
2012 IPC/IRC Plumbing Updates

Presented by:
William Lussier
Building Official/Licensed Plumber

D.E.S.I.G.N
and
TRADES
CONFERENCE
2016 ■ 15TH ANNUAL



PURPOSE

- Give building contractors and design professionals information related to Plumbing Code changes
- Identify proper Codes to be used
- This brief presentation is not intended to show all changes in the Plumbing Codes



Department of Administrative
Services
Division of Construction
Services

- WWW.ct.gov/dcs/site/default.asp

- **Division of Construction Services**
- **Building Code Adoption**
- **Office of the State Fire Marshal**
- **Office of the State Building Inspector**
- **[WWW.ct.gov/dcs/site/default.asp](http://www.ct.gov/dcs/site/default.asp)**

- **Connecticut General Statutes for chapter 541 (Statutory authority to the office of the State Fire Marshal), Chapter 393 Sec. 20-340 (licensing exemptions)**
- **<https://www.cga.ct.gov/current/pub/titles.htm>**

- **Int. Residential Code, Int. Plumbing Code**
- **www.ICCSafe.org**

- **2015 Connecticut State Fire Prevention Code**
- **http://www.ct.gov/dcs/lib/dcs/office_of_state_fire_marshall_files/fire_prevention_code_2012_eff_5-7-2015.pdf or**
- **Google: 2015 connecticut fire prevention code**

- **NFPA CODES**
- **<http://www.nfpa.org/>**



DEPARTMENT OF ADMINISTRATIVE SERVICES

[Home](#)

[About Us](#)

[DCS Library \(Forms & Publications\)](#)

[Contact Us](#)



Melody A. Currey
Commissioner

Office of Design and Construction

Office of Education and Data Management

Office of State Building Inspector

Office of State Fire Marshal



Welcome to the Division of Construction Services!

The Connecticut Department of Administrative Services (CT DAS), Division of Construction Services (DCS) is the state's primary department for executive and judicial branch construction-related services; administration of the state school construction grant program; and development, administration and training of state building and fire safety codes.

NEW: DCS Bidding and Contracts has moved to **Room 482** in the State Office Building (165 Capitol Ave, Hartford, CT 06106)!



DCS Library

DCS Resources

DCS Projects

- [State Police Firearms Relocation Project](#)
- [DCS Project Location Viewer](#) (best viewed using Internet Explorer)
- [DCS Groundbreakings](#)
- [DCS Ribbon Cuttings](#)
- [DCS Awards & Special Events](#)

DCS Information

- [DCS Awards & Special Events](#)
- [Human Resources](#)
- [Staff Directory](#)
- [Statutes and Regulations](#)
- [DCS Equipment Resources](#)
- [DCS Policy Statements](#)
- [DCS Vehicle Usage Policy](#)

Additional Links

- [OPM State Bond Commission](#)
- [State Contracting Portal for DCS](#)

Doing Business With DCS

INVITATIONS TO BID

- [Construction Project Bids](#)
- NEW:** Bidding and Contracts has moved to **Room 482!**

CONTRACTOR PRE-SELECTION RFQs

- [RFQs-SBE/MBE Contractor PreSelection](#)
- [RFQs-Contractor PreSelection](#)
- [Procedures & Information for SBE/MBEs](#)
- [Procedures & Information for Contractors](#)

REQUESTS FOR QUALIFICATIONS

- [Architecture & Engineering](#)
- [On-Call Consultant Services](#)
- [Construction Administrator](#)
- [Design-Build](#)
- [Construction Manager at-Risk](#)

ON-CALL CONSULTANT SERVICES

- [Search for Open On-Call RFQs](#)
- [On-Call RFO Submittal Materials](#)



DEPARTMENT OF ADMINISTRATIVE SERVICES

Home

About Us

DCS Library (Forms & Publications)

Contact Us



Melody A. Currey
Commissioner

OSBI Home

Building Code Adoption

Bureau of Boilers

Bureau of Elevators

Bureau of State Construction

Bureau of Technical Services

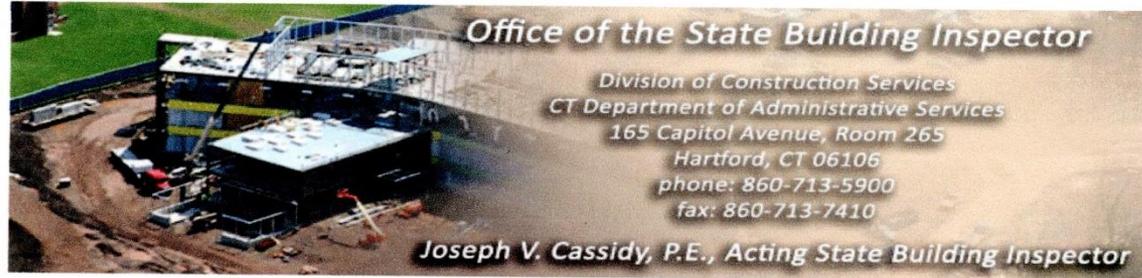
Contact Information

Codes & Standards Committee

OSBI Forms

OSFM Home

DCS Home



DAS-Office of the State Building Inspector
165 Capitol Avenue, Room 265
Hartford, CT 06106
Telephone: 860-713-5900
Fax: 860-713-7410

Welcome to the Office of the State Building Inspector's home page. The Office of the State Building Inspector is part of the Division of Construction Services. The Office of the State Building Inspector establishes and enforces building, electrical, mechanical, plumbing and energy code requirements necessary to promote the health and safety of the people of Connecticut by reviewing, developing, adopting and administering the State Building Code. For a more detailed description of the regulations and laws, please refer to Connecticut General Statutes Chapter 541 and Regulations of State Agencies Sections 29-262-1a through 29-262-11a.

Hot Topics

NEW Update regarding Demolition Permit Advisory

Passage of P.A. 15-131, "An Act Concerning Demolition Licensure and Demolition Permits"

Section 2 of P.A. 15-131 resolves the conflict addressed in our 2014 advisory. The new language included in this act requires a written notice from the demolition contractor containing the hold harmless language, but eliminates the requirement that it be included on the certificate of insurance.

Duct and Envelope Testing Rebate for Residential New Construction CL&P and UI are offering rebates to residential customers to offset the cost of duct and envelope testing needed to demonstrate compliance with the Energy Efficiency Code portion of the State Building Code.

-- **CL&P customers** can find this information at:
http://www.cl-p.com/Home/SaveEnergy/NewConstruction/Residential_New_Construction/?MenuID=4294985036
Click [here](#) for a copy of the rebate request (pdf).

-- **UI customers** can find this information at:
uinet.com/wps/portal/uinet/residential/newconstruction
Click [here](#) for a copy of the rebate request (pdf).





DEPARTMENT OF ADMINISTRATIVE SERVICES

[Home](#)

[About Us](#)

[DCS Library \(Forms & Publications\)](#)

[Contact Us](#)



Melody A. Currey
Commissioner

[OSFM Home](#)

[Bureau of Licensing & Permits](#)

[Bureau of Engineering](#)

[Crane Board](#)

[Fire Prevention Code Advisory Committee](#)

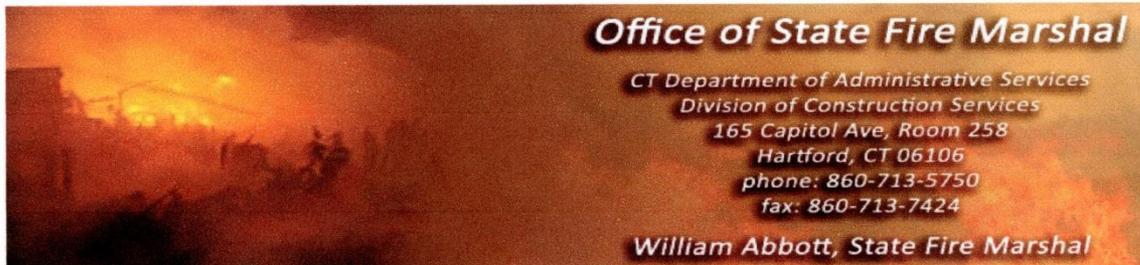
[Codes & Standards Committee](#)

[Contact Information](#)

[Consumer Product Safety Commission](#)

[OSBI Home](#)

[DCS Home](#)



Welcome to the Connecticut Office of State Fire Marshal home page. We are looking forward to using the tremendous opportunities offered by the Internet to support the needs of our valued customers. Each of our Bureaus will utilize this resource to offer Internet access to as many of our services as possible. If there is something you can't find or something that does not totally serve your needs, please advise us so we can take the steps to enhance and improve our service. It is the goal of the Office of State Fire Marshal to provide our customers with a user friendly service and we will continually strive to maintain that goal.



Mission Statement: The Office of State Fire Marshal is part of the Department of Administrative Services. This Office is responsible for promulgating and enforcing codes, standards and regulations to reduce the harm associated with fires, explosions, and mechanical failures. Connecticut General Statutes [Chapter 541, Section 29-291](#) gives the statutory authority to the Office of State Fire Marshal.

Sincerely,

William Abbott, State Fire Marshal

NOTICE FROM STATE FIRE MARSHAL WILLIAM ABBOTT

NEW ITEMS ON THE SITE:

The Office of State Fire Marshal has prepared a General Information Notice (GIN) on Mobile Food Units.

[Download the GIN by clicking here.](#)

The 2015 CT State Fire Prevention Code (effective May 7, 2015) is available below, please be advised that this has replaced the 2010 CT State Fire Prevention Code. We understand there are some typographical errors in the document we are working on a correction sheet that will



DEPARTMENT OF ADMINISTRATIVE SERVICES

- Home
- About Us
- DCS Library (Forms & Publications)
- Contact Us



[DCS Home](#) >> [OSBI Home](#) >> Building Code Adoption

- OSBI Home
- Building Code Adoption
- Bureau of Boilers
- Bureau of Elevators
- Bureau of State Construction
- Bureau of Technical Services
- Contact Information
- Codes & Standards Committee
- OSBI Forms
- OSFM Home
- DCS Home



BUILDING CODE ADOPTION



New State Building Code Adoption

Proposed Adoption of the New State Building Code: At the June 8, 2011 meeting of the Codes Amendment Subcommittee (CAS), the CAS along with the State Building Inspector voted to utilize the 2012 International Code Council's (ICC) Family of Codes as the basis for the next Connecticut State Building Code.

The new State Building Code is planned for adoption in the Fall of 2016 and will include the following model codes and a Supplement of Connecticut-specific items:

Model Codes	Date of Technical Review	Proposed Changes Due Date
2012 International Building Code	Preliminary Review Complete	12/15/13
2012 International Existing Building Code	Preliminary Review Complete	12/15/13
2012 International Plumbing Code	Preliminary Review Complete	12/15/13
2012 International Mechanical Code	Preliminary Review Complete	12/15/13
2012 International Energy Conservation Code	Preliminary Review Complete	12/15/13
2012 International Residential Code	Currently Under Review	2/01/14
2014 National Electrical Code (NFPA 70)	Anticipated Start Date—November 2014	10/15/14

[ICC Free eCode Viewer](#)

[NFPA Free Viewer](#)

[Where to purchase Model Code Books](#)

New State Building Code to be adopted in 2016, to include

- **2012 International Building code**
- **2012 International Existing Building code**
- **2012 International Plumbing code**
- **2012 International Mechanical code**
- **2012 International Energy Conservation code**
- **2012 International Residential code**
- **2014 NFPA 70 (National Electrical Code)**

Current Plumbing Codes

- **IMPORTANT NOTE**

- **As of the writing of this presentation the 2003 IPC and 2009 IRC are still in use until such time as the new State Building Code is adopted.**

