Ben Rosenfield
Controller

Monique Zmuda
Deputy Controller

M E M O R A N D U M

TO: Citizens' General Obligation Bond Oversight Committee

FROM: Claire Phillips, Performance Analyst, City Services Auditor
Christina Lee, Performance Analyst, City Services Auditor

DATE: October 28, 2013

SUBJECT: 2010 Earthquake Safety and Emergency Response Bond Program Management Review

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In fiscal year 2012-2013, the Citizens' General Obligation Bond Oversight Committee (CGOBOC) requested that the Controller's Office's City Services Auditor City Performance Unit conduct a high level management review of the 2010 Earthquake Safety and Emergency Response (ESER) Bond Program. The ESER bond is the result of a citywide assessment of emergency response capital needs. The overall goal of this bond is to fund repairs and improvements that will better allow the City to respond to an earthquake or disaster and to address seismically unsafe facilities.

The ESER Bond project consists of three main components for repairs and improvements:

1. Auxiliary Water Supply System (AWSS): AWSS projects consist of two tanks, one reservoir, two pump stations, nine pipe/tunnel projects, and approximately six cistern contracts that cover an estimated 30 cisterns.
2. Neighborhood Fire Stations (NFS): NFS improvements include seismic, comprehensive, and focused-scope work, such as emergency generator work, roof and shower replacement, repainting, and window and mechanical refurbishment at 23 fire stations.
3. Public Safety Building (PSB): The PSB project includes the construction of the new public safety building, relocation of the Southern District Police Station, creation of the new Mission Bay Fire Station and rehabilitation of historic Fire Station #30.

Component	Start Date	Completion Date	Budget	# of Projects
AWSS	April 2011	September 2017	$104.2 million	20
NFS	January 2011	October 2015	$73.2 million	23 stations
PSB	January 2009	August 2014	$239 million	1

This memo includes a status update on the three ESER Bond components and provides findings and recommendations for improving project implementation related to project management, staffing and coordination.

Methodology

This review includes a quantitative analysis of performance data and qualitative interviews conducted to learn of bond program management and implementation successes and challenges. We collected performance data as of April 30, 2013 and held interviews between July 17 and August 15. We interviewed eight individuals at the Department of Public Works (DPW), San Francisco Public Utilities Commission (SFPUC), San Francisco Fire Department (SFFD), and San Francisco Police Department (SFPD). Interviewees included the bond program manager, project managers, and financial officers.

To assess the performance of this bond program, the Controller's Office collected project schedule and budget data, as of April 30, 2013, from DPW and SFPUC project managers. The Controller's Office analyzed the data to determine if the projects were on schedule based on time and duration calculations, and within budget based on actual and approved budget calculations. Schedule was divided into two measures, duration and completion. The duration measure assessed the extent to which the project was completed within the amount of time that was approved in the original project schedule. Completion assessed the extent to which the project was completed on or near its approved completion date. The budget measure assessed the extent to which the project was completed within its approved budget. For this analysis, in-progress projects are assessed based on current and forecasted performance calculated using projected duration, completion, and budget data.

Performance scores are reported as follows:

- Green: Project has met or exceeded performance expectations
- Yellow: Project has not met performance expectations by greater than zero and less than ten percent
- Red: Project has not met performance expectations by greater than ten percent

For detailed descriptions of performance measure calculations, please refer to Appendix A.

Findings

1. Auxiliary Water Supply System

The Auxiliary Water Supply System (AWSS) improvements comprise two tanks, one reservoir, two pump stations, and nine pipe/tunnel projects, as well as approximately six cistern contracts covering an estimated 30 cisterns. Currently, there is a list of 37 potential candidate cistern sites for development. The actual number of cisterns that will be constructed will largely depend on actual and projected site costs and market conditions when the projects are bid. The first two contracts (11 cisterns total) have completed bidding; the third contract (5 cisterns) is bidding in October 2013; and the remaining contracts are expected to go to bid in 2014 and 2015. The total budget for all of the AWSS projects is $104.2 million.

The Mayor and the Board of Supervisors approved the AWSS ownership transfer from the Fire Department to the SFPUC in May 2010, after the pre-bond planning process was completed. This transfer created a challenge for the SFPUC with regard to project scope, schedule, and budget for the pump station projects, as described in the *Budget* and *Schedule* sections below.

Budget: The SFPUC had not submitted a budget revision as of April 30, 2013.

