

	STANDARD OPERATING PROCEDURE BUILDING & SITE DEVELOPMENT	Number: 340.1
Approval: Yves Khawam 		Effective Date: November 28, 2005
Subject: Special Inspections		Page 1 of 20

1.0 PURPOSE:

This document establishes requirements for Pima County Building & Site Development related Special Inspection performance, management, approval and enforcement.

2.0 REVISION HISTORY:

Revised on 2/07/06 by adding sections pertaining to the enforcement program. Revised on 7/01/06 by refining procedure and adding review criteria. Revised on 9/01/06 by introducing requirements for fabricated items. Revised on 2/1/08 by adding section 5.5 for medical gas. Renumbered SOP from 410.1 on 12/30/10. Revised on 8/6/12 to update references to 2012 code. Revised on 5/19/16 to include threshold for Group U occupancies.

3.0 PERSONS AFFECTED:

Permitting staff, Inspection staff, Records staff, owners or owner's agents, contractors, registrants responsible for Special Inspection and their designated *special inspectors*.

4.0 ADMINISTRATIVE POLICY:

All requirements for Special Inspection shall be clearly indicated on the construction documents and shall be approved by the County as follows:

Approval shall be based on a list of *approved registrants* which is to be maintained by the Building Safety & Sustainability Division and posted on our web site (www.pima.gov/developmentservices) indicating the authorized specialty area(s) of inspection. *Approved registrants* shall not be required to seek project-specific pre-approval prior to beginning inspection. Any registrant wishing to be added to the approved list must submit to Development Services Building Safety & Sustainability a resume of qualifications, experience and evidence of Arizona registration.

In regard to IBC 1704.2, special inspections are not required for Group U occupancies of maximum 400 square feet of floor area.

5.0 DEFINITIONS:

5.1 Approved Registrants



Approved Registrants are defined in this document as any registrant listed on the Pima County Building Safety & Sustainability web site as approved within an authorized specialty area(s) of inspection. Within the authorized area(s), the *approved registrant* shall be considered as a *special inspector* responsible for Special Inspection in accordance with the adopted technical Codes.

5.2 Special Inspector

A *special inspector* is an individual either meeting the requirements of Section 5.1, or one certified by or through a nationally recognized certification agency such as International Code Council (ICC), American Welding Society (AWS), American National Standards Institute (ANSI), American Concrete Institute (ACI), National Institute for Certification of Engineering Technologies (NICET) or other approved agency, in a specific area of Special Inspection categories outlined by the adopted codes.

There shall be a grace period for qualified individuals to obtain *Special Inspector* certifications extending through February 28, 2007. Beyond that date, Special Inspection certification requirements must be met.

Exception 1: For special inspection categories not having a nationally recognized certification associated with them, a related certification shall be obtained subject to the approval of the *approved registrant* responsible for the *special inspector*.

Exception 2: An individual not certified by an independent agency may be considered as a qualified *special inspector* if all of the following conditions apply:

- The Engineer of Record (EOR) is performing in the capacity of *approved registrant* responsible for Special Inspections and is located within the Pima County area.
- The individual performing the Special Inspections is a full time permanent employee of the Engineer of Record responsible for the design.
- The individual performing the Special Inspections is a Design Engineer, Engineer in Training (EIT) with a minimum of 2 years experience or an individual with substantial evidence of experience in the specific area(s).
- A special request is presented to the Building Official for consideration of an individual for a particular project to act as a *special inspector*, on an interim basis not to exceed one year (exception: this requirement does not apply to registered structural engineers acting as EOR).



- The individual is actively seeking certification by a nationally recognized certification agency (exception: this requirement does not apply to registered structural engineers acting as EOR).

5.3 Special Inspection Enforcement Officers

Special Inspection Enforcement Officers are Pima County Development Services personnel charged with ensuring that code-established and design-required Special Inspections are conducted in accordance with adopted Building Codes and regulations.

5.4 Approved Fabricators

An *approved fabricator* is a contractor or manufacturer producing fabricated items, who is currently a member in good standing through participating in a quality assurance program recognized or administered by a national industry association, as approved by the building official (i.e.: Truss Plate Institute (TPI), American Institute of Steel Construction (AISC), Precast/Prestressed Concrete Institute (PCI), International Accreditation Service, Inc. (IAS). Additionally, this definition will be extended to include fabricators in good standing with the Building Safety Departments of the City of Los Angeles, California and Clark County, Nevada.