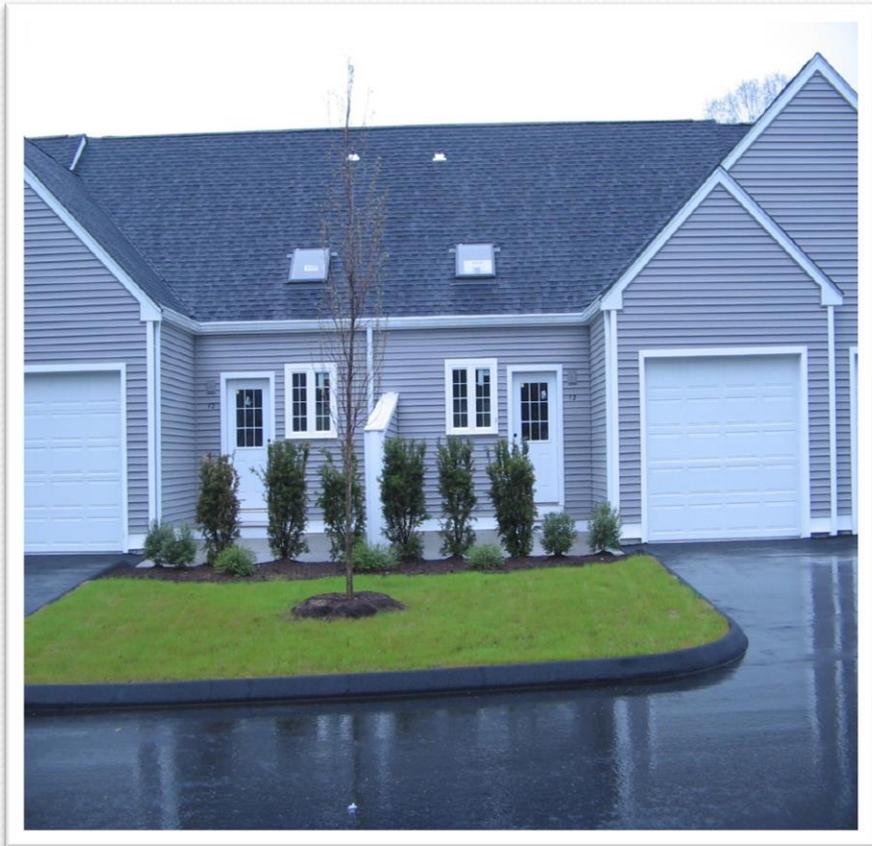
WHEN TO USE WHAT

- **International Residential Code used for;**
 - **Detached one and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories above grade plane in height with a separate means of egress and their accessory structures**

DETACHED 1 & 2 FAMILY



TOWNHOUSES



- **International Plumbing Code along with NFPA 54 used for everything not included under the uses for the International Residential Code.**
 - **Three family and above residential and all commercial installations**



Connecticut State Fire Prevention Code

- **Adopted May 7, 2015**
- **Includes 139 NFPA Standards**
- **Generally not for one and two family and townhouses**
- **One and two family and townhouses use 2012 IRC**

Plumbing Codes and Standards

- **One and two family and townhouses use IRC**
- **Three family and above, and commercial, use 2012 IPC**

GAS PIPING

- **Gas piping not found in the Plumbing or Mechanical codes.**
- **Gas piping for one and two family and townhouses found in chapter 24 International Residential Code.**
- **Gas piping for three family and above and commercial from NFPA 54 “*National Fuel Gas Code 2012*”**

CHANGES IN STATE BUILDING DEPARTMENT

- JULY 1, 2013, DEPARTMENT OF CONSTRUCTION SERVICES MERGED WITH DEPARTMENT OF ADMINISTRATIVE SERVICES
- **2013 SHALL ADOPT 2009 IRC AND 2011 NFPA70 (NAT. ELEC. CODE) (THIS WAS DONE)**

Sec. 106.2 Permits (exceptions)

- 1. The stopping of leaks in drains, water, soil, waste or vent pipe provided, however, that if any concealed trap, drainpipe, water, soil, waste or vent pipe becomes defective and it becomes necessary to remove and replace the same with new material, such work shall be considered as new work and a permit shall be obtained and inspection made as provided in this code

Exceptions continued

- 2. The cleaning of stoppages or the repairing of leaks in pipes, valves or fixtures, and the removal and reinstallation of water closets, provided such repairs do not involve or require the replacement or rearrangement of valves, pipes or fixtures.

Sec. 106.1 WHO MAY TAKE OUT PERMIT

- Any owner, authorized agent or contractor.
- All necessary documentation required
- General description of proposed work
- Location of work
- Other construction documents as required
- Applicant shall meet all qualifications established by statute, rules, ordinance or resolution

CGS CHAPTER 393, SEC.20-340 EXEMPTIONS FROM LICENSING REQUIREMENTS

- #11 Persons engaged in the installation, maintenance, repair and service of glass or electrical, plumbing, fire protection sprinkler systems, solar, heating, piping, cooling and sheet metal equipment in and about single-family residences owned and occupied or to be occupied by such persons; provided any such installation, maintenance and repair shall be subject to inspection and approval by the building official of the municipality in which such residence is located and shall conform to the requirements of the state Building Code.

CSST

- CORRUGATED STAINLESS STEEL TUBING
- CSST rules changed again



Memorandum

Date:	June 5, 2015
To:	Municipal Building Officials and Fire Marshals
From:	Joseph V. Cassidy, P.E., Acting State Building Inspector William Abbott, State Fire Marshal
Subject:	Bonding of Corrugated Stainless Steel Tubing (CSST)

The purpose of this memorandum is to clarify the requirements for bonding Corrugated Stainless Steel Tubing (CSST) gas piping systems. The recent adoption of the 2015 Fire Prevention Code and amendment to the State Building Code have led to much confusion what standards apply to which building types.

Until recently Connecticut General Statute (CGS) 29-329 provided the requirements for installation of gas equipment and gas piping in all buildings. This statute was changed to mandate that the State Fire Marshal adopt regulations within the Fire Prevention Code to regulate these installations. Similar changes were made in CGS 29-331 relating to liquefied petroleum gas installations.

The 2015 Connecticut Fire Prevention Code (CFPC) was adopted on May 7, 2015 and includes NFPA 54 National Fuel Gas Code as the standard for installation of gas equipment and piping. The scope of the CFPC excludes one and two family homes and townhouses, meaning the NFPA 54 standard in the CFPC cannot be enforced in these building types. The enforceable code for **one and two family homes and townhouses** is the 2009 International Residential Code (IRC) portion of the State Building Code.

For all installations **other than one and two family homes and townhouses** the bonding requirement is NFPA 54-2012 section 7.13.2, which states:

CSST gas piping systems shall be bonded to the electrical service grounding electrode system. The bonding jumper shall connect to a metallic pipe or fitting between the point of delivery and the first downstream CSST fitting. The bonding jumper shall not be smaller than 6 AWG copper wire or equivalent. Gas piping systems that contain one or more segments of CSST shall be bonded in accordance with this section.

For installations in **one and two family homes and townhouses** the CSST bonding requirement is found in the 2009 IRC section G2411.1.1 as amended, which states:

Corrugated stainless steel tubing (CSST). CSST gas piping shall be bonded in accordance with manufacturer's installation instructions.

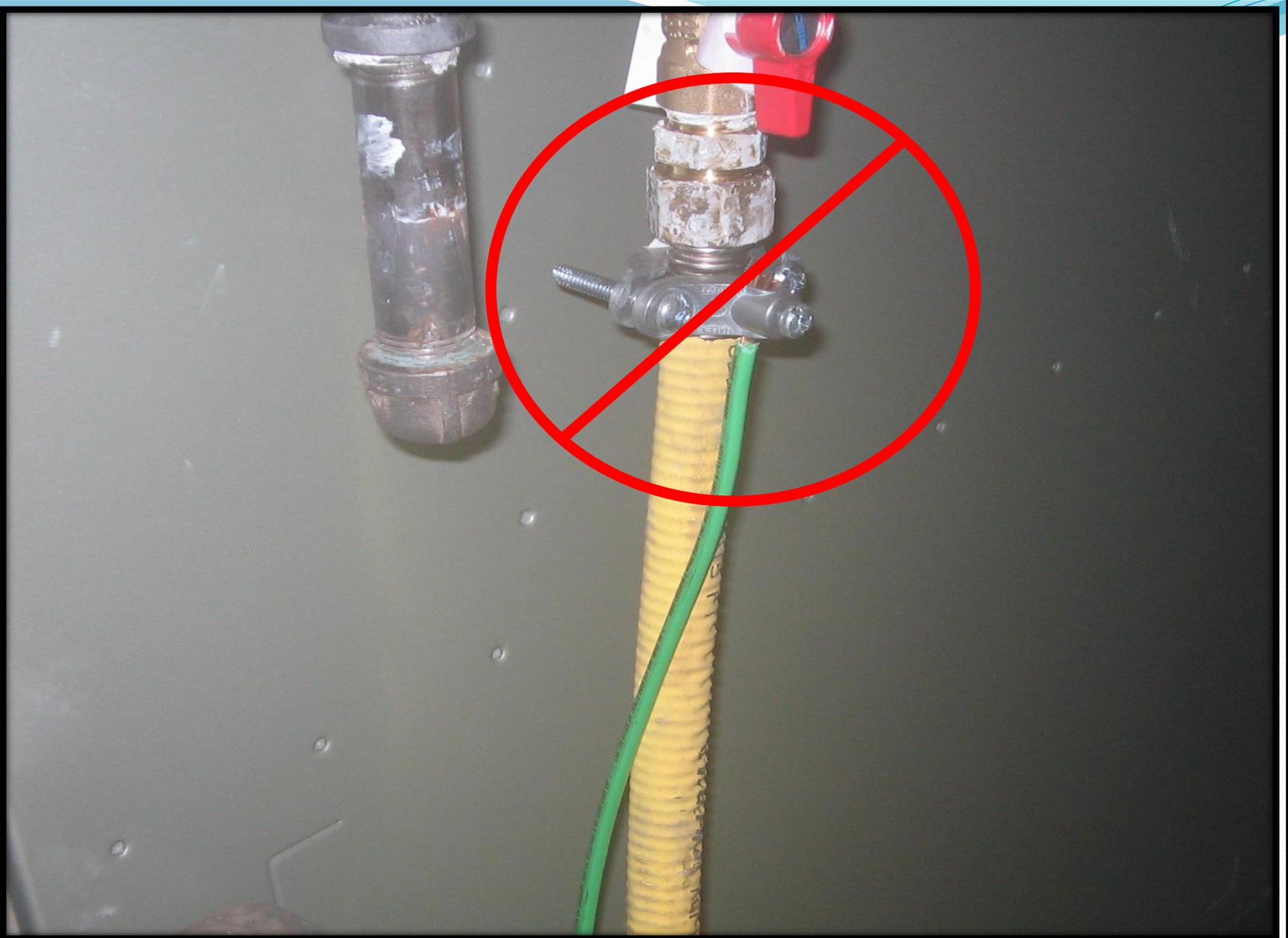
Connecticut



Division of
Construction Services

Most manufacturer's instructions we have reviewed do point to NFPA 54 as the standard for installation of their product, so the NFPA 54 bonding configuration will be the norm. However, there may be manufacturers that provide specific bonding instructions or refer to other standards, such as the National Electrical Code (NFPA 70). Having and understanding the manufacturer's installation instruction will be critical in properly inspecting residential CSST installations.

In the near future we will be adopting the 2012 IRC as part of the State Building Code. The bonding requirement in the 2012 IRC is the same as the section 7.13.2 NFPA 54-2012 requirement. Once the 2012 IRC is adopted into the State Building Code, all installations will be required to be bonded in this manner.



