

To: SUPERSEDED BY <u>EB 06-057</u> EFFECTIVE <u>5/3/07</u>		New York State Department of Transportation ENGINEERING INSTRUCTION	EI 02-042
Title: REVISION TO FOUNDATION SLAB REQUIREMENT FOR STANDARD SPECIFICATIONS SECTION 654 IMPACT ATTENUATORS			
Distribution: ☒ Manufacturers (18) ☐ Surveyors (33) ☒ Main Office (30) ☒ Consultants (34) ☒ Local Govt. (31) ☒ Contractors (39) ☒ Regions/Agencies (32) ☐ ()		Approved:  P. J. Clark, Deputy Chief Engineer, Design 01/21/03 Date	

ADMINISTRATIVE INFORMATION:

Effective Date. This EI is effective with projects submitted for the letting of 9/11/03.

Superseded Issuances. EI 01-026 is superseded.

Disposition. The specification revision will be included in the next Addendum to or printing of the *Standard Specifications*. The current version of the Standard Specifications on the Department internet and IntraDot sites will be updated. The *Highway Design Manual* (HDM) will be updated in the next revision of Chapter 10.

PURPOSE: This EI transmits a Standard Specification revision that requires a minimum thickness of 200 mm reinforced portland cement concrete for all attenuators requiring new foundation slabs under Section 654 Impact Attenuators. This change will result in improved durability of the foundation and a more uniform concrete pad thickness, thereby facilitating future designs and the interchangeability of differing systems on the same pad.

TECHNICAL INFORMATION:

Policy and Guidance. Design guidance and policy pertaining to impact attenuators are presented in Chapter 10 of the HDM. The installation detail describing the new concrete pad requirement for the proprietary attenuating systems in 10.2.6.3 is hereby superseded. The next revision to Chapter 10 of the HDM will reflect the new specification requirement. Details for new installations of impact attenuator concrete foundation slabs are not required in the plans for project proposals.

New Foundation slabs. Designers should not include any such details that contradict the attached shelf note when specifying items 654.10xxyy, 654.15xxyy, 654.20xxyy, 654.24xx, 654.30xx, and 654.34xx.

Existing Foundation Slabs. Considering satisfactorily demonstrated anchorage performance with *careful* installations in 150 mm concrete pads (with complete or nearly complete penetration of the slab), the Designers may use their discretion in allowing slabs thicknesses down to 150 mm when assessing whether an existing slab is suitable to be used as a foundation for an impact attenuator.

Actions. DQAB will effect the necessary revisions to the HDM and the Standard Specifications of January 2, 2002.

Cost. There will be no change in cost for the Reusable, HDPE Cylinder and Cable Type items (React 350) as the minimum reinforced slab thickness required was already 200 mm. For the other compression type attenuator items, where 150 mm reinforced or 200 mm unreinforced concrete slabs were permitted, there may be a minimal increase to offset the cost of the additional concrete or reinforcing steel needed to comply with the revised requirement. The two items series to which this applies are the Quad Beam Type with Expendable Modules (QuadGuard) and the Corrugated Beam Type with Metal Tearing Strips (TRACC).

Change. The Standard Specification §654-3.02 B. Foundation Slab will be revised such that it requires a reinforced concrete slab at least 200 mm thick, as a minimum. Minimum reinforcement details are specified.

IMPLEMENTATION:

DQAB. Starting with proposals submitted for the effective letting date, DQAB will insert the attached shelf note into the proposal whenever a 654 item is specified.

Design. Designers may implement the specification earlier than the effective letting date by either including the attached shelf note with their PS&Es or providing it with their amendment requests.

Construction. On existing contracts, the change may be incorporated into the Contract as an Order On Contract in accordance with §104-03 of the *Contract Administration Manual* (MURK Part IA). Construction will need to determine the amount of the additional cost, if any, to be paid to the Contractor.

TRANSMITTED MATERIALS: Attached is a shelf note that includes a revision to the Standard Specifications Section 654 Impact Attenuators.

BACKGROUND: The Federal Highway Administration (FHWA), pursuant to the Intermodal Surface Transportation and Efficiency Act, (ISTEA) (§1073, Public Law 102-240, 12/18/91) issued notice of a final rule on July 16, 1993 which required all new installations of traffic barrier, including end treatments, to meet NCHRP 350 requirements. FHWA approval is based on the "as tested" condition. The impact attenuators approved for use on Department projects were tested with anchorages embedded between 140-160 mm. The corresponding minimum acceptable slab thickness is 175-200 mm including an additional 25% depth for cover (typically recommended by the manufacturers of the adhesives used in these anchorages). Some attenuator manufacturers are recommending installation in a lesser 150 mm slab. To assure that the anchorages are installed properly, we should require a minimum new concrete pad of 200 mm thickness. Experience and testing has demonstrated that successful installations may still be achieved without the recommended cover in installations using careful construction practice; therefore *existing* concrete slabs may be less than 200 mm.

REFERENCES: Highway Design Manual, Chapter 10.2.6 Impact Attenuators

CONTACT: Marc Connolly of DQAB at (518) 485-5457 or by email at mconnolly@gw.dot.state.ny.us.

IMPACT ATTENUATORS REQUIRING A NEW FOUNDATION SLAB

SECTION 654 IMPACT ATTENUATORS

Make the following change to the Standard Specifications of January 2, 2002:

Page 6-170, lines 35 thru 43 (§654-3.02.B Foundation Slab), *delete* in their (its) entirety and *replace* with the following:

B. Foundation Slab. The Contractor shall construct the reinforced concrete foundation slab and back-up structure to the dimensions indicated in the working or manufacturer's drawings. The foundation slab shall be not less than the thickness indicated on the working drawings, manufacturer's drawings, or 200 mm, whichever is greatest.

The concrete shall be Class A concrete batched in accordance with §501-3 Portland Cement Concrete, Construction Details. If accelerators are needed, the Contractor shall submit the concrete mix design to the Materials Bureau for prior approval. The concrete shall be formed, placed, finished, and cured in accordance with §502-3 Portland Cement Concrete Pavement, Construction Details.

The reinforcing bars shall be in conformance to §709-04 Epoxy Coated Bar Reinforcement, Grade 420. The size, length, and bending details of reinforcement shall be as shown in the foundation slab details in the manufacturer's drawings or in the working drawings. The minimum allowable reinforcing shall be #16 longitudinal bars, spacing 400 mm on centers, and #16 cross bars, spacing 2 meters on centers. Longitudinal bars shall be placed such that they will not be cut during anchorage installation.