

A GUIDE TO PLUMBING UNDER-SLAB INSPECTIONS

Purpose

The purpose of this brochure is to provide owners, plumbers, and contractors of the current BC Plumbing Code requirements in relation to under-slab plumbing inspections.

References

BC Plumbing Code (Current) Sections 2.3 (BCPC)
BC Building Code (Current) Sections 9.31 (BCBC)
Manufacturer specs for Radiant/Hydronic Heat Pipe

Definitions

Water Column: Water filling the piping system, measured vertically.

Radiant/Hydronic: A system of heating or cooling by circulating fluid.

Requirements

BCPC

2.3.6.1 Tests and Inspection of a Drainage or Vent System

1) . . . before any fixture is installed or piping is covered, a water pressure test or air pressure test shall be conducted.

2.3.6.4 Water Pressure Tests

- 1) A water pressure test shall consist in applying a water column of at least 3m to all joints.
- 2) a) the system or section shall be kept filled for 15 min.

2.3.6.5 Air Pressure Test

- 1) a) air shall be forced into the system until a pressure of 35 kPa is created, and
b) this pressure shall be maintained for at least 15 min without drop in pressure.

2.3.7.2 Pressure Tests of a Potable Water System

- 1) a) without leaking, a water pressure that is at least equal to the maximum in-service pressure, or
b) an air pressure of not less than 700 kPa for at least 2 h without drop in pressure.

BCBC

9.31.4.3 Floor Drains

1) Where gravity drainage to a sewer, drainage ditch or dry well is possible, a floor drain shall be installed in a basement forming part of a dwelling unit.

Implementation

Visual Inspection

Joints, connections and traps need to be covered and visible for under-slab inspection.

Water Test for DWV

The draining in the under-slab needs at **least one stack of 10' (3m)**, filled with water for a minimum of 15 minutes with no leaks. In order to keep it upright for the test it may need support. This can be achieved by securing it to a foundation wall or using site build supports (e.g.

two 2x4 braces secured to the pipe near the top and staked into the ground). To extend the piping the workable site height, a mechanical (Frenco) or glued coupling can be used, and then removed after the inspection.

Air Test for DWV

An air test of 5 psi for 15 minutes is also acceptable and recommended when there is a risk of freezing temperatures.

Guards less than 4.2 m above grade or an adjacent level do not need to meet the requirement to not facilitate climbing. All other requirements including loads on guards, height, and size of openings must be adhered to.

Cable guards will require Letters of Assurance from a Registered Professional to ensure minimum loading and tensile strength requirements are adhered to.

Background and Technical Information

Glass Guardrail Systems

The use of glass guardrail systems has been increasing for a number of years and has led to questions on the structural integrity of the glass and rail components as well as impact resistance to objects both horizontally and vertically. Glass is a strong material but is very brittle and must be designed to meet structural loads and have redundancy of fail-safe load transfer. Failure of the glass can result in instantaneous failure resulting in no protection for a fall hazard.

Concerns with structural failures when glass is used as the main structural component:

- No top rail to resist vertical & horizontal impacts
- Tempered glass fails instantaneously into many blunt pieces
- Manufacturing of glass can include imperfections in the glass, which can expand and cause the glass to fail
- Design and installation of framing brackets. Who is designing for the loads and ensuring proper installation in the field?

Loads within the BCBC are expressed in kN or kN/m (kilo Newton metre). In simple terms this is a quantity very similar to 100 Kg (220 lb) of pressure per metre length. If, for example, it is stated that there is 1.0 kN/m it will be approximate to the equivalent of one person weighing 100 kg (220 lbs) putting their full weight on one metre length.

All guards shall be designed to withstand loads specified in BCBC 9.8.8.2. (*see attached*)

BC Building Code requirements

Guard: means a protective barrier around openings in floors or at the open sides of stairs, landings, balconies, mezzanines, galleries, raised walkways or other locations to prevent accidental falls from one level to another. Such a barrier may or may not have openings through it.

Guardrail design

Guards must be constructed so as to be strong enough to protect persons from falling under normal use. Many guards installed in dwelling units or on exterior stairs serving one or two dwelling units have demonstrated acceptable performance over time. All guards shall be designed to withstand loads specified in the BC Building Code. Owners and/or contractors shall be responsible for ensuring documentation is provided at the time of permit plan review, or prior to the installation of the guards. Permit drawings should indicate the guardrail design. Heights and restrictions to openings as outlined in Section 9.8 BCBC must also be adhered to.

9.6.1.3. Structural Sufficiency of Glass

- 1) Except as permitted by Sentence (2), glass used in buildings shall be designed in conformance with
 - a) CAN/CGSB-12.20-M89, "Structural Design of Glass for Buildings", or
 - b) ASTM E-1300, "Standard Practice for Determining Load Resistance of Glass in Buildings" (see also Article 4.3.6.1.)

CAN/CGSB – 12.20-M89 Structural Design of Glass for Buildings

- This is a limit states design code. The code addresses the brittle nature of glass where used as a structural material by stipulating that support members be designed with a redundant load path. The underlying principal being that if one member fails, a cascading or catastrophic failure mechanism does not develop.
- Free standing glass guards must have a top cap which spans over two or more panels and be designed to resist the factored load after failure of alternate panels.
- The deflection of the guard at the point of application of the load, with all panels intact must not exceed 40 mm

9.8.8.2. Loads on Guards

- 1) Guards shall be designed to resist the specified loads prescribed in Table 9.8.8.2. (*see attached*)

9.8.8.7. Glass in Guards

- 1) Glass in guards shall be:
 - a) safety glass of the laminated or tempered type conforming to CAN/CGSB-12.1-M90, “Tempered or Laminated Safety Glass” or
 - b) wired glass conforming to CAN/CGSB-12.11-M, “Wired Safety Glass”

This bulletin is a guide only, prepared to assist homeowners and contractors, and is not to be considered as a substitute for District of Summerland Bylaws and Regulations and current editions of the BC Building Code
