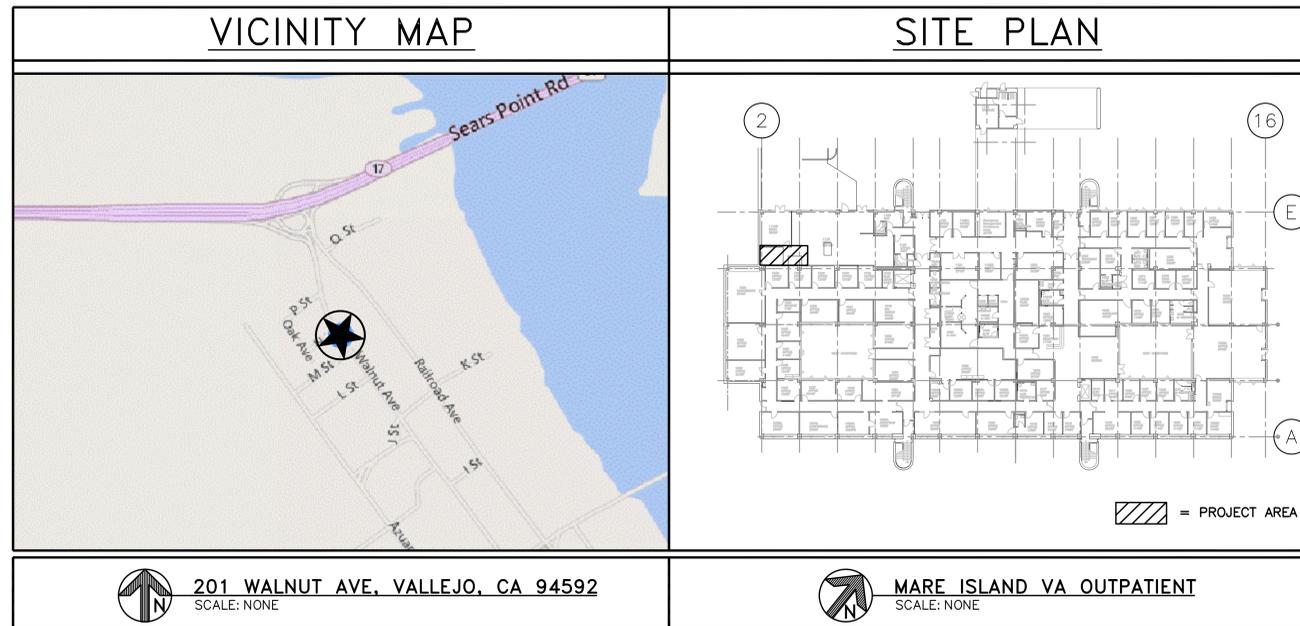


DEPARTMENT OF VETERANS AFFAIRS

MARE ISLAND CHILLER INSTALLATION OUTPATIENT CLINIC PROJECT NUMBER: 612-14-035



| PROJECT DATA | |
|--------------------|-------------|
| OCCUPANCY: | N/A |
| CONSTRUCTION TYPE: | N/A |
| FIRE PROTECTION: | N/A |
| NUMBER OF STORIES: | N/A |
| AREA OF WORK: | 207 SQ. FT. |

| PROJECT DESCRIPTION |
|--|
| THE PROJECT CONSISTS OF THE FOLLOWING: |
| <ul style="list-style-type: none"> PROVIDE AND INSTALL TWO NEW 75 TON CHILLERS PROVIDE AND INSTALL ASSOCIATED PIPING TO TIE INTO EXISTING CHILLED WATER PUMPS AND EXISTING CONDENSER WATER PUMPS UPDATE BMS FOR NEW CHILLER AND CHILLER ACCESSORIES PROVIDE INSTALL REFRIGERANT LEAK DETECTION |

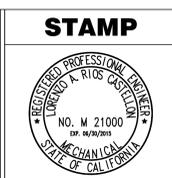
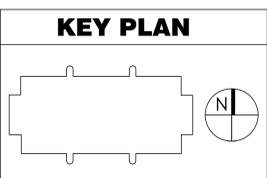
| DRAWING INDEX | |
|-------------------|---|
| NUMBER | DESCRIPTION |
| GENERAL | |
| G-001 | SITE MAP, VICINITY MAP, DRAWING INDEX, AND PROJECT DESCRIPTION |
| MECHANICAL | |
| H-001 | GENERAL NOTES, SYMBOLS AND ABBREVIATIONS |
| H-101 | PARTIAL FIRST FLOOR MECHANICAL PLAN - PHASE 1 & PHASE 2 |
| H-501 | DETAILS |
| H-601 | SCHEDULES |
| H-602 | SCHEMATIC DIAGRAM AND SEQUENCE OF OPERATION |
| ELECTRICAL | |
| E-101 | PARTIAL FIRST FLOOR POWER PLAN AND PARTIAL SINGLE LINE DIAGRAMS |

| DESIGN & SPECIFICATION REQUIREMENTS | |
|-------------------------------------|-------------------------------------|
| PG-18-1 | MASTER CONSTRUCTION SPECIFICATIONS. |
| H-18-8 | SEISMIC DESIGN HANDBOOK. |

| APPLICABLE CODES |
|------------------------------------|
| 2012 INTERNATIONAL BUILDING CODE |
| 2012 INTERNATIONAL MECHANICAL CODE |
| 2012 INTERNATIONAL PLUMBING CODE |
| 2014 NATIONAL ELECTRIC CODE |
| 2010 NFPA 72 |

| Revisions: | Date |
|---|----------|
| BID DOCUMENT SUBMITTAL (FINAL) (14-137) | 12/18/14 |
| 100% CONSTRUCTION DOCUMENTS (14-112) | 11/11/14 |
| 90% DESIGN DEVELOPMENT (14-101) | 10/28/14 |
| SCHEMATIC DESIGN SUBMITTAL (14-083) | 9/12/14 |

| CONSULTANTS: |
|--------------|
| |



ARCHITECT/ENGINEERS:

ADVANCE DESIGN CONSULTANTS, INC.

958 PARK AVENUE SAN JOSE CALIFORNIA 95128
 P: (408) 297-1881 F: (408) 294-3186 www.adcengineers.com

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PO# 14-308-37

| | |
|---|---|
| Drawing Title | Project Title |
| GENERAL SITE MAP, VICINITY MAP, DRAWING INDEX AND PROJECT DESCRIPTION | VA MARE ISLAND OUTPATIENT CLINIC CHILLER INSTALLATION |
| Approved: Project Director | Location |
| | VALLEJO, CA |
| | Date |
| | 11/11/2014 |

| | |
|-----------------|------------|
| Project Number | 612-14-035 |
| Building Number | 201 |
| Drawing Number | G-001 |
| Checked | L RIOS |
| Drawn | R RIOS |

Office of Facilities Management

Department of Veterans Affairs

three inches = one foot
 one and one half inches = one foot
 one inch = one foot
 three quarters inch = one foot
 one half inch = one foot
 one quarter inch = one foot
 three eighths inch = one foot
 one eighth inch = one foot

GENERAL NOTES

A. CONTRACTOR'S RESPONSIBILITY:

CONTRACTOR SHALL VERIFY THE FIELD CONDITIONS AND MAKE ADJUSTMENT TO THE CONSTRUCTION DRAWINGS AS REQUIRED. ANY CORRECTIVE MEASURE ARISING FROM AS LACK OF COORDINATION SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR SHALL COORDINATE WORK WITH OTHER TRADES.

B. CODE COMPLIANCE:

THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE AND LOCAL CODES ISSUED BY THE AUTHORITIES HAVING JURISDICTION. THE COMPLETE MECHANICAL INSTALLATION SHALL BE IN ACCORDANCE WITH THE ADOPTED EDITION OF IMC, IPC, IFC, IBC, OSHA, NFPA, V.A. DESIGN MANUAL REQUIREMENTS, THE LATEST RULES AND REGULATIONS OF THE SAFETY ORDERS ISSUED BY THE DIVISION OF INDUSTRIAL SAFETY, STATE OF CALIFORNIA. THE CONTRACTOR SHALL COMPLY DIVISION OF INDUSTRIAL SAFETY, STATE OF CALIFORNIA.

C. GENERAL AND SPECIAL REQUIREMENT:

CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS OF GENERAL REQUIREMENTS (010000) AND LATERAL FORCE ANCHORAGE PROVISIONS (130541). CONTRACTOR SHALL RETAIN THE SERVICES OF A LICENSED STRUCTURAL ENGINEER (S.E.) IN THE STATE OF CALIFORNIA TO PREPARE DETAIL EQUIPMENT SUPPORT DRAWINGS AND CALCULATIONS.

D. "AS-BUILT" DRAWINGS:

THE CONTRACTOR SHALL MAINTAIN AT THE JOB SITE AN UP-TO-DATE "AS-BUILT" DRAWING SET. THE "AS-BUILT" DRAWING SET SHALL REFLECT ALL APPROVED CHANGES TO THE DESIGN DRAWINGS AND FIELD CONDITION. THE "AS-BUILT" DRAWING SET SHALL BE KEPT CLEAN AND IN GOOD CONDITION AND SHALL BE TURNED OVER TO V.A. CONTRACTING OFFICER REPRESENTATIVE (C.O.R.) TWO (2) WEEKS AFTER COMPLETION OF THE PROJECT.

E. FUNCTIONAL TEST AND ACCEPTANCE:

UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL SCHEDULE AND PERFORM A COMPLETE FUNCTIONAL TEST TO DEMONSTRATE TO THE V.A. FACILITIES OPERATIONS AND MAINTENANCE PERSONNEL PROJECT MANAGER THAT THE MECHANICAL SYSTEMS ARE OPERATING AS INTENDED. ANY DEFECTS OR DISCREPANCIES IN THE MATERIAL OR WORK SHALL BE CORRECTED IMMEDIATELY TO THE SATISFACTION OF V.A. CONTRACTING OFFICER REPRESENTATIVE (C.O.R.) AT NO ADDITIONAL COST. NOISY OPERATION AND/OR VIBRATION TRANSMISSION TO THE BLDG. STRUCTURE WILL NOT BE ACCEPTED.

| ABBREVIATIONS | |
|---------------|-------------------------------|
| ABBREVIATION | DESCRIPTION |
| BHP | BRAKE HORSE POWER |
| BTU | BRITISH THERMAL UNIT |
| CHWS | CHILLED WATER SUPPLY |
| CHWR | CHILLED WATER RETURN |
| CV | CONTROL VALVE |
| CONT | CONTINUATION |
| DEG. F. | DEGREE FAHRENHEIT |
| DET. | DETAIL |
| DN | DOWN |
| E | EXISTING |
| EWT | ENTERING WATER TEMPERATURE |
| EFF | EFFICIENCY |
| (E) | EXISTING |
| GPM | GALLONS PER MINUTE |
| HWS | HEATING HOT WATER SUPPLY |
| HWR | HEATING HOT WATER RETURN |
| HP | HORSEPOWER |
| LWT | LEAVING WATER TEMPERATURE |
| MBH | 100 BTU PER HOUR |
| MAX/MIN | MAXIMUM/MIN |
| LBS/HR | POUNDS PER HOUR |
| N | NEW |
| N.C. | NORMAL CLOSED |
| N.O. | NORMALLY OPEN |
| PSI | POUNDS PER SQUARE INCH |
| P | PUMP |
| PD | PRESSURE DROP (FEET OF WATER) |
| VFD | VARIABLE FREQUENCY DRIVE |
| KW | KILOWATT |

