CITY OF ANN ARBOR
LARCOM CHILLER REPLACEMENT PROJECT
301 E. HURON STREET
ANN ARBOR, MICHIGAN 48104

DICLEMENTE SIEGEL DESIGN INC.
28916 GREENFIELD ROAD
SOUTHFIELD, MICHIGAN 48076-3048
(DSD Project No. 16-1304)

ENGINEERING AND ARCHITECTURE

ARCHITECTURAL SHEET INDEX

MECHANICAL SHEET INDEX

ELECTRICAL SHEET INDEX
1. ANY INTERRUPTIONS OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE SO AS NOT TO INTERFERE WITH THE PRESENT BUILDING'S OPERATION.

2. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF WORK TO BE PERFORMED. THE EXACT EXTENT OF DEMOLITION SHALL BE AS REQUIRED BY THE NEW WORK.

3. ALL MECHANICAL ITEMS TO BE REMOVED SHALL BE REMOVED COMPLETE WITH ALL RELATED ITEMS INCLUDING HANDBERS, SUPPORTS, CONTROLS, ETC. CAP ALL OPEN ENDED PIPES AND DUCTWORK.

4. THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL ON ALL EQUIPMENT BEING REMOVED.

DEMOLITION AND NOTES:

DEMO NOT REMOVED (APPLICABLE THIS SHEET ONLY)

1. REMOVE PIPING THRU FLOOR AND PIPE CURB. PATCH
   ROOF PENETRATION TO MATCH EXISTING ADJACENT.

2. REMOVE PIPING THRU WALL AND MAKE WATER TIGHT.
CHILLED WATER PIPING DIAGRAM

1. **Valves Shall Have Linear Characteristics.**
   - Three-way adjusting Teflon cones.
   - Upper penthouse floor plan - New work

2. **Valves Shall Have Metal Actuators Rather Than Plastic, and Copper tubing.**
   - Diaphragm style, either normally open or normally closed as required.
   - Electrical connections: screw terminal.

3. **Flanged Bronze Body.**
   - NPS 2 and smaller: single seated, straight through, globe, class 125 threaded.
   - NPS 2-1/2 and larger: single seated, straight through, globe, class 125.

4. **Liquid-pressure differential switch with set-point indicator.**
   - Diaphragm material: nylon or PTFE.
   - Pressure chamber material: steel or stainless steel.

5. **Factory Fabricated, of type, body material, and pressure class based on temperature limits: minus 30 to 150 deg F (minus 35 to 66 deg C).**
   - Fluid control valves shall be single seated, straight through, globe with pressure chamber material: steel or stainless steel.

6. **Circuit Breaker, Factory Installed, Factory-Wired 120 VA Control Power Transformer.**
   - Provides all unit control power (120 VAC secondary) and module power (24 VAC).
   - Molding case high interrupting capacity circuit breaker, mini circuit breaker.

7. **A Molded Case High Interrupting Capacity Circuit Breaker, Factory Installed, Factory-Wired 120 VA Control Power Transformer.**
   - Provides all unit control power (120 VAC secondary) and module power (24 VAC).
   - Molding case high interrupting capacity circuit breaker, mini circuit breaker.

8. **Close-off pressure rating of 150 percent of operating (inlet) pressure.**
   - Liquid pressure switch.
   - Close-off (differential) pressure rating: combination of actuator and liquid pressure switch.

9. **Electrical connections: screw terminal.**
   - Electrical connections: screw terminal.
   - Enclosure conduit connection: knock out or threaded connection.

10. **Design of the air-cooled condenser.**
    - Air-cooled condenser coils to have lanced aluminum fins mechanically brazed to internally-finned copper tubing.

11. **Brazing material, designed to withstand a refrigerant side working pressure of 1000 psig.**
    - Brazing material, designed to withstand a refrigerant side working pressure of 1000 psig.

12. **Operating data:**
    - Hazardous environments: explosion proof.
    - Outdoor and wet indoor installations: NEMA 250, type 4.

13. **Electrical rating: 15 A at 120- to 240-V AC.**
    - Electrical rating: 15 A at 120-V AC.
    - Operating data:
      - Indoor control panel.

14. **Electrical trades will provide three phase power for motors and 120V electrical rating: 15 A at 120-V AC.**
    - Electrical trades will provide three phase power for motors and 120V electrical rating: 15 A at 120-V AC.

15. **Allowable working pressure of the condenser is 650 PSIG.**
    - Allowable working pressure of the condenser is 650 PSIG.

16. **Electrical connection: screw terminal.**
    - Electrical connection: screw terminal.

