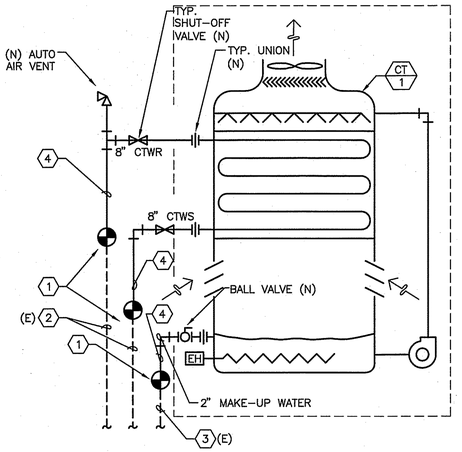
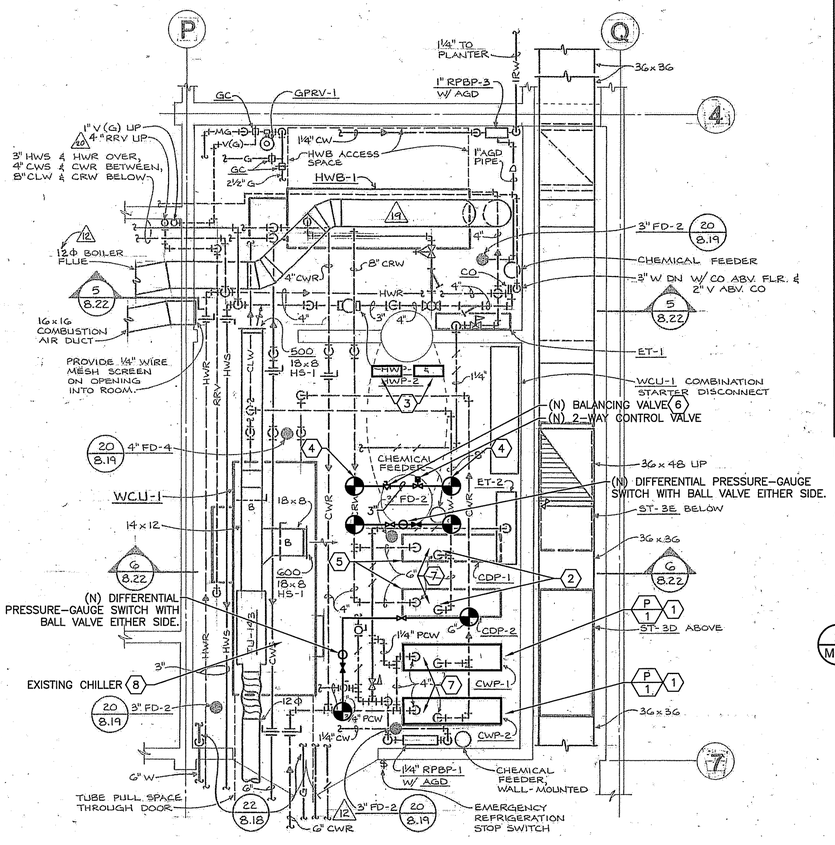
1 M0.1 NOTES

1. CONNECT TO EXISTING PIPING ON ROOF, SEE M1.0.
2. EXISTING PIPING BELOW ROOF. EXISTING HEAT TRACE TO REMAIN.
3. EXISTING PIPING BELOW ROOF LEVEL. EXISTING HEAT TRACE TO REMAIN.
4. REMOVE EXISTING HEAT TRACE FROM EXISTING PIPING. STORE FOR RE-USE. USE EXISTING TRACE AND INSTALL ON NEW PIPING PRIOR TO INSULATING PIPING. PROVIDE NEW HEAT TRACE (SAME WATT/FT AS EXISTING) AS REQUIRED TO APPLY TO FULL LENGTH OF PIPING.



1 M0.1 CLOSED-SYSTEM COOLING TOWER PIPING

NOT TO SCALE MPP-COOL-TOWR-CLOS-01



2 M0.1 PLAN - BOILER/CHILLER ROOM

SCALE: 1/4"=1' MPP-PUMP-02

MECHANICAL LEGEND

DUCTWORK FITTINGS (DOUBLE/SINGLE LINE) AND CONTROLS

—CTWR—	CTWR COOLING TOWER WATER RETURN
—CTWS—	CTWS COOLING TOWER WATER SUPPLY
—M—	MD MOTORIZED DAMPER

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
BTU	BRITISH THERMAL UNIT
(E)	EXISTING
GPM	GALLONS PER MINUTE
HP	HORSEPOWER
MBH	1000 BTU PER HOUR
MFR	MANUFACTURER
(N)	NEW
PSI	POUNDS PER SQUARE INCH

REFERENCE

- CONNECT TO EXISTING AT THIS POINT. VERIFY LOCATION, SIZE, AND CONDITION.
- (1) SHEET NOTE
- CT 1 EQUIPMENT MARK NUMBER SEE SCHEDULES
- 1 REVISION

NOTE: NOT ALL SYMBOLS OR ABBREVIATIONS CONTAINED IN THIS LEGEND WILL APPEAR ON DRAWINGS.

