

TECHNICAL MEMORANDUM

To: Trevor Walter, PE, City of Baxter
From: Alex Bitter, PE, Widseth
Subject: Coring Memo for the 2026 Mill & Overlay Improvements Project
Date: September 29, 2026
Project: 2026 Mill & Overlay Improvements Project: 2024-10233

Purpose

The purpose of this Memorandum is to review the pavement cores that were obtained on Joshua Tree Circle and Joneswood Circle and understand the effects of applying Mastic to roadway cracks following milling and prior to paving the final lift of bituminous pavement. This review is intended to document observations during the 2026 Mill & Overlay Improvements Project and provide guidance for future roadway maintenance practices.

Background

Mill & Overlay projects in the City of Baxter typically consist of milling 1.5-inches of existing pavement and replacing it with 2-inches of new bituminous surface. This maintenance is used to extend the pavement life.

During milling operations within the Mississippi Meadows neighborhood, existing pavement cracks were evaluated to determine the appropriate repair method. Areas with broken pavement or cracks wider than 4 inches were repaired through full-depth removal and replacement. Larger areas of block cracking were identified within the cul-de-sacs on Joshua Tree Circle and Joneswood Circle during the design phase. The original repair plan included full-depth milling of the cul-de-sacs followed by replacement of the entire area of bituminous.

Following the milling operations, the project team reviewed the options to repair the cul-de-sac and the City agreed this would be a good opportunity to Mastic the cracks as a test area. Mastic was applied to deep cracks that were less than 4 inches in width within the cul-de-sacs. Mastic operations were completed during the week of August 31, 2026, with the final applications occurring Thursday, September 3, 2026. The areas that Mastic was applied is shown in Photo 1.



Photo 1 - Mastic Locations

The Mississippi Meadows streets were paved on Friday, September 4, 2026. During paving operations, Mastic was observed on the surface of the new pavement in several locations through both cul-de-sacs, with more areas observed on Joneswood Circle. Initial observations in the field suggested that the Mastic may have seeped through the new pavement layer. Photo 2 shows Mastic visible on the pavement surface, and Photo 3 shows one of the soft, pliable areas where Mastic was present.



Photo 2 - Visible Mastic on Surface



Photo 3 - Pliable Area of Mastic

The pavement was inspected again on Tuesday, September 8, 2026. At that time, the areas containing Mastic on the surface remained soft and pliable. During the project walkthrough on Friday, September 11, 2026, three locations were selected for coring to further evaluate the pavement section and determine the source of the Mastic on the surface. The three coring locations are shown in Photo 4.



Photo 4 - Coring Locations

Core Observations

Core 1 was taken on Joshua Tree Circle near a manhole structure to verify pavement thickness. The pavement was flush with the casting which was set at 1.5" above the pavement surface. As shown in Photo 5, the core contained the existing pavement section (3.25-inches), tack coat, and the new overlay pavement section (2-inches). No abnormalities were found in the pavement section. Photo 6 shows the

top view of the first core. It was found the bituminous patch around the casting was left approximately 0.5-inch low causing the casting to be flush. Mastic was placed around the flush casting.

