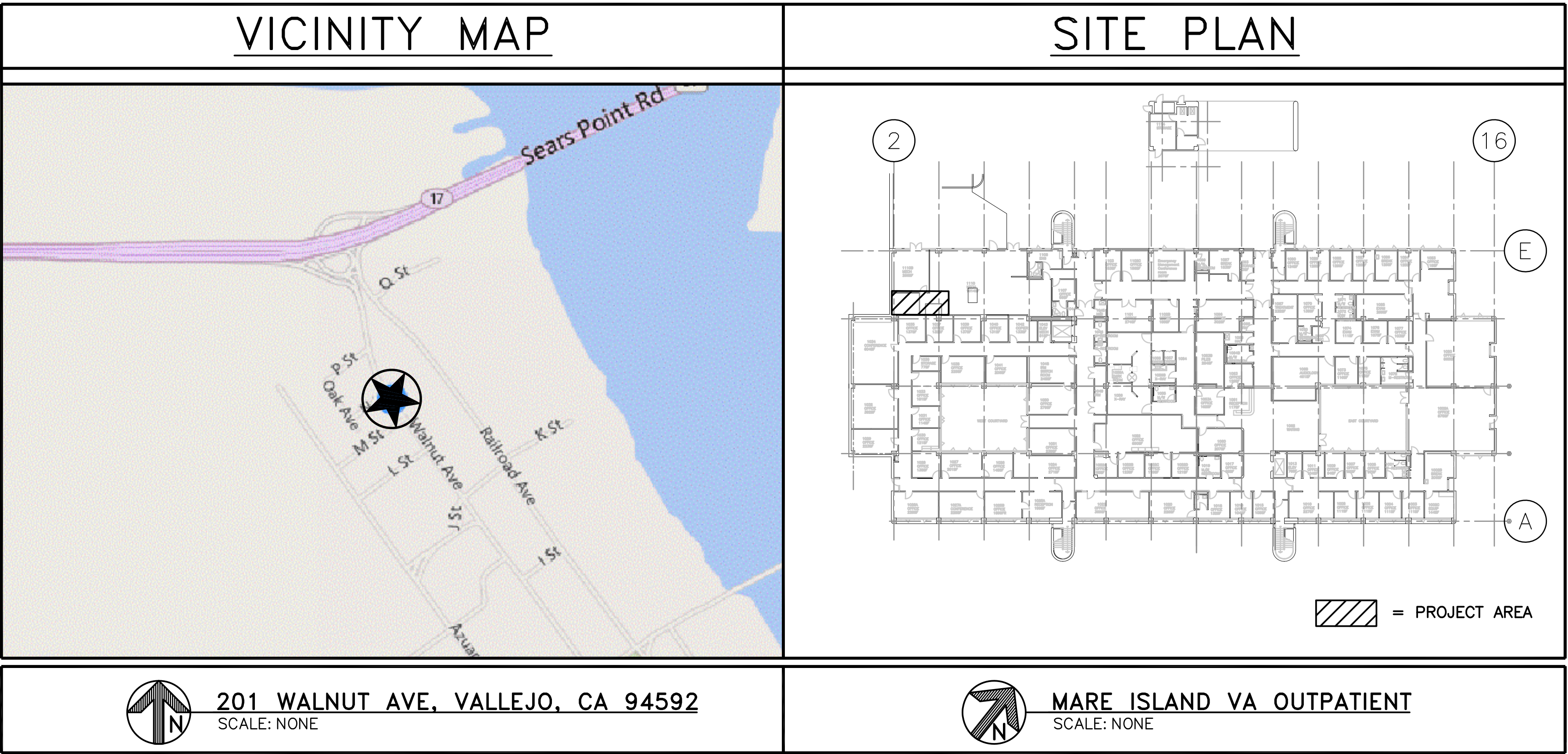


DEPARTMENT OF VETERANS AFFAIRS
MARE ISLAND
CHILLER INSTALLATION
OUTPATIENT CLINIC
PROJECT NUMBER: 612-14-035



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

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

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

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

| 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 |

| | |
|---|----------|
| 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 |

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

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

| STAMP |
|-------|
| |

| ARCHITECT/ENGINEERS: |
|---|
| ADVANCE DESIGN CONSULTANTS, INC. 998 PARK AVENUE SAN JOSE CALIFORNIA 95128 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. PO# 14-308-37 |

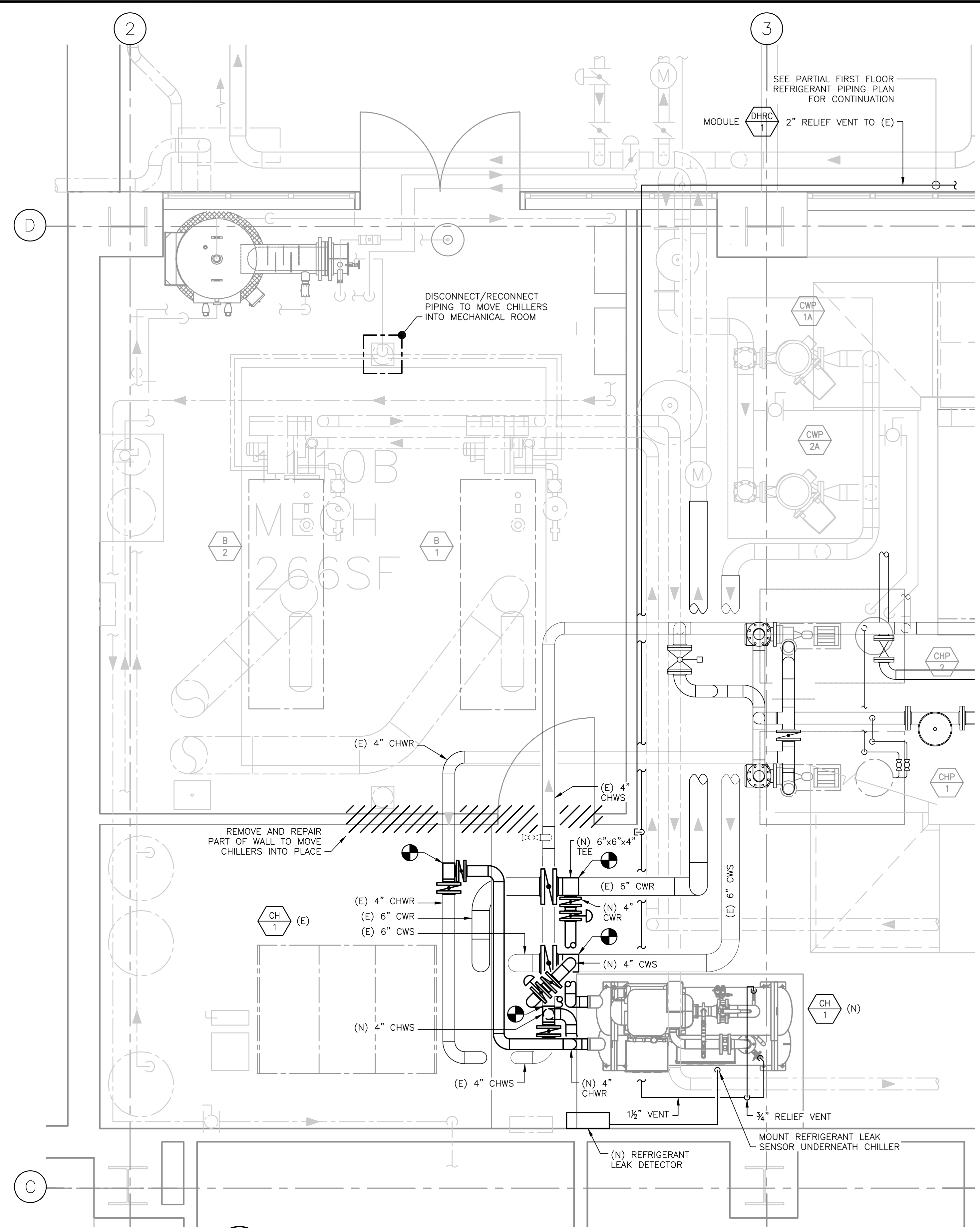
| |
|---|
| Drawing Title GENERAL SITE MAP, VICINITY MAP, DRAWING INDEX AND PROJECT DESCRIPTION |
| Approved: Project Director |

