



## Board Report

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### CONSTRUCTION COMMITTEE MAY 17, 2018

**SUBJECT: OFFICE OF THE INSPECTOR GENERAL CHANGE  
ORDER/MODIFICATION CONSTRUCTION SPOT  
CHECKS**

**ACTION: RECEIVE AND FILE**

#### **RECOMMENDATION**

RECEIVE AND FILE this Office of the Inspector General report on Change Order/Modification Construction Spot Checks for the period ending February 28, 2018.

#### **ISSUE**

On January 25, 2018, the Metro Board directed Office of Inspector General (“OIG”) to conduct random spot checks on the projects listed in the quarterly program management report to ensure that the delegation of authority to approve construction change orders policy is performing in the manner desired by the Board of Directors.

#### **BACKGROUND**

##### **I. SUMMARY**

The OIG made four Spot Checks of approved Change Orders/Modifications exceeding \$1 million each from four major transit construction projects: Crenshaw/LAX, Regional Connector, Westside Purple Line Extension Section 1, and Westside Purple Line Extension Section 2. We found that these Changes Orders were approved/executed on average 31.5 workdays (14, 35, 37, and 40 days) faster than the former Board approval process would have taken. In addition, the negotiated cost for each Change Order appears reasonable:

- First Spot Check - approved negotiated amount was \$4,925 or 0.38% over Metro’s independent cost estimate (ICE),
- Second Spot Check - approved negotiated amount was the same as the ICE,
- Third Spot Check - approved negotiated amount was \$222,174 or 9.2% under the ICE, and
- Fourth Spot Check - issued a unilateral change that notified the Contractor to commence work while cost is being negotiated.

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For the Change Orders/Modifications the OIG reviewed, some of the Spot Checks have shown that the delegation of authority has, in certain cases, resulted in:

- Minimizing/reducing delay costs,
- a negotiated amount that was reasonable for the work to be done; and
- Minimizing construction delays.

This report also describes the new OIG program developed for the Construction Change Order Spot Checks and documents lessons learned that might be used to avoid future Change Orders.

## II. OIG Program Description

The Program Management Department's quarterly report identifies pending and approved construction project related change orders and modifications (collectively "Change Order(s)") greater than \$500,000. The OIG has designed a spot check program ("Spot Checks") which primarily focuses on approved change orders and modifications that exceed \$1 million. This program is accomplished by:

- a. Reviewing a sample of Change Orders for a specified period identified in the Program Management Department's Program Management Information System (PMIS), and Metro and Contractor documentation supporting execution of the change order;
- b. Reviewing the Program Management Department's Monthly Project Status Report (PSR);
- c. Interviewing Project Managers, Program Controllers, and Procurement Officers with knowledge of the selected Change Order; and
- d. Reviewing the Project Budget and Specifications or related documentation

For the selected Change Orders, the OIG Spot Checks focus on:

- i. Scope of Work - matters such as:
  - a. Is the Change Order warranted?
  - b. Is it within the specifications?
  - c. Who is responsible for the cost of the change?
  - d. Are there any lessons learned?
  - e. Could the Change Order have been avoided?
  - f. Does the Change Order enhance safety?
  - g. Does the Change Order comply with applicable standards, rules, and regulations?
- ii. Budget - matters such as:
  - a. Is the dollar amount of the Change Order within the Life of Project Budget?
  - b. Is the negotiated amount near Metro's independent cost estimate (ICE)?
- iii. Time to Execute Change Order - matters such as:
  - a. How many days did it take to execute the Change Order using the "new delegation" process? versus
  - b. How many days would it have taken to execute the Change Order using the former

method of the Board approving the Change Order? This Change Order processing time is predicated upon the Board report submission deadline to the Vendor/Contract Management department.

The OIG will periodically report to the Board on Spot Checks performed.

## **DISCUSSION**

### **III. Spot Checks Performed in this Quarter**

#### **A. Spot Check#1 - Crenshaw/LAX Transit Project**

This OIG Spot Check report concerns the Crenshaw/LAX Transit Project (Contract C0988), Modification (MOD-00345). It was selected from the April Program Management Major Project Status Report (Board Item 32), covering December 2017, January 2018, and February 2018, of approved Change Orders greater than \$1 million dollars.

