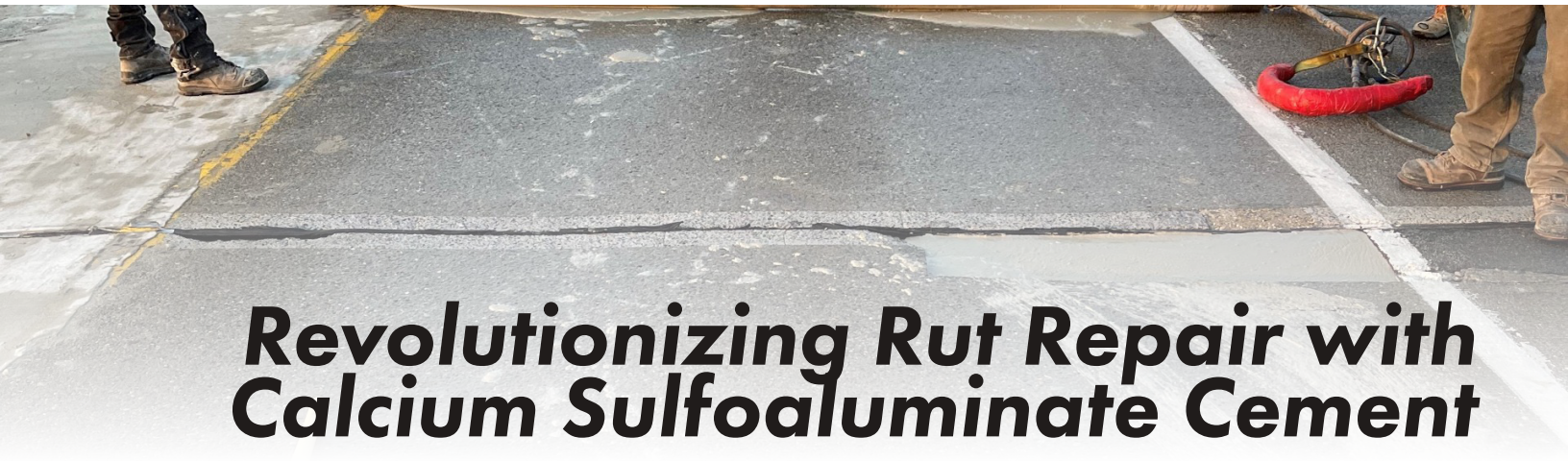

Revolutionizing Rut Repair with Calcium Sulfoaluminate Cement

THE CHALLENGE OF REPAIRING WHEEL RUTS ON CONCRETE PAVEMENTS is a persistent issue for infrastructure maintenance, particularly in regions with heavy snowfall and tire chain usage. A promising rut repair method calcium sulfoaluminate (CSA) cement, was chosen as a cost effective, easy-to-use and longer-lasting repair material for a project executed by ACME Concrete Paving Inc. in collaboration with the Washington State Department of Transportation (WSDOT), to remediate pavement ruts.

The project began in the summer of 2023 when ACME Concrete Paving Inc. undertook pavement panel replacements for WSDOT near Rosalia, Washington. The opportunity arose to test Rapid Set® UHPC Mortar by CTS Cement Manufacturing Corp. as a potentially superior solution for rut repair. The project focused on a 150-foot-long bridge deck exhibiting wheel ruts approximately 3/8 inches deep.

» CHALLENGES

The primary challenge was the need for a repair material that could withstand the unique environmental conditions of the region, where tire chains and studded tires are common. The selected material needed to be fluid yet sag-resistant, ensuring it would not run. Additionally, the repair process had to be efficient to minimize traffic disruptions.

» SOLUTION

Rapid Set UHPC Mortar provided the ideal solution. Comprising a blend of CSA cement, high-performance additives, and high-density aggregate, this mortar achieved compressive strengths of 8000 psi within four hours, 11,000 psi at 24 hours, and up to 17,000 psi at 28 days. Its ease of use and quick setting time allowed for rapid deployment and minimal downtime.

» IMPLEMENTATION

The ACME team conducted trial batching to ensure the mortar's suitability for the bridge's slope. The pavement surface was prepared by shotblasting, followed by mixing the mortar with water in a portable drum mixer. The mortar was then poured into the ruts, spread, and consolidated using a roller screed. Curing was achieved with wet burlap, ensuring optimal material performance. To enhance the smoothness and overall driving experience, diamond grinding was performed approximately four hours after the final placement.

The project demonstrated the superior performance of Rapid Set UHPC Mortar. The bond strength with the existing pavement was excellent, exhibiting wear comparable to traditional PPC after one winter season. The environmental benefits were also notable, as CSA cement products generally have a lower carbon footprint compared to traditional cements.

» COST AND ENVIRONMENTAL BENEFITS

Using CSA cement-based products like Rapid Set UHPC Mortar presents significant cost savings and environmental advantages. The material's durability extends the lifespan of roadway repairs, reducing the frequency of maintenance and associated costs. Its lower carbon footprint aligns with sustainable construction practices, making it an attractive choice for eco-conscious infrastructure projects.

The success of the rut repair project near Rosalia underscores the potential of CSA cement in transforming pavement maintenance practices. The Rapid Set UHPC Mortar by CTS Cement Manufacturing Corp. not only meets the rigorous demands of harsh environmental conditions but also offers a cost-effective and environmentally friendly solution, demonstrating innovation in construction materials that can lead to more durable and sustainable infrastructure. As more transportation departments adopt this approach, CSA cement's role in modernizing rut repair will likely expand, paving the way for more resilient roadways.

» PROJECT AT A GLANCE

- **Project Type:** Bridges
- **Application:** Deck repair
- **Location:** Rosalia, WA
- **Size:** 6,000 square feet
- **Date:** June 2023
- **Owner:** Washington State DOT (WSDOT)
- **Contractor:** ACME Concrete Paving Inc.
- **Product:** Rapid Set UHPC Mortar, Rapid Set SET Control by CTS Cement Manufacturing Corp.

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ABOUT IGGA

The International Grooving & Grinding Association (IGGA) is a non-profit trade association founded in 1972 by a group of dedicated industry professionals committed to the development of the diamond grinding and grooving process for surfaces constructed with Portland cement concrete and asphalt. In 1995, the IGGA joined in affiliation with the American Concrete Pavement Association (ACPA) to form what is now referred to as the Concrete Pavement Preservation Partnership (IGGA/ACPA CP3). The IGGA/ACPA CP3 now serves as the lead industry representative and technical resource in the development and marketing of optimized pavement surfaces, concrete pavement restoration and pavement preservation around the world.