| |
|--|
| Project Title VA MARE ISLAND OUTPATIENT CLINIC CHILLER INSTALLATION |
| Location VALLEJO, CA |
| Date 11/11/2014 |
| Checked L. RIOS |
| Drawn R. RIOS |

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

| |
|---------------------------------------|
| Office of Facilities Management |
| Department of Veterans Affairs |

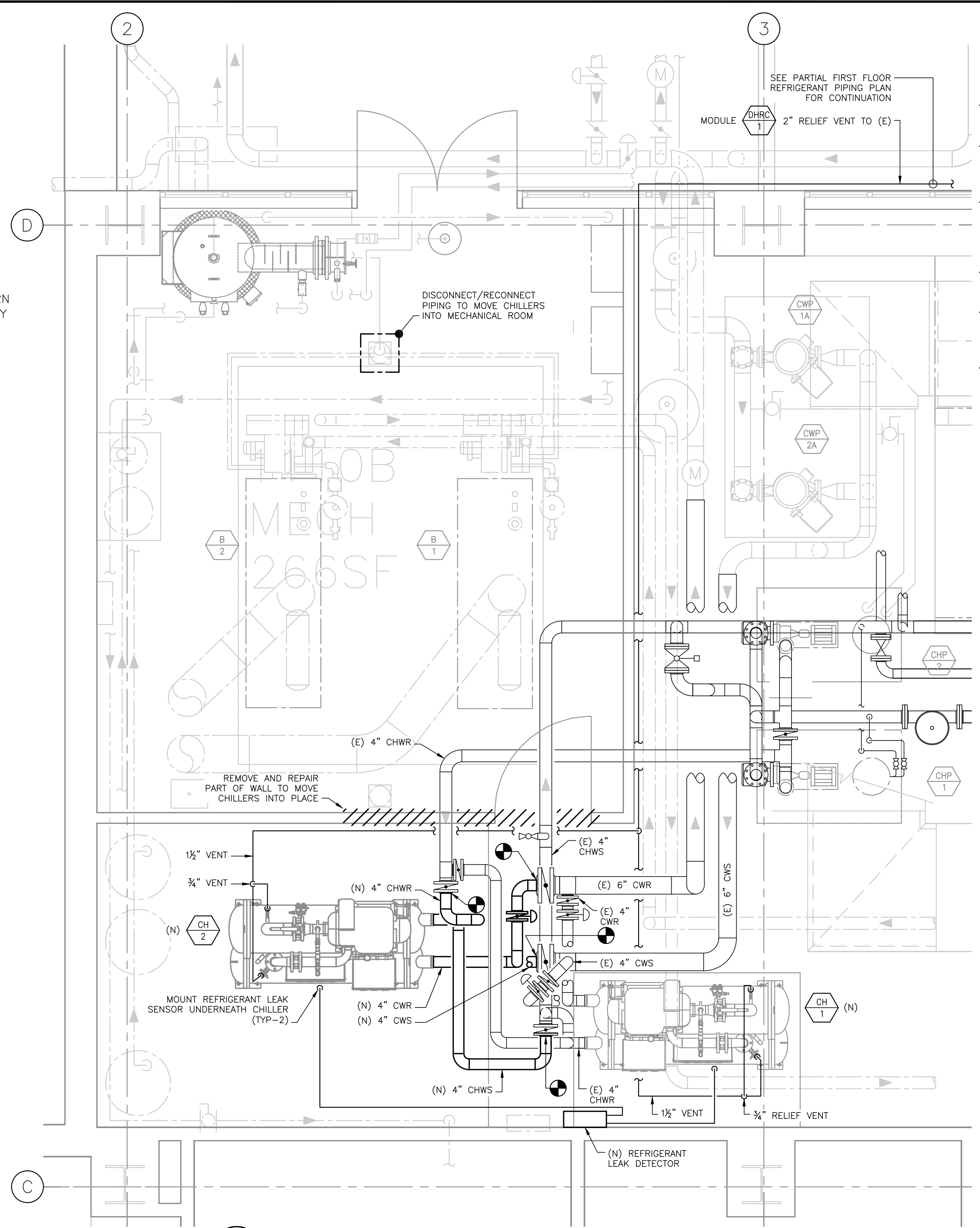
three inches = one foot
one and one half inches = one foot
one inch = one foot
three quarters inch = one foot
one half inch = one foot
one quarter inch = one foot
one eighth inch = one foot
one eighth inch = one foot



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

**PHASE 1
SHEET NOTES:**

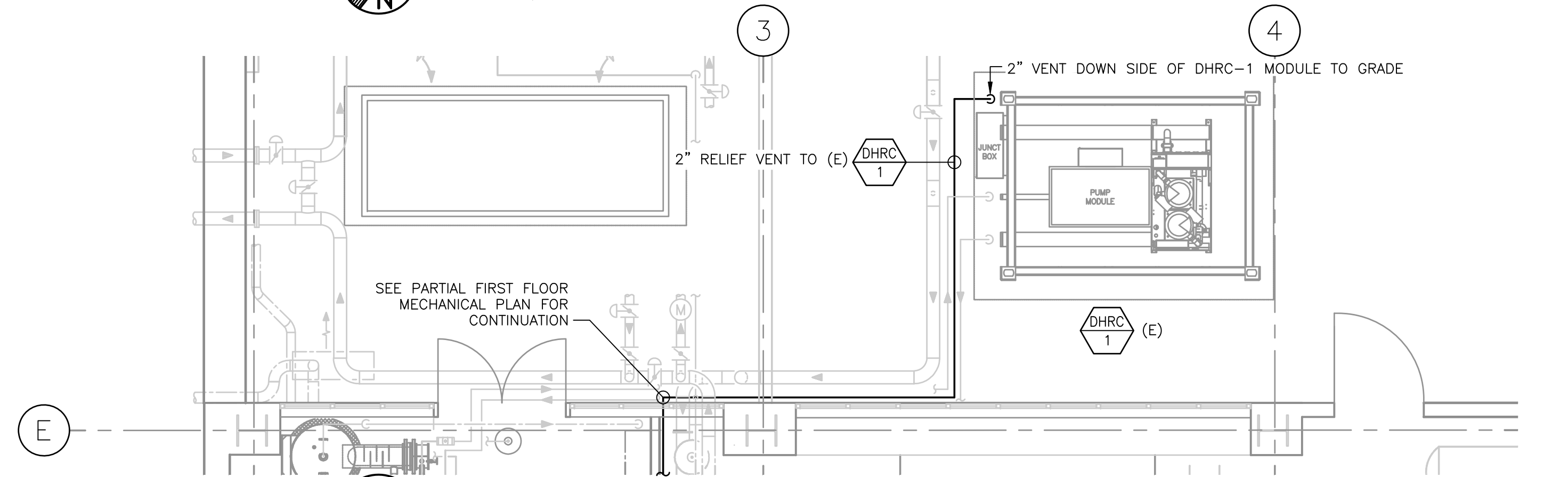
- 1 PRIOR TO ANY SYSTEM SHUT-DOWN NOTIFY VA COR 7 DAYS IN ADVANCE.
- 2 REPAIR/REPLACE AS NECESSARY (E) CONCRETE PAD FOR CH-1 AND CH-2
- 3 INSTALL 6x6x4 REDUCING TEE WITH 6" AND 4" BFV'S IN CONDENSER WATER SUPPLY AND RETURN.
- 4 INSTALL 4" TEE AND 4" BFV'S IN CHILLED WATER SUPPLY AND RETURN.
- 5 CONNECT (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"

