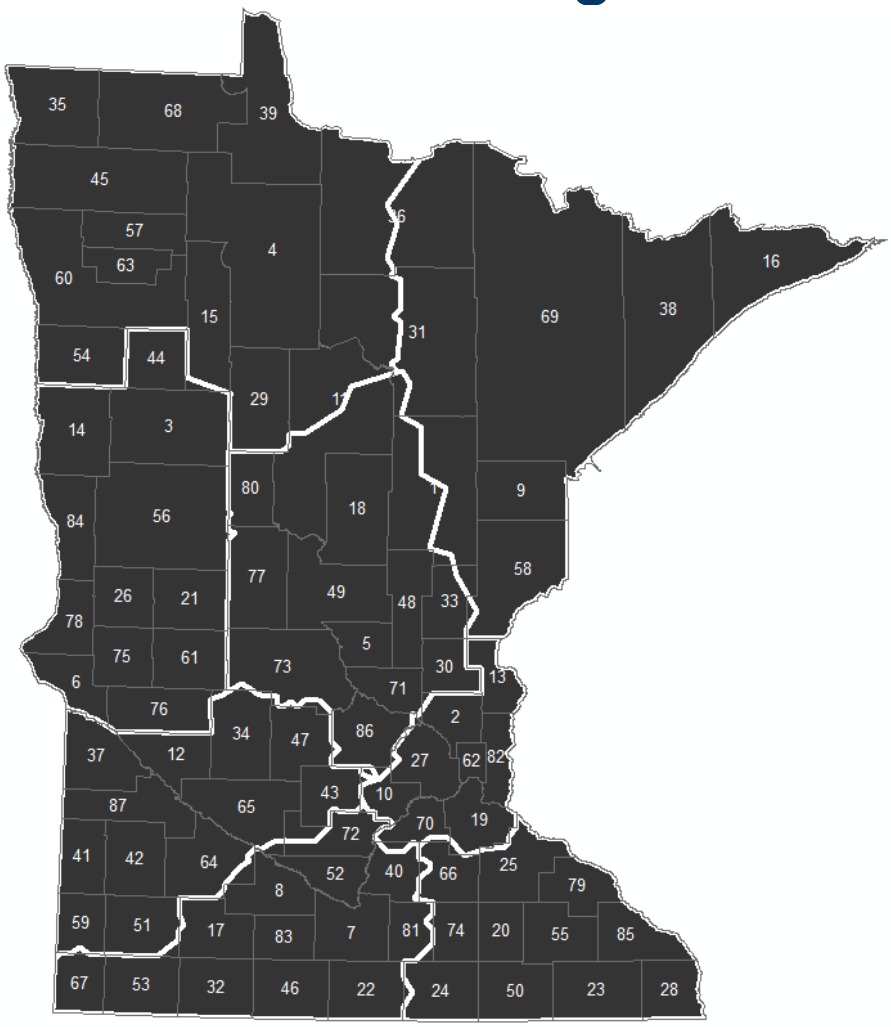
DEPARTMENT OF TRANSPORTATION

Chapter 8: Documentation

MnDOT Pavement Design Manual



December 16, 2019

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Introduction

There are two documents that may be required to provide for a pavement project. A Pavement Design Memorandum (PDM) is required when the Alternate Bidding process is followed. This document enables the MnDOT Pavement Design Engineer to review and approve the pavement design. A Materials Design Recommendation (MDR) is required for all projects that include grading or pavement. It is used to document and communicate pavement and geotechnical design recommendations to the project designers.

This chapter describes the content, development, review and approval processes of these two documents.

Section 800: Pavement Design Memorandum (PDM)

A PDM is required when the Alternate Bidding process is followed so that the pavement design can be reviewed and approved by the MnDOT Pavement Design Engineer. A PDM is written to document the alternate pavement designs that were considered, the information required for the pavement designs' development, and the project's LCCA. See **Chapter 7: Pavement-Type Selection** to determine if the project will follow the Formal LCCA process and, therefore, will require the completion of a PDM.

1. Format

   The PDM template must be used for all PDMs. The template is available on the MnDOT Pavement Design website at and directions for completing it are in **Section 820: PDM Template Instructions**.

2. Distribution and Review

   A. The draft PDM is sent to the MnDOT Pavement Design Engineer.

   B. The MnDOT Pavement Design Engineer reviews the PDM and attachments and may request any necessary changes to be made.

   C. The MnDOT Pavement Design Engineer will distribute the PDM to the representatives of the Concrete Paving Association of Minnesota (CPAM) and Minnesota Asphalt Pavement Association (MAPA). The associations will have a comment period of two weeks and the MnDOT Pavement Design Engineer will address any comments.

   D. The MnDOT Pavement Design Engineer will sign the finalized PDM and the project may proceed with the pavement designs described in the PDM.

Section 810: Materials Design Recommendation (MDR)

The MDR provides pavement and geotechnical design recommendations for MnDOT projects to the project designer. This includes recommendations for layer thickness, materials, treatments, and specifications necessary to design the project.

Note: Only the pavement designs that will be used in the project plans need to be included in the MDR.

1. Format

   A template for formatting the MDR is available on the MnDOT Pavement Design website. **The template format is required for projects that will use Alternate Bidding.** See **Section 830: MDR Template Instructions** for directions for using this template.

   Distribution and Review

   A. Complete a draft MDR.

   B. Complete a MDR routing sheet for the draft MDR. The MDR routing sheet template is available on the MnDOT pavement design website.

   C. Distribute the MDR and MDR routing sheet to the distribution list shown in **Table 810.1**.

      The method of distribution of the MDR, MDR routing sheet, and supporting documents vary by district preference and may be accomplished by e-mailing copies of the files, ProjectWise links, or electronic data management system (EDMS) links. These methods are all acceptable for review; however, the MDR, MDR routing sheet, and supporting material, must be archived in the MnDOT EDMS and should be placed there as early as possible.

   D. Provide for a review period of two weeks.

   E. Review comments, finalize, and archive the MDR.

Table 810.1 – Distribution List for Project MDRs

Office	Title	Project Type/Note
Materials & Road Research	MnDOT Pavement Engineer	Pavement projects.
Materials & Road Research	MnDOT Pavement Design Engineer	Pavement projects.
Materials & Road Research	MnDOT Bituminous Engineer	Projects that include HMA pavement.
Materials & Road Research	MnDOT Concrete Engineer	Projects that include PCC pavement.
Materials & Road Research	MnDOT Grading and Base Engineer	Projects that include any work to a roadway's subgrade, base, or include aggregate shoulders.
Materials & Road Research	MnDOT Pavement Preservation Engineer	Projects that include FDR, SFDR, CIR or any HMA pavement preservation.
Materials & Road Research	MnDOT Foundations Engineer	Projects that include fills of cuts deeper than 30'.
Materials & Road Research	MnDOT Geology	Projects that include rock cuts.
Central Office	MnDOT Special Provisions Engineer	Final MDR only
Central Office	MnDOT Design Support Engineer	Final MDR only
MnDOT District	This is the district's preference, but would typically include the Soils Engineer, Materials Engineer, Design Engineer, Project Engineer, and others.	District decision
FHWA	FHWA Pavement and Materials Engineer	Projects on the Interstate System

Section 820: PDM Template Instructions

This section contains directions for completing the template for PDMs.

Note: Delete any tables or rows within tables that do not apply to the project.

Office Memorandum

TO: *Recipient's Name*
MnDOT Pavement Design Engineer

FROM: *Sender's Name*
Author's Title

DATE: *Month, Day, Year*

SUBJECT: PAVEMENT DESIGN MEMORANDUM

SP # *The Project's SP Number.*

Highway # *The number(s) of the State Highway(s) within the project limits*

Project Limits *Text Description of the Project Limits*
RP XXX+00.XXXX to RP XXX+00.XXXX

Length of Project XX.XXX Miles

Funding Category *e.g. RC (Reconstruction), RD (Reconditioning), MC (Major Construction)*

Programmed Letting Date XX/XX/XXXX

MnDOT Pavement Design Engineer

Date

Project Information

Project Scope

Type of Work	*General project description e.g. mainline reconstruction and overlay ramps.(may be found in scoping)*
Benefit	*The expected improvement the project will provide; be specific (i.e. the amount of ride improvement).*

Pavement Design Segments

This is a list of project segments that require separate pavement designs.

Segment #	Highway #	From RP	To RP	Design Type
1				*PCC or HMA, Reconstruction, FDR,SFDR, etc.*
2				

Existing Facility

*This is a description of the existing road and its general geometry. Scoping documents and the Pavement Management System (see **Section 280**) may be useful in completing this section.*

Highway	*Multiple segments may be required to describe the existing road. Include a copy for each segment.*
From	*From RP*
To	*To RP*
Number of Lanes	*No. of lanes, if it's divided, and description of any median.*
Mainline Pavement Type	*HMA or PCC. For PCC include the joint spacing, # of dowels, thickness etc.*
Mainline Pavement Width	*Width in feet.*
Shoulder Type	*HMA, PCC, aggregate, any curb and gutter.*
Shoulder Width	*Width in feet of each shoulder.*
Seasonal Load Restriction	*The posted seasonal load restriction in tons; 10 tons if there is no posted restriction.*
Speed Limit	*The posted speed limit.*

Roadway Construction History

*See **Section 260** for guidance on obtaining this information. If this material is extensive, it may be placed as an appendix to this document.*

The following are examples of two sections of a project.

RP 123.789 to RP 126.987 - MN 23 to 3rd Street				
Year	**SP**	**Activity**	**Width**	**Depth**
1989	2309-001	Minor CPR/ Patching	30'	
1954	2309-123	CPR		
1945	2309-789	HMA Shoulders	6'	2.5"
1945	2309-789	Doweled PCC	30'	8"
1945	2309-789	Aggregate Base	30'	6'

RP 126.987 to RP 129.102 – 3rd Street to E Limits Franklin				
Year	**SP**	**Activity**	**Width**	**Depth**
1989	2309-01	HMA Overlay	24’	4.5”
1989	2309-01	HMA Milling	24’	3”
1973	2309-12	HMA Overlay	24’	4”
1951	2309-111	Chip Seal	24’	
1950	2309-22	Spot Patching	24’	
1945	2309-789	Doweled PCC with Aggregate Base	30’	8”

Roadway Condition

Pavement Distresses	*A general description of the visible distresses. For guidance see **Section 270.***
Areas of Concern	*Any areas that may need repair or special treatment, such as frost heaves or subgrade failure. For guidance see **Section 270**.*

Attach photos or diagrams as needed.

Pavement Performance Data

*This section documents the Pavement Performance Data for the road within the project limits. Pavement Performance Data is available from Pavement Management System (see **Section 280**).*

Year: *Year that the data was collected*							
Segment Description	**Dir.**	**From RP**	**To RP**	**RQI**	**SR**	**PQI**	**IRI (in/mile)**
	I, D, U						

R-Value/FWD Data

This section reports the R-value from either FWD data or laboratory testing (or both).

