

# STATE AUDITOR'S OFFICE PERFORMANCE AUDIT



## Local Government Performance Audit Construction Change Order Pricing

January 10, 2012

Report No. 1007057



WASHINGTON  
**BRIAN SONNTAG**  
STATE AUDITOR

# TABLE OF CONTENTS

---

Executive Summary ..... 3

Introduction..... 6

Background ..... 9

Leading Practices..... 10

Audit Results ..... 13

Recommendations ..... 20

Agency Responses ..... 21

Appendix A: Initiative 900 ..... 30

Appendix B: Methodology..... 31

Appendix C: Criteria..... 32

Appendix D: Glossary ..... 40

Appendix E: Transportation Dept. Markups ..... 41

Appendix F: Detailed Audit Results ..... 42

State Auditor’s Office Contacts..... 58

# EXECUTIVE SUMMARY

---

## Why we did this audit

Local governments in Washington, from cities and counties to fire and public utility districts, spend billions of dollars on construction projects every year. These governments work hard to hold down project costs but sometimes must use change orders, which increase project costs, to respond to unforeseen conditions.

We conducted this audit to identify leading practices local governments can use to help reduce the cost of change orders and to help ensure citizens that their tax dollars are well-spent.

We examined change order practices for construction and architectural and engineering (A&E) contracts at seven cities and one county from 2008 through June 2010. We did not attempt to comprehensively audit the construction programs, but selected a small number of contracts representing a wide range of issues that can arise as a result of change orders. We also compared change order prices paid for those contracts to the typical market prices or industry rates we identified.

Bellingham, Everett, Puyallup, Richland, SeaTac, Shoreline, Spokane and Thurston County participated in this audit.

We structured the audit to answer two specific questions:

- **Did the cities and county follow leading practices to control the pricing of labor, materials, equipment, and markups on selected change orders?**
- **When leading practices were not followed, what were the potential effects on change order costs and what can be done to minimize them in the future?**

## We designed the audit to help all governmental units

This audit provides information all local governments can use to:

- Identify contracting practices that may help them save money on construction and A&E contracts. Most of these practices can be put in place at little or no cost.
- Improve their review of change order pricing to help ensure project funds are well-spent.
- Reduce project costs by using the leading practices. Potential savings would come primarily from ensuring change order prices reflect typical market prices or industry rates for the work being performed.

## What we found

Change-order management experts indicate leading practices regarding change order pricing fall into two main areas:

- Establishing in the original contract how change order pricing will be handled.
- Reviewing the pricing for all change orders to ensure it reflects contract terms, invoices, market conditions or typical industry rates and prices.

We compared change-order pricing practices at the eight local governments to the leading practices we identified. We found that all of the local governments were using at least some of the leading practices. For the cities of Spokane, Shoreline and Thurston County, the practices they used or the prices they paid for change order work were most closely aligned.

We also identified opportunities for local governments to strengthen their control over change-order pricing by:

- **Establishing the basis for pricing** any additional work done through change orders. Most contracts we reviewed included rates or prices the local governments would pay for some types of change order work, but not for all types of change orders. When those rates and prices were not established, the governments sometimes paid more than typical market prices or industry rates.
- **Allowing contractors to price change orders** on a “per-unit” basis (e.g., cost per square foot) only if those unit prices are based on recent, similar work. Two change orders we reviewed, totaling more than \$780,000, used unit prices that did not appear to be based on recent, similar work. For example, in one instance a contractor charged \$29 per square foot for work done under the original bid, but \$285 per foot when this work was extended by a change order. In this case, the city should have required itemized charges for this work.
- **Requiring contractors to submit written change-order proposals.** Most original contracts we reviewed did not include that requirement for all types of change orders. However, the local governments generally obtained them.
- **Reviewing change order prices that contractors submit.** Local governments generally did not provide guidance to their staff or to A&E firms on the extent to which change order pricing should be scrutinized. We found only two cities conducted thorough reviews for all change orders we examined.

For those change orders examined, we identified the potential for savings:

- **Three cities paid somewhat more than prevailing wages** for change orders, or paid labor rate increases higher than those established by contract or the Producer Price Index. Altogether, the differences we saw accounted for up to \$74,000 of an estimated \$2.3 million in labor charges we could review.
- **Three cities paid markups for profit and overhead** that were somewhat higher than typical industry rates. Altogether, the higher markups we saw totaled \$101,000 out of the nearly \$3.2 million in markups we could review.

- **About \$1.1 million of the \$9.1 million in change-order charges** we audited did not have sufficiently detailed charges for labor, materials, equipment or markups. For some of these charges, local governments potentially paid more than typical rates and prices.

## Recommendations

We recommend the eight local governments work with their construction project managers and legal departments to establish policies, procedures and standard contract terms that use leading practices they do not already follow. In doing so, local governments should ensure that they:

- **Establish a basis for reasonable and typical prices and rates** for labor, materials, equipment and markups.
- **Require contractors to submit detailed change-order proposals** so prices and rates can be evaluated and compared to established prices and rates.
- **Scrutinize change orders** so that local governments do not pay more than established prices and rates. When local governments expect A&E firms to evaluate their construction change order pricing, their contracts should clearly describe this in the scope of work. Similarly, local governments should have policies and procedures to help staff members ensure change-order pricing matches established pricing and rates.

For projects funded by the Washington State Department of Transportation or other granting agencies, local governments should use these leading practices as permitted by the grantor's conditions.

## What's next?

Audits of local agencies and programs are reviewed by their governing bodies, usually city councils or county commissions, within 30 days of the publication of the audit reports. The state performance audit law requires them to allow public comment at these meetings.

Representatives of the State Auditor's Office will be available to discuss this audit with cities, counties, statewide local government associations, legislators and others.

Ultimately, individual local governments will decide whether to institute the audit recommendations. The State Auditor's Office conducts periodic follow-up to assess the status of recommendations and may conduct follow-up audits at its discretion.

# INTRODUCTION

---

## Audit Overview

Washington cities and counties spend billions of dollars each year on construction projects. Contracts are often modified through change orders that are used to extend the duration, scope and/or cost of construction and architectural and engineering (A&E) contracts to include new or expanded work and services.

In many cases, change orders respond to unforeseen conditions, imperfections in project design, owner-requested alterations, requests for additional work and other elements not anticipated when the original contracts were signed. As a result, they can drive up project costs appropriately but unexpectedly.

Governments typically award construction contracts competitively, based on price. They award A&E contracts competitively by comparing the statements of qualifications submitted by firms interested in performing the work, and then successfully negotiating a fair and reasonable price.

Change orders usually are negotiated after the contracts have been awarded, so contractors and A&E firms are better positioned to obtain more generous pricing for labor, materials and equipment, and markups for overhead and profit.

We conducted this audit to identify leading practices all local governments can use to save money by better managing change order pricing. We also examined practices in seven cities and one county with diverse contracting practices.

We designed the audit to answer two specific questions:

- **Did the selected cities and county follow leading practices to control the pricing of labor, materials, equipment and markups on selected change orders?**
- **When leading practices were not followed, what were the potential effects on change order costs, and what can be done to minimize them in the future?**

## Scope and methodology

Based on their significant change order activity on construction and A&E firm contracts during the three years ending June 2010, we reviewed the following seven cities and one county:

Bellingham	SeaTac
Everett	Shoreline
Puyallup	Spokane
Richland	Thurston County

For these eight municipalities, construction expenditures and other capital outlays totaled \$371 million in 2009. As shown in **Exhibit 1**, we reviewed change orders for 10 contracts whose original costs totaled just over \$61 million. In most cases, change orders increased the cost of original contracts by more than 10 percent.

