

SPECIAL INSPECTIONS MANUAL
CITY OF RICHMOND



From 2003 IBC
Effective November 16, 2005

Adopted by Virginia Uniform Statewide Building Code

Administered and Enforced by

CITY OF RICHMOND, VIRGINIA
DEPT. COMMUNITY DEVELOPMENT
BUREAU OF PERMITS AND INSPECTIONS

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Figure 1.1 Richmond Center

Overview

Inspection, Special: Inspection as herein required of the installation, fabrication, erection or placement of components and connections requiring special expertise to ensure compliance with construction documents and referenced standards- IBC definition

Special Inspections was first introduced as code text in the 1990 edition of BOCA and albeit new in the realm of code enforcement, relatively speaking it is not a concept new to the building code. The idea stems from the former process of combining code text with referenced standards. For example, testing agencies and individuals responsible for inspection and testing of concrete and masonry in “critical structures” utilized ACI 318 and ACI 530/ASCE 5/TMS 402, respectively, with any applicable building code text from the local jurisdiction having authority.

Now that we have defined the term and its genesis, we can take it a step further with the analysis of *special inspections* as a *process* centered around three critical components. The first deals with the adequacy of **materials**. *Are the building materials suitable for what’s being built?* Next, after the suitability of materials is established, attention should be placed on the **fabrication** of these materials. *How are we monitoring the fabrication of these items and their procedures?* Ensuring that the fabricator (e.g. structural steel, structural precast) maintains good quality control and conforms to approved construction documents is essential. Third, of equal if not greater significance are the project’s **construction techniques**. *What good are the materials and quality control if the construction is not congruous with the approved documents and safe construction practices?* This is the part in the process where means and methods come into play particularly with the larger, complex structures. It is paramount that special inspections does precisely what it was set up to do, which in great part is to improve communication with all involved in design and construction, particularly the structural engineer and

special inspector, thereby helping to prevent and minimize any construction deficiencies discovered via testing and inspection. After all, the whole process itself was established upon this very premise. As a result, we can pre-empt those (untimely and unfortunate) catastrophic failures that have occurred in the industry from happening again.

Hence, this notion becomes a key objective in the City of Richmond's enforcement of the IBC's special inspection requirements as adopted by the Virginia Uniform Statewide Building Code. For this very reason we take the "proactive" approach in dealing with matters pertaining to special inspections as opposed to the "reactive" i.e. post Bailey's Crossroads in Fairfax, the Meridian Building in Philadelphia and, most recently, the almost inevitable fireproofing impact code changes as a result of the September 11 World Trade Center collapse. The process really begins as soon as the owner selects the special inspector, after which we set up the required Special Inspections meeting. This conference serves to facilitate the process by bringing all parties together to establish lines of communication, outline the scope of special inspections, identify each person's role and responsibility within the process as well as touch on any other pertinent issues such as project phasing and how it will impact the owner obtaining that very important final document--the certificate of occupancy. The end result is everyone leaves the meeting with a clear understanding of the City's requirements for special inspections and what they have to do to make sure they're being met.

Moreover, it is our objective that the collaborative effort of the project design team communicating and working closely together with the City of Richmond and its Special Inspections Program from the initial meeting to the final inspection for Certificate of Occupancy, will be conducive to designing and building a safe project during construction; consequently, the owner gains an overall sound and completed structure that withstands the test of time and, in the grand scheme of things, contributes overall to the shared City and community mission of transforming Richmond into a "world class city."

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II. SPECIAL INSPECTIONS CRITERIA

MEMORANDUM

TO: Design Professionals, Owners, Contractors
FROM: Inder Midha, P.E. Engineer III
RE: SPECIAL INSPECTIONS CRITERIA
SUBJECT: **When *Special Inspections* is required in the City of Richmond**
DATE: MAY 11, 2004

As part of the City's effort to implement the Special Inspections Program we have attempted to identify exactly when special inspections are required so that the designers and building owners will know whether or not it is applicable to their project.

We have outlined in the **CSI** format those conditions that shall fall under the guidelines of special inspections per IBC 2000 ed. sec. 1704.0

2.20 DIVISION 2

02000 SUBSURFACE INVESTIGATION

- The owner shall provide a geotechnical report for all new commercial, industrial and multi-family buildings and structures.
- All buildings and structures designed with deep foundations
- All building and structures located in the boundaries identified and "problem soil areas" (see Richmond area shrink-swell map)

02100 SITE PREPARATION

The following earth retention systems with building foundations with more than ten feet of unbalanced fill shall be subject to special inspections:

02160

- Shoring & Underpinning
- Soldier Beams and Piles
- Lagging
- Tiebacks
- Sheet Piling(Steel, Timber, Precast)
- Slurry Wall
- Retaining Walls

02200 EARTHWORK

Excavation, fill placement and compaction for footings shall be subject to special inspections per IBC 2003 sec 1704.7

Exception: No special inspections required during placement of fill < 12” deep

- All footings within prepared structural fill

02350 PILES & CAISSONS

When a building or structure, regardless of height, is designed with deep foundations such as piles, caissons and drilled piers, special inspections are required per IBC 1704.8

DIVISION 3

03000 CONCRETE

In any building greater than three stories in height, concrete work shall be subject to special inspections with the exception of the examples listed in sec 1704.4 of the IBC 2003.

03300 CAST IN PLACE CONCRETE

3310 All structural concrete in buildings greater than 3-stories

3365 All post-tensioned concrete regardless of size

3366 All formwork/stripping and shoring/reshoring as determined by Code Official

03400 PRECAST CONCRETE

All structural precast construction in buildings greater than three stories shall fall under special inspections., which includes erection and connection of structural members.

3430	Structural Precast Lift-Slab
3431	Tilt-Up Precast
3432	Hollow-core slabs

DIVISION 4

04200 MASONRY

All Masonry designed in accordance with IBC 1704.5 and ACI 530/ASCE 5/TMS 402. depending on whether or not the building or structure is classified as an “essential”(buildings that are intended to remain operational in the event of environmental loading from flood, wind, snow or earthquake) or “nonessential” facility and the type of masonry design as “empirical” or “engineered.”

Exceptions: listed in IBC 1704.5

DIVISION 5

05100 STRUCTURAL STEEL

The following components, regardless of height, shall be subject to special inspection:

- Fabrication Procedures(ref. IBC 1704.2, 1704.3)
- Steel Trusses and Open Webbed Bar Joists(excluding those manufactured in accordance with SJI specifications)
- Plate Girders > 25 linear ft.
- Tensile Structures(excluding tents & other lightweight structures)
- Metal Stairs connecting more than two stories
- Space Frames
- Shear(Nelson) stud welds

The following are only applicable in buildings greater than 3 stories:

- Installation of High Strength Bolts A325/ A490(ref. IBC 1704.3.3)
- Welding
- Steel composite floor/ roof metal roof deck
- Open –Web joists

DIVISION 6

6100 WOOD CONSTRUCTION

IBC section 1704.6. Special inspection of fabrication process of prefabricated wood structural elements and assemblies.

IBC section 1704.6.1 Fabrication of high-load diaphragms.

DIVISION 7

7100 MOISTURE & PROTECTION

In buildings greater than three stories, protection on concrete and masonry walls shall be covered under special inspections or where the building foundation requires it.

- Waterproofing
- Dampproofing
- Drainage

7240 All Exterior Insulation and Finish Systems (EIFS) applications with exceptions:
EIFS applications installed over a water-resistive barrier with a means of draining moisture to the exterior.
EIFS applications installed over masonry or concrete walls

7250 Inspection and testing of all Sprayed Fireresistive Material(SFRM) of structural members for compliance with IBC 2000 sec. 1704.11 conformance with approved specified UL(or other approved agency) details and construction documents. Inspections include but are not limited to thickness, density and bond strength

DIVISION 15

SMOKE CONTROL

Compliance with IBC section 1704.14

**Furthermore, the City of Richmond requires special inspections per the Virginia Statewide Building Code, on any unique or unusual design cases as well as alternative methods of construction.(ref IBC 1704.13). The Building Official may also have the discretion to require special inspections on any given project, despite not meeting criteria set forth, under special circumstances.*

III PROCEDURAL/PERMIT REQUIREMENTS

PERMIT DOCUMENTS: The following documents shall be submitted to City for approval prior to permit issuance:

- 3.1 STATEMENT OF SPECIAL INSPECTIONS. IBC 2003 1704.1.1** The permit applicant shall submit a statement of special inspections prepared by the registered design professional in responsible charge in accordance with 111.2(VUSBC) as a condition for permit issuance. This statement shall include a list of materials and work requiring special inspections by this section, the inspections to be performed and a list of the individuals, approved agencies or firms intended to be retained for conducting such inspections

- 3.2** This document, prepared by permit applicant shall include Project Name, Address, assigned permit number, Group, Construction Type, and all project Design Professionals including the Architect of Record(AR), the Structural Engineer of Record, Geotechnical Engineer of Record, and the Special Inspector Engineer of Record. As well as the General Contractor. Signature of Preparer and Owner/Owner’s Rep. is also required for Building Official acceptance (see attached form)

- 3.2 SCHEDULE OF SPECIAL INSPECTIONS.** This detailed outline should be done in the format of the enclosed City form. It shall include Inspection Category (e.g. Structural Steel, Masonry, Concrete) and the types of inspections to be performed as well as inspection frequency. Also include the applicable Referenced Standards (e.g. ACI 318, ASTM C 43, UL #D771), the applicable IBC code section and the Completion date of each of the categories.

- 3.3 OWNER’S LETTER.** Owner or Owner’s rep shall furnish City with letter clearly identifying who has been hired as Special Inspector. The letter shall further indicate that the special inspector will be paid by the owner, not the General Contractor, and that they are separate from the GC.

- 3.4 RESUME OF SPECIAL INSPECTOR**

- 3.5 RESUME OF TESTING AGENCY OR LABORATORY**

- 3.6 TECHNICIANS.** Supply names of all technicians who will be performing the various inspections and tests. Also include copies of relevant certificates. These technicians shall only perform inspections in the areas where they have demonstrated competency through a recognized program.