The SFPUC identified a scope change with Pump Station #1 that involves new engines, which was not identified as a need during the pre-bond planning process. The SFPUC anticipates covering the costs of the new engines with funds from Pump Station #2, and plans to backfill Pump Station #2 with funding from a future bond sale or by reassigning cisterns or pipe/tunnel funds. The funding approach will be decided after the June 2014 election to first determine if an ESER 2 bond measure that is being proposed for that ballot passes.

Schedule: Baseline schedules were not finalized by the April 30, 2013 date for which we collected the project performance data. Therefore, the schedule dates in the performance data are estimates. The AWSS projects are tracking closely within these estimated schedules. Baseline schedules are being revised to reflect current forecast dates. SFPUC will revise the project schedule for Pump Station #1 to accommodate the scope change and budget challenge described above. Refer to Appendix B for comprehensive performance data by project.

Project Implementation: The SFPUC contracted with AECOM/AGS JV for the planning study. The SFPUC Engineering Management Bureau performs most of the design work. Geotechnical services will be provided by either DPW or consultants. Construction will be performed by licensed contractors hired through SFPUC's public bidding process. Additional design work is performed by DPW, SFMTA, and other city departments.

The AWSS Management Oversight Committee oversees the overall project and the Steering Committee advises the Management Oversight Committee on project prioritization options and project administration issues. During committee meetings, the Management Oversight Committee makes final decisions regarding project prioritization, scopes, schedules, and budgets.

Systems: The SFPUC project staff primarily use Oracle Primavera 6 (P6), and Microsoft Excel and Access, to track AWSS project information including scope, schedule, and budget data. The procedures for accessing project information within the SFPUC are sufficient; however, the process is being streamlined for greater efficiency. The SFPUC Project Controls Group is currently in the process of further integrating project information into P6 to create a central repository for project data that can be more easily accessed by SFPUC project and budget managers. The integration is scheduled to be completed in the fall of 2013. Once the system is active, the intention is to have the Project Controls Group regularly release more comprehensive financial, budget, labor, and schedule reports to SFPUC project and budget managers.

Coordination: The SFPUC and DPW project managers meet weekly to discuss project status. The SFPUC coordinates with the SFMTA on traffic control plans and the Planning Department to clear specific checkpoints before construction can begin on the AWSS projects.

There are no formal, written MOUs between the SFPUC and other city departments; however, departments, such as DPW, provide the SFPUC with signed project specific written scopes of work with detailed tasks and budgets prior to budget reallocations for the associated work. The SFPUC expressed challenges with regard to getting labor details from some City agencies that provide only expenditure summaries. The SFPUC should continue working closely with the SFMTA and other city departments to ensure that departments provide detailed labor data for accountability purposes.

Project Staffing: Current staffing is sufficient and there are no vacancies. If the second ESER Bond passes in June 2014, the SFPUC expects to review administrative staffing levels to maintain proper execution of the bond program.

2. Neighborhood Fire Stations

The Neighborhood Fire Station (NFS) component comprises improvements to 23 of the 46 City fire stations. Project improvements include seismic, comprehensive, and focused-scope work, such as emergency generator work, roof and shower replacement, repainting, and window and mechanical refurbishment. The total budget for the NFS work is $73.2 million. The Department of Public Works is managing the implementation of these improvements for the San Francisco Fire Department (SFFD).

Budget: DPW has not submitted a budget revision as of April 30, 2013.

Schedule: Performance data for this management review was collected as of April 30, 2013; however, DPW did not finalize NFS project schedules until June 2013. Therefore, the performance analysis below does not include baseline schedules and is based on DPW's April 2013 schedule estimates. The client department, SFFD, approves changes to project scopes, schedules, and budgets.

We reviewed 49 NFS projects for this memo, listed in Appendix B. As of April 30, 2013, 9 projects reviewed were complete, of which 6 had been completed on-time. Of the 40 in-progress projects, 32 are projected to be completed on-time. Three projects (one completed and two in-progress) experienced significant delays due to contractor performance issues and/or design changes. Refer to Appendix B for comprehensive performance data by project.

Project Implementation: DPW contracts with Jacobs/Saylor Joint Venture for construction management and support services (CMSS) including budget and cost estimating, document control systems, constructability reviews, and schedule support. DPW utilizes multiple service delivery methods including traditional design-bid-build, work by internal DPW Bureau of Building Repair, micro local business enterprise set-aside contracts, and the job order contract (JOC) process.

