

**STRUCTURES FOUNDATIONS (100% DYNAMIC TESTING OF PILES)
(REV7-1-15)**

SUBARTICLES 455-5.10.1 through 455-5.10.3 are deleted and the following substituted:

455-5.10.1 General: Drive piles to provide the bearing required for carrying the loads shown in the Plans. 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. Determine pile bearing using the method described herein or as shown in the Plans.

For foundations with 100% dynamic testing, the Engineer may accept a driven pile when the pile has achieved minimum penetration and the minimum required bearing obtained for 6 inches of consecutive driving, or the minimum penetration is achieved, driving has reached practical refusal in firm material and the bearing capacity is obtained in all the refusal blows. For foundations not requiring 100% dynamic testing, the Engineer may accept a driven pile when the pile has achieved minimum penetration, the blow count is generally increasing and the minimum required bearing capacity obtained for 24 inches of consecutive 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.

455-5.10.2 Bearing Criteria: For foundations with 100% dynamic testing, the Engineer will determine the bearing of all piles using the data received from dynamic load testing equipment utilizing internally or externally mounted sensors according to the methods describe in 455-5.11.1. For foundations not requiring 100% dynamic testing, the Engineer will determine the number of blows required to provide the required bearing according to the methods described herein. Determine the pile bearing by computing the penetration per blow with less than 1/4 inches rebound averaged through 12 inches each of penetration. When it is considered necessary by the Engineer, determine the average penetration per blow by averaging the penetration per blow through the last 10 to 20 blows of the hammer.

455-5.10.3 Practical Refusal: Practical refusal is defined as 20 blows per inch (or less penetration) with the hammer operating at the highest setting determined by the Engineer, and less than 1/4 inches rebound per blow. Stop driving as soon as the Engineer determines that the pile has reached practical refusal. 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 455-5.11.7 is deleted and the following substituted:

455-5.11.7 Structures Without Test Piles: For structures without test piles or 100% dynamic testing, the Engineer will dynamically test the first pile(s) in each bent or pier at locations shown in the Plans to determine the blow count criteria for the remaining piles. When locations are not shown in the Plans, allow for dynamic load tests at 5% of the piles at each bent or pier (rounded up to the next whole number). If the Engineer requires additional dynamic load tests for comparison purposes, the Contractor will be paid for an additional dynamic load test as authorized by the Engineer in accordance with 455-11.5.

Allow the Engineer one working day after driving the dynamic load tested piles for the Engineer to complete the signal matching analyses and determine the driving criteria for the subsequent piles in the bent or pier.

SUBARTICLE 455-11.5 is deleted and the following substituted:

455-11.5 Dynamic Load Tests: For structures without 100% dynamic testing shown in the Plans, payment will be based on the number of dynamic load tests shown in the Plans, authorized by the Engineer, or required in 455-5.11.7, 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 under Pay Item No. 455-34. No payment will be made for dynamic load tests on test piles. No payment will be made for dynamic load testing on production piles for structures with 100% dynamic testing shown in the Plans.

Payment for attaching equipment to each production pile for dynamic load testing prior to initial driving and as authorized by the Engineer will be 20 feet of additional pile. No payment will be made for attaching dynamic testing equipment for set-checks or redrives.

SUBARTICLE 455-12.5 is deleted and the following substituted:

455-12.5 Dynamic Load Tests:

455-12.5.1 Dynamic Load Tests/ Test Piles: All test piles will require dynamic load tests. Include all costs associated with dynamic load tests in the pay items for test piles.

455-12.5.2 Dynamic Load Tests/ Production Piles: Payment will be full compensation for all labor, equipment, materials, instrumentation and installation required to assist the Engineer in performing this work. Include all costs associated with dynamically testing production piles for structures with 100% dynamic testing shown in the Plans under Pay Item Nos. 455-34-1, 455-35-1 or 455-36-1.

SUBARTICLE 455-12.12 is deleted and the following substituted:

455-12.12 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- 34- Prestressed Concrete Piling - per foot.
- Item No. 455- 34-1 Prestressed Concrete Piling (100% Dynamic Testing) - per foot.
- Item No. 455- 35- Steel Piling - per foot.
- Item No. 455- 35-1 Steel Piling (100% Dynamic Testing) - per foot.

Item No. 455- 36-	Concrete Cylinder Piling - per foot.
Item No. 455- 36-1	Concrete Cylinder Piling (100% Dynamic Testing) - per foot.
Item No. 455-119-	Test Loads - each.
Item No. 455-120-	Point Protection - each.
Item No. 455-133-	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.

Do Not Use Without
CO Specs Authorization