



PROJECT:

PHONE (573) 882-1133

FAX (573) 882-1175

Date:

Cooling Tower Construction Checklist

Project:	
Date:	
Cooling Tower Tag:	
Building:	
Location:	

Submittal / Approvals

Submittal. The above equipment and systems integral to them are complete and ready for functional testing. The checklist items are complete and have been checked off only by parties having direct knowledge of the event, as marked below, respective to each responsible contractor. This construction checklist is submitted for approval, subject to an attached list of outstanding items yet to be completed. A Statement of Correction will be submitted upon completion of any outstanding areas. None of the outstanding items preclude safe and reliable functional tests being performed. ____ **List attached.**

Mechanical Contractor	Date	Controls Contractor	Date
Electrical Contractor	Date	Sheet Metal Contractor	Date
TAB Contractor	Date	General Contractor	Date

Construction checklist items are to be completed as part of startup and initial checkout, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- If this form is not used for documenting, one of similar rigor shall be used.
- Contractors assigned responsibility for sections of the checklist shall be responsible to see that checklist items by their subcontractors are completed and checked off.

Approvals. This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted below.

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Construction Management

University of Missouri-Columbia

Planning, Design & Construction Campus Facilities

117 General Services Building
Columbia, MO 65211-3200

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Commissioning Authority	Date	Owner's Representative	Date
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Tower 1 Information							
Make				Model Number			
Serial Number				Capacity		GPM	
Volts/Phase		Function		Service Area			
Motor Hp		Motor Eff		RPM			
Comments:							

Tower 2 Information							
Make				Model Number			
Serial Number				Capacity		GPM	
Volts/Phase		Function		Service Area			
Motor Hp		Motor Eff		RPM			
Comments:							

Associated Checklists					
Condenser Water Pump	<input type="checkbox"/>	Heat Exchanger	<input type="checkbox"/>	BAS	<input type="checkbox"/>
Condenser Water Piping	<input type="checkbox"/>	Chiller	<input type="checkbox"/>		
Comments:					

Requested documentation submitted	Rec'd	Comments
Manufacturer's cut sheets	<input type="checkbox"/>	
Performance data (pump curves, coil data, etc.)	<input type="checkbox"/>	
Installation and startup manual and plan	<input type="checkbox"/>	
O&M manuals	<input type="checkbox"/>	
Factory test results	<input type="checkbox"/>	
Sequences and control strategies	<input type="checkbox"/>	
Warranty Certificate	<input type="checkbox"/>	
Comments:		



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Installation Checks			
Check if Acceptable; Provide comment if unacceptable	NA	Comment	
General			
General appearance good, no apparent damage	<input type="checkbox"/>	<input type="checkbox"/>	
Tower foundation is installed per structural drawings	<input type="checkbox"/>	<input type="checkbox"/>	
Seismic anchoring (holdown bolts) installed per structural drawings	<input type="checkbox"/>	<input type="checkbox"/>	
Platforms, Ladders and Handrails installed per OSHA	<input type="checkbox"/>	<input type="checkbox"/>	
Manufacturer's required maintenance clearance provided	<input type="checkbox"/>	<input type="checkbox"/>	
Tower fill installed per manufacturers instructions	<input type="checkbox"/>	<input type="checkbox"/>	
Spray nozzles clean	<input type="checkbox"/>	<input type="checkbox"/>	
Distribution headers balanced	<input type="checkbox"/>	<input type="checkbox"/>	
Outlet screens clean	<input type="checkbox"/>	<input type="checkbox"/>	
Basin clean and clear of any debris	<input type="checkbox"/>	<input type="checkbox"/>	
Condenser Water system fill complete	<input type="checkbox"/>	<input type="checkbox"/>	
Condenser Water chemical treatment installed and functional	<input type="checkbox"/>	<input type="checkbox"/>	
Condenser Water filtration system installed and functional	<input type="checkbox"/>	<input type="checkbox"/>	
Condenser Water makeup water piping installed and functional	<input type="checkbox"/>	<input type="checkbox"/>	
Permanent labels affixed	<input type="checkbox"/>	<input type="checkbox"/>	
Vibration isolation installed if applicable	<input type="checkbox"/>	<input type="checkbox"/>	
Piping			
Tower piping installation checked against the drawings and all devices gages and appurtenances are in place	<input type="checkbox"/>	<input type="checkbox"/>	
Piping supported independently of the tower	<input type="checkbox"/>	<input type="checkbox"/>	
Piping type and flow direction labeled on piping	<input type="checkbox"/>	<input type="checkbox"/>	
Isolation valves and piping specialties installed	<input type="checkbox"/>	<input type="checkbox"/>	
Equalizer line installed and properly supported	<input type="checkbox"/>	<input type="checkbox"/>	
Overflow and drain is functional and piped to a proper discharge receptor	<input type="checkbox"/>	<input type="checkbox"/>	
Venting in place as required	<input type="checkbox"/>	<input type="checkbox"/>	
Condenser system flushing complete and strainers cleaned	<input type="checkbox"/>	<input type="checkbox"/>	
Fan			
Fan lubricated	<input type="checkbox"/>	<input type="checkbox"/>	
Fan drive properly aligned	<input type="checkbox"/>	<input type="checkbox"/>	
Fan turns freely, fan wheel is balanced	<input type="checkbox"/>	<input type="checkbox"/>	
Fan and Motor rotation checked	<input type="checkbox"/>	<input type="checkbox"/>	
Fan guard or shield is properly installed	<input type="checkbox"/>	<input type="checkbox"/>	