JOC is a process through which departments may accomplish a series of projects with a single, competitively bid contract awarded before the projects are identified. The JOC establishes a pool of contractors with technical qualifications to complete a range of tasks. The JOC process is often used for smaller projects and is designed to ensure that the City awards the contract to a contractor who can perform all the work required, including any specialized tasks, at the lowest cost. DPW project managers expressed concern about the pre-qualification process not being rigorous enough to result in a large pool of high quality contractors.

Systems: Jacobs/Saylor uses Oracle Primavera 6 (P6) to monitor project scopes, schedules and budgets. DPW uses Microsoft Enterprise Project Management (EPM) for project reporting and document storage, and DPW Stat to report on schedule and budget metrics.

Coordination: DPW has an MOU with the SFFD that defines each department's roles and responsibilities. The Department of Public Works meets with the SFFD twice each week to review project prioritization, project status, scopes, schedules, and budgets. SFFD has identified one staff to serve as the project liaison with whom DPW coordinates regularly on all aspects of project implementation.

Project Staffing: The Department of Public Works and the SFFD have sufficient project staffing to implement the NFS component of the bond program. The NFS component is staffed with two DPW project managers, one project manager assistant, one budget analyst and one intern. The SFFD has one Captain and one Lieutenant dedicated to the ESER bond program work. There are no current vacancies.

3. Public Safety Building

The Public Safety Building (PSB) will replace one functional use of the Hall of Justice by providing a new venue for the San Francisco Police Department (SFPD) Headquarters. The project will relocate the Southern District Police Station and create a new Mission Bay Fire Station at this location. This project component also includes the rehabilitation of historic Fire Station #30, which will serve as a multi-purpose facility for the SFFD and the community. The projected total budget for the PSB is $239 million.

Budget: DPW has not revised the PSB project budget as of April 30, 2013.

Schedule: The Public Safety Building is tracking within the project schedule, despite a 66 working day delay. The building is scheduled for final completion in August 2014 with a target move-in date in November 2014.

The PSB 66 day delay is due to the following factors:

1. The Department of Building Inspection (DBI) permit review process was delayed five working days, so construction could not legally begin. DPW was not aware of DBI's workload when they were initiating the permitting process; therefore, DPW was unable to accurately build the review process into the project schedule.
2. DPW's and the utility companies' (AT&T and PG&E) schedules did not converge, which presented challenges with coordinating the utility work causing an unexpected 36 working day delay at the beginning of the project.
3. In order to capitalize on favorable market conditions, DPW undertook an aggressive bid schedule for structural steel purchases. As a trade-off, DPW's design work was not finalized when the project went to bid and there were subsequent design changes that caused schedule delays.

DPW and consultant, Vanir/CM Pros employed two main methods to make up for this delay without significantly extending the project schedule:

1. Re-sequencing Project Tasks: DPW staff and Vanir/ CM Pros worked closely with their Construction Manager/General Contractor to identify opportunities for re-sequencing project tasks and remaining close to the original schedule.
2. Integrated Project Delivery (IPD): IPD allows the design and construction phases to overlap, rather than completing the entire design phase prior to beginning construction. Construction segments scheduled early in the project sequence are designed first so that construction may begin prior to designing subsequent segments. This allows construction to start earlier, which mitigates the project delay.

For comprehensive performance data, please refer to Appendix B.

Project Implementation: DPW is satisfied with the contractor Charles Pankow Builders that serves as the Construction Manager/General Contractor (CM/GC).

Systems: DPW staff use the Microsoft Enterprise Project Management (EPM) system primarily for project reporting, but this system is limited as a project management tool. For project management, DPW project staff use Microsoft Excel and Project to track project schedules and budgets.

Coordination: DPW has an MOU with the SFPD that defines each department's roles and responsibilities. The DPW project managers communicate with the SFPD on a daily basis. They have formal weekly standing meetings to discuss project status and any project issues. The SFPD liaison also participates in the weekly construction owner contractor meetings to stay current on project information.

Project Staffing: Project staff includes two project managers, a senior on-site construction manager, two full time on-site resident engineers, and one financial analyst. Staffing is lean, but sufficient. There are no vacancies; however, DPW is in the process of hiring a student intern to be at the PSB construction site, in addition to the construction management staff.