*Use this table to document FWD data using the TONN method, see **Section 200**. Any FWD (TONN Analysis) and Laboratory R-Values must be attached in the appendix.*

FWD Data			
Date: *Date of Testing*			
	Reported Capacity	**Overlay Thickness**	**R-Value**
Mean			
Std. Dev.			

Use this table to document any Laboratory R-values, see ***Section 220****.*

Laboratory R-Values				
Count	**Mean**	**Minimum**	**Maximum**	**Std. Dev.**
# of tests				

Comments: *Any notes, comments, or concerns about the collected data.*

Core/GPR

This section reports the HMA thickness (and condition) collected from coring or GPR see ***Sections 230 & 240****.*

Date: *Date that the data was collected on.*

Segment: *Segment #*					
Location	**Count**	**Average**	**Minimum**	**Maximum**	**Std. Dev.**
Mainline, shoulder, turn-lanes, etc					

Provide the location of any photos of the cores and of any GPR report. These may be attached, in EDMS, or ProjectWise.

Comments: *Any notes, comments, or concerns about the collected data.*

Traffic

*A signed MnDOT traffic forecast is required for all PDMs. See **Section 250**.*

Traffic Forecast #:					Traffic Forecast Date:		
Hwy	From RP	To RP	Base Year 2-way Design Lane HCADT	2-way HCADT Growth/ Year	20 Yr. Design Lane Cumulative BESAL's	20 Yr. Design Lane Cumulative CESAL's	35 Yr. Design Lane Cumulative CESAL's

Life-Cycle Cost Analysis (LCCA)

*This section contains the results of the LCCA analysis according to **Chapter 7**.*

	Alternate #1	Alternate #2	Alternate #3
Description			
Design Life			
Project Net Present Cost			
% of Low Cost			

Pavement Recommendations

*This section contains the recommended pavement design HMA and PCC (see **Chapter 7 – Pavement-Type Selection**).*

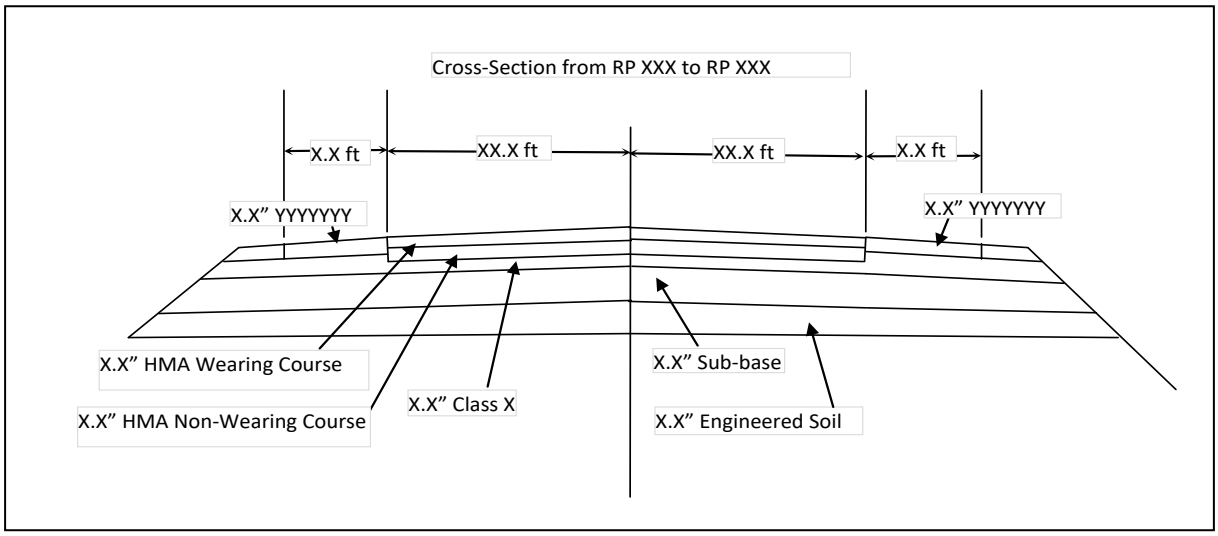
NEW HMA

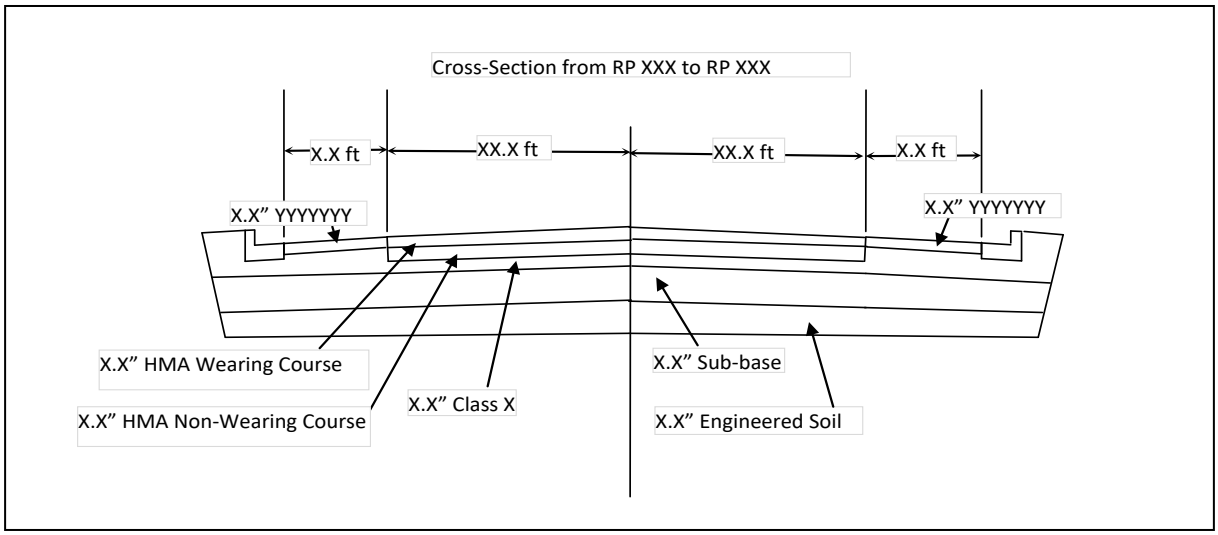
Segment #	Highway #	From RP	To RP	Design Type
#	TH #	###.###	###.###	New HMA

Mainline Pavement	Thickness (inches)	Lifts	Mix Design/ Material	Spec.	Compaction Testing	Width (ft.)
Wear	*Sec. 400*	----	----	---	----	*Scoping*
Non-Wear	*Sec. 400*	----	----	---	----	*Scoping*
Smoothness	---					
Notes						
Mainline Subsurface	**Thickness (inches)**		**Material**	**Spec.**	**Compaction Testing**	**Width (ft.)**
Base	*Sec. 400*		*Sec. 400 & 310*	---	---	
Subbase	*Sec. 400*		*Sec. 400 & 310*	---	---	
Eng. Soil	*Sec. 320*		*Sec. 320*	---	---	
Subgrade Prep.	*Sec. 320*			---	---	
Notes						

HMA Shoulders	Thickness (inches)	Lifts	Mix Design/ Material	Spec.	Compaction Testing	Width (ft.)	
						Lt	Rt
HMA	*Sec. 610*	---	---	---	---	*Scope*	*Scope*
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	---	---	*610*	*610*
Shoulder Agg. Base	*As Needed*		*Match Agg. Base*	---	---		
Notes							

Aggregate Shoulders	Thickness		Material	Spec.	Compaction Testing	Width	
						Lt	Rt
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	---	---	*Scope*	Scope
Added Aggregate Base	*As Needed*		*Match Agg. Base*	---	---		
Notes							


Cross-Section from RP XXX to RP XXX
X.X ft
XX.X ft
XX.X ft
X.X ft
X.X" YYYYYYY
X.X" YYYYYYY
X.X" HMA Wearing Course
X.X" HMA Non-Wearing Course
X.X" Class X
X.X" Sub-base
X.X" Engineered Soil


Cross-Section from RP XXX to RP XXX
X.X ft
XX.X ft
XX.X ft
X.X ft
X.X" YYYYYYY
X.X" YYYYYYY
X.X" HMA Wearing Course
X.X" HMA Non-Wearing Course
X.X" Class X
X.X" Sub-base
X.X" Engineered Soil

FDR/SFDR/CIR

Segment #	Highway #	From RP	To RP	Design Type
#	TH #	###.###	###.###	FDR,SFDR or CIR

Existing Mainline Pavement	Depth (inches)	Material	Note	Width (ft.)
Existing HMA	*Sec.230, 240, 260*	*HMA*		*Sec. 260*
Existing Aggregate	*Sec.230, 240, 260*	*Sec.230, 240, 260*		
Notes				

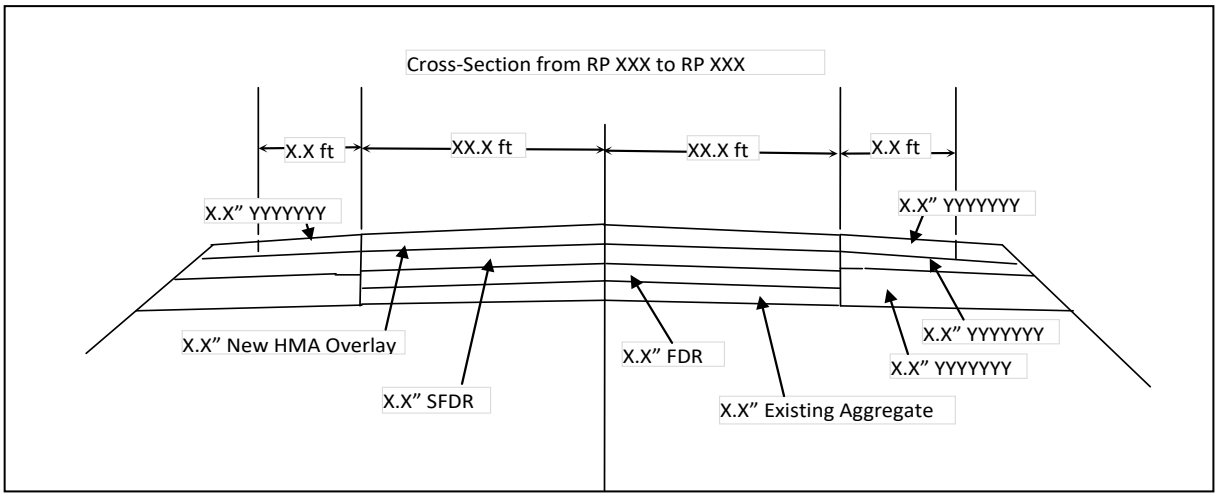
Mainline Pavement	Depth (inches)	Lifts	Material	Spec.	Width (ft.)
Milling	*Sec. 410*			---	*#.#*
Added Aggregate	*Sec. 410*		*Sec. 410*	---	*#.#*
Reclaim/ Recycle	*Sec. 410*		*Sec. 410*	---	*#.#*
Stabilize	*Sec. 410*		*Sec. 410*	---	*#.#*
Notes					

Mainline Pavement	Thickness (inches)	Lifts	Mix Design/ Material	Spec.	Compaction Testing	Width (ft.)
Wear	*Sec. 400*	---	*Sec. 450*	---	---	*Scoping*
Non-Wear	*Sec. 400*	---	*Sec. 450*	---	---	*Scoping*
Smoothness	---					
Notes						

HMA Shoulders	Thickness (inches)	Lifts	Mix Design/ Material	Spec.	Compaction Testing	Width (ft.)	
						Lt	Rt
HMA	*Sec. 610*	---	*Sec. 450*	---	---	*Scope*	*Scope*
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	---	---	*610*	*610*
Shoulder Agg. Base	*As Needed*		*Match Agg. Base*	---	---		
Notes							

	Thickness		Material	Spec.		Width (ft.)

