



BOBBY JINDAL
GOVERNOR

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

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WILLIAM D. ANKNER, Ph.D.
SECRETARY

August 14, 2009

STATE PROJECT NO. 450-30-0085
FEDERAL AID PROJECT NO. 1008(534)
CALCASIEU RIVER BRIDGE – I-10 INTERCHANGE
ROUTE I-210
CALCASIEU PARISH

SUBJECT: ADDENDUM NO. 13 (CONSTRUCTION PROPOSAL REVISION)

Gentlemen:

The following proposal revision dated 08/14/09 on the captioned project for which bids will be received on Wednesday, August 26, 2009 has been posted on <http://www.dotd.la.gov/cgi-bin/construction.asp>.

1. Revised the special provision entitled "NS Raising and/ or Under-Sealing Concrete Slabs (Polyurethane)".
(3 page)

Please note this revision in the proposal and bid accordingly. Mandatory electronic bidding is required for this project, and electronic bids and electronic bid bonds must be submitted via www.bidx.com for this letting date.

Sincerely,

RANDAL D. SANDERS, P. E.
CONTRACTS & SPECIFICATIONS ENGINEER

Attachments

cc: Mr. Brian Buckel
Mr. R. H. Hennigan
Mr. Donald Duberville
Mr. David Smith
Mr. Eric Burges
Mr. Masood Rasouljan

NS RAISING AND/OR UNDER-SEALING CONCRETE SLABS (POLYURETHANE) (08/09) (STATE PROJECT NO. 450-30-0085):

DESCRIPTION. This item consists of raising and/or under-sealing concrete slabs by an approved method using a high-density hydrophobic polyurethane foam (PF) at the locations shown on the plans, as described herein, as directed by the engineer, and in accordance with the manufacturer's recommendations. Hydrophobic means that the PF shall lose no more than 10 percent of its density or strength when injected into liquid water. This work includes drilling injection holes, installation of injection tubes directly below the slab or to a depth not to exceed 6 inches (150 mm) from the bottom of the concrete slab, if needed to raise the slab; injecting material to underseal the concrete slab; checking elevations to control lift of pavement; filling and sealing injection holes; cleanup and other related work.

MATERIAL. The material used for raising and/or under-sealing concrete slabs shall be high-density hydrophobic polyurethane foam, as approved by the engineer, having a water insoluble diluent that permits the formation of polyurethanes in excess water. The material shall have a free rise density ranging from 3.0 to 4.0 pounds per cubic foot (48.1 to 64.1 kg/m³) and a minimum average unconfined compressive strength of 50 psi (344 kPa).

(a) Material Specifications and Material Safety Data Sheets (MSDS). The contractor shall submit a manufacturer's materials specification and MSDS sheet that defines the typical resin properties, general description of material, mix ratio, typical reaction properties, typical physical properties, ingredients hazard classification, physical data, fire and explosion hazard data, and reactivity data. The formula and characteristics shall be certified by the manufacturer and verified in the field.

Prior to beginning work, 5 machine mixed field samples will be prepared by the contractor in 4-inch (100 mm) diameter molds approximately 4 inches (100 mm) tall in accordance with ASTM D1621. The samples shall then be taken to an approved laboratory at the contractor's expense and a 2-cubic inch (32.7 cm³) sample shall be taken from the center of the 4-inch (100 mm) diameter molded sample and an unconfined compressive strength shall be determined in accordance with ASTM D1621. The density of the material shall be determined from the specimen group used for unconfined compressive strength tests in accordance with ASTM D1622. The unconfined compressive strength and density determined from ASTM D1621 and ASTM D1622 shall be used to determine the percent of pay for this item as outlined in the Measurement and Payment section herein. The contractor shall submit to the engineer electronic copies of the stress strain curves (ASTM D1621) and density calculations (ASTM D1622) for each specimen tested. Field testing will be required for every 25,000 pounds (11,340 kg) of material used on the project or at the engineer's discretion.

