

- KEYNOTES:
- ① UTILIZE EXISTING CONDUITS.
 - ② PROVIDE AND INSTALL VFD/DISCONNECT FOR COOLING TOWER MOTOR. PROVIDE AND INSTALL WIRING FROM MOTOR TO VFD AND FROM VFD TO MCC.
 - ③ REUSE EXISTING CKT AND CONDUIT. PROVIDE NEW WIRING.


- SHEET NOTES:
- 1. PROVIDE FILTERS FOR VFD'S AS REQUIRED.
 - 2. ALL WIRING FOR VFD'S SHALL BE VFD RATED CABLES.
 - 3. THE COOLING TOWER IS ON THE ROOF OF THE CHILLER PLANT DIRECTLY ABOVE THE CHILLER. THE CHILLER ROOF FLOOR IS 25' ABOVE THE CHILLER ROOM FLOOR.

1 ELECTRICAL PLAN - NEW WORK (COOING TOWER)
CWPG2-E-103


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



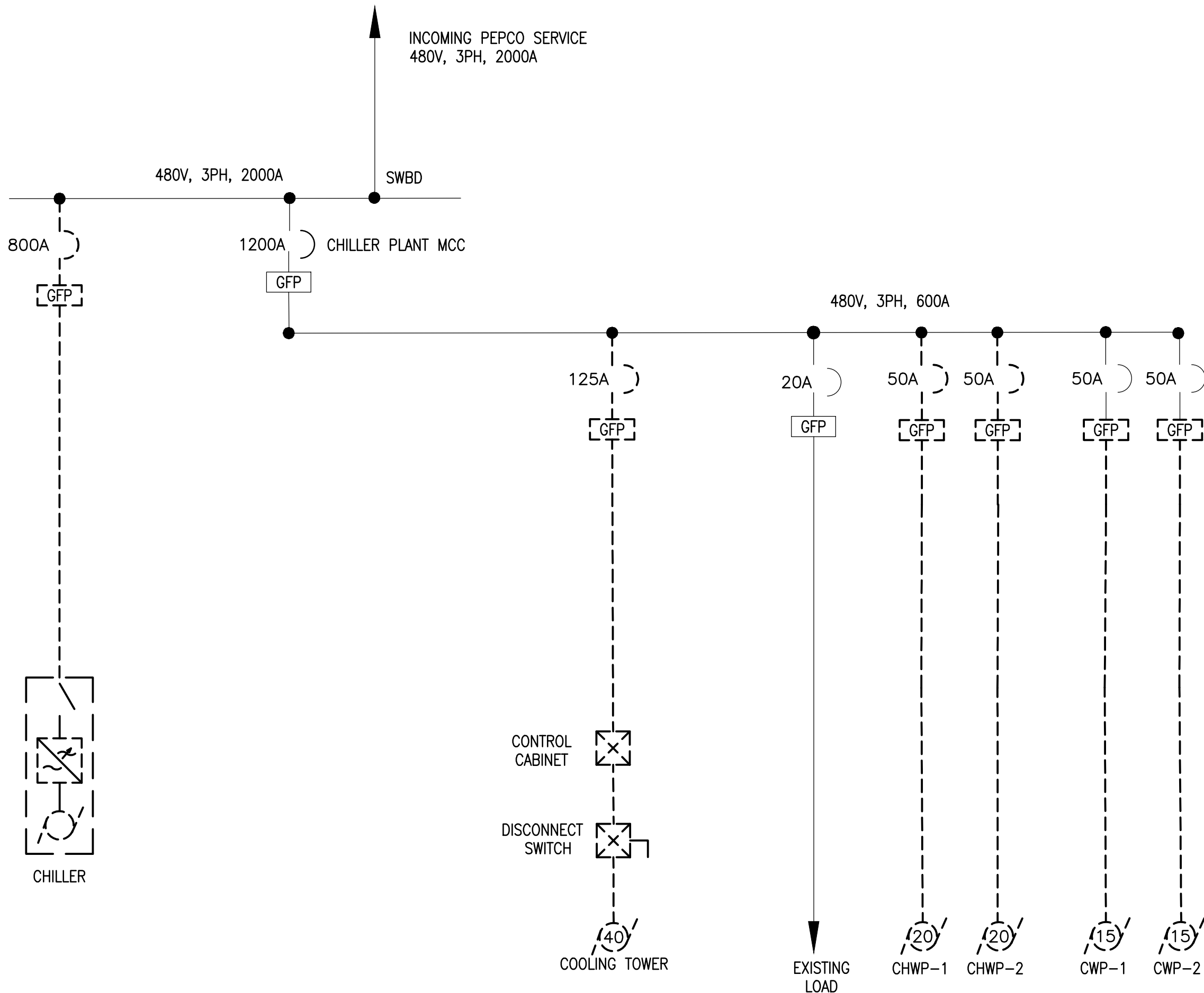
A Gannett Fleming/Parsons
JOINT VENTURE



State of Maryland Professional Certification. I hereby certify that these documents were prepared or **approved** by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 024687, Expiration Date: 03/15/2020


