Advanced Building Inspections of Commercial Structures

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Class Summary

- ode overview Techniques
  - Not a code overview class
  - Foundation – Roof
  - Building
  - FRR assemblies
  - Penetration fire stopping
  - Gypsum
  - Plumbing
  - Mechanical
  - Electrical
  - Special Inspection requirements
  - Class is Intended for Advanced level combo inspector

Based on small commercial project

Applicable to small or large department

 2

2

Professionalism

- Professional manner
- Courteous
- Prompt
- Good frame of mind
- Refrain from criticism
- Work to limit complaints

 3

3

Tools/Equipment

- Code Book!
- Code References

4

Project Plans

- Correct Set
- Changes approved?
- Deferred submittals
- Manufacturer's installation instructions

 5

5

Let's Look at the Building!

 6

6

Required Inspections IBC 110.3

- Footing and Foundation
- Concrete slab and under-floor
- Lowest floor elevation
- Framing
- Bldg types IV-A, IV-B, IV-C connection inspection
- Lath and gypsum board
- Weather exposed Balcony and walking surface waterproofing
- Fire- and smoke-resistant penetrations
- Energy efficiency
- Final Building
- Other Inspections
- Special Inspections
- Final Inspections

 7

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Soils, Footings, Foundations

 8

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Soils

- Review soils report
  - Verify type of soil
  - Natural material
  - Compacted fill
  - No foreign matter

 9

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Expansive/Collapsible Soils

- Special Consideration
  - Soils report
  - Void form
  - Special inspection?

 10

10

Excavation

- Dangerous drainage conditions
- Soil collapse issues
- Water & debris removed

 11

11

Foundation Location

- Set according to plans
- Set back/FSD compliance
- Floor plate compliance—does it look like the plan layout?

 12

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Foundation Drainage

- Lot slopes away from foundation
- 6” in 10 feet min or per soils report if more restrictive

 13

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Forms

- Proper dimensions
  - Height
  - Thickness
- Cleanliness
- Tightness
- Bracing
- Level

 14

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Forms

- Pipe penetrations
- Beam pockets

 15

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•Footings

TABLE 1809.7
PRESCRIPTIVE FOOTINGS SUPPORTING WALLS OF LIGHT-FRAME CONSTRUCTION[a,b,c,d,e]

NUMBER OF FLOORS SUPPORTED BY THE FOOTING[f]	WIDTH OF FOOTING (inches)	THICKNESS OF FOOTING (inches)
1	12	6
2	15	6
3	18	8[g]

Minimum Size

 16

16

Footings

- Forms
  - Depth
  - Thickness
    - Construction Documents
  - Depth below grade
  - Earth forms permitted when approved by building official

 17

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Footings

- Reinforcement
  - Approved drawings
  - Size
    - ACI 318, Section 3.5

 18

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Footings

- Reinforcement
  - Surface condition
    - Oil
    - Rust
    - ACI 318 7.4

 19

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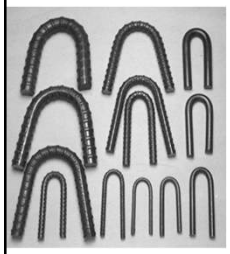
Footings

- Reinforcement
  - Location
    - Approved plans
  - Support

 20

20

Footings



- Reinforcement
  - Splices
    - Typically 30 bar diameters
  - Hooked Bars
  - ACI 318 Chapter 7

TABLE 7.2 — MINIMUM DIAMETERS OF BEND

Bar size	Minimum diameter
No. 3 through No. 8	$6d_b$
No. 9, No. 10, and No. 11	$8d_b$
No. 14 and No. 18	$10d_b$

 21

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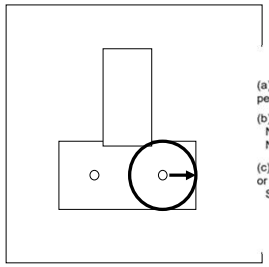
Footings/ foundations IBC section 1808.8



Concrete cover, in.

(a) Concrete cast against and permanently exposed to earth 3

(b) Concrete exposed to earth or weather:
No. 6 through No. 18 bars 2
No. 5 bar, W31 or D31 wire, and smaller 1-1/2

(c) Concrete not exposed to weather or in contact with ground:
Slabs, walls, joists:
No. 14 and No. 18 bars 1-1/2
No. 11 bar and smaller 3/4

ACI 318.1
Section 7.7

TABLE 1808.8.2
MINIMUM CONCRETE COVER

FOUNDATION ELEMENT OR CONDITION	MINIMUM COVER
1. Shallow foundations	In accordance with Section 20.6 of **ACI 318**
2. Precast nonprestressed deep foundation elements Exposed to seawater Not manufactured under plant conditions Manufactured under plant control conditions	 3 inches 2 inches In accordance with Section 20.6.1.3.3 of **ACI 318**
3. Precast prestressed deep foundation elements Exposed to seawater Other	 2.5 inches In accordance with Section 20.6.1.3.3 of **ACI 318**
4. Cast-in-place deep foundation elements not enclosed by a steel pipe, tube or permanent casing	2.5 inches
5. Cast-in-place deep foundation elements enclosed by a steel pipe, tube or permanent casing	1 inch
6. Structural steel core within a steel pipe, tube or permanent casing	2 inches
7. Cast-in-place drilled shafts enclosed by a stable rock socket	1.5 inches

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Foundation Walls

- Forms
  - Depth/Thickness
    - Construction Documents
    - ACI 318

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Foundation Walls

- Reinforcement
  - Size
    - Approved drawings
    - ACI 318, Section 3.5
  - Surface condition
    - Oil
    - Rust

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Foundation Walls

- Beam Pockets
- Ventilation openings
- Anchor bolt locations
  - (on site?)
- Lateral load hardware
- Poured-in-place holdowns

 25

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Concrete

- Premixed
- Proper design mix
- Slump
- Air entrainment
- Testing
  - Special inspection

 26

26

Concrete

- Curing
  - Protection
  - Humidity
  - Freezing
  - High heat

 27

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Removal of Forms

- Concrete cured
- Protection completed
- Bracing in place?

 28

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Masonry

- Materials
  - Hollow masonry
  - Solid masonry
  - Brick

 29

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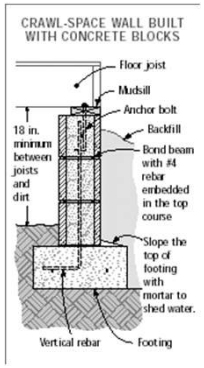
Masonry



- Materials
  - Stored properly
  - Dry
  - Proper sizes
  - Minimum 4” of solid masonry shall be provided at girder supports at the top of hollow masonry unit foundation walls

 30

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Masonry

- Mortar
  - Clean water
  - Clean sand
  - Mixing
    - Type M or S
  - Weather protection

 31

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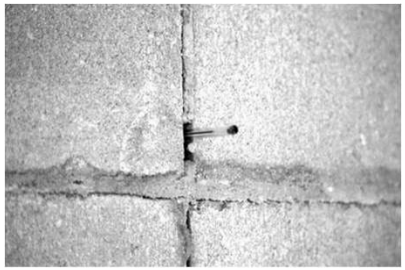
Masonry



- Size
- Spacing/location
- Condition
  - Wet/dry

 32

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Slab-on-Grade Foundations

- Post-Tension
- Mat Reinforcement
- Correct size/location
- Cable locations
- Concrete encased electrode

 33

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Foundation Drains

- Approved Drawings
  - Pipe material
  - Filter material
- Special inspections

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Damproofing

- Top of footing to grade
- Proper material
- Good coverage
- Proper Material

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Backfill

- Floor installed
- Foundation braced
- Concrete strength
- Too soon?

 36

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Backfill

- Compaction
  - Type of soil
  - Engineered fill
- Special inspection
  - Compaction testing
  - % of proctor

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Framing

- Approved drawings
  - Correct project
- Framing plans
  - Same as what was installed

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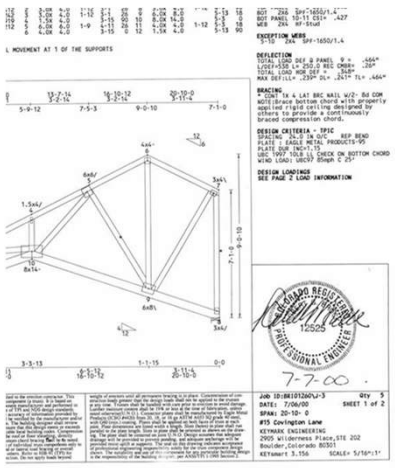
Framing
Truss drawings

- Truss drawings
  - Match roof layout
- Special engineering documents


L MOVEMENT AT 1 OF THE SUPPORTS

DEFLECTION
TOTAL LOAD DEF @ PANEL 9 = .666"
LOSE+SSB L= 250.0 REC CMBR= .26"
TOTAL LOAD NOR DEF = 3x8"
MAX DEFILL= .239" DL= .241" TL= .464"

BEARING
* CONT 1X 4 LAT BRC NAIL W/2- 8d COM
NOTE:Brace bottom chord with properly applied rigid ceiling designed by others to provide a continuously braced compression chord.

DESIGN CRITERIA - TPIC
SPACING 24.0 IN O/C REF BEND
PLATE : EAGLE METAL PRODUCTS-95
PLATE DUR INC=1.15
LBC : YES, CHECK ON BOTTOM CHORD
wind LOAD: ASCE7 09mph C 25'

DESIGN LOADINGS
SEE PAGE 2 LOAD INFORMATION

COLORADO REGISTERED 12005 PROFESSIONAL ENGINEER
7-7-00

Job ID:881012601/J-3 Qty 5
DATE: 7/06/00 SHEET 1 of 2
SPAN: 20-10- 0
#15 Covington Lane
KEYMARK ENGINEERING
2905 Wilderness Place,STE 202
Boulder,Colorado 80301
Keymark 3.156 SCALE= 5/16"=1'

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Proper truss bearing?

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Bracing
On correct web member
Size and location correct?

