North Carolina Office of the State Fire Marshal
Engineering and Building Codes Division in the Department of Insurance

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RE:	Appeal of the August 22, 2024, Decision by the City of Raleigh Planning and Development Department to deny an alternate material, design and method for sanitary drainage within a building.	)	OSFM DECISION

In accordance with N.C.G.S. § 160D-1127, Andew H. Smith, PE, representing Jordan Skala Engineers, Inc., has appealed the City of Raleigh Planning and Development Department decision to deny an alternate material, design and method for sanitary drainage within a high-rise student housing building located at 111 Cox Avenue, Raleigh, North Carolina.

N.C.G.S. § 160D-1127 allows appeals from any order, decision, or determination by a member of a local inspection department pertaining to the State Building Code or other State building laws to the State Fire Marshal or his designee.

PARTIES

Appellant: Andrew H. Smith, PE
Jordan Skala Engineers, Inc.
6201 West Plano Parkway, Suite 250
Plano, Texas 75093

Appellee: City of Raleigh – Planning and Development Department
One Exchange Plaza, Suite 400
Raleigh, NC 27601

BACKGROUND

On August 14, 2024, the appellant submitted a completed City of Raleigh Development Services Plan Revision Application to the appellee requesting to change the cast iron drainage system in the original drawings submitted to the appellee to an engineered plastic piping system (ProVent).

On August 16, 2024, the appellant submitted a completed City of Raleigh Development Services Alternate Material, Design, or Methods Form to the appellee requesting to change the cast iron drainage

system in the original drawings submitted to the appellee to an engineered plastic piping system (ProVent).

On August 22, 2024, the appellee sent an email to the appellant denying the two requests by the appellant by citing the mandatory enforcement of a North Carolina Office of the State Fire Marshal formal interpretation letter dated August 5, 2024. The cited formal interpretation noted the prohibition of the use of plastic pipe and fittings with an inside diameter of 2 inches and larger for drain, waste and vent conductors in buildings in which the top occupied floor exceeds 75 in height as per 2018 North Carolina Plumbing Code, Sections 702.1 Exception and 702.4 Exception, which became effective on January 1, 2019 and North Carolina General Statute 143-138 (b24), which became law within Section 36 of North Carolina General Assembly Session Law 2023-137 on October 10, 2023.

ISSUE RAISED IN APPEAL

The appellant is appealing the appellee's denial to allow the engineered plastic piping system (ProVent) to be used as alternative engineered design in lieu of a cast iron drainage system citing the application of 2018 North Carolina Plumbing Code, Section 316 Alternative Engineered Design.

The appellants' appeal reads as follows:

'Our office received the attached denial letter in reference to the use of ProVent Engineered Waste and Vent plumbing system for the above noted project. The alternate method form was submitted on August 16th, 2024 and the denial letter was sent via email by Bryan Robinson, Chief Building Official on August 22nd, 2024. We would like to appeal the denial decision.

The sudden expansion of the definition of the term "conductor" included in your office's letter dated August 5th, 2024 poses a significant challenge for our project based on current construction status. Our project submitted for our building permit in August of 2023 with a traditional cast iron sanitary drainage system, but began discussing the feasibility of changing to an engineered provent system back in January of 2024. In March of 2024, we revised our plumbing design to be provent with the understanding that we would submit a field revision after receiving our building permit to get it officially documented and permitted. The building permit process was significantly delayed and we did not receive our building permit until June 10th, 2024. Currently, all of our underground sanitary system has been installed, inspected and the majority of our slab on grade has been poured based on the provent design. The team is ready to proceed with sanitary risers in the upcoming weeks.

Our appeal is based, in one part, on the City of Raleigh's interpretation of the definition of "conductor" prior to August 5th, 2024. We ask that you consider what a challenge it poses for our project since we could not have anticipated an interpretation letter that was immediately binding with no grace-period. To our knowledge, there was no forewarning that this letter was going to be issued.

Our appeal is based, in a second part, on section 316 of the 2018 NCPC "Alternate Engineered Design" on which your office's letter dated August 5th, 2024 is silent. Thank you for your time and consideration, we look forward to your response.

