PLUMBING SAFETY
Information Bulletin

STANDATA

November 2012

Subject: EXPANSION AND CONTRACTION for drainage, venting and water distribution systems (including water hammer)

This bulletin has been jointly developed by Safety Services and the Plumbing Technical Council to inform the plumbing industry of the requirements associated with the installation of expansion joints to protect the drainage and venting systems in multi-storey buildings.

Designers, Installers and **Safety Codes Officers** are reminded that expansion joints, water hammer arresters or other equivalent protection is required to reduce the probability of damage to the piping system in buildings. Expansion, contraction or water hammer that is **not** accounted for could lead to leakage and/or breakage of drainage systems, venting systems and water distribution systems. Piping system failure could lead to a health risk, where microbiological growth or exposure to waste products could occur or result in major property damage.

The design and installation of every piping system shall include a means to accommodate It's expansion and contraction caused by temperature changes, movement of the soil, building shrinkage or structural settlement in accordance with Division B **Article 2.3.3.9** of the National Plumbing Code of Canada (NPC) 2010.

The Installer shall confirm the expansion rates for the piping materials being installed in accordance with good engineering practice and by using the linear expansion table in Appendix A of the NPC. In addition, experience has shown that shrinkage can be as much as ¾ of an inch per floor depending on the moisture content and height of the wood framing.

As a result, the installation of plastic piping supported with a single riser clamp on alternate storeys would require an expansion joint on alternate floors (see attached drawing). However, this is contingent on the piping design and the method of fire stopping. If riser clamps are installed on the top and bottom of each floor, an expansion joint will be required on each floor.

Residential plumbing systems often have quick closing valves on devices such as icemakers, dishwashers and clothes washers. Commercial systems have many potential locations where water distribution systems could be exposed to the effects of water hammer. Air chambers made from vertical pipe cannot provide acceptable protection and are considered unacceptable. Manufactured water hammer arrestor's are required and shall be installed following manufactures installation instructions to ensure proper protection for

Alberta Government

Issue of this STANDATA is authorized by the Administrator

[Original Signed]

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SAFETY CODES COUNCIL

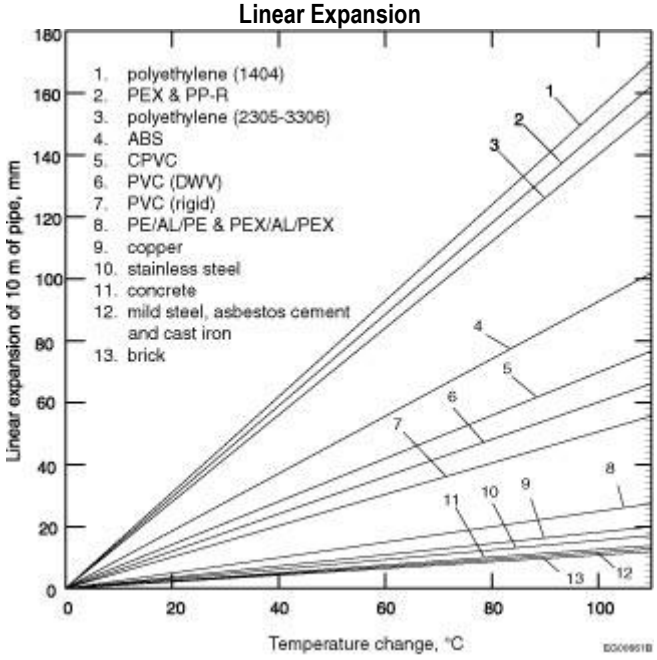
the piping system. This protection shall be provided to address water hammer in accordance with division B article 2.6.1.9. of the national plumbing code (NPC) 2010 for all water distribution systems.

Water distribution systems that are exposed to thermal expansion shall be protected by a suitably sized diaphragm expansion tank designed for use with the potable water system, an auxiliary thermal expansion relief valve conforming to CAN/CSA - B125 “plumbing fittings”, set at a pressure of 550K PA or less in designed for repeated use or other equally effective means. Thermal expansion shall be addressed when required in accordance with division B Article 2.6.1.11. of the national plumbing code (NPC) 2010.

The purpose of this notice is to clarify responsibilities under the *Safety Codes Act*. The **Designers** and **Installers** shall ensure that the design and installation of plumbing systems in all buildings complies with the *Act* and in accordance with the regulations.

