EXPECTED IMPLEMENTATION JANUARY 2009

DRAFT

455 STRUCTURES FOUNDATIONS.
(REV 8-13-08) (FA 8-29-08) (1-09)

SUBARTICLE 455-5.13 (of the Supplemental Specification) is deleted and the following substituted:

455-5.13 Dynamic Load Tests: The Engineer will take dynamic measurements during the driving of piles designated in the plans or authorized by the Engineer as Dynamic Load Test Piles. Install instruments on test piles and selected permanent piles for dynamic load testing. All test piles will have dynamic load tests. The Engineer will perform Dynamic Load Tests to evaluate any or all of the following:

1. Evaluate suitability of Contractor's driving equipment, including hammer, capblock, pile cushion, and any proposed follower.
2. Determine pile capacity.
3. Determine pile stresses.
4. Determine energy transfer to pile.
5. Determine distribution of soil resistance.
6. Evaluate soil variables including quake and damping.
7. Evaluate hammer-pile-soil system for Wave Equation analyses.
8. Evaluate pile installation problems.
9. Other.

Attach instruments (strain transducers to measure force and accelerometers to measure acceleration) with screws to the pile for dynamic load testing.

Make each pile to be dynamically tested available to drill holes for attaching instrumentation and for wave speed measurements. Support the pile with timber blocks placed at appropriate intervals. Ensure that the pile is in a horizontal position and does not contact adjacent piles. Provide a sufficient clear distance at the sides of the pile for drilling the holes. The Engineer will furnish the equipment, materials, and labor necessary for drilling holes and taking the wave speed measurements. If the Engineer directs dynamic load testing of piles already driven, provide the Engineer safe access to the top of the piles for drilling the attachment holes. After placing the leads provide the Engineer reasonable means of access to the piles to attach the instruments and for removal of the instruments after completing the pile driving.

The Engineer will monitor the stresses in the piles with the dynamic test equipment during driving to ensure the Contractor does not exceed the maximum allowed stresses. If necessary, add additional cushioning, replace the cushions, or reduce the hammer stroke to maintain stresses below the maximum allowable. If dynamic test equipment measurements indicate non-axial driving, immediately realign the driving system. If the cushion is compressed to the point that a change in alignment of the hammer will not correct the problem, add cushioning or change the cushion as directed by the Engineer.

Drive the pile to the required penetration and resistance or as directed by the Engineer. Dynamic load testing of a pile may average up to two hours longer than for driving an uninstrumented pile.

When directed by the Engineer, perform instrumented redrives. Do not use a cold diesel hammer for a redrive unless in the opinion of the Engineer it is impractical to do otherwise. Generally, warm up the hammer by driving another pile or applying at least 20 blows to a previously driven pile or to timber mats placed on the ground.

EXPECTED IMPLEMENTATION JANUARY 2009

SUBARTICLE 455-9.2 (of the Supplemental Specification) is deleted and the following substituted:

455-9.2 Materials: Meet the following requirements:

Concrete .....Section 346
Bar Reinforcement .....Section 931
Prestressing Reinforcement .....Section 933
Steel Sheet Piles .....Section 962*
*For temporary steel sheet piles meet the requirements specified in the plans.

SUBARTICLE 455-11.5 (of the Supplemental Specification) is deleted and the following substituted:

455-11.5 Dynamic Load Tests: Payment will be based on the number of dynamic load tests using instruments attached to the outside of the pile as shown in the plans or authorized by the Engineer, completed and accepted in accordance with the Contract Documents. No separate payment will be made for dynamic load tests used to evaluate the Contractor's driving equipment. This will generally be done on the first test pile or production pile driven on a project with each combination of proposed hammer and pile size and/or a separate pile to evaluate any proposed followers, or piles driven to evaluate proposed changes in the driving system. No payment will be made for dynamic load tests used to evaluate the integrity of a pre-planned epoxy-bonded dowel splice. Include all costs associated with dynamically testing production piles with epoxy-bonded dowel splices in the Pay Item 455-34.

Payment for Dynamic Load Tests will include all costs related to dynamic testing as described in 455-5.13 including the initial instrumented drive, and up to two instrumented set-checks that day. In the event the Engineer requires an instrumented set check or redrive of a pile after the day of initial driving, 1/2 the payment for a Dynamic Load Test will be added to the payment for the set check or redrive.

SUBARTICLE 455-12.5 (of the Supplemental Specification) is deleted and the following substituted:

455-12.5 Dynamic Load Tests:

455-12.5.1 Dynamic Load Tests/ Test Piles: No separate payment will be made for dynamic load tests on test piles. Anticipate all test piles will require dynamic load tests, and include all costs associated with dynamic load tests in the pay items for test piles.

455-12.5.2 Dynamic Load Tests/ Production Piles: Price and payment will be full compensation for all labor, equipment, and materials required to assist the Engineer in performing this work. Payment for each dynamic load test on a production pile authorized by the Engineer will be made as 20 feet of additional piling.

