ADMINISTRATIVE INFORMATION:

- **Effective Date.** This Engineering Instruction (EI) is effective immediately.
- **Supereceded Issuances.** None.
- **Disposition of Issued Material.** The guidance transmitted with this EI will be incorporated into a future revision of Chapter 13 of the Highway Design Manual (HDM).

PURPOSE: The purpose of this EI is to update Appendix 13C to include pavement restoration details.

TECHNICAL INFORMATION: There is a wide variety of situations that may be encountered for any given utility excavation in highway pavement. Pavement structure, size and type of excavation, proximity of cuts with respect to joints, and backfill options are among the many variables. To the extent practicable, drawings 7, 8, 9, and 10 address the latest pavement designs and excavation/repair techniques such that repair options for all pertinent situations are covered.

For ease of reference, the Backfill and Pavement Structure Replacement Details are organized as follows.

- Drawing 7 – Full-Depth Repair of Utility Cuts in Existing PCC Pavement
- Drawing 8 – Full-Depth Repair of Utility Cuts in Existing HMA Pavement
- Drawing 9 – For Utility Keyhole and Bellhole Cutouts
- Drawing 10 – Controlled Low Strength Material (CLSM) Backfill at Existing Utilities

The technical notes within each of these drawings have been further categorized by field operation (i.e., Pavement Cut, Backfill, Compaction, and Pavement Structure Replacement).

Implementation of this EI will result in no additional cost to the Department.

IMPLEMENTATION: Utility owners and their contractors are directed to perform pavement restorations in accordance with this EI, effective immediately.

TRANSMITTED MATERIALS: Materials used in the implementation of this EI are as follow:

- Text revisions to HDM Chapter 13, Appendix 13C.
- HDM Chapter 13, Appendix 13C, Drawings 7, 8, 9, and 10 (replacements for existing Drawings 7 and 8).
BACKGROUND: The Department’s main objective with regard to post-construction roadway cuts and excavations is to preserve the pavement in its optimal condition throughout its design life. This is best served by allowing no cuts in the pavement. This is not a viable option, however, since the overall interest of the public requires that utility companies be allowed to occasionally install new lines or to access existing lines below the pavement. Consequently, minimizing the number and size of pavement cuts is of primary importance. The use of excavation and replacement techniques that minimize soil disturbance or provide proper compaction with minimal effort is also highly encouraged. Quality repair details are the key feature for restoring pavement structure so it can function as intended for its design life.

In recent years, there have been significant changes in the structure and composition of highway pavements. Superpave, asphalt- and cement-treated permeable bases, and Controlled Low Strength Material (CLSM) are just a few examples of new technologies associated with highway pavements.

Improvements have also been made by the utility industry in terms of excavation techniques. Excavations, in the past, would have required the use of a backhoe can now be accomplished by use of vacuum excavation or other means. These methods allow for a much smaller and less extensive repair, thereby lending support to the Department’s goal of preserving the integrity of the pavement and furthering the goal of minimizing disruptions to motorists during the repair.

The changes in pavement composition and excavation technology, as described above, have made existing Drawings 7 and 8 in the Bluebook obsolete. The details and notes assembled on replacement Drawings 7, 8, 9, and 10 of this EI are intended to promote the least invasive operations by encouraging minimum-size cuts, use of self-compacting backfill, and allowing new excavation technologies. The details cover the latest pavement designs as well as older designs, showing treatments appropriate for the in-place pavement materials, and the type and size of the pavement cut.

These changes are offered for the ultimate benefit of the public with mutual benefit to DOT and utility companies --- striving to minimize the need to restrict traffic for repeat repairs of the pavement structure while reestablishing pavement integrity for its remaining structural life and permitting timely utility repairs.


CONTACT: Direct questions regarding this EI to Michael Mariotti of the Design Quality Assurance Bureau at (518) 485-8960 (e-mail mmariotti@dot.state.ny.us).
Note: Users of the HDM should file this page in HDM Appendix 13C after page 6, and the attached drawings 7, 8, 9, and 10 after page 22.

Make the following changes to the *Highway Design Manual*:

Chapter 13, Appendix 13C, Section 3.03.02 (page 6)
**delete** Section 3.03.02 and **replace** with:

3.03.02  Pavement and shoulder removal shall be done in a manner that provides for proper restoration of the replacement sections. Generally, straight, vertical cuts of the pavement and shoulder will be required. Sheetimg may be required (see 4.10 Sheetimg). Permittee shall follow NYSDOT Standard Specifications for materials and method of repair (see Dwgs No. 7 - 10). Pavement that becomes undermined shall be cut back and removed. Alternative repair methods may be used if prior approval is granted by the Region.