**IRC Sec. G2411 (2012), Bond wire on
BSP on house side of meter (point of
delivery) and before first CSST fitting**



PART ONE

- CODE CHANGES IN THE 2012
INTERNATIONAL PLUMBING CODE
(IPC) FROM THE 2003 ipc



- **Code books and
Commentary can be
purchased from ICC at**

- **ICCSAFE.ORG**

DEFINITIONS

- **BRANCH INTERVAL**
- **FLOW CONTROL VENTED**
- **GREASE INTERCEPTOR**
 - **HYDROMECHANICAL**
 - **GRAVITY**

CHAPTER 3: GENERAL REGULATIONS

Sec. 303.1, Identification ★

MANUFACTURER

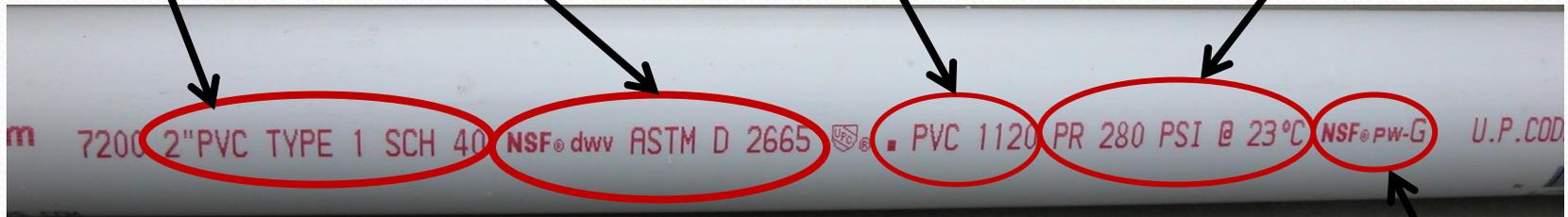


SIZE AND TYPE

NSF APPROVED

ASTM MATERIAL CLASS

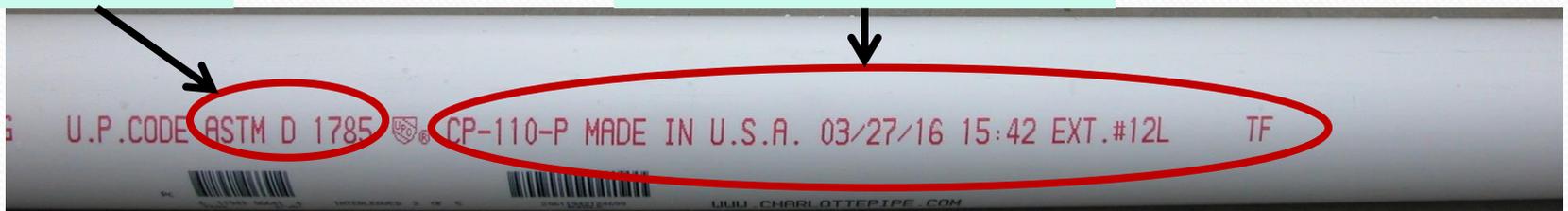
PRESSURE AND TEMP. RATING

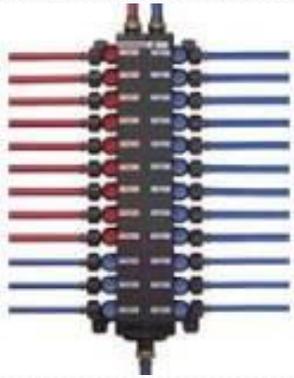


NSF POTABLE WATER

ASTM SPECIFICATION

MANUFACTURER'S INFO. LOT NUMBER, DATE ETC.

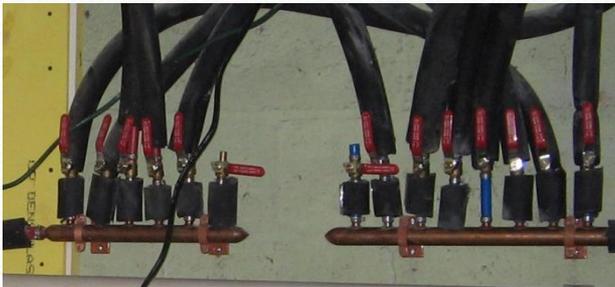




CHAPTER 3: GENERAL REGULATIONS



308.9 Parallel water distribution systems ★



CHAPTER 3: GENERAL REGULATIONS

1. Always use appropriate fittings matching materials.
2. Follow all manufacturers installation instructions



CHAPTER 4:

FIXTURES, FAUCETS AND FIXTURE FITTINGS

- **403.1.1 Fixture calculations**
- **403.2 Separate facilities, Exception 3**



Table 403.1 Business & Mercantile

MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES

- For Business and Mercantile occupancies with an occupant load of 15 or fewer, service sinks shall not be required
- See note “g” at end of table

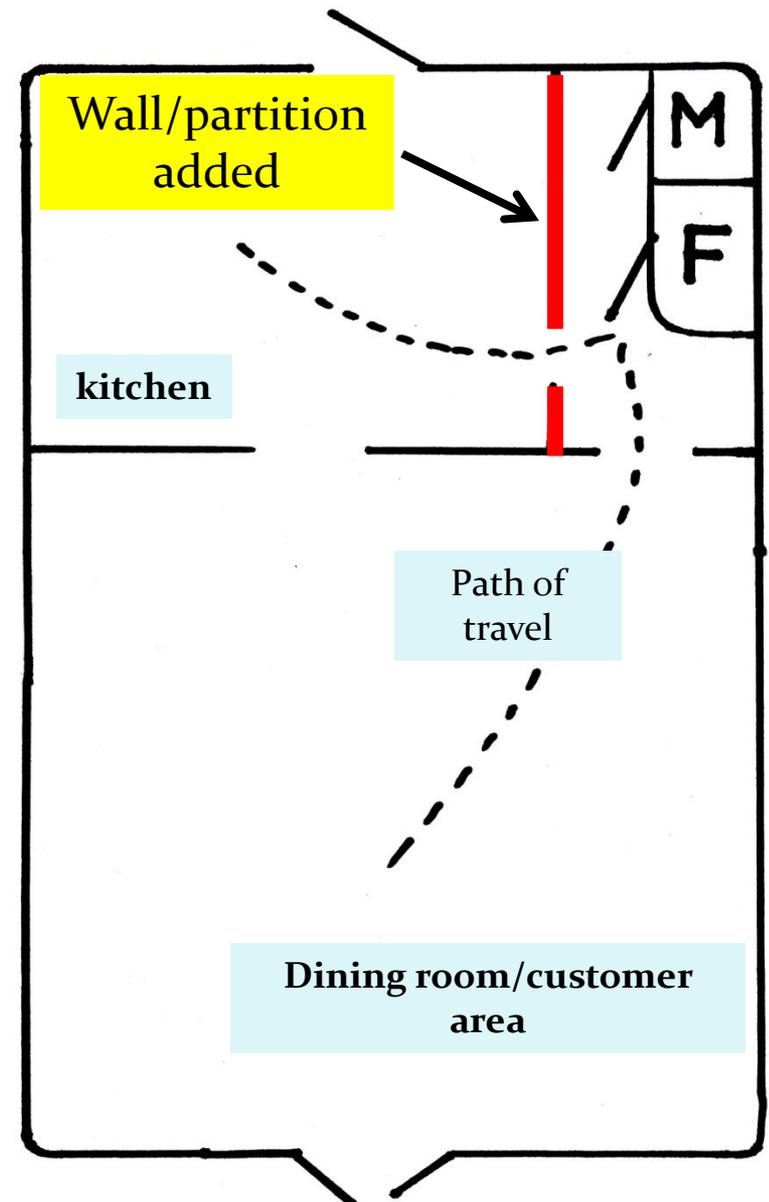
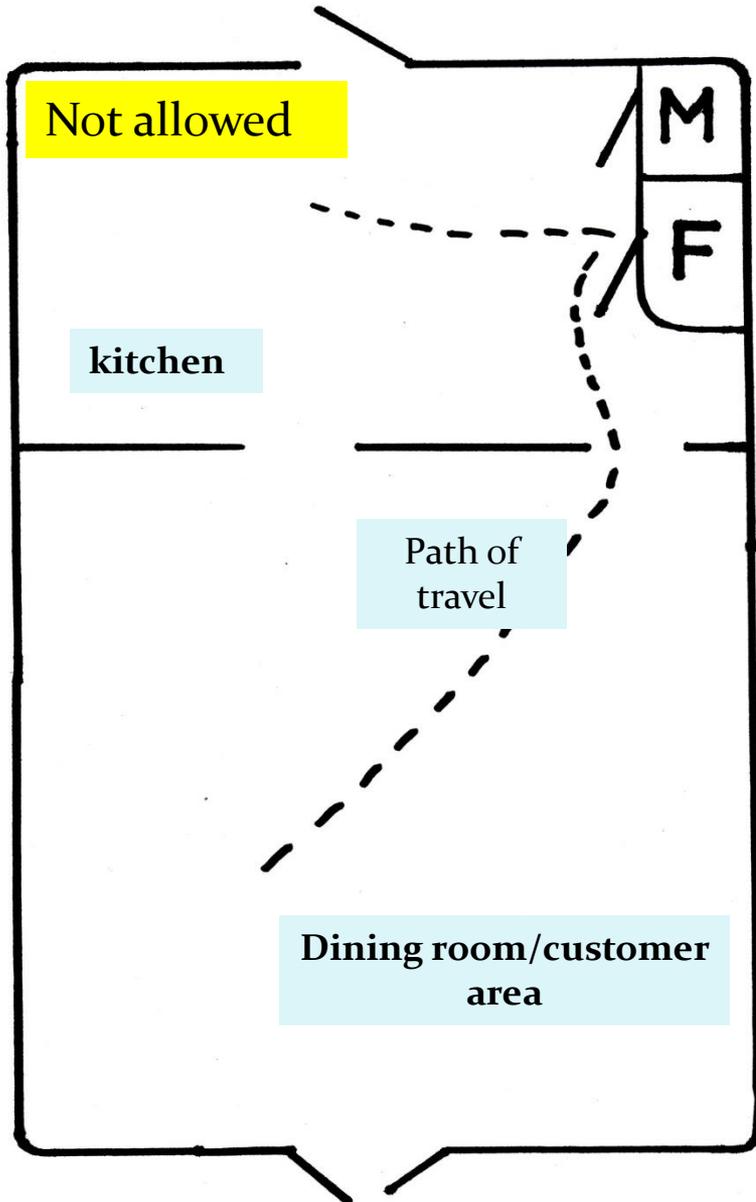
Chapter 4 continued

- **403.2.1 Family or assisted use toilet facilities serving as separate facilities ★**
- **403.3 Required public toilet facilities**
- **Exception** (open parking garages)

403.3.1 & 403.3.2 Toilet room access & location ★

- **Route to the public toilet facilities shall not pass through kitchens, storage rooms or closets.**

TOILET ROOM ACCESS NOT ALLOWED PASSES THROUGH KITCHEN



Chapter 4 continued

- 403.3.6 Door locking ★
- 403.4.1 Directional signage
- 403.5 Drinking fountain location ★
- 404.0 **Where required. Accessible plumbing facilities and fixtures shall be provided in accordance with the *International Building Code***

Chapter 4 continued

- **405.3.1 Water closets, urinals, lavatories and bidets (15 inches to wall min. and 30 inches center to center) ★**
- **405.3.4 Water closet compartment (single occupant toilet rooms, child day care, I-3 Housing)**
- **405.3.5 Urinal partitions**



Chapter 4 continued

- 407.2 Bathtub waste outlets and overflows ★
- 408.3 Bidet water temperature (110°)
- 410.0 Drinking Fountains Approval ★
 - ASME A112.19.1 or.2
- 410.2 Minimum number, (2)
 - Exception (1, combo. h/c and regular)

410.2 Minimum number drinking fountains



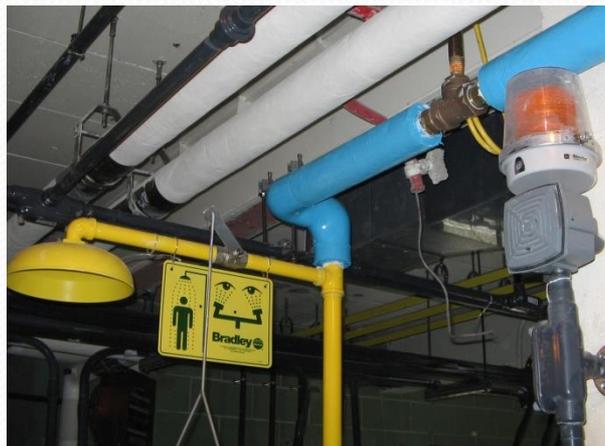
Chapter 4 continued

- **410.3 Substitution (restaurants)**
- **410.4 prohibited location (public rest rooms)**

Chapter 4 continued

- **Section 411, emergency showers and eyewash stations.**
 - (Code does not require installation)
- **411.1 Approval,**
 - (Shall conform to ISEA Z358.1)
- **411.2 Waste connections,**
 - (not required by IPC)

Emergency showers and eyewashes





Chapter 4 continued

- **Section 412 Floor and Trench Drains**
 - **Removable strainers and access for cleaning.**
- **412.2 Floor drains**
 - **Required in Public Laundries and central washing facilities**
 - **Trap seal (see 1002.4)**

Trench & Floor Drains



Trench & Floor Drains



**Opening for trap
primer fitting
attachment**

Chapter 4 continued

- **413.1 Food waste grinders, Approval, ASSE 1008**
- **413.3 Commercial food waste grinder waste outlets, (min. 1½ in.)**
- **413.4 Water supply required.**
 - **Water supply must be protected from backflow by air gap (vacuum breaker) or backflow preventer**

Chapter 4 continued

- **417.2 Water supply riser for shower**
 - (attached to structure)
- **417.4 Shower compartments**
 - (min. 900 Sq. inches, with exceptions)

