

Firestop Inspection for AHJs: Concepts, Codes & Standards



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TODAY'S SEMINAR

1 What Firestopping is Really About

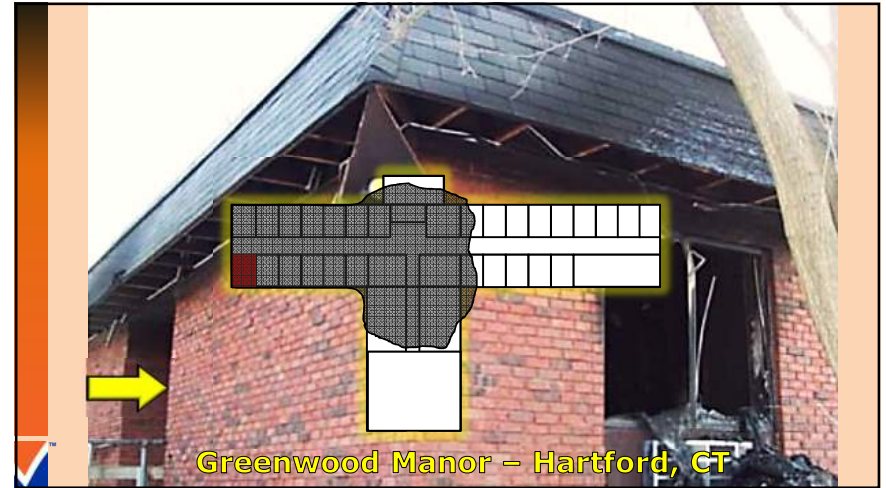
2 Why the ICC Now Requires Special Inspection for it

3 The "Who" & "How" of Special Inspections

4 What Impact Will the Code Change Have?







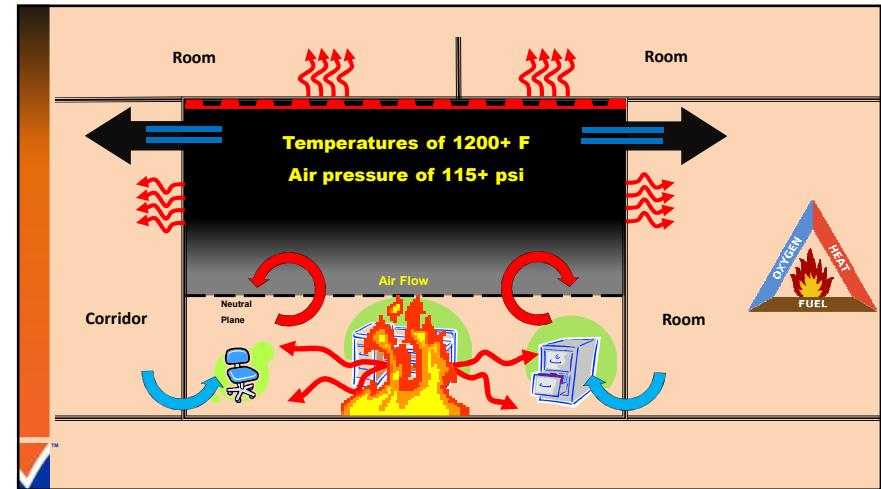
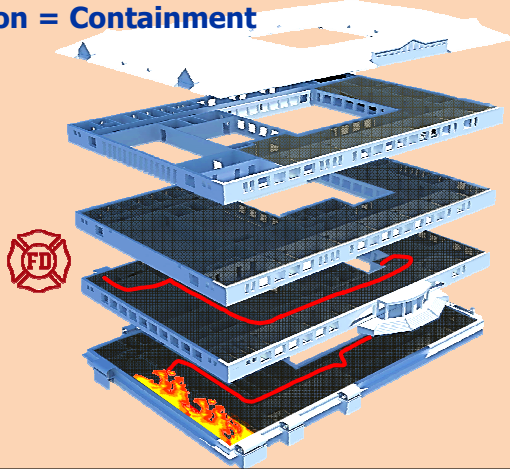
Compartmentation = Containment

