



IAS Special Inspections

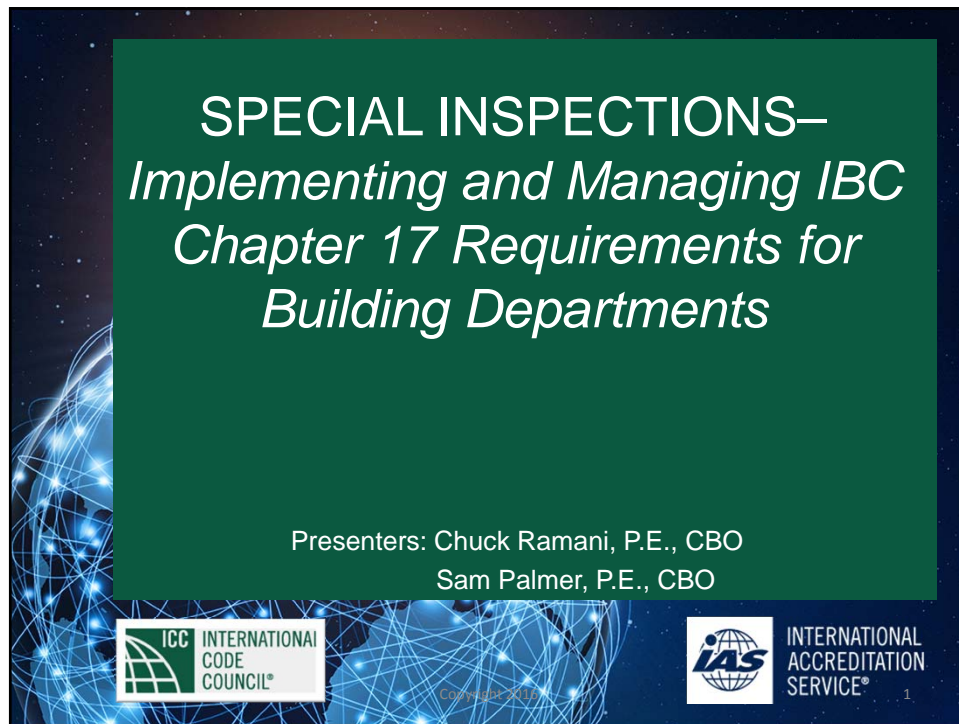
Presenters:

Chuck Ramani, P.E., CBO & Sam Palmer, P.E., CBO

Tuesday, September 12, 2017



9:45 AM - 11:15 AM




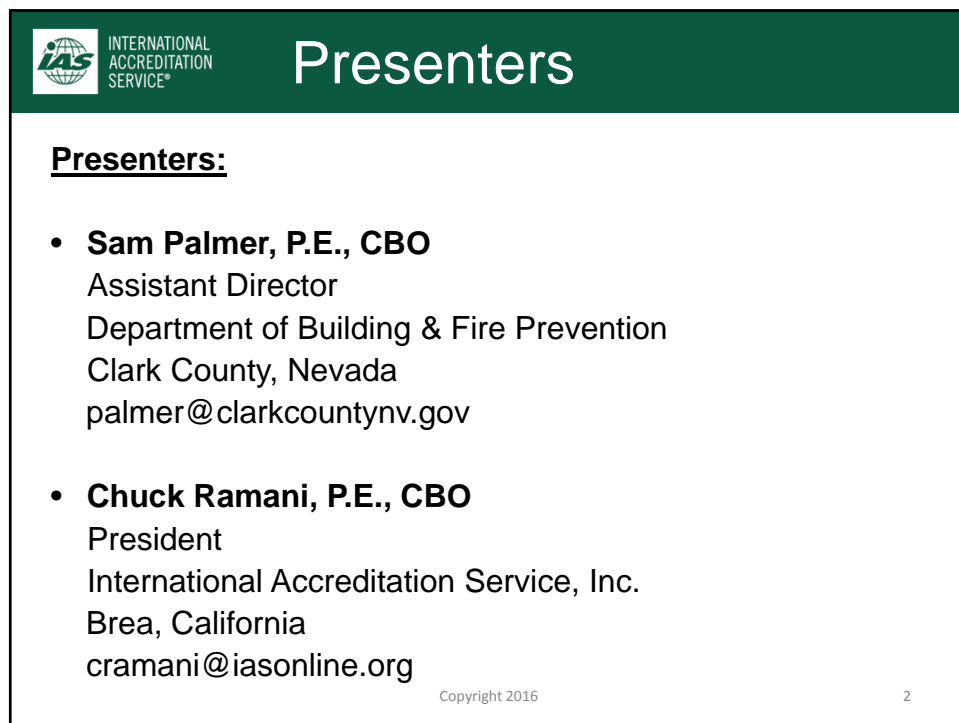


SPECIAL INSPECTIONS— *Implementing and Managing IBC Chapter 17 Requirements for Building Departments*

Presenters: Chuck Ramani, P.E., CBO
Sam Palmer, P.E., CBO



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Presenters

Presenters:

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Agenda

- **PART 1 - About IAS**
- **PART 2 - Overview of Special Inspection**
- **PART 3 - Special Inspection Agency Accreditation**
- **PART 4 - Resources**

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PART 1 – About IAS

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Who we are

- **Subsidiary** of the International Code Council
- Nonprofit, internationally recognized accreditation body
- Created to **assist** local government in ensuring public safety
- Prior to ICC, part of ICBO since **1975**

(Most members of the IAS Board and the Accreditation Committee are local government code officials)

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Formal Recognition of IAS

- **Governments from over 50 countries that make up the Asia Pacific Laboratory Accreditation Cooperation (APLAC) and the International Laboratory Accreditation Cooperation (ILAC)**
- **Numerous city, county and state building departments recognize accreditations granted by IAS**

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Formal Recognition of IAS

A SHORT LISTING OF FORMAL RECOGNITIONS:

- California Department of Transportation
- Chickasaw Nation
- U.S. Coast Guard
- U.S. Environmental Protection Agency (EPA)
- U.S. Federal Emergency Management Agency (FEMA)
- U.S. Federal Highway Administration (FHWA)
- United States Marines
- United States Navy
- Metal Building Manufacturers Association (MBMA)
- U.S. Nuclear Regulatory Commission
- International Code Council (ICC)
- ICC Evaluation Service (ICC-ES)
- Fire Stop Manufacturers Association (FSMA)

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What is Accreditation?

- Formal third-party recognition that a *body or agency* fulfills specified requirements and is **competent** to carry out specific conformity assessment tasks.
- Accreditation has been used for over 50 years as the **definitive** means of evaluating organizations, and is now utilized by all the world's major economies and many developing economies.
- It is becoming an important tool for Building and Fire Prevention Departments.
- All accreditation programs include on-site technical and management system verification.

