Statement of Special Inspections

Permit #

Date

Tax Map #

The current code in effect is the

2018 Virginia Uniform Statewide Building Code

This ***Statement of Special Inspections*** is submitted as a condition for permit issuance in accordance with the 2018 Edition of the Virginia Uniform Statewide Building Code, Section 111.2 and Chapter 17 of the 2018 Edition of the International Building Code. It includes a :

1. Complete **list of all materials and work requiring special inspections, and;**
2. Complete **list of all the inspections to be performed and whether they are required to be periodic or continuous inspections, and;**
3. Complete **list of the individuals, approved agencies or firms intended to be retained for conducting such inspections.**

The Registered Design Professional in Responsible Charge (RDPRC) shall keep records of all inspections and shall furnish ***Periodic Reports of Special Inspections*** to the Building Commissioner each month on the date shown below until the ***Final Report of Special Inspections*** is submitted. ***Periodic Reports of Special Inspections*** will include a summary of all activities requiring special inspections for the period along with a log of discrepancies noted. During the course of the project, discrepancies and deviations from the approved plans and specification and code violations observed during the conduct of special inspections services shall be brought to the immediate attention of the contractor for correction. **If such discrepancies are not corrected, the discrepancies shall be brought to the immediate attention of the Building Commissioner.** The special inspection program does not relieve the Contractor of his or her responsibilities.

Special Inspections are in addition to the regular inspections by Building Inspections personnel specified in Section 113.3 of the Virginia Uniform Statewide Building Code.

Special Inspectors are not authorized to inspect work for Building Inspections personnel!

A ***Final Report of Special Inspections*** documenting completion of all required special inspections and correction of any discrepancies noted in the inspections shall be submitted prior to issuance of a Final Inspection and/or a Certificate of Occupancy.

Job site safety and means and methods of construction are solely the responsibility of the Contractor.

Project Information:

Project Name

Property Address

Owner Name

Contractor Name

Form Prepared By:

Registered Design Professional in Responsible Charge

Company Name

Company Address

Phone #

Cell #

Email Address

Instructions For Completing This Form:

1. The Registered Design Professional (Architect/Engineer) in responsible charge of the Project shall complete this form and submit it with the Building Permit Application for review and approval by the Building Department prior to the issuance of the Building Permit for the Project. This Statement of Special Inspections (SSI) form will be issued to the job site at the time of issuance of the Building Permit.

2. Information detailing the qualifications including copies of all current certifications and accreditations of each Special Inspector, Special Inspection Agency, and Fabricator Shop, to be used for the Project shall be submitted by the Registered Design Professional (Architect/ Engineer) in responsible charge with this completed form (Sections 1703 and 1704.2.1 of VUSBC-2018). Information shall also be provided outlining the qualifications of any Testing Labs (soils, concrete, masonry, steel, and others) being used for the project. This includes information about the Accreditation of the Testing Lab, names and qualifications of each.

3. Included in this document are the **"QUALIFICATION STANDARDS FOR SPECIAL INSPECTIONS"**. Each party involved with the Project shall meet these minimum qualifications standards. (Sections 1701, 1702, 1703, and 1704 of VUSBC-2018)

4. This form is intended for buildings of structures that are assigned to Seismic Design Category A or B. The Registered Design Professional shall provide a modified Statement of Special Inspection for buildings or structures assigned to Seismic Design Category higher than B.

Special Inspection Categories (1701.1, 1702, 1704 & 1705):

Special inspections are required for materials, installation, fabrication, erection or placement of components and connections requiring special expertise to insure compliance with approved construction documents and applicable reference standards.
Section 1705 of VUSBC-2018 lists a total of 15 different categories of special inspections and testing (Categories A through O) as listed below). Please check the appropriate boxes below that apply to your project and enter the name of each individual responsible for the Special Inspection you have checked in the space provided to the right of each category. Please provide the appropriate documents that verify the qualifications of each individual or firm listed.

Time of Month for Delivery of Periodic Report of Special Inspections:

Periodic reports of special inspections must be submitted on the date listed above, if the reports are not submitted within 10 days of the date above, the permit maybe suspended until reports are submitted.

Prepared By (RDPRC):

Print Name

Signature

Registered Design Professional in Responsible Charge Seal

Owner's Authorization:

Signature Date

Building Commissioner's Acceptance:

Signature Field Date

A. Inspection of Fabricators (1704.2.5):

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 Section 1704.2.5 and as required elsewhere in USBC-2018.

See Category A1 or A2 below for each Fabricator as appropriate:

A. 1. Fabrication & Implementation Procedures (1704.2.5) for Fabricators Not Registered & Not Approved:

Check Box Below if Required	Indicate below all structural load-bearing members & assemblies that are being assembled on the premises of a fabricator's shop that is not registered and not approved (Section 1704.2.5)	Indicate below the name of the fabricator shop that is not registered and not approved (Section 1704.2.5)	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
☐	1. Structural Steel		
☐	2. Steel Joists & Girders		
☐	3. Pre-cast Concrete		
☐	4. Prestressed Concrete		
☐	5. Wood Construction (Section 1705.5) - Prefabricated Structural Elements Covering:		
☐	5.1. Manufactured Wood Trusses		
☐	5.2. Walls		
☐	5.3. Floors		
☐	5.4. Roof Assemblies		
☐	6. Cold Formed Steel Trusses		

A. 2. Fabricator Approval (1704.2.5.1) for Fabricators Registered & Approved:

Check Box Below if Required	Indicate below all structural load-bearing members & assemblies that are being assembled on the premises of a fabricator's shop that is registered and approved (Section 1704.2.5.1)	Indicate below the name of the fabricator shop that is registered and approved (Section 1704.2.5.1)	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
☐	1. Structural Steel		
☐	2. Steel Joists & Girders		
☐	3. Pre-cast Concrete		
☐	4. Prestressed Concrete		
☐	5. Wood Construction (Section 1705.5) - Prefabricated Structural Elements Covering:		
☐	5.1. Manufactured Wood Trusses		
☐	5.2. Walls		
☐	5.3. Floors		
☐	5.4. Roof Assemblies		
☐	6. Cold Formed Steel Trusses		

Required tasks to complying with the requirements of Category A-2:

1. Prior to issuance of the Building Permit, provide the Building Department with a copy of the selected fabricator's current shop accreditation/certification.

