Ball State University Engineering
MEP and FP Construction Inspection
Master Checklist
Updated 11/30/17

Project: _____

Civil/Site Utilities

- ☐ Meter pits have meters or spool piece same size as meter installed
- ☐ Link seals around all vault pipe penetrations with bolt heads inside the vault
- ☐ Tamper switches on the PIV and other FP valves present
- ☐ Sump pump installed in vault complete
- ☐ Buried water piping is 5'0" deep minimum
- ☐ HHW piping is ductile iron with granular insulation
- ☐ CHW is HDPE
- ☐ Thrust blocks are installed
- ☐ Piping tracer wires are installed.
- ☐ HHW and CHW valves are installed and boxes are at finished grade and the correct lids are installed
- ☐ Electrical duct banks are concrete encased. Warning tape installed.
- ☐ Duct bank conduits have been swabbed and mandrel pulled through
- ☐ All piping systems have been flushed
- ☐ Domestic disinfection complete with test reports turned over
- ☐ Hydrostatic pressure test report on fire, domestic, CHW and HHW received
- ☐ All excavations have been properly backfilled and compacted
- ☐ Flow fill used around valve boxes and CHW piping
- ☐ Natural gas service installed and active
- ☐ Field set of as-builts checked periodically

Plumbing

- ☐ Drains are cast iron
- ☐ Domestic water is copper with soldered joints
- ☐ Backflow preventers are Watts 909
- ☐ Pump bases are grouted
- ☐ Cleanouts are accessible and per plan
- ☐ Hammer arresters are accessible and per plan
- ☐ Shut off / isolation valves are accessible and per plan
- ☐ Steam pressure is verified and PRV is correct
- ☐ Insulation is fiberglass and correct thickness
- ☐ Valves and accessories are insulated per specs
- ☐ Vents are through roof instead of using air admittance valves
- ☐ Natural gas piping is black iron painted yellow
- ☐ NG pressure is acceptable
- ☐ Compressed air is per plans and is 80 psi minimum
- ☐ Water lines have been flushed and disinfected and reports turned over
- ☐ Pressure test reports turned over
- ☐ Storm drains are insulated
- ☐ Autoflush valves tested and operational
- ☐ Mop sink H/C supply lines have check valves installed
- ☐ Thermostatic mixing valves are set up and witnessed operational
- ☐ Stored HW is 140 degrees minimum
- ☐ Hand washing sink HW is 100 - 120 degrees
- ☐ Dishwashing sink HW is 110 - 120 degrees
- ☐ HW system has thermometers and pressure gages per plan
- ☐ Water heater(s) are plumbed per plan and piped to drain
- ☐ Condensing water heaters have neutralizer kits installed
- ☐ Water softener(s) are plumbed per plan and piped to drain
- ☐ Water softener(s) are set up and tested. Hardness report turned over
- ☐ Initial softener salt fill is supplied
- ☐ Exterior spigots/hydrants present per plan
- ☐ Basement pipe penetrations are sealed with link seals with bolt heads inside.
- ☐ Field set of as-builts checked periodically

Fire Protection

- ☐ Design drawings submitted to FM Global and the State w/ comments received
- ☐ Mains schedule 40. Roll grooved, not cut grooved
- ☐ Complete drain down is possible. Piped to drain. Incl. fire pump test header
- ☐ No traps without drains
- ☐ Pressure ratings (175 or 300) per specs
- ☐ Head temps are per drawings and specs
- ☐ Hydrostatic pressure test reports turned over
- ☐ Sprinkler bell is present and functioning
- ☐ FDC is 5" Storz
- ☐ Test header is located near a storm drain, easily hose accessible
- ☐ All flows and tampers are wired and tested
- ☐ All dry/preaction points are monitored by the fire alarm system
- ☐ Preaction system panel is installed and tested complete
- ☐ Concealed heads in finished spaces
- ☐ Zone valves are accessible and equipped with flow switches and drains/insp. test
- ☐ Fire pump transfer switch has been tested and pump run on generator
- ☐ Pump controller alarm points monitored by the fire alarm system
- ☐ Jockey pump is accessible
- ☐ Air compressor is accessible
- ☐ Risers have automatic air vents
- ☐ Hydraulic calcs and name plates present
- ☐ All testing complete and test reports turned over
- ☐ All valves are locked and monitored
- ☐ Fire pump room lighting is on emergency power
- ☐ Fire pump normal power feed is from pad mounted xfmr and thru a fused disconnect
- ☐ Field set of as-builts checked periodically