We reviewed these contracts to determine the extent to which the local governments used leading practices and paid typical rates and prices to control the pricing of change orders that, in total, added \$15.1 million to the contracts' initial costs. A preliminary review suggested each local government had some potential to strengthen its change order policies and practices. **Exhibit 1** shows the original cost and the amounts of the change orders we audited.

<b>Exhibit 1</b>			
<b>Local government contracts reviewed</b>			
Rounded dollars are in millions			
City/County	Project - original cost	Total change orders <sup>(1)</sup>	Amount selected for audit <sup>(2)</sup>
Bellingham	1) Federal Building renovation - \$1.5 M	\$383,000	\$362,000
	2) Sunset Drive Improvement - \$5 M	\$722,000	\$590,000
Everett	1) A&E for water filtration plant and water transmission lines - \$1.5 M	\$3.9 M	\$2.6 M
	2) Sewer system replacement "F" - \$2.6 M	\$386,000	\$114,000
Puyallup	City Hall construction - \$32.1 M	\$1.7 M	\$497,000
Richland	Library construction - \$9.6 M	\$1.3 M	\$411,000
SeaTac	Fire Station No. 46 electrical systems - \$539,500	\$82,000	\$25,000
Shoreline <sup>(3)</sup>	A&E for initial design of Aurora Corridor improvements - \$50,000	\$5.3 M	\$5.3 M
Spokane <sup>(3)</sup>	5-Mile Road improvement - \$5.0 M	\$119,000	\$71,000
Thurston County <sup>(3)</sup>	Bald Hill Road improvement - \$3.2 M	\$1.2 M	\$1.2 M
<b>Total</b>	<b>Original contract costs total \$61.1 M</b>	<b>\$15.1 M</b>	<b>\$9.1 M</b>
<b>Source:</b> City change orders and contract files.			
<b>Notes:</b>			
<sup>(1)</sup> Some contracts were active at the time of the audit so additional change orders may have occurred after our audit.			
<sup>(2)</sup> Of this amount, \$1.1 million in change orders or parts of change orders did not have sufficient detail about the pricing of labor, materials, markups and equipment for us to determine whether the local government paid typical market prices or industry rates.			
<sup>(3)</sup> These projects were financed in part with Washington State Department of Transportation funds.			

We did not evaluate each city's or the county's construction management practices as a whole, nor did we review all of their construction and A&E contracts. We evaluated only the pricing of labor, materials and equipment, and overhead and profit markup rates for specific change orders. We did not attempt to determine whether the quantity of materials or the number of hours charged were reasonable.

Our methodology consisted of:

- Identifying leading practices for controlling the pricing of change orders.
- Identifying typical pricing benchmarks or rates for materials, equipment, labor and markups.
- Determining the extent to which the municipalities followed the leading practices for controlling the cost of the change orders, and whether the amounts paid for change orders were consistent with typical prices and rates.

We consulted with the state associations of cities and counties as we planned this audit. We will continue to work with them and other representatives of local governments to communicate the results throughout the state.

We conducted this audit under the authority of state law (RCW 43.09.470), approved as Initiative 900 by Washington voters in 2005, and in accordance with generally accepted government auditing standards, prescribed by the U.S. Government Accountability Office. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

**Appendix A** describes the provisions of Initiative 900 and how the audit addressed the law's specific elements.

**Appendix B** describes our audit methodology in detail.



# BACKGROUND

---

## Types of change orders

The types of construction contract change orders discussed in this report generally fall into the following categories, each of which treats pricing or negotiations differently:

- **A unit-priced change order** is for work the owner and contractor agree to price at the “unit-of-work” level, for example, a change order for building additional space at a certain cost per square foot. The unit price for change order work usually is established by referring to the original contract bid or to other recent, similar work in which the price was competitively established. Unit-priced change orders are priced in total and do not break out separate costs and pricing for labor, materials, equipment and markups. The amount of the change order is agreed to before the work is performed.
- **A time and materials or force account change order** consists of work that is ordered by the local government without prior agreement with the contractor. In these situations, the local government reimburses the contractor on a time-and-materials basis, plus markups for profit and overhead. This approach typically is used when work cannot be easily or accurately estimated, or under emergency conditions such as a broken sewer line. For contracts funded at least in part by the Transportation Department, this is called force account work. The amount of the change order is unknown until after the work is performed.
- **Regular change orders** are all other change orders. The total cost is negotiated between the local government and the contractor before work is performed. These negotiations often start with a contractor submitting a change order proposal itemizing the quantities and prices for labor, materials, equipment and markups. The government then reviews the contractor’s proposal before the two parties arrive at a negotiated price.

# LEADING PRACTICES

---

## Leading practices for controlling change order pricing

Construction experts recognize the benefit of using leading practices to actively control change order pricing. In 2003, an article published in the Association for the Advancement of Cost Engineering, “Proactive Change Order Management,” said organizations that actively manage change order pricing are able to:

- Provide a predetermined, contractual basis for uniform change order pricing.
- Discourage contractors from artificially reducing (“low-balling”) project bids while intending to benefit later from costly change orders.
- Reduce or eliminate the negotiation of change order pricing.
- Reduce project managers’ costs associated with comparing contractors’ proposed pricing to their own independently developed estimates.
- Greatly decrease the likelihood of claims and disputes.
- Promote teamwork with the contractor.
- Support a fair, reasonable and equitable business relationship.

To identify leading practices, we examined change order pricing practices used by government agencies, including the Washington state departments of Transportation and General Administration (the latter is now part of the Department of Enterprise Services). We examined other performance audits and articles written by subject matter experts and researchers published by the Association for the Advancement of Cost Engineering, the National Institute of Building Sciences (NIBS) Municipal Research Services Center of Washington, the Association of Consulting Engineers of New Zealand, the Institution of Professional Engineering of New Zealand, and the Delaware Associated Builders and Contractors Partnership Committee.

We also reviewed the Federal Acquisition Register, the Federal Transit Administration’s Best Practices Procurement Manual, and the Architect’s Handbook of Professional Practice, all respected sources of leading practices for controlling construction project costs. We also spoke directly with subject matter experts including the strategic cost estimator for a major computer chip manufacturer, and professional consultants with expertise in all phases of construction.

**Exhibit 2** summarizes the leading practices we identified for controlling the pricing on change orders for both construction and A&E contracts.

Exhibit 2

**Leading Practices for Controlling Construction and A&E Change Order Prices**

1. **Establish terms in the original contract for how change order pricing will be handled.** Because contract change orders are not based on competition via price or qualifications, it is important to take steps to ensure change order pricing will be fair and reasonable, so the contracting entity does not pay more than necessary.
  - a. **Establish the basis to be used in pricing change orders.** For construction contracts, that can include tying pricing for additional work to the unit pricing in the original contract or to similar recently bid work, or pre-establishing change order prices or rates for labor, materials, equipment, and markups for overhead and profit. For A&E contracts, that can include establishing both labor rate increases for multi-year contracts and markup rates for overhead and profit.
 

