

Commercial

Construction:

Final Inspection / Occupancy Guide

BOLES FIRE PROTECTION DISTRICT

Revised April 5, 2008

This guide is provided to help you prepare for your upcoming commercial final inspection. This is a representative set of items, which may or may not apply to your particular project, and there may be additional requirements needed for your final inspection or occupancy approval. **NOTE:** You will need inspections and approvals of some of these items prior to gaining approval of any furniture, supplies or non-construction related employees to be allowed on site. **Please call the Fire Prevention Bureau at 636-742-2515 Ext. 203 or Ext. 244 if you have any questions.**

EXTERIOR

- All "No Parking Fire Lane" signs shall be installed, and curbs painted as needed for fire lanes – see the site plan included with your Fire District approved plans.
- Permanent building address shall be posted. Each tenant space in multiple tenant buildings shall have its address or suite number posted on the front and any rear doors. All numbers shall be Arabic. Numbers (and letters if part of the address or suite) shall be minimum four (4) inches high with a minimum stroke width of ½-inch.
- Fire Hydrants shall be approved and in service: (a) Assure there will be no parking that will block the fire hydrants; (b) Check for obstructions (trees, light poles, etc., none can be within 6 feet of the fire hydrant); (c) Check for the need of protective bollards; (d) Verify the orientation or position of the large main hydrant outlet; and (e) All private fire hydrants shall be painted to meet the Boles FPD ordinances.
- Trash dumpsters shall be a minimum of 15 feet from any building or lot line unless alternate protection has been previously approved.
- Automatic Fire Sprinkler Systems:
Fire Department Connection (FDC): (a) Unobstructed by trees, bushes, parking, etc., and clearly visible from the fire lane; (b) Clearly marked with approved signage/placard; (c) Swivels turn freely; (d) Protective caps properly secured in place with chains fastened as needed; (e) Ball drip valve drain terminates to exterior (if applicable).
Post Indicator Valve (PIV): (a) Unobstructed by trees, bushes etc., and clearly visible; (b) In the "OPEN" position, handle locked in place; (c) Tamper switch in place.
- A key storage vault (Knox Box) is required for all buildings. The Knox Box shall be installed in an approved location – generally on the front of the building near a main entrance. The following keys shall be provided for the Knox Box: Building master key, elevator door key, elevator control key, fire alarm panel key, sprinkler control room key, mechanical room key, electrical room key, roof hatch key and PIV lock key. **NOTE:** For large buildings, three (3) sets of keys may be required. All sets of keys shall be on key rings with each key identified or labeled.
- Exterior exit pathways and landings at exterior exit doors shall be in a smooth, passable condition, free of debris.
- All handrails and guards on stairs and ramps shall be installed, and protection from snow and ice shall be provided as applicable. **NOTE:** Stair treads and landings shall be solid, non-slip material. **ALSO:** Emergency lighting is required for exterior stairs and landings.
- Exterior fuel gas lines shall be painted to prevent corrosion. Natural gas or LP gas lines should be painted yellow, and labeled.
- All construction equipment, material and debris shall be removed, or placed a minimum of 15 feet from the building and arranged so as to not block any fire hydrants, fire lanes, FDC, PIV or exterior exit pathways.

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INTERIOR

- All Exitway Corridors and Stairs: Walls, floors, ceilings and lighting shall be completely finished. If conditional occupancy is desired before decorative wall, floor and/or ceiling finishes are applied (i.e. paint, wall paper, floor tile, carpet, etc.), exitway corridors and stairs shall be in a safe condition, shall be available for immediate use, and shall be free of all obstructions during normal occupancy of the building, and work in these areas shall only occur during non-occupied times. All required guards and handrails shall be installed.
- The egress pathway from the public area through stockrooms, store rooms or other non-public area shall be permanently marked. The marking shall be a minimum of 44 inches wide with a permanent contrasting color, and shall be continuous from the door leading from the public area to the exterior exit door.
- Exit Doors: All exit doors shall be readily openable from the side from which egress is to be made without the use of a key or special knowledge or effort. Double-keyed deadbolts, slide bolts, manually operated edge or surface bolts and flush bolts are prohibited. Thumb-turn deadbolts are prohibited except in specific applications. Panic hardware is required for Assembly and Educational use groups where the occupant load is over 50. Electrical locks, strikes or other access control devices shall be tested and approved.

- All required occupant load signs shall be posted – see your Fire District approved plans or contact your Fire District plan reviewer for the correct occupant loads.
- All stairway signage shall be installed. Buildings three (3) or more stories in height are required to have stairway signage on each floor indicating the floor number, the levels remaining to the exit discharge, the stairway number and the availability of roof access from the stair.
- Exit Signs and Emergency Lighting: All required lights and signs shall be installed and operating. Testing of the emergency power shall be by shutting down all lighting to the building or space. This should be pre-tested before the final inspection. **NOTE:** In addition to exit pathways, emergency lighting is required for electrical and mechanical rooms; penthouse areas; stairways; rooms containing roof access ladders; commercial kitchens; any room or areas of Use Group H; in any room or area that utilizes hazardous materials or hazardous processes.
- All ceiling tiles/pads shall be in place.
- Ceilings shall have markings or labels indicating the location of fire dampers and smoke dampers located above the ceilings.
- All holes and penetrations of floors and fire-resistance rated walls shall be properly firestopped.
- Fire door assemblies shall be installed in required locations, have labeled doors and frames, closers and latches, coordinators and astragals as needed, and listed glass as needed.
- Fire Extinguishers: Office type occupancies normally require a minimum 2A:10BC rated fire extinguisher with a maximum travel distance of 75 feet. Mercantile and storage occupancies generally require more coverage than business occupancies. Fire extinguishers shall be mounted not more than five (5) feet above the finished floor. Please consult your Fire District approved plans, or the Fire District plan reviewer for your project, regarding fire extinguisher location and coverage. Fire extinguishers shall be newly purchased or have a service date tag that is less than one year old.
- Fire Sprinklers shall be clean and free of paint, tape, joint compound or any other substance that could inhibit or delay operation. Sprinklers with non-manufacturer applied paint shall be discarded and replaced – cleaning them is not acceptable. All trim rings or escutcheons shall be in place.
- Required covers shall be in place on all electrical panels, boxes and devices. Panel circuit breakers shall be properly labeled as to what each one controls. **NOTE:** Circuit breaker handles for fire alarm systems are required to be red in color and secured from unauthorized operation.
- At all electrical service equipment, a working space clearance of 30 inches shall be marked on the floor with a permanent contrasting color or other approved method. The width of the space shall be the width of the equipment or 30 inches, whichever is greater.
- All fuel-burning appliances shall be provided with adequate combustion air. Please refer to your approved mechanical plans for specifics.
- Adequate clearances shall be maintained at all chimneys, flues, vent pipes and appliances.
- All construction equipment, material and debris shall be removed from the building.
- Compressed gas cylinders utilized by the tenant operations shall be secured from falling.

SYSTEM INSPECTION AND TESTING - GENERAL

- ALL SYSTEMS SHALL BE PRE-TESTED PRIOR TO THE ACCEPTANCE TEST CONDUCTED FOR APPROVAL. Failure to do so may result in time delays and extra inspection fees.
- Boles Fire Protection District Inspectors will be present only to witness the testing. **It is the responsibility of the permittee, general contractor, system subcontractor, owner or other responsible party to:** (a) provide all necessary manpower and equipment to perform the tests and re-set the systems. Usually, testing requires two or three construction or testing personnel, with walkie-talkies or other 2-way communication, to operate each basic system; (b) to understand the complete operation of all related systems prior to the acceptance testing; (c) to ensure that any testing does not harm any of the related systems' components (i.e. compressors, motors, starters, etc., damaged by repeated cycling); (d) to ensure that water flow or other fire suppression system discharge will not harm personnel, equipment, vehicles, landscaping, etc. in areas of discharge.
- Applicable records of completion or test certificates shall be provided at the time of final inspection.
- Many of the tests listed below are required to be witnessed by inspectors from other agencies. It is the responsibility of the permit holder to notify those inspectors prior to the acceptance test date.
- **NOTE:** Acceptance testing is generally considered a "commissioning" of the systems. Therefore, **AFTER ACCEPTANCE TESTING IS COMPLETED AND APPROVED, EACH SYSTEM SHALL BE RE-SET AND LEFT IN SERVICE.**

****HELPFUL HINTS**** (a) In order to save time, access panels, ceiling tiles, equipment covers that are opened/removed for pre-testing may be left opened/removed for acceptance testing. (b) When ladders are needed for testing multiple devices, "leap-frogging" 2 or more ladders may save time. (c) When multiple systems are to be tested the same day, work out a schedule ahead of time with all appropriate subcontractors as to what systems will be tested first, second, etc.

HVAC SHUTDOWN

- 1) Newly installed duct smoke detectors shall be tested with artificial or real smoke using approved methods – **this includes pre-testing.**
- 2) Each unit shall be tested for proper sequence of operation. All HVAC units sharing a common plenum shall be interconnected and shall shut down simultaneously, with no delay, upon activation of any one duct smoke detector serving the common plenum.
- 3) Where no fire alarm system is provided, activation of each duct smoke detector shall activate a visible and audible signal in an approved location.

SMOKE CONTROL SYSTEM: Acceptance test procedure shall be determined by the design engineer prior to testing.

FIRE SPRINKLER SYSTEMS

IT IS STRONGLY ADVISED TO HAVE YOUR SPRINKLER INSTALLING CONTRACTOR PERFORM ALL TESTING OF THE SPRINKLER SYSTEM.

- 1) **Inspection:** (a) All valves throughout the system shall be labeled. (b) Hydraulic design plate shall be attached to the riser. (c) Where sprinkler control valves are located in a separate room or closet, a sign shall be provided on the entrance door. The lettering shall be at least four (4) inches in height and shall read "SPRINKLER CONTROL VALVES". (d) A spare sprinkler box containing a proper assortment of sprinklers and a sprinkler wrench shall be mounted near the riser. (e) The sprinkler riser shall be protected from physical damage. (f) Control valves shall have tamper switches along with chain and padlocks as required. (g) Pressure relief valve shall be installed where required. (h) Sprinklers, complete with trim rings or escutcheons where required, shall be provided throughout the building. (i) Underground and above ground material and test certifications shall be provided at the time of final inspection. (j) A smoke detector and a manual pull shall be located at the fire alarm control panel that monitors the sprinkler system. (k) A fire alarm bell or horn/strobe is required on the exterior of the building – preferably located at the FDC. **ALL SYSTEMS SHALL BE PRE-TESTED PRIOR TO THE ACCEPTANCE TEST CONDUCTED FOR APPROVAL.** Failure to do so may result in time delays and extra inspection fees.
- **Tamper Switch Test:** Each control valve (including the PIV) shall be operated to verify a supervisory signal within two (2) revolutions of a valve wheel or one-fifth (1/5) of the valve control handle from its normal open position.
- **Main Drain Test:** After the static pressure is recorded, the main drain shall be opened fully. The residual pressure shall be recorded after it has stabilized. **NOTE:** The main drain is required to discharge to the outside of the building, unless the building drain can accept full flow of the main drain, while under pressure, without allowing water to flow onto the floor. Occupancy will not be approved if test water flows onto the floor.
- **Inspector's Test:** A test connection not less than one (1) inch in diameter shall be provided. The test connection shall be provided with a smooth bore corrosion-resistant orifice the diameter of which is the same as the smallest sprinkler on the system. This requirement is intended to simulate a single sprinkler flowing. Once the inspector's test valve is opened, the flow switch or alarm valve shall activate an alarm signal within 45 seconds. **NOTE:** We recommend that the flow switches be adjusted to activate between 30 and 45 seconds for optimal notification without undue false alarms. If there are multiple flow switches, the flow switches most remote from the base of the riser shall activate first. This requirement is intended to help pin-point the location of the water flow. **ALSO:** A dry pipe system shall deliver full water flow from the test pipe outlet within 60 seconds of full opening of the inspector's test valve. **NOTE:** The inspector's test drain is required to discharge to the outside of the building, unless the building drain can accept full flow of the inspector's test drain, while under pressure, without allowing water to flow onto the floor. Occupancy will not be approved if test water flows onto the floor.
- **AFTER ACCEPTANCE TESTING IS COMPLETED AND APPROVED, EACH SYSTEM SHALL BE RE-SET AND LEFT IN SERVICE.**

DRY PIPE SYSTEM: The following is required in addition to sprinkler inspection and testing above:

- Dry pipe valve shall be located in an area provided with heat to maintain at least 40°F.
- **Low Air Alarm:** Shut the control valve in the water supply for the dry pipe valve. Shut off power to the air compressor or air maintenance device. Record the static air pressure at the dry pipe valve. Slowly bleed off air pressure. Record the air pressure when the low air switch activates a supervisory signal at the fire alarm panel. Restore power to the air compressor or air maintenance device, and wait until the pressure reaches normal. Open the control valve in the water supply.
- **Inspector's Test:** In addition to the above inspector's test requirements and procedures, (a) Record static air pressure and static water pressure at dry pipe valve. (b) When inspector's test valve is opened, record trip time and trip pressure. Trip pressure shall be within the dry pipe valve manufacturer's specifications. (c) Record time from full opening of the inspector's test valve to full flow of water from inspector's test outlet. Full flow of water from inspector's test outlet shall occur within 60 seconds of full opening of the inspector's test valve.

