



FACILITIES DEVELOPMENT MANUAL

Wisconsin Department of Transportation

T411

Chapter 1: Introduction

Section 1-1 General

Chapter 2: Project Management

Section 2-1 Introduction and Definitions

Section 2-5 Program vs. Project Management

Section 2-10 Performance Management

Section 2-15 Project Integration Management

Section 2-20 Project Type - Design/Planning

Section 2-25 Design Phase

Section 2-30 Construction Phase

Chapter 3: Facilities Development Process

Section 3-1 Process Overview

Revise FDM 3-1 (Facilities Development Process – Process Overview) to combine and restructure phases to accommodate current procedures along with Asset Management and Performance-Based Practical Design principles.

Revise 3-1 Attachments 1.1 (Facilities Development Process) and 1.2 (Facilities Development Process Phase Activities) to combine and restructure phases to accommodate current procedures along with Asset Management and Performance-Based Practical Design principles.

Section 3-4 Environmental Scoping, Evaluation and Documentation

Section 3-5 Improvement Concepts

Add new section 3-5-1 (Asset Management) that incorporates former subsection FDM 3-5-2 (Highway Improvement Type Definitions).

Revise 3-5-5 (Federally Funded Preventive Maintenance Projects) guidance. Removed design specific guidance for preventive maintenance (PM) projects since it follows the procedures for Preservation Improvement Strategy projects. The WisDOT/FHWA PM agreement remains in place as the mechanism that allows for federal funding of PM type work.

Move 3-5 Attachments 5.2 (DOJ/DOT Joint Technical Assistance on the Title II of the Americans with Disabilities Act Requirements to Provide Curb Ramps when Streets, Roads or Highways are Altered through Resurfacing) and 5.3 (Glossary of the Terms for DOJ/FHWA Joint Technical Assistance on the ADA Title II Requirements to Provide Curb Ramps when Streets, Roads or Highways are Altered through Resurfacing) to FDM 11-46.

Section 3-10 Scheduling and Programming

Section 3-15 Complex or Unique Projects

Move 3-15-25 (Metric As Built Plans) to FDM 11-1-25.

Section 3-20 Local Program Related Topics

Revise 3-20 (Local Program Bridge Approach Length Eligible for Federal Funding) guidance to address local bridge program funding changes.

Revise 3-20 Attachment 1.1 (Local Bridge Improvement Assistance Program Replace in Kind Funding Policy) guidance.

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- [Section 7-40](#) Freeway/Expressway Designation Statute 84.295

Revise 7-40 Attachment 10.1 (Sample Finding Determination and Order, DT2169) and Attachment 10.3 (Sample Notice and Order Establishing Locations and Right of Way Widths, DT1536 and Attachment) to update form.

Add 7-40 Attachment 10.8 (Notice of Intent to Designate (NOITD)).

- [Section 7-45](#) Interstate Access Points
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[Chapter 9: Surveying and Mapping](#)

[Section 9-1](#) Introduction

[Section 9-5](#) Policies

Revise 9-5-1.5 (Procedure to Perpetuate USPLSS and/or Land Parcel Boundary Monuments) to clarify item 8 and to replace the word landmark with either monument or survey monument.

[Section 9-10](#) Public Relations

[Section 9-20](#) Spatial Reference Systems

[Section 9-25](#) Monumentation

Revise 9-25-6 (Right of Way Monumentation) to update language.

[Section 9-30](#) Real Time Kinematic (RTK) Surveys

[Section 9-35](#) Horizontal Control - Traverse

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[Section 9-65](#) Cross Sections/Digital Terrain Models (DTMs)

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[Section 9-80](#) Survey Mathematics

[Chapter 10: Erosion Control and Storm Water Quality](#)

[Section 10-1](#) General Introduction

Revise 10-1-1 (Introduction) to update contact information.

Revise title and replace information in 10-2-2.2 (Transportation Construction General Permit) to introduce new guidance for WisDOT's general WPDES permit.

Add 10-2-2.2.1 (Area of Land Disturbance) new guidance to define applicable land disturbance activities.

Revise title and replace information in 10-2-2.3 (Transportation Separate Storm Sewer System Permit) to introduce new guidance for WisDOT's general WPDES permit.

