



**CONSTRUCTION CONTRACTS:**  
Bureau of Environmental Services  
strengthened its contract management procedures

A REPORT FROM THE CITY AUDITOR  
February 2008



Office of the City Auditor  
Portland, Oregon





CITY OF  
**PORTLAND, OREGON**

OFFICE OF THE CITY AUDITOR  
Audit Services Division

**Gary Blackmer, City Auditor**  
Drummond Kahn, Director of Audit Services  
1221 S.W. 4th Avenue, Room 310  
Portland, Oregon 97204

(503) 823-4005 FAX (503) 823-4459  
[www.portlandonline.com/auditor/auditservices](http://www.portlandonline.com/auditor/auditservices)

February 12, 2008

TO: Tom Potter, Mayor  
Sam Adams, Commissioner  
Randy Leonard, Commissioner  
Dan Saltzman, Commissioner  
Erik Sten, Commissioner  
Dean Marriott, Director, Bureau of Environmental Services

SUBJECT: Audit – *Construction Contracts: Bureau of Environmental Services strengthened its contract management procedures* (Report #348B)

Attached is Report #348B containing the results of our audit of construction-related contracts managed by the Bureau of Environmental Services (BES). Commissioner Adams and managers within BES have reviewed report drafts, and we have included their joint written response at the back of this report.

This report is unusual in that our findings are favorable, and it contains no recommendations for improvement. As a result, there will be no need for BES to prepare a status report one year from now, as is customarily the case.

We congratulate BES for enacting strong contract management procedures. We again acknowledge the positive steps that were taken in response to the audit report we issued in 1998, which also concerned BES construction contracts.

We appreciate the cooperation and assistance we received from BES personnel as we conducted this audit.

  
GARY BLACKMER  
City Auditor

Audit Team: Drummond Kahn  
Doug Norman  
Beth Woodward

Attachment



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# CONSTRUCTION CONTRACTS:

## Bureau of Environmental Services strengthened its contract management procedures

**Summary** The Bureau of Environmental Services (BES) made significant improvements in its contract management procedures since our 1998 audit of BES construction-related contracts. For example, the Bureau established a new contract manager position, prepared a manual for managing consultant contracts, and, for several consecutive years, hired outside auditors to conduct independent audits of a sample of contracts.

During this audit we found a continuing effort by BES to strengthen its contract management practices. The Bureau prepared a manual on construction services procedures, added new software tools to assist project managers in their tracking of project status and costs, and improved project record-keeping. About half of the construction projects it manages close at the bid amount or less.

In addition, our review of a recent BES construction contract – “South Airport Phase II: Force Mains and Sanitary Sewers” – found that the Bureau’s contract management procedures are generally working well. We found excellent project records on construction inspections, meetings with the contractor, and updates on the status of construction work and costs. Construction was completed within the agreed-upon timeframe, and construction costs were less than the (unit price) contracted amount, despite contract changes that increased the contract amount by \$54,020.

We found, however, that although all construction work was completed by May 2005, final project close-out did not occur until more than two years later, due primarily to a lengthy resolution of the contractor’s claim for interest on two change orders. BES has, how-

ever, improved its change order form to prevent such interest claims in the future. In addition, BES reported that it also began developing an automatic reporting tool to improve procedural control on all contracts, even those with minimal financial risk.

Our review found that BES has taken positive steps to enhance its contract management procedures over the past several years. It has processes in place to identify and address problems as they arise, and to prevent the same problems from recurring. We believe that BES contract management procedures are generally adequate to ensure successful execution of construction-related contracts.

### **Background**

The Bureau of Environmental Services (BES) is responsible for providing sanitary sewer and stormwater management services to City residences and businesses, and to wholesale customers outside the City. The Bureau has experienced significant increases in capital expenditures in recent years due to the Combined Sewer Overflow project. The Bureau's capital improvement budget of \$155 million in FY 2007-08 represents 45 percent of the City's entire \$345 million capital improvement budget. BES expended more than \$160 million on capital improvements in each of the past four years.

Most capital projects are managed by staff within BES's Engineering Services Division. Each project is assigned an overall project manager, who is responsible for the design phase through solicitation of construction bids. When a construction contract is awarded, a construction manager is assigned to oversee the construction process, including contract administration and oversight of contractor work. The design manager continues to provide support during construction to ensure overall technical success of the project. Both individuals are responsible for cooperatively preparing a Final Project Report that documents what BES should learn from experience. These reports are part of the feedback to the BES planning group.

