
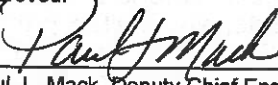



To:		New York State Department of Transportation ENGINEERING BULLETIN	EB 01-017
<i>Expires one year after issue unless replaced sooner</i>			
Title: COMPREHENSIVE PAVEMENT DESIGN MANUAL (CPDM)			
Distribution: <input type="checkbox"/> Manufacturers (18) <input type="checkbox"/> Surveyors (33) <input checked="" type="checkbox"/> Main Office (30) <input checked="" type="checkbox"/> Consultants (34) <input checked="" type="checkbox"/> Local Govt. (31) <input type="checkbox"/> Contractors (39) <input checked="" type="checkbox"/> Regions/Agencies (32) <input type="checkbox"/> _____ ()		Approved:  Paul J. Mack, Deputy Chief Engineer, Technical Services Division <u>3/20/01</u> Date  Phillip J. Clark, Deputy Chief Engineer, Design Division <u>03/26/01</u> Date	

ADMINISTRATIVE INFORMATION

This Engineering Bulletin (EB) becomes effective with contracts submitted for the letting of July 5, 2001. This EB supersedes EI 85-043, EI 89-008, EI 92-015, EI 92-026, EI 93-016, EI 93-028, EI 99-001, and the Pavement Thickness Design Manual (see details on pp 2-3).

PURPOSE

This EB announces the issuance of the Comprehensive Pavement Design Manual (CPDM) as NYSDOT's single source for pavement-related design guidance and standards for use on all NYSDOT approved pavement design projects. This EB also establishes a process to include future pavement-related references, guidance, and manuals into the CPDM.

Although significant effort has been expended jointly by the Design Division and Technical Services Division to produce a manual which is consistent from chapter to chapter and is coordinated with the Highway Design Manual and Standard Sheets (current and new), the size and scope of the CPDM opens the possibility that oversights and/or errors may exist. Users are encouraged to forward comments for future improvements of the CPDM to the Geotechnical Engineering Bureau at FAX: (518) 457-8080. A Comment Form is provided with the manual.

DESIGN INFORMATION

A. NEW AND/OR REVISED GUIDANCE INCLUDED IN THE CPDM

1. EI 92-015: Project-Level Pavement Selection Process - The information in EI92-015 was revised and incorporated into Chapter 3 of the CPDM. EI92-015 is superseded by this EB.
2. EI 92-026: Pavement Restoration Techniques, 1992 - The information in EI92-026 was completely updated and is included as Appendix 5B in the CPDM. Old item numbers no longer in use were deleted and the current items were provided, and new item numbers related to the latest specifications were added. EI92-026 is superseded by this EB.
3. New HMA Overlay Thickness Table - A new thickness table (Table 5-1 in Chapter 5) was developed to comply with the current Superpave specification. Changes reflect new aggregate sizes of top, binder, and base courses. This table supersedes HMA thicknesses given in Pavement Rehabilitation Manual (PRM), Vol. 2. For holders of the current Vol. 2 who do not receive the CPDM, Table 5-1 is attached to this EB.
4. Pavement Thickness Design Manual (PTDM) - Chapter 4 contains the thickness design portion of the PTDM, which has been completely rewritten including conventional and ESAL-based pavement design. A significant portion of the pavement-related design information from Chapter 3 of the HDM has also been included in this chapter. The guidance for shoulders and drainage has been moved to CPDM Chapters 7 and 9, respectively. The PTDM is superseded by this EB.

EB 01-017 Page 2 of 4

5. Cold Milling - Designer Information, previously issued in EI 89-008, has been metricated and is included in Section 5.4.2.2. Cold-In-Place Recycling (CIPR) - CIPR (Rehabilitation sections of Flexible- and Flexible-Over-Rigid Pavement chapters under Part 2: Treatment Guidelines and Typical Sections) of the PRM, Vol. 2 is revised and included in Section 5.4.2.3 of Chapter 5. Prefabricated Geocomposite Edge Drain (PGED) - References to PGED in Appendix 5B have been updated to reflect current item numbers.

6. Ultra-thin Whitetopping - This is new guidance (Section 5.4.2.5).

7. Shoulders - Chapter 7 has been developed from existing references and guidelines, which have been revised for consistency. Specific criteria are provided for designs on new construction, reconstruction, and rehabilitated pavement projects, which allow partial-depth shoulders in certain conditions. Optional Flexible Shoulder (OFS), Section 303 of the Standard Specifications, is **no longer recommended** for use on NYSDOT projects because it is too thin for milled-in audible rumble strips, and does not lend itself to mill-and-fill resurfacing operations. However, OFS may be suitable for use by other agencies.

