



AGENDA

**Baxter City Council Work Session
July 17, 2018
6:30 p.m.**

1. Cedar Scenic Road Improvements



Memorandum

To: *Honorable Mayor & City Council
Trevor Walter, PE, Public Works Director/City Engineer
City of Baxter*

From: *Chris Sonmor PE
WSB & Associates*

Copy: *Chuck Rickart, PT, PTOE
WSB & Associates*

Date: *July 12, 2018*

Re: *2018 Mill & Overlay and FDR Improvements Project
WSB Project No. 011248-000
City Project No. 4418*

Following direction from the City Council at the work session on June 19th, we have completed a more detailed review of the costs and options on how to proceed with the peat layer on Cedar Scenic Road. A summary of each alternative is provided below:

1. 26-Foot Wide Typical Section

The 26-foot wide typical section (with 1-foot shoulders) was analyzed. Going to the narrower section reduces the quantities of pavement and aggregate base as well as the excavation and fill quantities in the section. The total estimated cost for the 26-foot section is approximately \$520,000 (same as the previous estimate). This cost includes replacement of the peat with a clean, washed sand in the excavation to the elevation of the groundwater table (assumed at 1184.5' based on soil borings). A clean washed sand has been specified as backfill in the excavations where the soils will be saturated because of the groundwater. The washed sands will provide a better structural subgrade for the road over its life.

These costs include excavation to remove the peat to the full depth through the road section as identified in the soil borings that have been completed to date. Actual quantities may vary as the elevations and thicknesses of the peat may vary.

2. 40-Foot Wide Typical Section

The 40-foot wide typical section (with 12-foot drive lanes and 8-foot trail on each side) was also reviewed with the as-bid unit prices. The total estimated cost for the 40-foot section is approximately \$590,000 (previous estimate was \$660,000). Similar to the 26-foot option above, a clean, washed sand has been specified for backfill material in all excavations below the water table elevations.

Again, similar to the 26-foot wide option, these costs include excavation to remove the peat to the full depth through the road section as identified in the soil borings. Actual quantities may vary. The final

determination to the actual elevation of peat removal will need to be determined in the field at the time of excavation.

3. 40-Foot Wide Typical Section with 26-Feet of Pavement

Similar to option 2 above. The muck excavation could be completed and the road bed constructed for the 40-foot wide section, but only 26-feet of pavement would be placed. This could save 14-feet of pavement and class 5 from option 2. The total savings in pavement and aggregate base costs would be approximately \$20,000.

This option would easily allow the paved shoulders/trails to be added in the future without doing additional grading and muck excavation, but not spending the money now on the pavement.

4. Leave the Surface Unpaved to Allow Peat to Settle

Additional options to excavation and removal of the peat were also previously presented to council. One of those alternatives was to leave the surface unpaved and allow the peat layers below the surface to consolidate or settle out prior to placing the pavement. Because of the potential for up to 3.5-feet of settlement, this option is not recommended for a couple of reasons. First, with the unknown thickness of the peat layer adjacent to the areas where the borings were completed, it is difficult to anticipate the actual amount of settlement. The amount of settlement could be more than estimated, but could also be less. In addition to the difficulty in anticipating the amount of settlement, this could potentially be a maintenance problem for not only the short term, but long term. With settlement taking place, the road will need routine grading and placement of base material up until the time it is paved. It is also possible that the road could continue to settle over time even if the pavement is not placed for one or two freeze-thaw cycles resulting in additional maintenance for years to come. For these reasons, this option is not recommended.

5. Lightweight Fill

The last option that had been previously provided to City Council was the alternate to use a lightweight fill material. This option would allow some of the peat to remain in place. A subcut and removal of subgrade would still be required prior to placing the lightweight fill.

Geofoam systems that are used for lightweight fill are very expensive and would require additional engineering to determine precisely how much excavation is required and how much lightweight fill would be required to “bridge” the peat below. Cost for the lightweight fill option would most likely run 20-30% higher than excavating and removing the peat. Because of the higher cost, this alternative is also not recommended.

In summary, the cost comparison of the as bid costs, revised 40-foot section and 26-foot option are as follows:

40-Foot Typical Section As-Bid (No Peat Removal)	\$435,000
40-Foot Typical Section With Peat Removal	\$590,000
40-Foot Typical Section with Peat Removal with 26-Foot Paved Surface	\$570,000
26-Foot Typical Section With Peat Removal	\$520,000

WSB is asking for a recommendation on how to proceed with the project. We are asking which option City Council would like us to proceed with for the project. It is our recommendation to proceed with either the 26-foot or 40-foot typical section and fully excavate and remove all peat within the road section.