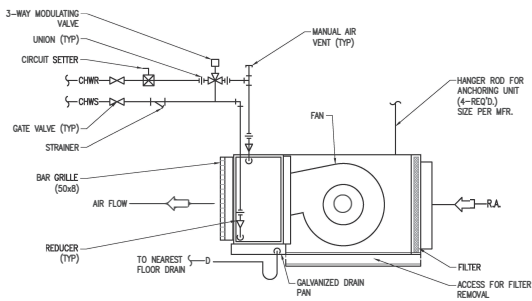


- NOTES:**
- UTILITY SINK DRAINAGE SHALL BE FIELD ROUTED TO NEARBY FLOOR DRAIN AND TERMINATED WITH AN AIR GAP. DRAIN PIPING SHALL BE ROUTED SUCH THAT IT IS NOT A TRIP HAZARD. PROVIDE BUMP AS NECESSARY.
 - NEW 3/4\"/>

EYEWASH & UTILITY SINK PIPING SCHEMATIC

NOT TO SCALE

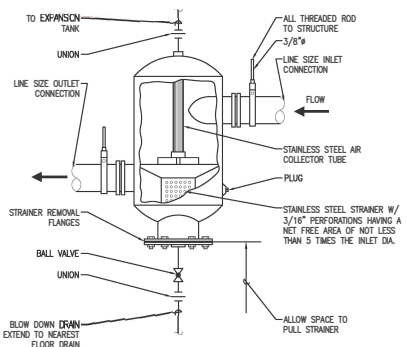


- NOTE:**
- PROVIDE MINIMUM REQUIRED CLEARANCE AND ACCESS FOR FILTER REMOVAL AND REPLACEMENT AS RECOMMENDED BY UNIT MANUFACTURER.

CEILING MOUNTED FAN COIL UNIT PIPING

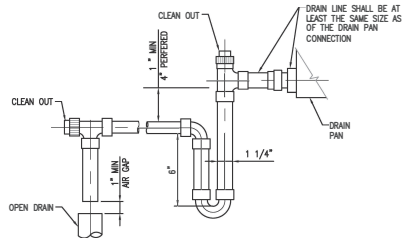
NOT TO SCALE

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. 41715, Expiration Date: 2019-03-09



TYPICAL AIR SEPARATOR TANK

NOT TO SCALE



TYPICAL CONDENSATE DRAIN TRAP PIPE

NOT TO SCALE

CONTRACT NO. **FQ17162**

DESIGNED	B. VIGNANATHAN	05/17
DRAWN	M. OLATA	05/17
CHECKED	J. SILVA	05/17
APPROVED	R. SILVA	05/17

NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION

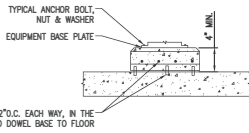
NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION



WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
 DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES
 OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM
 APPROVED: *Mark H. Kapperman*

GFP A GARRETT FIRMING/PALSONS JOINT VENTURE
 SUBMITTED: *[Signature]*
 PROJECT MANAGER

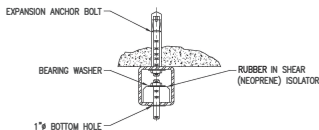
REPLACEMENT OF CHILLERS AND COOLING TOWERS AT THREE METRO-RAIL STATIONS	
MECHANICAL DETAILS SHEET 3 OF 5	
SCALE: NOT TO SCALE	DRAWING NO. M-502
CONTRACT NO. FQ17162	
PROJECT NO. M1299-035	



TYPICAL ANCHOR BOLT, NUT & WASHER EQUIPMENT BASE PLATE

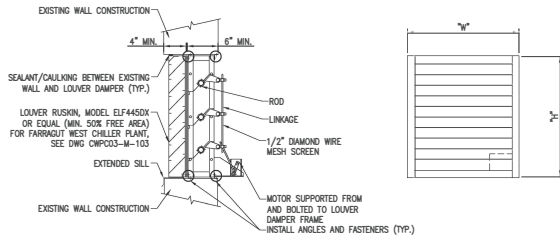
- NOTES:
1. LENGTH AND WIDTH DIMENSIONS SHALL BE 6" GREATER THAN THE EQUIPMENT BASE PLATE.