IV **GENERAL REQUIREMENTS**

- 4.1** **NOTIFICATION OF INSPECTION.** Contractor shall notify special Inspector for all required inspections; in addition, GC or subcontractor shall notify City prior to all concrete placement via written pour schedule or normal inspection request procedure.
- 4.2** **DAILY REPORTS.** Special Inspector shall leave a copy of each inspection on an inspection report form that shall be placed daily in a folder at the jobsite construction office. These reports should be available for review by City Code Official or Designer of Record.
- 4.3** **TEST REPORTS.** City shall be included on distribution list to receive and review all testing reports within 7 days of test date. This applies to every inspection item(e.g. concrete, structural steel, fireproofing, etc).
- 4.4** **SUMMARIES.** SIER shall prepare a brief summary biweekly highlighting the project’s main activities and issues pertaining to special inspections. The bi-weekly summary shall be sent to the City Building Official.
- 4.5** **CONFORMANCE AND DEFICIENCIES. 1704.1.2** “Reports shall indicate that work inspected was done in conformance to approved construction documents. Discrepancies shall be brought to the immediate attention of the contractor for correction. If the discrepancies are not corrected, the discrepancies shall be brought to the attention of the building official and to the registered design professional in responsible charge prior to the completion of that phase of the work” GC’s Failure to abate code violations or correct deficiencies within reasonable time manner will result in issuance of Stop Work Order and possibly Notice of Violation and/or fine. Likewise, failure of special inspector to submit required reports to city will result in Stop Wok Order.
***Moreover, any reports with language such as “appeared to conform with documents” will not be accepted.**
- 4.6** **FABRICATOR INSPECTION IBC 1704.2** Where fabrication of structural load-bearing members and assemblies is being performed on the premises of a fabricator’s shop, special inspection of the fabricated items shall be required by this section and as required elsewhere in this code. All structural elements fabricated on the premises of the fabricator’s shop shall require special inspection to ensure items being fabricated with the efficacy as it was designed. Furthermore, special inspector shall conduct on site plant inspections to ensure quality control procedures are up to par. The special inspector shall review the procedures for completeness and adequacy relative to the code requirements for the fabricator’s scope of

work. The in-plant inspection report shall be sent, after review of Engineer of Record, to City Code Official. For those fabricators who maintain certification with a recognized quality control agency such as **AISC**, **PCI** or **SJI**, up to date copies of these certifications shall be accepted in lieu of the special inspection of the plant.

- 4.7 FABRICATION & ERECTION DOCUMENTS.** All Shop Drawings shall be reviewed and affixed with shop stamp by the Architect/Engineer of Record. In addition, a cover letter signed and sealed from the appropriate designer of record shall accompany each structural steel, elevated concrete/formwork submittal(see enclosed sample) These approved shop drawing will be used by the Special Inspector and the code official and any submittal without the cover letter or review stamp will be rejected.
- 4.8 REVISIONS.** All addenda or amendments to the original approved construction documents which are regulated by the building code, zoning ordinance or City code shall be submitted to the code official for review in a timely manner. Those changes, typically those that affect building layout, elevation, encroachment or are historic must be brought in for review by all appropriate agencies. Any architectural or structural changes deemed minor in nature can be submitted directly to the code official. (Revision fees should be discussed between the City and the GC prior to permit issuance for clarification.) The building code official can review such changes on sketches, bulletin sheets, RFI responses and whole sets of drawings as long as they indicate the designer of record's authorization. Check with electrical, plumbing and mechanical divisions for their policies on revised drawings. The City and the Special Inspector will only perform inspections off of up to date approved construction documents. Failure to submit changes to City will result in Stop Work Orders, disapproval of the inspection, and delays in the project.
- 4.9 COMPLETION REPORTS.** Immediately upon completion of special inspections and testing for a particular construction Special inspector shall submit completion reports signed and sealed by the SIER and signed by the designer of record then submitted to the Building Official
- 4.10 FINAL REPORT.** Upon completion of all testing and inspections pertaining to special inspections, the special inspector shall, verify all outstanding issues are resolved, obtain sign off from the Engineer of record, and submit signed and sealed copy of Final Report to Building Official.

