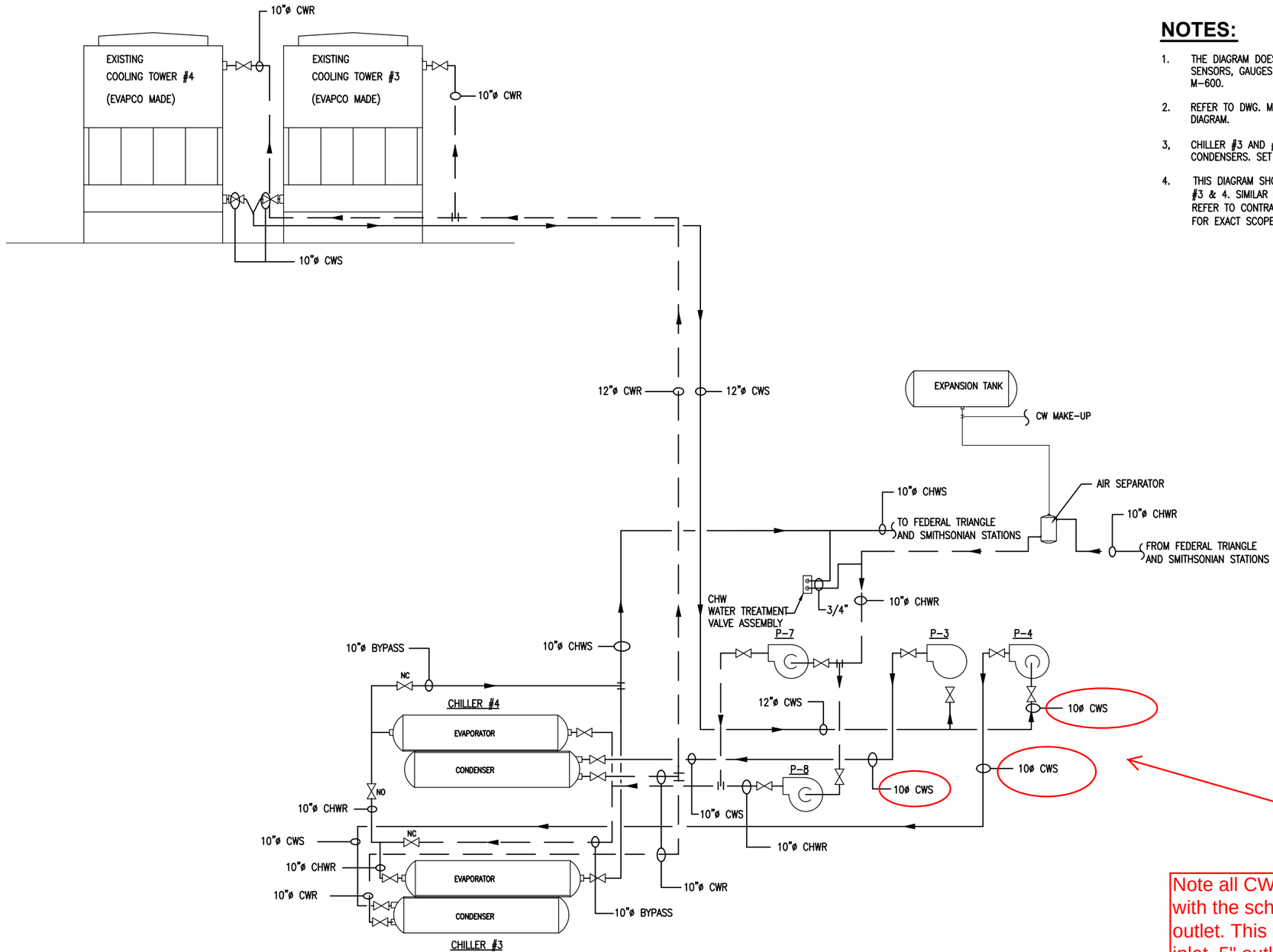
POTOMAC AVENUE CHILLER PLANT
MECHANICAL EQUIPMENT SCHEDULE

SCALE NONE

DRAWING NO. M–602

M–0000–025

Revised AM-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).

