Combination Inspections of IRC Buildings

Shums Coda Associates, Inc.

1

Instructor: Bill Clayton, CBO

- Over 33 years of Code Administration and enforcement experience
- Instructor, Consultant, Inspector, Plans Examiner, RCBO
- ICC/IBC General Committee 3 years
- ICC/IEBC Committee 9 years
- Instructor with CCC & Shums Coda 12+ years
- Co-Author of 2024 ICC resource book "Fire Stopping, Joint Systems, and Dampers"

2 © 2024 Shums Coda Associates, Inc.

2

Interactive Class

Don't be afraid to ask questions.
They are easier to handle than dumb mistakes

or smart questions

3

3

Class Summary

- Inspection Techniques
  - Personal Preparation
  - Tools/Equipment
  - Foundation – Roof
  - Building
  - Plumbing
  - Mechanical
  - Electrical
  - Energy
- 2024 International Residential Code
- Conventional Construction

4

4

Personal Preparation

- Personal Appearance
  - Professional
  - Look like an inspector
- Proper equipment and tools
- Proper attitude

5

5

Professionalism

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

6

6

Develop a Reputation

- Tough
- Knowledgeable
- Fair
- Reasonable
- Understands construction

- A jerk
- Hard to work with
- Unreasonable
- Arrogant
- Doesn't know the code
- #&*@$@&#%

7

7

Paperwork

- Keep good records
- Keep work up to date
- Be consistent with paperwork
- Streamline forms

8

8

Records

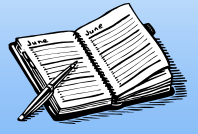
- Follow basic criteria for developing reports, letters, field cards, notes
  - Keep legal action in mind
- Set up efficient file system
- Destroy old files when permitted

9

9

Time Management

- Inspections
  - Number per day
  - Difficult projects
  - Unskilled persons
- Phone calls, messages
  - Set time of day
  - Cell phone?
- Report writing
  - In field or office
- Meetings
  - Staff, contractors, designers

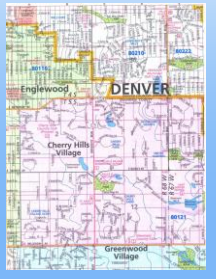


10

10

Inspection Preparation

- Set inspection route
- Estimate inspection times
- Review code/checklist
- Let permit technician know you are leaving



11

11

Field Relations

- Identify yourself
  - Name
  - Building Inspector
  - Jurisdiction
- Deal with person in authority
  - Superintendent
  - Foreman

12

12

Field Relations

- Arrive Promptly
  - If appointment was set
  - Phone if delayed
- Be courteous
- Be helpful
- Be professional

13

13

Field Relations

- Corrections
  - Write all corrections
    - Correction notice
    - Inspection report
    - Include code section
    - Bear legal action in mind
  - Explain corrections
    - Reason for requirement
    - Not "because the code requires it"

14

14

Field Relations

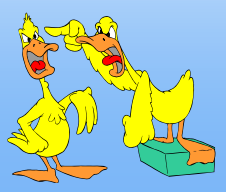
- Corrections
  - Be consistent
    - Same interpretation for all
    - Enforce the code, no more and no less
  - Offer alternatives if appropriate
- Follow up promptly
  - Time is money

15

15

Field Relations

- Resolve differences without argument
  - Maintain professionalism
  - Don't raise your voice
  - Leave if your safety is in question
  - Notify your superior



16

16

Field Relations

- ~~Unskilled~~ Inexperienced people
  - Be patient
  - Expect to spend more time doing inspection
  - Use opportunity to educate person about codes

17

17

Stop Work Orders

- Issue when necessary
  - Local policy
- Be professional
  - Identify yourself
  - Explain reason for issuing order
- Be Right!
- Follow up promptly

18

18

Favors

- **DO NOT ACCEPT FAVORS!**
  - Illegal
  - Compromises all inspector's reputation
  - Almost always backfires

19

19

City building inspector charged with bribe solicitation.