Less Loss of Life & Civilian Injuries

Less Thermal Damage

Less Smoke & Water Damage

Fewer Fire Fighter Injuries & Deaths



Passive Fire Protection Components



Doors / Hardware



Dampers



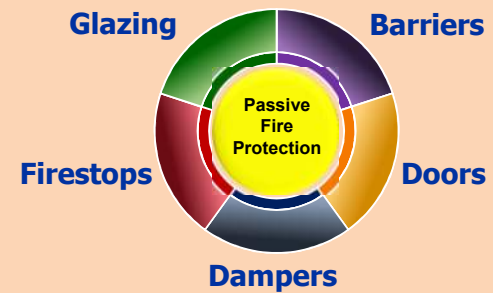
Glazing



Firestops

A System for Compartmentation & Containment

Passive Fire Protection Components



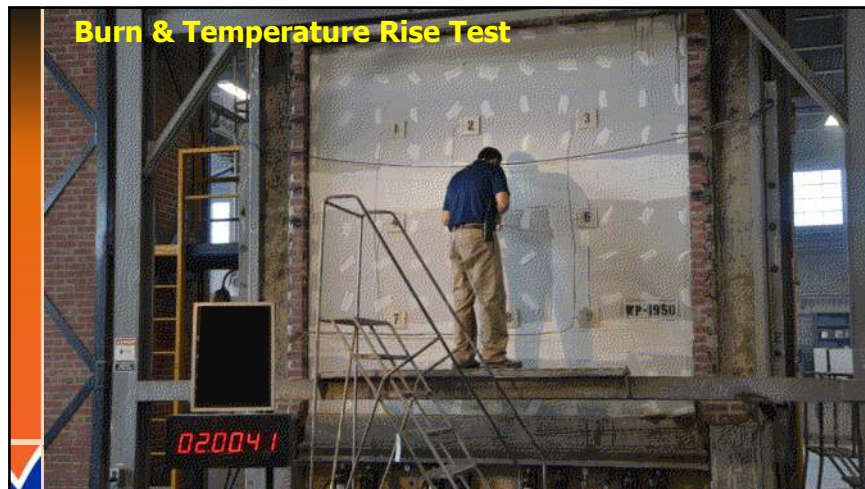
The Barrier is the Heart of Compartmentation



Burn & Temperature Rise Test



Burn & Temperature Rise Test



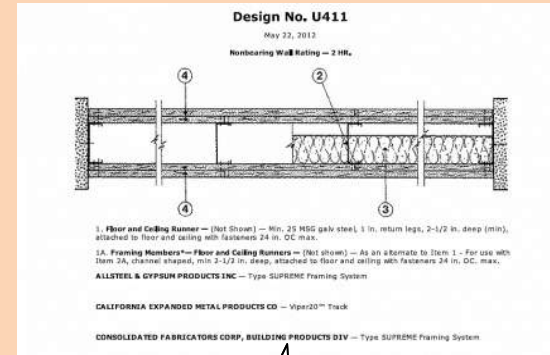
Post Burn



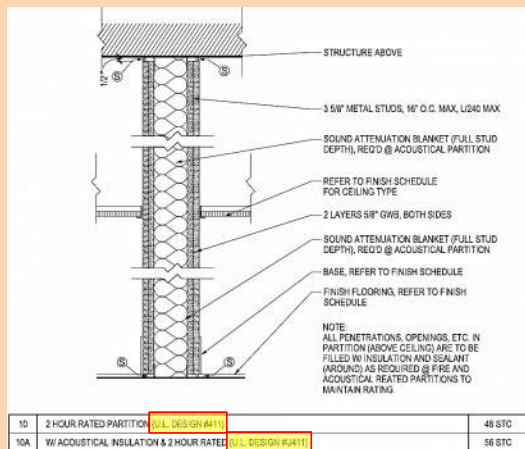
Hose Stream Test



Specific UL Design Listing



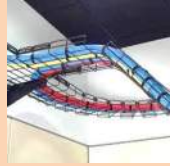
Full Listing = 7 pages



Great for building solid boxes...

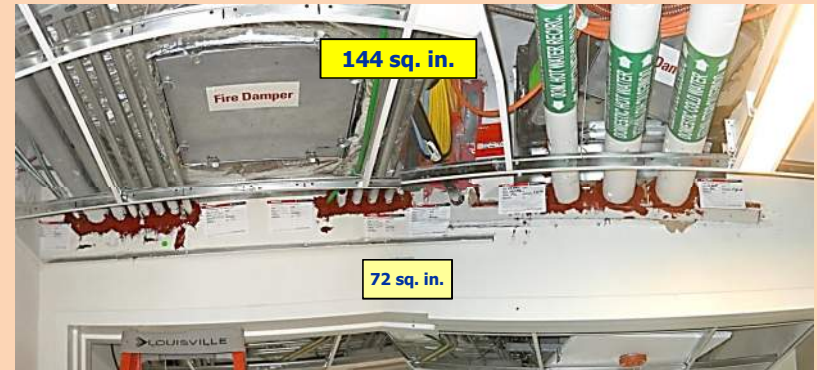


...but we need openings for...



