

2016 CALBO Education Week

2016 California Mechanical, Plumbing and Energy Codes: Significant Changes

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2016 CPC SIGNIFICANT CHANGES

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GENERAL

- Effective 01/01/2017
- Include the standard numbers in the Section instead of referencing Chapter 17
- Note "Section Relocation" table at front of code

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2015 Location	2012 Location	2015 Location	2012 Location
102.1	101.4	101.4, 101.5	103.7, 103.8
103.3	101.5	301.2 – 301.2.2	301.1 – 301.1.2
102.4	101.6, 101.11	301.2.5 – 301.5.6	301.1.3 – 301.4.6
102.4.1, 102.4.2	101.6.1, 101.6.2	313.3 – 313.5	313.1 – 313.3
102.3	101.7, 101.11.4	Table 313.3	Table 313.1
102.8	101.10	313.2	313.4
102.4	101.11	313.1	313.5
102.5	101.11.1	401.2	401.1
102.2	101.11.2	403.0, 403.1	402.7
102.6	101.11.3	402.7 – 402.11	402.8 – 402.12
102.3	101.11.4	411.2	403.2
103.0, 103.1	102.0 – 102.2	412.1, 412.1.1	403.3, 403.3.1
103.4	102.2.1	407.2.2	403.4
106.4 – 106.6	102.2.2 – 102.2.4	420.3	403.5
103.2	102.2.5	405.0 – 405.3	406.0 – 406.3
107.0 – 107.2	102.3, 102.3.1	406.0 – 406.4	407.0 – 407.4
106.0, 106.1	102.4	408.7.5	408.7.1
106.3	102.5	411.3	411.2 – 411.2.2

SECTION RELOCATION

2015 Location	2012 Location	2015 Location	2012 Location
1309.3.9, 1309.3.9.1	1318.6	1701.0, 1701.1	1401.0, 1401.1
1309.3.8 – 1309.3.8.10	1318.7	Table 1701.1	Table 1401.1
1309.3.10 – 1309.3.10.4	1318.8	1401.0 – 1406.4	1501.0 – 1506.4
1312.0	1319.0	1501.0 – 1501.9	1601.0 – 1601.9
1312.1.2	1319.1	Table 1501.5	Table 1601.5
1312.7 – 1312.8.1	1319.2 – 1319.3.2	1502.0, 1502.1	1602.0, 1602.1
1312.6.4, 1312.6.4.1	1319.3.3, 1319.3.4	1502.2	1602.2, 1602.2.1
1312.2 – 1312.4	1319.4 – 1319.6	1502.2.1 – 1503.8	1602.2.2 – 1603.8

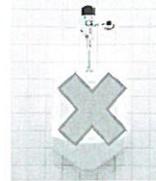
Section Relocation

SECTION RELOCATION

2015 Location	2012 Location	2015 Location	2012 Location
102.1	101.4	101.4, 101.5	103.7, 103.8
103.3	101.5	301.2 – 301.2.2	301.1 – 301.1.2
102.4	101.6, 101.11	301.2.5 – 301.5.6	301.1.3 – 301.4.6
102.4.1, 102.4.2	101.6.1, 101.6.2	313.3 – 313.5	313.1 – 313.3
102.3	101.7, 101.11.4	Table 313.3	Table 313.1
102.8	101.10	313.2	313.4
102.4	101.11	313.1	313.5
102.5	101.11.1	401.2	401.1

Bathroom Group

Any combination of fixtures,
not to exceed one water closet, two
lavatories, either one bathtub, or one
combination bath/shower, or a shower, and
 may include a bidet and an emergency
 floor drain.



CHAPTER 3

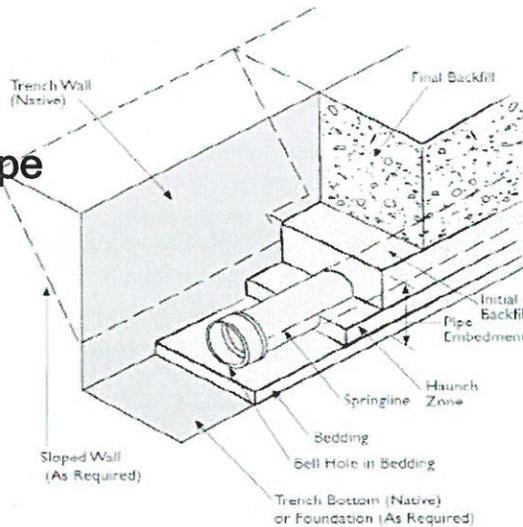
- 312.6 Freeze protection (when necessary) is now required for water piping in attics, crawl spaces or exterior walls
- 312.13 & 312.14 Exposed plastic piping : ABS & PVC shall be protected by water-based paint (PVC can also be wrapped with 0.04" tape)
- 314.4.1 Specific requirements for trench dimensions and compaction for plastic pipe

