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Sponsor

University Transportation
Center for Materials in Sustainable
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Project Title

Material Performance Assessment of Cross-Tie Alternatives for Rail Applications

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Project Summary

Technology Transfer Outreach Publication

Material Performance Assessment of Cross-Tie Alternatives for Rail Applications

Historically, the rail industry has relied primarily upon the lumber industry for materials to manufacture wooden cross-ties. Future developments are needed as a result of the limited amount of raw timber available for the manufacturing timber cross-ties, which typically requires old growth timber. Over the past few decades, pre-stressed concrete has become a favorable alternative for rail companies and are increasing in popularity, but this solution still has a number of shortcomings. New material developments and advances in manufacturing technologies potentially allow for the development of sustainable material solutions that can be used to preserve and repair existing ties or incorporate recycled products into the manufacturing of new cross-ties. For these new alternatives it is important to look closely at their availability, durability, and their potential for reuse and recycling at the end of their service life.

Research Objectives

The objective of this research project is to identify and evaluate alternatives to wooden railroad cross-ties. The research project will focus on two main tasks which will include a literature review of journal and industry publications, and a compilation of a manufacturers list and products offered as related to this project. In addition, a preliminary assessment of life cycle characteristics of these alternative materials will be initiated. The tie material evaluation will focus on compatibility, durability, life cost of the product, service life, performance test results, and the sustainability of the materials used to produce the crosstie. The goal is to develop a method for unbiased evaluation of the various tie alternatives.

Project Summary

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University Facts (2008-2009)

Total Enrollment	7018
Graduate Enrollment	984
Number of Faculty	445
Placement Rate	96%

Michigan Technological University is located in Houghton, Michigan on the south shore of Lake Superior. This rural area is known for natural beauty, pleasant summers, abundant snowfall, and numerous all-season outdoor activities. In addition, the University maintains its own downhill and cross-country ski facilities and golf course. There are numerous cultural activities and opportunities on campus and in the community. Michigan Tech has also been rated as one of the safest college campuses in the United States, and the local community provides excellent resources conducive to an outstanding quality of life.

For more information, visit the University's website.

www.mtu.edu

Research Benefit

The results of this project will be used to help identify an independent method for evaluating railroad cross-ties. There is a need for an independent method of evaluation of new alternative material ties to allow railroads to choose the best, most cost effective cross-tie for installation. It will also allow new cross-ties to be evaluated in an unbiased fashion and on an even plane. Alternative material cross-ties are expected to increase the in service life of the cross-tie, decrease maintenance, and decrease costs associated with frequent replacement.

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