5.5 Medical Gas

Certification of medical gas systems will not require an approved registrant responsible for Special Inspection. Instead, Pima County shall require certification of medical gas systems to be conducted by an individual accredited through NFPA 99 and demonstrated to hold the Medical Gas Verifiers Professional Qualification Standard through certification to ANSI/ASSE 6030.

6.0 RESPONSIBILITIES:

6.1 Approved registrants

Approved registrants will conduct Special Inspections themselves or employ *special inspectors* certified in the area of inspection to both conduct the inspections and generate field reports. Upon completion of the work, the *approved registrant* is to submit to Pima County Development Services a sealed letter attached to the field report summary indicating that the Special Inspection has been performed to approved plans, specifications/calculations and Pima County adopted building codes. In order to help expedite the approval of the



Special Inspection results, the project activity number should be on the cover letter.

It is the responsibility of the *approved registrant* employing *special inspectors* to ensure that all such *special inspectors* are fully qualified/competent and are certified by or through a nationally recognized certification agency such as ICC (various), AWS (welding), ACI (various), NICET (various), or an ANSI accredited agency. Violations of this requirement may result in the *approved registrant's* loss of Special Inspection privileges within unincorporated Pima County. Pima County will hold *approved registrants* responsible for all performance related actions of the Special Inspection.

No building codes related Special Inspections may be undertaken in unincorporated Pima County by any *special inspector* who is not representing a specific *approved registrant*. In engineering firms or inspection/testing agencies specifically performing Special Inspection services, each *special inspector* is required to work directly under the supervision of a designated *approved registrant* for a specific project. Any violation of this requirement may result in a firm's loss of Special Inspection privileges for all their *approved registrants*.

The *approved registrant* responsible for Special Inspections or the professional responsible for design shall provide a statement of Special Inspections to be submitted with the permit application. This statement shall include materials, systems, components and work required to have Special Inspection or testing. The statement shall include the type and extent of Special Inspection and the type and extent of each required test. Inspections and tests shall also be identified as continuous or periodic.

A statement of Special Inspections may be prepared by a qualified person approved by the Building Official for construction not required to be designed by a registrant.

The *approved registrant* shall perform Special Inspections as defined by the adopted codes and as required by regulations and accepted standards. Items observed as non-conforming shall be reported directly to the contractor for corrective action. Discrepancies shall be reported to the contractor, Architect/Engineer of Record, and Pima County when corrective action is not satisfactorily performed.

The *approved registrant* shall provide field reports to the contractor within 48 hours of the Special Inspection. Reports shall be provided to the Architect/Engineer of record and owner on a regular schedule not to exceed weekly, or as defined by the Architect/Engineer of record. Reports shall be



complete with locations defined, conformance criteria specified, date, activity number, and the *approved registrant's* name on all reports.

When the *approved registrant* utilizes a *special inspector* to perform the Special Inspections the *approved registrant* will review and verify the *special inspector's* qualifications, monitor performance and accept full responsibility for the individual's inspection-related actions.

The *approved registrant* shall be responsible for coordinating corrective action with the Architect/Engineer of Record for inspection deficiencies. The *approved registrant* shall submit a sealed letter to Pima County upon completion of Special Inspections. This letter shall state that compliance with all regulations has been met and be accompanied by copies of the field reports. The following minimum criteria shall be included in all reports:

- Name, address and Activity Number of the project.
- Name, address and phone number of the *approved registrant*.
- Specific category of the Special Inspection.
- If applicable, the name of the *special inspector* and certifications held.
- Specific and clearly defined location of the element(s) inspected.
- Special Inspection reports must include an acknowledgement that the soils report recommendations for compaction and testing were satisfactorily followed and that observation and testing of required engineered fill was performed (exception: *International Residential Code* structures will only require acknowledgement of a soils report as the contractor may elect to take responsibility for re-compaction of disturbed soils).
- Acknowledgement of "compliant" vs. "non compliant" clearly noted. Note: "compliant as noted" is not acceptable for Special Inspections, nor is a correction list unless the degree of minor corrections is acceptable to the Engineer of Record. (If the project does not have an Engineer of Record, all items shall be completed as "compliant").
- All specific and technical information as designated by the specified standard or manufacturer's literature for items such as epoxy anchors or expansion anchors in concrete or masonry. i.e., ASTM Standards, ICC Evaluation reports, applicable codes.