2. At the completion of fabrication, the Special Inspector and/or Special Inspection Agency shall obtain from each registered and approved fabricator and submit to the Building Department a Certificate of Compliance stating that the work was performed in accordance with the approved construction documents.

B.	Steel Construction (1705.2 & Table 1705.2.3):			
Check Box Below if Required	Continual	Periodic	Required Verification and Inspections:	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
			1. Material verification of high-strength bolts, nuts and washers:	
☐	-	X	**1.1. Identification markings to conform to ASTM standards specified in the approved construction documents.** Referenced Standard: AISC 360 and applicable ASTM material standards	
☐	-	X	**1.2. Manufacturer's certificate of compliance required.**	
			2. Inspection of high-strength bolting: Referenced Standard: AISC 360	
☐	-	X	**2.1. Snug-tight joints.**	
☐	-	X	**2.2. Pretensioned and slip-critical joints using turn-of-nut with matchmarking, twist-off bolt or direct tension indicator methods of installation.**	
☐	X	-	**2.3. Pretensioned and slip-critical joints using turn-of-nut without matchmaking or calibrated wrench methods of installation.**	
			3. Material verification of structural steel and cold-formed steel deck:	
☐	-	X	**3.1. For structural steel, identification markings to conform to AISC 360.** Referenced Standards: AISC 360.	
☐	-	X	**3.2. For other steel, identification markings to conform to ASTM standards specified in the approved construction documents.** Referenced Standards: Applicable ASTM material standards	
☐	-	X	**3.3. Manufacturer's certified test reports.**	
			4. Material verification of weld filler materials:	
☐	-	X	**4.1. Identification markings to conform to AWS specification in the approved construction documents.** Referenced Standard: AISC 360 and applicable AWS documents	

B. (con't)	Steel Construction (1705.2 & Table 1705.2.3):			
Check Box Below if Required	Continual	Periodic	Required Verification and Inspections:	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
☐	-	X	4.2. Manufactur's Certificate of Compliance required.	
☐			5. Inspection of welding:	
			5.1. Structural Steel and cold-formed steel deck: Referenced Standards: AWS & USBC-2018: 1705.2.2	
☐	X	-	5.1.1. Complete and partial penetration groove welds.	
☐	X	-	5.1.2. Multipass fillet welds.	
☐	X	-	5.1.3. Single-pass fillet welds greater than 5/16".	
☐	X	-	5.1.4. Plug and slot welds.	
☐	-	X	5.1.5. Single-pass fillet welds less than or equal to 5/16".	
☐	-	X	5.1.6. Floor and roof deck welds. Referenced Standards: AWS	
			5.2. Reinforcing steel: Referenced Standards: AWS & ACI 318	
☐	-	X	5.2.1. Verification of weldability of reinforcing steel other than ASTM A 706.	
☐	X	-	5.2.2. Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special structural walls of concrete and shear reinforcement.	
☐	X	-	5.2.3. Shear reinforcement.	

B. (con't)	Steel Construction (1705.2 & Table 1705.2.3):			
Check Box Below if Required	Continual	Periodic	Required Verification and Inspections:	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
☐	-	X	5.2.4. Other reinforcing steel.	
			6. Inspection of steel frame joint details for compliance:	
☐	-	X	6.1. Details such as bracing and stiffening.	
☐	-	X	6.2. Member locations.	
☐	-	X	6.3. Applications of joint details at each connection.	
☐	-	X	7. Cold-formed steel trusses spanning 60 feet or greater (1705.2.4): Verify that the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the approved truss submittal package.	

C.	Concrete Construction (1705.3 & Table 1705.3):			
Check Box Below if Required	Continual	Periodic	Required Verification and Inspections: Reference Standard ACI 318 per any VUSBC 2018 section 1905 modification	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
☐	-	X	1. Inspection of reinforcing steel, including prestressing tendon, and placement. Referenced Standards: ACI 318 & VUSBC-2018: 1908.4	
☐			2. Inspection of reinforcing steel welding in accordance with 1705.3.1, or 1705.3.2. Referenced Standards: AWS D1.4 & ACI 318	
☐	X	-	3. Inspection of bolts to be installed in concrete prior to and during placement of concrete where allowable loads have been increased or where strength design is used. Referenced Standards: ACI 318 & VUSBC-2018: 1901.3, 1905	

C. (con't)	Concrete Construction (1705.3 & Table 1705.3):			
Check Box Below if Required	Continual	Periodic	Required Verification and Inspections:	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
☐	-	X	**4. Inspection of anchors installed in hardened concrete.** Referenced Standards: ACI 318 & VUSBC-2018: 1901.3, 1905	
☐	-	X	**5. Verifying use of required design mix.** Referenced Standards: ACI 318 & VUSBC-2018: 1904, 1908.2, 1908.3	
☐	X	-	**6. 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.** Referenced Standards: ASTM C 172, ASTM C 31 & ACI 318 & VUSBC-2018: 1908.10	
☐	X	-	**7. Inspection of concrete and shotcrete placement for proper application techniques.** Referenced Standards: ACI 318 & VUSBC-2018: 1908.6, 1908.7, 1908.8	
☐	-	X	**8. Inspection for maintenance of specified curing temperature and techniques.** Referenced Standards: ACI 318 & VUSBC-1018: 1908.9	
☐			**9. Inspection of prestressed concrete:**	
☐	X	-	**9.1. Application of prestressing force.** Referenced Standards: ACI 318	
☐	X	-	**9.2. Grouting of bonded prestressing tendons in the seismic-force-resisting system.** Referenced Standard: ACI 318	
☐	-	X	**10. Erection of precast concrete members.** Referenced Standards: ACI 318	
☐	-	X	**11. Verification of in-situ concrete strength, prior to stressing of tendons in posttensioned concrete and prior to the removal of shores and forms from beams and structural slabs.** Referenced Standards: ACI 318	
☐	-	X	**12. Inspect formwork for shape, location and dimensions of the concrete members being formed.** Referenced Standards: ACI 318	