8. PCC Standard Sheets - New standard sheets M502-11 to M502-24, and M655-11, issued by EB 00-057, are included for reference in Chapter 8.

9. Subsurface Pavement Drainage - Chapter 9 has been developed based on existing pavement drainage and retrofit guidelines. A draft of Standard Sheet M605-2, titled "Edgedrain and Lateral Outlet Details" is included, while its issuance by EB is pending.

10. Preventive Maintenance - Chapter 10 contains preventive maintenance guidelines. A forthcoming EI will issue specifications for Paver-Placed Surface Treatment, Micro-Surfacing, and Quick-Set Slurry to be used on maintenance contracts and capital projects (D-contracts). Other types of maintenance projects should continue to use the appropriate Office of General Services OGS contract. Contact the Regional Materials Engineer for assistance in selecting the appropriate item number or OGS contract.

B. PROCESS TO INCLUDE FUTURE DESIGN INFORMATION, REFERENCES, AND GUIDELINES INTO THE CPDM

The CPDM is issued in a loose leaf binder to facilitate future revisions. In order to maintain the CPDM as a current, unified source of pavement-related design guidance and standards with proper cross-referencing, changes must be coordinated through the Geotechnical Engineering Bureau, using the official issuance system.

The CPDM contains Volumes 1 and 2 of the Pavement Rehabilitation Manual. These manuals will be updated by the respective authors, with the changes coordinated through the Geotechnical Engineering Bureau, using the official issuance system.

C. ENGINEERING INSTRUCTIONS SUPERSEDED BY THE CPDM

The pertinent content of the following EIs have been included into the CPDM. The EIs are superseded.

EI #	Title	Location in CPDM	
		Chapter	Section
EI 85-043	Sawing and Sealing Joints in Bituminous Concrete Overlays	5	5.4.1.2
EI 89-008	Cold Milling	5	5.4.2.2
EI 92-015	Project-Level Pavement Selection Process	3	3.3
EI 92-026	Pavement Restoration Techniques, 1992	5	Appendix 5B
EI 93-016	Rapid Setting Concrete Pavement Repairs	5	5.3.9
EI 93-028	Repair of Spalled Areas, Joints, and/or Cracks in PCC Pavement	5	5.3

D. ENGINEERING INSTRUCTIONS INCLUDED IN THE CPDM

The following EI has been included in its entirety in the CPDM and is superseded.

EI #	Title	Location in CPDM	
		Chapter	Section
EI 99-001 *	1R Requirements - Federal-Aid Single Course Overlay	3	Appendix 3D

* Future references to this material should list Appendix 3D of the CPDM, not the EI.

E. ENGINEERING INSTRUCTIONS AND DIRECTIVES EXCERPTED INTO THE CPDM

Design guidance from the following issuances has been excerpted into the appropriate chapters of the CPDM. These issuances are still in effect because they contain other nondesign guidance not superseded by this issuance.

EI #	Title	Location in CPDM	
		Chapter	Section
EI 96-029	Cracking and Seating Existing PCC Pavement	5	5.4.1.3
EI 96-030	Rubblizing Existing PCC Pavement	5	5.4.1.4
EI 98-020	Revisions to Standard Specification Section 401-3.13B, Longitudinal Joints	8	8.3.1
EI 98-041	Quality Payment Items for Hot Mix Asphalt Performance Related Specifications	6	6.2.8
ED 99-001	Revised Friction Aggregate Requirements in Hot Mix Asphalt Specifications	6	6.2.7

F. MANUALS SUPERSEDED BY THE CPDM

The content of the following manual has been incorporated into appropriate chapters of the CPDM. The Thickness Design Manual referred to in the Highway Design Manual as the Pavement Thickness Design Manual (PTDM) is superseded.

Revision #	Title	Location in CPDM	
		Chapter	Section
Rev. 1, October 1994	The New York State Thickness Design Manual for New and Reconstructed Pavements	4, 7 and 9	

EB 01-017 Page 4 of 4

G. MANUALS INCLUDED IN THE CPDM

The following two manuals are included "as is" in the CPDM. These manuals remain in effect except as indicated in Table 5.1 of the CPDM.

Revision #	Title	Location in CPDM	
		Chapter	Section
February 1992	Pavement Rehabilitation Manual, Volume 1 - Pavement Evaluation	2	Appendix 2A
May 1993	Pavement Rehabilitation Manual, Volume 2 - Treatment Selection	5	Table 5.1, Appendix 5B

BACKGROUND

When construction, maintenance, and rehabilitation costs are considered, the most costly element of our highway system is the pavement structure. In an effort to reduce this cost, NYSDOT has developed guidelines and standards associated with pavement materials, design, construction, and maintenance. Because these guidelines and standards reside in different DOT units within the Technical Services, Design, Transportation Maintenance, and Construction Divisions, it is difficult and time consuming for highway design engineers to locate and use this information in an efficient manner. In view of this, the Technical Services Division and the Design Division formed a Joint Standing Committee on Pavement Design which recommended the development of a Comprehensive Pavement Design Manual (CPDM) as a single source of pavement-related design guidelines and standards. The committee also determined that the Geotechnical Engineering Bureau (GEB) will be responsible for updating the CPDM to keep it current with NYSDOT approved pavement design policy and procedures.

