



## Advisory

Effective Sept. 1, 2010

Revised Nov. 1, 2016

*Revisions identified by the delta symbol (Δ)*

Subject:

Hydronic heating system requirements

## Background:

On Nov. 1, 2016, Section 9.36 of the Alberta Building Code introduced new energy efficiency requirements for buildings. This has affected the CSA 214-12 Installation Code for Hydronic Heating Systems and permit requirements. Specifically, hydronic heating systems that are designed as the building's primary heat source or secondary heat source (e.g. a house heated with a forced-air furnace that has hydronic radiant under floor tube in the basement).

## Advisory:

### Inspection requirements:

- All hydronic heating systems require approved drawings to be on-site for review at the time of inspection.  
(Reference: ABC – Directors Interpretation 97-DI-009R1)
- An air test is required at the time of inspection on all in-floor hydronic systems.  
(Reference: B214-12 - 4.5.1 Standard – 60 psi or 1.5 times operating pressure for 1 hour)
- Δ All radiant under-floor or panel type systems must have insulation installed on the underside or back side of the tubing.
  - When tubing is installed in the joist cavity, the cavity must be insulated with material having an R value of at least 12.  
(Reference B214-12 - 14.5.3)
- Δ All radiant in-floor systems in concrete in contact with the ground will have insulation installed on the underside of the floor.
  - When a poured concrete radiant floor system is installed on ground, it must be insulated with a material having an R value of at least 16.13.  
(Reference ABC2014 – 9.36.2.8.)
- Each radiant loop will be tagged to indicate the length and area serviced.  
(Reference B214-12 - 14.3.3)
- Each zone or radiant loop must have a method of system balancing.  
(Reference B214-12 – 13.4)
- The permit holder must request an inspection **before** covering. A safety codes officer will inform the permit holder the day of the inspection if there will be a site visit.

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**Design requirements:**

Hydronic heating systems may be:

1. A pre-engineered package
2. Custom designed by:
  - a. A professional engineer licensed in Alberta, or
  - b. An individual who holds one of the following qualifications:
    - i. A hydronics designer, certified by the Canadian Hydronics Council, or
    - ii. A residential hydronics design technician, as certified by the Heating, Refrigeration and Air Conditioning Institute of Canada

Pre-engineered packages must include basic generic system specifications and installation details prepared by a professional engineer, and any additional system design data and floor plans, specifically applicable to the project. The additional specific system design must be performed by:

1. A professional engineer licensed in Alberta, or
2. An individual who holds one of the following qualifications:
  - a. A hydronics designer, certified by the Canadian Hydronics Council, or
  - b. A residential hydronics design technician, as certified by the Heating, Refrigeration and Air Conditioning Institute of Canada

**Plan and specification requirements:**

For all hydronic heating system designs, the plans and specifications must include, but not limited to:

1. The schematic arrangement of the system and the equipment specifications including, but not limited to: boilers, pumps, expansion tanks, zone controls, mixing valves and other system components, such as supplementary baseboard and/or fan-coil units, water heater, etc. connecting to the system.
2. Boiler room layout, and if required, venting and combustion air provisions for all gas appliances.
3. Piping specifications, spacing, sizes, maximum loop lengths and pipe support details. Floor plans showing a general layout of the piping loops are required for each room or space and the location of the main headers, if applicable.
4. Locations, sizes and specifications for all heat terminal units, such as baseboard heaters, radiators, fan-coil units, etc., if applicable.
5. Cross sections through typical floor assemblies, to show piping loop locations and the type of insulation to be provided.
6. System operating parameters including supply and return water temperatures, design flow rates and heat output coefficient of individual piping loops.

**Note:**

Examples of hydronic heating systems would include, but not limited to:

- Poured-floor radiant tubing
- "Staple-up" radiant tubing
- Convective-plate in-floor tubing
- Radiators
- Baseboard heaters
- Fan-coil units

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