<div>DESIGNED <u>B. IDILBI</u> 09/30/17 DATE</div> <div>DRAWN <u>J. ZHU</u> 09/30/17 DATE</div> <div>CHECKED <u>D. KHAN</u> 03/23/18 DATE</div>			REFERENCE DRAWINGS		REVISIONS			<div><div>WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY</div><div>DEPARTMENT OF DESIGN AND CONSTRUCTION SERVICES</div><div>OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM GROUP</div></div> <div>APPROVED <u>Mark H. Magnusson</u> 03/2018 00000177 MAGNUSSEN MANAGER, ENV. PLANNING AND COMP</div> <div>APPROVED <u>Gabe Spiller</u> 03/2018 GRAHAM SPILLER GFP DEPUTY PROGRAM MANAGER</div>	REPLACEMENT OF CHILLERS AND COOLING TOWER ACCESSORIES AT EIGHT METRO-RAIL STATIONS CWPG2 - CAPITOL HEIGHTS (G02) ELECTRICAL PLAN - NEW WORK				
			NUMBER	TITLE	DATE	NUM	DESCRIPTION						
					03/30/2018	0	FINAL CONTRACT DRAWINGS						
								M NO.	CONTRACT NO.	SCALE	DRAWING NO.	SHEET NO.	
								M1304	FQ-18102	1/4"=1'-0"	CWPG2-E-103	127 of 173	

- SHEET NOTES:
1. ALL SHOWN EQUIPMENT IS EXISTING TO REMAIN UNLESS SHOWN OTHERWISE.
 2. REMOVE AND DISPOSE OF DEMOLISHED EQUIPMENT ALONG WITH ASSOCIATED WIRING.
 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 WMATA ENGINEER.




B ELECTRICAL SINGLE LINE DIAGRAM - DEMOLITION
CWPG2-E-601

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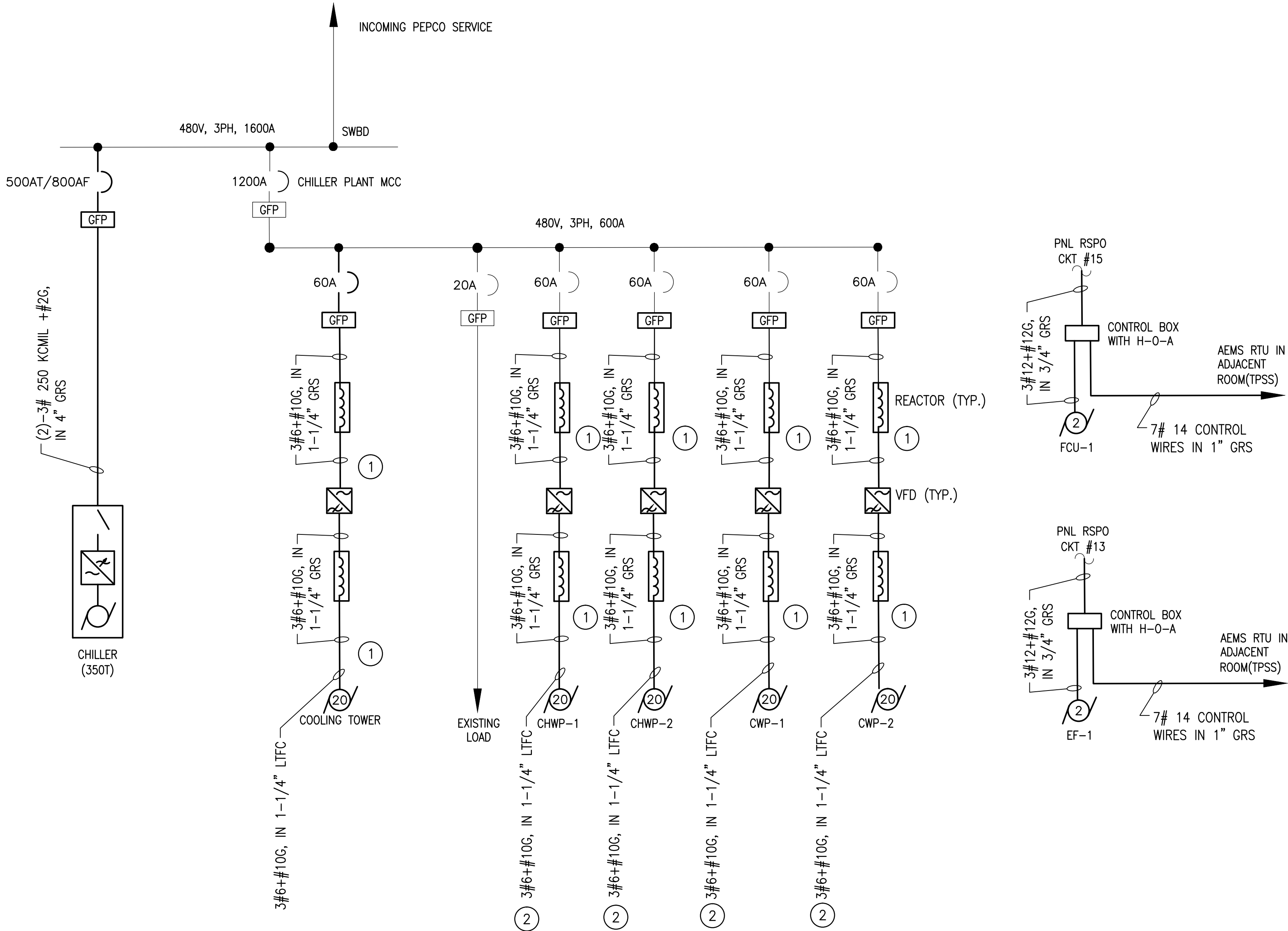


