

Combination Waste and Vent

Plumbing Systems Interactive
2021 Uniform Plumbing Code



Combination Waste and Vent Systems

Section 910.0

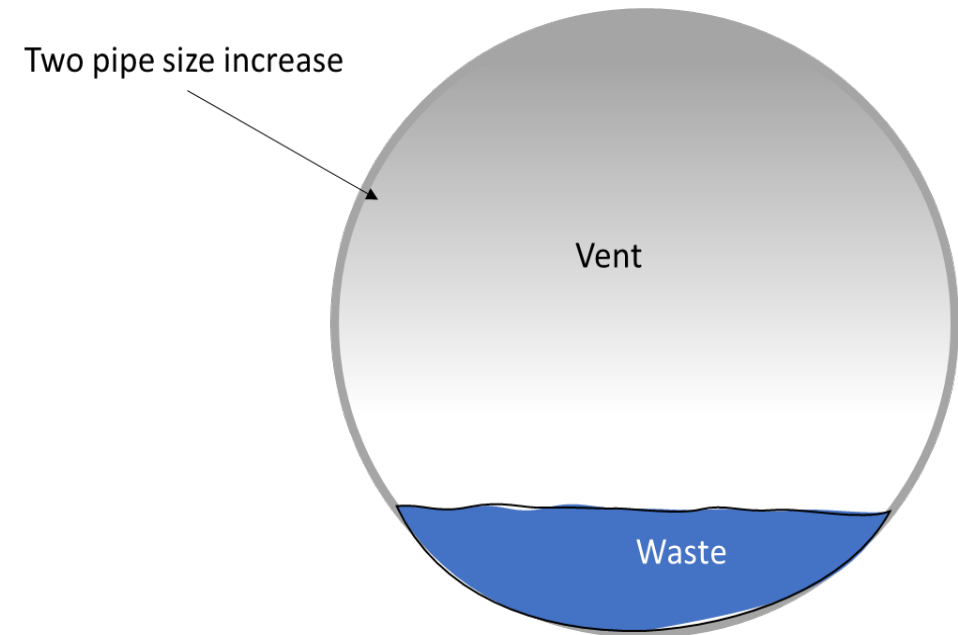


Chapter 2 Definitions

Combination Waste and Vent System

A specially designed system of waste piping embodying the horizontal wet venting of **one or more** sinks or floor drains using a common waste and vent pipe adequately sized to provide free movement of air above the flow line of the drain.

- **Sinks**
- **Floor drains**



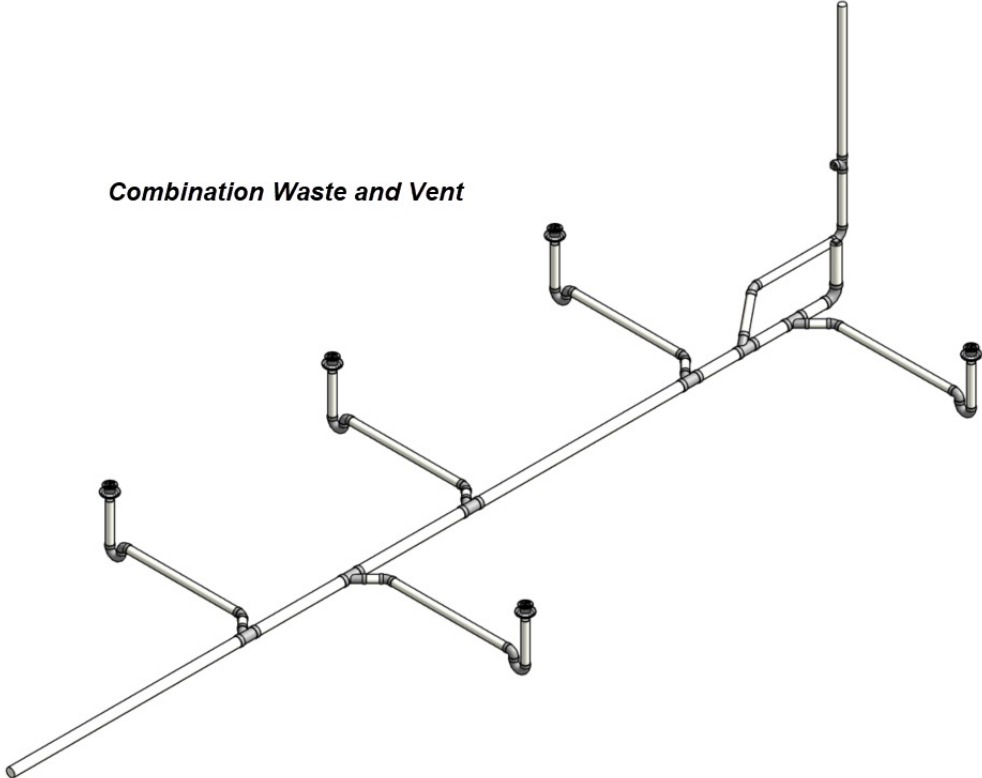
Combination Waste and Vent System

910.1 Where Permitted

Combination waste and vent system shall be permitted where structural conditions preclude the installation of conventional systems as otherwise prescribed by this code.



Combination Waste and Vent



Combination Waste and Vent System

910.2 – Approval

Construction documents for each combination waste and vent system shall first be approved by the Authority Having Jurisdiction before a portion of such system is installed.

IMPORTANT NOTICE: Plan Review Required for Plumbing and Gas Piping Installations

The WA State adopted plumbing code (2015 Uniform Plumbing Code) section 113 requires a permit to be obtained from the Authority Having Jurisdiction prior to each installation, alteration, repair, replacement or remodel. Section 114 sets requirements for a permit application.

Subsection 4 states that a permit application to be "accompanied by plans, diagrams, computations and specifications, equipment schedules and other data as required by the Authority Having Jurisdiction."

Be Informed: Not all plumbing and gas piping installations are subject to a plan review. Please open and read the "Plan Review Submittal" information (open Plan Review Information on the left side of this page) to determine if your project requires a plan review.

Please check our website periodically for upcoming updates and changes.

Public Health
Seattle & King County

Permit No :
Date Issued :
Date Renewed :
Add On Date :
Expires :
Page: 1 of 1

PLUMBING PERMIT

Status : Issued
 Owner Name :
 Job Location :
 Parcel :

Insp. Code : Inspection Area 16
 Bldg. Type : Multi-Family
 Note : NEW

CONTRACTOR :
 Bus Ph :

License No :
 Inspection Request Phone# :
 Val. By : EE000004

NOTICE TO OWNER AND CONTRACTOR :

Plumbing approval DOES NOT cover side sewer or septic tank inspection. Do NOT accept work without HEALTH DEPARTMENT approval. Work must NOT be covered until inspected and approved by inspector. All work must conform to requirements of the KING CO. and SEATTLE CITY Ordinance. Permits expired less than a year from expiration date may be renewed for one half of permit's cost or \$50.00 whichever is less.

Rough In OK _____ Date _____ Insp. _____
 Final OK _____ Date _____ Insp. _____

**** Required Corrections (SEE REVERSE SIDE FOR DETAILS)**

List of Fixtures	Number of Outlets
PLAN REVIEW submitted 9.11.2018	1
Total Number of Fixtures	1

Date	Fee Description	Amount
09/11/2018	Plumbing - Plan Review (hourly rate)	\$201.00
09/11/2018	PAYMENT	\$201.00

End of Report 8801 v10



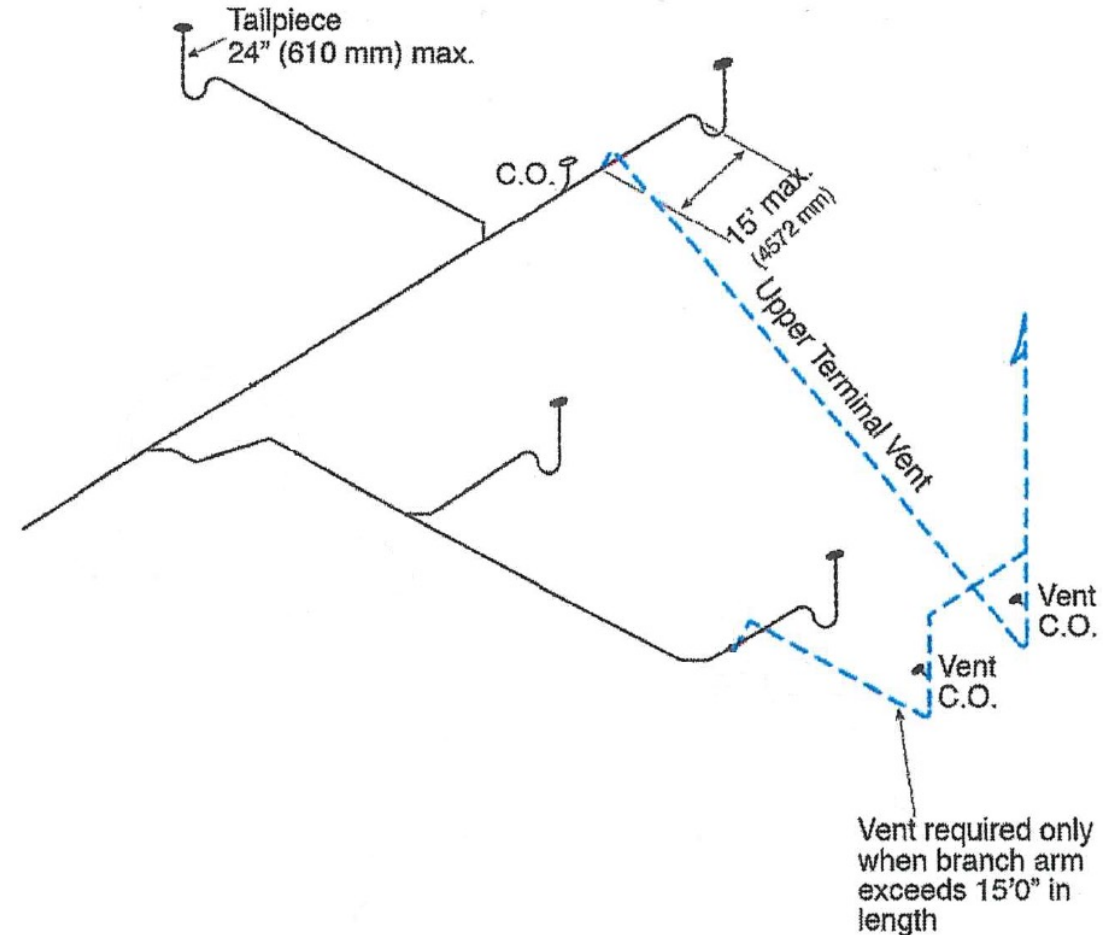
Combination Waste and Vent System

910.3 Vents

Each combination waste and vent system, as defined in Chapter 2, shall be provided with a vent or vents adequate to ensure free circulation of air. A branch exceeding 15 feet in length shall be separately vented in an approved manner. The area of a vent installed in a combination waste and vent system shall be not less than one-half the inside cross-sectional area of the drain pipe served. The vent connection shall be downstream of the uppermost fixture.

Important: Combination waste and vent systems are similar to trap arms in appearance; however, they are defined as a branch – see definition.

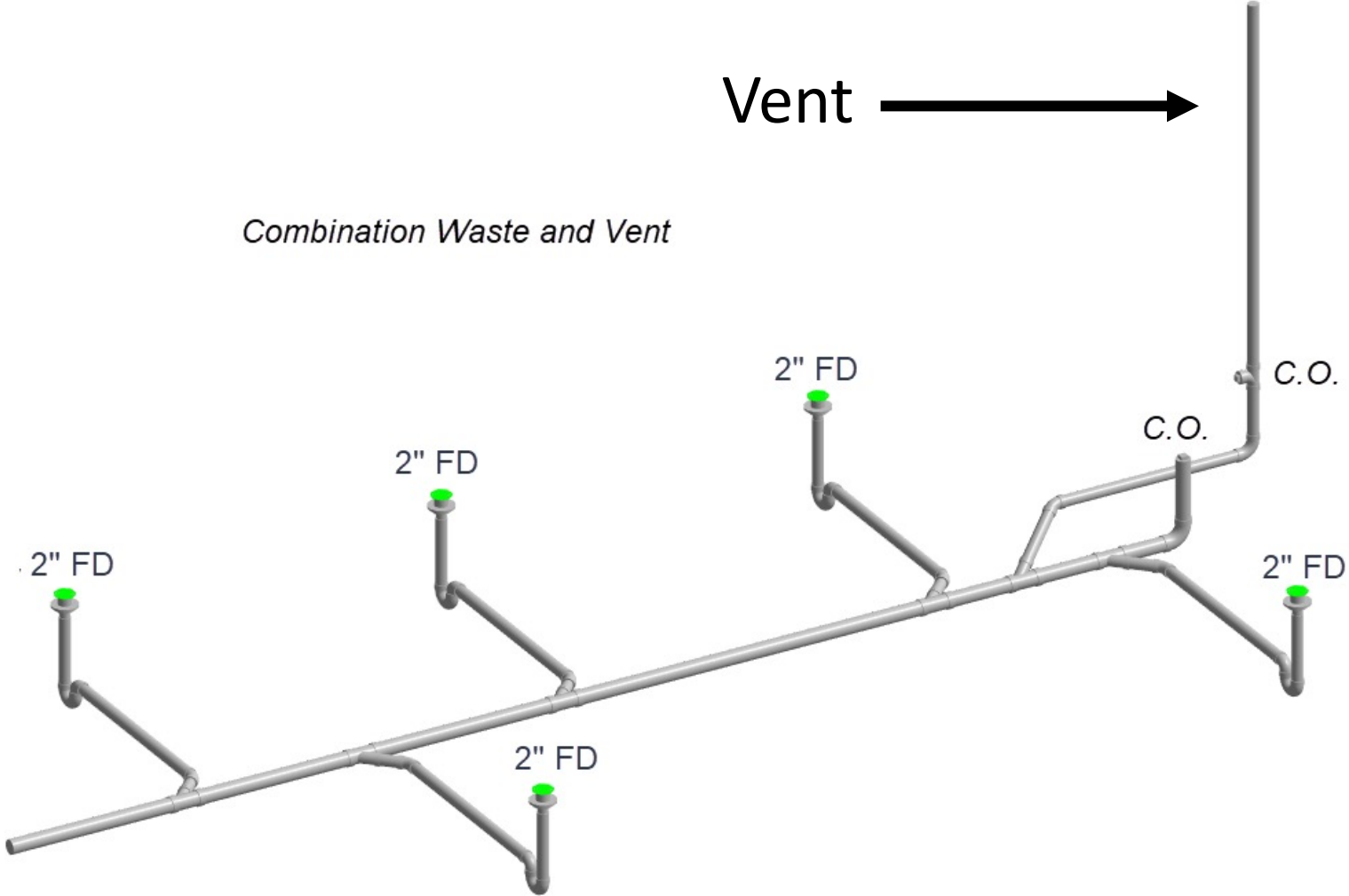
Note: trap arm requirements do not apply to branches, only Section 910.0 requirements are applicable to the branch, trap and tailpiece.