Note all CWS piping is 10" at this location, with the schedule indicating 8" inlet, 6" outlet. This confirms that Crystal City 6" inlet, 5" outlet is correct. (C1)

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

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METRO CENTER, POTOMAC AVE, & CRYSTAL CITY CHILLER REPLACEMENTS

METRO CENTER CHILLER PLANT
CHILLED AND CONDENSER WATER FLOW DIAGRAM

SCALE: NONE

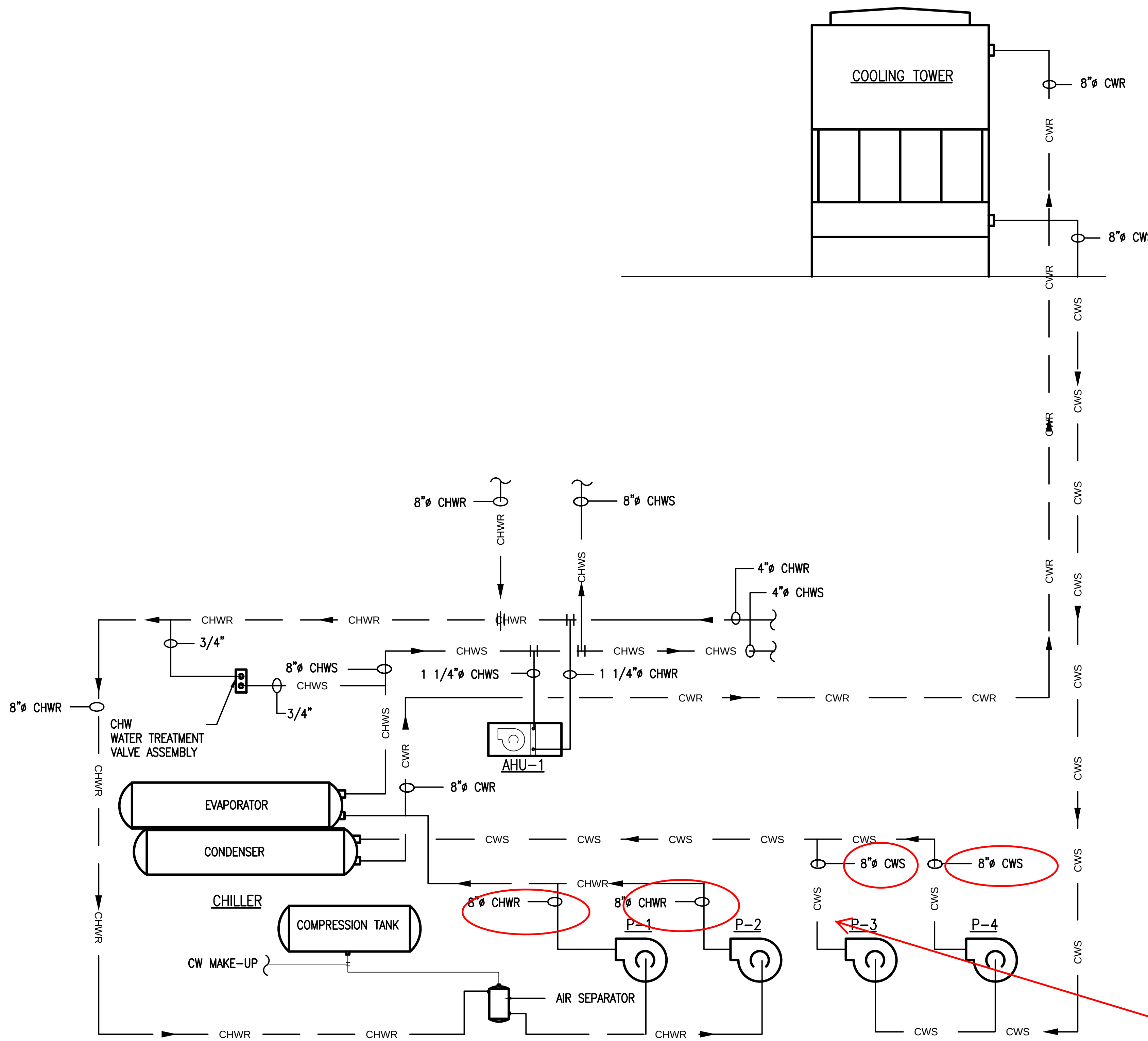
DRAWING NO.: M-603

M-0000-026

Revised AM-1

NOTES:

1. THE DIAGRAM DOES NOT SHOW ALL VALVES, STRAINERS, FLOW SENSORS, GAUGES, ETC. REFER TO THE EQUIPMENT DETAILS ON DWG M–601.
2. REFER TO DWG M–615 FOR CHILLER PLANT MONITORING DIAGRAM.
3. CHILLER HAS 2–PASS EVAPORATOR AND 2–PASS CONDENSER.
4. THIS DIAGRAM SHOWS GENERAL PIPING ARRANGEMENT FOR CHILLER. REFER TO CONTRACT DOCUMENTS (DRAWINGS & SPECIFICATION FOR EXACT SCOPE OF WORK).



Pumps P-1, P-2, P-3, and P-4 all have 8" piping. (C1)

FLOW DIAGRAM

CONTRACT NO. FQ 14005D-13-03

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CHECKED	C. ROSS	02/14 DATE
APPROVED	C. ROSS	02/14 DATE

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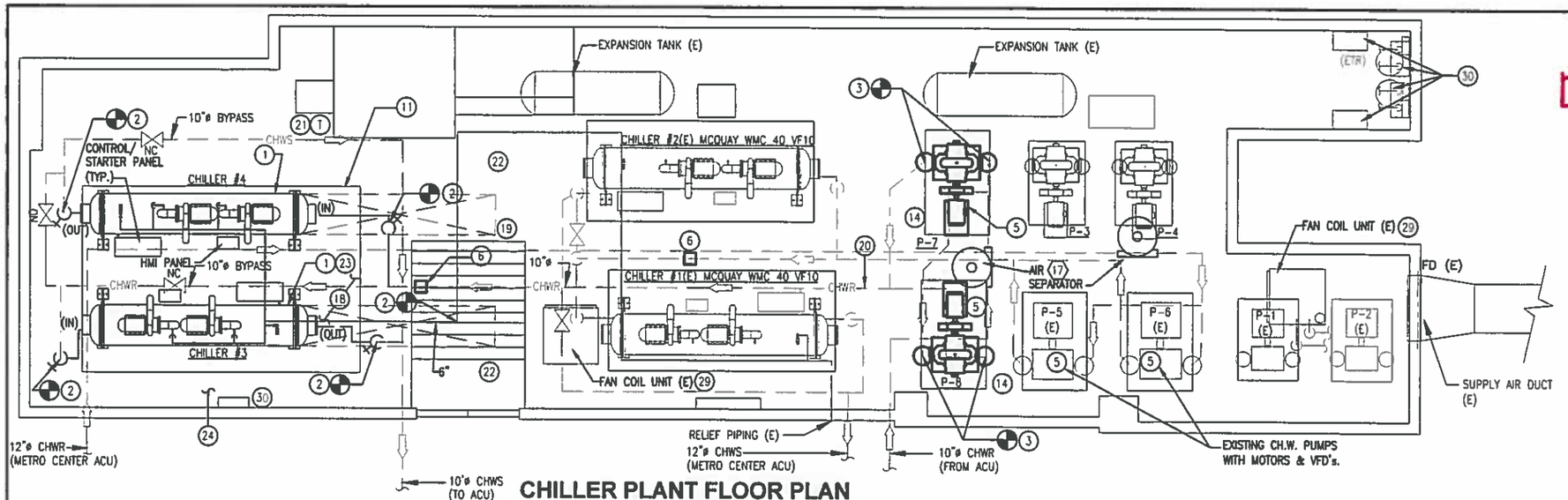
CRYSTAL CITY CHILLER PLANT
CHILLED AND CONDENSER WATER FLOW DIAGRAM

