



DESIGN REVIEW & EQUIPMENT STARTUP

Checklist For Cooling Tower Replacement / Retrofit

Equipment type: Cooling tower
Equipment designation: CT-1
Bar code designation: 111111
Area served: Base building
Equipment location: Roof

ELECTRICAL INSPECTION

- | | YES | NO |
|--|--------------------------|--------------------------|
| • Electrical completed and disconnect install per code compliance. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Starter and wire sized per contract documents. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Disconnect furnished and installed. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Terminations and panel circuit labeled. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Voltage and motor amps (per phase) documented. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Heat tracing of outdoor piping completed. | <input type="checkbox"/> | <input type="checkbox"/> |

ELECTRICAL INSTALLATION (PER CONTRACT DRAWINGS AND SPECIFICATION)

- | | YES | NO |
|--|--------------------------|--------------------------|
| • Rigging coordinated with police detail. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Structural supports in place to receive new cooling tower/footprint. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Piping complete at unit. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Adequate makeup water capacity. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Seismic restraints complete. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Manufacturers' O&Ms available. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Manufacturers' startup sheets attached with this checklist. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Warranty certificate available. | <input type="checkbox"/> | <input type="checkbox"/> |

DISTRIBUTION (TO AND FROM EQUIPMENT)

- | | YES | NO |
|--|--------------------------|--------------------------|
| • Piping pressure tested per contract documents. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Piping adequately supported independent to the tower. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Condenser water piping properly sized. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Consideration should be given to condenser water flow velocity. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Air venting in place. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Adequate net positive suction head (NPSH). | <input type="checkbox"/> | <input type="checkbox"/> |
| • Insulation completed. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Installation per contract documents (specification and details). | <input type="checkbox"/> | <input type="checkbox"/> |
| • TAB report and field notes attached with this checklist. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Identification per contract documents. | <input type="checkbox"/> | <input type="checkbox"/> |

AUTOMATIC CONTROLS

- | | YES | NO |
|---|--------------------------|--------------------------|
| • Temperature controls completed. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Control "points" confirmed. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Electrical system interlocks completed. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Vibration switch installed and wired to BAS computer alarm. | <input type="checkbox"/> | <input type="checkbox"/> |

ENERGY EFFICIENCY AND OTHER ADVANTAGES

- | | YES | NO |
|--|--------------------------|--------------------------|
| • University or hospital campus, winter cooling loads. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Possibility to reduce peak electric charges. | <input type="checkbox"/> | <input type="checkbox"/> |
| • Consider using VSDs on tower fans. | <input type="checkbox"/> | <input type="checkbox"/> |

- | | YES | NO |
|---|--------------------------|--------------------------|
| • Could possibly be a small footprint for existing locations. | <input type="checkbox"/> | <input type="checkbox"/> |

REFERENCE

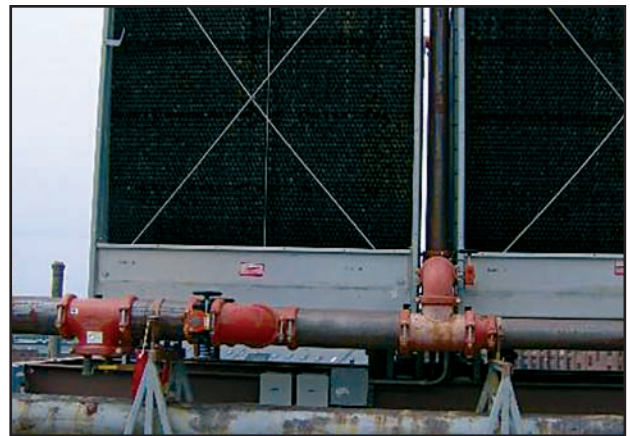
• 2004 ASHRAE Handbook – Systems & Equipment, Chapters 1 and 4 for additional information relative to central chiller plants, Chapter 36, "Cooling Towers," and Chapter 13, "Condenser Water Systems" for additional information relative to condenser water systems and equipment.

DESIGN REVIEW / TRICKS OF THE TRADE

- Confirm there is safe access to the equipment.
- Confirm there is the manufacturers' recommended clearance around equipment.
- Spot-check cooling capacity by dividing square feet by tons cooling for sq-ft/ton.
- Spot-check tonnage vs. new tower size selection.
- Spot-check condenser water capacity at 3.4 gpm/ton for absorption unit and 3 gpm/ton for electrical centrifugal unit.
- Spot-check total pump head for excessive/inadequate water pressure drop.
- Attach equipment schedule and design criteria to checklist.
- Attach sequence of operation to checklist.
- Attach associated contract detail drawing to checklist.

NOTE

- Refer to the equipment manufacturers' literature for additional data and requirements.
- Refer to the July 2006 "HVACR Designer Tips" for more information on the design review and equipment startup for the cooling tower replacement/retrofit project. **ES**



If you have any comments, suggestions, or questions regarding this designer checklist, contact Amanda McKew at amckew@rdkengineers.com. This column is meant to provide some basic guidelines for good design. Always consult all necessary codes and resources relevant to each particular project.