V. EARTHWORK.

- 5.1 SOILS REPORT.** Where required by V.U.S.B.C., the GER shall prepare a soils report based on subsurface investigation. GER shall sign and seal report before submitting to City prior to permit issuance.
- 5.2 SOILS & SITE PREPARATION.** Special inspections on existing soil conditions, fill placement(prior and during) and load-bearing requirements shall be followed and the approved soils report used to ensure compliance.
- 5.3 PREPARED FILL.** Because of the soil's significance to a building's structural integrity, close attention should be paid to soils particularly when the building or structure foundation sits on prepared fill. IBC 2003 sec 1803.5 requires the soils report to include the following:
1. Specifications for the preparation of the site to receive the fill.
 2. Specifications for material to be used for the fill.
 3. Test method to be used to determine the maximum dry density and optimum moisture content of the fill material.
 4. Maximum allowable thickness of each lift of compacted fill material.
 5. Field test method for determining the in-place dry density of the compacted fill.
 6. Minimum acceptable in-place dry density expressed as a minimum percentage of the maximum dry density determined in accordance with item 3.
 7. Number and frequency of field tests required to determine compliance with item 6.
- Exception:** Compacted fill material less than 12 inches in depth need not comply with an approved report, provided it has been compacted to a minimum of 90% Modified Proctor in accordance with ASTM D 1557. The compaction shall be verified by a quality inspector approved by the building official.
- 5.3 TESTING AND INSPECTION.** Special inspector shall check site prior to fill placement to ensure site preparation is conformance with approved construction documents. Additionally, fill material and lift placement shall be checked for conformance with approved documents. Contractor

shall notify special inspector to conduct all required dry density tests of compacted material.

5.4 PILE FOUNDATIONS. Special inspections of all pile foundations shall comply with IBC 1807.2.22

5.5 DEMOLITION. On all projects with building demolition, grading, compaction and other earthwork and the testing thereof which is beyond the scope of the demolition permit shall not begin without notifying the code official.

5.6 REPORTS. Special inspector shall leave all daily reports jobsite office and submit **earthwork completion** report to code official with seal and signature of Geotechnical Engineer of Record.



Fig 1.2 Riverside Village Residential Tower over Micropiles

VI. GENERAL CONCRETE

- 6.1 APPROVED DOCUMENTS** All concrete inspections conducted by City or Special Inspector shall be done with current approved construction documents. In addition to city stamped contract drawings, approved shop drawings w/ appropriate design professional review stamp and cover letter will be used for inspections.
- 6.2 FORMWORK.** A Registered Design Professional shall prepare and seal all fabrication and erection drawings for concrete formwork of all structural elevated concrete. Drawing shall clearly detail formwork stripping criteria, shoring and reshoring diagrams, and all applicable load calculations. *No elevated form removal is permitted until authorized by the SIER.* Separate copy of approved documents shall be submitted to city for review. General formwork shall be inspected for compliance with Section 6.1 of ACI 318. And 1906 of 2000 IBC
- 6.3 POST-TENSIONING.** SER approved fabrication and erection drawings shall be submitted to city signed and sealed in the same manner as formwork submittals. Inspections shall be performed to ensure compliance with all approved construction documents and Section 18.18 of ACI 318.
- 6.4 MIX DESIGN.** Copy of approved concrete mix designs shall be sent to code official before initial pour.
- 6.5 QUALITY CONTROL.** Special inspector shall conduct an initial batch plant inspection prior to any placement and submit report of findings to city. For structural pre-cast concrete, up to date PCI certifications shall be submitted to code official in lieu of plant inspection.
- 6.6 INSPECTION & NOTIFICATION.** Contractor is responsible for making certain all footings and foundations are inspected and concrete is tested. Special inspector shall be given proper notice for inspections and city shall be notified for all concrete pours as well; however, the special inspector is the primary concrete inspector since the city inspector will not be able to inspect every pour.
- 6.7 SIER TESTING.** All testing and frequency by special inspector shall be done in strict accordance with the applicable standards, ASTM, UL, ACI etc, listed in the inspection checklist.

6.8 POUR SCHEDULE. Contractor shall post pour schedule at jobsite office and update code official weekly with scheduled concrete activity via fax, telephone or e-mail.

6.9 CONCRETE VERIFICATIONS Refer to attached Table 1704.4 for required concrete inspections:

TABLE 1704.4				
Required Verification of Concrete Construction				
VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REF. STANDARD	IBC SEC.
1. Inspection of reinforcing steel including Prestressing tendons and placement	–	X	ACI 318; 3.5, 7.1-7.7	1903.5, 1907.1 1907.7, 1914.4
2. Inspection of reinforcing steel welding in accordance w/ Table 1704.3 item 5B	–	–	AWS D1.4 ACI 318: 3.5.2	1903.5.2
3. Inspect bolts to be installed in concrete prior to and during placement where allowable loads have been increased	X	–	–	1912.5
4. Verifying use of required design mix	--	X	ACI 318: Ch.4 5.2-5.4	1904, 1905.2-1905.4, 1914.2, 1914.3
5. At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	--	ASTM C 172 ASTM C 31 ACI 318: 5.6, 5.8	1905.6, 1914.10
6. Inspection of concrete and shotcrete placement for proper application techniques.	X	—	ACI 318: 5.9, 5.10	1905.9, 1905.10, 1914.6, 1914.7, 1914.8
7. Inspection for maintenance of specified curing temperature and techniques.	–	X	ACI 318: 18.16.4 5.11-5.13	1905.11, 1905.13 1914.9
8. Inspection of prestressed concrete: a. Application of prestressing forces b. Grouting of bonded prestressing tendons in the seismic -force Resisting system	X X	–	ACI 318: 18:20 ACI 318:18.18.4	–
9. Erection of precast concrete members	-	X	ACI 318: Ch. 16	-
10. Verification of in-situ concrete strength, prior to stressing of tendons in posttensioned concrete and prior to removal of shores and forms from beams and structural slabs.	–	X	ACI 318: 6.2	1906.2
11. Inspection of concrete formwork, shoring and re-shoring	–	X	ACI 318: 6.1, 6.2	1906