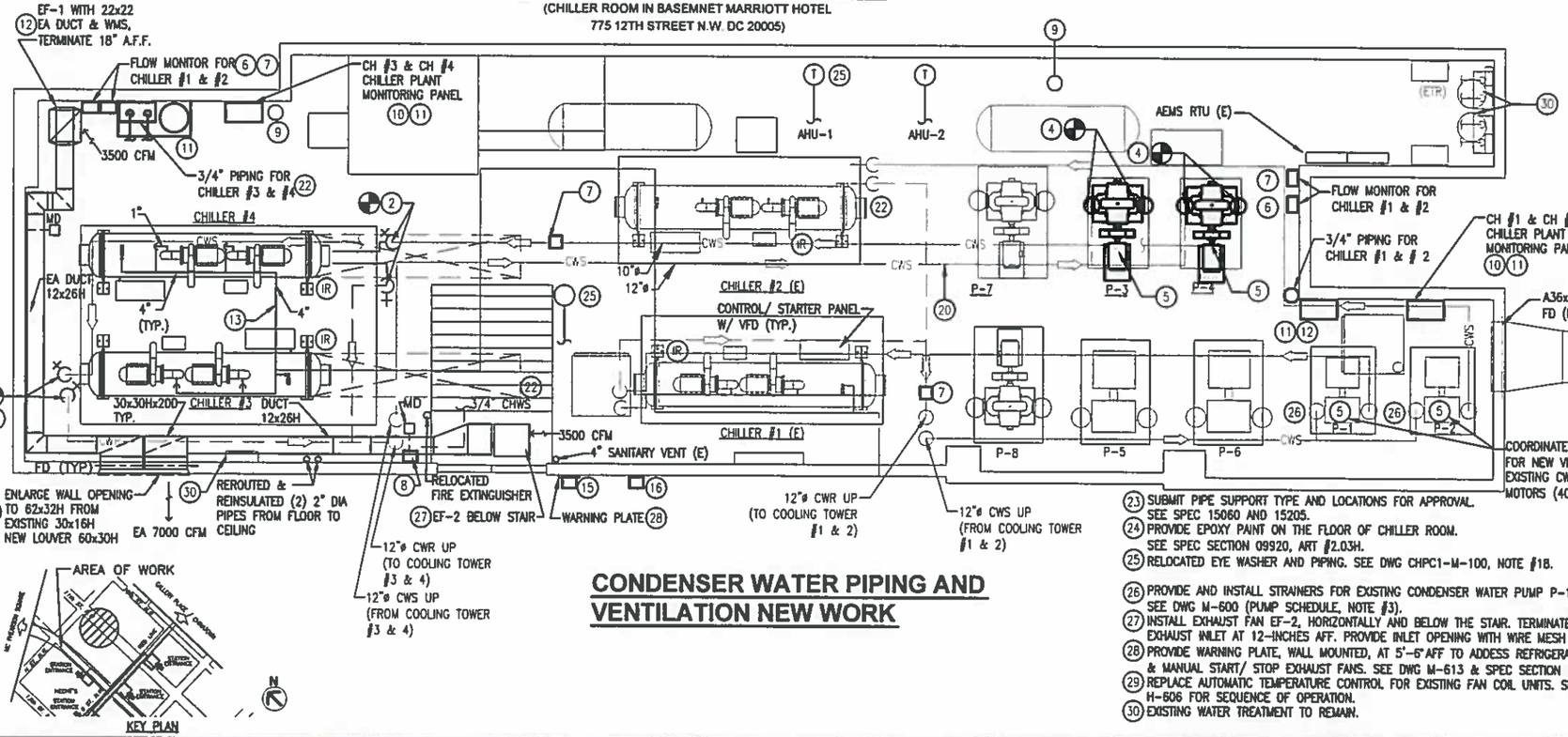
SCALE NONE | DRAWING NO. M–604 | M–0000–027

Revised AM-1



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

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 TRETMENT/VALVE ASSEMBLY. VERIFY IN-FIELD THE LOCATION OF EXISTING PIPING TAP-OFF.
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.
28. PROVIDE WARNING PLATE, WALL MOUNTED, AT 5'-6"AFF TO ADDESS 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.

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

SCALE 1/4"=1'-0" (1 0 1 2 3 4 5)
DRAWING NO. CHPC1-M-110
M-0000-008

Revised AM-1