
PILING

GENERAL

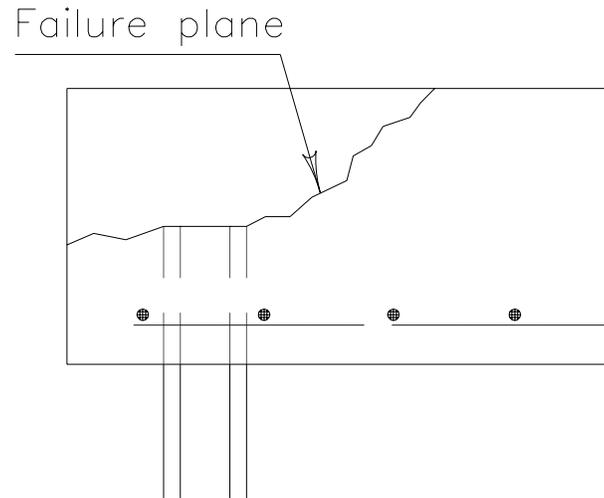
1. All projects with piling shall require a minimum 26,000 ft-lb hammer; therefore, no piling should be used with a section area less than an HP 12 X 53.
2. Alternate piling no longer needs to be identified under the summary of quantities, unless the Geology Report recommends pipe piling as an alternate.
3. Pile type and tip elevations will be given in the Geology Report, and should be shown on the plans with a minimum tip elevation. This minimum tip elevation is normally 10 feet above the estimated tip elevation, unless the designer feels there is unusual geologic circumstances that warrant a recommendation from Geology. The designer should select the size of pile based on actual loads. Generally, maximum economy is achieved by using the largest size piles acceptable in keeping with a reasonable pile spacing and pile footing configuration. It is preferable to have one pile size per project.
4. If the Geology Report indicates that pre-drilling may be required, this requirement shall be discussed with the geologists to determine the reason for the uncertainty. If the requirements remain valid after a structural evaluation by the designer, a pay item should be included on the plans for pre-drilling all piling involved, as though pre-drilling is required.

SPACING

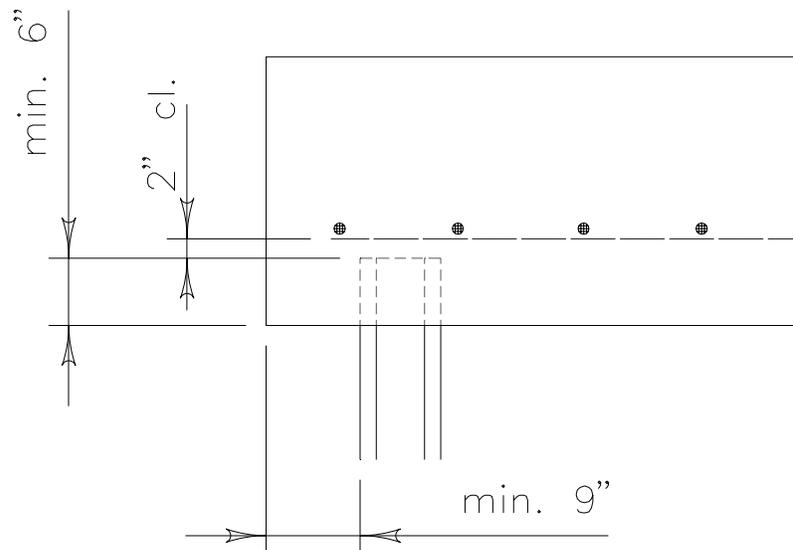
1. Spacing and clearances shall be as per AASHTO except as amended herein.
2. A 6" minimum clear edge distance may be used in special cases where a channel or some other structural element or method is used to align the piles.
3. Pipe piles shall be spaced no closer than 3'-0".
4. For footings only, use a 1'-6" minimum clear edge distance when a group of 5 or fewer piles is used.

ORIENTATION

1. Footings can meet AASHTO punching shear requirements and still fail in a tensile plane as shown by the following sketch:



Therefore, the preferred orientation of piling with a footing is as follows:



2. A "V" bar through the web, or other special tie-down, is normally required only if there is potential for uplift on the pile.

CAISSON DESIGN

The capacity of the soil to support vertical loads from caissons shall be based on end bearing and/or side shear, depending on the type of geological materials in which the caisson is embedded. The plans shall indicate the values of end bearing and side shear used in design.

The use of shear rings or a roughened hole surface shall not be used as a means of increasing the design value of side shear unless the engineer can justify their use. When shear rings or roughened holes are needed the engineer shall request allowable design values for smooth holes, holes with shear rings and roughened holes. The geotechnical engineer shall be requested to dimension the size and spacing of shear rings, these dimensions shall be shown on the plans. Hole roughening methods shall be as stated in the project special provisions.

When shear rings are specified they must be inspected to positively determine the condition of the hole surface. The special provisions shall include defining the inspection method to verify the condition of the holes. No special methods will be necessary when a roughened hole surface is used but the method of roughening must be specified.