

THE
**BUILDING
 & PLUMBING**
 BULLETIN | FALL 2017 ISSUE



REGULATORY RESOURCES

Inconsistencies in Code and Standards Systems

The Canadian Advisory Council on Plumbing (CACP) is a group of provincial and territorial regulators, manufacturer representatives, accredited certification bodies and other stakeholders from the Canadian federal government, including Health Canada, the Standards Council of Canada (SCC) and the National Research Council Canada (NRC). The CACP meets annually and is an effective forum to discuss the current state of the plumbing industry, address health and safety issues related to plumbing, express concerns and exchange information. At a recent meeting of the CACP held in Charlottetown, Prince Edward Island, a topic of discussion was the inconsistencies in the codes and standards systems used in Canada.

Canada has a single model National Plumbing Code (NPC), which the provinces and territories use to legislate the plumbing codes for their individual jurisdictions. With one model code, one might expect that enforcement of the plumbing code across Canada would be simple and consistent. However, discussion in the industry and at CACP meetings has made it clear that this is not the case.

Within Canada, there are 10 provinces and three territories that all independently legislate the plumbing codes to be enforced. Each province and territory has its own process for the adoption of the NPC which allows for additional requirements and deviations from the NPC based on the need of the



authority having jurisdiction (AHJ). To exacerbate the situation, the provinces and territories have all adopted different editions of the NPC and have different timelines for implementation of those codes. Adding further to this complexity, there are approximately 2,500 city and county AHJs within these provinces and territory, each of which may have its own deviations and requirements.

Inconsistencies include:

- ✓ Provincial/territorial differences
- ✓ City and county differences
- ✓ Timelines for implementation of codes
- ✓ Version of the code(s) adopted
- ✓ Difference in update cycle for codes and standards
- ✓ Product acceptance between different regions within Canada



Adopting different editions of the code can pose several problems, the most obvious of which is that the requirements may vary from one edition to the next. Additionally, the edition of the standards referenced in the NPC may differ depending on the most current standard edition available at the time the code was published. This can result in situations where a product that is compliant in one province may not be compliant in another. Because plumbing codes are inherently complex, trade personnel who are well versed in the code of one province may be challenged when working in a different province with different requirements.

Even in the most current code, discrepancies can develop with the edition of the standard referenced. The code process is on a five-year review cycle, but the standards are on a three-year cycle. The different review timelines almost guarantee that there will be instances where the most current edition of the code does not reference

the most current edition of the standard. Manufacturers ensure that their product is compliant to the most recent edition of the standard and often are listed to that edition. Even slight differences in requirements can lead to inconsistencies between jurisdictions causing a product to be compliant in only certain parts of Canada.

Initiatives to correct some of these issues have been a topic of discussion at the CACP and other forums across Canada for several years. Two potential solutions to address irregularities related to the code adoptions have been identified: interim updates and auto adoption.

Interim Updates

The NRC is responsible for the code process and the publishing of the codes. Recently, the process has been modified to allow for an interim update, half way through the code cycle, to the standards referenced in the NPC. The interim updates are only allowed if there

is no change to requirements between the two standard editions. This solution addresses products listed to a more current standard than referenced in the code, but it does not address situations where there is an actual change to the requirements in the standard. While it doesn't address all of the consistency issues, it would alleviate many of the problems associated with different editions.