Combination Waste and Vent

910.3 Vents

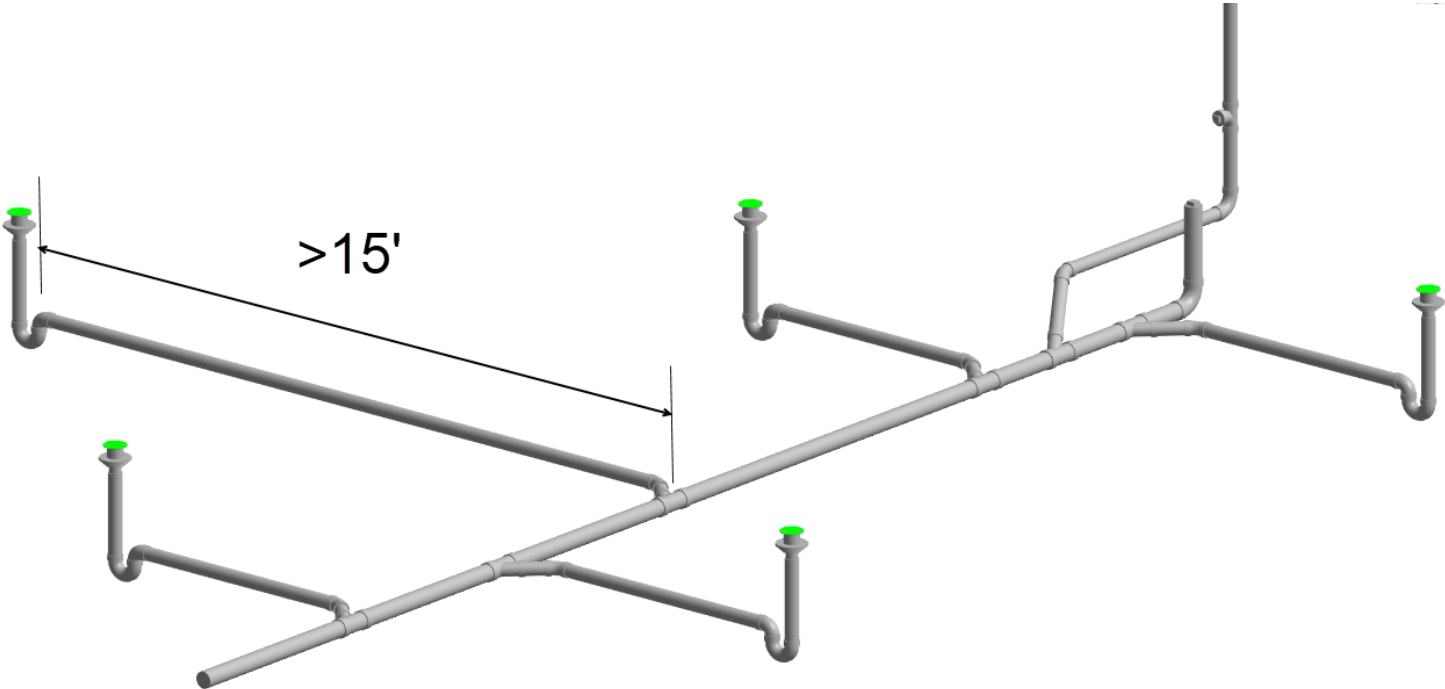
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Combination Waste and Vent

910.3 Vents

A branch exceeding 15' in length shall be separately vented in an approved manner.

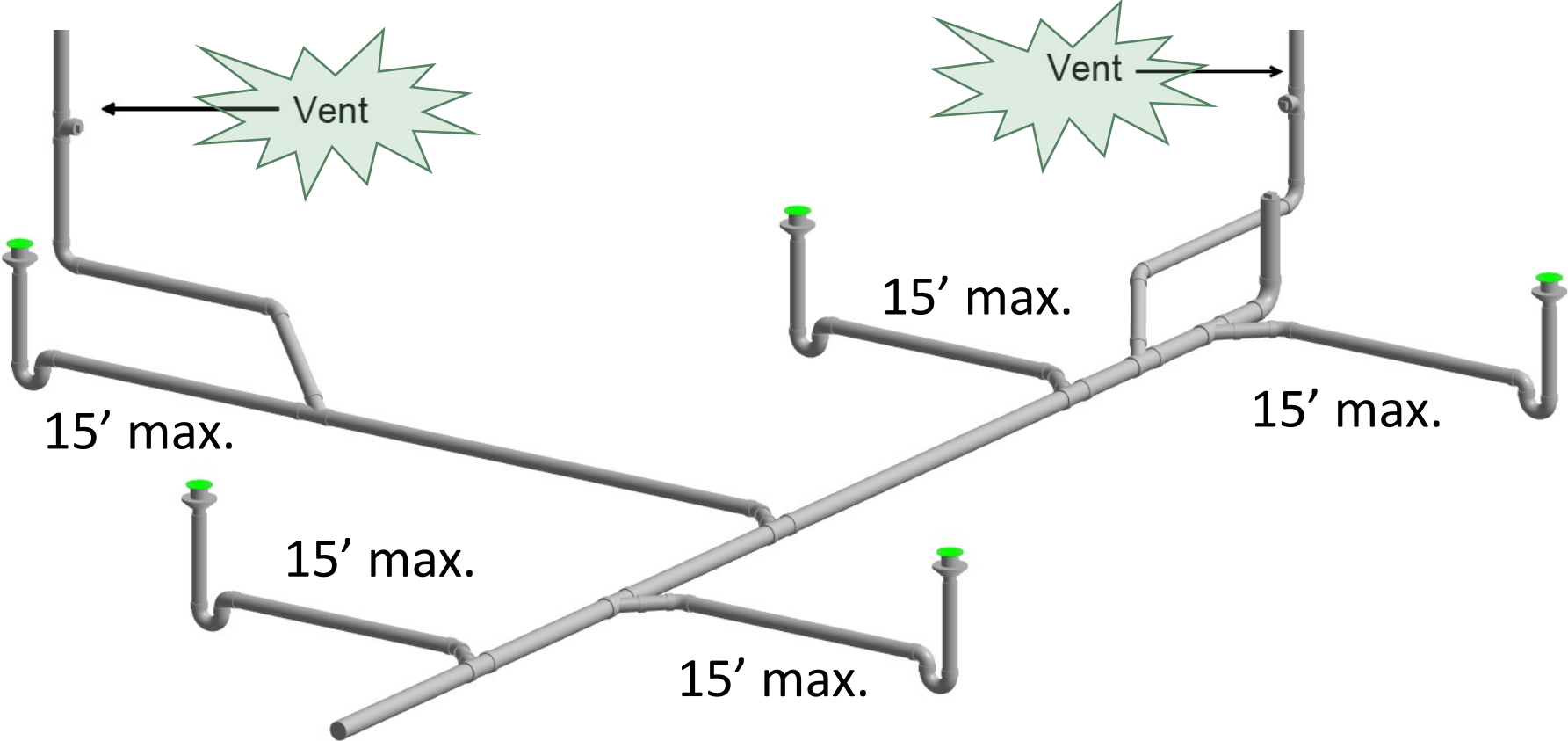


Combination Waste and Vent

910.3 Vents

2 – Combination Waste Vent Systems

A branch exceeding 15' in length shall be separately vented in an approved manner.



Combination Waste and Vent

910.3 Vents

A branch exceeding 15' in length shall be separately vented in an approved manner.

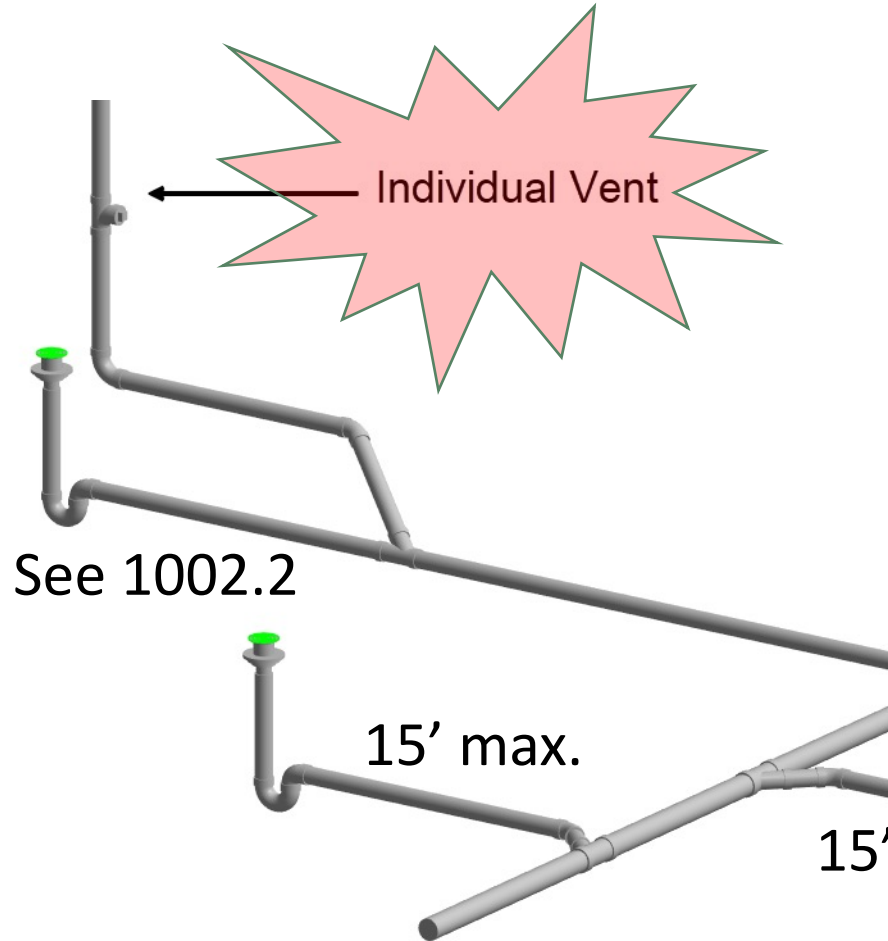


TABLE 1002.2
HORIZONTAL LENGTHS OF TRAP ARMS
(EXCEPT FOR WATER CLOSETS AND SIMILAR FIXTURES)^{1, 2}

TRAP ARM PIPE DIAMETER (inches)	DISTANCE TRAP TO VENT MINIMUM (inches)	LENGTH MAXIMUM (inches)
1¼	2½	30
1½	3	42
2	4	60
3	6	72
4	8	120
Exceeding 4	2 x Diameter	120

For SI units: 1 inch = 25.4 mm

Notes:

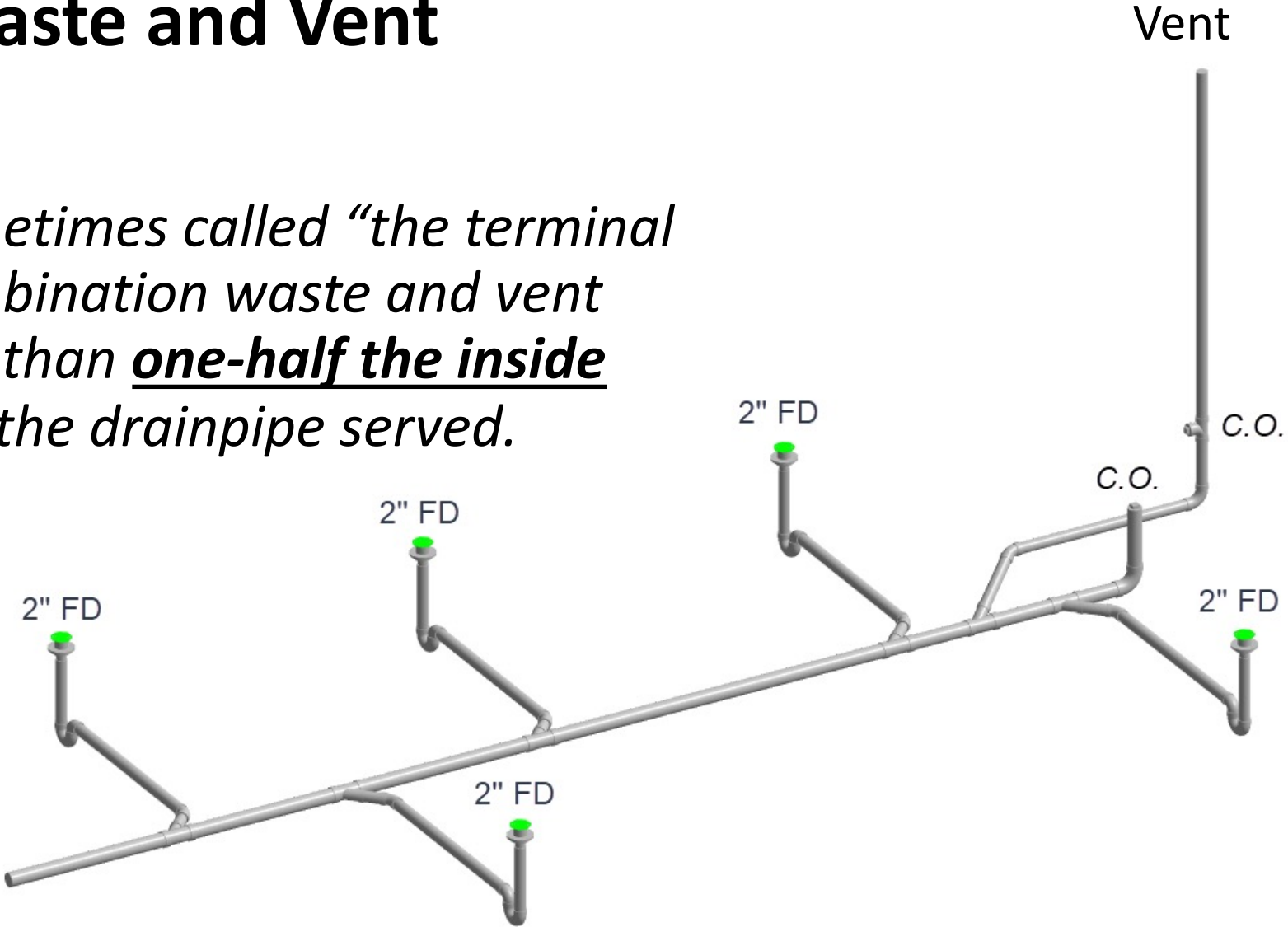
- ¹ Maintain ¼ inch per foot slope (20.8 mm/m).
- ² The developed length between the trap of a water closet or similar fixture (measured from the top of the closet flange to the inner edge of the vent) and its vent shall not exceed 6 feet (1829 mm).



Combination Waste and Vent

910.3 Vents

The area of a vent, sometimes called “the terminal vent”, installed in a combination waste and vent system shall be not less than one-half the inside cross-sectional area of the drainpipe served.