Any opening de-rates the entire barrier.

Little Holes = Big Problem



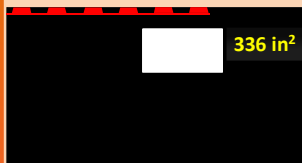
1/2" annular space around each penetration
Top of wall joint doubles the unprotected area

Speed of Spread

~420 ft. / minute at 1500° F = 5 mph to 15 mph

Hallway - 100' long, 10' wide, 8' high

Top of Wall joint = 5/8" high x 20 feet long



Hallway fills 100% with smoke in 4-5 minutes

Sprinklers suppress flames, NOT smoke





Can this be avoided...

...or does
compartmentation
just not work?

REVIEW

- 1 Choke the Smoke, Contain the Flame
- 2 Firestop **systems**, RESTORE the barrier rating
- 3 Small Holes = Massive Smoke/Heat Migration
- 4 Most damage, injury & death due to smoke

NEXT

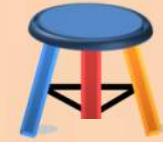
- 1 What the IBC says
- 2 **Systems** versus Materials
- 3 What the heck is a **system**
- 4 Firestopping versus Fireblocking

What DOES the Code Require??

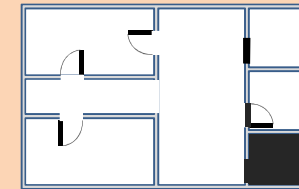


A Balanced Approach

Detection



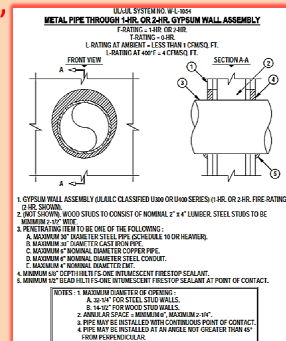
Suppression



Compartmentation

2012/15 IBC - Sections 714.3.1.2

“Through-penetrations shall be protected by an **approved** penetration **firestop system** installed as tested ...”



Firestopping is NOT the Materials

System

[sis-tuh m]

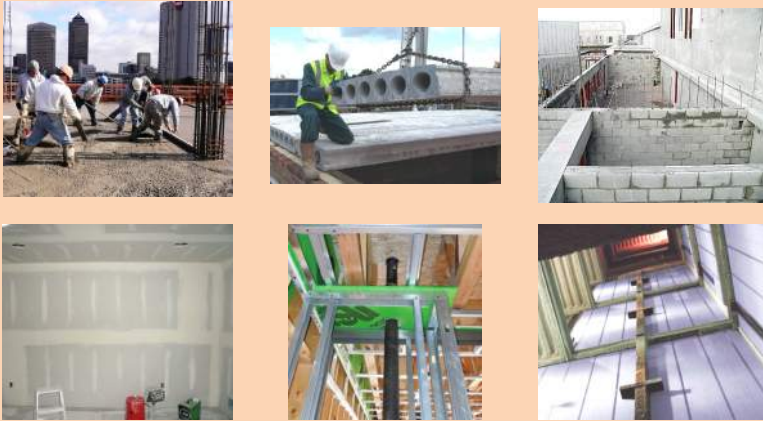
Noun

A combination of things or parts forming a **complex** whole.

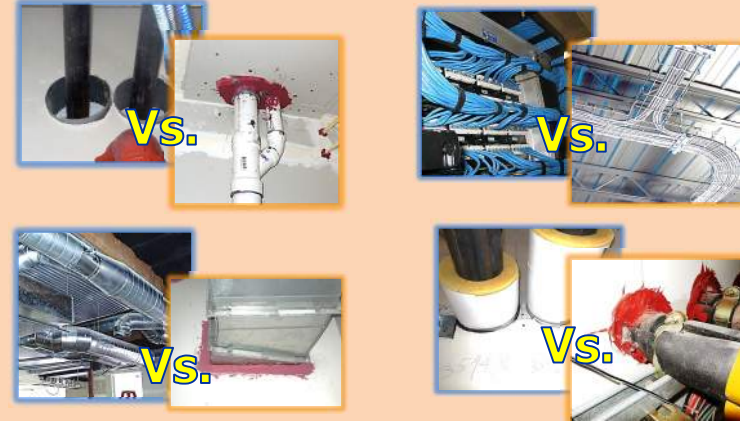
EVERY
firestop system
has **three** parts.