San Francisco Chronicle
Jason B. Johnson, Chronicle Staff Writer

Saturday, June 24, 2006

An Alameda building inspector tried to shake down the owner of a Chinese restaurant for free meals, materials to build an addition to his home and a food blender to give his wife for Christmas, according to court documents filed Friday.

Hans Warner Williams, 46, of Dublin, was arrested at his home Thursday on two counts of solicitation of bribery and arraigned Friday in Superior Court. He entered no plea and is due back in court on July 7. He was released after posting $30,000 bail.

Williams, who was placed on administrative leave, has worked for the city for more than a decade with no complaints. His arrest came as a surprise to city officials.

His attorney, William Linehan, declined to discuss details of the case but said the charges do not match his client's "unblemished record" in more than a decade on the job.

The alleged crimes took place between December 2005 and June 2006. The investigation began after local businessman Richard Chiu, whose family owns the Chef's Wok restaurant on Webster Street, called the FBI to file a complaint.

20

20

Fa

In December, Williams spoke to Chiu at the restaurant, which was having its kitchen remodeled, and pointed out several problems, according to court documents.

Williams suggested he could overlook the problems, telling Chiu "you help me and I'll help you," according to documents. Williams also allegedly said he could help grease the wheels with city officials regarding other projects the family wanted to develop.

The inspector said he was planning to build an addition to his Dublin home and suggested Chiu and his family set up an account at an Oakland store called Economy Lumber so that Williams could buy supplies and charge them to the account, authorities say.

During that and other meetings, Williams ate food prepared by Chef's Wok and did not pay. He later asked if he could get free food from Chef's Wok and the House of Bagels, another establishment the family owned, according to court documents.

Chiu could not be reached for comment Friday, and Williams did not return a telephone call seeking comment for this story.

On Dec. 13, Williams showed up unexpectedly at Chef's Wok to perform an inspection, and declined to sign off on work in progress, records show. Before leaving, he gave Chiu printed information about a Vita-Mix food blender that he said he wanted to give his wife for Christmas. Williams suggested that Chiu buy the blender at Costco, which had the best price.

The next day, Williams approved the progress of the work without comment. In an interview with investigators, Chiu said he bought the Vita-Mix blender and left it with an employee at the restaurant. He said Williams picked it up before Christmas.

Chiu began to secretly record conversations with Williams in the middle of January, court records show. During those talks, Williams again discussed setting up the joint account, mentioning he wanted to buy a window and a skylight.

21

21

As the investigation progressed, agents provided Chiu with audio and video equipment to record additional conversations with Williams.

During a March 24 lunch at the restaurant, Williams allegedly discussed the lumber store account with Chiu, telling him, "I'm going to be starting my project in six or seven weeks" and "I want to be able to access the account, but I don't want to make it too obvious."

Williams told Chiu the work being done on his house wasn't that large. "It's only going to be 300 square feet ... don't worry, you can always say no. ... I am not going to build another house on the side."

According to the city's Web site, Williams gave final approval to the remodeling work at Chef's Wok on March 24. The site lists no comments from Williams. On April 26, Williams met Chiu and gave him a list of building supplies, which Chiu turned over to investigators.

When Chiu expressed reservations about the gifts during a May 4 conversation, Williams responded, "I don't want you to think I'm going to nickel-and-dime you for the next five years."

22

22

Tools/Equipment

- Personal Protection
  - Work Boots
    - Steel toe
    - Good support
  - Work Clothes
    - Full pants
    - Appropriate shirt
  - Hard Hat
  - Safety Glasses
  - Ear Protection

23

23

Tools/Equipment

- Inspection Tools
  - Clipboard
  - Pen/Pencil
  - Measuring Tape
  - Flashlight
  - Ladder
  - Binoculars
  - Mirror
  - Outlet Tester (GFCI)

24

24

Tools/Equipment

- Miscellaneous Tools
  - Small square
  - Screwdriver
  - Multi-Purpose tool
  - Staple Gun
  - Tape
  - Gloves

25

25

Tools/Equipment

- Code Book!
- Code References

26

26

Inspection Procedures

- Develop a routine
  - Top to Bottom
  - Bottom to Top
  - Clockwise
  - Counter clockwise
- Follow checklist until comfortable

27

27

When Does Inspection Begin?

