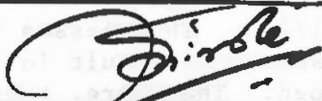


TO: SUPERSEDED BY EB 98-014 EFFECTIVE 4/24/98		ENGINEERING INSTRUCTION NEW YORK STATE DEPARTMENT OF TRANSPORTATION	
		SUBJECT: PRESTRESSED CONCRETE STRUCTURES - ELIMINATION OF CEMENT MORTAR PADS (ITEM 568.32) USED AS ELASTOMERIC BEARING SUPPORTS. Subject Code: 7.27-1-557; 7.35-6	
Distribution: 30 Main Office 32 Regions 34 Special		Code: 91-18 Date: 8/22/91 Supersedes:	
APPROVED:  8/22/91 A. M. SHIROLE, Deputy Chief Engineer (Structures)			

All new prestressed concrete structure designs shall require elastomeric bearings of sufficient thickness to ensure that the end of the prestressed unit will be a minimum of one-half inch above the bridge seat. Cement Mortar Pads, Item 568.32, shall not be designated under any circumstances. All references to the use of Cement Mortar Pads, as related to prestressed concrete superstructure design, shall be disregarded. This change is effective immediately. If the P.S.&E. date has passed, the plans and estimate should be changed by amendment.

When new prestressed concrete structures require concrete pad bearing supports (Pedestals) due to unusual cross slope transitions, etc., Class D Concrete shall be designated for this application. The minimum concrete pad thickness shall be 1-1/2 inches. The appropriate portions of Section 582 of the Standard Specification shall apply.

For rehabilitation projects that will require cement mortar pad replacement, the Designer is free to choose any one of the following alternatives:

1. Replacement of the existing elastomeric bearings and mortar pads with new, thicker elastomeric bearings.
2. Insertion of an elastomeric bearing of the proper thickness to replace the mortar pad.
3. Insertion of a coated steel plate of the proper thickness to replace the mortar pad. (Coating Material and Procedure to be approved by DCES)
4. Step the bridge seat, or pedestal, to an elevation sufficient to provide the necessary clearance. This option will normally require the use of Class D Concrete, as specified in Section 582 of the Standard Specifications.

When choosing an alternative, the Designer should strive for the most cost-effective solutions. Alternatives may be sent to this office for evaluation.

NOTE: The total thickness of elastomeric bearing shall not exceed 3".

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This change is required because recent investigations of Cement Mortar Pad installations have revealed that the pads often crack and displace during early stages of construction. Present construction requirements for prestressed concrete structures mandate that a Cement Mortar Pad, Item 568.32, be placed between the bottom of the elastomeric bearing and top of bridge seat, or pedestal. The purpose of the pad is to raise the prestressed unit sufficiently to prevent the end of the unit from contacting the bridge seat. Generally, Cement Mortar Pads have been constructed to a two inch thickness. Inquiries to various Manufacturers of Cementitious Materials (701-05) have yielded information that the optimal thickness for mortar placements is one-half (1/2"). Thicknesses in excess of one-half inch will, according to the Manufacturers, result in shrinkage cracking with consequent displacement of the pad. Therefore, they do not recommend using Cementitious Mortars in thicknesses greater than one-half inch.

In light of the foregoing, the Department has made inquiries regarding the additional costs associated with manufacturing elastomeric bearings to a thickness beyond the design thickness, sufficient to keep the end of the prestressed unit a minimum of one-half inch above the bridge seat. All indications are that such thicker bearings are cost equivalent, or less expensive, to provide and install than the present elastomeric bearing plus mortar pad.

The parameters for computing the minimum thickness of the elastomeric bearing required to replace the current Cement Mortar Pad and Bearing System are the following:

Longitudinal grade, beam dap (1/4" minimum), clearance from bottom of beam to top of bridge seat or pedestal (1/2" minimum), distance from edge of dap to point of minimum clearance (end of beam or face of bridge seat, pedestal, etc.) and effect of rotation due to final beam camber.

Example: Grade = 5%, Bearing length = 8", Effects of camber = Negligible, Distance from edge of dap to face of bridge seat (point of minimum clearance) = 12", Lateral clearance from each edge of dap to edge of bearing = 2".

Total Computed Bearing Thickness, "T":

"T" = .25" (min. Dap) + .05 (8" + 2" + 2" + 12") + .5" (min. clearance) = 1.95".

If the distance from the top of bridge seat, pedestal, etc. to the bottom of beam, defined as "H", is equal to or less than 3", then the design bearing thickness "T" shall be equal to "H". If "H" is greater than 3", then the design bearing thickness "T" shall be 1-1/2" and pedestals conforming to the requirements of Section 582, or Coated Steel Plates shall be used for the bearing support surface.

Questions regarding this Instruction may be addressed to the Structures Division, Main Office, Concrete Engineering Unit, (518) 457-4534.