1st Part of a **System**: The Rated Assembly



2nd Part of a **System**: The Penetrant



3rd Part of a **System**: Materials



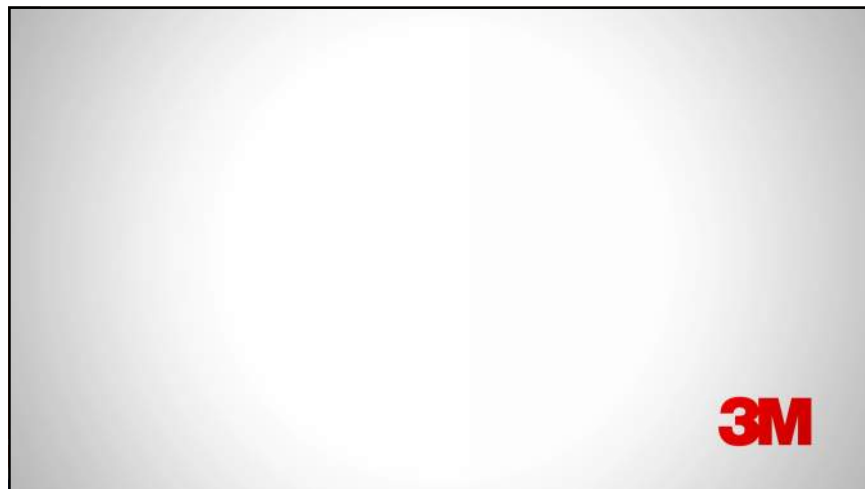
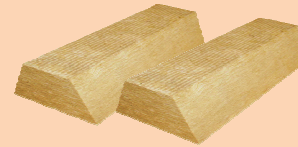
1st Part of a Joint **System**: The Assemblies that Form the Joint

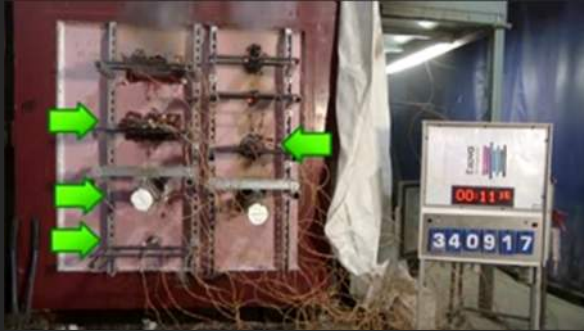


2nd Part of a Joint System: The Gap



3rd Part of a Joint System: The Materials





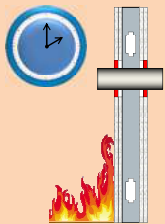
Firestop Systems must be "Listed"

Independent verification

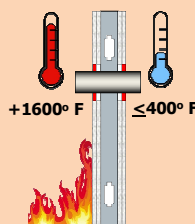


**They CANNOT be made up in the field!
It is NOT up to the installer!**

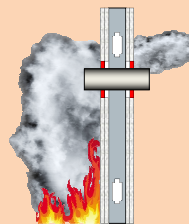
ASTM E 814 / UL 1479 Test Ratings



F-rating
Length
of time



T-rating
Time &
Temperature



L-rating
Smoke
Leakage

W-rating How long the system will resist water passing through

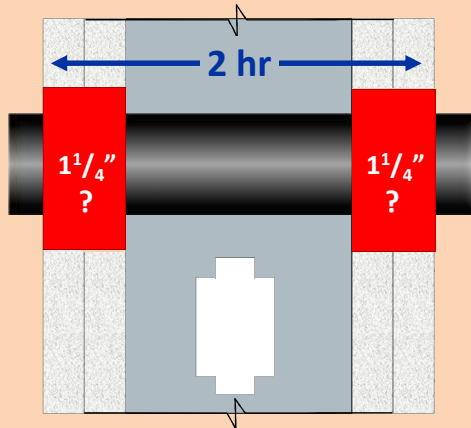
Now you have a LISTED Firestop System



Assigned a unique alpha-numeric identifier
Published in the UL, WHI or FM directory/website

12,000+ Listed Systems Currently

Why a System must be followed?