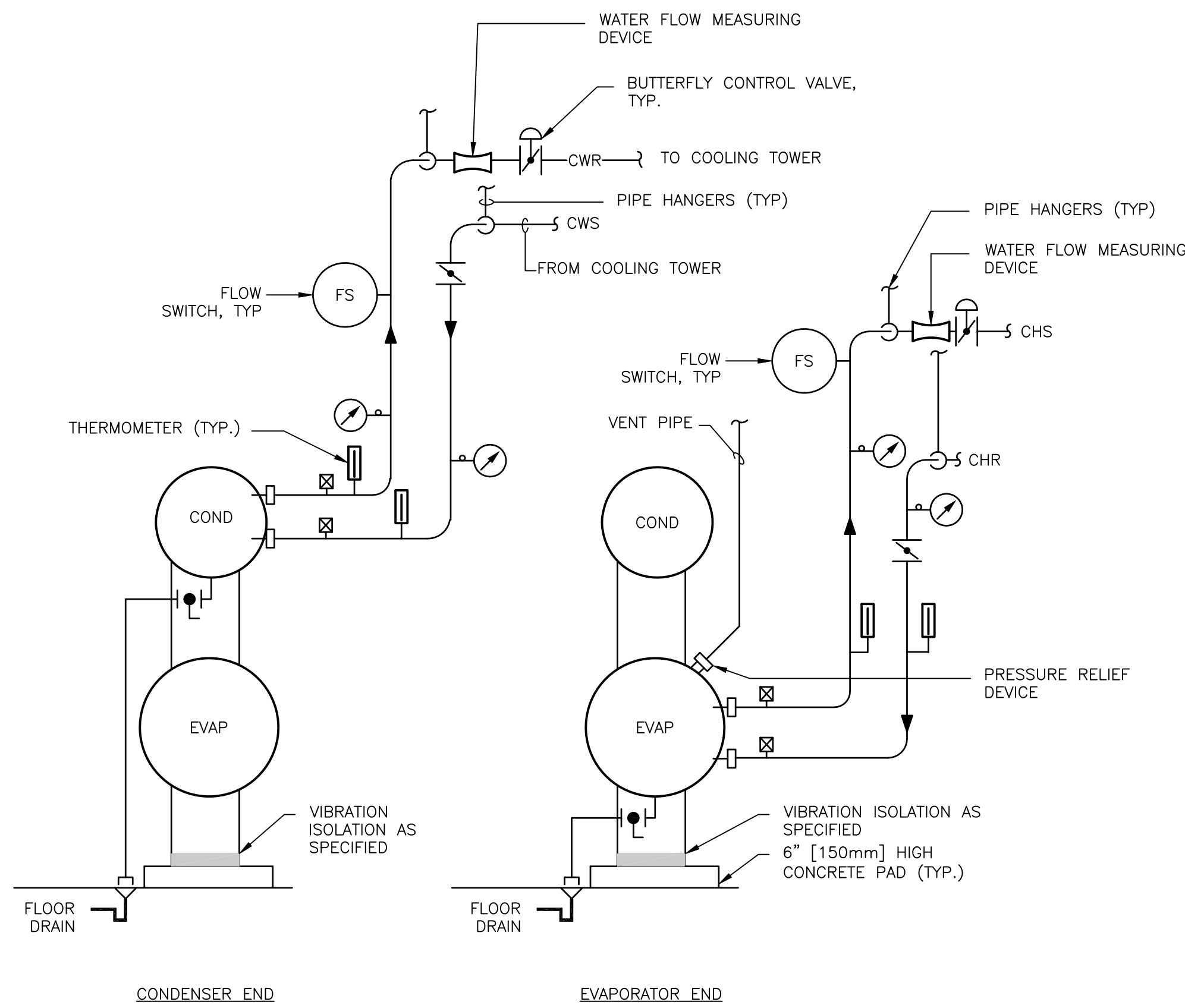
**PHASE 2
SHEET NOTES:**

- 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"

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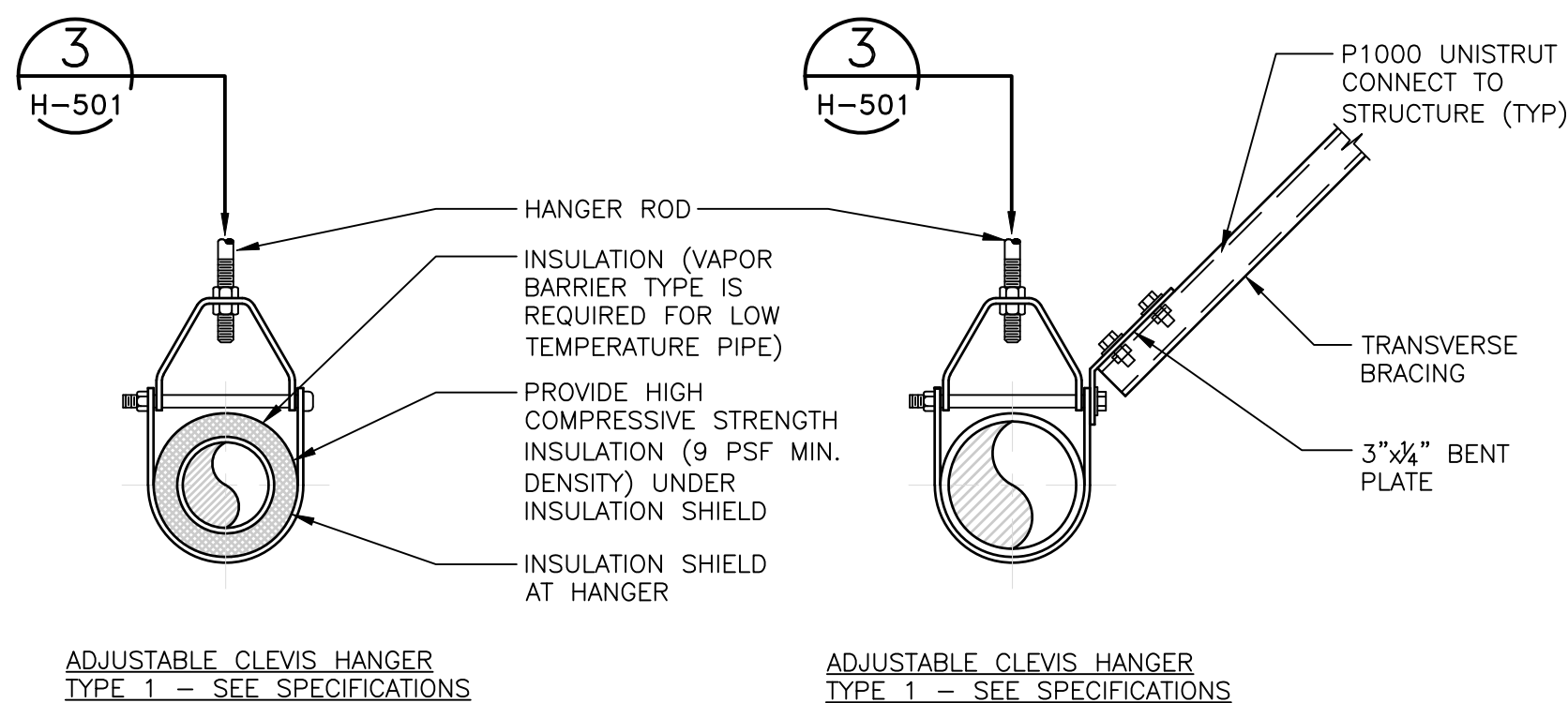


