CASE STUDY

BUILDING DURABLE INFRASTRUCTURE IN CHALLENGING TERRAIN: LESSONS FROM POLAND'S MS-3 BRIDGE

KRATON™

MS-3 Bridge near Ostróda, Poland

Partner: Lotos Asphalt, Budimex S.A., GDDKiA Olszteyn

Market: Paving

Product(s): HiMA

Highlights

- Designed for bridge conditions exposed to traffic, temperature, and structural movement.
- HiMA™ technology enabled enhanced performance with familiar application methods.
- Material handled similarly to conventional mastic asphalt during installation.
- Bridge deck has shown strong resistance to permanent deformation.
- Durable materials support life cycle performance and long-term infrastructure reliability.

Northern Poland's Mazury region shows how advanced materials can help infrastructure perform in complex terrain. For the MS-3 bridge near Ostróda, HiMA™ technology-enabled mastic asphalt supported a durable bridge deck designed for high traffic loads, environmental stress, and demanding service conditions.

CHALLENGE

Mazury, in northeastern Poland, is known for natural beauty, 2,000 post-glacial lakes, and undulating terrain. Those same conditions create difficult requirements for road and bridge construction, especially where projects must cross waterways, wildlife corridors, and existing transportation infrastructure.

For the bypass and expressway project around the city of Ostróda, the MS-3 bridge added multiple layers of complexity. The 677-meter structure crosses a creek, two existing roadways, and two animal passageways. Beyond construction, the stakeholder, GDDKiA Olszteyn, needed a pavement system that could deliver long-term performance on a bridge exposed to high traffic loads, environmental stress, temperature fluctuations, structural movement, and demanding service conditions.

SOLUTION

Working with leading polymer-modified bitumen (PMB) producer, Lotos Asphalt, the general contractor, Budimex S.A., selected a Kraton HiMA™ technology-enabled mastic asphalt. The bridge deck structure was engineered to balance durability with constructability, combining a 25 cm reinforced concrete bridge deck, a methyl methacrylate waterproofing membrane, and two 4 cm mastic asphalt layers, including a high-performance layer modified with 45/55-90 HiMA.

During execution, mastic asphalt production temperatures ranged from 190 to 210°C, the material was transported for up to eight hours at approximately 200°C, and compaction occurred at 200 to 220°C. Despite the high polymer content and elevated temperatures, Budimex S.A. reported that the material handled similarly to conventional mastic asphalt. This helped the project team apply an advanced material solution without introducing additional construction complexity or moving away from familiar application practices.

IMPACT

Since completion in 2017, the MS-3 bridge deck has demonstrated strong resistance to permanent deformation, meeting the project's durability objectives. For GDDKiA, the project delivered reduced maintenance requirements, lower life cycle costs, and increased long-term reliability for road users. In a region where environmental and structural challenges are unavoidable, the project reinforces the value of selecting materials designed for long-term performance rather than focusing only on initial delivery.

CONCLUSION

The MS-3 bridge demonstrates how HiMA™ technology-enabled mastic asphalt can support resilient infrastructure in demanding environments. By combining deformation resistance with practical application, the project highlights the role of advanced material selection in improving bridge deck durability, lifecycle performance, and long-term transportation reliability.

Handles similarly to conventional mastic asphalt despite high transportation and compaction temperatures.

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2026.07MS-Case-Study