17. **Pre-wired with terminal block power connections and equipped with a liquid pressure switch, diaphragm operated, low pressure: 2 psi.**
    - Pre-wired with terminal block power connections and equipped with a liquid pressure switch, diaphragm operated, low pressure: 2 psi.

18. **Electrical connections: screw terminal.**
    - Electrical connections: screw terminal.

19. **Close-off pressure rating of 150 percent of total system (pump) head.**
    - Close-off pressure rating of 150 percent of total system (pump) head.

20. **Electrical connection: screw terminal.**
    - Electrical connection: screw terminal.

21. **System (pump) head.**
    - System (pump) head.

22. **Brazes plate evaporator to be made of stainless steel with copper as the braze material.**
    - Brazes plate evaporator to be made of stainless steel with copper as the braze material.

23. **Lockable external operator handle to disconnect the chiller from main power.**
    - Lockable external operator handle to disconnect the chiller from main power.

24. **A molded case high interrupting capacity circuit breaker, factory installed, factory-wired 120 VA control power transformer.**
    - A molded case high interrupting capacity circuit breaker, factory installed, factory-wired 120 VA control power transformer.

25. **Provided all unit control power (120 VAC secondary) and module power (24 VAC).**
    - Provided all unit control power (120 VAC secondary) and module power (24 VAC).

26. **Close-off pressure rating of 150 percent of total system (pump) head for condenser.**
    - Close-off pressure rating of 150 percent of total system (pump) head for condenser.

27. **Liquid pressure switch, diaphragm operated, low pressure: 2 psi.**
    - Liquid pressure switch, diaphragm operated, low pressure: 2 psi.
CHW CONTROL SEQUENCE

CHW CONTROL SEQUENCE

CHW CONTROL POINTS SCHEDULE

CHW SYSTEM
1. Any interruptions of existing services and/or equipment shall be performed at a time approved in advance by the owner's representative so as not to interfere with the present building's operation.

2. These drawings are diagrammatic and indicate the general extent of work to be performed. The exact extent of demolition shall be as required by the new work.

DEMOLITION KEY NOTES:
- Disconnect and remove service to existing cooling tower back to source.
- Remove abandoned starter formerly serving water-cooled chiller C-1, and associated feeder.
- Disconnect and remove services to condenser water pumps CP-1 and CP-2 back to source in their entirety.

Lower Penthouse Floor Plan - Demolition

Upper Penthouse Floor Plan - Demolition
THESE DRAWINGS ARE DIAGRAMMATIC & INDICATE THE GENERAL EXTENT OF THE WORK. PROVIDE PIPING SYSTEMS COMPLETE AND PER SPECIFICATIONS, AND PER APPLICABLE CODES INCLUDING ALL NECESSARY OFFSETS, AND FITTINGS WHICH ARE REQUIRED DUE TO SPACE CONSTRAINTS OR OTHER CONDITIONS.

CONTRACTOR SHALL COORDINATE HIS WORK WITH THE WORK OF ALL OTHER TRADES. VERIFY ALL CLEARANCES PRIOR TO THE FABRICATION OF ANY WORK.

ALL WORK TO BE DONE IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRICAL CODE.

PROVIDE TWO 200A, 3-POLE FUSIBLE NEMA 1 SWITCHES FOR SERVICE TO EXISTING AIR-COoled CHILLER C-3 AND NEW AIR-COoled CHILLER C-4. FEED SWITCHES FROM EXISTING 400A SWITCH IN DISTRIBUTION PANEL DP-4. PROVIDE 200A FEEDERS FROM DP-4 TO EACH 200A SWITCH, 3#3/0 & #6 GND, 2"C. (10-FOOT TAP RULE). FUSE 400A SWITCH AT 400A. FUSE 200A SWITCHES AT 175A.

REWORK EXISTING C-3 FEEDER FROM DP-4 TO NEW 200A SWITCH ADJACENT TO DP-4.

PROVIDE NEW SERVICE TO AIR-COoled CHILLER C-4 FROM NEW 200A SWITCH ADJACENT TO POWER PANEL PP-3. PROVIDE BRANCH CIRCUIT, 3#3/0 & #6 GND, 2"C.

PROVIDE 120V, 20A BRANCH CIRCUIT FOR AIR-COoled CHILLER C-4 HEATING CIRCUIT, 2#12 & #12 GND, 3/4"C. FROM LOAD CENTER LP-7B-2. PROVIDE 20/20A SQUARE D TYPE QO TANDEM BREAKER IN EXISTING SPACE NO. 7.