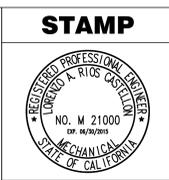
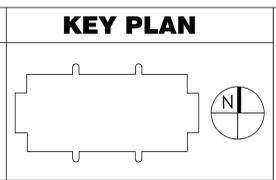
| PIPING SYMBOLS | |
|----------------|--|
| SYMB. | DESCRIPTION |
| | SERVICE PIPING IDENTIFICATIONS |
| | PIPE SLOPE DIRECTION |
| | ELBOW TURN UP & DOWN |
| | ELBOW TURN DOWN |
| | RISE OR DOWN |
| | BRANCH TOP CONNECTION |
| | BRANCH BOTTOM CONNECTION |
| | PIPE CAPPED OR PLUGGED |
| | FLOW DIRECTION |
| | CONCENTRIC REDUCER |
| | ECCENTRIC REDUCER |
| | PIPE GUIDE |
| | PIPE ANCHOR OR SUPPORT |
| | UNION |
| | FLANGE |
| | FLOW SWITCH |
| | FLEXIBLE CONNECTOR OR EXPANSION CONNECTOR |
| | STRAINER W/BLOWDOWN VALVE, HOSE COUPLING & CAP |
| | THERMOWELL |
| | PRESSURE RELIEF VALVE |
| | PRESSURE GAUGE W/GA. COCK & SNUBBER |
| | AUTOMATIC VENT W/GA. COCK |
| | BUTTERFLY VALVE |

| PIPING SYMBOLS | |
|----------------|--------------------------|
| SYMB. | DESCRIPTION |
| | 2-WAY CONTROL VALVE |
| | PRESSURE REDUCING VALVE |
| | 3-WAY CONTROL VALVE |
| | PETE'S PLUG |
| | BALANCING VALVE |
| | CIRCUIT SETTER |
| | CHECK VALVE |
| | THERMOMETER |
| | TEMPERATURE SENSOR |
| | FLOW METER |
| | SOLENOID VALVE |
| | DRAIN |
| | CHILLED WATER SUPPLY |
| | CHILLED WATER RETURN |
| | HEATING HOT WATER SUPPLY |
| | HEATING HOT WATER RETURN |
| | CONDENSATE DRAIN |
| | MOTORIZED VALVE |

| GENERAL SYMBOLS | |
|-----------------|---|
| | EQUIPMENT TYPE |
| | EQUIPMENT NO. |
| | SECTION LETTER OR DETAIL NUMBER |
| | SHEET NUMBER WHERE SECTION OR DETAIL IS SHOWN |
| | SHEET NOTE |
| | DEMOLITION NOTE |
| | NEW |
| | EXISTING |

| Revisions: | Date |
|---|----------|
| BID DOCUMENT SUBMITTAL (FINAL) (14-137) | 12/18/14 |
| 100% CONSTRUCTION DOCUMENTS (14-112) | 11/11/14 |
| 90% DESIGN DEVELOPMENT (14-101) | 10/28/14 |
| SCHEMATIC DESIGN SUBMITTAL (14-083) | 9/12/14 |

| CONSULTANTS: | |
|--------------|--|
| | |



ARCHITECT/ENGINEERS:

ADVANCE DESIGN CONSULTANTS, INC.

998 PARK AVENUE SAN JOSE CALIFORNIA 95128
 P: (408) 297-1881 F: (408) 294-3186 www.adcengineers.com

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PO# 14-308-37

| Drawing Title |
|---|
| MECHANICAL GENERAL NOTES, SYMBOLS AND ABBREVIATIONS |
| Approved: Project Director |

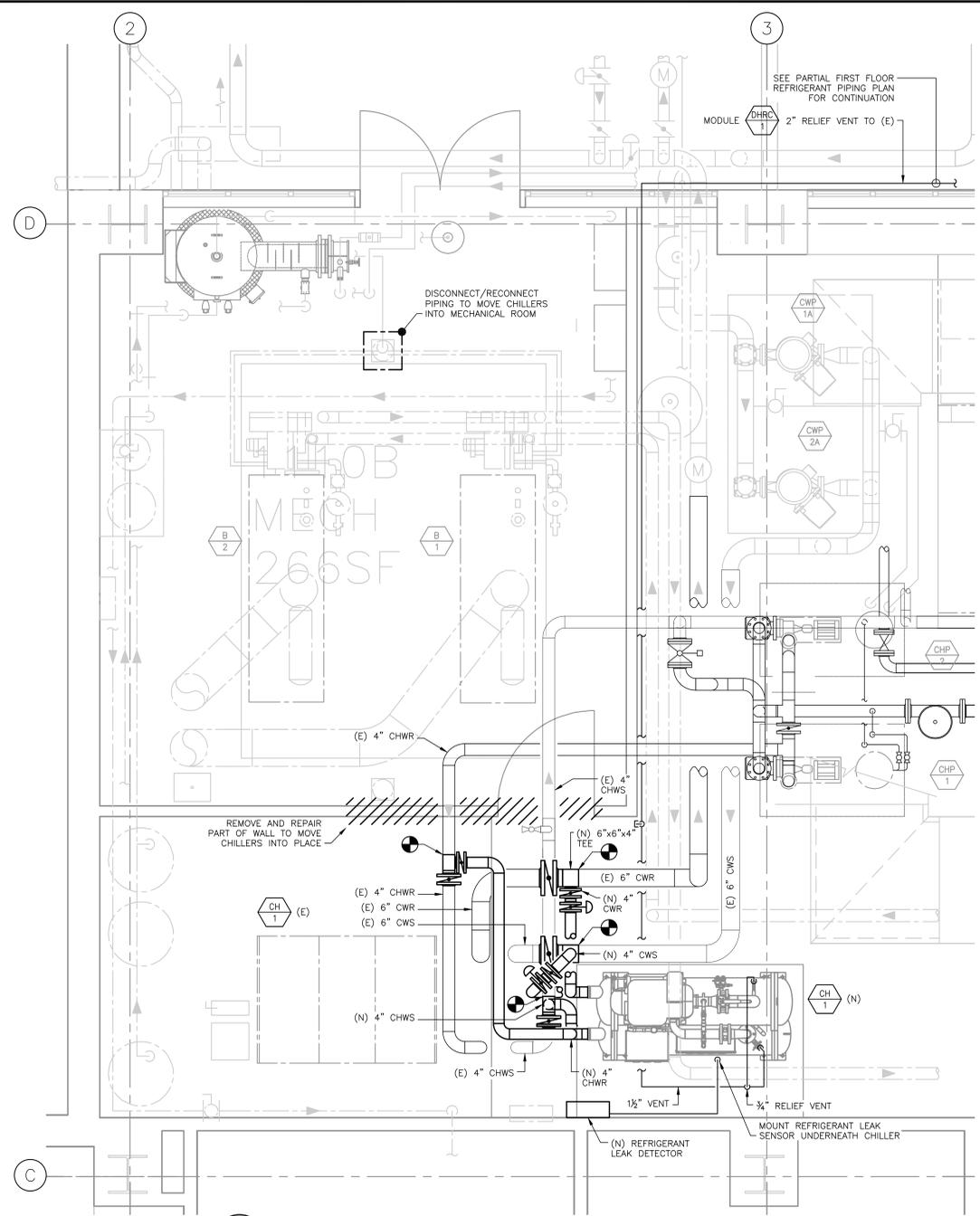
| Project Title | Location | Date | Checked | Drawn |
|---|-------------|------------|------------|-------------|
| VA MARE ISLAND OUTPATIENT CLINIC CHILLER INSTALLATION | VALLEJO, CA | 11/11/2014 | D. HAMMOND | J. ROTHWEIN |

| Project Number | Building Number | Drawing Number |
|----------------|-----------------|----------------|
| 612-14-035 | 201 | H-001 |

Office of Facilities Management

Department of Veterans Affairs

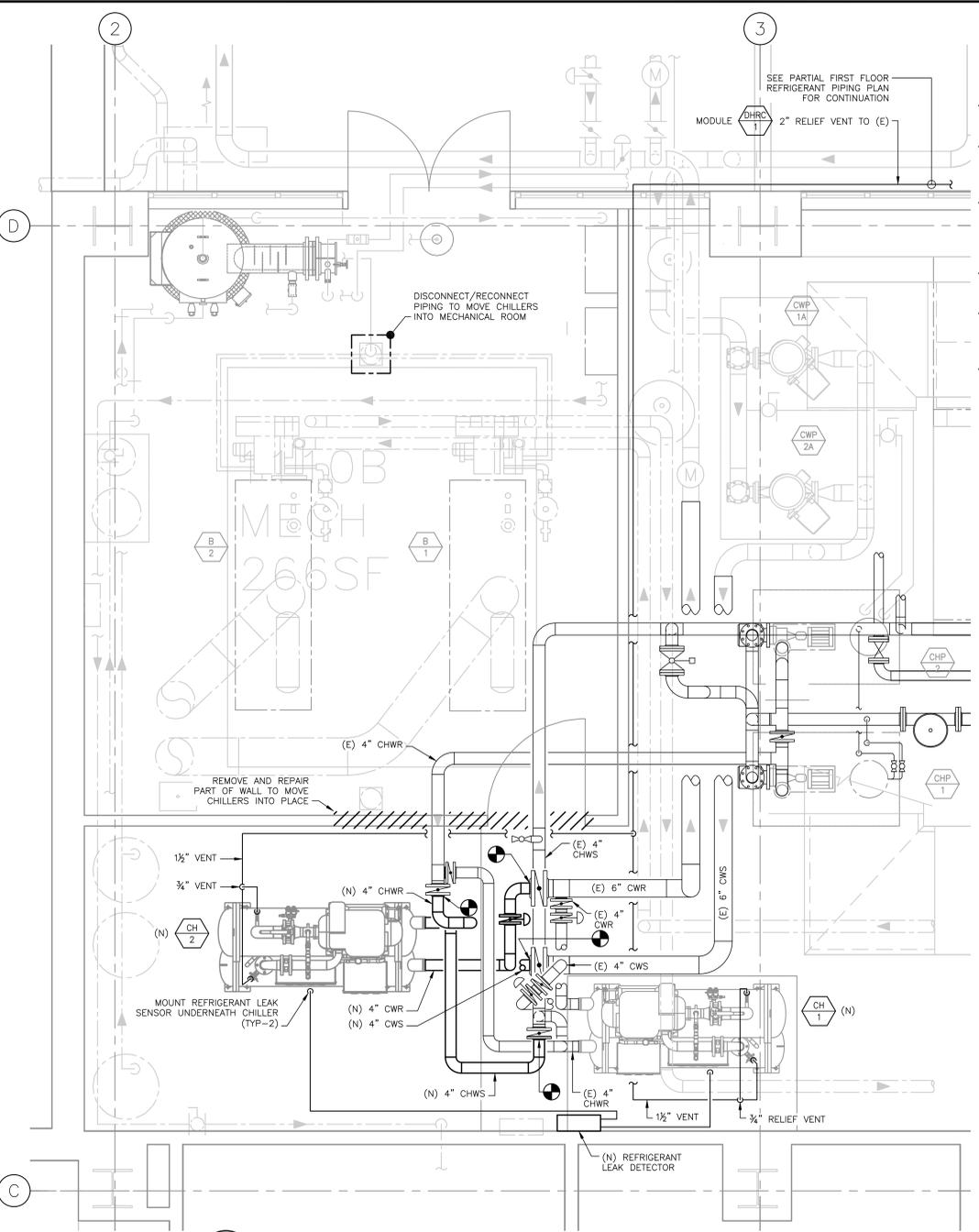
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 one and one half inches = one foot
 one inch = one foot
 three quarters inch = one foot
 one half inch = one foot
 one quarter inch = one foot
 three eighths inch = one foot
 one eighth inch = one foot



