Design Standards Letter

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Section/Plan No.: D4-04, D4-07, D8-02, D6-01, D6-02, D6-03, D6-04, D6-05, D6-06, D6-07, D6-08, Pay Items

Subject: Chapter IV, Detail Design Section 4-04, Basic Design Criteria; Section 4-07, Urban Projects - Chapter VI, Pavement Structure Design - Chapter VIII, Traffic Control Devices Section 8-02, Traffic Signals

Body

Enclosed are copies of revisions to Chapter IV, Detail Design, Chapter VI, Pavement Structure Design; and Chapter VIII, Traffic Control Devices of the Policy, Procedure and Design Manual. These revisions are effective with the October, 1993 letting providing that the development of plans has not progressed to the point that the revisions would require significant changes or delays in the submittal of plans. The June 1, 1993 revision dates shown on the pages and figures are for information only. A summary of the revisions follows.

Contents, Volume 1
Revision date for Section 4-04 and 4-07 changed to 6-1-93.

Table of Contents, Chapter IV, Detail Design

Changed to reflect revisions dated 6-1-93.

Figure 4-04.1, General Design Data
The design data table was revised to implement the new pavement design (NPD).

Figure 4-04.1A, General Design Data Notes
The original figure 4-04.1 was divided into two figures because of space limitations. Figure 4-04.1A lists the notes that apply to figure 4-04.1.

Figure 4-04.2. No Revisions..

Section 4-07.3(3)(f) Shoulders
Freeway shoulders are revised to reflect value engineering study for shoulders.

Figure 4-07.1. Basic Design Criteria
Design criteria for pavement and shoulders revised to reflect the new pavement design and shoulder VE study.

Figure 4-07.2. Typical Sections - Urban Area
Shoulder type revised to Type U1 or U2 depending on ADT.

Figure 4-07.3. Typical Sections - Urban Area
The shoulder types and widths have been revised and the location of longitudinal joints indicated.

Figure 4-07.4. Typical Sections - Urban Area
The shoulder types and widths have been revised and the loacation of . longitudinal joints indicated.

Figure 4-07.5. Sidewalk - No Revisions

Contents, Volume II
Revision dates for Section 6-01 thru 6-07 of Chapter VI changed to 6-1-93, Revision date for Section 8-02 of Chapter VIII changed to 6-1-93.

Table of Contents, Chapter VI, Pavement Structure Design
Changed to reflect revisions dated 6-1-93
The entire chapter contents have been rewritten to implement the new pavement design theory and the value engineering study on shoulders. Revised Chapter VI should be reviewed carefully. Existing Chapter VI should be discarded in its entirety and replaced with the enclosed revised Chapter VI. Below is a brief summary of the major changes in Chapter VI.

Section 6-01 now includes contractor-furnished borrow and has been slightly revised for clarity.

Section 6-02 has been revised to include the various types of underdrainage such as pipe-aggregate underdrains, french drains and geocomposite edge drains. Also provided is an explanation of when underdrainage should be used.

Section 6-03 has been completely revised with the following major changes:

Heavy, medium and light-duty pavements have replaced high, intermediate and low-type
for pavement structural design purposes.

A statement has been added allowing the headquarters office to use other design criteria when necessary to appropriately address special cases.

The definition of equivalent single-axle loads (ESAL) has been added to comply with AASHTO requirements.

Two AE's have been replaced by ESAL's to comply with AASHTO requirements.

Pavement design is now based on the use of the 1986 AASHTO design criteria approved by the FHWA in February of 1993.

The district is now allowed to preform pavement design and selection for light-duty pavements including outer roadways having a design traffic of 750 ADT or less rather than 400 as previously allowed

The district is now encouraged to submit a recommendation for pavement type approval for projects less than 0.5 mile in length because of small quantities and the need to match in kind.

The flexible design chart has been replaced by a flexible design table in accordance with AASHTO requirements. Increases in flexible pavement thickness are now attributed to increases in traffic to comply with AASHTO requirements.

The special rules for design in commercial areas around cities have been removed because the design table will cover these types of loads when the correct ESAL data is used.

The design tables specify a 4" lift of aggregate base under all bituminous material.

The surface lift thickness has now been standardized at 1 3/4" unless otherwise specified. Also, the type of asphalt mixture to be used in the surface lift is now included in the manual.

Selective grading has been revised to use a minimum of 18" with an allowance for even thicker caps, and the equation for determining capping materials has been eliminated.

Contractor furnished borrow now states that contractor furnished borrow is required to meet or exceed the group index used for pavement design.

The rigid design table has been revised to reflect that only NRPCCP is to be used and that a minimum pavement thickness of 8" is required.

Standard transverse joint spacings have been revised to 15'. The longitud- inal joint adjacent to the shoulder for heavy, medium and some light-duty pave- ments will be placed such that the pavement structure for the lane is 14' in width striped back to 12' with the additional 2' of pavement classified as shoulder.