PROVIDE 120V, 20A GFCI DUPLEX OUTLET WITH WEATHER-PROOF WHILE-IN-USE COVER AND ASSOCIATED BRANCH CIRCUIT, 2#12 & #12 GND, 3/4"C. BACK TO LIGHTING PANEL LP-7B, CIRCUIT 15.

TEMPERATURE, TYPE III LIGHT DISTRIBUTION. 120V, PHOTOCELL RECEPTACLE, SINGLE FUSE, SURGE PROTECTIVE DEVICE AND DARK BRONZE FINISH: LITHONIA NO. TWH LED ALO 50K T3M 120 PER SF SPD DDBXD WITH DLL127F1.5JU PHOTOCELL, OR EQUAL. PROVIDE WP LOCAL WALL-MOUNTED SWITCH AND BRANCH CIRCUIT TO LOAD CENTER LP-7B-2.
1. THESE DRAWINGS ARE DIAGRAMMATIC & INDICATE THE GENERAL EXTENT OF THE WORK. PROVIDE PIPING SYSTEMS COMPLETE AND PER SPECIFICATIONS, AND PER APPLICABLE CODES INCLUDING ALL NECESSARY OFFSETS, AND FITTINGS WHICH ARE REQUIRED DUE TO SPACE CONSTRAINTS OR OTHER CONDITIONS.

2. CONTRACTOR SHALL COORDINATE HIS WORK WITH THE WORK OF ALL OTHER TRADES. VERIFY ALL CLEARANCES PRIOR TO THE FABRICATION OF ANY WORK.

3. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRICAL CODE.

- DISCONNECT AND REMOVE SERVICE TO CONDENSER WATER PUMP CP-1, INCLUDING STARTER AND BRANCH CIRCUIT BACK TO SOURCE AT PENTHOUSE PANEL PP-3. IDENTIFY SWITCH AT PANEL AS SPARE.
- DISCONNECT AND REMOVE SERVICE TO CONDENSER WATER PUMP CP-2, INCLUDING STARTER AND BRANCH CIRCUIT BACK TO SOURCE AT PENTHOUSE PANEL PP-3. IDENTIFY SWITCH AT PANEL AS SPARE.
- DISCONNECT AND REMOVE SERVICE TO COOLING TOWER CT-1, INCLUDING STARTER AND BRANCH CIRCUIT BACK TO SOURCE AT PENTHOUSE PANEL PP-3. IDENTIFY SWITCH AT PANEL AS SPARE.
- DISCONNECT EXISTING CIRCUIT SUPPLYING AIR-COOLED CHILLER C-3 FROM 400A SWITCH AT PENTHOUSE DISTRIBUTION PANEL DP-4. RETAIN FEEDER FOR RE-USE.
- PROVIDE 480V, 3P, 200A HEAVY DUTY FUSIBLE DISCONNECT SWITCHES ADJACENT TO DISTRIBUTION PANEL DP-4 FOR SERVICE TO EXISTING AIR-COOLED CHILLER C-3 AND NEW AIR-COOLED CHILLER C-4. PROVIDE FEEDERS TO EACH SWITCH FROM 400A SWITCH IN DP-4 AS INDICATED. FUSE SWITCH IN DP-4 AT 400A.
- REWORK FEEDER FROM CHILLER C-3 TO NEW 200A FUSIBLE SWITCH. FUSE SWITCH AT 175A.
- PROVIDE FEEDER FROM 200A FUSIBLE SWITCH TO NEW 480V, 200A, 3-POLE NON-FUSIBLE NEMA 3R DISCONNECT AT CHILLER C-4 EXTEND FEEDER TO CHILLER CONTROL PANEL. PROVIDE 175A FUSES AT FUSIBLE SWITCH.

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<th>LOAD TYPE</th>
<th>VA AT 120/208VOLT-1PHASE-3WIRE+GRND PANELBOARD SCHEDULE</th>
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<td>TOTAL DEMAND</td>
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<tr>
<td>AMP BUS</td>
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| PANELBOARD DESIGNATION: LP-7B-2 | SURFACE MOUNTING: FLUSH | LOCATION: LOWER PENTHOUSE COL. D7 | X | X | X | X | X | X | X | X |

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<td>SQUARE D TYPE QO LOAD CENTER</td>
<td>C-4 FREEZE PROTECTION</td>
<td>EXTERIOR LIGHT AT CHILLER C-4</td>
<td>PUMPS</td>
<td>EXISTING LOAD</td>
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| ONE-LINE DIAGRAM | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

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DiClemente Siegel Design Inc. Engineering and Administration