- As soon as you drive up to the job site
- When you walk in the front door

28

28

Address/Permit

- Street Address
  - Is there one?
  - Can it be seen from the street?
- Permit
  - Is there one?
  - Correct for work being inspected and done?
  - Posted so it can be seen

29

29

Property Lines

- Identify property lines
  - Staked?
  - Batter boards
- Identify setbacks
  - Are they per the plans
- Property fenced?
  - Required by local ordinance

30

30

Site Condition

- Site grade
  - Sloped away from building
  - Safe to access
- Job Cleanliness
  - Trash contained
  - Safe to access

31

31

Responsible Party

- Construction trailer
- Superintendent's office
- Job Foreman
- Owner

32

32

Inspection Record Card

- On the job?
- Correct permit?
- All previously required inspections completed?

33

33

Project Plans

- R106.3.1
- Where the building official issues a permit, the construction documents shall be approved in writing or by a stamp that states "REVIEWED FOR CODE COMPLIANCE."
- One set of construction documents so reviewed shall be retained by the building official.
- The other set shall be returned to the applicant, shall be kept at the site of work and shall be open to inspection by the building official or a duly authorized representative.

34

34

Project Plans

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

35

35

Let's Look at the Building!

36

36

Required Inspections R109.1

- Foundation inspection
- Plumbing, mechanical, gas and electrical systems inspection
- Floodplain inspections
- Frame and masonry inspection
- Other inspections
- Fire-resistance-rated construction inspection
- Final inspections

37

37

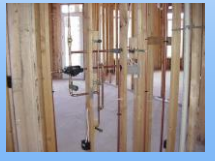
Mechanical Inspections

- Underground inspection
- Rough-in
- Final

38

38

Required Plumbing Inspections P2503



- Building sewer testing
- Drain, waste and vent systems testing
- Rough plumbing
- Drainage and vent final test
- Shower liner test
- Water-supply system testing
- Backflow prevention devices

39

39

Electrical Inspections

- Underground
- Rough-in
- Final

40

40

Soils, Footings, Foundations

41

41

Soils

- Is a soils report required?
- Review soils report
  - Verify type of soil
  - Natural material
  - Compacted fill
  - No foreign matter

42

42

Expansive/Collapsible Soils

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

43

43

Excavation

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

44

44

Foundation Location

- Set according to plans
- Set back compliance
- Floor plate compliance

45

45

Foundation Drainage

- Lot slopes away from foundation
- 6" in 10 feet

46

46

Forms

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

47

47

Forms

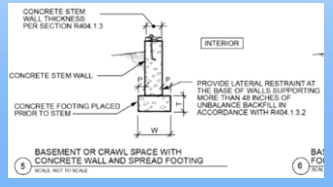
- Pipe penetrations
- Beam pockets

48

48

Footings

- Minimum Size



49

49

Footings

- Forms
  - Depth/Thickness
    - Construction Documents
  - Depth below grade (frost line)
  - Earth forms permitted when approved by building official

50

50

Footings

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

51

51

Footings

- Reinforcement
  - Surface condition
    - Oil
    - Rust

52

52

Footings

- Reinforcement
  - Location
    - Approved plans
  - Support

53

53

Footings

TABLE R608.5.4(1) LAP SPLICE AND TENSION DEVELOPMENT LENGTHS

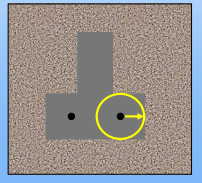
	BAR SIZE NO.	YIELD STRENGTH OF STEEL, f_y psi (MPa)	
		40,000 (280)	60,000 (420)
		Splice length or tension development length (inches)	
Lap splice length-tension	4	20	30
	5	25	38
	6	30	45
Tension development length for straight bar	4	15	23
	5	19	28
	6	23	34
Tension development length for: a. 90-degree and 180-degree standard hooks with not less than 2 1/2 inches of side cover perpendicular to plane of hook. b. 90-degree standard hooks with not less than 2 inches of cover on the bar extension beyond the hook.	4	6	9
	5	7	11
	6	8	13
Tension development length for bar with 90-degree or 180-degree standard hook having less cover than required in items a and b.	4	8	12
	5	10	15
	6	12	18