Recommendations

1. For the AWSS component, the SFPUC and DPW should create a memorandum of understanding that describes each agency's roles and responsibilities regarding project needs, coordination, scope, and reporting requirements.
2. DPW should develop new strategies to attract and retain high quality contractors. DPW should consider the following options:
    a. Implement the design-build model for contracting and bidding, as appropriate. This model delivers projects in which the design and construction services are contracted to a single entity. Prior to any implementation efforts, this model should be vetted to identify and mitigate any potential risks, ensure the City has input into the design process, and address implementation concerns.
    b. Develop new strategies to generate and retain a larger pool of highly qualified JOC contractors. This strategy may include a strong marketing and outreach campaign, as well as implementing a more rigorous screening process.
3. To prevent potential project delays, DPW should work with the Department of Building Inspection to develop a process flow for the permitting process. This process flow should include information such as expected trade packages, plan check reviews, a permit and approval process flow chart, and a schedule of deliverables.
4. DPW should consider further developing the EPM system as a project management tool for all project managers to track project budgets and schedules, in addition to currently using it as a reporting tool.

Appendix A
Performance Measures Descriptions

Performance Measure 1: Duration

Description: Assesses the extent to which the project was completed within the amount of time (duration) that was projected in the original approved project schedule.
Calculation: The difference between the project's actual and approved duration is expressed as a percentage of its original approved duration:

$$x = \frac{\text{(Actual Duration)} - \text{(Approved Duration)}}{\text{(Approved Duration)}}$$

Performance Measure 2: Completion

Description: Assesses the extent to which the project was completed on or near its approved completion date.
Calculation: The difference between the project's actual and approved completion dates is expressed as a percentage of the project's approved duration:

$$x = \frac{\text{(Actual Completion Date)} - \text{(Approved Completion Date)}}{\text{(Approved Duration)}}$$

Performance Measure 3: Budget

Description: Assesses the extent to which the project was completed within its approved budget.
Calculation: Expressed as the percentage difference between the project's actual budget and its approved budget:

$$x = \frac{\text{(Actual Budget)} - \text{(Approved Budget)}}{\text{(Approved Budget)}}$$

Performance Measure Scoring:
Green: **x** is less than or equal to 0%
Yellow: **x** is greater than 0% or less than or equal to 10%
Red: **x** is greater than 10%

Definitions

Actual Duration*:* actual Completion Date – actual Start Date
Approved Duration*:* Original Approved Completion Date – Original Approved Start Date
Completion Date*:* date of substantial completion of the project, when it is ready and available to be used by the public even if project closeout has not been completed.
Original Approved Budget, Completion Date, and Start Date*:* As included in the projects' original approved planning documents.
Start Date*:* The start of the schematic design phase, when funds start to be expended on the project.

Appendix B
Project Performance Indicators

Performance data as of April 30, 2013; Duration, Completion, and Budget Scores for in-progress projects are based on schedule and budget projections.

Legend

Green: (met or exceeded performance expectations)
Yellow: (did not meet performance expectations by greater than zero to less than ten percent)
Red: (did not meet performance expectations by greater than ten percent)

Project	Dept. Owner	Current Phase	Duration	Completion	Budget
AWSS Core Facilities					
Jones Street Tank	SFPUC	Bid & Award			
Ashbury Heights Tank	SFPUC	Bid & Award			
Twin Peaks Reservoir	SFPUC	Bid & Award			
Pump Station #1	SFPUC	Design			
Pump Station #2	SFPUC	Design			
Cisterns					
Cisterns Contract #1	SFPUC	Not Applicable[i]			
Cisterns Contract #2	SFPUC	Design / Bid & Award			
Cisterns Contract #3	SFPUC	Not Applicable			
Cisterns Contract #4	SFPUC	Design			
Pipelines & Tunnels					
Pipes and Tunnels AWSS Modernization Study	SFPUC	Planning			
Pipe/Tunnel #1	SFPUC	Design			
Pipe/Tunnel #2	SFPUC	Not Applicable			
Pipe/Tunnel #3	SFPUC	Not Applicable			