TYPICAL HOUSEKEEPING PAD
NOT TO SCALE



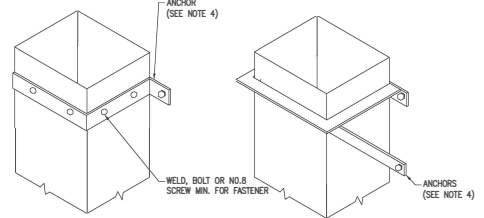
- NOTES:
1. SPACING, DIAMETER, AND LENGTH OF BOLTED EMBEDS SHALL BE DETERMINED AND ENGINEERED BY CONTRACTOR, AND SUBMITTED FOR REVIEW BY THE A.R.
 2. LOAD RANGE: 25 LBS. TO 1,000 LBS. AS REQUIRED.
 3. STANDARD ROD SIZE 5/8" (BY OTHERS) EQUIPMENT BASE.

CEILING MOUNTED VIBRATION ISOLATOR
NOT TO SCALE

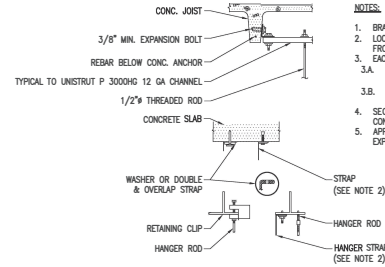


- NOTES:
1. REFER TO DWG CWP003-M-103 FOR FARRAGUT WEST LOUVER, INDOOR TYPE.
 2. SUBMIT TO WMATA WALL OPENING REQUIREMENT AND SHOP DRAWINGS FOR LOUVER, FOR APPROVAL.

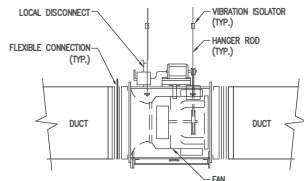
OUTDOOR TYPE LOUVER AND MOTORIZED DAMPER
NOT TO SCALE



- NOTES:
1. BRACKETS ARE SIZED FOR 12 FT OF DUCT MAX.
 2. LOCATE DUCTS AGAINST WALL OR MAX OF 2" AWAY FROM WALL.
 3. EACH WALL ANCHOR SHALL SATISFY THE FOLLOWING:
 - 3.A. TENSILE LOAD = 3/8 X DUCT WEIGHT; SAFETY FACTOR OF 4.
 - 3.B. SHEAR LOAD = 1/2 X DUCT WEIGHT; SAFETY FACTOR OF 4.
 4. SECURE WITH APPROVED ANCHORS TO MATCH WALL CONSTRUCTION.
 5. APPLY COATING FOR CORROSION PROTECTION WHEN EXPOSED TO WEATHER.



TYPICAL WALL AND CEILING HANGERS FOR DUCTWORK
NOT TO SCALE



- NOTES:
1. PROVIDE LOCAL DISCONNECT FOR UNIT.
 2. MOUNT UNIT IN A LOCATION WHERE IT CAN BE CONVENIENTLY SERVICED BY TECHNICIANS.
 3. RE-ORIENT MOTOR LOCATION IF NECESSARY TO PROVIDE PROPER MOTOR ACCESS AND ALIGNMENT TO EXISTING DUCTWORK.

TUBULAR BELT-DRIVEN IN-LINE CENTRIFUGAL FAN
NOT TO SCALE



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.41715, Expiration Date: 2019-03-08

CONTRACT NO. FQ17162

DESIGNED	B. YOKHANNATHAN	05/17
DRAWN	M. OLATA	05/17
CHECKED	J. SILVA	05/17
APPROVED	R. SILVA	05/17

NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION

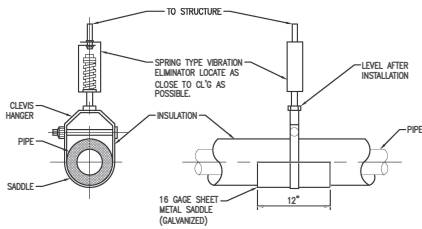
NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION



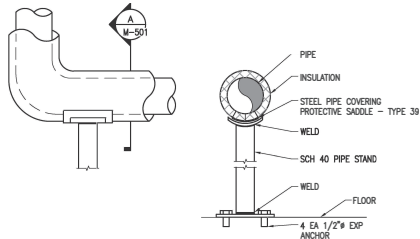
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES
OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM
APPROVED: *Mark H. Kapperman*

GFP A GARRETT FERRIS/PAULSON JOINT VENTURE
SUBMITTED: *GFP*
PROJECT MANAGER

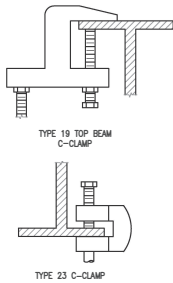
REPLACEMENT OF CHILLERS AND COOLING TOWERS AT THREE METRO-RAIL STATIONS
MECHANICAL DETAILS SHEET 4 OF 5
SCALE: NOT TO SCALE
DRAWING NO. M-503
M1299-036



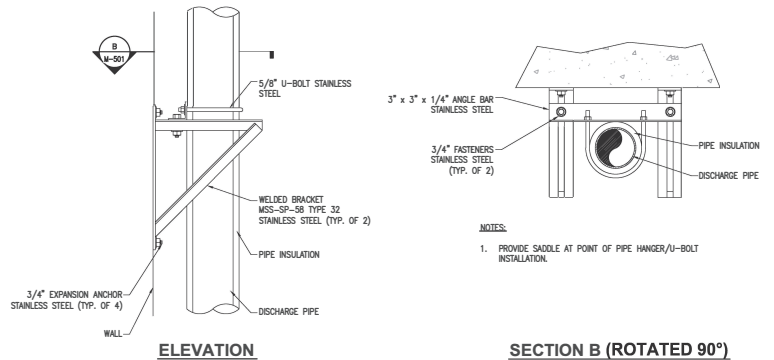
CHILLED WATER PIPE HANGERS
NOT TO SCALE



PIPE STAND WITH SADDLE SUPPORT
NOT TO SCALE



TYPICAL PIPE SUPPORT UPPER ATTACHMENT
NOT TO SCALE



VERTICAL PIPE SUPPORT - WALL
NOT TO SCALE



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.41715, Expiration Date: 2019-03-08

CONTRACT NO.
FQ17162

DESIGNED	B. YOKANATHAN	05/17
DRAWN	M. OLATA	05/17
CHECKED	J. SILVA	05/17
APPROVED	R. SILVA	05/17

NUMBER	DESCRIPTION	DATE	BY	DESCRIPTION

DATE	BY	DESCRIPTION



WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES
OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM
APPROVED: *Mark H. Kapperman*

GFP A GARRETT FIRMING/PARSONS JOINT VENTURE
SUBMITTED: *[Signature]*
PROJECT MANAGER

REPLACEMENT OF CHILLERS AND COOLING TOWERS AT THREE METRO-RAIL STATIONS
MECHANICAL DETAILS SHEET 5 OF 5
SCALE: NOT TO SCALE
DRAWING NO. M-504
M1299-037

