February 16, 2017

TO: HART Board of Directors

THROUGH: Krishniah N. Murthy
Interim Executive Director and CEO

FROM: Charles S. Carnaggio
Project Director
Officer-in-Charge

Mike Yoshida
Project Manager

SUBJECT: Request for Change Order Approval:
KHG Shaft Operations and Construction Changes
Contract No. CT-HRT-11H0195

Overview

If approved by the Board of Directors, ("the Board"), this bilateral Contract Change Order is for a credit from the Design-Builder, Kiewit Infrastructure West Co. ("KIWC") in the amount of (-$1,099,235.00) and includes four (4) separate issues that were affected by shaft operations or construction changes.

1. Elimination of Method and Test Shafts: The KHG contract required KIWC to install 4 Method Shafts and 6 Test Shafts. Of these, KIWC has done 1 Method Shaft and 4 Test Shafts. KIWC proposed to eliminate the remaining method shafts on the grounds that the shafts were of similar means and methods to those performed on Farrington Highway. Previously it was determined by executive agreement between KIWC and HART that Test Shaft #10 could be deleted from the KHG test shaft program. Shafts to be eliminated included three (3) method shafts (M4, M5, M6) and two (2) test shafts (T10 & T13). This change resulted in a credit of (-$1,640,000.00).

2. Voids Under Tuff layer: Cost of $217,000.00 to compensate the Design-Builder for the additional installation of low pressure grout under the tuff layer to fill the voids and stabilize the soil below 14 shafts.

3. Drill Spread Additional Mobilization at Aloha Stadium: Cost of $195,000.00 to compensate the Design-Builder for their additional demobilization and mobilization at the Aloha Stadium Lot during the abandoned Navy septic tank remediation work.

4. Aloha Stadium Demobilization: Cost of $128,765.00 to compensate the Design-Builder, for their additional demobilization and mobilization at the Aloha Stadium Lot.

Net value of this CCO is for a credit of (-$1,099,235.00).
Justification

1. **RFCC 28, Elimination of Method and Test Shafts:** Demonstrating the method of constructing a drill shaft foundation is part of the submittal for RFCC 28, KIWC submitted the "KHG Drilled Shaft Design Methodology", which outlined the following points as the basis for the deletion of Method Shafts M4, M5 & M6, and Test Shafts T10 & T12:

   a. KIWC argued that the project would realize a cost benefit from removing the requirement for Method Shaft construction. Based upon KIWC's planned KHG drilled shaft construction methods, which were substantially the same as was previously performed on the West Oahu Farrington Highway (WOFH) contract, where similar Method Shafts and Load Tests were constructed in similar ground conditions that will be encountered on the KHG project, HART management agreed to the deletion.

   b. KIWC planned to implement a similar drilled shaft construction method in similar subsurface conditions for 14,575 LF of the project's alignment. Per the contract, a site shall be defined as a contiguous portion where the subsurface conditions can be characterized as geologically similar in terms of subsurface stratification, i.e., sequence, thickness, and geologic history of strata, the engineering properties of the strata and the groundwater conditions not exceeding 5,000 feet in total length. As the Contract disallows sites to be in excess of 5,000 LF, three (3) each Test Shafts were required by contract. Due to the similarity of T10 with the two (2) other planned test shafts, KIWC argued that the significant disruption to the traveling public far outweighed the benefits of performing three similar Test Shaft at the planned Site. HART agreed to eliminate Test Shaft T10.

   c. KIWC had access to as-tested base resistance data for base-grouted Test Shafts in coarse-grained granular material obtained during the pre-construction effort on the WOFH Contract. This information allowed KIWC to advance the design for the KHG shafts using data collected on the WOFH contract.

   KIWC's "KHG Drilled Shaft Design Methodology" paper was reviewed by the GEC Geotechnical Engineer, Jianping Pu, and was found to be technically acceptable.

2. **RFCC 00051, Voids Under Tuff Layer:** While performing borings the drill encountered unidentified voids within the area under the tuff that are not indicated in the Contract Documents and which constitutes a Differing Site Condition. This Differing Site Condition has impacted KIWC's time and cost of performance since KIWC will now needs to perform unanticipated and additional Work including the use of a low pressure grout under the tuff layer to fill the voids and stabilize the soil below the shafts. The borings provided to KIWC in the HART Geotechnical Data Report ("GDR") as part of the contract documents were reviewed and compared to the borings found during the design development phase of this design-build contract. The HART GDR did not baseline any voids below the tuff. Since the GDR did not baseline any voids below tuff as found during the contractor's geotechnical investigation, this constitutes a differing site condition and has merit for additional compensation.
3. **RFCC 00061, Drill Spread Additional Mobilization at Aloha Stadium**: In November 2011, KIWC discovered an unknown, abandoned Navy septic tank while conducting geotechnical boring operations at shaft 422R located in the Kohomua Yard at Aloha Stadium. To mitigate equipment “standby” costs during the guideway construction delay necessary to perform the remediation, KIWC reassigned the 3900 drilling machinery and its crew. The tank remediation was completed in December 2015 and KIWC remobilized in early January 2016 and drilled the four shafts using the 3900 machine.