Chapter 4 continued

- **419.1, approvals, Urinals** (ANSI Z125.9, ASME A112.19.2/CSA B45.1)
- **419.2 Urinal Substitution for water closets**
 - **Not more than 67% in assembly and educational**
 - **Not more than 50% in all other occupancies**

Waterless Urinals



Chapter 4 continued

- **421 Whirlpool bathtubs**
- **421.4 Suction fittings,**
 - (ASME A112.19.7/CSA B45.10)
- **421.5 Access to pump required**
 - 12" x 12" within 2 feet, greater than 2 feet 18" x 18"

Chapter 4 continued

- **424.2 Hand showers (ASME A112.18.1/CSA B125.1)**
 - Backflow prevention
 - Max 120° if hands free mounted
- **424.3 Individual shower valves, (ASSE 1016, or ASME A112.18.1/CSA B125.1)**
- **424.4 Multiple (gang) showers**
 - ASSE 1069 mixing valve, or
 - Point of use ASSE 1016, balanced-pressure, thermostatic or combo. balanced-pressure/thermostatic valve

Approximate Time and Temperature Relationship to Severe Burns in Children and the Elderly

Water Temperature

104 degrees F

120 degrees F

127 degrees F

133 degrees F

140 degrees F

155 degrees F

Time for 3rd degree burn to occur

Safe for bathing

2.5 Child/ 5 Adults

10 sec. child/1 min. Adult

4 sec. child/15 sec. adult

1 sec. child/5 sec. adult

0.5 sec. child/1 sec. adult

Maximum temperature allowed at fixtures

<i>Fixture</i>	<i>Maximum Temp.</i>	<i>Standard</i>
Bidet	110 degrees	ASSE 1070
Public lavatory	85 to 110 degrees	ASSE 1070
Individual shower valve	120 degrees	ASSE 1016 or CSA B125
Multiple showers (Gang)	120 degrees	ASSE 1069 or CSA B125
Bathtub, whirlpool	120 degrees	ASSE 1070, or ASSE 1016 type valve or CSA B125

CHAPTER 5

2012 IPC

WATER HEATERS

Chapter 5

- **501.8 Temperature controls required.**
 - **Not to be used alone to satisfy temperature requirements of chapter 4**
- **502 Installation, (manufacturer's installation instructions) AND**
 - **Oil (IMC)**
 - **Gas (NFPA 54)**
 - **Electric NFPA 70)**

Chapter 5 continued

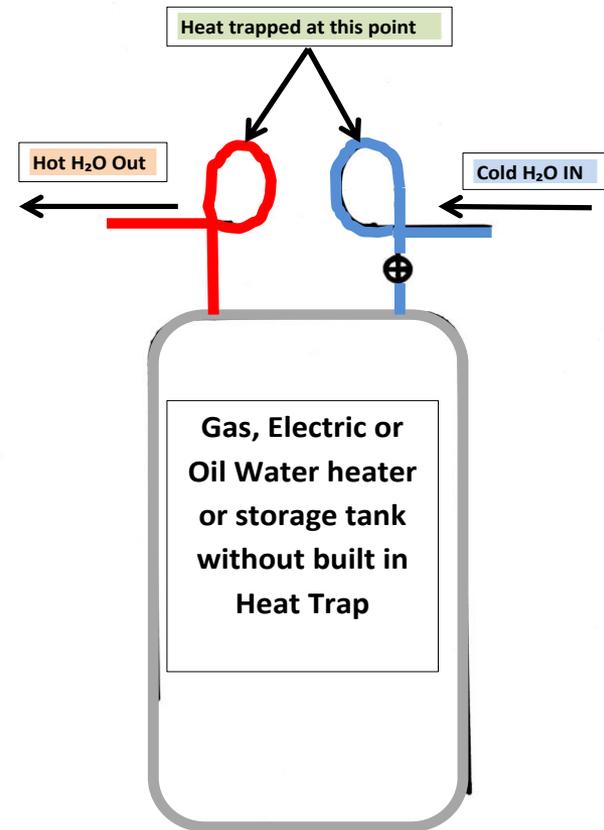
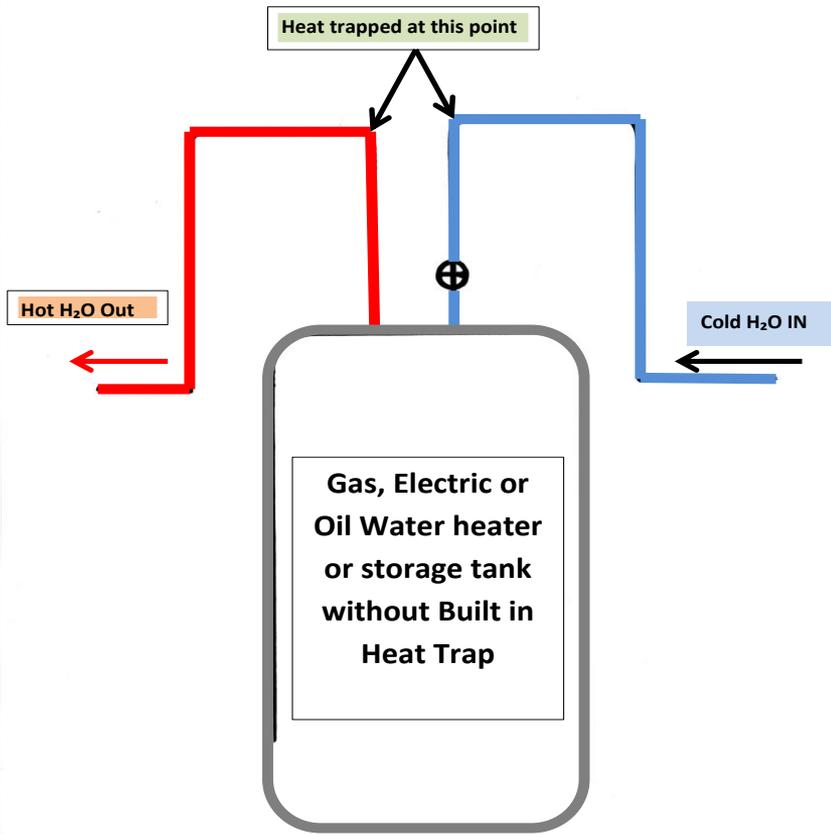
- **502.3 Water heaters installed in attics (access requirements)**
 - Unobstructed passageway
 - Large enough to remove water heater
 - Min. 30” High x 22” Wide
 - Max 20’ in length
 - Continuous solid flooring, 24” wide
 - Service space 30” x 30”
- **504.3 Shutdown (Electric not in sight of Elec. Panel)**

DIELECTRIC HEAT TRAP WATER HEATER FITTINGS



Chapter 5 Water Heaters, Heat Trap Required

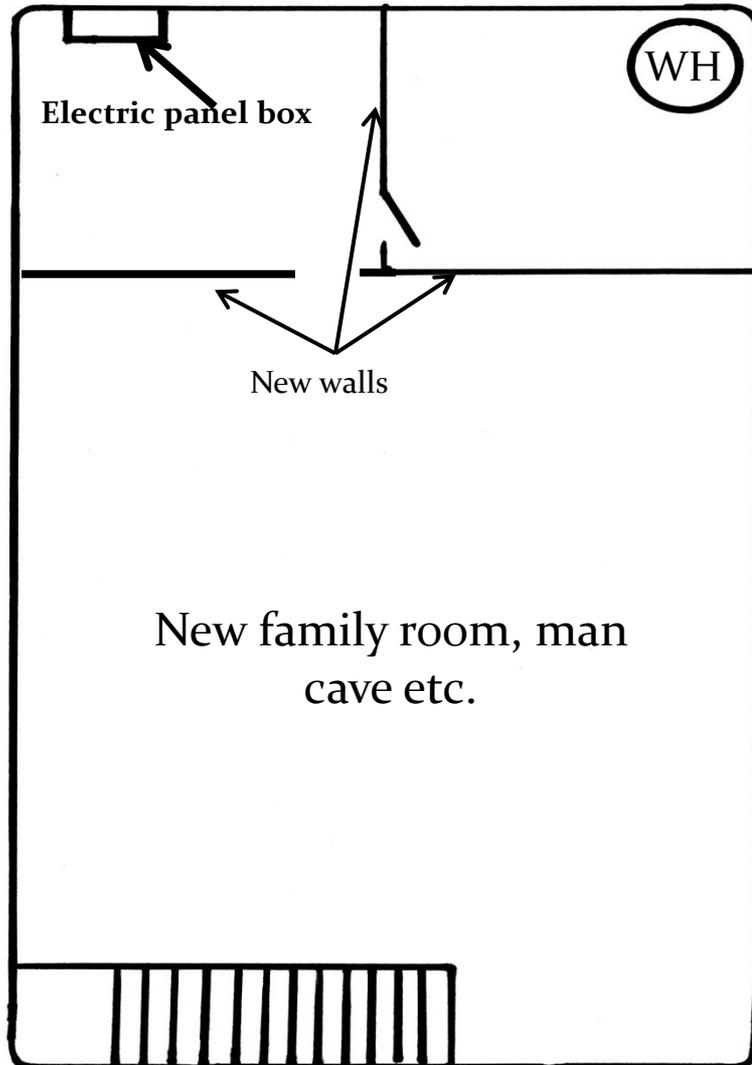
Built in or add on



CHAPTER 5 WATER HEATERS

- Sec. 504.2 Bottom fed water heaters and tanks required to have vacuum relief valve installed.
- Shutdown for electric water heaters required to be within sight of water heater.

Water heaters in remodeled basements



- Where water heater is no longer within sight of electric panel, a switch to shut off power to water heater required within sight of heater. Sec. 504.3
- Gas or oil fired heaters may also require outside combustion air.
- All are now required to have drip pan. Sec.504.7

Chapter 5 continued

- **504.6 Requirements for relief valve discharge piping (13 items required)**
- **504.7 Required pan, where leakage will damage building ★**

CHAPTER 6

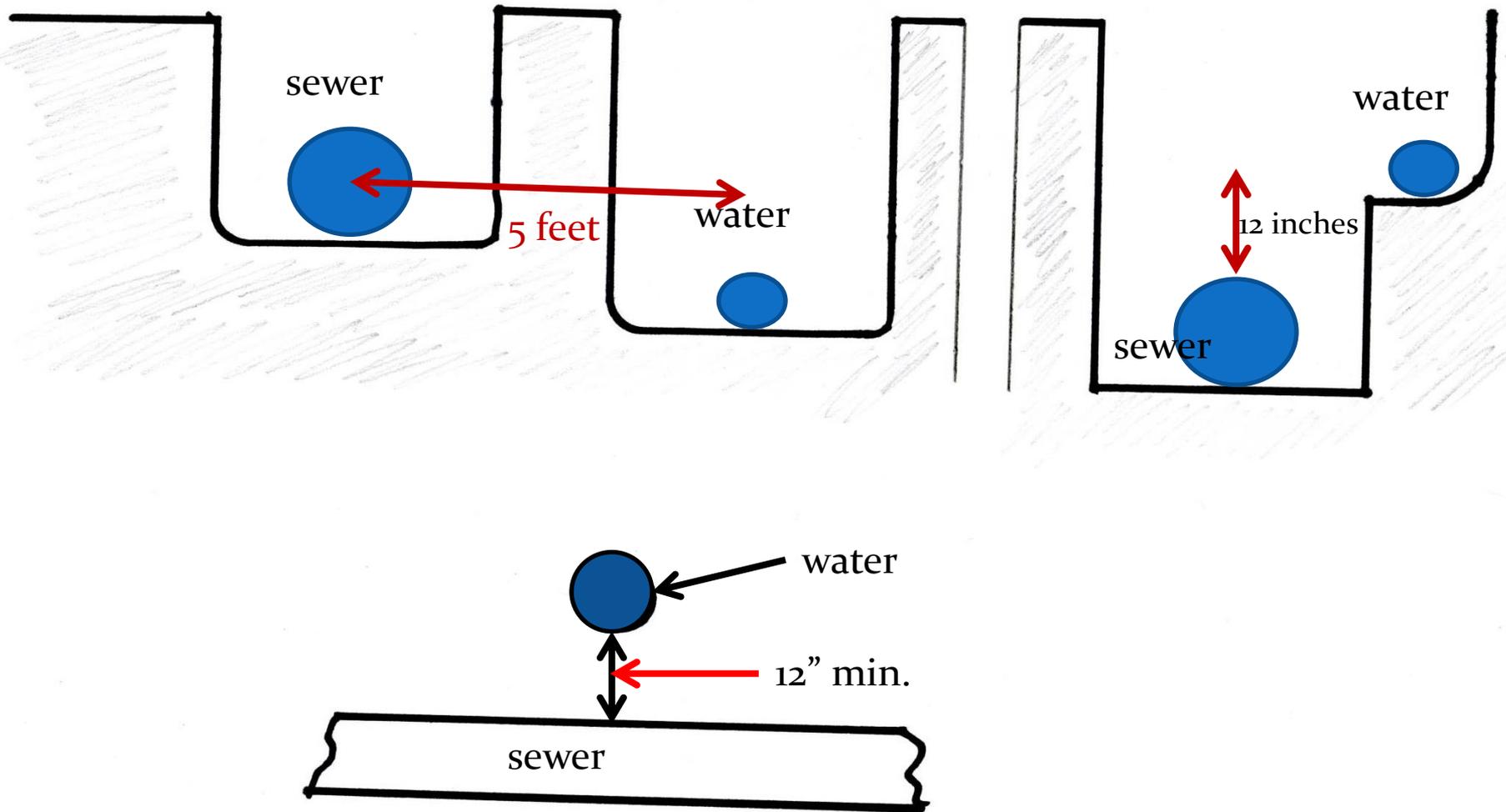
2012 IPC

WATER SUPPLY AND DISTRIBUTION

Chapter 6

- **603.2 Separation of water service and building sewer (code says 5 feet, with exceptions, but beware of local ordinances where more is required)**

