

ITEM 502.0101 91 - INSTALLATION OF PRECAST CONCRETE HIGHWAY PAVEMENT SLABS

DESCRIPTION:

Furnish and install reinforced precast concrete highway pavement slabs as shown on the plans in accordance with this specification.

The Contractor is advised that certain elements and/or processes contained in the plans and this specification for Precast Concrete Highway Pavement Slabs may be patented or subject to patents pending by the Fort Miller Company, Inc. of Schuylerville, NY. Ph: (518) 695-5000.

PRE-PLACEMENT MEETING

Convene a pre placement meeting a minimum of ten (10) days before the planned start of slab installation layout to coordinate and familiarize everyone with the technology, proper installation techniques, including equipment review, construction methods and inspection of the precast paving slabs. Attendees will include the Engineer, Inspectors, Regional Materials Engineer, Precast Slab manufacturer, all contractor/subcontractor staff involved in the layout, sawcutting, LTD installation and encasement, surface preparation, installation of the precast slabs and bedding grout working under this specification

MATERIALS:

Precast Concrete Pavement Slabs. Apply the requirements of §704-15, "Precast Concrete Pavement Slabs". Slabs may be fabricated either single planed or warped planed as required. Single planed slabs have all corners of the slab surface residing in the same plane. Warped planed slabs have three corners of the slab surface residing in the same plane and the fourth corner either above or below the other three corners as shown on the approved shop drawings. All sides of the warped slab shall be straight, and cross sections must be taken at right angles to the long side are straight. This is to insure an accurate fit with the subgrade surface produced in accordance with this specification.

Load Transfer Devices (LTDs). Use 460 mm long, 38 mm diameter, smooth, epoxy coated, Grade 420 steel dowels, coated with a bond breaker from a supplier appearing on the Approved List for §705-15, "Transverse Joint Supports", or alternative devices meeting the requirements below .

Alternative LTD's. Alternative load transfer devices may be submitted for evaluation as follows: At least 28 days before installing the precast panels, provide the Engineer with the following:

- Two samples (460 mm long) of the epoxy coated steel dowels coated with the bond breaker along with the Suppliers name and address.
- Material certification from the supplier, certifying that LTD's meet the "Tests and Material Requirements" portions of §705-15, except using Grade 420 steel.
- Material certification from the rolling mill as to the type and grade of steel used.
- Epoxy coating manufacturer's name and address, and brand of coating.
- Epoxy coating applicator's name and address, and certification that the bars have been coated, tested, and meet the requirements of §705-14, Longitudinal Joint Ties.
- The brand of bond breaker and the name and address of the Manufacturer.

ITEM 502.0101 91 - INSTALLATION OF PRECAST CONCRETE HIGHWAY PAVEMENT SLABS

The Department may perform supplementary sampling and testing of the bars and assemblies to ensure conformance with §705-14 and §705-15.

Longitudinal Joint Ties. When placing precast slabs adjacent to one another such that there is a common longitudinal joint between the precast slabs, provide and install epoxy coated 19 mm deformed two-piece threaded ties as depicted on the M502 Standard Sheet, Longitudinal Joint Ties. Use Approved List Epoxy Coatings “Reinforcing, Epoxy Coatings and Applicators”.

At least 7 days prior to drilling holes, provide the Engineer with the following:

- Material certification from the Manufacturer.
- Epoxy coating brand, name and address of the Manufacturer.
- Epoxy coating Applicator name and address, material certification from the Applicator certifying that the bars have been coated, tested, and meet the requirements of 705-14, Longitudinal Joint Ties.

Alternative longitudinal joint ties may be submitted to the Director of the Materials Bureau for approval. The Materials Bureau will render a decision on acceptability within 60 days of submission.

LTD Encasement Material. Use a pumpable cement based material used to encase the Load Transfer Devices (LTDs) in precast concrete pavement slabs.

Material Requirements

Use Approved List Materials meeting the requirements of Table 1 when tested under NYSDOT Test Method 701-13F, and conform to the following requirements:

- Portland Cement §701-01, §701-03
- Mortar/Grout Sand §703-03, §703-04
- Water §712-01

Independent test data must be submitted to the Materials Bureau certifying that the material will meet the requirements of Table 1 along with a labeled standard production size sample of the material and mix design. The Materials Bureau will render a decision on acceptability within 60 days of submission.

As an alternate, use a prepackaged Approved List cement based material meeting the requirements of Table 1. Follow the Manufacturer’s mixing instruction. Should the Manufacturer’s mixing ratio’s be altered for any reason, independent test data must be submitted to the Materials Bureau certifying that the material will meet the requirements of Table 1, along with a labeled standard production sample. The Materials Bureau will render a decision on acceptability within 60 days of submission. If in the opinion of the Engineer the material is determined to be unsuitable for Department work, the material will be rejected.

**ITEM 502.0101 91 - INSTALLATION OF PRECAST CONCRETE HIGHWAY
PAVEMENT SLABS**

TABLE 1 - LTD Encasement Material Requirements

Property	Minimum	Maximum
Compressive Strength ASTM C 109 (opening to traffic)	17 MPa	
Compressive Strength ASTM C 109 (28-day)	28 MPa	
Expansion (%)		0.04%
Contraction (%)		0.05%
Freeze/Thaw (% loss)		1.0%
Bond Strength (dry)	2.1 MPa	
Working Time (minutes)	15	
Chloride Content (%)		0.05 %
Sulfate Content (%)		5.0 %

Bedding Grout. Use a pumpable cement based material to fill voids between precast concrete pavement slabs and granular subbase.