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**Objectives, Scope, and Methodology**

Our objective in conducting the current audit was to determine if BES contract management procedures were adequate to ensure successful contract execution in several areas, including project cost and timeliness, material and work quantities, payment of invoices, and administrative requirements such as insurance and bonding. To achieve this objective, we reviewed BES policies and procedures for managing construction contracts, and interviewed the Engineering Services manager, the Business Services manager, the Construction Services manager, and the assigned construction manager.

In addition, we obtained a list of contracts managed by BES and judgmentally selected one construction contract for detailed review – “South Airport Phase II: Force Mains and Sanitary Sewers.” The project appeared to be a typical sewer construction project in terms of size and nature of work.

We examined project documents, including construction bid documents, addenda, contract, contract changes, and selected meeting notes and invoices. We also reviewed portions of the design (PTE) contract associated with this project, including contract changes and other documents. We reviewed relevant legal and regulatory requirements, including City Code 5.68 on PTE contracts, Bureau of Purchases’ PTE and construction contracting manuals, City Code 5.34 on public improvements and construction services, and Oregon Revised Statutes Chapter 279 on public contracting.

We reviewed our 1998 audit of the BES construction and consultant contracts (Report #238) and actions taken by BES to address the audit report’s recommendations. We also reviewed best practices reported by the U.S. Government Accountability Office, the Project Management Institute, Associated General Contractors of America, and Carnegie Mellon University’s Project Management for Construction.

This audit was included in the City Auditor’s FY 2006-07 audit schedule. We conducted our work in accordance with generally accepted government auditing standards.

**Improvements in BES  
Contract Management  
Procedures**

BES made several improvements to its construction contract management process in response to our 1998 audit. For example, the Bureau:

- established a new contract manager position
- developed a procedures manual for consultant/PTE contracts, then later adopted the City's new PTE manual prepared by the Bureau of Purchases
- for several consecutive years, BES hired independent auditors to review two construction contracts

Our interviews with personnel and review of contracting procedures in BES during this audit indicated the Bureau has made a continuing effort to improve its contract management practices. For example, BES has incorporated numerous software tools to assist project managers in their tracking and communication of project status and costs. In addition, we were told that construction work is observed on a full-time basis, and each day's record is reviewed and initialed by a senior inspector. About half of BES construction contracts closed at the bid amount or less, for the three years prior to our review.

BES staff also believe they are able to improve design quality and achieve greater control over construction work by designing most construction projects with in-house staff. As a result, BES project managers are able to perform technical review both during the design and construction phases of a project.

Managers told us that continually improving processes is part of the bureau's culture. The Bureau of purchases delegated signature authority to BES for PTE contracts up to \$100,000, as a result of its practices.

**Review of Construction  
Contract #35193**

The contract we reviewed – "South Airport Phase II: Force Mains and Sanitary Sewers" – was signed on March 5, 2004. The original contract amount was \$773,383, with construction work to be completed by January 13, 2005 (300 days from contractor receipt of Notice to Proceed). See Figure 1.



**Figure 1 Construction Contract #35193**

Project Name	South Airport Phase II - Force Mains and Sanitary Sewers
Description	Construction of force mains and sanitary sewers
Date Signed	March 5, 2004
Payment Structure	Unit price
Original Dollar Amount	\$773,383
Time Allowed to Complete Construction	300 days – \$1,000 per day in liquidated damages could be charged for exceeding this agreed-upon timeframe
Contract Changes	7 changes increased the contract amount to \$827,403 (+\$54,020) and days allowed to 315 (+15) mostly due to changed conditions
Total Payment Amount	\$697,559
Actual Construction Time	315 days – the maximum time allowed by contract

Note: The design of the force mains and sanitary sewers in this contract was part of a larger design project that also included two pump stations. The Invitation to Bid for construction included the entire project, divided into two parts in order to encourage the most competitive bids for each part. Separate construction contracts were awarded for each of the two parts.

**Quantity of Work and Materials**

We found that the materials and work quantities listed in the contractor’s invoices matched those listed in the inspectors’ notes.

**Timeliness of Construction Work**

Construction work on contract #35193 was substantially completed (pipe and manholes completed and tested) by January 28, 2005, matching the maximum limit of 315 days allowed by contract, including the 15 days added by contract changes. All work was accepted as complete (including surface restoration) on May 2, 2005.

### **Contract Changes**

The five contract changes that occurred during construction all appeared reasonable. The addition of 15 days allowed to complete construction work was due to unforeseen conditions. Two additional contract changes resolved the contractor's claims for \$2,024 in interest on the amount the City had already agreed to pay for a dewatering change order. The total for all changes was \$54,020.