[Section 10-5](#) Developing An Erosion Control Plan

[Section 10-10](#) Erosion and Sediment Control Devices

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[Section 10-25](#) Stormwater Quality

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[Section 10-35](#) Stormwater Control Measure Selection

[Section 10-40](#) Maintenance Best Management Practices (BMPs)

[Chapter 11: Design](#)

[Section 11-1](#) Introduction

Revise 11-1-1 (General Design Introduction) to update contacts. Reformat and update subsection for asset management and current performance based practical design guidance.

Revise, retitle and renumber former FDM 11-1-10 (Performance Based Practical Design) and move to FDM 11-1-5 (Asset Management by a Practical Design System Preservation Approach) to update guidance to incorporate asset management and Performance Based Practical Design (PBPD) language.

Revise 11-1-5.2 (WisDOT Perspective on Performance-Based Practical Design) to update to incorporate Asset Management and current Performance Based Practical Design principles.

Add new section FDM 11-1-10 (Application of Design Criteria) and FDM 11-1 Attachment 10.1 (Improvement Strategies, Improvement Concepts, and Applications of Design Criteria) from former guidance FDM 11-1-1 (Application of Standards) and revise to add guidance for S-1, S-2, and S-3 application definitions.

Add 11-1 Attachment 10.1 (Improvement Strategies, Improvement Concepts and Standard Applications) to incorporate asset management and current performance based practical design principles.

Revise and renumber former FDM 11-1-4 (Programmatic Exception to Standards) that linked to FDM 11-40-4 (Application of Safety Screening Analysis (SSA) for Programmatic Exception to Standards (PES)) guidance to note that PES process has been superseded with the Safety Screening Process (SCP).

Move former section FDM 11-1-2 (Exceptions to Standards) to FDM 11-1-20 and revise title to Design Justification (Formerly Exceptions to Standards). Delete 11-1 Attachment 2.1 (Exceptions to Standards Approval Flowcharts) and Attachment 2.2 (Exceptions to Standards: Sample Transmittal Letters and Title Sheets). Revise guidance to conform to asset management.

Move former FDM 11-1-3 (Metric and Design) and incorporate former FDM 3-15-25 (Metric As Built Plans) into this new subsection.

Section 11-2Alternative Contracting

Section 11-3Community Sensitive Design

Revise 11-3 (Design – Asset Management) to include Asset Management applications.

Revise 11-3 Attachments 5.1 to 5.14 for asset management.

Section 11-4Reports

Revise 11-4-1 (Concept Definition Report) to reflect asset management language and update organization information.

Add 11-4-3 (Final Scoping Certification) guidance to define the asset management final scoping certification process.

Add 11-4 Attachment 3.1 (Final Scope Certification Document Template).

Revise 11-4-10 (Design Study Report) guidance to reflect asset management changes. Update terminology from “Exception to Standards” to “Design Justification” and provide procedure for design justification approval by FHWA. Also, update changes to FDM 3-1 phases and add new DSR formats for asset management.

Revise 11-4 Attachments 10.1 to 10.9 to update and add DSR templates for asset management projects. Add design justifications approval signature page, local and NHS local program signature pages and renumber attachments.

Section 11-5General Design Considerations

Section 11-10Design Controls

Revise 11-10 Attachment 5.2 (Sight Distance Categories and Applications), Attachment 5.4 (Sight Distance for Crest Vertical Curves), Attachment 5.6 (Sight Distance for Sag Vertical Curves), and Attachment 5.14 (Sample Problem - Intersection Sight Distance) for asset management.

Section 11-15Cross-section Elements for Modernization Projects on Rural Highways, Freeways and Interstates

Revise 11-15 Attachments 1.1, 1.2, 1.3, 1.4, 1.5, 1.6 and 1.7. Add Attachment 1.18.

Section 11-20Cross Section Elements for Modernization of Urban Highways

Revise 11-20 (Design – Cross Section Elements for Modernization of Urban Highways) guidance to reflect asset management changes to text and attachments.

Revise 11-20-1.3 (Design Criteria Guidance) to define how to use design criteria values for Reconstruction versus New Construction projects and the use of the SCD and DSR DJ in the selection process.

Revise 11-20 Attachments 1.1 to 1.8 guidance to reflect asset management changes.

Section 11-25 Intersections at Grade

Add new subsection 11-25-1.4.2 (OSOW for Perpetuation and Rehabilitation Projects) to add guidance for Perpetuation and Rehabilitation projects.

Revise 11-25-2 (Design Criteria and Guidelines) to add guidance regarding perpetuation and rehabilitation projects.