54

54

Footings

- Secured in the proper location in the forms with tie wire or other bar support system to prevent displacement during the concrete placement operation
- Minimum support & cover
  - Concrete cast against the earth - 3 inches
  - Concrete cast in removable forms that will be exposed to the earth or weather – 1½ for No. 5 bars and smaller, and 2 inches for No. 6 bars and larger.
  - Concrete cast in removable forms that will not be exposed to the earth or weather, and for concrete cast in stay-in-place forms - 3/4 inch.



55

55

Foundation Walls

- Forms
  - Depth/Thickness
    - Construction Documents

56

56

Foundation Walls

- Reinforcement
  - Size
    - Approved drawings
  - Surface condition
    - Oil
    - Rust

57

57

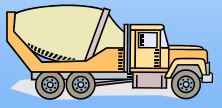
Foundation Walls

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

58

58

Concrete



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

59

59

Concrete

- Curing
  - Protection
  - Humidity
  - Freezing Are Blankets on-site?

60

60

Removal of Forms

- Concrete cured
- Protection completed

61

61

Masonry

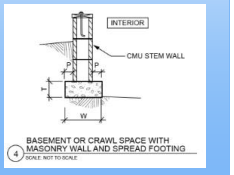
- Materials
  - Hollow masonry
  - Solid masonry
  - Brick

62

62

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



63

63

Masonry

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

64

64

Masonry

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

65

65

Slab-on-Grade Foundations

- Post-Tension
- Mat Reinforcement
- Correct size/location
- Cable locations
- UFER Ground

66

66

Foundation Drains

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

67

67

Damproofing

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

68

68

Backfill

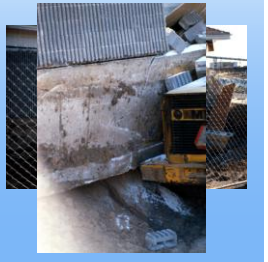
- Floor installed
- Foundation braced
- Concrete strength

69

69

Backfill

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



70

70

Rough Inspections

71

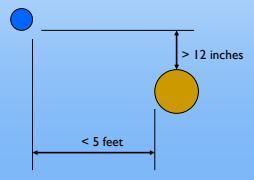
Building Sewer

- Material
  - ABS plastic pipe
  - Cast-iron pipe
  - Copper or copper-alloy tubing
  - PVC plastic pipe
- Table P3002.2

72

72

Building Sewer



- Location relative to water piping
  - Approved material per Table P3002.1(2)
  - Not per table
    - Minimum 5 feet away
    - Sleeved for 5 feet each side when crossing
    - Water service pipe minimum of 12 inches above the top of the highest point of the building sewer

73

73

Building Sewer

- Test
  - Gravity Sewer
    - 10 foot high head of water
    - 15 minutes
  - Forced Sewer
    - 5 psi greater than ejector pump rating
    - 15 minutes

74

74

Building Sewer

- Slope
  - 2-1/2" or less
    - ¼" per foot
  - 3" or more
    - 1/8" per foot

75

75

Building Sewer

- Proper size of pipe
  - Approved drawings
  - Section R3005.4 – drainage fixture units
- Support
  - Firm ground
  - Proper pipe bedding

76

76

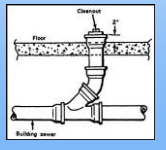
Building Sewer

- Connections/Joints
  - Same material
  - Proper

77

77

Building Sewer



- Cleanouts
  - Every 100 feet
  - Junction of the building drain and the building sewer

78

78

Building Sewer

- Backfilling
  - Clean material
  - No rocks, rubble, etc.
  - Tamped earth
  - Don't damage pipe

79

79

Underground Plumbing

- Material
  - ABS plastic pipe
  - Cast-iron pipe
  - Copper or copper-alloy tubing
  - PVC plastic pipe

80

80

Underground Plumbing

- Slope
- Support
- Proper size of pipe
- Test
  - 10 foot high head of water for 15 minutes
  - 5 psi air test for 15 minutes
  - (Except PVC or ABS)