Installation of thermoplastic pipe

314.4.1 Installation of Thermoplastic Pipe and Fittings. Trench width for thermoplastic sewer pipe shall be 1.25 times the outside diameter of the piping plus 12 inches or the outside diameter of the piping plus 16 inches.

Thermoplastic piping shall be bedded in not less than 4 inches of granular fill supporting the piping. The backfill for thermoplastic piping shall be compacted along the sides of the piping in 6 inch layers and continue to not less than 12 inches above the piping. Compaction shall be not less than a 85 percent standard proctor density.

Installation of thermoplastic pipe



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Definition of Thermoplastic Pipe

A plastic pipe that is capable of being repeatedly softened by increase of temperature and hardened by decrease of temperature. These would include, but are not limited to: Polybutylene (PB), Polyethylene (PE), and Polyvinylchloride (PVC).

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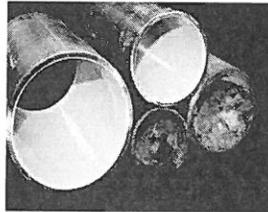
TABLE 313.3
HANGERS AND SUPPORTS

MATERIALS	TYPES OF JOINTS	HORIZONTAL		VERTICAL
		Support	Splicing	Support
Cast	Lead and Oakum	3 feet, except 10 feet where 10 foot lengths are installed ^{1,2,3}		Base and each floor, not to exceed 15 feet
	Compression Gasket	Every other joint, unless over 4 feet then support each joint ^{1,2,3}		Base and each floor, not to exceed 15 feet
Cast Iron Hubs	Shielded Coupling	Every other joint, unless over 4 feet then support each joint ^{1,2,3}		Base and each floor, not to exceed 15 feet
Copper & Copper Alloys	Soldered, Brazed, Threaded, or Mechanical	1 1/2 inches and smaller, 6 feet; 2 inches and larger, 10 feet		Each floor, not to exceed 10 feet
	Threaded or Welded	1/2 inch and smaller, 10 feet; 1 inch and larger, 12 feet		Every other floor, not to exceed 24 feet ⁴
Steel Pipe for Water or DWV	Threaded or Welded	1/2 inch, 6 feet; 3/4 inch and 1 inch, 8 feet; 1 1/2 inches and larger, 10 feet		Base and each floor, provide mid-story guides, provide for expansion every 30 feet
Schedule 40 PVC and ABS DWV	Solvent Cemented	All sizes, 4 feet, allow for expansion every 30 feet ⁵		Base and each floor, provide mid-story guides, provide for expansion every 30 feet
CPVC	Solvent Cemented	1 inch and smaller, 3 feet; 1 1/2 inches and larger, 4 feet		Base and each floor, provide mid-story guides, not to exceed 4 feet
Lead	Wiped or Flamed	Continuous Support		Not to exceed 4 feet
Steel	Mechanical	In accordance with standards acceptable to the Authority Having Jurisdiction		Base and each floor, provide mid-story guides
FLX	Cold Expansion, Insert, and Compression	1 inch ⁶ and smaller, 72 inches; 1 1/2 inches and larger, 4 feet		Base and each floor, provide mid-story guides
FLX-AL-FLX	Metal Insert and Metal Compression	1/2 inch } All sizes 68 inches 3/4 inch } 1 inch }		Base and each floor, provide mid-story guides
FL-AL-FL	Metal Insert and Metal Compression	1/2 inch } All sizes 68 inches 3/4 inch } 1 inch }		Base and each floor, provide mid-story guides
FR-RT	Insert and Compression	1 inch and smaller, 12 inches; 1 1/2 inches and larger, 4 feet		Base and each floor, provide mid-story guides
Polystyrene (PS)	Insert and Compression	1 inch and smaller, 12 inches; 1 1/2 inches and larger, 4 feet		Base and each floor, provide mid-story guides

For 5/8 inch, 1 inch = 25.4 mm; 1 foot = 304.8 mm
 Note:
 1 Support allowed to span, not to exceed 18 inches (457 mm).
 2 Base not to exceed 40 feet (12,192 mm) intervals to prevent horizontal movement.
 3 Support at each horizontal branch connection.
 4 Hangers shall not be placed on the coupling.
 5 Vertical water lines shall be supported in accordance with approved engineering principles with regard to expansion and contraction, where first approved by the Authority Having Jurisdiction.