Revise 11-25 Attachment 2.2 (WisDOT Interim Policy on Checking Criteria for OSOW-ST and OSOW-MT Vehicles at Intersections) to add guidance regarding perpetuation projects.

Section 11-26 Roundabouts

Section 11-30 Interchange

Section 11-35 Structures

Revise 11-35-5 (Temporary Bridges) to update guidance regarding temporary bridges.

Revise 11-35-1.1 (Three Lane Bridge Criteria – General) guidance and refer user to other section of FDM for work zone highway capacity analysis.

Delete former subsection 11-35-10.2 (Highway Capacity Analysis). Renumber remaining subsections.

Revise 11-35-10.3 (Bridge Rehabilitation and Widening Practices) guidance.

Section 11-38 Safety Certification Process

Add new section 11-38 (Design - Safety Certification Analysis) to add guidance for WisDOT's safety certification process.

Section 11-40 Perpetuation and Rehabilitation Requirements for Highways

Revise 11-40 (Design - Perpetuation and Rehabilitation Requirements for Highways) and retitle entire subsection and replace text with updated information.

Revise 11-40 Attachment 7.1 (S-2 Application Design Criteria for Rehabilitation Projects), Attachment 7.2 (Design Standards for Rehabilitation Projects on Rural State Trunk Highways Functionally Classified as Arterials), Attachment 7.3 (Design Standards for Rehabilitation Projects on Rural State Trunk Highways Functionally Classified as Collectors and Locals), Attachment 7.4 (Design Standards for Rehabilitation Projects on Town Roads), Attachment 7.5 (Design Standards for Rehabilitation Projects on Rural County Trunk Highways Functionally Classified as Arterials), and Attachment 7.6 (Design Standards for Rehabilitation Projects on Rural County Trunk Highways Functionally Classified as Collectors and Locals).

Section 11-45 Other Elements Affecting Geometric Design

Revise 11-45-2.3.6.2.1 (Sight Distances) to change wording from exception to standards to design justification.

Revise 11-45-2.3.6.3.1 (Standard Barrier Sections) guidance regarding footings.

Add 11-45-4 (Roadside Design Application - Perpetual and Rehabilitation Improvements) guidance to address asset management improvement projects.

Add 11-45 Attachment 4.1 (Roadside Hazard and Guardrail Flowchart for Perpetuation and Rehabilitation Highway Improvement Projects) guidance.

Section 11-46 Bicycle and Pedestrian Accommodations

Added 11-46-1.1.3 (Asset Management guidance).

Added 11-46-1.1.4 (Asset Management and ADA Curb Ramp Compliance guidance).

Added 11-46-1.1.5 (ADA Curb Ramp Compliance and Right-of-Way Requirements guidance).

Added 11-46-1.1.6 (Bikeways guidance).

Added 11-46-1.1.7 (Sidewalks guidance).

Revise 11-46-1.3.1.3 (Constrained Environments) to update guidance.
Revise 11-46-1.3.1.4 (Absence of Need) to update guidance.
Revise 11-46-1.3.1.4.1 (Sidewalks) to update guidance.
Revise 11-46-1.3.1.5 (Refusal to Maintain Sidewalks) to update guidance.
Revise 11-46 List of Attachments to add new attachments.
Revise 11-46-5 (Introduction) to update guidance.
Revise 11-46-5.1.1 (ADA Compliance) to update guidance.
Revise 11-46-5.1.2 (Technical Infeasibility) to update guidance.
Revise 11-46-10 1(General) to update guidance.
Added 11-46-10.2.2 (Curb Ramp Flares)
Added 11-46-10.2.3 (Curb Ramp Construction Details)
Revise 11-46-10.2.4 (Truncated Domes) to update guidance.
Revise 11-46-10.3 (Curb Ramp Design Considerations) to update guidance.
Revise 11-46-15.2 (Design Guideline and Basic Improvements) to update guidance.
Revise 11-46-15.4 (Rural On-road Bicycle Accommodations) to update guidance.
Revise 11-46-15.4.1 (Rural Paved Shoulders) to update guidance.
Revise 11-46-15.8 (Manhole and Utility Covers) to update guidance.
Section 11-50 Traffic Control
Revise 11-50-1.2 (Responsibilities) guidance.
Revise 11-50-5.11.1 (TMP Strategies Matrix Overview) guidance to add examples of services that are not eligible for funding.
Revise 11-50-15.11 (Bureau of Traffic Operations Involvement) guidance.
Revise 11-50-20.5 (Speed Limits During Construction) guidance.
Revise 11-50-20.10.2 (Queue Warming System) guidance.
Section 11-52 Traffic Engineering and Operations
Section 11-55 Special Features
Revise 11-55-20.2 (Overhead Sign Supports) to revise guidance.
Section 11-60 Detours
<u>Chapter 12: Right-of-Way Plat Development</u>
Section 12-1 General
Section 12-5 Making Right-of-Way Determinations
Section 12-10 Transportation Project Plat Preparation
Section 12-15 Traditional Right-of-Way Plat Preparation
<u>Chapter 13: Drainage</u>
Section 13-1 Drainage Practice
Revise 13-1-1 (Drainage Practice Background – Introduction) to update the author.