81

81

Underground Plumbing

- Connections/Joints
  - Same material
  - Different materials
- Type of Joint
  - Mechanical
  - Solvent cementing
  - Brazed
  - Soldered
  - Threaded
  - Welded
  - Caulked
  - Lead & Oakum
  - Slip Joint

82

82

Underground Plumbing

- Cleanouts
  - Change of direction greater than 45 degrees. More than one change of direction, only one cleanout required for each 40 feet of developed length
  - base of each waste or soil stack
  - Every 100 feet
  - Junction of the building drain and the building sewer
- Opening Direction

83

83

Underground Plumbing

- Venting
  - Proper Size
  - Proper location
  - Trap arm length

84

84

Water Service Piping

- Material
- Size
- Support
- Test

85

85

Underground Electrical

- Depth of cover
- Proper wire material

86

86

Rough Water Piping

- Material
- Size
- Support
- Test

87

87

Rough Waste & Vent

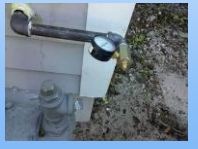
- Material
- Test
- Size
- Support
- Cleanout

88

88

Rough Gas Piping

- Material
- Test
- Size
- Pressure test



89

89

Rough Gas Piping

- Support
- Regulators
- Shutoffs
- Underground piping protected

90

90

Water Heater

- Not always installed at rough
- Location
- Approved appliance
- Appliance vented
  - Continues to roof
- Combustion air
- P & T Valve

91

91

Rough Mechanical

- Appliances
  - Access
  - Listed
  - Installed per Manufacture's instruction
  - Combustion air

92

92

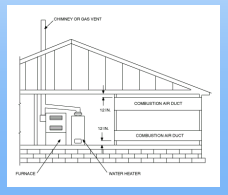
Rough Mechanical

- Appliance venting
  - Suitable for fuel
  - Size
  - Clearances
  - Termination
  - Joints

93

93

Rough Mechanical



- Combustion air
  - High/Low
  - Sizing
  - Source
  - Not blocked, restricted
  - Screening

94

94

Rough Mechanical

- Ducts
  - Proper material, size, gauge
  - Support
  - Insulation
  - Sealing
  - Expansion joints
  - Circulating air

95

95

Rough Mechanical

- Exhaust Systems
  - Proper sizes
  - Duct construction
  - Duct connectors
  - Duct termination

96

96

Rough Electrical

- Branch Circuits
  - Number & location of outlets
  - Supports
  - Workmanship
  - Wire size
  - Wire insulation
  - Size of conduit & boxes
  - Plaster rings
  - Panels

97

97

Rough Electrical

- Overcurrent protection
  - Wire size
  - Total loads of each circuit

98

98

Rough Electrical

- Electrical Service
  - Height of service head
  - Location
  - Load
  - Size of wire & conduit
  - Meter socket
  - Main Switch for correct size & capacity
  - Panel size for required number of circuits
  - Underground service
  - Bonding

99

99

Rough Electrical

- Grounding
  - UFER Ground
  - Termination
  - Conductors
  - Fittings

100

100

Rough Electrical

- Box & Panel Knockout seals
- Connector, bushing & connector tightness
- Terminal connections

101

101

Rough Electrical

- Smoke Alarms
  - Location
  - Hardwired
- Carbon Monoxide Alarms
  - Location
  - Hardwired

102

102

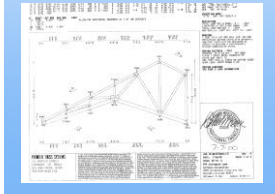
Framing

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

103

103

Framing



- Truss drawings
  - Match roof layout
- Special engineering documents

104

104

105

105

Bracing

106

Framing

- Structural Review
  - Materials
    - Wood
      - Grade stamp
      - Proper species
    - Structural Steel
      - Size/weight

