Virgin River Trail Phase I & II, Washington City
F-LC53(37)
CM/GC Final Report
(Draft)

Prepared by:

WCEC Engineers, Inc.

Prepared for:

Utah Department of Transportation
1345 South 350 West
Richfield, UT 84701

December 05, 2008

TABLE OF CONTENTS

List of Tables

PURPOSE

The purpose of this report is to fulfill the final report requirements outlined in Section 4.1 of Memorandum of Understanding (MOU) between the Utah Department of Transportation (UDOT) and the Federal Highway Administration (FHWA) for Alternative Contracting Process – SEP 14; Construction Manager / General Contractor Contracts (CM/GC) dated May 5, 2007.

This report presents a brief overview of the project, a discussion of Evaluation Criteria contained in the MOU and Lessons Learned throughout the project.

The Evaluation Criteria consists of the following:

a) Design and Constructability
b) Innovation
c) Project Schedule
d) Risk
e) Learning Opportunities
f) Environmental Stewardship
g) Benefit to the Public

The Lessons Learned consists of the following:

a) Contractor Ownership
b) Project Budget
c) Selection of Contractor
d) Bidding Process
e) Streamlined CM/GC Application and Selection Process
f) Contractor Involvement in the Environmental Process

PROJECT OVERVIEW

Washington City secured Enhancement Funds through UDOT's Enhancement Funding process to construct a Bicycle Pedestrian path on both City and Bureau of Land Management (BLM) properties. Because of the sensitive terrain and limited budget associated with this project it was determined during the design process that CM/GC may be a good process to use on this project.

Through UDOT's application process this project was selected as a CM/GC project under the provisions of Special Experimental Project No. 14 (SEP 14) for the use of innovative contracting practices. Pursuant to Utah Code Ann. Section 63-56-13, this contracting method establishes UDOT's ability to procure transportation construction under the CM/GC approach authorized in Utah Code Ann. Section 63-56-36.1

The project is located in Washington City, Utah. The project alignment is divided into three sections. The first section alignment runs in an easterly direction from the tee intersection 100 East and Industrial Drive and ties into 300 East just north of the Virgin River. The second section runs in a southerly direction, from the tee intersection of Telegraph Street and Washington Parkway, down Grapevine Pass to the north bank of the Virgin River. It then continues along the north bank of the Virgin River, in an easterly direction, to Sunrise Valley

Road. The third section starts approximately ½ mile downstream of where Cottonwood Wash crosses Telegraph Street. It runs in a southwesterly direction down Cottonwood Wash and ties into the second section noted above that runs down Grapevine Pass. Because of environmental concerns associated with the Southwest Willow Flycatcher habitat, the first section noted above was removed from the project during the environmental process. Section two and three noted above were the sections constructed as part of this project.

The project was originally two Enhancement projects funded in two separate years and was later combined into one Enhancement project in August of 2006. Project Milestones are noted in Table 1 below.

Table 1

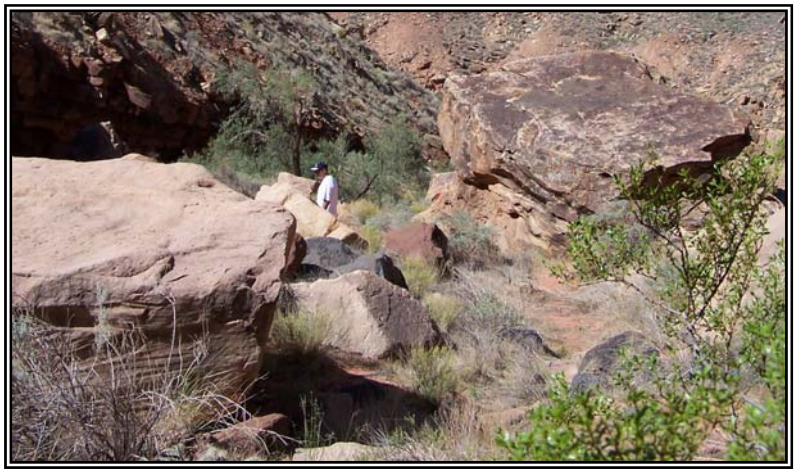
Project Milestones

Milestones	Date
Begin Design	August 1, 2006
CMGC RFP Advertised	June 16, 2007
Contractor Selected	August 1, 2007
Environmental Document	October 4, 2007
Construction NTP	May 27, 2008
Substantially Complete	October 31, 2008

EVALUATION CRITERIA

The Evaluation Criteria is outlined in the MOU and consists of seven areas identified below.

Design and Constructability



The Virgin River Trail project required the construction of a bicycle/pedestrian facility through rugged terrain. The constructed alignment winds through small canyons, large rock outcroppings and boulders. Identifying alignments and creative excavation methods that eliminated blasting and minimized excavation costs was critical to the project budget. Having the contractor assist in identifying cost effective construction methods in this unique environment was critical to maintaining an efficient project budget. Without this needed expertise the project may have been designed, advertised and awarded before it is realized costly excavation methods were required to complete the project.

The CMGC process allowed the contractor to develop ownership in the project. The Contractor's participation in the design process allowed him to give input into how the final product would be developed and created. This input allowed the Contractor to develop a vested interest in building the product he helped design.

One example of this vested interested was the Contractor's ability to help us keep the project within budget. The Contractor understood early on that the City could not go beyond the budget that had been established. Throughout the design and construction process the Contractor was very good to propose solutions to issues that keep the project within budget. For example during the design process while walking the alignment the contractor pointed out several locations that if we adjusted and simplified we could eliminate a significant amount of retaining walls. This was included in the design and the amount of retaining walls estimated was significantly reduced. After construction work began the Contractor was able to maximize the use of large rocks in the alignment to eliminate the need for all remaining retaining walls in the plans.

Innovation

Because CM/GC allows the contractor to be involved during the design process, innovations are a natural by-product of the Contractor and Designer working together. Some of the project team's innovations are discussed in other sections of this report but include the following:

- Adjustment of alignments to eliminate need for retaining walls.
- Use of experienced personnel during construction to minimize impacts to the environment and reduce excavation costs.
- Use of RAP in place of UTBC.
- Use of a double chip seal pavement design to reduce cost associated with high oil prices.
- Cost effective solutions to remove and retard the growth of Tamarisks.
- Cost effective stream crossing solutions.

Project Schedule

It was originally thought that the CM/GC process would reduce the project schedule by reducing the amount of time during the advertising and award process. Although there was some time savings realized through the advertising and award process, the project experienced some minor delays by incorporating additional changes proposed by the Contractor during design. These delays are small in comparison to the cost savings realized by the reduction of risk to the Department by incorporating the Contactor's proposed changes.

Risk

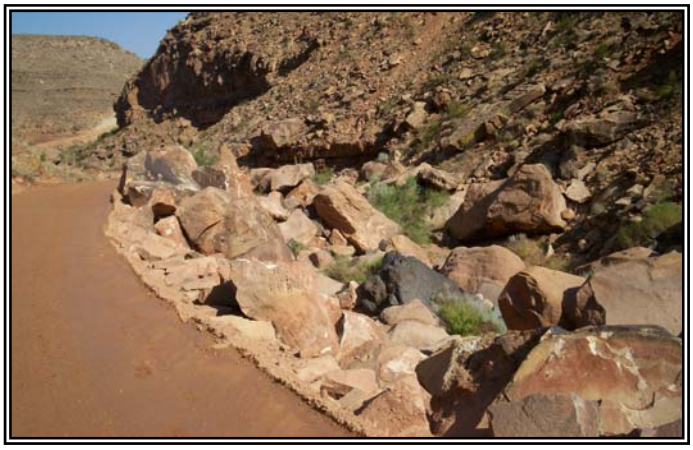
CM/GC allows for a more thorough design process in which the Contractor assists in the design, information gathering, and review. This involvement reduced the Contractor's risk because he better understands the details associated with the project and is better prepared to bid the project. The standard design-bid-build process only allows four weeks, during the advertising process, for the Contractor to become familiar with the project plans. Because the Contractor was closely involved with the design, his

understanding of the project was much greater than it would have been on a design-bid-build project.

An example of this reduction of risk is illustrated by the estimated savings associated with elimination of addition survey and geotechnical work. Because of the rugged terrain associated with the project, additional survey and geotechnical work would have been needed during the design process to adequately estimate the need quantities for Roadway Excavation, Borrow, and Blasting. This additional work was roughly estimated at over $200,000. The project did not have the budget for these additional costs. By bringing an experienced contractor on board who had extensive experience in working in this type of terrain we were able to identify quantities for Roadway Excavation, Borrow and Blasting that both the Engineer and the Contractor were comfortable with without procuring the additional survey and geotechnical work. Our design charges for the contractor are approximately $20,000. This leaves us with an estimated savings of $180,000.

Learning Opportunities

Learning opportunities were created for both the Contractor and the Engineer. The Contractor was able to understand how the design was developed and why certain design requirements were necessary to make the project successful. The Engineer was able to become familiar with the construction methods needed to build the project which enabled the project team to better optimize the design to stay within the project budget and meet the intent of the Environmental Document.



For example the Contractor proposed using his most experienced backhoe operator to pick his way through the rough terrain minimizing the impacts to the environment while optimizing the use of boulders as retaining walls. This method added additional working days to the contract but minimized retaining wall costs and environmental impacts. It also created ownership in the backhoe operator to provide the best product possible. He took great pride in his work.

Environmental Stewardship

The trail alignment runs through rugged virtually untouched terrain. Identifying specific excavation and construction methods that minimize impacts to the environment was important. Having the Contractor participate in the design process enabled the project team to develop the best design alternatives and construction methods that minimized impacts to the environment. Most of the alignment was constructed on BLM land. At the final inspection, an individual from BLM indicated that they were very pleased with how the project turned out, in particular, how impacts to the environment were minimized.

Benefit to Public

The CMGC process allowed the available project funding to be better managed throughout design and construction. Construction cost information that was provided by the Contractor allowed the project stakeholders to make critical scope decisions using real construction estimates.

A good portion of the trail alignments cross through rugged terrain consisting of large boulders and rock outcroppings situated in washes and small canyons. There is also an alignment that runs along the north bank of the Virgin River crossing heavily vegetated sections. Because of the unique terrain associated with this project, it was critical to the project budget that cost efficient construction methods were identified during the design phase. The CMCG process allowed the design team to work directly with the contractor during the design phases to identify construction methods that are practical and cost efficient. Without the Contractor's expertise during the design phase, alignments may have been designed and construction methods determined that may have resulted in costly change orders during construction.

LESSONS LEARNED

The following is an overview of Lessons Learned discussed by the project team at the final inspection of the project. The over tone of the discussion was very positive from all parties involved. All parties were very supportive of the CM/GC process and expressed interest in using the process on future projects. Parties represented in this discussion included representatives from Washington City, UDOT, BLM, Contractor, Resident Engineer and Design Engineer.

Contractor Ownership

Because the Contractor was involved in designing the project, he took ownership in making the project successful. This included constructing the project within scope and budget. The Contractor was very good to propose value oriented solutions within the project budget. For example, the stone bench's that were originally specified are not nearly as nice or constructed as well as the benches the contractor provided. The Contractor recommended a much nicer bench at the same cost as the originally specified benches.

Project Budget

Because the project budget was set, the project team worked together through both the design and construction process to develop value oriented solutions that were within the project budget. For example, during the design process, because of escalating oil prices, the surfacing course was changed from 4" of Hot Mix Asphalt to a special type of double chip seal used for bike paths. This was done to keep the project within budget. After the project was bid and construction had begun the Contractor became aware of some Recycled Asphalt Product (RAP). They proposed this RAP be used in place of the untreated base course (UTBC). By proposing the RAP the project was able to realize a pavement structure value similar to the original pavement design for much less cost.

Selection of Contractor

The City felt the biggest asset to CM/GC allowed them to choose the right contractor for the job. Because they were able to choose the right contractor the project turned out like they had envisioned. It is interesting to note that the Contractor selected did not have the lowest bid. Lowest bid does not guarantee the best value. If done correctly CM/GC can provide the best value.

Bidding Process

Because CM/GC bidding process was still being developed when this project was advertised there were two elements in the bidding process that need to be rectified for future CM/GC projects. First, the DBE requirements were not made known to the contractor until after the bids were submitted. This put the contractor in an awkward situation in trying to meet the DBE requirements. Fortunately, we were still able to meet the DBE requirements.

Second, the advertised plan set was never packaged and sent to all parties like a normal design, bid, build package. This sometimes created confusion in the field because everybody had their own set that was not necessarily exactly the same as what the engineer had. Fortunately, the project team was familiar enough with the design to work through these issues.

Streamline CM/GC Application and Selection Processes

Although the City was very pleased with the outcome of the project, they were concerned about the amount of time the CM/GC application and award process added to the project. It took over 3 months to apply and be approved to use the CM/GC process on this project. The selection of the contractor took several months as well. The City asked on future projects, if these times could be reduced.

Contractor Involvement in the Environmental Process

Although the Contractor was brought on about a month before the Environmental Document was signed, it was not enough time for him to have any input to the document. As we completed the design with the Contractor we were confined to alignments that were not always the best. Although we had justification to go back and update the Environmental Document, we did not have time in the schedule. Had we had the Contractor on board while we were developing the Environmental Document, we could have made better decisions not only for the environment but also for the project. The project team recommends that the Contractor be brought on board prior to the Environmental Document being finalized.

CONCLUSION

Because of the unique terrain associated with this project, it was critical that the project team have construction experience in this type of environment. Using the CM/GC process allowed the project team to select a contractor with this type of experience. The Low Bid process does not effectively allow a project team to select a contractor based on experience and expertise. Without this type of experience on the design team, alignments may have been developed and construction methods used that may have resulted in an increased budget and/or costly change orders during construction.

Washington City is very pleased with how this project turned out. They feel using the CM/GC process allowed them to select the right Contractor for the job. Low Bid projects do not always create the best value. It was felt by the project team that the CM/GC process, if managed and applied correctly, is a good tool to bring best value to a project.