

Weil-McLain Michigan City, Indiana

Weil-McLain is a gray iron foundry in Michigan City, Indiana. In 2003, Weil-McLain partnered with Reith-Riley, a large Indiana paving contractor, to use foundry sand in a commercial asphalt mix. The asphalt was used at the AM General Test Track for Hummers in Mishawaka, Indiana.

Reith-Riley transported the sand, incorporating it into their existing transportation scheme by picking the sand up from Weil-McLain's facility as a backhaul. Weil-McLain compensated Reith-Riley for using the sand, with a portion of the compensation being used to cover Reith-Riley's transportation costs. This was an advantageous arrangement for Weil-McLain, as the foundry paid Reith-Riley only 25% of what the local landfill fee was at the time. In the end, roughly 4000 tons of foundry sand was used in this project. The foundry sand made up roughly 10% (by weight) of the asphalt aggregate. The foundry sand was made up of a variety of types (Table 1) and was tested for several paving specifications (Table 2).

Sand Type	Amount Used
Green Sand	< 10%
No-bake	< 25%
Cold Box	~ 25%
Warm Box	~ 40%

Table 1: Types and proportions of sand used.

Parameter	Value
Density	100 – 110 lb/cf
Bulk Specific Gravity	2.61
Sodium Sulfate Soundness	6.9% total loss
Absorption	0.4%
Uncompacted Void Content	33.2%

Table 2: Foundry Sand Specifications

This project was possible because Indiana state law accommodates several beneficial uses of foundry sand under its Type III

restricted waste classification. Foundries can apply for the classification by testing their sand and submitting a formal application (with testing results) to the Indiana Department of Environmental Management. Pending test results, the agency can issue a classification that is valid for up to five years.

The benefits of this project went primarily to Weil-McLain. Because they paid Reith-Riley only about 25% of what it would have cost to landfill their sand, they saved over \$50,000 on disposal costs for their foundry sand over the course of the entire project. There were no economic benefits for Reith-Riley, as they operate local aggregate sources near their asphalt plant. However, because Weil-McLain did compensate Reith-Riley for using the foundry sand, it did make the business relationship economically viable. Additionally, Reith-Riley reported that they believed using the foundry sand contributed to producing a smooth finish surface for the asphalt. Both Reith-Riley and Weil-McLain were pleased with the results of this project, and Weil-McLain intends to seek out other similar projects for its foundry sand in the future.



Photo 1: A core taken from a test pad at the construction site.



Case Study: Weil-McLain: Foundry Sand as an Asphalt Pavement Ingredient

Personnel	<p>Foundry: Weil-McLain</p> <p>Engineers/Contractors: Reith-Riley</p>
Site	<p>Location: Mishawaka, Indiana</p> <p>Site Description: Reith-Riley was compensated to transport Weil-McLain's foundry sand to a site where it was incorporated into an asphalt mix. The asphalt mix was used to construct portions of the AM General Test Track for Hummers.</p>
Materials Utilized	<p>Approximately 4,000 tons of foundry sand.</p>
Project Costs and Benefits	<p>Costs Include:</p> <ul style="list-style-type: none">• Weil-McLain paid Reith-Riley to both use and transport the foundry sand. <p>Benefits Include:</p> <ul style="list-style-type: none">• Weil-McLain saved over \$50,000 in avoided landfill tipping fees.