- 6.10 COLD WEATHER PROVISIONS** SIER shall ensure concreting compliance for cold weather per ACI 306R if after three consecutive days the average daily temperature is below 40 degrees Fahrenheit or the concrete temperature falls below 50 degrees Fahrenheit. Adequate curing shall be adhered with a 50 degree F temperature maintained for (7) days or (3) if high early strength is used. Special inspector shall maintain temperature log
- HOT WEATHER REQUIREMENTS 1905.13.** During hot weather, proper attention shall be given to ingredients, production methods, handling, placing, protection and curing to prevent excessive concrete temperatures or water evaporation that could impair the required strength or serviceability of the member or structure.
- 6.11 CONCRETE DEFICIENCIES.** All concrete deficiencies shall be corrected prior to placement and verified by SIER with the exception of those of greater magnitude which require a fix by the SER. SIER shall maintain a log documenting all deficiencies and when they were corrected. **ALL LOW CONCRETE 28-DAY BREAKS** shall be submitted to code official with SER recommendations. Acceptance of 56 day breaks shall also be accompanied by approval letter from SER.
- 6.12 COMPLETION REPORT** Immediately after concrete work is completed and all deficiencies resolved, SIER shall prepare concrete completion report with seal and signature and SER review signature to submit to city for Building Official approval.

VII STRUCTURAL STEEL

7.1 STEEL FABRICATION. Prior to any structural steel erection, SIER shall perform inspections of steel fabricated items with the exception per IBC 1704.3:

“Exception: Special inspection of the steel fabrication process shall not be required where the fabricator does not perform any welding, thermal cutting or heating operation of any kind as part of the fabrication process. In such cases the fabricator shall be required to submit a detailed procedure for material control which demonstrates the fabricator’s ability to maintain suitable records and procedures such that, any time during the fabrication process, the material specification, grade and mill test reports for the main stress-carrying elements and bolts are capable of being determined.

7.2 QUALITY CONTROL. To ensure that the fabricator maintains detailed fabrication and quality control procedures that provide a basis of control for workmanship, ability to conform to approved construction documents and referenced standards, SIER shall conduct fabricator in plant inspections.

- The fabricator may demonstrate to the SIER compliance with fabrication procedures by providing a current copy of AISC certificate or its equivalent.
- SIER shall furnish code official with written report that fabricator is implementing and maintaining proper fabrication procedures. This may be from current project or within twelve months of report.

7.3 FABRICATION AND ERECTION DOCUMENTS. SER shall approve steel shop drawings that shall either be submitted to code official or left at jobsite office for review. Documents shall include affixed shop stamp w/ SER review signature and drawings for primary structural framing shall be accompanied by SER signed and sealed cover letter approving all connections.

7.4 INSPECTION. SIER shall perform special inspections of bolts, welding, verifying welder’s certificates and other connections. IBC Table 1704.3 outlines special inspections for structural steel:

6. Inspection of steel frame joint detail for compliance with approved construction documents: a. Details such as bracing and stiffening b. Member locations c. Application of joint details at each connection	-	X	-	1704.3.2
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For SI: 1 inch = 25.4 mm.

a. Where applicable, see also section 1707.1, Special inspection for seismic resistance

Critical to the bolted structural steel inspections is monitoring of the specified nut-tightening, such as the turn of the nut method, to ensure proper torque. Welding inspection per AWS D1.1 includes qualification. All welder certifications shall be verified by SIER. Additionally, weld inspectors are also required to be qualified per AWS.

7.5 ERECTION. Inspection of High-Strength bolts, A325 and A490 shall be in accordance with ASTM as does weld inspection in compliance with AWS D1.1. Special inspections of structural framing shall also include bracing and stiffening

7.6 COMPLETION REPORT. Immediately upon completion of all work related to structural steel and deficiencies cleared, SIER shall prepare completion report for structural steel signed and sealed accompanied by SER review signature and submit to building official for approval. No fireproofing or stud framing inspections will be done until steel completion report is submitted and approved.