107

107

Framing

- Beams/Headers
  - Size
  - Support
  - Fastening

108

108

Framing

- Column sizes
  - Size
  - Support
  - Fastening

109

109

Framing

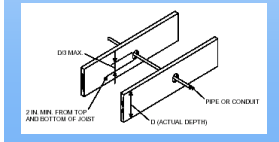
- Joist/Rafters
  - Conventional Lumber
    - Species & grade
    - Span, Size & spacing
    - Hangers, fastening
    - Blocking
    - Laps
    - Double joists under bearing wall
    - Notches, holes

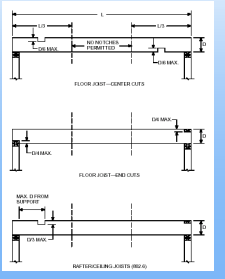
110

110

Framing

- Notching/Drilling of Joist/Rafter/Studs





111

111

Framing

- Lumber
  - Checks & Splits
  - Rot
  - Fungus

112

112

Framing

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

113

113

Engineered Wood Products Holes

114

Drilling & Notching Engineered Wood

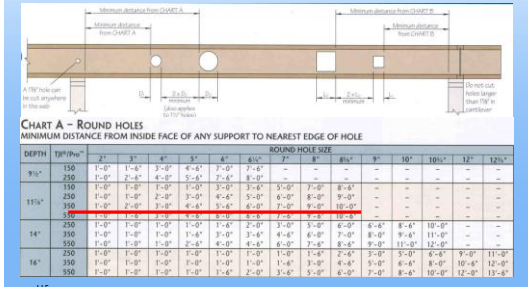


CHART A – ROUND HOLES
MINIMUM DISTANCE FROM INSIDE FACE OF ANY SUPPORT TO NEAREST EDGE OF HOLE

DEPTH	TJI® Pro™	ROUND HOLE SIZE												
		2"	3"	4"	5"	6"	6¼"	7"	8"	8⅝"	9"	10"	10½"	12"	12⅝"
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"	5'-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'-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"

115

115

Framing

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

116

116

Framing

- Under-floor Area
  - Blocking
  - Ventilation
  - Clearance for vents
  - Access

117

117

Framing

- Sill Plates
  - Proper materials
  - Anchor bolts or ties
  - Connection to floor or wall
- Subflooring
  - Panel Markings
  - Fastening

118

118

Framing

- Lateral bracing
  - Per plans
  - Material
  - Fastening

119

119

Framing

- Room sizes
  - Floor areas
  - Ceiling height

120

120

Framing

- Stairways
  - Width
  - Riser height
  - Tread Dimension
  - Headroom
  - Fireblocking
  - Remember you measure rise and run at rough without finishes

121

121

Framing

- Emergency escape and rescue openings
  - Sill height
  - Clear opening
  - Obstructions
  - Path to public way

122

122

Framing

- Smoke Alarms
  - Location
  - Hardwired
- Carbon Monoxide Alarms
  - Location
  - Hardwired

123

123

Framing

- Miscellaneous
  - Safety Glazing
  - Attic Access

124

124

Some days we just get stuck, and bogged down.
Some days all you can do is smile and wait for someone to kindly remove your butt from the hole you find it wedged into.

125

125

Miscellaneous Inspections

126

126

Required/Optional Inspections

- Section R109
  - Lowest floor elevation
  - Energy
  - Lath/Gypsum Board
  - Fire-resistive penetrations
  - Other inspections
    - Determined by building official

127

127

R109.1.6.1 Elevation documentation

- If located in a flood hazard area, the documentation of elevations required in Section R306.1.10 shall be submitted to the building official prior to the final inspection.
  - FEMA Certificate

128

128

Insulation/Energy

- Jurisdiction inspection
- Third-party agency

129

129

Insulation/Energy

- Insulation
- Proper R-Values
  - Ceilings
  - Walls
  - Floors
  - Ducts
- Installation

130

130

Insulation/Energy

- Fenestrations
- Window U-Factors
- Door U-Factors

131

131

Insulation/Energy

- Air Leakage
  - Joints, penetrations
  - Recessed lights
    - IC rated
    - Clearances
- Blower door test

132

132

Insulation/Energy

- Ducts
  - Sealed
    - Approved tape
    - No duct tape
  - Balancing system

133

133

Insulation/Energy

- Temperature Controls
- Pipe Insulation
- Heating/Cooling Efficiencies

134

134

Fire-Resistance-rated construction

- Separation between dwelling units
- Location on property
- Before any plaster is applied, or before panel joints and fasteners are taped and finished.

