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Bearing Pin Piers

There have been requests for clarification and interpretation of the Minnesota State Building Code and supporting documents to define Inspectrons position of non-compliance of Bearing Pin Piers. The following information shall establish the grounds for our decision.

ICC-ES Evaluation Report ESR-1895:

The ICC report evaluates a product named Diamond Pier, however, this report highlights bearing pin pier performance as an Alternative Material, Design, or Method as defined in Minnesota Building Code Administration, Section 1300.0110 Sobp.13. The report states reference in Section 5.4, The Minnesota Residential Code Section R403.1.4.1. The following code section applies.

ICC-ES Evaluation Report ESR-1895:
Section 5.7.

Frost protection for accessory structures defined by the IRC is beyond the scope of this report, except free standing accessory structures where frost protection is not required.

Minnesota Building Code Administration:
Section 1303.1600, Subpart 1. Minimum footing depth:

In the absence of a determination by an engineer competent in soil mechanics, the minimum allowable footing depth in feet due to freezing is five feet in zone I and 31/2 feet in zone II.

R403.1.4.1 Frost Protection. Footings shall not bear on frozen soil. Foundation walls, piers, and other permanent supports of buildings and structures not otherwise protected from frost shall be protected by one or more of the following methods.

1. Extend below the frost line specified in Table R301.2(1).
2. Constructing in accordance with Section R403.3.
3. Constructing in accordance with ASCE32.

4. Erected on solid rock.
5. Constructed in accordance with Minnesota Rules, Chapter 1303.

SECTION1809
SHALLOW FOUNDATIONS

1809.1General.
Shallow foundations shall be designed and constructed in accordance with Sections 1809.2 through 1809.13.

1809.2Supporting soils.
Shallow foundations shall be built on undisturbed soil, compacted fill material or controlled low-strength material (CLSM). Compacted fill material shall be placed in accordance with Section 1804.5. CLSM shall be placed in accordance with Section 1804.6.

1809.3Stepped footings.
The top surface of the footings shall be level. The bottom surface of footings shall be permitted to have a slope not exceeding one unit vertical in 10 units horizontal (10-percent slope). Footings shall be stepped where it is necessary to change the elevation of the top surface of the footing or where the surface of the ground slopes more than one unit vertical in 10 units horizontal (10-percent slope).

1809.4Depth and width of footings.
The minimum depth of footings below the undisturbed ground surface shall be 12 inches (305 mm). Where applicable, the requirements of Section 1809.5 shall be satisfied. The minimum width of footings shall be 12 inches (305 mm).

1809.5Frost protection.
Except where otherwise protected from frost, foundations and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods:

1. 1.Extending below the frost line specified in Minnesota Rules, part 1303.1600.
2. 2.Constructing in accordance with ASCE 32.
3. 3.Erecting on solid rock.

Exception: Freestanding buildings constructed in accordance with Minnesota Rules, Chapter 1303, shall not be required to be protected.

Shallow foundations shall not bear on frozen soil.

1809.8Plain concrete footings.
The edge thickness of plain concrete footings supporting walls of other than light-frame construction shall be not less than 8 inches (203 mm) where placed on soil or rock.

ICC-ES Evaluation Report ESR-1895:
Section 5.7.

Use of the bearing pin piers where soil constituents, changing water levels or other factors indicate possible deleterious (causing harm or damage) effects on the pier foundation assembly, is beyond the scope of the report.

Stored water in soil is a dynamic property the changes spatially in response to climate, compaction, freeze-thaw cycles, excavation, backfill, change in adjacent topography, and change in watershed to name a few. Soil bulk density may increase or decrease due to changing conditions, therefore, hindering soils ability to move air and water. The soil structure and texture also dictates its ability to move water through subsoil which then could liquify the soil and decrease the load bearing capacity of the soil and increase the potential for heaving due to freezing and thawing.

Based on the forementioned information and supporting references Inspectron Inc **shall not permit Bearing Pin Piers at this time without the following requirements being met.**

- **Soil verification provided by a Soils Engineer licensed in the State of Minnesota.**
- **Structural Engineering to verify the structural assemblies and components meet or exceed the requirements of the Minnesota State Building Code. Lateral load resistance, uplift, frost protection, change in water table, and other applicable code requirements.**
- **All projects will be evaluated individually and site specific.**