The increased dollar amount of the contract was not reached, however, because some actual material and work quantities – for pipe, asphalt, and disposal of contaminated soil and water – were less than the amounts listed in the contractor's unit price proposal, as estimated by BES.

### **Project Documentation**

Project managers consistently documented work accomplished, plans, problems and solutions, and claims. Records we reviewed appeared to be complete and sufficiently detailed. Meeting notes, design review records, and documentation of daily inspections were clear and specific. In addition, meeting notes prepared each week during construction were used to automatically create agendas and draft notes for subsequent meetings. Project managers used the Bureau's electronic project status report system to update project progress, although individual records within the system were not always clear. Contract changes, submittal records, and meeting notes were all prepared by BES staff.

### **Insurance**

Evidence of contractor-provided insurance was lacking after October 1, 2004, even though final project close-out tasks were not completed until May 2005. However, most of the contractor's insurance was provided by the City's Owner Controlled Insurance Program, which BES uses on construction projects. BES managers stated that currency of insurance and bonding is verified by the Bureau of Purchases.

### **Delayed Project Close-Out**

A \$1638 change order amount resolving the contractor's claim for interest on an earlier change order for dewatering, was not paid in a timely way. The delay led to a second, \$316, change order for interest

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in July 2007, more than a year later and two years after construction was complete. The contract Certificate of Completion was issued in December 2007, after auditors requested a copy of the Final Project Report from BES.

Although the reasons for the delays in payment of the initial claim for interest and project closure are not clear, the Bureau is making changes to prevent such delays in the future. We found that BES has improved its change order form to prevent future interest claims. In addition, BES reported that it has also begun developing an automatic reporting tool to improve procedural control on all contracts, even those without significant financial risk.

**Conclusion**

BES has many large and complex capital projects that it manages at any given time. It is a challenge for project managers to keep tabs on every aspect of every project. Nevertheless, we found that BES contract management procedures were generally adequate to ensure successful contract execution of construction-related contracts. BES made a number of improvements in its construction contract management procedures, and processes were in place to identify and address problems as they arose, and to prevent the same problems from recurring.



# RESPONSES TO THE AUDIT





CITY OF

**PORTLAND, OREGON**

OFFICE OF PUBLIC UTILITIES

**Sam Adams, Commissioner**  
1221 S.W. Fourth Avenue, Rm. 220  
Portland, Oregon 97204-1994  
(503) 823-3008  
FAX: (503) 823-3017  
E: [samadams@ci.portland.or.us](mailto:samadams@ci.portland.or.us)  
[www.commissionersam.com](http://www.commissionersam.com)

Date: January 22, 2008

To: Gary Blackmer, City Auditor

From: Sam Adams   
Dean Marriott 

Re: Auditor's Report on BES Construction Contracts (Report # 348B)

Thank you for the thorough review of BES construction contracting procedures and performance. As your report recognizes, the Bureau has made a significant commitment to providing high quality and cost-effective service to our rate-payers. BES has made significant improvements since the last audit in 1998 including additional personnel for oversight, development and documentation of standardized policies and procedures, staff training, and utilization of interim independent audits.

BES continually strives to improve its contract management practices. As noted in your report, one area they are already working to improve is timeliness of contract closeout. They have identified procedures that will assist staff and compel contractors to agree to final quantities and payment amounts in a more timely manner. BES will enlist the aid of the National Underground Contractor's Association (NUCA), the City Attorney's office and the Bureau of Purchases toward that end.

We look forward to public release of the document as we believe it confirms the Bureau's commitment to quality service.

cc: Bill Ryan  
Mark Hutchinson  
James Hagerman







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Office of the City Auditor  
1221 SW 4th Avenue, Room 310  
Portland, Oregon 97204  
503-823-4005  
[www.portlandonline.com/auditor/auditservices](http://www.portlandonline.com/auditor/auditservices)**

*Construction contracts: Bureau of Environmental Services strengthened its contract management procedures*

Report #348B, February 2008

Audit Team Members: Doug Norman  
Beth Woodward

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Gary Blackmer, City Auditor  
Drummond Kahn, Director of Audit Services

**Other recent audit reports:**

*Construction Contracts: Facilities Services needs to improve coordination with bureaus to reduce costs and delays (#348A, January 2008)*

*City of Portland Service Efforts and Accomplishments: 2006-07, Seventeenth Annual Report on City Government Performance (#340, December 2007)*

*Downtown Parking Meters: Meters and pay stations working, but certain transactions can be challenging (#352A, October 2007)*

