

Proposed Change 2132

Code Reference(s):	NPC25 Div.B 2.4.7.1.(7) (first printing) NPC25 Div.B 2.4.7.2. (first printing)
Subject:	Drainage Systems
Title:	Spacing of Cleanouts in Vertical Drainage Pipes
Description:	This proposed change introduces a requirement for the spacing of cleanouts in stacks serving sinks, where provided.
Related Code Change Request(s):	CCR 1941

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 2.4.7.2. of the National Plumbing Code of Canada (NPC) outlines requirements for the nominal pipe size and spacing of cleanouts in nominally horizontal drainage pipes, as well as other requirements for manholes, developed length of building sewers, and rodding. Table 2.4.7.2., specifically, addresses the spacing of cleanouts for horizontal drainage pipes.

The installation of cleanouts in horizontal drainage pipes at a maximum interval spacing, as required by the Code, is considered more important than that in vertical pipes because horizontal pipes are more prone to buildup. Grease, debris or sediment can build up in these pipes due to the slower flow where they gradually slope. As a result, these cleanouts need to be more accessible and closely spaced to allow for rodding when blockages occur.

Cleanout spacing in vertical drainage pipes has been considered less critical, as gravity facilitates flow, reducing the likelihood of blockages in vertical stacks. However, modern plumbing systems often use high-efficiency fixtures, which reduce the flow of water

through drainage pipes. While this reduced flow helps conserve water, it also means there is less force to carry solids through stacks, which increases the risk of buildup and blockages over time.

While the NPC currently includes a requirement for cleanout fittings in vertical stacks in Sentence 2.4.7.1.(7), this proposed change specifies the maximum spacing where cleanouts are installed in vertical drainage stacks serving sinks.

Justification

Failure to specify a maximum spacing for cleanouts in vertical drainage stacks serving sinks could lead to limited access for maintenance and result in the need for costly cleanup and repairs, as blockages are more difficult to remove without proper entry points. The intent of this proposed change is to reduce the likelihood that improper design or placement of these cleanouts (or access covers) would limit access for maintenance or increase the risk of drainage system blockages and surcharge, which can lead to unsanitary conditions and harm to building occupants.

In some cases, limited access to the vertical drainage system may be attempted through a sink drain by removal of the trap and insertion of rodding equipment. While this approach may provide a more affordable and less invasive option for minor or localized blockages, it is not always feasible for blockages located deeper within a vertical stack and may not provide sufficient access for effective maintenance. Also, this method is not prescribed by the Code and should not be considered a substitute for properly installed cleanouts.

By establishing a maximum spacing interval of 15 m for cleanouts in certain drainage stacks, this proposed change would update the NPC to provide a requirement that addresses the risk of blockages and facilitates maintenance. This proposed change aligns with the capabilities of common maintenance equipment, creates consistency with horizontal cleanout spacing provisions, ensures vertical systems remain efficient and reliable, and provides a reasonable balance between the constructability and long-term maintainability of drainage systems. The interval of 15 m is sufficiently frequent to limit invasive repair work in the event of a blockage while avoiding an unnecessary installation burden.

PROPOSED CHANGE

[2.4.7.1.] 2.4.7.1. Cleanouts for Drainage Systems

[1] 7) *Stacks* shall be provided with

[a] a) a *cleanout* fitting

[i] --) at the bottom of the stack,

[ii] --) not more than 3 m upstream of the bottom of the stack, or

[iii] --) on a Y fitting connecting the stack to the *building drain* or *branch, and*

[b] b) additional *cleanouts* in accordance with Sentence 2.4.7.2.(6).-2030.

[2.4.7.2.] 2.4.7.2. Size and Spacing of Cleanouts

- [1] 1)** Except as provided in Sentences (2), (3) and 2.4.7.1.(6), the *nominal pipe size* and spacing of *cleanouts* in *nominally horizontal* pipes of a *drainage system* shall conform to Table 2.4.7.2.

Table [2.4.7.2.] 2.4.7.2.
Permitted Size and Spacing of Cleanouts in Nominally Horizontal Pipes
Forming Part of Sentence [2.4.7.2.] 2.4.7.2.([1] 1)

Nominal Pipe Size of Drainage Pipe, NPS	Minimum Nominal Pipe Size of Cleanout, NPS	Maximum Spacing, m	
		One-Way Rodding	Two-Way Rodding
less than 3	Same NPS as drainage pipe	7.5	15
3 and 4	3	15	30
over 4	4	26	52

- [2] 2)** The spacing between manholes serving a *building sewer*
 [a] a) of NPS 24 or less shall not exceed 90 m, and
 [b] b) over NPS 24 shall not exceed 150 m.
- [3] 3)** The *developed length* of a *building sewer* between the *building* and the first manhole to which the *building sewer* connects shall not exceed 75 m.
- [4] 4)** Where a *building sewer* connects to another *building sewer* other than by a manhole, the *developed length* between the *building* and the *building sewer* to which it connects shall not exceed 30 m.
- [5] 5)** *Cleanouts* that allow rodding in one direction only shall be installed to permit rodding in the direction of flow.
- [6] --)** Where *cleanouts* are provided on a vertical sink waste *stack*, they shall be installed at intervals not exceeding 15 m, measured from the base of the *stack*.