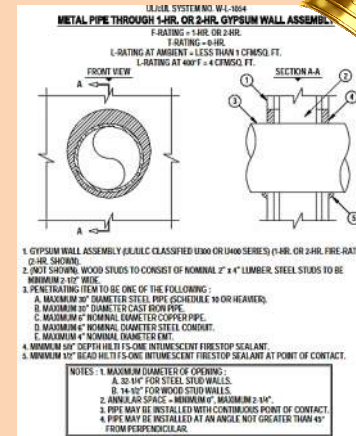
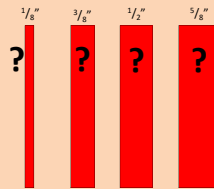


5/8" Gypsum removed

Chemically bound H₂O

Replaced with what?

How much?



Systems Rule!

Without systems installers are just smearing "red stuff"

No basis for inspection



REVIEW

1 IBC requires **SYSTEMS**, not magic red stuff

2 Barrier + Penetrant + Material(s) = **System**

3 **Materials** have a Rating of Zero

4 Install & Inspection **MUST** follow **SYSTEMS**



NEXT

- 1 It Will **NOT** Happen Without YOU!
- 2 Current Failure Rates
- 3 Code Authority & Changes
- 4 Inspection Protocols

It Will **NOT** Happen Without You

AHJs

A/Es

GCs

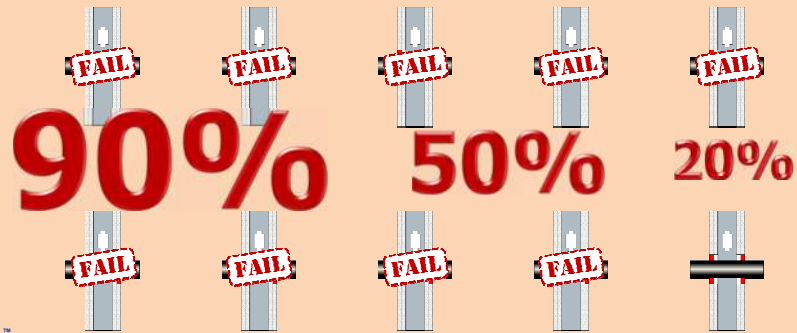
GC's and Subs

"Use more red stuff!"

"Close enough!"

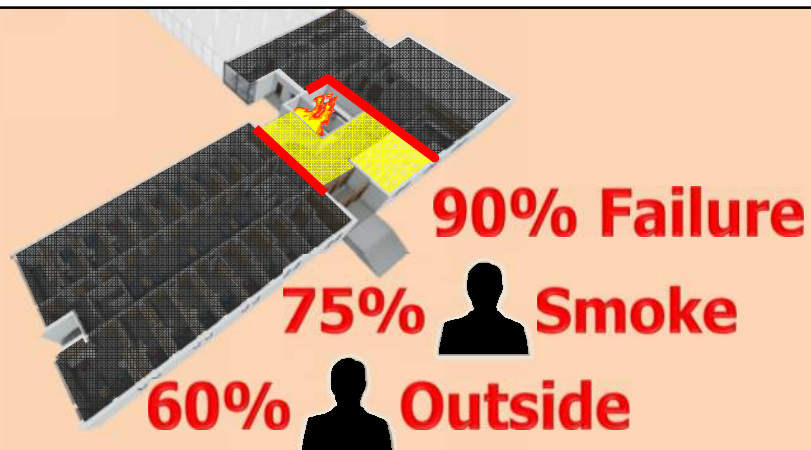
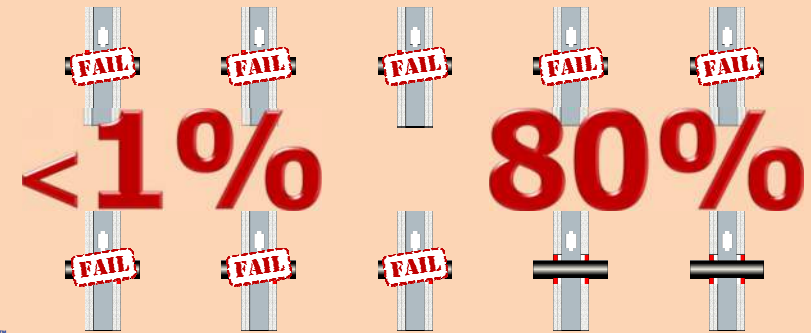
Why the Change – BAD Firestopping