PARTIAL FIRST FLOOR MECHANICAL PLAN - PHASE 1
 SCALE: 1/2" = 1'-0"

PHASE 1 SHEET NOTES:

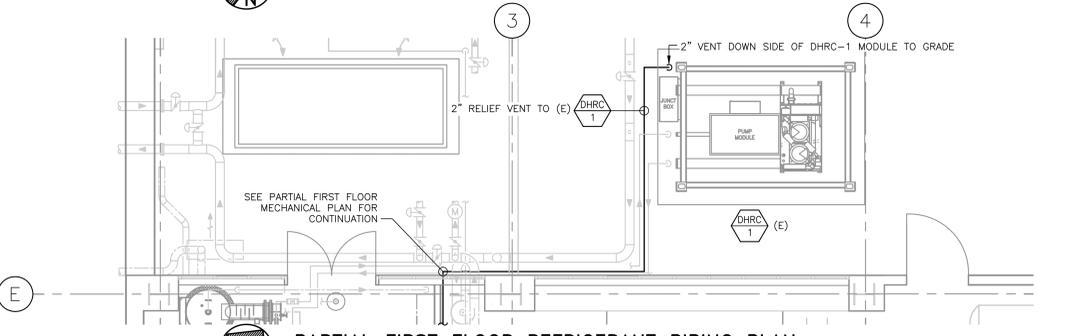
- 1 PRIOR TO ANY SYSTEM SHUT-DOWN NOTIFY VA COR 7 DAYS IN ADVANCE.
- 2 REPAIR/REPLACE AS NECESSARY (E) CONCRETE PAD FOR CH-1 AND CH-2
- 3 INSTALL 6x6x4 REDUCING TEE WITH 6" AND 4" BFV'S IN CONDENSER WATER SUPPLY AND RETURN.
- 4 INSTALL 4" TEE AND 4" BFV'S IN CHILLED WATER SUPPLY AND RETURN.
- 5 CONNECT (N) CHILLER-1 TO 4" CONDENSER WATER SUPPLY AND RETURN CONNECT TO 4" CHILLED WATER SUPPLY AND RETURN.
- 6 INSTALL REFRIGERANT LEAK DETECTOR WITH AUDIBLE ALARM AND STROBE INSIDE THE MECHANICAL ROOM AND AT EACH ENTRANCE TO THE MECHANICAL ROOM.
- 7 RELIEF VENT PIPE TO BE INSTALLED TO VENT AT A LOCATION 20' FROM ANY OPENING INTO THE BUILDING.
- 8 AFTER (N) CHILLER-1 IS OPERATIONAL (E) MODULAR CH-1 CAN BE DISCONNECTED AND REMOVED.
- 9 CHILLER SHUT DOWN SHALL OCCUR AFTER NORMAL HOSPITAL HOURS AND/OR ON WEEKEND ONLY.



PARTIAL FIRST FLOOR MECHANICAL PLAN - PHASE 2
 SCALE: 1/2" = 1'-0"

PHASE 2 SHEET NOTES:

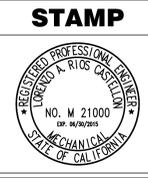
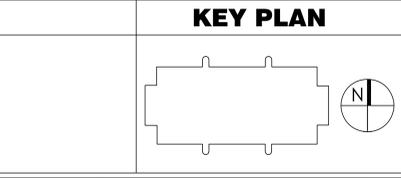
- 1 PRIOR TO ANY SYSTEM SHUT-DOWN NOTIFY VA COR 7 DAYS IN ADVANCE.
- 2 INSTALL (N) CHILLER-2 AND CONNECT TO 4" CWS, CWR, CHWS AND CHWR LINES.
- 3 INSTALL 1 1/2" RELIEF VENT LINE CONNECT TO 3/4" VENT VALVES ON CHILLER AND 2" VENT LINE INSTALLED IN PHASE 1.
- 4 INSTALLED REF. LEAK SENSOR UNDER CHILLER-2.
- 5 CHILLER SHUTDOWN SHALL OCCUR AFTER NORMAL HOSPITAL HOURS AND/OR WEEKEND ONLY.
- 6 THE PORTION OF THE (E) WALL TO BE REMOVED TO MOVE CHILLERS INTO THE MECHANICAL ROOM TO BE REPAIRED TO MATCH THE EXISTING WALL.



PARTIAL FIRST FLOOR REFRIGERANT PIPING PLAN
 SCALE: 1/4" = 1'-0"

| Revisions: | Date |
|---|----------|
| BID DOCUMENT SUBMITTAL (FINAL) (14-137) | 12/18/14 |
| 100% CONSTRUCTION DOCUMENTS (14-112) | 11/11/14 |
| 90% DESIGN DEVELOPMENT (14-101) | 10/28/14 |
| SCHEMATIC DESIGN SUBMITTAL (14-083) | 9/12/14 |

CONSULTANTS:



ARCHITECT/ENGINEERS:
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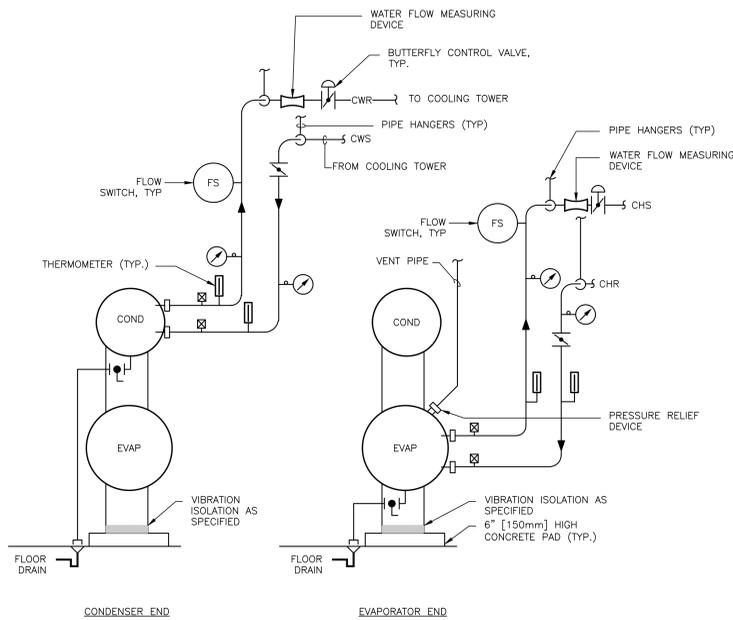
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 POW 14-308-37

Drawing Title
MECHANICAL PARTIAL FIRST FLOOR MECHANICAL PLAN - PHASE 1 AND PHASE 2
 Approved: Project Director

Project Title
VA MARE ISLAND OUTPATIENT CLINIC CHILLER INSTALLATION
 Location
VALLEJO, CA
 Date
11/11/2014
 Checked
D. HAMMOND
 Drawn
J. ROTHWEIN

Project Number
612-14-035
 Building Number
201
 Drawing Number
H-101



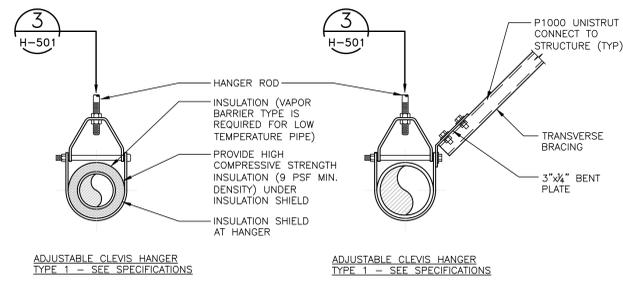


1 WATER COOLED CHILLER PIPING CONNECTIONS
SCALE: N.T.S.

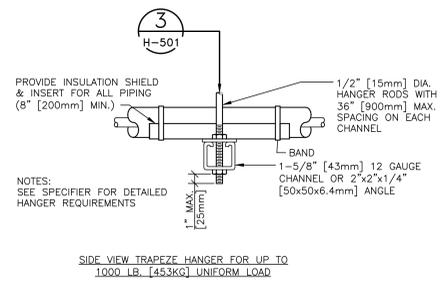
- NOTE:**
1. DRAIN ALL LOW POINTS OF SYSTEMS TO NEAREST SEWER FLOOR DRAIN.
 2. NOT USED.
 3. COLLECT VENT PIPES FROM ALL REFRIGERANT PRESSURE RELIEF DEVICES AND EXTEND TO EXTERIOR OF BUILDING IN ACCORDANCE WITH ASHRAE STANDARD 15. HEADER SIZE TO EQUAL OR EXCEED TOTAL AREA OF DEVICES CONNECTED TO THE HEADER.
 4. PROVIDE MODULATING BUTTERFLY VALVES ON BOTH CHWR & CWR. VALVES CONTROLLED BY ECC.
 5. ALL PIPING TO BE WELDED, DO NOT USE MECHANICAL COUPLINGS.

| NOM. SIZE | | MAXIMUM PIPE/TUBING SUPPORT SPACING | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|-----------|-------------------------------------|------------|------------|--------|------------|--------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----|--|--|--|--|--|--|
| IN. (mm) | THRU (20) | 1 (25) | 1 1/4 (32) | 1 1/2 (40) | 2 (50) | 2 1/2 (65) | 3 (75) | 4 (100) | 5 (125) | 6 (150) | 8 (200) | 10 (250) | 12 (300) | 14 (350) | 16 (400) | 18 (450) | 20 (500) | 24 (600) | | | | | | | |
| PIPE | 2 1/2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 60 | 72 | 84 | 96 | | | | | | |
| TUBING | 1 1/2 | 2 | 2 1/2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 15 | 18 | 24 | 30 | 36 | 42 | 48 | 60 | 72 | | | | | | |

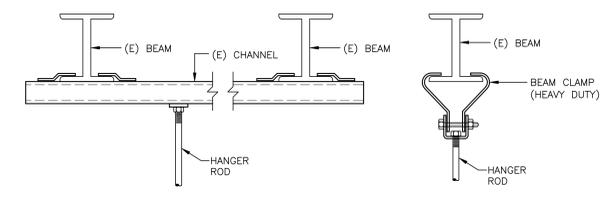
NOTE: FOR TRAPEZE HANGER TAKE SPACING OF SMALLEST SIZE ON TRAPEZE.



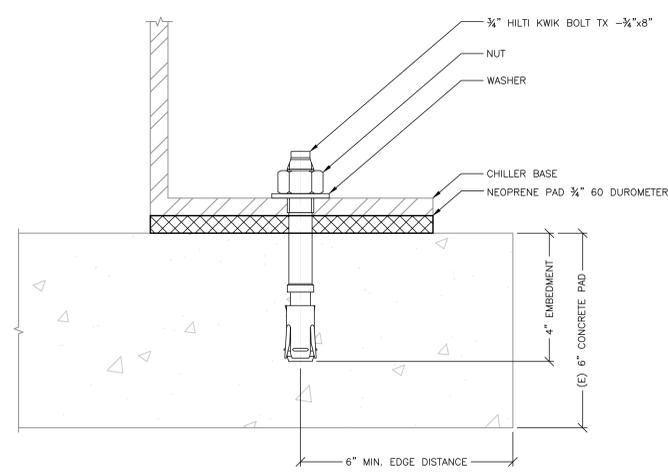
2 TYPICAL PIPE HANGER DETAILS
SCALE: N.T.S.



