Brookhaven National Laboratory
Plant Engineering - E&CS Division
Engineering Change Notice Form

PROJECT: CCWF II **JOB No.** 11705

ECN Title: Cooling Tower Site Plan **ECN No.** 41

Affected Documents: ES-401

Requested Change (Attach sketch if applicable): COOLING TOWER LIGHTING PLAN:
1. Install junction boxes as shown on the attached sketch to extend lighting circuits to lights for future cooling towers 7, 8, & 9.

COOLING TOWER POWER PLAN:
1. Do not install receptacle on south end of cooling tower 6. Cap conduit for future extension.

2. Extend 1 ½" conduit below grade for future cooling tower fans 7, 8, & 9 vibration switches to southwest corner of pier for cooling tower 9.

3. All conduit penetrations for motor & motor heater power & vibration switches for cooling tower fans 5 & 6 shall be made on the north end of cooling tower 5.

4. Provide junction box or wiring trough below 30A disconnect switches for cooling tower motor heaters. Run conductors from junction box or wiring trough to each 30A disconnect switch. Do not pull conductors through one disconnect switch to the other as shown on original drawing ES-401.

5. Motor heaters are located inside the cooling tower fan motors. Tee conduits from 30A motor heater disconnect switches into conduits from 200A motor disconnect switches. Run one conduit to each fan motor containing both motor power and heater power conductors.

6. Route 1" conduits from A1 and DI/DO junction boxes to LT-762 & LS-763 on top of cooling twr basin.

Resolution: See attached sketches.

Approvals: A/E or Proj. Eng.: D. Danseglio Date: 7/1/10

Project Coordinator: A. Raphael Date: 7/8/10

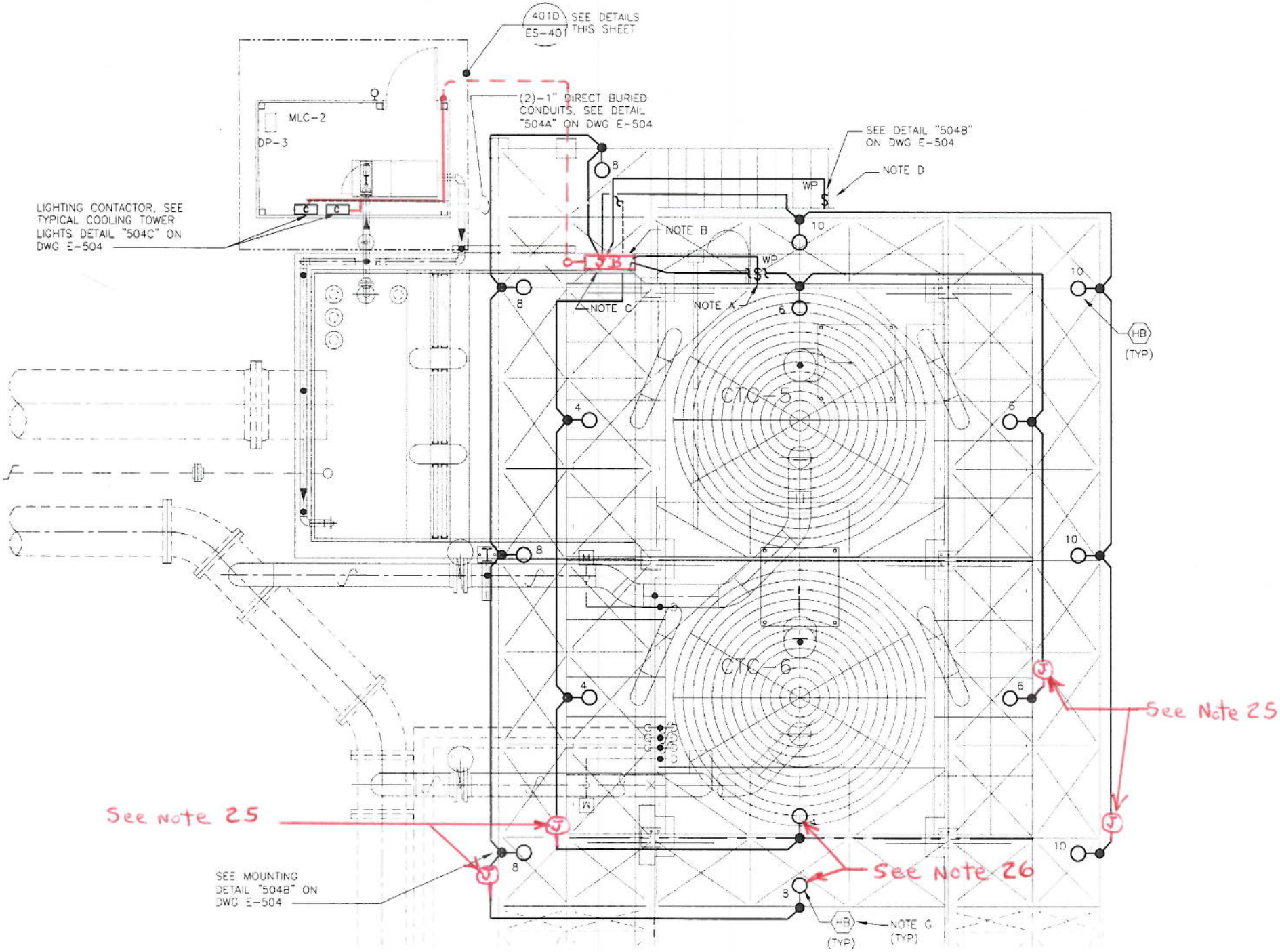
Manager: Date:

Contractor shall take the following action:

- ☐ Await change order from P&PM
- ☑ Proceed with change as described
- ☐ Provide cost proposal for change as described

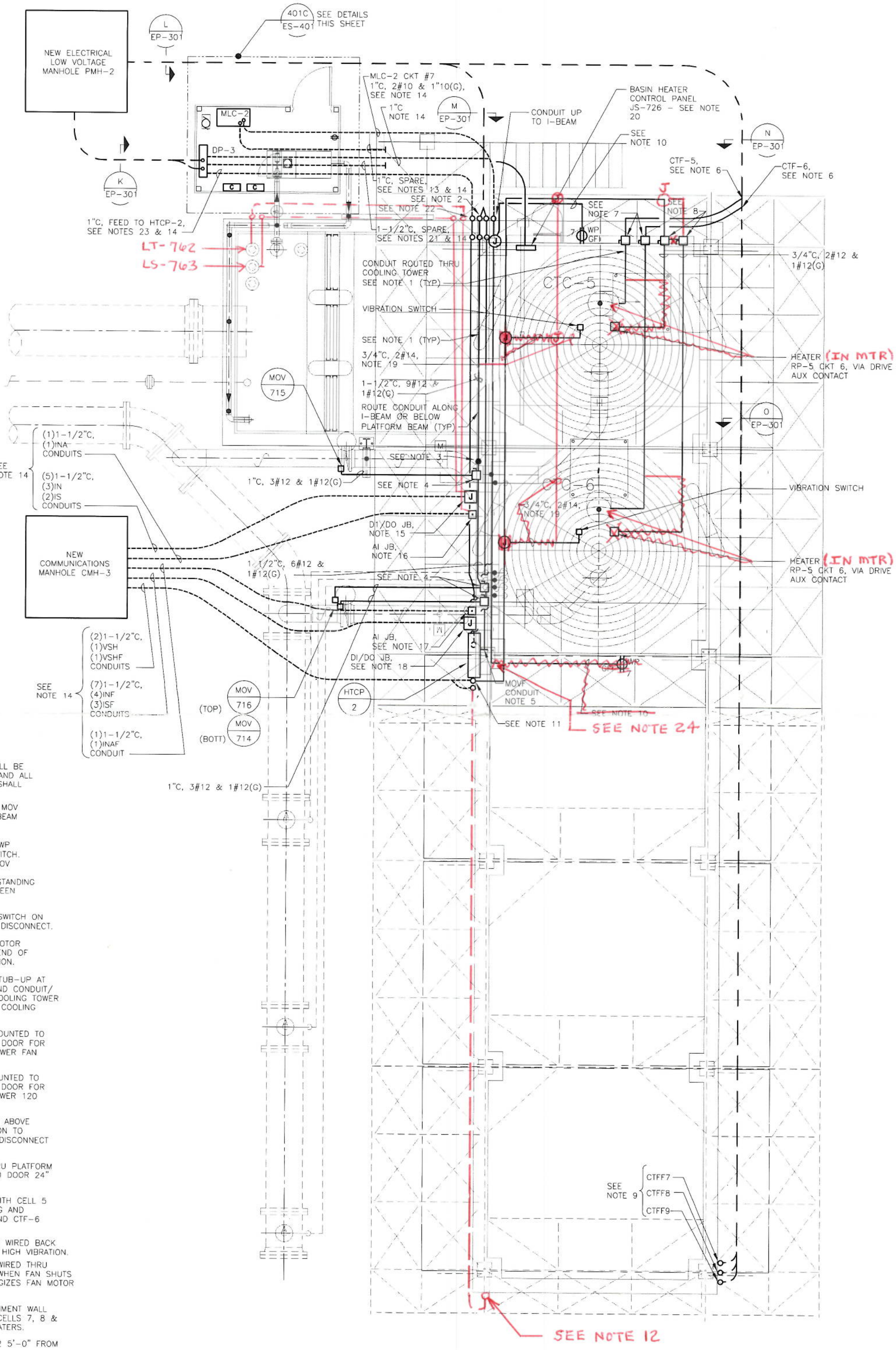
Distribution:

E. W. Howell	Giffels	PPM
E&U	MPO	
O&M	DOE	
NSLS II	ECN File	



401B COOLING TOWER LIGHTING PLAN

ES-101 SCALE 1/4" -1'-0"



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C-2 5'-0" FROM

"504A" ON

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ORDINATE WITH

19. CONDUIT UP FROM JUNCTION BOX THRU PLATFORM INTO SIDE OF COOLING TOWER TO VIBRATION SWITCH.

20. FEED TO BASIN HEATER CONTROL PANEL FROM

401A COOLING TOWER POWER PLAN

ES-101 SCALE 1/4" -1'-0"

LIGHTING PLAN & DETAILS 401C & D NOTES:

A. LIGHT SWITCH MOUNTED 46 INCHES ABOVE LOWER LEVEL PLATFORM ADJACENT TO LADDER.

B. CONDUIT DIRECT BURIED FROM MLC-2 (CKTS 4 & 6) VIA CONTACTOR THEN UP TO JUNCTION BOX BELOW PLATFORM. ONE CONDUIT FROM JUNCTION BOX UP THRU PLATFORM TO LIGHT SWITCH. OTHER TWO CONDUITS UNDER PLATFORM TO LIGHT FIXTURE LOCATION THEN UP THRU PLATFORM TO FIXTURE.

C. CONDUIT DIRECT BURIED FROM MLC-2 (CKTS 8 & 10) VIA CONTACTOR THEN UP TO JUNCTION BOX BELOW PLATFORM. ONE CONDUIT FROM JUNCTION BOX TO STAIR RAIL THEN TO LIGHT SWITCH, OTHER TWO CONDUITS FROM JUNCTION BOX UNDER PLATFORM TO LIGHT FIXTURE LOCATION THEN UP TO FIXTURE.