CHAPTER 3

- 320.0 "Acknowledge" epoxy lining as rehabilitation for pressure piping and require that it be done in accordance with ASTM F2831



ASTM F2831

- Spools of pipe shall be installed in random locations (for testing and inspection)
- third party testing when required
- Pipe must be cleaned and cleaned surface shall be free of all visible oil, grease, dirt, mill scale, rust and previously applied
- Coatings with no more than 33% remaining in the piping
- Coating thickness shall be a minimum .01 inches and determined by a wet film thickness gauge
- Cure times are designated by the manufacturer's listing and by NSF 61 Standards
- Visual inspection at entrance and exit of piping and removal of spools for testing epoxy coating thickness

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ASTM F2831

- Air test of 150 psig or hydrostatic test of 1-1/2 times the working pressure
Flow test to ensure the system meets required locally adopted code flow rates
- Epoxy coatings used in potable water shall have a chemical extraction test annually to ensure compliance with NSF 61
- Installers must be trained and certified
- Internally coated pipe and tubing shall be permanently and legibly marked at each outlet and on the outside of exposed pipe with the following markings applied at 20-ft intervals: Manufacturer's name or trademark and coating designation and material with prohibition on the use of flame and heat to repair any part of system.

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CHAPTER 3

- **321.0 OSHPD3, Surgical clinics: Emergency power to:**
 - Domestic water booster pumps, circulating pumps, sewage ejector pumps, sump pumps
 - Domestic water heater equipment & controls
 - Fuel pumps
 - Grease removal devices requiring power

CHAPTER 4

- **Plumbing Fixtures Allowable Flow:**
 - 407 Lavs: Public 0.5 gpm
 - metered: 0.25 g/cycle (*Non-Res 0.20 g/cycle*) (*required in restaurants, service stations, train...*)
 - Max temp 120° (Energy 110°)
 - Private 2.2 gpm (*Res 1.2 gpm*)
 - 408.2 Showers: 2.5 gpm (*CALGreen 2.0 gpm*)
 - 411.2 WC: 1.6 gpf (*CALGreen 1.28 gpf*)
 - 412.1 U: 1 gpf (*CALGreen 0.125 wall mounted; 0.5 floor mounted*)
 - 412.1.1 Non-water U: install 1FU fixture upstream (*OSHPD 3 no longer outlaws non-water urinals*)
 - 407.2.1.1 (*CALGreen*) Kitchen faucets: 1.8 gpm
- **401.3 (HCD) Replace non-compliant plumbing fixtures when altering a building**

Chapter 4

408.5 Finished Curb or Threshold. The immediate adjoining space to showers without thresholds shall be considered a wet location and shall comply with the requirements of the building, residential, and electrical codes.

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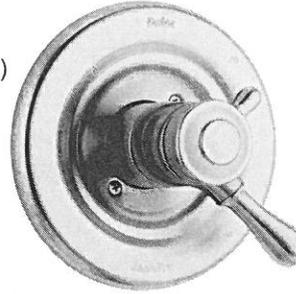
CHAPTER 4

- 408.7.1 Include PVC sheets & CPE sheets as approved lining for built-up showers
- 418.3 Require a floor drain in boiler rooms

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CHAPTER 4

- 417.5 Single-handed mixing valves installed in showers and tub-shower combinations shall have the flow of hot water correspond to the markings on the fixture fitting.
- 415.2 Bottle filling stations can substitute 50% of drinking fountain requirements. (No DF for ≤ 30 occ.)