A-2.3.3.9. Linear Expansion

Figure A-2.3.3.9.
Linear Expansion

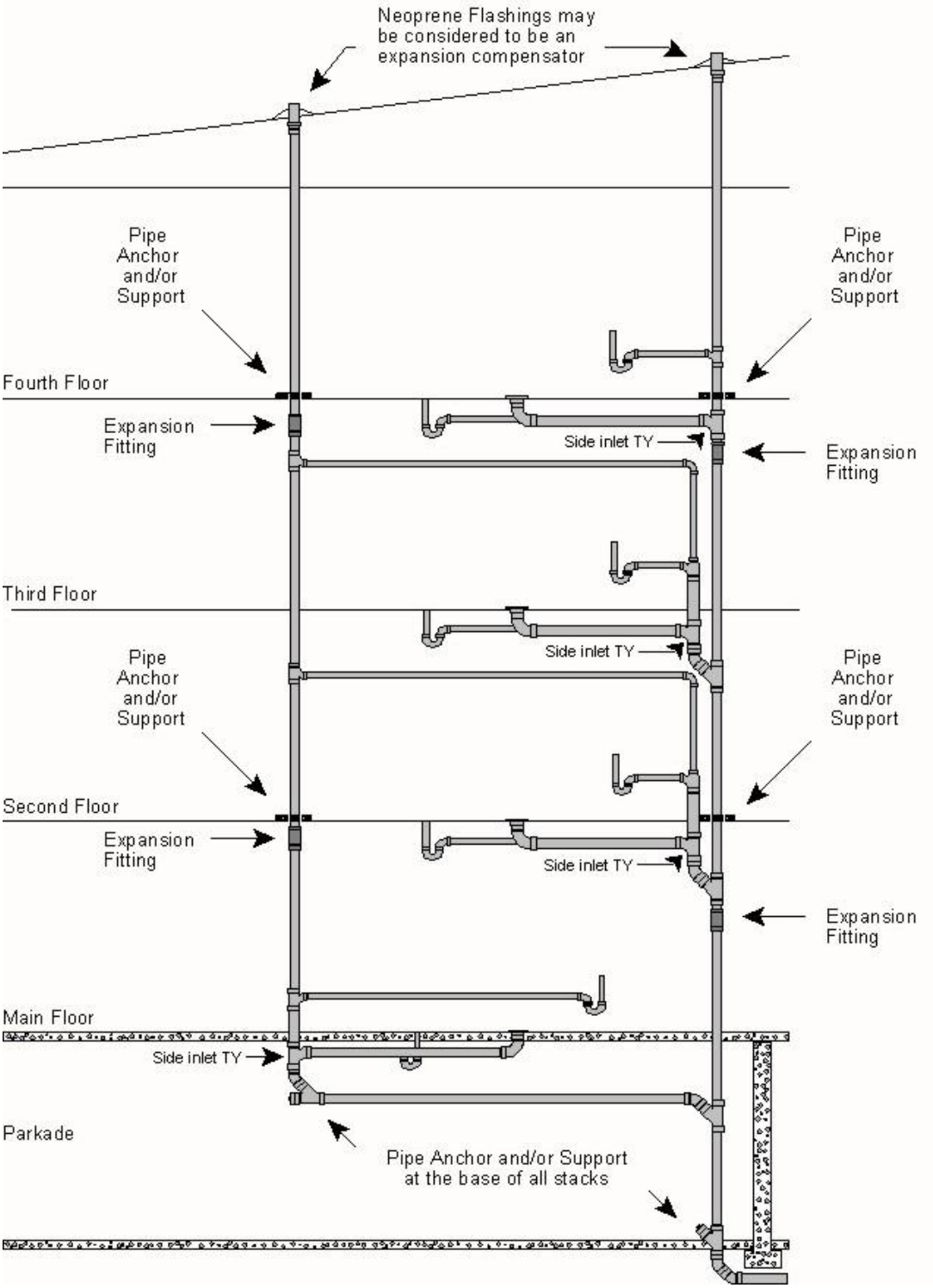


Example: To determine the expansion of 20 m of ABS pipe for a temperature change from 10°C to 60°C.

- Temperature change = 60 – 10 = 50°C,
- Enter the chart at 50°C, read up to ABS line, and then across to the mm scale = 47 mm/10 m of pipe,
- ∴ change in length of 20 m of pipe =

$$\frac{20}{10} \times 47 = 94 \text{ mm}$$

Expansion/Contraction Compensation



NOTE: This typical drawing is of a general nature and does not necessarily include the allowances that must be taken into account in each specific installation.