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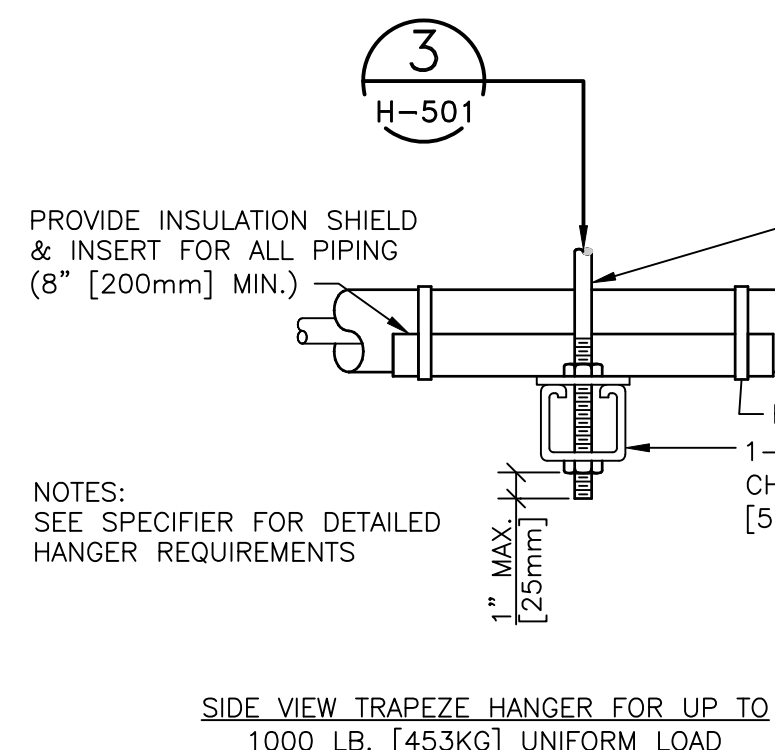
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| PIPE | FT. (mm) | 2100 | 2100 | 2100 | 2700 | 3000 | 3400 | 3700 | 4100 | 4900 | 5200 | 5800 | 6700 | 7000 | 7600 | 8200 | 8500 | 9100 | 9600 | | | | |
| TUBING | FT. (mm) | 5 | 6 | 7 | 8 | 9 | 10 | 12 | 13 | 14 | 16 | - | - | - | - | - | - | - | - | | | | |

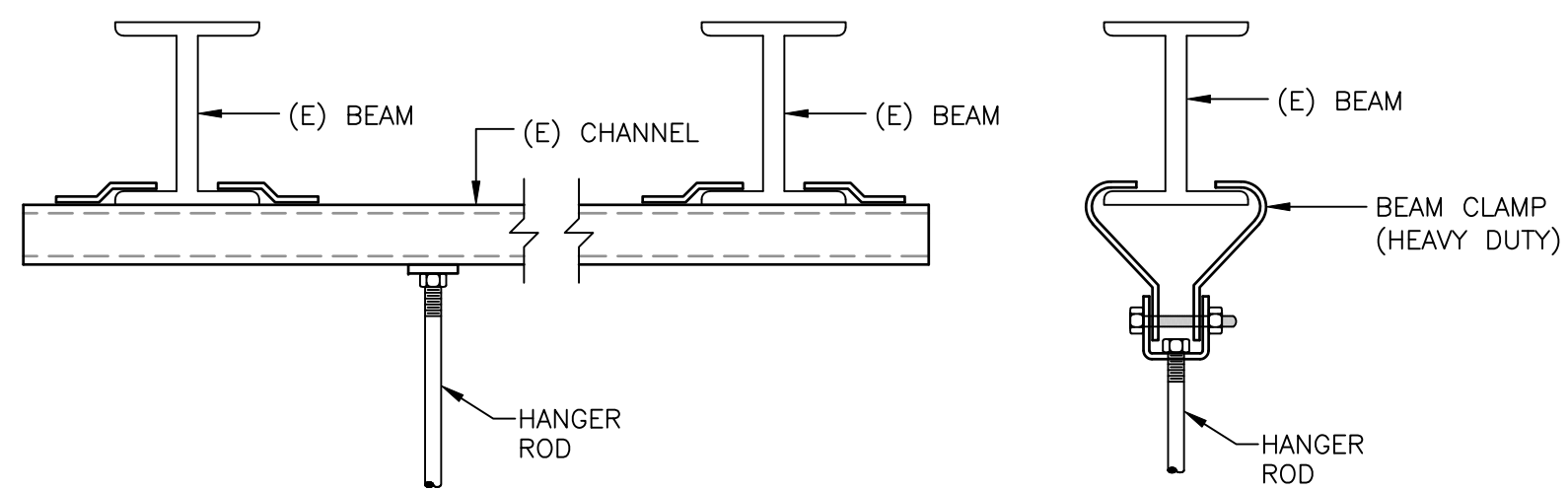
NOTE: FOR TRAPEZE HANGER TAKE SPACING OF SMALLEST SIZE ON TRAPEZE.