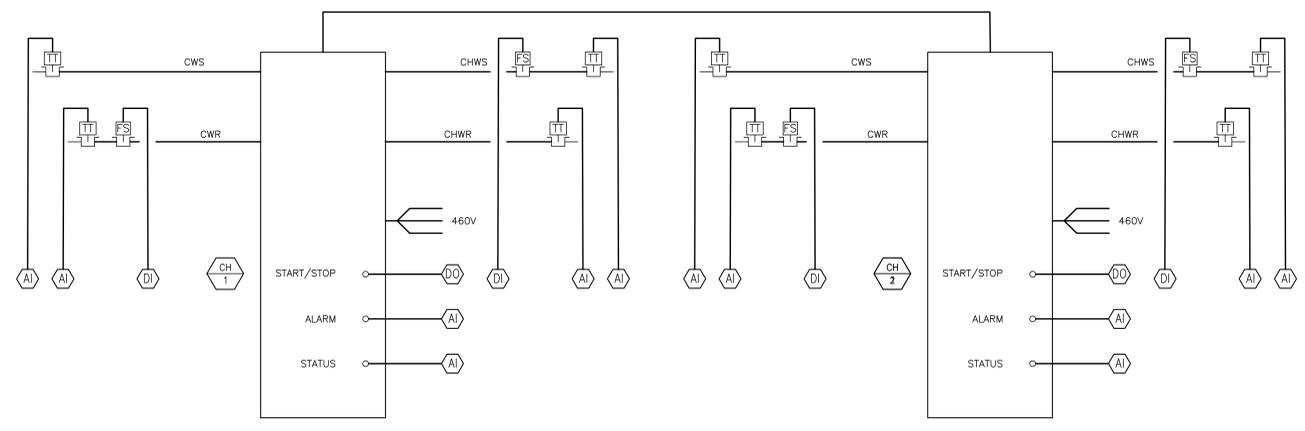
3 TYPICAL HANGER ROD ATTACHMENT
SCALE: N.T.S.



3 TYPICAL HANGER ROD ATTACHMENT
SCALE: N.T.S.



4 CHILLER ANCHOR MOUNTING DETAIL
SCALE: N.T.S.



CHILLER CONTROLS DIAGRAM
SCALE: N.T.S.

CONTROL NOTES

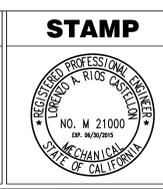
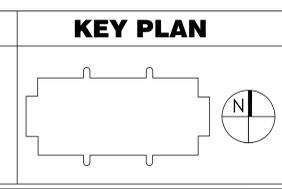
1. CHILLERS TO BE PROVIDED INTERFACE WITH THE EXISTING JOHNSON CONTROLS BUILDING MANAGEMENT SYSTEM (BMS). COMPONENTS TO BE INSTALLED BY THE CONTRACTOR. COORDINATE WITH CHILLER MANUFACTURER. ONLY THE JCI REPRESENTATIVE SHALL MAP THE NEW CONTROL SYSTEM TO THE EXISTING METASYS MBS.
2. CONTRACTOR IS RESPONSIBLE FOR INTERFACING NEW SYSTEMS TO EXISTING CONTROL SYSTEM BMS. THEY SHALL COORDINATE WITH COTR TO ENSURE COMPATIBILITY OF NEW CONTROL SYSTEM. OVERALL CONTROL SEQUENCE FOR (E) EQUIPMENT (COOLING TOWER, CONDENSER PUMPS, CHILLED WATER PUMPS ETC) SHOWN ON DRAWING H-601.
3. THE NEW CHILLER GRAPHICS TO BE FULLY REPRESENTED ON THE (E) AND (N) CONTROLS.

SEQUENCE OF OPERATION FOR CHILLED WATER CONTROL

- A. SEQUENCE OF OPERATIONS MULTISTACK MS-80T WATER COOLED CHILLER**
- WHEN ENABLED THE CHILLERS SHALL OPERATE TO PROVIDE THE REQUIRED CHILLED WATER TO THE BUILDING SYSTEMS.
- THE CHILLED WATER SUPPLY SET-POINT WILL BE SET TO 44 DEGREES FAHRENHEIT (FIELD ADJUSTABLE). CHILLER 1 WILL MODULATE THE COMPRESSOR FOR CHILLER 1 AND CHILLER 2 TO MAINTAIN THE LEAVING CHILLED WATER TEMPERATURE SET-POINT.
- IF AT ANY TIME THE ENTERING OR LEAVING WATER TEMPERATURES, REFRIGERANT PRESSURES OR TEMPERATURES OR COMPRESSOR MOTOR WINDING TEMPERATURES EXCEED THE CHILLER'S DESIGN ENVELOPE THE CORRESPONDING PORTION OF THE CHILLER WILL BE LOCKED OUT ON A SAFETY.
- B. MONITORING AND REPORT.**
1. CHILLED WATER EWT & LWT.
 2. CONDENSER WATER EWT & LWT.

| Revisions: | Date |
|---|----------|
| BID DOCUMENT SUBMITTAL (FINAL) (14-137) | 12/18/14 |
| 100% CONSTRUCTION DOCUMENTS (14-112) | 11/11/14 |
| 90% DESIGN DEVELOPMENT (14-101) | 10/28/14 |
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| CONSULTANTS: | |
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| | |



ARCHITECT/ENGINEERS:

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PO# 14-308-37

Drawing Title
MECHANICAL DETAILS

Approved: Project Director

Project Title
VA MARE ISLAND OUTPATIENT CLINIC CHILLER INSTALLATION

Location
VALLEJO, CA

Date
11/11/2014

Checked
D. HAMMOND

Drawn
J. ROTHWEIN

Project Number
612-14-035

Building Number
201

Drawing Number
H-501



FLUID COOLER SCHEDULE

| MARK | LOCATION | SERVICE | TOWER TYPE | TOTAL NOMINAL CAPACITY | | # CELLS | FLOW RATE EACH CELL | | WPD | | TEMPERATURE | | | | | | FAN MOTOR | | | | SPRAY PUMP POWER | | SPRAY PUMP FLOW RATE | | INTERNAL COIL VOLUME | | MAX OPERATING WEIGHT | | MAX HEIGHT W/ HANDRAIL | MANUFACTURER | MODEL NO. | REMARKS | | | | | |
|------|----------|-------------------|-----------------|------------------------|------|---------|---------------------|-------|------|-------|-------------|------|------|----|------|----|-----------|-------|----|-------|------------------|-----|----------------------|-----|----------------------|-------|----------------------|------|------------------------|--------------|-----------|---------|------|-----|------|-------------|---|
| | | | | TONS | (KW) | | GPM | (L/S) | FT | (KPA) | AMBIENT WB | | EWT | | LWT | | NO | POWER | | PHASE | VOLT | RPM | SPEED CONTROL | HP | (KW) | GAL | (L) | IN | | | | | (MM) | IN | (MM) | | |
| | | | | | | | PSIG | (KPA) | *F | (°C) | *F | (°C) | | HP | (KW) | | | | | | | | | | | | | | | | | | | | | | |
| (E) | FC-1 | OUTSIDE MECH ROOM | CONDENSER WATER | FLUID COOLER | 75 | (330) | 1 | 225 | (14) | 7.2 | (22) | 71.0 | (22) | 90 | (32) | 80 | (27) | 1 | 25 | (19) | 3 | 460 | 1,800 | VFD | 1.5 | (1.1) | 220 | (14) | 198 | (750) | 13,000 | (5900) | 15 | (5) | BAC | VF1-048-41N | - |

PUMP SCHEDULE

| MARK | LOCATION | AREA AND/OR BLDG SERVED | SYSTEM AND/OR SERVICE | TYPE | CIRCULATING FLUID | | | | | | | | ELECTRICAL | | | | | MANUFACTURER | MODEL NO. | REMARKS | | | | | | |
|------|----------|-------------------------|-----------------------|-----------------|-------------------|-----------------|-------|--------|-------|----------------|---------------|-------------|------------|-------|------------|---------------|------|--------------|-----------|---------|-------|----------|-----------|---------------|-----------|---|
| | | | | | FLUID | FLOW | | HEAD | | NPSH AVAILABLE | | TEMPERATURE | | SP GR | MIN. % EFF | NOMINAL POWER | | | | | PHASE | VOLT | MAX RPM | SPEED CONTROL | | |
| | | | | | | GPM | (L/S) | FT | (KPA) | FT | (KPA) | *F | (°C) | | | HP | (KW) | | | | | | | | | |
| (E) | CWP-1A | MECH ROOM | BUILDING 201 | CONDENSER WATER | VERTICAL IN LINE | CONDENSER WATER | 450 | (28) | 110 | (329) | CLOSED SYSTEM | N/A | 80 | (27) | 1 | 75 | 25 | (19) | 3 | 460 | 3,600 | SEE NOTE | ARMSTRONG | 4300 | IVS 3x3x8 | - |
| (E) | CWP-2A | MECH ROOM | BUILDING 201 | CONDENSER WATER | VERTICAL IN LINE | CONDENSER WATER | 450 | (28) | 110 | (329) | CLOSED SYSTEM | N/A | 80 | (27) | 1 | 75 | 25 | (19) | 3 | 460 | 3,600 | SEE NOTE | ARMSTRONG | 4300 | IVS 3x3x8 | - |
| (E) | CHP-1 | MECH ROOM | BUILDING 201 | CHILLED WATER | END SUCTION | CHILLED WATER | 265 | (16.4) | 50 | (150) | CLOSED SYSTEM | N/A | 44 | (6.7) | 1 | | 5 | (3.7) | 3 | 460 | 1750 | | ARMSTRONG | 4280 | 4x3x8 | - |
| (E) | CHP-2 | MECH ROOM | BUILDING 201 | CHILLED WATER | END SUCTION | CHILLED WATER | 265 | (16.4) | 50 | (150) | CLOSED SYSTEM | N/A | 44 | (6.7) | 1 | | 5 | (3.7) | 3 | 460 | 1750 | | ARMSTRONG | 4280 | 4x3x8 | - |

AIR SEPERATOR SCHEDULE

| MARK | LOCATION | SYSTEM AND/OR SERVICE | TYPE | AIR SEPERATOR | | | | | | WATER TEMP. *F | BUILT IN STRAINER | DIAMTER x HEIGHT | | WEIGHT LBS | MANUFACTURER | MODEL NO. | REMARKS |
|------|----------|-----------------------|-----------------|---------------|------|-------|-------|------|-------|----------------|-------------------|------------------|-------|------------|--------------|-----------|---------|
| | | | | SIZE IN | | FLOW | | WPD | | | | IN | MM | | | | |
| | | | | IN | (MM) | GPM | (L/S) | FT | (KPA) | | | | | | | | |
| (E) | AS-1 | MECH ROOM | CONDENSER WATER | VORTEX | 8 | (150) | 450 | (28) | 0.9 | (3) | 80 | NO | 16x32 | 265 | ARMSTRONG | VA-6 | - |