PART 1:

The denial letter is based on the 2018 NCPC sections 702.1, 702.4, 1102.2, and 1102.7 – Use of plastic pipe for above ground sanitary drainage and storm drainage in buildings over 75 feet in height. We take no exceptions to sections 1102.2 and 1102.7 since the storm piping is cast iron.

The Plastic Pipe and Fittings Association (PPFA) publishes a Design Guide called "PVC Piping Systems for Commercial and Industrial Applications." (Charlotte Pipe & Foundry was a contributor to the design guide). In that document are installation requirements that affect all standards PVC Manufacturers must adhere to. The "Design Guide," compiled by the PPFA, endorsed by the PVC Manufacturer Member Companies, shows design engineers in the State of North Carolina just how to best design and install the vertical and horizontal PVC sanitary, drain, waste and vent and storm drainage systems, which meet the 2018 North Carolina Plumbing Code, and also meets the 2015 International Plumbing Code, which is the base document adopted with NC amendments for the 2018 NCPC. PVC is also approved for use by our neighboring states of Georgia (2018 IPC), South Carolina (2021 IPC), Tennessee (2012 IPC) and Virginia (2021 IPC). Charlotte Pipe and Foundry Company is a current member of the PPFA.

Based on what is stated in the exception to sections 702.1 and 702.4, and as defined in Chapter 2 of the 2018 NCPC, plastic pipe and fittings can be used in all buildings for above-ground sanitary drainage piping.

2018 NCPC 702.1 Above-ground sanitary drainage and vent pipe. Above-ground soil, waste and vent pipe shall conform to one of the standards listed in Table 702.1. Pipe fittings shall not be solvent-cemented inside of plastic pipe.

Exception: Plastic pipe with an inside diameter 2 inches (51 mm) and larger shall not be used for storm drainage drain, waste, and vent conductors in buildings in which the top occupied floor exceeds 75 feet (23 m) in height.

The exception specifically indicates "storm drainage drain, waste and vent conductors" and does not indicate anything about above-ground sanitary drainage.

Per Chapter 2 of the 2018 NCPC the definition of conductor:

Conductor. A pipe inside the building that conveys storm water from the roof to a storm or combined building drain.

2018 NCPC TABLE 702.1 ABOVE- GROUND DRAINAGE AND VENT PIPE includes PVC Piping:

Polyolefin pipe	ASTM F1412; CSA B181.3
Polyvinyl chloride (PVC) plastic pipe in IPS diameters, incluing Schedule 40, DR 22 (PS 200), and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2665; ASTM F 891; ASTM F1488; CSA B181.2
Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D. and a solid, cellular core or composite wall	ASTM D2949, ASTM F1488

2018 NCPC 702.4 Fittings. Pipe fittings shall be approved for installation with piping material installed and shall comply with the applicable standards listed in Table 702.4. Piping fittings shall not be solvent cemented inside of plastic pipe.

Exception: Plastic pipe fittings and plastic plumbing appurtenances with an inside diameter 2 inches (51 mm) and larger shall not be used for drain, waste and vent conductors in buildings in which the top occupied floor exceeds 75 feet (23 m) in height.

The exception specifically indicates “drain, waste and vent conductors” and does not indicate anything about above-ground sanitary drainage.

Per Chapter 2 of the 2018 NCPC the definition of conductor:

Conductor. A pipe inside the building that conveys storm water from the roof to a storm or combined building drain.

2018 NCPC TABLE 702.4 PIPE FITTINGS includes PVC Fittings:

Polyolefin	CSA B181.3
Polyvinyl chloride (PVC) plastic in IPS diameters	ASTM D2665; ASTM F1866
Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters	ASTM D3034
Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D.	ASTM D2949
Polyvinylidene fluoride (PVDF) plastic pipe	ASTM F1673; CSA B181.3

Chapter 7: Sanitary Drainage and Chapter 11: Storm Drainage are 2 separate Chapters for a reason, because they are meant to be 2 separate systems, unless allowed to be combined (see sections 703.6 and 1109.1 for reference).