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DESIGNED <u>B. IDILBI</u> 09/30/17 DATE DRAWN <u>J. ZHU</u> 09/30/17 DATE CHECKED <u>D. KHAN</u> 03/23/18 DATE			REFERENCE DRAWINGS		REVISIONS			 WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY DEPARTMENT OF DESIGN AND CONSTRUCTION SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM GROUP APPROVED <u>Mark H. Magnusson</u> 03/2018 MARK MAGNUSSEN MANAGER, ENV. PLANNING AND COMP DATE APPROVED <u>Graham Spiller</u> 03/2018 GRAHAM SPILLER GFP DEPUTY PROGRAM MANAGER DATE	REPLACEMENT OF CHILLERS AND COOLING TOWER ACCESSORIES AT EIGHT METRO-RAIL STATIONS CWPG2 - CAPITOL HEIGHTS (G02) ELECTRICAL SINGLE LINE DIAGRAM - DEMOLITION				
			NUMBER	TITLE	DATE	NUM	DESCRIPTION		M NO. M1304	CONTRACT NO. FQ-18102	SCALE AS NOTED	DRAWING NO. CWPG2-E-601	SHEET NO. 128 of 173
					03/30/2018	0	FINAL CONTRACT DRAWINGS						

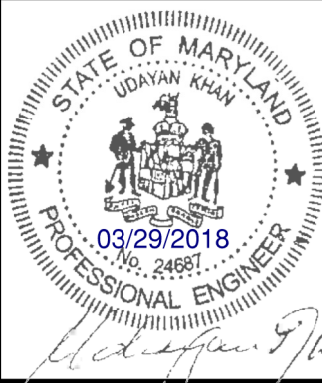
- SHEET NOTES:
1. PROVIDE NEW CIRCUIT BREAKER WITH GROUND FAULT PROTECTION IN EXISTING MCC.

- PLAN NOTES:
- ① LINE AND LOAD REACTORS FOR EACH VFD SHALL BE MOUNTED IN A SINGLE NEMA 4X ENCLOSURE
 - ② RUN NEW RGS FROM VFD AND STOP AT CONVENIENT PLACE NEAR MOTOR. CONTINUE WITH LTFC TO MOTOR.






B ELECTRICAL SINGLE LINE DIAGRAM - NEW WORK
CWPG2-E-602

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DESIGNED B. IDILBI 09/30/17 DATE			REFERENCE DRAWINGS		REVISIONS			 WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY	REPLACEMENT OF CHILLERS AND COOLING TOWER ACCESSORIES AT EIGHT METRO-RAIL STATIONS CWPG2 - CAPITOL HEIGHTS (G02) ELECTRICAL SINGLE LINE DIAGRAM - NEW WORK				
			NUMBER	TITLE	DATE	NUM	DESCRIPTION						
DRAWN J. ZHU 09/30/17 DATE					03/30/2018	0	FINAL CONTRACT DRAWINGS	DEPARTMENT OF DESIGN AND CONSTRUCTION SERVICES OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM GROUP	M NO. CONTRACT NO. SCALE DRAWING NO. SHEET NO. M1304 FQ-18102 AS NOTED CWPG2-E-602 129 of 173				
CHECKED D. KHAN 03/23/18 DATE								APPROVED  03/2018 MARK MAGNUSSEN DATE MANAGER, ENV. PLANNING AND COMP	APPROVED  03/2018 GRAHAM SPILLER DATE GFP DEPUTY PROGRAM MANAGER				

NOTE 4

NOTE 4

NOTE 3

NOTES:

NOTES:

1. RELOCATE CKT 38 AND ITS LOAD TO BUSSED SPACE 41.
2. INSTALL 3 POLE, 50A CKT BREAKER IN BUSSED SPACES 38, 40 & 42.
3. INSTALL NEW DISTRIBUTION PANEL RSPA1, 208/120V, 12 CKTS.
4. IN PANEL RSP0 INSTALL 2-3 POLE, 20A CIRCUIT BREAKERS IN POSITION #13, # 15 AND WIRE THEM TO EF-1 CONTROL BOX AND FCU-1 CONTROL BOX.