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CHAPTER 4

- 422.2.1 When separate facilities are required for each sex, "family" restroom to be permitted as both rooms (each can be unisex)
- Notes Table 422.1:
 - Note 4: Urinals added in excess of minimum can replace water closets but minimum water closets not less than 2/3 of required
 - Note 5: Group lavatories 24" lineal, 18" circular



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CHAPTER 5

- 507.5: Drainage pan under a water heater to be at least 1-1/2" deep
- Rest of changes in this Chapter are made to be consistent with the CMC

CHAPTER 6

- Table 604.1 New material CPVC-AL-CPVC
- 604.1 When fittings and valves has copper alloy > 15% zinc, shall be resistant to dezincification & stress corrosion
- *604.1.1 (HCD) CPVC installation to be as per the mfg installation instructions (instead of IS 20)—flushing twice is still required*
- 606.5 Manifold with parallel water supply in attic, crawl space, not readily accessible, in addition to valves at manifold, valve at each fixture/appliance
- 607.0 Potable Water Supply Tanks:
 - NSF 61
 - Tightly covered and vented, screened with No. 24 mesh
 - Min. 16 sq in overflow, screened with No. 24 mesh
 - Valves:
 - If pressure tank, pressure relief valve
 - If above fixtures, vacuum relief

CHAPTER 6

604.10.1 Tracer Wire. Plastic materials for building supply piping outside underground shall have a blue insulated copper tracer wire or other approved conductor installed adjacent to the piping. Access shall be provided to the tracer wire or the tracer wire shall terminate aboveground at each end of the nonmetallic piping. The tracer wire size shall be not less than 18 AWG and the insulation type shall be suitable for direct burial.

CHAPTER 6

- 608.3 Expansion tanks are required regardless of the type of water heater (if closed system)
- A storage tank-type water heater shall be provided with T&P valve, except for instantaneous heaters < 3" inside diameter
- 614.1 OSHPD3-Dialysis water distribution branch lines may be PFA (perfluoroalkoxy)
- 609.11 The plumbing code now requires insulation of hot water piping. There are discrepancies between the plumbing and the energy codes. Here are the the more restrictive of the two:
 - < 1" diameter pipe - 1" insulation
 - 1" & 1-1/2" diameter pipe - 1-1/2" insulation
 - ≥ 2" diameter pipe - 2" insulation
- The other discrepancy is that ALL hot water piping is to be insulated (except connectors and through framing members)

CHAPTER 6

- 612 New section covering fire sprinkler systems for SFD and townhomes. Repeating NFPA 13D requirements, which are very similar to Section R313 of the CRC.
- Minor differences, mainly less restrictive than the CRC except: (*Note SFM amended to match CRC*)
 - Allow PEX-AL-PEX (but did not provide sizing table)
 - Require plastic piping to be rated at 130 psi @ 180°F
 - Require 1/2" drain (CRC does not specify size)

