

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	IM-2-094(186)217	170	2

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100 SCOPE OF WORK: This project consists of removing an existing bridge and building a new 2-span prestressed concrete I-beam bridge with an overall bridge length of 253'-4" and a clear roadway width of 32'-0".

100 GENERAL: Include the cost of furnishing and placing preformed expansion joint filler, concrete inserts, rebar couplers, silicone sealant, waterproof membrane, and other miscellaneous items in the price bid for the appropriate concrete bid items.

202 REMOVAL OF STRUCTURE: The existing structure is a 4-span prestressed concrete I-beam bridge, 224'-0" long with a clear roadway width of 24'-0", and concrete substructures. The abutments are supported on steel H-piling and the piers are supported on spread footings. There are pier protection items including concrete barriers, barrels, and concrete barrel slabs, adjacent to the middle pier.

Remove the bridge superstructure, concrete abutments, middle pier and middle pier protection items entirely. Cut the abutment piling at a depth 1 foot below the finished grade. Remove the outside piers to a depth 1 foot below the finished ground line. Removal of outside pier protection items are paid separately.

Include all costs for the removal of the bridge and median pier protection items in the contract unit price for "Removal of Structure."

210 EXCAVATION: Include the excavation costs at the abutments, as shown in the "Detail at Abutment", and the excavation costs at the pier in the lump sum bid item, "Class 1 Excavation."

602 BRIDGE CONCRETE: Supply AE Portland Cement Concrete using well graded or optimized aggregates as specified in Section 802.02 B. Design a mix that meets Section 802 and will attain a minimum compressive strength of 4,000 psi at 28-days.

The Engineer will verify the mix design using materials that are to be used on the project. Supply samples of materials as specified in the table below. Provide additional materials upon request.

Material	Sample Size
Cement	100 lbs
SCM	35 lbs
Aggregate	1000 lbs
Admixtures	½ pint each

Deliver the samples and the mix design, including the test results, to the Materials and Research Division a minimum of 14 calendar days before placing concrete. Attach a tag to all samples identifying the Department's project number and the type of material. On the day the material is delivered, provide the Engineer with a copy of the mix design and test results, and notify the Engineer the samples have been delivered.

602 DIAPHRAGMS AND ENDWALLS: Place the pier diaphragm and endwall concrete at the same time as the bridge slab concrete.

602 DECK PLACEMENT: Do not place deck concrete until the entire deck is formed. Place the deck concrete at a minimum rate of 40 CY per hour. Allow the deck to cure a minimum of 72 hours between deck pours.

602 FORM LINERS: Include the cost to provide and install the form liners in the price bid for the appropriate concrete bid items.

602 BARRIERS: Do not construct V-grooves through form liner areas.

602 WATER WASHING EQUIPMENT: In addition to the water-washing equipment listed in Section 602.02 D, a cold water pressure washer that provides a minimum nozzle pressure of 3,000 psi may be used.

602 PENETRATING WATER REPELLENT TREATMENT: Apply penetrating water repellent to the driving surface of the bridge deck and approach slabs prior to crack sealing. Do not allow traffic on the driving surfaces until the solution has completely penetrated and the entire driving surface is dry.

602 CRACK SEALING: After the penetrating water repellent has been applied and is dry, the Engineer will perform a visual inspection of the bridge deck and approach slabs to determine the need for crack sealing. Mark and repair all visible cracks on the top surface measuring 0.012" or greater in width at the widest segment or as directed by the Engineer.

Immediately before applying the sealer, clean the cracks by removing all dust and debris with compressed air. Seal the cracks with a two-part epoxy in accordance with the manufacturer's recommendations. Chase crack with the sealant application to the limits of the crack, including those portions that are narrower than 0.012" wide. Use Paulco TE-2501 (Viking Paints, Inc.), Dural 50 LM (Euclid Chemical Co.), TK-9000 or TK-2110 (TK Products), or an approved equal epoxy sealer.

Include all material, labor, and equipment required to crack seal the bridge deck and approach slabs in the price bid for Bridge Deck Concrete.

602 SPECIAL SURFACE FINISH: Clean the surfaces that are to receive the Tex-Cote surface finish using sandblasting, shot blasting, or water-washing equipment to remove all dirt, grease, oil, efflorescence, and laitance. Ensure any curing compounds and release agents have been completely removed from the surfaces to receive the Tex-Cote surface finish.

Apply Tex-Cote XL 70 Bridge Cote with Silane to the areas listed below. Apply the surface finish in accordance with the manufacturer's recommended application procedures to attain a dry film thickness of 15 mils. Do not apply Tex-Cote special surface finish to any form liner areas.

- All exposed substructure surfaces
- Outside edges of the bridge deck
- Underside of the bridge deck overhang
- Outside and bottom surfaces of the exterior beams
- Exposed endwall areas outside the exterior beams
- All bridge and approach slab barrier surfaces (except form liner areas)

Finish the surface with a uniform texture, color, and appearance free from fins, projections, cavities, and porous areas. Use a sand textured finish. Use gray surface finish color number 36424 meeting AMS-STD-595 for the inside and top surfaces of the bridge and approach slab barriers. Use a color matching the lightest shade of brown used in the Architectural Surface Finish, as it looks applied to the barrier form liner

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areas, for all other surfaces. Submit to the Engineer a 1' x 1' sample of the brown surface finish.