VIII **FIREPROOFING**

- 8.1** **DOCUMENTS.** SIER shall submit AR approved submittals with UL details or other testing labs to code official prior to any application of sprayed fireresistive material. Drawings and other constructions documents shall clearly illustrate all area and members to receive fireproofing, various thicknesses. All painted or primed steel to receive SFRM shall be identified and documents shall indicate compatibility of paint with SFRM for adequate bond strength.
- 8.2** **INSPECTION.** SIER shall verify all areas of structural steel are signed off prior to testing of substrate and subsequent SFRM application.
- SIER shall inspect steel substrate prior to all fireproofing to ensure adequate surface conditions exist in accordance with SFRM manufacturer's specification.
 - SIER shall verify ambient temperatures prior to and after application of SFRM as specified by the manufacturer. Temperature gauges shall be set up in cold weather to check ambient and steel substrate temperatures.
- 8.3** **THICKNESS.** SIER shall test fireproofing of structural member thickness to ensure conformance with approved details.
- IBC 1704.11.3.1 Floor, roof and wall assemblies:
The thickness of the sprayed cementitious and mineral fiber fireresistive material applied to the underside of the floor, roof, and wall assemblies shall be determined by taking the average of ten measurements in a 144-square inch sample area, having a minimum width of 6 inches, for each 1,000 square feet of the sprayed area on each floor or part thereof.
 - IBC 1704.11.3.2 For fireproofing of the structural members, i.e. beams and columns etc., thickness testing shall be performed on not less than 25 percent of the structural members on each floor not every 10,000 sq. ft as prescribed by ASTM.
- 8.4** **DENSITY AND BOND STRENGTH** SIER shall perform density testing of SFRM as well as adhesion/cohesion testing to ensure bond strength meets design specification and complies w/ IBC 1704.11.4 & 1704.11.5-5.2 at required frequency.
- 8.5** **PATCHWORK.** All fireproofing removed after SIER testing and inspection shall be subject to patchwork in accordance with project

specifications. Code official shall instruct GC on all members requiring SFRM patchwork prior to closing up of walls, columns, and ceilings.

- 8.6 **COMPLETION REPORT.** Immediately after completion of satisfactory testing of all required, SIER shall submit copy of fireproofing completion report signed and sealed with AR review signature to city for approval. City will not conduct any above ceiling inspection or any other applicable type(e.g wall framing, column) until fireproofing completion report submitted and approved.



IX. MASONRY

9.1 INSPECTION. All masonry designed in accordance with ACI 530/ASCE 5/TMS 42 shall be subject to the following under special inspections:

TABLE 1704.5.1					
LEVEL 1 SPECIAL INSPECTION Engineered Masonry in nonessential facilities					
INSPECTION TASK	FREQUENCY		REFERENCE FOR CRITERIA		
	Continuous	Periodic	IBC SECTION	ACI 530/ASCE 5/TMS 402	ACI 530.1/ ASCE 6/TMS 602
1). As masonry begins, the following shall be verified to ensure compliance					
a. Proportions of site prepared mortar		X			Art. 2.6A
b. Construction of mortar joints.		X			Art. 3.3B
c. Location of reinf'g & connectors.		X			Art. 3.4
2). The inspection program shall verify:					
a. Size and location of struct'l members		X			3.3G
b. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction.		X		Sec. 1.15.4, 2.1.2	
c. Specified size, grade and type of reinforcement		X		Sec. 1.12	Art. 1.8
d. Welding of reinforcing bars.	X		2108.9.2 #2	2.1.8.6/6.2	
e. Protection of masonry during cold weather(sub 40°F) or hot weather(above 90°F)		X	Sec. 2104.3 2104.4		Art 1.8
3). Prior to grouting, the following shall					
a. Grout space is clean		X			Art. 3.2D
b. Placement of reinforcement and connectors.	-	X	-	Sec. 1.12	Art. 3.4
c. Proportions of site-prepared grout.		X			Art. 2.6B
d. Construction of mortar joints		X			Art. 3.3B
4). Grout placement shall be verified to ensure compliance with code and construction document provisions	X	-	-	-	Art. 3.5
5). Preparation of any required grout specimens, mortar specimens and/or prisms shall be observed	X	-	Sec. 2105.3, 2105.4 2105.5	-	Art.1 .4
6). Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified.	-	X	-	-	Art. 1.5

TABLE 1704.5.3					
LEVEL 2 SPECIAL INSPECTION Engineered Masonry in nonessential facilities					
INSPECTION TASK	FREQUENCY		REFERENCE FOR CRITERIA		
	Continuous	Periodic	IBC SECTION	ACI 530/ASCE 5/TMS 402	ACI 530.1/ ASCE 6/TMS 602
1). From the beginning of masonry construction, the following shall be verified to ensure compliance:					
a. Proportions of site mixed mortar and grout		X			Art. 2.6A
b. Placement of masonry units and construction of mortar joints		X			Art. 3.3B
c. Placement of reinforcement and connectors		X			Art. 3.4
d. Grout space prior to grouting	X				Art. 3.2D
e. Placement of grout	X				Art. 3.5
2). The inspection program shall verify:					
a. Size and location of struct'l members		X			3.3G
b. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction.	X			Sec. 1.15.4, 2.1.2	
c. Specified size, grade and type of reinforcement		X		Sec. 1.12	Art. 1.8
d. Welding of reinforcing bars.	X		2108.9.2 #2	2.1.8.6/6.2	
e. Protection of masonry during cold weather(sub 40°F) or hot weather(above 90°F)		X	Sec. 2104.3 2104.4		Art 1.8
3). Preparation of any required grout specimens, mortar specimens and/or prisms shall be observed.	X	—	Sec. 2105.3 2105.4, 2105.5	—	Art. 1.4
4). Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified	—	X	—	—	Art. 1.5

For SI: °C = (°F-32)/1.8.

a. The specified standards referenced are those listed in Chapter 35

9.2 BRACING SER shall design and SIER shall ensure provision of adequate bracing that will assure wall stability during construction.

