Prefunctional Checklist

Project _____

PC-____ COOLING TOWER #'s _____

Associated checklists: Chiller, Chilled Water Piping, CHW Pumps, CDW Pumps

1. 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 prefunctional 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

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

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- 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.
- "Contr." column or abbreviations in brackets to the right of an item refer to the contractor responsible to verify completion of this item. A/E = architect/engineer, All = all contractors, CA = commissioning agent, CC = controls contractor, EC = electrical contractor, GC = general contractor, MC = mechanical contractor, SC = sheet metal contractor, TAB = test and balance contractor, ____ = _____.

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

_____ Commissioning Agent	_____ Date	_____ Owner's Representative	_____ Date

Notes:

2. Requested documentation submitted

Check if Okay. Enter comment or note number if deficient.

Check	Equip Tag->						Contr.
Manufacturer's cut sheets							
Performance data (fan curves, coil data, etc.)							
Installation and startup manual and plan							
Sequences and control strategies							
O&M manuals							

- ***Documentation complete as per contract documents .....___ YES ___ NO***

3. Model verification [Contr = _____]

1 = as specified, 2 = as submitted, 3 = as installed. Check if Okay. Enter note number if deficient.

Equip Tag--->						
Manuf.	1					
	2					
	3					
Model	1					
	2					
	3					
Serial #	3					
Capacity	1					
	2					
	3					
Motor Hp	1					
	2					
	3					

- ***The equipment installed matches the specifications for given trade .....___ YES ___ NO***

4. Installation Checks

Check if Okay. Enter comment or note number if deficient.

Check	Equip Tag->						Contr.
General Installation							
Cooling tower in place and in good condition							
Fan belts adjusted							
Fan shaft collars installed and tight							
Fan lubricated							
Fan blade pitch adjusted (propeller fans only)							
Tower basin access in place							
Tower basin sump strainers clean and sump filled							
Sump heater and other freeze protection in place (alarms, tape)							
Temperature gauges installed							
Pressure gauges installed across circulating pump							
Spray water inlet strainer installed and clean							
Spray nozzles clean							

Notes:

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->						Contr.
Electrical						
Power to unit and disconnect installed						
All electrical components grounded						
Power available to sump heater						
Motor protection and safeties installed						
Controls						
Sensors calibrated (see below)						
Control system interlocks hooked up and functional						
All control devices, pneumatic tubing and wiring complete						
Bypass valve spanning calibrated per Section 7.3 below						
Tower isolation valve spanning calibrated per Section 7.3 below						
Piping (Immediately around unit. Full piping in CHW Piping Checklist.)						
Pipe fittings and accessories complete						
Makeup water supply piped						
Makeup water shut-off valve installed						
Pipes are properly labeled (direction, etc.)						
Valves are properly tagged						
Chemical treatment system or plan installed						
Water treatment report submitted						
Distribution header balanced						
Test plugs installed						
Isolation and balancing valves installed per drawings						

- ***The checklist items of Part 4 are all successfully completed for given trade.___ YES ___ NO***

5. Operational Checks (These augment mfr's list. This is not the functional performance testing.)

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->						Contr.
Cooling tower starts and runs						
Fan rotation correct						
Measure line to line voltage phase imbalance for each fan: (%Imbalance = 100 x (avg. - lowest) / avg.) Record imbalance of each pump in cell. Imbalance less than 2%?						

Notes:

Check if Okay. Enter comment or note number if deficient.

Check Equip Tag->						Contr.
Record full load running amps for each fan. _____rated FL amps x _____srvc factor = _____ (Max amps). Running less than max?						
Motorized valves, dampers and float switches functional						
No unusual noise or vibration						
After at least 24 hrs of operation, readjust belt tension						
Vibration alarm: Jump the vibration sensor to simulate an alarm. Verify fan shut down and BAS alarm.						
Verify sump heater operation, including staging.						
Test high and low water alarms.						
Specified point-to-point checks have been completed and documentation record submitted for this system						
Bypass valves and other valves and dampers calibrated per below						

- ***The checklist items of Part 5 are all successfully completed for given trade.___ YES ___ NO***

6. Sensor and Actuator Calibration [ ]

All field-installed temperature, relative humidity, CO, CO_2 and pressure sensors and gages, and all actuators (dampers and valves) on this piece of equipment shall be calibrated using the methods and tolerances given in the Calibration and Leak-by Test Procedures document. 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 & Location	Loc-ation OK	**1st** Gage or BAS Read'g	Instr. Meas'd Value or Visual	**Final** Gage or BAS Read'g	Pass Y/N?
Bypass valve					

Sensor & Location	Loc-ation OK	**1st** Gage or BAS Read'g	Instr. Meas'd Value or Visual	**Final** Gage or BAS Read'g	Pass Y/N?

Gage reading = reading of the permanent gage on the equipment. BAS = building automation system. Instr. = testing instrument. Visual = actual observation. The Contractor's own sensor check-out sheets may be used in lieu of the above, if the same recording fields are included and the referenced procedures are followed.

- ***All sensors are calibrated within required tolerances.....___ YES ___ NO***

-- END OF CHECKLIST --

Notes: