

TAB Journal



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Professional Independent Balancing

- IMPROVED ENERGY EFFICIENCY
- OCCUPANT COMFORT
- COST SAVINGS

TAB SERVICE and BUILDING CODES



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Enforcement of building codes involves interpretive actions by many people, from initial design professionals, through city plan review, then actual construction with special inspections and performance inspections during and after construction to project closeout.

The goal of a safe, comfortable and energy efficient building can seem burdensome all along the way. Various opinions and interpretations encountered throughout the process add twists and turns that make every project a challenge.

Standard building codes establish the baseline so we all know what to expect, and the municipality or state should ensure the project will be inspected with uniformly applied procedures. There are many life safety issues involved with material inspections and electrical inspections among others; however this article will focus only on smoke control and ventilation systems as they apply to TAB service and the professional registrant.

The City of Phoenix provides a good reference since it is progressive in code development and enforcement on all public projects, from the largest hospital to the smallest retail space that may include just one 3-ton packaged unit and ceiling exhaust

fan. Phoenix has followed the uniform codes, then the 2003 international codes, and in 2007 adopted the 2006 IBC and IMC, with amendments. The Certificate of Occupancy and final Certificate of Completion is not issued until all inspections are accounted for, and that is definite.

During 2006, Arizona AABC companies worked with Phoenix in the wording of applicable code amendments, with great help of some members of the professional consulting mechanical engineers community and legal council. Areas of concerns were **1)** definitions of special and performance inspections, **2)** technical responsibility of the TAB agency, **3)** involvement of the registered professional engineer, and **4)** responsibility for code enforcement.

Special inspections relate to life safety issues, and for our interest apply primarily to smoke control systems⁽¹⁾, such as duct detectors, smoke dampers, smoke exhaust, smoke pressurization and fan operation. They require a “special inspector”⁽²⁾ and “... certification as air balancers”⁽³⁾ with a review of the inspection report by the “responsible registered design professional.”⁽⁴⁾

The certified TAB agency has the technical experience and instruments necessary for testing system performance. Given the

large number of projects most full-time air balance technicians work on during the course of a year, it would be very difficult indeed for any trade or engineer to accumulate similar experience. The inventory and calibration of instruments would be difficult for any small group to maintain if it were not a primary business.

We put our trust in the field technicians, and they are fully conscious that the smoke control system is a life safety issue. TAB technicians also realize very quickly that integrity is the base business, and if the TAB agency is not reputable some contractors may try to take advantage, and registered professionals will not be willing to accept their reports, which is not good for business or the technician's job. It is simpler to just impartially report as it is, and eventually, installers will realize that the smoke system will have to function before anyone can be done. All that being stated, it is important that special inspection forms state that testing is for performance on the date noted, not a guarantee for continuing performance, and systems must be retested after six months (*or 3 or 12?*) or if there is any remodel in the building.

Performance inspections are considered by Phoenix as balancing of ventilation systems⁽⁵⁾, and generally reference fresh air intake, exhaust air and kitchen hood performance. A Phoenix amendment requires a "nationally accepted air balancing test method" with a final report submittal to the mechanical inspector and engineer of record, but not a P.E. seal.

Performance inspections are also taken seriously. Outside air flow rates at each intake are measured and adjusted within established technical standards and the system's ability to be measured. Technically, the supply air distribution throughout the building must be balanced to establish correct supply air flow across the A/C unit before adjusting to design OSA, and to ensure proportional distribution of fresh air within the building. Phoenix inspectors take this position also, at least on medical and high occupancy buildings. All exhaust inlets are also balanced to design. Air balance of kitchen hoods is not complete until a capture and containment test is performed and witnessed by the TAB agency and so noted in the TAB report.

The Phoenix inspector will ask for the TAB report during the final inspection and will check the report for key items. Some larger projects may need time after the Certificate of Occupancy for the final TAB report and punch list items, in which case there is a 90-day period allowed before a final Certificate of Completion. (*Although smoke control systems must be fully inspected before occupancy.*)

The responsibility of the registered professional is much more difficult to define. Legal issues are beyond the scope of this article, except to advise one to seek council for consideration of specific projects and codes in your area and liability exposure. The state's Board of Technical Registration should also be involved. Concerns discussed in the Phoenix experience were extensive and are beyond the scope of this article. Omitting all these considerations, the professional procedure used in Phoenix

in rigorously following the IBC/IMC is as follows.

The engineer of record includes a "Mechanical/Plumbing Special Inspections Certificate" with the initial building permit plan review submittal to the Development Services Department.⁽⁶⁾ The Certificate has checkmarks on the special inspections applicable to the project (*smoke detectors, etc.*), with the name of the "third party inspection" agency or person listed. The Certificate also has the wet seal of the engineer of record.

During construction completion, it may be that the TAB agency is not the same as the third party inspector listed on the Special Inspections Certificate. The engineer of record may then issue a new sealed Certificate with that TAB agency listed. The TAB smoke control inspections report is reviewed by the engineer of record, who then signs the bottom of the certificate concurring with the report. Phoenix does not necessarily need to see the report itself, just the signed certificate.

There is a back door: The Special Inspections Certificate has a prepared paragraph next to the engineer's seal which refers to the code language of a "responsible registered design professional" instead of the "engineer of record." Therefore, any registered professional engineer may issue a new Certificate for the project, as far as Phoenix is concerned. This comes into play when the engineer of record may be out of state or otherwise unavailable, or whose involvement ended when the permit was issued, or for other reasons including the general contractor not being able to wait a few more days. The "responsibility" apparently pertains only to those inspections listed on the certificate, and does not assume responsibility for the building design or construction.

Finally, who has the responsibility for code enforcement? Phoenix inspectors still inspect and tag the projects. All the various construction trades are obviously prime players. The TAB agency provides smoke control inspections, which is part of the public safety concern. The building gets air balanced for required fresh air and exhaust air, which is good for public health. The engineer of record is still responsible for the design, and is favored to have more involvement at project closeout. Legal liability issues have always been an issue on projects, and anyone involved has been and is still exposed (*except that city inspectors are exempt*). We all are responsible to various degrees. A definite building code with consistent enforcement helps achieve the goal of a safe and well-tuned building, an improvement from five or ten years ago, especially from our narrow view focused on TAB service. 🌐



Code References

- ⁽¹⁾ IBC 2006 [F] 909.3 Special inspections and test requirements.
- ⁽²⁾ IBC 2006 [F] 909.18.8 Special Inspections for Smoke Control.
- ⁽³⁾ IBC 2006 [F] 909.18.8.2 Qualifications.
IBC 2006 [F] 1704.14.2 Qualifications.
- ⁽⁴⁾ IBC 2006 [F] 909.18.8.3 Reports.
- ⁽⁵⁾ IMC 2006 [F] 403.3.4 Balancing
- ⁽⁶⁾ IBC 2006 [F] 1705.1 General.