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Framing

- Structural Review
- Correct header sizes
- Number of king and jack studs (trimmers)
- Notching and boring

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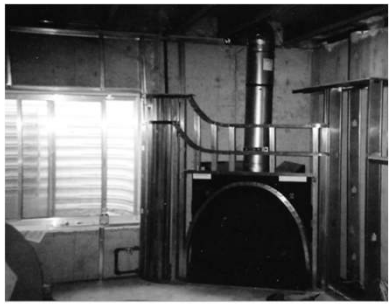
Framing



- Light Steel Framing
  - Proper gauge
  - Attachments
  - Floating walls as required
  - PT sill plates where in contact with slab on grade
  - Fire blocking at chases, basements, horizontal to vertical juncture

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Framing

- Beams/Headers
  - Size
  - Support jack studs and King studs
  - Fastening

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Framing

- Joist/Rafters
  - Conventional Lumber
    - Species & grade
    - Span, Size & spacing
    - Hangers, fastening
    - Blocking
    - Laps
    - Double joists under bearing wall
    - Notches, holes

 45

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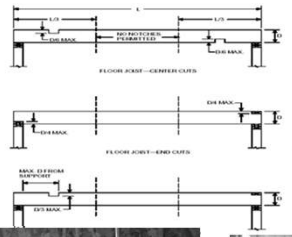
Framing

- Notching/Drilling of Joist/Rafter/Studs



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Framing ---floors

- Joist/Rafters
- I-Joists
  - Manufacturer's Instructions
  - Span, Size & Spacing
  - Hangers
  - Blocking
  - Doubled under bearing wall
  - Notches, holes

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Engineered Wood Products Holes

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Drilling & Notching Engineered Wood

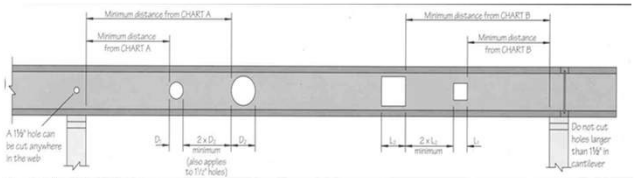

CHART A – ROUND HOLES
MINIMUM DISTANCE FROM INSIDE FACE OF ANY SUPPORT TO NEAREST EDGE OF HOLE

DEPTH	TJI®/Pro™	ROUND HOLE SIZE												
		2"	3"	4"	5"	6"	6½"	7"	8"	8⅛"	9"	10"	10¾"	12"	12¾"
9½"	150	1'-0"	1'-6"	3'-0"	4'-6"	7'-0"	7'-6"	–	–	–	–	–	–	–	–
	250	1'-0"	2'-6"	4'-0"	5'-6"	7'-6"	8'-0"	–	–	–	–	–	–	–	–
11⅞"	150	1'-0"	1'-0"	1'-0"	1'-0"	3'-0"	3'-6"	5'-0"	7'-0"	8'-6"	–	–	–	–	–
	250	1'-0"	1'-0"	2'-0"	3'-0"	4'-6"	5'-0"	6'-0"	8'-0"	9'-0"	–	–	–	–	–
	350	1'-0"	2'-0"	3'-0"	4'-6"	5'-6"	6'-0"	7'-0"	9'-0"	10'-0"	–	–	–	–	–
	550	1'-0"	1'-6"	3'-0"	4'-6"	6'-0"	6'-6"	7'-6"	9'-6"	10'-6"	–	–	–	–	–
14"	250	1'-0"	1'-0"	1'-0"	1'-0"	1'-6"	2'-0"	3'-0"	5'-0"	6'-0"	6'-6"	8'-6"	10'-0"	–	–
	350	1'-0"	1'-0"	1'-0"	1'-6"	3'-0"	3'-6"	4'-6"	6'-0"	7'-0"	8'-0"	9'-6"	11'-0"	–	–
	550	1'-0"	1'-0"	1'-0"	2'-6"	4'-0"	4'-6"	6'-0"	7'-6"	8'-6"	9'-0"	11'-0"	12'-0"	–	–
16"	250	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-6"	2'-6"	3'-0"	5'-0"	6'-6"	9'-0"	11'-0"
	350	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-6"	3'-0"	4'-6"	5'-0"	6'-6"	8'-0"	10'-6"	12'-0"
	550	1'-0"	1'-0"	1'-0"	1'-0"	1'-6"	2'-0"	3'-6"	5'-0"	6'-0"	7'-0"	8'-6"	10'-0"	12'-0"	13'-6"

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Framing

- Walls
  - Species, size & height
  - Proper fastening
  - Plate requirements
  - Lateral bracing
  - Corner Construction
  - Holes, notches
  - Vent clearances

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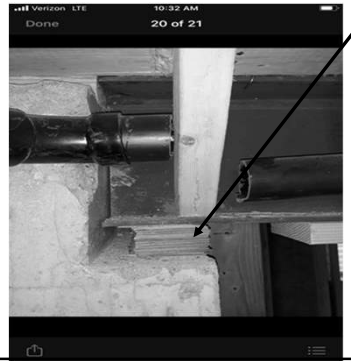
Framing



- Under-floor Area
  - Blocking
  - Ventilation
  - Clearance for vents
  - Access
  - Cut plumbing or joists?
  - Shims grouted or glued?
  - Columns secured to pier or pad and beam.

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Framing Anchor bolts

- Sill Plates
  - Proper materials
-

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Framing: Stairs

- Rise/run/width
- Measure at rough without floor coverings Code changed in 2018
- Head room

Fire stopped top and bottom

Anchoring to framing

Glazing by stairs

Overcuts at rise/run notches

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Framing

- Penetration fire stopping
- Material
- Location
- Proper application
- Fire blocking
- Use where required and listed—not a fix-all
- Expensive stuff to require where not needed.

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Framing

- Lateral bracing
  - Per plans
  - Material
  - Fastening
  - Hold-downs

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Framing

- Room sizes
  - Floor areas
  - Ceiling height
  - Good time to check for ANSI accessibility clearances at toilets, sinks, doors etc.

 56

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Framing

- Miscellaneous
  - Egress Window
  - Safety Glazing
  - Attic Access
  - Crawl space access

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Framing

- Where are the Fire-Resistant-Rated assemblies?
- Do they meet the continuity requirements of Chapter 7?
- Are the framing members used appropriate for the type of construction and for the chosen FRR assembly?

- Look at the actual assembly listing.
- Read the details closely.
- Some assemblies require closer spacing of framing members. You can tighten spacing but not extend it..
- Make sure you know the difference in:
- Fire wall
- Fire Barrier
- Fire partition
- Smoke barrier
- Horizontal assembly

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Fire blocking IBC 718

- 2’ nominal lumber
- 2 thicknesses of 1” lumber
- One thickness of 0.719 wood structural panels with joints backed
- One layer of .75” particle board with joints backed
- One half inch Gyp board
- ¼” cement based mill board
- Batts of blankets of mineral wool or mineral fiber or other approved materials secured in place
- Cellulose insul. Tested and intended for use and demonstrate its’ ability to stay in place to retard spread of fire
- Mass timber

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Framing

- New inspections for Type IV A, B & C construction
- Connections
- Covering in type IV A and B

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Drywall inspection

- Tile backer board not green board behind tile surfaces in tubs and showers
- Proper fastening of interior gypsum shear walls.
- Appropriate gypsum product for the assembly? Type X or Type C required?
- Look at fastening details Type S or G screw required?
- Joint separation
- Orientation per assembly instructions?

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Fire resistive assemblies

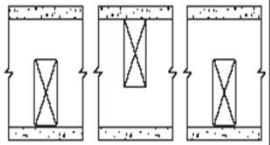
- Generic fire-resistance ratings (those not designated as PROPRIETARY* in the listing) in the GA 600 shall be accepted as if herein listed.

GA FILE NO. WP 3380	GENERIC	1 HOUR FIRE	40 to 44 STC SOUND

GYPSUM WALLBOARD, WOOD STUDS

One layer 5/8" type X gypsum wallboard or gypsum veneer base applied parallel or at right angles to each side of 2 x 4 wood studs 16" o.c. staggered 8" o.c. on 2 x 6 wood plates with 6d coated nails, 17/8" long, 0.0915" shank, 1/4" heads, 7" o.c.

Joints staggered 24" on opposite sides. Horizontal bracing required at mid-height. (LOAD-BEARING)



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GA Proprietary Systems

- Where the word "proprietary" appears in system descriptions either the system or one or more of its components is considered proprietary.
- Each proprietary system shall be built utilizing the components specified by the company or companies listed under the detailed description for that system.
- All other systems are generic.
- Generic systems are applicable to the products of any manufacturer, whether a member of the gypsum association or not, provided the products meet the appropriate standards.

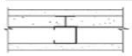
GA FILE NO. ASW 1501	PROPRIETARY*	2 HOUR FIRE

GYPSUM WALLBOARD, STEEL I, C-H OR C-T STUDS

One layer 1" x 24" proprietary type X gypsum panels inserted between 2½" floor and ceiling runners with tab-flange section of 2½" steel I, C-H or C-T studs between panels. One layer 5/8" proprietary type X gypsum wallboard or gypsum veneer base applied parallel to each side with 1" Type S drywall screws 12" o.c. **(NLB)**

PROPRIETARY GYPSUM BOARD

American Gypsum Company LLC - - 5/8" FireBloc® Type X 1" Shaft Liner



Thickness: 3½"
Approx. Weight: 9 psf
Fire Test: UL R14196, 05NK29331, 2-18-06; UL R14196, 06NK09317, 4-11-06 UL Design V455

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GA Explanatory Notes

- 11. In floor-ceiling or roof-ceiling systems, the addition or deletion of mineral or glass fiber insulation in ceiling joist spaces could possibly reduce the fire-resistance rating. The addition of up to 16 ¾ inches of 0.5 pcf glass fiber insulation (R-40), either batt or loose-fill, to any 1- or 2-hour fire resistance rated floor-ceiling or roof-ceiling system having a cavity deep enough to accept the insulation is permitted provided that one additional layer of either 1/2 inch type X or 5/8 inch type X gypsum board is applied to the ceiling. The additional layer of gypsum board shall be applied as described for the face layer of the tested system except that the fastener length shall be increased by not less than the thickness of the additional layer of gypsum board.

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Fire-Resistive Penetrations

- 110.3.8 Protection of joints and penetrations in fire-resistance-rated assemblies shall not be concealed from view until inspected and approved.

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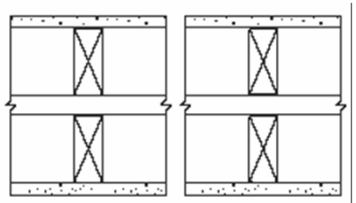
GA Explanatory Notes



- 17. Within design limitations, the distance between parallel rows of studs, such as in a chase wall, shall be permitted to be increased beyond that tested.
- When stud cavities in walls constructed of parallel rows of steel studs exceed 9 ½ inches and cross bracing is required the cross bracing shall be fabricated from steel studs.

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GA Explanatory Notes

- 21. Additional layers of type X or regular gypsum board shall be permitted to be added to any system.

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Exterior Wall

GA FILE NO. WP 8006 | **PROPRIETARY*** | **1 HOUR FIRE**

GYPSUM WALLBOARD, GLASS MAT GYPSUM SUBSTRATE, STEEL STUDS, MINERAL OR GLASS FIBER INSULATION

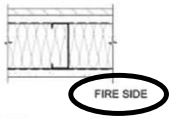
EXTERIOR SIDE: One layer 5/8" proprietary type X glass mat gypsum substrate (sheathing) applied parallel to 3½" 20 gage steel studs 24" o.c. with 1" Type S-12, self-drilling, corrosion resistant, bugle head, drywall screws 12" o.c. Studs attached to both vertical legs of floor and ceiling runners either by welding or with ½" Type S-12 pan head screws. Mineral or glass fiber insulation friction fit into the stud space. Exterior cladding to be attached through glass mat gypsum panel to studs.

INTERIOR SIDE: One layer 5/8" proprietary type X gypsum board applied parallel to studs with 1" Type S-12 drywall screws 12" o.c.

