

CM@Risk

Final Report

Project 213403-1-52-01

Florida Welcome Center



Tom Crossman, P.E.
Sr. Project Engineer
Lake City Construction, FDOT

COST COMPARISON

(Supplemental Agreements | Work orders | Field SA's were not applicable).

This contract used:

Contract Modifications -used to modify the contract language or value.

Change Orders (CO)- used to modify the contract time, add scope.

Owner's Contingency funds- used by owner to add additional work not specified in the contract

CM Contingency funds - used by CM firm for changes to items within the scope of the contract (changes in subcontractor's bids, market price changes etc.)

Original Guaranteed Maximum Price (GMP) amount (includes contingencies)= \$13,240,420

Contract Modification #3, increased contract amount + \$ 60,000

Total contract dollars (GMP amount+ C0#3) = \$13,300,420

Final contract amount = \$13,101,578

Initial Contingency funds within GMP (CM and Owners)= \$748,887 or 5.6% of contract value

Contingency funds used (CM and Owners) = \$491,025 or 3.7% of contract value

Unused contingency funds returned to FDOT = \$198,842 or 1.5% of contract value

CM Shared Savings = \$155,258 or 1.2 % of contract value

Number of Contract Modifications = 4

Number of Change orders = 5

Number of Owner contingency authorizations = 12 (involves 33 issues)

Number of CM contingency authorizations = 8 (involves 26 issues)

Number of Requests for Information (RFI's) = 105

Number of Claims = 0

Cost of the building, consisting of lobby, refrigeration units, vending areas, and bathrooms = \$219 per square foot.

Additional post construction design services costs \$166,734 or 16% of total design cost. Many of these design changes could have been avoided by bringing the CM on board earlier .

Additional inspection costs for Threshold inspections by Universal Engineering= \$52,858. This was an open book contract whereby the owner had full access to all records pertaining to all bid costs and any added costs for extra work.

This project was constructed under budget by \$198,842 or 1.5%.

In a comparison with similar facilities constructed in District 2 from 1995 through 2002, the range of money overruns was from 8% to 86%, with an average overrun of 22%. If this project is compared to the average performance on the previous eleven (11) projects of this type work, the Department would have expected to see an increase in price of \$2,748,137.

SCHEDULE COMPARISON

The advertisement for selection of CM firm was issued on September 15, 2003.
Notice to Proceed, (NTP) into the pre-construction phase was issued on November 26, 2003.
Notice to Proceed into the construction phase was issued on April 8, 2004.

Substantial Completion scheduled for July 27, 2005.
Substantial Completion achieved on July 25, 2005.

Final Completion date scheduled for September 10, 2005.
Final Completion anticipated September, 2006.

Scheduled contract time= 507 days (from NTP into Construction phase to Final Acceptance)
+ 14 days granted as Force Majeure events for four hurricanes

Revised contract time = 521 days

Actual construction time frame from the beginning date on site construction activities started until Substantial Completion was 419 days. This is the time frame that the traveling public incurred impacts during construction. There were 55 days at the beginning of the project for subcontractor acquisition I mobilization, and 45 days after construction for contract close out.

The CM firm met the Substantial Completion date. At Substantial Completion the owner was occupying the building and the site and was being using it for its intended purpose. However, the CM firm did not meet the scheduled Final Completion date of September 10, 2005. The CM firm was working on punch list items between Substantial Completion and Final Completion. All of the punchlist items were completed by the Final Completion date with the exception of two items consisting of pond surveys and video taping/desilting the new drainage system.

Completing the final two items took an exceedingly long time frame after Substantial Completion not anticipated by the CM firm. A more detailed discussion of these items will follow in the "Lessons Learned" section.

**Substantial Completion was achieved 2 days early.
Final Completion was not achieved on time.**

In a comparison with similar facilities constructed in District 2 from 1995 through 2002 the range of time overruns was from 12% to 122%, with an average overrun of 50%. If this project is compared to the average performance on the previous eleven (11) projects of this type work, the Department would have expected to see an increase in time of 254 days or approximately 8.5 months.

QUALITY COMPARISON

This project is comparable with or exceeds the quality of any commercially constructed facility throughout the state. The Construction Manager did not self-perform any of the work with their own forces. They managed the project and hired subcontractors to perform all of the different trades including electricians, masons, glaziers, plumbers, etc. Many of these trades are licensed by the state. The building was constructed in a similar method to any school, hospital, etc. However, the roadway portion was constructed per Florida Department of Transportation (FDOT) Specifications which are generally stricter than in the private sector.

Our specification package consisted of two distinct sections. The 2000 FDOT Specifications governed all of the work outside the footprint of the building and technical specifications from the architect governed all of the work inside the footprint of the building.

The following systems were used to monitor the operations of the work:

- Laboratory Information Management System, (LIMS)
- Contractor Quality Control, (CQC)
- Contractor Past Performance Report, (CPPR) grading system, Final Grade= 94%
- Maintenance of Traffic, (MOT) reports
- Storm Water Pollution Prevention Plan, (SWPPP) reports
- Disposition of Defective Materials, (DDM's)
- Hummingbird archiving system
- Density Log books
- Threshold and Verification inspection by Universal Engineering
- Materials Certifications
- Inspections by Hamilton County building inspector
- Inspections by Fire Marshall
- Civil Inspections by Cal-Tech Engineering

DEGREE OF INNOVATION

This pilot project was a unique process that had many advantages over conventional Design Bid Build, (DBB) projects. During the pre-construction phase, the (Project Team) consisting of

Construction, Maintenance, Design, Federal Highway Administration (FHWA), VisitFlorida, Division of Blind Services, Infrastructures corp. of America (ICA), the Construction Manager and numerous other agencies, worked together in a process called redi-check. This was an extensive plans review process, performed prior to bidding, that resulted in finding numerous areas of concern with the plans that had the potential to create problems during construction. We found over 200 items, some small and some substantial, that had the potential to cost the Department millions of dollars and months worth of delays if they had made it to the construction phase.

The Department's initial estimate was 8.2 million. The Construction Manager (CM) provided the Department with a preliminary budget estimate of 10.7 million. The high budget was partly due to the remote rural location and limited subcontractor availability. Steel and concrete shortages also affected the subcontractor's bids. The Department's initial estimate was low due to the fact that Construction Management costs were not included in the estimate. The project was bid out and received initial bids of 14.6 million. This resulted in a modified value engineering, (VE) phase called "Budget Tracker" in which the project team looked at the existing plans and reviewed items that could be changed to reduce the overall cost, yet not affect the initial intent or design of the structure. During this process the team identified 74 items that allowed the team to reduce the budget estimate by approximately 10%, bringing the construction cost down to 13.2 million. This allowed the funding to be acceptable and the project moved forward into the construction phase.

These two concepts were the single greatest advantage of this process. During the above mentioned phases it truly was a team effort by all involved to balance all the requirements of the facility in the best interest of the owner.

ANALYSIS OF INDUSTRIES REACTION

Statewide input was solicited for the Construction Manager at Risk (CM@Risk) concept. The CM@Risk delivery method has been discussed with the Florida Transportation Builder's Association (FTBA) representative. FTBA is in favor of the process for vertical construction projects by FDOT but not for horizontal construction. The concept has been discussed at the FDOT's Statewide Alternative Contracting Task Team Meeting to solicit input from construction and consultant firms. Many of these firms offer both Construction Management services in addition to CM@Risk services. Most of the discussion was positive for the delivery method. One concern raised is the limitation that might be placed on a firm's ability to self-perform portions of the work. The team is forming a subcommittee to make recommendations for continued implementation of this delivery method.

LESSONS LEARNED

This pilot project was a great learning process for all involved. It was a challenge to mesh two completely different construction delivery methods together and achieve such a fine facility. The Construction Manager was not familiar with FDOT Specifications, testing and documenting procedures. Likewise, FDOT was not familiar with architectural specifications and their format. Merging these two systems together was a challenge but through true cooperation and working

together as a team we were able to make it work.

For this project the Construction Manager was acquired at 100% plans and specs. They should have been brought on board at 30% plans or earlier to:

- 1) Shorten the pre-construction phase
- 2) Be involved earlier to be in a position to provide an earlier budget estimate to the owner
- 3) Save design costs and provide needed input to the project concerning constructability and provide potential cost savings proposals (Value Engineering) during the design phase.

Scanning of project documents into Hummingbird was a troublesome process. The CM firm was not familiar with this system. With this as a pilot project there was an estimated 5-10 times the volume of documents generated than a "normal" project. The CM firm experienced connectivity problems to our system due to their own security systems. Improvements to this area will need to be made in future projects. Clear guidelines on what documents will be scanned and by whom will need to be addressed on future projects.