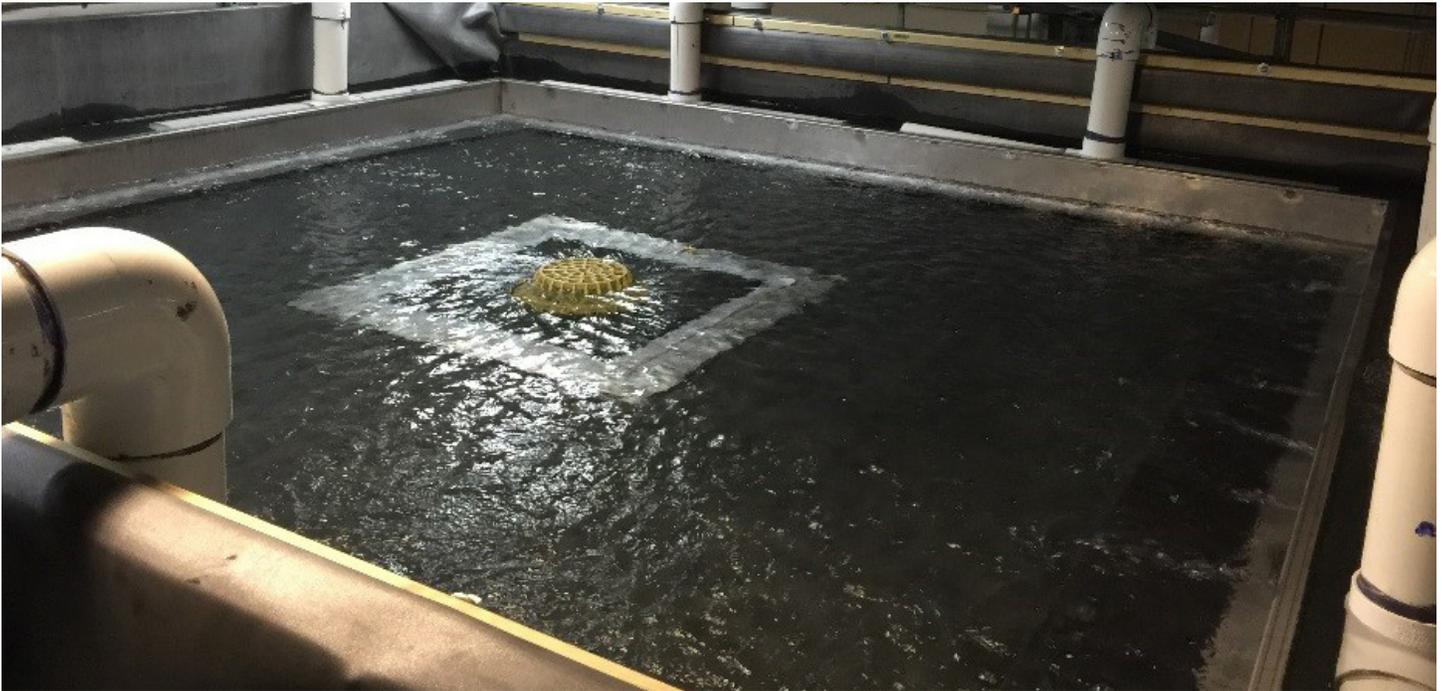
Auto Adoption

Another initiative that has significant momentum is the idea of "auto adoption" of the code. There has been much support for this initiative among regulators, provincial governments and various ministries of the Canadian government. The goal of the initiative is to provide a mechanism for all AHJs to automatically adopt the NPC when it is published. The intent is to initiate this process prior to the publication of the 2020 NPC. Auto adoption would improve consistency because all provinces and territories would reference the same NPC edition. Local deviations would still be a potential source of inconsistency and should be discussed at CAPC meetings to improve understanding between AHJs.

A good takeaway should be that consistency remains an issue wherever codes are applied. CACP is a very effective forum in which the stakeholders from throughout Canada can come together and work to resolve their issues. A forum similar to CACP would benefit the U.S., but may not be feasible due to its size. It would, however, benefit the U.S. industry to observe the actions of the CACP and potentially learn from its efforts at improving consistency.

Article by Terry Burger, Senior Engineer, Plumbing, NSF International. 

Roof Drain Flow Rate Testing



One of Froet Industries, LLC's roof drain rigs on test at NSF International

In the plumbing industry, roof drains are not as large a part of the discussion as they should be. But while these vital pieces of equipment are not well known or advertised, they are an integral component to the construction of buildings. Any plumbing professional who has ever seen an undersized or faulty roof drain installed is well aware of the need for the correct size and installation of roof drains on a building. Installing the wrong size roof drain can result in catastrophic property damage along with safety concerns for the building occupants. It seems completely reasonable that any drain should be evaluated to properly verify the performance capabilities of the product, especially if it is going to be responsible for draining water from a flat roof top.

Currently testing is being conducted by NSF International to the ASPE/IAPMO/ANSI Z1034 method to determine the

flow rate capabilities of roof drains to be sold in the United States. The standard requires a simulated roof to be constructed in a laboratory area along with installing pumps capable of introducing massive amounts of water to the testing rig to simulate real-life scenarios for flow. The photo here shows the rig with a drain installed ready for testing. You can see the test rig in action by going to YouTube and searching for "Froet Industries." The video that appears with the title "TRIM" is a short clip of the test rig with a Froet roof drain installed.

