

Use fluted steel pile shells for cast-in-place concrete piles, unless the contract indicates use of steel pipe pile shells.

If using steel pipe piles, use steel pipe pile shell in accordance with ASTM A572, Grade 50 with a minimum wall thickness of 1/4-inch. For welded pipe piles, provide seams that are straight or spiral-butt welded having full strength welded joints. Seamless steel pipe piles can also be used. Equip all piles with cast steel, inside-flange, extra strong, ribbed 60-degree conical points. Securely fit the conical points to the bottom of the pile shells by welding with a 30-degree beveled groove weld all around, and in such a manner to minimize any extrusion beyond the outside surface of the steel shells. A maximum 1/4-inch protrusion is permissible. If the protrusion exceeds 1/4-inch, grind the protruding weld flush with the outside surface of the pile shell.

If using fluted steel pile shells, provide a tapered section as shown in the contract. Splice piles by cutting the walls in a serrated pattern, inserting the added section, crimping back, and welding along the entire perimeter with a continuous 3/4-inch fillet weld. Perform welding with AWS certified welders, approved by the Department. Maintain current welding certifications current and show passing qualifications for the type of welding performed. Use steel shells conforming to SAE 1010 or 1015 and having a minimum yield point of 50,000 PSI, and a minimum thickness of 7 gage.

Construct all field splices to have the full strength of the sections the splices connect. Keep a minimum distance of 40 feet between field splices when possible. Obtain approval from the engineer for all field splices.

1032.3.2 Protective Coating.

When indicated on the contract, protect the steel shells with a coating consisting of either coal tar epoxy or fusion bonded epoxy.

If the specifications require a coal tar epoxy coating, apply 2 coats of dark red coal tar epoxy. Thoroughly dry and commercially blast clean the pile shell in accordance with SSPC-SP 6 before coating. Perform the two-coat application, final drying time, touch-up, and inspection in accordance with the specifications of the SSPC. Provide a dry film thickness of each coat of 8 mils minimum and 16 mils maximum for the two-coat system.

If specifications indicate the use of a fusion bonded epoxy coating, provide a 1-part, heat curable, thermosetting powder coating, meeting the following requirements:

Property	Test Method	Value
Gloss 60°	ASTM D523	25 to 90%
Impact (5/8" Top) [16 mm Top]	ASTM G14	80-160 Inch Pounds (9 to 18 J)
Taber Abrasion*	ASTM D4060	70 mg/1,000 Cycles
Chemical Resistance	ASTM D1308	10% CaCl ₂ No Effect 10% NaOH No Effect Sat Ca(OH) ₂ No Effect
Color	Red Standard (for other colors, consult coater.)	

*Taber abrasion run CF 10-wheel, 1,000 g load, 1,000 cycles.

Apply the fusion bonded epoxy coating in a fully enclosed environmentally controlled plant. Use a blast cleaning apparatus and coating application system approved and prequalified by the Department before use. Blast clean all surfaces coated in accordance with SSPC-SP 5 White Metal Blast Cleaning Standards. Achieve a blast profile of 2 to 3 mils. Measure the surface profile in accordance with ASTM D4417.

Submit a repair procedure should the blast profile exceed the requirements. Apply the coating within 8 hours after blast cleaning. Apply the coating as an electrostatically charged dry powder sprayed onto the grounded pile. Heat and cure the coating in accordance with the manufacturer's recommended procedures, to provide a fully cured finish. Apply the coating to a cured thickness of 25 ± 2 mils, as tested in accordance with ASTM D7091.

Provide a compatible touch-up compound for repairing areas damaged during driving for coal tar and fusion bonded epoxy coatings. Apply the touch-up compound to all visible open areas, in accordance with the manufacturer's recommended procedures.

When specifications require the use of a protective coating for the production piles, apply a protective coating to the entire length of each pile, test pile, and production pile.

1032.3.3 PCC.

Use Class A PCC in accordance with Section 1022.

1032.3.4 Bar Reinforcement.

Use bar reinforcement in accordance with Section 611.

1032.3.5 Storage and Handling.

Store and protect the steel shells to avoid dents, abrasions, and other injuries, and pick up in a manner that will avoid bending and distortion. The engineer will reject pile shells damaged by improper storage or handling.

1032.3.6 Inspection.

The Department will inspect steel shells at the point of shipment before application of any protective coating. If using a required protective coating, the plant will inspect the application of the coating. The pile shells remain subject to inspection at the project site before driving. All defective piles will result in rejection.

1032.4 Steel H Pile Materials.**1032.4.1 Material Requirements.**

Submit mill certifications for approval. Unless otherwise indicated, use only steel H piles in accordance with ASTM A709, Grade 50. Use the same materials for splices or reinforced tips as the H pile except that cast steel may suffice for tips. Perform welding in accordance with Section 1039. Use steel that is straight and true within the permissible mill tolerances.

1032.5 Precast, Prestressed Concrete Pile Materials.**1032.5.1 PCC.**

Use PCC for square prestressed concrete piles conforming to the requirements of Sections 610, 612, and 1022. A 28-day compressive strength of 6,000 PSI is required unless noted otherwise on the contract. Develop and submit the concrete mix design for approval in accordance with Section 1022.

1032.5.2 Prestressing Strands.

Provide 1/2-inch prestressing strands in accordance with Section 1038. Arrange the strands in accordance with the contract and stress in accordance with Section 612.3.4.

1032.5.3 Spiral Reinforcing.

Use spiral reinforcing in accordance with AASHTO M336.

1032.5.4 Bar Reinforcement.