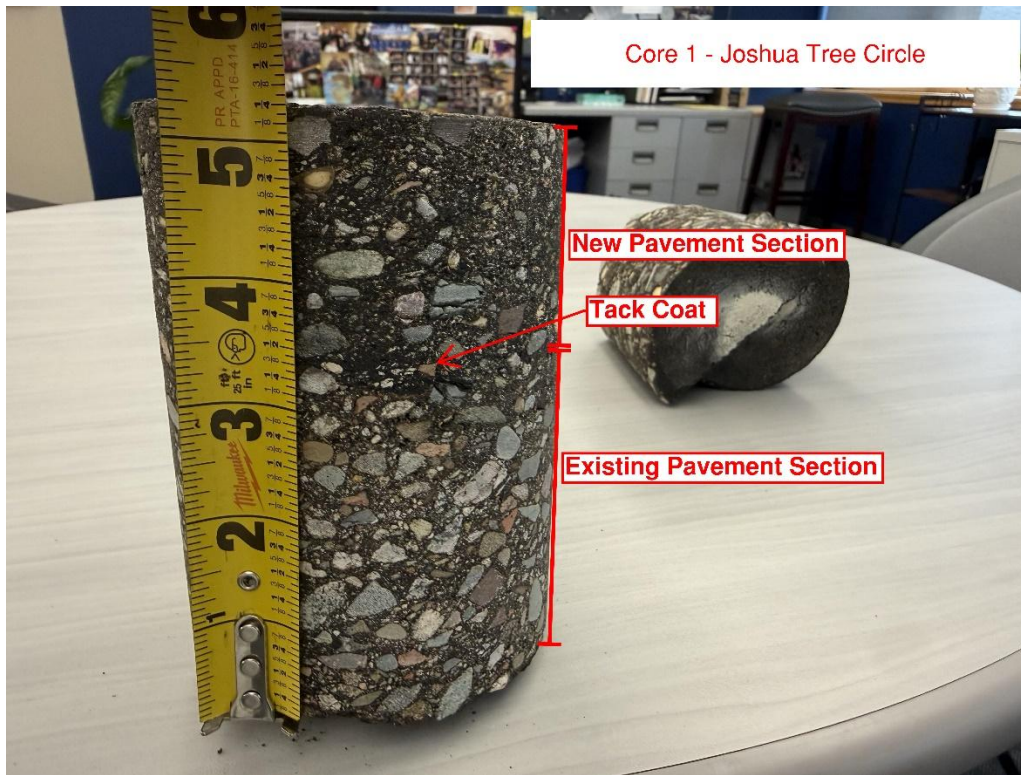


Photo 5 - Section View of Core 1

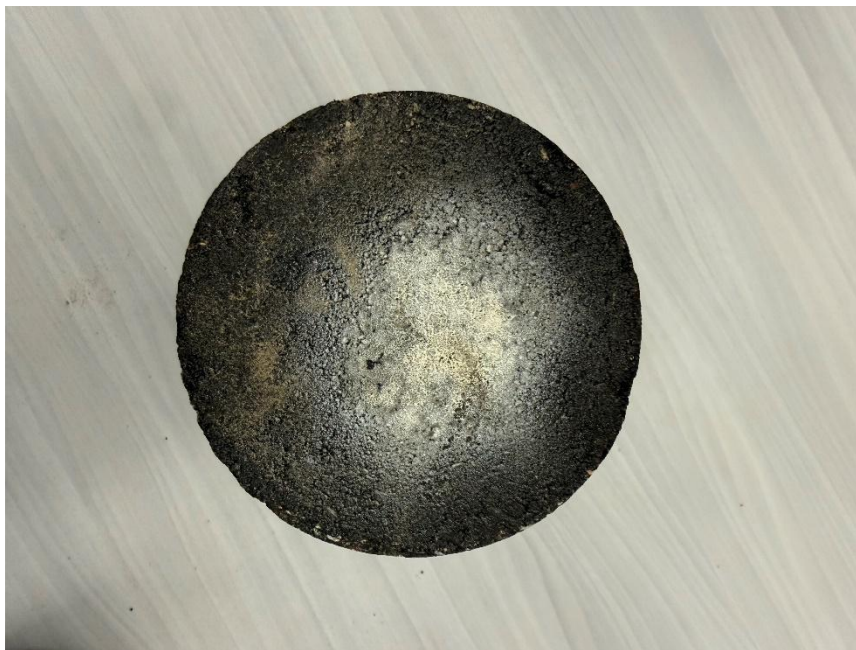


Photo 6 - Top View of Core 1

Core 2 was also taken on Joshua Tree Circle, this in an area where dirt was visible on the surface of the newly paved road. As shown in Photo 7, the pavement section consisted of the existing pavement (2.75-inches), a layer of Mastic placed over the crack (0.75-inches), an existing deep crack to the class 5 base

section, tack coat and the new overlay pavement (2.25-inches). The top of the core contained dirt as shown in Photo 8. This location was selected to verify adequate pavement thickness and the condition beneath the observed dirt. After observation of Core 2, the Mastic layer was visible between the existing and new pavement sections. The dirt on top of the core and mastic found in between the two pavement sections indicates that the dirt was likely due to turning movements of the trucks, paver, or roller during paving operations. It is not believed that mastic made its way through the new pavement section rather the mastic was mixed in as it was rolled.