For this project the scheduled time frame from Substantial Completion to Final Acceptance was scheduled to be 45 days. During these 45 days, the Construction Manager was to complete the items on the punch list, demobilize from the site, close out all subcontractor contracts, complete as-built plans, and complete all final documents to close out the contract. In our case all went well within the allowed time frame with the exception of two items: surveying the on site ponds, and dewatering/videotaping of the new drainage system. Completing these two items consumed an exceedingly long time frame after Substantial Completion. All of the punch list items were completed by Final Acceptance with the exception of these two items. The pond surveys were submitted to the Engineer of Record, (EOR) multiple times due to incomplete survey data. The new drainage pipes were also dewatered/videotaped numerous times by the subcontractor prior to providing satisfactory tapes of all the piping. Some minor pipe repairs were required. We held retainage during this time frame but it proved to be an inadequate incentive to have the work completed in a timely manner. I have discussed this at length with the Construction Manager and there are numerous avenues to pursue to avoid this in the future. This same problem existed on both of the pilot projects. The following might need to be considered in the future:

- 1) Write into the subcontracts a required completion time frame identifying these two items to be completed prior to Substantial Completion.
- 2) Extend Liquidated Damages through to Final Acceptance rather than through to Substantial Completion.
- 3) Keep the Construction Manager mobilized on site until Final Completion until all items are completed.
- 4) Be more proactive in replacing subcontractors that perform poorly.
- 5) Extend the time frame between Substantial Completion and Final Completion to 90 days rather than 45 days.

Although neither of the above items interfered with the facilities operation or had any impacts to the traveling public they were two items that lingered and kept the Department from Final Accepting.

More post design services time and money should be budgeted up front in the process. More

post design services were required as compared to DBB to handle the redi-check process and the VE revision phase. There were some delays in plans revisions due to monies not being available during the pre-construction phase. This expenditure would most likely be less if the CM is brought on at 30% plans.

The Department did not include the additional cost of Construction Management fees in their initial estimate. This cost needs to be considered when monies are encumbered for the project.

FDOT roadway designers are typically allowed 45 days for shop drawing turn around. Due to the accelerated construction schedule the CM expects a 10 day turn around. Although we were able to work through these issues without any major problems, on future projects the EOR needs to be aware of the quick turn around that is required.

In future projects we may consider having someone similar to an FDOT Project Administrator/ Contract Support Specialist as a member of the Construction Managers staff. This person would assist the CM with the FDOT paper work process With items such as Hummingbird, asphalt reports, compliance, MOT reports, SWPPP reports, quality assessment review (QAR), density log books, daily work reports, etc. It would streamline this area and make it more efficient if this person was on site assisting. On future projects we should also clarify the reporting/inspection requirements for the FDOT Specifications a little more whereby the CM can address early in the project.

The Department may want to consider having a portion of the Owner's Contingency funds outside of the GMP estimate. Any remaining unused CM Contingency funds are split between the owner and the CM. If the contractor is allowed to bid out the work prior to submission of a GMP this split savings may need to be reduced or eliminated due to the fact that the risk for the CM was substantially reduced by bidding out the project prior to GMP.

During this project we had weekly progress meetings and monthly Executive meetings. This was a valuable tool for keeping the team informed of all issues.

The initial design of the project was pay item. We changed it to lump sum during the preconstruction phase. This had favorable results. We allowed composite pay factors and monthly bituminous adjustments only for asphalt. No other adjustments were allowed for fuel, steel, etc. On future projects we may need to consider only having composite pay factors or no adjustments at all. Pricing adjustments could be absorbed by the CM contingency funds. These type of market adjustments are generally anticipated and built into the subcontractor's bids.

For this project the subcontractor performing the Civil portion of the work signed the subcontract only a week or two prior to the start of the scheduled work. The CM did not anticipate or allow enough time for the Quality Control Plan, Erosion Control Plan, and MOT plan approval prior to construction. On future projects the civil subcontractor should be brought on board earlier.

During this project teleconferencing was used extensively. Arrangements should be made early to acquire a consistent teleconference line for 8-10 persons. We used the FDOT Maintenance Department's system. However, this depended on the availability of their resources. A designated project specific line would have been more consistent to schedule.

The selection process we used to choose the Construction Manager was very similar to the selection process for a consultant. This worked well and should remain the same in the future.

In using the CPPR grading system, we graded the CM from the notice to proceed into the construction phase through Substantial Completion. We might want to extend the grading period through to Final Acceptance to aid in encouraging the contractor to close out the project between Substantial Completion and Final Completion.

There was some confusion concerning the time suspensions that are given in the specs for Christmas, New Years, Thanksgiving, Labor Day etc. The CM initially did not understand that these time suspensions applied to the roadway work as well as the building work. We used good judgment and were able to prevail without impacting the schedule. This clarification needs to be addressed in the scheduling phase for future projects so the CM can allow for any required shutdowns.

The "Let Date" for a project is tied to many aspects of the FDOT contract language. This was not a major problem. However, flexibility and common sense needs to be exercised in this area to fit this style of contract.

The primary personnel involved in this project are as follows:

Construction Manager (CM): Jim Matkovics, Centex Construction

Architect: Gary Cranston, Engineer of Record: Bill Bentley, Bentley Architects and Engineers

Project Management: Tom Crossman, Lake City Construction, FDOT