Separation of Water Service and Building Sewer



Chapter 6 continued

- **Table 604.3, “water distribution system design criteria required capacity at fixture supply outlets”**
- **604.4 Maximum flow and water consumption**

604.4

Capacity at fixtures

fixture	Flow rate (gpm)	Pressure (psi)
Bathtub	4	20
Shower	3	20
Urinal valve	12	25
Water closet, flushometer	25	35
W/C siphonic, flushometer	25	35
W/C close couple	3	20
W/C blow out flushometer	25	45

- **Contractors and designers be aware of existing street pressure or well pressure limitations**

Chapter 6 continued

- **606.2 Location of full open valves** (Not to be confused with location of shutoff valve requirements 606.2)
 - 1. Curb box
 - 2. At entrance
 - 3. Discharge side of water meter
 - 4. Base of every riser (with exceptions)
 - 5. Top of down feed piping
 - 6. entrance to dwelling unit
 - 7. water supply pipe to water tank
 - 8. supply to water heater

Chapter 6 continued

- **606.7 Labeling of water distribution pipes in bundles (Required) ★**

Chapter 6 continued

- **607.4 Flow of hot water to fixtures,**
(left side)
- **607.5 Pipe insulation. (Recirculating hot water systems required to be insulated) ★**

Chapter 7

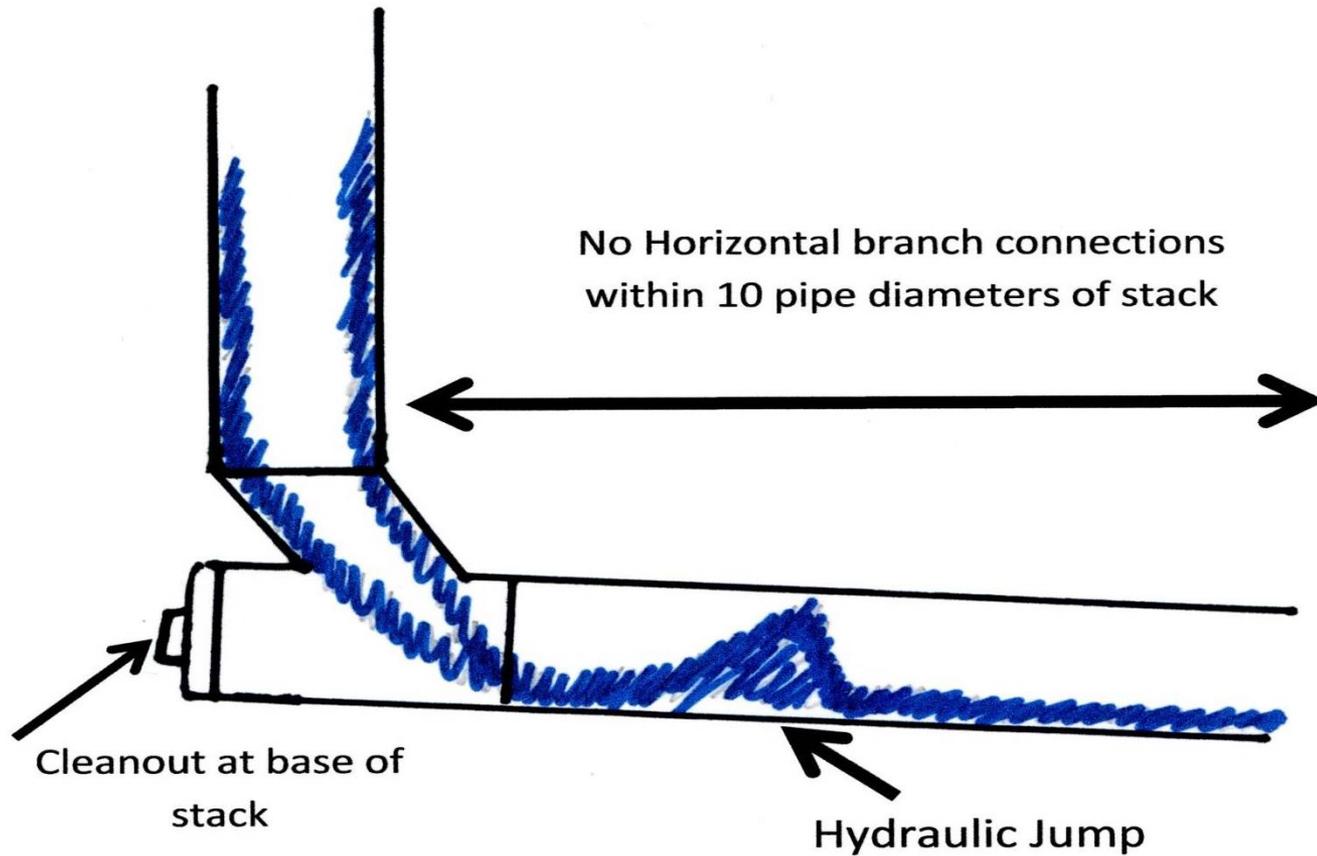
2012 IPC

SANITARY DRAINAGE

Chapter 7 continued

- **704.3 Connections to offsets and bases of stacks** ★
- **Horizontal branches connected downstream 10 times the diameter of drainage stack.**
 - (not found in 2012 IRC)
 - Sec. 708.3.4 requires C/O at base of stack