Aggregate Shoulders					Compaction Testing	Lt	Rt
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	---	---	*Scope*	*Scope*
Added Aggregate Base	*As Needed*		*Match Agg. Base*	---	---		
Notes							



Rubblize/Crack & Seat

Segment #	Highway #	From RP	To RP	Design Type
#	TH #	###.###	###.###	Rubblize/Crack & Seat

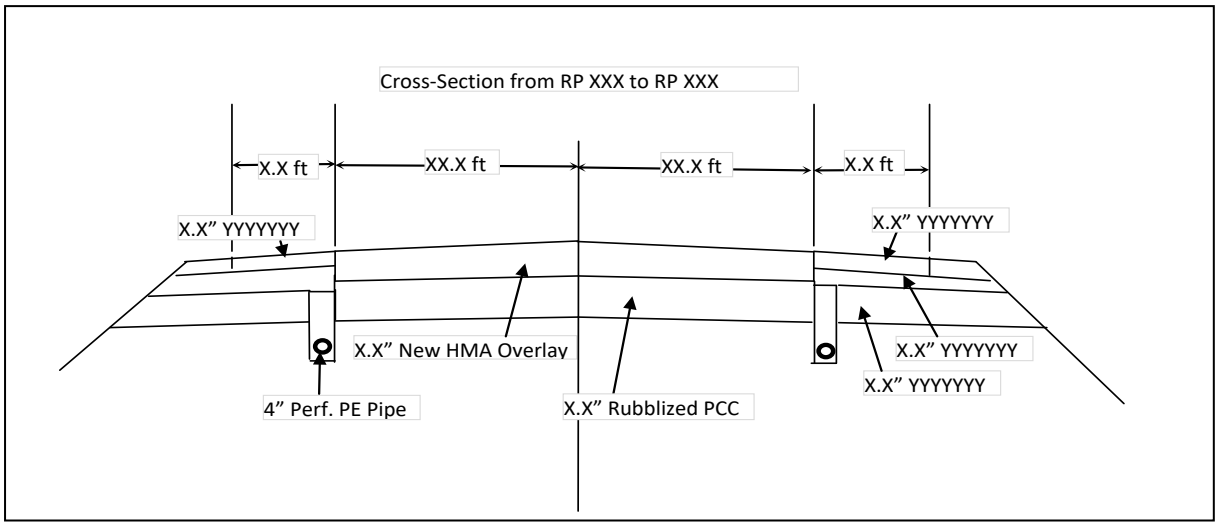
Mainline Pavement	Depth (inches)	Material	Note	Width (ft.)
Existing HMA	*Sec. 230, 240, 260*	*HMA*		*Sec. 260*
Existing PCC	*Sec. 260*	*PCC*		*Sec. 260*
Existing Aggregate	*Sec. 230, 240, 260*	*HMA*		
Notes				

Mainline Pavement	Depth (inches)	Lifts	Material	Spec.	Width (ft.)
Mill HMA	*Sec. 410*			---	*#.#*
Rubblize/ Crack & Seat	*Special Provision # and if any edits are required, Sec. 420*				
Subsurface Drains	*Type of drain & outlets and its specification, Sec. 420*				
Notes					

Mainline Pavement	Thickness (inches)	Lifts	Mix Design/ Material	Spec.	Compaction Testing	Width (ft.)
Wear	*Sec. 420*	---	*Sec. 450*	---	---	*Scoping*
Non-Wear	*Sec. 420*	---	*Sec. 450*	---	---	*Scoping*
Smoothness	*Sec. 450*					
Notes						

HMA Shoulders	Thickness (inches)	Lifts	Mix Design/ Material	Spec.	Compaction Testing	Width (ft.)	
						Lt	Rt
HMA	*Sec. 610*	---	*Sec. 450*	---	---	*Scope*	*Scope*
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	---	---	*610*	*610*
Shoulder Agg. Base	*As Needed*		*Match Agg. Base*	---	---		
Notes							

Aggregate Shoulders	Thickness		Material	Spec.	Compaction Testing	Width	
						Lt	Rt
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	---	---	*Scope*	*Scope*
Added Aggregate Base	*As Needed*		*Match Agg. Base*	---	---		
Notes							



NEW PCC

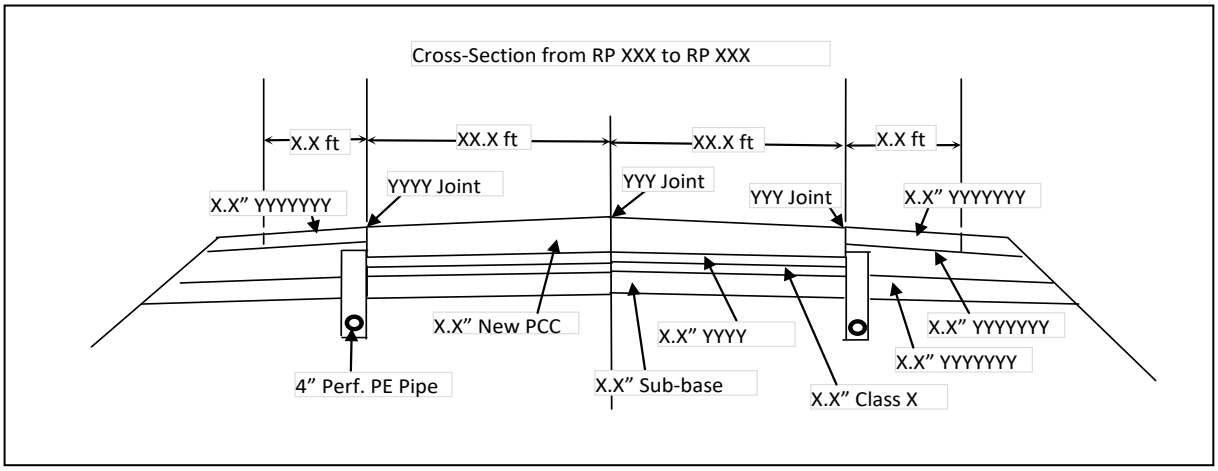
Segment #	Highway #	From RP	To RP	Design Type
#	TH #	###.###	###.###	New PCC

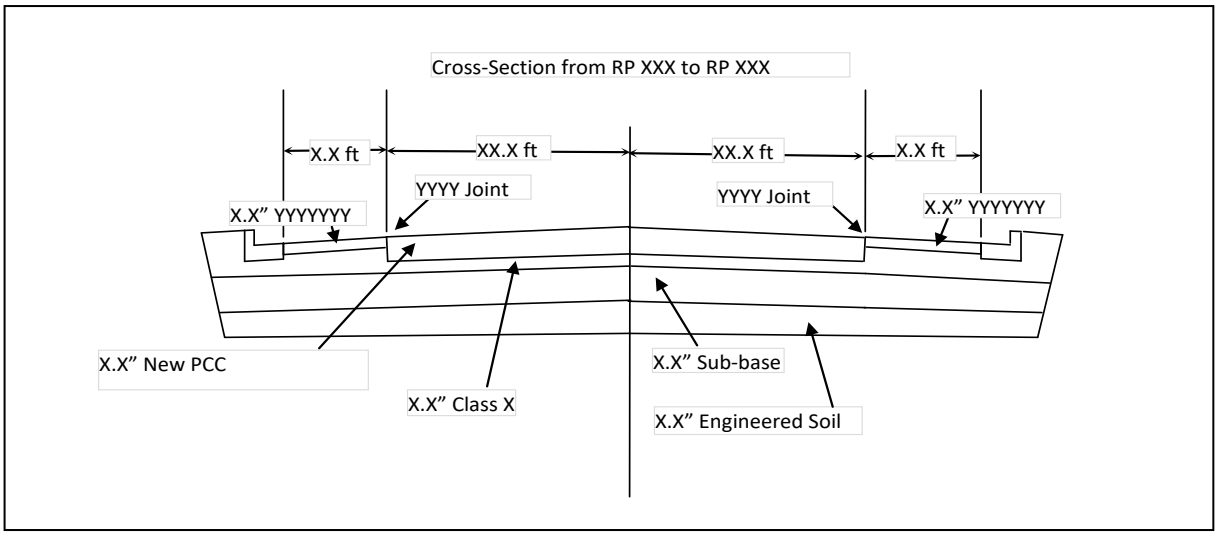
Mainline Pavement	Thickness (inches)	Joint Spacing (ft.)	Dowel Arrangement	Dowel Size	Sealant	Width (ft.)
PCC	*Sec. 500*	*Sec. 530*	*Sec. 530*	*530*	*Sec. 530*	*Scoping*
Notes						
Mainline Subsurface	**Thickness (inches)**	**Lifts**	**Material**	**Spec.**	**Compaction Testing**	**Width (ft.)**
Base	*Sec. 500*		*Sec. 500 & 310*	---	---	
Subbase	*Sec. 500*		*Sec. 500 & 310*	---	---	
Eng. Soil	*Sec. 320*		*Sec. 320*	---	---	
Subgrade Prep.	*Sec. 320*			---	---	
Subsurface Drains	Type of Drain & outlets, Sec. 500					
Notes	---					

HMA Shoulders	Thickness (inches)	Lifts	Mix Design/ Material	Spec.	Compaction Testing	Width (ft.)	
						Lt	Rt
HMA	*Sec. 610*	---	*Sec. 450*	---	---	*Scope*	*Scope*
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	---	---	*610*	*610*
Shoulder Agg. Base	*As Needed*		*Match Agg. Base*	---	---		
Notes							

Aggregate Shoulders	Thickness		Material	Spec.	Compaction Testing	Width	
						Lt	Rt
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	---	---	*Scope*	*Scope*
Added Aggregate Base	*As Needed*		*Match Agg. Base*	---	---		
Notes							

PCC Shoulders	Thickness		Material	Spec.	Compaction Testing	Width	
						Lt	Rt
PCC	*Sec. 610*					*Scope*	*Scope*
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	---	---	*610*	*610*
Shoulder Agg. Base	*As Needed*		*Match Agg. Base*	---	---		
Notes							


Cross-Section from RP XXX to RP XXX
X.X ft
XX.X ft
XX.X ft
X.X ft
YYYY Joint
YYY Joint
YYY Joint
X.X" YYYYYYY
X.X" YYYYYYY
X.X" New PCC
X.X" YYYY
X.X" YYYYYYY
X.X" YYYYYYY
4" Perf. PE Pipe
X.X" Sub-base
X.X" Class X