6.2 Special Inspectors

A *special inspector* working under an *approved registrant* shall perform Special Inspections as specified by code requirements and acceptable standards, and limited within the scope of his or her certification.



The *special inspector* shall report non-conforming observations to the *approved registrant*, contractor and Pima County when corrective action has not been performed satisfactorily.

The *special inspector* shall not perform the Special Inspection unless all relevant current Evaluation Reports concerning manufacturer's data are present on site for reference purposes.

6.3 General contractor

The contractor shall be available to the *special inspector* for the Special Inspection process and shall provide immediate corrective action as required to conform to the project construction documents, specifications, and code requirements. The contractor shall provide project soils reports, construction documents, Architects Supplemental Information (ASIs), Request For Information (RFIs), change orders, approved compaction tests and other applicable field reports, and all relevant current Evaluation Reports concerning manufacturer's data for field use by the *special inspector*. Without such data, the *special inspector* will not be able to perform inspections.

The contractor is responsible for re-compaction and for assuring compaction tests are performed on any area of engineered/compacted fill that has been disturbed due to utility installation, vehicular traffic, or other occurrences which affect the project site. Reports reflecting such re-compactions shall be provided to the *special inspector* (exception: the contractor may elect to take responsibility for re-compaction of *International Residential Code* structures in lieu of providing Special Inspection observation and testing, unless precluded from doing so by the Architect/Engineer of Record).

The contractor shall perform Quality Control prior to Special Inspections. The contractor shall be fully aware that Special Inspections are provided as Quality Assurance for the Owner/Public at large and is not Quality Control for the contractor. The contractor shall post Special Inspection reports on site within 48 hours.

6.4 Owner or owner's agent

It is the responsibility of the owner or owner's agent to employ the *approved registrant* in charge of Special Inspections. The contractor is responsible for ensuring that the owner's *approved registrant* is scheduled for the required Special Inspections and that the inspections are performed on schedule. Development Services will require up to 48 hours to approve any submitted Special Inspection paperwork. As the release of certain County inspections is



contingent on the prior approval of Special Inspections, it is in the interest of the owner or agent to provide requisite paperwork completed to specification with appropriate lead-time. Pima County will share no responsibility if County inspections are delayed due to late submittal of paperwork.

Beginning on July 1, 2008, it is also the responsibility of the owner or owner's agent to demonstrate to the satisfaction of Development Services that all fabricated items, as defined in Chapter 17 of the Building Code, are either manufactured by an *approved fabricator*, or are provided with Special Inspections sealed by a registrant licensed to practice engineering in the State where the item is fabricated. Special Inspection of fabricators will not need to adhere to the detailed requirements governing *special inspectors* within this standard operating procedure beyond providing a registrant sealed letter indicating that Special Inspections have been conducted per the Building Code for all fabricated items.

7.0 PROCEDURES:

7.1 Development Services Records staff (internal DSD process)

When it is determined by Pima County field inspectors that a need exists for Special Inspections not called out in the initial permit approval, inspectors shall notify Records staff who shall add both the following:

- 7.1.1 A "prior to intermediates" or "prior to final" condition shall be entered for the required Special Inspection item on the specified project so as to alert permitting staff as to the additional required submittal.
- 7.1.2 An "INSP:" comment shall be entered in "L/H/N" (as a comment) regarding the required Special Inspection to alert the inspectors that this inspection item is not to be approved until the Special Inspection has been approved.

7.2 Development Services Plans Examining, Inspection and Records staff (internal DSD process)

Plans examiners shall stamp the front sheet of the drawings, indicating that special inspections are required. Plans examiners shall also enter an "INSP:" comment in "L/H/N" (as a comment) when a Special Inspection is required so as to alert the inspector that he or she is not to approve the item. If the inspector inspects a component of the Special Inspection item, he or she is only to issue a code of "partial approval," adding on the inspection paperwork a statement such as "balance of item to be approved by Special Inspection." Final approval of



the Special Inspection item (per SI) will be cleared by Records staff upon verification that the Special Inspection condition has been approved by the plans examining staff.

7.3 Development Services Special Inspection Enforcement Officers

Special Inspection Enforcement Officers shall provide monitoring and enforcement of Special Inspection activities within unincorporated Pima County.

Pima County *Special Inspection Enforcement Officers* shall perform random visits to construction sites to observe Special Inspection activities and shall document all violations. Alleged violations reported by Pima County building inspectors, contractors, owners and other sources shall also be investigated.

