2021 Initial Idea Development

2021-2022 NRRA Research and MnROAD Construction Development
(Updated Form – March 23, 2021)

Initial Proposal is for NRRA Executive Team to Approve for further development (keep to two pages)

Research Title:	Performance Evaluation of Wicking Geotextiles for Improving Drainage and Stiffness of Road Foundation
NRRA Team(s):	Geotech, Flex, Rigid
Type of Effort:	Research
Developed By:	Lydia Brownell (MoDOT), Terry Beaudry (MnDOT), Raul Velasquez (MnDOT), and David White (Ingios)
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Research Funding Estimate:	$150,000 (include funding sources and partnership matches)
Research Years Expected:	**2 years**
Beneficial Partnerships:	**N/A**

Number of Test Sections:	Cell 4 (sFDR repair), Cell 15, and other Cells that need foundation repair
Instrumentation Effort:	**Medium – Moisture Tree**
MnROAD Monitoring:	**MnROAD staff will cover routine monitoring and dynamic testing**

Research Objectives:

Evaluate performance benefits (e.g., maintaining stiffness, improving drainage, and stabilizing moisture profile) of relatively recent developed single-layer wicking geosynthetic. Construction observation, design analysis, field testing and instrumentation are to be planned for reconstruction of selected MnROAD test cells (Cell 4, 15, and others TBD). Additionally, an accelerated laboratory load testing program is planned. Program will simulate trafficking to determine load-deformation response with controlled drainage/wicking. Research studies on this technology are limited and what is available focuses on only the drainage capabilities and short-term performance.

Pavement Test Cells Needed:

Cell 4 (sFDR repair), Cell 15, and other Cells that need foundation repair.

NRRA Sustainability/Resiliency and or Intelligent Construction:

A sustainable and resilient pavement structure requires a foundation with a robust drainage system. Wicking geosynthetic technology, if used properly, offers the potential for enhanced pavement foundation performance that can extend the design life of the pavement. The results from this project would be used to quantify the benefit of using wicking geosynthetics in terms of long-term performance and providing an enhanced design input parameter for pavement design engineers.

Cross-cutting Opportunities:

Flex Team is proposing an idea for sFDR repairs which includes work on Cell 4 and Cell 15. This research project can complement that effort. Other cross-cutting opportunity is for any Rigid Team idea that requires drainage/base reconstruction.

Implementation Plan:

•Research Pays Off (RPO) or TRB/Conference presentation summarizing wicking fabric lab and field performance.
•Provide guidelines on the proper design and installation of wicking fabrics for pavement foundations. A list of best practices on the use of wicking fabric for pavement applications.