10.3 FOUNDATIONS WITH SEAL COURSE

10.3.1 GENERAL

This BDM provides guidance on foundations with a seal course. A seal course should be used when advised by the geoprofessional. A seal course prevents subsurface water from entering the cofferdam. Sealing the bottom of the cofferdam allows the excavation to be dewatered and permits the construction of footing in the dry condition. The seal course is a concrete slab placed underwater by the tremie placement method and is constructed thick enough so that its weight is sufficient to resist uplift from hydrostatic forces. The friction bond between the seal course concrete, the cofferdam, and the piles also helps resist uplift. The seal course is used to facilitate construction and typically has no structural significance. The length and width of the seal course are usually larger than the length and width of the footing. The actual dimensions of the seal course may be equal to the dimensions of the cofferdam constructed in the field.

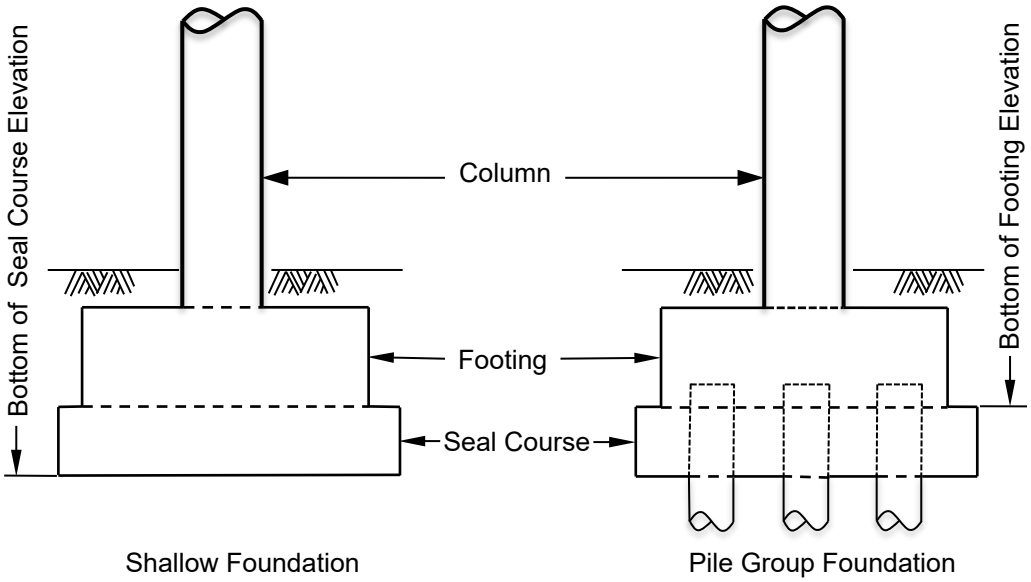

Figure 10.3.1-1 Bridge Footings with Seal Course

Reporting loads to the geoprofessional for foundations with a seal course is the same as reporting loads for foundations without a seal course. Gross bearing stress is calculated at the bottom of the footing elevation shown on the plans. When a seal course is recommended, the geoprofessional should provide the thickness in the foundation report.

The plans should show the bottom of the footing or pile cap elevation and the anticipated seal course thickness.

A seal course may be needed above the soil plug of a CISS pile to facilitate concrete placement under dry conditions. For CISS piles, the plans should show the required limits

of structural concrete and a seal course thickness that is provided in the foundation report. Outside the limits of structural concrete, the steel shell may be occupied by a seal course or soil plug.

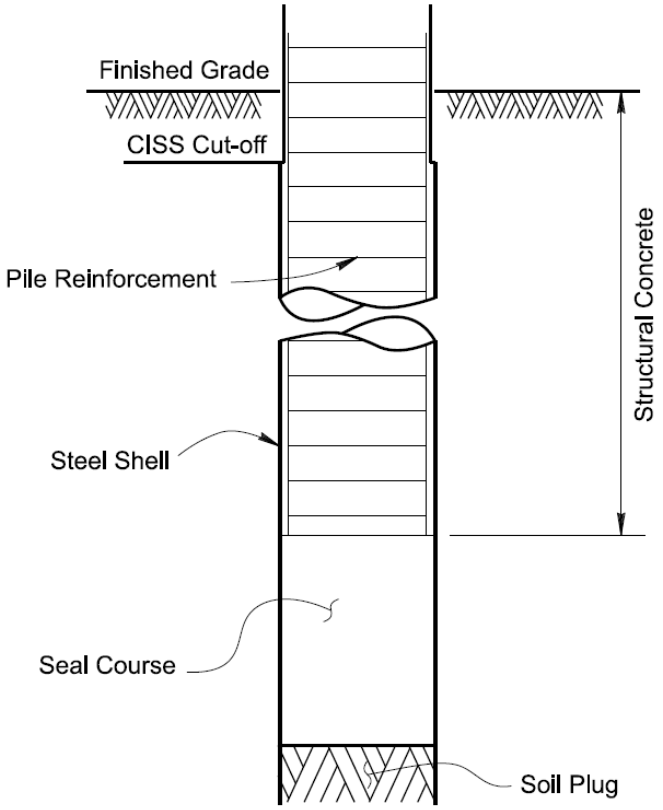

Figure 10.3.1-2 CISS pile with Seal Course

10.3.2 CONSTRUCTION CONSIDERATIONS

In the event that the seal course thickness needs adjustment during construction due to a differing site condition, the preferred option is to keep the bottom of the footing elevation unchanged.

10.3.3 OTHER RESOURCES

The Bridge Design Details 7.4 *Footing with Seal Course* provides the detailing information. The construction and inspection of the seal course can be found in Caltrans *Foundation Manual* Chapter 12, *Cofferdams and Seal Courses*, Bridge Construction Memo (BCM) 19-3.01A, *Earthwork – Structure Excavation and Backfill – Summary*, and BCM 19-3.03B(5) *Earthwork – Structure Excavation and Backfill – Construction – Structure Excavation – Water Control and Foundation Treatment*.