Non-Compliant Special Inspections and alleged violations shall be documented and discussed with the complainant. Site field conditions shall be observed and a referral made to the *approved registrant* in the form of a Notice of Violation. The date, project name, activity number, *special inspector* and non-compliant activity will be included in the Notice of Violation. The Notice shall list actions required to meet compliance, request the *approved registrant* to submit qualification credentials of his or her *special inspector*, and indicate potential disciplinary action. The *approved registrant* shall respond to the Notice of Violation within the time period indicated therein.

7.3.1 Disciplinary actions relative to Registrants

Approved registrants shall be disciplined for non-compliant actions. Depending on the severity of the violation, Pima County may at its discretion refer the *approved registrant* to the State Board of Technical Registration for disciplinary action or undertake legal action as required. While Pima County may at any time administer the highest form of discipline available by law against a registrant for gross negligence, standard disciplinary levels are defined as follows:

- Disciplinary Level One: the initial violation of Special Inspection requirements shall result in a Letter of Reprimand.
- Disciplinary Level Two: the second violation shall result in Probation.
- Disciplinary Level Three: the third violation shall result in loss of *approved registrant* privileges and a prohibition of operating as such within unincorporated Pima County. The individual shall be



removed from the *approved registrant* list and shall be placed on a list of disciplined registrants.

APPENDIX A: SPECIAL INSPECTION REPORT REVIEW CRITERIA

(This information is to be used by Plans Examiners for reviewing submitted Special Inspection reports)

The following is a summary of minimum criteria, which should be included in *The Engineer Sealed Special Inspection Reports* submitted to Pima County for approval prior to final inspection by Pima County Field Inspectors.

Minimum Criteria as outlined in this Standard Operating Procedure

1. Name of Project
2. Address of Project
3. Activity Number
4. Special Inspection Category
5. Name, address, and phone number of approved registrant. (Verification that report is sealed by approved registrant on Pima County list).
6. Name of Special Inspector and Certificate held
7. Location of Special Inspection
8. Clear definition of "Compliant" or "Non-Compliant"

Special Inspector Responsibilities/Tasks (For informational purposes only).

1. Reference the Outline developed by The Arizona Structural Engineers Association and Pima County area jurisdictions (Appendix B) .

Soils Report

1. Report will be project specific and in accordance with Chapter 18 of the IBC
2. Soils Report must include date, Soils Engineers name, and design recommendations
3. All Soils Reports must be representative of the building code in effect (ie: for reports generated significantly in advance of the project commencing the report must be accompanied by a letter from the Geotechnical Engineer who prepared the report stating the report is valid under the current code or update as required).

Soils Compaction and Density Tests (Observation and Testing) Special Inspections

1. All Engineered fill and compaction requirements must be performed in accordance with the soils report recommendations.
2. Soils reports shall not be required for IRC structures bearing on engineered fill if the footing or engineered foundation is either prescriptive or is designed for maximum 1500 psf. For these instances, if selecting not to obtain a full soils report, the registrant responsible for special inspection will need to certify not only that the



fill meets 1500 psf, but that the natural earth on which the fill is bearing can withstand applied loads.

3. Re-compaction and testing must be performed on disturbed engineered compacted soils. (Note: for *International Residential Code* projects, the re-compaction requirements are to be verified by the General Contractor).

Minimum Concrete Testing Requirements: (Reference IBC Chapter 19)

1. Minimum tests shall be as designated by the Architect or Engineer of Record as specified in the project specifications and ACI 318.
2. Reference ACI 318-11 Section 5.6.2: Samples shall be taken for each class of concrete placed each day and not less than once a day nor less than once for each 150 cubic yards nor less than once for each 5000 S.F. of wall or slab. When the pour is less than 50 yards strength tests are not required when evidence of satisfactory strength is submitted. (Note this evidence is very specific and is relative to trial batch, standard deviation, 30 consecutive reports, proportions based on field experience, or documentation of average strength).