Cross-Section from RP XXX to RP XXX
X.X ft
XX.X ft
XX.X ft
X.X ft
YYYY Joint
YYYY Joint
X.X" YYYYYYY
X.X" YYYYYYY
X.X" New PCC
X.X" Sub-base
X.X" Class X
X.X" Engineered Soil

Whitetopping

Segment #	Highway #	From RP	To RP	Design Type
#	TH #	###.###	###.###	Whitetopping

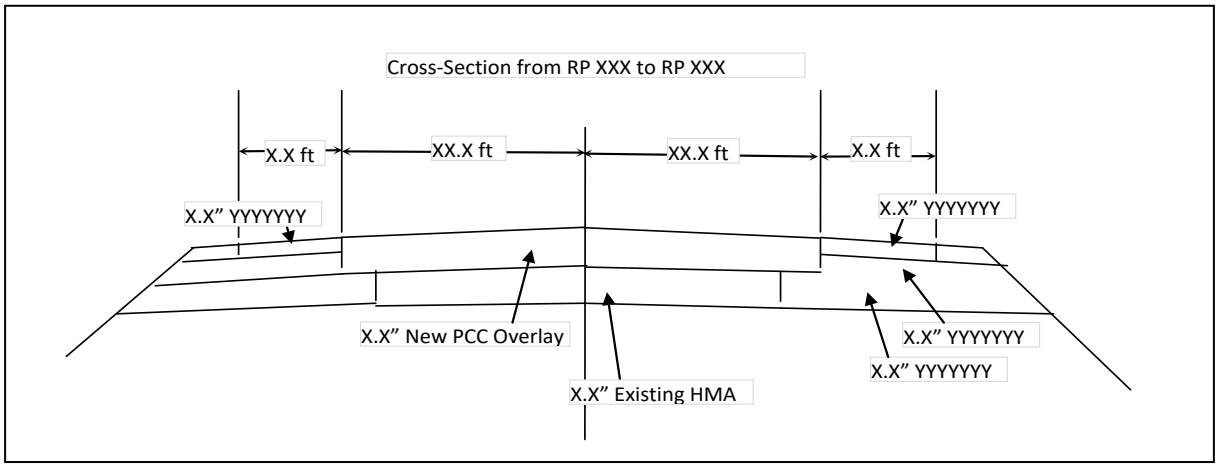
Mainline Pavement	Depth (inches)	Lifts	Material	Spec.	Width (ft.)
Mill HMA	*Sec. 510*			*Sec. 510*	*#.#*
Notes					

Mainline Pavement	Thickness (inches)	Joint Spacing (ft.)	Dowel Arrangement	Dowel Size	Sealant	Width (ft.)
PCC Overlay	*Sec. 500*	*Sec. 530*	*Sec. 530*	*530*	*Sec. 530*	*Scoping*
Notes						

HMA Shoulders	Thickness (inches)	Lifts	Mix Design/ Material	Spec.	Compaction Testing	Width (ft.)	
						Lt	Rt
HMA	*Sec. 610*	---	*Sec. 450*	---	---	*Scope*	*Scope*
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	---	---	*610*	*610*
Shoulder Agg. Base	*As Needed*		*Match Agg. Base*	---	---		
Notes							

Aggregate Shoulders	Thickness		Material	Spec.	Compaction Testing	Width	
						Lt	Rt
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	---	---	*Scope*	*Scope*
Added Aggregate Base	*As Needed*		*Match Agg. Base*	---	---		
Notes							

PCC Shoulders	Thickness		Material	Spec.	Compaction Testing	Width	
						Lt	Rt
PCC	*Sec. 610*					*Scope*	*Scope*
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	---	---	*610*	*610*
Shoulder Agg. Base	*As Needed*		*Match Agg. Base*	---	---		
Notes							



UBOL

Segment #	Highway #	From RP	To RP	Design Type
#	TH #	###.###	###.###	Unbonded Overlay

Mainline Pavement	Depth (inches)	Lifts	Material	Spec.	Width (ft.)
Mill HMA	*Sec. 520*			---	#.#
Notes					

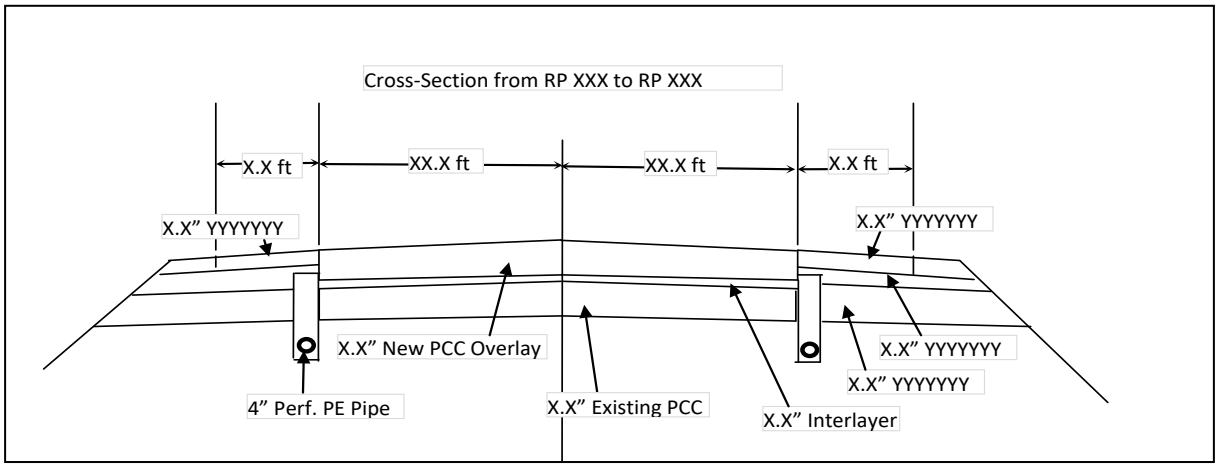
Mainline Pavement	Thickness (inches)	Joint Spacing (ft.)	Dowel Arrangement	Dowel Size	Sealant	Width (ft.)
PCC Overlay	*Sec. 500*	*Sec. 530*	*Sec. 530*	*530*	*Sec. 530*	*Scoping*
Notes						

Mainline Subsurface	Thickness (inches)	Lifts	Material	Spec.	Compaction Testing	Width (ft.)
Interlayer	*Sec. 520*		*Sec. 520*	---	---	
Subsurface Drains	*Type of drain & outlets, Sec. 520*					
Notes						

HMA Shoulders	Thickness (inches)	Lifts	Mix Design/ Material	Spec.	Compaction Testing	Width (ft.)	
						Lt	Rt
HMA	*Sec. 610*	---	*Sec. 450*	---	---	*Scope*	*Scope*
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	---	---	*610*	*610*
Shoulder Agg. Base	*As Needed*		*Match Agg. Base*	---	--		
Notes							

Aggregate Shoulders	Thickness		Material	Spec.	Compaction Testing	Width	
						Lt	Rt
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	---	---	*Scope*	*Scope*
Added Aggregate Base	*As Needed*		*Match Agg. Base*	---	---		
Notes							

PCC Shoulders	Thickness		Material	Spec.	Compaction Testing	Width	
						Lt	Rt
PCC	*Sec. 610*					*Scope*	*Scope*
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	---	---	*610*	*610*
Shoulder Agg. Base	*As Needed*		*Match Agg. Base*	---	---		
Notes							



Attachments:

Attach or provide a link to the location of the following:

Printouts of the pavement design programs' output for each pavement design.
Signed Traffic Forecast Summaries.
Soil Borings and Cores (or link)
The LCCA and any supporting calculations.
Any LCCA or Alternate Bidding Exceptions.
Any GPR, Geotechnical, or other reports.

Section 830: MDR Template Instructions

This section contains directions for completing the template for MDR.

Note: Delete any tables or rows within tables that do not apply to the project.

Office Memorandum

TO: *Recipient's Name*
Recipient's Title

FROM: *Sender's Name*
Author's Title

DATE: *Month, Day, Year*

SUBJECT: MATERIALS DESIGN RECOMMENDATION

SP # *The Project's SP Number.*

Highway # *The number(s) of the State Highway(s) within the project limits*

Project Limits *Text Description of the Project Limits*
RP XXX+00.XXXX to RP XXX+00.XXXX

Length of Project XX.XXX Miles

Funding Category *e.g. RC (Reconstruction), RD (Reconditioning), MC (Major Construction)*

Programmed Letting Date XX/XX/XXXX

Project Information

Project Scope

Type of Work	*General project description e.g. mainline reconstruction and overlay ramps.(may be found in scoping)*
Benefit	*The expected improvement the project will provide; be specific (i.e. the amount of ride improvement, or amount of life extension).*
LCCA Process	*Formal or District (see **Chapter 7**)*
Alternate Bid	*Yes or No (see **Chapter 7**)*

Pavement Design Segments

This is a list of project segments that require separate pavement designs.

Segment #	Highway #	From RP	To RP	Design Type
1				*PCC or HMA Overlay, Reconstruction, FDR,SFDR, etc.*
2				

Existing Facility

*This is a description of the existing road and its general geometry. Scoping documents and Pavement Management System (see **Section 280**) may be useful in completing this section.*

Highway	*Multiple segments may be required to describe the existing road. Include a copy for each segment.*
From	*From RP*
To	*To RP*
Number of Lanes	*No. of lanes, if it's divided, and description of any median.*
Mainline Pavement Type	*HMA or PCC. For PCC include the joint spacing, # of dowels, thickness etc.*
Mainline Pavement Width	*Width in feet.*
Shoulder Type	*HMA, PCC, aggregate, any curb and gutter.*
Shoulder Width	*Width in feet of each shoulder.*
Seasonal Load Restriction	*The posted seasonal load restriction in tons; 10 tons if there is no posted restriction.*
Speed Limit	*The posted speed limit.*

Roadway Construction History

*See **Section 260** in Chapter 2 for guidance on obtaining this information. If this material is extensive, it may be placed as an appendix to this document.*

The following are examples of two sections of a project.

RP 123.789 to RP 126.987 - MN 23 to 3rd Street				
Year	**SP**	**Activity**	**Width**	**Depth**
1989	2309-001	Minor CPR/ Patching	30'	
1954	2309-123	CPR		
1945	2309-789	HMA Shoulders	6'	2.5"
1945	2309-789	Doweled PCC	30'	8"
1945	2309-789	Aggregate Base	30'	6'

RP 126.987 to RP 129.102 – 3rd Street to E Limits Franklin				
Year	**SP**	**Activity**	**Width**	**Depth**
1989	2309-01	HMA Overlay	24’	4.5”
1989	2309-01	HMA Milling	24’	3”
1973	2309-12	HMA Overlay	24’	4”
1951	2309-111	Chip Seal	24’	
1950	2309-22	Spot Patching	24’	
1945	2309-789	Doweled PCC with Aggregate Base	30’	8”

Roadway Condition

Pavement Distresses	*A general description of the visible distresses. For guidance see **Section 270.***
Areas of Concern	*Any areas that may need repair or special treatment, such as frost heaves or subgrade failure. For guidance see **Section 270**.*

Attach photos or diagrams as needed.

