558.03.1 Submittals

A. Drilled Shaft ASC and WN outlining:

3. Methods to clean shaft excavation including details for air-lift systems.

558.03.4 Shaft Excavation

Use excavation methods that provide contact with firm, undisturbed soil or rock with the sides and bottom of the drilled shaft. Do not excavate holes larger than the outside diameter of permanent casings.

558.03.7 Permanent Casing

B. Limit the excavation in advance of the casing tip to no more than 10 feet (3 m) unless synthetic slurry is being used.

558.03.8 Excavation Stability

Do not use slurry construction methods as an alternative to or in conjunction with temporary casing unless specified in the contract. Use casings to facilitate shaft construction and prevent sloughing and caving of the shaft sidewalls. Elsewhere, the contract may specify temporary casing minimum elevations. Place the temporary casing(s) deeper if necessary to prevent material from entering the shaft excavation.

558.03.10 Cleaning

Remove all loose or disturbed material from the bottom of the shaft excavation immediately prior to placing reinforcing steel and concrete. After cleaning, no more than 1-inch (25 mm) of loose or disturbed material is permitted in the bottom of the shaft.

For wet shafts not founded in sand or gravel, use an air lift to demonstrate that the shaft is clean. Use an air-lift system meeting the following requirements:

1. Sufficient length to discharge outside of the shaft;

2. Minimum of 4 inches (100 mm) diameter;

3. Compressed air input line located within 12 inches (300 mm) of the bottom of the lift pipe.

4. Air compressor capable of producing 100 psi (185 CFM at 6.9 bar).

During final cleanout and until concrete placement is complete, maintain the fluid level within the shaft at a level of 5 feet (2 m) or more higher than the water level present outside of the shaft.

558.03.11 Installation of Cross-hole Sonic Logging (CSL) Tubes

Use 1½-inch (38 mm) nominal diameter schedule 40 PVC CSL access tubes. Provide an end plug at the lower end of the pipe and make all joints watertight. Install the CSL access tubes evenly spaced around the reinforcing cage and inside of hoops and spiral reinforcing steel shown in the contract, using connectors that will allow the tubes to slide through them when force is applied. Position the connectors so that couplings will not prevent the tubes from sliding. Ensure tubes extend to the shaft bottom. After inserting the shaft reinforcing steel, drive each tube down until contact is made with the shaft bottom.

558.03.12 Reinforcing Steel

Use non-corroding, roller-type spacers or other non-corroding devices as approved by the Project Manager along the steel cage length and around the steel cage perimeter to align and maintain clearance from reinforcing cage to edge of casing during concrete placement. Begin placing the drilled shaft concrete immediately after the Project Manager has inspected and approved the location and alignment of the cage within the drilled shaft. Remove the steel cage

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Moved (insertion) [2]

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Moved up [1]: Use 1½-inch (38 mm) nominal diameter schedule 40 PVC CSL access tubes.

Moved up [2]: Provide an end plug at the lower end of the pipe and make all joints watertight.

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and re-inspect the excavation as directed by the Project Manager if the concrete placement is not started within 3 hours of placing the steel cage in position.

558.04.6 CSL Tubes and Testing

Pay for all costs associated with coring, engineering design, cost required to correct the defect and any construction delay costs, if a defect is found based on the CSL drilled shaft testing, coring or other physical investigation. Pay the costs of CSL drilled shaft retesting of the repaired drilled shafts. If no defect is found in the drilled shaft based on the physical investigation, the investigation will be considered extra work, and paid for in accordance with Subsection 109.04, and considered for time adjustment in accordance with Subsection 108.07.

558.05 BASIS OF PAYMENT

Payment for obstruction removal will be made on a force account basis.

Air-lifting is not measured separately for payment. Include costs for all airlifting in the Drilled Shaft Item.

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COMMENTS

1. 558.03.10: "….~~capable of producing 100 psi (185 CFM at 6.9 bar).~~" "….capable of producing 185 CFM at 100 psi (5.2 m3/min at 6.9 bar)"

   Response: The subject sentence has been reworded.

2. 558.03.10: For wet shafts ~~not founded in sand or gravel~~ founded in rock, use an air lift…

   Response: The subject sentence has been reworded.

3. Please add the following to 558.03.10: 5. Meet all applicable environmental requirements relating to discharge.

   Response: Agreed

4. 558.04.6: ~~Pay for all costs associated with coring, engineering design, cost required to correct the defect and any construction delay costs, if a defect is found based on the CSL drilled shaft testing, coring or other physical investigation.~~ If a defect is found based on the CSL drilled shaft testing, coring, or other physical investigation, pay for all costs associated with the physical investigation, engineering design, shaft repairs, and any construction delay costs.

   Response: The subject sentence has been reworded.