Minimum Grout Report (ASTM C1019)

1. Mix Design
2. Slump
3. Type and Number of Units used to form the specimens
4. Description of the specimens: (dimensions, and amount out of plumb in percent)
5. Curing History (including initial temperature, age of specimens when transported to the lab, when tested)
6. Maximum load and compressive strength of each specimen and average compressive strength of the specimen
7. Description of failure

Concrete Test Reports Min. Criteria: (Reference ASTM C31 and ASTM C39)

1. Mix Identification Number and Supplier
2. Location of concrete represented by the samples
3. Date, Time, and name of the individual molding specimens
4. Slump, air content, concrete temperature, test results, and results from any deviations from referenced standard methods.
5. Curing methods
6. Diameter (and length if outside the range of 1.8D to 2.2D) in inches.
7. Cross sectional area in square inches
8. Max. load in pounds
9. Compressive strength calculated to the nearest 10 PSI
10. Type of fracture if other than the usual cone
11. Defects in either specimen or caps
12. Age of specimens
13. Required minimum design strength of concrete



Post Installed Anchors (Epoxy or Expansion Anchors) Comply with ICC Report of Manufactured Item. Required items may vary depending on manufacturer but the following are examples of required report items from Simpson Strong Tie Epoxy:

1. Product Description
2. Adhesive Expiration Date
3. Anchor Diameter and Steel Grade
4. Compliance of drill bit with the report requirements
5. Hole Diameter
6. Cleanliness of Hole and Anchor
7. Adhesive Application
8. Anchor Embedment
9. Verification that the anchor is in accordance with the manufacturers installation requirements and the Evaluation Report

Post-Tension Slab on Grade (Post-Tensioning Institute Training/Certification and ICC Reinforced Concrete Certification)

1. Name of Approved Registrant, Special Inspector and his/her certifications
2. Verification that soils excavation/fill and compaction has been performed in accordance with the Geotechnical Soils Report. Report should reference the Special Inspection report number. Any disturbance to compaction due to utilities and/or re-grading requires re-compaction and verification by the General Contractor that re-compaction has been satisfactorily performed (re-compaction exception: IRC structures).
3. Verification that all structural elements cast in concrete are secured in place prior to concrete placing operations
4. Inspection statements concerning the reinforcing steel placement
5. Inspection statements concerning the continuous observation and placement of concrete
6. Concrete Strength Test Reports
7. Tendon identification number
8. Date of stressing
9. Identification number of the stressing equipment
10. Required gauge pressure as per the calibration chart supplied by the post tension supplier
11. Name of the Project
12. Name of the General Contractor
13. Name of the Operator
14. Measured elongation
15. Date of approved installation drawing, used for installation stressing
16. Recorded measurement compared with the calculated elongation
17. All reports must indicate compliant or non-compliant

Reinforced Concrete (Greater than 2500 PSI)



1. Concrete Strength Test Reports
2. Reinforcing steel placement conformance to project construction documents and specifications
3. Observation of Concrete Placement and Consolidation (compliance with Table 1705.3 IBC)
4. Mix Design verification with approved mix
5. Acknowledgement of "Compliant" or "Non-Compliant"

Structural Masonry

1. Verification of reinforcing steel placement per project construction documents and specifications
2. Observation of grout placement
3. Verification of mortar and grout mixes per project specifications
4. Acknowledgement of "Compliant" or "Non-Compliant"
5. Note: If grout or mortar is mixed on site the proportions must be in accordance with ASTM C476 (Grout) and ASTM C270 (Mortar)

Structural Wood Elements

1. Type of Inspection must be clearly noted. (i.e. shear panels, roof diaphragm, etc.)
2. Clearly defined locations of inspected elements
3. Compliance determined and noted for hold-downs, drag struts, braces, and anchors, nailing or bolting as applicable to the project.
4. Compliance for all special inspections for nailing pattern 4" or less.

Structural Welding (Per AISC Steel Construction Manual and AWS D1.1)

1. Type of weld inspection must be noted on the report such as Visual Testing (VT), Penetrant Testing (PT), Magnetic Particle Testing (MT), Ultra Sonic Testing (UT), or Radiographic Testing (RT) in accordance with AISC
2. Define location of welds inspected
3. Inspection results (Compliant or non-compliant)

Structural High Strength Bolting (AISC Section 9 of RCSC & chapter 17 of the IBC))

1. Bolting inspection in conformance with AISC Steel Manual
2. Specify tightening Method
3. Specify connection type
4. Define location of inspected connections
5. Inspection results (compliant or non-compliant)

Steel Frame (Chapter 17 of the IBC)

1. Elements as specified in the "Statement of Special Inspections" prepared by the Engineer of Record must be defined
2. Location of the specified items must be clearly defined
3. Compliance or non-compliance must be noted



The outlined information is intended as a general reference in determining whether the reports are satisfactorily complete. Conditions and specifications may vary between projects.