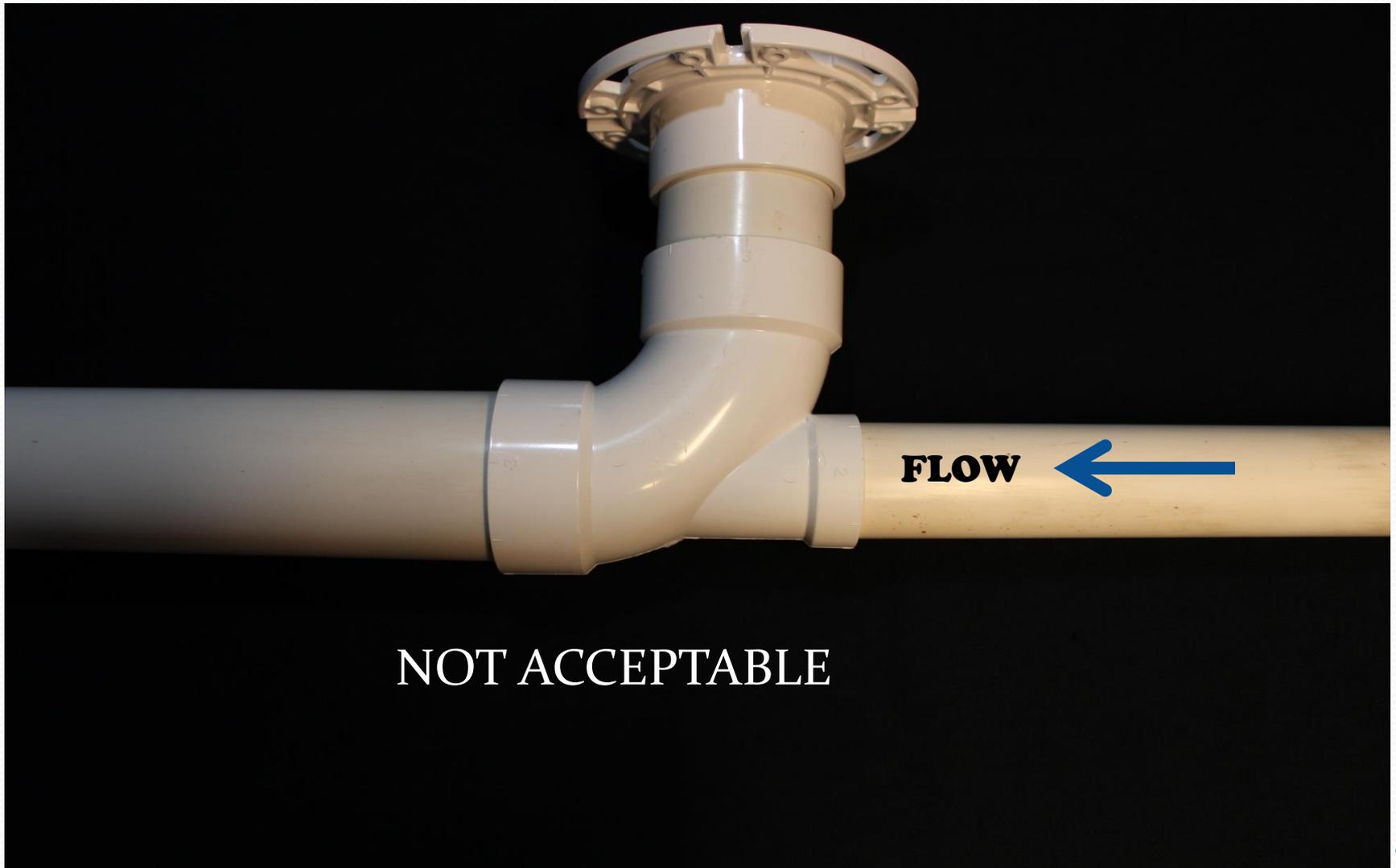
Hydraulic jump



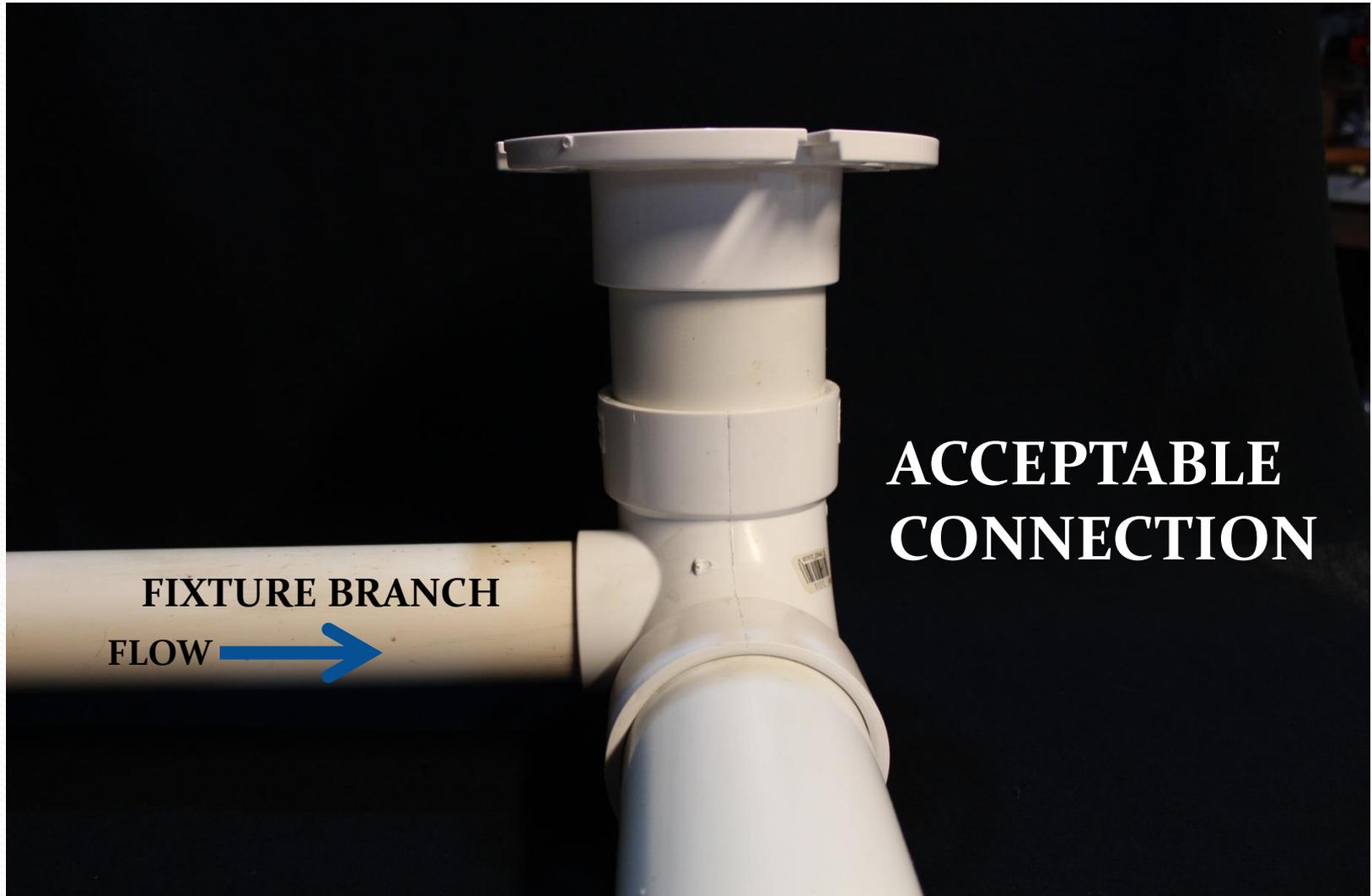
Chapter 7 continued

- **706.4 Heel or side-inlet quarter bends, allowed with exceptions** ★
 - **Also found in 2012 IRC**

Section 706.4 Heel and side-inlet quarter bends



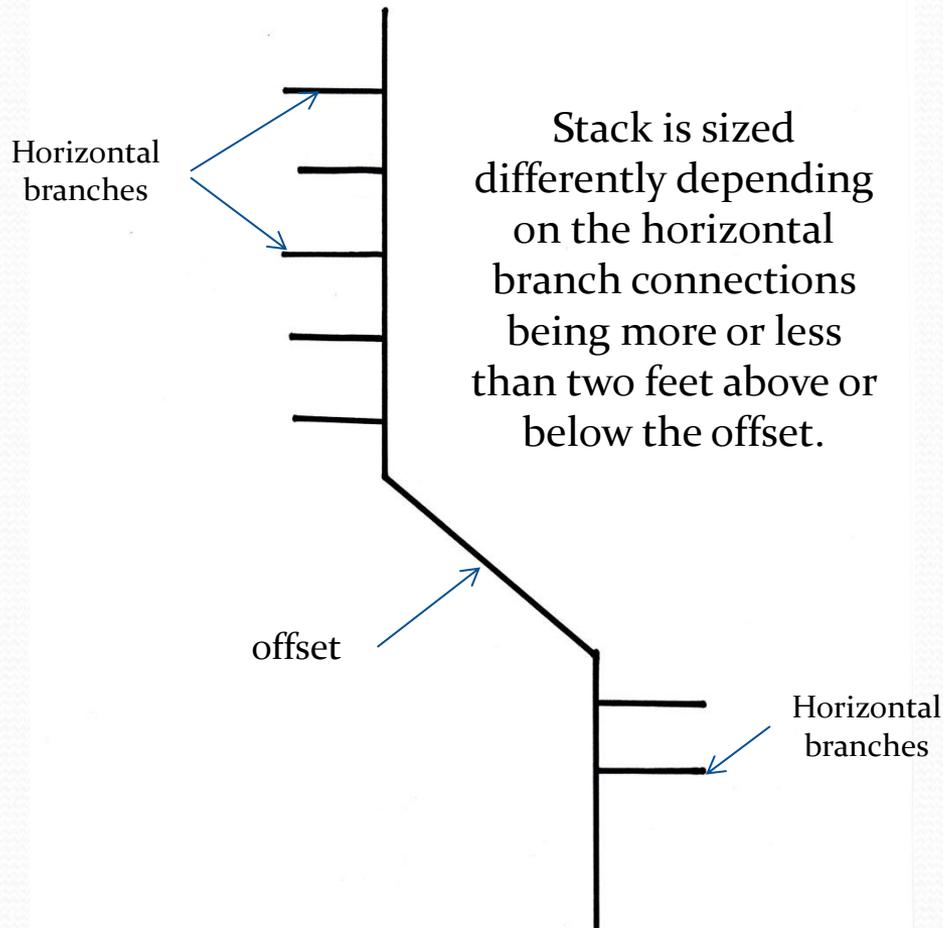
Section 706.4 Heel and side-inlet quarter bends



Chapter 7 continued

- **711.2.1 Omission of vents for horizontal stack offsets ★**

Section 711, offsets in drainage piping in buildings of five stories or more



- System designers be aware of this change along with Fig. 711.1(1), 711.1(2), 711.1.1, 711.2(1), 711.2(2), and 711.2.1 when branch connections are within two feet above or below vertical and horizontal stack offsets. (where to install the vent). This section can be very confusing and requires further investigation when buildings of this type are encountered.

Chapter 7 continued

- **715.1 Sewage backflow** ★
- **Backwater valves required where any openings in drainage system are below the next upstream manhole cover.**

Backwater valves

No backwater valve required



Basement

First floor and basement require backwater valve



Basement

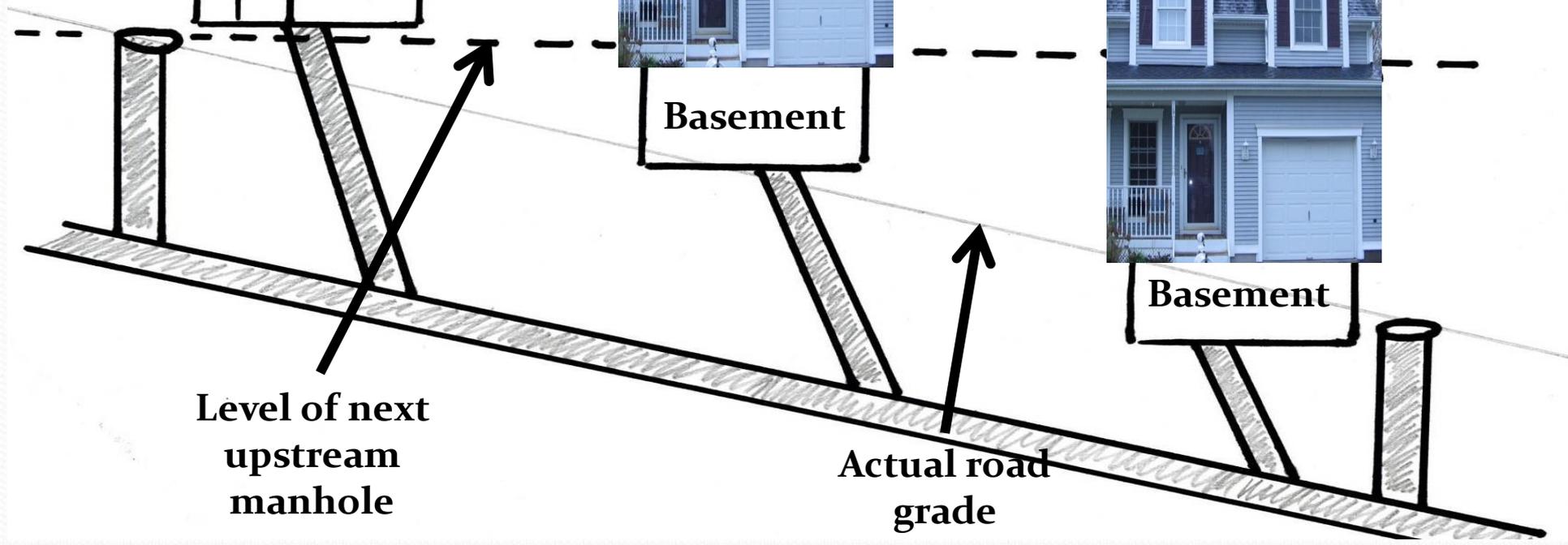
Entire house requires backwater valve



Basement

Level of next upstream manhole

Actual road grade



Chapter 8

2012 IPC

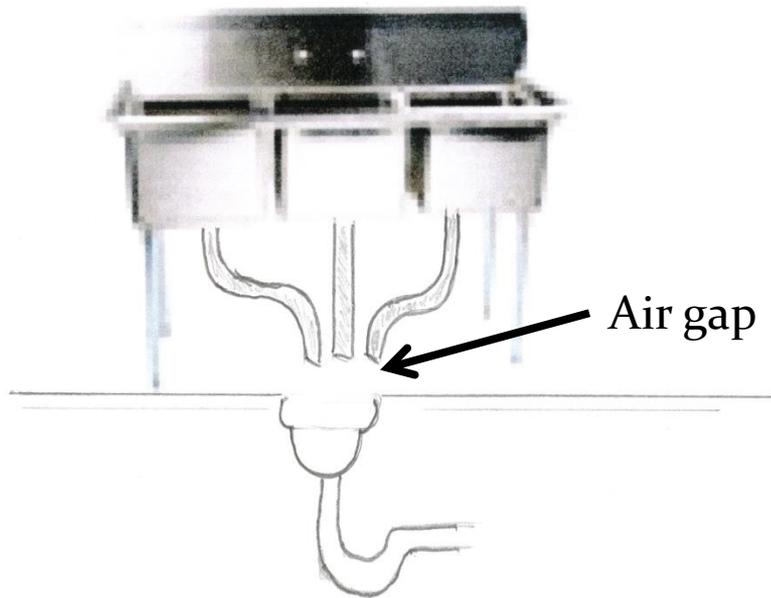
INDIRECT/SPECIAL WASTE

Chapter 8

- **802, 802.1 Where required**
 - **FOOD HANDLING EQUIPMENT AND CLEAR WATER WASTE**

- **802.1.8 Food utensils, dishes, pots and pans sinks ★**

Food Handling



- **Food prep and 3 bay sinks required to be indirectly connected through air gap**