Pavement Performance Data

*This section documents the Pavement Performance Data for the road within the project limits. Pavement Performance Data is available from Pavement Management System (see **Section 280**).*

Year: *Year that the data was collected*							
Segment Description	**Dir.**	**From RP**	**To RP**	**RQI**	**SR**	**PQI**	**IRI (in/mile)**
	I, D, U						

R-Value/FWD Data

Projects must develop an R-value from either FWD data or laboratory testing (or both).

Use this table to document FWD data using the TONN Method, see Section 200. Any FWD (TONN Analysis) and Laboratory R-Values must be attached in the appendix.

FWD Data			
Date: *Date of Testing*			
	Reported Capacity	**Overlay Thickness**	**R-Value**
Mean			
Std. Dev.			

Use this table to document any Laboratory R-values, see ***Section 220****.*

Laboratory R-Values				
Count	**Mean**	**Minimum**	**Maximum**	**Std. Dev.**
# of tests				

Comments: *Any notes, comments, or concerns about the collected data.*

Core/GPR

This section reports the HMA thickness (and condition) collected from coring or GPR see ***Sections 230 & 240****.*

Date: *Date that the data was collected on.*

Segment: *Segment #*					
Location	**Count**	**Average**	**Minimum**	**Maximum**	**Std. Dev.**
Mainline, shoulder, turn-lanes, etc					

Provide the location of any photos of the cores and of any GPR report. These may be attached, in EDMS, or ProjectWise.

Comments: *Any notes, comments, or concerns about the collected data.*

Traffic

*See **Section 250**.*

Traffic Forecast #:					Traffic Forecast Date:		
Hwy	From RP	To RP	Base Year 2-way Design Lane HCADT	2-way HCADT Growth/ Year	20 Yr. Design Lane Cumulative BESAL's	20 Yr. Design Lane Cumulative CESAL's	35 Yr. Design Lane Cumulative CESAL's

Life-Cycle Cost Analysis (LCCA)

*This section contains the results of the LCCA analysis according to **Chapter 7**.*

	Alternate #1	Alternate #2	Alternate #3
Description			
Design Life			
Project Net Present Cost			
% of Low Cost			
Selected			

*Exception: Does the district request an exception to either selecting the low-cost option? See **Chapter 7**. Any exception form should be attached.*

Pavement Recommendations

This section contains the recommended pavement design(s) for the Pavement Design Segments (listed on the second page of the memo).

Note: The table columns that have the heading “spec.” are intended to contain the number of the appropriate construction specification or special provision, or indicate that a plan note will be provided.

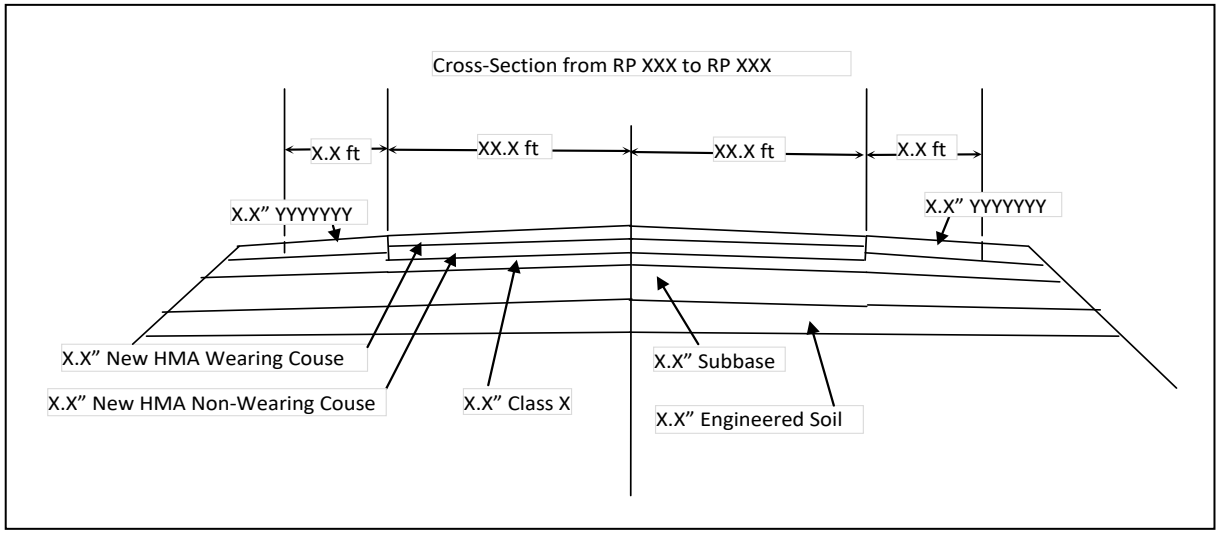
NEW HMA

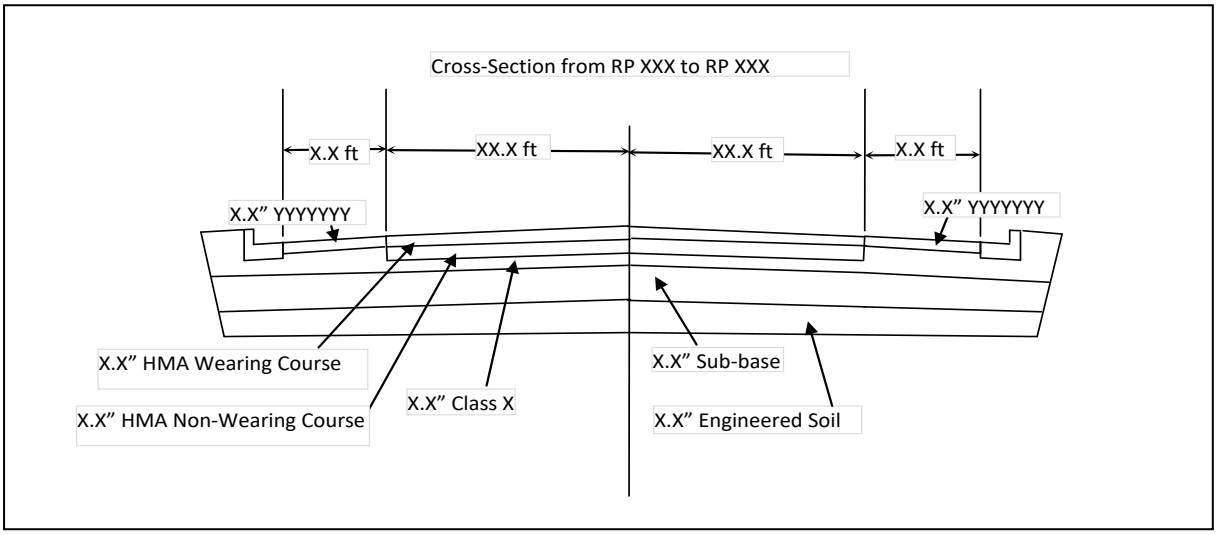
Segment #	Highway #	From RP	To RP	Design Type
#	TH #	###.###	###.###	New HMA

Mainline Pavement	Thickness (inches)	Lifts	Mix Design/ Material	Spec.	Compaction Testing	Width (ft.)
Wear	*Sec. 400*	*Sec. 450*	*Sec. 450*	*Spec, SP, or Plan Note*	*Sec. 450*	*Scoping*
Non-Wear	*Sec. 400*	*Sec. 450*	*Sec. 450*	*Spec, SP, or Plan Note*	*Sec. 450*	*Scoping*
Smoothness	*Sec. 450*					
Notes						
Mainline Subsurface	**Thickness (inches)**	**Lifts**	**Material**	**Spec.**	**Compaction Testing**	**Width (ft.)**
Base	*Sec. 400*		*Sec. 400 & 310*	*Spec, SP, or Plan Note*	*Sec. 330*	
Subbase	*Sec. 400*		*Sec. 400 & 310*	*Spec, SP, or Plan Note*	*Sec. 330*	
Eng. Soil	*Sec. 320*		*Sec. 320*	*Spec, SP, or Plan Note*	*Sec. 330*	
Subgrade Prep.	*Sec. 320*			*Spec, SP, or Plan Note*	*Sec. 330*	
Notes						

HMA Shoulders	Thickness (inches)	Lifts	Mix Design/ Material	Spec.	Compaction Testing	Width (ft.)	
						Lt	Rt
HMA	*Sec. 610*	*Sec. 450*	*Sec. 450*	*Spec, SP, or Plan Note*	*Sec. 450*	*Scope*	*Scope*
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	*Spec, SP, or Plan Note*	*Sec. 330*	*610*	*610*
Shoulder Agg. Base	*As Needed*		*Match Agg. Base*	*Spec, SP, or Plan Note*	*Match Agg. Base*		
Notes							

Aggregate Shoulders	Thickness		Material	Spec.	Compaction Testing	Width	
						Lt	Rt
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	*Spec, SP, or Plan Note*	*Sec. 330*	*Scope*	Scope
Added Aggregate Base	*As Needed*		*Match Agg. Base*	*Spec, SP, or Plan Note*	*Match Agg. Base*		
Notes							





Misc. Pavement Recommendations and Instructions to Designers

Provide any other necessary instructions to the project designer for the design and construction of this pavement segment that were not provided in the previous tables.

FDR/SFDR/CIR

Segment #	Highway #	From RP	To RP	Design Type
#	TH #	###.###	###.###	FDR,SFDR or CIR

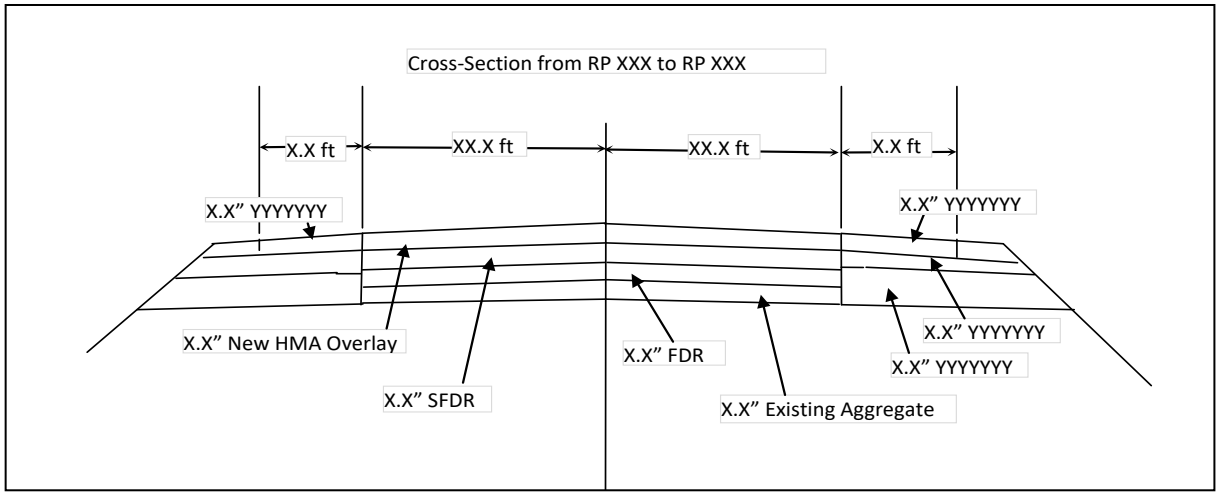
Existing Mainline Pavement	Depth (inches)	Material	Note	Width (ft.)
Existing HMA	*Sec. 230,240, 260*	*HMA*		*Sec. 260*
Existing Aggregate	*Sec. 230,240, 260*	*Sec. 230, 240, 260*		
Notes				