EXPANSION TANK SCHEDULE

| MARK | LOCATION | SYSTEM AND/OR SERVICE | TYPE | APPROX. SYSTEM VOLUME | | SYSTEM TEMPERATURE RANGE | | | | INITIAL PRESSURE IN TANK | | MAX OPERATING PRESSURE | | FILL PRESSURE AT TANK | | | | MIN VOLUME TANK | | MIN BLADDER VOLUME | | PIPE SIZE TO TANK | | COLD WATER FILL SIZE | | MANUFACTURER | MODEL NO. | REMARKS | |
|------|----------|-----------------------|-----------------|-----------------------|-------|--------------------------|--------|--------|--------|--------------------------|-------|------------------------|-------|-----------------------|-------|---------|-------|-----------------|-------|--------------------|-------|-------------------|------|----------------------|------|--------------|-----------|----------------|---|
| | | | | GAL | (L) | MIN *F | MAX *F | MIN *F | MAX *F | PSIG | (KPA) | PSIG | (KPA) | RELIEF VALVE | | AT TANK | | GAL | (L) | GAL | (L) | IN | (MM) | IN | (MM) | | | | |
| | | | | | | | | | | | | | | PSIG | (KPA) | PSIG | (KPA) | PSIG | (KPA) | PSIG | (KPA) | | | | | | | | |
| (E) | ET-1 | MECHANICAL ROOM | CONDENSER WATER | VERTICAL BLADDER | 6,500 | (25000) | 40 | (4) | 100 | (38) | 12 | (83) | 125 | (860) | 92.7 | (640) | 12 | (83) | 80 | (300) | 80 | (300) | 1.5 | (38) | 1.5 | (38) | ARMSTRONG | A300-L-CAL S G | - |

CHILLER SCHEDULE

| UNIT | LOCATION | NO. MODULE | MIN. TOTAL TONS | MAX. IPLV | COMPRESSOR MOTOR | | EVAPORATOR | | | | | CONDENSER | | | | | OPERATING WEIGHT LBS. | MANUFACTURER AND MODEL NO. | REMARKS | |
|------|----------|------------|-----------------|-----------|------------------|--------|------------|--------|--------|---------|------------|-----------|--------|--------|---------|------------|-----------------------|----------------------------|---------------------|----------------------|
| | | | | | KW INPUT | V/ø/HZ | GPM | EWT *F | LWT *F | HD. FT. | PASSES NO. | GPM | EWT *F | LWT *F | HD. FT. | PASSES NO. | | | | |
| (N) | CH-1 | MECH ROOM | 1 | 75 | .365 | 46.5 | 460/3/60 | 130 | 60 | 44 | 11 | 4 | 225 | 80 | 90 | 6.6 | 2 | 5430 | MULTISTACK MS5082FC | 1, 2, 3, 4, 5, 6 & 7 |
| (N) | CH-2 | MECH ROOM | 1 | 75 | .365 | 46.5 | 460/3/60 | 130 | 60 | 44 | 11 | 4 | 225 | 80 | 90 | 6.6 | 2 | 5430 | MULTISTACK MS5082FC | 1, 2, 3, 4, 5, 6 & 7 |

- COMPRESSOR TO BE OIL A CENTRIFUGAL OIL FREE MAGNETIC BEARING TYPE.
- PROVIDE NON FUSED MAIN POWER DISCONNECT.
- PROVIDE REFRIGERANT LEAK DETECTION, CONNECT TO (E) JOHNSON CONTROLS BUILDING MANAGEMENT SYSTEM (BMS) AND ALERT WHEN ALARMED.
- PROVIDE FLOW SWITCH FOR CONDENSER WATER AND CHILLED WATER.
- CHILLER SHALL TIE INTO THE EXISTING JOHNSON CONTROLS BUILDING MANAGEMENT SYSTEM (BMS). CHILLED WATER SET POINT SHALL BE ADJUSTABLE BY THE BMS. MONITOR CONDENSER WATER SUPPLY AND RETURN TEMP, CHILLED WATER SUPPLY AND RETURN TEMP, CHILLER FAULT INDICATION TO ALARM.
- MAXIMUM SHELL LENGTH 6 FEET.
- MULTI-STACK OR APPROVED EQUIVALENT

SCOPE OF WORK

| CONSULTANTS: | |
|---|----------|
| BID DOCUMENT SUBMITTAL (FINAL) (14-137) | 12/18/14 |
| 100% CONSTRUCTION DOCUMENTS (14-112) | 11/11/14 |
| 90% DESIGN DEVELOPMENT (14-101) | 10/28/14 |
| SCHEMATIC DESIGN SUBMITTAL (14-083) | 9/12/14 |
| Revisions: | Date |

| KEY PLAN |
|----------|
| |

STAMP

ARCHITECT/ENGINEERS:

ADVANCE DESIGN CONSULTANTS, INC.

998 PARK AVENUE SAN JOSE CALIFORNIA 95126
P: (408) 297-1881 F: (408)294-3186 www.adcengineers.com

ATTENTION: ONLY WET SIGNED DOCUMENTS CONSTITUTE ADVANCE DESIGN CONSULTANTS, INC. PROFESSIONAL WORK AND BECAUSE OTHER REPRODUCIBLE DOCUMENTS MAY BE EASILY ALTERED WITHOUT THE CONSENT OF ADVANCE DESIGN CONSULTANTS, INC. THE WET SIGNED DOCUMENTS MUST BE REFERRED TO FOR THE ORIGINAL AND CORRECT INFORMATION. IF THERE ARE ANY DIFFERENCES BETWEEN THE WET SIGNED DOCUMENTS AND ANY OTHER DOCUMENTS, THE WET SIGNED DOCUMENTS SHALL GOVERN. ADVANCE DESIGN CONSULTANTS, INC. IS NOT RESPONSIBLE FOR ANY MODIFICATIONS MADE TO OUR DOCUMENTS BY ANYONE OTHER THAN AUTHORIZED REPRESENTATIVES OF ADVANCE DESIGN CONSULTANTS, INC. POW 14-308-37

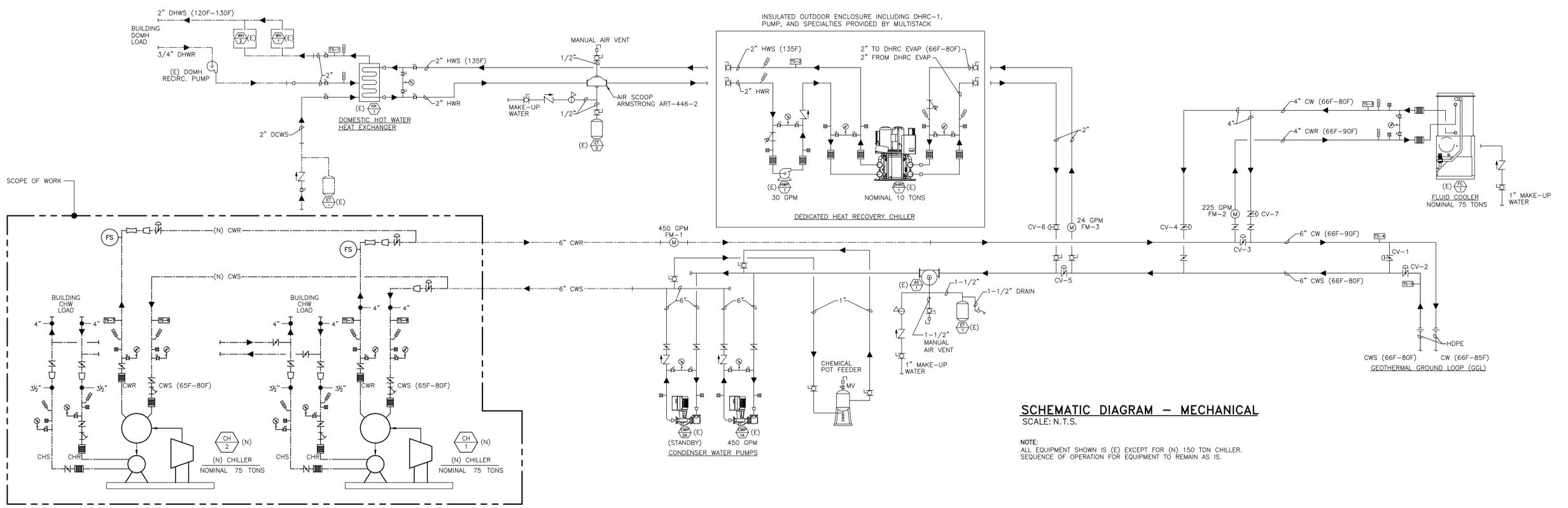
| Drawing Title |
|----------------------------|
| MECHANICAL SCHEDULES |
| Approved: Project Director |

| Project Title | Project Number |
|---|-----------------|
| VA MARE ISLAND OUTPATIENT CLINIC CHILLER INSTALLATION | 612-14-035 |
| Location | Building Number |
| VALLEJO, CA | 201 |
| Date | Checked |
| 11/11/2014 | D. HAMMOND |
| Drawn | Drawn |
| | J. ROTHMEN |
| | H-601 |

Office of Facilities Management

Department of Veterans Affairs

three inches = one foot
 one and one half inches = one foot
 one inch = one foot
 three quarters inch = one foot
 one half inch = one foot
 one quarter inch = one foot
 three eighths inch = one foot
 one eighth inch = one foot



SCHEMATIC DIAGRAM - MECHANICAL
 SCALE: N.T.S.

NOTE:
 ALL EQUIPMENT SHOWN IS (E) EXCEPT FOR (N) 150 TON CHILLER.
 SEQUENCE OF OPERATION FOR EQUIPMENT TO REMAIN AS IS.

SEQUENCE OF OPERATIONS

PROVIDE ALL LABOR, MATERIALS, PROGRAMMING, INTERFACE MODULES, CONTROLLERS, SENSORS, AND ASSOCIATED ACCESSORIES AS REQUIRED FOR A COMPLETE AND FULLY FUNCTIONAL CONTROL SYSTEM FOR THE DEDICATED HEAT RECOVERY AND CONDENSER WATER SYSTEMS. THESE SYSTEMS INCLUDE THE EXISTING CHILLER (CH-1), CONDENSER WATER PUMPS WITH INTEGRAL VARIABLE FREQUENCY DRIVES (CWP-1A, CWP-2A), FLUID COOLER (FC-1), GEOTHERMAL GROUND LOOP, DEDICATED HEAT RECOVERY CHILLER WITH INTEGRAL PUMP (DHRC-1), DOMESTIC HOT WATER HEAT EXCHANGER (HX-1), ASSOCIATED CONTROL VALVES, FLOW METERS, AND TEMPERATURE SENSORS. CONTROL EACH SYSTEM BY INDEPENDENT CONTROL MODULES. MONITOR THE OPERATING PARAMETERS AND ADJUST THE SETPOINTS THROUGH THE EXISTING JOHNSON CONTROLS BUILDING MANAGEMENT SYSTEM (BMS). PROVIDE ALL MODIFICATIONS TO THE CONTROL SYSTEM TO ENSURE THE FOLLOWING SEQUENCE IS PROVIDED.

IN THE EVENT THAT POWER IS INTERRUPTED TO THE CONTROL SYSTEM HEAD END OR THERE IS A COMMUNICATIONS FAILURE WITH THE HEAD END, ALL OF THE SYSTEM PROGRAMMABLE CONTROL MODULES SHALL CONTINUE TO OPERATE, REGARDLESS OF THE STATUS OF THE HEAD END, IN THE MODE THEY WERE IN PRIOR TO THE LOSS OF POWER OR LOSS OF COMMUNICATION WITH THE HEAD END.