APPENDIX B: TASK LISTINGS

The job tasks listed in this appendix are intended to represent the basic inspection tasks and do not necessarily describe every detail of the job

General Inspection Practice

The following listed tasks may be applicable to all work requiring Special Inspection.

I. Pre-Inspection Functions

The following tasks shall be performed prior to commencement of inspection, or prior to inspection of specific areas of the work:

- **Plans & Standards:** Obtain and review complete set of approved plans and specifications, including all addenda and approved change orders thereto. Review and become familiar with applicable Codes and Standards.
- **Test Specimen Selection Procedure:** Confirm the method of randomly selecting material test specimens in accordance with applicable standards, if required.
- **Pre-inspection meetings:** Attend meetings or discuss with contractor, sub-contractor(s), supplier(s) to review special inspection requirements of plans and specifications as required.

II. Inspection Functions

The following tasks should be performed during special inspection of the work:

- **Presence at Job:** Be present for continuous or periodic inspection, as required, during execution of all work for which the special inspector has been engaged.
- **Inspection Report:** Prepare a Special Inspection Report after each site visit providing details of the inspections performed and distribute as required.
- **Nonconforming Work:** Notify contractor when work does not conform to plans and specifications.
- **Uncorrected Nonconforming Work:** Notify the building official and engineer or architect of record when nonconforming work is not corrected.

FABRICATORS



Special Inspections shall be performed in accordance with IBC Section 1704.2.5. *Approved fabricators* are defined in Section 5.4 of this document and requirements governing fabricated items are listed in Section 6.4.

STEEL CONSTRUCTION - WELDING

Special Inspections shall be performed in accordance with IBC Section 1705.2.2.1.

STEEL CONSTRUCTION

Special Inspections shall be performed in accordance with IBC Section 1705.2.

CONCRETE CONSTRUCTION

Special Inspections shall be performed in accordance with IBC Section 1705.3.

MASONRY CONSTRUCTION

Special Inspections shall be performed in accordance with IBC Section 1705.4.

WOOD CONSTRUCTION

Special Inspections shall be performed in accordance with IBC Section 1705.5.

SOILS (SPECIAL GRADING, EXCAVATION AND FILLING)

Special Inspections shall be performed in accordance with IBC Section 1705.6. To assist in performing this inspection, the following job tasks have been identified:

- Site preparation: verify clearing and grubbing of deleterious materials, and that the site has been benched or sloped in accordance with the plans and specifications.
- Over excavation: verify over excavation location, width, and depth into proper soil materials when required.
- Scarification: verify scarification for proper depth, moisture conditioning and compaction when required.
- Fill materials: verify fill materials for type, gradation, and moisture content.
- Fill Placement: observe, and test as required, fill placement, compaction, moisture conditioning, and slope configuration.

PILE FOUNDATION



Special Inspections shall be performed in accordance with IBC Section 1705.7/1705.9.

PIER FOUNDATION

Special Inspections shall be performed in accordance with IBC Section 1705.8.

SPRAYED FIRE-RESISTANT MATERIALS

Special Inspections shall be performed in accordance with IBC Section 1705.13.

EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS)

Special Inspections shall be performed in accordance with IBC Section 1705.15.

SPECIAL CASES POST-INSTALLED ANCHORS

Introduction

Prior to consolidation of the three model building codes, BOCA, ICBO and SBCCI, the International Conference of Building Officials (ICBO) provided Evaluation Services and Evaluation Reports (ES Reports) for various building materials and products. The consolidation of all evaluation services (ICBO ES, NES, SBCCI PST & ESI, and BOCAI evaluation services) into ICC Evaluation Service, Inc. (ICC-ES) occurred on February 1, 2003. The evaluation reports now have the status of ICC-ES "Legacy Reports." ICC-ES is a subsidiary of the International Code Council

Generally, it is necessary to develop ICC-ES acceptance criteria for products that are structural in nature and/or affect life-safety. Acceptance criteria are developed by the ICC-ES technical staff in consultation with the report applicant; are the subject of open public hearings of the ICC-ES Evaluation Committee (made up entirely of code officials); and must be approved by the committee. Acceptance criteria are used as the basis for evaluating a product, and establishing conditions of acceptance in an evaluation report, when the product type is not clearly addressed in existing codes and code-related documents.

