November 17, 2025

Dear Florida Building Commission,

Nu Flow Technologies USA respectfully requests that the Florida Building Commission (FBC) reject the proposed modifications of Florida Plumbing Code Section 718.1 (MOD 11834 and MOD 11851) because these proposed modifications would eliminate the proven "gapping" method for cured-in-place pipe (CIPP) linings to rehabilitate damaged pipes. This method has been used throughout the nation for over 20 years and specifically in the state of Florida for 22 years. Eliminating the gapping method through this proposed code change – without any fiscal impact assessment or any objective technical or safety assessment by the FBC or TAC – will unnecessarily damage the building and plumbing industries in Florida. The code change will harm commercial and residential consumers for whom the gapping method is the best way to make long-lasting repairs to damaged pipes. Moreover, it will unnecessarily cost Florida residents hundreds of millions of dollars to implement more costly non-gapping methods, and it will reduce consumer choice and freedom in the State where choice and freedom are valued most, impeding additional innovation in the industry. In some cases, the unavailability of the cost-effective gapping method will discourage consumers from making needed pipe repairs in the first instance because such repairs will be cost-prohibitive, leading to health and safety issues that can be avoided by denying the proposed modification of Section 718.1.

What is Cured-in-Place Pipe (CIPP)?

CIPP is used to rehabilitate piping that has damage or deterioration without having to replace the piping entirely. Using the existing pipe as a mold, an absorbent carrier material fabricated as a tube is saturated with resin and positioned inside the defective piping. The tube is expanded and held tightly against the existing pipe while the resin is cured to form a solid replacement pipe liner. Depending on the type of resin used, well known curing methods include heat via steam, exposure to UV light, and curing under ambient conditions.

If, and only if, the CIPP process creates a liner that covers a service connection, the service connection must be reinstated by cutting a hole in the liner. Non-gapping CIPP methods line and cover service connections, therefore requiring such reinstatement of the service connections.

But where service connections and fittings are intact, i.e., do not need repair, piping can be repaired using the proven gapping method of CIPP. In the gapping method, the pipe is rehabilitated where damaged, without lining over the intact service connections and fittings upstream or downstream. Such repairs need no cutting for reinstatement.

It is unheard of that every drainage pipe and service connection within a building must be lined with CIPP when rehabilitating damaged piping. In other words, plumbers and contractors address and repair the damaged piping only, and they do not repipe the entire building unnecessarily in each job.

The Gapping Method Fixes Damaged Pipe Where Needed, Creating a Continuous Installation that is Consistent with ASTM F1743 and F3541

From a technical perspective, it does not make sense to eliminate the widely utilized, proven gapping method for CIPP. Yet, the proposed modification of Section 718.1 would add the language "with no gaps in coverage at branch or service connections." If authorized by the FBC and codified, new Section 718.1 would eliminate the reliable gapping method.

The gapping method has been used successfully and cost effectively for decades now in Florida and many other states, allowing repair of a pipe where it is damaged or deteriorated. Notably, the gapping method results in a water-tight *continuous* CIPP installation. For example, a thirty-story high-rise building that has only a single floor's worth of vertical-damaged pipe between floors 19 and 20, adjacent to branch or lateral connections that are sound and intact, could be rehabilitated using the gapping method by installing a continuous CIPP lining only for the damaged pipe. This would restore 100% water flow. In contrast, a non-gapping CIPP installation would necessitate lining all the vertical pipe and fitting up the entire thirty stories, from the roof to the sewer, and then reinstating every branch and lateral using a cutting tool simply to repair the single, damaged pipe between two floors. This non-gapping solution would unnecessarily and illogically increase the time, disruption, and cost of the repair with no added benefit. Moreover, no part of any CIPP code or standard requires such a roof-to-sewer installation.

CIPP using the gapping method is targeted, unlike the non-gapping reinstatement method. The gapping method is tailored to line only the part of the piping that is damaged or deteriorated, preserving the original hydraulic design of the system and ensuring consistent, efficient flow. With this gapping method, the undamaged, structurally-sound portions of the piping, which are not lined by CIPP, remain intact and functional as originally designed. Likewise, fittings and branch connections that are sound remain unhindered and operate as usual.