D.	**Masonry Construction (1705.4):** Masonry construction shall be inspected and verified in accordance with the requirements of Sections 1705.4 through 1705.4.2 , depending on the classification of the building or structure or nature of the occupancy. Please check the applicable categories of D.1 or Category D.2. **Exception:** Special Inspections are not required for masonry construction that meets one of the three exceptions listed in Section 1705.4.			
☐	**D.1.**	**Special Inspection (1705.4.1) for Empirical Designed Masonry, Glass Unit Masonry and Masonry Veneer in Occupancy Category IV (Essential Facilities):** Special inspections and tests for empirically designed masonry, glass unit masonry or masonry veneer designed in accordance with Section 2109, 2110 or Chapter 14, respectively, where they are part of a structure classified as Risk Category IV shall be performed in accordance with TMS 602 Level 2.		
☐	**D.2.**	**Special Inspection (1705.4.1) for Empirical Masonry in Occupancy Category I, II, or III (Nonessential Facilities):** The minimum Special Inspection Program for masonry designed per Section 2107 or 2108 or per Chapters referenced by sections 2107 or 2108 of TMS 402/ACI 530/ASCE 5 in structures classified as Occupancy Category I, II, or III, in accordance with Section 1604.5.		
Check Box Below if Required	Continual	Periodic	Required Verification and Inspections:	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
☐	-	X	**1. Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified.** Reference for Criteria: TMS 602	
☐	-	X	**2. Verification of f'_m and f'_{AAC} prior to construction except where specifically exempted by code.** Reference for Criteria: TMS 602	
☐	X	-	**3. Verification of slump flow and VSI as delivered to the site for self-consolidating grout.** Reference for Criteria: TMS 602	
			4. As masonry construction begins, the following shall be verified to ensure compliance:	
☐	-	X	**4.1. Proportions of site-prepared mortar.** Reference for Criteria: TMS 602	
☐	-	X	**4.2. Construction of mortar joints.** Reference for Criteria: TMS 602	
☐	-	X	**4.3. Location of reinforcement, connectors, prestressing tendons and anchorages.** Reference for Criteria: TMS 602	
☐	-	X	**4.4. Prestressing technique.** Reference for Criteria: TMS 602	
☐	-	X	**4.5. Grade and size of prestressing tendons and anchorages.** Reference for Criteria: TMS 602	

	D.1. (con't)	Level #1 Special Inspection (1705.4.1):		
Check Box Below if Required	Continual	Periodic	Required Verification and Inspections:	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
			5. During construction the inspection program shall verify:	
☐	-	X	5.1. Size and location of structural elements. Reference for Criteria: TMS 602	
☐	-	X	5.2. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction. Reference for Criteria: TMS 402	
☐	-	X	5.3. Specified size, grade and type of reinforcement, anchor bolts, prestressing tendons and anchorages. Reference for Criteria: TMS 402	
☐	X	-	5.4. Welding of reinforcing bars. Reference for Criteria: TMS 402	
☐	-	X	5.5. Protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F). Reference for Criteria: TMS 602	
☐	X	-	5.6 Application and measurement of prestressing steel. Reference for Criteria: TMS 602	
			The following shall be verified to insure compliance:	
☐	-	X	6.1. Grout space is clean. Reference for Criteria: TMS 602	
☐	-	X	6.2. Placement of reinforcement, connectors and prestressing tendons and anchorages. Reference for Criteria: TMS 402	
☐	-	X	6.3. Proportion of site-prepared grout and prestressing grout for bonded tendons. Reference for Criteria: TMS 602	

	D.1. (con't)	Special Inspection (1705.4.1):		
Check Box Below if Required	Continual	Periodic	Required Verification and Inspections:	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
☐	X	-	6.4. Verification of proportions of materials in premixed or preblended mortar and grout as delivered to the site. Reference for Criteria: TMS 602	
☐	-	X	6.5. Construction of mortar joints. Reference for Criteria: TMS 602	
☐	X	-	7. Grout placement shall be verified to ensure compliance with code and construction document provisions. Reference for Criteria: TMS 602	
☐	X	-	7.1. Grout space prior to grouting. Reference for Criteria: TMS 602	
☐	-	X	7.2. Placement of prestressing grout. Reference for Criteria: TMS 602	
☐	-	X	7.3. Grouting of prestressing bonded tendons. Reference for Criteria: TMS 602	
☐	-	X	8. Size and location of structural elements. Reference for Criteria: TMS 602	
☐	X	-	8.1. Type, size and location of anchors, including other details of anchorag of masonry to structural members, frames or other construction. Reference for Criteria: TMS 402	
☐	-	X	8.2. Specified size, grade and type of reinforcement, anchor bolts, prestressing tendons and anchorages. Reference for Criteria: TMS 402 & TMS 602	
☐	X	-	8.3. Welding of reinforcing bars. Reference for Criteria: TMS 402	

	D.1. (con't)	Special Inspection (1705.4.1):		
Check Box Below if Required	Continual	Periodic	Required Verification and Inspections:	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
☐	X	-	**8.4. Application and measurement of prestressing force.** Reference for Criteria: TMS 602	
☐	X	-	**9. Preparation of any required grout specimens, mortar specimens and/or prisms shall be observed.** Reference for Criteria: VUSBC-2018: Sec. 2105.1 & TMS 602	

E.	Structural Wood Construction (1705.5): 1. Special Inspections of the fabrication process of prefabricated wood structural elements and assemblies (covering: walls, floors, or roof assemblies along with manufactured roof trusses) shall be in accordance with Section 1704.2.5 (see Category A above). 2. Special Inspections of site-built assemblies shall be in accordance with Section 1705.5 as indicated below.	
Check Box Below if Required	Required Verification and Inspections:	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
☐	**1. Fabrication of high-load diaphragms designed in accordance with Section 2306.2 shall be installed with Special Inspections as indicated in Sections 1704.2:**	
	1.1. Inspect the wood structural panel sheathing to ascertain that it is of the grade and thickness shown on the approved plans.	
	1.2. Verify the nominal size of the framing members at adjoining panel edges, the nail or staple diameter and length, the number of fastener lines and that the spacing between fasteners in each line and at edge margins agrees with the approved plans.	
☐	**2. Metal-plate-connected wood trusses spanning 60 feet or greater (1705.5.2):** **Verify that the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the approved truss submittal package.**	
☐	**3. Prefabricated wood shear panels covering:**	
	3.1. Holdown anchor size and placement, including embedment length, spacing and edge distance.	
	3.2. The connection of the structure to the shear panels.	