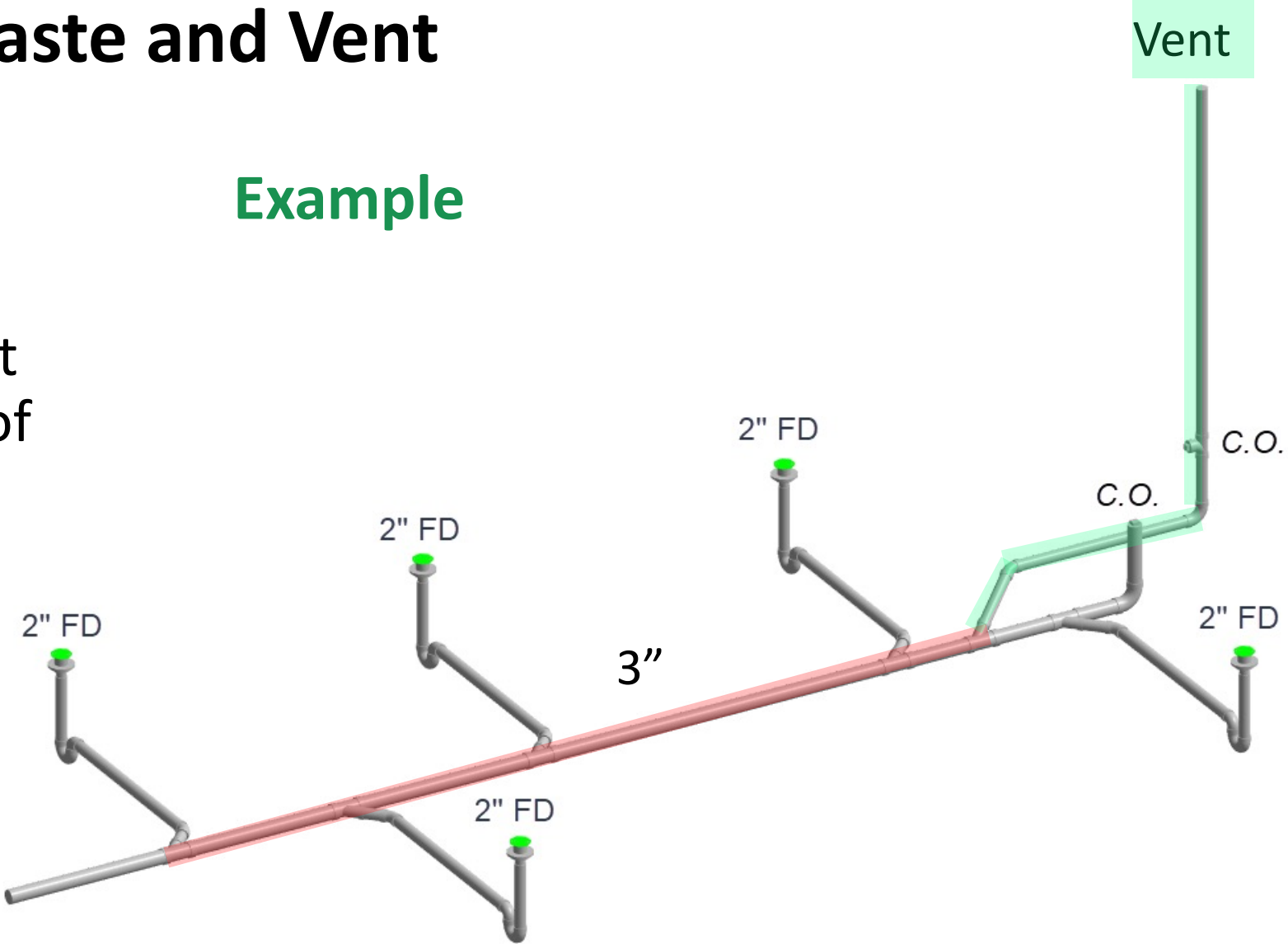


Combination Waste and Vent

910.3 Vents

- The drainpipe is 3".
- The vent must be at least 1/2 the area of the drainpipe.

Example

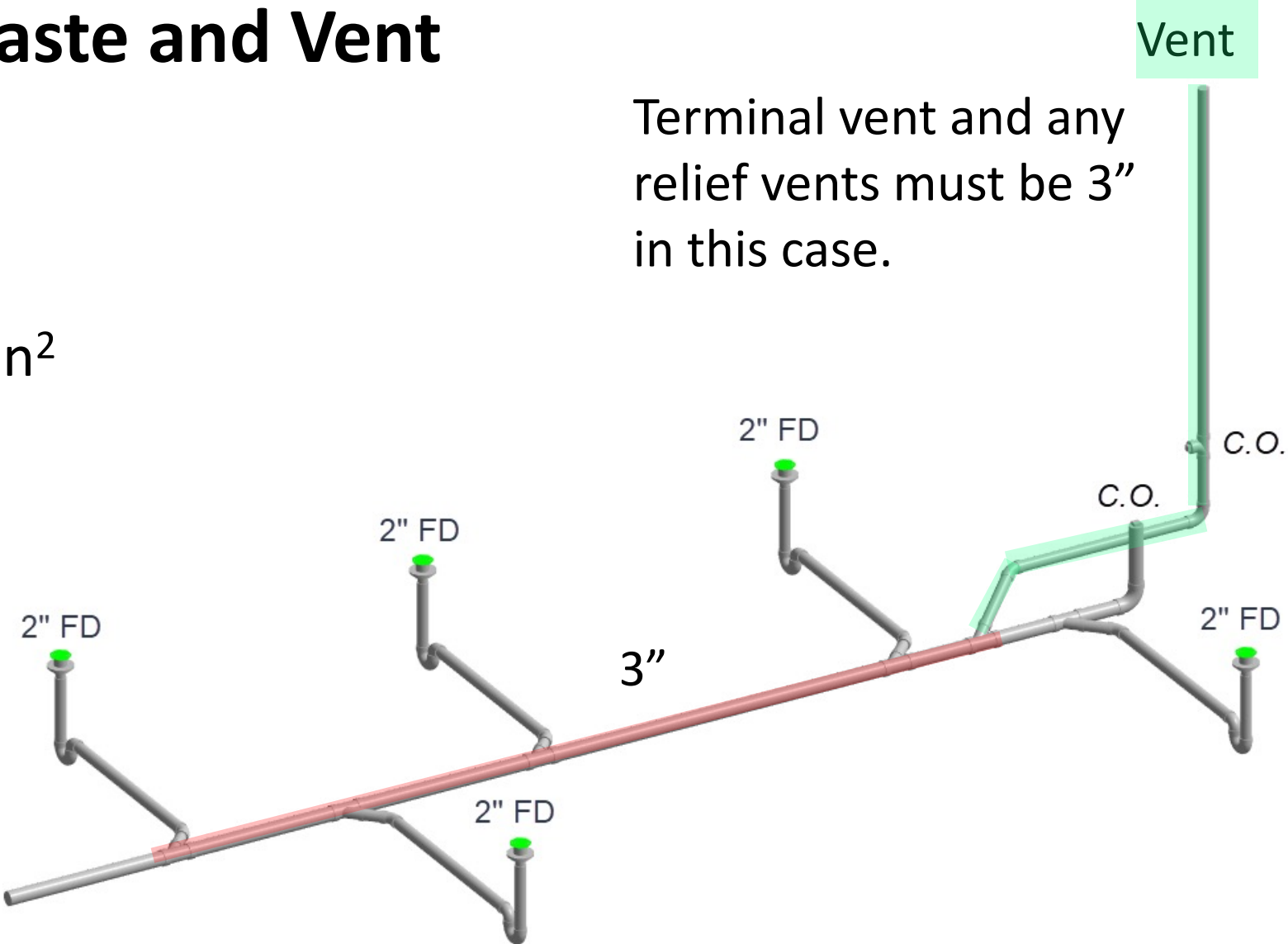


Combination Waste and Vent

910.3 Vents

- 3" pipe = 7.07 in²
- 7.07 in² / 2 = 3.53 in²
 - (2" = 3.14in²)

Terminal vent and any relief vents must be 3" in this case.

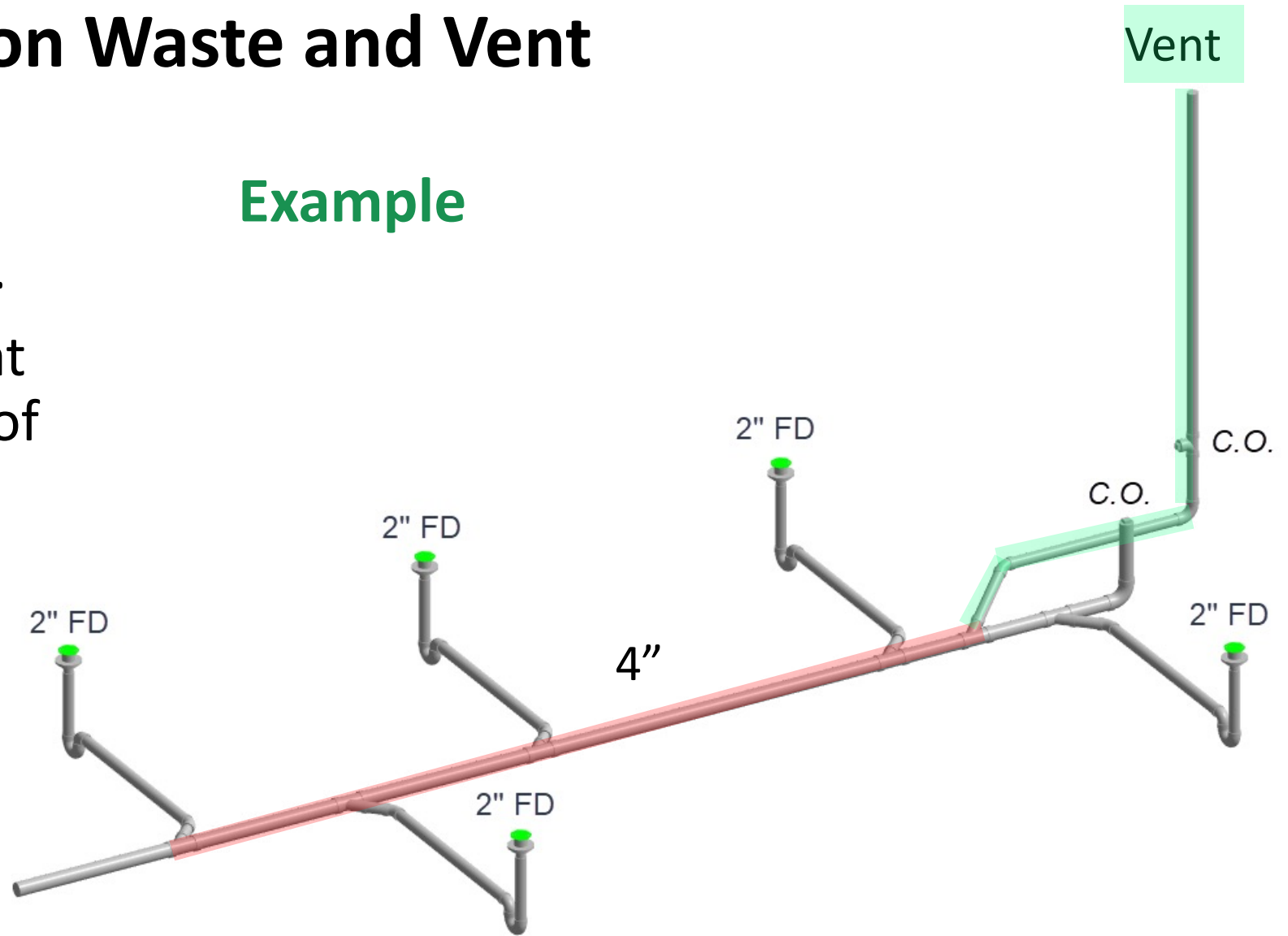


UPC Combination Waste and Vent

910.3 Vents

- The drainpipe is 4”.
- The vent must be at least $1/2$ the area of the drainpipe.

Example

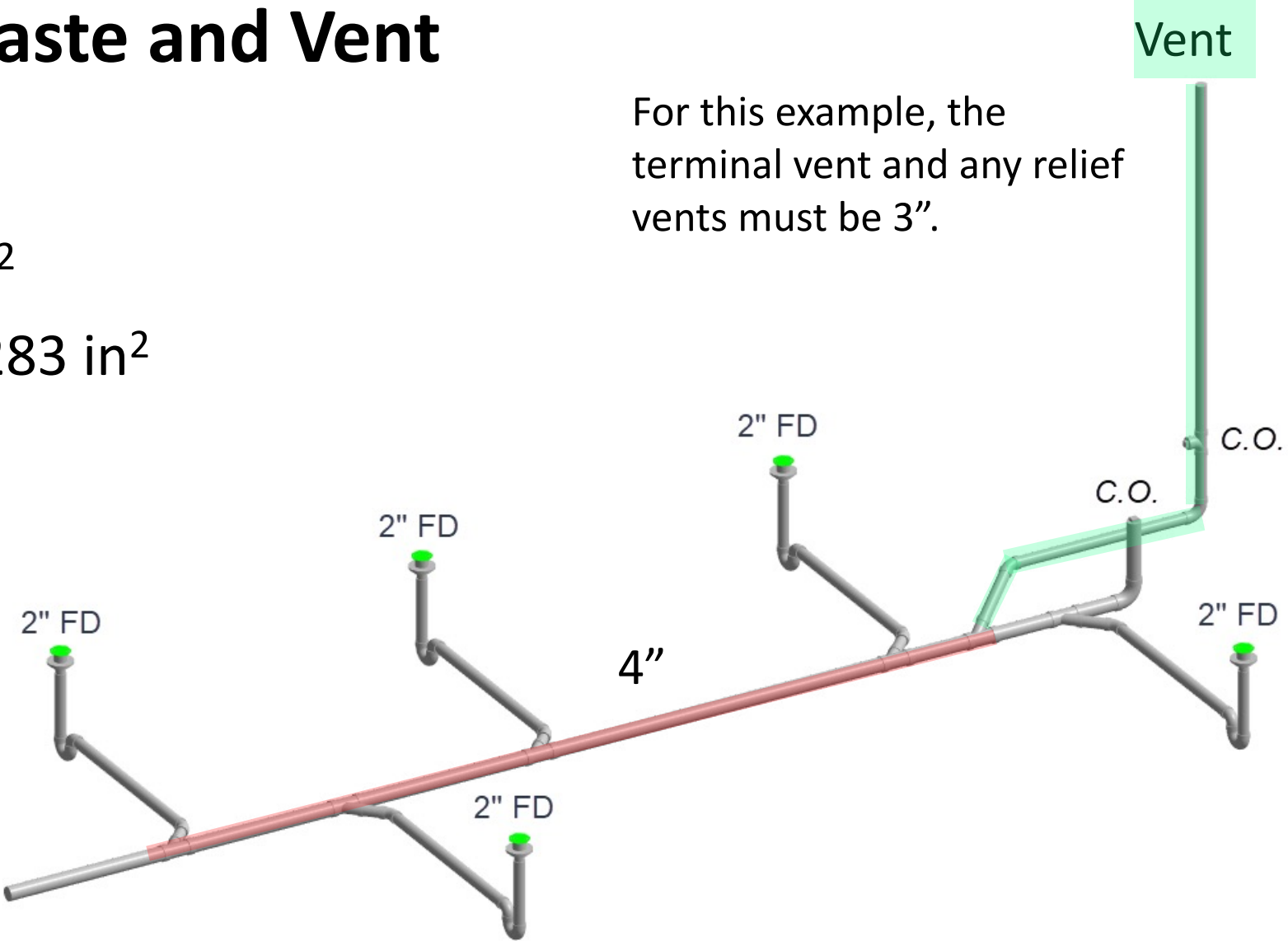


Combination Waste and Vent

910.3 Vents

- 4" pipe = 12.566 in²
- 12.566 in² / 2 = 6.283 in²
 - (3" = 7.07 in²)

For this example, the terminal vent and any relief vents must be 3".