Failure rates – GC & sub self-install – Qualified inspection

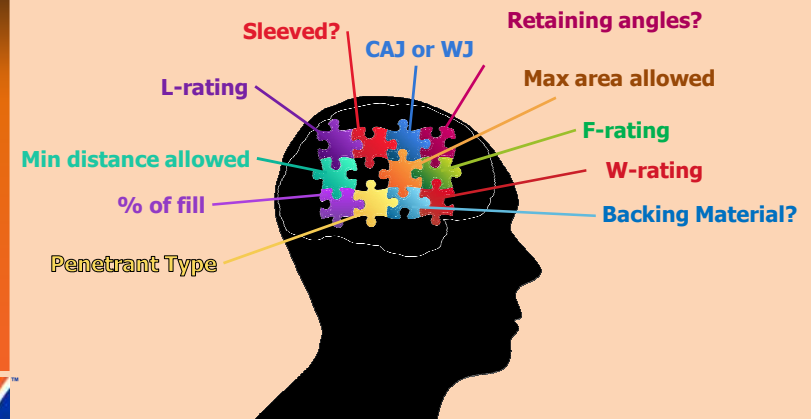


Inspection Failure Rates

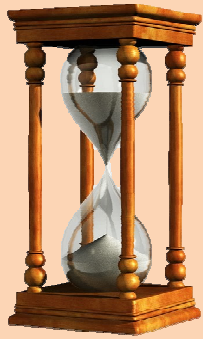
Single Firestop Contractor



Adequate Knowledge is a Challenge



Time is a Challenge



Your Time



Their Time

Inspection under IBC 2015

1705.17 Fire-resistant penetrations and joints.

In high-rise buildings or in buildings of Risk Category III or IV in accordance with Section 1705.16.1, fire-resistance-rated walls, floors, and roof assemblies for through-penetrations, membrane penetrations, and joints, and perimeter fire barrier systems that are required to have a fire-resistance rating in accordance with Sections 714.3.1.2, 714.4.1.2, 715.3 and 715.4 shall be in accordance with Section 1705.16.1 or 1705.16.2.

Where

1705.17 Penetration firestop

Inspections of penetrations in fire-resistance-rated walls, floors, and roof assemblies shall be conducted by an approved inspection agency in accordance with Section 1705.16.1 or 1705.16.2.

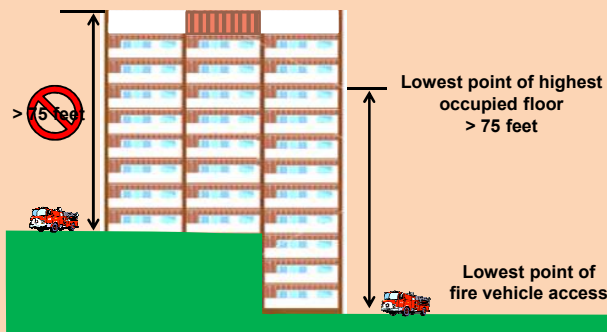
What

1705.17 Fire-resistance-rated walls, floors, and roof assemblies.

Inspection of fire-resistance-rated walls, floors, and roof assemblies shall be conducted by an approved inspection agency in accordance with Section 1705.16.1 or 1705.16.2.

How

Where - High Rises



Where - Risk Category III Buildings

I-2 Resident Care >50
No emergency or surgical



Primary & secondary ed
Day Care >250



Adult Education >500

Where -Risk Category III Buildings



All I-3
Prisons/Jails



Public Assembly
>300



Any occupancy >5000

Where -Risk Category III Buildings



Power Generating
Plants



Water Treatment,
Waste Water Treatment



Toxic or Explosive Material storage buildings
Exceeding limits of Table 307.1(1) or 307.1(2)

Where - Risk Category IV Buildings



Hospitals



Fire, Rescue
Stations & Garages



Police Stations &
Garages



Water Storage & Pump
Facilities

Where - Risk Category IV Buildings



Communication &
Control Centers



Severe Weather &
Earthquake Shelters



Utilities Backup
Facilities