D. REFER TO TYPICAL COOLING TOWER LIGHTS CONTROL DIAGRAM "504C" ON DRAWING E-504.

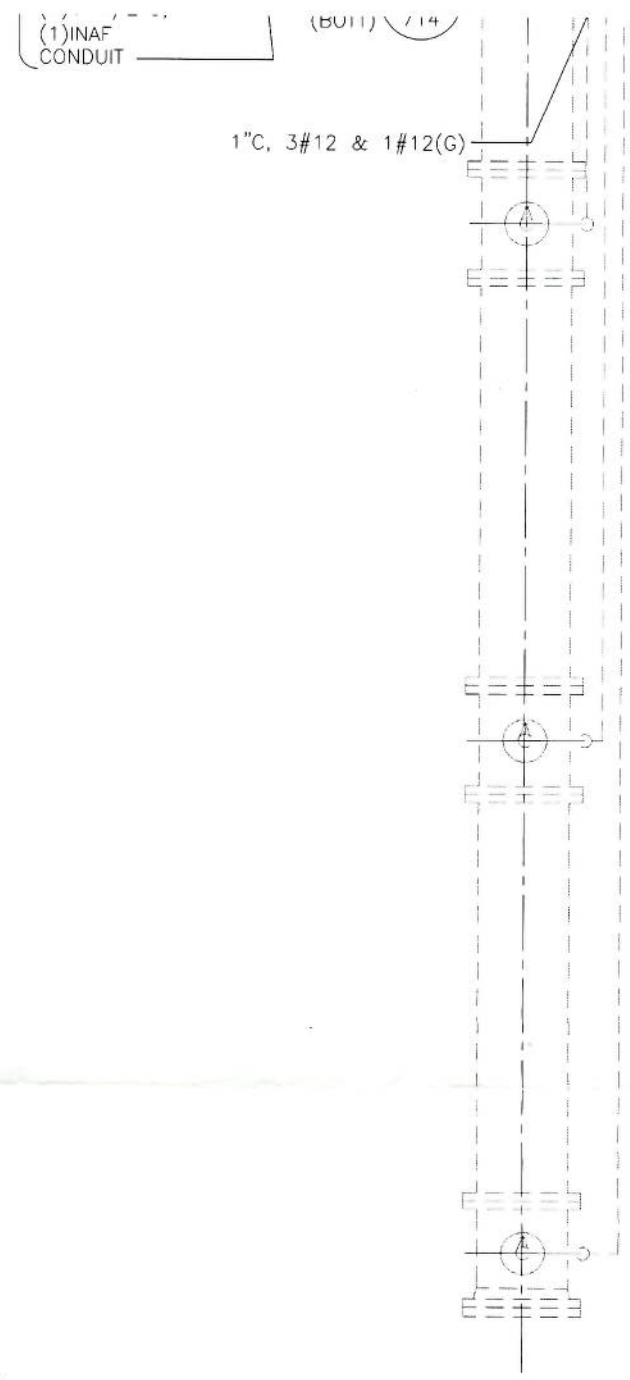
E. REFER TO MLC-2 PANEL SCHEDULE AND DP-3 RISER DIAGRAM ON DRAWING E-607.

F. DIGITAL TIME SWITCH FOR BUILDING LIGHT CONTROL. SEE GENERAL NOTE 15 ON DRAWING E-001 FOR DIGITAL TIME SWITCH.

G. LIGHTING FIXTURE TYPE – REFER TO LIGHTING FIXTURE SCHEDULE ON DRAWING E-501.

NOTES:

1. AT COOLING TOWER, ALL CONDUIT SHALL BE PVC JACKETED RIGID STEEL CONDUIT, AND ALL CONDUIT FITTINGS, ENCLOSURES, ETC SHALL BE PVC COATED OR NEMA 4X.
2. ROUTE 1-1/2" DUCT BANK CONDUITS MOV AND MOVF UP TO COOLING TOWER I-BEAM AND ROUTE ALONG I-BEAM.
3. DROP CONDUIT DOWN AND ROUTE TO WP JUNCTION BOX UNDER DISCONNECT SWITCH. FROM JUNCTION BOX TAKE FEED TO MOV DISCONNECT SWITCH AND TO NEXT DISCONNECT. PROVIDE CONDUIT FREE STANDING SUPPORT ON CONTAINMENT WALL BETWEEN DISCONNECT SWITCHES AS REQUIRED.
4. PROVIDE FREE STANDING DISCONNECT SWITCH ON CONTAINMENT WILL FOR MOV'S POWER DISCONNECT.
5. TAKE 1-1/2" CONDUIT FOR FUTURE MOTOR OPERATED VALVES ALONG I-BEAM TO END OF I-BEAM AND CAP FOR FUTURE EXTENSION.
6. PEEL CONDUIT OFF DUCT BANK AND STUB-UP AT COOLING TOWERS INDICATED AND EXTEND CONDUIT/ WIRING TO DISCONNECT SWITCH FOR COOLING TOWER FAN MOTOR MOUNTED ON OUTSIDE OF COOLING TOWER ADJACENT TO ACCESS DOOR.
7. 200A NEMA 4X DISCONNECT SWITCH MOUNTED TO COOLING TOWER ADJACENT TO ACCESS DOOR FOR DISCONNECTING POWER TO COOLING TOWER FAN MOTOR.
8. 30A NEMA 4X DISCONNECT SWITCH MOUNTED TO COOLING TOWER ADJACENT TO ACCESS DOOR FOR DISCONNECTING POWER TO COOLING TOWER 120 VOLT HEATER.
9. STUB-UP CONDUIT APPROXIMATELY 12" ABOVE GRADE AND CAP FOR FUTURE EXTENSION TO FUTURE COOLING TOWER FAN MOTORS DISCONNECT SWITCH.
10. ROUTE UNDER PLATFORM THEN UP THRU PLATFORM TO RECEPTACLE MOUNTED ADJACENT TO DOOR 24" ABOVE PLATFORM.
11. 1-1/2"C, 4#14 & 4#12 & 1#12(G) WITH CELL 5 & 6 VIBRATION SWITCH CONTACT WIRING AND HEATER POWER WIRING FROM CTF-5 AND CTF-6 DRIVES ON ELECTRICAL MEZZANINE:
    A. VIBRATION SWITCH CONTACT (2#14) WIRED BACK TO DRIVE TO SHUT DOWN FAN ON HIGH VIBRATION.
    B. HEATER CIRCUIT (2#12, 1#12(G)) WIRED THRU AUXILIARY CONTACT ON DRIVE SO WHEN FAN SHUTS DOWN CONTACT CLOSES AND ENERGIZES FAN MOTOR HEATER.
12. STUB-UP 1-1/2" CONDUIT ~~AT CONTAINMENT WALL~~ APPROXIMATELY 12" ABOVE GRADE AND CAP FOR FUTURE EXTENSION TO CELLS 7, 8 & 9 VIBRATION SWITCHES AND MOTOR HEATERS.
13. BRING 1" CONDUIT FROM PANEL MLC-2 5'-0" FROM BUILDING AND CAP.
14. SEE DIRECT BURIED CONDUIT DETAIL "504A" ON DRAWING E-504.
15. DI/DO JUNCTION BOX MOUNTED ON CONTAINMENT WALL FOR DISCRETE I/O CABLES BETWEEN I/O PANELS 600-1N AND 600-IS IN PIPE TUNNEL AND COOLING TOWER CELLS 5 & 6. COORDINATE WITH I&C FOR BOX SIZE.
16. AI JUNCTION BOX MOUNTED ON CONTAINMENT WALL FOR ANALOG I/O CABLES BETWEEN I/O PANEL 600-1N IN PIPE TUNNEL AND COOLING TOWER CELLS 5 & 6. COORDINATE WITH I&C FOR BOX SIZE.
17. A1 JUNCTION BOX MOUNTED ON CONTAINMENT WALL FOR FUTURE ANALOG CABLES TO FUTURE COOLING TOWER CELLS 7, 8 & 9 FROM I/O PANEL 600-IN. COORDINATE WITH I&C FOR BOX SIZE.
18. DI/DO JUNCTION BOX MOUNTED ON CONTAINMENT WALL FOR FUTURE DISCRETE CABLES BETWEEN I/O PANELS 600-IN & 600-IS AND FUTURE COOLING TOWER CELLS 7, 8 & 9. COORDINATE WITH I&C FOR BOX SIZE.



19. CONDUIT UP FROM JUNCTION BOX THRU PLATFORM INTO SIDE OF COOLING TOWER TO VIBRATION SWITCH.
20. FEED TO BASIN HEATER CONTROL PANEL FROM DP-3. SEE RISER DIAGRAM ON DWG E-607. THE CONTRACTOR SHALL CONNECT THE BASIN HEATER ELEMENTS TO THE BASIN HEATER CONTROL PANEL.
21. BRING 1-1/2" CONDUIT FROM PANEL DP-3 5'-0" FROM BUILDING AND CAP.
22. ROUTE CONDUIT/WIRING FOR FEED TO HTCP-2 FROM DP-3 BELOW GRADE TO COOLING TOWER THEN UP TO I-BEAM BELOW PLATFORM AND ALONG I-BEAM TO HTCP-2. THEN DROP DOWN FOR BOTTOM ENTRY INTO PANEL.
23. FEED TO HTCP-2 FROM DP-3, SEE RISER DIAGRAM ON DRAWING E-607.
24. CAP CONDUIT FOR FUTURE EXTENSION
25. INSTALL JBS FOR EXTENSION OF LIGHTING CIRCUITS TO LIGHTS FOR FUTURE COOLING TOWERS 7, 8, AND 9.
26. THESE LIGHTS TEMPORARY. MOVE TO SOUTH END OF FUTURE COOLING TOWER 9 WHEN COOLING TOWER 9 IS INSTALLED.