F. Soils (1705.6 & Table 1705.6):

1. Perform Special Inspections of existing site soil conditions, fill placement and load-bearing requirements as required by Section 1705.6 and Table 1705.6.
2. Determine compliance using the approved geotechnical report (Section 1803), and the construction documents prepared by the Registered Design Professional.
3. Determine that proper materials and procedures are used during fill placement and in accordance with the provisions of the approved geotechnical report.

Exception: Where Section 1803 does not require reporting of materials and procedures for fill placement, the special inspector shall verify that the in-place dry density of the compacted fill is not less than 90% of the maximum dry density at optimum moisture content determined in accordance with ASTM D 1557.

Check Box Below if Required	Continual	Periodic	Required Verification and Inspections:	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
☐	-	X	1. Verify materials below shallow footings are adequate to achieve the design bearing capacity.	
☐	-	X	2. Verify excavations are extended to proper depth and have reached proper material.	
☐	-	X	3. Perform classification and testing of compacted fill materials.	
☐	X	-	4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill.	
☐	-	X	5. Prior to placement of compacted fill, observe subgrade and verify that site has been prepared properly.	

G. Driven Deep Foundations (1705.7 & Table 1705.7:

1. Perform Special Inspections during installation and testing of driven deep foundation elements as required by Table 1705.7
2. Determine compliance using the approved geotechnical report (section 1803), and the construction documents prepared by the Registered Design Professional.

Check Box Below if Required	Continual	Periodic	Required Verification and Inspections:	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
☐	X	-	1. Verify elements materials, size and lengths comply with the requirements.	
☐	X	-	2. Determine capacities of test elements and conduct additional load tests, as required.	
☐	X	-	3. Inspect driving operation and maintain complete accurate records for each element.	
☐	X	-	4. Verify placement locations and plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and document any damage to foundation element.	

G. (con't)	Driven Deep Foundations (1705.7 & Table 1705.7:			
Check Box Below if Required	Continual	Periodic	Required Verification and Inspections:	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
☐			5. For steel elements, perform additional inspections in accordance with 1705.2 (see Category B above).	
☐			6. For concrete elements and concrete-filled elements, perform additional inspections in accordance with Section 1705.3 & Table 1705.3 (see Category C above).	
☐			7. For specialty elements, perform additional inspections as determined by the Registered Design Professional in Responsible Charge.	

H.	Cast-In-Place Deep Foundations (1705.8 & Table 1705.8): 1. Perform Special Inspections during installation and testing of cast-in-place deep foundation elements as required by Table 1705.8. 2. Determine compliance using the approved geotechnical report (Section 1803), and the construction documents prepared by the Registered Design Professional.			
Check Box Below if Required	Continual	Periodic	Required Verification and Inspections:	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
☐	X	-	1. Observe drilling operations and maintain complete and accurate records for each element.	
☐	X	-	2. Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end-bearing strata capacity. Record concrete or grout volumes.	
☐			3. For concrete elements, perform additional inspections in accordance with Section 1705.3 & Table 1705.3 (see Category C above).	

I. Helical Pile Foundations (1705.9):

Check Box Below if Required	Continual	Periodic	Required Verification and Inspections:	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
☐	X	-	**1. Perform Special Inspections continuously during installation of helical pile foundations.**	
☐	X	-	**2. Record information for each helical pile that includes installation equipment used, pile dimensions, tip elevations, final depth, final installation torque and other pertinent installation data as required by the Registered Design Professional in Responsible Charge.**	
☐	X	-	**3. Use the approved geotechnical report (Section 1803) and the approved construction documents prepared by the Registered Design Professional to determine compliance.**	

K. Spray-Applied Fire-Resistant Materials (SFRM) (1705.14):

1. Special Inspections for sprayed fire-resistant materials (SFRM) applied to floor, roof and wall assemblies and structural members shall be in accordance with Sections 1705.14 through 1705.14.6.3
2. Special Inspections shall be based on the fire-resistance design as designated in the approved construction documents.
3. *The tests set forth in Section 1705.14.1 shall be based on samplings from specific floor, roof and wall assemblies and structural members.*
4. Special Inspections shall be performed after the rough installation of electrical, automatic sprinkler, mechanical and plumbing systems and suspension systems for ceilings, where applicable.

Check Box Below if Required	Required Verification and Inspections:	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
☐	**Physical and Visual Tests (1705.14.1):** Perform Special Inspections for SFRM to include the following test and observations to demonstrate compliance with listing and fire-resistance rating covering condition of substrate, thickness of application, density in pounds per cubic foot, bond strength adhesion/cohesion and condition of finished application (see below for requirements).	
☐	**Structural Member Surface Conditions (1705.14.2):** **1.** Prepared the surfaces in accordance with the approved fire-resistance design and the written instructions of approved manufacturers. **2.** Inspect the prepared surface of structural members to be sprayed before the application of the SFRM.	
☐	**Application (1705.14.3):** **1.** Verify that the substrate has a minimum ambient temperature before and after application as specified in the written instructions of approved manufacturers. **2.** Verify that the area for application is ventilated during and after application as required by the written instructions of approved manufacturers.	