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Building Department Focus

IAS provides several accreditation programs to assist state and local government carry out their duties and obligations to ensure public safety and property protection.

- Fabricators
- Testing Laboratories
- Product Certification Agencies
- Special Inspection Agencies
- Metal Building Manufacturers
- Field Evaluation Bodies
- Building Departments
- Fire Prevention Departments
- Building Department Service Providers

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What are Accreditation Criteria?

- **A required accreditation criteria exists for every IAS accreditation program.**
- **All IAS accreditation criteria are on the IAS website.**
Examples:
 - AC291 Special Inspection Agencies
 - AC354 Field Evaluation of Unlisted Electrical Equipment
 - AC370 Product Certification Agencies
 - AC402 Third-party Permitting, Plan Review and Inspection Providers
 - AC251 Building Departments/Code Enforcement
 - AC426 Fire Prevention and Life Safety Departments
 - AC474 Personnel Certification Bodies

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Process for Code Development and IAS Accreditation Criteria Very Similar

- IAS criteria are developed with **input** from parties such as special inspection agencies, code officials, affected industries and the public.
- **Open, public** hearing process
- ***Anyone*** can participate
- Held annually (minimum)



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PART 2 – Overview of Special Inspections

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What is Special Inspection?

- The **monitoring** of materials, installation, fabrication, erection and placement of components and connections that require special expertise that are critical to the integrity of the building structure.
- Special inspections are **in addition** to the typical municipal inspections required by the building department specified in *International Building Code*® (IBC®) Section 110 or specific structural observations as may be required in IBC Section 1704.6.
- Code officials may require **other inspections** per IBC Section 110.3.8. Code officials may require “other” inspectors to qualify similarly to special inspectors per IBC Section 104.4.

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Special Inspections

Why do we need it?

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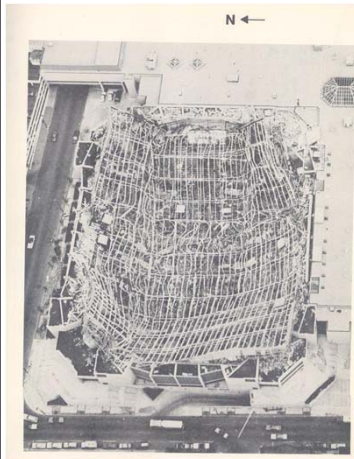
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Special Inspection Failures

Hartford Civic Center Coliseum – Hartford, CN - 1978



- 4:19am collapse
- No injuries or fatalities
- Interior members were insufficiently braced, exterior members were only braced at 30' rather than at 15' as specified in design. No midpoint braces were provided on the top layer members.
- Inadequate inspection and quality control.
- Welding of filler plates on trusses reduced the connection capacity.
- Diagonal members were misplaced and the wrong steel strength was used.

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Why do we need Special Inspections?

- Special inspectors **monitor** the materials and workmanship critical to the **structural** and **fire-resistive integrity** of a building.
- **Required** to ensure compliance with the approved construction documents (plans) and standards referenced in the applicable codes.
- Special inspectors bring **technical expertise** to the job that isn't typically available in local government.



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Special Inspections are Mandatory

- The IBC clearly specifies situations in which the **employment** of special inspectors or special inspection agencies is **mandatory**.
- The **use** of special inspectors and special inspection agencies is **not discretionary**.
- The **use** of special inspectors and special inspection agencies is **ministerial**.

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Special Inspections are Mandatory

- Official immunity **does not necessarily apply** to the performance of ministerial duties.
- Duties **are considered ministerial** if they are prescribed and defined by statute, rule, or regulation with such certainty that there is nothing left to the public official's or employee's decision or judgment and he or she has no choice in the performance of such duties.
- A public official may be **personally liable** for damages that result from the failure to perform ministerial duties.

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Benefits of Special Inspections

FOR THE CONTRACTOR:

- Special inspections can be **available** during times when the building department is not available, ensuring construction stays on schedule.
- Special inspections allow for **prompt replies** to questions from contractors.
- **Expedites** corrective measures to address errors.
- Facilitates team **communication** between designers, contractors, and the building department, minimizing misinterpretation of the intended structural design, building code or ordinance.
- Documents **compliance** Provides a shield against liability.

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Special Inspection Failures

David L. Lawrence Convention Center – Pittsburgh PA - 2002



Pittsburgh Tribune - Review

- 1 Dead – 2 Injured
- Truss collapse – **wrong nuts** used at the connection, ½ sized and not high strength
- Special inspector was a materials tester – He said no one had told him which nut was correct for the trusses and he **“probably wouldn’t have noticed anyway”**

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Special Inspection Failures



D'Amato Law Firm

Tropicana Casino Parking Garage Atlantic City, NJ - 2003

- 4 Dead – 20 Injured
- Reinforcing steel was ***not properly installed*** to allow floors to be secured to columns and shear wall
- Concrete ***not tested*** for strength
- Inspectors ***did not verify*** reinforcing steel was installed properly

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Benefits of Special Inspections

FOR THE DESIGNER:

- Intended design is ***what is*** constructed
- Additional ***knowledgeable review*** of installations
- Documents ***compliance***
- Provides a ***shield*** against liability

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Special Inspection Failures




Dr. Lee Lowery, Jr., P.E.

Hyatt Regency Hotel, Kansas City, MO - 1981

- 114 Dead – 200+ Injured
- During the construction phase, the design of the hanger rod connections **was changed** from a one-rod to a two-rod system
- The engineers stated that they requested on-site representation on numerous occasions, but were **turned down due to additional costs** for on-site inspection
- Poor workmanship, improper welding and connections, inadequate building materials, **failure** on the part of the hotel **to hire special inspectors**, as well as failure of the jurisdiction by allowing the building to be occupied despite its hazards, were also factors in the collapse

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Benefits of Special Inspections

FOR THE OWNER:

- **Assurance** that they are getting what they paid for
- Documents **compliance**
- Provides a **shield** against liability

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Special Inspection Failures

Blacksburg HS Gym Montgomery Co, VA - 2010



- Built in 1974
- Investigation revealed **lower-than-specified yield strength** in the steel and **inferior welding** were contributing factors to the roof collapse
- Testing found **weak welds** at the truss seat which did not meet the AWS standards for structural welds
- 17 hours before, the gym had been **fully occupied** for a basketball game

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Special Inspection Failures

Shelbyville Central HS Shelbyville, TN - 2014



- Three seriously injured from **collapse** of one wall of an unfinished football Fieldhouse at Shelbyville Central High School
- Construction experts who examined the remains of the structure said the walls were **poorly constructed, noting a lack of rebar** in the blocks. Earlier, the building's foundation failed at least one state inspection, records show.