#### **Sources Reviewed**

The information for this Spot Check was collected from the Program Management Department's PMIS. Also, in-person and telephonic interviews were conducted with Crenshaw Program Management, Project Control, and Procurement staff.

**Facts**

<u>Description of Modification C0988-MOD-00345:</u> Oil Water Separator at Underground (UG) Stations – The sump pump discharge from the UG Stations required treatment to meet discharge limits of the City of Los Angeles Department of Public Works Bureau of Sanitation Industrial Waste Management Division.	
<u>Change Order Dates:</u>	
i. Change Order Initiated	December 11, 2017
ii. Modification Executed	February 8, 2018
<u>Elapsed Time for Executing Change Order:</u>	
iii. Using new delegated process	42 work days
iv. Estimate using former Board approval process	56 work days
<u>Cost of Change Order:</u>	
v. Metro independent cost estimate (ICE)	\$1,295,000
vi. Contractor’s proposed cost	\$1,678,678
vii. Negotiated amount	\$1,299,925
viii. Negotiated amount over/(under) ICE	\$4,925
ix. Percentage of negotiated amount over ICE	0.38%

**Conclusion**

Scope of Work - In the original scope of work, the three Oil Water Separators (OWS) were to be located in the escalator pits for three underground stations (Expo, MLK, and Vernon). During the review period, the Public Works Bureau of Sanitation Industrial Waste, City of Los Angeles, requested LA Metro to provide calculations for the capacity of the OWS. The design criteria of the OWS to handle the combined load for the underground station track drain, elevators, and escalators was not clearly stated in LA Metro’s original design requirements. When this matter was discovered, the concrete foundation for the three stations had already been poured; therefore, the contractor was unable to install a pit for the OWS as required by the City. The agreed upon solution was to install the OWS “at grade” and have the oil and water mixture pumped up to the OWS.

Budget - The cost associated with this change order consists of: (1) designing and constructing an OWS for each of the three underground stations, (2) sizing an OWS large enough to hold the amount of water entering the station from a 1 hour rain event with 2 inch/hour rain intensity, and (3) designing calculations for drainage OWS outfall and the sewer outfall. The Contractor’s proposed cost for this change was \$1,678,678. The Procurement team negotiated a reduction from the contractor’s proposal to \$1,299,925, a reduction of \$378,753. The final total cost of \$1,299,995 for all three underground stations is \$4,925, or 0.38%, higher than Metro’s ICE amount of \$1,295,000.

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Schedule - The new delegation process allowed this change order to be initiated, processed, approved, and executed in a total elapsed time of 42 work days. The previous Board approval process would have required at least 56 work days. Using the former process, the earliest that this Change Order, submitted on December 11, 2017, could have been approved by the Board was the meeting on March 1, 2018 (February Board cycle). Thus, the new delegation process was 14 days quicker than the former process.

### **Recommendation**

The Metro rail design criteria (MRDC) was updated on October 31, 2017, to reflect the addition of the elevator, escalator pit drain and underground station track drains to be processed through a clarifier to remove oil, grease, and sand. Metro management should:

1. Update the “Lessons Learned” files regarding the OWS change to the MRDC and communicate the lesson to other Project Managers working major transit construction projects (This is consistent with recommendation 51 and 89p in the OIG’s Construction Management Best Practices Study.).
2. Investigate this change to determine:
  - a. If the scope of work of other major transit construction projects require this design update for the OWS.
  - b. If the Regional Connector and the Westside Purple Line Extension sections 1, 2, and 3 should be amended for the same OWS omission to reduce additional change orders and costs.
  - c. When should have the City been provided this information and reviewed construction plans prior to the cement being poured to avoid redesign costs.

### **B. Spot Check#2 - Regional Connector Transit Project**

This Spot Check report concerns the Regional Connector Transit Corridor Project (Contract C0980). Change Notice (CN-00166) was selected from the April Program Management Major Project Status Report (Board Item 32), covering December 2017, January 2018, and February 2018, of Change Orders greater than \$1 million. This Change Order has now been approved and is identified as Modification (C0980-MOD-00111).

### **Sources Reviewed**

The information for this Spot Check was collected from the PMIS program. Also, in-person and telephonic interviews were conducted with Regional Connector Program Management, Project Control, and Procurement staff.

