State of Wyoming
Department of Transportation
Cheyenne, Wyoming

Standard Specifications for Road and Bridge Construction

2010 Edition

Adopted by
the Transportation Commission of Wyoming
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SECTION 506
Drilled Shaft Foundations

506.1 DESCRIPTION

1 This section describes the requirements for constructing drilled shaft foundations.

506.2 MATERIALS

1 Provide materials in accordance with the following:

Material	Subsection
Admixtures	801.4
Aggregate for Concrete	803
Fly Ash	801.2
Portland Cement	801.1
Reinforcing Steel	811.1
Water	814.1

506.3 EQUIPMENT

1 Ensure that equipment meets the following requirements:

Equipment	Subsection
Batch Plant	513.3.1
Mixers	513.3.2
Placing Equipment	513.3.3

2 Provide a power-driven rotary auger or, if required, rock drilling equipment. Provide a rig of sufficient size and capacity and equipped to produce holes of the diameter and depth specified.

506.4 CONSTRUCTION

506.4.1 Drilled Holes

1 Drill shafts to within 3 in [75 mm] of their specified locations, measured at the top of the center axis. Drill vertical shafts no more than 1.5 percent of their length from plumb. For their full length, drill battered shafts no more than 5 percent from the specified angle of inclination.

2 Drill holes deep enough to meet design requirements. The engineer may change the specified elevation of the bottom of a drilled hole depending on where satisfactory material is encountered. Do not place reinforcing steel or concrete until the final bottom elevation has been established.

3 Use removable casing, when necessary, to prevent caving or water seepage. Ensure that such casing is smooth, watertight, and made of metal strong enough to resist hydrostatic pressure, concrete pressure, and surrounding earth pressure. Ensure that the casing is clean, extends to the top of the drilled hole excavation, and has an outside diameter not less than the specified diameter of the drilled hole.

4 When the top of the drilled shaft is below ground level, use a removable oversize casing or other approved forming method from the ground surface to the shaft as required to control caving.

5 If caving conditions are encountered, stop drilling and change methods.

6 Use water for drilling mud or slurry only with approval of the engineer.

7 As approved by the engineer, dispose of excavated material not used as backfill around the completed structure.

506.4.2 Cleaning and Inspection

1 Do not place concrete before the engineer has inspected drilled holes for tolerances, satisfactory bearing material, and freedom from debris and loose material. The department will consider a hole sufficiently dry if water depth can be kept at 3 in [75 mm] or less while placing concrete.

506.4.3 Reinforcing Steel

1 Assemble the reinforcing steel cage completely and place as a unit.

2 Anchor the reinforcing cage adequately to prevent movement after installation. Use spacers to ensure proper clearance between the reinforcing steel cage and shaft face.

3 Extend the bars in the lower portion of the shaft to the bottom of the hole if the shaft is lengthened and full-depth reinforcement is specified. Lap-splice the bars to proper length in accordance with Subsection 514.4.5, Placing and Fastening, and Table 506.4.3-1, Lap Lengths for Drilled Shaft Reinforcing Steel.

SECTION 514
Reinforcing Steel

514.1 DESCRIPTION

1 This section describes the requirements for furnishing and placing reinforcing steel.

514.2 MATERIALS

514.2.1 Reinforcing Steel

1 Provide materials in accordance with the following:

Material	Subsection
Reinforcing Steel	811.1

514.2.2 Reinforcing Steel Supports and Ties

1 When using metal supports, provide with legs curved to form a hook, with the ends at least ⅛ in [3 mm] above the form work. Protect metal supports for uncoated reinforcing steel that are in contact with the exterior surface of the concrete by galvanizing or coating with plastic or epoxy. Ensure that coatings do not chip, crack, deform, or peel. Extend protection at least ½ in [12 mm] above the form work. Apply plastic protection by dipping; ensure a minimum thickness of $^{1}/_{16}$ in [2 mm] at points of contact with form work.

2 Coat metal supports for epoxy-coated reinforcing steel completely with epoxy or plastic. Use galvanized metal supports for galvanized reinforcing steel. For coated bars, provide support legs in accordance with the dimensional and coating requirements for uncoated bars.

3 Use plastic- or epoxy-coated tie wires for epoxy-coated reinforcing steel, galvanized tie wires for galvanized reinforced steel, and stainless-steel tie wires for use with mechanical tying equipment.

514.2.3 Mechanical Reinforcing Steel Splices

1 Provide mechanical reinforcing steel splices consisting of a lap or butt splice system capable of developing at least 125 percent of the AASHTO specified

2 The department specifies spacing dimensions for reinforcing steel by referring to the centers of bars.

3 When not specified, ensure a concrete cover of 2 in [50 mm] to the face of reinforcing steel.

4 Provide reinforcing steel in the full lengths specified; do not splice except to replace test samples.

5 Overlap welded wire fabric ends and sides at at least one mesh opening and fasten with wire or other approved fasteners at intervals of 12 in [300 mm].

6 Tie bundled bars together at a maximum of 6 ft [1.8 m] centers.

7 Hold reinforcing bars in position with precast mortar blocks, ferrous metal chairs, spacers, metal hangers, plastic supports, and supporting wires capable of supporting applied loads. Do not use wooden or aluminum supports. Do not place bars on fresh concrete, adjust bars during concrete placement, or insert bars after placing concrete.

514.4.5.2 Reinforcing Steel Splices

514.4.5.2.1 Lap Splices

1 Overlap splices in accordance with Table 514.4.5-1, Minimum Lap Lengths for Reinforcing Steel Splices.