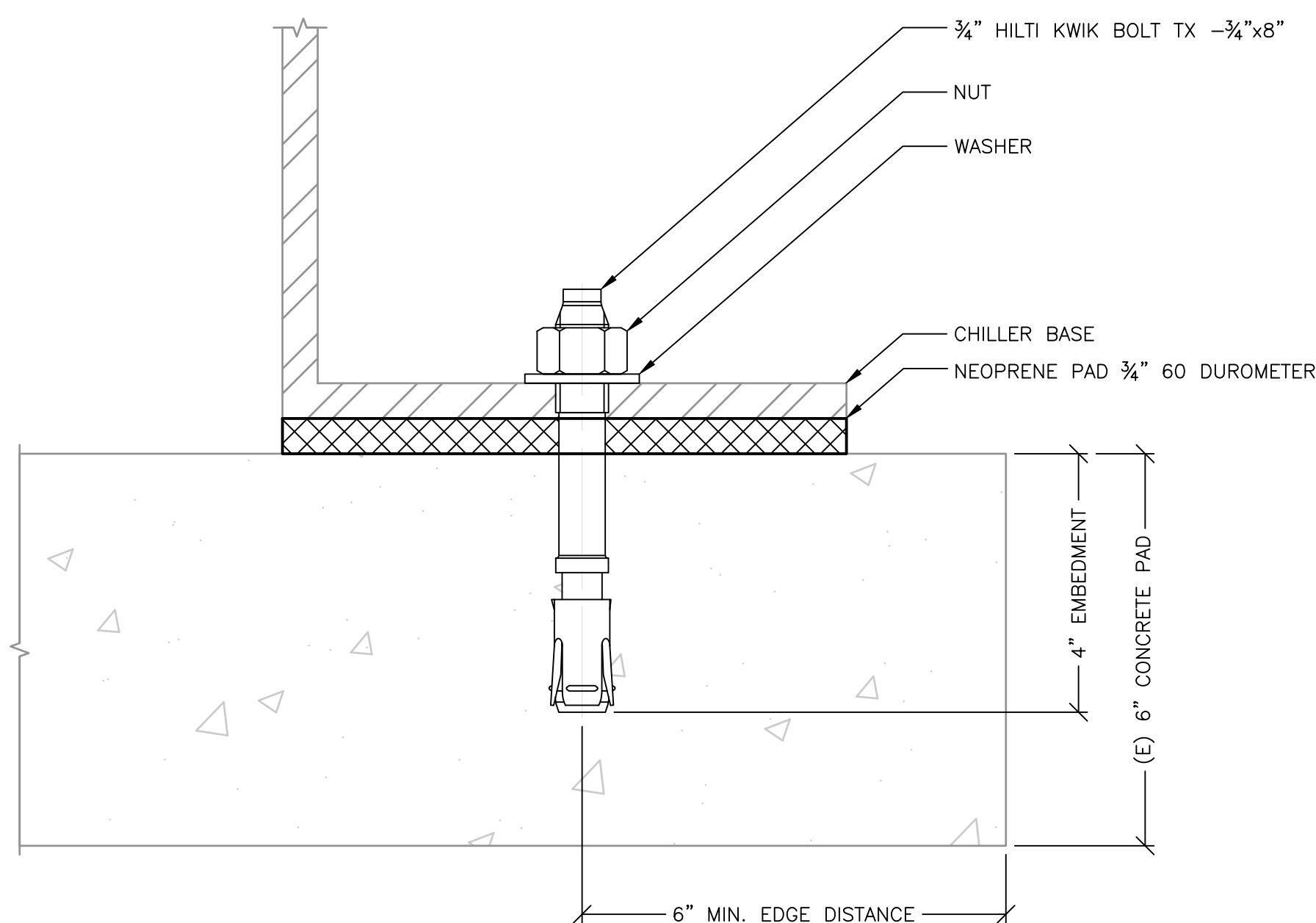
2 TYPICAL PIPE HANGER DETAILS
SCALE: N.T.S.



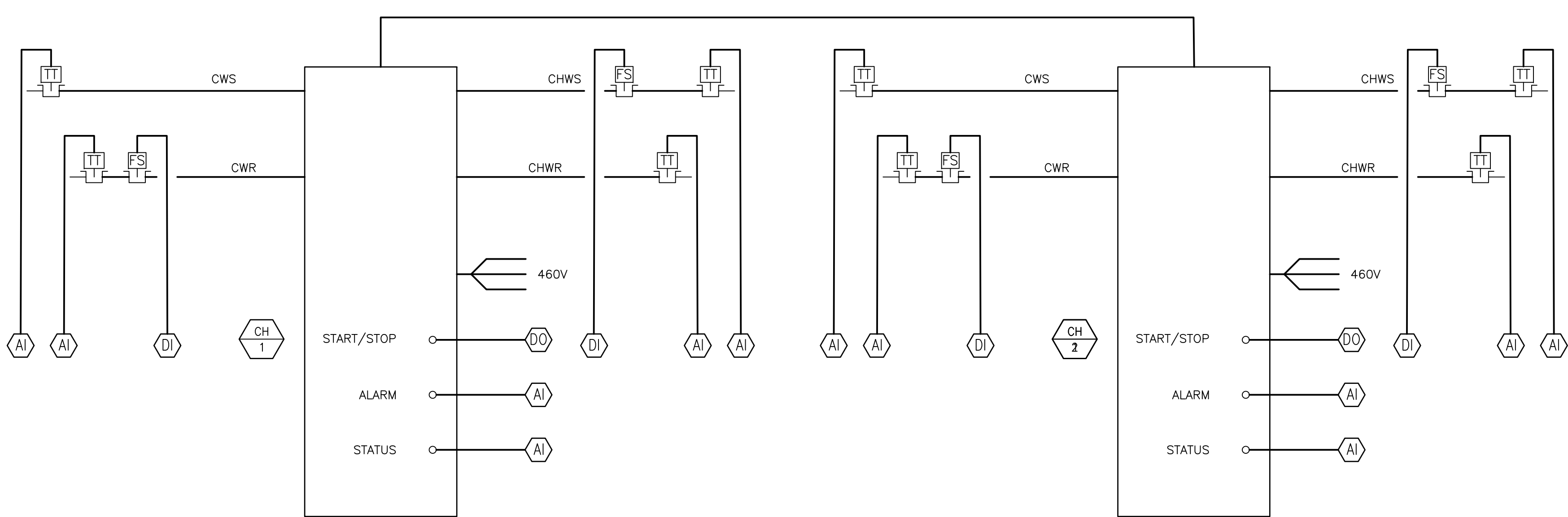
3 TYPICAL HANGER ROD ATTACHMENT
SCALE: N.T.S.



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 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.

| | | | | | | | | | |
|---|--|-----------------|--------------|-----------------------------|--|---|-------------------------------------|--|--------------------------------|
| CONSULTANTS: | | KEY PLAN | STAMP | ARCHITECT/ENGINEERS: | Drawing Title MECHANICAL DETAILS | Project Title VA MARE ISLAND OUTPATIENT CLINIC CHILLER INSTALLATION | Project Number 612-14-035 | Office of Facilities Management Department of Veterans Affairs | |
| Revisions: | | | | | Approved: Project Director | Location VALLEJO, CA | Building Number 201 | | |
| BID DOCUMENT SUBMITTAL (FINAL) (14-137) | | | | | | Date 11/11/2014 | Checked D. HAMMOND | Drawn J. ROTHWEIN | Drawing Number H-501 |
| 100% CONSTRUCTION DOCUMENTS (14-112) | | | | | | | | | |
| 90% DESIGN DEVELOPMENT (14-101) | | | | | | | | | |
| SCHEMATIC DESIGN SUBMITTAL (14-083) | | | | | | | | | |
| Revisions: | | | | | | | | | |
| Date | | | | | | | | | |

