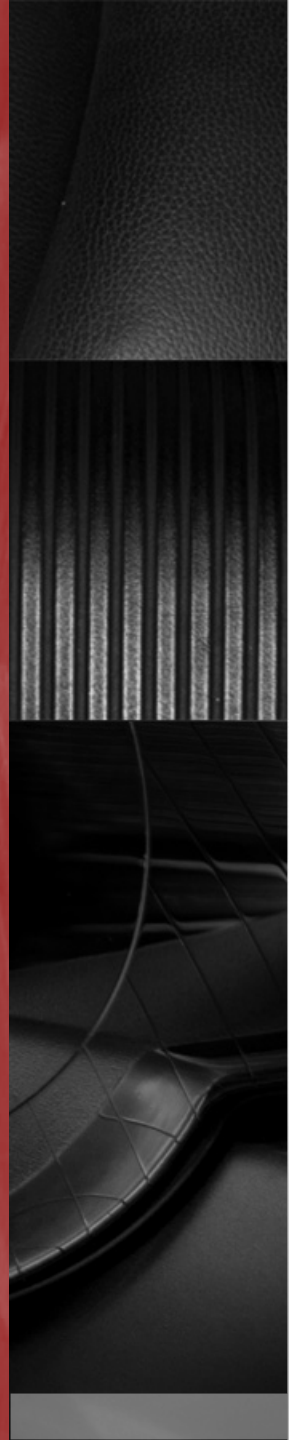


Introduction to Building Code Inspections on VA Tech Properties.

Presented by
*the VA Tech Office of the University Building
Official.*





Before we begin....

- This presentation should run 45-60 minutes
- Time for questions will be provided during the last 15 minutes.
- Please turn off all cells/pagers/etc.
- Please sign in
- There will be a test and record of certification

Change is the Key to the Future



Past Practice at VT is not
the model for the future.



Observations of the Past

- Code Inspections generally limited to State Fire Marshall
- Many reports appear to be “received and filed” with little VT oversight or review of results
- Effectively, no building code inspections (No Building Code Official on Campus)
- Construction Inspection, Special Inspection, Misc. Inspections generally comingled, poorly understood and not in compliance
- Minimal to ineffective outdated special inspection program
- Minimum construction inspection
- Work is often Contract/Contractor Driven (vs. quality or compliance driven)



Basic Definitions

- Construction Inspections



Basic Definitions

- Construction Inspections
- Code Inspections



Basic Definitions

- Construction Inspections
- Code Inspections
- Special Inspections



Basic Definitions

- Construction Inspections
- Code Inspections
- Special Inspections
- Third party independent inspections

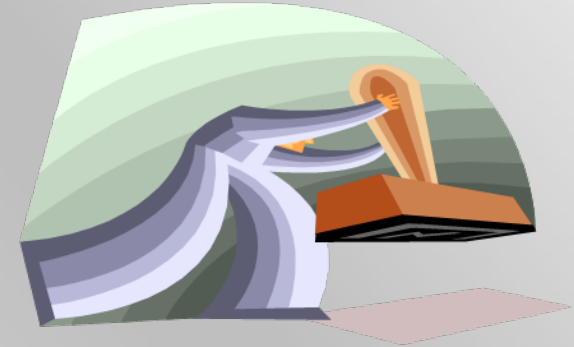


Basic Definition

- Construction Inspections
- Code Inspections
- Special Inspections
- Third party independent inspections
- Fire Code Inspections

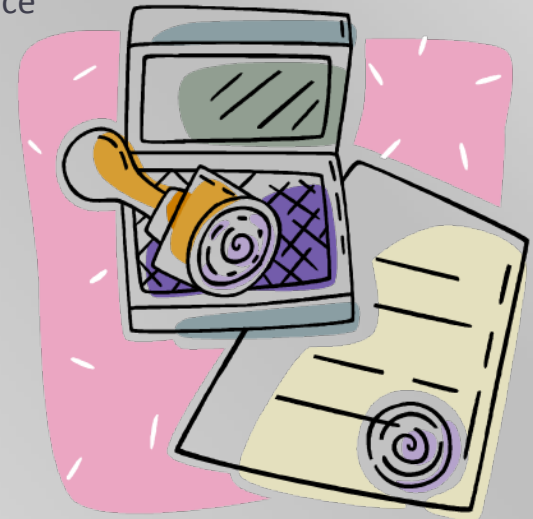
Document Hierarchy

- Construction drawings
- Specifications
- Shop Drawings as approved by the RDP
- OEM Documentation