IN THE EVENT THAT POWER IS INTERRUPTED TO A SINGLE OR ALL OF THE PROGRAMMABLE CONTROL MODULES, THE PROGRAMMABLE CONTROL MODULES SHALL RESTART AFTER POWER IS RESTORED AND SHALL INDEX TO THE MODE OF OPERATION THEY WERE IN PRIOR TO THE LOSS OF POWER.

PROVIDE COMMUNICATING CONTROLLERS AS REQUIRED TO INTERFACE AND CONNECT EACH CONTROLLER TO THE BMS AND OBTAIN ALL POINTS AVAILABLE FROM THE CONTROLLERS. IF ADDITIONAL POINTS ARE LISTED BELOW THAT ARE NOT AVAILABLE FROM THE CONTROLLER, PROVIDE INDEPENDENT DDC SENSORS AND ACCESSORIES AND MONITOR THESE POINTS INDEPENDENTLY THROUGH THE BMS.

ALL SETPOINTS SHALL BE ADJUSTABLE. USE THE INDICATED SETPOINTS FOR INITIAL SYSTEM SET UP. CONFIRM ANY CHANGES IN SETPOINT SETTINGS REQUIRED FOR INTENDED SYSTEM OPERATION IMPLEMENTED DURING START-UP AND TESTING WITH THE BUILDING OPERATIONS STAFF. NOTE ALL SETPOINT CHANGES ON THE AS-BUILT DRAWINGS AND THE BALANCING REPORTS.

AFTER ALL MECHANICAL AND CONTROL SYSTEMS HAVE BEEN TESTED AND CONFIRMED AS FULLY FUNCTIONING IN ACCORDANCE WITH THE DESIGN DOCUMENTATION, SUBMIT A 5-DAY TRENDRING LOG (15 MINUTE INTERVALS) OF EACH OF THE FOLLOWING PARAMETERS FOR THE ENGINEER'S REVIEW:

- OUTSIDE AIR DRY BULB TEMPERATURE
- OUTSIDE AIR WET BULB TEMPERATURE
- CWP-1A VFD FREQUENCY
- CWP-2A VFD FREQUENCY
- FC-1 VFD FREQUENCY
- DHRC-1 OPERATING CAPACITY
- HX-1 3-WAY CONTROL VALVE POSITION
- TEMPERATURE SENSOR (TS-1 THROUGH TS-7)
- ANY ASSOCIATED ALARM CONDITIONS RELATED TO THIS SYSTEM

SYSTEM GRAPHIC:

MODIFY THE EXISTING BMS OPERATORS WORKSTATION TO INCLUDE AN OVERALL SYSTEM SUMMARY PAGE SHOWING THE EXISTING CHILLER (CH-1), CONDENSER WATER PUMPS WITH INTEGRAL VARIABLE FREQUENCY DRIVES (CWP-1A, CWP-2A), FLUID COOLER (FC-1), GEOTHERMAL GROUND LOOP (GGL), DEDICATED HEAT RECOVERY CHILLER WITH INTEGRAL PUMP (DHRC-1), DOMESTIC HOT WATER HEAT EXCHANGER (HX-1), ASSOCIATED CONTROL VALVES, FLOW METERS, TEMPERATURE SENSORS, AND ALL OF THE MONITORED POINTS AND ALARMS LISTED BELOW. UPDATE THE SYSTEM GRAPHICS BASED ON THE EQUIPMENT LAYOUT SHOWN IN THESE DOCUMENTS TO REFLECT THE AS-BUILT CONFIGURATION OF THE SYSTEM AND DISPLAY THE MONITORING AND ALARM POINTS SPECIFIC TO EACH PIECE OF EQUIPMENT.

AS A MINIMUM, THE FOLLOWING POINTS MUST BE PROVIDED ON THE GRAPHIC, WHERE A MONITORED POINT INDICATES "STATUS". THIS POINT SHALL DISPLAY THE COMMANDED STATE AND THE ACTUAL STATUS OF THE POINT THROUGH INDEPENDENT CONFIRMATION.

MONITOR AND CONTROL THE FOLLOWING POINTS AND ALARMS FOR EACH DEVICE LISTED.

EXISTING CHILLER (CH-1) ADDITIONAL MONITORING POINTS:

- ENTERING CONDENSER WATER TEMPERATURE (TS-6)
- LEAVING CONDENSER WATER TEMPERATURE (TS-7)

CONDENSER WATER PUMPS (CWP-1A AND CWP-2A):

- STATUS (ACTIVE/STANDBY)
- VFD FREQUENCY (HERTZ)
- CONDENSER WATER FLOW RATE - FM-1 (GPM)
- ALARM - FLOW CONFIRMATION (CONFIRMED/NO FLOW)
- ALARM - PUMP FAILURE

FLUID COOLER (FC-1):

- FAN STATUS (ON/OFF)
- VFD FREQUENCY (HERTZ)
- FC-1 ENTERING WATER TEMPERATURE (TS-7)
- FC-1 LEAVING WATER TEMPERATURE (TS-3)
- MAKE-UP WATER VALVE POSITION (OPEN/CLOSED)
- OUTSIDE AIR DRY BULB TEMPERATURE (BASED ON THE PREVIOUS 12 HOURS)
- OUTSIDE AIR WET BULB TEMPERATURE
- CV-3 COMMANDED VALVE POSITION (% OPEN)
- CV-3 ACTUAL VALVE POSITION (% OPEN)
- CV-4 COMMANDED VALVE POSITION (OPEN/CLOSED)
- CV-4 ACTUAL VALVE POSITION (OPEN/CLOSED)
- CV-7 COMMANDED VALVE POSITION (OPEN/CLOSED)
- CV-7 ACTUAL VALVE POSITION (OPEN/CLOSED)
- FC-1 FLOW RATE - FM-2 (GPM)
- ALARM - CV-3 VALVE FAILURE
- ALARM - CV-4 VALVE FAILURE
- ALARM - CV-7 VALVE FAILURE
- ALARM - FAN FAILURE
- ALARM - HIGH ENTERING WATER TEMPERATURE (INITIAL SETTING 95°F)
- ALARM - LOW ENTERING WATER TEMPERATURE (INITIAL SETTING 38°F)
- ALARM - HIGH LEAVING WATER TEMPERATURE (INITIAL SETTING 85°F)
- ALARM - LOW LEAVING WATER TEMPERATURE (INITIAL SETTING 38°F)
- ALARM - HIGH BASIN WATER LEVEL
- ALARM - LOW BASIN WATER LEVEL
- ALARM - MAKE-UP WATER VALVE FAILURE
- ALARM - VIBRATION CUTOFF SWITCH

GEOTHERMAL GROUND LOOP (GGL):

- GGL NIGHTTIME COOL-DOWN CONDENSER WATER TEMPERATURE SETPOINT (70°F)
- GGL ENTERING WATER TEMPERATURE (TS-4)
- GGL LEAVING WATER TEMPERATURE (TS-5)
- AVERAGE GGL TEMPERATURE (0.5 x (TS-4 + TS-5))
- DAILY MAXIMUM AVERAGE GGL TEMPERATURE (BASED ON THE PREVIOUS 12 HOURS)
- CV-1 COMMANDED VALVE POSITION (% OPEN)
- CV-1 ACTUAL VALVE POSITION (% OPEN)
- CV-2 COMMANDED VALVE POSITION (OPEN/CLOSED)
- CV-2 ACTUAL VALVE POSITION (OPEN/CLOSED)
- ALARM - CV-1 VALVE FAILURE
- ALARM - CV-2 VALVE FAILURE

DEDICATED HEAT RECOVERY CHILLER (DHRC-1):

- LEAVING HEATING WATER TEMPERATURE SETPOINT (135°F)
- STATUS (ON/OFF)
- OPERATING CAPACITY (TONS)
- LEAVING HEATING WATER TEMPERATURE (TS-2)
- CV-5 COMMANDED VALVE POSITION (% OPEN)
- CV-5 ACTUAL VALVE POSITION (% OPEN)
- CV-6 COMMANDED VALVE POSITION (OPEN/CLOSED)
- CV-6 ACTUAL VALVE POSITION (OPEN/CLOSED)
- DHRC-1 FLOW RATE - FM-3 (GPM)
- ALARM - CV-5 VALVE FAILURE
- ALARM - CV-6 VALVE FAILURE
- ALARM - COMMON DHRC-1 ALARM
- ALARM - LOW LEAVING HEATING WATER TEMPERATURE (5°F BELOW SETPOINT)
- ALARM - HIGH LEAVING HEATING WATER TEMPERATURE (5°F ABOVE SETPOINT)
- ALARM - NO EVAPORATOR WATER FLOW
- ALARM - NO HEATING WATER (CONDENSER) FLOW

DOMESTIC HOT WATER HEAT EXCHANGER (HX-1):

- LEAVING HEATING WATER TEMPERATURE SETPOINT (125°F)
- STATUS (ENABLED/OFF)
- 3-WAY CONTROL VALVE POSITION (% OPEN)
- LEAVING DHWH WATER TEMPERATURE (TS-1)
- ENTERING HEATING WATER TEMPERATURE (TS-2)
- ALARM - 3-WAY CONTROL VALVE FAILURE

A DEVICE IS DEFINED TO HAVE FAILED ("FAILURE") IF THE COMMANDED STATE AND THE ACTUAL STATUS DO NOT MATCH. SUBMIT A PROPOSED POINTS LIST WITH THE CONTROL SHOP DRAWING SUBMITTAL INDICATING ALL POINTS FOR THE SYSTEM.

CHILLER ENABLED" MODE:

IF THE CHILLER IS ENABLED, IT SHALL CONTROL IN ACCORDANCE WITH THE EXISTING CONTROL LOGIC TO MAINTAIN THE EXISTING CHILLED WATER SETPOINT. THE FOLLOWING SHALL OCCUR WHEN THE EXISTING CHILLER (CH-1) IS ENABLED EITHER DURING OCCUPIED MODE, NIGHT SETBACK, OR MORNING WARM-UP/COOL-DOWN.

CONDENSER WATER SUPPLY TEMPERATURE SETPOINT:

PROVIDE THE FOLLOWING CONTROL POINTS AT THE BMS: CONDENSER WATER SUPPLY TEMPERATURE SETPOINT RESET SCHEDULE (ENABLED/ DISABLED) CONDENSER WATER SUPPLY TEMPERATURE SETPOINT OVERRIDE (ONLY AVAILABLE IF THE RESET SCHEDULE IS DISABLED) PROVIDE INPUT PROMPT FOR MANUALLY ENTERED TEMPERATURE SETPOINT

PROVIDE AN OUTSIDE AIR DRY BULB AND WET BULB TEMPERATURE SENSOR AND LOCATE OUTSIDE NEAR THE FLUID COOLER INTAKE. IF THE CONDENSER WATER SUPPLY TEMPERATURE SETPOINT RESET SCHEDULE IS ENABLED, THE CONDENSER WATER SUPPLY TEMPERATURE SETPOINT SHALL BE CALCULATED BASED ON THE FOLLOWING LINEAR RESET SCHEDULE:

| OUTSIDE AIR TEMPERATURE | CONDENSER WATER SUPPLY TEMPERATURE SETPOINT |
|-------------------------|---|
| 71°F WB OR ABOVE | 80°F (ADJUSTABLE HIGH LIMIT) |
| 55°F WB OR BELOW | 67°F (ADJUSTABLE LOW LIMIT) |

CONDENSER WATER PUMPS (CWP-1A AND CWP-2A):

START THE PRIMARY CONDENSER WATER PUMP (CWP-1A OR CWP-2A). PROVIDE PROGRAMMING AND CONTROLS AS REQUIRED TO ALTERNATE THE PRIMARY AND STANDBY PUMP EACH TIME THE SYSTEM STARTS. IF THE SELECTED PUMP DOES NOT START, GOES INTO ALARM, OR THERE IS A LOSS OF FLOW ALARM, THE PRIMARY PUMP SHALL STOP AND THE STANDBY PUMP SHALL START. COORDINATE THE PRIMARY/STANDBY FUNCTIONALITY WITH THE PUMP MANUFACTURER. PROPORTIONATELY MODULATE THE ACTIVE PUMP'S INTEGRAL VFD TO PROVIDE 450 GPM OF CONDENSER WATER FLOW RATE AT THE FLOW METER (FM-1).