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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 | |
|------|-------------------|-----------------|--------------|------------------------|-------|---------|---------------------|-------|-----|-------|-------------|-------|-----|------|-----|------|-----------|-------|------|-------|------|-------|------------------|-----|----------------------|-----|----------------------|-----|----------------------|--------|------------------------|----|--------------|-----------|-------------|---------------|
| | | | | | | | | | | | AMBIENT WB | | EWT | | LWT | | NO | POWER | | PHASE | VOLT | RPM | | | | | | | | | | | | | | SPEED CONTROL |
| | | | | TONS | (KW) | | GPM | (L/S) | FT | (KPA) | PSIG | (KPA) | *F | (°C) | *F | (°C) | | HP | (KW) | | | | | | | | | | | | | | | | | |
| 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 | | | | | | | | | | MIN. % EFF | ELECTRICAL | | | | | | MANUFACTURER | MODEL NO. | REMARKS |
|--------|-----------|-------------------------|-----------------------|------------------|-------------------|------|--------|------|-------|----------------|-------|-------------|-------|-------|------------|---------------|-------|-------|------|---------|---------------|--------------|----------------|---------|
| | | | | | FLUID | FLOW | | HEAD | | NPSH AVAILABLE | | TEMPERATURE | | SP GR | | NOMINAL POWER | | PHASE | VOLT | MAX RPM | SPEED CONTROL | | | |
| | | | | | | GPM | (L/S) | FT | (KPA) | FT | (KPA) | *F | (°C) | | | HP | (KW) | | | | | | | |
| 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 | - |
| 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 | - |
| 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 | - |
| 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 | | | | | | | | | | MANUFACTURER | MODEL NO. | REMARKS |
|------|-----------|-----------------------|--------|---------------|-------|------|-------|-----|-------|-------------|-------------------|------------------|--------|--------------|-----------|---------|
| | | | | SIZE IN | | FLOW | | WPD | | WATER TEMP. | BUILT IN STRAINER | DIAMTER x HEIGHT | WEIGHT | | | |
| | | | | IN | (MM) | GPM | (L/S) | FT | (KPA) | *F | | IN | LBS | | | |
| 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 |
|------|-----------------|-----------------------|------------------|-----------------------|---------|--------------------------|------|-----|------|--------------------------|-------|------------------------|-------|-----------------------|-------|---------|-------|-----------------|-------|--------------------|-------|-------------------|------|----------------------|------|--------------|----------------|---------|
| | | | | | | MIN | | MAX | | | | | | RELIEF VALVE | | AT TANK | | | | | | | | | | | | |
| | | | | GAL | (L) | *F | (°C) | *F | (°C) | PSIG | (KPA) | PSIG | (KPA) | PSIG | (KPA) | PSIG | (KPA) | GAL | (L) | GAL | (L) | IN | (MM) | IN | (MM) | | | |
| 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. | | | |
| 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 |
| 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 |

1. COMPRESSOR TO BE OIL A CENTRIFUGAL OIL FREE MAGNETIC BEARING TYPE.
2. PROVIDE NON FUSED MAIN POWER DISCONNECT.
3. PROVIDE REFRIGERANT LEAK DETECTION, CONNECT TO (E) JOHNSON CONTROLS BUILDING MANAGEMENT SYSTEM (BMS) AND ALERT WHEN ALARMED.
4. PROVIDE FLOW SWITCH FOR CONDENSER WATER AND CHILLED WATER.
5. 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.
6. MAXIMUM SHELL LENGTH 6 FEET.
7. MULTI-STACK OR APPROVED EQUIVALENT

SCOPE OF WORK

CONSULTANTS:

KEY PLAN

STAMP

ARCHITECT/ENGINEERS:

Drawing Title
MECHANICAL SCHEDULES

Approved: Project Director

Project Title
VA MARE ISLAND
OUTPATIENT CLINIC
CHILLER INSTALLATION

Location
VALLEJO, CA

Date
11/11/2014

Checked
D. HAMMOND

Drawn
J. ROTHMEN

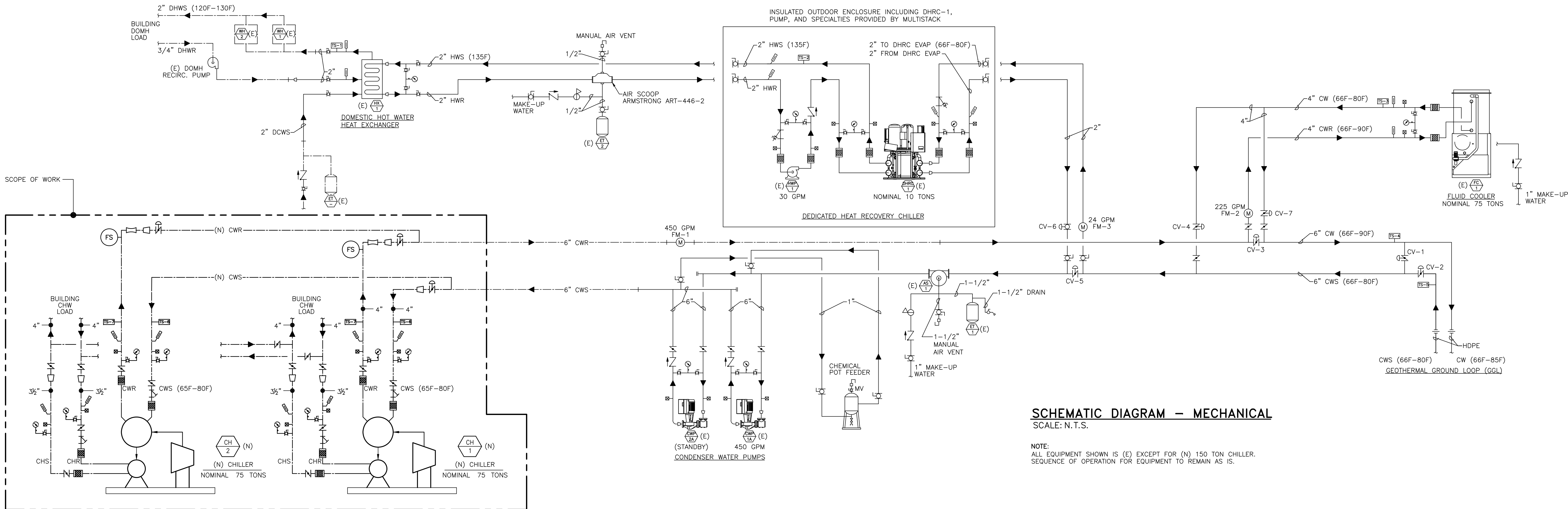
Project Number
612-14-035

Building Number
201

Drawing Number
H-601

Office of
Facilities
Management

Department of
Veterans Affairs



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 CONTROLS 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 FUNCTIONAL IN ACCORDANCE WITH THE DESIGN DOCUMENTATION, SUBMIT A 5-DAY TRENDING 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 ACTUAL VALVE POSITION (OPEN/CLOSED)
FC-1 FLOW RATE - FM-2 (GPM)
ALARM - FAN 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):

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 DOMH 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 MANUFACTURERS 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 65°F
LEAVING DOMH 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 DOMH WATER TEMPERATURE SETPOINT (125°F) BASED ON THE LEAVING DOMH 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 TEMPERATURE. AFTER THIS CONDITION IS ACHIEVED, ENTER THE CONDENSER WATER SYSTEM 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 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