4. **RFCC 00067, Aloha Stadium Demobilization**: In early 2012, KIWC was granted access to the Aloha Stadium lot TMK 1-9-9-003-71. KIWC mobilized into this parcel in March 2012 to develop a staging yard and complete method and test shafts. Included in KIWC's efforts was installing features such as BMPs, perimeter fence and a security system. Based on the Special Provision 12.3, KIWC understood this grant of access by HART to KIWC into the Aloha Stadium Park & Ride would be of sufficient duration to enable KIWC to perform all Work necessary as reflected in its plan and schedule. The granting of access to the subject TMK was made with no conditions or time limits on the part of HART. As such, KIWC could rightfully assume they could proceed with all work necessary to mobilize into the parcel. The access was granted prior to a long term agreement being finalized between HART and the Aloha Stadium Authority, resulting in the Authority requesting KIWC vacate the parcel prior to the 2012 University of Hawaii football season. This subsequent requirement for them to vacate the parcel temporarily (due to what?) caused KIWC to perform additional and duplicative work that was not within the original scope of work.

**Recommendation**

HART Staff recommends that the HART Board of Directors approve this bilateral Contract Change Order in the amount of $1,099,235.00 for the deletion of select method and test shafts, additional installation of low pressure grout under the tuff layer, and additional demobilizations and mobilizations at the Aloha Stadium Lot.

**Fiscal Impact**

This Contract Change Order will restore a total of $1,099,235.00 to the KHG allocated contract contingency.
KHG Shaft Operations and Construction Changes
February 16, 2017
Summary

A bilateral Contract Change Order (CCO) for a credit to HART in the amount of ($1,099,235) for:

1. RFCC 00028, Elimination of Method and Test Shafts: ($1,640,000) credit
2. RFCC 00051, Voids Under Tuff layer: $217,000
3. RFCC 00061, Drill Spread Additional Mobilization at Aloha Stadium: $195,000
4. RFCC 00067, Aloha Stadium Demobilization: $128,765
RFCC 28- Elimination of Method and Test Shafts

- KHG drilled shaft construction methods were the same as on WOFH
- Reduced the impact to the traveling public
- The project would realize a schedule benefit from removing the requirement for Method Shaft construction
- Final negotiated credit of $1,640,000
  - Original KIWC Cost Proposal value of $939,923 (credit)
  - Original HART Estimate value of $1,784,000 (credit)
RFCC 51- Voids Under Tuff Layer

• While performing geotechnical borings, the Design-Builder encountered unanticipated voids within the area under the tuff that qualified as a Differing Site Condition (DSC)

• The DSC resulted in a need to install low pressure grout under the tuff layer to fill the voids and stabilize the soil below the shafts.

• This affected 14 shafts within the KHG alignment

• Final negotiated cost of $217,000
  • Original KIWC Cost Proposal value of $260,849
  • Original HART Estimate value of $280,624
RFCC 61- Additional Mobilization at Aloha Stadium

• During design development, the Design-Builder discovered an unknown, abandoned Navy septic tank at the location of Shaft 422R

• The septic tank required environmental remediation and backfilling with grout

• The remediation caused a schedule delay resulting in an additional demobilization and remobilization of the drilling equipment

• Final negotiated cost of $195,000
  • Original KIWC Cost Proposal value of $211,190
  • Original HART Estimate value of $200,145
RFCC 67- Aloha Stadium Demobilization

• In March 2012, the Design-Builder was granted access to the Aloha Stadium lot and began installing features such as BMPs, perimeter fence and a security system.

• Because HART failed to obtain a long term agreement with the Aloha Stadium Authority prior to granting access, it became necessary for KIWC to vacate this property no later than August 31, 2012.

• Final negotiated cost of $128,765
  • Original KIWC Cost Proposal value of $182,706
  • Original HART Estimate value of $153,275
## Cost Impact of KHG Change Order 45

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Requested Action

• Approve Change Order 45 for a credit of $1,099,235 to finalize a bilateral agreement of KHG shaft related changes.
Mahalo!