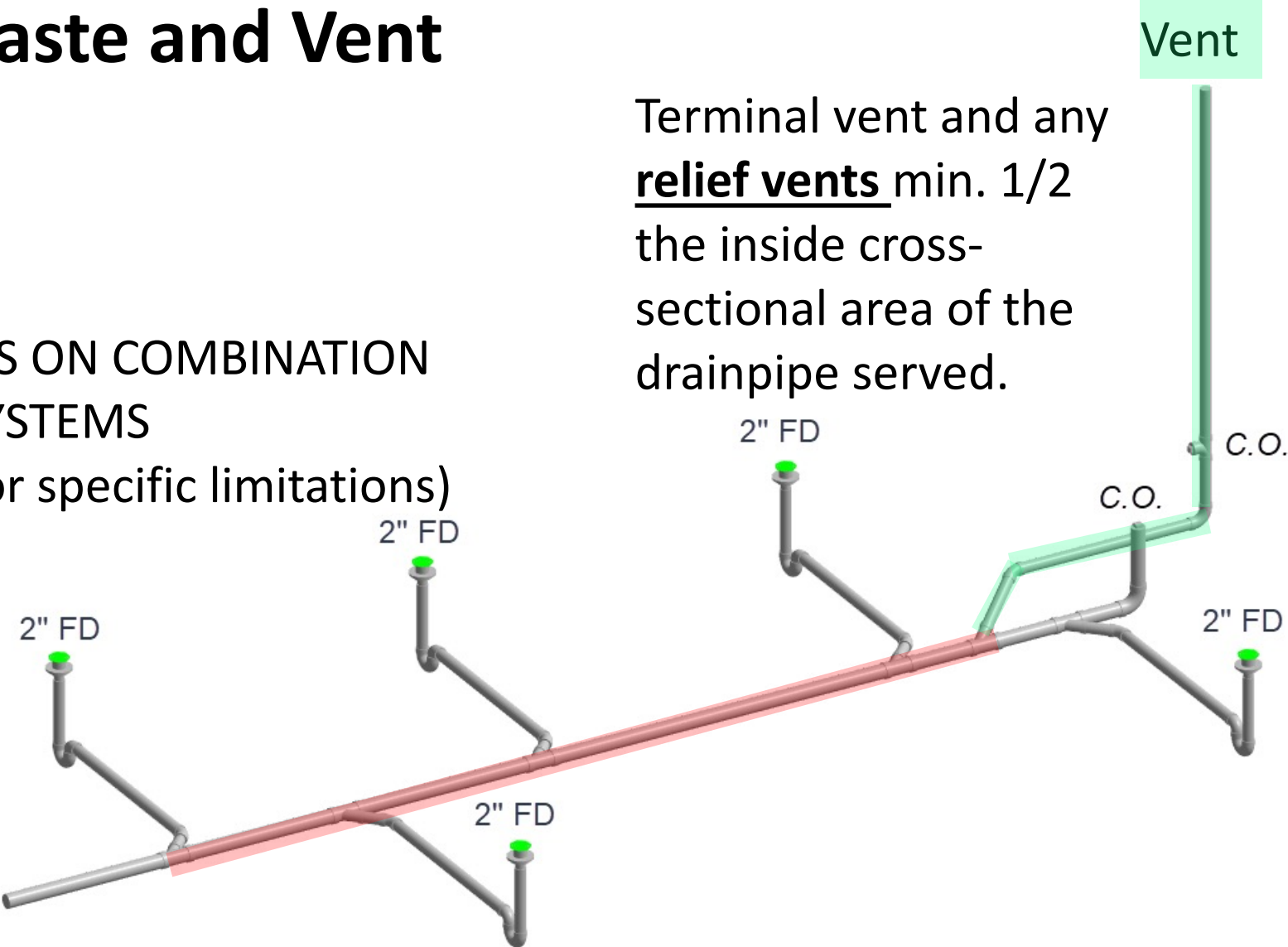


Combination Waste and Vent

910.3 Vents

APPENDIX B
EXPLANATORY NOTES ON COMBINATION
WASTE AND VENT SYSTEMS
(See Section 910.0 for specific limitations)

Terminal vent and any **relief vents** min. 1/2 the inside cross-sectional area of the drainpipe served.



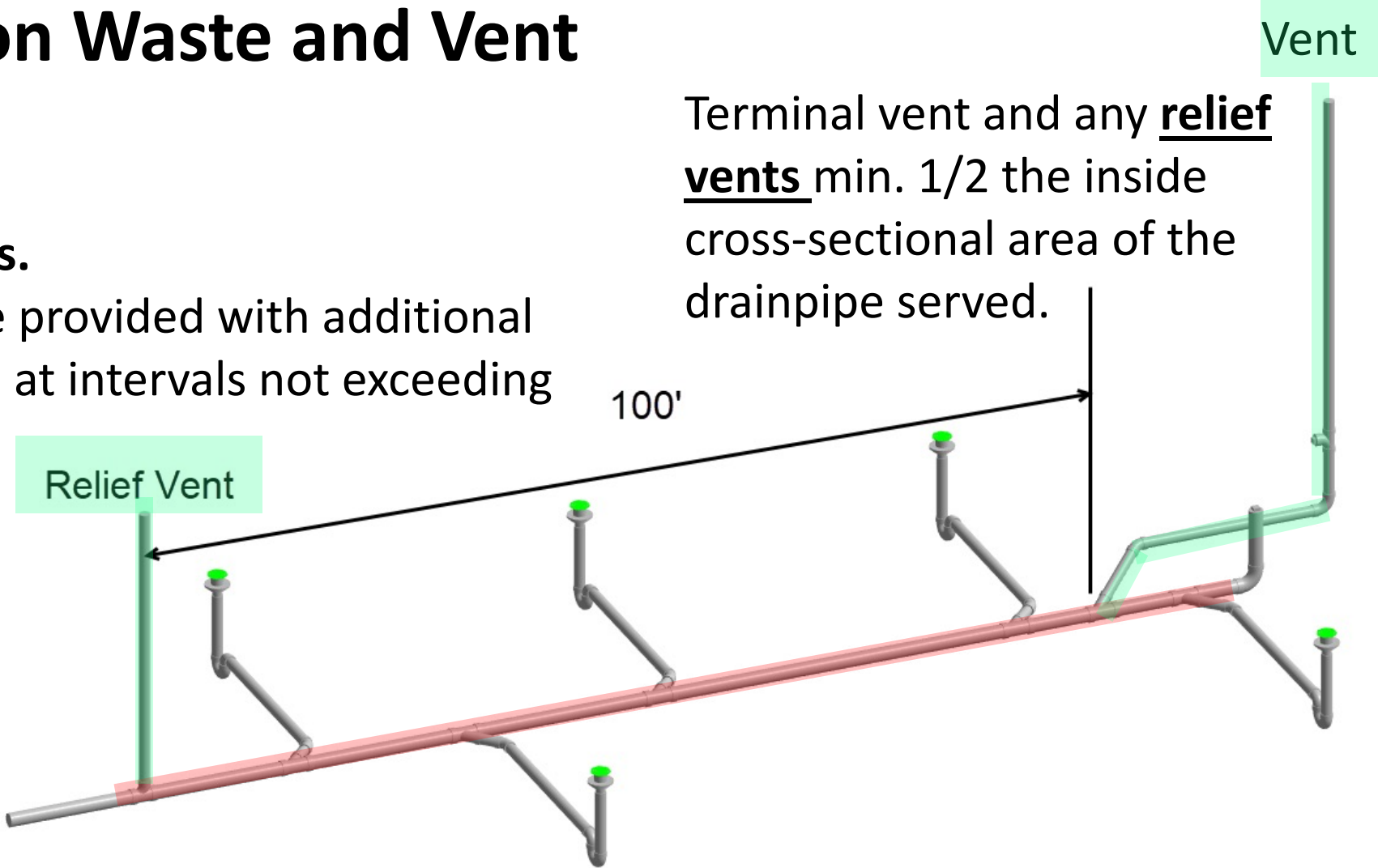
Combination Waste and Vent

910.3 Vents

B 101.4 Pneumatics.

Long mains shall be provided with additional relief vents located at intervals not exceeding 100 feet

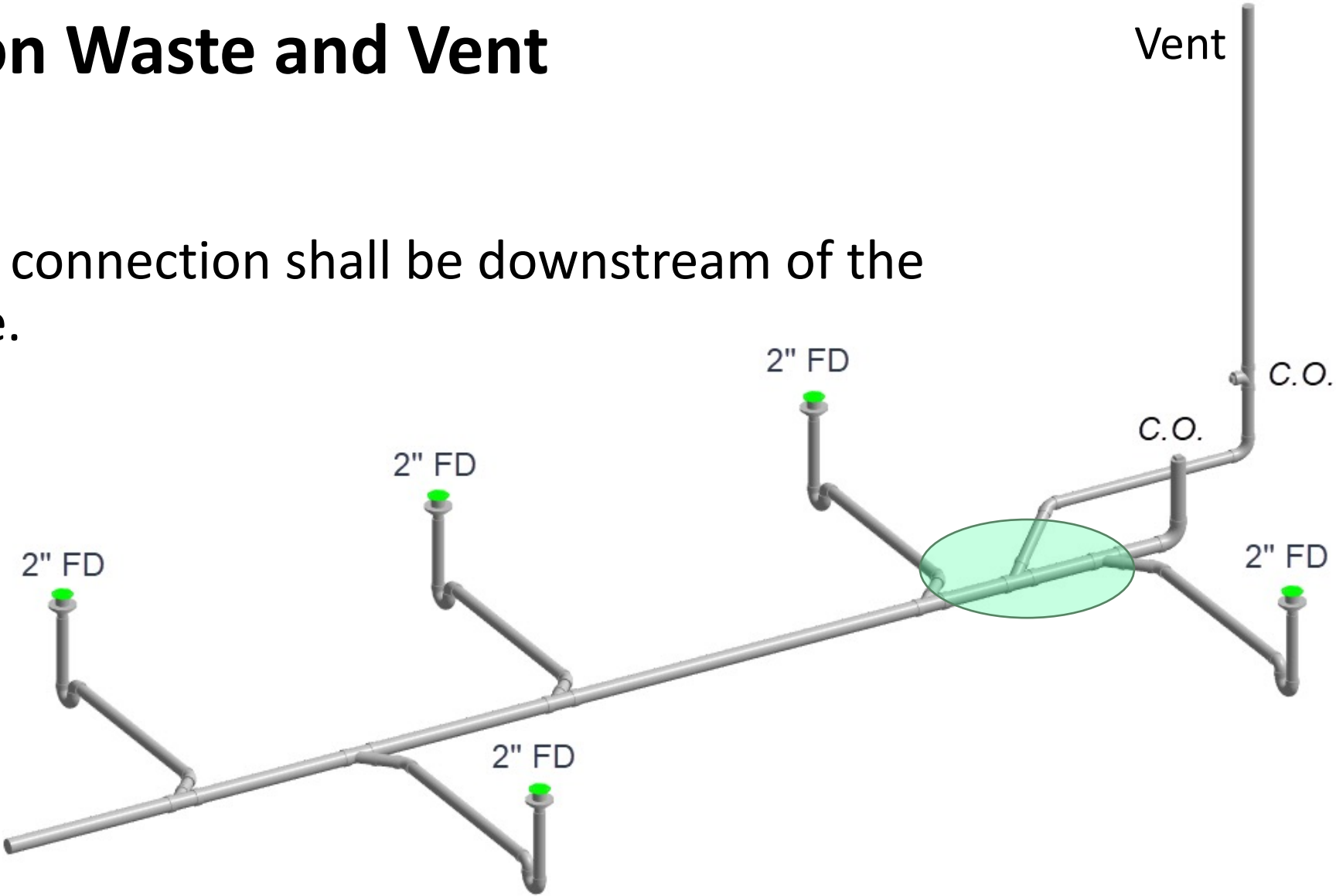
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Combination Waste and Vent

910.3 Vents

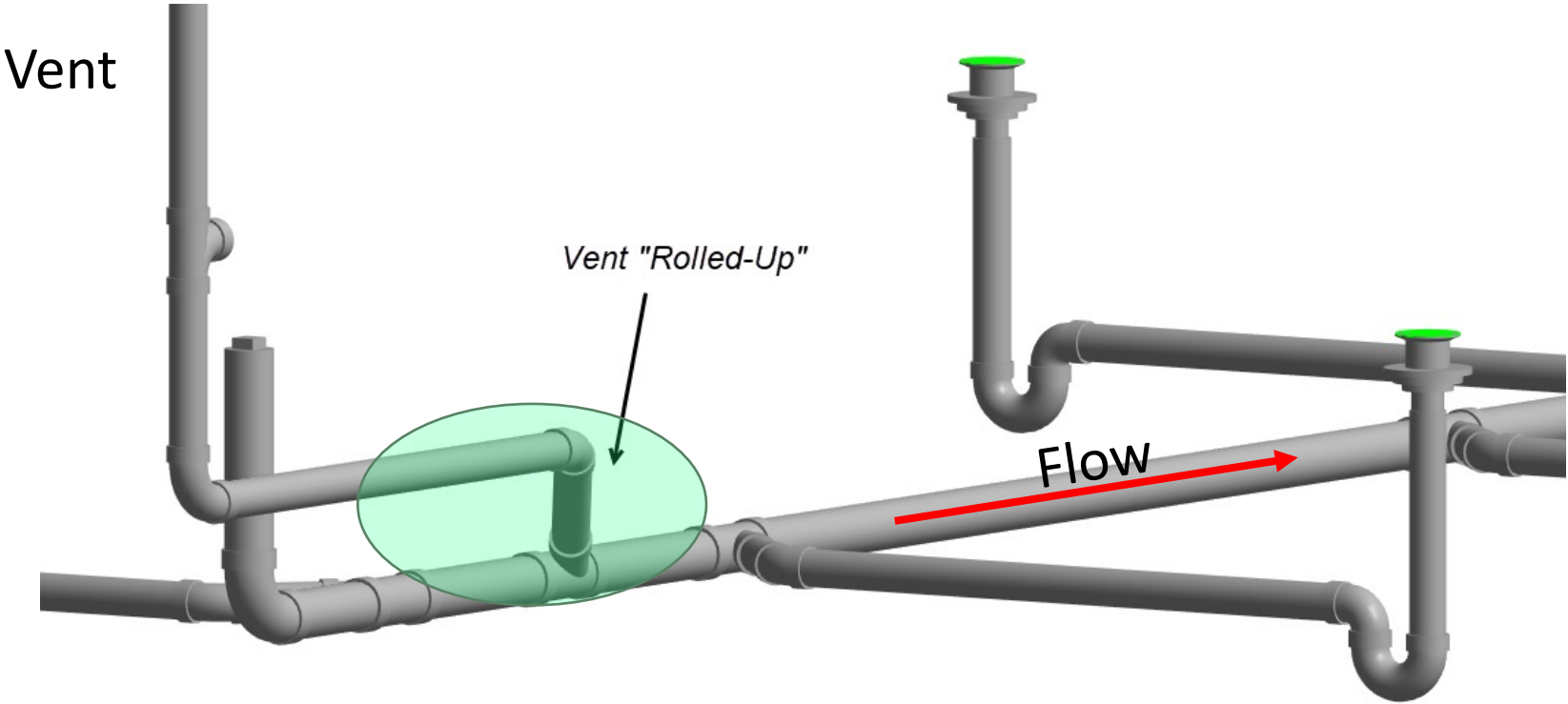
The terminal vent connection shall be downstream of the uppermost fixture.