**Facts**

<b>Description of Modification C0980-MOD-00111:</b> Left Tunnel Boring Machine Differing Site Conditions: Resolution of all impacts due to Differing Site Conditions experienced during mining of the Left Tunnel.	
<b>Change Order Dates:</b>	
<b>i.</b> Metro initiated Change Order	February 23, 2018
<b>ii.</b> Modification Executed	March 30, 2018
<b>Elapsed Time for Executing Change Order:</b>	
<b>iii.</b> Using new delegated process	29 work days
<b>iv.</b> Estimate using former Board approval process	64 work days
<b>Cost of Change Order:</b>	
<b>v.</b> Metro independent cost estimate (ICE)	\$7,062,237
<b>vi.</b> Contractor's proposed cost	\$7,603,491
<b>vii.</b> Negotiated amount	\$7,062,237
<b>viii.</b> Negotiated amount over/(under) ICE	\$0
<b>ix.</b> Percentage of negotiated amount over ICE	0%

**Conclusion**

Scope of Work - During mining of the left tunnel, the Tunnel Boring Machine (TBM) struck an unforeseen steel object (I-beam) buried in its path. This encounter damaged the TBM, which required repairs after new parts (3 large screws and 17 other components) were procured. The scope of this modification includes: (1) engineering analysis of the broken screw, (2) repairs to the TBM, (3) a 32 calendar-day time extension for excusable/compensable delay (at \$99,779 per calendar day), (4) mining delays and inefficiencies, (5) TBM - 24-hour acceleration, and (6) Flower Street surface heave repairs. As mentioned above, the construction schedule was extended by 32 calendar days.

Budget - The cost associated with this Modification include excusable and compensable delays and repairs. The Procurement team negotiated a \$541,254 reduction from the contractor's proposal of \$7,603,491. The final total cost for the Modification is \$7,062,237, which is the same amount as in Metro's ICE.

Schedule - The new delegation process allowed this Modification to be initiated, processed, approved, and executed in a total elapsed time of 29 work days. Under the previous Board approval process, the earliest that this Modification could have been completed was 64 work days, since the Metro Board could not have approved the Modification until the May 24, 2018 Board Meeting (February 23, 2018 was the Metro initiated Change Order date. The field Vendor\Contract

Management staff deadline date for receipt of the change order request, was one (1) working day later on February 26, 2018. Staff said they would not be able to perform their work and process the necessary paperwork that quickly, which would force the Change Order to the next Board meeting in May.). Thus, the new delegation process was 35 work days faster than the former process.

**Recommendation**

None

**C. Spot Check#3 - Westside Purple Line Extensions - Section 1 Transit Project**

The purpose of this report is to perform a Spot Check on the Westside Purple Line Extension - Section 1 Transit Project (Contract C1078). The Change Notice (CN-11) was selected from the April Program Management Major Project Status Report (Board Item 32), covering December 2017, January 2018, and February 2018, of Change Orders greater than \$1 million. This Change Order has been approved and is a Modification (C1078-MOD-00011).

**Sources Reviewed**

The information for this Spot Check was collected from the PMIS program. Also, in-person and telephonic interviews were conducted with Westside Purple Line - Section 1 Program Management, Project Control, and Procurement staff.

**Facts**

<b>Description of Modification C1078-MOD-00011:</b> Schedule Impacts from Arcadis Work (includes Chalmers Impacts): Change to accommodate construction schedule extension due to site impacts.	
<b>Change Order Dates:</b>	
i. Metro initiated Change Order	February 9, 2018
ii. Modification Executed	March 6, 2018
<b>Elapsed Time for Executing Change Order:</b>	
iii. Using new delegated process	18 work days
iv. Estimate using former Board approval process	55 work days
<b>Cost of Change Order:</b>	
v. Metro independent cost estimate (ICE)	\$2,409,650
vi. Contractor's proposed cost	\$2,408,228
vii. Negotiated amount	\$2,187,476
viii. Negotiated amount over/(under) ICE	(\$222,174)
ix. Percentage of negotiated amount under ICE	(9.2%)

## **Conclusion**

Scope of Work - During the hazardous material investigation by Metro's environmental remediation contractor, multiple underground storage tanks and buried reinforced concrete slabs were discovered. The abatement remediation contractor had to remove these items and excavate all contaminated soil. The hazmat abatement plan caused a schedule extension of an additional 253 unplanned days, which affected the Design-Builder's critical path schedule. Modification of the Scope of Work includes: compensation to the Design-Builder for all costs and schedule impacts for 253 calendar days at (\$8,646 per calendar day). The contract was extended a total of 253 days.