Project	Dept. Owner	Current Phase	Duration	Completion	Budget
Neighborhood Fire Stations					
Focused Scope					
7431A Roofing (Stations #6, 38, 41, 42)[1]	DPW	Construction Complete			
7431A-1 Roofing (Station #28)	DPW	Complete			
7431A-3 Roofing (Stations #18,40,31 Western)	DPW	Closeout			
7431A-4 Roofing (Stations #15,17,26,32)	DPW	Complete			
7430A Roofing (Station 2 AZUL/JOC)[2]	DPW	Construction			
7431A-5 Roofing (Stations #10, 13 Western Roofing)	DPW	Construction			
7432A Showers Station #15[3]	DPW	Not Applicable			
7432A Showers Station #6	DPW	Pre-Construction			
7432A Showers (Station #32,40,10,18,17,13,2,31,26)	DPW	Not Applicable			
7434A-Windows (Station #6)	DPW	Complete			
7434A-Windows (Station #28)	DPW	Complete			
7434A-Windows (Station #38)	DPW	Complete			
7434A-Windows (Station #41)	DPW	Complete			
7434A-Windows (Station #42)	DPW	Complete			
7434A-Windows (Station #2)	DPW	Not Started			
7434A-Windows (Station #10)	DPW	Not Started			

[1] 7431A Roofing (Stations #6, 38, 41, 42) was originally scheduled for completion in December 2011; however, the actual completion was November of 2012. The contractor needed to correct non-conforming work and they were unable to close out the project in time.

[2] 7430A Roofing (Station 2 AZUL/JOC) was originally scheduled for completion in March 2013, but the completion date was revised to August 2013. The City rejected the Air Handling Unit installation; the contractor was asked to remove the installed unit, apply the special marine grade coating and re-install the unit as per contract documents.

[3] 7432A Showers Station #15 was originally scheduled for completion in July 2012; however, the completion date was revised to October 2013. The City and SFFD rejected the initial installation and requested that a corrective plan be implemented with new ½" shower panels instead of the ¼" panels originally designed.

Project	Dept. Owner	Current Phase	Duration	Completion	Budget
7434A-Windows (Station #13)	DPW	Not Applicable			
7434A-Windows (Station #15)	DPW	Not Applicable			
7434A-Windows (Station #17)	DPW	Not Applicable			
7434A-Windows (Station #26)	DPW	Not started			
7434A-Windows (Station #31)	DPW	Not started			
7434A-Windows (Station #32)	DPW	Not Applicable			
7434A-Windows (Station #40)	DPW	Not Applicable			
7435A Mechanical Repairs (Stations #6,17,38,42)	DPW	Construction			
7435A Mechanical Repairs (Stations #15, 40, 26, 31, 28, 2, 41, 18, 32, 10, 13)	DPW	Pending completion & approval by SFFD			
7436A-3 Exterior Paint (Stations #6 BBR)	DPW	Design Complete			
7436A-3 Exterior Paint (Stations #28 BBR)	DPW	Design Complete			
7436A Exterior Paint (Stations #38 BBR)	DPW	Complete			
7436A-1 Exterior Paint (Station #41 BBR)	DPW	Design Complete			
7436A-2 Exterior Paint (Station #42 Micro LBE)	DPW	Design Complete			
7436A-3 Exterior Paint (Stations #49 BBR)	DPW	Construction			
7436A-4 Exterior Paint (Stations #15,32,40)	DPW	Construction			
7436A-5 Exterior Paint (Station #10,17,18)	DPW	Not applicable			
7436A-6 Exterior Paint (Station #2,13,26,31)	DPW	Not applicable			
7437A-1 Emergency Generator (Station 6)	DPW	Construction			
7437A-3 Emergency Generator (Station 15)	DPW	Not applicable			
7437A-2 Emergency Generator (Station 17)	DPW	Not applicable			
7437A-3 Emergency Generator (Station 12&21)	DPW	Not applicable			
7437A-3 Emergency Generator Construction	DPW	Not Applicable			
7438A Station #44 - Construction	DPW	Design			

Project	Dept. Owner	Current Phase	Duration	Completion	Budget
Comprehensive					
7427A Fire Station No. 36 Construction	DPW	Bid & Award			
7427A Fire Station No. 36 Project Controls	DPW	Bid & Award			
Seismic					
7440A Fire Station No. 5 Construction	DPW	Concept			
7440A Fire Station No. 5 Project Controls	DPW	Concept			
7441A Fire Station No. 9 Utility Isolation	DPW	Not started			
7442A Fire Station No. 16 Construction	DPW	Design			
7424A Fire Boat/ Fire Station No. 35 Construction	DPW	Project on Hold Pending Warriors Development			
7424A Fire Boat/ Fire Station No. 35 Construction	DPW	Project on Hold Pending Warriors Development			
7425A Medical/Equipment Logistics Center	DPW	Not Started			
Public Safety Building					
Construction	DPW	Construction			

[i] Not Applicable: The data provided by project managers was not available at the time of data collection or was not applicable to that project.