NOTE 1

DEPARTMENT OF DESIGN AND CONSTRUCTION SERVICES
OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM GROUP

03/2018

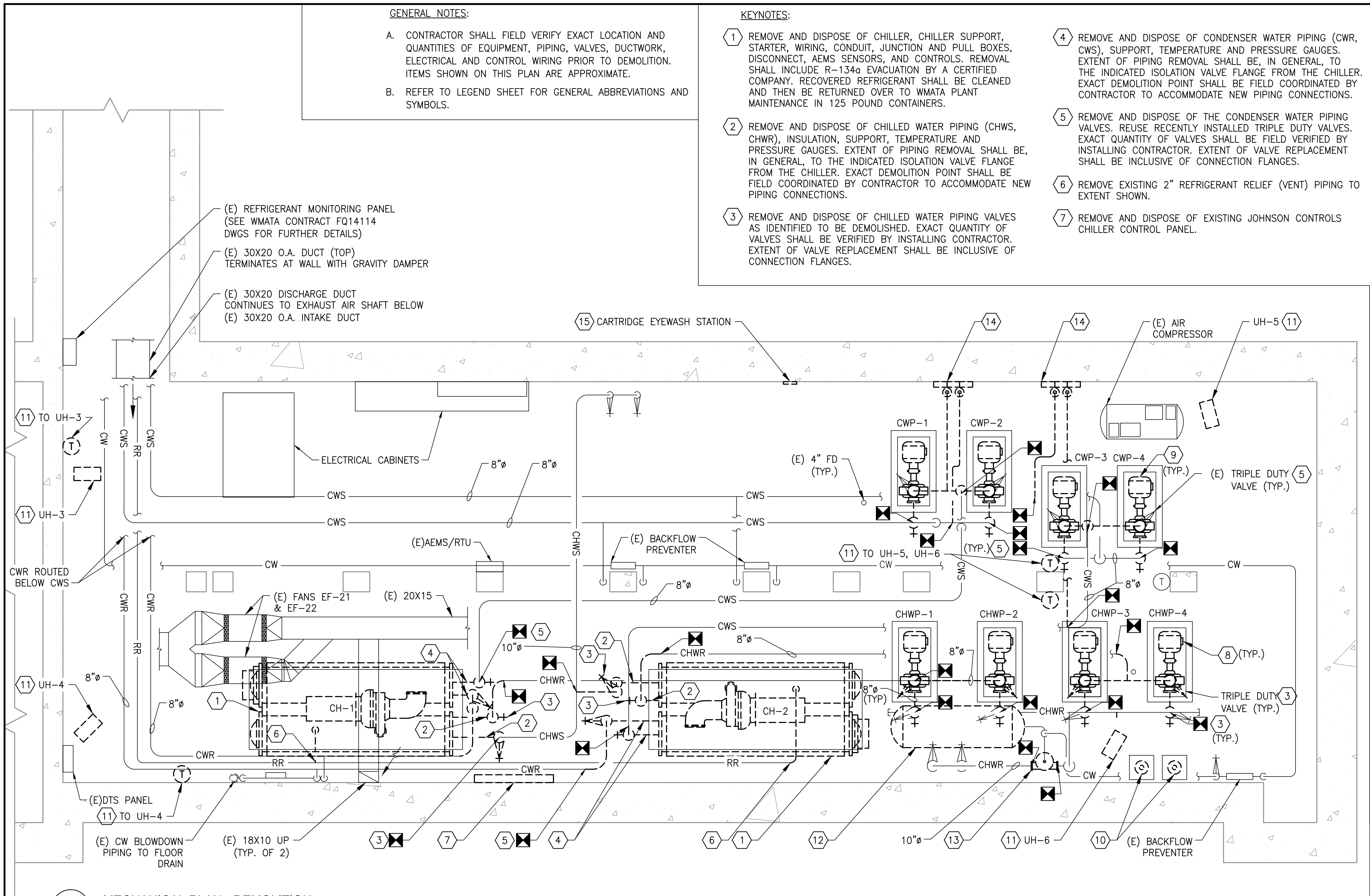
03/2018

REPLACEMENT OF CHILLERS
AND COOLING TOWER ACCESSORIES AT EIGHT METRO-RAIL STATIONS
CWPG2 - CAPITOL HEIGHTS (G02)
ELECTRICAL EQUIPMENT AND PANEL SCHEDULE

M NO.	CONTRACT NO.	SCALE	DRAWING NO.	SHEET NO.
M1304	FQ-18102	AS NOTED	CWPG2-E-603	130 of 173



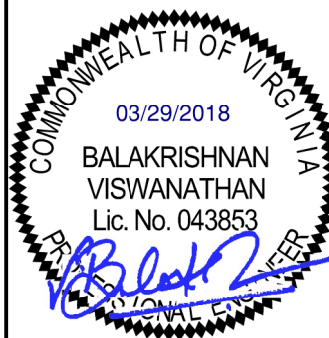
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1 MECHANICAL PLAN - DEMOLITION
CWPK1-M-100

1/4" = 1'-0"