Subject-matter experts and others cite such sources as original contract prices, schedules of rates or values, prevailing wage rates, invoices, and price indices as the basis for establishing the prices or rates that will be paid for change order work. Establishing the basis for change order prices and rates allows the change order negotiations to focus on the quantities of work and materials needed. **The typical prices and rates we identified are discussed in the section following Exhibit 4. (a)**
  - b. **Contractually require contractors to submit detailed change order proposals** when the work to be performed will not be based on unit prices. Such proposals typically include detailed prices and rates for labor, materials, equipment and markups. **(a)** Local governments may want to define and exempt change orders that are very small in nature, where the cost attributable to this practice may exceed the benefits.
  - c. **Specify the level of monitoring expected by A&E firms charged with overseeing change order pricing.** When A&E firms are involved with construction contracts, specifying the expected level of scrutiny over change order pricing in the contract helps ensure firms obtain the pricing details needed to assure local governments do not pay more than the pre-established rates and prices.

2. **Manage and review construction and A&E change order costs.** Once projects are under way, it is important to take steps to ensure that the prices paid for change order work are appropriate and agree with pre-established rates, prices and other contract terms.
  - a. **Obtain written change orders** for all additional work or materials beyond the scope or sum of the original contract.
  - b. **Accept unit pricing for change orders only when it's appropriate.** This issue is discussed in more detail immediately below this exhibit.
  - c. **Perform detailed reviews of contract change order costs proposed by contractors.** This includes comparing change order prices against the original contract prices, or to the schedules of units, rates or values, vendor invoices, price indices, or other sources that are pre-established by contract. Such reviews help ensure the additional charges are reasonable and conform to the contract conditions. Most sources call for developing an independent cost estimate to evaluate the reasonableness of the firm's or contractor's proposal. When prices are pre-established, independent cost estimates can focus on the quantities contained in the contractor's proposal.
  - d. **Spot-check the scrutiny provided by A&E firms** that perform construction oversight to make sure detailed pricing information is obtained and the local government is not paying too much for labor, materials, equipment and markups.

**Sources:** *Subject matter experts, the state departments of General Administration (now part of the Department of Enterprise Services) and Transportation, the U.S. Federal Transit Administration, the Architect's Handbook of Professional Practice, articles published by the Association for the Advancement of Cost Engineering, and the National Institute of Building Sciences.*

**Notes:** *(a) Transportation contracts that are financed at least in part with Transportation Department and/or Federal Highway Administration funds must comply with the requirements specified in Transportation's Standards Specifications Manual for Road, Bridge and Municipal Construction. See **discussion immediately preceding Exhibit 4** for more information.*

## Benchmarks for typical change order prices and rates

Establishing the basis for the prices and rates that will be paid for change order work in the initial contract can help control the cost of change orders. We reviewed a variety of sources to help identify the pricing benchmarks described in the following sections and discussed in more detail in **Appendix C**. We obtained information for typical prices paid for labor, materials, and equipment, and for markup rates for overhead and profit from a number of sources inside and outside Washington. Those sources included construction policies, contracts, and general conditions at state agencies and local governments engaged in construction projects, including roads and facilities.

- **Unit prices** are used when appropriate for the circumstances and based on recent competition for similar work. For such work, using the unit prices from the original bid or from other recent bids (e.g., cost per square foot) as the basis to price change orders can be appropriate. However, unit pricing may not be appropriate when significant changes in market prices have occurred, or the location, timing, nature, or conditions of the work has changed.
- **Construction labor costs.** Because they are tied to market conditions, many government agencies tie construction labor costs to the prevailing wage rate plus the payroll taxes in effect at the time of the work. State law (RCW 39.12.020) requires contractors to pay no less than the prevailing wage on public works, but it does not obligate local governments to pay contractors for higher labor rates on change orders. The *General Conditions for Washington State Facilities Construction* limits labor rates on change orders to those submitted on the Statement of Intent to Pay Prevailing Wages or higher amounts if justified and approved by the Department.

For force account change orders on contracts funded by the Transportation Department, labor charges must agree to the labor rates contractors submit at the start of the contract. (*See Section 1-09.6 (page 1-95) of the 2010 Department's Standard Specifications Manual.*)

- **Increases in A&E firms' labor rates** can be tied to the original contract plus a predetermined escalation rate, such as the Consumer Price Index, the Producer Price Index for A&E services (Industry Code 5413) or other reasonable sources.
- **Materials prices** typically are limited to vendor quotes, the contractors' cost or the original contract price. For example, the *General Conditions for Washington State Facilities Construction* indicates prices are to be developed from actual known costs, from supplier quotations if actual costs are not available, or from standard industry pricing guides.
- **Equipment rental rates.** Most state transportation departments and numerous municipalities use the Rental Rate Blue Book. It is a common industry guide for determining **reimbursement rates** for heavy equipment use.

# AUDIT RESULTS

For the eight local governments we reviewed, we compared their practices for controlling the pricing of change orders to the leading practices we identified. We also compared the prices or rates they paid for labor, materials, equipment, and markups for overhead and profit with the typical pricing and rates we identified.

Overall, we found that all the municipalities we audited used leading practices to some extent on the contracts and change orders. For the cities of Spokane, Shoreline, and Thurston County, the practices they used or the prices paid for change order work were most closely aligned. We also found opportunities for local governments to:

- A. Strengthen their procedures to control rates and prices for change orders. **Exhibit 3** and the discussion that follows present the results of our comparisons to leading practices for those governments.
- B. Ensure that change-order prices are pre-established and reflect typical industry rates. **Exhibit 4** summarizes the extent to which the eight local governments paid typical rates and prices. More detailed information about each is presented in **Appendix F**.

## A. These local governments have opportunities to strengthen the procedures they used to control change order prices.

**Exhibit 3** shows our comparisons to leading practices for the seven cities and county.

Exhibit 3 Leading Practices in Place by City and County								
City/County	Bellingham (C)	Everett (C, A)	Puyallup (C)	Richland (C)	SeaTac (C)	Shoreline (A)	Spokane (C)	Thurston (C)
<b>1. Establish terms in the original contract for how change order pricing will be handled.</b>								
a. Pre-establish the basis for pricing change orders	P	P	Y	P	P	Y	P	P
b. Contractually require contractors to submit detailed change order proposals when unit pricing is not used	P	P	Y	Y	N	Y	P	P
c. Specify the level of monitoring expected by A&E firms charged with overseeing change order pricing	N	N/A	N	N	N/A	N/A	N/A	N/A
<b>2. Manage and review construction and A&amp;E change order costs.</b>								
a. Obtain written change orders for additional work or materials	Y	Y	Y	Y	Y	Y	Y	P
b. Accept unit pricing for change orders only when it's appropriate	P	N/A	N/A	N/A	N/A	N/A	Y	P
c. Perform detailed reviews of change order costs submitted by contractors	P	Y	P	P	Y	Y	Y	P
d. Spot-check the quality of scrutiny provided by A&E firms' hired to perform construction oversight	N	N/A	N	N	N/A	N/A	N/A	N/A
<p><b>Source:</b> Interviews of City project managers and staff responsible for construction and A&amp;E contracts, review of the terms and conditions in those contracts, and review of the costs and pricing paid on change orders and contract amendments.</p> <p><b>Notes:</b> <b>N/A</b> (not applicable) means the leading practice did not apply to the specific contract(s) we reviewed. <b>N (No)</b> means the leading practice was not implemented. <b>P (Partly)</b> means the leading practice was observed but the local government had not fully implemented it. <b>Y (Yes)</b> means the leading practice was fully followed or mostly implemented.</p> <p><b>C = Construction contract. A = Architectural and engineering contract.</b></p>								

All the cities and the county used leading practices to at least some extent. However, we found improvements could be made.

