

Technical Solution Sheet 5.11

5: Cold Water Plumbing

Use of Steel Pipe (Tube) In Water Services

AIM

The aim of this technical solution is to inform practitioners about limitations on the use of steel pipe (tube) in drinking water services, and firefighting water services.

PLUMBING REGULATIONS 2008

The Plumbing Code of Australia (PCA) is adopted by and forms part of the Plumbing Regulations 2008. Part B1 of the PCA specifies the objectives and performance requirements related to the installation of cold water services. [AS/NZS 3500.1: Plumbing and drainage Part 1: Water services](#), is a “deemed to satisfy” document listed in Part B1 of the PCA and contains a section on “Materials and products”. The installation of firefighting water services must be in accordance with [AS/NZS 3500.1](#), and local regulatory requirements.

BACKGROUND

In water services used for general purposes, there is a continual flow of oxygenated water. In galvanized or black steel pipes, the flow of oxygenated water will cause internal corrosion that will both reduce the bore of the pipe and corrode the pipe material ultimately resulting in leaks. Under certain environmental conditions, especially below ground, the external galvanizing coating may also be subject to rapid corrosion.

[AS/NZS 3500.1](#) prohibits the use of any steel pipes in drinking water systems. All materials and products in contact with drinking water

must comply with [AS/NZS 4020 Testing of products for use in contact with drinking water](#).

There are also restrictions on the use of steel pipes in fire services located above and below ground, and this applies to both galvanized and black steel pipes.

GALVANIZED COATING

The life or durability of galvanized steel pipe and fittings is proportional to grams/metre² (g/m²) coating. The thickness and method of application of the galvanized coating will determine the life of the pipe and not the wall thickness of the pipe itself. The internal and external coating on pipes and fittings must be a minimum of 300g/ m² hot-dipped galvanizing to [AS/NZS 4680: Hot-dip galvanised \(zinc\) coatings on fabricated ferrous articles](#) or [AS/NZS 4792: Hot-dip galvanised \(zinc\) coatings on ferrous hollow sections](#), applied by a continuous or a specialized process. Any damage to the galvanized coating when installing the pipes must be repaired using a zinc rich primer or equivalent in accordance with [AS/NZS 4792](#).

STEEL PIPE IN HYDRANT AND BOOSTER SYSTEMS

[AS 2419.1: Fire hydrant installations - System design, installation and commissioning](#) currently requires that steel pipes be manufactured to [AS 1074: Steel tubes and tubulars for ordinary service](#). Pipe sizes less than DN80 must be “Heavy” gauge, and for DN80 and larger may be “Medium” gauge.

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Where any steel pipe is used in hydrant systems it must be galvanized.

Galvanized steel fire hydrant or booster riser pipes may be installed below ground, however the maximum length permitted below ground level is 1.5 metres. The riser, including any fittings, must be protected against corrosion by double continuous wrapping in petrolatum tape.

Steel pipes can only be used in fire services (non-drinking water) downstream of the principal backflow device which is usually fitted at the property boundary.

Steel pipes cannot be used upstream of the backflow device i.e. on a fire service between the water main and the inlet of the backflow device (see Figure 1). Steel pipes must not be used where hose reels are permitted to be part of a drinking water service.

LIGHT WALL STEEL PIPE

Where permitted by the relevant installation standards for fire services, light wall steel pipe may be used – refer to [AS 2118.1: Automatic fire sprinkler systems](#) and [AS 2419.1](#). The straight lengths of pipe must be marked as required in [AS 2118.1](#) and [AS 2419.1](#) throughout the length and at intervals not exceeding 1 metre.

The water authority's "Conditions of Approval" for the fire service installation usually specify that the fire service can only be used for firefighting purposes. It is essential that these conditions of approval be observed.

Fire services must be installed in accordance with Section 6, [AS/NZS 3500.1](#) and the requirements of the relevant regulatory authority.

FIGURE 1 - TYPICAL HYDRANT AND BOOSTER SYSTEM CONNECTION