Impact analysis

Tables 1 and 2 present the estimated costs for cleanout installation and blockage removal, respectively, which have been evaluated to determine the financial implications of the proposed change.

Table 1. Estimated Cost of Cleanout Installation

Category	Estimated Cost ¹ (CAD)	Description
Labour costs	\$180–\$300	1.5 to 2 hours at \$120 to \$150 per hour
Material costs	\$40–\$80	Cleanout fittings and associated materials, depending on pipe size and material
Total	\$220–\$380	Combined estimated labour and materials

Note to Table 1:

- ¹ Exact costs are difficult to estimate, as the required parts may vary significantly depending on site conditions. The estimates provided in this table are based on scenarios involving a limited section of piping and are intended to represent realistic conditions.

The estimated cost of installing a cleanout in a vertical drainage stack is approximately \$250 to \$380 per cleanout. This cost includes the labour and materials required to install the cleanout to help ensure proper access for maintenance over the service life of the drainage system. Although this estimate is presented on a per-cleanout basis, where multiple cleanouts are installed at the same time, the associated labour and initial costs related to site preparation and access may be distributed across the installations. As a result, the average cost per cleanout may be lower when several cleanouts are installed concurrently during construction.

Table 2. Estimated Cost of Blockage Removal Where No Cleanout Is Provided

Category	Estimated Cost ¹ (CAD)	Description
Labour costs	\$720–\$1 500	6 to 10 hours at \$120 to \$150 per hour
Material costs	\$150–\$1 000+	Cleanout fittings, replacement piping and materials for wall or floor repairs
Total	\$870–\$2 500+	Combined estimated labour and materials, depending on the extent of blockage and existing wall and floor finish materials

Note to Table 2:

- ¹ Exact costs are difficult to estimate, as the required parts and the extent of the blockage may vary significantly depending on site conditions. The estimates provided in this table are based on scenarios involving a limited section of piping and are intended to represent realistic conditions.

The estimated total cost of removing a blockage that cannot be accessed from a cleanout point ranges from \$870 to over \$2 500, as shown in Table 2. This total includes the labour required to locate and access the blockage, which often involves cutting and later repairing walls or floors, along with rodding, snaking or hydro-jetting the piping. In addition, the removal process may require the installation of a new cleanout to restore appropriate access, further increasing the total cost. These expenses highlight the importance of ensuring cleanouts are properly installed during construction to avoid significantly higher long-term maintenance costs.

As demonstrated by the cost comparison, the cost of installing cleanouts during construction is significantly lower than the cost of resolving blockages where adequate access is not provided. Depending on how many additional cleanouts must be installed to meet the requirement, compared to existing practices where maximum spacing may not be clearly defined, the proposed change may result in higher initial installation costs due to the provision of additional cleanouts. However, in the event of a blockage, the cost of investigation, access and repair is typically significantly higher than the upfront installation cost.

Blockages can occur in any drainage system; however, the proposed change is primarily relevant to buildings that contain long vertical drainage stacks, such as multi-unit residential buildings, mixed-use buildings, and other multi-storey buildings where drainage stacks serve multiple storeys or multiple dwelling units. The proposed 15 m spacing is intended to address vertical runs where access for maintenance may otherwise be limited over a significant height of stack. It is not expected to have the same level of impact on typical single-family dwelling units, where vertical drainage runs are generally shorter and more readily accessible.

The proposed change would not require a cleanout to be installed for every dwelling unit in a multi-unit building, except in the rare case that the units each have their own dedicated stack exceeding 15 m. Rather, the number and location of cleanouts would depend on the configuration of the drainage system, including stack height, offsets, changes in direction, and available access points. For example, where a vertical run is less than 15 m but includes a significant offset or change in direction, the applicable cleanout requirements for changes in direction and accessible maintenance points would continue to apply.

Similarly, where a vertical stack serves multiple units, the intent is to provide practical access to the stack for maintenance, not to require a separate cleanout for each unit unless needed by the layout of the system. While the frequency of blockages can vary depending on building type, occupancy, system design, and maintenance practices, blockages remain a foreseeable maintenance event over the service life of a drainage system.

The cost impact of additional cleanouts, if necessary, is expected to vary by building type and drainage system configuration. In larger buildings, the cost may be less significant when considered as part of the overall drainage system and distributed across multiple units or storeys. In smaller buildings, particularly single-family dwellings, the proposed change is expected to have limited application unless the building contains unusually long vertical drainage runs. However, where cleanouts are not readily accessible, even infrequent blockages can result in disproportionately high

costs due to invasive repair work, service disruption and potential water damage. Ensuring proper installation from the outset helps mitigate these lifecycle risks, improves the maintainability of the drainage system, and supports long-term performance and reliability.

Enforcement implications

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

Who is affected

This proposed 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

[2.4.7.1.] 2.4.7.1. ([1] 7) [F81-OH2.1]

[2.4.7.2.] 2.4.7.2. ([1] 1) [F81-OH2.1]

[2.4.7.2.] 2.4.7.2. ([2] 2) [F81-OH2.1]

[2.4.7.2.] 2.4.7.2. ([3] 3) [F81-OH2.1]

[2.4.7.2.] 2.4.7.2. ([4] 4) [F81-OH2.1]

[2.4.7.2.] 2.4.7.2. ([5] 5) [F81-OH2.1]

[2.4.7.2.] -- ([6] --) [F81-OH2.1]