K. (con't)	Spray-Applied Fire-Resistant Materials (SFRM) (1705.14):	
Check Box Below if Required	Required Verification and Inspections:	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
☐	**Thickness (1705.14.4):** No more than 10% of the thickness measurements of the SFRM applied to floor, roof and wall assemblies and structural members shall be less than the thickness required by the approved fire-resistance design, but in no case less than the minimum allowable thickness required by Section 1705.14.4.1. **1.** Minimum allowable individual thickness (1705.14.4.1): **1.1.** For design thicknesses 1 inch or greater. It shall be the design thickness minus 1/4 inch. **1.2.** For design thicknesses less than 1 inch, it shall be the design thickness minus 25%. **1.3.** Thickness shall be determined in accordance with ASTM E 605. **1.4.** Samples of the SFRM shall be selected in accordance with Section 1705.14.4.2 and 1705.14.4.3 (see below). **2.** Floor, roof and wall assemblies (1705.14.4.2): Determine the thickness of the applied SFRM in accordance with ASTM E 605, making not less than 4 measurements for each 1,000 square feet of the sprayed area in each story or portion thereof: **3.** Cellular decks (1705.14.4.3): Select the thickness measurements from a square area,12" by 12" in size. Make a minimum of 4 measurements that are located symmetrically within the square area. **4.** Fluted decks (1705.14.4.4): Select the thickness measurements from a square area, 12" by 12" in size. Make a minimum of 4 measurements that are located symmetrically within the square area, including one each of the following: valley, crest and sides. Report the average of the measurements. **5.** Structural members (1705.14.4.5): Determine the thickness of the applied SFRM in accordance with ASTM E 605. Perform thickness testing on not less than 25% of the structural members on each floor: **6.** Beams and girders (1705.14.4.6): Make thickness measurements at 9 locations around the beams or girder at each end of a 12-inch length. **7.** Joists and trusses (1705.14.4.7): Make thickness measurements at 7 locations around the joist or truss at each end of a 12-inch length. **8.** Wide-flanged columns (1705.14.4.8): Make thickness measurements at 12 locations around the column at each end of a 12-inch length. **9.** Hollow structural section and pipe (1705.14.4.9): Make thickness measurements at 4 locations around the column at each end of a 12-inch length.	

K. (con't) Spray-Applied Fire-Resistant Materials (SFRM) (1705.14):

Check Box Below if Required	Required Verification and Inspections:	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
☐	**Density (1705.14.5):** The density of the SFRM shall not be less than the density specified in the approved fire-resistance design. Determine the density of the SFRM in accordance with ASTM E 605. Select the test samples to determine the density of the SFRM as follows: **1.** From each floor, roof and wall assemblies at the rate of not less than 1 sample for every 2,500 square feet or portion thereof of the sprayed area in each story. **2.** From beams, girders, trusses and columns at a rate of not less than 1 sample for each type of structural member for each 2,500 square feet of floor area or portion thereof in each story.	
☐	**Bond Strength (1705.14.6):** Verify that the cohesive/adhesive bond strength of the cured SFRM applied to floor, roof and wall assemblies and structural members shall not be less than 150 pound per square foot. Determine the cohesive/adhesive bond strength in accordance with the field test specified in ASTM E 736 by testing in-place samples of SFRM selected in accordance with Sections 1704.12.6.1 through 1704.12.6.3 (see below): **1.** Floor, roof and wall assemblies (1705.14.6.1): Select the test samples for determining the cohesive/adhesive bond strength of the SFRM from floor, roof and wall assembly at a rate of not less than 1 sample for every 2,500 square feet of the sprayed area in each story or portion thereof. **2.** Structural members (1705.14.6.2): Select the test samples for determining the cohesive/adhesive bond strength of the SFRM from beams, girders, trusses, columns and other structural members at a rate of not less than 1 sample for every 2,500 square feet of floor area or portion there of in each story. **3.** Primer, paint and encapsulated bond tests (1705.14.6.3): Conduct bond tests to qualify a primer, paint or encapsulate when the SFRM is applied to a primed, painted or encapsulated surface for which acceptable bond-strength performance between these coatings and fire-resistant material has not been determined. Verify that a bonding agent approved by the SFRM manufacturer is applied to a primed, painted or encapsulated surface where the bond strengths are found to be less than required values.	

L. Mastic & Intumescent Fire-Resistant Coatings (1705.15):

Check Box Below if Required	Required Verification and Inspections:	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
☐	**Special Inspections for mastic and intumescent fire-resistant coatings applied to structural elements and decks shall be in accordance with AWCI 12-B and shall be based on the fire-resistance design as designated in the approved construction documents.**	

M.	Exterior Insulation and Finish Systems (EIFS) (1705.16):	
Check Box Below if Required	Required Verification and Inspections:	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
☐	**Special Inspections are required for all EIFS applications unless one of the following exceptions applies.** **Exception #1:** EFIS applications installed over a water-resistive barrier with a means of draining moisture to the exterior (unless the Special Inspection is required by the ICC Report of Approval for the selected EFIS). **Exception #2:** EFIS applications installed over masonry or concrete walls. **Note:** The Registered Design Professional shall indicate on the space to the right and on the plans the ICC Report of Approval number for the selected EFIS.	

O.	Special Inspections for Smoke Control (1705.18): Smoke control systems shall be tested by a Special Inspector.	
Check Box Below if Required	Required Verification and Inspections:	Please provide the name and phone number of the special inspection agency and individual performing this special inspection service in the space below
☐	**Testing Scope (1705.18.1): The test scope shall be as follows:** **1. During erection of ductwork and prior to concealment for the purpose of leakage testing and recording of device location.** **2. Prior to occupancy and after sufficient completion for the purposes of pressure difference testing, flow measurements and detection and control verification.**	

Qualification Standards for Special Inspections

Special Inspectors, Laboratory Technicians, Special Inspection Agencies, Testing Labs and Fabricator Shops

General Notes:

Note #1: Basis for formulating City of Roanoke's Building Safety Department Special Inspection Program (SIP):

These requirements were based on the "*Model Program for Special Inspection (Based on the IBC Chapter 17)*" published by the International Code Council (ICC) and the International Accreditation Services (IAS) and reflect the following:

1. Applicable provisions of Chapter 17 of VUSBC;
2. Applicable portions of the following IAS Accreditation Criteria:
2.1. AC89 - Accreditation Criteria for Testing Laboratories;
2.2. AC98 - Accreditation Criteria for Inspection Agencies;
2.3. AC157 - Accreditation Criteria for Fabrication Inspection Programs for Reinforced Concrete;
2.4. AC172 - Accreditation Criteria for Fabrication Inspection Programs for Structural Steel;
2.5. AC196 - Accreditation Criteria for Fabrication Inspection Programs for Wood Wall Panels;
2.6. AC204 - Accreditation Criteria for Calibration Laboratories;
2.7. AC291 - Accreditation Criteria for Special Inspection Agencies;
2.8. AC370 - Accreditation Criteria for Product Certification Agencies;
2.9. AC472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems; and/or
3. Applicable portions of the following Standards by International Organization for Standardization/International Electrotechnical Commission (ISO/IEC):
3.1. ISO/IEC 17011: 2004(E), Conformity Assessment - General Requirements for Accreditation Bodies Accrediting Conformity Assessment Bodies;
3.2. ISO/IEC 17020: 1998(E), General Criteria for the Operation of Various Types of Bodies Performing Inspection;
3.3. ISO/IEC 17024: 2003, Conformity Assessment - General Requirements for Bodies Performing Inspection;
3.4. ISO/IEC 17025: 2005(E), General Requirements for the Competence of Testing and Calibration Laboratories;
3.5. ISO/IEC 17025: 2005/Cor.1:2006(E), General Requirements for the Competence of Testing and Calibration Laboratories;
3.6. ISO/IEC Guide 6.5: General Requirements for Bodies Operating Product Certification Systems.

Note #2: Guideline to Determine Compliance and Competence of Designated Special Inspector and Special Inspections Agency:

This information will be used as a guideline by the Building Safety Department to verify compliance with applicable provisions of Sections 1703 and 1704 of VUSBC in determining the competence of each designated Special Inspector, Laboratory Technician, Special Inspection Agency, Testing Laboratories and/or Fabricator Shop listed in the Statement of Special Inspections.

Note #3: Minimum Qualifications for Special Inspectors:

The minimum qualifications for Special Inspectors listed below are from the International Accreditation Service's "Accreditation Criteria for the IBC Special Inspection Agencies" AC 291.

Note #4: Required Information/Documentation and How it Will be Used:

This information shall be used by the Registered Design Professional in Responsible Charge of the project and/or the Responsible Professional Engineer representing the Special Inspection Agency and/or Testing Laboratory to measure the qualifications of each designated Special Inspector, Laboratory Technician, Special Inspection Agency, Testing Laboratory and Fabricator Shop that are listed in the Statement of Special Inspections. The Building Safety Department will consider equivalent criteria for the qualifications of any designated party, if submitted by the Registered Design Professional and/or Responsible Professional Engineer. The Registered Design Professional and/or Responsible Professional Engineer shall provide the Building Safety Department with sufficient documentation to substantiate the equivalency request.

General Notes (Con't):

Note #5: Special Inspection Agency Qualification Standards:

Each designated Special Inspection Agency shall be:

1. An agency that maintains IAS current accreditation with the scope of accreditation covering the disciplines for which the agency is designated; OR

2. An agency that meets the requirements of Section 1700 of VUSBC. The Registered Design Professional and/or Responsible Professional Engineer of the agency shall provide all documentation as necessary for the Building Safety Department to determine if the Agency meets the applicable code requirements; OR

3. An agency that has been accredited by an approved Inspection Agency in accordance with ISO/IEC 17020.

Note #6: Special Inspector Qualification Standards:

Each designated Special Inspector and Laboratory Technician shall meet the **"Minimum Qualifications for Special Inspectors"** and related criteria as listed below.

Note #7: Special Inspector in Training (SIIT):

1. The intent of this provision is to provide practical opportunities for a Special Inspector in Training (SIIT) to gain the needed experience to qualify as a Special Inspector.

2. An Inspector who does not meet the qualifications for a Special Inspector may be allowed to perform a "Special Inspection" at the discretion of the Special Inspection Agency's Registered Design Professional, provided one or more of the following conditions are met:

2.1. The individual is working under the direct and continuous supervision of a Special Inspector fully qualified for the type of work involved.

2.2. The individual is working under the indirect or periodic supervision of a Special Inspector, and the scope of work is minor and/or routine and within the capabilities of the individual.

Note #8: Testing Labs Qualification Standards:

Each designated Testing Lab shall be accredited by one the following major acceptable accreditation authorities:

1. IAS Accreditation with the scope of accreditation covering the discipline's for which the Testing Lab is designated.

2. AASHTO Accreditation Program per either AASHTO R18 or ISO/IES 17250.

3. American Association of Laboratory Accreditation.

4. National Voluntary Laboratory Accreditation Program.

5. Other Accreditation Authority Program. The Testing Lab shall be accredited by a third party and shall meet the requirements of Section 1703 of VUSBC.

Note #9: Laboratory Technician Qualification Standards:

Each Laboratory Technician shall have certification in the appropriate category and one year minimum experience.

Note #10: Experience:

1. For experience to count toward qualifications, it shall be based on verifiable work directly related to the category or type of inspection involved.

2. An engineering degree (BS) plus appropriate in-house training may be substituted for not more than one year of experience. An engineering technology degree plus appropriate in-house training may be substituted for not more than six months experience. (Degree experience may not be substituted for more than half of the experience requirements in any category.)

3. Five or more years experience as a qualified Special Inspector in one or more categories of work may fulfill up to half the experience requirements in any category, at the discretion of the Special Inspection Agency's designated Responsible Professional Engineer.

Note #11: Certification:

Certification, when specified, is intended to mean the successful completion of:

1. AN ICC examination appropriate to the category of work involved; and/or

2. Having other specific certification obtained from a Nationally recognized certifying organization that is appropriate to the category of work involved and is acceptable to the Building Department.

