

# Special Inspections, WHAT ARE WE DOING?



**Section 1704 OBC**

**Majed A. Dabdoub, P.E.**

**Cincinnati, Ohio**

**(513) 352-3313**

**Majed.Dabdoub@Cincinnati-  
oh.gov**

# What is *Special Inspection*?

- ◆ Inspection (observing work)
- ◆ Testing
- ◆ Require proper fabrication, installation and placement
- ◆ It is in addition to Inspection by Building Officials and structural observation by (DP)

# Who are the players?

- ◆ Owner
- ◆ Registered Design Professional
- ◆ Contractor
- ◆ Building Official
- ◆ Qualified Special Inspector (or Agency)



## \* Owner

- ◆ Money
- ◆ Retain & pay for Special Inspection



## \* Contractor

Construction

Safe place to work

- • Safe access to (Special Inspection)
- • Quality control

## \* Building Official

- Review plan, Statement of (S.I.), qualifications of (S.I)
- • Issue permits
- • Talk to all parties involved
- • Normal Inspection
- • Issue C. O.



## Special Inspector

- Special inspection and testing
- Submit Statement of Special Inspection & Final Report
- Report discrepancies
- Communicate with all players
- Maintain records
- Review records
- Monitor work
- Paid by the owner or RDP (not) contractor !

## R D P

- Design and prepare Construction Documents
- Inform the owner of the need for the Special Inspection
- Work with all players
- Submit Engineering Changes
- Structural Observation (1709)



## \* Execution of Special Inspection process

- 1) 1) Statement of Special Inspection
  - Identify the project and people involved
  - Schedule of Special Inspection
  - Initiated by (R D P)
  - Reviewed and approved by Building Officials
  - Specifies inspection and testing
- 2) Interim Reports sent by (Special Inspection)
- 3) Final Report of Special Inspection
  - At the completion of the project
  - All recorded problems or deficiencies should be documented as having been addressed.
  - Complete all Special Inspections submitted to the Building Official

## \* Required Verification and Inspection of Steel Construction (Table 1704.3)

- 7 Continuous
- 9 Periodic



**\* Required Verification & Inspection of Concrete Construction  
(Table 1704.4)**

- 5 Continuous
- 5 Periodic

**\* Masonry Construction**

- Design Method

- a) a)Empirical
- b) b)Engineered

- Type of Facility
- a) a)essential
- b) b)non-essential

- Level of Inspection
- a) a)Level 1 - (Engineered / non-essential) and (Empirical / essential)
  - 4 Continuous
  - 15 Periodic
- b) b)Level 2 – (Engineered / Essential)
  - 7 Continuous
  - 9 Periodic



## \* Issues and Concerns

- ◆ 1) Are Code Officials enforcing *Special Inspections* requirements properly?
- ◆ 2) What is actually going on in the field?
- ◆ 3) Are all parties doing what they are supposed to do?
- ◆ 4) Has the liability issue been defined?



## \* Where do we go from here?

- ◆
- ◆ 1) Does the Code cover all requirements?
- ◆ 2) If it is not working, should we get rid of it from the Code?
- ◆ 3) Should we have a national standard for *Special Inspection Forms*?
- ◆ 4) Should ICC take the responsibility to evaluate and publish a list of approved *Special Inspectors* ?
- ◆ 5) Should ICC evaluate and publish a list of approved Fabricators?

# 2006 IBC

## (4) Tier Inspection / Observation

1. Inspection by “Building Official” (Sec. 109)
2. Inspection by “Qualified Special Inspector” (Sec. 109.4 and 1704.1) (This would not necessarily include structural engineers.)
3. Structural Observation by “Registered Design Professional” (Sec. 1709) (This would include structural engineers.)
4. Nondestructive Testing in Seismic Design Categories C – F (Section 1708)

*“Each inspection considered a separate task. . . to be performed by a different qualified person”*



## Material or Product Identification

**Certificate of Compliance** - Certificate stating compliance with specified standards or approved construction documents

**Inspection Certificate** - Identification by an approved agency indicating name of the manufacturer, function and characteristics, and indication of performed inspection and evaluation



## Section 1701

# SPECIAL INSPECTION

- √ **Why...** “to ensure proper fabrication, installation and placement of specific components that require special knowledge or expertise”
- √ In addition to ensuring a proper construction process, the “*special inspector*” is responsible for verifying that specified construction materials are being used in the construction process



## Section 1701 SPECIAL INSPECTION

- ✓ Knowledge and duties of “*special inspector*” differ from that of “*jurisdiction building inspector*” in that their expertise is very narrow in scope yet very specialized . . .hence the term . . . “*special*”



## Section 1702

# SPECIAL INSPECTION

- ◆ **Special Inspection** - Inspection of materials, fabrication, installation, erection or placement of structural elements and connections requiring “special expertise” to ensure compliance with approved construction documents and referenced standards
- ◆ **Continuous Special Inspection** - Full-time observation of work while being performed. . .by an approved special inspector




## Section 1702

# SPECIAL INSPECTION

- ◆ **Periodic Special Inspection** - Part-time or intermittent observation of work while being performed or at completion of work. . .by an approved special inspector
- ◆ **Approved Special Inspector** - Qualified person who shall demonstrate competence to building official for inspection of particular type of construction requiring special inspection

