

**ITEM 91502.01 M - INSTALLATION OF PRECAST CONCRETE HIGHWAY
PAVEMENT SLABS**

Reason for DisApproval:

Specification has been revised from lessons learned. Use Item 502.0101—91.

This Spec is DisApproved

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DESCRIPTION:

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

Use fabricated slabs that are either single planed where all corners of the slab surface reside in the same plane or warped planed where three corners of the slab surface reside in the same plane and the fourth corner is either above or below the other three as shown on the approved shop drawings. All sides of the warped slab are straight and all cross sections taken at right angles to the long side are straight so they accurately fit the subgrade surface produced in accordance with this specification.

MATERIALS:

Apply the requirements of 704-15 Precast Concrete Pavement Slabs.

Load Transfer Devices (LTDs). Obtain LTDs from a supplier appearing on the Approved List for §705-15, Transverse Joint Supports.

Use 460 mm long, 38 mm diameter, smooth, epoxy coated, Grade 420 steel dowels coated with a bond breaker. Use an epoxy coating appearing on the Approved List for “Epoxy Coatings for Longitudinal Joint Ties” or “Epoxy Coatings for Steel Reinforcing Bars” that is applied by an applicator appearing on the Approved List for “Applicators for Steel Reinforcing Bars”.

At least 14 days before installing the precast panels, provide the Engineer:

- The name and address of the LTD supplier.
- Material certification from the supplier that dowels meet the “Tests” and “Material Requirements” portions of §705-15, except Grade 420 steel is supplied.
- Material certification from the rolling mill as to the type and grade of steel used.
- The brand of epoxy coating and the name and address of the Manufacturer.
- The name and address of the epoxy coating applicator.
- The brand of bond breaker and the name and address of the Manufacturer.
- Material certification from the epoxy coating applicator that the bars have been coated, tested, and meet the requirements of §705-14, Longitudinal Joint Ties.

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

When placing precast slabs adjacent to one another such that there is a common longitudinal joint between the precast slabs, provide epoxy coated 19 mm deformed two

piece threaded ties depicted on the M502 Standard Sheet, Longitudinal Joint Ties. Use an epoxy coating appearing on the Approved List for “Epoxy Coatings for Longitudinal Joint Ties” or “Epoxy Coatings for Steel Reinforcing Bars” that is applied by an applicator appearing on the Approved List for “Applicators for Steel Reinforcing Bars”. At least 7 days prior to drilling holes, provide the Engineer:

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- Material certification from the rolling mill as to the type and grade of steel used.
- The brand of epoxy coating and the name and address of the Manufacturer.
- The name and address of the epoxy coating applicator §705-14 and
- Material certification from the epoxy coating applicator that the bars have been coated, tested and meet the requirements of 705-14, Longitudinal Joint Ties.

Backfill Material. Use DBR Retrofit Mortar, HD-50, Five Star Highway Patch, or an alternate prepackaged portland cement based patching material submitted for use as an approved equal. Follow the Manufacturer’s mixing instructions. Provide those instructions to the Engineer.

Submit alternate patching material in 30 kg (maximum) bags to the Engineer for transmittal to the Materials Bureau for approval. Alternate material must meet the requirements of Table 1, Backfill Material Requirements. The Materials Bureau will render a decision on material acceptability within 45 days of submission to the Engineer.

TABLE 1 - BACKFILL MATERIAL REQUIREMENTS

<i>Property</i>	<i>Extension</i>	<i>Minimum</i>	<i>Maximum</i>
3 Hour Compressive Strength	None	24 MPa	-
24 Hour Compressive Strength	None	35 MPa	-
Contraction	None	-	0.05 %
Freeze - Thaw Loss	60 %	-	1.0 %
Bond to SSD PCC	60 %	2.8 MPa	-
Bond to Dry PCC	60 %	2.1 MPa	-
Working Time	60 %	15 Minutes	-
Chloride Content		-	0.0 %
Magnesium Phosphate Content		-	0.0 %

For bedding grout material use a pumpable mix of Type I or Type II cement, water and admixtures as required (alternate grout material shall be submitted to the Engineer for approval) to produce a flow rate of 30 seconds, as measured by the flow cone designated in ASTM C939, and capable of attaining a compressive strength of 5.25 Mpa before the slabs are opened to traffic. All testing is the Contractor’s responsibility.

CONSTRUCTION DETAILS.

Hold the meeting a minimum of 10 working days prior to beginning work at a site selected by the Engineer at a mutually agreed upon time and location. Familiarize all field personnel and inspection representatives of the Engineer with the technology, proper installation techniques and inspection of the precast paving slabs.

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Fourteen days prior to the first installation of any precast panel, mix a trial batch of the bedding grout to demonstrate the required strength gain, 5.25 Mpa, by breaking grout cubes at the interval determined by the Engineer. Testing is to be done by an independent laboratory approved by the Regional Materials Engineer or as per the provisions of Section 502 - Portland Cement Concrete Pavement.

Fourteen days prior to the first installation of any precast panel, mix a trial batch of the tie bar and dowel grout to demonstrate the required strength gain (18 Mpa) by breaking grout cubes at the expected interval. Testing is to be done by an independent laboratory approved by the Regional Materials Engineer or as per the provisions of Section 502 - Portland Cement Concrete Pavement.

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.

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 dowels and tie bars 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 form oil on the exposed dowel bar.

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 12 mm.

If an early traffic opening is required, protect any dowels that protrude 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 dowel and tie bar grout in strict accordance with the manufacturer's directions. After the slabs have been placed, install grout dams at ends of joints to prevent grout from escaping during pumping. Pump dowel grout into one grout port in each inverted bar or dowel 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 dowel and tie bar grout within one day of original placement of the slab.

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Install bedding grout after installation of the dowel grout 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. Modify the mix design or his operation accordingly. 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.

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
91502.01	INSTALLATION OF PRECAST CONCRETE HIGHWAY PAVEMENT SLABS	Cubic Meter