Bracing: Lateral bracing spaced not over 40" o.c. shall be 1" by 18 gage steel straps attached to each side or channel bracing attached to each stud with a clip angle. For studs with holes or punch-outs in the web the "Q" factor shall be determined by means of stub column tests. Tested at 100 percent of design load. **(LOAD-BEARING)**

PROPRIETARY GYPSUM PANEL PRODUCTS

CertainTeed Gypsum Inc.	-	5/8" ProRoc® Type X Gypsum Panels
	-	5/8" GlasRoc® Sheathing Type X Gypsum Panels
CertainTeed Gypsum Canada Inc.	-	5/8" ProRoc® Type X Gypsum Panels
Georgia-Pacific Gypsum LLC	-	5/8" ToughRock® Fireguard®
	-	5/8" DensGlass Gold® Fireguard®
National Gypsum Company	-	5/8" e²XP® FIRE-SHIELD® Gypsum Sheathing
	-	5/8" Gold Bond® Brand FIRE-SHIELD® Gypsum Board
Temple-Inland	-	5/8" GreenGlass Type X
	-	5/8" Type X



Thickness: 4¾"
Approx. Weight: 6 psf
Fire Test: UL R3660/R15187, 01NK21103, 2-4-02; ULR8937, 07NK08079, 9-19-08; UL Design U425

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Gypsum Board Joint Treatment (Fire Taping)

- Unless otherwise specified in the specific design all gypsum board systems except those with predecorated or metal covered surfaces have joints taped and joints and fastener heads covered with one coat of joint compound (fire taped).
- Base layers in multi layer systems are not required to have joints or fastener heads taped or covered with joint compound.

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Prescriptive Fire Resistance 721

- The provisions of this section contain prescriptive details of fire-resistance-rated building elements, components or assemblies.
- The materials of construction listed in Table 720.1(1), Table 720.1(2), and Table 720.1(3) shall be assumed to have the fire-resistance ratings prescribed therein.
- Where materials that change the capacity for heat dissipation are incorporated into a fire-resistance-rated assembly, fire test results or other substantiating data shall be made available to show that the required fire-resistance rating time period is not reduced.

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722 Calculated Fire Resistance

- The provisions of this section contain procedures by which the fire resistance of specific materials or combinations of materials is established by calculations.
- These procedures apply only to the information contained in this section and shall not be otherwise used.

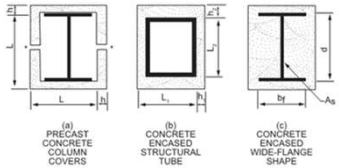


FIGURE 722.5.1(6)
CONCRETE PROTECTED STRUCTURAL STEEL COLUMNS[a, b]

71

Fire-Resistance Rating of Structural Members – 704.1

- The fire-resistance ratings of structural members and assemblies shall comply with this section and the requirements for the type of construction as specified in Table 601.
- The fire-resistance ratings shall not be less than the ratings required for the fire-resistance-rated assemblies supported by the structural members.
  - Exception: Fire barriers , fire partitions , smoke barriers and horizontal assemblies as provided in Sections 707.5, 708.4, 709.4 and 711.2, respectively.

72

Column protection 704.2

- Where columns are required to be fire-resistance rated, the entire column shall be provided individual encasement protection by protecting it on all sides for the full column length, including connections to other structural members, with materials having the required fire-resistance rating.
- Where the column extends through a ceiling, the encasement protection shall be continuous from the top of the foundation or floor/ceiling assembly below through the ceiling space to the top of the column.

 73

73

Protection of the Primary Structural Frame Other Than Columns - 704.3

- Members of the primary structural frame other than columns that are required to have a fire-resistance rating and support more than two floors or one floor and roof, or support a load-bearing wall or a non-load-bearing wall more than two stories high, shall be provided individual encasement protection by protecting them on all sides for their full length, including connections to other structural members, with materials having the required fire-resistance rating.

 74

74

Section 704.3

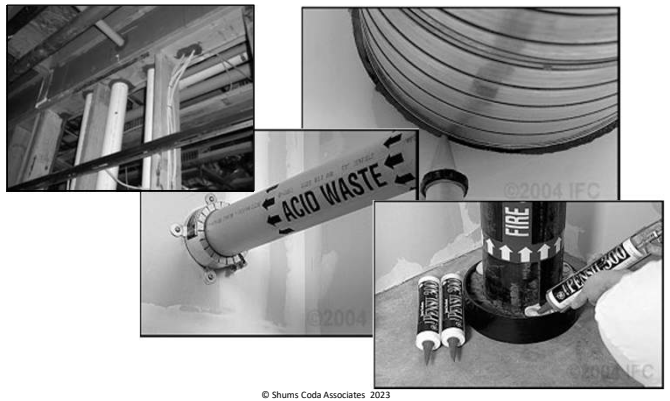
- Exception:
  - Individual encasement protection on all sides shall be permitted on all exposed sides provided the extent of protection is in accordance with the required fire-resistance rating , as determined in Section 703.

 75

75

Containment In Construction

Through–Penetrations



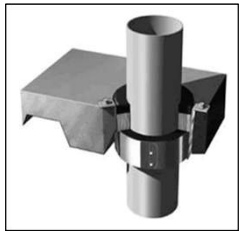
 76

76

Penetration Firestop System

Consists of:

- Assembly being penetrated
- Penetrating item
- Fill, void or cavity materials (firestopping materials)



77

Penetrations 714.1

- The provisions of this section shall govern the materials and methods of construction used to protect through penetrations and membrane penetrations of horizontal assemblies and fire-resistance-rated wall assemblies.

78

UL Penetrations

- Penetrations through all or a portion of an assembly can significantly affect the rating.
- Firestop systems developed to protect openings created by penetration items are covered in Volume 2 of the Fire Resistance Directory.

79

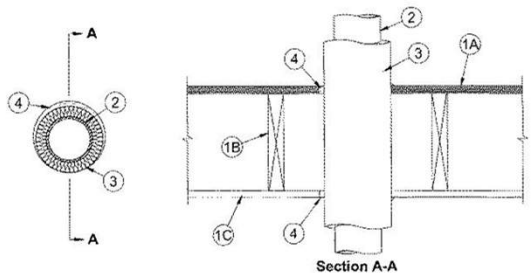
Installation Details 714.2

- Where sleeves are used, they shall be securely fastened to the assembly penetrated.
- The space between the item contained in the sleeve and the sleeve itself and any space between the sleeve and the assembly penetrated shall be protected in accordance with this section.

80

Installation Details 714.2

- Insulation and coverings on or in the penetrating item shall not penetrate the assembly unless the specific material used has been tested as part of the assembly in accordance with this section.



81

81

Be careful of product choices. This is not approved as penetration sealant ---only as draft stop.

82

82

Cannot do this in a Fire resistance rated common wall!

83

83

Penetrations FRR walls and ceilings

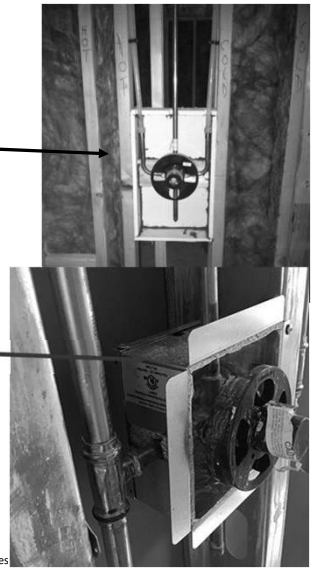
- Look at electrical boxes
- Look at non-electrical penetrations such as plumbing or dryer vent boxes

84

84

Not an approved method to protect a penetration

A listed solution Barri-Box



85

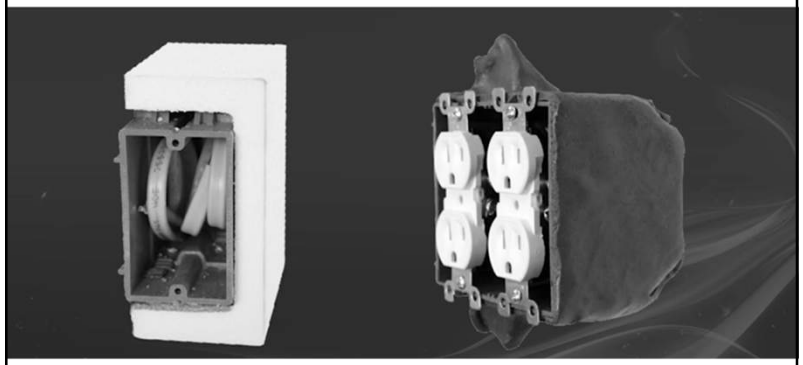
Membrane Penetration Exceptions

- Listed electrical outlet boxes tested for use in fire-resistance- rated assemblies and installed in accordance with the listing instructions
  - By the horizontal distance specified in the listing of the electrical boxes;
  - By solid fireblocking in accordance with Section 717.2.1;
  - By protecting both boxes with listed putty pads; or
  - By other listed materials and methods.
- Electrical boxes of any size or type, which have been listed as part of a wall opening protective material system and installed in accordance with the listing instructions.
- by boxes other than electrical boxes, provided such penetrating items and the annular space between the wall membrane and the box, are protected by an approved membrane penetration firestop system installed as tested in accordance with ASTM E 814 or UL 1479
- Sprinkler escutions

 86

86

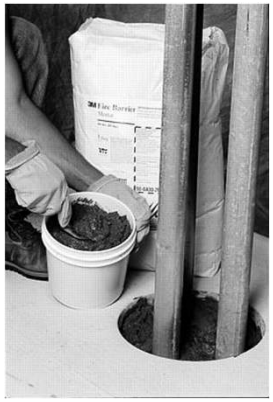
Added protection required for plastic boxes unless listed without protection.



 87

87

Horizontal assemblies 714.4



- Penetrations of a floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly not required to be enclosed in a shaft shall be protected

  Exceptions:

  1. Penetrations by steel, ferrous or copper conduits, pipes, tubes or vents or concrete or masonry items through a single fire-resistance-rated floor assembly where the annular space is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E 119 or UL 263

 88

88

Horizontal assemblies 714.4

Exceptions

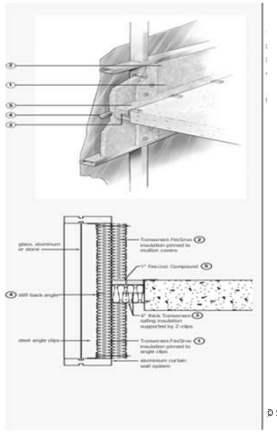
2. Penetrations in a single concrete floor by steel, ferrous or copper conduits, pipes, tubes or vents with a maximum 6-inch nominal diameter, provided the concrete, grout or mortar is installed the full thickness of the floor or the thickness required to maintain the fire-resistance rating.
3. Penetrations by listed electrical boxes of any material

 89

89

Fire Resistant Joint Systems

- Correct materials
- Correct installation



 90

90

Other Inspections

- 110.3.10
- In addition to the inspections specified above, the building official is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of this code and other laws that are enforced by the department of building safety.
  - Accessibility, Roofing, Exterior Finishes

 91

91

Roofing

- Roof is a system
  - Class A, B, C roofing

 92

92

Roofing

- Mid-Roof
  - Prior to installation of roofing material
  - During installation

 93

93

Roofing

- Final Roof
  - When roof is complete
  - Part of final building inspection?