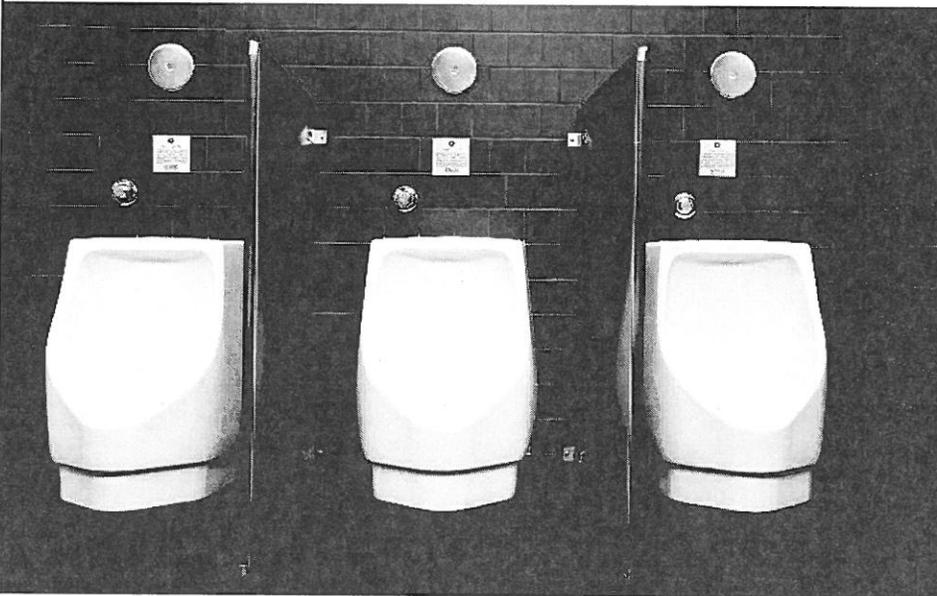
CHAPTER 7

- Table 702.1 added "Sink, Exam Room" to have 1-1/2" waste & 1 FU
- Table 703.2 removed the 2-1/2" column
- 704.3 Section requiring direct connection to drainage with a floor drain upstream for pot sinks, etc. has omitted dishwashers requiring such connection (and therefore, to be indirectly connected as per 807.1)
- 707.4 A clean-out is now required above fixture connection fitting serving a Urinal, regardless of location of Urinal in the building:
 - Other floors
 - Even if Urinal is directly above main drain equipped with c/o
- 707.9 Clearance in front of clean-outs:
 - ≤ 2" diameter piping to be 18" (instead of 12")
 - > 2" diameter piping to be 24" (instead of 18")
 - If under-floor, max 5' from access (instead of 20')

**TABLE 703.2
MAXIMUM UNIT LOADING AND MAXIMUM LENGTH OF DRAINAGE AND VENT PIPING**

SIZE OF PIPE (Inches)	1/4	1/2	2	3	4	5	6	8	10	12
Maximum Units										
Drainage Piping ¹										
Vertical	1	2 ²	16 ³	48 ⁴	256	600	1380	3600	5600	8400
Horizontal	1	1	8 ³	35 ⁴	216 ⁵	428 ⁵	720 ⁵	2640 ⁵	4680 ⁵	8200 ⁵
Maximum Length										
Drainage Piping										
Vertical, (feet)										
Horizontal (unlimited)	45	65	85	212	300	390	510	750	—	—
Vent Piping										
Horizontal and Vertical ⁶										
Maximum Units	1	8 ³	24	84	256	600	1380	3600	—	—
Maximum Lengths, (feet)	45	60	120	212	300	390	510	750		

For SI units: 1 inch = 25 mm, 1 foot = 304.8 mm



CHAPTER 8

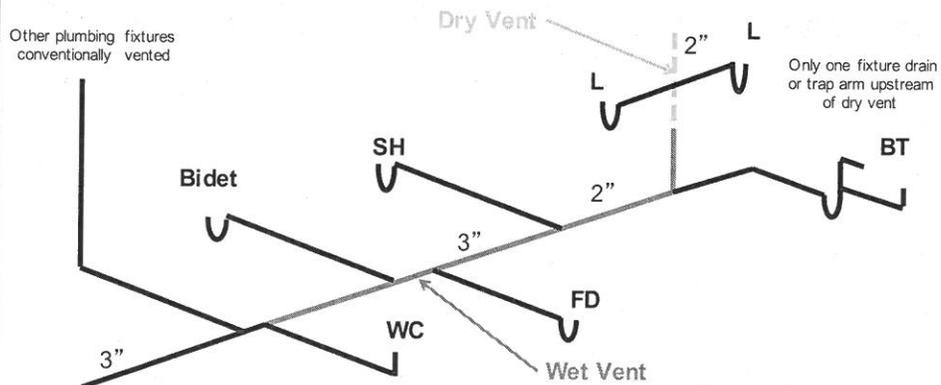
- 814.1.1 Condensate pump for primary drain is allowed if approved by AHJ
 - To rise vertically until it can connect to a gravity drain
 - Each A/C unit to have its own pump
 - Interlock with equipment
 - Multiple pumps could connect to same gravity drain if each is equipped with a check valve
- 814.5 Condensate drain to be trapped as per mfg