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Special Inspection Successes

THEN



NOW



- Maxim Hotel - multistory hotel built in 1970
- Westin purchased it in 2003
- Special inspection after purchase, determined that **complete major rehabilitation** of structure was required
- Interior and exterior shear walls were added

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Westin Remodel Las Vegas, NV circa 2003


Discontinuous shear wall



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Cosmopolitan Hotel Las Vegas, NV circa 2007



- These pictures were taken within East Tower.
- Special Inspection revealed no additional action required.

(Apparently the beams were required for construction sequencing and not for the final structure)

Note steel girders cut out for cable tray.

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Harmon Hotel Las Vegas, NV circa 2009



Harmon Hotel in forefront blue exterior approximately 50 stories located at the corner of Harmon and Las Vegas Boulevard

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Luxor Hotel Las Vegas, NV circa 2000



- Construction & inspection personnel injured
- 1- Death
- Shoring failure during concrete placement
- Horse Arena
- Basement Level

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Palms Hotel Las Vegas, NV circa 2001



- What happens **after** special inspections are complete?
- Mechanical Floor

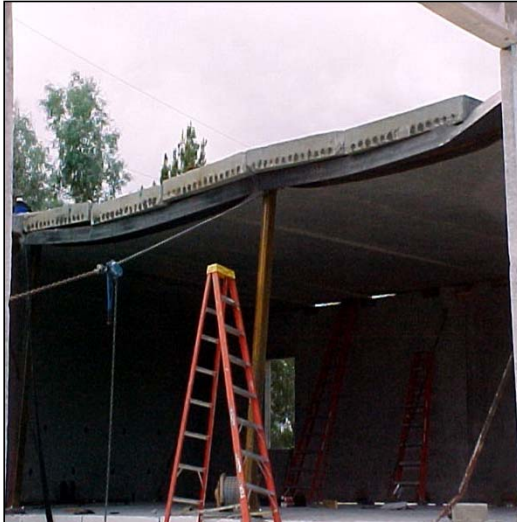
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Residential Garage Las Vegas, NV early 2000s



- Gravity load failure during placement of precast panels
- Lack of compression flange bracing
- *Specified beam slightly smaller than calculated*

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Benefits of Special Inspections

FOR THE JURISDICTION:

- **Saves jurisdiction money**, not having to conduct the inspections.
- Allows jurisdiction to have access to **highly specialized staff**.
- Allows critical work to be **continuously** inspected.
- Documents compliance provides a **shield** against liability.

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Who is Responsible for
Special Inspection?

- **Owner** or registered design professional acting as the **owner's agent - Hires** special inspectors or agencies.
- **Permit applicant - Submits statement** of special inspections prepared by registered design professional in charge.
- **Building Official - Approves** special inspectors or agencies.
- **Special inspection agencies** or special inspectors – **Conduct and document** special inspections.

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Where are special inspection
requirements in the Code?

International Building Code, Chapter 17

CHAPTER 17
SPECIAL INSPECTIONS AND TESTS

Use note: Code change proposals to actions prescribed by the description (207) will be considered by the 2015 Fire Safety Code Development Committee during the 2015 Group A Code Development Cycle. Actions prescribed by the description (27) will be considered by the International Fire Code Development Committee during the 2015 Group B Code Development Cycle. All other code change proposals will be considered by the 2015 Structural Code Development Committee during the Group B Cycle. See explanation on page 18.

SECTION 1701
GENERAL

1701.1 Scope. The provisions of this chapter shall govern the quality, workmanship and requirements for materials covered. Materials of construction and tests shall conform to the applicable standards listed in this code.

1701.2 New materials. New building materials, equipment, appliances, systems or methods of construction not provided for in this code, and any material of equal or similar quality proposed for use in the construction of a building or structure, shall be approved in the same procedure as that provided in the approved rules to determine character, quality and fitness for use.

SECTION 1702
DEFINITIONS

1702.1 Definition. The following terms are defined in Chapter 2:

APPROVED AGENCY.
APPROVED FABRICATOR.
CERTIFICATE OF COMPLIANCE.
DESIGNATED SEISMIC SYSTEM.
FABRICATED ITEM.
INTERMEDIATE FIRE-RESISTANT COATING.
MASS WOOD-FIRE-RESISTING SYSTEM.
MASTIC FIRE-RESISTANT COATING.
SPECIAL INSPECTION.
Customer special inspection.
Firelife special inspection.
SPECIAL INSPECTOR.
SPRAYED FIRE-RESISTANT MATERIALS.
STRUCTURAL OBSERVATION.

SECTION 1703
APPROVALS

1703.1 Approved agency. An approved agency shall provide all information as necessary for the building official to determine that the agency meets the applicable requirements specified in Sections 1703.1.1 through 1703.1.3.

1703.1.1 Independence. An approved agency shall be objective, competent and independent from the contractor responsible for the work being inspected. The agency shall also disclose to the building official and the registered design professional an acceptable charge possible condition of awards to that organization on the contract.

1703.1.2 Equipment. An approved agency shall have adequate equipment to perform approved tests. The equipment shall be periodically calibrated.

1703.1.3 Personnel. An approved agency shall employ experienced personnel dedicated to conducting, supervising and evaluating tests and special inspections.

1703.2 Written approval. Any material, appliance, equipment, system or method of construction requiring the registration of this code shall be approved in writing after satisfactory completion of the required tests and submission of required test reports.

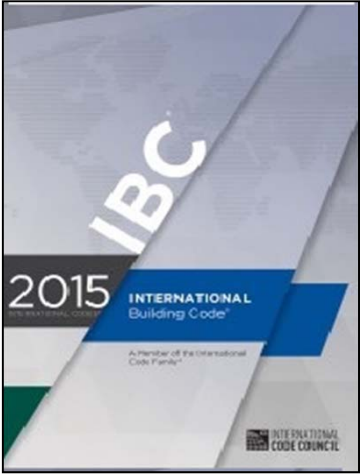
1703.3 Record of approval. For any material, appliance, equipment, system or method of construction that has been approved a record of such approval, including the conditions and limitations of the approval, shall be kept on file at the building official's office and shall be available for public review at appropriate times.

1703.4 Performance. Specific information consisting of test reports conducted by an approved agency in accordance with the appropriate referenced standards, or other such information as necessary, shall be provided for the building official to determine that the product, material or assembly meets the applicable code requirements.

1703.4.1 Research and development. Sufficient technical data shall be submitted to the building official to indicate that the product, material or assembly meets the requirements. If it is determined that the evidence submitted is satisfactory proof of performance for the requirements of this code, the costs, reports and investigation required under these provisions shall be paid by the owner or the owner's authorized agent.

1703.4.2 Research reports. Supporting data, where necessary to assist in the approval of products, materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources.

2015 INTERNATIONAL BUILDING CODE® 403



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2017 ICC Annual Conference Education Programs
Columbus, OH

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Approved Agency

- **Section 1702 - “Approved Agency” is defined as:**
 “An established and recognized agency that is regularly engaged in conducting tests or furnishing inspection services, where such agency has been approved by the building official.”
- **Section 202 – “Approved” is defined as:**
“Acceptable to the building official.”