Include all special surface finish costs in the price bid for the appropriate concrete bid items.

602 WEATHER LIMITATIONS: All requests in accordance with 602.04 C.4 "Weather Limitations" require approval from the NDDOT Bridge Division.

602 REMOVAL OF FORMS: Deck slab forms may be removed 1 day after completion of the curing period if the bridge deck concrete has reached 70 percent of the required design strength.

604 PRESTRESSED BEAMS: Set prestressed beams on bearing seats without field bending substructure or beam reinforcing steel.

622 PILING: Drive piling using a diesel hammer meeting the minimum specifications listed below for each substructure unit. The operating energy is the energy a hammer is capable of producing during pile driving under actual project conditions, and shall be estimated to be no greater than 85% of the hammer's maximum rated energy as specified in the manufacturer's literature. Submit specifications for all pile hammers proposed for use on the project to the Engineer for review at least 14 calendar days prior to beginning pile driving operations.

Approach Slab Piling: Minimum Ram Weight = 3,500 lbs
 Minimum Operating Energy = 32,000 foot-pounds

Abutment Piling: Minimum Ram Weight = 5,500 lbs
 Minimum Operating Energy = 53,000 foot-pounds

Pier Piling: Minimum Ram Weight = 6,500 lbs
 Minimum Operating Energy = 60,000 foot-pounds

Run the hammer at an energy that produces a penetration at bearing between 1/2" and 3 inches in the last 10 blows.

If the pile has not reached bearing 10 feet beyond the estimated depth, stop driving the pile and wait 24 hours to allow pile setup to occur. After 24 hours, warm the hammer with a minimum of 20 blows by striking the ground or timber mats. If bearing was not achieved during restrrike, continue to drive the pile until bearing is achieved.

930 ROADWAY CANOPY: Construct a canopy above the traveled roadway under the new structure to protect traffic from falling material. The canopy is an added safeguard and does not relieve the Contractor from any responsibility for the safety of the public.

Submit the canopy details, including materials that will be used, to the Engineer for review at least 14 calendar days prior to installation of the canopy. Provide a canopy under the new structure with a minimum vertical clearance of 16'-6" above the traveled roadway. Extend the canopy a minimum distance of 5'-0" beyond the outside edge of the bridge deck and a minimum distance of 5'-0" beyond the edge of the driving lanes beneath the structure. Notify the Engineer two calendar days prior to installation of the canopy. The Engineer will update the NDDOT travel map for the reduced vertical clearance with the canopy in place.

The canopy must be in place before installing formwork for the new deck and remain in place until after the new superstructure is complete. The canopy may be supported from the ground or suspended from the girders. Complete the installation of the canopy in a minimum amount

of time and with the least inconvenience to the public. Remove the canopy after the bridge superstructure is completed.

Include all costs for construction, maintenance, and removal of the canopy system in the contract unit price for "Roadway Canopy."

930 AGGREGATE SLOPE PROTECTION: Place aggregate slope protection on the embankment slopes as shown.

Clear the subgrade of rubbish and vegetation before placing the aggregate slope protection. Thoroughly compact all loose material. Excavate or backfill as required to obtain the plan cross-section or lines and grades established in the field.

The gradation of the material used to form the slope protection is given in the following chart:

Sieve Size	% Passing
2"	100%
3/4"	5-35%
#4	0-5%

The minimum fractured face requirement of the aggregate is 50% by weight on the portion of the aggregate retained on the No. 4 sieve. To be considered fractured the rock must have at least one fractured face.

Deposit, spread, consolidate, and shape the aggregate by mechanical or hand methods to provide a uniform depth and density and produce a uniform surface appearance. Apply MC-250 that meets the requirements of Section 818.02 C, "Medium-Curing Cutback Asphalt" at an approximate rate of 1.8 gallons per square yard. Emulsified asphalts grade CSS-1, CSS-1H, RS-1, or CRS-2 that meet the requirements of Section 818.02 E, "Cationic Emulsified Asphalt," or Section 818.02 F "Anionic Emulsified Asphalt", can be substituted for MC-250. Apply the emulsified asphalts at a rate of 2.5 gallons per square yard based on a dilution ratio of 7 parts emulsion to 3 parts water.

The bituminous materials are to penetrate to a depth of not less than one-half the required thickness of the aggregate. Protect adjacent structure surfaces against bituminous splatter.

Include all costs for labor, materials, and equipment to complete this work in the unit price bid for "Aggregate Slope Protection".

930 SHORING: Install temporary shoring as needed for removal of the center bridge pier. Temporary shoring may only be in place when barriers shown in the Median Barrier Layout are present. Design, construct, maintain, and remove the temporary shoring. Submit a shoring plan to the Engineer at least 14 calendar days prior to installation of the temporary shoring. Include all labor, equipment, and materials required to complete this work, including any excavation required outside the limits of Class 1 Excavation defined in the plans, in the bid item "Shoring". A quantity of 1 EA will be paid for this work.

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