Manufacturers can elect to have their roof drains tested and verified for flow rate, even though this is not currently a national requirement. Some states do have requirements; for example, the State of Michigan requires roof drains to have flow rate data from an accredited laboratory prior to installation on a building. Manufacturers who elect to have

their roof drains tested and/or certified by an accredited third party have the ability to set themselves apart from the competition. Plumbing professionals are encouraged to contact the seller and/or manufacturer of the roof drains proposed for use to confirm that the products have in fact been tested and independently verified prior to installation.

Testing and certification demonstrate stated flow rates are accurate, and provide a way for quality products to set themselves apart from underperforming products. The ASPE/IAPMO/ANSI Z1034 method and the testing rig at NSF International allow quality manufacturers to display their engineering and design capabilities by providing clear, unbiased scientific evidence of the performance.

Article by Dave Purkiss, General Manager, Plumbing Products. 

Onsite Residential Water Recycling Systems Could Help Southern California Save Water

The American Southwest has been experiencing higher than average temperatures and increasing drought. With increasing percentages of land experiencing extreme drought conditions, water allocation becomes increasingly contested. Even though some areas of California received double the average precipitation from January to March 2017 and there has been extreme flooding, much of the water does not reach the aquifers, which would provide increased water security, as natural aquifer recharge is a slower process. Californians have made changes in their

water consumption, but the stability of water resources still requires careful attention. The continued threat of water scarcity could encourage people to seek further water savings, including onsite water reuse.

The International Residential Code (IRC), International Plumbing Code (IPC), Uniform Plumbing Code (UPC) including the State of California plumbing code, and International Green Construction Code (IgCC) all require water reuse systems to meet the requirements of NSF/ANSI 350: *Onsite Residential and*

Commercial Water Reuse Treatment, which establishes criteria for water reuse system material, design and performance. NSF/ANSI 350 certified systems can also earn credits during LEED certification. The standard has residential and commercial categories for systems that treat graywater (such as water from residential laundry or bathing) and combined black and graywater. The treated water can then be used for non-potable activities, such as toilet flushing and irrigation. Onsite water reuse systems reduce greenhouse gas emissions and water needs.



1. http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/docs/2017mar/fs030717_jan_conservation.pdf



A recent study¹ found that onsite treatment systems cost between \$6,000 and \$13,000, with annual maintenance costs between \$200 and \$1,000 per year. The study calculated that single family home residents use approximately 1,320 liters (350 gallons) of water each day, of which slightly more than half is used for irrigation. Multifamily home residents use approximately 810 liters of water per day with 18 percent being used for irrigation. The study also calculated that about half of indoor water is used for bathing and laundry, and is eligible to be treated by an onsite water reuse treatment unit for reuse. The study estimated that operation and investment costs could be recouped if recycling 310,000 liters (82,000 gallons) annually (or 225 gallons per day).

The National Academies of Sciences, Engineering, and Medicine estimates that Los Angeles households could save 5,400 gallons of water per year, at a savings of \$54 per year for onsite treating of laundry water for irrigation use. Additionally, household graywater recycling could save 13,000 gallons of water per year, at a cost savings of \$130 annually.²

As California continues to champion statewide sustainability, including reducing greenhouse gas emissions, onsite recycling of graywater could allow homeowners to participate in this initiative. A study by the Pacific Institute determined that there could be net energy savings with onsite residential reuse of graywater, even if household energy use increased.

“One important thing to note is that onsite water reuse systems require separate plumbing. The cost of retrofitting an existing home with updated plumbing depends on numerous factors and is different for each dwelling, but new home construction can cost-effectively incorporate plumbing for graywater². The California Building Standards Commission requires commercial and multifamily dwellings to install dual plumbing to incorporate graywater recycling, and the City of Tucson, Arizona has mandated residential construction to include plumbing accommodating graywater reuse². As financial barriers are lowered, an increasing number of residences will find onsite graywater recycling and reuse to be accessible.

2. <https://watereuse.org/event/using-graywater-and-stormwater-to-enhance-local-water-supplies-an-assessment-of-risks-costs-and-benefits/>