9.3 PROTECTION. Contractor shall cover top of unfinished masonry for proper weather protection.

9.4 COMPLETION REPORT. Upon completion of all masonry work covered under special inspections, SIER shall submit masonry completion report signed and sealed with designer of record review signature to city for building official's approval.

X. MISCELLANEOUS

10.1 EXTERIOR INSULATION AND FINISH SYSTEMS(EIFS). All applications with exceptions per IBC sec 1704.12

10.2 SPECIAL CASES Any work or construction method deemed atypical within the parameters of critical structures; for example, IBC 1704.13 lists the following cases:

1. Construction of materials and systems which are alternatives to materials and systems prescribed by this code
2. Unusual design applications of materials described in this code.
3. Materials and systems required to be installed in accordance with additional manufacturer's instructions that prescribe requirements not contained in this code or in standards referenced by this code.

10.3 Special Inspection for smoke control per IBC sec 1704.14

10.4 PUBLIC PROTECTION During construction adequate safeguards shall be constructed such as sidewalk sheds, fences or bridges in accordance with IBC 2000 sec 3306.0

10.5 FIRE PROTECTION During construction, standpipes either temporary or permanent shall be installed where required once work surpasses 40 feet above the lowest level of fire department access in accordance with IBC 2000 sec 3311

SCHEDULE OF SPECIAL INSPECTIONS

ITEM	INSPECTION TYPE	Y/N	AGENT	STANDARD	DATE COMPLETED
GENERAL					
EARTHWORK					
Soils Investigation					
Subgrade					
Compaction					
Fill Material					
In Place Density					
Earth Retention					
FOUNDATIONS					
Bearing Capacity					
General Conditions					
Other					
PIER FOUNDATIONS				IBC 1704.8	
PILE FOUNDATIONS					
CONCRETE					
In Plant Inspection					
Approved Mix Design					
Materials					
Concreting Placement					
Reinforcing					
Prestressing					
Postensioning					
Formwork					
Shoring & reshoring					

ITEM	INSPECTION TYPE	Y/N	AGENT	STANDARD	DATE COMPLETED
CONCRETE Cont'd					
Stripping & Criteria					
Precast QC					
Precast Erection					
Precast connections					
Other					
Other					
MASONRY					
Reinforcing					
Protection					
Mortar and Grout					
STEEL					
Fabrication					
Material ID					
Shop Drawings					
Erection					
Density					
Bond strength					
Other					
WOOD					
Fabrication Drawings					
Trusses					
Other					
EIFS				IBC 2003 1704.12	
SMOKE CONTROL				1704.14	

ITEM	INSPECTION TYPE	Y/N	AGENT	STANDARD	DATE COMPLETED
SPECIAL CASES				1704.13	
Materials					
Manufacturer's Data					
Other					
INSPECTION AGENTS	COMPANY			ADDRESS	
SIER					
Testing Agency #1					
Testing Agency #2					
Testing Agency #3					
Testing Agency #4					
Testing Agency #5					

CITY OF RICHMOND

COMPLETION REPORT OF SPECIAL INSPECTIONS FOR A PARTICULAR CONSTRUCTION ITEM

Permit Number: _____

Project: _____

Address: _____

Special Inspections Engineer of Record: _____

Construction Item: _____

Pursuant to the requirements of the City of Richmond Special Inspections Program, this Completion report for the item listed above is submitted for approval.

Based on my professional review, I agree that the special inspections for the construction item specified for this permit have been completed. The building elements subject to special inspections have been found to be in compliance with the approved construction documents and in conformance with project specifications. All discrepancies discovered during the conduct of special inspections for this particular construction item were brought to the attention of the appropriate registered design professional of record, the General Contractor, and Code Official for resolution and have been corrected and approved.

Submitted by Special Inspections Engineer:

Signature *Date*

Signature *Date*

SIER P.E. Seal & Signature

**Reviewed by
Registered Design Profession of Record:**

Signature *Date*

Type or Print Name

Building Official:

Signature *Date*

Type or Print Name

CITY OF RICHMOND
FINAL REPORT OF SPECIAL INSPECTIONS

Permit Number: _____

Project: _____

Address: _____

Special Inspections Engineer of Record: _____

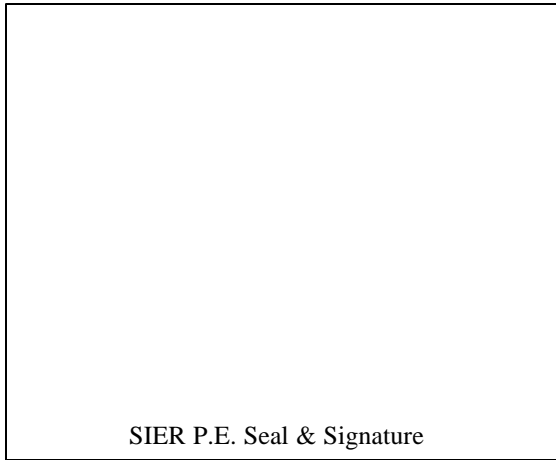
Pursuant to the requirements of the City of Richmond Special Inspections Program, I submit this Final report of the item listed above for approval. Inspection reports numbered _____ to _____, and test reports numbered _____ to _____, all submitted and reviewed prior to this Final Report, form a basis for, and are to be considered an integral part of this final report.