While the former evaluation services were integrated into ICC-ES on February 1, it will take some time to fully consolidate operations. The ICC-ES web site provides further information.

Under ICC-ES rules:

- Existing evaluation reports (for example, reports originally issued by ICBO ES) that are re-examined with no changes, or with editorial changes only, will be processed as ICCES legacy reports. Re-examinations that involve technical changes, on the other hand, will be processed as new ICC-ES reports. (Report holders have an option of maintaining their existing recognition in a legacy report while securing the new



recognition by applying for a new ICC-ES report.)

- The former ICBO ES Evaluation Committee is now the ICC-ES Subcommittee on Uniform Codes. The Subcommittee will cease to exist after its meeting in October 2003, and acceptance criteria that have not been approved by that date will be completed by the new ICC-ES Evaluation Committee.

[ICC Evaluation Service](http://www.iccsafe.org) (ICC ES) has made its entire library of product evaluation reports available on the internet, enabling access to read or print any ES Report at no charge. Visit www.iccsafe.org.

Execution

Post Installed Anchors:

- All post installed anchors shall have a current ICC Evaluation Service report.
- Post installed anchors shall include the following: Bolts or dowels utilizing epoxy adhesive which are installed in cured concrete, masonry, or wood. Expansion bolts installed in cured concrete or masonry. Other manufactured anchors used in structural applications which are required to have Special Inspection during installation.

Installation Instructions:

- Special Inspector shall obtain ICBO-ES Report, ICC-ES Legacy Report, or ICC-ES Report (as applicable) for the type and brand of product or material being inspected. Special Inspection and installation of post installed anchors shall be in accordance with ES Reports.

To assist in performing this inspection, the following job tasks have been identified:

- Anchor location: verify approximate horizontal and vertical location of anchor(s) as required in project plan.
- Anchor
 - Type: verify bolt vs. reinforcing steel and required grade of steel.
 - Size: verify diameter and length.
 - Condition: verify that anchors are free of oil, dirt, loose rust, loose dry mortar, or damage.
- Epoxy:
 - Type: verify epoxy to be used is the brand and type specified or, if not specified, meets the requirements cited above.
 - Condition: verify epoxy does not indicate signs of being exposed to adverse weather conditions including, but not limited to, excessive heat or cold or exposure to rain.
- Hole
 - Size: verify diameter and depth of drilled hole.
 - Condition: verify hole is clean, dry, and free of debris. Verify contractor has cleaned holes using clean, oil-free compressed air, a wire brush and then



compressed air again as required by project requirements or, if none, by manufacturer's recommendations.

- Visual Inspection
 - Verify application of epoxy to bottom of hole and during withdrawal.
 - Verify insertion of anchor to proper depth with proper length extending out of hole.
 - Verify proper coating of anchor by noting extrusion of epoxy from hole and twisting to coat entire anchor.

SPECIAL CASES

RESIDENTIAL POST-TENSIONED CONCRETE SLABS

Special Inspections shall be performed in accordance with IBC Section 1705.3. To assist in performing this inspection, the following job tasks have been identified:

- Approved plans: obtain construction document drawings approved for the specific lot by the Building Official. Verify presence of standard plan and any option plans.
- Concrete mix designs: obtain engineer of record approved mix designs.

Pre-Slab Inspection

- Soil preparation & excavations: verify proper compaction and testing of sub-grade soils. Verify foundation excavations for proper location, length, width, depth below native or finish grade for all exterior wall footings, interior column footings, point load footings, shovel trenches, pot shelves, shear wall footings, and footings for anchor bolts for hold downs. Verify proper transitions of the base (finished subgrade). Verify removal of loose soil materials.
- Form work: verify form work for proper location, width, length, and height; slab thickness; elevation changes; drops in slab; drip trays; curbs; joints; and keys. Verify size and location of openings, and blockouts for utilities. Verify removal of all debris from forms.
- Tendons:
 - Size: verify grade, diameter, length and number of strands in tendon.
 - Length: verify sufficient stressing tails at live ends.
 - Sheathing: verify proper plastic sheathing strip at live and dead ends.
 - Placement: verify location, number of tendons, minimum and maximum spacing, drape within thickness of slab (clearance to top and bottom of slab-F.F.E. and base).
 - End anchors: verify size, location, and type.
 - Clearance: verify minimum clearance between tendons, between tendons and forms, between tendons and all penetrations (plumbing, electrical, ductwork, rebar, etc.), and minimum cover over top tendons.
 - Condition: verify that tendon sheathing is not cut or damaged to allow leakage of concrete. Verify there are no bends, kinks or broken strands in the tendons.
 - Stability: verify that tendons are adequately tied, chaired and supported to



prevent displacement during concrete placement.