Importantly, the gapping method creates a *continuous* CIPP over the entire length of an installation, lining the portion of the piping that is damaged to effectuate the repair. The gapping method therefore meets the performance standard set by ASTM F1743 and F3541. In its workmanship section, ASTM F1743-22 states that the "finished CIPP should be continuous over the entire length of the installation."[1] Although this is a performance guideline on workmanship (which means it is not a required installation method), a proper CIPP installation using the gapping method still meets this standard. Put another way, *gapping* and a *continuous* installation are not mutually exclusive. To the contrary, *gapping only works and is done correctly when the completed installation is continuous over its length*, which is the portion of the piping that was damaged and is now rehabilitated with a CIPP lining. The fact that gapping provides

[1] In ASTM F1743-25 and ASTM F3541-22, the word "should" is replaced by "shall", but this change has no impact on the application of the performance standard to the gapping method of CIPP.

finished CIPP that is continuous over the entire length of the installation undercuts the main argument that proponents of the proposed code modification have made.[2]

The following is an illustration of a properly-installed finished CIPP using the gapping method that is continuous over the entire length of the installation. In this example, the pipes above, between, and below two connections have been rehabilitated using CIPP.

ASTM F1743 and F3541 also expressly contemplate CIPP methods that do not require reinstatement of service connections based on cutting, such as methods like gapping. For example, Note 7 of ASTM F1742-25 acknowledges that (1) not all CIPP has dimples at service connections, where such dimples are a feature of the non-gapping reinstatement method, and (2) CIPP with dimples "shall not be construed to provide a 100% watertight seal at all service connections." Critically, it states, "[i]f total elimination of infiltration and inflow is desired, other means, which are beyond the scope of this practice [i.e., beyond non-gapping CIPP with dimples], may be necessary to seal service connections and to rehabilitate service lines and manholes." The gapping method of CIPP is one "other means" to seal service connections and rehabilitate service lines.

Although the gapping method satisfies ASTM F1743 and F3541, regardless, ASTMs should not be used to justify amendment of the plumbing code so that *it would prohibit methods of CIPP*

[2] The Technical Advisory Committee (TAC), in voting in October to allow the proposed code modification to proceed to the FBC, was wrongly led to believe that the Gapping Method does not produce "a finished CIPP" that is "continuous over the entire length of the installation" under ASTM F1743 and ASTM F3541. Because the Gapping Method does satisfy this standard, the TAC had no basis for voting as it did. Moreover, these ASTMs do not state that the finished CIPP must be continuous over the entire length of the piping system.

rehabilitation, like the gapping method. The primary purpose of the ASTMs is to set measurable objectives of performance, define tests to demonstrate compliance, and outline general procedures to guide installation. The ASTM documents are not meant to prescribe mandatory installation methods, let alone a single method or material. Moreover, no language in the ASTMs prohibits gapping. This built-in flexibility of the ASTMs is deliberate; it allows for new and evolving techniques to be used as long as they deliver results that are consistent with the performance requirements. In this way, the ASTMs encourage innovation while still protecting public health and safety. Here, the gapping method is consistent with the ASTM's primary purpose.

As seen throughout the United States and specifically in the State of Florida, gapping that is performed properly allows CIPP rehabilitation that is safe, reliable, and cost effective. By contrast, the proposed code modification, if adopted, would eliminate this entire class of reliable CIPP methods by dictating that there can be "no gaps in coverage at branch or service connections."

This proposed code modification would also have other harmful effects on plumbing rehabilitation methods. Namely, beyond eliminating the gapping method of CIPP for pipe repair, it would eliminate other repair methods for service connections that could be seen as implementing a gap in coverage—e.g., (1) installation of fitting liners, and (2) conventional replacement of fittings pre-lining. This is another reason that the FBC should reject the proposed code modification.