ABBREVIATIONS

AC	ALTERNATING CURRENT, AIR CONDITIONING
A, AMP	AMPERES
AF	AMPERES FRAME
AHJ	AIR HANDLING UNIT
AR	AUTHORITY REPRESENTATIVE
AT	AMPERES TRIP
AWG	AMERICAN WIRE GAUGE
BRKR	BREAKER
C, CND	CONDUIT
CF	CENTRIFUGAL FAN
CH	CHILLER
CHW, CHWP, CHP	CHILLED WATER PUMP
CP	CONTROL PANEL
CT	COOLING TOWER
CTL	CONTROL
CHWP	CONDENSER WATER PUMP
DWG	DRAWING
EF	EXHAUST FAN
EG	EQUIPMENT GROUND
EHC	ELECTRIC HEATING COIL
ELEC	ELECTRICAL
ELEV	ELEVATOR
EM	EMERGENCY
EIH	ELECTRIC UNIT HEATER
EXIST	EXISTING
FOU	FAN COIL UNIT
FLA	FULL LOAD AMPERES
G, GND	GROUND
GFP	GROUND FAULT PROTECTION
GFS	GALVANIZED RIGID STEEL
HP	HORSE POWER, HEAT PUMP
HTR	HEATER
HVAC	HEATING, VENTILATING, AIR CONDITIONING
HZ	HERTZ
IWH	INSTANTANEOUS WATER HEATER
JB	JUNCTION BOX
KCMIL	THOUSAND CIRCULAR-MIL
KVA	KILO-VOLT AMPERE
KW	KILOWATT
LFC	LIQUIDTIGHT FLEXIBLE CONDUIT
LTD	LIGHTING
LTS	LIGHTS
MACH	MACHINE
MD	MOTORIZED DAMPER
MEZZ	MEZZANINE
MCA	MAXIMUM CIRCUIT AMPACITY
MCC	MOTOR CONTROL CENTER
MCP, MOP	MINIMUM OVER-CURRENT PROTECTION
MFR	MANUFACTURER
MECH	MECHANICAL
MLO	MAN LIFT ONLY
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
#, NO.	NUMBER
P	POLE
PASS	PASSAGEWAY
#/PH	PHASE
PLT	PLANT
PNL	PANEL
PWR	POWER
QTY	QUANTITY
RECP	RECEPTACLE
RLA	RUNNING LOAD AMPERES
RM	ROOM
RMS	ROOT MEAN SQUARE
SWBD	SWITCHBOARD
TYP	TYPICAL
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORING
UNO	UNLESS OTHERWISE NOTED
V	VOLT
VFD	VARIABLE FREQUENCY DRIVE
W	WIRE
XFMR	TRANSFORMER

SYMBOLS

	CIRCUIT BREAKER, RATING AS SHOWN.
	TRANSFORMER - SIZED AS NOTED ON SCHEDULE. SUBSCRIPT IS IDENTIFIER.
	JUNCTION BOX - CEILING MOUNTED TYPE AS INDICATED OR AS REQUIRED BY CODE.
	JUNCTION BOX - WALL MOUNTED.
	MOTOR CONNECTIONS, NUMBER IS HP.
	NON-FUSED SAFETY SWITCH, RATING AS SHOWN (AMPACITY/POLES).
	MAGNETIC STARTER, FWR, SIZED AS REQUIRED.
	CONDUIT OR CABLE TURNING AWAY OR DOWN.
	CONDUIT OR CABLE TURNING UPWARD OR TOWARDS VIEWER.
	CONDUIT OR CABLE EXPOSED.
	CONDUIT RUN CONCEALED.
	HOME-RUN TO DISTRIBUTION EQUIPMENT. EQUIPMENT GROUND WIRE SHALL BE PROVIDED FOR ALL CIRCUITS. MINIMUM 3/4" AND #12 WIRING.
	ELECTRICAL EQUIPMENT, TYPE AS INDICATED.
	PANELBOARD, DISTRIBUTION AND LIGHTING, 480/277V.
	PANELBOARD, LIGHTING AND APPLIANCE, 208/120V.
	VARIABLE FREQUENCY DRIVE (VFD).
	SINGLE POLE SWITCH, +48 AFF U.O.N. LETTER INDICATES FIXTURES CONTROLLED.
	4' SURFACE-MOUNTED FLUORESCENT STRIP LIGHT LETTER INDICATES CONTROLLING SWITCH.
	4' SURFACE-MOUNTED FLUORESCENT STRIP EMERGENCY LIGHT.
	4' SURFACE-MOUNTED FLUORESCENT STRIP LIGHT FOR DEMOLITION.
	KEYED NOTE FOR DEMOLITION PLAN.
	KEYED NOTE FOR NEW WORK PLAN.
	EMERGENCY STOP PUSH BUTTON.