Combination Waste and Vent

910.3 Vents

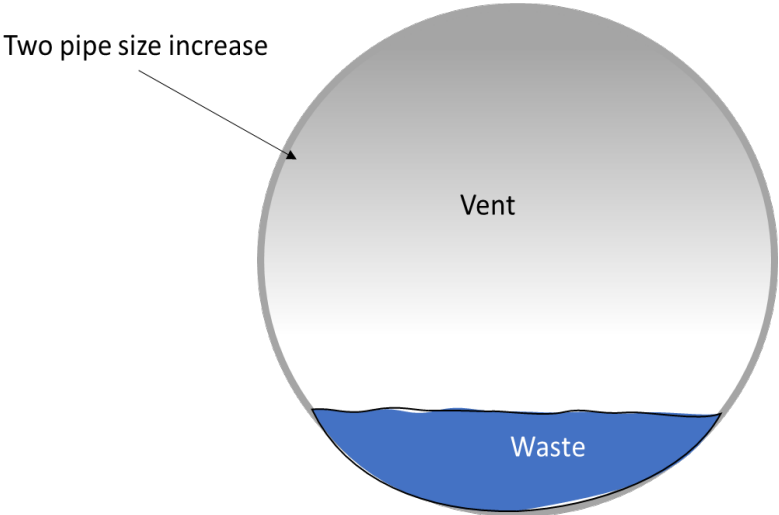
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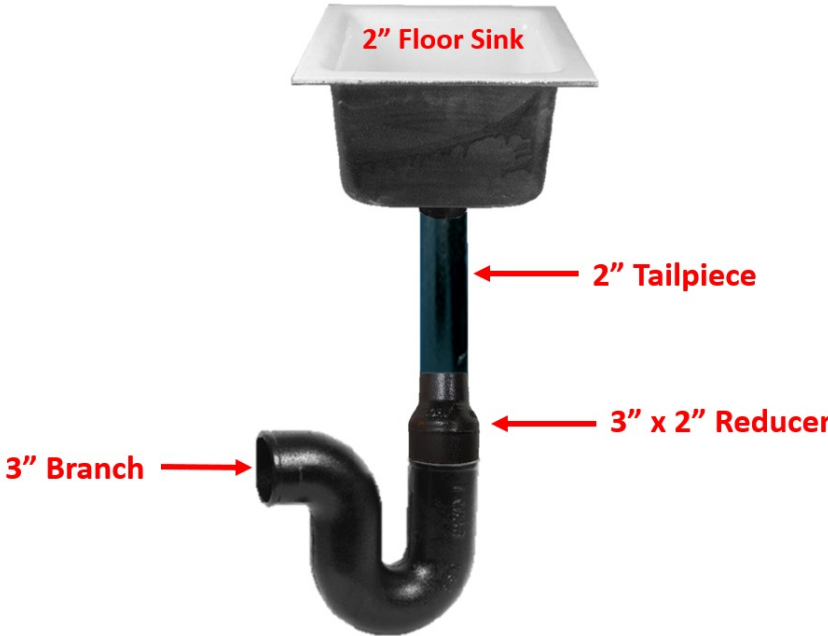
Combination Waste and Vent System

910.4 Size

Each waste pipe and each trap in such a system shall be not less than two pipe sizes exceeding the sizes required by Chapter 7 of this code, and not less than two pipe sizes exceeding a fixture tailpiece or connection.



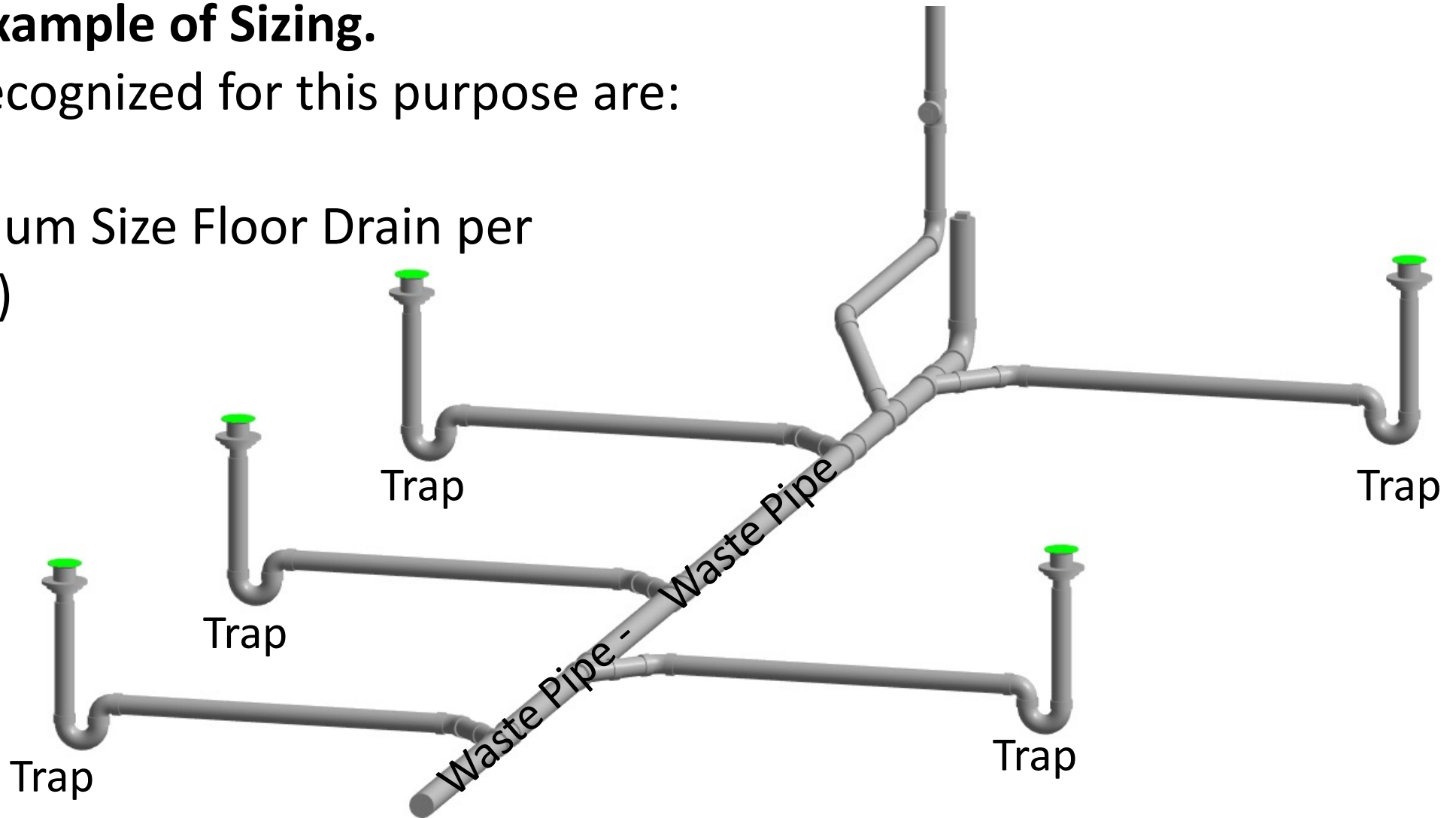
Visualization of Flow in Combination Waste and vent



B 101.6.1 Example of Sizing.

Pipe sizes recognized for this purpose are:

- 2" (Minimum Size Floor Drain per Chapter 7)
- 2 1/2"
- 3"
- 3 1/2"
- 4"
- 4 1/2"
- 5"
- 6"



Combination Waste and Vent

910.4 Size

Each waste pipe and each trap in such a system shall be not less than two pipe sizes exceeding the sizes required by Chapter 7 of this code, and not less than two pipe sizes **exceeding a fixture tailpiece or connection.**

**TABLE 702.1
DRAINAGE FIXTURE UNIT VALUES (DFU)**

PLUMBING APPLIANCES, APPURTENANCES, OR FIXTURES	MINIMUM SIZE TRAP AND TRAP ARM ⁷ (inches)	PRIVATE	PUBLIC	ASSEMBLY ⁸
Bathtub or Combination Bath/Shower	1½	2.0	2.0	—
Bidet	1¼	1.0	—	—
Bidet	1½	2.0	—	—
Clothes Washer, domestic, standpipe ⁵	2	3.0	3.0	3.0
Dental Unit, cuspidor	1¼	—	1.0	1.0
Dishwasher, domestic, with independent drain ²	1½	2.0	2.0	2.0
Drinking Fountain or Water Cooler	1¼	0.5	0.5	1.0
Food Waste Disposer, commercial	2	—	3.0	3.0
Floor Drain, emergency	2	—	0.0	0.0
Floor Drain, optional (See Section 702.0)	2	2.0	2.0	—



Combination Waste and Vent

910.4 Size

Each waste pipe and each trap in such a system shall be not less than two pipe sizes **exceeding the sizes required by Chapter 7** of this code, and not less than two pipe sizes exceeding a fixture tailpiece or connection.

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

SIZE OF PIPE (inches)	1¼	1½	2	3	4	5	6	8	10	12
Maximum Units										
Drainage Piping ¹										
Vertical	1	2 ^{2,7}	16 ³	48 ⁴	256	600	1380	3600	5600	8400
Horizontal	1	1 ⁷	8 ³	35 ⁴	216 ⁵	428 ⁵	720 ⁵	2640 ⁵	4680 ⁵	8200 ⁵
Maximum Length										
Drainage Piping										
Vertical, (feet)	45	65	85	212	300	390	510	750	—	—
Horizontal (unlimited)										
Vent Piping										
Horizontal										

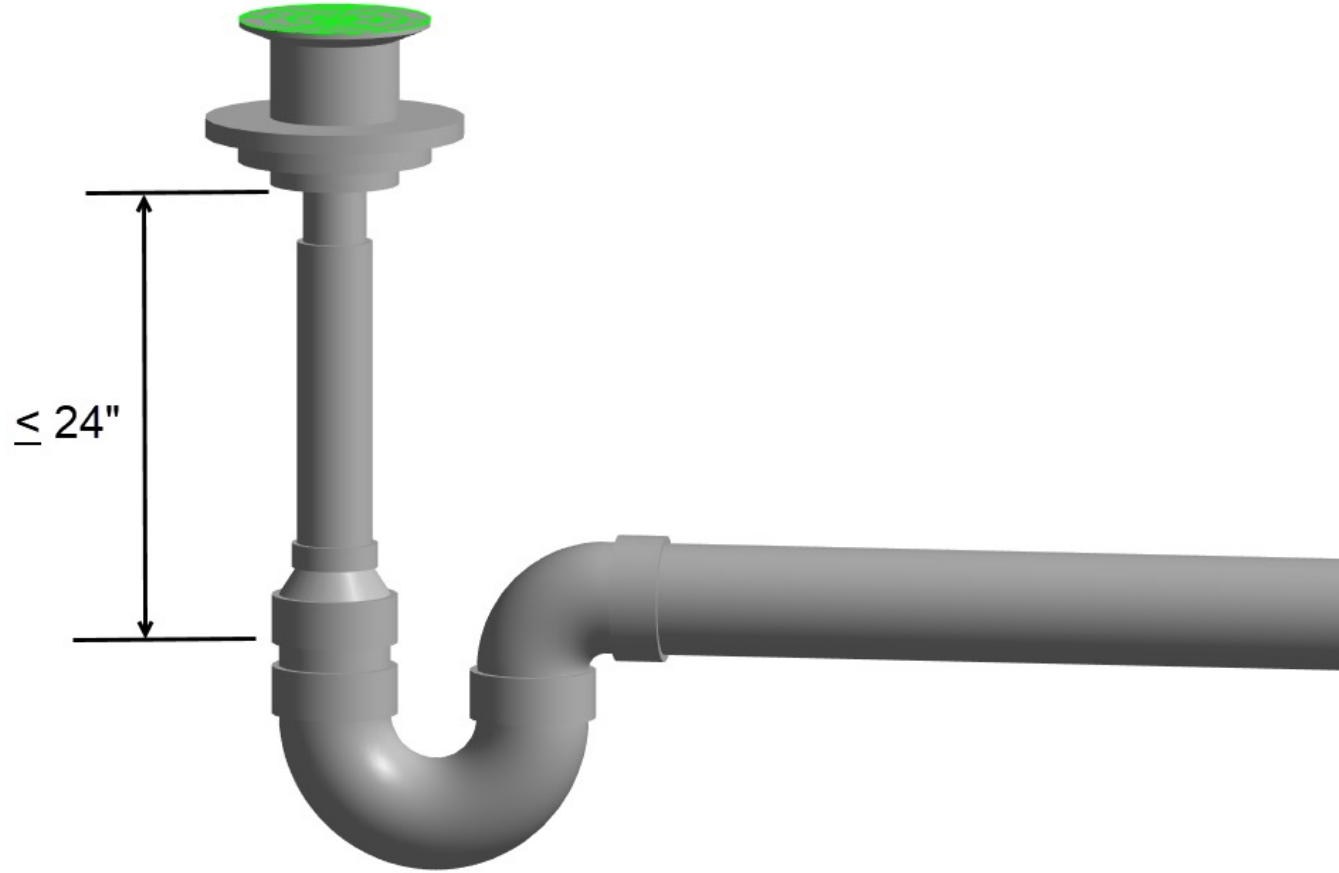


Combination Waste and Vent

910.5 Vertical Waste Pipe

No vertical waste pipe shall be used in such a system, except the tailpiece or connection between the outlet of a plumbing fixture and the trap. Such tailpieces or connections shall be as short as possible, and in no case shall exceed 2 feet.

Exception: Branch lines shall be permitted to have 45 degree vertical offsets.

