DPD | Director's Rule 10-2009

Applicant:	Page	Supersedes:
City of Seattle Department of Planning & Development	1 of 3	12-2001
	Publication: 5/18/09	**Effective:** 12/14/09
Subject: Small Diameter Pipe Piles (Pin Piles)	**Code and Section Reference:** SMC Section 1809.3.4	
	Type of Rule: Code Interpretation	
	Ordinance Authority: SMC Section 3.06.040	
Index: Building Code Technical Requirements	**Approved** (Signature on file) **Diane M. Sugimura, Director**	**Date** 12/14/09

BACKGROUND

Section 1809.3.4 of the 2006 Seattle Building Code (SBC) requires driven pipe piles to be a minimum of 8 inches in diameter. The purpose of this Rule is to establish consistency in the level of involvement with design professionals and in the quality of installation and inspections for driven pipe piles with diameters less than 8 inches (also known as "pin piles"). Projects for which pin piles are used generally involve relatively light structures, such as single family residences (foundation repair, small additions, exterior deck support, etc.) and alterations to small commercial buildings.

Pin piles range from 2-6 inches in diameter and generally have capacities ranging from 2 to 15 tons. Design and installation requirements are based on the size and type of pin pile to be used and on the size and type of project, with fewer requirements on smaller projects with smaller capacity piles and more requirements on larger projects with larger capacity piles.

PURPOSE

The purpose of this Rule is to establish, in certain instances, minimum requirements to allow the use of steel pipe piles with diameters of less than 8 inches and to indicate minimum requirements that must be addressed by the design professionals when using this Director's Rule as a standard code alternate to comply with Section 104.10 of the SBC.

RULE

The Department of Planning and Development (DPD) will allow the use of pin piles for axial compressive loading only and for certain types of structures according to the requirements listed in the table below.

Minimum requirements for pin pile installation[1,2]	
Pile Size	
2-inch diameter	• Geotechnical report with analysis required[3] • Geotechnical special inspection required [4] • No ASTM testing • 30 feet maximum length • 3 ton maximum capacity except in liquefaction-prone (ECA 5) and peat settlement-prone (ECA 11) areas • 2 ton maximum capacity in ECA 5 and ECA 11
3-inch diameter	• Geotechnical report with analysis required • Geotechnical special inspection required • ASTM quick test required on minimum 3% of piles up to 5 piles maximum (1 minimum) • Typical capacity 6 tons
4-inch diameter	• Geotechnical report with analysis required • Geotechnical special inspection required • ASTM quick test required on minimum 3% of piles up to 5 piles maximum (1 minimum) • Typical capacity 10 tons
6-inch diameter	• Geotechnical report with analysis required • Geotechnical special inspection required • ASTM quick test required on minimum 3% of piles up to 5 piles maximum (1 minimum) • Typical capacity 15 tons

1. The minimum pile weight for 2-inch diameter pin piles shall be extra strong as noted in the AISC Steel Construction Manual. Pile weight for all other piles shall be as recommended in the geotechnical report.
2. Piles larger than 2 inches in diameter may be designed by the geotechnical engineer for capacities greater than the tabular values, provided adequate justification is submitted to DPD.
3. For additions < 750 square feet, repairs, or alterations to a single family residence or associated structures, an evaluation from a registered architect, engineer or pre-approved contractor may be submitted in lieu of the geotechnical report. For "push piles" (piles pushed into the ground hydraulically rather than driven), a geotechnical report with analysis is required with no exception.
4. The need for special inspections will be determined on a case by case basis. Examples where special inspections would be required include landslide stabilization projects, and projects where there are critical life safety issues directly related to the use of pin piles.

Geotechnical Report. A geotechnical report and analysis shall be prepared by a Washington State Registered Civil Engineer who has experience in soil investigation and design (Geotechnical). The report shall include an analysis that addresses site conditions, driving criteria, pile size, capacity, embedment depth into bearing soil, and shows that the design concept will provide the prescribed pile capacity for the given site conditions. The report shall require a minimum factor of safety of 2 for pile capacity based on the tangent line method of pile load test analysis or an approved alternate. (The Davisson method is not considered appropriate for use with pin piles.) The report shall also address corrosion protection requirements for all work. Geotechnical reports require DPD approval prior to permit issuance.

ASTM Testing. Whenever ASTM testing is required, it shall mean that the pile installation shall be tested in general accordance with ASTM Standard D 1143-81 for Piles under static axial compressive load. Use of the Quick Load Test Method in the Standard is the minimum required.

Geotechnical Inspection. Special inspection shall be as specified for piling in Section 1704.8 of the SBC. Minimum requirements include continuous monitoring of installation and testing of piles, confirming driving criteria, pile length and minimum embedment depth. In addition, daily report submittals and a final summary report stamped by the design professional shall be submitted to DPD. **See footnote 3 of table above for exceptions.**

The intent of this rule is to provide a standard code alternate that provides a set of minimum requirements that more easily allows for the use of pin piles. When submitting a design that conforms to this rule, the following code alternate statement must be included on the project documents:

> "It is recognized that the SBC requires 8-inch minimum diameter pipe for pipe pile installation. The appropriate analysis/evaluation and testing requirements in conformance with Director's Rule 10-2009 are provided to allow for use of piles less than 8 inches in diameter as required by Section 104.9 of the SBC."

Any use of piles smaller than 8 inches in diameter <u>that do not comply</u> with this Rule will require approval as a specific code modification or a code alternate as specified in Section 104.9 or 104.10 of the Seattle Building Code. The code alternate request for piles that do not conform to this rule must include recognition of the 8-inch minimum size requirement of the code and justification for acceptance of piles less than 8 inches in diameter.