

FY 2020/2021 QC Category No. 9
STATEWIDE INSPECTION GUIDELIST
Structures Foundations

PILE PRE-DRIVING

1. When pre-forming pile holes, verify that the Contractor complies with hole sizes and depths covered in the contract documents. The void between pile and hole must be filled with approved sand or grout. [Spec. 455-5]
2. For concrete piles, verify that the proper number of lifting points is used. Piles must also be stored properly. [Spec. 455-7 & Standard Plan 455-001]
3. Prestressed concrete piles must be inspected for defects as soon as possible upon delivery to the project site. Defects must be reported to the Project Administrator as soon as possible, but in any case, prior to use. [Good Practice, CPAM 10.2.5]
4. Verify jetting operations. Jetting requirements include: no jetting in completed embankments, jetting and driving with external jets requires 2 jets, specific jet nozzle placement, all piles in a group must be jetted prior to driving where practical; and pumps, supply lines and jet pipes per Pile Installation Plan (PIP). [Spec. 455-5]
5. Verify that Pre-drilling of holes through compacted fill or as starter holes complies with the specifications. [Spec. 455-5]
6. For proprietary mechanical pile splices - threaded rebars must penetrate into the splice plate at least the distance specified in the shop drawings - verify by measuring the distance from plate top to bar end. (Good practice). Verify that the splice is listed on the QPL. Verify Buy America provisions are met, if applicable.

PILE DRIVING

7. Comply with the pile driving criteria as established by Geotechnical Engineer. [Spec. 455-5], making sure of not exceeding the maximum strokes defined in the driving criteria letter. Do not drive beyond practical refusal.
8. Verify that the Contractor maintains proper alignment of leads and pile within tolerances. [Spec. 455-5]
9. Fill out pile driving log, keeping special driving procedures and precautions in mind. For open-end diesel hammers, Contractor must provide a device to determine ram stroke. For hydraulic hammers, Contractor must provide a device to determine impact energy and/or equivalent stroke. [Spec. 455-5]. For projects let after June 30th, 2020, the CEIs must provide a pile inspection device that displays and stores electronically: stroke for open-ended diesel hammers, blows per foot and blows per minute for all hammers, and exports the electronic data in a format compatible with the Department's Pile Driving Record form, or replicates the Department's Pile Driving Record form.
10. Detailed bearing and penetration requirements are covered in the specifications. [Spec. 455-5]
11. Detailed set check and redrive procedures are covered in the Specifications related to blow count interval, same pile cushion, and hammer warm up. [Spec. 455-5]

PILE DRIVING ... continued

12. Splices and Buildups for concrete and steel piles must be performed properly. [Spec. 455-7 and 455-8]
13. Final pile top elevation and alignment must be within tolerance, (strands and reinforcement must be severed prior to breaking of piles that require cut off and pile must be visually checked for deficiencies after driving is complete). [Index 20601Spec. 455-5 (pile splices) & 455-7 (pile cut-offs)]

ALL DRILLED SHAFTS INCLUDING SHAFTS UNDER MISCELLANEOUS STRUCTURES

14. Fill out pile Drilled Shaft Installation log, keeping special installation procedures and precautions in mind. Have an approved copy of the drilled shaft installation plan on site. [Spec. 455-15]
15. When drilled shaft concrete is placed in any wet shaft, the QC Manager shall provide slump loss test results before drilled shaft concrete operations begin. The tests shall demonstrate that the drilled shaft concrete maintains a slump of at least 5 inches throughout the concrete elapsed time. Inform the Engineer at least 48 hours before performing such tests in order to allow proper Verification of the results. The Contractor shall perform slump loss testing of the drilled shaft mix using a laboratory acceptable to the Engineer.
16. Drilled Shaft Test Hole (demonstration) and Production Shafts: document activities in the Drilled Shaft log forms and note problems in the Daily Report of Construction, test shafts must be removed to 2 ft. [0.6 m] below ground line. [Spec. 455-18]
17. Slurry properties: Verify Contractor performs properly slurry testing at both premix conditions and prior to placement of concrete. Density, pH, viscosity and sand content must be within acceptable limits [Spec. 455-15.8].
18. Verify the Contractor uses proper sample tool to sample and test the slurry prior to placing concrete. Verify that samples are taken at the correct depths [Spec. 455-15.8.3]
18. Shaft inspection: when using a shaft inspection device, assist the Geotechnical Engineer as needed; when shaft inspection device is not used, the shaft bottom must be probed with a solid bar, if possible, or with a weighted line to check for sediments, unevenness and firmness. [Spec. 455-15]
19. Temporary casing in drilled shafts supporting miscellaneous structures must be provided with at least one foot above the ground surface to at least five feet below the ground surface [455-15]
20. Verify that the proper reinforcement cage is assembled according to the plans, indexes or specifications with the proper number and dimension of rebars, with the proper number, type and size of spacers, and that the number, length, top and bottom of the access tubes are according to the specifications? [Spec. 455-16]. [Spec. 455-16, 415]
21. Drilled shaft concrete placement must conform to all applicable Specs, including 346, 400 and 455 including method of placement, pump line requirements, duration of placement, and slump. Concrete must be overpoured until good quality concrete is evident at the top of the shaft. [Spec. 455-17]