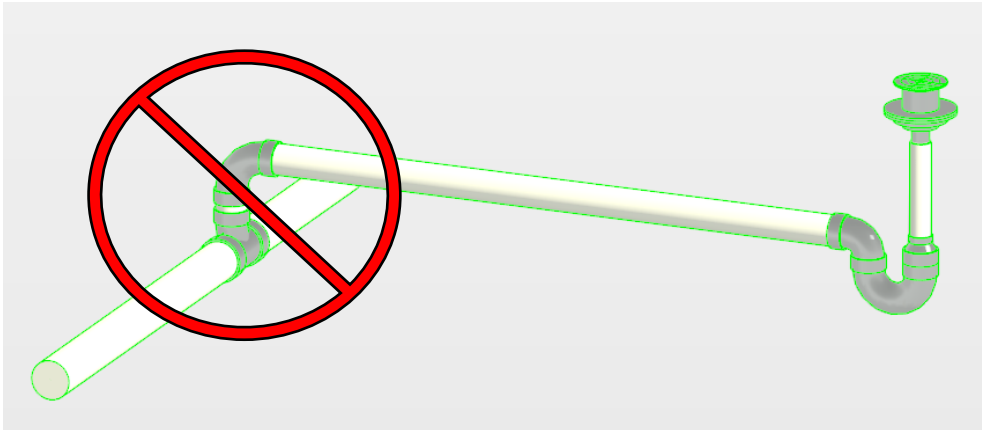
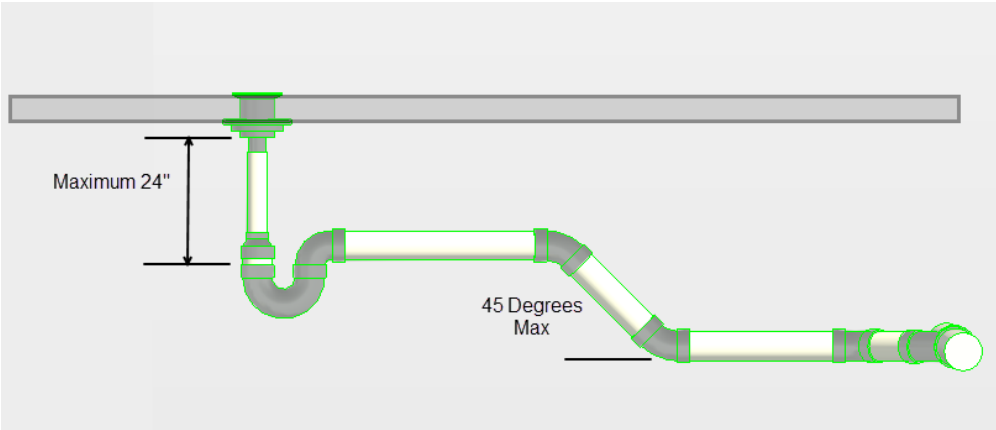


Combination Waste and Vent System

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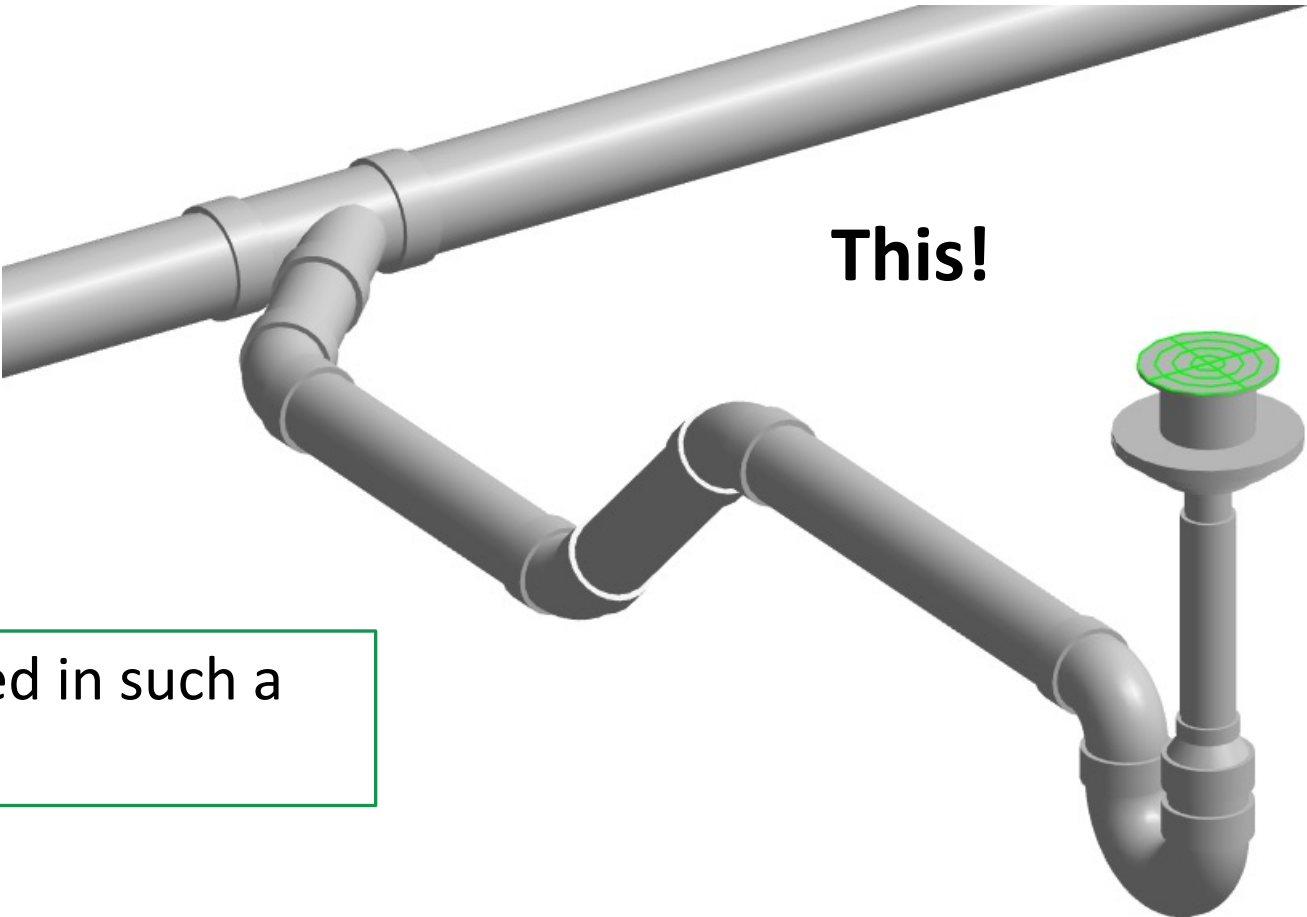
- **Exception:** Branch lines shall be permitted to have 45 degree



Combination Waste and Vent

910.5 Vertical Waste Pipe

Exception: Branch lines shall be permitted to have 45° vertical offsets.



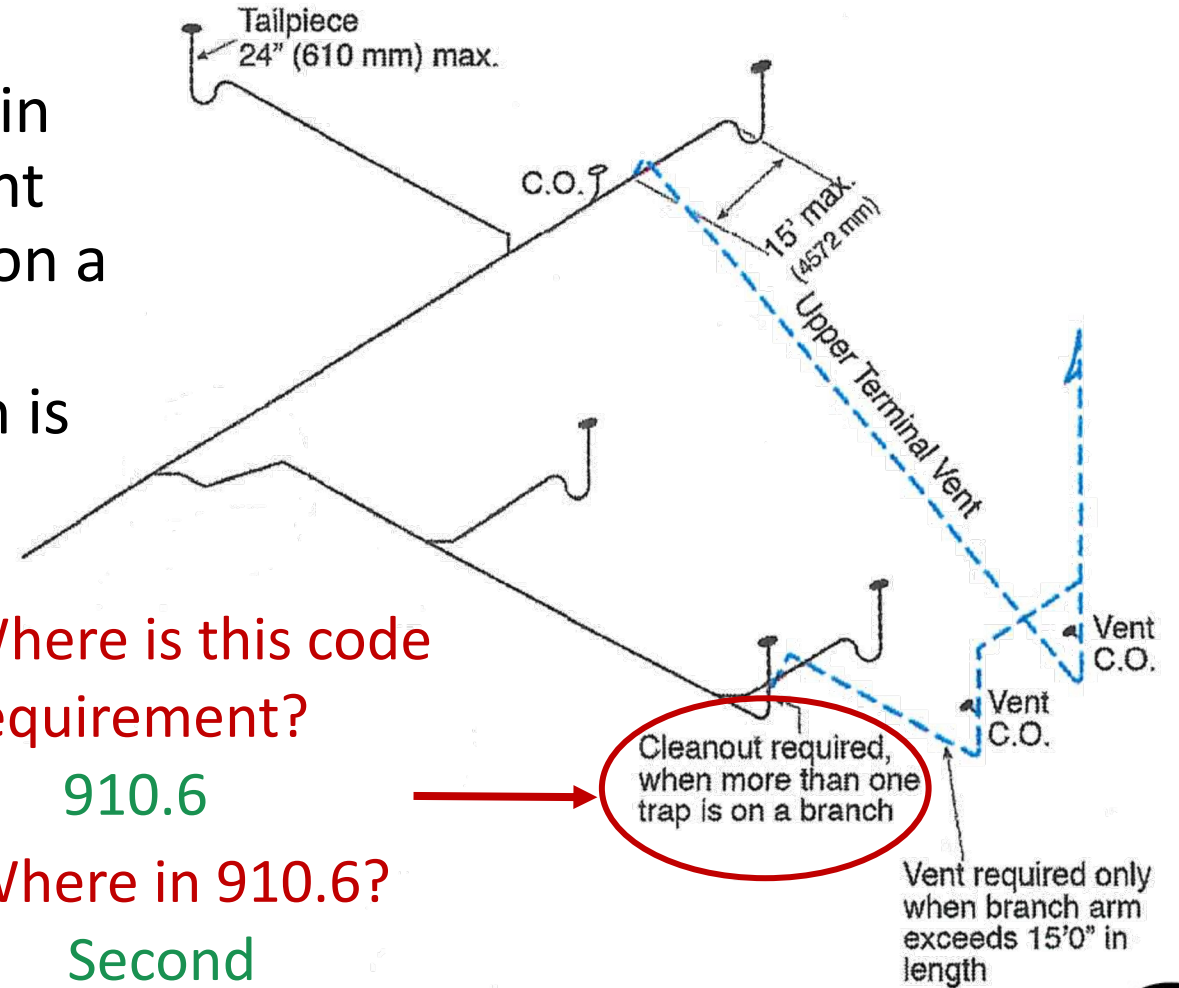
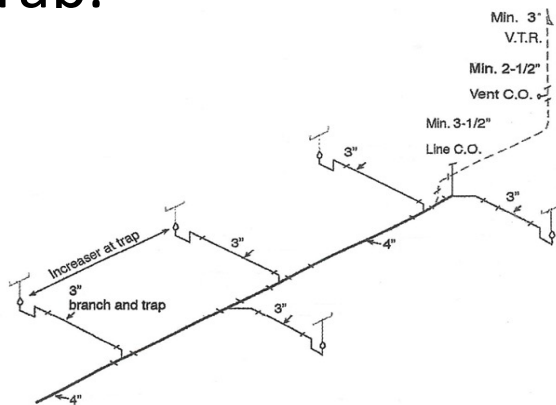
No vertical waste pipe shall be used in such a system, except the tailpiece



Combination Waste and Vent System

910.6 Cleanouts

An accessible cleanout shall be installed in each vent for combination waste and vent system. Cleanouts shall not be required on a wet-vented branch serving a single trap where the fixture tailpiece or connection is not less than 2 inches in diameter and provides ready access for cleaning through the trap.



Where is this code requirement?

910.6

Where in 910.6?