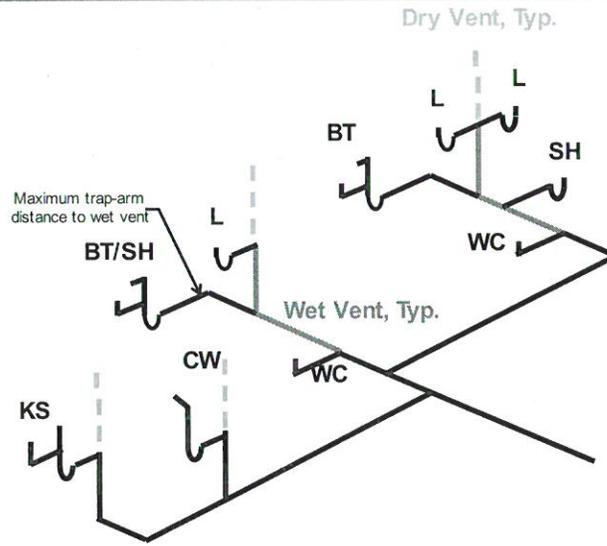
CHAPTER 9

- 908.2.1 Horizontal Wet Venting:
 - Same floor
 - Only one Bathroom Group is now allowed (instead of two)—One bathroom group up to:
 - 1 water closet
 - 2 lavatories
 - 1 bathtub or Bathtub/shower
 - 1 shower
 - 1 bidet
 - 1 floor drain
 - Dry vent to be a vent for bidet, shower, bathtub or 1 or 2 lavatories (not WC or FD)
 - Only 1 wet vented fixture drain or trap arm upstream of dry vent
 - Dry vent connection as per 905.2 & 905.3:
 - Vent connection to horizontal drain above center line
 - Vent to rise 6" above highest fixture flood rim before offsetting horizontally; or must be treated as drain
 - Must rise 6" above highest fixture before connecting to another vent

CHAPTER 9

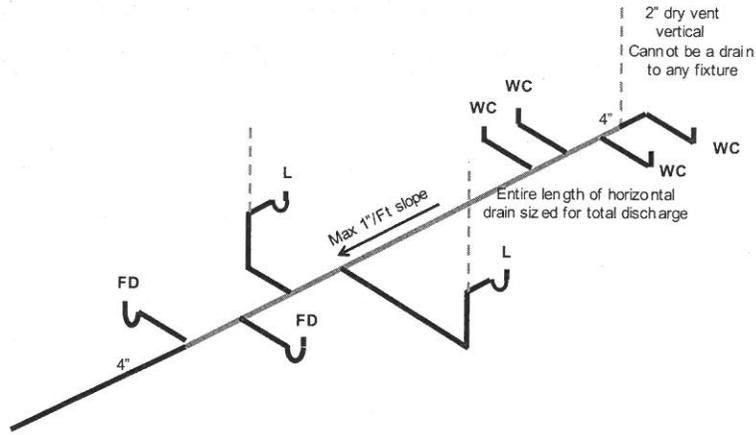
- 908.2.1 Horizontal Wet Venting, Cont'd:
 - Trap arm limitation (to wet vent)
 - Vent above weir of trap except WC
 - WC downstream of all other fixtures
 - Additional fixtures conventionally vented may connect downstream of wet vent
 - Sizing:
 - 2" for up to 4 FU
 - 3" for > 4 FU





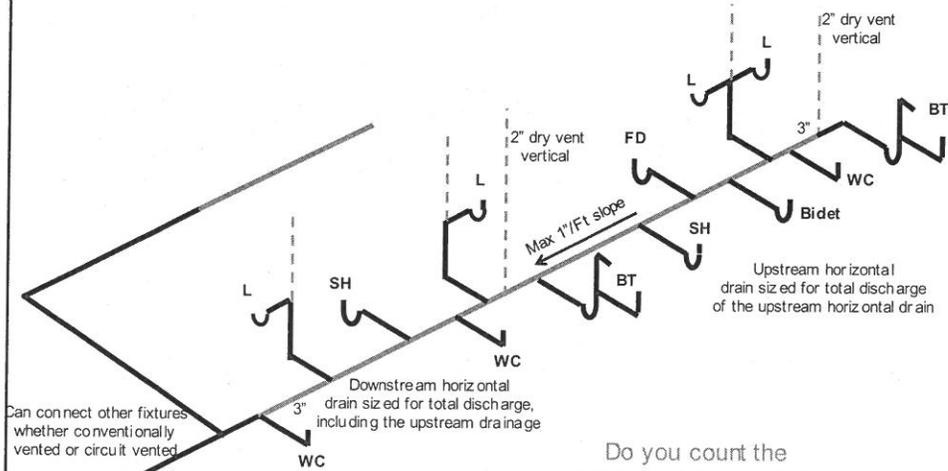
CHAPTER 9

- 911 Circuit Venting:
 - Residential or nonresidential
 - 8 Fixtures max per circuit vented section
 - WC anywhere
 - Circuit vent 2" dry vent, vertical
 - Could have more than 1 circuit vented sections in a row as long as each follow requirements
 - Slope shall not exceed 1"/ft
 - Entire length of horizontal wet vent to be sized for total drainage discharge
 - 2" Relief vent required when circuit venting 4 or more water closets AND connecting to a vertical drainage stack receiving waste from upper horizontal branches
 - Relief vent to be between stack and most downstream fixture connection into wet vent
 - Relief vent to be vertical but could be a fixture drain for a fixture within the group with FU not exceeding 4 FU