Note: The Building Safety Department will consider equivalent certifications from Nationally recognized organization obtained by written examination when sufficient documentation to substantiate the equivalency is provided by the Special Inspection Agency's designated Responsible Professional Engineer.

Minimum Qualifications for Special Inspectors

Based on IAS AC291 Accreditation Criteria for Special Inspection Agencies

A. - Inspections of Fabricators (1704.2.5):

A.1. - Fabrication and Implementation (1704.2.5) for Fabricators not Registered and not Approved:

1. The designated Special Inspector and/or Special Inspection Agency shall perform in-plant periodic visits and reviews of all listed fabricator shops that are not registered and not approved per Section 1704.2.5 (see Category A.2. below). The duties include:
1.1. Verify that the fabricator maintains detailed fabrication and quality control procedures that provide a basis for inspection control of the workmanship and the fabricator's ability to conform to approved construction documents and referenced standards, and
1.2. Review the procedures for completeness and adequacy relative to the code requirements for the fabricator's scope of work.
2. The designated Special Inspector and/or Special Inspection Agency inspecting a fabricator shop for compliance with Section 1704.2.1 shall be pre-approved by the Building Department for the specified category of construction prior to Building Permit issuance. See the specific category below for minimum qualification criteria:
2.1. For Structural Steel Construction: See Category B below.
2.2. For Precast/Prestressed Concrete: See Category C below.
2.3. For Wood Construction: Se Category E below.

A.2. - Fabricator Approval (1704.2.5.1) for Fabricators Registered and Approved:

1. Special Inspections required by Section 1704 are not required where the work is done on the premises of a Fabricator registered and approved to perform such work without Special Inspection. Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by an approved Special Inspection Agency (a third-party that is recognized by the Building Safety Department).
2. Special Inspections are not required for work done on the premises of a registered and approved Fabricator that has a current accreditation from the International Accreditation Service (IAS), a current certification from a Nationally recognized organization (see item #4 below), or an equivalent certification (see Note below).
3. An IAS-accredited fabricator that is listed on that AIAS web site (www.iasonline.org). The IAS Accreditation is based on the IAS Fabrication Accreditation Standards (IAS Fabricator Accreditation Program currently offers accreditation services for reinforced concrete, precast concrete, structural steel and wood panel assemblies)
4. A Nationally recognized organization/body that includes a third-party oversight of the fabricators facility (including processes and final products) as defined by the VUSBC. This option is subject to the review and acceptance by the Building Safety Department. The following National Fabricator Certifying Organizations are recognized and acceptable by City of Roanoke's Building Safety Department:
4.1. American Institute of Steel Construction (AISC) for Fabricators of Structural Steel.
4.2. American Steel Joist Institute (SJI) for Fabricators of Steel Joists.
4.3. Precast/Prestressed Concrete Institute for Fabricators of Precast and Prestressed Concrete.
4.4. Truss Plate Institute (TPI) for Fabricators of Wood Trusses.
Note: Equivalencies are subject to review and acceptance by the Building Department and shall be performed by an approved Special Inspection Agency in accordance with applicable provisions of Sections 1704.2.5 and 1703 of VUSBC.

B. - Steel Construction:

B.1. - High Strength Bolting:

1. Current ICC certification as a Structural Steel and Bolting Special Inspector and a minimum one year of experience; OR
2. Virginia Professional Engineer and a minimum one year of direct experience in structural steel and bolting construction (Inspector shall be qualified under Item #1).
3. American Welding Society (AWS) Certified Welding Inspector (CWI) and has a minimum of one year of experience (Inspector shall be qualified under Item #B.1.1).
Note: ICC certifications for Structural Steel and Welding Special Inspectors are valid for the Bolting Special Inspector until the date of expiration.

B. - Steel Construction (con't):

B.2. - Welding:

1. American Welding Society (SAWS) Certified Welding Inspector (CWI); OR
2. Current ICC Certification as a Structural Steel and Welding Special Inspector and has a minimum one year of experience; OR
3. American Welding Society (AWS) Certified Associate Welding Inspector (CAWI) working under the direct on-site supervision of a Certified Welding Inspector (CWI) and a minimum one year of experience (Inspector shall be qualified under either Item #B.2.1 or Item #B.2.2).

B.3. - Nondestructive Testing (NDT):

1. Personnel qualified in accordance with nationally-recognized NDT personnel qualification practice or standard, such as ANSI/ANST-CP-189 or SNT-TC-1A; OR
2. American Society of Nondestructive Testing (ASNT) Level II and a minimum of 120 hours of direct testing experience or training as determined and approved by an ASNT Level III.

C. - Concrete Construction:

C.1. - Reinforced Concrete:

1. Current ICC Certification in Reinforced Concrete Special Inspection and one year of experience; OR
2. *Virginia* Professional Engineer and minimum one year of direct experience in reinforced concrete construction (Inspector shall be qualified under Item #C.1.1); OR
3. Bachelor's degree in Civil or Structural Engineering from an accredited institution and a minimum two years of experience (Inspector shall be qualified under Item #C.1.1); OR
4. ACI Concrete Construction Special Inspector or ACI Concrete Field Testing Technician Grade 1 and a minimum one year of experience (Inspector shall be qualified under Item #C.1.1).

C.2. - Pre-stressed/Pre-cast/Cast-in-Place/Poured-in-Place Concrete:

1. Current ICC Certification in Prestressed Concrete Inspection and one year of experience; OR
2. Virginia Professional Engineer and minimum one year of direct experience in prestressed concrete construction (Inspector shall be qualified under Item #C.2.1 above); OR
3. Bachelor's degree in Civil or Structural Engineering from an accredited institution and a minimum one year of experience (Inspector shall be qualified under Item #C.2.1 above); OR
4. ACI Concrete Construction Special Inspector or ACI Concrete Field Testing Technician Grade 1 and a minimum two years of experience (Inspector shall be qualified under Item #C.2.1 above).

