

ITEM 10551.107896 M - EPOXY COATED STEEL PILE JACKETS

DESCRIPTION

This work shall consist of fabricating, furnishing, and installing epoxy coated steel pile jackets as well as furnishing and installing suitable devices to temporarily support the steel pile jackets and plastic concrete, and installing them on existing piles where indicated on the plans.

MATERIALS

A. Steel Pile Jackets

All steel plate and shapes shall conform to the requirements of Subsection 715-01 and to ASTM A36M. Concrete anchors shall conform to the requirements of Subsection 709-05. All bolts and washers for the steel pile jackets shall be stainless steel and conform to the requirements of Subsection 715-16. Nuts for the steel pile jackets shall conform to the requirements of ASTM A563M.

The epoxy coating material shall be an organic powdered epoxy resin that is applied by electrostatic methods. Epoxy coating material shall be approved by the Department.

The epoxy coating manufacturer shall supply written certification to the coating applicator that the coating material is in compliance with the specification testing requirements.

The fusion-bonded epoxy coating shall be a one-part, heat curable, thermosetting powdered coating, and shall meet the requirements listed below:

<u>Property</u>	<u>Test Method</u>	<u>Value</u>
Gloss	ASTM D 523	10-90%
Impact (16.0 mm Tup)	ASTM G 14	9-18 N.m
Taber Abrasion*	ASTM D 1044 Mod.	Less than 70 mg/1000 cycles
Chemical Resistance	ASTM D 1308	10% Ca Cl ₂ No Effect
30 Days		10% NaOH No Effect
		Sat Ca(OH) ₂ No Effect
Cathodic	ASTM G 8	Less than 10 mm.
Disbondment		Disbonding Radius
Color		Federal Standard 595
		Color No. 26622

*Taber Abrasion run CS 10 Wheel, 1000 Gr. Load. 1000 Cycles

B. Concrete Fill for Pile Jackets shall conform to Subsection 501-2 Materials, and Subsection 501-3, Construction Details, with the following modifications:

Cement shall be Type 2.

Mix design criteria for Class GG concrete shall be as follows:

<u>Cement</u>	<u>Sand %</u>	<u>Water/</u>	<u>Air</u>	<u>Slump</u>	<u>Type of</u>
<u>Kg/cubic meter</u>	<u>Total Agg</u>	<u>Cement</u>	<u>Content</u>	<u>Range</u>	<u>Coarse</u>
	<u>(Solid Volume)</u>	<u>Weight</u>	<u>%</u>	<u>(mm)</u>	<u>Aggregate</u>
					<u>Gradation</u>
475	45	0.45	5	150-175	CA1

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These mix design criteria are based upon fine aggregate fineness modulus of 2.80. The mixture proportions shall be determined using actual conditions for fineness modulus and bulk specific gravities (saturated surface dry for aggregates). The proportions shall be computed according to Department written instructions. The values given for slump and air content in the mix design criteria are target values for designing the mix. For acceptance, the air content and slump will be measured while the concrete is plastic, prior to placements, and the acceptance limits shall be the following maximum and minimum:

	<u>Minimum</u>	<u>Desirable</u>	<u>Maximum</u>
Slump, mm	-	150-175	200
Air Content %	3	5	7

If test results fall consistently close to upper or lower limits of properties, the Contractor shall take appropriate steps to bring these properties closer to the mid-range or desirable values.

The Contractor shall submit all constituent materials and mix proportions for the actual materials to be used to the Director, Materials Bureau for verification. The quantities to be submitted shall be determined by the Director, Materials Bureau, and shall be submitted at least 45 calendar days prior to use.

Any adjustments to the Class GG mixture shall be pre-approved by the Director, Materials Bureau.

The Contractor shall submit his proposed methods and equipment schedule for placing Class GG concrete to the Engineer for approval at least 45 days prior to concrete placement.

C. Concrete Grouting Material

Concrete grouting material shall conform to Subsections 701-05 or 701-06.

CONSTRUCTION DETAILS

All fabrication and installation shall be as indicated on the plans, and in accordance with the requirements of the New York State Steel Construction Manual, and the coating manufacturer's recommendations for coating applications.

Prior to installing new steel jackets, piles shall be recleaned to remove marine growth AOB. Payment for this work shall be included in the price bid for this item.

The Contractor shall submit resumes of the diving personnel employed for underwater work. All diving personnel shall have had at least three years of diving experience.

The supporting devices shall be detailed such that a complete perimeter seal between the supporting device and the base of the steel pile jacket is ensured to prevent any blowout during the concrete placement. Also, details of the devices shall be such that no damage to the existing concrete piles occurs during installation, use or removal of the supporting devices. If any damage to the existing piles occurs due to the Contractor's operations, repairs shall be made to the satisfaction of the Engineer at no cost to the State.

The Contractor shall submit to the Engineer for approval, shop drawings of the steel pile jackets and their supporting devices, which shall conform to the requirements of the New York State Steel Construction

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Manual. The Contractor shall allow the Engineer not less than four (4) weeks to review the shop drawings.

All steel fabrication, including welding of concrete anchors to the steel shells, shall conform to the requirements of the New York State Steel Construction Manual, and shall be completed prior to the application of the epoxy coating.

Prior to coating application, the steel jackets shall be free of oil and all mill coatings, and shall be gritblasted to white metal (SSPC-SP5), using a mixture of steel shot and grit. Cleaned surfaces shall be protected from conditions of high humidity, rainfall, or surface moisture.

The coating shall be applied in an environmentally controlled plant that is fully enclosed. The coating system shall have the capabilities of preheating and post-baking. The gritblast cleaning machine shall be fully enclosed in an environmentally controlled plant.

The powdered epoxy resin coating shall be applied to the cleaned surface as soon as possible after cleaning and before visible oxidation occurs. In no case shall more than 8 hours elapse between cleaning and coating. The coating is required on all surfaces of the steel jackets.

The coating material shall be applied strictly in accordance with the coating manufacturer's recommendation as to coating application procedure and curing schedule. In no case shall the oven temperatures or temperature of the steel jackets during any part of the curing process exceed 260_ C.

The cured coating shall be of uniform color, gloss, and thickness and shall be free of blisters, pinholes, fish eyes, sags, runs, and any other irregularities.

The finished coat thickness shall be a minimum of 0.38 mm as tested in accordance with ASTM G12.

The Contractor shall be responsible for all quality control checking, including visual inspection and thickness measurements, and shall keep records on the results of all inspections on a form acceptable to the Engineer.

The Engineer or his representative shall have access to each part of the process and shall have the right and opportunity to witness any of the quality control tests and/or perform the test himself on a random sampling basis.

After coating, the steel jackets shall be checked for continuity using a 67 1/2 volt wet sponge detector to check for pinholes and discontinuities.

A compatible touch-up system shall be provided for repair of defects, all areas damaged during erection, and all visible open areas. Field touch-up shall be applied by the Contractor in accordance with the recommendations of the coating manufacturer. Patching or repair materials shall be supplied by the coating manufacturer and be compatible with the epoxy coating and insert concrete, and shall be suitable for making field repairs.

Class GG Concrete and concrete grouting material shall be placed where indicated on the plans.

METHOD OF MEASUREMENT

This work will be measured as the number of meters, measured vertically along the pile, of epoxy coated steel pile jackets completely installed. The words "completely installed" shall be interpreted to mean that all concrete and grout have been placed and properly cured, and the temporary support has been removed.

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BASIS OF PAYMENT

The unit price bid per meter of jacket installed shall include the cost of all labor, material, equipment, and any incidentals necessary to complete the work.