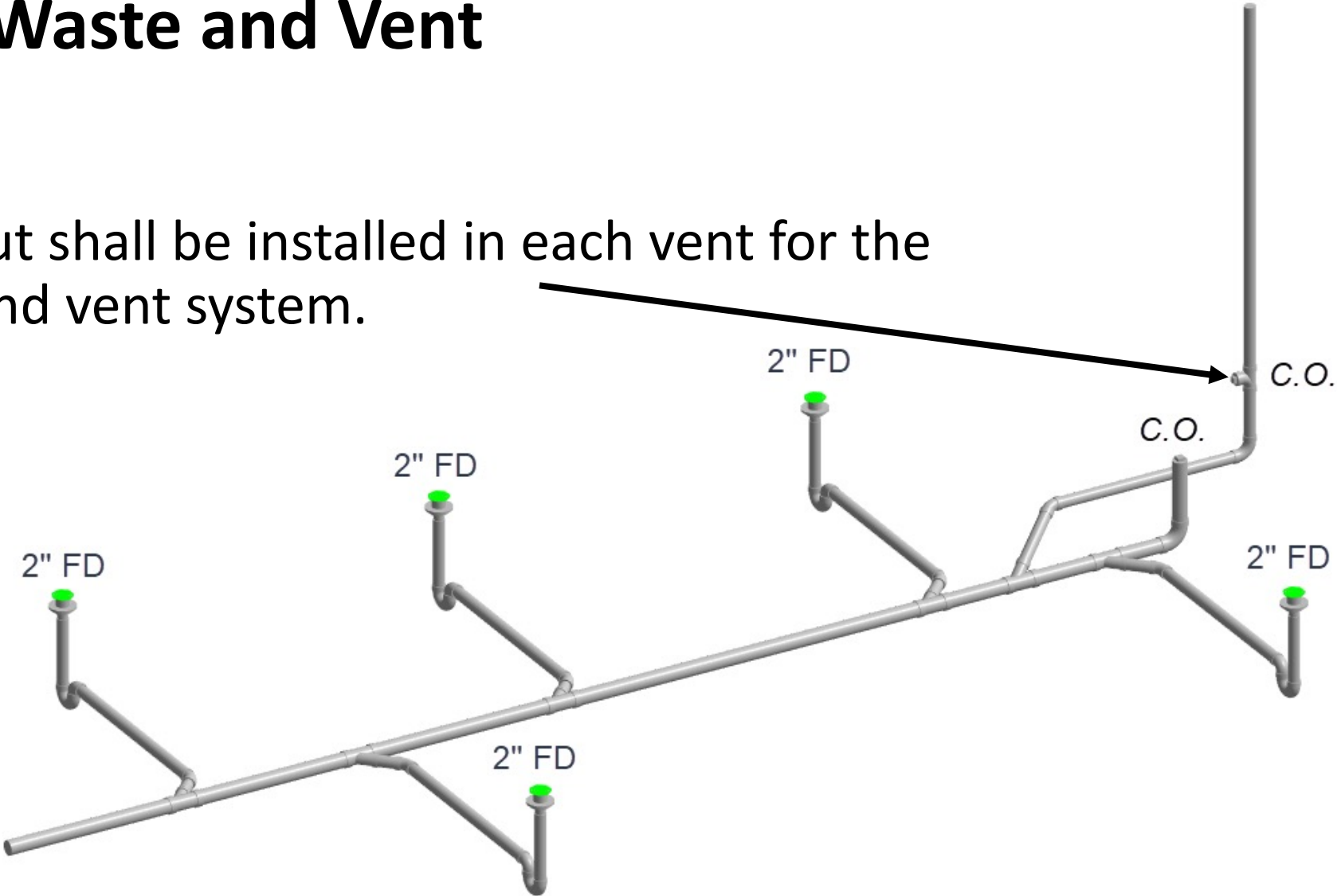
Second Sentence



Combination Waste and Vent

910.6 Cleanouts

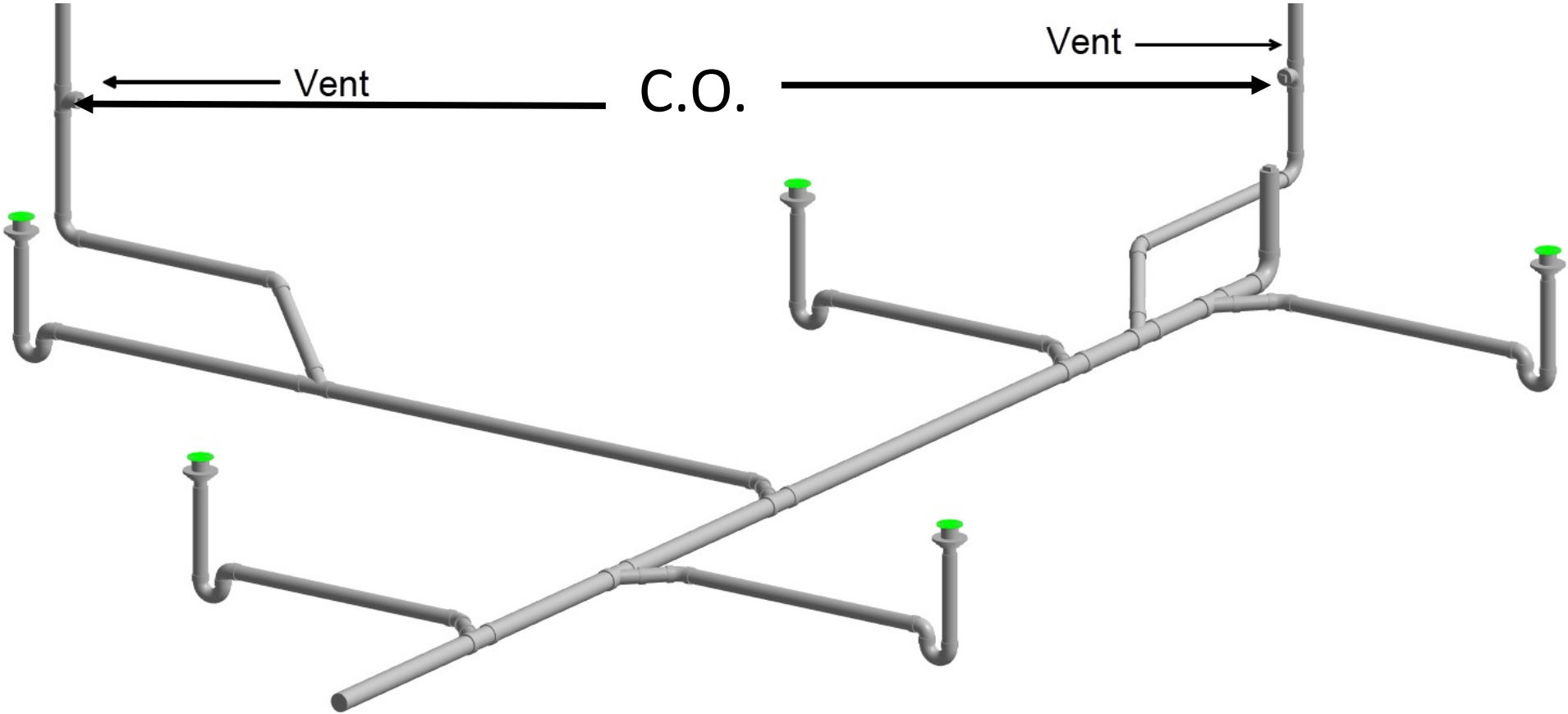
An accessible cleanout shall be installed in each vent for the combination waste and vent system.



Combination Waste and Vent

910.6 Cleanouts

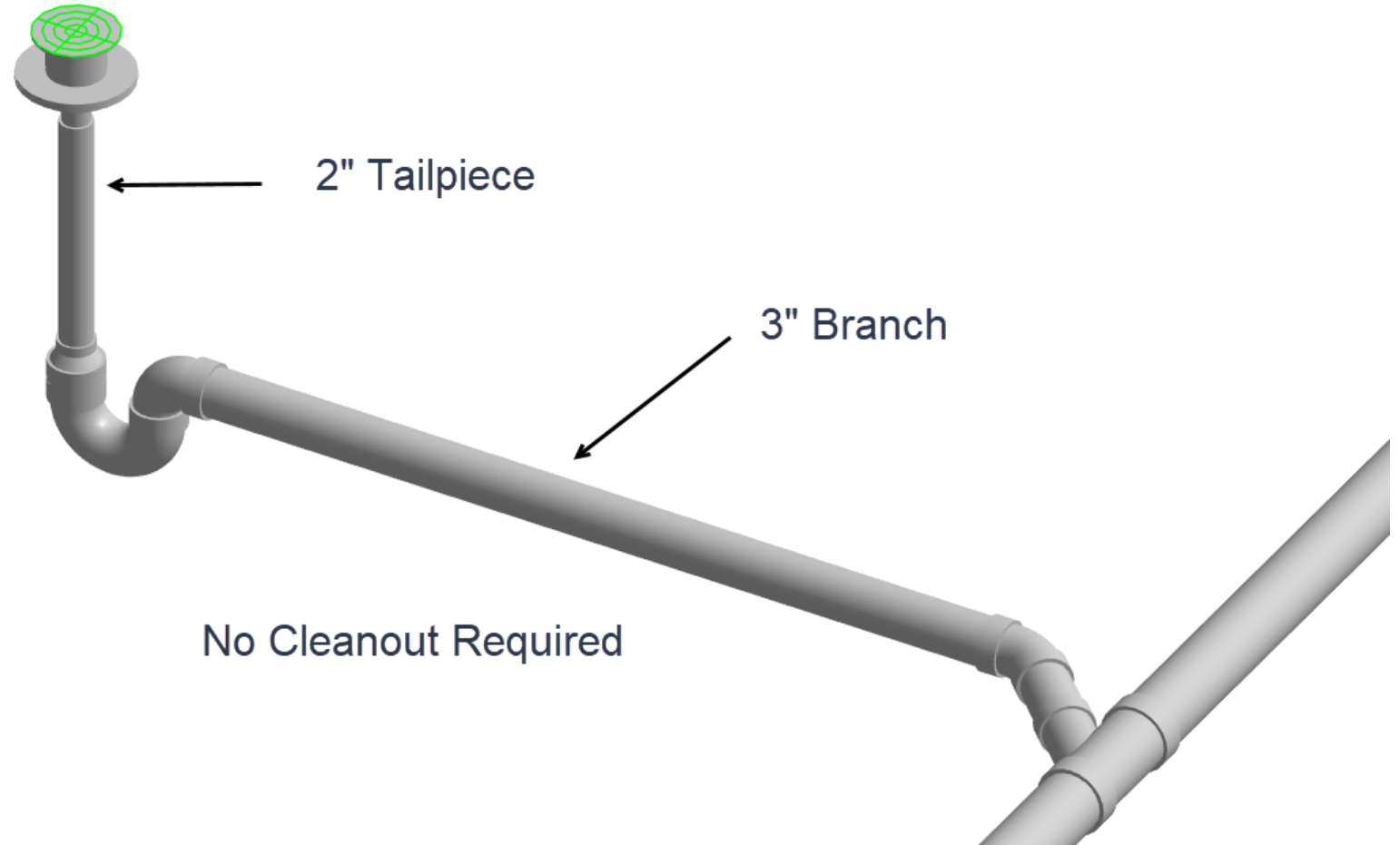
An accessible cleanout shall be installed in **each** vent for the combination waste and vent system.



Combination Waste and Vent

910.6 Cleanouts

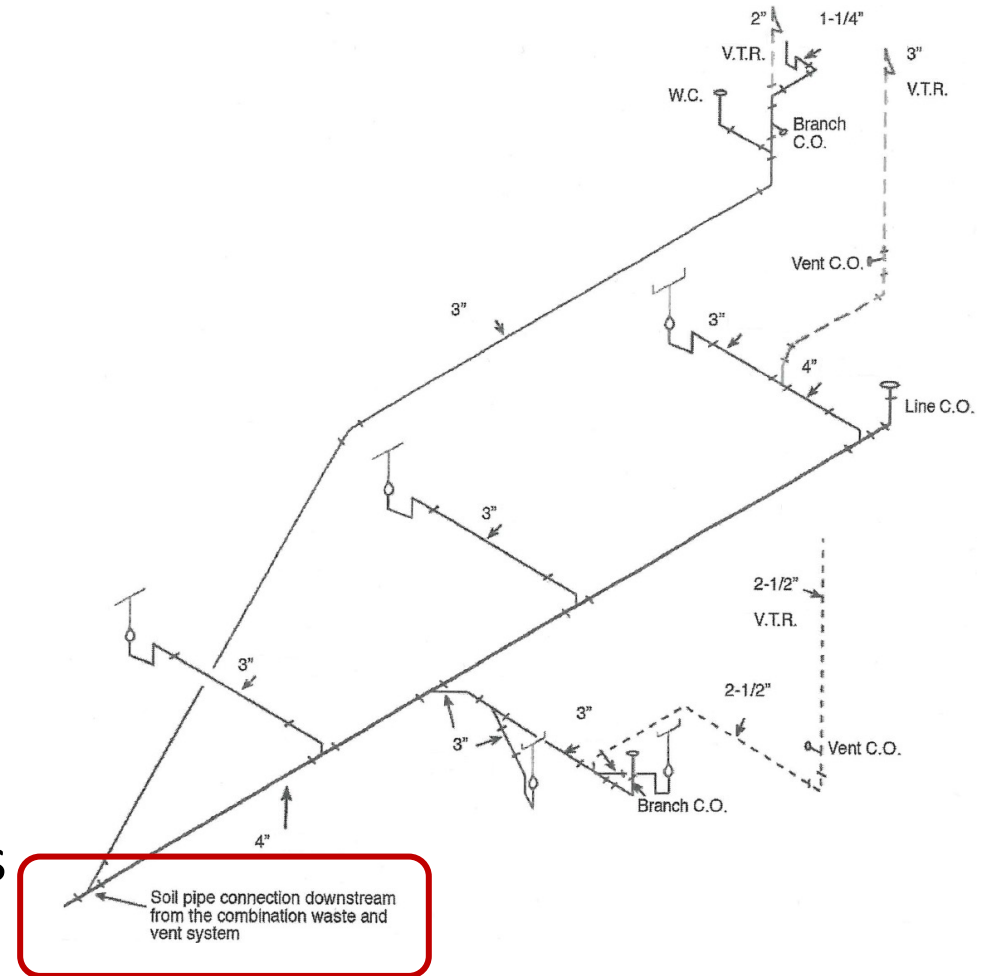
Cleanouts shall not be required on a wet-vented branch serving a single trap where the fixture tailpiece or connection is not less than 2" in diameter and provides ready access for cleaning through the trap.



Combination Waste and Vent System

910.7 Fixtures

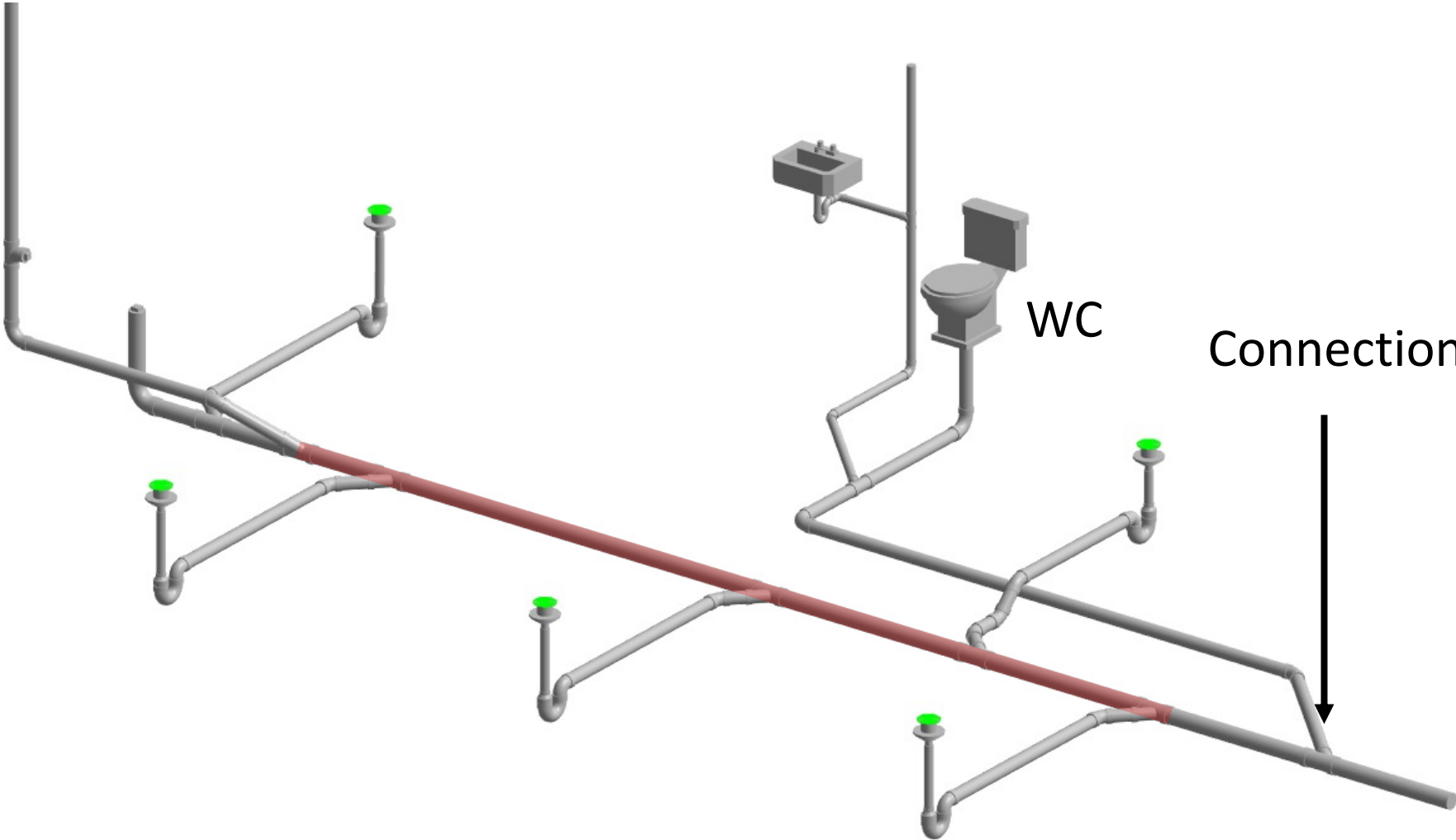
- No water closet or urinal shall be installed on such a system. Other one-, two-, or three-unit fixtures remotely located from the sanitary system and adjacent to a combination waste and vent system shall be permitted to be connected to such system in the conventional manner by means of waste and vent pipes of regular sizes, providing that the two pipe size increase required in Section 910.4 is based on the total fixture unit load connected to the system.
- See Appendix B of this code for explanatory notes on the design of combination waste and vent systems.