There are generally two conditions of PCC pavements that may be encountered: new PCC designs and older PCC designs. The notes for PCC pavement replacement in Drawings 7 and 9 have been subdivided to make a distinction between the two. The distinction lies in the fact that the restoration requirements for new pavements, identified by their short panels (6.1 m and less in length), necessitate restoring panel function to realize their full remaining design life. Under this condition the PCC pavement should be replaced in-kind. Expansion joints with dowel bars should be installed to reestablish proper load transfer and function. Existing longitudinal joints should be left untied to allow the replacement panel and the panels of adjacent lanes to act independently.

Most, but not all, older PCC pavements (identifiable by panel lengths of 60 ft - 100 ft which is 2 to 3 times the new 6.1 m panels) have already reached their design life and may, therefore, be repaired with HMA.

Chapter 13, Appendix 13C, Section 3.03.03 (page 6)
**delete** Section 3.03.03 and **replace** with:

3.03.03  Backfill shall be with granular material meeting the specification requirements for select granular fill in the NYSDOT Standard Specs, Section 206. Mortar, concrete, controlled backfill, or low-strength material or other self-densifying materials may be substituted, as approved by the Region. In all cases – old PCC, new PCC or HMA pavement – keyholes and bellholes with a dimension of less than 500 mm (20 in.) require Controlled Low Strength Material (CLSM) for backfill and subbase (see Drawings 9 and 10). Some restrictions apply, however, based on pipe material. As part of the Department’s permit process, the Regional Permit Engineer (RPE) should inform the permit applicant as to which pavement repair approach is appropriate. The RPE should consult, as necessary, the Resident Engineer for guidance relevant to the age of the pavement, and the Regional Materials Engineer for a pavement and/or pipe evaluation.

Chapter 13, Appendix 13C, pages 23 and 24 (Drawings 7 and 8)
**delete** and **replace** with Drawings 7, 8, 9, and 10 dated 10/15/2003.
GENERAL NOTES
A. SECTION 204 OF THE STANDARD SPECIFICATIONS APPLIES, EXCEPT AS MODIFIED BY THE FOLLOWING NOTES.

B. THE FOLLOWING NOTES PERTAIN TO THE USE OF "CONTROLLED LOW STRENGTH MATERIAL (CLSM)" FOR BACKFILL AT EXISTING UNDERGROUND UTILITY INSTALLATIONS. SEE CURRENT STANDARD SHEET M204-1 ALSO, "CONTROLLED LOW STRENGTH MATERIAL (CLSM)"

1. CLSM PLACEMENT
A. IN WORK INVOLVING QUANTITIES OF CLSM LESS THAN 2 m³ (2.6 yd³), THE REGIONAL PERMIT ENGINEER MAY PERMIT USE OF A SMALL CONSTRUCTION MIXER, CAPABLE OF PRODUCING CLSM HAVING THE SPECIFIED COMpressive STRENGTH AND FLOW CONSISTENCY. FOR CLSM PLACED UNDER SUCH CONDITIONS, MIX TIME IS A MINIMUM OF 90 SECONDS AFTER ALL THE MATERIALS ARE IN THE MIXER DRUM.

B. WHEN PLACING CLSM FOR PIPE BACKFILL, DISCHARGE THE MATERIAL ONTO THE TOP OF THE PIPE AT THE CENTER.

C. PLACE A MINIMUM OF 150 mm (6 in) CLSM OVER THE PIPE.

D. WHERE THE DISTANCE BETWEEN THE TOP OF THE PIPE AND THE SUBGRADE SURFACE IS LESS THAN 600 mm (24 in), USE CLSM FOR THE BACKFILL MATERIAL UP TO THE SUBGRADE SURFACE.

E. OBSERVE PROPER SET TIME FOR CLSM BEFORE PLACING OVERLYING BACKFILL MATERIALS.

2. CLSM RESTRICTIONS
A. DO NOT PLACE CLSM IN CONTACT WITH ALUMINUM PIPE OR CONNECTIONS UNLESS ALUMINUM IS COATED WITH AN APPROVED PRIMER.

B. DO NOT PLACE CLSM CONTAINING FLY ASH IN CONTACT WITH CAST IRON OR DUCTILE IRON PIPES OR FITTINGS.

C. FOR LIGHTWEIGHT PIPE INSTALLATIONS, IT MAY BE NECESSARY TO COUNTERACT THE BOUNCINESS OF THE PIPE DURING THE CLSM PLACEMENT. METHODS SUCH AS PARTIALLY FILLING WATER TIGHTPIPES WITH WATER, OR USING ANCHOR STRAPS OR GRAVEL BAGS TO HOLD DOWN THE PIPES CAN BE USED TO PREVENT FLOATATION.