A draft CPDM was distributed to Regional Design Engineers and Main Office units for internal review in mid-1999. Significant changes were made in response to comments received. Current Engineering Instructions were examined and coordinated with the appropriate chapters of the CPDM.

DISTRIBUTION

Distribution of the CPDM will go directly to the Regions and appropriate Main Office units. Consultants doing pavement design for State projects, Contractors, and others may purchase copies at a cost of \$29.00 each from the Plan Sales Unit at the Address shown below:

New York State Department of Transportation
Plan Sales Unit
Building 5, Room 109A
1220 Washington Avenue
Albany, NY 12232-0204

CONTACT

Direct any questions concerning the CPDM to Gary E. Douglas in the Geotechnical Engineering Bureau at (518) 457-4791 or gdouglas@gw.dot.state.ny.us.

Table 5-1 HMA Overlay Thicknesses For Flexible and Flexible-Over-Rigid Pavement Rehabilitation

Treatment as it appears in <u>Pavement Rehabilitation Manual Volume II: Treatment Selection</u>	Pavement Layer Type (Nominal Aggregate Size)	Layer Thickness
Saw and Sealed HMA Overlay (≥ 90 mm)	HMA Binder (19.0 mm or 25.0 mm) HMA Top (9.5 mm or 12.5 mm)	50 mm or 65 mm 40 mm
Sawed and Sealed HMA Overlay (≥ 90 mm)	HMA Binder (19.0 mm or 25.0 mm) HMA Top (9.5 mm or 12.5 mm)	50mm or 65 mm 40 mm
HMA Overlay (≥ 140 mm) Preceded by Cracking and Seating	Initial HMA course, Binder (19.0 mm or 25.0 mm) HMA Binder (19.0 mm or 25.0 mm) HMA Top (9.5 mm or 12.5 mm)	50mm or 65 mm 50mm or 65 mm 40 mm
HMA Overlay (≥ 165 mm) Preceded by Rubblizing	HMA Base HMA Binder (19.0 mm or 25.0 mm) HMA Top (9.5 mm or 12.5 mm)	75 mm 50mm or 65 mm 40 mm
Two Course Overlay (≥ 90 mm)	HMA Binder (19.0 mm or 25.0 mm) HMA Top (9.5 mm or 12.5 mm)	50mm or 65 mm 40 mm
Cold Milling with Single Course Overlay (≥ 80 mm)	HMA inlay course HMA Top (9.5 mm or 12.5 mm)	≥ 40 mm 40 mm
Hot In-Place Recycle with Single Course Overlay (≥ 90 mm)	Hot in-place recycle HMA Top (9.5 mm or 12.5 mm)	50mm or 65 mm 40 mm
Cold In-Place Recycle with Single-Course Overlay (≥ 115 mm)	Cold in-place recycle HMA Top (9.5 mm or 12.5 mm)	75 - 100 mm 40 mm
Multiple-course Overlay (≥ 130 mm)	HMA strengthening course HMA Binder (19.0 mm or 25.0 mm) HMA Top (9.5 mm or 12.5 mm)	≥ 40 mm 50mm or 65 mm 40 mm
Cold Milling with Multiple-Course Overlay (≥ 230 mm)	HMA inlay and/or strengthening course Multiple courses required for lifts HMA Binder (19.0 mm or 25.0 mm) HMA Top (9.5 mm or 12.5 mm)	≥ 40 mm > 100 mm 50mm or 65 mm 40 mm
Cold In-Place Recycle with Multiple Course Overlay (≥ 165 mm)	Cold in-place recycle HMA Binder (19.0 mm or 25.0 mm) HMA Top (9.5 mm or 12.5 mm)	75 - 100 mm 50mm or 65 mm 40 mm
Remove Flexible Overlay, Crack and Seat with Multiple Course Overlay (≥ 130 mm)	Initial HMA course HMA Binder (19.0 mm or 25.0 mm) HMA Top (9.5 mm or 12.5 mm)	≥ 40 mm 50mm or 65 mm 40 mm
Remove Flexible Overlay, Rubblize with Multiple Course Overlay (≥ 165 mm)	HMA Base HMA Binder (19.0 mm or 25.0 mm) HMA Top (9.5 mm or 12.5 mm)	75 mm 50mm or 65 mm 40 mm