- Anchors
 - Condition: verify for condition, that live and dead ends are free of any damage or debris.
 - Connection: verify proper and secure connection at live and dead ends, pocket formers at live ends, clearance to form at dead end.
 - Clearance: verify proper clearance of anchors at live and dead ends, to other anchors, to rebar, to plumbing and electrical penetrations.
 - Reinforcement: verify proper hairpins at each live end and each dead end anchor.
- Reinforcement steel
 - Size: verify rebar diameter, length, bends, end anchorage.
 - Grade: verify rebar grade.
 - Placement: verify rebar location for footings, bays, corners, bends, steps, dowels from masonry or concrete stem footings to slab, and verticals for concrete or masonry walls. Verify number of bars, minimum and maximum spacing.
 - Splices: verify rebar laps for location, length, and stagger.
 - Clearance: verify minimum clearance between bars, and between bars and forms or soil, and minimum cover over top bars.
 - Condition: verify that rebar is free of oil, dirt, loose rust, loose dry mortar, or damage.
 - Stability: verify that rebar is adequately tied, chaired and supported to prevent displacement during concrete placement.
- Welding
 - Verify that welding of rebar utilized proper grade of steel, and was properly inspected and approved
 - Verify that pre-stressing steel was not welded, or otherwise damaged by nearby welding.
- Anchor bolts:
 - Size: verify bolt diameter, length, standard bolt head, hooks or bends.
 - Grade: verify bolt grade and type.
 - Location: verify minimum spacing, minimum edge distance, depth of embedment.
 - Stability: verify that bolt template is adequately supported to prevent bolt displacement during concrete placement.
- Embedded items
 - Weld plates: verify steel plate size, thickness, and location; and type, size, and number of anchors.
 - Inserts: verify installation of rebar inserts, pipe hanger inserts or other embedded items noted on the plans.

Concrete Placement

- Provisions for concrete placement: verify that proper provisions have been made for



concrete placement, consolidation, finishing, and curing, including adequate equipment, tools, men and materials; protection against sun, rain, hot or cold weather.

- Conditions: verify proper weather precautions are taken; preparations completed; specified interval since previous placement; lighting for night work. Verify pad is free of standing water or debris
- Base preparation: verify that base for concrete is wetted and free of standing water, the soil has been treated for termites, and that a release agent has been applied to forms.
- Concrete mix: verify that delivery ticket conforms with approved mix design, and that concrete will be discharged within the specified time limit. Verify that any water added at the job site is added only if permitted by, and in accordance with, the plans and specifications.
- Conveying and placement: verify that conveying and depositing of concrete results in uniform placement, without segregation.
- Consolidation: verify that concrete is properly consolidated with vibrators to result in uniform, dense concrete. Consolidation should not be used to cause concrete to flow laterally within forms, and should not be overworked.
- Curing: verify that concrete surfaces are cured in accordance with project plans, and specifications.
- Concrete tests: verify that samples of concrete for testing are prepared for each lot according to requirements of Special Inspection and Testing Schedule and plans and specifications. Verify that slump test is performed and compliance or noncompliance of measured slump is reported to the concrete contractor and builder representative, if present.
- Test results: verify that concrete test cylinders are subjected to compressive strength tests and test results comply with project requirements. Verify that 28-day design strength for the project is met.

Tendon Stressing (Post-Tensioning)

- Presence: the Special Inspector shall be on site during stressing.
- Condition: verify that the slab is not loaded prior to stressing or that the stage of construction (loading) does not exceed the maximum identified in the construction documents.
- Calibration of stressing ram: verify stressing ram has been properly calibrated.
- Stressing: after verifying that concrete has reached transfer strength, verify that steel is stressed to proper design stress and elongations according to techniques and sequences noted on the plans, including recording of both stress levels (gauge reading) and elongations.
- Protection of end anchors: verify that excess lengths of steel are cut-off and end anchors are properly sealed and protected as noted on the plans.

SMOKE CONTROL

- Special Inspections shall be performed in accordance with IBC Section 1705.17.



- Job Task Listings shall be developed by the Architect or Engineer of Record, consistent with manufacturer's recommendations.