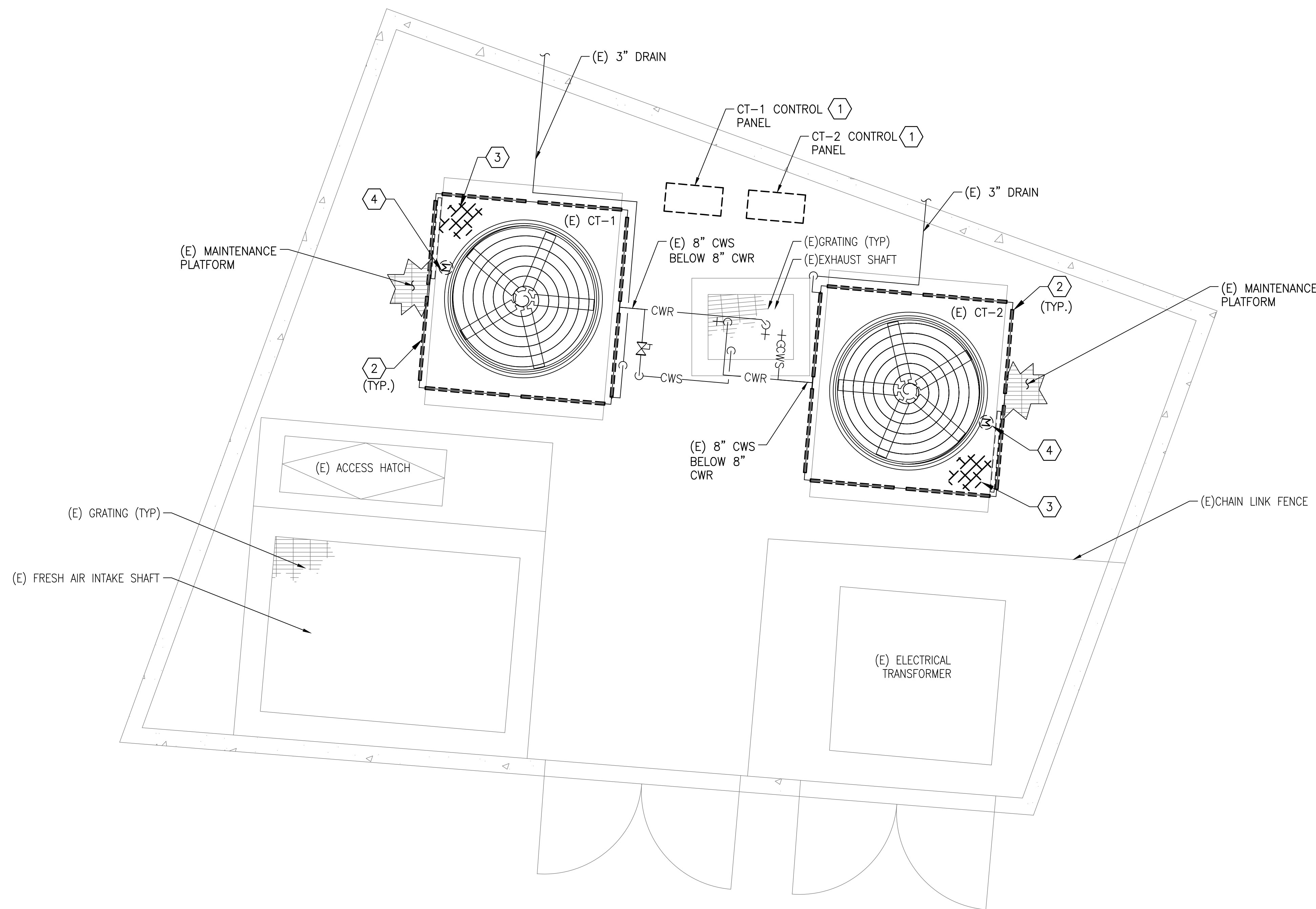
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DESIGNED			DATE		
K. STOCKINGER			08/11/17		
DRAWN			DATE		
K. STOCKINGER			08/11/17		
CHECKED			DATE		
R. SILVA			03/23/18		

REFERENCE DRAWINGS		REVISIONS	
NUMBER	TITLE	DATE	DESCRIPTION
		03/30/2018	FINAL CONTRACT DRAWINGS

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		REPLACEMENT OF CHILLERS AND COOLING TOWER ACCESSORIES AT EIGHT METRO-RAIL STATIONS	
DEPARTMENT OF DESIGN AND CONSTRUCTION SERVICES		CWPK1 - CLARENDON (K02)	
OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM GROUP		MECHANICAL PLAN - DEMOLITION	
APPROVED <i>Mark H. Magnusson</i>	03/2018	APPROVED <i>Gabe Siller</i>	03/2018
MARK MAGNUSSEN	DATE	GRAHAM SPILLER	DATE
MANAGER, ENV. PLANNING AND COMP		GFP DEPUTY PROGRAM MANAGER	
M NO.	CONTRACT NO.	SCALE	DRAWING NO.
M1304	FQ-18102	1/4" = 1'-0"	CWPK1-M-100
		SHEET NO.	
		131 of 173	



GENERAL NOTES:

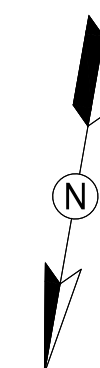
- A. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION AND QUANTITIES OF EQUIPMENT, PIPING, VALVES, DUCTWORK, ELECTRICAL AND CONTROL WIRING PRIOR TO DEMOLITION. ITEMS SHOWN ON THIS PLAN ARE APPROXIMATE.
- B. REFER TO LEGEND SHEET FOR GENERAL ABBREVIATIONS AND SYMBOLS
- C. COOLING TOWERS LOCATED AT GRADE LEVEL AT 2750 CLARENDON BLVD.
- D. ALL COOLING TOWER COMPONENTS THAT ARE REMOVED ARE TO BE REPLACED IN KIND. INSTALLING CONTRACTOR SHALL COORDINATE WITH COOLING TOWER MANUFACTURER PRIOR TO REMOVAL.

KEYNOTES:

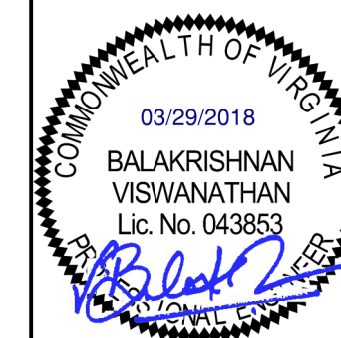
- 1 REMOVE COOLING TOWER FAN STARTER, DISCONNECT, AND CONTROLLER.
- 2 REMOVE AND DISPOSE OF EXISTING LOUVER ON COOLING TOWER.
- 3 REMOVE AND DISPOSE OF EXISTING FILL, IN THE COOLING TOWER.
- 4 REMOVE EXISTING FAN MOTOR, BELT DRIVEN FAN DRIVE ASSEMBLY, BELTS, SHEAVES, AND MOUNTING HARDWARE.

1 MECHANICAL PLAN - DEMOLITION
CWPK1-M-101

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



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JOINT VENTURE



WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

DEPARTMENT OF DESIGN AND CONSTRUCTION SERVICES
OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM GROUP

APPROVED *Mark H. Magnusson* 03/2018
MARK MAGNUSSEN
MANAGER, ENV. PLANNING AND COMP

APPROVED *Graham Spiller* 03/2018
GRAHAM SPILLER
GFP DEPUTY PROGRAM MANAGER

REPLACEMENT OF CHILLERS
AND COOLING TOWER ACCESSORIES AT EIGHT METRO-RAIL STATIONS
CWPK1 - CLARENDON (K02)
MECHANICAL PLAN - DEMOLITION

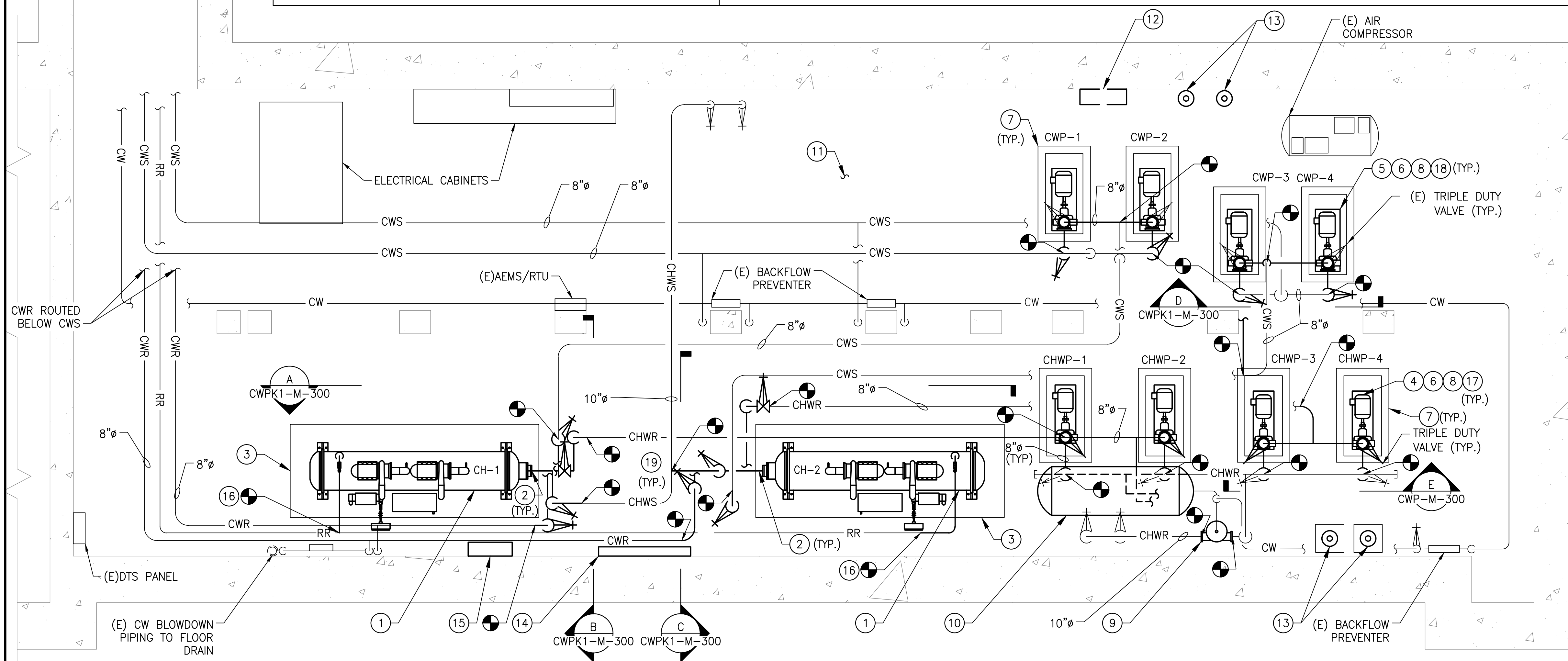
M NO.	CONTRACT NO.	SCALE	DRAWING NO.	SHEET NO.
M1304	FQ-18102	1/4" = 1'-0"	CWPK1-M-101	132 of 173