(b) Warranty. Manufacturer shall warrant the product performance for five (5) years from final acceptance. Manufacturer shall be responsible for all costs associated with repair or replacement.

EQUIPMENT. The following list of under-sealing equipment shall be considered the minimum amount of equipment to perform the work.

(a) A drill capable of drilling 5/8-inch (16 mm) diameter holes shall be provided and, when directed, injection tubing installed to a depth not to exceed 6 inches (150 mm) from the bottom of the concrete slab.

(b) A pumping unit capable of injecting the polyurethane material to the depth required under the pavement and capable of controlling the rate of rise of the pavement. Pumping units shall be equipped with a manufacturer's certified flow meter to measure the amount of chemical injected. The certified flow meter shall have a digital output in both pounds (kg) and gallons (liters). Polyurethane material will be measured to the nearest pound (kg) as displayed by the certified flow meter.

(c) A laser leveling unit to ensure that the concrete pavement is raised to an even plane or to the required elevation.

CONSTRUCTION REQUIREMENTS.

(a) Drilling and Injecting. A series of 5/8-inch (16mm) diameter holes shall be drilled at approximately 6-foot (2-meter) intervals maximum through the concrete in the area to be raised and/or under-sealed. The exact location and spacing of the holes shall be determined by the contractor and approved by the engineer. A high-density polyurethane formulation shall be injected under the slab to a maximum depth not to exceed 6 inches (150 mm) beneath the concrete slab, only if needed to raise the slab. The pumping unit shall control the amount of rise by regulating the rate of injection of the polyurethane material. The finished concrete slab shall conform to the grade and cross-section of the slab prior to settlement. Elevations shall be within a tolerance of +/- 1/4-inch (6 mm) of the required grades or as much as the slab allows, at the direction of the engineer. When the nozzle is removed from the hole, any excessive polyurethane material shall be removed from the area and the hole sealed for the full depth of the concrete pavement with an approved cementitious grout. If the engineer determines that the base is too wet, polyurethane injection will be postponed until conditions improve.

The contractor shall be responsible for any pavement blowouts, cracking, excessive lifting, or uneven pavement that results from raising and/or under-sealing of the pavement. Any damage to the pavement occurring prior to final acceptance shall be repaired by the contractor as directed at no direct pay.

(b) Set-Time. The high-density polyurethane formulation used shall set and obtain at least 90 percent of its ultimate compressive strength within 15 minutes after final injection.

MEASUREMENT AND PAYMENT. Polyurethane material will be measured to the nearest pound (kg) as displayed by the certified flowmeter. Under-sealing Concrete Slabs will be measured and paid for at the adjusted contract unit price per pound (kg) of high-density polyurethane material injected, including all materials, tools, equipment, labor, warranty, and incidentals necessary to complete the item. Payment per pound (kg) shall be determined and/or adjusted as follows:

Payment Adjustment for Density and Unconfined Compressive Strength ¹

| | | | | | |
|---|------------------|-----------------------------|-------------------------|-----------------------------|-----------------|
| Density, lb/ft ³ . (kg/m ³) | < 2.5 (<40.1) | 2.5 to 2.9 (40.1 – 46.5) | 3.0 to 4.0 (48 - 64) | 4.1 to 4.5 (65.7 - 72.1) | > 4.5 (72.1) |
| % Pay | No pay | 75 | 100 | 75 | No pay |
| Unconfined Compressive Strength, psi (kPa) | < 30 (207) | 30 – 39 (207 – 269) | 40 to 49 (276 – 338) | Min.50 (345) | ---- |
| % Pay | No pay | 50 | 80 | 100 | ---- |

¹ The total payment will be the lowest of the percent payments for density and compressive strength.

Payment will be made under:

| <u>Item No.</u> | <u>Pay Item</u> | <u>Pay Unit</u> |
|-----------------|---|-----------------|
| NS-602-00003 | Raising and/or Under-Sealing Concrete Slabs (Polyurethane) | Pound (kg) |