 94

94

Roofing

- Underlayment
  - Proper material
    - Insulation
    - Base plies
  - Maintain drainage plane

 95

95

Roofing

- Flashing
  - Proper material
    - Noncorrosive
  - Installed properly
  - Maintain drainage plane

 96

96

Roofing

- Roofing material
  - Installed per manufacturers' instruction
    - Exposure
    - Fasteners
    - Special requirements
  - Maintain drainage plane

 97

97

Exterior Finishes

- Masonry veneer
- Wood
- Hardboard siding
- Stucco
- Foam plastics chapter 26

 98

98

Exterior Finishes

- EIFS
  - Evaluation Report
  - Weather barrier
  - Fasteners
  - Flashing
  - Special inspection
    - Section 1705.17

 99

99

SECTION TWO

THIRD PARTY INSPECTION REPORT

File No.:_____ Date:_____

Project Name/Address

Applicator Name/Address

Certificate No.:_____

Type of Dryvit System:
- Outsulation®
- Outsulation® Plus MD System®
- Outsulation® MD System®
- Outsulation® LCMD™ Systems
  - System 1
  - System 2
  - System 3
  - System 4
  - System 5
- Outsulation® RMD™ System
- Outsulation® SMD™ System
- Outsulation® X System
- Outsulation® HDCI System

Inspections Made:
- Material Storage
- Substrate Inspection
- Air/Water-Resistive Barrier Installation/Application
- Drainage Medium
- Insulation Board Installation
- Application of Base Coat and Reinforcing Mesh
- Application of Finish Coat
- Application of Sealants
- Application of Flashing

List items requiring correction, corrections of previously listed findings, and previously listed uncorrected findings:

Finding	Report Ref./Date	Correction	Complete

Comments:

To the best of my knowledge, work inspected was in accordance with the project specification and Dryvit Systems, Inc. latest Dryvit "_____ System Specifications, dated _____, Application Instructions, dated _____, and Installation Details, dated _____, except as noted above. In case of discrepancy between the Specifications, Application Instructions and Details, and Dryvit's suggested Specifications, Application Instruction and Details for the system being installed, the third-party inspector shall have the design professional confirm in writing which documents apply.

* Fill in name of system.

Signed:
Date:
Print Full Name:
Company Name:
Address:

Telephone:
E-Mail Address:

 100

100

Exterior Finishes

- Masonry veneer
  - Weather barrier
  - Anchors
  - Weep holes
  - Flashing

 101

101

Exterior Finishes

- Wood/
- Hardboard siding
  - Weather Barrier
  - Anchors
  - Flashing

 102

102

Exterior Finishes

- Stucco
  - Weather barrier
  - Proper lath
  - Fasteners
  - Flashing

 103

103

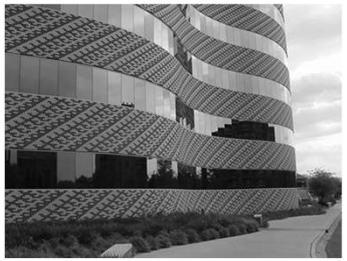
Final Inspections

- Plumbing, Mechanical, Electrical, Building

 104

104

Final Inspections



- 1110.3.12
- The final inspection shall be made after all work required by the building permit is completed.
- Last time to inspect
- Certificate of Occupancy

 105

105

Final Building

- Building must be completed
- All other finals complete
- Conducted to issue Certificate of Occupancy

 106

106

Final Building

- Final Grade
  - Slopes away from building
    - 6” in first 10’ or per the soils report
  - Grade Drains to approved area
  - Compacted
  - Safe

 107

107

Final Building

- Exterior
  - Address on building visible from street
  - Exterior Finish completed
  - Flatwork completed
  - Accessible routes and signage completed.

 108

108

Final Building

- Guards & handrails
- Exit Discharge & discharge lighting installed

 109

109

Final Building

- Means of Egress
  - Door swing
  - Hardware correct type
  - Landings
  - Gates
  - Signage

 110

110

Final Building

- Means of Egress
  - Stairways
    - Rise/Run
    - Handrail- continuation & height
    - Landings size & slope
    - Headroom
    - Light fixtures or other obstruction in the circulation path

 111

111

Final Building

- Means of Egress
  - Exit signs
  - R-1 required low exit signs installed
  - Illumination
  - Door swing
  - Hardware
  - Fire resistance ratings in tact

 112

112

Final Building

- Means of Egress
  - Corridors
  - Aisles
  - Items extending into Circulation path
  - Clear path to public way
  - Accessible means of egress
  - Exit passageways in compliance with 1024

 113

113

Final Building

- Exit Enclosures
  - Stairs
  - Ramps
  - Signage in stair enclosures
  - Penetrations by items not serving the enclosure
  - Handrail extensions

 114

114

Final Building

- Accessibility
  - Accessible route & MOE
    - Ramps
    - Changes of elevation
  - Reach distances
  - Door swing, door closing speed, lever type handles on faucets & doors, etc
  - Ramp slope and landings
  - Signage
  - Accessible Parking
  - Grab bars
  - Operating controls within reach ranges

 115

115

Final Building

- Light and Ventilation
  - Natural light/ventilation
  - Exhaust fans
  - Artificial lighting

 116

116

Final Building

- Fire-Resistant Rated Construction
  - Maintained
- Labeled assemblies
  - Doors & frames
    - Labels
    - Self-closing
    - Speed & force
  - Windows
    - Labels

 117

117

Final Building

- Firestopping & penetration protection maintained
  - New penetrations
  - New penetrations

 118

118

Final Building

- Interior Finishes
  - Flame Spread ratings—
  - Verify it is what was submitted
  - Carpet Radiant Flux
  - Use of Foam plastics in trim
  - Chapter 8 and 26 requirements

 119

119

Final Building

- Fire sprinkler requirements
  - Fire department approval
  - Notification devices

 120

120

Final Building

- Fire Alarm System
  - Automatic Detection
  - Manual Alarm
  - Fire Department Approval
  - Smoke and carbon monoxide alarm /detection

 121

121

Special Inspections and Tests
Chapter 17

122

Scope
1701.1

- The provisions of this chapter shall govern the quality, workmanship and requirements for materials covered.
- Materials of construction and tests shall conform to the applicable standards listed in the IBC.

 123

123

Approved Agency
1703.1

- An approved agency shall provide all information as necessary for the building official to determine that the agency meets the applicable requirements specified in Sections 1703.1.1 through 1703.1.3.

 124

124

Special Inspections 1704.2

- Where application is made to the building official for construction as specified in Section 105, the owner or the owner's authorized agent, other than the contractor, shall employ one or more approved agencies to provide special inspections and tests during construction on the types of work specified in Section 1705 and identify the approved agencies to the building official.
- These special inspections and tests are in addition to the inspections by the building official that are identified in Section 110.

 125

125

Special Inspections 1704.2 - Exceptions

- 1. Special inspections and tests are not required for construction of a minor nature or as warranted by conditions in the jurisdiction as approved by the building official.

 126

126

Special Inspections 1704.2 - Exceptions

- 2. Unless otherwise required by the building official, special inspections and tests are not required for Group U occupancies that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.

 127

127

Special Inspections 1704.2 - Exceptions

- 3. Special inspections and tests are not required for portions of structures designed and constructed in accordance with the cold-formed steel light-frame construction provisions of Section 2211.1.2 or the conventional light-frame construction provisions of Section 2308.

 128

128

Special Inspections 1704.2 - Exceptions

- 4. The contractor is permitted to employ the approved agencies where the contractor is also the owner.

 129

129

Special Inspector Qualifications 1704.2.1

- Prior to the start of the construction, the approved agencies shall provide written documentation to the building official demonstrating the competence and relevant experience or training of the special inspectors who will perform the special inspections and tests during construction.
- Experience or training shall be considered relevant where the documented experience or training is related in complexity to the same type of special inspection or testing activities for projects of similar complexity and material qualities.
- These qualifications are in addition to qualifications specified in other sections of this code.

 130

130

Special Inspector Qualifications 1704.2.1

- The registered design professional in responsible charge and engineers of record involved in the design of the project are permitted to act as the approved agency and their personnel are permitted to act as special inspectors for the work designed by them, provided they qualify as special inspectors.

 131

131

Statement Of Special Inspections 1704.2.3

- The applicant shall submit a statement of *special inspections in accordance* with Section 107.1 as a condition for permit issuance.
- This statement shall be in accordance with Section 1704.3.

132

132

Statement Of Special Inspections 1704.2.3 Exception

- A statement of special inspections is not required for portions of structures designed and constructed in accordance with the cold-formed steel light-frame construction provisions of Section 2211.1.2 or the conventional light-frame construction provisions of Section 2308.

 133

133

Statement of special inspections 1704.3

STATEMENT OF SPECIAL INSPECTIONS AGREEMENT

To permit applicants of projects requiring special inspection and/or testing per Section 1704 of the *International Building Code* (IBC):

Project Address: _____Permit No.: _____

BEFORE A PERMIT CAN BE ISSUED, two (2) copies of this agreement, including the Statement of Special Inspection and the Special Inspection and Testing Schedule with the required acknowledgments shall be completed by the owner, or registered design professional in responsible charge acting as the owner's agent. A pre-construction conference with the parties involved may be required to review the special inspection requirements and procedures.

APPROVAL OF SPECIAL INSPECTORS: Special inspectors may have no financial interest in projects for which they provide special inspection. Special inspectors shall be approved by the building department prior to performing any duties. Special inspectors shall submit their qualifications and are subject to personal interviews for prequalification. Special inspectors shall display approved identification, as stipulated by the building official, when performing the function of special inspector.

Special inspection and testing shall meet the minimum requirements of Sections 1704 through 1707 of the *International Building Code*. The following conditions are also applicable:

A. Duties and Responsibilities of the Special Inspector

1. General requirement. Special inspectors shall review approved plans and specifications for special inspection requirements. Special inspectors will comply with the special inspection requirements of the enforcing jurisdiction found in the Statement of Special Inspections including work and materials.
2. Signify presence at job site. Special inspectors shall notify contractor personnel of their presence and responsibilities at the job site. If required by the building official, they shall sign in on the appropriate form present with the building permit.
3. Observe assigned work. Special inspectors shall inspect all work according to the Statement of Special Inspections for which they are responsible for conformance with the building department approved (stamped) plans and specifications and applicable provisions of IBC Section 1704.
4. Report nonconforming items. (Discrepancies). Special inspectors shall bring all noncon forming items to the immediate attention of the contractor. If any such item is not resolved in a timely manner or is about to be incorporated into the work, the engineer or architect of record and the building official should be notified immediately and the item noted in the special inspector's written report (Section 1704.1.2). The building official may require this report to be provided in a conspicuous place on the job site. The special inspector should include in the report, as a minimum, the following information about each noncon forming item:
   - Description and exact location.
   - Reference to applicable detail of approved plans/specifications.
   - Name and title of each individual notified and method of notification.
   - Resolution or corrective action taken.

Model Program for Special Inspection 17

- Where special inspections or tests are required by Section 1705, the registered design professional in responsible charge shall prepare a statement of special inspections in accordance with Section 1704.3.1 for submittal by the applicant in accordance with Section 1704.2.3.

 134

134

Statement of special inspections 1704.3

Exception:

- The statement of *special inspections* is permitted to be prepared by a qualified person *approved* by the *building official* for construction not designed by a *registered design professional*.