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Approved Agency

1703.1 - Approved agency to provide evidence of:

- Independence – no conflicts of interest (**Critical**).
- Equipment – adequate to perform required tests.
- Personnel – competent in conducting, supervising and evaluating tests and/or inspections in the *appropriate* discipline.

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Special Inspector Qualifications

1704.2.1 “Special inspector qualifications:

The special inspector shall provide written documentation to the building official demonstrating his or her **competence** and **relevant experience** or **training**. Experience or training shall be considered relevant when the documented experience or training is related in **complexity** to the same type of special inspection activities for projects of similar complexity and material qualities. These qualifications are in addition to those specified in other sections of this code.”.

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Approved Agency

1704.2.1 “The **registered design professional in responsible charge and engineers of record** involved in the design of the project are permitted to act as the **approved agency** and their personnel are permitted to act as the **special inspector** for the work designed by them, **provided they qualify as special inspectors.**”

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Focus of Special Inspections

The IBC includes 16 major categories of special inspection that are critical to life-safety and structural-safety roles:

- Inspection of fabricators
- Concrete construction
- Masonry construction
- Steel construction
- Wood construction
- Soils
- Pile foundations
- Smoke control
- Wind requirements
- Pier foundations
- Vertical masonry elements
- Sprayed fire-resistant materials
- Mastic and intumescent fire-resistant coatings
- Exterior insulation and finish systems
- Special cases
- Seismic requirements

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Two Types of Special Inspections

- **Continuous special inspections** involve *full-time* observation of work by an approved special inspection agency or special inspector while work is being performed.
- **Periodic special inspections** involve *part-time or intermittent* observation of work by an approved special inspection agency or special inspector while work is performed or completed.
- **Identified in IBC**, Chapter 17, Tables 1705.2.3, 1705.3, 1705.6, 1705.7, 1705.8.

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IBC, Table 1705.3

Concrete Construction

TYPE	REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION		IBC REFERENCE
	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	
1. Inspect reinforcement, including prestressing tendons, and verify placement.	—	X	ACI 318 Ch. 20, 25.2, 25.3, 26.1, 26.2, 26.3, 1908.4
2. Inspect the quality of finishing materials other than ASTM A 706.	—	X	ANSI BQ.4 ACI 318: 26.5.4
3. Inspect anchors cast in concrete.	X	—	ACI 318: 17.8.2
4. Inspect anchors post-installed in hardened concrete members:			
a. Adhesive anchors installed in horizontally or vertically inclined orientations to meet minimum bond length.	X	—	ACI 318: 17.8.2.4
b. Mechanical anchors and adhesive anchors installed in situ.	—	X	ACI 318: 17.8.2
5. Verify use of required design mix.	—	X	ACI 318 Ch. 19, 26.4.3, 26.4.4
6. Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	—	ASTM C 172 ASTM C 191 ACI 318: 26.4.3, 26.5.2
7. Inspect concrete and observe placement for proper application techniques.	X	—	ACI 318: 26.4.3
8. Verify maintenance of specified curing time, temperature, and substrate.	—	X	ACI 318: 26.4.7, 26.4.9
9. Inspect prestressed concrete for:			
a. Application of prestressing forces; and	X	—	ACI 318: 26.9.2.1
b. Grouting of bonded prestressing tendons.	X	—	ACI 318: 26.9.2.3
10. Inspect condition of precast concrete members.	—	X	ACI 318 Ch. 26.8
11. Verify in-situ concrete strength, prior to release of shoring or removal of concrete and forms from beams and slabs.	—	X	ACI 318: 26.10.2
12. Inspect formwork for shape, location and dimensions of the concrete member being formed.	—	X	ACI 318: 26.10.1(b)

Continuous
Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.

Periodic
Identification markings to conform to ASTM standards specified in the approved construction documents.

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Seven Steps of a Special Inspection Program

G = General J = Job

1. Establish qualifications for special inspectors and special inspection agencies. **G**
2. Communicate Chapter 17 requirements and building department expectations. **G**
3. Require submittal of statement of special inspections. **J**
4. Evaluate and approve special inspection agencies and special inspectors. **J**
5. Develop and implement report procedures to monitor special inspections. **G & J**
6. Practice site verification. **J**
7. Review, accept, and retain final report of special inspections. **G & J**

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Seven Steps of a Special Inspection Program Step 1

1. **Establish minimum qualifications for special inspectors and special inspection agencies.**

- Must have a criteria or standard for evaluating agencies and inspectors.
- Building code, standards, IAS Accreditation Criteria AC291.
- Criteria sets a level playing field for all evaluations.
- Covers individual qualifications, procedures and policies for performing and reporting special inspections, equipment used in inspections, storage of records, etc.

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Seven Steps of a Special Inspection Program Step 2

2. **Communicate Chapter 17 requirements and building department expectations.**

- Owner or registered design professional/agent to submit SIA for approval.
- Owner or registered design professional/agent to hire SIA.
- RDP prepares statement of special inspections (qualified person exception).
- Permit applicant to submit statement of special inspections.
- SIA reporting, including the final report.

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Seven Steps of a Special Inspection Program Step 3

3. **Require submittal of statement of special inspections (Section 1704). This statement shall identify:**

- Materials, systems, components, and work required to undergo special inspection by the building official, or by the RDP for each portion of the work.
- ***Type and extent of each special inspection.***
- Type and extent of each test.
- Additional requirements for special inspection for seismic or wind resistance.
- For each type of special inspection, whether it will be ***continuous or periodic.***

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Seven Steps of a Special Inspection Program Step 3

Samples of statement of special inspections:


www.acec.org/case/news/publications/statement_of_si.doc

http://www.seari.org/files/SEARI_Suggested_Statement_of_Special_Inspections.pdf

<https://www.auroragov.org/cs/groups/public/documents/document/008745.pdf>


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Seven Steps of a Special Inspection Program Step 3

Example
Special
Inspection
Agreement
(Statement)
Cont.



**SPECIAL INSPECTION AGREEMENT
(SI-3)
Effective April 9, 2009**

To permit applicants of projects requiring special inspection and/or testing per Chapter 17 of the 2005 International Building Code (IBC):

Project Name/Address: _____ Plan Cl. # _____
Application # _____
Name of City of Las Vegas Inspector/Supervisor: _____ Telephone # _____

BEFORE A PERMIT CAN BE ISSUED: The Owner or Owner's agent shall obtain special inspection services from a special inspection agency accredited by the International Accreditation Service (IAS) and approved by the Building Official. The owner or owner's agent shall complete two (2) copies of this agreement and the attached scope of work for special inspections.