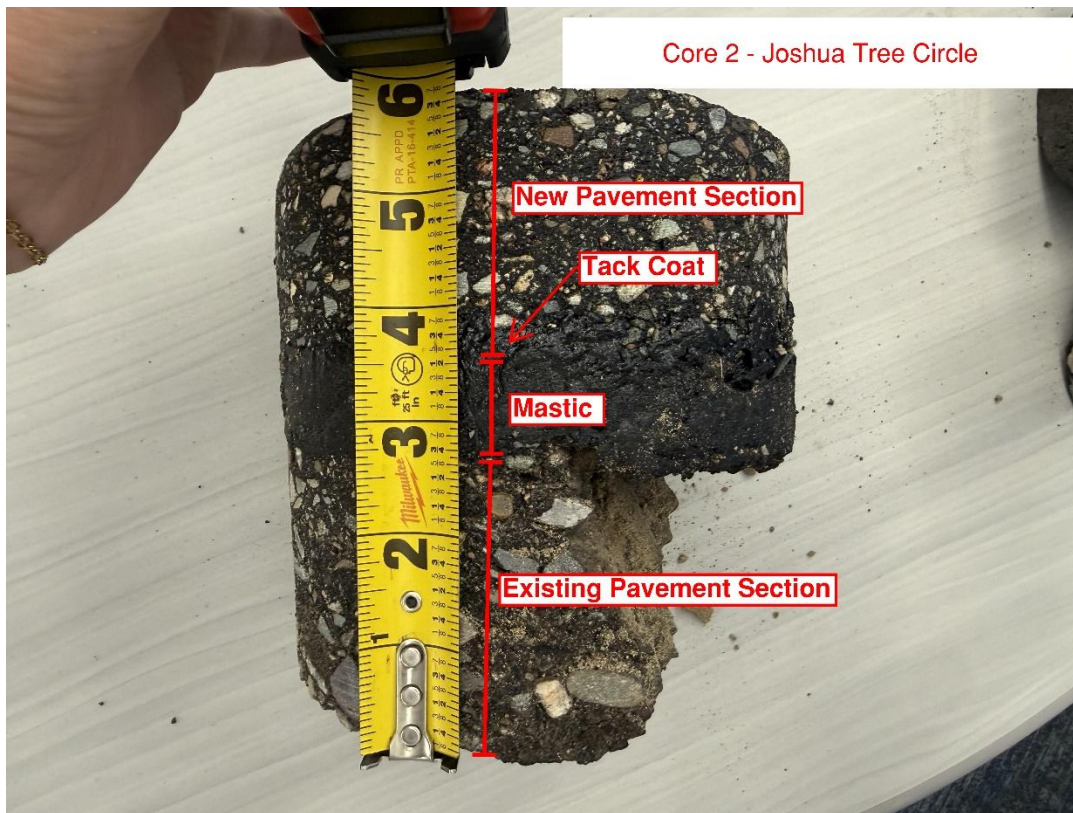


Photo 7 - Section View of Core 2



Photo 8 - Top View of Core 2

Core 3 was taken from Joneswood Circle at a location where Mastic had been observed on the pavement surface following the paving operations. The core, shown in Photo 9, was cut to determine whether Mastic had seeped through the newly placed pavement. Examination of the core did not show Mastic between the existing and new layer of pavement. Mastic was only observed in the surface of the core. The more probable explanation is that Mastic was picked up by construction traffic during the paving operations and rolled into the surface of the final lift. Photo 10 shows the top view of core 3.