Mainline Pavement	Depth (inches)	Lifts	Material	Spec.	Width (ft.)
Milling	*Sec. 410*			*Sec. 410*	*#.#*
Added Aggregate	*Sec. 410*		*Sec. 410*	*Sec. 410*	*#.#*
Reclaim/ Recycle	*Sec. 410*		*Sec. 410*	*Sec. 410*	*#.#*
Stabilize	*Sec. 410*		*Sec. 410*	*Sec. 410*	*#.#*
Notes					

Mainline Pavement	Thickness (inches)	Lifts	Mix Design/ Material	Spec.	Compaction Testing	Width (ft.)
Wear	*Sec. 400*	*Sec. 450*	*Sec. 450*	*Spec, SP, or Plan Note*	*Sec. 450*	*Scoping*
Non-Wear	*Sec. 400*	*Sec. 450*	*Sec. 450*	*Spec, SP, or Plan Note*	*Sec. 450*	*Scoping*
Smoothness	*Sec. 450*					
Notes						

HMA Shoulders	Thickness (inches)	Lifts	Mix Design/ Material	Spec.	Compaction Testing	Width (ft.)	
						Lt	Rt
HMA	*Sec. 610*	*Sec. 450*	*Sec. 450*	*Spec, SP, or Plan Note*	*Sec. 450*	*Scope*	*Scope*
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	*Spec, SP, or Plan Note*	*Sec. 330*	*610*	*610*
Shoulder Agg. Base	*As Needed*		*Match Agg. Base*	*Match Agg. Base*	*Match Agg. Base*		
Notes							

Aggregate Shoulders	Thickness		Material	Spec.	Compaction Testing	Width	
						Lt	Rt
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	*Spec, SP, or Plan Note*	*Sec. 330*	*Scope*	*Scope*
Added Aggregate Base	*As Needed*		*Match Agg. Base*	*Spec, SP, or Plan Note*	*Match Agg. Base*		
Notes							



<u>Misc. Pavement Recommendations and Instructions to Designers</u>

Provide any other necessary instructions to the project designer for the design and construction of this pavement segment that were not provided in the previous tables.

Rubblize/Crack & Seat

Segment #	Highway #	From RP	To RP	Design Type
#	TH #	###.###	###.###	Rubblize/Crack & Seat

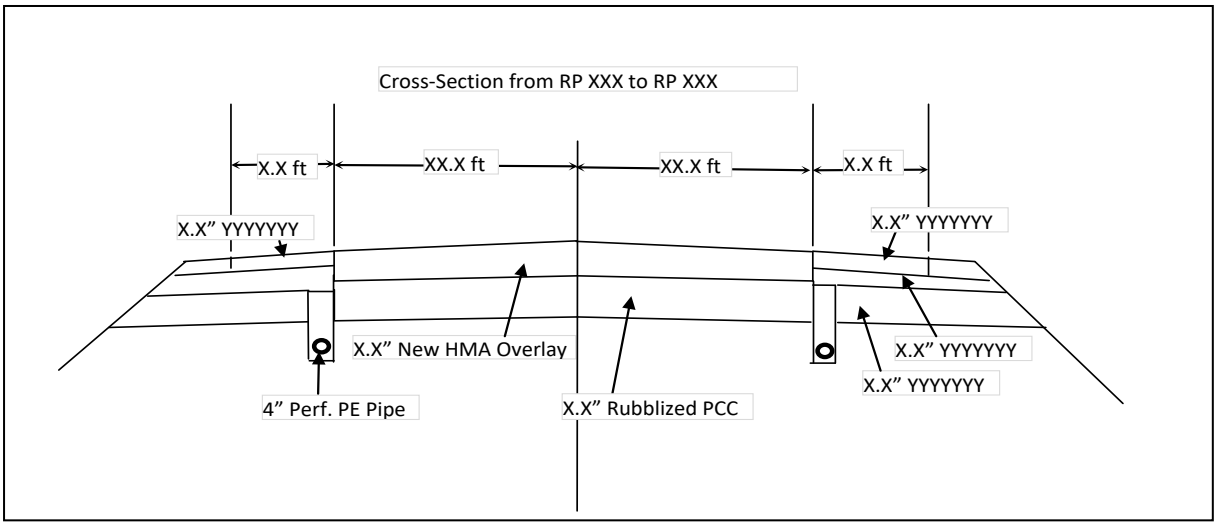
Mainline Pavement	Depth (inches)	Material	Note	Width (ft.)
Existing HMA	*Sec. 230, 240, 260*	*HMA*		*Sec. 260*
Existing PCC	*Sec. 260*	*PCC*		*Sec. 260*
Existing Aggregate	*Sec. 230, 240, 260*	*HMA*		
Notes				

Mainline Pavement	Depth (inches)	Lifts	Material	Spec.	Width (ft.)
Mill HMA	*Sec. 410*			*Sec. 410*	*#.#*
Rubblize/ Crack & Seat	*Special Provision # and if any edits are required, Sec. 420*				
Subsurface Drains	*Type of drain & outlets and its specification, Sec. 420 & 370*				
Notes					

Mainline Pavement	Thickness (inches)	Lifts	Mix Design/ Material	Spec.	Compaction Testing	Width (ft.)
Wear	*Sec. 420*	*Sec. 450*	*Sec. 450*	*Spec, SP, or Plan Note*	*Sec. 450*	*Scoping*
Non-Wear	*Sec. 420*	*Sec. 450*	*Sec. 450*	*Spec, SP, or Plan Note*	*Sec. 450*	*Scoping*
Smoothness	*Sec. 450*					
Notes						

HMA Shoulders	Thickness (inches)	Lifts	Mix Design/ Material	Spec.	Compaction Testing	Width (ft.)	
						Lt	Rt
HMA	*Sec. 610*	*Sec. 450*	*Sec. 450*	*Spec, SP, or Plan Note*	*Sec. 450*	*Scope*	*Scope*
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	*Spec, SP, or Plan Note*	*Sec. 330*	*610*	*610*
Shoulder Agg. Base	*As Needed*		*Match Agg. Base*	*Match Agg. Base*	*Match Agg. Base*		
Notes							

Aggregate Shoulders	Thickness		Material	Spec.	Compaction Testing	Width	
						Lt	Rt
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	*Spec, SP, or Plan Note*	*Sec. 330*	*Scope*	*Scope*
Added Aggregate Base	*As Needed*		*Match Agg. Base*	*Spec, SP, or Plan Note*	*Match Agg. Base*		
Notes							



Misc. Pavement Recommendations and Instructions to Designers

Provide any other necessary instructions to the project designer for the design and construction of this pavement segment that were not provided in the previous tables.

HMA Overlay

Segment #	Highway #	From RP	To RP	Design Type
#	TH #	###.###	###.###	HMA Overlay

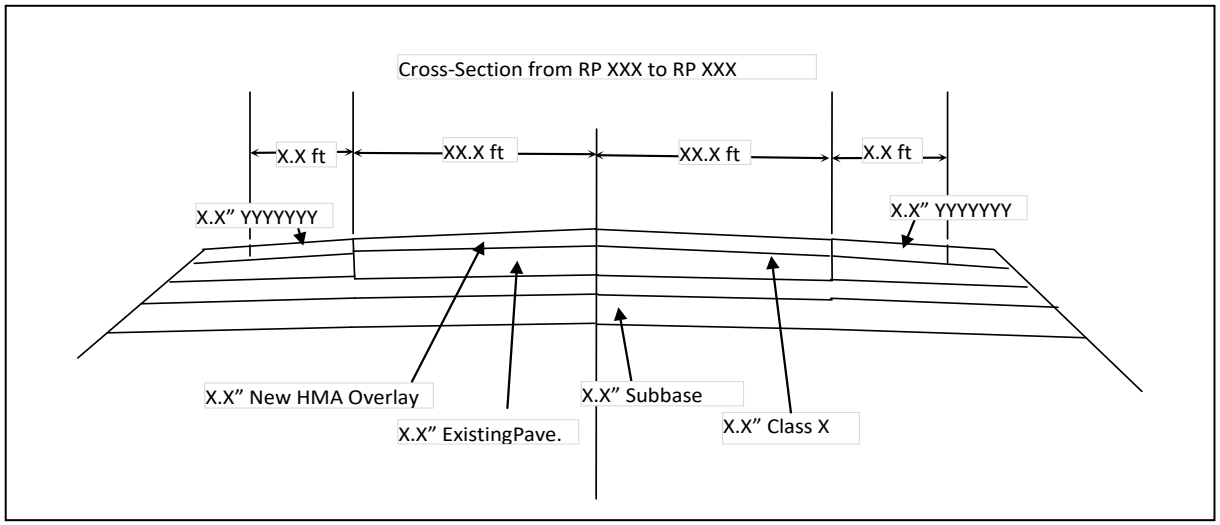
Mainline Pavement	Depth (inches)	Material	Note	Width (ft.)
Existing HMA	*Sec. 230, 240, 260*	*HMA*		*Sec. 260*
Existing PCC	*Sec. 260*	*PCC*		*Sec. 260*
Existing Aggregate	*Sec. 230, 240, 260*	*HMA*		
Notes				

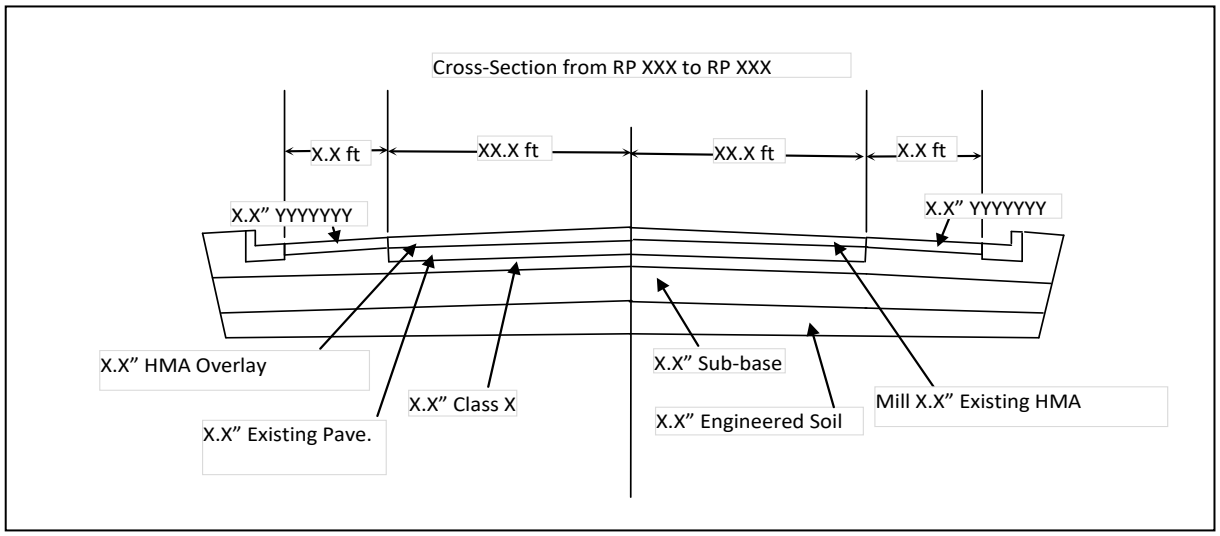
Mainline Pavement	Depth (inches)	Lifts	Material	Spec.	Width (ft.)
Mill HMA	*Sec. 440*			*Sec. 410*	*#.#*
Notes					