Revise 13-1-10.2 (Bridge and Box Culvert Design) to describe current process for Structure Survey Report (SSR) e-submittal.

Revise 13-1-15.1 (Application) to add a link for culvert replacement information for perpetuation and rehabilitation projects.

Revise 13-1-15.2 (Selection Standard) to add a link for culvert replacement material information for perpetuation and rehabilitation projects.

Revise 13-1-15.8 (Tied Joints) to clarify information for reinforced concrete pipe culvert tied joints.

Revise 13-1-15.9 (Height of Cover for Culvert Pipes) to clarify information.

Revise 13-1-17.6.2 (Tied Joints) to clarify information.

Revise 13-1-17.7 (Height of Cover for Storm Sewer) to clarify information.

Revise 13-1-25 (Design Criteria) to clarify information regarding bedding.

Add 13-1-30 (Culvert Replacement and Analysis for Perpetuation and Rehabilitation Projects) to describe culvert replacement and analysis for perpetuation and rehabilitation projects including inspection and design procedures, materials, and end treatments.

Add 13-1 new Attachments 30.1 (Guidelines for Defining a Rural Area) and 30.2 (Culvert Sizing Quick Check).

[Section 13-5](#)Field Work

[Section 13-10](#)Hydrology

[Section 13-15](#)Hydraulic Design of Culverts

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[Section 13-25](#)Storm Sewer Design

[Section 13-30](#)Channels and Road Ditches

[Section 13-35](#)Erosion and Water Pollution Control

[Section 13-40](#)Subgrade Drainage

[Section 13-45](#)Culvert and Storm Sewer Rehabilitation and Replacement

Add FDM 13-45 (Culvert and Storm Sewer Rehabilitation and Replacement) guidance for culvert and storm sewer rehabilitation and replacement including sliplining and trenchless technology.

Add FDM 13-45 Attachment 10.1 (Culvert Liner Hydraulic Analysis Example).

Chapter 14: Pavements

[Section 14-1](#)General

[Section 14-5](#)Base Course

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[Section 14-15](#)Pavement Type Selection

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Chapter 15: Plan Preparation

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Revise 15-5 Attachments 3.3. (CADDs AutoCAD Civil 3D File and Layout Naming Standard) and Attachment 3.6 (CADDs MicroStation Base File Naming Standard) guidance.

[Section 15-10](#)Review

Chapter 17: Railroad Coordination

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Chapter 19: Plans, Specifications, and Estimates

[Section 19-1](#)Introduction

Revise 19-1-3 (Project Letting Process (PLP)) guidance.

[Section 19-5](#)Estimates

Revise 19-5-3.2 (Usage Guidance for Other Items) regarding the use of the conversion factors table for granular materials.

Revise 19-5-3.3.3 (Rounding Quantities) guidance and add guide to rounding quantities tables.

[Section 19-10](#)PS&E Transmittal and Composition

[Section 19-15](#)Special Provisions

[Section 19-21](#)Quality Management Program

Revise 19-21-2.1.1 (Ride Quality) to update reference to standard specifications 740.

Move and revise 19-21-2.1.4 (QMP Base Aggregate) guidance from 19-21-5.2.1.

Moved former guidance for 19-21-5.2.1 (QMP Base Aggregate) to 19-21-2.1.4 and revise. Renumber remaining subsections.

Revise 19-21-10.1.1 (HMA Pavement Percent Within Limits (PWL) QMP – General Information) to add link for QMP website for SPV templates.

[Section 19-22](#)Post-Advertisement Activities
[Section 19-25](#)Local Force Account Agreements
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