- A. CONTRACTOR SHALL FIELD VERIFY AND COORDINATE LOCATION OF NEW EQUIPMENT, PIPING, VALVES, DUCTWORK, ELECTRICAL AND CONTROL WIRING WITH EXISTING PRIOR TO INSTALLATION. ITEMS SHOWN ON THIS PLAN ARE APPROXIMATE.
- B. REFER TO LEGEND SHEET FOR GENERAL ABBREVIATIONS AND SYMBOLS.
- C. REFER TO CHILLER PIPING SCHEMATIC FOR ALL VALVES. ALL VALVES MAY NOT BE SHOWN ON THIS DRAWING FOR CLARITY.
- D. INSTALL ALL EQUIPMENT AND COMPONENTS PER MANUFACTURERS RECOMMENDATION. PROVIDE ACCESS CLEARANCE AT ALL LOCATIONS OF VALVES, STRAINERS, INSTRUMENTATION, AND EQUIPMENT AS REQUIRED BY MANUFACTURER FOR EASE OF MAINTENANCE.

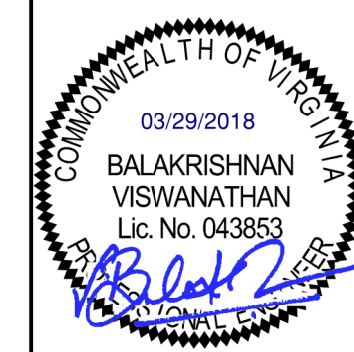
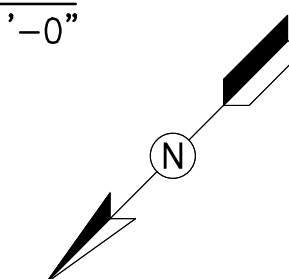
- 1 PROVIDE AND INSTALL CHILLER, CORRESPONDING VIBRATION ISOLATION, ANCHOR AND SUPPORT.
- 2 PROVIDE AND INSTALL ALL PIPING, FITTINGS, VALVES, PIPING INSULATION AND INSTRUMENTATION FOR CONNECTION TO CHILLER. PROVIDE A VICTAULIC COUPLING CONNECTION PIECE AT EACH PIPE CONNECTION TO CHILLER FOR EASE OF MAINTENANCE.
- 3 REUSE EXISTING EQUIPMENT PAD. REPAIR AND MODIFY AS REQUIRED TO FIT NEW INSTALLATION.
- 4 PROVIDE AND INSTALL CHILLED WATER PUMPS, CHWP-1, CHWP-2, CHWP-3 AND CHWP-4. INSTALLATION SHALL INCLUDE PUMP, INVERTER DUTY RATED MOTOR FOR VFD APPLICATION, VIBRATION SUPPORT, IMMEDIATE PIPING, ISOLATION VALVES, CHECK VALVES, SUCTION DIFFUSER WITH INTEGRAL STRAINER, FLEXIBLE CONNECTORS AND CORRESPONDING INSTRUMENTATION & CONTROLS. INSULATE PUMPS AND PIPING.

- ⑤ PROVIDE AND INSTALL ALL CONDENSER WATER PUMPS, CWP-1, CWP-2, CWP-3 AND CWP-4. INSTALLATION SHALL INCLUDE PUMP, INVERTER DUTY RATED MOTOR FOR VFD APPLICATION, VIBRATION SUPPORT, IMMEDIATE PIPING, SUCTION DIFFUSER WITH INTEGRAL STRAINER, FLEXIBLE CONNECTORS AND CORRESPONDING INSTRUMENTATION & CONTROLS. IF THE RECENTLY REPLACED TRIPLE DUTY VALVES ARE IN WORKING CONDITION, REUSE. IF FOUND DEFECTIVE, REPLACE IN KIND.
- ⑥ INTEGRATE PUMP VFD WITH CHILLER CONTROL PANEL. REFER TO ELECTRICAL DRAWINGS FOR EXACT LOCATION OF VFD's.
- ⑦ REUSE EXISTING EQUIPMENT PAD, SPRING ISOLATOR AND INERTIA PAD. REPAIR AND MODIFY AS REQUIRED TO FIT NEW INSTALLATION.
- ⑧ PROVIDE AND INSTALL ALL APPROPRIATE PIPE FITTINGS FOR CONNECTION TO PUMPS.
- ⑨ PROVIDE AND INSTALL AIR SEPARATOR, CORRESPONDING PIPING AND SUPPORTS. INSULATE AIR SEPARATOR AND PIPING.