135

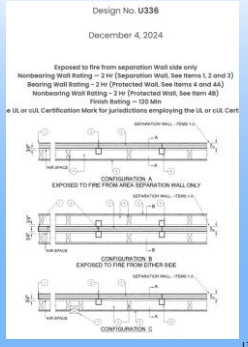
135

Fire-Resistive Assemblies

- Approved Plans
- Installed per listed design
  - Gypsum Association
  - Underwriters Laboratory
  - Warnock Hersey

136

136


Design No. U336

December 4, 2024

Exposed to fire from separation Wall side only
Nonbearing Wall Rating — 2 Hr (Separation Wall, See Items 1, 2 and 3)
Bearing Wall Rating - 2 Hr (Protected Wall, See Items 4 and 4A)
Nonbearing Wall Rating - 2 Hr (Protected Wall, See Item 4B)
Finish Rating — 120 Min

CONFIGURATION A
EXPOSED TO FIRE FROM AREA SEPARATION WALL ONLY

CONFIGURATION B
EXPOSED TO FIRE FROM EITHER SIDE

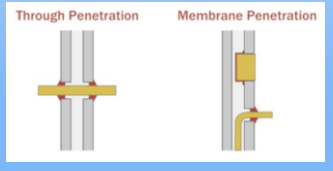
CONFIGURATION C

137

137

Fire-Resistive Penetrations

- Penetrations in fire-resistance-rated assemblies.

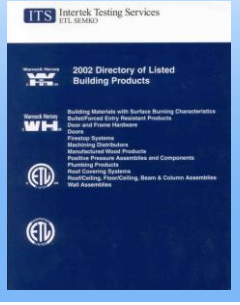


138

138

Fire-Resistive Penetrations

- Approved plans
- Approved listing
  - Underwriters Laboratory
  - Warnock Hersey



139

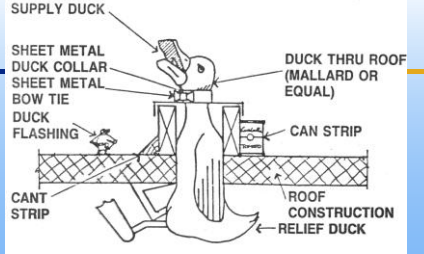
139

Fire-Resistive Penetrations

- Correct materials
- Correct installation
  - Annular space
  - Collar
  - Listed System
  - This is not just fire caulking!

140

140



141

141

Other Inspections

- R109.1.5
- In addition to inspections in Sections R109.1.1 through R109.1.4, the building official shall have the authority to make or require any other inspections to ascertain compliance with this code and other laws enforced by the building official.
  - Roofing, Exterior Weather Barriers, Flashing

142

142

Roofing

- Roof sheathing
  - Proper material
  - Spacing
  - Nailing

143

143

Roofing

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

144

144

Roofing

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

145

145

Roofing

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

146

146

Roofing

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

147

147

Roofing

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

148

148

Exterior Finishes

- Masonry veneer
- Wood/Hardboard siding
- Stucco

149

149

Exterior Finishes

- EIFS
  - Evaluation Report
  - Weather barrier
  - Fasteners
  - Flashing
  - Special inspection
    - Section 1704.14

150

150

Exterior Finishes

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

151

151

Exterior Finishes

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

152

152

Exterior Finishes

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

153

153

A specialist (consultant) is a person who knows very much about very little and continues to learn more and more about less and less until eventually he knows practically everything about almost nothing at all.