**Most local governments established in original contracts the rates or prices they would pay for some, but not all, types of change order work.** We found local governments generally pre-established the basis they would use for pricing force account and unit-priced change orders. Others did not do so for regular change order work. For example:

- Puyallup and Shoreline pre-established the **labor rates** they would pay for all change orders, but Everett, Bellingham, Spokane and Thurston County established them only for force account change orders.
- Puyallup limited **materials** pricing on change orders to the contractor's net material costs after all discounts or rebates, freight costs, express charges, or special delivery costs. However, Bellingham, Everett, Spokane and Thurston County limited materials pricing only for force account change orders.
- Puyallup, Richland, SeaTac and Shoreline pre-established **markups** for all change orders, but Thurston County, Bellingham, Everett and Spokane established them only for force account change orders. In addition, Everett's two A&E contracts established a comprehensive hourly rate for each position, but the contracts did not identify the labor, profit and overhead components that made up these hourly rates.

Two of the eight construction contracts we reviewed were financed in part with state and federal transportation dollars. As discussed later in this report and shown in **Exhibit 4**, change orders for such contracts are subject to state requirements that do not fully allow the use of some leading practices we identified.

**Most contracts we reviewed did not require contractors to submit written change order proposals for all additional work to be performed, even though local governments did obtain them for all but one contract we reviewed.** Only Puyallup, Richland, and Shoreline required contractors to submit written change order proposals for all additional work. Bellingham, Everett, Spokane, and Thurston County required contractors to submit them only for force account change orders. All the local governments actually obtained them except for some change work at Thurston County. However, contractors are not obligated to provide written change order proposals unless that language is in the contract.

In addition, we noted that SeaTac, Shoreline, and Spokane obtained detailed pricing information for all change orders we reviewed, but Bellingham, Everett, Puyallup, Richland and Thurston County did not always do so. Requiring and obtaining written change orders can help local governments track changes to the original contract and ensure that costs and quantities are reasonable and controlled.

**Local governments generally did not provide guidance on the extent to which change order pricing should be scrutinized.** Bellingham, Puyallup and Richland used A&E firms to scrutinize change orders, but none included this expectation in their contracts. Only Richland provided its staff with documented guidance on how they should conduct such reviews. The absence of guidance can be especially challenging for staff who are not experts at reviewing change order costs and pricing.

**The unit prices used for two change orders were not based on recent, similar work, which could mean the local governments paid more than they needed to for the change order work.** In Thurston County, county officials and the contractor agreed to adjust the unit pricing for some work from the original bid, but did not document the basis for those adjustments.

In Bellingham, the unit prices the contractor submitted for most of a change order we reviewed were for different work, and were significantly higher than the prices specified in the original contract. For example, in one instance the contractor charged \$29 per square foot for work done under the original bid, but \$285 per foot when this work was extended by change order. City engineers indicated the price paid was higher because the additional work was more complicated.

Experts caution that using contract unit prices for change orders is not appropriate in cases in which the type of work to be performed is not similar, the unit prices used are not current, the locations are very different, or the quantities involved vary too much. Because unit prices do not break out itemized charges for labor, materials, equipment and overhead, neither the City of Bellingham nor our auditors could determine whether the amount the City paid was reasonable.

**Local governments did not always compare change order costs against invoices, vendor quotes, and original contract prices and terms, or spot-check the quality of A&E firms' scrutiny.** SeaTac and Spokane thoroughly reviewed all change orders. Shoreline and Everett mostly did so. Most other local governments did not obtain detailed information for all the change orders we reviewed. Without sufficiently detailed information and thorough reviews, local governments have less assurance that they are paying only the prices agreed to, and are not being charged for things they should not be.

When local governments relied on A&E firms to scrutinize change orders for the construction contracts we reviewed, they generally did not verify that this scrutiny had occurred. Verification is important to ensure local governments are obtaining the services they expect and are not paying too much for labor, materials, equipment and markups.

**Contracts for local transportation projects must comply with Transportation Department change order requirements.** Two of the eight construction contracts we reviewed were financed in part with state or federal highway funds. In such instances, local governments must manage these contracts in accordance with Transportation's *Local Agency Guidelines*. Change orders for such contracts must meet the requirements of the state's *Standard Specifications Manual for Road, Bridge and Municipal Construction*. The Transportation Department coordinates with the Association of General Contractors (AGC) and the American Public Works Association (APWA) to establish and update the requirements in this manual.

As shown in **Exhibit 4**, the Transportation Department does not require local governments to use two of the leading practices we identified for state and federally funded contracts. Department officials indicate local governments cannot contractually require contractors to submit detailed change order proposals using pre-established pricing for regular change orders. Instead, it instructs local governments to establish the change order amount by performing independent cost estimates.

Department officials indicated that because contractual language requiring such practices would be an exception to its *Standard Specifications Manual*, such language would not likely be approved. They expressed concerns that establishing the basis for pricing change orders could result in inflated bids, something that could happen if that pricing basis was not reasonable. They also expressed concerns that requiring contractors to submit detailed change order proposals may not be cost-beneficial for situations involving very minor changes. However, they said they recognized that obtaining detailed change order proposals from contractors was a best practice that should be followed when feasible. Department officials also indicated they are willing to explore the costs and benefits of leading practices we identified with the AGC and the APWA.

<b>Exhibit 4</b>			
<b>Similarities and differences between the Transportation Department’s change order practices and the leading practices identified in this audit</b>			
Leading practice	Unit-priced change orders	Force account change orders	Regular change orders
<b>Contractually establish the basis for pricing <u>all</u> change orders.</b> Does Transportation require?	Yes	Yes	No
<b>Contractually require contractors to submit detailed change orders (for non-unit-priced work)</b> Does Transportation require?	N/A	Yes	No*
<b>Obtain written change orders for <u>all</u> additional work or materials beyond the scope or sum of the original contract.</b> Does Transportation require?	Required for new work that differs from the original contract. <u>Required or allowed</u> when additional quantities are needed to complete the work spelled out in the original contract. See Section 1-04.6 of the <i>Standard Specifications Manual</i> .	Yes	Yes
<b>Source:</b> Review of Transportation’s <i>Standard Specifications Manual for Road, Bridge and Municipal Construction</i> and interviews with various Transportation staff.			
<b>Notes:</b> * WSDOT requires contractors to submit detailed change order cost estimates if there is a dispute as to the amount determined by the local government.			



**B. Local governments have opportunities to reduce change order costs.**

When we compared the change order prices the local governments paid with contract terms and the typical prices and rates we identified on page 12, we found they sometimes paid more for labor or markups than they had agreed to or than the typical prices and rates. The results of our comparison are summarized in **Exhibit 5**. More detail for each local government is in **Appendix F**.