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STATEMENT OF SPECIAL INSPECTION FORM

PROJECT _____ PERMIT # _____

ADDRESS _____ DATE _____

INSPECTION AGENCY _____ PHONE # _____

ADDRESS _____ CITY _____ ZIP _____

AGENCY CONTACT PERSON _____

DESIGN PROFESSIONAL _____ COMPANY _____

ADDRESS _____ CITY _____ ZIP _____

Check Required Special Inspections - per International Building Code, Section 1704 1704.7 IBC:

Seismic Force Resisting Systems requiring inspection (IBC 1705) _____

__1. Structural Welding (Steel 1704.3.1)
__2. High Strength Bolting (Steel 1704.3.2)
__3. Structural Concrete and Reinf. Steel (1704.4)
__4. Anchor Bolts in Concrete (1704.4)
__5. Prestressed Concrete and PT tendons (1704.4)
__6. Shotcrete (1704.6)
__7. Masonry (1704.5) Level 1 or Level 2 (Circle One)
__8. High Load Diaphragms (Wood 1704.6)
__9. Grading, excavation, and filling (Soils 1704.7)
__10. Pile Foundations (1704.8)
__11. Pier Foundations (1704.8)
__12. Sprayed Fire-Resistant Materials (1704.10)
__13. Mastic and Intumescent Coatings (1704.11)
__14. Ext. Insul. and Fin. System (EIFS 1704.12)
__15. Expansion and Adhesive Anchors (1704.13)
__16. Smoke Control (1704.14)
__17. Cont. SI for Struct. Welding (SSR 1707.2)
__18. Structural Wood (SSR1707.3)
__19. Cold-Formed Steel Framing (SSR 1707.4)
__20. Stor. Racks and Access Flrs. (SSR 1707.6)
__21. Architectural Components. (SSR 1707.7)
__22. Mech. and Elec. Components (SSR 1707.8)
__23. Other inspections as required by the Design Professional or the Building Official (1704.13)

__24. Items by an approved Fabricator (1704.2)

(For item 24: Refer to MBP Pro sy Statement on Approved Fabricators-List only those items constructed by an approved fabricator when special inspections will not be provided. A certificate of compliance from the fabricator shall be provided).

Section 1705-Structural Observations (List requirements) _____

 135

135

Structural Observations 1704.6

- Where required by the provisions of Section 1704.6.1, the owner or the owner's authorized agent shall employ a registered design professional to perform structural observations.
- The structural observer shall visually observe representative locations of structural systems, details and load paths for general conformance to the approved construction documents. Structural observation does not include or waive the responsibility for the inspections in Section 110 or the special inspections in Section 1705 or other sections of this code.

 136

136

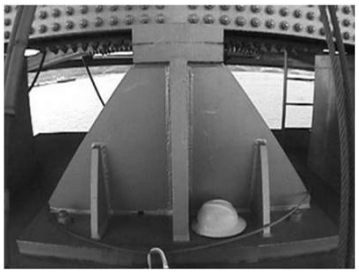
Structural Observations 1704.6

- Prior to the commencement of observations, the structural observer shall submit to the building official a written statement identifying the frequency and extent of structural observations.
- At the conclusion of the work included in the permit, the structural observer shall submit to the building official a written statement that the site visits have been made and identify any reported deficiencies that, to the best of the structural observer's knowledge, have not been resolved.

 137

137

1704.6.1 – Structural Observations for structures



- Structural observations shall be provided for those structures where one or more of the following conditions exist:
- 1. The structure is classified as Risk Category III or IV.
- 2. The structure is a high-rise building.

 138

138

1704.6.1 – Structural Observations for structures

3. The structure is assigned to Seismic Design Category E, and is greater than two stories above the grade plane.
4. Such observation is required by the registered design professional responsible for the structural design.
4. Such observation is specifically required by the building official.

 139

139

Special Cases 1705.1.1

- Special inspections and tests shall be required for proposed work that is, in the opinion of the building official, unusual in its nature, such as, but not limited to, the following examples:
  - 1. Construction materials and systems that 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.

 140

140

Steel Construction 1705.2

- The special inspections and nondestructive testing of steel construction in buildings, structures, and portions thereof shall be in accordance with this section.

 141

141

Steel Construction 1705.2 Exeption

- Special inspections of the steel fabrication process shall not be required where the fabrication process for the entire building or structure does not include any welding, thermal cutting or heating operation of any kind.
- In such cases, the fabricator shall be required to submit a detailed procedure for material control that demonstrates the fabricator's ability to maintain suitable records and procedures such that, at any time during the fabrication process, the material specification and grade for the main stress-carrying elements are capable of being determined.
- Mill test reports shall be identifiable to the main stress-carrying elements where required by the approved construction documents.

 142

142

Structural steel 1705.2.1

- Special inspections and nondestructive testing of structural steel elements in buildings, structures and portions thereof shall be in accordance with the quality assurance inspection requirements of AISC 360.
  - Exception: Special inspection of railing systems composed of structural steel elements shall be limited to welding inspection of welds at the base of cantilevered rail posts.

 143

143

ANSI/AISC 360-05
An American National Standard

Specification for Structural Steel Buildings

March 9, 2005

Supersedes the *Load and Resistance Factor Design Specification for Structural Steel Buildings* dated December 27, 1999, the *Specification for Structural Steel Buildings—Allowable Stress Design and Plastic Design* dated June 1, 1989, including Supplement No. 1, the *Specification for Allowable Stress Design of Single-Angle Members* dated June 1, 1989, the *Load and Resistance Factor Design Specification for Single-Angle Members* dated November 10, 2000, and the *Load and Resistance Factor Design Specification for the Design of Steel Hollow Structural Sections* dated November 10, 2000, and all previous versions of these specifications.

Approved by the AISC Committee on Specifications and issued by the AISC Board of Directors

AMERICAN INSTITUTE OF STEEL CONSTRUCTION
One East Wacker Drive, Suite 700
Chicago, Illinois 60601-1802

 144

144

Cold-formed steel deck 1705.2.2

- Special inspections and qualification of welding special inspectors for cold-formed steel floor and roof deck shall be in accordance with the quality assurance inspection requirements of SDI QA/QC.

 145

145

Open-web steel joists and joist girders 1705.2.3

- Special inspections of open-web steel joists and joist girders in buildings, structures and portions thereof shall be in accordance with Table 1705.2.3.

TABLE 1705.2.3
REQUIRED SPECIAL INSPECTIONS OF OPEN-WEB STEEL JOISTS AND JOIST GIRDERS

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD[a]
1. Installation of open-web steel joists and joist girders.			
a. End connections – welding or bolted.	—	X	SJI specifications listed in Section 2207.1.
b. Bridging – horizontal or diagonal.	—		
1. Standard bridging.	—	X	SJI specifications listed in Section 2207.1.
2. Bridging that differs from the SJI specifications listed in Section 2207.1.		X	

 146

146

Cold-formed Steel Trusses Spanning 60 Feet or Greater – 1705.2.4

- Where a cold-formed steel truss clear span is 60 feet or greater, the special inspector shall 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.

 147

147

Concrete Construction 1705.3

- Special inspections and tests of concrete construction shall be performed in accordance with this section and Table 1705.3.

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Concrete Construction
1705.3 Exceptions

Special inspections and tests shall not be required for:

1. Isolated spread concrete footings of buildings three stories or less above grade plane that are fully supported on earth or rock.

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Concrete Construction
1705.3 Exceptions

2. Continuous concrete footings supporting walls of buildings three stories or less above grade plane that are fully supported on earth or rock where:

   2.1. The footings support walls of light-frame construction;

   2.2. The footings are designed in accordance with Table 1809.7; or

   2.3. The structural design of the footing is based on a specified compressive strength, not more than 2,500 psi, regardless of the compressive strength specified in the approved construction documents or used in the footing construction.

 150

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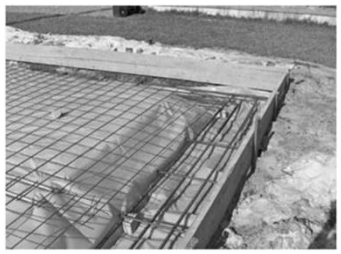
Concrete Construction
1705.3 Exceptions

3. Nonstructural concrete slabs supported directly on the ground, including prestressed slabs on grade, where the effective prestress in the concrete is less than 150 psi.



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151

Concrete Construction
1705.3 Exceptions

4. Concrete foundation walls constructed in accordance with Table 1807.1.6.2.

TABLE 1807.1.6.2
CONCRETE FOUNDATION WALLS[b,c]

MAXIMUM WALL HEIGHT (feet)	MAXIMUM UNBALANCED BACKFILL HEIGHT[a] (feet)	MINIMUM VERTICAL REINFORCEMENT-BAR SIZE AND SPACING (inches)								
		Design lateral soil load[a] (psf per foot of depth)								
		30[d]			45[d]			60		
		Minimum wall thickness (inches)								
		7.5	9.5	11.5	7.5	9.5	11.5	7.5	9.5	11.5
5	4	PC	PC	PC	PC	PC	PC	PC	PC	PC
	5	PC	PC	PC	PC	PC	PC	PC	PC	PC
6	4	PC	PC	PC	PC	PC	PC	PC	PC	PC
	5	PC	PC	PC	PC	PC	PC	PC	PC	PC
	6	PC	PC	PC	PC	PC	PC	PC	PC	PC
7	4	PC	PC	PC	PC	PC	PC	PC	PC	PC
	5	PC	PC	PC	PC	PC	PC	PC	PC	PC
	6	PC	PC	PC	PC	PC	PC	#5 at 48	PC	PC
	7	PC	PC	PC	#5 at 46	PC	PC	#6 at 48	PC	PC
8	4	PC	PC	PC	PC	PC	PC	PC	PC	PC
	5	PC	PC	PC	PC	PC	PC	PC	PC	PC
	6	PC	PC	PC	PC	PC	PC	#5 at 43	PC	PC
	7	PC	PC	PC	#5 at 41	PC	PC	#6 at 43	PC	PC
	8	#5 at 47	PC	PC	#6 at 43	PC	PC	#6 at 32	#6 at 44	PC

 152

152

Concrete Construction
1705.3 Exceptions

5. Concrete patios, driveways and sidewalks, on grade.

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Concrete Construction
Table 1705.3

TABLE 1705.3
REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD[a]	IBC REFERENCE
1. Inspect reinforcement, including prestressing tendons, and verify placement.	—	X	ACI 318: Ch. 20, 25.2, 25.3, 26.6.1-26.6.3	—
2. Reinforcing bar welding:				
a. Verify weldability of reinforcing bars other than ASTM A706;	—	X	AWS D1.4 ACI 318: 26.6.4	—
b. Inspect single-pass fillet welds, maximum $^5/_{16}$"; and	—	X		
c. Inspect all other welds.	X	—		
3. Inspect anchors cast in concrete.	—	X	ACI 318: 17.8.2	—
4. Inspect anchors post-installed in hardened concrete members.[b]				
a. Adhesive anchors installed in horizontally or upwardly inclined orientations to resist sustained tension loads.	X	—	ACI 318: 17.8.2.4	—
b. Mechanical anchors and adhesive anchors not defined in 4.a.	—	X	ACI 318: 17.8.2	
5. Verify use of required design mix.	—	X	ACI 318: Ch. 19, 26.4.3, 26.4.4	1904.1, 1904.2
6. Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	—	ASTM C31 ASTM C172 ACI 318: 26.5, 26.12	—

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Concrete Construction
Table 1705.3

7. Inspect concrete and shotcrete placement for proper application techniques.	X	—	ACI 318: 26.5	—
8. Verify maintenance of specified curing temperature and techniques.	—	X	ACI 318: 26.5.3-26.5.5	—
9. Inspect prestressed concrete for:				
a. Application of prestressing forces; and	X	—	ACI 318: 26.10	—
b. Grouting of bonded prestressing tendons.	X	—		
10. Inspect erection of precast concrete members.	—	X	ACI 318: 26.9	—
11. For precast concrete diaphragm connections or reinforcement at joints classified as moderate or high deformability elements (MDE or HDE) in structures assigned to Seismic Design Category C, D, E or F, inspect such connections and reinforcement in the field for:			ACI 318: 26.13.1.3	—
a. Installation of the embedded parts	X	—	ACI 550.5	
b. Completion of the continuity of reinforcement across joints.	X	—		
c. Completion of connections in the field.	X	—		
12. Inspect installation tolerances of precast concrete diaphragm connections for compliance with ACI 550.5.	—	X	ACI 318: 26.13.1.3	—
13. Verify in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.	—	X	ACI 318: 26.11.2	—
14. Inspect formwork for shape, location and dimensions of the concrete member being formed.	—	X	ACI 318: 26.11.1.2(b)	—

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Concrete Construction
Table 1705.3

Footnotes

a. Where applicable, see also Section 1705.13, Special inspections for seismic resistance.
b. Specific requirements for special inspection shall be included in the research report for the anchor issued by an approved source in accordance with 17.8.2 in ACI 318, or other qualification procedures. Where specific requirements are not provided, special inspection requirements shall be specified by the registered design professional and shall be approved by the building official prior to the commencement of the work

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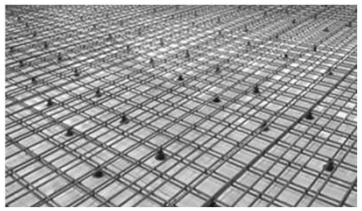
156

Welding of reinforcing bars 1705.3.1

- Special inspections of welding and qualifications of special inspectors for reinforcing bars shall be in accordance with the requirements of AWS D1.4 for special inspection and of AWS D1.4 for special inspector qualification.



