

Proposed Change 2133

Code Reference(s):	NPC25 Div.B 2.3.4.5.(1) (first printing)
Subject:	Drainage Systems
Title:	Installation of Drainage Piping Without Depressions
Description:	This proposed change introduces requirements for the installation of drainage piping to prevent sagging and depression.
Related Code Change Request(s):	CCR 1942

This change could potentially affect the following topic areas:

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| ☐ Division A | ☒ Division B |
| ☐ Division C | ☒ Design and Construction |
| ☐ Building operations | ☒ Housing |
| ☒ Small Buildings | ☒ Large Buildings |
| ☐ Fire Protection | ☐ Occupant safety in use |
| ☐ Accessibility | ☐ Structural Requirements |
| ☐ Building Envelope | ☐ Energy Efficiency |
| ☐ Heating, Ventilating and Air Conditioning | ☒ Plumbing |
| | ☐ Construction and Demolition Sites |

Problem

Article 2.3.4.5. of Division B of the National Plumbing Code of Canada (NPC) requires that nominally horizontal piping inside a building be braced to prevent swaying and buckling, and to control the effects of thrust. The intent of this provision is to ensure structural stability and maintain the functional performance of piping systems.

Sentence 2.5.6.1.(1) requires vent piping to be installed without depressions in which moisture can collect. While this requirement is explicitly for vent systems, drainage piping is subject to comparable installation conditions, material properties, and long-term structural influences. As with vent piping, improper support spacing, inadequate bracing, long-term pipe deflection, and building settlement can all result in sagging or depression in horizontal drainage piping.

Depressions in drainage piping systems may create unintended low points, or stagnant zones, where solids and wastewater can accumulate, potentially reducing flow and hydraulic efficiency and increasing the likelihood of blockage, foul odours and

unsanitary conditions. Over time, such conditions can lead to more frequent maintenance requirements and, in severe cases, lead to surcharge or backflow into occupied spaces.

This proposed change adds sagging and depression avoidance to the required installation practices for drainage piping in Article 2.3.4.5. It clarifies the connection between the intended piping installation and the long-term performance of the drainage system, reduces maintenance risks, and aligns drainage installation practices with the established intent of the structural support requirements.

Justification

Article 2.3.4.5. is primarily framed as a structural support requirement. It does not currently explicitly link the presence of sagging or depression to drainage system performance; however, the intent of the provision is to prevent the failure of the drainage piping system, which would include the prevention of sagging and depression in addition to swaying and buckling.

The proposed change to Article 2.3.4.5. is intended to clarify that the prevention of sagging or depression is not solely a structural consideration but also essential to maintaining proper drainage performance. Further, since vent and drainage systems commonly use similar piping materials and support methods, reinforcing the requirement for horizontal drainage piping to be installed to prevent depression would promote consistency across system types and align installation practices.

This proposed change would maintain flow, reduce the likelihood of localized buildup, and enhance long-term drainage system efficiency. It would also reduce the risk of high maintenance frequency and service disruption and protect occupants from foul odours and the potential health concerns associated with waste retention.

PROPOSED CHANGE

[2.3.4.5.] 2.3.4.5. Support for Horizontal Piping

- [1] 1)** *Nominally horizontal* piping that is inside a *building* shall be braced to prevent swaying, ~~and~~ buckling, sagging and depression and to control the effects of thrust.

Impact analysis

The proposed clarification would not introduce new materials, technologies or system components. Rather, it would reinforce established system design and installation practices to ensure that the drainage piping referred to in Article 2.3.4.5. is installed in a way that maintains continuous flow in the direction of drainage, without sagging or depression.

The required slope of drainage piping, including minimum gradients based on pipe size, is already referenced in the NPC. In addition, maximum spacing for supports for aboveground horizontal piping is specified in Article 2.3.4.5., and requirements for underground piping support are addressed in Article 2.3.4.6.

Adequate support spacing, including hangers installed at prescribed intervals and near fittings, helps maintain proper alignment and prevents sagging over time. The use of approved piping materials, avoidance of excessive unsupported spans, and proper coordination during installation further reduce the likelihood of low points forming. For underground piping, proper bedding, backfill placement, and compaction are essential to prevent post-installation settlement that could result in depressions.

In aboveground installations, compliance may require careful verification of support spacing and slope during rough-in. In some cases, minor adjustments to hanger placement or additional supports may be necessary to maintain alignment, particularly for longer horizontal runs or larger pipe sizes. However, pipe supports are already required under existing Code provisions; therefore, any additional cost would generally be limited to incremental labour for alignment verification or minor support adjustments, which would be necessary to achieve compliance with the existing Code requirements regardless.

In residential construction, compliance may require minor additional fasteners or hanger adjustments during installation. In commercial applications, coordination of pipe supports within ceiling spaces or service corridors may require some additional attention to maintain grade and prevent deflection. These measures are consistent with, and would already be necessary to meet, existing Code provisions; therefore, the impacts are expected to be limited and installation-specific.

Verification during installation, such as confirming slope and alignment prior to concealment, supports the consistent enforcement of the requirement. Where minor deviations are identified, corrective action during construction, such as adjusting hangers or regrading short sections, is typically less costly than addressing performance issues after occupancy.

Overall, the incremental impacts associated with this proposed change are primarily related to installation quality and inspection verification rather than material costs. By reinforcing proper support and slope control, the proposed change is expected to improve long-term drainage performance, reduce the likelihood of the accumulation of solids or wastewater, reduce the likelihood of blockages, and decrease maintenance interventions over the service life of the system, resulting in a net positive lifecycle impact.

Enforcement implications

This proposed change is expected to require limited need for additional Code enforcement resources.

Who is affected

This proposed code change may affect a broad range of stakeholders involved in the design, specification, manufacture, approval, construction, and operation of drainage systems, including but not limited to designers, specifiers, manufacturers, building owners, contractors and building officials.

OBJECTIVE-BASED ANALYSIS OF NEW OR CHANGED PROVISIONS

[\[2.3.4.5.\]](#) 2.3.4.5. ([\[1\]](#) 1) [F20-OS3.1]

[\[2.3.4.5.\]](#) 2.3.4.5. ([\[1\]](#) 1) [F20-OH2.1,OH2.3]

[\[2.3.4.5.\]](#) 2.3.4.5. ([\[1\]](#) 1) [F20-OP5]