Per Chapter 2 of the 2018 NCPC the definitions of Drainage System:

DRAINAGE SYSTEM. Piping within a public or private premise that conveys sewage, rainwater or other liquid waste to a point of disposal. A drainage system does not include the mains of a public sewer system or a private or public sewage treatment or disposal system.

Building gravity. A drainage system that drains by gravity into the building sewer.

Sanitary. A drainage system that carries sewage and excludes storm, surface and groundwater.

Storm. A drainage system that carries rainwater, subsurface water and similar liquid waste.

Section 36 of S.L. 2023-137, which become law on October 10, 2023, amended G.S. 143-138(b24) to preserve the existing limitations on the use of plastic pipe. G.S. 143-138(b24), which remains effective law, provides:

(b24) Limitation on Use of Plastic Pipes. - No State, county, or local building code or regulation shall allow for the use of plastic pipes, plastic pipe fittings, and plastic plumbing appurtenances with an inside diameter 2 inches (51 millimeters) and larger in either of the following circumstances:

(1) Drain, waste, and vent conductors in buildings in which the top occupied floor exceeds 75 feet (23 meters) in height.

(2) Storm drainage conductors in buildings in which the top occupied floor exceeds 75 feet (23 meters) in height.

Conductors are not defined in S.L. 2023-137 and based on Chapter 2 of the 2018 NCPC:

Conductor. A pipe inside the building that conveys storm water from the roof to a storm or combined building drain.

PART 2:

Section 917 of the 2018 NCPC allows for the single-stack vent system to be installed in a building as an engineered single stack system that is listed in accordance to the standards of the specific material utilized in the system, designed by a design professional and install in accordance with the manufacturer's installation instructions. This is a separate section of the plumbing code and allows for a Provent and Sovent system to be designed, permitted, installed, and inspected, and accepted by AHJ for sanitary drainage without any stipulations or exceptions. The NCPC Plumbing Code Amendment for section:

917.1.1 Engineered Single Stack Systems. Engineered single stack systems shall be listed in accordance to the standards of the specific material utilized in the system, designed by a design professional and installed in accordance with the manufacturer's installation instructions.

This amendment was adopted January 1, 2021 and includes above ground sanitary drainage under G.S. 143-136; 146-138 and was not addressed in Section 36 of S.L. 2023-137 which became law on October 10, 2023 to preserve existing limitations on the use of plastic pipe. G.S. 143-138(b24), which remains effective law, provides:

(b24) Limitation on Use of Plastic Pipes. - No State, county, or local building code or regulation shall allow for the use of plastic pipes, plastic pipe fittings, and plastic plumbing appurtenances with an inside diameter 2 inches (51 millimeters) and larger in either of the following circumstances:

(1) Drain, waste, and vent conductors in buildings in which the top occupied floor exceeds 75 feet (23 meters) in height.

(2) Storm drainage conductors in buildings in which the top occupied floor exceeds 75 feet (23 meters) in height.

Again, conductors are not defined in S.L. 2023-137 and based on Chapter 2 of the 2018 NCPC:

Conductor. A pipe inside the building that conveys storm water from the roof to a storm or combined building drain.

The last part of the letter from OSFM dated August 5, 2024 does not apply because 2024 NCPC does not apply since it does not become effective until January 1, 2025, and this project is being permitted prior to January 1, 2025.

All storm drainage piping and conductors for this project are cast iron piping and comply with 2018 NCPC as well as Section 36 of S.L. 2023-137 which became law on October 10, 2023 to preserve existing limitations on the use of plastic pipe. G.S. 143-138(b24), which remains effective law.

Above ground sanitary drainage and vent pipe also comply with 2018 NCPC as Section 36 of S.L. 2023-137 which became law on October 10, 2023 to preserve existing limitations on the use of plastic pipe. G.S. 143-138(b24), which remains effective law since those are not conductors. 2018 NCPC Section 917 allows for Provent system design for and the drawings comply with that section. Furthermore, 2018 NCPC Section 316 Alternative Engineered Design allows for an alternative engineered design. The drawings currently comply with NCPC Section 316 as well as 2018 NCPC 917.1.1 plumbing code amendment.

