

MINNESOTA DEPARTMENT OF TRANSPORTATION
State Aid Division
Technical Memorandum No. 20-SA-01
November 5, 2020

To: County Engineers
City Engineers
MnDOT District State Aid Engineers
MnDOT District Materials Engineers
FHWA

From: Kristine Elwood, P.E. 
State Aid Engineer

Subject: State Aid for Local Transportation (SALT)
Use of PavementDesigner.org Software for Design of Concrete Pavements
for Cities and Counties

Expiration

This Technical Memorandum will remain in effect until November 5, 2025 unless superseded prior to this date, or the information provided in this Technical Memorandum is incorporated into the State Aid Manual.

Implementation

This Technical Memorandum, which allows the use of the PavementDesigner.org (PavementDesigner) software for jointed concrete pavement design as an alternative to the MnPAVE-Rigid software, is effective immediately. In deciding which software program to use, several factors, including those mentioned in this Technical Memorandum, shall be considered by the Engineer. City, county and consultant engineers working on State Aid and Federal-aid concrete pavement projects are allowed to use the PavementDesigner software program as an alternative to the MnPAVE-Rigid software program. However, concrete pavement projects within Trunk Highway right-of-way must continue to implement the MnPAVE-Rigid design software.

Introduction

To stay current with new technology and design methods, in October 2019 State Aid for Local Transportation (SALT) initiated a study by Braun Intertec to compare PavementDesigner to MnPAVE-Rigid.

Based on the recommendations found in the report titled "PavementDesigner.org Evaluation and Comparison to MnPAVE-Rigid", SALT will allow the PavementDesigner software to be used as an alternative design mechanism for concrete pavement.

Purpose

There are three main purposes of this Technical Memorandum. First, to describe which

projects are approved to use the PavementDesigner concrete pavement design software. Second, to describe how to obtain a copy of software program, and third, to offer some recommendations on how to begin using the PavementDesigner software as mentioned in the “PavementDesigner.org Evaluation and Comparison to MnPAVE-Rigid”

Guidelines: Applicable Project Types

The PavementDesigner concrete design software may be used on State Aid funded and Federal Aid funded projects (**this software is not approved for use on projects within the Trunk Highway right-of-way**).

Please note it is not required to use the PavementDesigner software in place of the MnPAVE-Rigid software. The Engineer has the option to use whichever software package they prefer. It may be desirable to use both software programs on a few projects and compare the results to gain an understanding of the program differences. You may also contact the MnDOT Pavement Design Engineer, Concrete Paving Association of Minnesota (CPAM), or Aggregate & Ready Mix association of Minnesota (ARM) with any questions regarding concrete pavement design.

Use of PavementDesigner for Project Type other than “Street” is not approved by SALT.

How to Obtain a Copy of the PavementDesigner Program

The PavementDesigner software program is fully housed at <https://www.pavementdesigner.org/> and is operated through the website as an online program, it is not a downloadable program.

PavementDesigner Software Recommendations

The following are some general guidelines for using PavementDesigner that should be considered while designing concrete pavements:

Most importantly, use the “HELP” menus in the software for guidance and to select the majority of the input values. The “HELP” menus offer detailed explanations of input choices and values, although the terminology may be different. It can be turned “On” in the upper right corner of the screen.

The following are recommended user input values:

Project Level Screen

- Spectrum Type: Selected by user
- Design Life: Selected by user
- User Defined Traffic Info: Selected by user.
- Reliability: Selected by user.
- % of Slabs Cracked at End of Design Life: Selected by user.

Pavement Structure Screen

- Subgrade: Use R-value. A general range of R-values from 12 to 70 is common for soils in Minnesota.
- 28-Day Flex Strength: Use 500 psi for 3rd Point Loading.
- Modulus of Elasticity: Use default value of 4,000,000 psi
- Macrofibers in Concrete – check No

- Edge Support – check Yes if width is a minimum of 1 foot wider than the lane width

Summary Screen

This screen shows the Minimum and Recommended Thicknesses, as well as the Maximum Joint Spacing. Note the **Analysis and Guidance** section on the right side of the screen.

Final Design

The engineer should use Pavement Designer and MnPave-Rigid as inputs to their final design.

- If dowels are used, a minimum concrete thickness of 7 inches is recommended.
- If concrete thickness is less than 7 inches, use panel size as determined in Table 530.1 in the Pavement Design Manual at https://www.dot.state.mn.us/materials/pvmtdesign/docs/manual/MnDOT_PaveDesign_Chapter5.pdf

Questions

For information on the technical contents of this memorandum, please contact Bill Meinholz at 651-366-3832.

A link to all active and historical State Aid for Local Transportation Technical Memoranda can be found at: <http://www.dot.state.mn.us/stateaid/tech-memos.html>

To request this document in an alternative format, please contact the Office of Equity and Diversity at 651-366-4720 or 1-800-657-3774 (Greater Minnesota); 711 or 1-800-627-3529 (Minnesota Relay). You may also send an email to ADArequest.dot@state.mn.us. (Please request at least one week in advance).