Material Requirements. Approved List Materials conform to the following requirements:

- Portland Cement §701-01
- Water §712-01
- Compressive Strength ASTM C 109 (opening to traffic) – 2.0 MPA min.
- Flow Rate ASTM C939 - 30 seconds/min.

Independent test data must be submitted to the Materials Bureau certifying that the material will conform to the above requirements along with the mix design and a labeled standard production size sample of the material. The Materials Bureau will render a decision on acceptability within 60 days of submission.

TRIAL INSTALLATIONS. A minimum of 14 days prior to the installation of any precast pavement slabs, the Contractor shall demonstrate to the Regional Materials Engineer (or designee) that their construction methods used to the encase of the Load Transfer Devices, and place the Bedding Grout will meet the contract requirements. Material conformance to the above requirements will be verified at this time. All testing is the Contractor’s responsibility, and shall be done by an independent laboratory approved by the Regional Materials Engineer or as per the provisions of §502, “Portland Cement Concrete Pavement”

CONSTRUCTION DETAILS.

Avoid walking on or otherwise disturbing the subgrade after the fine grading has been completed. Mark out leading edges and leading ends of all slabs except for single drop-in slabs. Allow for the design width of joints in this layout. Just prior to placing the precast slab spray the subgrade with water until the surface is uniformly damp to facilitate subsequent placement (flow) of bedding grout.

Place single (drop-in) slabs in the pavement opening as shown in the Contract Drawings.

ITEM 502.0101 91 - INSTALLATION OF PRECAST CONCRETE HIGHWAY PAVEMENT SLABS

Set the precast pavement slab in a manner such that the slab contacts the fine graded surface uniformly to avoid disturbing the finished fine graded surface and to avoid damaging the edges of the concrete slab. Insure the inverted dovetail slots on the bottom of the slab properly align with the embedded LTD's and longitudinal joint ties protruding from previously placed or existing pavement slabs. Provide a minimum of 19 mm of clearance on either side of the dowel bar

Use tie off ropes to avoid chipping or spalling edges of the new precast slabs. Use wood wedges or similar devices to guide the slab in to the correct position. The use of steel pry bars that chip edges should be avoided. Repair chipped or spalled areas as required by the Engineer.

For multiple slab installations place each slab to leading end and leading edge lines. The leading end of the slab being placed is the end with protruding transverse dowel bars.

Apply bond breaker on the exposed LTD's.

Ensure that the newly placed slab is within the allowable differential edge elevations of 3 mm or as specified in the Contract Drawings. Any edge differences exceeding the allowable difference will require diamond grinding. Remove and re-set any slab with an edge differential exceeding 6 mm.

If an early traffic opening is required, protect any protruding steel from the end of a slab against bending or against damage to the coating by installing a "protection" precast slab provided by the fabricator. Alternative methods are subject to the approval of the Engineer.

Mix LTD and longitudinal joint tie grout in strict accordance with the approved manufacturer's directions. After the slabs have been placed, install grout dams at ends of joints to prevent grout from escaping during pumping. Place LTD grout into one grout port in each inverted bar or LTD slot until it exudes from the second grout port in the same slot. Insure the grout achieves the required strength before opening the pavement to traffic. Place LTD and longitudinal joint tie grout within one day of original placement of the slab. Avoid or minimize spilling of grout on the surface of the precast slabs.

Install bedding grout after installation of the LTD and longitudinal joint tie grouting is complete. Commence grout pumping at the downhill chamber at the lowest port. Pump the grout until it exudes from the corresponding port at the other end of the slab insuring full bedding of the slab in that chamber. Monitor grout pressure and slab elevation to insure the slab is not jacked upward out of position. Complete the bedding operation, chamber by chamber until all remaining chambers are filled. If the grout does not exude from the port at the other end of the slab as described above, check the flowability of the mix using the flow cone. Place the bedding grout within two days of original placement of the slab.

Seal or fill joints between slabs within 7 days of being opened to traffic. If the permanent joint seals are not installed within 7 days, seal the joints with a temporary joint sealing material, acceptable to the Engineer, at the top of the slab. All longitudinal and transverse joints shall be sealed or filled in accordance with the joint sealing or filling specification.

**ITEM 502.0101 91 - INSTALLATION OF PRECAST CONCRETE HIGHWAY
PAVEMENT SLABS**

Fill all lifting insert and grout port holes with dowel grout material specified in the Backfill Material Section of this Specification. Finish the repair surface flush to the precast slab surface and apply a texture similar to that of the precast slab.

METHOD OF MEASUREMENT:

The work for the installation of precast concrete highway pavement slabs will be measured as the number of cubic meters of precast slab units satisfactorily furnished and installed.

BASIS OF PAYMENT:

Include the cost of all labor, materials and equipment necessary to satisfactorily complete the work.

Payment will be made under:

Item	Description	Pay Unit
91502.0101	INSTALLATION OF PRECAST CONCRETE HIGHWAY PAVEMENT SLABS	Cubic Meter

DISAPPROVED BY E1 05-0042