P2503.5.1

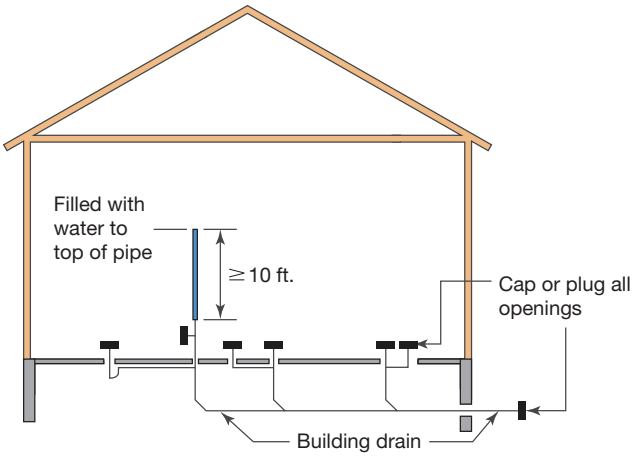
Drain, Waste and Vent Systems Testing

CHANGE TYPE: Modification

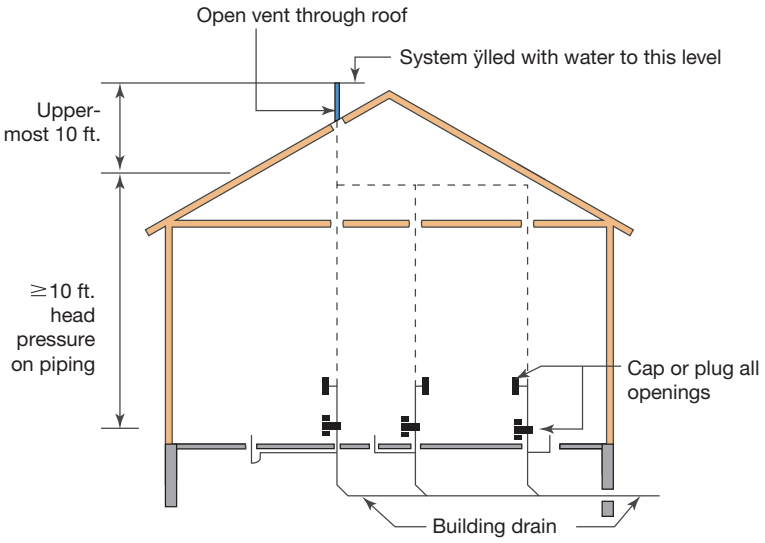
CHANGE SUMMARY: The head pressure for a water test of drain, waste and vent (DWV) systems has increased from 5 feet to 10 feet. Air vacuum testing is now permitted for plastic piping DWV systems.

2021 CODE: P2503.5.1 Rough plumbing. DWV systems shall be tested on completion of the rough piping installation by water ~~or~~, by air for piping systems other than plastic, ~~by air,~~ or by a vacuum of air for plastic piping systems, without evidence of leakage. ~~Either~~ The test shall be applied to the drainage system in its entirety or in sections after rough-in piping has been installed, as follows:

1. Water test. Each section shall be filled with water to a point not less than ~~5~~ 10 feet (~~1524~~ 3048 mm) above the highest fitting connection in that section, or to the highest point in the completed



Phase 1 - below slab



Phase 2 - above ground

Water test on DWV system.

This excerpt is taken from ***Significant Changes to the International Residential Code, 2021 Edition***.

The Significant Changes series takes you directly to the most important changes that impact projects. Key changes are identified then followed by in-depth discussion of how the change affects real-world application. Photos, tables and illustrations are included to further clarify application. Available for the IBC, IRC, IFC, IECC and IPC/IMC/IFGC, the Significant Changes publications are very useful training and review tools for transitioning to a new code edition.

system. Water shall be held in the section under test for a period of 15 minutes. The system shall prove leak free by visual inspection.

2. Air test. The portion under test shall be maintained at a gauge pressure of 5 pounds per square inch (psi) (34 kPa) or 10 inches of mercury column (34 kPa). This pressure shall be held without introduction of additional air for a period of 15 minutes.
3. Vacuum Test. The portion under test shall be evacuated of air by a vacuum type pump to achieve a uniform gauge pressure of -5 pounds per square inch or a negative 10 inches of mercury column (- 34 kPa). This pressure shall be held without the removal of additional air for a period of 15 minutes.

CHANGE SIGNIFICANCE: Prior to the 2015 edition, the IRC required a 10-foot head pressure for testing drain, waste and vent (DWV) systems with water. In the 2015 code, the head pressure was reduced to 5 feet. Although the 10-foot head pressure has been a long-standing tradition, the change in 2015 was based on an assumption that the actual head pressure is not nearly as critical as the visual nature of the test, and that a 10-foot head test was unlikely to reveal any leaks or defects that would not be detected by a 5-foot head water test.

In the 2021 IRC, the test pressure has been changed back to 10 feet. Reasons for changing back included inconsistency with the required air pressure (when testing with air), which was not decreased in the 2015 IRC. The 5-foot height also does not match the 10-foot height required in the *International Plumbing Code* (IPC).

In this water test, the DWV systems are filled with water to a point 10 feet higher than the piping being tested and the piping and joints are visually inspected for any leaks that might develop. The duration of the water test is 15 minutes to ensure that the system is water tight. The top 10 feet of the DWV systems, which is typically the highest vent through the roof, is only filled with water to the top of the vent terminal. Adding an additional 10-foot standpipe above the vent terminal would not be easily accomplished and would not provide any benefit because the vent will not carry water and not be under pressure in service.

New to the 2021 IRC, a vacuum air test is permitted for testing plastic DWV systems. This alternate test is a means for testing plastic piping systems when the ambient temperatures are below freezing and testing with water presents a challenge. There is no safety hazard in testing with a vacuum such as has occurred in the past with a positive air pressure test on plastic piping. The equipment to perform the test is readily available on the market and a number of contractors are performing the test. Vacuum air testing provides an additional option for testing of plastic piping systems.