 157

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Material Tests 1705.3.2

- In the absence of sufficient data or documentation providing evidence of conformance to quality standards for materials in Chapters 19 and 20 of ACI 318, the building official shall require testing of materials in accordance with the appropriate standards and criteria for the material in Chapters 19 and 20 of ACI 318.

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Masonry construction 1705.4

- Special inspections and tests of masonry construction shall be performed in accordance with the quality assurance program requirements of TMS 402/ACI 530/ASCE 5 and TMS 602/ACI 530.1/ASCE 6.

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Masonry Construction 1705.4 Exception

Special inspections shall not be required for:

1. 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 I, II or III.

- Empirical - A "rule of thumb" method which uses a set of easy to follow guidelines for masonry design. …establishes several simple formulas that enable one to size walls without an in depth analysis.
  - Masonry Advisory Council

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TABLE 1604.5
RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES

RISK CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: • Agricultural facilities. • Certain temporary facilities. • Minor storage facilities.
II	Buildings and other structures except those listed in Risk Categories I, III and IV
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: • Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. • Buildings and other structures containing elementary school, secondary school or day care facilities with an occupa load greater than 250. • Buildings and other structures containing adult education facilities, such as colleges and universities, with an occupant load greater than 500. • Group I-2 occupancies with an occupant load of 50 or more resident care recipients but not having surgery or emergency treatment facilities. • Group I-3 occupancies. • Any other occupancy with an occupant load greater than 5,000[a]. • Power-generating stations, water treatment facilities for potable water, waste water treatment facilities and other public utility facilities not included in Risk Category IV. • Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the *International Fire Code*; and Are sufficient to pose a threat to the public if released [b].
IV	Buildings and other structures designated as essential facilities, including but not limited to: • Group I-2 occupancies having surgery or emergency treatment facilities. • Fire, rescue, ambulance and police stations and emergency vehicle garages. • Designated earthquake, hurricane or other emergency shelters. • Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. • Power-generating stations and other public utility facilities required as emergency backup facilities for Risk Category IV structures. • Buildings and other structures containing quantities of highly toxic materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(2) or per outdoor control area in accordance with the *International Fire Code*; and Are sufficient to pose a threat to the public if released [b]. • Aviation control towers, air traffic control centers and emergency aircraft hangars. • Buildings and other structures having critical national defense functions. • Water storage facilities and pump structures required to maintain water pressure for fire suppression.

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Masonry Construction
1704.5 Exception

2. Masonry foundation walls constructed in accordance with Table 1807.1.6.3(1), 1807.1.6.3(2), 1807.1.6.3(3) or 1807.1.6.3(4). (Prescriptive Design)

3. Masonry fireplaces, masonry heaters or masonry chimneys installed or constructed in accordance with Section 2111, 2112 or 2113, respectively.

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Glass unit masonry and masonry veneer in Risk Category IV – 1705.4.1

- Special inspections and tests for glass unit masonry or masonry veneer designed in accordance with Section 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.

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Vertical masonry foundation elements
1705.4.2

- Special inspections and tests of vertical masonry foundation elements shall be performed in accordance with Section 1705.4.

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164

Wood construction 1705.5

- Special inspections of prefabricated wood structural elements and assemblies shall be in accordance with Section 1704.2.5.
- Special inspections of site-built assemblies shall be in accordance with this section.

165

High-Load Diaphragms 1705.5.1

- High-load diaphragms designed in accordance with Section 2306.2 shall be installed with special inspections as indicated in Section 1704.2.
- The special inspector shall inspect the wood structural panel sheathing to ascertain whether it is of the grade and thickness shown on the approved construction documents.
- Additionally, the special inspector must verify the nominal size of 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 construction documents.

166

Metal-plate-connected wood trusses spanning 60 feet or greater - 1705.5.2

- Where a truss clear span is 60 feet (or greater), the special inspector shall 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.

Errata!

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1705.5.3 Mass timber construction

- Special inspections of mass timber elements in Types IV-A, IV-B and IV-C construction shall be in accordance with Table 1705.5.3.

TABLE 1705.5.3
REQUIRED SPECIAL INSPECTIONS OF MASS TIMBER CONSTRUCTION

TYPE			CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION
1.	Inspection of anchorage and connections of mass timber construction to timber deep foundation systems.		—	X
2.	Inspect erection of mass timber construction.		—	X
3.	Inspection of connections where installation methods are required to meet design loads.			
	Threaded fasteners	Verify use of proper installation equipment.	—	X
		Verify use of pre-drilled holes where required.	—	X
		Inspect screws, including diameter, length, head type, spacing, installation angle and depth.	—	X
	Adhesive anchors installed in horizontal or upwardly inclined orientation to resist sustained tension loads.		X	—
	Adhesive anchors not defined in preceding cell.		—	X
	Bolted connections.		—	X
	Concealed connections.		—	X

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Soils
1705.6

- Special inspections and tests of existing site soil conditions, fill placement and load-bearing requirements shall be performed in accordance with this section and Table 1705.6.
- The approved geotechnical report and the construction documents prepared by the registered design professionals shall be used to determine compliance.
- During fill placement, the special inspector shall verify that proper materials and procedures are used in accordance with the provisions of the approved geotechnical report.

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Soils
1705.6

- 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 percent of the maximum dry density at optimum moisture content determined in accordance with ASTM D 1557.

 170

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TABLE 1705.6
REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION
1. Verify materials below *shallow foundations* 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. During fill placement, verify use of proper materials and procedures in accordance with the provisions of the approved geotechnical report. Verify densities and lift thicknesses during placement and compaction of compacted fill.	X	—
5. Prior to placement of compacted fill, inspect subgrade and verify that site has been prepared properly.	—	X

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171

Driven deep foundations
1705.7

- Special inspections and tests shall be performed during installation of driven deep foundation elements as specified in Table 1705.7.
- The approved geotechnical report and the construction documents prepared by the registered design professionals shall be used to determine compliance.

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TABLE 1705.7
REQUIRED SPECIAL INSPECTIONS AND TESTS OF DRIVEN DEEP FOUNDATION ELEMENTS

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION
1. Verify element materials, sizes and lengths comply with the requirements.	X	—
2. Determine capacities of test elements and conduct additional load tests, as required.	X	—
3. Inspect driving operations and maintain complete and 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.	X	—
5. For steel elements, perform additional special inspections in accordance with Section 1705.2.	In accordance with Section 1705.2	
6. For concrete elements and concrete-filled elements, perform tests and additional special inspections in accordance with Section 1705.3.	In accordance with Section 1705.3	
7. For specialty elements, perform additional inspections as determined by the registered design professional in responsible charge.	In accordance with Statement of Special Inspections	

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Cast-In-Place Deep Foundations 1705.8

- Special inspections and tests shall be performed during installation of cast-in-place deep foundation elements as specified in Table 1705.8.
- The approved geotechnical report and the construction documents prepared by the registered design professionals shall be used to determine compliance.

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TABLE 1705.8
REQUIRED SPECIAL INSPECTIONS AND TESTS OF CAST-IN-PLACE DEEP FOUNDATION ELEMENTS

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION
1. Inspect 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.	X	—
3. For concrete elements, perform tests and additional *special inspections* in accordance with Section 1705.3.	In accordance with Section 1705.3	

 175

175

Helical Pile Foundations 1705.9

- Continuous special inspections shall be performed during installation of helical pile foundations.
- The information recorded shall include 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.
- The approved geotechnical report and the construction documents prepared by the registered design professional shall be used to determine compliance.

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1705.10 – Structural integrity of deep foundation elements

- Whenever there is a reasonable doubt as to the structural integrity of a deep foundation element, an engineering assessment shall be required.
- The engineering assessment shall include tests for defects performed in accordance with ASTM D4945, ASTM D5882, ASTM D6760 or ASTM D7949, or other approved method.

 177

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Special inspections for wind resistance – 1705.12

- Special inspections for wind resistance specified in Sections 1705.13.1 through 1705.13.3, unless exempted by the exceptions to Section 1704.2, are required for buildings and structures constructed in the following areas:
  1. In wind Exposure Category B, where V is 150 miles per hour or greater.
  2. 2.In wind Exposure Category C or D, where V is 140 mph or greater.

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Structural Wood 1705.12.1

- Continuous special inspection is required during field gluing operations of elements of the main windforce-resisting system.
- Periodic special inspection is required for nailing, bolting, anchoring and other fastening of elements of the main windforce-resisting system, including wood shear walls, wood diaphragms, drag struts, braces and hold-downs.

 179

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Structural Wood 1705.12.1

- Exception:
  Special inspections are not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other elements of the main windforce-resisting system, where the lateral resistance is provided by structural sheathing and the specified fastener spacing at panel edges is more than 4 inches on center.

 180

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Cold-Formed Steel Light-Frame Construction – 1705.12.2

- Periodic special inspection is required for welding operations of elements of the main windforce-resisting system.
- Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of elements of the main windforce-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs.

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Cold-Formed Steel Light-Frame Construction – 1705.12.2

- Exception:

  Special inspections are not required for cold-formed steel light-frame shear walls and diaphragms, including screwing, bolting, anchoring and other fastening to components of the windforce resisting system, where either of the following applies:

  1. The sheathing is gypsum board or fiberboard.
  2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the specified fastener spacing at the panel or sheet edges is more than 4 inches on center.

 182

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Wind-Resisting Components 1705.12.3

- Periodic special inspection is required for fastening of the following systems and components:
  - 1. Roof covering, roof deck and roof framing connections.
  - 2. Exterior wall covering and wall connections to roof and floor diaphragms and framing.

 183

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Special Inspections for Seismic Resistance – 1705.13

- Special inspections for seismic resistance shall be required as specified in Sections 1705.13.1 through 1705.13.9, unless exempted by the exceptions of Section 1704.2.

