

STRUCTURES FOUNDATIONS - PILING
(REV 8-6-09) (FA 8-27-09) (1-10)

SUBARTICLE 455-5.10.1 (Page 534) is deleted and the following substituted:

455-5.10.1 General: Drive piles to provide the bearing capacities required for carrying the loads shown in the plans. The Engineer will determine pile capacities using the methods described herein. For all types of bearing piles, consider the driving resistance as determined by the methods described herein sufficient for carrying the specified loads as the minimum bearing which is accepted for any type of piles.

The Engineer may accept a driven pile when the pile has achieved minimum penetration, and the minimum required bearing capacity obtained for two consecutive 12 inch increments of driving. At his discretion, the Engineer may also accept a driven pile when the minimum penetration is achieved and driving has reached practical refusal in firm material.

SUBARTICLE 455-5.10.2 (Page 534) is deleted and the following substituted:

455-5.10.2 Bearing Criteria: The Engineer will determine the bearing resistance of the pile using the data received from Embedded Data Collector (EDC) equipment installed in each pile according to the methods described herein.

SUBARTICLE 5-10.3 (Page 534) is deleted and the following substituted:

455-5.10.3 Practical Refusal: Practical refusal is defined as 20 blows per inch with the hammer operating at the highest setting which can be used without exceeding the tension or compressive allowed stresses specified in 455-5.11.2 and less than 1/4 inch rebound per blow. Stop driving as soon as the Engineer determines that the pile has reached practical refusal. The Engineer will generally make this determination within 2 inches of driving. When the required pile penetration cannot be achieved by driving without exceeding practical refusal, use other penetration aids such as jetting or Preformed Pile Holes.

SUBARTICLE 455-5.11.1 (Page 535) is deleted and the following substituted:

455-5.11.1 General: Notify the Engineer two work days prior to placement of piles within the template and at least one work day prior to driving piles. Do not drive piles without the presence of the Engineer.

The Engineer will determine pile capacity of the first production pile at each pier or bent based on the results of a Dynamic Load Test using externally mounted instruments. Allow the Engineer one work day after driving the dynamic load tested pile to analyze the data and determine the damping value for the EDC equipment. After determining the appropriate damping value, the Engineer will determine the capacity of the production piles for each pier or bent based on EDC equipment using the Fixed Method of analysis.

If the EDC does not perform to the satisfaction of the Engineer due to actions of the Contractor, engage a Specialty Engineer to perform Dynamic Load Testing of the pile installation at no additional cost to the Department. Set Dynamic Load Test equipment to the damping value provided by the Engineer prior to driving the production pile.

If the Engineer requires an additional Dynamic Load Test for comparison purposes on piles with a properly functioning EDC, the Contractor will be paid an additional Dynamic Load Test. If the Engineer directs the Contractor to engage a Specialty Engineer to perform Dynamic Load Tests on a pile with a properly functioning EDC, the Specialty Engineer will be paid for as Unforeseeable Work.

The Engineer may also require static load tests to confirm pile capacities. When the Contract Documents do not include pay items for Static Load Tests, they will be paid for as Unforeseeable Work.

SUBARTICLE 455-5.14 (Pages 541 and 542) is deleted and the following substituted:

455-5.14 Pile Lengths: Authorized lengths are provided as Production Pile Order Lengths in the Pile Data Table in the Structure Plans. Use these lengths for furnishing the permanent piling for the structure.

SUBARTICLE 455-7.2 (Page 543) is deleted and the following substituted:

455-7.2 Manufacture: Fabricate piles in accordance with Section 450. Supply and install EDCs in all square prestressed bridge foundation piles in accordance with Index 20602. Ensure the EDCs are installed by the manufacturer's approved personnel.

SUBARTICLE 455-7.8 (Pages 545 and 546) is deleted and the following substituted:

455-7.8 Pre-Planned Splices: Splices shall be made by the doweled splice method contained in the Standard Indexes or may be made using proprietary splices which are listed on the Department's QPL. Splice test piles in the same manner as the production piles. Include in the pile installation plan, the chosen method of splicing and the approximate locations of the splice. Generally, place the splice at approximately the midpoint between the estimated pile tip and the ground surface, considering scour if applicable. Stagger the splice location between adjacent piles by a minimum of 10 feet. Obtain the Engineer's approval prior to constructing any pile sections. Construct piles which are to be spliced using the doweled splice with preformed dowel holes in the bottom section and embedded dowels in the upper section.

When electing to use dowel splices, assist the Engineer in performing a dynamic load test on each dowel spliced pile to verify the splicing integrity at the end of driving. Replace any damaged pile splices in accordance with 455-11.2.7. Provide the Engineer 48 hours advance notification prior to driving piles with epoxy-bonded dowel splices.

Ensure sections of mechanically spliced piles are restrained from rotating with respect to the other sections. Mechanical pile splices shall be capable of developing the following capacities in the pile section unless shown otherwise in the plans and capable of being installed without damage to the pile, EDC, or splice:

a) Compressive strength = (Pile Cross sectional area) x (28 day concrete strength)

b) Tensile Strength = (Pile Cross sectional area) x 900 psi

Pile Size (inches)	Bending Strength (kip-feet)
18	245
20	325
24	600
30	950
36	1600

ARTICLE 455-11 (Pages 549 - 553) is expanded by the following:

455-11.15 Embedded Data Collectors: The quantity to be paid for will be the number of EDCs as shown in the plans or authorized by the Engineer, actually installed in piles, completed and accepted in accordance with the Contract Documents. The price of EDC will include all costs related to the work as described herein.

SUBARTICLE 455-12.15 (Pages 555 and 556) is deleted and the following substituted:

455-12.15 Embedded Data Collectors: Price and payment will be full compensation for all labor, equipment, and materials required to perform this work.

ARTICLE 455-12 (Pages 553 – 556) is expanded by the following:

455-12.16 Payment Items: Payment will be made under:

- Item No. 455- 2- Treated Timber Piling - per foot.
- 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.
- Item No. 455-146- Embedded Data Collector (EDC) - each.