SUBARTICLE 455-12.15 (of the Supplemental Specification) is deleted and the following substituted:

455-12.15 Payment Items: Payment will be made under:

Item No. 455- 2- Treated Timber Piling - per foot.

EXPECTED IMPLEMENTATION JANUARY 2009

Item No. 455- 14-	Concrete Sheet Piling - per foot.
Item No. 455- 18-	Protection of Existing Structures - lump sum.
Item No. 455- 34-	Prestressed Concrete Piling - per foot.
Item No. 455- 35-	Steel Piling - per foot.
Item No. 455- 36-	Concrete Cylinder Piling - per foot.
Item No. 455- 37-	Fiberglass Structurally Reinforced Composite Piles-per foot.
Item No. 455-119-	Test Loads- each.
Item No. 455-120-	Point Protection - each.
Item No. 455-133-	Steel Sheet Piling - per square foot.
Item No. 455-143-	Test Piles (Prestressed Concrete) - per foot.
Item No. 455-144-	Test Piles (Steel) - per foot.
Item No. 455-145-	Test Piles (Concrete Cylinder) - per foot.

SUBARTICLE 455-15.1.3 (of the Supplemental Specification) is deleted and the following substituted:

455-15.1.3 General Methods & Equipment: Perform the excavations required for the shafts and bell footings, through whatever materials encountered, to the dimensions and elevations shown in the Contract Documents, using methods and equipment suitable for the intended purpose and the materials encountered. Provide equipment capable of constructing shafts supporting bridges to a depth equal to the deepest shaft shown in the plans plus 15 foot or plus three times the shaft diameter, whichever is greater, except when the plans require equipment capable of constructing shafts to a deeper depth. Provide equipment capable of constructing shafts supporting non-bridge structures, including mast arms, signals, signs and light supports to a depth equal to the deepest shaft shown in the plans plus 5 feet.

Construct drilled shafts according to the Contract Documents using generally either the dry method, wet method, casing method, or permanent casing method as necessary to produce sound, durable concrete foundation shafts free of defects. Use the permanent casing method only when required by the plans or authorized by the Engineer. When the plans describe a particular method of construction, use this method except when permitted otherwise by the Engineer after field trial. When the plans do not describe a particular method, propose a method on the basis of its suitability to the site conditions and submit it for approval by the Engineer.

Set a suitable temporary removable surface casing to at least 1-1/2 shaft diameters below the ground surface to prevent caving of the surface soils and to aid in maintaining shaft position and alignment except as noted in 455-15.8.3. The Engineer may require predrilling with slurry and/or overreaming to the outside diameter of the casing to install the surface casing at some sites.

SUBARTICLE 455-15.2 (of the Supplemental Specification) is deleted and the following substituted:

455-15.2 Dry Construction Method: Use the dry construction method only at sites where the ground water table and soil conditions, generally stiff to hard clays or rock above the water table, make it feasible to construct the shaft in a relatively dry excavation and where the

sides and bottom of the shaft are stable and may be visually inspected by the Engineer prior to placing the concrete.

In applying the dry construction method, drill the shaft excavation, remove accumulated seepage water and loose material from the excavation and place the shaft concrete in a relatively dry excavation.

Use the dry construction method only when shaft excavations, as demonstrated in a test hole, have 12 inches or less of seepage water accumulated over a four hour period, the sides and bottom remain stable without detrimental caving, sloughing, or swelling for a four hour period, and the loose material and water can be satisfactorily removed prior to inspection and prior to placing concrete. Use the wet construction method or the casing construction method for shafts that do not meet the requirements for the dry construction method.

SUBARTICLE 455-15.6.2 (of the Supplemental Specification) is deleted and the following substituted:

455-15.6.2 Cores: Take cores when shown in the plans or directed by the Engineer to determine the character of the material directly below the shaft excavation. Provide equipment to retrieve the core from a depth of 5 times the diameter of the drilled shaft below the bottom of the drilled shaft excavation in accordance with ASTM D 2113 Standard Practice for Diamond Core Drilling for Site Excavation. Cut the cores with an approved core barrel to a minimum depth of 3 times the diameter of the drilled shaft below the bottom of the drilled shaft excavation after completing the shaft excavation, as directed by the Engineer. The Engineer may require the Contractor to cut any core to a total depth below the bottom of the drilled shaft excavation of up to 5 times the diameter of the drilled shaft.

For cores or pilot holes, use only a double or triple wall core barrel designed:

(a) to cut a core sample from 4 to 6 inches in diameter, at least 5 feet in length, and,

(b) so that the sample of material cored can be removed from the shaft excavation and the core barrel in an undisturbed state, and

The Engineer will inspect the cores and determine the depth of required excavation. When considered necessary by the Engineer, take additional cores. Place the core samples in suitable containers, identified by shaft location, elevation from and to, and job number, and deliver to the Department within 48 hours after cutting. When called for in the plans, substitute Standard Penetration Tests (SPT) for coring. In such cases, supply these tests at no additional cost per foot to the Department above that bid for core (shaft excavation).