 184

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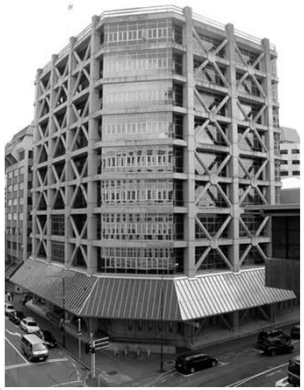
Special Inspections for Seismic Resistance – 1705.13 Exception



Exception: The special inspections specified in Sections 1705.13.1 through 1705.13.9 are not required for structures designed and constructed in accordance with one of the following:

- 1. The structure consists of light-frame construction; the design spectral response acceleration at short periods, *SDS*, as determined in Section 1613.3.4, does not exceed 0.5; and the building height of the structure does not exceed 35 feet.
- 2. The seismic force-resisting system of the structure consists of reinforced masonry or reinforced concrete; the design spectral response acceleration at short periods, SDS, as determined in Section 1613.3.4, does not exceed 0.5; and the building height of the structure does not exceed 25 feet

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Special Inspections for Seismic Resistance – 1705.13 Exception

- 3. The structure is a detached one- or two-family dwelling not exceeding two *stories above grade plane* and does not have any of the following horizontal or vertical irregularities in accordance with Section 12.3 of ASCE 7:
  - 3.1. Torsional or extreme torsional irregularity.
  - 3.2. Nonparallel systems irregularity.
  - 3.3. Stiffness-soft story or stiffness-extreme soft story irregularity.
  - 3.4. Discontinuity in lateral strength-weak story irregularity.

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Structural Steel 1705.13.1

- Special inspections for seismic resistance shall be in accordance with Section 1705.13.1.1 or 1705.13.1.2, as applicable.

 187

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Seismic force-resisting systems 1705.13.1.1

- Special inspections of structural steel in the seismic force-resisting systems in buildings and structures assigned to Seismic Design Category B, C, D, E or F shall be performed in accordance with the quality assurance requirements of AISC 341.

 188

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Seismic force-resisting systems 1705.13.1.1 Exceptions

- 1. In buildings and structures assigned to Seismic Design Category B or C, special inspections are not required for structural steel seismic force-resisting systems where the response modification coefficient, R, designated for "Steel systems not specifically detailed for seismic resistance, excluding cantilever column systems" in ASCE 7, Table 12.2-1, has been used for design and detailing.

 189

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Seismic force-resisting systems 1705.13.1.1 Exceptions

- 2. In structures assigned to Seismic Design Category D, E, or F, special inspections are not required for structural steel seismic force-resisting systems where design and detailing in accordance with AISC 360 is permitted by ASCE 7, Table 15.4-1.

 190

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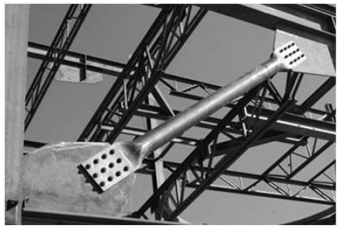
Structural steel elements 1705.13.1.2

- Special inspections of structural steel elements in the seismic force-resisting systems of buildings and structures assigned to Seismic Design Category B, C, D, E or F other than those covered in Section 1705.13.1.1, including struts, collectors, chords and foundation elements, shall be performed in accordance with the quality assurance requirements of AISC 341.



 191

191

Structural steel elements 1705.13.1.2 Exceptions

- 1. In buildings and structures assigned to Seismic Design Category B or C, special inspections of structural steel elements are not required for seismic force-resisting systems with a response modification coefficient, R, of 3 or less.

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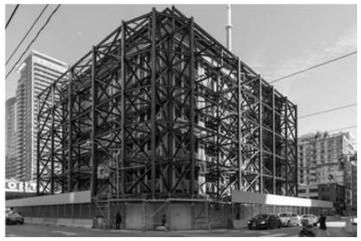
Structural steel elements
1705.13.1.2 Exceptions

- 2. In structures assigned to Seismic Design Category D, E, or F, special inspections of structural steel elements are not required for seismic force-resisting systems where design and detailing other than AISC 341 is permitted by ASCE 7, Table 15.4-1. Special inspection shall be in accordance with the applicable referenced standard listed in ASCE 7, Table 15.4-1.



 193

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Structural Wood
1705.13.2

- For the seismic force-resisting systems of structures assigned to Seismic Design Category C, D, E or F:
  - 1. Continuous special inspection shall be required during field gluing operations of elements of the seismic force-resisting system.
  - 2. Periodic special inspection shall be required for nailing, bolting, anchoring and other fastening of elements of the seismic force-resisting system, including wood shear walls, wood diaphragms, drag struts, braces, shear panels and hold-downs.

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Structural Wood
1705.13.2

- Exception:

  Special inspections are not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other elements of the seismic force-resisting system, where the lateral resistance is provided by structural sheathing, and the specified fastener spacing at the panel edges is more than 4 inches on center.

 195

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Cold-Formed Steel Light-frame Construction
1705.13.3

- For the seismic force-resisting systems of structures assigned to Seismic Design Category C, D, E or F, periodic special inspection shall be required:
  - 1. For welding operations of elements of the seismic force-resisting system; and
  - 2. For screw attachment, bolting, anchoring and other fastening of elements of the seismic force-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs.

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Cold-Formed Steel Light-frame Construction 1705.13.3

Exception:

Special inspections are not required for cold-formed steel light-frame shear walls and diaphragms, including screw installation, bolting, anchoring and other fastening to components of the seismic force-resisting system, where either of the following applies:

1. The sheathing is gypsum board or fiberboard.
2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the specified fastener spacing at the panel or sheet edge is more than 4 inches on center.

 197

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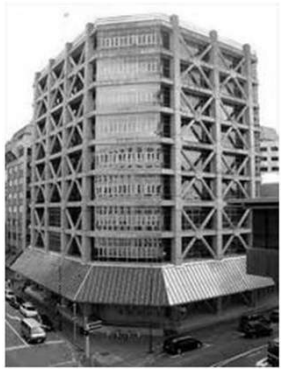
Designated Seismic Systems 1705.13.4



- For structures assigned to Seismic Design Category C, D, E or F, the special inspector shall examine designated seismic systems requiring seismic qualification in accordance with Section 13.2.2 of ASCE 7 and verify that the label, anchorage and mounting conform to the certificate of compliance.

 198

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Architectural Components 1705.13.5

- Periodic special inspection is required for the erection and fastening of exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer in structures assigned to Seismic Design Category D, E or F.

 199

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Architectural Components 1705.13.5

Exception: Periodic special inspection is not required for the following:

1. Exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer 30 feet or less in height above grade or walking surface.
2. Exterior cladding and interior and exterior veneer weighing 5 psf or less.
3. Interior nonbearing walls weighing 15 psf or less.

 200

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Access floors 1705.13.5.1

- Periodic *special inspection* is required for the anchorage of access floors in structures assigned to *Seismic Design Category* D, E or F.

 201

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Plumbing, Mechanical and Electrical Components - 1705.13.6

- Periodic special inspection of plumbing, mechanical and electrical components shall be required for the following:
  - 1. Anchorage of electrical equipment for emergency and standby power systems in structures assigned to Seismic Design Category C, D, E or F.
  - 2. Anchorage of other electrical equipment in structures assigned to Seismic Design Category E or F.

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Mechanical and Electrical Components 1705.13.6

3. Installation and anchorage of piping systems designed to carry hazardous materials and their associated mechanical units in structures assigned to Seismic Design Category C, D, E or F.
4. Installation and anchorage of ductwork designed to carry hazardous materials in structures assigned to Seismic Design Category C, D, E or F.
5. Installation and anchorage of vibration isolation systems in structures assigned to Seismic Design Category C, D, E or F where the approved construction documents require a nominal clearance of 1/4 inch (6.4 mm) or less between the equipment support frame and restraint.

 203

203

Mechanical and Electrical Components 1705.13.6

- 6. Installation of mechanical and electrical equipment, including duct work, piping systems and their structural supports, where automatic fire sprinkler systems are installed in structures assigned to Seismic Design Category C, D, E or F to verify one of the following:
  - 6.1. Minimum clearances have been provided as required by Section 13.2.3 ASCE/SEI 7.
  - 6.2. A nominal clearance of not less than 3 inches has been be provided between fire protection sprinkler system drops and sprigs and: structural members not used collectively or independently to support the sprinklers; equipment attached to the building structure; and other systems' piping.
- Where flexible sprinkler hose fittings are used, special inspection of minimum clearances is not required.

 204

204

Storage Racks 1705.13.7

- Steel storage racks and steel cantilevered storage racks that are 8 feet in height or greater and assigned to Seismic Design Category D, E or F shall be provided with periodic special inspection as required by Table 1705.13.7.

TABLE 1705.13.7
REQUIRED INSPECTIONS OF STORAGE RACK SYSTEMS

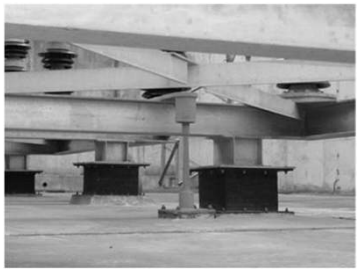
TYPE	CONTINUOUS INSPECTION	PERIODIC INSPECTION	REFERENCED STANDARD	IBC REFERENCE
1. Materials used, to verify compliance with one or more of the material test reports in accordance with the approved construction documents.	—	X	—	—
2. Fabricated storage rack elements.	—	X	—	Section 1704.2.5
3. Storage rack anchorage installation.	—	X	ANSI/MH16.1 Section 7.3.2	—
4. Completed storage rack system, to indicate compliance with the approved construction documents.	—	X	—	—

 205

205

Seismic Isolation System 1705.13.8

- Periodic special inspection shall be provided for seismic isolation systems in seismically isolated structures assigned to Seismic Design Category B, C, D, E or F during the fabrication and installation of isolator units and energy dissipation devices.



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206

Cold-formed steel special bolted moment frames – 1705.13.9

- Periodic special inspection shall be provided for the installation of cold-formed steel special bolted moment frames in the seismic force-resisting systems of structures assigned to Seismic Design Category D, E or F.

 207

207

Testing and qualification for seismic resistance - 1705.14

- Testing for seismic resistance shall be required as specified in Sections 1705.13.1 through 1705.13.4, unless exempted from special inspections by the exceptions of Section 1704.2.

 208

208

Structural steel
1705.14.1

- Nondestructive testing for seismic resistance shall be in accordance with Section 1705.13.1.1 or 1705.13.1.2, as applicable.

 209

209

Seismic force-resisting systems
1705.14.1.1

- Nondestructive testing of structural steel in the seismic force-resisting systems of buildings and structures assigned to Seismic Design Category B, C, D, E or F shall be performed in accordance with the quality assurance requirements of AISC 341.

 210

210

Seismic force-resisting systems
1705.14.1.1 Exceptions

- 1. In buildings and structures assigned to Seismic Design Category B or C, nondestructive testing is not required for structural steel seismic force-resisting systems where the response modification coefficient, R, designated for "Steel systems not specifically detailed for seismic resistance, excluding cantilever column systems" in ASCE 7, Table 12.2-1, has been used for design and detailing.

 211

211

Seismic force-resisting systems
1705.14.1.1 Exceptions

- 2. In structures assigned to Seismic Design Category D, E, or F, nondestructive testing is not required for structural steel seismic force-resisting systems where design and detailing in accordance with AISC 360 is permitted by ASCE 7, Table 15.4-1.

 212

212

Structural steel elements 1705.14.1.2

- Nondestructive testing of structural steel elements in the seismic force-resisting systems of buildings and structures assigned to Seismic Design Category B, C, D, E or F other than those covered in Section 1705.13.1.1, including struts, collectors, chords and foundation elements, shall be performed in accordance with the quality assurance requirements of AISC 341.