FLUID COOLER (FC-1):

IF THE CONDENSER WATER TEMPERATURE ENTERING THE CHILLER (TS-6) IS BELOW THE CONDENSER WATER SUPPLY TEMPERATURE SETPOINT, FC-1 SHALL REMAIN OFF AND THE CONDENSER WATER SHALL BYPASS FC-1 (FULLY OPEN CV-3, AND FULLY CLOSE CV-4 AND CV-7). IF THE CONDENSER WATER TEMPERATURE ENTERING THE CHILLER (TS-6) IS GREATER THAN OR EQUAL TO THE CONDENSER WATER SUPPLY TEMPERATURE SETPOINT, ENABLE FC-1 AND MODULATE THE CONTROL VALVES TO PROVIDE CONDENSER WATER TO FC-1 (FULLY OPEN CV-4, FULLY CLOSE CV-7, AND PROPORTIONATELY MODULATE CV-3 AS REQUIRED TO PROVIDE 225 GPM OF FC-1 FLOW RATE AT THE FLOW METER (FM-2)).

IF ENABLED, ENERGIZE THE FLUID COOLER'S INTEGRAL SPRAY WATER CIRCULATION PUMP AND FAN AND PROPORTIONATELY MODULATE ITS VFD CONTROLLED FAN SPEED TO MAINTAIN THE ACTIVE (CALCULATED OR MANUALLY OVERRIDDEN) CONDENSER WATER SUPPLY TEMPERATURE SETPOINT BASED ON THE CHILLER ENTERING CONDENSER WATER TEMPERATURE MEASURED AT TS-6.

IF THE FC-1 LEAVING WATER TEMPERATURE (TS-3) FALLS BELOW 40°F IN AN EFFORT TO ACHIEVE THE CONDENSER WATER SUPPLY TEMPERATURE SETPOINT AT TS-6, OVERRIDE THE FAN SPEED CONTROL TO MAINTAIN A MINIMUM OF 40°F LEAVING WATER TEMPERATURE (TS-3). TURN OFF AND BYPASS FC-1 (FULLY OPEN CV-3, AND FULLY CLOSE CV-4 AND CV-7) IF THE CONDENSER WATER TEMPERATURE ENTERING THE CHILLER (TS-6) FALLS BELOW 66°F WHILE THE CHILLER IS ENABLED.

IN ADDITION TO THE INTEGRAL MANUFACTURER'S SAFETIES ENABLED ON THE FLUID COOLER, THE BAS SHALL DE-ENERGIZE THE FLUID COOLER IF ANY OF THE FOLLOWING CONDITIONS OCCUR:
 BOTH CONDENSER WATER PUMPS ARE OFF
 FC-1 FAN FAILURE
 LOW ENTERING WATER TEMPERATURE ALARM
 LOW LEAVING WATER TEMPERATURE ALARM
 EXCESSIVE VIBRATION (VIBRATION CUTOFF SWITCH)

MODULATE THE MAKEUP WATER SOLENOID VALVE TO MAINTAIN THE BASIN WATER LEVEL. CONTROL THE DOLPHIN WATER TREATMENT SYSTEM AND ASSOCIATED BLOW-DOWN VALVE IN ACCORDANCE WITH THE UNITS' INTEGRAL CONTROL LOGIC.

GEOTHERMAL GROUND LOOP (GGL):

IF THE CONDENSER WATER TEMPERATURE ENTERING THE CHILLER (TS-6) IS BELOW 66°F WHILE THE CHILLER IS ENABLED, THE CONDENSER WATER SHALL BYPASS THE GGL (FULLY OPEN CV-1 AND FULLY CLOSE CV-2). IF THE CONDENSER WATER TEMPERATURE ENTERING THE CHILLER (TS-6) IS GREATER THAN OR EQUAL 66°F, MODULATE THE CONTROL VALVES TO PROVIDE CONDENSER WATER TO THE GGL (FULLY OPEN CV-2 AND FULLY CLOSE CV-1). IF THE GGL LEAVING WATER TEMPERATURE (TS-5) IS GREATER THAN THE GGL ENTERING WATER TEMPERATURE (TS-4) AND THE CHILLER HAS BEEN ENERGIZED FOR 30 MINUTES OR LONGER, BYPASS THE GGL (FULLY OPEN CV-1 AND FULLY CLOSE CV-2).

DEDICATED HEAT RECOVERY CHILLER (DHRC-1):

DHRC-1 SHALL REMAIN OFF AND THE CONDENSER WATER SHALL BYPASS DHRC-1 (FULLY OPEN CV-5 AND FULLY CLOSE CV-6) UNLESS ALL OF THE FOLLOWING CONDITIONS ARE MET: CONFIRMATION THAT EITHER CWP-1A OR CWP-2A IS OPERATING CONFIRMATION THAT EITHER WH-1 OR WH-2 ENABLED CHILLER ENTERING WATER TEMPERATURE (TS-6) IS ABOVE 60°F LEAVING DHWH WATER TEMPERATURE (TS-1) IS LESS THAN 130°F

IF ALL OF THE ABOVE CONDITIONS ARE MET, DHRC-1 SHALL ENABLE AND MODULATE THE CONTROL VALVES TO PROVIDE WATER TO DHRC-1 (FULLY OPEN CV-6 AND PROPORTIONATELY MODULATE CV-5 AS REQUIRED TO PROVIDE 24 GPM OF DHRC-1 FLOW RATE AT THE FLOW METER (FM-3)).

IF ENABLED, ENERGIZE THE DHRC'S INTEGRAL HEATING WATER PUMP (HWP-1) UPON CONFIRMATION OF FLOW THROUGH THE EVAPORATOR AND CONDENSER (THROUGH CONTRACTOR PROVIDED FLOW SENSORS). DHRC-1 SHALL START AND MODULATE ITS INTEGRAL DIGITAL SCROLL COMPRESSORS IN ACCORDANCE WITH ITS INTEGRAL CONTROL LOGIC TO MAINTAIN THE LEAVING HEATING WATER TEMPERATURE SETPOINT (135°F). IF ANY OF THE ABOVE ENABLE CONDITIONS FAIL TO BE MAINTAINED DURING SYSTEM OPERATION OR IF THERE IS A LOSS OF FLOW ALARM IN THE EVAPORATOR OR CONDENSER TURN OFF DHRC-1 AND THE ASSOCIATED HEATING WATER PUMP (HWP-1) AND BYPASS DHRC-1 (FULLY OPEN CV-5 AND FULLY CLOSE CV-6).

DOMESTIC HOT WATER HEAT EXCHANGER (HX-1):

ENABLE HX-1 IF DHRC-1 IS ENABLED. PROPORTIONATELY MODULATE THE HEAT EXCHANGER'S INTEGRAL 3-WAY HEATING WATER CONTROL VALVE TO MAINTAIN THE LEAVING DHWH WATER TEMPERATURE SETPOINT (125°F) BASED ON THE LEAVING DHWH WATER TEMPERATURE (TS-1).

EXISTING DOMESTIC WATER HEATERS (WH-1 AND WH-2):

IF THE WATER HEATERS ARE ENABLED, THEY SHALL CONTROL IN ACCORDANCE WITH THEIR EXISTING CONTROL LOGIC TO MAINTAIN THE WATER HEATER SUPPLY TEMPERATURE SETPOINT. ADJUST THE EXISTING WATER HEATER SUPPLY TEMPERATURE SETPOINT TO 120°F.

CHILLER OFF MODE:

WHEN THE CHILLER IS INDEXED OFF AS IT ENTERS THE UNOCCUPIED MODE, THE FOLLOWING SHALL OCCUR TO REDUCE THE TEMPERATURE OF THE GEOTHERMAL GROUND LOOP (GGL) WHILE TAKING ADVANTAGE OF THE COOLER NIGHTS AND INCREASED FC-1 EFFICIENCY:
 THE ACTIVE CONDENSER WATER PUMP SHALL REMAIN ENERGIZED

IF THE GGL IS IN BYPASS, MODULATE THE CONTROL VALVES TO PROVIDE CONDENSER WATER TO THE GGL (FULLY OPEN CV-2 AND FULLY CLOSE CV-1). FC-1 SHALL REMAIN ENABLED AND OPERATE IN ACCORDANCE WITH THE CHILLER ENABLED MODE WITH THE FOLLOWING EXCEPTIONS:

- FULLY OPEN CV-7, FULLY CLOSE CV-4, AND PROPORTIONATELY MODULATE CV-3 AS REQUIRED TO PROVIDE 225 GPM OF FC-1 FLOW RATE AT THE FLOW METER (FM-2)
- PROPORTIONATELY MODULATE FC-1'S VFD CONTROLLED FAN SPEED TO MAINTAIN A FC-1 LEAVING WATER TEMPERATURE (TS-3) 10°F COOLER THAN THE FC-1 ENTERING WATER TEMPERATURE (TS-7)
- IF THE DAILY MAXIMUM OUTSIDE AIR DRY BULB TEMPERATURE IS HIGHER THAN 85°F, THE GGL NIGHTTIME COOL-DOWN CONDENSER WATER TEMPERATURE SETPOINT (FOR THAT DAY) SHALL BE 2°F HIGHER THAN THE DEFAULT SETPOINT; OTHERWISE, THE GGL NIGHTTIME COOL-DOWN CONDENSER WATER TEMPERATURE SETPOINT SHALL BE BASED ON THE DEFAULT SETPOINT (70°F)
- CONTINUE TO COOL DOWN THE GGL IN ACCORDANCE WITH THE SEQUENCE ABOVE UNTIL THE AVERAGE GGL TEMPERATURE IS LESS THAN OR EQUAL TO (2 * GGL NIGHTTIME COOL-DOWN CONDENSER WATER TEMPERATURE SETPOINT) - THE DAILY MAXIMUM AVERAGE GGL CONDENSER WATER TEMPERATURE SETPOINT SHALL BE ENTER THE CONDENSER WATER SETPOINT OFF MODE.