## Section 1704

# SPECIAL INSPECTION

- 
- ◆ **Some key items. . .**
    - √ Owner or Registered Design Professional to employ Special Inspector
    - √ Special Inspector to be qualified and demonstrate qualifications to building official for type of construction requiring special inspection
  - ◆ **Employed by whom - Special inspectors. . .** as required by code to perform special inspections. . . to be employed (paid) by “owner or registered design professional” (not contractor)



## Section 1704

# SPECIAL INSPECTION

- ✓ Special inspection to be in addition to those performed by building official
- ✓ Special inspection not required for . . .
  - minor work when approved by building official
  - work performed by an “*approved fabricator*”



# Building Permit Requirement (Section 1704.1.1)

## Special Inspection Program. . .

- √ Generally Prepared by “*Registered Design Professional*”
  - part of submittal documents
  - condition for permit issuance
  - designate special inspection work
  - name individuals/firms to perform special inspection
  - outline duties of “*Special inspector*”



# Building Permit Requirement

Final approval by building official

*Note. . . “Registered Design  
Professional” responsible for Special  
Inspection Program*



## 1704.1.2 Report Requirement

### Duties of “Special Inspector” . . .

- review structural details and perform inspections to verify compliance with approved construction documents
- keep accurate records of inspections
- furnish inspection reports to building official and registered design professional



## 1704.1.2 Report Requirement

notify contractor of observed discrepancies for correction

- notify building official and registered design professional of uncorrected discrepancies
- submit final inspection report to building official and registered design professional



## 1704.2 Inspection of Fabricators

Special inspection required for shop fabricated items

√**Except. . . “*Approved Fabricators*”**

“Fabricator has an approved independent inspection or quality control agency to conduct periodic in-plant inspections that ensure conformance with the agency’s approved quality control program”



## Inspection of Fabricators

*Approved Special Inspection Agency*” to notify building official of any change in workmanship and quality control

- Fabricator to submit “*Certificate of Compliance*” to building official at completion of shop fabricated items



## 1704.2.2 Approved Fabricator

*Approved Fabricator*” defined as an established and qualified person, firm or corporation approved by building official

- “
- written procedural and quality control manuals
  - joint auditing of fabrication facilities with approved inspection agency

# IBC SECTION 1706

## WIND “QUALITY ASSURANCE”

### PLAN

The wind quality assurance” provisions will provide specific requirements for inspection of conventional construction and residential structures. . .which account for a high percentage of property loss due to high winds!”

Why: “high winds kill more Americans and destroy more property than any other natural disaster. . . including earthquakes.

Cause: lack of attention to wind-critical details, especially connections. This is particularly true for residential buildings.



# Special Inspection

**Other” types of work requiring Special Inspection. . .**

## **Wood construction**

- shop fabrication of wood structural elements and assemblies

## **Soils**

- site preparation, fill placement, in-place density, load bearing requirements

## **Pile foundations**

- in accordance with Section 1704.8 of the 2003 IBC



## Special Inspection Cont'd.

### Pier foundations

- in accordance with Section 1704.9 of the 2003 IBC (only for Seismic Design Categories C – F)

Special uses such as **Architectural wall panels/veneers**

- buildings assigned to Seismic Design Categories E and F



## Special Inspection

### **Sprayed fire-resistant materials (Section 1704.11)**

- structural elements and decks
- thickness/density/cohesion/adhesion. . .to be determined by ASTM. . .E 605 and E 736
- thickness testing shall be performed on a minimum of 25% of the structural members

### **Exterior insulation and finish systems (EIFS) (Section 1704.12)**

**Special cases. . .as determined by building official  
(Section 1704.13)**

## IBC Section 1705

# SEISMIC “QUALITY ASSURANCE” PLAN

Why... “post earthquake damage reports indicate that many cases of severe damage and collapse could have been prevented by better construction practices through improved quality assurance”

“Seismic design provisions of the IBC rely heavily on the concept of quality control to ensure adequate performance of the seismic-force-resisting system during earthquake events”



# IBC Section 1709 & UBC Section 1702 STRUCTURAL OBSERVATION

Why... “to ensure that structural system is constructed in general conformance with construction documents”

✓ **Structural observation. . .**

- Performed by “*Registered Design Professional*”
- Provided for structures assigned to Seismic Design Categories D, E, & F. . .under specific conditions
- Provided to structures with design wind speed greater than 110 mph. . .under specific conditions



# STRUCTURAL OBSERVATION

Provided when specifically requested by registered design professional or building official

- Visual observation of structural system for compliance with approved construction documents
- Performed at significant construction stages and at completion of structural system



# STRUCTURAL OBSERVATION

- ◆ **Note.** . . .Structural Observation does not waive inspections required by the code!



# CHANGES 2006 IBC

- ◆ TABLE 1704.7 SOILS 1 CONT. 4 PERIOD.
- ◆ TABLE 1704.8 PILES
- ◆ TABLE 1704.9 PIERS
- ◆ 1705 STATEMENT OF SI
- ◆ 1706 STATEMENT OF SI
- ◆ 1708 SI FOR M&E COMPONENTS
- ◆ 1708.5 SEISMIC QUALIFICATION OF M&E EQUIPMENT