APPROVAL OF SPECIAL INSPECTORS: Each special inspection agency shall be accredited by IAS and approved by the Building Official prior to permit issuance and prior to performing any duties. Special inspectors shall display approved identification, as stipulated by the Building Official, when performing the function of a special inspector.


Special inspection and testing shall meet the minimum requirements of IBC Chapter 17.

All sections and chapters are from the 2005 International Building Code.

A. Duties and Responsibilities of the Special Inspector and Special Inspection Agency:

1. **Observe work**
The special inspector shall observe the work for conformance with the Building Department approved (stamped) design, drawings and specifications and applicable workmanship provisions of the IBC.
2. **Report non-conforming items**
The special inspector shall bring non-conforming items to the immediate attention of the contractor and note all such items on the daily report. If any item is not resolved in a timely manner or is about to be incorporated in the work, the special inspector shall immediately notify the Building Department by telephone or in person, notify the engineer or architect, and post a discrepancy notice.
3. **Furnish Daily reports**
On request, each special inspector shall complete and sign both the special inspection record and the daily report form for each day's inspections to remain at the job site with the contractor for review by the Building Department's inspector.
4. **Furnish weekly Reports**
The special inspector or inspection agency shall furnish weekly reports of tests and inspections directly to the Building Department, project engineer or architect, and others as designated. These reports must include the following:
 - a. Description of daily inspections and tests made with applicable locations.
 - b. Listing of all non-conforming items.
 - c. Report on how non-conforming items were resolved or unresolved as applicable, and
 - d. Itemized charges authorized by the architect, engineer and building department if not included in non-conformance item.

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Seven Steps of a Special Inspection Program Step 3


Example
Special
Inspection
Agreement
(Statement)
Cont.

5. **Furnish final report**
The special inspector or inspection agency shall submit a final signed report to the Building Department stating that all items requiring special inspection and testing were fulfilled and reported and, to the best of his/her knowledge, in conformance with the approved design drawings, specifications, approved change orders and the applicable workmanship provisions of the IBC. Items not in conformance, unresolved items or any discrepancies in inspection coverage (i.e., missed inspections, periodic inspections when continuous was required, etc.) shall be specifically itemized in his report. Final report shall be reviewed, signed and stamped by the principal of the special inspection agency who is a registered design professional (civil or structural engineer) in the State of Nevada.
6. The special inspection agency shall provide a complete and accurate final report based on the requirements of the City of Las Vegas SIA document. No modifications, additions or subtractions to the requirements of the SIA document shall be accepted. An hourly fee shall be assessed for each final inspection report submitted as noted on the SIA (SI). If a substantial report is submitted to the Building Department, the report will be rejected and assessed the full review fee. The same hourly fee will be assessed for each additional review of the same report.

B. Contractor's Responsibilities

1. **Notify the special inspector**
The contractor is responsible for notifying the special inspector or agency regarding individual inspections for items listed on the attached schedule and as noted on the Building Department approved plan. Adequate notice shall be provided so that the special inspector has time to become familiar with the project.
2. **Provide access to approved plans**
The contractor is responsible for providing the special inspector access to approved plans at the job site.
3. **Retain special inspection records**
The contractor is also responsible for retaining at the job site all special inspection records submitted by the special inspector, and providing these records for review of the Building Department's inspector upon request.
4. **Seismic force resisting systems, designated system or component**
Contractor's Statement of Responsibility per Section 1706 of the 2005 International Building Code, where required:
To comply with the requirements of Section 1706, the contractor acknowledges the following:
 - The company is aware of the special requirements contained in the statement of special inspections prepared by the engineer of record or the registered design professional per the requirements of Section 1705 of the 2005 IBC.
 - Control will be exercised to obtain conformance with the construction documents approved by the Building Official.
 - The company has procedures for exercising control within our organization, the method and frequency of reporting and the distribution of reports.
 - The company has the qualified personnel to exercise such control.
5. The contractor shall not intimidate or try to influence Special Inspection Agencies or Special Inspectors. If reports of abuse are reported a special investigation by the City of Las Vegas Building Dept. shall ensue. If any charge is substantiated the contractor will incur the cost of the investigation @ \$100 per hour. Any action related to the outcome of the investigation will be at the discretion of the Building Official.

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Seven Steps of a Special Inspection Program Step 3

Example Special Inspection Agreement (Statement) Cont.

C. Engineer of Record's responsibilities:

1. Specify on the project plans and specifications all items requiring special inspections, including periodic inspections in accordance with Chapter 17.
2. Prepare a statement of special inspections, including seismic requirements, in accordance with Section 1705.
3. If structural observation is required per section 1709, and if owner hires the engineer of record, conduct structural observations. All final reports to be submitted to the Building Official.

D. Owner's responsibilities:

1. Obtain and fund special inspection services by contract with an agency approved by the City of Las Vegas.
2. Submit the signed SI-3 and SI-6 to the Building Official prior to permit issuance.
3. Obtain and fund structural observation by engineer of record as required by Section 1709.
4. This Agreement shall be binding. Termination of this agreement will require written notice as to why this agreement should be nullified. All parties shall agree to the termination with the City of Las Vegas issuing the final approval.

E. Scope of Work:

All work falling within the categories identified on the attached addendum (SI-d) shall be inspected and/or tested in accordance with the provisions of Chapter 17 of the International Building Code.

F. Some items noted in the project's scope of work, SI-6, are to be inspected by City of Las Vegas inspectors. Call 229-5112 to schedule these inspections. An inspection hold will be in place until these inspections are scheduled. Special inspection fees apply. (\$125 per hour, 2 hour minimum)

G. For masonry walls that require special inspections, all the wall footings and the reinforcing steel are to be included in the Special Inspection agency's scope of work.

H. All Final Special Inspection reports are to be submitted to the City of Las Vegas Area Inspection Supervisor at the City of Las Vegas Street Service Center: 7551 W. Sauer Dr., Las Vegas, NV 89123. The review fee is \$150 per hour with a one-hour minimum.

I have read and agree to comply with the terms and conditions of this agreement.

Owner: _____ Date: _____
 By: _____ Print Name: _____
 Special Inspection Agency: _____ Date: _____
 By: _____ Print Name: _____
 Contractor: _____ Date: _____
 By: _____ Print Name: _____
 Sub-consultant (if any): _____ Date: _____
 By: _____ Print Name: _____
 Engineer of Record: _____ Date: _____
 (Signature required if box is checked)
 By: _____ Print Name: _____

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Seven Steps of a Special Inspection Program Step 4

4. Evaluate and approve special inspection agencies and inspectors. Use criteria established in Step 1, such as:

- Individual *professional* qualifications (certifications, licenses, education, experience, etc.).
- **Interviews** with individuals.
- **Field observations.**
- **IAS accreditation.**

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Seven Steps of a Special Inspection Program Step 5

5. Develop reporting requirements.

- Describe the reports to be submitted and the criteria that determine whether a report is ***acceptable and properly formatted***.
- All report forms for use in performing quality assurance inspection, engineering and/or testing ***must be approved*** by the building department.
- Report forms ***can*** be created by the building department to help streamline the reporting process.