Documents

- Must be using for referring the documents approved and stamped by UBO office
- UBO approved documents must be on site
- RFI must be submitted, reviewed, and approved by UBO prior to inspection.
- Approved RFI is to be made part of approved construction drawings
- OEM documents need to be on site for review





Construction Inspections

- Normally related to the requirements of contract payments, milestones, contractor coordination, Owners due diligence or better business practice by the project team

Examples:

Roof Coring

Roof Thermograph

California Bearing Ratio Test



Building Code Inspections

- Specified in VUSBC Section 113
- Several specific types of inspections
- Can be done, and in large projects normally done, as a series of partials that comprise the total as elements are ready
- Trades (Mechanical, Electrical and Plumbing) break into separate rough in and finals as well as partials



Special Inspection

- Specified in VUSBC Section 1704
- Been in building codes since late 70's
- Focused on structural elements because of past building failures due to “value engineering” efforts
- A birth-build process for structural elements (and other issues added more recently)
 - Fabrication Plant Certification
 - Documents (Design drawings, shop drawings, mix designs, etc.)
 - Material Certification
 - Fabrication Certifications
 - Proper Material Received
 - Welder and Contractor Certifications
 - Materials installed correctly
- New Program for 2009 (per approved construction drawings) VUSBC Code Cycle
- BCOM Program is poorly defined and very outdated
- Past Practice/Program misses a lot of issues and adds unnecessary items as “SI”




Third Party/Independent Inspection

- Used to fill gaps due to schedule
- Used to address special or unique cases or design elements
- Need prior discussion/written approval by University Building Official if it is to be applied to code issue or inspection.
- Any inspection done for the due diligence contract administration, etc. can be done without the UBO authorization.



Fire Code Inspections

- Managed by Deputy State Fire Marshall or State Fire Marshall
- Separate State Organization and Line of Authority
- Done independent of UBO in some cases
- Done in cooperation with UBO in some cases limited
- Some limited crossover in Building and Fire Code Inspections
- Building code more applicable in construction phase
- Fire code more applicable after CO is issued



Putting Aside the Construction, Special, Independent and Fire Inspection, What are the required building code inspections?

Based on VUSBC Section 113.2

1. Footings
2. Foundations
3. Prep Work for Concrete
4. Structural Members and Fasteners
5. Mechanical, Electrical, Plumbing
6. Energy Conservation
7. Final
8. Per VUSBC Section 113.3, Additional inspections as required to verify General Conformance
9. Per VUSBC Section 113.4, in plant and factory inspection



How does that get applied here at VA Tech?

Required Inspections:

- Footings
- Foundation
- Framing (this will include heavy and light gauge steel framing, steel joists, steel decks, rated assemblies, penetrations and insulation)
- Mechanical (this will include rated assemblies, penetrations)
- Electrical (this will include rated assemblies, penetrations)
- Plumbing (this will include rated assemblies, penetrations)
- Final (this will include accessibility and commissioning issues)

How does this Code Inspection Process work in detail?

Footing/Foundations Inspections

- Work in field must meet the design documents – no exception. Contractor can not deviate from design documents without RFI authorization or equivalent documentation
- Trench is open, forms and reinforcement is in place, have geotechnical inspect and leave report, The SI shall inspect and leave report and THEN UBO will inspect. If rejected, fix and call for re-inspection. If pass call for concrete.
- Can do as partials as elements are ready
- Masonry follows same process
- Underslab inspections may also be required (if they exist in design)
- SI can not recommend an alternate design



How does this Code Inspection Process work in detail?

Masonry

- Inspection of lifts
- Have wall ties and all reinforcement in place
- Have plates and beam seats in place or ready to place with grout



How does this Code Inspection Process work in detail?