- (10) PROVIDE AND INSTALL EXPANSION TANK AND CORRESPONDING PIPING. REUSE EXISTING CEILING HUNG SUPPORT.
- (11) CONTRACTOR SHALL PAINT CHILLER PLANT FLOORS AND EQUIPMENT PADS WITH BATTLE SHIP GREY OR EQUAL. THE SAFETY LINES AND TRIPPING HAZARD SHALL BE PAINTED YELLOW OR RED.
- (12)
 - A. COORDINATE WITH OTHER WMATA CONTRACT INSTALLING WATER TREATMENT SYSTEM.
 - B. PROVIDE AND INSTALL NEW WMATA CHILLED WATER SYSTEM LOOP. THE LOOP SHALL INCLUDE PIPING, VALVES, HACH INDUCTIVE CONDUCTIVITY SENSOR - 3725E2T, FLOW SWITCH GEM SENSORS FS-500 170231, AND CONVERTIBLE DIGITAL PH SENSOR HACH DPC1R2A. REFER TO REFERENCE DRAWING DD-ME-HVAC-007.
 - C. PROVIDE AND INSTALL A NEW WMATA CONDENSER WATER SYSTEM LOOP. THE LOOP SHALL INCLUDE PIPING, VALVES, HACH INDUCTIVE CONDUCTIVITY SENSOR - 3725E2T, FLOW SWITCH GEM SENSORS FS-500 170231. REFER TO REFERENCE DRAWING DD-ME-HVAC-008.
- (13) PROVIDE AND INSTALL CHEMICAL POT FEEDER FOR CONDENSER WATER AND CHILLED WATER SYSTEM. CHEMICAL POT FEEDER SHALL BE NEPTUNE VTF-SHF.
- (14) PROVIDE AND INSTALL ONE CHILLER PLANT CONTROL PANEL (CPCP). REFER TO REFERENCE DRAWINGS DD-ME-HVAC-009 FOR CPCP DETAILS. PANEL SHALL BE INSTALLED 48" ABOVE FINISHED FLOOR.
- (15) PROVIDE AND INSTALL CHILLED WATER AND CONDENSER WATER FLOW MONITORING SYSTEM. PROVIDE AND INSTALL COMMUNICATIONS WIRING IN RIGID CONDUIT FROM FLOW MONITORING PANEL TO CHILLER PLANT CONTROL PANEL, UTILIZING BELDEN 89842 MULTI-CONDUCTOR; LOW CAPACITANCE TO COMPUTER POINT OF SERVICE (POS) CABLE OR EQUIVALENT. INSTALL 48" ABOVE FINISHED FLOOR. FLOW METER SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDED INSTALLATION PROCEDURES. FLOW METERS AND SENSOR CABLES SHOULD NOT BE INSTALLED WITHIN EIGHT FEET OF VFDs OR FLORESCENT LIGHT FIXTURES.
- (16) PROVIDE AND INSTALL REFRIGERANT VENT/ RELIEF PIPING FROM CHILLER (AS PER CHILLER MANUFACTURER). FIELD VERIFY AND CONNECT NEW 2" REFRIGERANT RELIEF PIPING FROM CHILLER TO EXISTING REFRIGERANT RELIEF MAIN.
- (17) PROVIDE 8" TO 5" SUCTION GUIDE WITH INTEGRAL STRAINER, ANGLE FLANGE FOR 8" CHILLED PIPING INLET INTO CHILLED WATER PUMP. PROVIDE A 8" TO 6" FLANGE AT CHILLED WATER PUMP OUTLET FOR CONNECTION TO CHILLED WATER DISCHARGE PIPING.
- (18) PROVIDE 8" TO 6" SUCTION GUIDE WITH INTEGRAL STRAINER ANGLE FLANGE FOR 8" CONDENSER WATER PIPING INLET INTO CONDENSER WATER PUMP. PROVIDE A 5" TO 8" ANGLE FLANGE AT CONDENSER WATER PUMP OUTLET FOR CONNECTION TO CONDENSER WATER DISCHARGE PIPING.
- (19) PROVIDE FLOOR MOUNTED, PIPE SADDLE SUPPORT WITH BASE STAND AS NECESSARY FOR NEW PIPING. CHILLED WATER PIPING SUPPORTS SHALL BE PRE-INSULATED.



1 MECHANICAL PLAN - NEW WORK
CWPK1-M-102

$$1/4'' = 1'-0''$$
[illegible]