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Seven Steps of a Special Inspection Program Step 5

Types of Reports:


- Daily Report, Weekly Report, Discrepancy Notice, Final Report.

Reporting Oversight:

- Building departments need to ***perform verification audits*** and ***review the reports*** submitted by special inspection agencies and special inspectors.
- Determine how audits will be performed, what ***evaluation criteria*** will be used, and what happens if the audited party is found to be performing in an unsatisfactory manner.

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Seven Steps of a Special Inspection Program Step 5

Example:

Daily Report
Special Inspection

SPECIAL INSPECTION DAILY REPORT

City/Country of _____ Permit No.: _____ Date: _____
 Project Name/Address: _____
 Inspection Type(s)/Coverage: _____
 Continuous Periodic; frequency: _____

Inspections made, including locations: _____

Tests performed: _____

Items requiring 1) correction, 2) correction of previously listed items, and 3) previously listed uncorrected items: _____

Changes to approved plans authorized by engineer or architect of record: _____


Comments: _____

To the best of my knowledge, work inspected was in accordance with the building department approved plans, specifications and applicable workmanship provisions of the IBC except as noted above.

Signed: _____ Inspection Agency: _____
 Print full name: _____ ID / Certificate Number: _____

* Building official may require the signature / stamp of agency engineer responsible for special inspection.

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Seven Steps of a Special Inspection Program Step 5

Example:

Weekly Report
Special Inspection

SPECIAL INSPECTION WEEKLY REPORT

City/Country of _____ Permit No.: _____ Date: _____
 Project Name/Address: _____
 Inspection Type(s)/Coverage: _____
 Continuous Periodic; frequency: _____

Total inspection time each day:

Date:						
Hours						
Inspector						

Inspections made, including locations: _____

Tests performed: _____

Items requiring 1) correction, 2) correction of previously listed items, and 3) previously listed uncorrected items: _____

Changes to approved plans authorized by engineer or architect of record: _____


Comments: _____

To the best of my knowledge, work inspected was in accordance with the building department approved plans, specifications and applicable workmanship provisions of the IBC except as noted above.

Signed: _____ Inspection Agency: _____
 Print full name: _____ ID / Certificate Number: _____
 cc: Building Department
 Engineer/Architect

* Building official may require the signature / stamp of agency engineer responsible for special inspection.

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Seven Steps of a Special Inspection Program Step 5

SPECIAL INSPECTION DISCREPANCY NOTICE

City/County of _____ Permit No. _____ Date _____
Project Name/Address: _____
Inspection Type(s)/Coverage: _____
 Continuous Periodic; frequency: _____
Notice delivered to: Contractor Engineer/Architect Building Department

The following discrepancies require correction and inspection approval prior to proceeding with this phase of the work:

Signed: _____ Inspection Agency: _____
Print full name: _____ ID / Certificate Number: _____
* Building official may require the signature / stamp of agency engineer responsible for special inspection.


DO NOT REMOVE THIS NOTICE
Post with building permit inspection record card

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Example:

**Discrepancy
Notice
Special
Inspection**

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Seven Steps of a Special Inspection Program Step 5

SPECIAL INSPECTION FINAL REPORT

City/County of _____ Permit No. _____ Date _____
Attention: _____
Project Name/Address: _____

In accordance with Section 1704 of the International Building Code, special inspection has been provided for the following items:

Based upon inspections performed and our (my) substantiating reports, it is our (my) professional judgment that, to the best of our (my) knowledge, the inspected work was performed in accordance with the approved plans, specifications and applicable workmanship provisions of the International Building Code.

Signed: _____ Inspection Agency: _____
Print full name: _____ ID / Certificate Number: _____
* Building official may require the signature / stamp of agency engineer responsible for special inspection.

cc: Client/Project Owner
Engineer/Architect

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Example:

**Final Report
Special
Inspection**



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Seven Steps of a Special Inspection Program Step 6

6. Practice site verification.

- Verify the special inspector is on site for all continuous inspections.
- Verify that the special inspectors on site were the ones approved.
- Spot check daily, weekly, and review discrepancy reports in field where the special inspector is readily questioned.

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Seven Steps of a Special Inspection Program Step 6

- Talk with the special inspectors, make sure you're available to them, verify that they're comfortable with their authority.
- Verify that all special inspection steps are completed before 'next-step' building department inspections are conducted.

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Seven Steps of a Special Inspection Program Step 7

7. Review, accept and retain final report of special inspections.

- **Before** final approval of permit or issuance of C of O.
- Review exceptions or discrepancies **and** corrections.
- Accept when satisfied that no unresolved issues exist.
- Retain records according to **written** policy and statutory requirements.

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General Responsibilities of a Special Inspector (Sample)

1. **Responsibilities and authority:** Apply special inspector responsibilities and authority and **comply** with requirements of enforcing jurisdiction.
2. **Notification:** Notify the local jurisdiction of the inspection job and specify the type of inspection for which the special inspector has been engaged, in accordance with enforcing jurisdiction requirements.
3. **Presence at job:** Be present for continuous inspection during execution of **all work** for which the special inspector has been engaged.

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General Responsibilities of a Special Inspector (Sample)

4. **Acceptable conditions:** Verify that the local jurisdiction inspector has approved the conditions at the site when required. Typically special inspectors ***don't*** have the authority to stop work!
5. **Progress report:** Submit ***timely***, periodic written and verbal progress reports to the local jurisdiction when required.
6. **Identify discrepancies:** Notify contractors when discrepancies occur. ***Don't design solutions!***
7. **Uncorrected discrepancies:** ***Timely notify*** the building official and designer when discrepancies are not corrected.

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General Responsibilities of a Special Inspector (Sample)

8. **Plan changes:** Verify that structural plan changes are properly documented and **approved** by the enforcing jurisdiction.
9. **Record keeping:** Maintain records of work inspected, including discrepancies and actions taken.
10. **Compliance report:** Submit ***timely*** final report of compliance.

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Specific Responsibilities of a SIA for Concrete (Sample)

Concrete Mix Verification:

1. **Mix design:** Verify concrete mix design based on water/cement ratio or laboratory mix design, that cement type is as specified, that aggregate type, weight and size are as specified and that admixtures are correct.
2. **Trip ticket:** Determine that mixer truck trip ticket specifies mix in truck is mix required.
3. **Mixing water:** Verify that total water added to mix **does not exceed** that allowed by concrete mix design and is of acceptable quality.

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Specific Responsibilities of a SIA for Concrete (Sample)

Concrete Mix Verification:

4. **Adequate equipment:** Verify that concrete mixing and placing equipment at site is adequate for the intended use.
5. **Quality of concrete:** Verify that the quality of the concrete is indicative of adequate mixing time, consistency and relevant time limits.