Budget - The cost associated with this Modification resulted in contractor compensation and time extension that were found excusable and compensable. Metro's ICE for this Modification was \$2,409,650, and the Contractor's proposal was \$2,408,228. The Procurement team negotiated a \$220,752 reduction from the contractor's proposal. The final cost for this Modification is \$2,187,476 or 9.2%, less than Metro's ICE amount of \$2,409,650.

Schedule - The new Delegation process allowed this Change Order to be initiated, processed, approved, and executed in a total elapsed time of 18 work days. The previous Board approval process would have required at least 55 work days. Using the prior process, the earliest that this Change Order, submitted on February 9, 2018, could have been approved by the Board was April 26, 2018. Thus, the new process was 37 work days faster than the former process.

## **Recommendation**

All Environmental Site Assessments were performed prior to excavation. No record of underground tanks or buried reinforced concrete slabs were found by the Department of Conservation and Division of Oil, Gas, and Geothermal Resources (DOGGR). However, based on lessons learned from this site, Metro management should:

1. Conduct Ultrasonic Soil Examinations at future questionable sites to attempt to avoid unidentified hazards. This is consistent with recommendations (88b, 88c, and 88d) in the OIG's report on Capital Project Construction Management Best Practices Study (February 29, 2016).
2. Perform research to determine who could have installed the tanks and buried reinforced concrete slabs, and provide this information to the LA Metro Legal department for consideration of possible legal action to recover the cost of remediation under the Comprehensive Environmental Response, Compensations and Liability Act of 1980 (CERCLA).
3. Perform an assessment of the schedule to determine if any recovery of time is possible.



**D. Spot Check#4 - Westside Purple Line Extension - Section 2 Transit Project**

The purpose of this Spot Check report concerns the Westside Purple Line Extension - Section 2 Transit Project. The Change Order (CO-00002) was selected from the April Program Management Major Project Status Report (Board Item 32), covering December 2017, January 2018, and February 2018, of Change Orders greater than \$1 million.

**Sources Reviewed**

The information for this Spot Check was collected from the PMIS program. Also, in-person and telephonic interviews were conducted with Westside Purple Line Extension - Section 2 Program Management, Project Control, and Procurement staff.

**Facts**

<u>Description of Modification CO-00002: Worksite Traffic Control for SCG &amp; AT&amp;T Advanced Utility Relocations (AUR): Southern California Gas (SCG) and AT&amp;T are scheduled to perform AUR at the same time within close proximity of each other. The project master schedule assumes each utility would provide their own traffic control. However, the overlap in traffic control area can cause conflicts, and both utilities are concerned that one utility's traffic control efforts may interfere with the other's work. To mitigate this and expedite the work, both utilities have agreed to allow the C1120 Contractor (TPOG) to provide the overall traffic control. WSP has designed the traffic control plans and obtained City of Beverly Hills approval, and TPOG will implement the traffic control plans per WSP's design. Metro issued this unilateral change to formally direct the contractor to commence work and invoice for work performed while both parties continue evaluating the Scope of Work and continue negotiations. Once the Scope of Work and pricing is agreed upon, Metro intends to issue a contract modification.</u>	
<u>Change Order Dates:</u>	
i. Metro initiated Change Notice	December 6, 2017
ii. Change Order Executed	January 24, 2018
<u>Elapsed Time for Executing Change Order:</u>	
iii. Using new delegated process	34 work days
iv. Estimate using former Board approval process	74 work days
<u>Cost of Change Order:</u>	
v. Metro independent cost estimate (ICE)	-
vi. Contractor's proposed cost	\$3,931,001
vii. Unilateral Change Award amount	\$2,242,400
viii. Negotiated amount over/(under) ICE	TBD
ix. Percentage of negotiated amount under ICE	TBD

## **Conclusion**

Scope of Work - The Master Schedule assumes each utility would provide their own traffic control plans. Southern California Gas (SCG) and AT&T are scheduled to perform Advanced Utility Relocation (AUR) at the same time within close proximity of each other. To mitigate potential work and schedule conflicts, both utilities have agreed to allow the Design Build Contractor to perform the overall traffic control.