Provide areas for the disposal of unsuitable materials and excess materials as defined in 120-5 that are removed from shaft excavations, and dispose of them in a manner meeting all requirements pertaining to pollution.

When shown in the plans, excavate bells to form a bearing area of the size and shape shown. Bell outlines varying from those shown in the plans are permissible provided the bottom bearing area equals or exceeds that specified. If the diameter of the bell exceeds three times the shaft diameter, drill the excavation deeper as directed and form a new bell footing. Excavate bells by mechanical methods.

Furnish the additional drilled shaft concrete over the theoretical amount required to complete filling any excavations for bells and shafts which are larger than required by the plans or authorized by the Engineer, at no expense to the Department.

EXPECTED IMPLEMENTATION JANUARY 2009

SUBARTICLE 455-16.3 (of the Supplemental Specification) is deleted and the following substituted:

455-16.3 Support, Alignment, and Tolerance: Tie and support the reinforcing steel in the shaft so that the reinforcing steel will remain within allowable tolerances as specified in 455-20 and Section 415.

Use concrete wheels or other approved noncorrosive spacing devices near the bottom, within 3 feet of the top, and intervals not exceeding 15 feet along the shaft to ensure concentric spacing for the entire length of the cage. Do not use block or wire type spacers. Use a minimum of one spacer per 30 inches of circumference of cage with a minimum of three at each level. Provide spacers at the bottom of the drilled shaft reinforcing cage to maintain the specified distance between the bottom of the cage and the bottom of the shaft. Use a minimum of one spacer per 30 inches of cage circumference with a minimum of three spacers. Use spacers constructed of approved material equal in quality and durability to the concrete specified for the shaft. The Engineer will approve spacers subject to satisfactory performance in the field.

Check the elevation of the top of the steel cage before and after placing the concrete. If the rebar cage is not maintained within the specified tolerances, correct it as directed by the Engineer. Do not construct additional shafts until modifying the rebar cage support in a manner satisfactory to the Engineer.

SUBARTICLE 455-17.2(of the Supplemental Specification) is deleted and the following substituted:

455-17.2 Placement Time Requirements: The elapsed time for placing drilled shaft concrete includes the concrete mixing and transit time, the concrete placement time, the time required to remove any temporary casing that causes or could cause the concrete to flow into the space previously occupied by the casing, and the time to insert any required column steel, bolts, weldments, etc. Maintain a minimum slump of 4 inches throughout the elapsed time. Use materials to produce and maintain the required slump through the elapsed time that meets the class of concrete specified. Provide slump loss tests that demonstrate to the Engineer that the concrete will maintain a 4 inch or greater slump for the anticipated elapsed time before beginning drilled shaft construction.

SUBARTICLE 455-23.3 (of the Supplemental Specification) is deleted and the following substituted:

455-23.3 Unclassified Shaft Excavation: The quantity to be paid for will be the length, in feet, of unclassified shaft excavation of the diameter shown in the plans, completed and accepted, measured along the centerline of the shaft from the ground surface elevation after any required excavation per 455-1.2 to the plan bottom of shaft elevation authorized and accepted plus up to 15 feet or 3 shaft diameters, whichever is deeper, of additional excavation as authorized by the Engineer. When drilled shafts are constructed through fills placed by the Contractor, the original ground surface before the fill was placed will be used to determine the quantity of unclassified shaft excavation. When the Contractor elects to use O.D. casing, the quantity as determined above will be multiplied by the factor “F” determined as described in 455-23.1.

EXPECTED IMPLEMENTATION JANUARY 2009

SUBARTICLE 455-40 (of the Supplemental Specification) is deleted and the following substituted:

455-40 Materials.

Meet the following material requirements:

(1) Portland Cement (Types I, II, III, IP, and IS) .....Section 921

(2) Fly Ash, Slag and other Pozzolanic Materials for Portland Cement Concrete.....Section 929

(3) Fine Aggregate (Sand)* .....Section 902

(4) Admixtures.....Section 924

(5) Water .....Section 923

(6)Fluidifier.....ASTM C 937

* The Contractor may use any clean sand with 100% passing 3/8 inch sieve and not more than 10% passing the 200 mesh sieve. The Engineer will only permit Silica Sand except as provided in 902-5.2.3.

SUBARTICLE 455-41 (of the Supplemental Specification) is deleted and the following substituted:

455-41 Grout Mix Proportions.

Use a grout mix consisting of a mixture of Portland cement, fly ash, retarder, sand and water proportioned and mixed to produce a mortar capable of maintaining the solids in suspension without appreciable water gain and which may be pumped without difficulty and fill open voids in the adjacent soils. The grout mix may also include a fluidifier if desired. Proportion these materials to produce a hardened grout of the required strength shown on the plans.