

Revisiting the Fundamentals

Every once in awhile we need to stop and evaluate where we are to clearly understand where we are going. You see this in all kinds of situations and professions, especially sports. When a team is plagued by poor performances, the most common solution to get players back on track is returning to the fundamentals.

In sports the fundamentals are those areas of the game that you learned early; they are the base on which good players are developed. I believe we have the same situation in the plumbing design profession. We need to learn a good knowledge base early that we build on to develop into good designers. Critical to this base is the theories behind the information that is contained in the various codes, tables, and graphs, or understanding why and how that information was developed in the first place.

I have given seminars on the science of plumbing to various groups of plumbing contractors. These seminars delve into the formulas and theories of fluid flow in drain-

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age systems, pressure water piping systems, and venting systems. I enjoy the looks of excitement and big smiles that result when attendees learn the one piece of information that helps them understand the concepts behind the systems they have been installing. After a session it is not uncommon for several people to tell me that some of the information they just learned could have saved them a lot of time and effort in a previous project.

Even experienced professionals need to revisit the basics and review the theories behind the information that we use on a daily basis. One such area is Manning's Formula. Manning's Formula is used to calculate flow in gravity drainage piping. This formula was used in the development of the tables in the codes that limit the number of fixture units permitted on any portion of a building drain. You never can predict when you may need to know how that information could be used and when you should take the time to calculate the flow in the piping and not just how many fixture units are connected to that piping.

Some technology that has been around for awhile is being applied in new ways within the building construction industry. Vacuum drainage technology is being used very successfully in different applications and is a perfect example of when you need to know how to apply Manning's Formula. I and another plumbing designer discussed how the drainage system needs to be reviewed so the correct assumptions could enhance the plumbing design and not create problems in the system. By understanding these issues and knowing that the use of Manning's Formula is necessary, the design of the system will not be compromised.

Understanding other formulas that are required and the basic theory of how air and water work together to flow through piping is critical to keeping yourself out of trouble. Recently during a discussion with one of my friends I made the statement that even storm water piping requires a vent. Of course this raised the eyebrows of the person to whom I was speaking, and he stated that we do not connect vent piping to storm drains. I agreed that we do not provide a separate vent piping system for the storm drainage system, but that does not change the fact that storm drains are vented. You see: Water cannot drain without air. Storm drains get air from the atmosphere, and, since a trap is not on the system, the vent is in fact the roof drain opening. When I presented my case in this fashion, my friend just smiled and understood the point I was making.

I encourage you to seek out ways to revisit the fundamentals of plumbing system design and learn how the tables and graphs were developed. You may find that some of the assumptions included in the development of the tables and graphs may not fit within the parameters of the system that you are designing. You may need to modify the assumption to ensure the design will perform in the correct manner. Where can you look to find a place to revisit these fundamentals? I recommend attending your local ASPE chapter meeting and being ready to ask some questions. Another way to revisit the fundamentals is to take the time to teach someone new to the industry. Everyone needs a mentor—who can you help? **PSD**



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