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Vibration isolation devices installed and functional	<input type="checkbox"/>	<input type="checkbox"/>	
Vibration sensor is installed and wired if applicable	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
Electrical and Controls			
Power disconnects located within site of the unit it controls and labeled	<input type="checkbox"/>	<input type="checkbox"/>	
All electric connections tight	<input type="checkbox"/>	<input type="checkbox"/>	
Grounding installed for components and unit	<input type="checkbox"/>	<input type="checkbox"/>	
Safeties installed and operational	<input type="checkbox"/>	<input type="checkbox"/>	
Starter overload breakers installed and correct size	<input type="checkbox"/>	<input type="checkbox"/>	
All control devices and wiring complete	<input type="checkbox"/>	<input type="checkbox"/>	
Control system interlocks connected and functional	<input type="checkbox"/>	<input type="checkbox"/>	
Size of overcurrent heater in motor starter correct (where applicable)	<input type="checkbox"/>	<input type="checkbox"/>	
HOA Switch installed per manufacturer's instructions (if applicable)	<input type="checkbox"/>	<input type="checkbox"/>	
Operation of HOA switch checked in all positions	<input type="checkbox"/>	<input type="checkbox"/>	
Proper safeties in control when HOA switch in Hand position	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
VFD			
Installation per manufacturer's requirements and start up instructions completed	<input type="checkbox"/>	<input type="checkbox"/>	
Drive location not subject to excessive moisture or dirt	<input type="checkbox"/>	<input type="checkbox"/>	
Drive location not subject to excessive temperatures	<input type="checkbox"/>	<input type="checkbox"/>	
Appropriate Volts vs. Hz curve is being used	<input type="checkbox"/>	<input type="checkbox"/>	
Drive size matches motor size	<input type="checkbox"/>	<input type="checkbox"/>	
Drive mounted on house keeping pad (if applicable)	<input type="checkbox"/>	<input type="checkbox"/>	
Cooling air flow path clean and unobstructed	<input type="checkbox"/>	<input type="checkbox"/>	
Permanent label affixed and UL stamp approved	<input type="checkbox"/>	<input type="checkbox"/>	
VFD interlocked to control system	<input type="checkbox"/>	<input type="checkbox"/>	
Unit is programmed with full written programming record on site	<input type="checkbox"/>	<input type="checkbox"/>	
Accel time set to _____ and Decel time set to _____	<input type="checkbox"/>	<input type="checkbox"/>	
Operation checked in HAND, OFF, and AUTO. As applicable operation also checked in BYPASS	<input type="checkbox"/>	<input type="checkbox"/>	
Where applicable, ensure safeties are active in all modes	<input type="checkbox"/>	<input type="checkbox"/>	
Coordinated with BAS for all interface ranges and signal isolation	<input type="checkbox"/>	<input type="checkbox"/>	
Restart on Power Failure parameter set to auto	<input type="checkbox"/>	<input type="checkbox"/>	
VFD powered (wired to controlled equipment)	<input type="checkbox"/>	<input type="checkbox"/>	
Grounding installed for components and unit	<input type="checkbox"/>	<input type="checkbox"/>	
Drive min and max speed set to _____ Hz min and 60 Hz max	<input type="checkbox"/>	<input type="checkbox"/>	
Security settings set per Owner direction and Password documented for Owner	<input type="checkbox"/>	<input type="checkbox"/>	
Drive response to loss of signal set to _____	<input type="checkbox"/>	<input type="checkbox"/>	



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Output pulse resolution set to _____ MHz. (This is coordinated with the application to minimize audible noise and coordinated with driven bearing allowances.)	<input type="checkbox"/>	<input type="checkbox"/>	
Checked the input voltage with drive disconnected	<input type="checkbox"/>	<input type="checkbox"/>	
Input of motor FLA represents 100% to 105% of motor FLA rating	<input type="checkbox"/>	<input type="checkbox"/>	
Upper frequency limit set at 100%, unless explained otherwise	<input type="checkbox"/>	<input type="checkbox"/>	
Sensors and Gages			
Temperature, pressure and flow gages and sensors installed	<input type="checkbox"/>	<input type="checkbox"/>	
Piping gages, BAS and associated panel temperature and pressure readouts match	<input type="checkbox"/>	<input type="checkbox"/>	
TAB			
Installation of system and balancing devices allowed balancing to be completed following specified NEBB or AABC procedures and contract documents	<input type="checkbox"/>	<input type="checkbox"/>	

Operational Checks			
Check if Acceptable; Provide comment if unacceptable	NA	Comment	
Specified sequences of operation and operating schedules have been provided with all variations documented	<input type="checkbox"/>	<input type="checkbox"/>	
Specified point-to-point checks have been completed and documentation record submitted for this system	<input type="checkbox"/>	<input type="checkbox"/>	
Startup report completed with this checklist attached (includes full listing of all internal settings with notes as to which settings are BAS controlled or monitored and which are integral	<input type="checkbox"/>	<input type="checkbox"/>	
Startup report includes written certification from cooling tower manufacturer that all specified features, controls and safeties have been installed and are functioning properly and that the installation and application comply with the manufacturer's recommendations	<input type="checkbox"/>	<input type="checkbox"/>	
Start up complete	<input type="checkbox"/>	<input type="checkbox"/>	

Sensor and Actuator Calibration

All field-installed sensors and gages, and all actuators (dampers and valves) on this piece of equipment shall be calibrated in accordance with Specification Section 01810. All test instruments shall have had a certified calibration within the last 12 months: **Y/N** _____. Sensors installed *in* the unit at the factory with calibration certification provided need not be field calibrated.

Sensor or Actuator Tag & Location	Location OK	1 st Gage or BAS Value	Instrument Measured Value	Final Gage or BAS Value	Pass Y / N



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Comments:

*Fill out all form fields before signing!

Name	Organization	Title	Signature

University of Missouri Commissioning Authority



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