Mainline Pavement	Thickness (inches)	Lifts	Mix Design/ Material	Spec.	Compaction Testing	Width (ft)
Wear	*Sec. 440*	*Sec. 450*	*Sec. 450*	*Spec, SP, or Plan Note*	*Sec. 450*	*Scoping*
Smoothness	*Sec. 450*					
Notes						

HMA Shoulders	Thickness (inches)	Lifts	Mix Design/ Material	Spec.	Compaction Testing	Width (ft.)	
						Lt	Rt
HMA	*Sec. 610*	*Sec. 450*	*Sec. 450*	*Spec, SP, or Plan Note*	*Sec. 450*	*Scope*	*Scope*
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	*Spec, SP, or Plan Note*	*Sec. 330*	*610*	*610*
Shoulder Agg. Base	*As Needed*		*Match Agg. Base*	*Match Agg. Base*	*Match Agg. Base*		
Notes							

Aggregate Shoulders	Thickness		Material	Spec.	Compaction Testing	Width	
						Lt	Rt
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	*Spec, SP, or Plan Note*	*Sec. 330*	*Scope*	*Scope*
Added Aggregate Base	*As Needed*		*Match Agg. Base*	*Spec, SP, or Plan Note*	*Match Agg. Base*		
Notes							





Misc. Pavement Recommendations and Instructions to Designers

Provide any other necessary instructions to the project designer for the design and construction of this pavement segment that were not provided in the previous tables.

NEW PCC

Segment #	Highway #	From RP	To RP	Design Type
#	TH #	###.###	###.###	New PCC

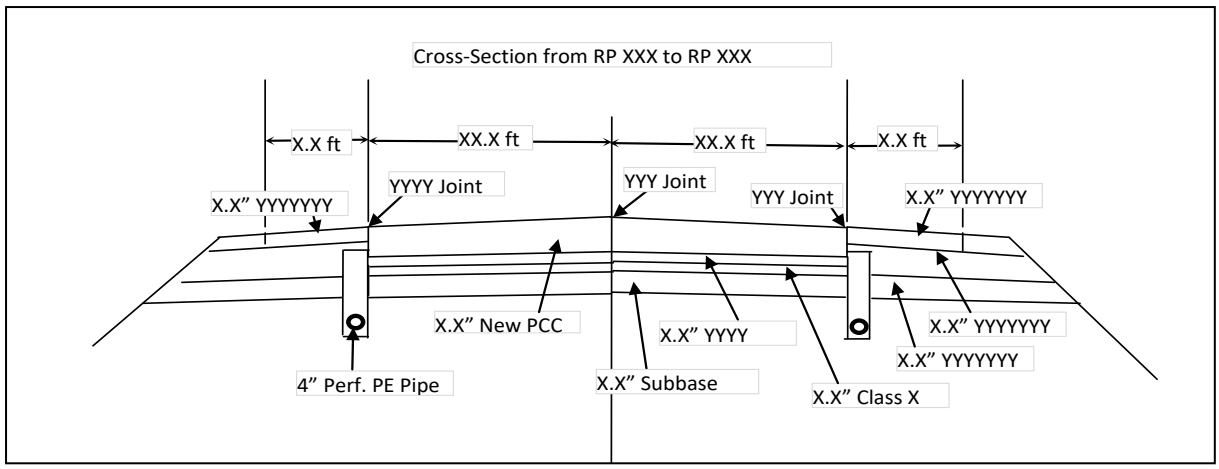
Mainline Pavement	Thickness (inches)	Joint Spacing (ft.)	Dowel Arrangement	Dowel Size	Sealant	Width (ft.)
PCC	*Sec. 500*	*Sec. 530*	*Sec. 530*	*530*	*Sec. 530*	*Scoping*
Notes						
Mainline Subsurface	**Thickness (inches)**	**Lifts**	**Material**	**Spec.**	**Compaction Testing**	**Width (ft.)**
Base	*Sec. 500*		*Sec. 500 & 310*	*Spec, SP, or Plan Note*	*Sec. 330*	
Subbase	*Sec. 500*		*Sec. 500 & 310*	*Spec, SP, or Plan Note*	*Sec. 330*	
Eng. Soil	*Sec. 320*		*Sec. 320*	*Spec, SP, or Plan Note*	*Sec. 330*	
Subgrade Prep.	*Sec. 320*			*Spec, SP, or Plan Note*	*Sec. 330*	
Subsurface Drains	Type of drain & outlets and its specification, sec. 500 & 370					
Notes						

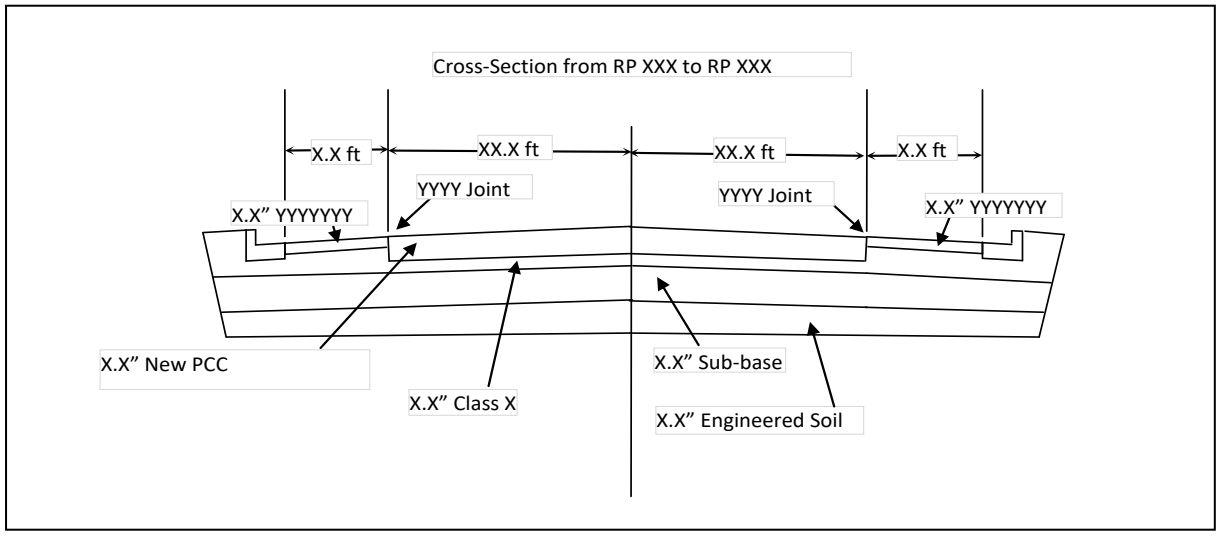
HMA Shoulders	Thickness (inches)	Lifts	Mix Design/ Material	Spec.	Compaction Testing	Width (ft.)	
						Lt	Rt
HMA	*Sec. 610*	*Sec. 450*	*Sec. 450*	*Spec, SP, or Plan Note*	*Sec. 450*	*Scope*	*Scope*
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	*Spec, SP, or Plan Note*	*Sec. 330*	*610*	*610*
Shoulder Agg. Base	*As Needed*		*Match Agg. Base*	*Match Agg. Base*	*Match Agg. Base*		
Notes							

Aggregate Shoulders	Thickness		Material	Spec.	Compaction Testing	Width	
						Lt	Rt
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	*Spec, SP, or Plan Note*	*Sec. 330*	*Scope*	*Scope*
Added Aggregate Base	*As Needed*		*Match Agg. Base*	*Spec, SP, or Plan Note*	*Match Agg. Base*		
Notes							

PCC Shoulders	Thickness		Material	Spec.	Compaction Testing	Width	
						Lt	Rt
PCC	*Sec. 610*					*Scope*	*Scope*
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	*Spec, SP, or Plan Note*	*Sec. 330*	*610*	*610*
Shoulder Agg. Base	*As Needed*		*Match Agg. Base*	*Match Agg. Base*	*Match Agg. Base*		
Notes							

PCC Joint Designation (MnDOT Standard Plan 5-297.221)		
Joint	**Type**	**Sealant Spec.**
Contraction Joint	*Sec. 530*	*Sec. 530*
Longitudinal Joint	*Sec. 530*	*Sec. 530*
Outside Shoulder Joint	*Sec. 530*	*Sec. 530*
***XXXXXXX* Joint**	*Sec. 530*	*Sec. 530*





Misc. Pavement Recommendations and Instructions to Designers

*Provide a list of the PCC paving standard plans and plates that the designer must include in the project plans (see **Section 550**). Provide any other necessary instructions to the project designer for the design and construction of this pavement segment that were not provided in the previous tables.*

Whitetopping

Segment #	Highway #	From RP	To RP	Design Type
#	TH #	###.###	###.###	Whitetopping

Mainline Pavement	Depth (inches)	Lifts	Material	Spec.	Width (ft.)
Mill HMA	*Sec. 510*			*Sec. 510*	*#.#*
Notes					

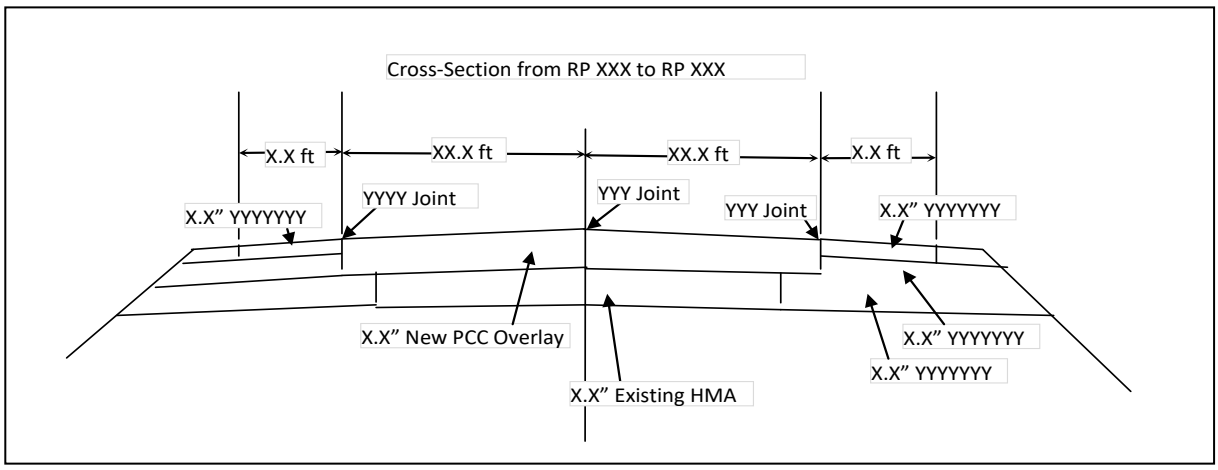
Mainline Pavement	Thickness (inches)	Joint Spacing (ft.)	Dowel Arrangement	Dowel Size	Sealant	Width (ft.)
PCC Overlay	*Sec. 500*	*Sec. 530*	*Sec. 530*	*530*	*Sec. 530*	*Scoping*
Notes						