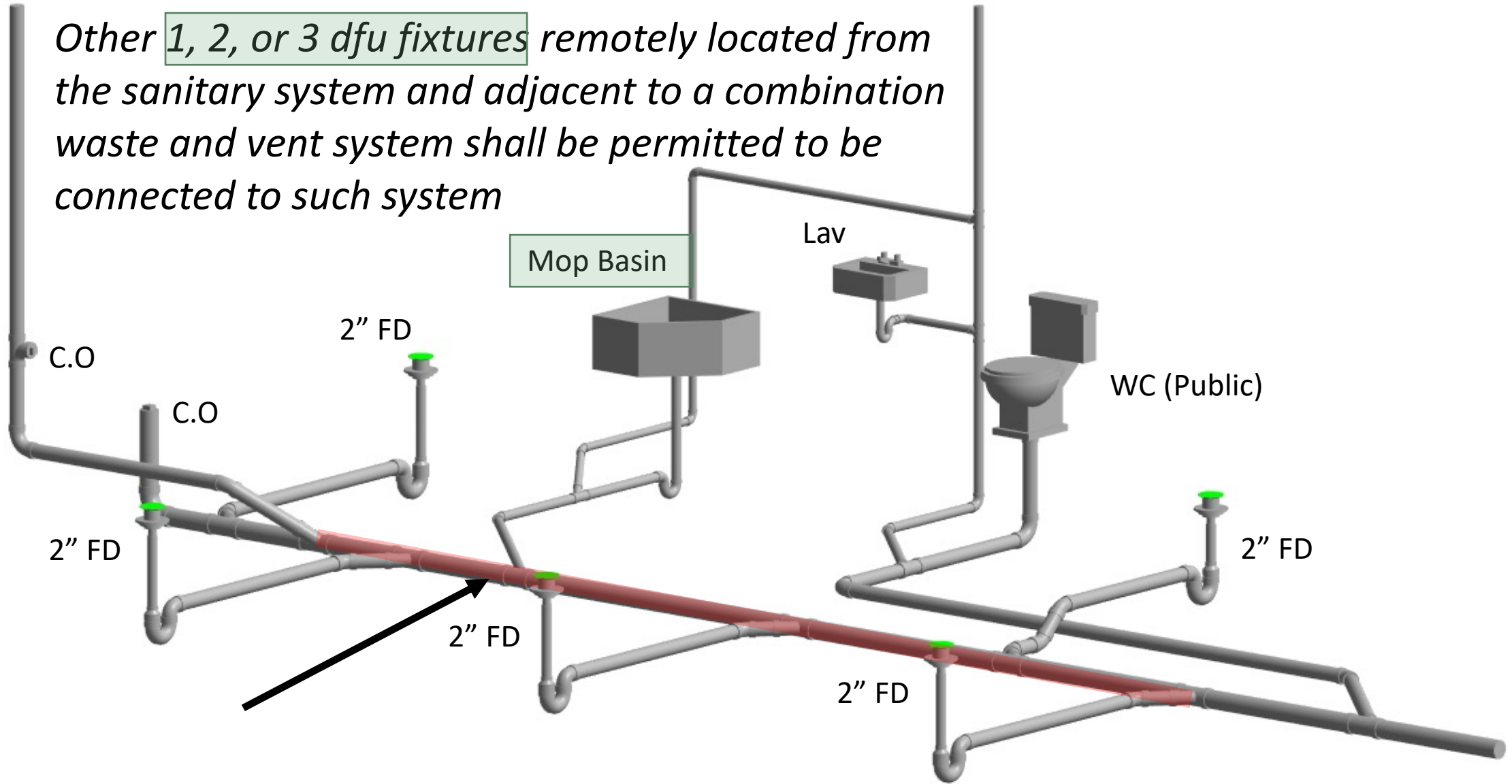
Combination Waste and Vent

910.7 Fixtures

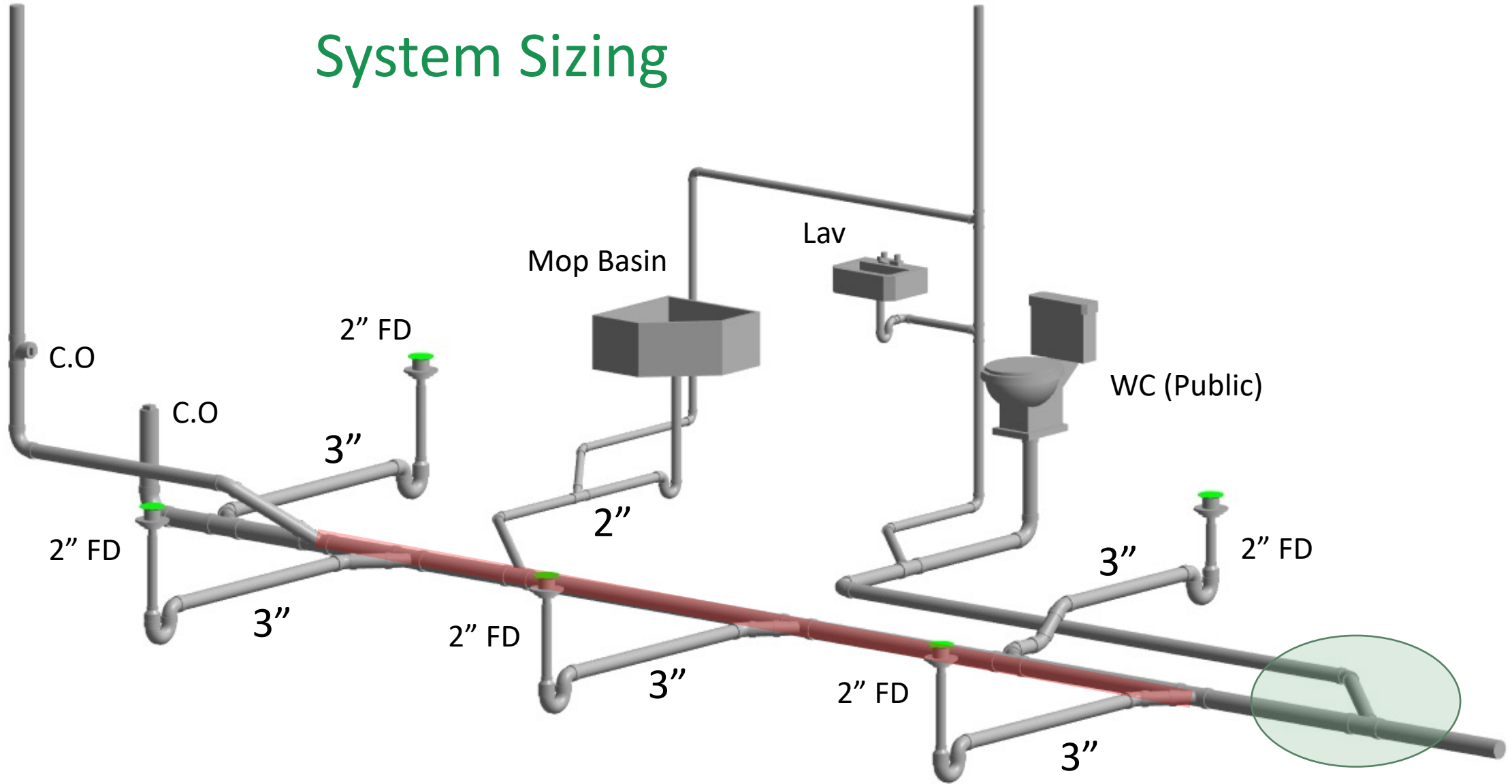
No water closet or urinal shall be installed on such a system.



Other 1, 2, or 3 dfu fixtures remotely located from the sanitary system and adjacent to a combination waste and vent system shall be permitted to be connected to such system



System Sizing



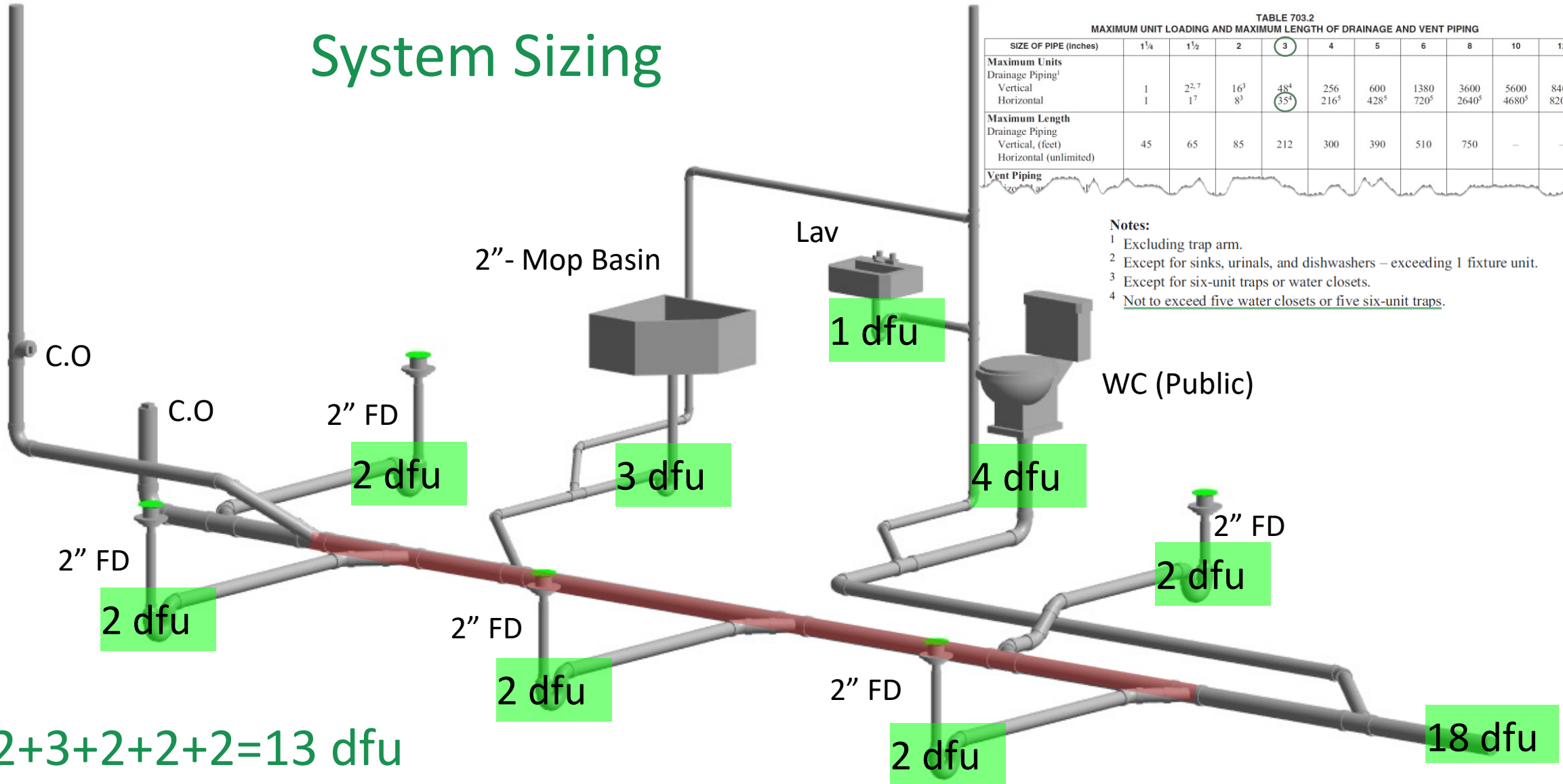
System Sizing

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

SIZE OF PIPE (Inches)	1¼	1½	2	3	4	5	6	8	10	12
Maximum Units										
Drainage Piping¹										
Vertical	1	2 ^{2,7}	16 ³	48 ⁴	256	600	1380	3600	5600	8400
Horizontal	1	1 ⁷	8 ³	35 ⁴	216 ⁵	428 ⁵	720 ⁵	2640 ⁵	4680 ⁵	8200 ⁵
Maximum Length										
Drainage Piping										
Vertical, (feet)	45	65	85	212	300	390	510	750	-	-
Horizontal (unlimited)										
Vent Piping										
Vertical, (feet)	45	65	85	212	300	390	510	750	-	-

Notes:

- ¹ Excluding trap arm.
- ² Except for sinks, urinals, and dishwashers – exceeding 1 fixture unit.
- ³ Except for six-unit traps or water closets.
- ⁴ Not to exceed five water closets or five six-unit traps.



$2+2+3+2+2+2=13 \text{ dfu}$

Is three inch the correct size for the waste-n-vent section?



Combination Waste and Vent

910.7 Fixtures

B 101.3 Caution. Caution shall be exercised to exclude appurtenances delivering large quantities or surges of water (such as pumps, sand interceptors, etc.) from combination waste and vent systems so that adequate venting will be maintained. Small fixtures with a waste-producing potential of less than 7½ gallons per minute (gpm) (0.47 L/s) shall be permitted to be safely assigned a loading value of one unit. Long runs shall be laid at the minimum permissible slope to keep tailpieces as short as possible. Tailpieces shall not exceed 2' in length, which shall necessitate slopes up to 45 degrees (see definition of horizontal pipe) on some branches.

See Appendix B of this code for explanatory notes on the design of combination waste and vent systems.



Appendix B – Explanatory Notes on Combination Waste and Vent Systems

(See Section 910.0 for specific limitations)

B 101.0 General

B 101.1 – Applicability ...

B 102.2 General Requirements ... Sinks, lavatories, and other fixtures that rough in above the floor, shall not be permitted on a combination waste and vent system, ...In view of its grease-producing potential, restaurant kitchen equipment shall not be connected to the combination waste and vent system.

B 101.3 – Caution ...

B 101.4 – Pneumatics ...

Long mains shall be provided with additional relief vents located at intervals not exceeding 100 feet. ...

B 101.5 – Trap Sizes ...

B101.6 – Layout Drawings

Duplicate layout drawings of each such proposed piping system shall be presented to the Authority Having Jurisdiction and approval obtained before an installation is made. Complicated layouts shall be checked by qualified personnel.

B101.6.1 – Example of Sizing ...

WHERE IN DOUBT, CHECK WITH YOUR LOCAL Authority Having Jurisdiction



CEU Certificates

CEU certificates will be available for download from iapmolearn.org within seven business days. An account has been created for you at iapmolearn.org if you have not already created one yourself, please reach out to seminars@iapmo.org for your sign in credentials. Please allow 24 to 48 hours for a reply.



QUESTIONS?