Framing Inspections

- Column Stud, Beam Joist, size and material
- Column Stud, Beam Joist, placement, attachment (bolted/welded)
- Bracing
- Anchorage
- Fire rated assembly details
- Sound rated assembly details
- Insulation
- Above ceiling inspections
- Framing is in place, secure
- Connections are visible
- SI can not recommend alternate designs
- Contractor can not deviate without prior documentation (RFI) that has been reviewed and approved for conformance to the VUSBC.



How does this Code Inspection Process work in detail?

Mechanical/Electrical/Plumbing Inspections

- Conduits, pipes and ducts are rough in and observable
- Conductors, fixtures and equipment are in place and can be observed
- Pressure and load tests are ready
- Prior to and after insulation is installed



Final

- All prior inspections are complete
- All Special inspections are complete
- The A & E has verified the project is complete and in conformance
- Preliminary tests of equipment and systems are complete and ready to past inspection.
 - Fire Systems
 - Security Systems
 - Plumbing Systems
 - Mechanical Systems
- Where the State Fire Marshall is involved, we prefer to coordinate our inspections.



Note the UBO office is not going to create a punch list for the project. We will conduct our inspection up to the point that it is clear the building is or is not ready for inspection. A significant number of failures will result in a termination of inspection without the inspection completed.



But what if.....

Changes in the project occur due to:

- Problems in the design
- Problems in the construction
- Problems in the supplies for materials
- Change in scope or use
- Budget issue



But what if.....?

Issue a change order or an RFI – Get documents for Review and approval



But what if.....?

We fail to call for an inspection?



But what if.....?

We have a problem. Possible outcomes are:

- Complete or partial demolition to exposure
- Additional third party testing
- Additional time to collect documentation to prove and demonstrate compliance



The Change.....

- BCOM too far away to efficiently manage details, VT now the Authority Having Jurisdiction (AHJ)
- Full suite of code required inspections will be conducted
- UBO on site and can address details
- From “no or few” building code inspections to the “full suite”
- Past inspections jumbled and done “selectively” with little documentation of results will be parsed and reviewed for oversight, omissions and compliance information
- Approved construction documents on site
- Construction will be held strictly to construction documents
 - Details altered or not adhered in field without RDP involvement and approval
- No longer will issues of construction be Contractor and Sub-Contractor driven as it has become
- Better Schedules and planning will be required



The Change.....

- Document & Code Driven
- VT Driven
 - Contractor must do more scheduling for tests and inspections
- Non Code related inspection and issues need to be handled outside Code Officials office



Results

- Attention to Detail
- More RFI's are expected to get the A/E to address issues during construction
- Contractor/PM will need to plan for inspection
- Contractor/PM will need to get, review and submit documents to UBO office
- Additional contracts possible due to separation and better definition of professional testing services
- Improved identification of the costs of special tests versus construction. Tests and potential areas to reduce cost through better oversight.
- Better Construction and Management Outcomes



Recap Steps

- Understand

- Big Picture
- Concepts of Inspection
- Terms and Nomenclature
- Code Basics and Application

- Re-Orient

- Re think services from A/E
- Rethink services from inspectors
- Focus on documentation

- Coordinate

- Project Manager
- A/E Services
- Test Agency Services
- Contractor

- Manage

- Contracts
- Process
- Schedule
- RFI's
- Reports

Recap

- Separate the processes of inspections into the four categories
- Define required inspections for each project based on the project
- Contract for any construction inspections not being done in house
- Contract for special inspections as a program, not a series of individual tests



Recap

- PM or Designee Shall call for Code Inspections prior to work being covered up
 - 24 hour notice for all inspections
 - The failure to be ready will result in a rejection and re-inspections (no sooner than the next day)
- PM or Designee Shall have special inspection done just before building code inspection
- PM or Designee Shall review all inspection reports for deviations, potential RFI's, potential back charges and incorrect schedules
- PM or Designee Shall plan and schedule for inspection. The Code Inspector is not there to create a punch list, we may terminate the inspection at any point of rejection based on our schedule and magnitude of this issue
- We will look for the permits and approved documents and related RFI's on site. Failure to have these available is cause for a rejection and termination of the inspection requiring a re-inspection.

Note the, Project Manager's or permit applicants must read and review all RFI's, inspection reports, submittals, etc. Our office will mark up and/or reject any inspection report that fails to clearly describe the inspection and results.