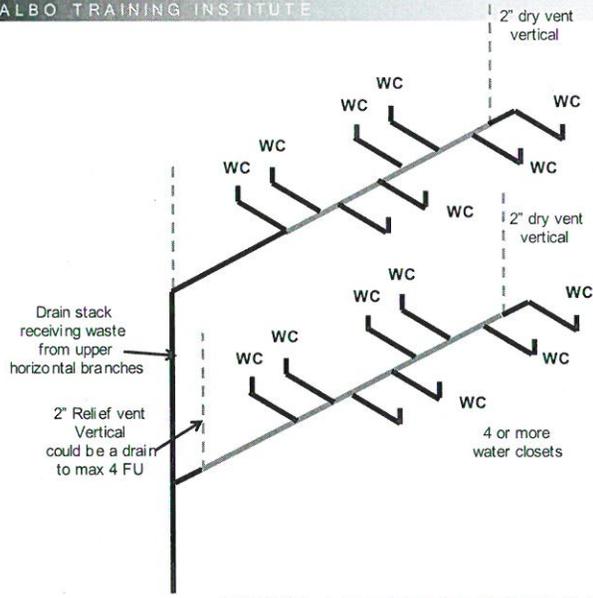
Do you count the vented fixtures or not?

NON-RESIDENTIAL



Do you count the vented fixtures or not?

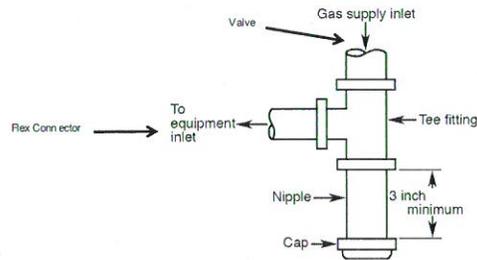
RESIDENTIAL



NON-RESIDENTIAL

CHAPTER 12

- 1212.1(7) Connectors are not allowed thru housing unless protected against damage
- 1212.8 Sediment trap to be installed upstream of the flex connector



- 1213.3 Test pressure for CSST carrying gas more than 14" water column to be 30 psi for 30 minutes

GENERAL

- Chapter 14 is moved to Chapter 17 (Referenced Standards)
- Chapter 15 becomes Chapter 14 (Firestop Protection)
- Chapter 16 becomes Chapter 15 (Alternate Water Sources...)
- Chapter 17 becomes Chapter 16 (Nonpotable Rain Water...)

CHAPTER 15

- *1501.7 HCD Remove requirements that multi-family dwellings have treated water at "Tertiary" state and left it up to AHJ. (Recommend AHJ require Tertiary)*
- *1501.11.2.4: Annual inspection is now required for systems used to flush toilets & urinals (visual, but full test at least every 4 years)*
- *1501.12 Underground treated water separation to sewer (other than gray water) same as potable water; separation to potable water: 12" if both piping approved within building; 60" if not, with potable above treated*
- *1501.13 Abandonment: piping disconnected, drained and capped; tank drained & filled with earth, sand...*
- *1501.14 Sizing: same as potable water*

CHAPTER 15

- *1504.7 HCD: On-site treated systems water to be NSF 350 listed.*
 - *Currently, there are only three NSF listed systems:*
 - *Bio-Microbics, Shawnee, KS: 500, 1000, 1500 GPD for SFD*
 - *E-Z Treat, Rocky Mtn, NC: 600, 1200 GPD for SFD*
 - *Nexus eWater Pty Ltd, San Diego, CA: 200 GPD for SFD & Multi & Commercial*

CHAPTER 15

- *HCD & BSC are currently working on amendments to the 2016 plumbing code to require mandatory installation of recycled water systems in new residential and non-residential buildings. This could require "dual plumbing systems" for both drainage and water supply in all new buildings!*
- *Effective date is still to be determined ~ possibly mid-cycle*