

PennDOT e-Notification

Bureau of Business Solutions and Services
Highway/Engineering Applications Division



ABLRFD

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Version 1.11.0.0 User's Manual Revision

The User's Manual for the Department's LRFD Abutment and Retaining Wall Analysis and Design (ABLRFD) Version 1.11.0.0 has been revised to clarify the detailed input description for the PIL command Service Axial Capacity parameter in Section 6.12.4 for piles supported on bedrock. Refer to the revised page attached.

The revised User's Manual been placed on PennDOT servers for use by the Districts. Consultants and others, who have a current license for ABLRFD, can download the revised User's Manual **free** of charge from the PennDOT Engineering Software Support website, <http://penndot.engrprograms.com>. Installation instructions are provided at the website.

Please direct any questions concerning the above to:

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Attachment

Archived copies of all previously distributed e-Notifications can be obtained from the PennDOT LRFD and Engineering Programs website at <http://penndot.engrprograms.com/home> and clicking on "e-Notification" and then "Mailing List Archives."

Chapter 6 Detailed Input Description

6.12 PIL - PILE COMMAND

6.12.3 Pile Embedment

Pile embedment is used when evaluating the punching shear requirements. The program compares the pile embedment to the minimum acceptable value as per DM-4 specifications. The user may describe footing rebar over the piles or alongside the piles (see CVR command).

6.12.4 Service Axial Capacity

The Service Axial Capacity is equal to the smaller of (a) one third the ultimate geotechnical capacity or (b) the service axial structural capacity as indicated below.

For piles driven to refusal on bedrock, use the service **limit** axial structural capacity **equal to the strength limit structural capacity**. The check for geotechnical capacity is **typically** not needed when piles are driven to absolute refusal on bedrock; the structural capacity of the pile should govern.

The service axial capacity for friction piles is assumed to be equal to one third the ultimate geotechnical resistance at Strength Limit State (not one third the factored geotechnical resistance). Refer to DM-4 D10.7.3 for Resistance at Strength Limit State.

6.12.5 Strength Axial Capacity

The Strength Axial Capacity is equal to the smaller of (a) factored geotechnical capacity or (b) the factored strength axial structural capacity as indicated below.

For piles driven to refusal on bedrock, the factored strength axial structural capacity is $\phi f_y A_s$ for steel piles, in accordance with DM-4 D6.15.2. The check for geotechnical capacity is not needed when piles are driven to absolute refusal on bedrock; the structural capacity of the pile should govern. The resistance factor, ϕ , to use for steel piles is given in DM-4 D6.5.4.2. Note that for typical point-bearing piles on non-soluble rock, for axial resistance in compression and subject to damage due to severe driving conditions where use of a pile tip is necessary, a resistance factor of 0.35 shall be used. For typical point-bearing piles on non-soluble rock, for axial resistance in compression under good driving conditions where use of a pile tip is not necessary, a resistance factor of 0.45 shall be used.

For concrete filled steel pipe piles, determine the factored strength axial structural capacity in accordance with DM-4 D5.13.4.7P. The resistance factor, ϕ , to use for concrete piles is given in DM-4 D5.5.4.2.1.

The strength axial capacity for friction piles is equal to the factored geotechnical resistance at Strength Limit State, and is to be computed in accordance with DM-4 D10.7.3.