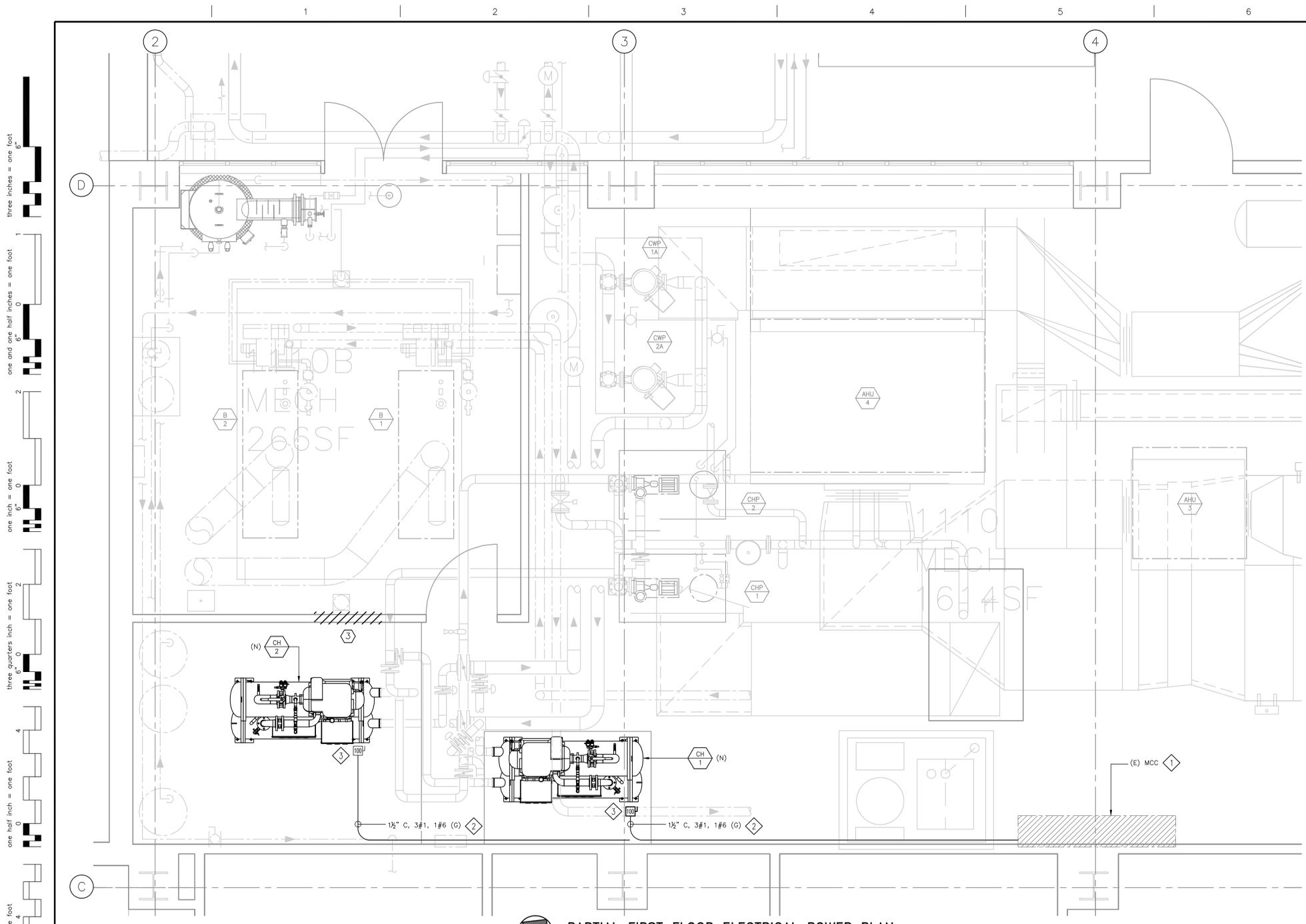
CONDENSER WATER SYSTEM "OFF" MODE

IF THE CHILLER IS INDEXED OFF (DURING UNOCCUPIED MODE) AND THE CONDENSER WATER SYSTEM IS ON, THE CONDENSER WATER SYSTEM SHALL TURN OFF 4-HOURS PRIOR TO THE NEXT SCHEDULED CHILLER START (MORNING WARM-UP/ COOL DOWN) TO ALLOW THE GEOTHERMAL GROUND LOOP (GGL) TO EQUALIZE TO A CONSISTENT TEMPERATURE PRIOR TO OCCUPANCY. WHEN THE CONDENSER WATER SYSTEM IS INDEXED TO OFF MODE, THE FOLLOWING SHALL OCCUR:

- FC-1 AND THE ASSOCIATED SPRAY WATER CIRCULATION PUMP SHALL DE-ENERGIZE AND THE ASSOCIATED CONTROL VALVES SHALL RETURN TO THE BYPASS MODE
- DHRC-1 AND THE INTEGRAL HEATING WATER PUMP (HWP-1) SHALL DE-ENERGIZE AND THE ASSOCIATED DHRC-1 CONTROL VALVES SHALL RETURN TO THE BYPASS MODE
- AFTER A 15 MINUTE TIME DELAY, THE OPERATING CONDENSER WATER PUMP (CWP-1A OR CWP-2A) SHALL DE-ENERGIZE

FOR REFERENCE ONLY

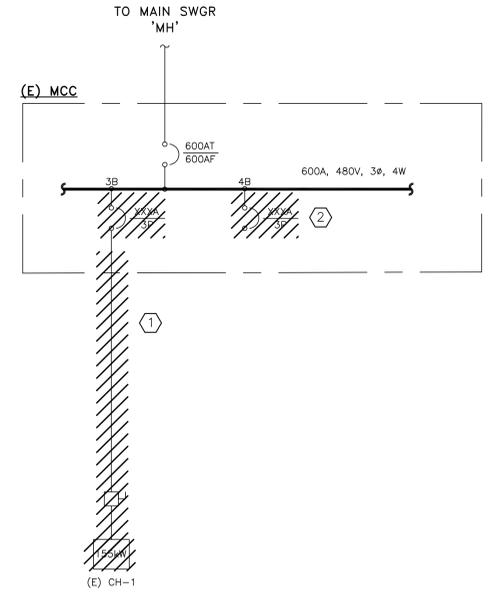
| | | | | | | | | | | | | | | | | | |
|--|--|-----------------|--|---------------------|--|--|--|--|--|---|--|-------------------------------------|--|--|--|--------------------------------|--|
| CONSULTANTS: | | KEY PLAN | | STAMP | | ARCHITECT/ENGINEERS: | | Drawing Title (E) MECHANICAL SCHEMATIC DIAGRAM AND SEQUENCE OF OPERATION | | Project Title VA MARE ISLAND OUTPATIENT CLINIC CHILLER INSTALLATION | | Project Number 612-14-035 | | Office of Facilities Management | | | |
| BID DOCUMENT SUBMITTAL (FINAL) (14-137) 12/18/14 | | | | NO. M 21000 | | ADVANCE DESIGN CONSULTANTS, INC. | | Approved: Project Director | | Location VALLEJO, CA | | Building Number 201 | | | | Drawing Number H-602 | |
| 100% CONSTRUCTION DOCUMENTS (14-112) 11/11/14 | | | | MECHANICAL | | 998 PARK AVENUE SAN JOSE CALIFORNIA 95126 P: (408) 297-1881 F: (408)294-3186 www.adcengineers.com | | Date 11/11/2014 | | Checked D. HAMMOND | | Drawn J. ROTHMAN | | | | | |
| 90% DESIGN DEVELOPMENT (14-101) 10/28/14 | | | | STATE OF CALIFORNIA | | | | Date 11/11/2014 | | Checked D. HAMMOND | | Drawn J. ROTHMAN | | Department of Veterans Affairs | | | |
| SCHEMATIC DESIGN SUBMITTAL (14-083) 9/12/14 | | | | | | | | | | | | | | | | | |
| Revisions: | | Date | | | | | | | | | | | | | | | |



PARTIAL FIRST FLOOR ELECTRICAL POWER PLAN
SCALE: 1/2" = 1'-0"

DEMOLITION NOTES:

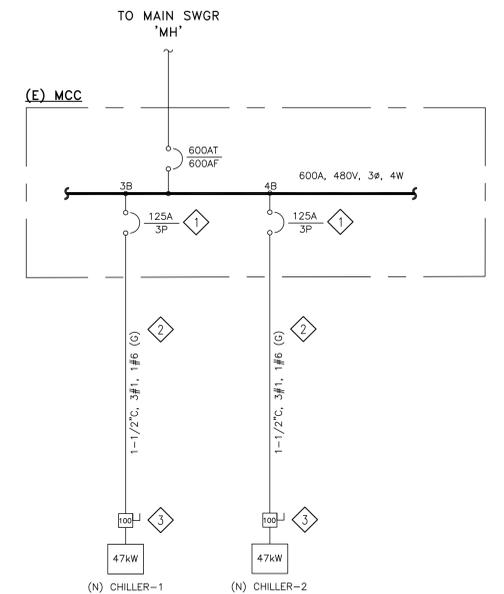
- ① CONTRACTOR SHALL DE-ENERGIZE THE EXISTING CIRCUIT FOR CHILLER "CH-1" AND REMOVE THE CIRCUIT BREAKER, CONDUIT, CONDUCTORS AND ASSOCIATED DISCONNECT SWITCH.
- ② CONTRACTOR SHALL DE-ENERGIZE, DISCONNECT AND REMOVE THE CIRCUIT BREAKER AT SECTION "4B" OF THE EXISTING MCC.
- ③ CONTRACTOR SHALL RELOCATE ANY CONDUITS, RECEPTACLES OR ELECTRICAL BOXES DURING THE REMOVAL OF THE WALL.



PARTIAL SINGLE LINE DIAGRAM - DEMOLITION
SCALE: N.T.S.

SHEET NOTES:

- ① CONTRACTOR SHALL PROVIDE AND INSTALL A NEW MCC SECTION (BUCKET) WITH A NEW CIRCUIT BREAKER WITH SIZE AS SHOWN ON THE DRAWING. THE TYPE AND THE RATING SHALL MATCH THE EXISTING.
- ② CONTRACTOR SHALL PROVIDE AND INSTALL NEW CONDUIT AND CONDUCTORS WITH MINIMUM SIZES AS SHOWN ON THE DRAWING.
- ③ CONTRACTOR SHALL PROVIDE AND INSTALL A NEW SINGLE THROW, THREE POLE, HEAVY DUTY, LOCKABLE DISCONNECT SWITCH WITH SIZE AS SHOWN ON THE DRAWING.

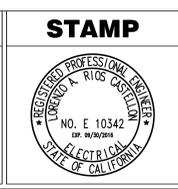
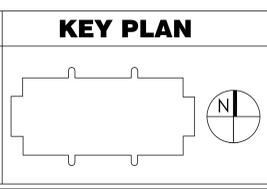


PARTIAL SINGLE LINE DIAGRAM - NEW WORK
SCALE: N.T.S.

three inches = one foot
 one and one half inches = one foot
 one inch = one foot
 three quarters inch = one foot
 one half inch = one foot
 one half inch = one foot
 three eighths inch = one foot
 one quarter inch = one foot
 one eighth inch = one foot
 one eighth inch = one foot

| Revisions: | Date |
|---|----------|
| BID DOCUMENT SUBMITTAL (FINAL) (14-137) | 12/18/14 |
| 100% CONSTRUCTION DOCUMENTS (14-112) | 11/11/14 |
| 90% DESIGN DEVELOPMENT (14-101) | 10/28/14 |
| SCHEMATIC DESIGN SUBMITTAL (14-083) | 9/12/14 |

CONSULTANTS:



ARCHITECT/ENGINEERS:
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 998 PARK AVENUE SAN JOSE CALIFORNIA 95126
 P: (408) 297-1881 F: (408) 294-3186 www.adcengineers.com

Drawing Title:
 ELECTRICAL
 PARTIAL FIRST FLOOR LINE POWER PLAN
 AND PARTIAL SINGLE LINE DIAGRAMS

Approved: Project Director

Project Title:
 VA MARE ISLAND
 OUTPATIENT CLINIC
 CHILLER INSTALLATION

Location:
 VALLEJO, CA

Date: 11/11/2014
Checked: R. RAWAL
Drawn: J. ROTHWEIN

Project Number: 612-14-035
Building Number: 201
Drawing Number: E-101