GENERAL NOTES (ELECTRICAL)

A. OBTAIN THE SERVICES OF A ELECTRICIAN LICENSED IN THE STATE OF OREGON TO DISCONNECT EXISTING PUMPS AND RECONNECT TWO NEW PUMPS VIA NEW VFD'S PER THE SCOPE INDICATED ON THIS SHEET. DISCONNECT EXISTING PUMPS AND REMOVE EXISTING STARTERS, ETC. RE-USE EXISTING POWER FEEDERS TO SERVE NEW PUMPS (NO LOAD INCREASE). COORDINATE REQUIREMENTS WITH MECHANICAL CONTRACTOR.

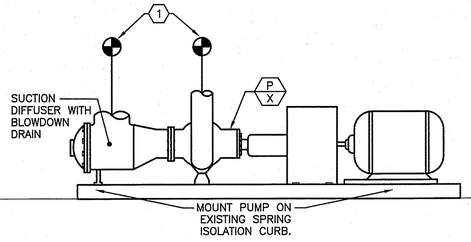
2 M0.1 NOTES

1. INSTALL NEW P-1, P-2. SEE 2/M0.1.
2. REMOVE EXISTING SECTION OF VERTICAL PIPING. MEASURE DISTANCE BETWEEN PUMP AND HORIZONTAL PIPING ACCURATELY AND INSTALL NEW SECTION OF PIPING SO PIPE IS STRAIGHT AND PLUMB. WELD JOINTS OR PROVIDE NEW VICTAULIC FITTINGS AS REQUIRED.
3. PROVIDE NEW UNISTRUT FRAME FOR NEW CHILLED WATER PUMP VFD'S. FRAME TO BE SIMILAR TO EXISTING VFD FRAME FOR CONDENSER WATER PUMPS. MOUNT FRAME ON CONCRETE COLUMN DIRECTORY ACROSS FROM EXISTING FRAME MOUNTED ON CONCRETE COLUMN.
4. CONNECT NEW " BY-PASS PIPE TO CONDENSER WATER SUPPLY AND RETURN PIPING.
5. EXISTING ARMSTRONG SERIES 4030 MODEL 4X3X10 CONDENSER WATER PUMP. REMOVE EXISTING IMPELLER AND REPLACE WITH 4009 IMPELLER.
6. SET AT 100 GPM.
7. REMOVE EXISTING THERMOMETER ON PIPING. INSTALL NEW THERMOMETER.
8. SEE SPECIFICATION (SECTION 15010) FOR FACTORY START-UP OF EXISTING CHILLER.

PUMP SCHEDULE

MARK NUMBER	(1) P 1 / P 2 (3)
SYSTEM	CHILLED WATER
TYPE	BASE MTD.
FLOW RATE (GPM)	300
HEAD (FT)	85
MOTOR (HP)	10
RPM	1750
DESIGN WEIGHT (LBS)	
ELECTRICAL (V-PH)	480V, 3PH
VIBRATION ISOLATION	N/A
MANUFACTURER/MODEL	ARMSTONG 4030 3x2x10 (2)