The Non-Gapping Reinstatement Method has Significant Limitations

The FBC should not leave the non-gapping reinstatement method, which is touted by proponents of the code change, as the only one available. It would be the only option if the proposed modification to Section 718.1 were approved, creating a windfall and monopoly for proponents of the non-gapping reinstatement method at the expense of Florida residents.

While the non-gapping reinstatement method is also a viable option for CIPP, it has drawbacks. For a case of localized pipe damage or deterioration, it relies on a CIPP lining that is unnecessarily along the entire length of the pipe *system* and requires reinstatement of branches using an expensive cutting tool. This method is much more likely than the gapping method to violate existing Florida Plumbing Section 706.2, which dictates that "fittings shall not have ledges, shoulders or reductions capable of retarding or obstructing flow in the piping." The non-gapping method lines much more of the pipe system than is necessary, as it lines both the damaged and undamaged portions, covering perfectly good and structurally sound pipe and fittings with a liner. It therefore risks blocking branch connections and altering the system hydraulics. Moreover, the non-gapped liners can cross over P-traps and fittings, causing trap blowouts and resin migration. And they can cause narrowing or distortion of the flow paths at the fittings, disrupting the design.

In the non-gapping method, the use of extremely expensive robotic cutting tools for reinstatement of branches and laterals exacerbates the problems discussed above. Because a properly-used cutting tool cannot get close enough to the fittings and the boundary between the new liner and the fittings to risk damaging them, reinstatement cutouts made by these cutting tools have ledges and shoulders that are capable of retarding or obstructing flow in the piping. This is contrary to the explicit requirement of Florida Plumbing Code Section 706.2. Additionally, the cutting blade can grind against and damage existing fittings and the new liner. For example, cutting blade grinding can cause pin holes that allow for water migration under the liner. This does not happen in the gapping method as a CIPP liner using the gapping method creates a water-tight seal between the liner and the underlying pipe without such risk of water migration.

Beyond these technical and safety deficiencies, the non-gapping reinstatement method is much more expensive. If Section 718 is changed to preclude the much-less-expensive gapping method, that change will cost Floridians hundreds of millions, if not billions, of dollars over time, by requiring unnecessarily expensive and time-consuming pipe rehabilitations using the non-gapping reinstatement method.

Conclusion – the FBC Should Not Change Section 718.1

In practice, gapping CIPP lining and non-gapping CIPP lining are not opposing methods but complementary tools. Each has its place, depending on the condition of the existing system, and each should be available for use by plumbers and contractors where and when most appropriate on a project-by-project basis.

Use of the gapping method of CIPP to repair deteriorated pipes, while leaving sound fittings and pipes intact, is consistent with existing code, existing industry practice and standards, and common sense. Allowing gapping preserves flexibility for contractors, reduces the risk of unintended damage, and ensures that rehabilitation efforts remain focused on the sections of piping that truly require repair. If only piping or portions of piping have deteriorated, it is not reasonable to have a plumbing code that requires complete replacement or lining of fittings that remain structurally sound, particularly because fittings are often thicker and more durable than the connecting piping. However, this unreasonable requirement to line over all fittings and service connections would be the only method allowed if the gapping method were prohibited via the proposed code change. Prohibiting gapping would thus eliminate a proven, cost-effective option that can extend service life without introducing unnecessary risks.

Finally, the proposed code modification to eliminate the gapping method would violate Section 553.73(9)(a)4 of the Florida Building Code. That section explicitly states that a technical amendment to the plumbing code may not “discriminate against materials, products, methods, or systems of construction of demonstrated capabilities.” But that is just what the proposed code revision is: discrimination against the well demonstrated and efficient capability to effect CIPP rehabilitation with the gapping method.

We therefore urge the Florida Build Commission to deny MOD 11834 and MOD 11851, which would modify Section 718.1, and instead to continue to allow contractors to have the flexibility to choose both gapping and non-gapping methods of CIPP rehabilitation in Florida as allowed under the current version of Section 718.1.

Sincerely Yours,

Tom Bowman
President, Nu Flow Technologies USA, Inc.

Chris Cheek
Technical Plumbing Director,
Nu Flow Technologies USA, Inc.