Composite pavement design is now included in the manual, and instruction for this type of design is also included.

Section 6-03.6, Base Considerations, includes the different types of bases normally used

in the pavement design. They include permeable bases, rock fill bases, Type 5 aggregate base, Types 1 and 2 aggregate bases, and stablized bases. This section explains what the above mentioned bases consist of and where they are to be used.
The reference, in this section, to provide special design consideration if unusual subgrade conditions are encountered during the pavement type selection process continues to be reviewed and any necessary changes will be forwarded to you as soon as they are available.
Instructions are now included for the design of ramps and high speed directional ramps
as well as crossovers, temporary bypasses and other appurtenances.

Figures 6-03.1 through 6-03.4and Tables 1 through 25 have been deleted and replaced with new Figures 6-03.1 through 6-03.9 including the new pavement configurations, design tables and corridor locations.

Section 6-04has been completely revised with the following major changes:

Shoulders have been reclassified from roman numeral to alphabetic designation.
Shoulders have further been classified by type of pavement, light, medium, and heavy-duty pavements in addition to ADT considerations.
Details for shoulders in non-urban areas have been included with the figures for pavement and are included in Section 6-03.
Included in Section 6-04 are shoulders for urban areas with less than 20,000 ADT and urban areas with greater than 20,000 ADT. The shoulder types have been classified as U2 and U1 respectively.
The resurfacing section of 6-04 has been entirely rewritten to reflect resurfacing, restoration and rehabilitation projects.
The major change in this section requires the use of the same type shoulder as would be required for new construction regardless of the shoulder width.
The only exception is that shoulders for rehabilitation projects are designed for 10-year
projected traffic while new construction is designed for 20-year projected traffic.
A section has been added for ruble strips.

Section 6-05 has been completely revised with the following major changes:
This section has been renamed as 3R/4R Projects.

Section 6-05.2, Preparation of the Old Surface, has been rewritten to include the latest techniques.

Section 6-05.3, has been rewritten to include retrofit pavement edge drains.

Section 6-05.4, Pavement Repair, has been rewritten to include the latest requirements for pavement repair.

Section 6-05.5, Spot Wedge and Leveling Course, has been rewritten to cover latest practices and procedures.

Section 6-05.6,Widening and Resurfacing; Section 6-05.7, Asphaltic Concrete Pavement; and Section 6-05.8, Bridge Resurfacing and/or Deck Repair Procedures, have been rewritten bringing these sections up to current practices and procedures.

Section 6-05.10, Guard Rail, has been rewritten to include the most recent applications of guard rail modifications for resurfacing projects.

The remainder of this section contains minor revisions.

Section 6-06 has only minor revisions for clarity.

Section 6-07 has been revised to include present criteria for the use of Type I-C, I-B, and special asphaltic concrete mixtures.

Section 6-08 Traffic Signals, has been completely rewritten and reorganized. We suggest you review the entire section to become familiar with all the revisions. Existing Section 8-02, Traffic Control Devices, should be discarded in its entirety and replaced with the enclosed, revised Section 8-02. A summary of the major revisions follows.
Table of Contents, Chapter VIII, Traffic Control Devices

Revised to reflect revisions dated 6-1-93.

Section 8-02, Traffic Signals All reference to the Enable spreadsheets has been removed. A
guideline for selecting left turn phasing has been added.

Section 8-02.11, Detectors, has been updated to current industry standards. We will be providing additional information on the plans about detector assignments.

Section 8-02.12, Pull Boxes, has been revised to include different sizes of preformed pull
boxes. We have also defined where a preformed pull box map be used. A new standard drawing for the pull boxes will be issued in the future. In the interim, we have added a

special sheet for your use.

Figures 8-02.1, 8-02.9, 8-02.11 and 8-012.19 have been revised.

Figures 8-02.4, 8-02.5, 8-02.8, 8-02.20, 8-02.21 and 8-02.22 are new figures. We have included several examples to illustrate the use of the new figures and D-37 sheets. The new D-37 and D-38 sheets and the special sheet will be sent to your office electronically.

Included below is a list of new pay items required to implement the revised section and special sheet.

NEW PAY ITEMS .
ITEM NO. UNIT TYPE ITEM DESCRIPTION .
902-82.00 10.0 Lin Ft Cable, 0 AWG 1 Conductor, Power
902-88.10 1.0 Each Pull Box, Preformed Class 1
902-88.11 1.0 Each Pull Box, Preformed Class 2
902-88.12 1.0 Each Pull Box, Preformed Class 3
902-88.20 1.0 Each Pull Box, Concrete, Standard
902-88.21 1.0 Each Pull Box, Concrete, Double

901-61.10 1.0 Each Pull Box, Preformed Class 1
901-61.11 1.0 Each Pull Box, Preformed Class 2
901-61.12 1.0 Each Pull Box, Preformed Class 3
901-61.20 1.0 Each Pull Box, Concrete, Standard
901-61.21 1.0 Each Pull Box, Concrete, Double

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