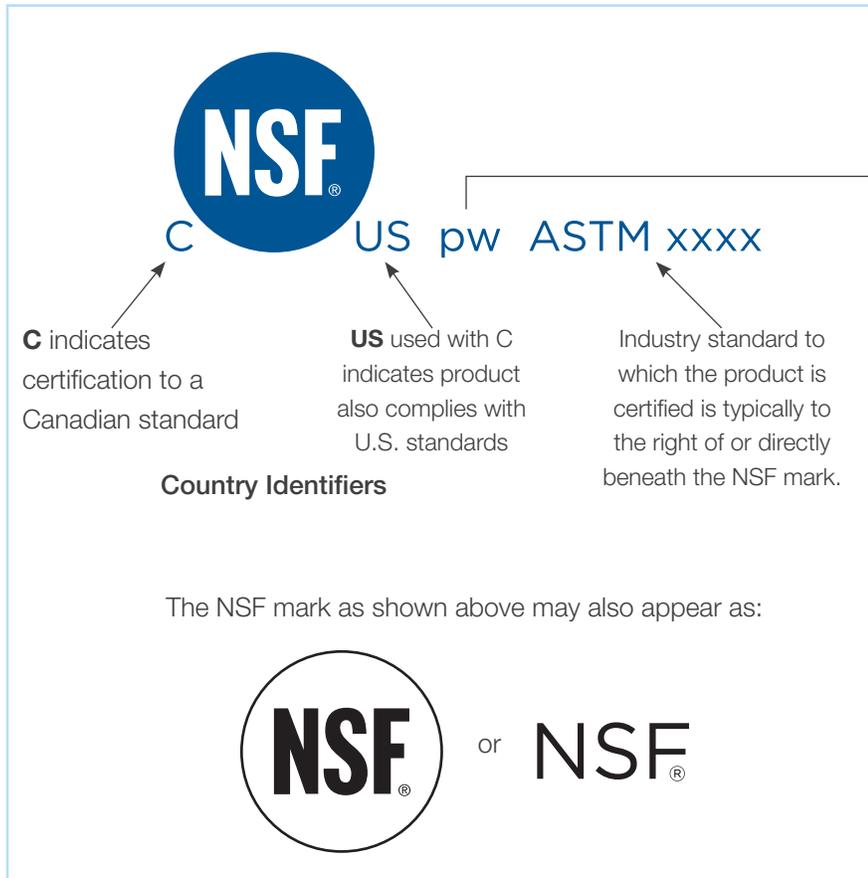
A primary concern about recycled wastewater is the removal of pathogens and contaminants. NSF/ANSI 350's performance requirements for treated water quality can provide residents and governments with assurance that the onsite graywater is safe for its intended use of subsurface irrigation and toilet flushing. As people are not likely to ingest treated gray water, a properly maintained system carries little risk of public health hazards. Systems certified to NSF/ANSI 350 undergo a 26-week test, demonstrating the rigor of the technology. Certified systems must achieve effluent with an overall test average of less than 10 mg/L for CBOD₅, 10 mg/L for TSS, 5 NTU for turbidity and less than 14 MPN/100 ml for *E. coli*. Commercial systems must achieve effluent with an overall test average of less than 10 mg/L for CBOD₅, 10 mg/L for TSS, 2 NTU for turbidity and less than 2.2 MPN/100 ml for *E. coli*. These requirements, coupled with the intended final use of the graywater, are intended to safeguard public health and minimize contamination risks.

Systems with proven technologies, such as those certified under NSF/ANSI 350, minimize public health risks while improving potable water use rates and reducing energy use and emissions. Graywater reuse can contribute to water source stability, by reducing demand for potable water for nonpotable purposes. As water scarcity and drought conditions persist in the American Southwest, onsite graywater reuse offers the opportunity to reduce human impact on the natural environment.

Article by Sharon Steiner, Business Unit Manager, Wastewater. 

NSF Marks Guide for Inspectors, Regulators and Code Officials

Plumbing products certified to plumbing performance standards are marked as shown below.



END USE DESIGNATIONS FOR NSF-14 PLASTIC PIPING SYSTEMS ONLY:

pw	potable water
dwv	drain, waste, vent
wc	well casing
tubular	continuous waste
sewer	sewer
rfh	radiant floor heating
rw	reclaimed water
gas	gas
geo	geothermal
NRTL	electrical
fs	fire safety
U.P.Code	Uniform Plumbing Code

NOTE: pw and wc marks also demonstrate compliance with NSF/ANSI 61.





QUESTIONS? CALL THE NSF HOTLINE

The NSF Regulatory and Consumer Information Hotline is a valuable resource for plumbing officials, inspectors, consumers and manufacturers who have questions about product certification. The hotline, which fields more than 15,000 inquiries each year, can help with your questions about NSF certification marks, the certification process and where to find certified products. If you have a question or comment, call us at [+1.800.673.8010](tel:+18006738010) or info@nsf.org.

NSF STANDARDS AVAILABLE FOR REVIEW

Contact us for a complimentary version of any NSF water-related standard.