The *special inspections* relative to the permit listed above have been completed. The building elements subject to special inspections have been found to be in compliance with the approved construction documents and in conformance with project specifications. All discrepancies discovered during the conduct of special inspections for this permit were brought to the attention of the appropriate registered design professional of record, the General Contractor, and Code Official for resolution and have been corrected and approved.

Submitted by Special Inspections Engineer of Record:

Signature *Date*

Type or Print Name



Reviewed by
Registered Design Professional of Record:

Accepted by:
Building Official:

Signature *Date*

Signature *Date*

Sample Cover Letter for Submittals

City of Richmond
Dept. of Community Development
Bureau of Permits and Inspections

900 E. Broad St, Rm 110
Richmond, VA 23219



Date:

Bureau of Permits and Inspections
City of Richmond
900 E. Broad St. Room 110
Richmond, VA 23219
Attention: Rabbiah Sabbakhan

Re: Shop Drawing Review

Dear Mr. Sabbakhan:

As the design professional of record, we have reviewed the shop drawings submitted by the contractor for our phase of the work. Our review included comments, if required, and were validated by our affixed shop drawing stamp. We found these drawings to be in compliance with the intent of our design

Therefore, we have released the shop drawings for job construction use.

Sincerely,

Designer of Record

Appropriate AR/PE Seal

LIST OF TERMS AND ABBREVIATIONS

AR- Architect of Record
AITC- American Institute of Timber Construction
ASTM- American Society For Testing Materials
AWS- American Welding Society
AISC- American Institute of Steel Construction
ACI- American Concrete Institute
BOCA- Building Officials & Code Administrators
CSI- Construction Specification Institute
EIFS- Exterior Insulation and Finish System
GC- General Contractor
GER- Geotechnical Engineer of Record
IBC- International Building Code
NFPA- National Fire Protection Association
PCI – Precast/Prestressed Concrete Institute
RDP- Registered Design Professional
SER- Structural Engineer of Record
SFRM- Sprayed Fireresistive Material
SIER- Special Inspector Engineer of Record
SJI- Steel Joist Institute
SSI- Statement of Special Inspections
SWO- Stop Work Order
TMS- The Masonry Society
UL- Underwriter's Laboratory
VUSBC- Virginia Uniform Statewide Building Code

DEFINITIONS

Agents of the Special Inspector (AGENTS) – Qualified individuals or firms working under the direction of the Special Inspector who are providing the inspections and tests necessary to complete the Special Inspection process

Approved Fabricator- An established and qualified person, firm, or corporation approved by the building official.

Certificate of Occupancy- document issued by codes official authorizing permit holder

Building Official – The officer or other designated authority charged with the administration and enforcement of the Virginia Uniform Statewide Building Code (V.U.S.B.C) or a duly authorized representative who has the legal authority to see that all of the provisions of the Special Inspection process are carried out.

Building Permit- document issued to proceed with construction in accordance with all codes, ordinances, and laws of The City of Richmond and its various agencies or owner/tenant to occupy building or space

City Approved Documents- all drawings, specs, submittals, etc which have been reviewed and approved by various city departments

Fabricated Item- Structural load bearing or lateral load-resisting assemblies, consisting of materials assembled prior to installation in a building or structure, or subjected to operations such as heat treatment, thermal cutting, cold working or reforming after manufacture and prior to installation in a building or structure.

Final Report of Special Inspections – A certification submitted by the SIER indicating that all construction elements subject to special inspections as identified in the City approved Statement of Special Inspections and Schedule of Special Inspections have been completed and all outstanding deficiencies corrected.

Label- An identification applied on a product by the manufacturer that contains the name of the manufacturer, the function and performance characteristics of the product or material, and the name and identification of an approved agency and that indicates that the representative sample of the product or material has been tested and evaluated by an approved agency.

Owner – The individual, Agency, corporation or other legally recognized entity which owns the structure being constructed or rehabilitated and is responsible for hiring the Special Inspector.

Partial Certificate of Occupancy- approval for occupancy for a specified portion of a building.

Registered Design Professional (RDP)- An Architect or professional Engineer, licensed to practice architecture or engineering, as defined under 54.1-400 of the Code of Virginia.

Special Inspection- Inspection as herein required of the materials, installation, fabrication, erection or placement of components and connections requiring special expertise to ensure compliance with approved construction documents and Referenced standards.

Temporary Certificate of Occupancy- approval for use of building or portion for a specified duration, usually 30-60-90 days for temporary events or work substantially complete.