

Fish Hatchery Road Reconstruction Project

ID 19-3488



Summary of Revised Pavement Design Report

Monthly Project Meeting August 15, 2018

An update to the March 2018 pavement memo is being prepared due recent upward trends in concrete pavement prices and a closer evaluation of other contributing factors (overall project costs, constructability, compatibility with bicycle accommodations, streetscaping and long-term maintenance).

Prices and Total Project Costs

More recent bids show an increase of approximately \$2 per sy for 9" PCC pavements. HMA prices showed a decreasing trend by approximately \$3 per ton over the 2 different mix types. Total project costs with these updated unit prices have been estimated as follows:

- HMA pavement - \$12,397,920.00 (previous: \$12,514,225.00)
- Concrete pavement - \$12,886,635.00 (previous: \$12,732,395.00)

Life Cycle Cost Analysis (LCCA)

The LCCA was re-evaluated based on these new pavement prices and some adjustments to the rehab scenarios to closer model anticipated timelines. Those results are below.

	Alternative 1	Alternative 2
	PCC	HMA
Pavement Structure	9" PCC 6" BAD 1-1/4" 16" Select Crushed Material	7-1/2" HMA 1-LAYER: 5 MT 58-28 S 2-LAYERS: 3 MT 58-28 S 18" BAD 1-1/4" 16" Select Crushed Material
Thickness (inches)	31" total	41.5" total
Initial Construction Costs	\$3,137,000	\$2,627,000
Maintenance Costs	\$43,000	\$26,000
Rehabilitation Costs	\$163,000	\$272,000
Rehabilitation Salvage Value	(\$15,000)	(\$25,000)
Total Facility Costs	\$3,328,000	\$2,900,000
Percent Difference	+14.8%	+0.0%

These values are not intended to represent the total project costs or precise pavement costs due to limitations of the program. Long term variability of material and labor costs for either alternative are also not factored into the analysis.

Other Contributing Factors

Overall Project Costs

The LCCA does not account for the total project costs. For example, there is approximately 33% of additional excavation required for the HMA alternative. This equates to an additional \$271,000 in project cost with this alternative that is not required to construct with concrete pavement.

When HMA over-excavation and current pavement prices are used in the overall project cost estimates for the 2 alternatives, the HMA alternative remains less expensive by approximately 4%.

Constructability and Staging

- Construction timeframe is essentially equal for the two alternatives
 - HMA option requires additional time for excavation, placing base course, and multiple pavement layers
 - Concrete option requires additional time to place pavement and allow for cure, also reconstructing intersections will require longer closures
- Impacts with excavation will differ between the two alternatives
 - Conflicts with buried infrastructure (utilities and storm sewers) will be extensive with both alternatives
 - Due to the 10.5" deeper depth of the HMA option, a greater number of conflicts with buried infrastructure are anticipated within the excavation limits. Additional project costs are likely required with this alternative, but have not been quantified to-date
 - Underdrain installation will be more difficult with a deeper HMA section potentially resulting in replacement of more inlets to provide positive drainage, another potential cost factor
- Other factors
 - Expect some time savings and potentially cost savings with HMA pavement vs concrete due to the ability to stage access points and intersections more quickly, and with increased flexibility
 - HMA pavement require concrete curbs to be initially installed, which can reduce viability of some staging opportunities (paving medians for example)
 - HMA pavement will require an additional surface paving stage once all gaps in the curb sections (access points across the medians) are restored
 - A permanent HMA plant is only 3.5 miles from project; where a temporary concrete batch plant would likely be set up near the project

Compatibility with On-Street Bicycle Accommodations

- Both alternatives would maintain the minimum 5' on-street accommodation.
- HMA construction would eliminate need for integral curb and gutters which are not preferred and introduce some additional project costs

Long Term Maintenance

- Concrete construction incurs higher costs for maintenance of traffic during rehabilitations (lanes are closed for a longer period for curing of patches)
- Dane County has expressed a preference for HMA pavement based on experience with poor longevity and higher maintenance costs

Compatibility with Potential Streetscaping

- Both alternatives would allow streetscaping measures within the medians and terraces.
- Concrete construction provides more opportunities for colored crosswalks and continuity of pavement type between City Hall and the Madison Beltline.

Next Steps

Identifying a preferred pavement alternative is a critical path item for the project. A pavement alternative needs to be identified within 1-2 months, otherwise may risk jeopardizing the ability to meet a June 1, 2019 advertisement deadline.