Mechanical

- ☐ Incoming HHW and CHW basement penetrations sealed with link seals
- ☐ Copper hydronic piping is brazed joint
- ☐ Pump bases grouted
- ☐ Pumps aligned
- ☐ Belts aligned and tensioned
- ☐ All equipment and system startup tasks complete and documented
- ☐ Isolation valves installed per plan and accessible
- ☐ Control wiring installed in conduit
- ☐ Data jacks installed near BAS system control panels
- ☐ LED displays are installed on the front of main control panels
- ☐ Laminated copies of control drawings are located in control panels
- ☐ BTU Meters are installed per manufacturer's recommendations and are Onicon system 10 with F-3500 flow meters
- ☐ Roller hangers are used where HHE or steam pipe exceed 100' of straight length
- ☐ Filter sections accessible
- ☐ HHW incoming full flow bag filter installed
- ☐ Bridges installed per plan
- ☐ Incoming HHW and CHW S/R are labeled
- ☐ Fire and smoke dampers installed and accessible
- ☐ Control boxes on VAV's and FCU's are accessible
- ☐ Volume dampers installed and accessible with handles left on
- ☐ Correct insulation and thickness installed complete incl. at valves and accessories
- ☐ Insulation sealed
- ☐ Piping system and direction labeling complete
- ☐ Valve tags installed and charted
- ☐ Piping and ductwork pressure test witnessed and reports received
- ☐ Duct openings sealed throughout construction
- ☐ Equipment clearances maintained
- ☐ Piping systems flushed and treated
- ☐ Flex duct limited to 5'0" max
- ☐ Air vents installed at high points
- ☐ Piping per details incl. all accessories
- ☐ TAB complete and pencil copy and final copies of reports turned over
- ☐ Commissioning visits documented and deficiency reports addressed
- ☐ Commissioning complete
- ☐ BMS user interface (laptop/tablet) has been turned over
- ☐ Air handling units, fan coil units and blower coil units have been cleaned including all internal sections
- ☐ All air filters are new and an extra set has been provided for each piece of equipment.
- ☐ Field set of as-builts checked periodically

Electrical

- ☐ Correct feeder/service main bonding jumper arrangement
- ☐ Correct generator bonding arrangement (3P/4P ATS's)
- ☐ Ground ring installed and/or bonded to
- ☐ Transformers properly grounded and bonded
- ☐ Breakers are set per Engineer's settings report
- ☐ No water piping over electrical equipment
- ☐ Panel covers are hinged door-in-door style
- ☐ Working clearances maintained
- ☐ All box supports in stud walls span 2 studs
- ☐ Box rough-in heights are correct
- ☐ No back-to-back boxes
- ☐ No MC/AC cable except for fixture whips
- ☐ Fixture whips are 6'0" or less and are only from box to fixture, not daisy chained
- ☐ Conduits run in center of stud walls to avoid drywall screw penetration
- ☐ Conduits supported within 3' of boxes
- ☐ EMT fittings are steel (no die cast)
- ☐ Rigid elbows used for floor slab penetrations
- ☐ Minimum conduit size is 3/4"
- ☐ No conduits run within floor slabs
- ☐ Exposed exterior conduits are GRC
- ☐ Office and conference room sensors are vacancy mode set to 30 minutes
- ☐ Corridor and RR sensors are occupancy and set to 30 minutes
- ☐ All sensors are PIR only with the most sensitive setting
- ☐ Generator housing is true walk-in
- ☐ Generator fuel initial fill provided
- ☐ Generator testing and training complete
- ☐ Arc flash labels are installed
- ☐ Meters are installed in main switchgear and have Ethernet jack installed
- ☐ Field set of as-builts checked periodically

Fire Alarm

- ☐ All fire alarm cabling is installed in conduit
- ☐ Metasys cabinet furnished and installed
- ☐ All flows and tampers are wired and accessible
- ☐ Sprinkler bell is wired through FACP
- ☐ Fire pump control panel is monitored (all points)
- ☐ Preaction system panel is monitored and/or controlled
- ☐ All smoke and heat detectors are accessible incl. duct detectors
- ☐ Owner's witnessed testing is 100% complete
- ☐ Final test reports are turned over
- ☐ Internet connectivity demonstrated
- ☐ All mass notification functions tested and demonstrated
- ☐ All panel bypasses tested and demonstrated
- ☐ Training is complete
- ☐ Copy of the software is turned over
- ☐ Field set of as-builts checked periodically

Telecommunications

- ☐ All box supports in stud walls span 2 studs
- ☐ Minimum conduit size is 1" and is stubbed to corridor skeletal openings
- ☐ Data cabling is CAT 6A with blue jacket
- ☐ All cabling is plenum rated
- ☐ MDF and IDF's are built per the drawings
- ☐ Data jacks are installed at each meter, each BMS panel, FACP and each access control panel
- ☐ Copper and fiber test results turned over
- ☐ Field set of as-builts checked periodically

NOTE: The above list is meant to be used as a tool for both all involved to use for MEP construction inspection from rough-in through punch-out. It is not an all-inclusive list and is not project specific but rather a "one size fits all" minimum requirement for the applicable items on any given project. Some projects may require more or less inspection.