

September 2, 2005

TO: John Szerlag, City Manager

FROM: Brian Murphy, City Manager/Services  
Steven J. Vandette, City Engineer

SUBJECT: Section 23 Pavement Replacement Project  
Change Order No. 2, Contract 05-02

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**RECOMMENDATION:**

It is recommended that City Council approve Change Order No. 2 with Florence Pavement Providers in the amount of \$413,223.15 for the Section 23 Pavement Replacement project in Raintree Village No. 1.

In addition, we are requesting authorization to approve additional work, if needed, not to exceed 10% of Change Order No. 2. The total amount requested for authorization is \$454,545.47.

**BACKGROUND:**

In early July we experienced a problem with the asphalt paving operation in the Raintree subdivision due to heavy rains immediately following removal of the existing concrete pavement. The clay roadbed became saturated and ultimately unstable in some areas following the asphalt paving. We also suspected that there was a problem with the asphalt mix itself (not meeting specifications) that was used for the second layer. There were sections of pavement that were rutting and cracking. While it is normal to have some failed sections, due to heavy construction traffic, that must be cut out and replaced before the final (third) asphalt layer is put down, this was not normal to have the high number of failed areas that were experienced.

Our testing consultant, TEC, took core samples of the asphalt and initial test results showed the mix was within specifications. There are indications of lack of bond between the first and second asphalt layers (tack coat problem) and of course the problems with unstable roadbed conditions due to moisture content. Additional testing is being done and the results and final report from our consultants is not yet available. Based on these findings we will determine if any actions could be taken against the contractor relative to repair costs. Staff is also reviewing our consultants design to see if there is any culpability.

Paving operations were suspended while we considered utilizing a new technique, called Lime stabilization, for stabilizing the existing roadbed after the concrete was removed. We experienced some excessive rainfalls in June that caused the roadbed to become saturated and take a long while to dry out and firm up (just in time for another "scattered" shower). Lime stabilization would dry out and stabilize the roadbed quickly and allow the asphalt work to proceed the next day. Our goal was to stabilize the roadbeds on Harmony, Crimson and Lakewood that did not have any asphalt on one side and get them paved as soon as possible. The existing failed asphalt sections on the other side would then be cut out and replaced before placing the third and final layer of asphalt.

Ultimately there was a problem with the Lime Stabilization technique that could not be overcome. After extensive discussions with suppliers, consultants and the contractor we determined that the proper equipment for mixing the lime with the existing soil was not available. This specialized piece of equipment for mixing was being used on a state highway project and was not available for loan to our road project. There were also issues related to the work area and maintaining access to residents which would not allow Lime stabilization to be an effective solution to the problem.

As it appeared that the cycle of hot dry days followed by wet weather was not changing anytime soon, waiting out the weather did not appear to be a viable option. Consequently, we designed a modified roadway cross section that included excavation of the wet roadbed material, laying down a geogrid material separator and placing two different layers of stone material on top of that. This engineered roadbed stabilizes the base, even when wet, and allows the paving work to continue on a firm foundation and at a constant rate. We determined that this modified section was a viable option after hand digging the gas services and finding them to be deeper than what was found on other streets. We priced out the work with the contractor and found this new method to be a cost effective alternative to the pavement cross section provided in the contract.

We anticipated that some asphalt areas on North Lake may need to be cut out and replaced but after additional testing, it was found that significant roadbed areas were still unstable. We ultimately decided to remove and replace North Lake Street with the new road cross section.

The Contractor has placed new asphalt pavement on Harmony, Lakewood, Crimson and North Lake with good results. The original asphalt on Northlake Court was not removed. The asphalt was finished on North Lake on September 1, 2005. The final surface layer of asphalt will be done later once the rest of the streets in the subdivision are ready.

Due to the problems encountered with rain saturating the roadbed, the possibility of significant conflicts with gas services on the streets remaining to be done and less than half the construction season remaining a road conditioning and overlay process was investigated for the remaining streets. This process would allow some of the concrete pavement to remain in place and be utilized as the base for the asphalt. This process would result in much less traffic disruption and a shorter construction time for the remainder of the project, while providing a strong, solid base for the asphalt and a final pavement cross section equal to the areas that have been totally removed and replaced.

Concrete milling on Crestline, Lakewood, Woodgate, Sherwood, Crimson and Floyd started on Wednesday, August 23<sup>rd</sup> and finished on Friday the 26<sup>th</sup>. This process milled away up to 3 inches of the existing concrete in order to reveal sound concrete that will be used as a base for the new asphalt and reveal unsound concrete areas that will require conditioning that includes removal and replacement with concrete and joint repairs with asphalt.

After the concrete conditioning is complete, a layer of asphalt will be placed to level out the road surface. Traffic will be able to get back on the streets after the asphalt cools in 3-4 hours depending on weather conditions. An engineered paving mat called TruPave, a pavement interlayer fabric designed to create a moisture-resistant barrier and retard asphalt cracking, will be placed between this first asphalt layer and the second and final layer of asphalt. School bus traffic will not be disrupted, as the contractor will work around the bus schedule.

After completion of the milling operation, all remaining streets in Raintree Village No. 1 were evaluated to determine the appropriate rehabilitation option. The primary factor in determining the most cost effective solution was the amount of concrete pavement conditioning (joint and base repairs) required. The two options considered, as discussed previously are:

1. Overlay of the milled concrete with two (2) layers of asphalt including a geotextile paving fabric.
2. Complete removal of the existing concrete pavement and replacement with the modified asphalt pavement cross section.

Based on analyzing the costs for each option for all remaining streets, the following streets are scheduled to be rehabilitated using Option 1:

1. Crestline
2. Woodgate
3. Sherwood
4. Floyd

While the following streets will be rehabilitated using Option 2:

1. Crimson
2. Lakewood

### **CHANGE ORDER DETAILS**

Change Order No. 2 provides for an increase of \$976,223.20 in new or additional contract items and a corresponding reduction of \$563,000.05 in deleted or decreased contract items. The net increase is \$413,223.15 to the original contract amount of \$839,557.35. The revised contract amount upon approval of Change Order No. 2 would be \$1,252,780.50.

### **BUDGET:**

Funds are available in the 2005-06 Local Road budget, account number 401499.7989.021025, for the completion of this project, due to carry forward from the previous fiscal year and the timing of the Section 6 seal coat SAD project.

September 8, 2005

TO: The Honorable Mayor and City Council Members

FROM: John Szerlag, City Manager

SUBJECT: Supplement to Staff Memo Regarding Section 23 Pavement Replacement Project Change Order No. 2, Contract 05-02

At this point I'm not convinced that the City of Troy is responsible for the entire change order. As such, I'll be reviewing this matter with staff, the contractor and consultant for this project. Having said that, it's important for us to proceed with the project so that we may draw closure thereon.

Of course, I'll keep you advised of this matter as more information becomes available.