Exhibit 5 Comparing the prices and rates cities and the county paid with typical prices and rates								
	Bellingham	Everett	Puyallup	Richland	SeaTac	Shoreline	Spokane	Thurston
<b>Unit rates:</b> paid the same rate as the original contract or those paid for similar, recently bid work on other contracts	P	N/A	N/A	N/A	N/A	N/A	Y	P
<b>Labor rates:</b> paid the prevailing wage or allowable/typical escalations	Y	P	P	Not tested	P	Y	Y	Y
<b>Materials charges:</b> paid the contractor's actual costs	Y	Not tested	Y	Not tested	Not tested	N/A	N/A	Y
<b>Markup rates:</b> paid typical markup rates for overhead and profit	N	P	P	P	Y	Y	Y	Y
<p><b>Source:</b> Review of the costs and pricing paid on change orders and contract amendments.</p> <p><b>Notes:</b> <b>N/A</b> (not applicable) means the charges were not applicable to the specific contract(s) we reviewed. <b>N (No)</b> means the municipality paid more than typical rates or prices for the change order costs we reviewed. <b>P (Partly)</b> means the local government paid typical prices or rates for some but not all the change order costs we reviewed. <b>Y (Yes)</b> means the municipality paid typical prices or rates for all the change order costs we reviewed <b>or</b> the overall difference was less than two percent.</p>								

We examined \$9.1 million in change orders across eight municipalities. As described below, we found that those municipalities would have paid up to \$174,000 less for those change orders if they would have paid typical rates and prices, or the rates and prices specified in the original contracts:

- **For labor charges**, Everett, Puyallup and SeaTac paid somewhat more than prevailing wages for change orders that were not Transportation Department funded force account work, or paid labor rate increases that were higher than those established by contract or the Producer Price Index. Altogether, the differences we saw accounted for up to \$74,000 of an estimated \$2.3 million in labor charges we could review.

Puyallup paid the labor rates shown on certified payroll reports, which sometimes exceeded the prevailing wage rates, because officials thought state law obligated them to pay the labor rates that contractors paid. Everett officials thought the same. Although state law (RCW 39.12.020) requires contractors to pay no less than the prevailing wage on public works, it does not obligate local governments to pay contractors for higher labor rates on change orders. Everett officials also thought state law and the Transportation Department *Standards Specifications Manual* required them to pay the labor rates that contractors paid. That manual requires local governments on Transportation Department funded contracts to reimburse contractors for force account work in accordance with a contractor-submitted project labor list. However, Everett's contract was not funded by the Transportation Department.

One city indicated that capping labor rates on change orders would result in contractors submitting higher construction bids. A publication by the Association for the Advancement of Cost Engineering indicates that pre-establishing pricing expectations for change orders up front in contracts should discourage contractors from artificially reducing ("low-balling") their bids while intending to benefit later from costly change orders.

- **For markup rates for overhead and profit**, Bellingham, Everett, Puyallup and Richland paid markups for profit and overhead that were somewhat higher than typical industry rates. For example, for one contract at Everett contractors were allowed to charge force account markup rates for change order work that was not funded by the Transportation Department. Local governments are not prohibited from doing so, but some of those rates can be 6 percent to 7 percent higher than the typical markup rates we identified. In addition, the Department's *Guide to the WSDOT Construction Change Order Process* cautions that, "...the use of Force Account markups for overhead and profit should not be automatic and may not be appropriate for all change work."

We also saw some local governments had established rates in the contract that were slightly higher than typical markups, had not specified rates in the contract and paid the amounts the contractor submitted, or paid for bonding costs and B&O taxes that are typically covered by markups or were specifically prohibited by contract. Altogether, the higher markups we reviewed totaled \$101,000 out of the nearly \$3.2 million in markups.

**In addition, about \$1.1 million of the \$9.1 million in change order charges we selected for audit did not have sufficiently detailed charges** for labor, materials, equipment or markups. For some of these charges, local governments may have paid more than typical rates and prices. As described earlier, Bellingham paid \$29 per square foot for work done under the original bid, but \$285 per square foot when this work was extended by change order. These unit prices combined materials, equipment, labor and markup costs into a lump-sum price. As a result, we could not determine whether the city paid typical rates and prices.

# RECOMMENDATIONS

---

We recommend the eight local governments work with construction project managers and their legal departments to establish policies, procedures and standard contract terms that include leading practices we identified that they do not already follow. In doing so, local governments should ensure:

- **Contracts establish the basis for reasonable and typical prices and rates** for labor, materials, equipment and markups.
- **Contracts require contractors to submit detailed change order proposals** so that prices and rates can be evaluated and compared to pre-established prices and rates.
- **Change orders are scrutinized** to ensure that local governments do not pay more than established prices and rates. When local governments expect A&E firms to evaluate construction change order pricing, their contracts with these firms should clearly describe this in the scope of work. Similarly, internal staff who perform such reviews should be guided by policies and procedures that describe how they should evaluate change order pricing to assure it agrees with pre-established pricing and rates.

For projects funded by the Transportation Department or other granting agencies, local governments should follow leading practices as permitted by the conditions specified by the grantor.

# AGENCY RESPONSES

---

## City of Bellingham

From: TCarlson@cob.org [mailto:TCarlson@cob.org]  
Sent: Thursday, December 22, 2011 2:04 PM  
To: Christopher Cortines  
Cc: JCarter@cob.org; KDrummond@cob.org  
Subject: Change Order Pricing Audit - Bellingham response

Good afternoon Chris,

First of all, I want to thank you for working with the City of Bellingham throughout this process. We appreciate the opportunity given us to comment on the draft document and the subsequent changes made by the SAO.

It is a core mission of the City of Bellingham Public Works Department to provide safe reliable infrastructure for our community while being responsible stewards of public funds. The City of Bellingham uses the WSDOT Standard Specifications as the base contractual reference for all street and utility projects. These specifications are the foundation from which all of our general and special provisions are crafted and come from years of refinement and collaboration between WSDOT, local agencies, the American Public Works Association (APWA), and many others with experience in managing and delivering public construction projects in the most efficient manner. The Standard Specifications document has served the State for many years and is the accepted manual for most public work. Bellingham will present the results of the performance audit to WSDOT so they can evaluate the auditors' recommendation to determine if the standard specifications should be modified. We look forward to working with WSDOT on this issue in the future.

The City of Bellingham continually strives to improve our process and methods in an effort to deliver quality public infrastructure, and while we do not agree with all of the comments in the audit report, we do believe it provides some quality recommendations on how we can improve our already extensive change order process. The City will continue to work with engineering, inspection, and legal staff on policies, specifications, and contract language that will result in the delivery quality infrastructure projects in the most cost effective manner.

In addition, there are a couple of typographic errors for consideration:

- Page 14, Item A refers to Exhibit 3. We can not locate this anywhere between Exhibit 2 and Exhibit 4.
- Page 38, first sentence should read, "We reviewed larger change orders.... renovation and a \$5 million street sewer line improvement..."

Thanks again Chris, and please let me know if you have any questions. Ted

Ted Carlson  
Public Works Director  
City of Bellingham  
360.778.7998  
tcarlson@cob.org

## City of Everett

From: Gordon Larson [mailto:GLarson@ci.everett.wa.us]

Sent: Tuesday, December 20, 2011 8:22 AM

To: Larisa Benson; Christopher Cortines

Cc: Barb Hinton; Bruce Botka; Debra Bryant; Dave Davis; Susy Haugen; Matt Welborn; Ryan Sass; Richard Tarry; Tom Fuchs; Al Rosenzweig; Keith Alewine; Shaun Bridge

Subject: RE: Change Order Pricing performance audit

Larisa and Chris,

The City's response to the final draft of your local government performance audit on Change Order Pricing follows:

The City of Everett continually strives to be good stewards of public funds and to improve our methods while maintaining compliance with established guidelines in managing the City's construction projects.

City staff uses the existing guidelines identified in the 2010 Standard Specifications for Road, Bridge, and Municipal Construction manual to manage all of its infrastructure projects. These standards were designed to achieve the lowest final cost for the construction of infrastructure projects, and are the result of years of refinement and collaboration among agencies with extensive experience and expertise in managing public construction projects in the Pacific Northwest, including the Washington State Department of Transportation (WSDOT), the American Public Works Association (APWA), the Associated General Contractors of America (AGC), as well as representatives from cities and counties throughout the state.

Major infrastructure projects are highly complex and require a unified team effort among all parties involved to complete construction in an efficient and cost effective manner. Consequently, there is great value in using an established set of common rules for the construction of roads, bridges, and utility projects, regardless of funding source.

We will continue to work with our construction project managers, our engineering staff, and our legal department to identify and implement policies, procedures, and standard contract terms that will enable efficient and cost effective infrastructure construction contracts. Additionally, we will present the results of this performance audit to the WSDOT/APWA/AGC standing committees so they may evaluate the auditors' recommendations and determine if the standard specifications should be modified.

Please contact me if you have any questions regarding this response.

Gordon

## City of Puyallup

**From:** Brenda Arline [mailto:Brenda@ci.puyallup.wa.us] On Behalf Of Ralph Dannenberg  
**Sent:** Tuesday, December 20, 2011 3:38 PM  
**To:** Larisa Benson; Christopher Cortines  
**Cc:** Cliff Craig  
**Subject:** City of Puyallup Performance Audit Report

Dear Ms. Benson and Mr. Cortines,

The City of Puyallup would like to thank the State Auditor's Office for the opportunity to be a part of the recently completed performance audit report. This was a great learning experience for our staff. I appreciate all the hard work performed and professionalism displayed by the audit team.

The recommendations will help ensure that the City of Puyallup receives an even greater value for our taxpayers' dollars in future construction projects.

Sincerely,

Ralph W. Dannenberg

City Manager  
City of Puyallup  
333 S. Meridian | Puyallup, WA 98371  
Phone 253-770-3324 | ralph@ci.puyallup.wa.us

## City of Richland

From: Underwood, Dan [mailto:DUnderwood@CI.RICHLAND.WA.US]  
Sent: Thursday, December 22, 2011 2:04 PM  
To: Christopher Cortines\  
Cc: King, Bill; Rogalsky, Pete; Roseberry, Ann; Noble, John  
Subject: Richland's Performance Audit response.

*Chris, please find attached our response for the Change Order Performance Audit. Thank you for all your effort on this project. We very much appreciated your willingness to work through the process with us.*

*Dan*

A large portion of the library construction project chosen for the audit involved refurbishing of an older structure. Construction projects of this nature almost always reveal unexpected issues; so it is not surprising change orders exceeded 10% of the construction bid. Given the complexity and specialized nature of the construction it was determined the city would be best served by hiring subject matter experts as the construction management team. This decision in fact proved to be advantageous in that the expert team identified several opportunities to save money or improve value in many of the change orders that were implemented. The contractor markup rates paid were authorized in the construction contract, were capped in the contract, and were at a level typical for this building construction industry. The report validates the City's administration of its project contract, but identifies proposed contract terms that may help reduce costs on similar type projects. The research provided in the report will be helpful to the City in negotiating lower caps in the future.

The City of Richland is committed to providing the highest level of service and quality to citizens at the best value. The report validates the City's commitment by noting that Richland has established a leading practice by adopting and following a contract change order policy. To maintain Richland's commitment, future construction contracts not mandated to follow other standards, will implement the recommended practices. Thank you to the State Auditor's Office for their efforts in completing this performance audit; the results will help achieve our commitment to quality by to most economical means.





## Memorandum

**DATE:** December 23, 2011

**TO:** Larisa Benson, Director of Performance Audit  
Chris Cortines, Principal Performance Auditor

**FROM:** Debbie Tarry, Assistant City Manager

**RE:** Local Government Performance Audit, Construction Change Order  
Pricing, Technical Review

**CC:** Julie Underwood, City Manager  
Mark Relph, Public Works Director  
Kirk McKinley, Transportation Services Manager  
Kris Overleese, Capital Projects Manager  
Patti Rader, Finance Manager

---

The City of Shoreline takes very seriously its responsibility to manage tax payer dollars as effectively and efficiently as possible. As such our staff makes every effort to follow best practices. The City of Shoreline followed the guidance provided by the Washington State Department of Transportation (WSDOT) Local Agency Guideline (LAG) manual in managing the audited architectural and engineering (A&E) contract. Managing contracts in accordance with the LAG manual is not only considered to be a best practice by Washington public agencies, it is mandated for projects that include Federal Highway Administration (FHWA) funds for transportation projects. The Aurora project continues to receive funding from FHWA. The following is an excerpt from the LAG manual: “This manual was published to provide local agencies with statewide policies and standards to follow when using Federal Highway Administration (FHWA) funds for transportation projects. Considerable effort has been made to provide guidance on how to accomplish the work and document the results...(April 2007)”

City staff works closely with WSDOT to confirm compliance with LAG requirements and industry best practices. The City of Shoreline recognizes the importance of continuous improvement and embraces opportunities to improve processes in partnership with WSDOT.

The City would like to thank the Auditor’s office for the opportunity to submit this response.



**Finance Division**  
808 W. Spokane Falls Blvd.  
Spokane, Washington 99201-3313  
(509) 625-6586

**Gavin J. Cooley**  
Chief Financial Officer

January 9, 2012

Larissa Benson  
Director of Performance Audit  
Washington State Auditor's Office  
P O Box 40022  
Olympia, WA 98504-0022

Dear Ms. Benson,

The City of Spokane would like to take this opportunity to thank the Washington State Auditor's Office for their audit and review of Local Government Change Order Pricing and the resulting objective analysis of the efficiency and effectiveness of the policies and operations of local governments.

The proper development and award of construction change order requests is a key stewardship function. We are therefore proud that the State Auditors' Office recognized in this report that the City of Spokane effectively utilized the following best practices:

- Establishing the basis for pricing
- Allowing contractors to price change orders on a "per-unit" basis only if those unit prices are based on recent, similar work.
- Requiring contractors to submit written change-order proposals.
- Reviewing change order prices that contractors submit.

We note that, of the 8 audited entities in Exhibit 3, Leading Practices in Place by City and County, the City of Spokane was the only local government able to answer "Yes" to all applicable best practices. We feel that is indicative of the exceptional job that our construction management team provides on behalf of our community and taxpayers.

Additionally, with regard to other suggestions, the City's construction management team offers the following:

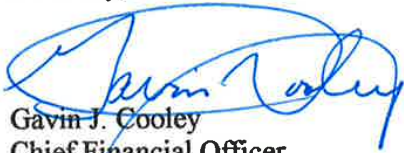
- The best opportunity for SAO to get their recommended practices implemented would be through convincing WSDOT to revise their practices and specifications. We believe every local agency in this state uses WSDOT standard specifications as their framework for local projects. This is required for federal and state funded projects. To be consistent, we use it for local projects as well.
- The SAO recommended implementation of differing practices, differing overhead rates, etc. on locally funded projects. This would not only be difficult and time consuming to manage, but would add conflict to change order negotiations. Contractors anticipate consistent treatment contract to contract. This is a reasonable expectation. We

- respectfully disagree with this suggestion by SAO. Also, it would be unnecessary if SAO succeeded in getting WSDOT to modify their practices.
- In actual practice, the suggestion to limit wages to prevailing wages may not allow Contractors to retain their most trusted employees. To not provide some latitude above prevailing wages does not allow them flexibility to build a consistent team that will provide consistently good results. Quality contractors pay to retain their key talent. Local agencies would ultimately suffer from this restriction. We would, however, agree with some reasonable limitation on compensation for labor above prevailing wage.
- SAO notes that the City of Spokane does not have any established policy for review of change orders'. While we have not created our own written policy, we do use WSDOT's published guidance provided in their many manuals. The WSDOT Construction manual has very good guidance in methodology for managing most construction issues that occur, including change order review.

We acknowledge additional tips and suggestions provided to add to our current practices; and, we welcome the knowledge sharing that these exercises provide.

The City appreciates the State Auditors Office's efforts to provide this valuable information to our citizens, and to assist us in our continuous improvement efforts.

Sincerely,



Gavin J. Cooley  
Chief Financial Officer



COUNTY COMMISSIONERS

Cathy Wolfe  
District One

Sandra Romero  
District Two

Karen Valenzuela  
District Three

---

**BOARD OF COUNTY COMMISSIONERS**

---

December 28, 2011

Ms. Larisa Benson  
Director of Performance Audit  
Washington State Auditor's Office  
PO Box 40022  
Olympia WA 98504-0022

Dear Ms. Benson:

Thurston County is pleased to be one of eight jurisdictions, and the only county in Washington State selected for the Local Government Performance Audit on Construction Change Order Pricing conducted by the Washington State Auditor's Office. The report developed by your staff will be very useful to us as we continue to improve our policies and procedures in our commitment to safeguard the investment of taxpayers.

We appreciate receiving audit results indicating that of nearly \$1 million in change orders for the Bald Hill Road project, Thurston County paid \$197 more than necessary (or 2/100ths of a percent of the cost of audited change orders). We believe this outcome demonstrates the county is using the most leading practices to ensure costs are managed in compliance with state and federal standards.

The Washington State Department of Transportation (WSDOT) Standard Specifications break a project down into detailed costs for each item of work. We believe it is important to note the specifications do not further delineate the work into categories of material, labor or equipment. Doing so would require a change to the Division 1 General Requirements of WSDOT Standard Specifications, which is an action local agencies are not allowed to take. Another significant factor is that counties are required to follow the Local Agency Guidelines Manual requiring a detailed, independent cost justification to substantiate a contractor's proposal for change orders.

We hope you will continue to recognize controlling project costs can be more complex than reviewing change orders for labor, materials and equipment. Unforeseen conditions such as soils, utility conflicts, weather, a contractor's experience level, and many other obstacles can occur daily on site. WSDOT acknowledges these obstacles by the use of unit pricing, understanding that road projects will vary from the estimated materials bid item and actual quantities used. Accordingly, WSDOT does not require change orders until a 25% threshold change has occurred.

Building # 1, Room 269, 2000 Lakeridge Drive SW, Olympia, Washington 98502-6045 (360) 786-5440  
TDD (360) 754-2933

With that in mind, Thurston County would support the formation of an expert panel including representatives from your Office and WSDOT's Division for Local Programs to review construction change order pricing.

The Engineering Standards Team in our Public Works Department is charged with reviewing the audit recommendations and implementing process improvement changes. Our goal is to continue to reduce the number of change orders and improve our control of costs. We will make this one of our annual performance standards reported to the Board of County Commissioners.

Thank you for the professionalism demonstrated by the Washington State Auditor's Office in conducting this review.

Sincerely,



Donald D. Krupp  
County Manager

Cc: Lester Olson, Director of Public Works

# APPENDIX A: INITIATIVE 900

Initiative 900, approved by Washington voters in 2005 and enacted into state law in 2006, authorized the State Auditor’s Office to conduct independent, comprehensive performance audits of state and local governments. The law directs the Auditor’s Office to “review and analyze the economy, efficiency, and effectiveness of the policies, management, fiscal affairs, and operations of state and local governments, agencies, programs, and accounts.” Performance audits are to be conducted according to U.S. General Accountability Office government auditing standards. The law identifies nine elements that are to be considered within the scope of each performance audit. The State Auditor’s Office evaluates the relevance of all nine elements to each audit. The table below indicates which elements are addressed in the Construction Change Order Pricing audit.

I-900 Element	Addressed in Audit
1. Identification of cost savings (or the potential for savings)	<b>Yes.</b> The audit identifies examples of local governments paying more than necessary for work performed through change orders and identifies strategies to help all local governments minimize costs.
2. Identification of services that can be reduced or eliminated	<b>No.</b> This audit assessed whether seven cities and one county followed leading practices to control change order costs and recommends that cities and counties either maintain or increase these practices.
3. Identification of programs or services that can be transferred to the private sector	<b>No.</b> Some local governments use private architectural and engineering firms to review change orders on their behalf, but the audit does not recommend reducing or expanding these services.
4. Analysis of gaps or overlaps in programs or services and recommendations to correct gaps or overlaps	<b>Yes.</b> The audit identifies leading practices to hold down the cost of labor, materials and markups on change orders. All of the local governments used at some of these practices, but none was using all of them when we conducted the audit.
5. Feasibility of pooling information technology systems within the department	<b>No.</b> The leading practices we identified do not require the pooling of information technology systems.
6. Analysis of the roles and functions of the department, and recommendations to change or eliminate departmental roles or functions	<b>Yes.</b> We recommend that local government project managers not rely solely on their A&E firms to review change orders but should spot-check those reviews to ensure they receive quality services from those firms.
7. Recommendations for statutory or regulatory changes that may be necessary for the department to properly carry out its functions	<b>Yes.</b> The audit recommends that all local governments establish policies and contract conditions that incorporate leading practices for controlling the pricing of labor, materials, equipment and markups on change orders.
8. Analysis of departmental performance data, performance measures, and self-assessment systems	<b>Yes.</b> The audit looked at how effectively each of the seven cities and one county were scrutinizing and assessing the pricing of labor, materials and markups on selected change orders.
9. Identification of best practices	<b>Yes.</b> The audit identified leading practices that all local governments can use to control change order pricing.

# APPENDIX B: METHODOLOGY

---

To understand each government's practices for controlling the pricing of change orders, we reviewed prior audits of construction and architectural contracts, bids and change orders. We interviewed construction project managers who were responsible for construction and A&E contracts, and for review and approval of change orders .