Chapter 9

2012 IPC

VENTS

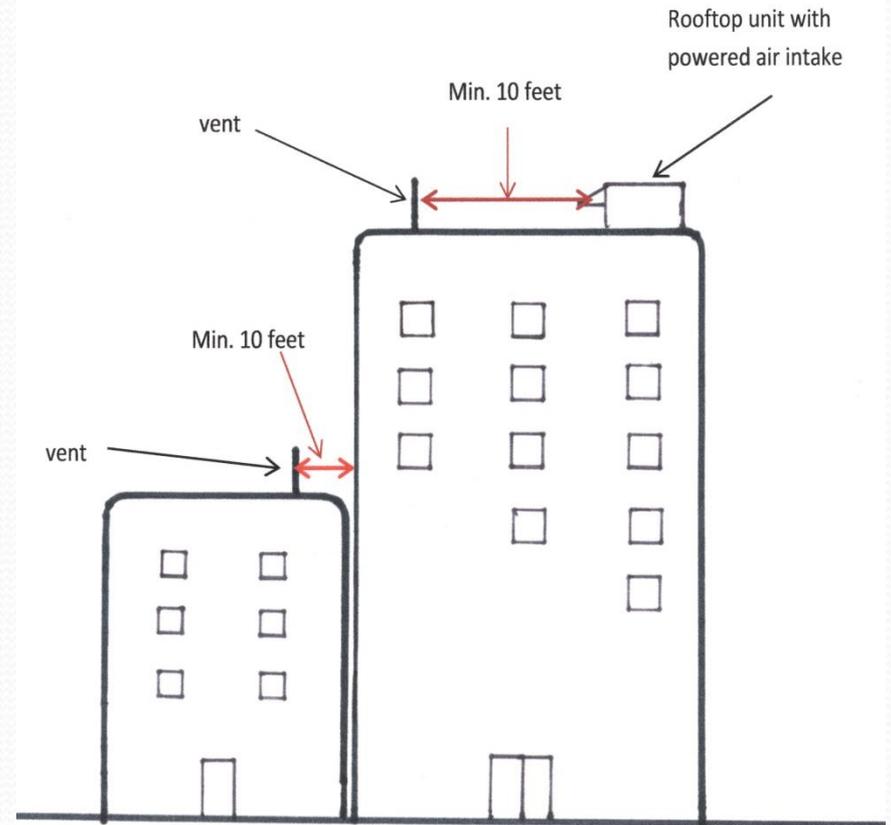
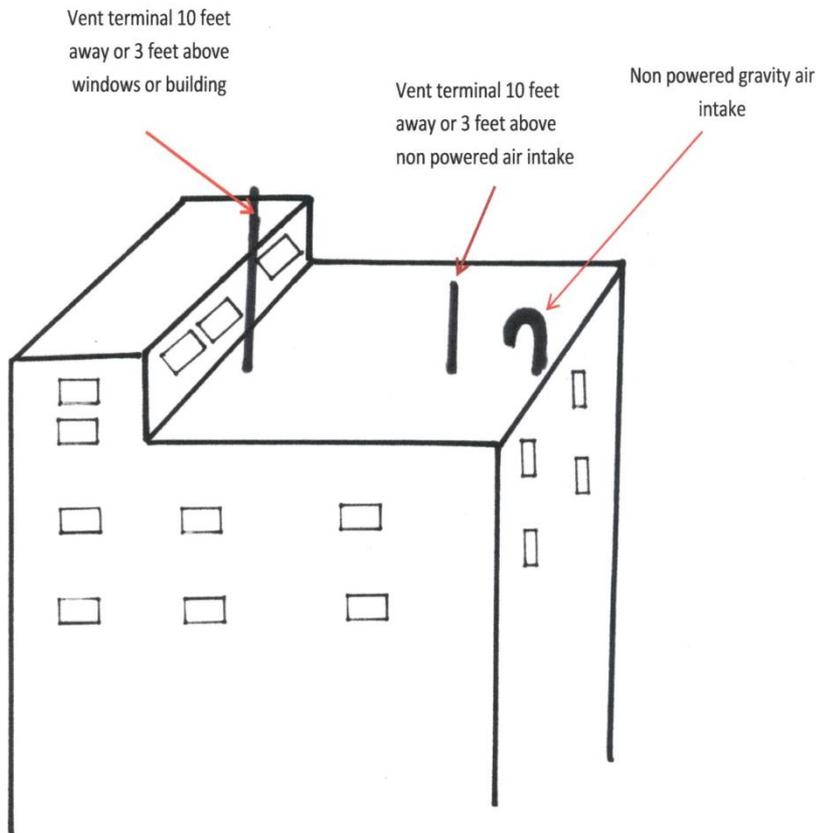
Chapter 9 continued

- **901.3 Chemical systems** ★
- **Chemical Air Admittance valves allowed**

Chapter 9 continued

- **903.5 Location of vent terminal** ★

Vent terminal locations



Chapter 9 continued

- **Section 917, Single stack vent** 
system (not in 2009 or 2012 IRC)
- **Entire section has been added**
- **917.1 Where permitted**
- **917.2 Stack size** (see Table 917.2)

Sec. 917, Single Stack Vent System

- **For multistory buildings where toilet rooms are stacked one above the other.**
- **Drainage stack serves as a single stack vent system**
- **Drainage stack and branch piping shall be the vents for the drainage system**
- **The drainage stack shall have a stack vent**

MAXIMUM HORZ. DEVELOPED LENGTH FOR OTHER FIXTURES IN A SINGLE STACK VENT SYSTEM

- In properly designed and installed system other fixtures such as urinals, showers, tubs etc. may be up to 12 feet away from stack.
- Additional offset venting of stack required when additional branches are installed below offset.

Chapter 9 continued

- **918.3 Air admittance valves, Where permitted**
 - (numerous options for air admittance valve installation)

Chapter 10

2012 IPC

TRAPS, INTERCEPTORS AND SEPARATORS

Chapter 10

- **1002.4 Trap seals**
 - (SHALL BE MAINTAINED WHERE TRAP SEAL IS SUBJECT LOSS BY EVAPORATION)

TRAP PRIMERS



ALSO
AVAILABLE ARE
TRAP SEAL
PROTECTORS
WITH
ELASTOMERIC
SEALS



Chapter 10

- **1003.1 Interceptors and separators, where required**
- **1003.3 Grease interceptors**
- **1003.3.1 Grease interceptors and automatic grease removal devices** ★

GREASE INTERCEPTORS



GREASE INTERCEPTORS





Chapter 11

2012 IPC

STORM DRAINAGE

Chapter 11

- **Few changes**
- **1105.1 Roof drains, general**
- **Table 1106.2(2) Total change**
- **(Size of rectangular vertical conductors and leaders)**
- **1107 Siphonic roof drainage systems**
- **1108.1 Secondary (emergency overflow) drains or scuppers required if ponding possible**

Chapter 12

2012 IPC

SPECIAL PIPING AND
STORAGE SYSTEMS

NO CHANGES

Chapter 13

2012 IPC

GREY WATER RECYCLING SYSTEMS

NEW CHAPTER

- **This a new chapter to IPC. Chapter contains extensive information on materials, design, construction and installation of grey water systems for flushing of water closets and urinals and for subsurface landscape irrigation**



- **Protection of Structures**

PROTECTION OF STRUCTURE

- Information on protection of structures can be found in several locations including but not limited to:
- 2012 International Plumbing Code, Appendix F
- 2012 International Residential Code;
- 2012 International Building Code;
- 2012 International Plumbing Code:
 - Appendix F
 - Section F101.1, Joist notching
 - Section F101.2, Stud cutting and notching
 - F101.3, Bored Holes
 - F101.4 to F101.6, Structural steel Framing, Cutting, Notching, Boring and non-structural steel framing.
 - Section 305.6 Protection from Physical Damage
 - Section 307, Structural Safety refers you to the Building Code
- 2012 International Residential Code;
 - Section R502.8 to R502.8.2, Floors
 - Section R505.2.5 to Section R505.2.5.3, Steel floor framing
 - Section R602.6 Drilling and Notching of Studs
 - Section R602.6.1, Drilling and notching of Top Plate
 - Section R603.2.5.1 Steel wall framing, Web Holes
 - Section R603.3.4 Steel wall framing, cutting and notching
- 2012 International Building Code;
 - Section 2308.8.2.1 Engineered wood products
 - Section 2308.8.2 to 2308.8.2.1; Framing details, Engineered wood products
 - Section 2308.9.8; Pipes in walls
 - Section 2308.9.10 to 2308.10; Cutting, notching, bored holes, roof and ceiling framing
 - Section 2308.10.4.2; Notches and holes



Protection of Structures

- Information on protection of structures can be found in several locations including but not limited to:
- 2012 International Plumbing Code, Appendix F
- 2012 International Residential Code;
- 2012 International Building Code;

- 2012 International Plumbing Code:
- Appendix F
- Section F101.1, Joist notching
- Section F101.2, Stud cutting and notching
- F101.3, Bored Holes
- F101.4 to F101.6, Structural steel Framing, Cutting, Notching, Boring and non-structural steel framing.
- Section 305.6 Protection from Physical Damage
- Section 307, Structural Safety refers you to the Building Code

Section IX: Protection of Structure

- 2012 International Residential Code;
- Section R502.8 to R502.8.2, Floors
- Section R505.2.5 to Section R505.2.5.3, Steel floor framing
- Section R602.6 Drilling and Notching of Studs
- Section R602.6.1, Drilling and notching of Top Plate
- Section R603.2.5.1 Steel wall framing, Web Holes
- Section R603.3.4 Steel wall framing, cutting and notching



Section IX: Protection of Structures

- 2012 International Building Code;
- Section 2308.8.2.1 Engineered wood products
- Section 2308.8.2 to 2308.8.2.1; Framing details, Engineered wood products
- Section 2308.9.8; Pipes in walls
- Section 2308.9.10 to 2308.10; Cutting, notching, bored holes, roof and ceiling framing
- Section 2308.10.4.2; Notches and holes

Drilling and Notching "Floors" Sawn Lumber

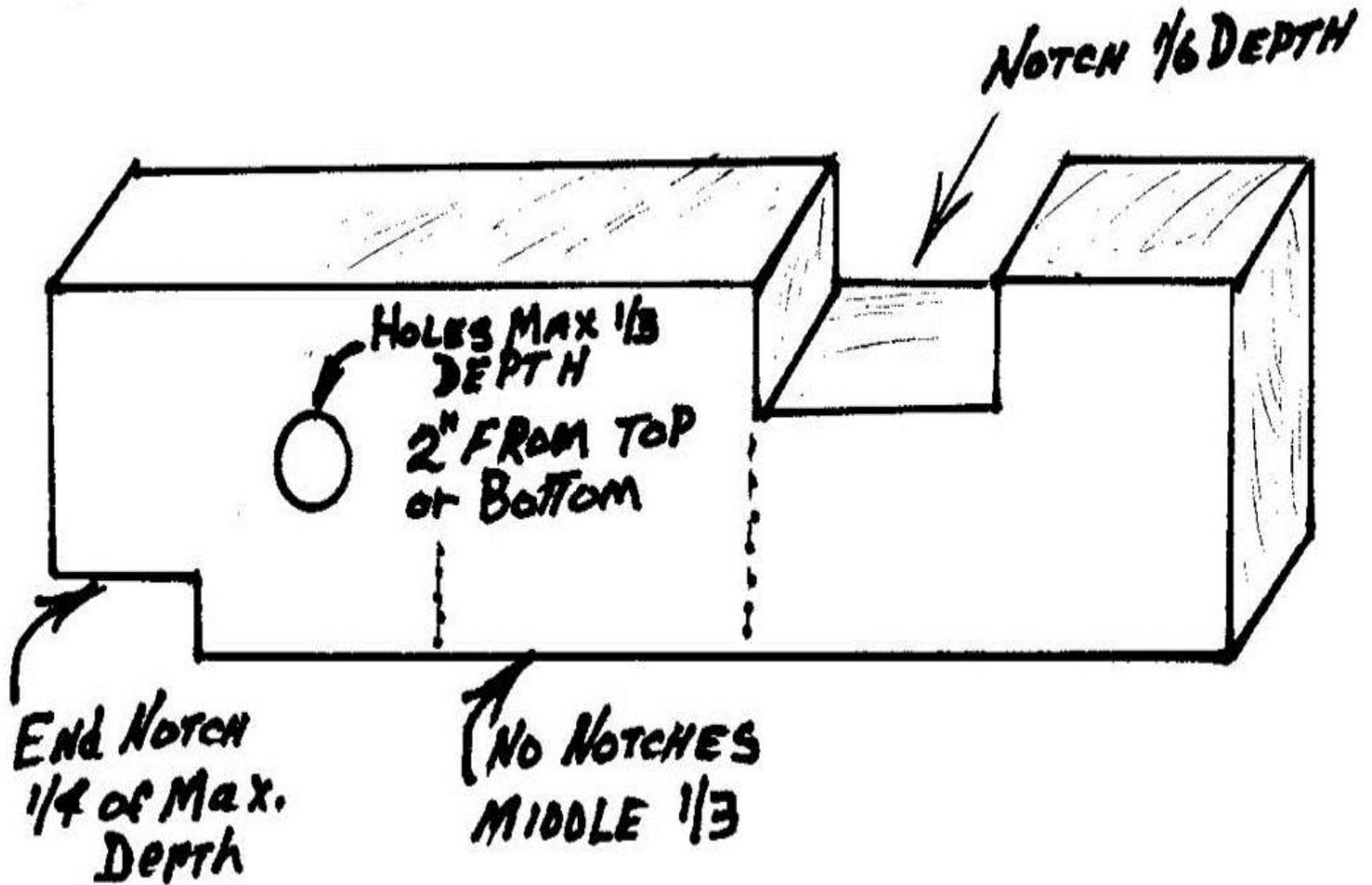
-
- Notches in solid lumber joists, rafters and beams shall not exceed one-sixth of the depth of the member,
- shall not be longer than one third of the depth of the member
- and shall not be located in the middle one third of the span.
- Notches at the ends of the member shall not exceed one-fourth the depth of the member.



Drilling and Notching "Floors" Sawn Lumber

- The tension side of members 4 inches or greater nominal thickness shall not be notched except at the ends of the member.
- The diameter of holes bored or cut into the members shall not exceed one third the depth of the member.
- Holes shall not be closer than 2 inches to the top or bottom of the member, or to any other hole located in the member.
- Where the member is also notched, the hole shall not be closer than 2 inches to the notch.

FLOOR FRAMING



FLOOR JOISTS SPANS, NOTCHING & BORING

FLOOR JOIST SPANS - 40LB LIVE LOAD

NOTCHING

BORING

DF #2

12" o.c.