However, this project is seeking approval for a plumbing revision based on section 316 - “Alternate Engineered Design” of the 2018 NCPC. Reference the following page outlining the requirements of this section.

To close, the underground plumbing system is 100% installed in the field, based on the alternate engineered section and has received field approval for the use of this system. We are asking, in light of the code justifications included in this letter as well as the construction status of our project, that we be allowed to continue with approvals and installation of the above ground engineered Provent system for sanitary waste and vent. The project was designed and started with the understanding that an engineered Provent system is allowable for above-ground sanitary waste and vent per code. It would be very detrimental to the completion of the project to make a change at this stage in construction. Thank you for your consideration.’

SECTION 316
ALTERNATIVE ENGINEERED DESIGN

316.1 Alternative engineered design.

The design, documentation, inspection, testing and approval of an *alternative engineered design* plumbing system shall comply with Sections 316.1.1 through 316.1.6.

316.1.1 Design criteria.

An *alternative engineered design* shall conform to the intent of the provisions of this code and shall provide an equivalent level of quality, strength, effectiveness, fire resistance, durability and safety. Material, equipment or components shall be designed and installed in accordance with the manufacturer's instructions.

316.1.2 Submittal.

The registered design professional shall indicate on the permit application that the plumbing system is an *alternative engineered design*. The permit and permanent permit records shall indicate that an *alternative engineered design* was part of the *approved* installation.

316.1.3 Technical data.

The registered design professional shall submit sufficient technical data to substantiate the proposed *alternative engineered design* and to prove that the performance meets the intent of this code.

316.1.4 Construction documents.

The registered design professional shall submit to the code official two complete sets of signed and sealed construction documents for the *alternative engineering design*. The construction documents shall include floor plans and a riser diagram of the work. Where appropriate, the construction documents shall indicate the direction of flow, all pipe sizes, grade of horizontal piping, loading and location of fixtures and appliances.

316.1.5 Design approval.

Where the code official determines that the *alternative engineered design* conforms to the intent of this code, the plumbing system shall be *approved*. If the *alternative engineered design* is not *approved*, the code official shall notify the registered design professional in writing, stating the reasons thereof.

316.1.6 Inspection and testing.

The *alternative engineered design* shall be tested and inspected in accordance with the requirements of Sections 107 and 312.

FINDINGS

Based on information submitted by the appellant, the undersigned makes the following findings:

1. Sections 702.1, 702.4, 1102.2, and 1102.7 of the 2018 North Carolina Plumbing Code ("NCPC") each contain exceptions limiting the sanitary drainage (Chapter 7) and storm drainage (Chapter 11) use of plastic pipe with an inside diameter of 2 inches and larger in buildings in which the top occupied floor exceeds 75 feet in height: the exception to Section 702.1 provides that plastic pipe with an inside diameter of 2 inches and larger shall not be used for storm drainage, drain, waste and vent conductors; the exception to Section 702.4 provides that plastic pipe fittings and plastic plumbing appurtenances with an inside diameter of 2 inches and larger shall not be used for drain, waste and vent conductors; the exception to Section 1102.2 provides that plastic pipe with an inside diameter of 2 inches and larger shall not be used for storm drainage conductors; and the

exception to Section 1102.7 provides that plastic pipe fittings and plastic plumbing appurtenances with an inside diameter of 2 inches and larger shall not be used for storm drainage conductors in buildings in which the top occupied floor exceeds 75 feet.

2. Additionally, Section 36 of S.L. 2023-137, which became law on October 10, 2023, amended G.S. 143-138(b24) to preserve these existing limitations contained within Sections 702.1, 702.4, 1102.2, and 1102.7 of the 2018 NCPC on the use of plastic pipe for both sanitary sewer (drain, waste and vent) and storm drainage conductors in buildings in which the top occupied floor exceeds 75 feet within the 2024 NCPC.

