



Fire Resistance Ratings Methods

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Building Official

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This policy is to address the process and procedures for applying the International Building Code (IBC) Section 703.3 Methods for Determining Fire Resistance, which states:

“703.3 Methods for determining fire resistance. The application of any of the methods listed in this section shall be based on the fire exposure and acceptance criteria specified in ASTM E 119 or UL 263. The required fire resistance of a building element, component or assembly shall be permitted to be established by any of the following methods or procedures:

1. Fire-resistance designs documented in approved sources.
2. Prescriptive designs of fire-resistance-rated building elements, components or assemblies as prescribed in Section 721.
3. Calculations in accordance with Section 722.
4. Engineering analysis based on a comparison of building element, component or assemblies designs having fire-resistance ratings as determined by the test procedures set forth in ASTM E 119 or UL 263.
5. Alternative protection methods as allowed by Section 112.2.
6. Fire-resistance designs certified by an approved agency.

Overview

The Registered Design Professional (RDP) may submit fire-resistance designs in accordance with:

- Documented designs in approved sources;
- Prescriptive designs in accordance with Section 721;
- Calculated designs in accordance with Section 722.

An Approved Fire Protection Engineer (FPE) may submit fire-resistance designs requiring an Engineering Judgment in accordance with:

- Engineering analysis;
- Alternative protection methods in accordance with Section 112.2;
- Designs certified by an approved agency.



Registered Design Professionals

1. **Building Plan Review Submission:** The RDP shall provide the required information on the proposed building plans for the following methods:
 - **Fire-Resistance Designs Documented in Approved Sources** – For fire-resistance designs documented in approved sources the RDP shall provide the approved source used with the correct fire rated assembly designation. The Building Plans shall also contain a copy of the listing for each tested fire-rated assembly.
 - **Prescriptive Designs** – For prescriptive designs the RDP shall provide the applicable IBC information and references in accordance with IBC Section 721.
 - **Calculated Designs** – For the calculated designs the RDP shall provide the documentation demonstrating compliance with the appropriate procedures in accordance with IBC Section 722.
2. **Field Revisions for Fire Rated Assemblies during Construction:** In accordance with [Policy: Inspections – Field Revisions](#), the RDP may submit a Field Revision to the Building Construction Inspections Branch during construction to revise the fire rated assemblies in accordance with:
 - A. Proprietary through penetration firestopping systems, including proprietary judgments issued by the manufacturer for their proprietary product and assembly.
 - B. Fire-resistance designs in approved sources, prescriptive designs and calculated designs.

Approved Fire Protection Engineer

1. **Fire Protection Engineer Qualifications:** A Virginia Fire Protection Engineer (FPE) may submit their qualifications for review and approval by the Building Construction Inspection Branch Chief or designee. If the FPE meets the minimum qualifications, the FPE will be placed on the [Prince William County Approved List of Fire Protection Engineers](#). The minimum qualifications for the FPE are:
 - **Licensing:** Licensed as a Virginia Professional Engineer.
 - **Education:** Bachelor's Degree in Fire Protection Engineering or Fire Protection Engineering Technology or an equivalent 4 years of documented direct experience practicing as a FPE. (NOTE: If the equivalent years of experience is used for the minimum education requirement, those same years cannot be used for the next criteria.)
 - **Experience:** A minimum of 3 years of documented direct experience practicing as a FPE with specific experience in the area conducting engineering analysis and designing alternative methods for determining fire resistance.



2. **Fire Protection Engineer - Engineering Judgment Guidelines:** Engineering Judgments will be developed, presented and reviewed in accordance with the International Firestop Council's publication [Recommended IFC Guidelines for Evaluating Firestop System Engineering Judgments](#).
3. **Building Plan Review Submission with an Engineering Judgment:** For an engineering analysis, alternative designs and fire-resistance designs by approved agencies, a [Prince William County Approved Fire Protection Engineer](#) shall submit the [Fire Rated Assembly Engineering Judgment](#) form that provides the required information and analysis to substantiate that the fire-resistance ratings are equivalent to a tested building element, component or assembly. Prior to submission to the County the RDP will review and approve the [Fire Rated Assembly Engineering Judgment](#) form. The County will review and consider approval of the [Fire Rated Assembly Engineering Judgment](#) form in conjunction with the County's plan review process for the project. The RDP shall coordinate and incorporate the approved [Fire Rated Assembly Engineering Judgment](#) form into the proposed plans.
4. **FPE Inspection Certification with Engineering Judgment for Fire Rated Assemblies during Construction -** Following are the required steps:
 - A. A field coordination meeting will be held on site. At a minimum, the FPE, the contractor and the County Inspector will attend the meeting. It is recommended that the owner and RDP attend the meeting. (NOTE: Based on the technical complexity of the conflict/resolution, the Building Construction Inspection Branch Chief or designee may waive the field coordination meeting.)
 - B. The FPE is responsible for coordinating the RDP's approval of the [Fire Rated Assembly Engineering Judgment](#) in advance of submission to the Building Construction Inspections Branch. The Building Construction Inspection Branch Chief or designee is authorized to review and approve the [Fire Rated Assembly Engineering Judgment](#).
 - C. The FPE will inspect the installation of the fire rated assemblies approved under the [Fire Rated Assembly Engineering Judgment](#) and shall submit the [Building Inspection Certification Form](#) to the Building Construction Inspections Branch for review and approval. The Building Construction Inspection Branch Chief or designee is authorized to review and approve the [Building Inspection Certification Form](#).

Attachment/Hyperlinks

- [Prince William County Approved List of Fire Protection Engineers](#)
- [Recommended IFC Guidelines for Evaluating Firestop System Engineering Judgments](#)
- [Fire Rated Assembly Engineering Judgment](#)
- [Policy: Inspections – Field Revisions](#)
- [Building Inspection Certification Form](#)