**ALL DRILLED SHAFTS INCLUDING SHAFTS UNDER MISCELLANEOUS STRUCTURES ...
continued**

22. Curing of the top surface of the shaft shall be as specified in Spec. 400-16 and shafts exposed to a body of water shall be protected from the action of the water by leaving the forms or casings in place for a minimum of 7 days unless the concrete has attained a compressive strength of 2500 psi or greater. [Spec. 455-17]
23. Reinforcement bars, dimensions, length, spacing and number, must be in accordance with the plans and standard plans. Spacers, with the size, frequency and spacing meeting the specifications, must be installed in the cage. Access tubes must be installed in all shafts in accordance with the required numbers and configuration. [Spec. 455-16]
24. Verify that the Contractor inserts simulated or mock probes in each cross-hole-sonic access tube prior to concreting to ensure the serviceability of the tube. Verify that the Contractor fills access tubes with clean potable water and recap prior to concreting. The Contractor must repair or replace any leaking, misaligned or unserviceable tube prior to concreting [Section 455-16.4].
25. Verify Integrity testing is performed as required. [Spec 455-17]
26. Ensure that if the time of excavation exceeds the limits specified in the specifications, overreaming must be performed. [Spec. 455-15.11.5]

AUGER CAST PILES

27. Auger Cast Pile Installation Plan (ACPIP): Have an approved copy of the ACPIP on site. [Spec. 455-47]. Verify the auger flights are of the proper diameter and length, continuous and without breaks and gaps.
28. Ensure the demonstration Pile is performed successfully prior to the start of production piles [Spec. 455-39]. Document demonstration pile and production pile activities in the Auger Cast-in-Place Pile Installation Record (Form 700-011-03) and note problems in the Daily Report of Construction.
29. Verify the flow cone test is performed in accordance with the specifications [455-42].
30. Verify cylinders as cast in accordance with the specifications [455-43]
31. Ensure the pump is properly calibrated [455-42] and an accurate calibration factor in units of volume/stroke is obtained in accordance with FM 5-612. Pump calibration must be performed prior to the installation of the demonstration pile, immediately after any significant pump maintenance or repair is performed or at any time the inspector suspects the pump is operating differently from the last calibration.
32. Verify that the soft or unsuitable material is removed and replaced in accordance with the specifications [455-44, item 2]. If more than 5 ft of unsuitable material is encountered a pile redesign is required. A review and acceptance of the redesign will be required prior to continuing with the pile construction.
33. Verify the auger is advanced in a continuous rate to the required depths [455-44, item 7].

34. Verify the bottom of the auger is plugged [455-44, item 9].
35. Ensure that at least 5 ft of head is established before withdrawing the auger [455-44, item 10]. NOTE: Be aware that when the Developmental Specification for auger cast piles is used, the initial head requirements for piles longer than 50 ft are stricter than the Standard Specification
36. Make sure the contractor complies with the minimum over pour percentage defined by the specifications [455-44, item 11]. NOTE: When the Developmental Specification is used a greater over pour is required for bridge foundations.
37. Make sure Contractor meets the minimum grout volume requirements [455-44 items 11, 12], re-drills and re-grouts in accordance with the specifications when the return depth is less than 5 ft [455-44, item 11], when grouting is interrupted by any reason [455-44, item 11], or when the minimum over pour requirements are not met [section 455-44, item 12] in any segment of the pile. Ensure proper records and auger cast pile logs are maintained by the responsible party. NOTE: When the Developmental Specification for auger cast piles is used, the minimum return depth, and the re-drilling and re-grouting requirements of 455-44 are stricter than the Standard Specification.
38. Verify the reinforcement is of the correct bar size and lengths. Ensure the reinforcement is without kinks, without unspecified bends clean [455-44, item 14].
39. Ensure centralizers are used to center the reinforcement in the hole.
40. Ensure the Contractor does not use mechanical equipment or tool to push or impact the cage to force the reinforcement cage into the grout.
41. Ensure that Auger Cast Pile mixing, sampling and testing, pumping cement grout operations are consistent with requirements and duration of placement limits as outlined in Specifications 455 or required by contract documents? [Spec. 455-43]
42. Ensure the methods and equipment for Auger Cast Pile construction are consistent with the contract plans and the approved Auger Cast Pile Installation Plan.