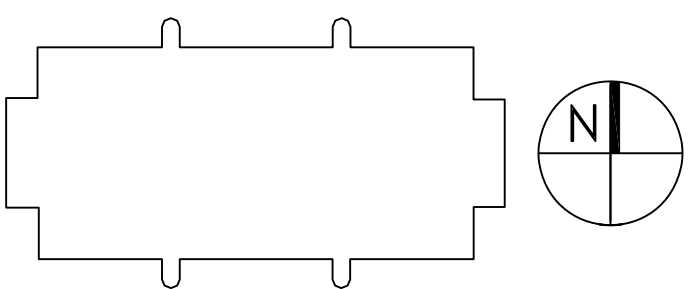
FOR REFERENCE ONLY

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| 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 |

VA FORM 08-6231, OCT 1978

CONSULTANTS:

KEY PLAN



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POM 14-308-37

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|----------------------------|--|
| Drawing Title | (E) MECHANICAL SCHEMATIC DIAGRAM AND SEQUENCE OF OPERATION |
| Approved: Project Director | |

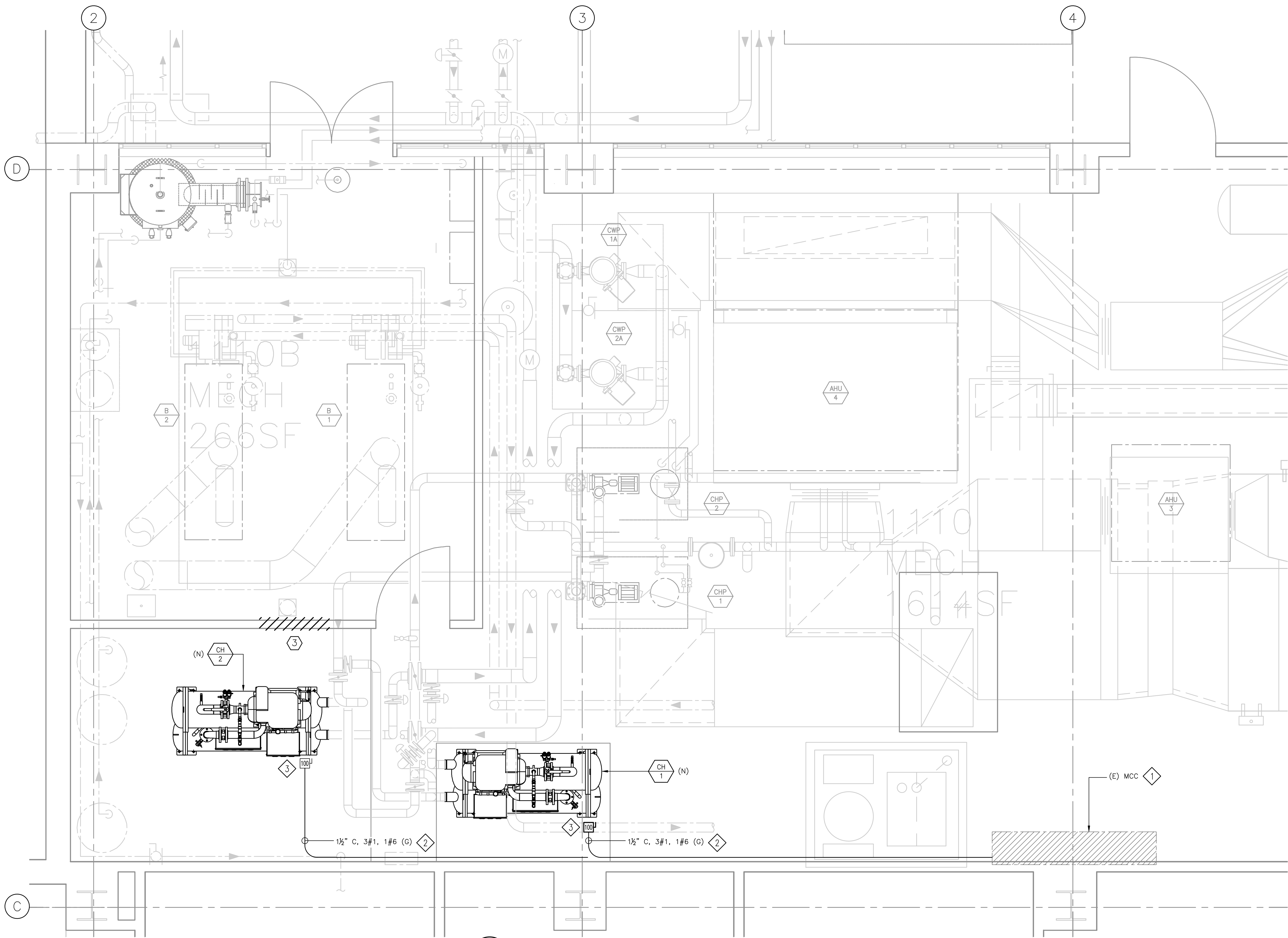
| | |
|---------------|---|
| Project Title | VA MARE ISLAND OUTPATIENT CLINIC CHILLER INSTALLATION |
| Location | VALLEJO, CA |
| Date | 11/11/2014 |
| Checked | D. HAMMOND |
| Drawn | J. ROTHMAN |

| | |
|-----------------|------------|
| Project Number | 612-14-035 |
| Building Number | 201 |
| Drawing Number | H-602 |