16" o.c.

24" o.c.

END

OUTER
1/3

2" to
EDGE

2 X 6

10' 9"

9' 9"

8' 6"

1 3/8"

7/8"

1 1/2"

2 X 8

14' 2"

12' 10"

11' 3"

1 7/8"

1 1/4"

2 3/8"

2 X 10

18'

16' 5"

14' 4"

2 5/16"

1 1/2"

3 1/16"

2 X 12

21' 11"

19' 11"

17' 5"

2 13/16"

1 7/8"

3 3/4"



ty rates and use.

by Electric

STATE OF CALIFORNIA
ADANGER
Warning: Temperature over 120°F and
pressure over 150 psi may cause scalding or
death from burns.
Children, disabled and elderly are
at high risk of being scalded.
See instructions manual before
adjusting temperature of water heater.
Turn water heater off before bathing or
showing.
Temperature setting valves are
available for rental.



WALL FRAMING NOTCHING AND BORING

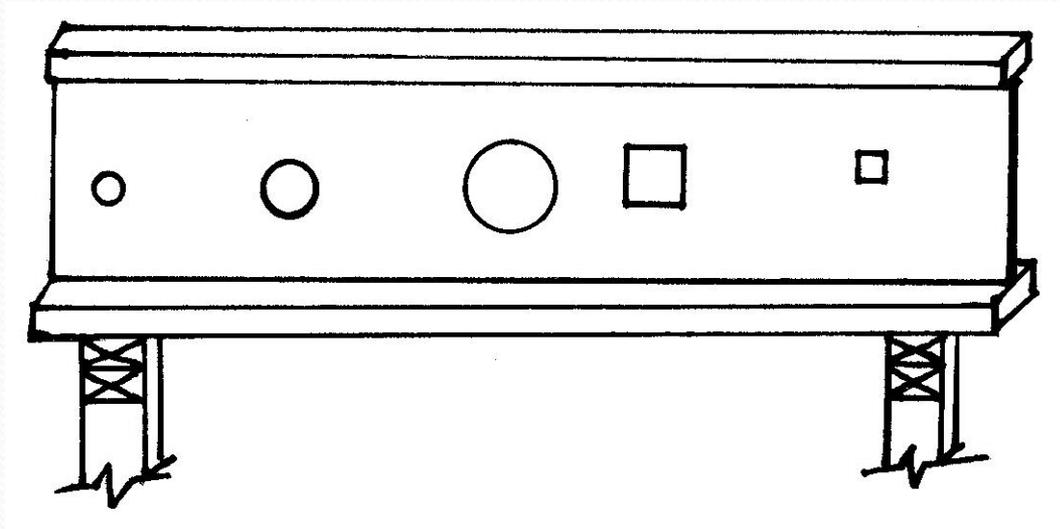
Stud Sizing and Spacing			
Stud Size	2 X 4	3 X 4	2 X 6
BEARING WALLS			
max. height	10'	10'	10'
max. spacing, roof & ceiling	24" O.C.	24" O.C.	24" O.C.
1 floor. max. spacing, roof & ceiling	16" O.C.	24" O.C.	24" O.C.
2 floors, max spacing, roof & ceiling	n/a	16" O.C.	16" O.C.
Notching	7/8"	7/8"	1 3/8"
Boring	1 7/16"	1 7/16"	2 3/16"
Boring 2 doubled consecutive studs	2"	2"	3 5/16"
NONBEARING WALLS			
Max. height	14'	14'	20'
Max. spacing	24" O.C.	24" O.C.	24" O.C.
Notching	1 7/16"	1 7/16"	2 3/16"
Boring	2"	2"	3 5/16"

Engineered Wood Products

- Cuts, notches and holes placed in Trusses, Laminated Veneer Lumber, Glue-Laminated Members or I-Joists are not permitted unless the effects of such penetrations are specifically considered in the design of the member, or are permitted by the manufacturer's recommendations.

"TJI" BORING

Generally Big Holes in the middle, small holes in the outer third. Manufacturer's instructions must always be on site. Never guess or assume





**Hole more
than 50% of
width
IRC 602.6.1**

NAIL PLATES

- IPC Sec. 305.6 protection against physical damage.
- Steel nail plates 0.0575 in. thick (16 gage) required where concealed pipes (other than steel or cast iron) are within 1½ inches of edge.
- Plates shall cover area of pipe.
- Plates shall extend 2” above and below sole and top plates.

STEEL WALL FRAMING

- The 2012 International Residential Code has an extensive section on steel wall framing. Some general rules for cutting and notching steel framing
- Flanges and lips of steel studs, headers and load bearing steel floor framing members shall not be cut or notched.

STEEL WALL FRAMING

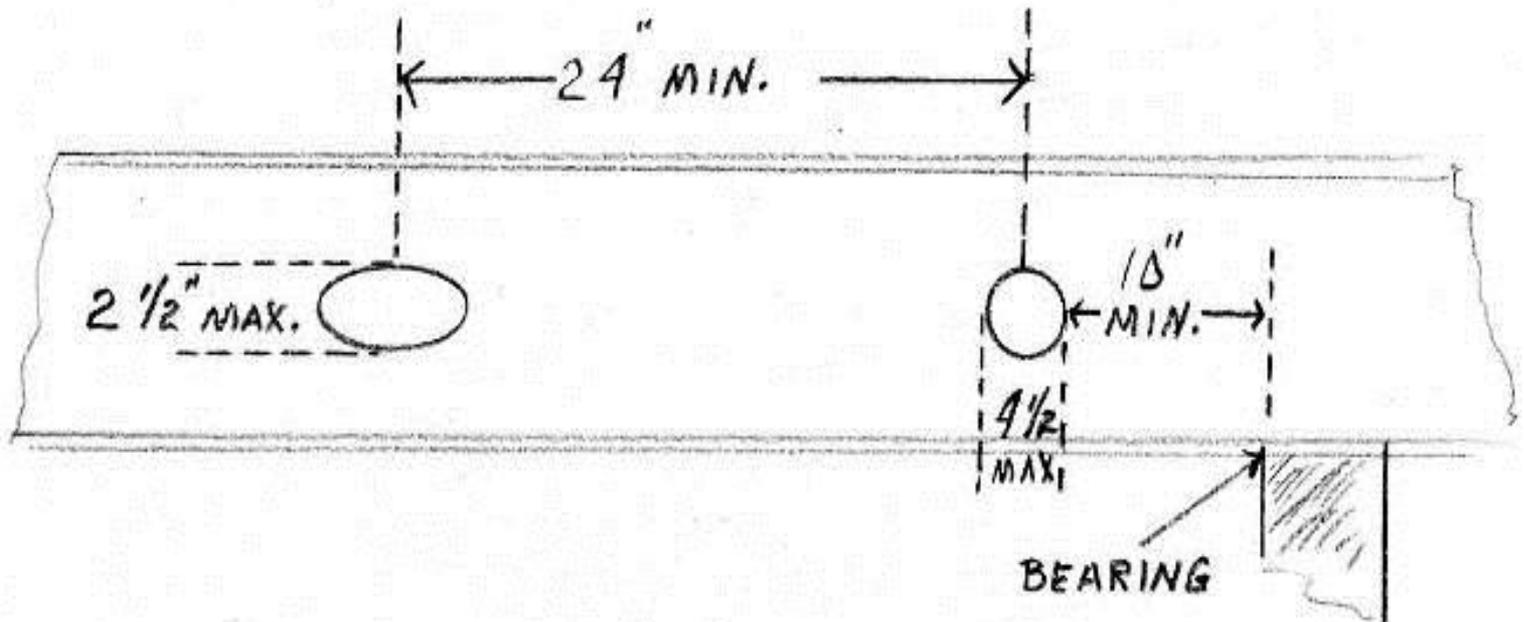
- Holes in webs only allowed along centerline of web.
- Center to center hole spacing not to exceed 24 inches.
- Holes not greater than $\frac{1}{2}$ the member depth or $1 \frac{1}{2}$ inches.
- Length of web hole max. $4 \frac{1}{2}$ inches.
- Minimum distance between edge of hole and edge of bearing surface is 10 inches.

STEEL WALL FRAMING

- Sections R603.2.5.2 and R603.2.5.3 Address Web hole reinforcing and patching. Pipes with an outside diameter equal to or greater than 1 ½ inches installed in steel studs are not allowed without an accepted engineering design.

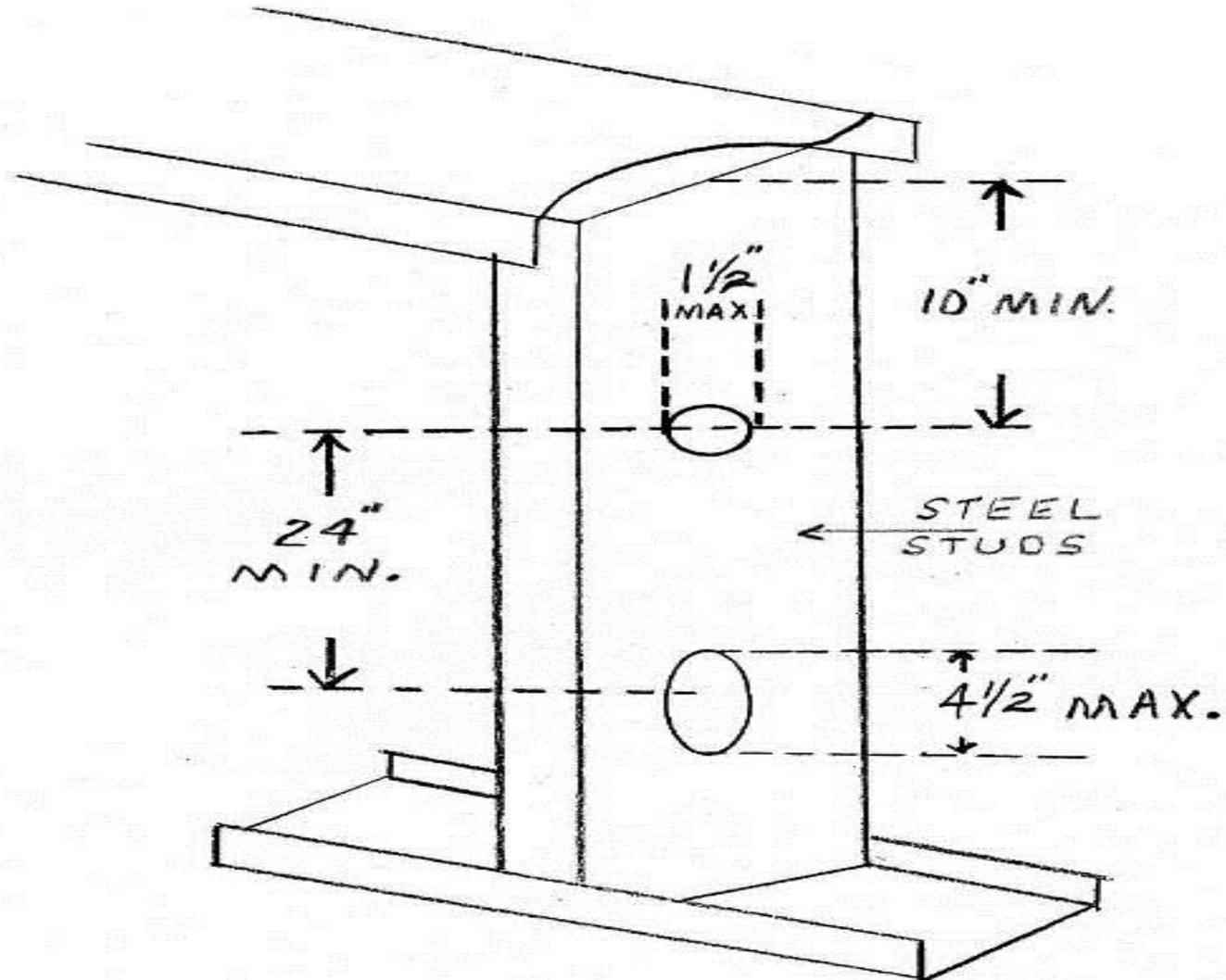
STEEL WALL and FLOOR FRAMING

FLOORS



STEEL WALL and FLOOR FRAMING

WALLS



Home Improvement Contractor Registration

- When the work being done in a residence exceeds the definition of Plumbing and Piping work as defined in CGS Sec. 20-330 a plumbing contractor requires a Home Improvement Contractor Registration.











QUESTIONS

THE
END

