



## Pin Foundation

This **Advanced Method and Material** was developed jointly by the City of Bellingham Building Services Division and Sustainable Connections to decrease site excavation, removal of native vegetation, and reduction of resource consumption through the use of pin foundations for homes and structures.



## BENEFITS

Pin foundation systems allow for the construction of structures with substantial loads in areas with soft soils or where existing groundcover retention is desired. Construction requires a heavy duty air compressor and minor labor without any assistance from large machinery. Specific benefits are:

- Can be installed in areas with poor soils/drainage
- Provide high point-load bearing capacity
- Require minimal disturbance and equipment for installation
- Require minimal materials

Building structures in regions with abundant soft soils such as the Northwest generally require large spread footings which require substantial excavation and clearing. Retaining groundcover reduces the potential for soil erosion during and after construction which has significant surface water quality impacts. This foundation approach uses 5-10% of the concrete that would be required for a typical foundation thus regional materials are conserved. The foundation can be removed with relative ease if the structure is to be moved or deconstructed.

## POLICY/CONDITIONS

Pin Foundations may be installed when the following conditions are met:

- The site soils must be reviewed and described by a licensed geotechnical engineer.
- The structure shall be designed by a Washington State licensed architect or engineer specifying lateral load connections to the foundation system.
- Design calculations, a lateral load analysis and foundation specification shall be provided by the pin foundation supplier along with the building permit application.

## COMPLIANCE WITH THESE STANDARDS

- Concrete – ASTM A 820, Type 1 Fiber reinforcing, ACI 318, CRSI
- Steel – ASTM A 53, ASTM A123, ASTM A153
- Connections – per architect or engineer

## SCOPE

Residential and commercial structures, boardwalks, decks, carports and other structures that do not require a basement. Ideal for use in areas with soft soil.

## DEFINITIONS

**Pile Head:** Surface contact point for loads on the pin foundation system. Different sizes are available subject to the desired capacity

**Pin Pile:** Galvanized rod installed through pile head in 4 locations. These are sized by a pin foundation vendor subject to the site soils report.

## PERMIT REQUIREMENTS

In general, the person installing the pin foundation obtains any required permits. For specific information applicants should contact the **COB Permit Center/Building Services Division** for more information: (360) 778-8300 or [permits@cob.org](mailto:permits@cob.org).



## Pin Foundation (cont'd)

### REFERENCES / SOURCES

*Puget Sound Action Team – Low Impact Development – Technical Guidance Manual for Puget Sound*

### FINANCIAL INCENTIVES

#### City of Bellingham

Use of pin foundation will help to meet criteria that could qualify a project for a 50% reduction in the stormwater development charges. See Bellingham Municipal Code 15.16.030 or contact City staff for details and criteria about the reduced stormwater development charges.

Additionally, pin foundation can also be incorporated into a project to help avoid the triggering of the 0.1 cfs increase in flow for the 100-year storm threshold to require stormwater detention or to reduce the required size of stormwater mitigation facilities by using allowed stormwater modeling credits. Credits can be found in Stormwater Management Manual for Western Washington published in 2005 or the Low Impact Development Technical Guidance Manual for Puget Sound.

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### ADDITIONAL RESOURCES

#### Pin Foundations

Details on how to install a reliable and durable foundation with reduced environmental impact. [www.buildinggreen.com](http://www.buildinggreen.com)



#### Puget Sound Partnership

The Puget Sound Partnership is a community effort of citizens, governments, tribes, scientists and businesses working together to restore and protect Puget Sound. [www.psp.wa.gov](http://www.psp.wa.gov)



#### Nooksack Salmon Enhancement Association

Nooksack Salmon Enhancement Association (NSEA) is a community-based nonprofit organization dedicated to restoring sustainable wild salmon runs in Whatcom County. [www.n-sea.org](http://www.n-sea.org)