PRE-ACTION SYSTEM: The following is required in addition to sprinkler inspection and testing above:

- 1) The automatic operation of the pre-action valve shall be tested in accordance with the manufacturer's instructions.
- 2) All detection devices shall be tested in an approved manner.
 - The low air alarm (if equipped) shall be tested in accordance with the Dry Pipe System instructions above.

SPRINKLER FDC AND ALARM BELL SIGNAGE

- A sign shall be installed above all Fire Department Connections. The sign shall have 6" red reflective letters with a white back ground.
- 6) A sign above the flow alarm bell shall state to contact 911 if the alarm bell is ringing.

FIRE ALARM SYSTEMS

IT IS STRONGLY ADVISED TO HAVE YOUR FIRE ALARM DESIGNER OR INSTALLING CONTRACTOR PERFORM ALL TESTING OF THE FIRE ALARM SYSTEM.

All smoke detection devices shall be tested with artificial or real smoke using approved methods – **this includes pre-testing**. A smoke detector and a manual pull shall be located at the fire alarm control panel. 100% of all alarm-initiating devices and circuits, alarm-indicating appliances and circuits, supervisory signal initiating devices and circuits, signaling line circuits, and primary and secondary power supplies shall be tested in accordance with NFPA 72, 2002 Edition. ALL DEVICES, APPLIANCES AND OPERATIONS SHALL BE PRE-TESTED PRIOR TO THE ACCEPTANCE TEST CONDUCTED FOR APPROVAL. A record of completion shall be provided at the time of final inspection.

- **Tie-in Test:** DO NOT NOTIFY THE ALARM MONITORING COMPANY OF ANY TESTING THE DAY OF THIS TEST! The purpose of this test is to verify that the alarm monitoring company handles the alarm signal in an appropriate and timely manner. The alarm monitoring company shall notify our emergency dispatching agency immediately upon receipt of the alarm signal, and shall not make any other contacts in regard to this alarm signal until the emergency dispatching agency has been contacted (i.e. do not call the site to verify a fire until after the emergency dispatch agency has been notified). The maximum time allowed for this test is three (3) minutes.
- **24-hour Battery Test:** Normal power is disconnected from the fire alarm system for a period of 24 hours. All alarm indicating appliances are then activated and are required to operate properly for a period of five (5) minutes. **EXCEPTION:** This test is not required for fire alarm systems connected to stand-by or emergency generators.
- **Alarm Signals:** Activate each alarm initiating device – smoke and heat detectors, manual pull stations, flow switches, etc., and check fire alarm panel reading for proper signal and zone or address. Each alarm initiating device shall cause an "alarm signal" which shall activate the notification appliances (horns, speakers, strobes, etc.), release magnetic door hold-open devices, release electric door locking devices and transmit the alarm signal to the monitoring company. **EXCEPTION:** HVAC duct smoke detectors are permitted to cause an "alarm signal" OR a "trouble signal". HVAC duct smoke detectors are also required to shut down all appropriate air handlers (see "HVAC SHUTDOWN" above). Also, see "ELEVATOR ACCEPTANCE" for all smoke and heat detector related elevator functions. During the alarm signal tests, all alarm notification appliances will be checked for proper location and operation.
- **Trouble Signals:** At random, remove or disconnect smoke detectors or other equipment to simulate a trouble condition, and check the fire alarm panel reading for proper signal and zone or address. A trouble condition shall cause a "trouble signal" which shall activate an audible signal at the panel and transmit the trouble signal to the monitoring company. A "trouble signal" shall **NOT** activate alarm notification appliances.
- **Supervisory Signals:** Activate all tamper switches and check fire alarm panel reading for proper signal and zone or address. Disconnect power to the panel and check for proper signal. A supervisory condition shall cause a "supervisory signal" which shall activate an audible signal at the panel and transmit the supervisory signal to the monitoring company. A "supervisory signal" shall **NOT** activate alarm notification appliances.
- **Permanent Records:** Two (2) sets of as-built drawings, operation and maintenance manuals, a written sequence of operation, and a completed Record of Completion such as Figure 4.5.2.1 of NFPA 72 2002 Edition shall be provided at the final inspection. One set of these documents shall be given to the owner and one shall be given to the Fire District.
- AFTER ACCEPTANCE TESTING IS COMPLETED AND APPROVED, EACH SYSTEM SHALL BE RE-SET AND LEFT IN SERVICE.