HMA Shoulders	Thickness (inches)	Lifts	Mix Design/ Material	Spec.	Compaction Testing	Width (ft)	
						Lt	Rt
HMA	*Sec. 610*	*No. and Thickness, Sec. 450*	*Sec. 450*	*Spec, SP, or Plan Note*	*Sec. 450*	*Scope*	*Scope*
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	*Spec, SP, or Plan Note*	*Sec. 330*	*610*	*610*
Shoulder Agg. Base	*As Needed*		*Match Agg. Base*	*Match Agg. Base*	*Match Agg. Base*		
Notes							

Aggregate Shoulders	Thickness		Material	Spec.	Compaction Testing	Width	
						Lt	Rt
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	*Spec, SP, or Plan Note*	*Sec. 330*	*Scope*	*Scope*
Added Aggregate Base	*As Needed*		*Match Agg. Base*	*Spec, SP, or Plan Note*	*Match Agg. Base*		
Notes							

PCC Shoulders	Thickness		Material	Spec.	Compaction Testing	Width	
						Lt	Rt
PCC	*Sec. 610*					*Scope*	*Scope*
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	*Spec, SP, or Plan Note*	*Sec. 330*	*610*	*610*
Shoulder Agg. Base	*As Needed*		*Match Agg. Base*	*Match Agg. Base*	*Match Agg. Base*		
Notes							

PCC Joint Designation (MnDOT Standard Plan 5-297.221)		
Joint	**Type**	**Sealant Spec.**
Contraction Joint	*Sec. 530*	*Sec. 530*
Longitudinal Joint	*Sec. 530*	*Sec. 530*
Outside Shoulder Joint	*Sec. 530*	*Sec. 530*
***XXXXXXX* Joint**	*Sec. 530*	*Sec. 530*



Misc. Pavement Recommendations and Instructions to Designers

*Provide a list of the PCC paving standard plans and plates that the designer must include in the project plans (see **Section 550**). Provide any other necessary instructions to the project designer for the design and construction of this pavement segment that were not provided in the previous tables.*

UBOL

Segment #	Highway #	From RP	To RP	Design Type
#	TH #	###.###	###.###	Unbonded Overlay

Mainline Pavement	Depth (inches)	Lifts	Material	Spec.	Width (ft.)
Mill HMA	*Sec. 520*			*Sec. 520*	*#.#*
Notes					

Mainline Pavement	Thickness (inches)	Joint Spacing (ft.)	Dowel Arrangement	Dowel Size	Sealant	Width (ft.)
PCC Overlay	*Sec. 500*	*Sec. 530*	*Sec. 530*	*530*	*Sec. 530*	*Scoping*
Notes						

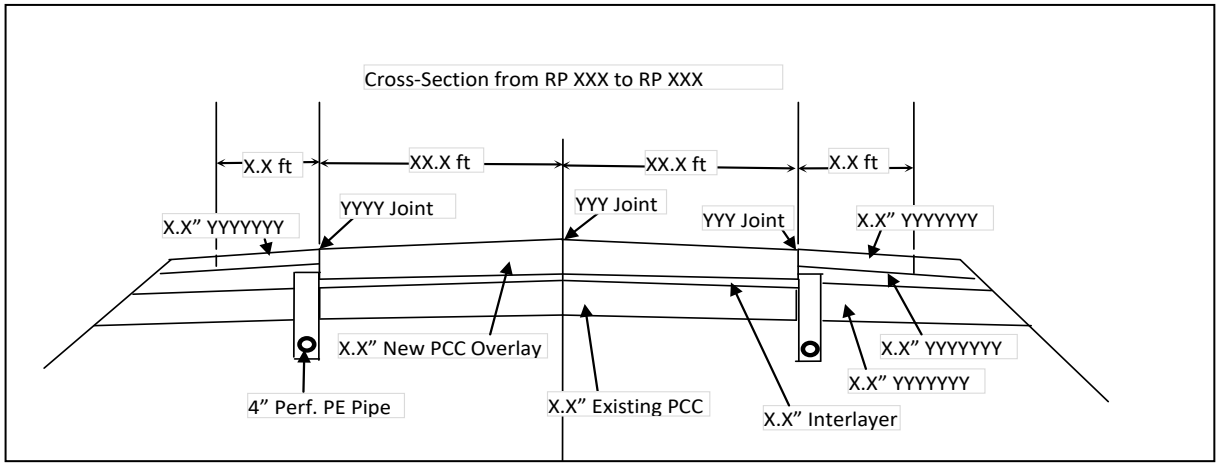
Mainline Subsurface	Thickness (inches)	Lifts	Material	Spec.	Compaction Testing	Width (ft.)
Interlayer	*Sec. 520*		*Sec. 520*	*520*	*Sec. 450*	*Scoping*
Subsurface Drains	*Type of drain & outlets and its specification, Sec. 520 & 370*					
Notes						

HMA Shoulders	Thickness (inches)	Lifts	Mix Design/ Material	Spec.	Compaction Testing	Width (ft)	
						Lt	Rt
HMA	*Sec. 610*	*Sec. 450*	*Sec. 450*	*Spec, SP, or Plan Note*	*Sec. 450*	*Scope*	*Scope*
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	*Spec, SP, or Plan Note*	*Sec. 330*	*610*	*610*
Shoulder Agg. Base	*As Needed*		*Match Agg. Base*	*Match Agg. Base*	*Match Agg. Base*		
Notes							

Aggregate Shoulders	Thickness		Material	Spec.	Compaction Testing	Width	
						Lt	Rt
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	*Spec, SP, or Plan Note*	*Sec. 330*	*Scope*	*Scope*
Added Aggregate Base	*As Needed*		*Match Agg. Base*	*Spec, SP, or Plan Note*	*Match Agg. Base*		
Notes							

PCC Shoulders	Thickness		Material	Spec.	Compaction Testing	Width	
						Lt	Rt
PCC	*Sec. 610*					*Scope*	*Scope*
Aggregate Surfacing	*Sec. 610*		*Sec. 610*	*Spec, SP, or Plan Note*	*Sec. 330*	*610*	*610*
Shoulder Agg. Base	*As Needed*		*Match Agg. Base*	*Match Agg. Base*	*Match Agg. Base*		
Notes							

PCC Joint Designation (MnDOT Standard Plan 5-297.221)		
Joint	**Type**	**Sealant Spec.**
Contraction Joint	*Sec. 530*	*Sec. 530*
Longitudinal Joint	*Sec. 530*	*Sec. 530*
Outside Shoulder Joint	*Sec. 530*	*Sec. 530*
***XXXXXXX* Joint**	*Sec. 530*	*Sec. 530*



Misc. Pavement Recommendations and Instructions to Designers

*Provide a list of the PCC paving standard plans and plates that the designer must include in the project plans (see **Section 550**). Provide any other necessary instructions to the project designer for the design and construction of this pavement segment that were not provided in the previous tables.*

Use of Paver Mounted Thermal Profile (PMTP) and Intelligent Compaction (IC) Methods

PMTP and/or IC may be used with the construction of HMA pavement, SFDR, CIR or CCPR projects. See **section 450.5** for project selection guidance.

Specify using PMTP or IC on a project with MnDOT Special Provision – 2016 "QUALITY MANAGEMENT – Intelligent Construction Technology Methods".

Use of Automated Machine Guidance

Milling method

Milling Method recommended when milling existing asphalt for whitetopping (**section 550)** or when using existing asphalt pavement as a bond-breaker for an unbonded PCC overlay (**section 520)**.

Include both of the following special provisions to use this method:

- (2232SP) Mill Pavement Surface – Automated Machine Guidance – Milling Method Using Robotic Total Stations
- (2011SP) Construction Surveying – Automated Machine Guidance – Milling Method Using Robotic Total Stations

Muck excavation method

Muck excavation method is recommended for use when muck excavation quantities are greater than or equal to 50,000 cy, when muck excavation activities are anticipated to be under water (consider the size and/or depth of excavation activities), or if conditions make it difficult to use conventional survey methods for creation of the as-built surface and calculation of volumes.

Include both of the following special provisions to use this method:

- (2011SP) Construction Surveying – Digital Surface Model Method Using the AMG-Excavation System
- (2105SP/2106SP) Excavation and Embankment – Digital Surface Model Method Using the AMG-Excavation System

Removals

Any needed directions to the designer to provide for the removal of existing materials.

Geotechnical Recommendations

Special Treatments

Swamp areas, shadow treatments, rock excavation, or subgrade corrections: For any of these areas specify:

- The depth of the correction/treatment and its limits (**Section 320.2**)
- The backfill material and its specification (**Section 320.2**)
- Compaction testing (**Section 330**)
- Any tapers or transitions in materials (**Section 320.4)**

Embankment

If there will be any additional embankment construction specify the:

- Embankment material, its specification, and any plan note or special provision edits to modify the material (**Section 320.3**)
- Compaction testing (**Section 330**)
- Application of any surcharge (**Section 320.3.c**)
- Monitoring equipment (**Section 320.3.d**)

Topsoil

If construction activities will disturb any topsoil, provide the depth of topsoil to be stripped and reused.

Borrow Shrinkage Factor

If there will be a quantity of borrow using specification 2105 then develop a borrow shrinkage factor (**Section 340**).

Culverts

- Frost depth and soil-type: Provide an estimated frost depth and soil-type (plastic or granular). This information is used to select the correct culvert backfill treatment (**Section 360.1**).
- Fabric: Specify if any geotextile fabric, and type, (**Section 360.2**) should be included in the culvert backfill treatment.
- Plastic Soil Cap: Specify if a plastic soil cap treatment (**Section 360.3**) is required for any culverts.
- Modifications: Give full instructions, and specify the materials, of any modifications to the standard culvert backfill treatment drawings (**Figures 360.1-4**).

Plan Notes

Provide the text to any notes to be included in the project plans.

Edits or Additions to Special Provisions

Provide any changes or text that is intended to be added to any special provisions.

Attachments:

Attach or provide a link to the location of the following:
Printouts of the pavement design programs' output for each pavement design.
Signed traffic forecast summaries.
Soil borings and cores (or link).
The LCCA and any supporting calculations.
Any LCCA or alternate bidding exceptions.
Any GPR, geotechnical, or other reports.