PRESERVE EXISTING NORTH CAROLINA BUILDING CODE LIMITATION ON THE USE OF PLASTIC PIPE IN CERTAIN BUILDINGS

SECTION 36. G.S. 143-138 is amended by adding a new subsection to read:

"(b24) Limitation on Use of Plastic Pipes. – No State, county, or local building code or regulation shall allow for the use of plastic pipes, plastic pipe fittings, and plastic plumbing appurtenances with an inside diameter 2 inches (51 millimeters) and larger in either of the following circumstances:

(1) Drain, waste, and vent conductors in buildings in which the top occupied floor exceeds 75 feet (23 meters) in height.

(2) Storm drainage conductors in buildings in which the top occupied floor exceeds 75 feet (23 meters) in height."

CONCLUSIONS

Based on the forgoing findings of fact, the following conclusions are made:

1. It is the interpretation of this office that, notwithstanding the definition of "conductor" provided in Section 202 of the 2018 NCPC as "a pipe inside the building that conveys storm water from the roof to a storm or combined building drain," the prohibition on the use of plastic pipes in buildings in which the top floor exceeds 75 feet in height also includes above-ground sanitary drainage piping. The intent of both the 2018 NCPC and G.S. 143-138(b24) is to prohibit the use of plastic pipes in this application because the language in G.S. 143-138(b24) relies on the plain meaning of the term "conductor" and is not restricted to the definition provided in the 2018 NCPC. *See Hall v. Torreros, II, Inc.*, 176 N.C. App. 309, 318-19, 626 S.E.2d 861, 868 (2006) ("'whatever force and effect a rule or regulation has is derived entirely from the statute under which it is enacted' … 'an administrative agency has no power to promulgate rules and regulations which alter or add to the law it was set up to administer or which have the effect of substantive law.'") (quoting *Swaney v. Steel Co.*, 259 N.C. 531, 542, 131 S.E.2d 601, 609 (1963) and *Comr. Of Insurance v. Insurance Co.*, 28 N.C. App. 7, 11, 220 S.E.2d 409, 412 (1975)). Here, the applicable plain meaning of the word "conduct" is "to convey in a channel" or "to act as a medium for conveying or transmitting." *Conduct*, MERRIAM-WEBSTER'S COLLEGIATE DICTIONARY (11th ed. 2020). Accordingly, above-ground sanitary piping falls within the prohibition set forth in G.S. 143-138(b24) because such piping coneys sanitary drainage through a channel and acts as a medium for conveying or transmitting said sanitary drainage. Moreover, the relevant 2018 NCPC code provisions include conveyances

(i.e., waste and vent conductors) that are distinct from storm water. Consequently, the intent of G.S. 143-138(b24) and Sections 702.1, 702.4, 1102.2, and 1102.7 is to prohibit the sanitary drainage (Chapter 7) and storm drainage (Chapter 11) use of plastic pipes with an inside diameter of 2 inches or larger in buildings in which the top occupied floor exceeds 75 feet in height for above-ground drain, waste, vent, and storm drainage conductors, fittings and appurtenances.

2. The use of plastic piping for sanitary drain and storm conductors as an alternative material within the application of the technical codes that comprises the North Carolina State Building Code is prohibited by state law (G.S. 143-138(b24)). The use of plastic piping materials for sanitary drain and storm conductors as an alternative engineered design within the application of the 2018 North Carolina Plumbing Code, Section 316 is prohibited by state law (G.S. 143-138(b24)).

APPEAL DECISION

Based on the above findings and conclusions, the decision by the appellee to deny an alternate material, design and method for sanitary drainage within the high-rise student housing building located at 111 Cox Avenue, Raleigh, North Carolina is UPHELD.

This 31st day of January 2025.

David Rittlinger, PE, LEED AP
Division Chief – Codes & Interpretations
North Carolina Office of State Fire Marshal

FURTHER APPEAL RIGHTS

The appellant and appellee have the right to appeal this decision to the NC Building Code Council. Please refer to N.C.G.S. § 160D-1114 and the NC Administrative Code and Policies, Section 202.9.2 for further appeal rights. In accordance with N.C.G.S. § 143-141, you have 30 days in which to appeal this decision to the NC Building Code Council.

Cc:
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