5. 558.03.11: Use 1½-inch (38 mm) nominal diameter schedule 40 PVC CSL access tubes. Provide an end plug at the lower end of the pipe and make all joints watertight. ~~Install the CSL access tubes evenly spaced around the reinforcing cage and inside of hoops and spiral reinforcing steel shown in the contract, using connectors that will allow the tubes to slide through them when force is applied. Position the connectors so that couplings will not prevent the tubes from sliding. Ensure tubes extend to the shaft bottom. After inserting the shaft reinforcing steel, drive each tube down until contact is made with the shaft bottom.~~ Install the CSL access tubes evenly spaced around the reinforcing cage and inside of hoops and spiral reinforcing steel shown in the

contract. Provide a means of adjusting the tubes downward to make contact with the shaft bottom after installation of the reinforcing cage.

Response: The subject sentences have been reworded.

FINAL
EFFECTIVE July 14, 2016

558.03.1 Submittals

A. Drilled Shaft ASC and WN outlining:

3. Methods to clean shaft excavation including details for air-lift systems.

B. Name and experience record of Contractor, and Superintendent and driller(s) that will perform the drilled shaft work on this project. Include all experience in the last 10 years.

558.03.4 Shaft Excavation

Use excavation methods that provide contact with firm, undisturbed soil or rock with the sides and bottom of the drilled shaft. Do not excavate holes larger than the outside diameter of permanent casings.

558.03.7 Permanent Casing

D. Limit the excavation in advance of the casing tip to no more than 10 feet (3 m) unless synthetic slurry is being used.

558.03.8 Excavation Stability

Do not use slurry construction methods as an alternative to or in conjunction with temporary casing unless specified in the contract. Use casings to facilitate shaft construction and prevent sloughing and caving of the shaft sidewalls. The contract may specify temporary casing minimum elevations. Place the temporary casing(s) deeper if necessary to prevent material from entering the shaft excavation.

558.03.10 Cleaning

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For wet shafts founded in rock, use an air lift to demonstrate that the shaft is clean. Use an air-lift system meeting the following requirements:

1. Sufficient length to discharge outside of the shaft;

2. Minimum of 4-inch (100 mm) diameter;

3. Compressed air input line located within 12 inches (300 mm) of the bottom of the lift pipe.

4. Air compressor capable of producing 185 CFM at 100 psi (5.2 m^3/min at 6.9 bar).

5. Meet all applicable environmental requirements relating to discharge.

During final cleanout and until concrete placement is complete, maintain the fluid level within the shaft at a level of 5 feet (2 m) or more higher than the water level present outside of the shaft.

558.03.11 Installation of Cross-hole Sonic Logging (CSL) Tubes

Use 1½-inch (38 mm) nominal diameter schedule 40 PVC CSL access tubes. Provide an end plug at the lower end of the pipe and make all joints watertight. Install the CSL access tubes evenly spaced around the reinforcing cage and inside of hoops and spiral reinforcing steel

shown in the contract, using connectors that will allow the tubes to slide through them when force is applied. Position the connectors so that couplings will not prevent the tubes from sliding. Ensure tubes extend to the shaft bottom. After inserting the shaft reinforcing steel, drive each tube down until contact is made with the shaft bottom.

558.03.12 Reinforcing Steel

Use non-corroding, roller-type spacers or other non-corroding devices as approved by the Project Manager along the steel cage length and around the steel cage perimeter to align and maintain clearance from reinforcing cage to edge of casing during concrete placement. Begin placing the drilled shaft concrete immediately after the Project Manager has inspected and approved the location and alignment of the cage within the drilled shaft. Remove the steel cage and re-inspect the excavation as directed by the Project Manager if the concrete placement is not started within 3 hours of placing the steel cage in position.

558.04.6 CSL Tubes and Testing

Include all costs associated with furnishing and installing CSL access tubes and any required extensions and providing a power source in the Drilled Shaft pay item. No measurement or payment will be made for construction delays resulting from the initial CSL drilled shaft testing. The Department will extend the contract time by 1 day for each day over 12 calendar days required to complete the CSL drilled shaft testing. The Department will pay the costs for the initial CSL drilled shaft testing.

If a defect is found based on the CSL drilled shaft testing, coring, or other physical investigation, the contractor is responsible for all costs associated with the physical investigation, engineering design, shaft repairs, and any construction delay costs. Pay the costs of CSL drilled shaft retesting of the repaired drilled shafts.

If no defect is found in the drilled shaft based on the physical investigation, the investigation will be considered extra work, and paid for in accordance with Subsection 109.04, and considered for time adjustment in accordance with Subsection 108.07.

558.05 BASIS OF PAYMENT

Payment for obstruction removal will be made on a force account basis.

Air-lifting is not measured separately for payment. Include costs for all airlifting in the Drilled Shaft Item.