154

154

Final Inspections

Plumbing, Mechanical, Electrical, Building

155

Final Inspections

- R109.1.6
- Final inspection shall be made after the permitted work is complete and prior to occupancy.
  - Last time to inspect
  - Certificate of Occupancy

156

Final Plumbing

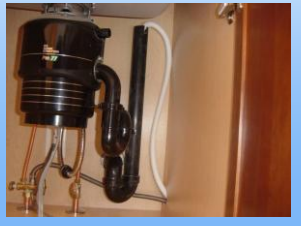
- Approved fixtures
- Defects and Damage
- Check support
- Fixture level

157

157

Final Plumbing

- Test fixtures
  - Hot water
  - Cold on right
- P-Trap
- Water shutoffs



158

158

Final Plumbing

- Cleanouts
  - Size
  - Accessibility

159

159

Final Plumbing

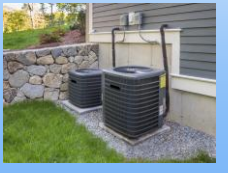
- Water Heater
  - Gas connection
  - Gas shutoff
  - Water shutoff
  - Vent still connected
  - P & T Relief pipe properly
  - Pan is protection is required

160

160

Final Mechanical

- Heating/Cooling system working
  - Adjust thermostat
  - Circulating air
  - Return air
  - Combustion air if required
- Exhaust fans operating
- Terminated properly?
- Makeup air if necessary



161

161

Final Mechanical

- Appliances
  - Access
  - Gas connections
  - Gas shutoff
  - Condensate Drains piped properly

162

162

Final Mechanical

- Safety controls
  - Approved devices
  - Proper support
  - Wiring protected
  - Location of limit switches
  - Controls accessible
  - Duct detectors

163

163

Final Mechanical

- Clearance to combustibles
  - Furnace/boilers
  - Doors, walls, ceilings
  - Vent connector and draft hood
- Fire-resistant construction around appliance

164

164

Final Electrical

- Check for hazardous wiring
- Confirm number and location of outlets (this should have been verified at rough)
  - Covered outlets
- Switches/Receptacles firmly supported

165

165

Final Electrical

- Test out system
  - GFI
  - Arc-Fault
  - Grounding
  - Short Circuits
  - Correct polarity
  - Lighting

166

166

Final Electrical

- Main panel
  - Circuits labeled
  - No damage to panel or meter housing
  - Lugs tight
  - No double lugs

167

167

Final Building

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

168

168

Final Building

- Final Grade
  - Slopes away from building
    - 6" in first 10'
  - Drains to approved area
  - Compacted
  - Safe

169

169

Final Building

- Exterior
  - Address
  - Finish completed
  - Flatwork completed
  - All exterior surfaces painted or weather protected

170

170

Final Building

- Guards
  - Height
  - Intermediate railing

171

171

Final Building

- Means of Egress
  - Stairways
    - Rise/Run
    - Handrail
    - Landings
    - Headroom
  - Doors
    - Hardware
    - Landings

172

172

Final Building

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

173

173

Final Building

- Sanitation
  - Plumbing fixtures connected & operating

174

174

Final Building

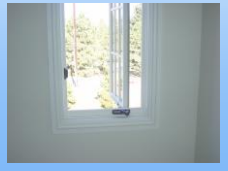
- Fire-Resistant Rated Construction
  - Maintained
- Door between dwelling/garage
  - Self-closing
  - Self-latching

175

175

Final Building

- Emergency escape and rescue openings
  - Sill height
  - Clear opening
  - Obstructions
  - Path to public way



176

176

Final Building

- Smoke Alarms
  - Interconnected
  - Location
  - Test to confirm
- Carbon Monoxide Alarms
  - Interconnected
  - Location
  - Test to confirm

177

177

Other Approvals

- Other Departments
  - Fire
  - Zoning
  - Public Works
  - Administration
- Other Agencies

178

178

"*Shums Coda Associates, Inc.*" is a Registered Provider with ***The American Institute of Architects Continuing Education Systems (AIA/CES)***. Credit(s) earned on completion of this program will be reported to ***AIA/CES*** for AIA members. Certificates of Completion for both AIA members and non-AIA members are available upon request.

This program is registered with ***AIA/CES*** for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

179

179

Bill Clayton, CBO
Shums Coda Associates, Inc.

Ph. 303-400-6564

www.shumscoda.com
Bill.Clayton@shumscoda.com

SHUMS CODA ASSOCIATES

INTERNATIONAL CODE COUNCIL PREFERRED PROVIDER

180

180