C.3. - Post-installed Structural Anchor in Concrete:

1. Current ICC Certification in Reinforced Concrete Special Inspection; OR
2. Current ICC Certification as a Residential or Commercial Building Inspector, as applicable, and a minimum two years of experience related to the activity being inspected; OR
3. Virginia Professional Engineer and minimum one year of experience related to the activity being inspected (Inspector shall be qualified under Item #C.3.1 above); OR
4. Bachelor's degree in Civil or Structural Engineering from an accredited institution and a minimum two years of experience related to the activity being inspected (Inspector shall be qualified under Item #C.3.1 above).

D. - Masonry Construction:

1. Current ICC Certification in masonry and a minimum one year experience; OR
2. Virginia Professional Engineer and minimum one year of relevant experience (Inspector shall be qualified under Item #D.1 above); OR
3. Bachelor's degree in Civil or Structural Engineering from an accredited institution and a minimum two years of experience (Inspector shall be qualified under Item #D.1 above).

E. - Masonry Construction:

1. Virginia Professional Engineer and minimum one year of relevant experience related related to the activity being inspected; OR
2. Bachelor's degree in Civil or Structural Engineering from an accredited institution and a minimum two years of experience related to the activity being inspected; OR
3. Current ICC Certification as a Commercial or Residential Building Inspector, as applicable, AND
3.1. A minimum two years of related experience in engineered wood products.

F. - Soils:

1. NICET Level II Geotechnical Engineering Technology Certification, or ICC Soils Special Inspector Certification, and a Minimum two years of experience; OR
2. Technician with a minimum three years of documented experience directly related to soils testing and inspection under a licensed Virginia Professional Engineer (Inspector shall be qualified under Item #F.1 above); OR
3. Bachelor's degree in Civil or Structural Engineering/Geotech/Geologist from an accredited institution and a minimum of one year of experience (Inspector shall be qualified under Item #F.1 above); OR
4. Virginia Professional Engineer and a minimum one year of experience (Inspector shall be qualified under Item #F.1 above); OR
5. Professional Engineer in Geotechnical Engineering.

G. - Driven Deep Foundations:

1. Current ICC Certification in Concrete Special Inspection in addition to having one of the following (Virginia Professional Engineer, NICET III or IV, NICET CT Certified Engineering Technologist or Bachelors Degree in Civil or Structural Engineering); OR
2. Virginia Professional Engineer and minimum one year of relevant experience. In addition, Inspector shall obtain ICC Certification in Concrete Special Inspection; OR
3. NICET III or IV (geotechnical/construction or construction material testing/soils) and a minimum of five years experience. I addition, Inspector shall obtain ICC Certification in Concrete Special Inspection; OR
4. NICET CT Certified Engineering Technologist and a minimum of five years of experience. In addition, Inspector shall obtain ICC Certification in Concrete Special Inspection; OR
3. Bachelor's degree in Civil or Structural Engineering from an accredited institution and a minimum three years of experience. In addition, Inspector shall obtain ICC Certification in Concrete Special Inspection).

H. - Cast-in-Place Deep Foundations:

Same as **Category G** (see above).

I. - Helical Pile Foundations:

Same as **Category G** (see above).

J. - Vertical Masonry Foundation Elements:

Same as **Category D** (see above).

K. - Spray-Applied Fire-Resistant Materials (SFRM):

1. Current ICC Certification as a Spray-applied Fireproofing Special Inspector and a minimum one year experience; OR
2. Virginia Professional Engineer and minimum one year of experience in fireproofing applications (Inspector shall be qualified under Item #K.1 above); OR
3. Bachelor's degree in Civil or Structural Engineering from an accredited institution and a minimum two years of experience in fireproofing applications (Inspector shall be qualified under Item #K.1 above); OR
4. American Concrete Institute Concrete Field Testing Technician Grade 1 or American Welding Society Certified Welding Inspector and a minimum of one year experience in fireproofing applications (Inspector shall be qualified under Item #K.1 above).

L. - Mastic and Intumescent Fire-Resistant Coatings:

Same as **Category K** (see above).

M. - Exterior Insulation and Finish Systems (EIFS)::

1. Current ICC Certification as a Reinforced Concrete Special Inspector; OR
2. Current ICC Certification as a Commercial or Residential Building Inspector, and a minimum two years of experience related to the activity being inspected; OR
3. Virginia Professional Engineer and minimum one year of experience related to the activity being inspected (Inspector shall be qualified under Item #M.1 above); OR
4. Bachelor's degree in Civil or Structural Engineering from an accredited institution and a minimum two years of experience related to the activity being inspected (Inspector shall be qualified under Item #M.1 above); OR
5. NICET CT Certified Engineering Technologist and a minimum five years of experience related to the activity being inspected (Inspector shall be qualified under Item #M.1 above); OR
6. Virginia Licensed Architect and a minimum one year of experience related to the activity being inspected (Inspector shall be qualified under Item #M.1 above).

N. - Special Cases As Determined by the Building Safety Department:

1. Current ICC Certification as a Special Inspector and a minimum two years of experience related to the activity being inspected; OR
2. Virginia Professional Engineer and minimum one year of experience related to the activity being inspected (Inspector shall be qualified under Item #N.1 above); OR
3. Bachelor's degree in Civil or Structural Engineering from an accredited institution and a minimum two years of experience related to the activity being inspected (Inspector shall be qualified under Item #N.1 above).
Exception: Individuals who have proven expertise in a field of specialty, either through education or field experiences of not less than five years, may be considered as meeting criteria to conduct one or more classes of Specialty Inspections.

O. - Special Inspections for Smoke Control:

1. Special Inspection Agencies for smoke control shall have expertise in fire protection engineering, mechanical engineering and certification as air balancers (Documentation of qualifications shall be submitted to the Building Safety Department for review and approval); OR
2. Virginia Professional Engineer, Air Balancer Certification, and on year of relevant experience; OR
3. Bachelor's degree in Engineering, Air Balancer Certification and three years of relevant experience; OR
4. NEDD Certification, National Air Balancer Certification and three years of relevant experience, including installation and operation skills for smoke control systems.