(1) PROVIDE SUCTION DIFFUSER ON PUMPS
(2) TO MATCH EXISTING PUMP
(3) PROVIDE VARIABLE FREQUENCY DRIVE

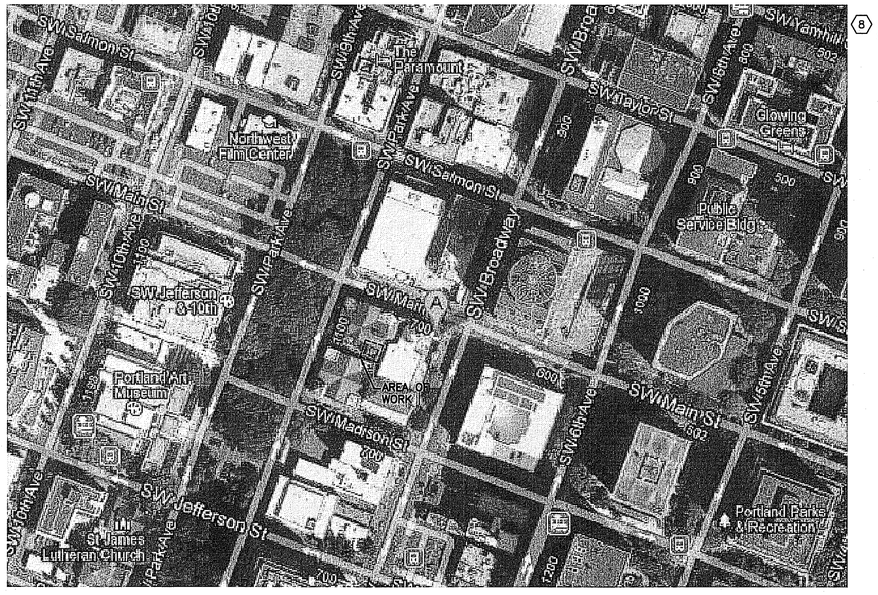


3 M0.1 NOTES

1. CONNECT TO EXISTING PIPING. ALIGN PIPING AS REQUIRED FOR FULLY ALIGNED, PLUMB CONNECTION TO PUMP.

3 M0.1 BASE-MOUNTED PUMP DETAIL

NOT TO SCALE MPP-PUMP-02



4 M0.1 PROJECT LOCATION

PCPA HATFIELD HALL

COOLING TOWER SCHEDULE

MARK NUMBER	CT 1 (1) (2) (3)
SYSTEM	BUILDING
TYPE	CLOSED CIRCUIT
CAPACITY (TONS)	NOMINAL 230
GPM	850
WATER PRESSURE DROP (MAX)	13
ENTERING WATER (°F)	95
LEAVING WATER (°F)	85
AMBIENT DB/WB (°F)	95
FAN MOTOR SIZE (HP)	20 HP
PUMP MOTOR SIZE (HP)	5 HP
SUMP HEATER (KW)	8 KW
DESIGN WEIGHT (LBS)	17,800
ELECTRICAL (V-PH)	480V,3PH
MANUFACTURER/MODEL	BAC FXV-0812-24

(1) MAXIMUM DIMENSIONS OF TOWER TO BE 12'-0"L X 8'6"W X 18'1"H.
(2) PROVIDE VARIABLE FREQUENCY DRIVE FOR FAN.
(3) PROVIDE AIR SOLUTION CO. INDUSTRIAL GRADE FILTERS AND FRAMES FOR AIR INLET SECTION.

DRAWING LIST

M0.1 SCHEDULES/DETAILS
M1.0 PLAN LEVEL 141'-0" – HVAC

THIS LINE IS 2 INCHES AT FULL SCALE
IF IT DOES NOT MEASURE 2 INCHES, SCALE ACCORDINGLY

REGISTERED PROFESSIONAL ENGINEER
10,802
OREGON
JULY 18, 1986
DONALD C. PFAFF
10/25/12
EXPIRES 12/31/12

R&W ENGINEERING, INC.
"Engineering Integrated Solutions"
9615 S.W. Allen Blvd., Suite 107
Beaverton, Oregon 97005
Phone: (503) 726-3340
Fax: (503) 726-3326
E-mail: rweng@rweng.com

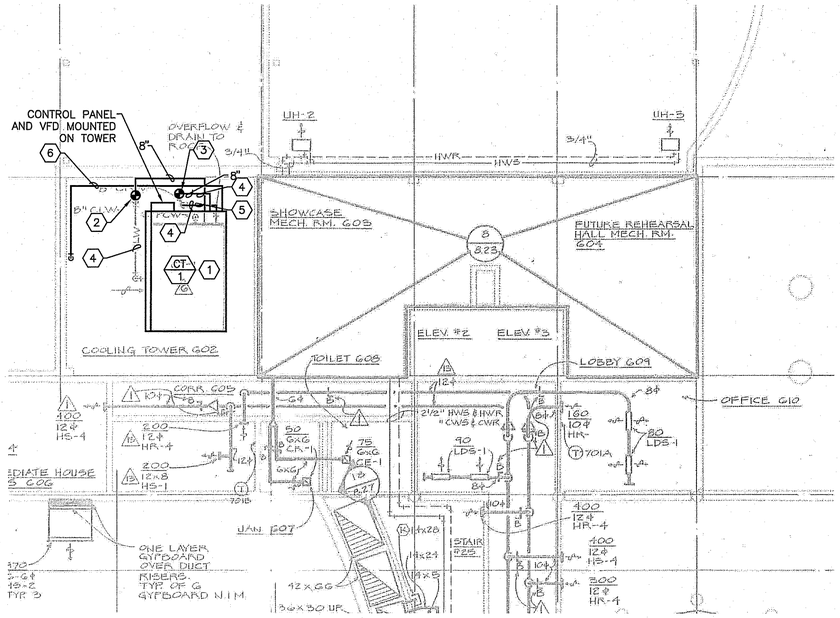
REV	DATE	DESCRIPTION	BY

PCPA HATFIELD HALL TOWER REPLACEMENT

SCHEDULES/DETAILS

DESIGNED:	DCP
DRAWN:	VAF
CONTACT:	Don Pfaff
PROJECT #:	443.009.001
DATE:	8/24/12

DRAWING NO.
M0.1
SHEET 1 OF 2



PLAN LEVEL 141'-0"
HVAC
1/M1.0 SCALE: 1/8" =1'