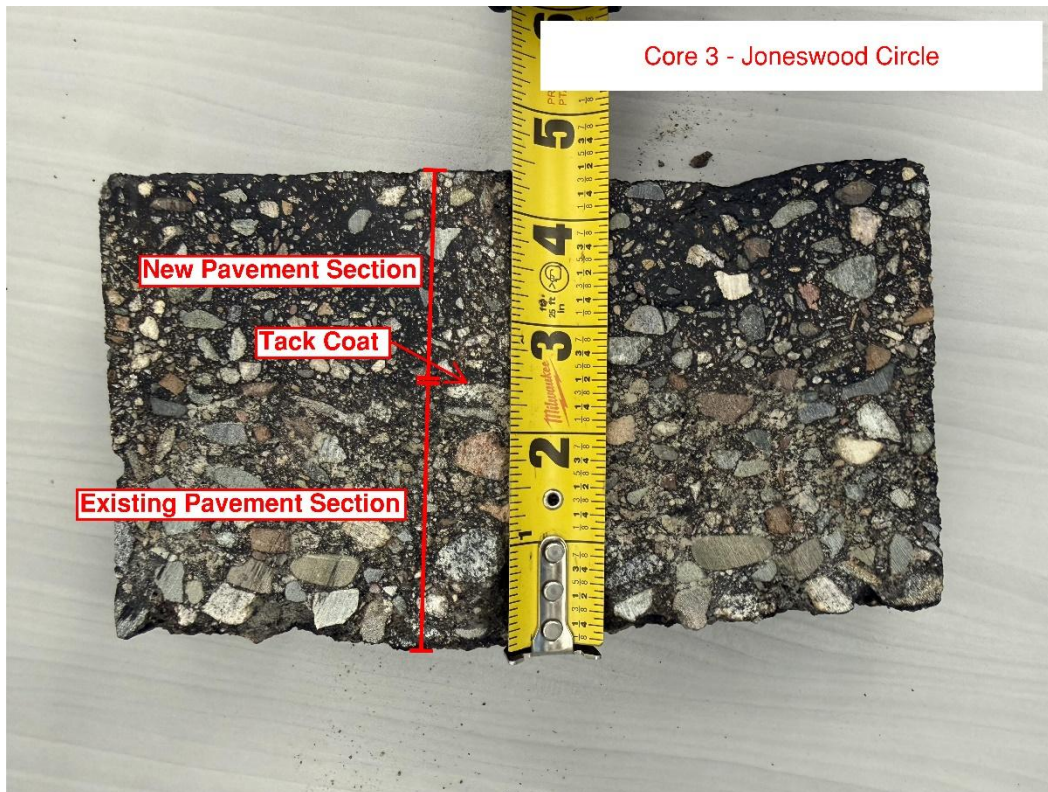


Photo 9 - Section View of Core 3



Photo 10 - Top View of Core 3

Conclusion

The pavement cores do not indicate that Mastic seeped through the new bituminous overlay. While Mastic was observed on the pavement surface in isolated areas following paving, the cores suggest the material remained between the existing and new bituminous sections. The evidence supports the areas where Mastic or dirt was seen on the surface were likely a result of construction traffic interaction with Mastic that wasn't provided adequate time to set rather than seeping through the overlay pavement. Additionally, the road was tacked prior to paving causing the tires to become sticky and this along with turning movements disturbed the Mastic causing it to be pulled up. The City applied Mastic to Park Street on September 10, 2026, to continue testing. The Mastic was given over two weeks to cure, and the final lift was paved on September 28, 2026. The Mastic appeared to stay in place and was not found on the final mat.

Recommendation

Applying Mastic is a possible solution to reduce the reflective cracking on mill and overlay roads. City Staff and Widseth will continue to monitor the three areas and compare the reflective cracking to the pictures taken prior to paving.

As an initial best practice, when Mastic is used following milling operations, a minimum of a 2-week cure time should be provided to the Mastic prior to paving and attention should be made towards construction traffic over Mastic areas.