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Specific Responsibilities of a SIA for Concrete (Sample)

Other concrete areas to be checked by Special Inspectors. Each includes multiple steps not included in this presentation:

- Concrete **Reinforcement** and **Prestressing Steel**
- Concrete Formwork and **Embedded Items**
- Concrete Preparation and Placement
- Samples and Tests
- Concrete Protection
- **Prestressing** and Grouting

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PART 3 – IAS Special Inspection Agency Accreditation

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What is the Program?

- A ***comprehensive*** program that helps building departments manage special inspections in the jurisdiction.
- IAS assesses and monitors the special inspection agencies to ensure they ***meet the requirements*** in Chapter 17 of the *IBC*.
- IAS helps building departments ***do everything*** from writing adoption language to use the program, to setting a timeline, providing training, evaluating the special inspection agencies, etc.

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IAS Special Inspection Agency Accreditation Program

Objective:

- Provide building departments with **verification** that special inspection agencies are qualified to work in their jurisdiction.
- Helps building departments ***to approve*** special inspections.



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Accreditation Benefits for Building Department

IAS SIA Program Benefits for Building Departments:

- **Ensures Code Compliance** – IAS provides a **stringent process** to determine if SIAs comply with Chapter 17 of the IBC.
- **Saves Time** – IAS takes the **burden off** the building department to make sure that SIAs are regularly assessed for quality and competence.
- **Standardizes Assessments** – All SIAs are evaluated using the same criteria and assessment process, creating a **level playing field** for everyone.

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Accreditation Benefits for Building Department

More IAS SIA Program Benefits for Building Departments:

- **Limits Liability** – Typically requiring SIAs to be accredited by IAS provides evidence of due diligence to ensure the competence of such agencies.
- **Easy to Use** – Building departments can search by organization name, listing number or scope on the [IAS website](#).
- **Economizes resources** – There is **little to no cost** for building departments that participate in the IAS SIA Accreditation Program.

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Comments from Building Department

**Earl Russell, Building and Safety Department
Inspections Manager, City of Las Vegas, NV (retired):**

“Not long ago, we really struggled to keep our heads above water. Today, we’re confident that our special inspection agencies meet national requirements, assuring us that our infrastructure is built to the tightest code standard of the day.”

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Accreditation Benefits for Special Inspection Agencies

- Helps SIAs get approved by building departments.
- Improves SIA’s existing program.
- Improves organization’s operational efficiency.
- Improves on delivery of inspection services.
- Increases qualifications of personnel.
- Creates a more level playing field when proposing on projects.

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Comments from an Accredited Special Inspection Agency

- **Stephen R. Johnson, Vice President and Materials Department Manager, GeoTek, Inc., Las Vegas, NV**

“The best part about this process is that it allowed us to review our current program with an eye on improvement. In fact, we enacted several beneficial procedures to meet these requirements and help us provide better service to our clients.”

“We’ve had some unexpected benefits. Accreditation has also helped us qualify with a nationally-based client that typically requires agencies to follow a client-defined internal process for assessment. Because of the accreditation, we developed a relationship with this client and were able to stand out from our competitors.”

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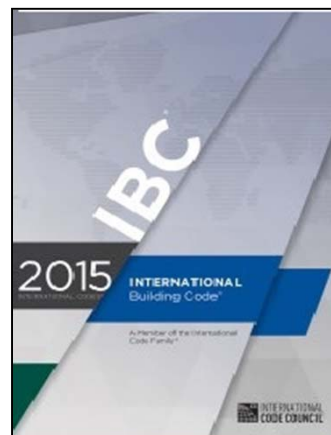
75



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Basis for IAS Special Inspection Agency Accreditation

- International Building Code (IBC), **Chapter 17**
- IAS Accreditation Criteria – **AC291**
- **ISO/IEC 17020**, Conformity assessment – Requirements for the operation of various types of bodies performing inspection (applicable portions)



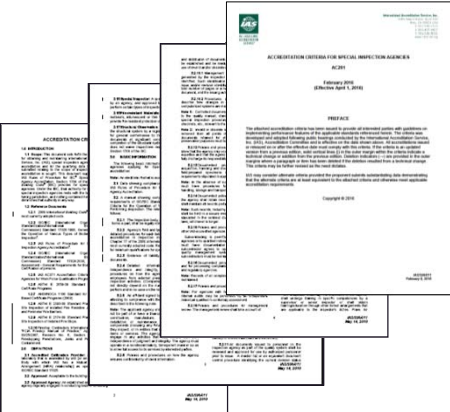
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Accreditation Criteria (AC291)

- Basis for the Special Inspection Agency Accreditation Program.
- Available on the IAS website.
- May be updated as needed.



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Basis for Approving Agencies

IAS accreditation provides building departments with information the code requires to approve SIAs:

IBC 1703.1 – Approved Agencies: An approved agency shall provide all information as necessary for the building official to determine that the agency meets the applicable requirements.

- Independency.** . .no conflicts of interest.
- Equipment.** . .adequate to perform required tests.
- Personnel.** . .shall employ experienced/knowledgeable in conducting, supervising, and evaluating tests and/or inspections.

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Accreditation Criteria (AC291)

A Few of the Items Covered in the Criteria:

- **Competence** of special inspectors (interviews, field observations)
- **Policies and procedures** (inspections, reporting, sample handling, subcontracting, complaints)
- **Tools** (code books, data sheets, inspection forms, equipment)
- **Records** (inspections, training, etc.)

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Accreditation Criteria (AC291)

1.0 INTRODUCTION

- 1.1 Scope [of Program]
- 1.2 Reference and Normative Documents

2.0 DEFINITIONS

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Accreditation Criteria (AC291)


3.0 DOCUMENTED INFORMATION SUBMISSION

Information that must be submitted by agencies applying for Special Inspection Agency Accreditation:

3.2 Management system documentation complying with ISO/IEC Standard 17020:2012 and other requirements

3.3 – 3.38 Additional required information

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Accreditation Criteria (AC291)

4.0 ASSESSMENTS

- Assessments are performed on-site prior to accreditation and once every two years after the initial accreditation
- Assessments are performed remotely after the first year of accreditation and in years when an on-site assessment is not due
- Supplementary on-site assessments may be conducted as shown in the Rules of Procedure

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Accreditation Criteria (AC291)

5.0 CONTENTS AND COVERAGE OF INSPECTION REPORTS

6.0 TRAINING

7.0 SUPERVISION/MONITORING OF INSPECTORS

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Accreditation Criteria (AC291)

8.0 MINIMUM QUALIFICATIONS FOR SPECIAL INSPECTORS

- See Table 1

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Accreditation Criteria (AC291) cont.