 213

213

Structural steel elements 1705.14.1.2 Exceptions

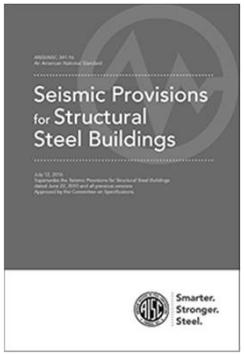
- 1. In buildings and structures assigned to Seismic Design Category B or C, nondestructive testing of structural steel elements is not required for seismic force-resisting systems with a response modification coefficient, R, of 3 or less.

 214

214

Structural steel elements 1705.14.1.2 Exceptions

- 2. In structures assigned to Seismic Design Category D, E or F, nondestructive testing of structural steel elements is not required for seismic force-resisting systems where design and detailing other than AISC 341 is permitted by ASCE 7, Table 15.4-1. Nondestructive testing of structural steel elements shall be in accordance with the applicable referenced standard listed in ASCE 7, Table 15.4-1.



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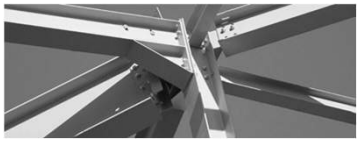
Nonstructural components 1705.14.2

- For structures assigned to Seismic Design Category B, C, D, E or F, where the requirements of Section 13.2.1 of ASCE 7 for nonstructural components, supports or attachments are met by seismic qualification as specified in Item 2 therein, the registered design professional shall specify on the approved construction documents the requirements for seismic qualification by analysis, testing or experience data.
- Certificates of compliance for the seismic qualification shall be submitted to the building official as specified in Section 1704.5.



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Designated seismic systems 1705.14.3

- For structures assigned to Seismic Design Category C, D, E or F and with designated seismic systems that are subject to the requirements of Section 13.2.2 of ASCE 7 for certification, the registered design professional shall specify on the approved construction documents the requirements to be met by analysis, testing or experience data as specified therein.
- Certificates of compliance documenting that the requirements are met shall be submitted to the building official as specified in Section 1704.5.

 217

217

Seismic isolation systems 1705.14.4

- Seismic isolation systems in seismically isolated structures assigned to Seismic Design Category B, C, D, E or F shall be tested in accordance with Section 17.8 of ASCE 7.

 218

218

Sprayed Fire-Resistant Materials 1705.15

- Special inspections and tests of sprayed fire-resistant materials applied to floor, roof and wall assemblies and structural members shall be performed in accordance with Sections 1705.15.1 through 1705.15.6.
- Special inspections shall be based on the fire-resistance design as designated in the approved construction documents.

 219

219

Sprayed Fire-Resistant Materials 1705.15

- The tests set forth in this section shall be based on samplings from specific floor, roof and wall assemblies and structural members.
- Special inspections and tests shall be performed during construction with an additional visual inspection after the rough installation of electrical, automatic sprinkler, mechanical and plumbing systems and suspension systems for ceilings, and before concealment where applicable.
- The required sample size shall not exceed 110 percent of that specified by the referenced standards in Sections 1705.15.4.1 through 1705.15.4.9.

 220

220

Physical And Visual Tests 1705.15.1

- The special inspections and tests shall include the following to demonstrate compliance with the listing and the fire-resistance rating:
  1. Condition of substrates.
  2. Thickness of application.
  3. Density in pounds per cubic foot.
  4. Bond strength adhesion/cohesion.
  5. Condition of finished application.

 221

221

Structural Member Surface Conditions 1705.15.2

- The surfaces shall be prepared in accordance with the approved fire-resistance design and the written instructions of approved manufacturers.
- The prepared surface of structural members to be sprayed shall be inspected by the special inspector before the application of the sprayed fire-resistant material.

 222

222

Application 1705.15.3

- The substrate shall have a minimum ambient temperature before and after application as specified in the written instructions of approved manufacturers.
- The area for application shall be ventilated during and after application as required by the written instructions of approved manufacturers.

 223

223

Thickness 1705.15.4

- No more than 10 percent of the thickness measurements of the sprayed fire-resistant materials 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 1704.12.4.1.

 224

224

Minimum Allowable Thickness 1705.15.4.1

- For design thicknesses 1 inch or greater, the minimum allowable individual thickness shall be the design thickness minus 1/4 inch.
- For design thicknesses less than 1 inch, the minimum allowable individual thickness shall be the design thickness minus 25 percent.
- Thickness shall be determined in accordance with ASTM E 605.
- Samples of the sprayed fire-resistant materials shall be selected in accordance with Sections 1704.12.4.2 and 1704.12.4.3.

 225

225

Floor, Roof and Wall Assemblies 1705.15.4.2

- The thickness of the sprayed fire-resistant material applied to floor, roof and wall assemblies shall be determined in accordance with ASTM E 605, making not less than four measurements for each 1,000 square feet of the sprayed area in each story or portion thereofm, in each story.

 226

226

Cellular Decks 1705.15.4.3

- Thickness measurements shall be selected from a square area, 12 inches by 12 inches in size.
- A minimum of four measurements shall be made, located symmetrically within the square area.

 227

227

Fluted Decks 1705.15.4.4

- Thickness measurements shall be selected from a square area, 12 inches by 12 inches in size.
- A minimum of four measurements shall be made, located symmetrically within the square area, including one each of the following: valley, crest and sides.
- The average of the measurements shall be reported.

 228

228

Structural Members 1705.15.4.5

- The thickness of the sprayed fire-resistant material applied to structural members shall be determined in accordance with ASTM E 605.
- Thickness testing shall be performed on not less than 25 percent of the structural members on each floor.

 229

229

Beams and Girders 1705.15.4.6

- At beams and girders thickness measurements shall be made at nine locations around the beam or girder at each end of a 12-inch length.

 230

230

Joists and Trusses 1705.15.4.7

- At joists and trusses, thickness measurements shall be made at seven locations around the joist or truss at each end of a 12-inch length.

 231

231

Wide-Flanged Columns 1705.15.4.8

- At wide- flanged columns, thickness measurements shall be made at 12 locations around the column at each end of a 12-inch length.

 232

232

Hollow structural section and pipe columns – 1705.15.4.9

- At hollow structural section and pipe columns, thickness measurements shall be made at a minimum of four locations around the column at each end of a 12-inch length.

 233

233

Density 1705.15.5

- The density of the sprayed fire-resistant material shall not be less than the density specified in the approved fire-resistance design.
- Density of the sprayed fire-resistant material shall be determined in accordance with ASTM E 605.
- The test samples for determining the density of the sprayed fire-resistant materials shall be selected as follows:

 234

234

Density 1705.15.5

1. From each floor, roof and wall assembly at the rate of not less than one 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 the rate of not less than one sample for each type of structural member for each 2,500 square feet of floor area or portion thereof in each story .

 235

235

Bond Strength 1705.15.6

- The cohesive/adhesive bond strength of the cured sprayed fire-resistant material applied to floor, roof and wall assemblies and structural members shall not be less than 150 psf.
- The cohesive/adhesive bond strength shall be determined in accordance with the field test specified in ASTM E 736 by testing in-place samples of the sprayed fire-resistant material selected in accordance with Sections 1704.12.6.1 through 1704.12.6.3.

 236

236

Floor, Roof and Wall Assemblies 1705.15.6.1

- The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from each floor, roof and wall assembly at the rate of not less than one sample for every 2,500 square feet of the sprayed area, or portion thereof, in each story.

 237

237

Structural Members 1705.15.6.2

- The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from beams, girders, trusses, columns and other structural members at the rate of not less than one sample for each type of structural member for each 2,500 square feet of floor area or portion thereof in each story.

 238

238

Primer, Paint and Encapsulant Bond Tests – 1705.15.6.3

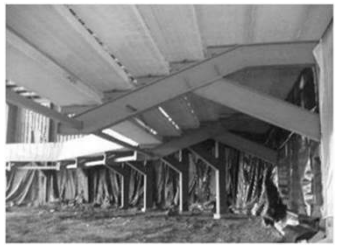
- Bond tests to qualify a primer, paint or encapsulant shall be conducted when the sprayed fire-resistant material is applied to a primed, painted or encapsulated surface for which acceptable bond-strength performance between these coatings and the fire-resistant material has not been determined.
- A bonding agent approved by the SFRM manufacturer shall be applied to a primed, painted or encapsulated surface where the bond strengths are found to be less than required values.

 239

239

Mastic and Intumescent Fire-Resistant Coatings – 1705.16

- Special inspections and tests for mastic and intumescent fire-resistant coatings applied to structural elements and decks shall be performed in accordance with AWCI 12-B.
- Special inspections and tests shall be based on the fire-resistance design as designated in the approved construction documents. Special inspections and tests shall be performed during construction.
- Additional visual inspection shall be performed after the rough installation and, where applicable, prior to the concealment of electrical, automatic sprinkler, mechanical and plumbing systems.



 240

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Exterior Insulation and Finish Systems 1705.17

- Special inspections shall be required for all EIFS applications.
- Exceptions:
  1. Special inspections shall not be required for EIFS applications installed over a water-resistive barrier with a means of draining moisture to the exterior.
  2. Special inspections shall not be required for EIFS applications installed over masonry or concrete walls.

 241

241

Water-Resistive Barrier Coating 1705.17.1

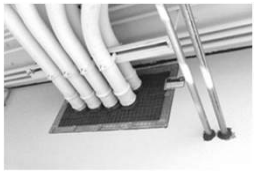
- A water-resistive barrier coating complying with ASTM E 2570 requires special inspection of the water-resistive barrier coating when installed over a sheathing substrate.

 242

242

Fire-resistant penetrations and joints - 1705.18

- In high-rise buildings, in buildings assigned to Risk Category III or IV, or in fire areas containing Group R occupancies with an occupant load greater than 250, special inspections for through-penetrations, membrane penetration firestops, fire-resistant joint systemsand perimeter fire containment systems that are tested and listed in accordance with Sections 714.4.1.2, 714.5.1.2, 715.3.1 and 715.4 shall be in accordance with Section 1705.18.1 or 1705.18.2.



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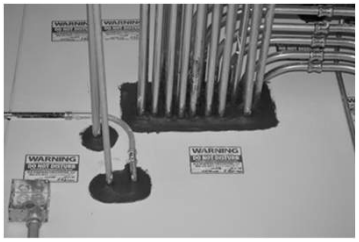
Penetration firestops 1705.18.1



- Inspections of penetration firestop systems that are tested and listed in accordance with Sections 714.3.1.2 and 714.4.2 shall be conducted by an approved agency in accordance with ASTM E 2174.

 244

244

Fire-resistant joint systems 1705.18.2

- Inspection of fire-resistant joint systems that are tested and listed in accordance with Sections 715.3 and 715.4 shall be conducted by an approved agency in accordance with ASTM E 2393.

 245

245

Smoke Control Systems 1705.19

- Smoke control systems shall b tested by a special inspector.

 246

246

Testing Scope 1705.19.1

- The test scope shall be as follows:
  1. During erection of ductwork and prior to concealment for the purposes 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.

 247

247

Qualifications 1705.19.2

- Approved agencies for smoke control testing shall have expertise in fire protection engineering, mechanical engineering and certification as air balancers.

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 248

248

1705.20
Sealing of mass timber

- Periodic special inspections of sealants or adhesives shall be conducted where sealant or adhesive required by Section 703.7 is applied to mass timber building elements as designated in the approved construction documents.

 249

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