Budget - This Change Order is a unilateral contract change by Metro. The Change Order allows the Contractor to commence work and invoice for work performed while a final modification is negotiated. Only a portion of the ICE has been issued to the contractor; negotiations have not been established at the time this report was written.

Schedule - The new Delegation of Authority process allowed this unilateral change to be initiated, processed, approved, and executed in an elapsed time of 34 work days. Under the previous Board approval process, the earliest that this could have been completed was 74 work days, since the Metro Board could not have approved the change until the March 22, 2018 Board Meeting. Thus, the new delegation process was 40 work days faster than the former process.

## **Recommendation**

Metro management should:

1. Establish a single party to serve as a “clearinghouse” for all utilities relocations during construction. The “clearinghouse” could be assumed by the Metro group, Third Party Administration. (This is consistent with recommendations 80, 88, 89, 89j, 89n, and 89v in the OIG’s report on Capital Project Construction Management Best Practices Study.)
2. Utilize the “clearinghouse” process to improve the Advance Utility Relocations. (Consistent with recommendations 79, 83, 87, 89b, 89c, 89d, 89g, 89h, 89s, and 89t in the Best Practices Study.)
3. Create “Lessons Learned” for the establishment of a single clearinghouse in the initial scope of work for the Design Build Contractor to avoid future costly change orders. (This is consistent with recommendation 89p in the Best Practices Study.)

## **NEXT STEPS**

The Office of Inspector General will continue reporting to the Board the results of Construction Change Order Spot Checks selected from the Program Management Major Project Status Quarterly Report. The next OIG Construction Spot Check report will be in July.

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# Office Of Inspector General Construction Change Order Spot Check Report

Presented By

**Karen Gorman**  
Inspector General

# Construction Spot Check Program

The Metro Board directed the OIG to perform spot checks on change orders

## **OIG Program Description**

The OIG Spot Check program focuses on approved change orders that exceed \$1 million. It includes:

- Review sampling of change orders
- Review of Program Management's Project Status Report
- Interview Project Managers, Program Controllers, and Procurement Officers
- Review project budget, specifications, any related documentation

## **OIG Spot Checks focus on:**

- Scope of Work
- Budget
- Schedule impacts
- Making recommendations

# Construction Spot Check Items

## Summary of spot checks from April 2018 Program Management report

Four OIG spot checks of change orders / 4 major construction projects show:

- Negotiated amounts appear reasonable
- Some change orders processed have positive schedule impacts,
- Where there are positive schedule impacts, delay costs are saved, and
- Staff time is saved

PROJECT	NEW Delegated Process (workdays)	Former Board Approval Process (workdays)	Time Saved (workdays)
CRENSHAW/LAX	42	56	14
REGIONAL CONNECTOR	29	64	35
WESTSIDE PURPLE LINE SECT 1	18	55	37
WESTSIDE PURPLE LINE SECT 2	34	74	40

Some OIG recommendations made might avoid future change orders.

EXAMPLE

# Crenshaw/LAX Transit Project

## Change Activity

APPROVED MODIFICATIONS/CHANGES GREATER THAN \$500K IN THIS REPORTING PERIOD (December 1, 2017 - February 28, 2018)				
MOD/CHANGE #	DESCRIPTION	Submission Date	Approval Date	Amount
<b>DESIGN BUILD CONTRACT C0988</b>				
MOD-00345	Oil Water Separator at UG Stations: The sump pump discharge from the Underground Stations requires treatment to meet the City of Los Angeles Department of Public Works Bureau of Sanitation Industrial Waste Management Division discharge limits.	1/12/2018	2/8/2018	\$1,299,995
CO-00153.1	Radio System - Additional Head-end Equipment: Relocate the Uplink above ground antennas from their original proposed location at the TFS#8 site to their new location above ground at the CLAX Exposition Station. Provide all of the necessary detailed design, material, equipment, and labor for a complete installation.	2/5/2018	2/16/2018	\$862,138
CO-00176.1	Underground Station Emergency Vent: This change order is issued to clarify to WSCC and its subcontractors exactly which elements of the three (3) underground stations' emergency ventilation fan and damper work Metro believes to be impacted by the UL 2196 delisting and includes authorization to begin procurement of materials and immediate construction thereof.	2/2/2018	2/15/2018	\$800,000