8.0 MINIMUM QUALIFICATIONS FOR SPECIAL INSPECTORS

Includes qualifications for the following Special Inspectors:

- Prestressed/Precast Concrete
- Reinforced Concrete
- Nondestructive Testing
- Pier and Pile Foundations
- Post-installed Structural Anchors in Concrete
- Soils
- Spray-applied Fire-resistant Materials
- Steel (High-strength Bolting and Welding)
- Masonry Construction
- Wood Construction

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Accreditation Criteria (AC291) cont.

8.0 MINIMUM QUALIFICATIONS FOR SPECIAL INSPECTORS

Includes qualifications for the following Special Inspectors:

- Exterior Insulation and Finish Systems
- Firestop Systems
- Wall Panels, Curtain Walls, and Veneers
- Smoke Control Systems
- Mechanical Systems
- Fuel-oil Storage and Piping Systems
- Structural Cold-formed Steel
- Excavation – Sheeting, Shoring and Bracing
- High-pressure Steam Piping (Welding)
- Structural Safety – Stability and Mechanical Demolition
- Site Storm Drainage Disposal and Detention
- Sprinkler Systems

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Accreditation Criteria (AC291) cont.

8.0 MINIMUM QUALIFICATIONS FOR SPECIAL INSPECTORS

Includes qualifications for the following Special Inspectors:

- Standpipe Systems
- Heating Systems
- Chimneys
- Seismic Isolation Systems
- Special Cases

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Accreditation Criteria (AC291)

Summary of AC291:

Section 1 – Introduction

Section 2 – Definitions

Section 3 – Documented Information Submission (Management System Documentation)

Section 4 – Assessments

Section 5 – Contents and Coverage of Inspection Reports

Section 6 – Training

Section 7 – Supervision/Monitoring of Inspectors

Section 8 – Minimum Qualifications for Special Inspectors

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Management System Documentation – What is it?

- **AC291, Section 3.2** Requires documentation showing compliance with the relevant requirements.
- This Management System documentation is designed to ensure that special inspections meet the relevant regulatory and contractual requirements for each project undertaken.
- A company's resume for quality!




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Management System Documentation – Sample Content

- Quality Policy and Objectives**
- Quality Program**
- Organization and Management**
- Organization Chart**
- Communication**
- Inspection, Measuring and Test Equipment**
- Records and Reports Management**
- Document Control**
- Review & Approval of Contracts, Bids and Proposals**
- Procurement of Materials, Supplies and Equipment**
- Materials Management**
- Oversight and Quality Control of Field Operation**


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Management System Documentation – Content (cont.)


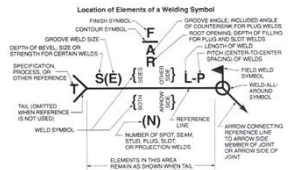

- Staff Training and Qualification
- Continuous Improvement
- Operations Review
- Internal Audits
- Corrective and Preventive Action
- Client Feedback and Complaints
- Management Review
- Reporting Non-conforming Work
- Sub-contracting Special Inspection Work
- Sample Management
- Ethics Policy
- Technical Staff Matrix

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IAS Assessors – People who Assess the Inspection Agencies

- **Experienced** in special inspections, engineering, construction, certifications, accreditations.
- **Knowledgeable** about welding, high-strength bolting, structural steel, concrete, soils, sampling and other special inspection duties.

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Certificate of Accreditation – Page 2



SCOPE OF ACCREDITATION


IAS Accreditation Number	ISA-106
Accredited Entity	Angle Engineering
Address	1605 General Street Las Vegas, NV 89118
Contact Name	David W. Nathan Sr. Vice President
Telephone	702.522.4433
Effective Date of Scope	August 11, 2015

FIELD AND TYPES OF INSPECTION	INSPECTION PROCEDURES AND REFERENCE DOCUMENTS
Concrete Construction - Reinforced	2012 International Building Code, Section 1705.3 and Table 1705.3 (except item 3); and Angle Engineering, Inspection Procedure for Reinforced Concrete, Appendix E
Masonry Construction	2012 International Building Code, Section 1705.4 and Angle Engineering, Inspection Procedure for Structural Masonry, Appendix E
Soils	2012 International Building Code, Section 1705.8 and Table 1705.8, and Angle Engineering, Inspection Procedure for Special Clearing, Excavation and Filling, Appendix E
Wood Construction	2012 International Building Code, Section 1705.5 and Section 5.5 of Angle Engineering Quality Control Manual
Structural Steel - Welding - High Strength Bolting	2012 International Building Code, Section 1705.2 - Welding Inspection AWS D1.1, D1.3 and D1.4 Standard Specification for High-strength steel bolts per ASTM Standards A 325 and A 325U

Page 2 of 2
 ISA-106, Angle Engineering


Scope covers specific types of inspection the company is qualified by accreditation to perform.

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PART 4 – Resources


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Information Online

- Program information
- Accreditation criteria
- Accreditation process
- Rules and procedures
- Applications
- News
- Meetings and events

www.iasonline.org



The screenshot shows the IAS website homepage with a navigation menu on the left and a main content area. The navigation menu includes: Accreditation Search, News Room, Application Information, Accreditation Criteria, International Connections, Training Programs, Guidelines & Policies, Chinese, Deutsch, and Español. The main content area features a 'News' section with several articles, including 'Pacific Accreditation Cooperation Recognizes IAS Management System Certification Body Accreditation Program' and 'IAS is now accepting applications for the Metal Building Assembler Inspection Accreditation Program'. There are also logos for APLAC, IBC-MIRA, IAF, and PAC at the bottom.


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Getting to IAS from ICC Website

www.iccsafe.org



The screenshot shows the ICC website homepage with a navigation menu at the top: About ICC, Membership, Codes & Tech Support, Education & Certification, Store, and Forums. The main content area features several news items, including 'ICC Disaster Response Network Supports Communities Damaged by Natural Disasters', 'ICC voter validation reminder', and 'Applications being accepted for 2015 Standard Bearers Award'. A 'Quick Links' section is visible at the bottom, with a red arrow pointing to the 'International Accreditation Service' link.


1. Bottom of ICC Home Page
2. Click on Link

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QUESTIONS?



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THANK YOU!

<p><u>INTERNATIONAL ACCREDITATION SERVICES (IAS):</u></p> <p>Chuck Ramani, P.E., CBO President, IAS cramani@iasonline.org</p> <hr/> <p>Raj Nathan Senior Vice President, IAS rnathan@iasonline.org</p>	<p><u>BUILDING DEPTS:</u></p> <p>Sam Palmer P.E., CBO Asst. Direct., Clark County, NV palmer@clarkcountynv.gov</p> <hr/> <p>Akshay Mishra Program Mgr., New York SIAs amishra@iasonline.org</p>
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IAS: 562.364.8201, or 866.427.4422, ext. 3309

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