Office of
Facilities
Management

Department of
Veterans Affairs

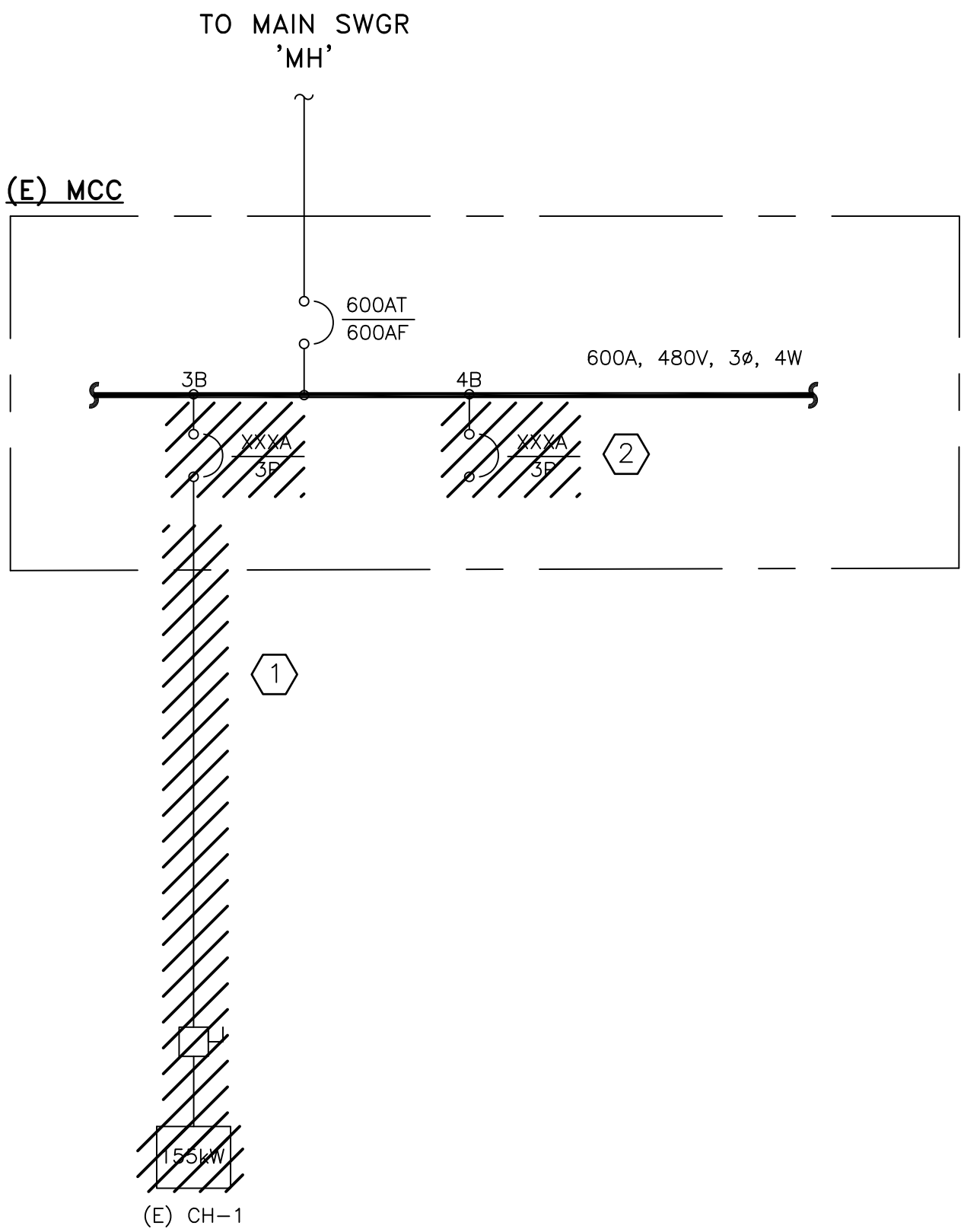
three inches = one foot
one and one half inches = one foot
one inch = one foot
three quarters inch = one foot
one half inch = one foot
one quarter inch = one foot
one eighth inch = one foot
one eighth inch = one foot



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

DEMOLITION NOTES:

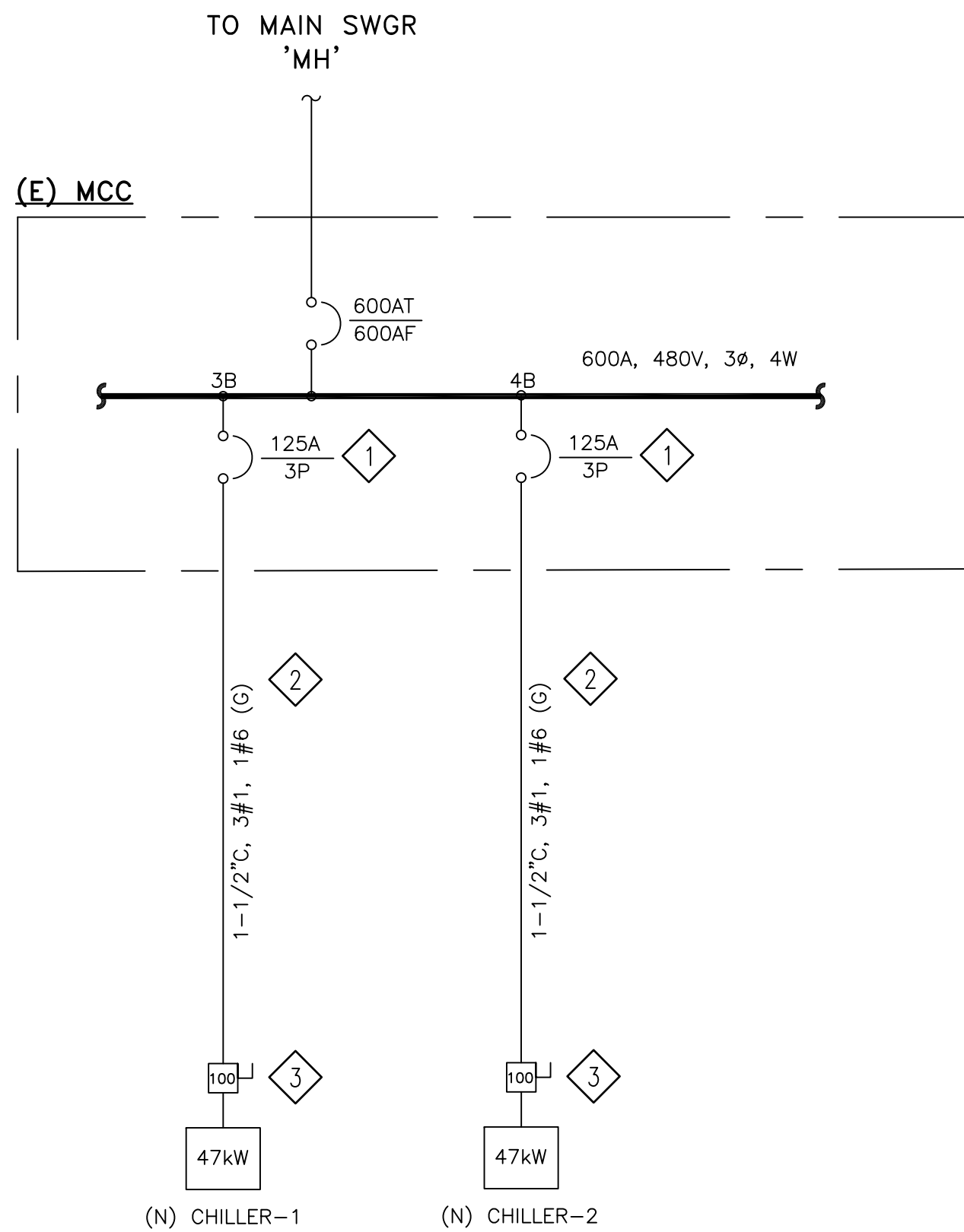
- CONTRACTOR SHALL DE-ENERGIZE THE EXISTING CIRCUIT FOR CHILLER "CH-1" AND REMOVE THE CIRCUIT BREAKER, CONDUIT, CONDUCTORS AND ASSOCIATED DISCONNECT SWITCH.
- CONTRACTOR SHALL DE-ENERGIZE, DISCONNECT AND REMOVE THE CIRCUIT BREAKER AT SECTION "4B" OF THE EXISTING MCC.
- CONTRACTOR SHALL RELOCATE ANY CONDUITS,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



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

SHEET NOTES:

- 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.
- CONTRACTOR SHALL PROVIDE AND INSTALL NEW CONDUIT AND CONDUCTORS WITH MINIMUM SIZES AS SHOWN ON THE DRAWING.
- 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.

| Revisions: | |
|---|----------|
| Date | |
| BID DOCUMENT SUBMITTAL (FINAL) (14-137) | 12/18/14 |
| 100% CONSTRUCTION DOCUMENTS (14-112) | 11/11/14 |
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CONSULTANTS:

KEY PLAN

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PO# 14-308-37

Drawing Title
**ELECTRICAL
PARTIAL FIRST FLOOR 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

**Office of
Facilities
Management**

**Department of
Veterans Affairs**