1. **PILES (5-16-17)**

Revise the *2012* *Standard Specifications* as follows:

**Page 4-70, Article 450-2, Materials,** line 2,in the materials table, replace “Neat Cement Grout, Nonshrink” with “Neat Cement Grout, Type 1”.

**Page 4-70, Article 450-2, Materials,** line 8,in the last sentence of the second paragraph, replace “approved by the Materials and Tests Unit.” with “that are on the NCDOT Approved Products List.”

**Page 4-71, Subarticle 450-3(D), Driven Piles,** line 10,add the following after the first sentence of the third paragraph.

Use AASHTO driving stress limits for severe corrosive environments when calcium nitrite corrosion inhibitor is required for prestressed concrete piles.

**Page 4-72, Subarticle 450-3(D)(3), Required Driving Resistance,** lines 26-30, replace first paragraph with the following:

The Engineer will determine if the proposed pile driving methods and equipment are acceptable and provide the blows/ft and equivalent set for the required driving resistance noted in the plans, i.e., “pile driving criteria” except for structures with pile driving analyzer (PDA) testing. For structures with PDA testing, provide pile driving criteria for any bents and end bents with piles in accordance with Subarticle 450-3(F)(4).

**Page 4-73, Subarticle 450-3(E)(1), Pile Excavation,** lines 19-20,in the third sentence of the second paragraph, replace “use smooth or corrugated clean watertight steel casings” with “use smooth non-corrugated clean watertight steel casings”.

**Page 4-73, Subarticle 450-3(F), Pile Driving Analyzer,** lines 45-48, replace third paragraph with the following:

The Engineer will complete the review of the proposed pile driving methods and equipment within 7 days of receiving PDA reports and pile driving criteria. Do not place concrete for caps or footings on piles until PDA reports and pile driving criteria have been accepted.

**Page 4-75, Subarticle 450-3(F), Pile Driving Analyzer,** line 21, add the following to the end of Article 450-3:

* 1. Pile Driving Criteria

Analyze pile driving with the GRL Wave Equation Analysis Program (GRLWEAP) manufactured by Pile Dynamics, Inc. Use the same PDA Consultant that provides PDA reports to perform GRLWEAP analyses and develop pile driving criteria. Provide driving criteria sealed by an engineer approved as a Project Engineer (key person) for the same PDA Consultant.

Analyze pile driving so driving stresses, energy transfer, ram stroke and blows/ft from PDA testing and resistances from CAPWAP analyses correlate to GRLWEAP models. Provide pile driving criteria for each combination of required driving resistance and pile length installed for all pile types and sizes. Submit 2 copies of pile driving criteria with PDA reports. Include the following for driving criteria:

* + 1. Project information in accordance with Subarticle 450-3(F)(3)(a)
		2. Table showing blows/ft and equivalent set vs. either stroke for multiple strokes in increments of 6" or bounce chamber pressure for multiple pressures in increments of 1 psi
		3. Maximum stroke or blows/ft or pile cushion requirements to prevent overstressing piles as needed
		4. GRLWEAP software version information
		5. PDF copy of all pile driving criteria and executable GRLWEAP input and output files

**Page 4-75, Article 450-4, Measurement and Payment,** line 24, add the following after the first paragraph:

*Pile Driving Equipment Setup for \_\_\_\_ Prestressed Concrete Piles*, *Pile Driving Equipment Setup for \_\_\_\_ Steel Piles* and *Pile Driving Equipment Setup for \_\_\_\_ Galvanized Steel Piles* will be measured and paid in units of each. Setting up equipment to drive piles will be measured as one per pile. No payment will be made for pile driving equipment setup for installed piles that are not driven. The contract unit price for *Pile Driving Equipment Setup for \_\_\_\_ Prestressed Concrete Piles*, *Pile Driving Equipment Setup for \_\_\_\_ Steel Piles* and *Pile Driving Equipment Setup for \_\_\_\_ Galvanized Steel Piles* will be full compensation for mobilizing and demobilizing pile driving equipment, personnel, supplies and incidentals, setting up and breaking down pile driving equipment, e.g., pile hammer, crane, template, etc. and submitting the proposed pile driving methods and equipment.

**Page 4-75, Article 450-4, Measurement and Payment,** line 31, in the fifth sentence of the second paragraph, replace “driving piles” with “furnishing and installing piles except for the items paid for separately in this article”

**Page 4-76, Article 450-4, Measurement and Payment,** lines 27-29, replace third sentence of the sixth paragraph with the following:

The contract unit price for *PDA Testing* will be full compensation for performing PDA testing the first time a pile is tested, performing CAPWAP analysis on data collected during initial drive, restrikes and redrives, providing PDA reports, performing GRLWEAP analysis and developing and providing pile driving criteria.

**Page 4-76, Article 450-4, Measurement and Payment,** line 33, add the following after the list headings:

| **Pay Item** |  | **Pay Unit** |
| --- | --- | --- |
| Pile Driving Equipment Setup for \_\_\_\_ Prestressed Concrete Piles | Each |
| Pile Driving Equipment Setup for \_\_\_\_ Steel Piles | Each |
| Pile Driving Equipment Setup for \_\_\_\_ Galvanized Steel Piles | Each |

**PE SEAL NAME**

**PE #**