GENERAL NOTES

- REFER TO DRAWING NO. G-002 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 POSSES 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 NUMBERS/LETTERS FOR THIS DRAWING ARE THE SAME AS IN THE ORIGINAL DRAWING. THIS IS DONE TO AVOID ANY CONFUSION FOR THE MAINTENANCE AND THE FIELD 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, ANS, 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 REQUESTS FOR PAYMENT ARE SUBMITTED.
- GUARANTEE WORK IN WRITING FOR ONE 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 NUMBER 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 NEMA SPECIFICATION AND THE NATIONAL AND LOCAL ELECTRICAL CODES.
- NEW CIRCUIT BREAKER RATING SHALL BE COMPARABLE WITH EXISTING PANELBOARD CIRCUIT BREAKERS AND IAC RATINGS.
- AT LOCATIONS WHERE NEW CONDUITS AND CABLES EXIT MECHANICAL AND/OR AC SWITCHBOARD ROOMS, 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 AC/UFAN 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, LOW SMOKE ZERO HALOGEN.
- INSULATION RESISTANCE TEST SHALL BE PERFORMED ON ALL NEW AND REUSED CABLES IF RESISTANCE FOR REUSED CABLE FAILS, THE CABLE SHALL BE REMOVED AND REPLACED WITH A NEW CABLE.
- ALL NEW AND REUSED CONDUITS, CABLES AND ELECTRICAL DEVICES ARE TO BE LABELED AS PER NEMA SPECIFICATIONS.



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. 24687, Expiration Date: 2018-03-15

CONTRACT NO. FQ17162

DESIGNED	DATE	REFERENCE DRAWINGS		REVISIONS	
		NUMBER	DESCRIPTION	DATE	DESCRIPTION
0.1/REM/RLA/EF	05/17				
DRAWN	DATE				
CHECKED	DATE				
APPROVED	DATE				

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
 DEPARTMENT OF TRANSIT INFRASTRUCTURE AND ENGINEERING SERVICES
 OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM

APPROVED: *Patrick H. Kappas*

SUBMITTED: *GFP*
 PROJECT MANAGER

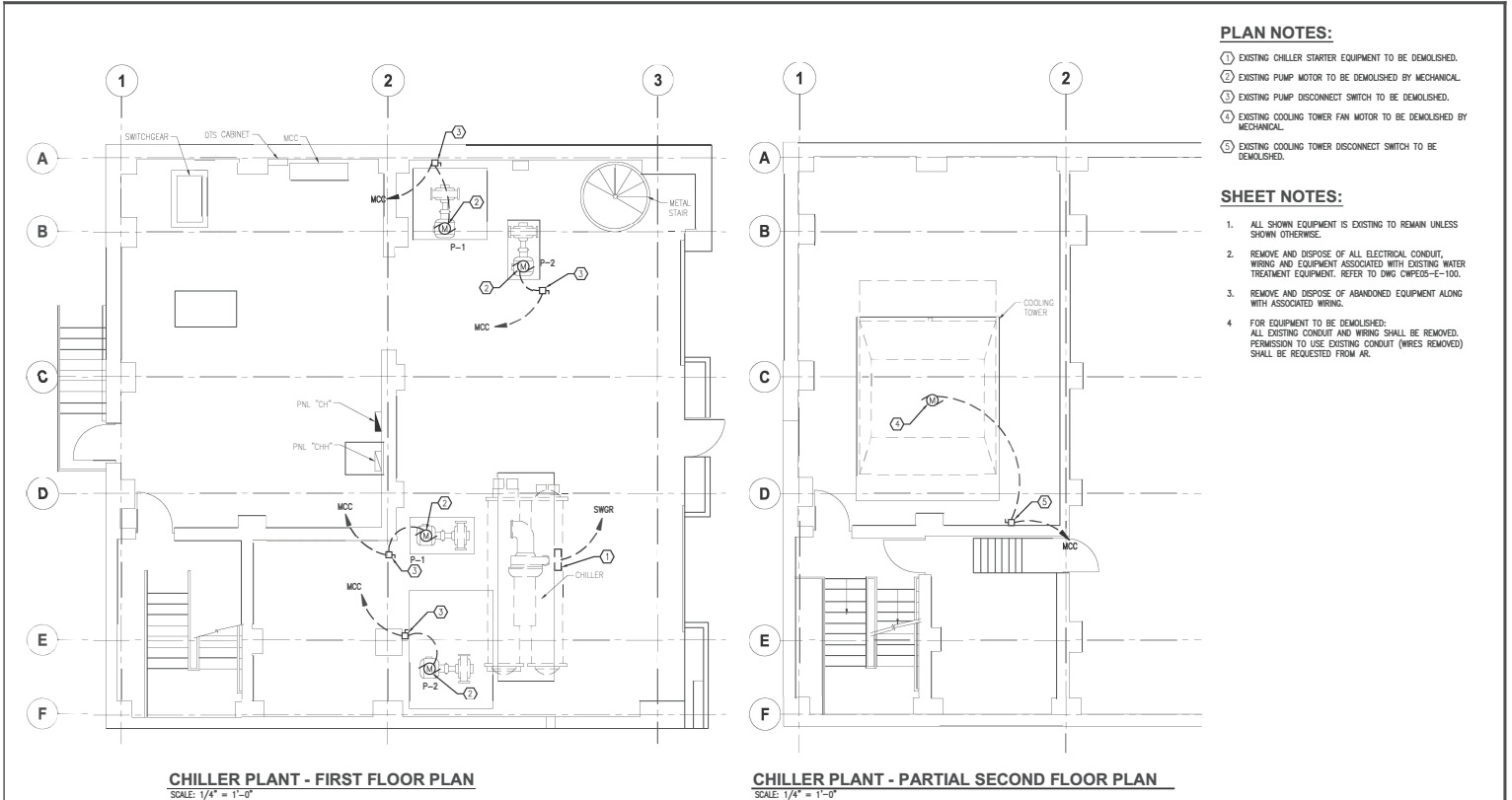
REPLACEMENT OF CHILLERS AND COOLING TOWERS AT THREE METRO-RAIL STATIONS

ELECTRICAL ABBREVIATIONS, SYMBOLS, AND NOTES

SCALE: NONE

DRAWING NO. E-001

M1299-038



PLAN NOTES:

- ① EXISTING CHILLER STARTER EQUIPMENT TO BE DEMOLISHED.
- ② EXISTING PUMP MOTOR TO BE DEMOLISHED BY MECHANICAL.
- ③ EXISTING PUMP DISCONNECT SWITCH TO BE DEMOLISHED.
- ④ EXISTING COOLING TOWER FAN MOTOR TO BE DEMOLISHED BY MECHANICAL.
- ⑤ EXISTING COOLING TOWER DISCONNECT SWITCH TO BE DEMOLISHED.

SHEET NOTES:

1. ALL SHOWN EQUIPMENT IS EXISTING TO REMAIN UNLESS SHOWN OTHERWISE.
2. REMOVE AND DISPOSE OF ALL ELECTRICAL CONDUIT, WIRING AND EQUIPMENT ASSOCIATED WITH EXISTING WATER TREATMENT EQUIPMENT. REFER TO DWG CWPE05-E-100.
3. REMOVE AND DISPOSE OF ABANDONED EQUIPMENT ALONG WITH ASSOCIATED WIRING.
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.

CHILLER PLANT - FIRST FLOOR PLAN
SCALE: 1/4" = 1'-0"

CHILLER PLANT - PARTIAL SECOND FLOOR PLAN
SCALE: 1/4" = 1'-0"

CONTRACT NO.
FQ17162

DESIGNED	C. HILL	05/17
DRAWN	C. HILL	05/17
CHECKED	J. DUBS	05/17
APPROVED	D. KHAN	05/17

REFERENCE DRAWINGS		REVISIONS	
NUMBER	DESCRIPTION	DATE	DESCRIPTION



WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
DEPARTMENT OF TRANSIT INFRASTRUCTURE
AND ENGINEERING SERVICES
OFFICE OF INFRASTRUCTURE RENEWAL PROGRAM
APPROVED: *Mark H. Kappeler*

GFP A GARRETT FIRMING/PALSONS
JOINT VENTURE
SUBMITTED: *[Signature]*
PROJECT MANAGER

REPLACEMENT OF CHILLERS AND COOLING TOWERS AT THREE METRO-RAIL STATIONS
CWPE05 - GEORGIA AVE - PETWORTH
ELECTRICAL PLANS - DEMOLITION
SCALE: 1/4" = 1'-0"
DRAWING NO.: CWPE05-E-100
M1299-039