GENERAL NOTES (ELECTRICAL)

A. OBTAIN THE SERVICES OF A ELECTRICIAN LICENSED IN THE STATE OF OREGON TO CONNECT NEW COOLING TOWER AND ASSOCIATED ANCILARY CONNECTIONS PER SCOPE INDICATED ON THIS SHEET. DISCONNECT EXISTING COOLING TOWER AND REMOVE TOWER CONTROL PANEL, STARTERS AND MISCELLANEOUS CONNECTIONS. RE-USE EXISTING POWER FEEDER TO SERVE NEW COOLING TOWER (NO LOAD INCREASE). COORDINATE REQUIREMENTS WITH MECHANICAL CONTRACTOR.

NOTES THIS SHEET

1. REMOVE EXISTING COOLING TOWER, PIPING, CONTROLS AND MOUNTING FRAME. INSTALL NEW TOWER ON NEW FRAME. SEE STRUCTURAL SPEC AND DRAWINGS FOR FRAME AND MOUNTING. SEE 1/M0.1.

2. CONNECT TO EXISTING CONDENSER WATER SUPPLY PIPING AT A LOCATION 1'-0" ABOVE ROOF. EXTEND UP TO 20" ABOVE ROOF AND ROUTE UP TO PIPING HORIZONTALLY AND CONNECT TO TOWER AS REQUIRED. SUPPORT PIPING ON "PIPE-PIER 300" SUPPORT PAD WITH "XTENSION" ELEVATION KIT. SEE M1/M0.1. PROVIDE ONE INJECTION POINT FITTING AND VALVE IN HORIZONTAL PIPING FOR WATER TREATMENT.

3. CONNECT TO EXISTING CONDENSER WATER RETURN PIPING AT A LOCATION 1'-0" ABOVE ROOF. EXTEND UP TO 20" ABOVE ROOF AND ROUTE UP TO PIPING HORIZONTALLY AND CONNECT TO TOWER AS REQUIRED. SUPPORT PIPING ON "PIPE-PIER 300" SUPPORT PAD WITH "XTENSION" ELEVATION KIT. SEE 2/M0.1. PROVIDE ONE INJECTION POINT FITTING AND VALVE IN HORIZONTAL PIPING FOR WATER TREATMENT.

4. REMOVE 8" CONDENSER WATER SUPPLY AND RETURN PIPING ABOVE ROOF FROM LOCATION OF ROOF PENETRATION TO EXISTING TOWER. REMOVE EXISTING INSULATION AND HEAT TRACE. SEE NOTE ON M0.1 FOR RE-INSTALLATION OF HEAT TRACE.

5. CONNECT TO EXISTING 2" MAKE-UP WATER AT 12" ABOVE ROOF. EXTEND AND CONNECT TO TOWER.

6. REMOVE EXISTING OVERFLOW AND DRAIN PIPING. INSTALL NEW PIPING FULL SIZE FROM TOWER TO ROOF DRAIN. MOUNT ON 4" HIGH SUPPORTS (MIRO MODEL 3-R OR EQUAL). STRAP PIPE TO SUPPORTS. INSTALL SUPPORTS AT TOWER, AT ELBOWS, AT DISCHARGE ROOF DRAIN, AND AT 8'-0" O.C. FOR PIPE RUNS.

REGISTERED PROFESSIONAL ENGINEER
10,802
OREGON
JULY 18, 1980
DONALD C. PFAFF
7-27-12
EXPIRES 12/31/12

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Fax: (503) 726-3326
E-mail: rweng@rweng.com

REV	DATE	DESCRIPTION	BY

PCPA HATFIELD HALL TOWER REPLACEMENT

PLAN LEVEL 141'-0" - HVAC

DESIGNED:	DCP
DRAWN:	VAF
CONTACT:	Don Pfaff
PROJECT #:	443.009.001
DATE:	8/24/12

DRAWING NO.
M1.0
SHEET 2 OF 2

THIS LINE IS 2 INCHES AT FULL SCALE
IF IT DOES NOT MEASURE 2 INCHES, SCALE ACCORDINGLY