Next, we identified leading practices for construction change order management local governments could use to control the pricing on change orders and amendments for construction and A&E contracts. We examined contract terms, policies and practices used by various state and local governments, including those that participated in this audit. We also spoke with subject matter experts in change order management. These included the strategic cost estimator for a major computer chip manufacture with a significant capital budget and professional consultants, each with years of expertise in all phases of construction.

**Appendix C** lists the sources we reviewed and the subject matter experts we interviewed regarding leading practices.

Finally, we examined whether and how effectively the audited cities and county used the leading practices. We reviewed up to nine change orders at each municipality and compared the prices paid for labor, materials and equipment, and markups to our benchmarks. Complete, detailed pricing information was lacking for some change orders , so we focused on larger change orders for which relatively detailed prices were available.

We audited contracts for activities such as building construction, road improvements and sewer system upgrades, in which the local governments used a variety of procedures to oversee change orders. We verified local officials' assertions that specific policies and practices were in place .

To measure the potential savings when local governments did not employ leading practices, we calculated the amount they might have saved by comparing the prices they paid for change-order work to the pricing benchmarks we identified.

# APPENDIX C: CRITERIA

---

## A. Leading practices used in this audit and the sources that identified them

We interviewed subject matter experts on leading practices for controlling change order costs and reviewed articles and publications written by subject matter experts and organizations familiar with managing change orders. We also examined procurement and construction guidelines published by state and federal agencies, prior performance audits performed in part by subject matter experts. These leading practices and the sources we identified are shown below.

**1. Establish in the original contract the basis to be used in pricing change orders.** Construction contracts are awarded through a competitive bidding process, where the reasonableness of bid prices is established. **A&E contracts are awarded based on which firm has submitted the best statement of qualifications.** Because contract change orders are not based on competition via price or qualifications, it is important to take steps to ensure that the change order pricing will be fair and reasonable so that the contracting entity does not pay more than necessary. This includes:

- a. **Establish how change order work will be priced.** For construction contracts, that includes tying unit pricing for additional work, when appropriate, to the unit pricing in the original contract for similar, recent work, or setting upfront prices and rates for labor, materials, equipment, and markups for overhead and profit. For A&E contracts, that includes labor rate increases for multi-year contracts and markup rates for overhead and profit.

Subject-matter experts and others cite such sources as original contract prices, schedules of rates or values, prevailing wage rates, invoices, and price indices as the basis for pre-establishing the prices or rates that will be paid for change order work.

### Sources:

- **“General Conditions for Washington State Facility Construction”** published by the Washington State Department of General Administration. Part 7.02 B.7 Available: <http://www.ga.wa.gov/EAS/EA-References/GENCO697.pdf>
- **“Proactive Change Order Management.”** Written by Frank Kettlewell and published in 2003 by the Association for the Advancement of Cost Engineering. Pages 16.1 and 16.3. Available: <http://www.consultingalliance.net/cdr16.pdf>
- **“Best Practice from the Delaware Chapter of the Associated Builders and Contractors Partnering Committee (A Joint Committee of Facility Owners, Contractors and Architects and Engineers) – Prevailing Wage Rate Construction Change Orders.”** Published in June 2006. Source: [http://www.abcdelaware.com/Industry\\_Best\\_Practices.aspx](http://www.abcdelaware.com/Industry_Best_Practices.aspx)
- **“Standard Specifications for Road, Bridge, and Municipal Construction.”** Section 1-09.6, Page 1-95. Published by the Washington State Department of Transportation. Available: <http://www.wsdot.wa.gov/publications/manuals/fulltext/M41-10/SS2010.pdf>
- **“Local Agency Guidelines.”** Published by the Washington State Department of Transportation. Chapter 31.3.31, 31.3.32.3, 31.3.32.4, and Appendix 31.99 Local Agency Standard Consultant Agreement. Available: <http://www.wsdot.wa.gov/publications/manuals/fulltext/M36-63/LAGManual.pdf>
- **“Performance Audit – Mid-Columbia Public Utility Districts – Report No. 1003384.”** Published by the Washington State Auditor’s Office in May 2010. Criteria at page 166. Available: <http://www.sao.wa.gov/AuditReports/AuditReportFiles/ar1003384.pdf>



- **“Construction Phase Cost Management.”** Written by Scott Cullen and published in January 2011 by the Whole Building Design Guide, a program of the National Institute of Building Sciences. Available: [http://www.wbdg.org/resources/construct\\_cost.php](http://www.wbdg.org/resources/construct_cost.php)
- **“Proactive Change Order Management.”** Written by Frank Kettlewell and published in 2003 by the Association for the Advancement of Cost Engineering. Pages 16.1 and 16.3. Available: <http://www.consultingalliance.net/cdr16.pdf>
- **Interviews with subject matter experts.**
- **“Best Practices from the Delaware Chapter of the Associated Builders and Contractors Partnering Committee (A Joint Committee of Facility Owners, Contractors and Architects and Engineers) – Prevailing Wage Rate Construction Change Orders.”** Published in June 2006. Available: [http://www.abcdelaware.com/Industry\\_Best\\_Practices.aspx](http://www.abcdelaware.com/Industry_Best_Practices.aspx)
- Interviews with the **Strategic Cost Estimator for a major chip manufacturer, Plan B Consultancy, and the Claims and Disputes Manager for the Washington State Department of General Administration.**

b. **Accept unit pricing for change orders only when it’s appropriate.**

**Sources:**

- **“General Conditions for Washington State Facility Construction”** published by the Washington State Department of General Administration. Parts; 7.02 A.4, 7.02 B.1, and 7.02.B.7. Available: <http://www.ga.wa.gov/EAS/EA-References/GENCO697.pdf>
- **“Construction Phase Cost Management.”** Written by Scott Cullen and published in January 2011 by the Whole Building Design Guide, a program of the National Institute of Building Sciences. Available: [http://www.wbdg.org/resources/construct\\_cost.php](http://www.wbdg.org/resources/construct_cost.php)
- **“Proactive Change Order Management.”** Written by Frank Kettlewell and published in 2003 by the Association for the Advancement of Cost Engineering. Page 16.3. Available: <http://www.consultingalliance.net/cdr16.pdf>
- **“A Guide to the WSDOT Construction Change Order Process.”** Section F, page 15. Published by the Washington State Department of Transportation. Available: <http://www.wsdot.wa.gov/biz/construction/pdf/guidetochangeorderprocess.pdf>
- **“Performance Audit – Mid-Columbia Public Utility Districts – Report 1003384.”** Published by the Washington State auditor’s Office in May 2010. Criteria at page 166. Available: <http://www.sao.wa.gov/AuditReports/AuditReportFiles/ar1003384.pdf>
- **“Proactive Change Order Management.”** Written by Frank Kettlewell and published in 2003 by the Association for the Advancement of Cost Engineering. Page 16.2. Available: <http://www.consultingalliance.net/cdr16.pdf>
- Interviews with the **Strategic Cost Estimator for a major chip manufacture, Plan B Consultancy, and the Claims and Disputes Manager for the Washington State Department of General Administration.**

- c. **Perform detailed reviews of contract change order costs proposed by firms and contractors.** This includes comparing change order prices against the original contract prices, or to the schedules of rates or values, vendor invoices, price indices, or other sources that are established by contract. Such reviews help ensure the additional charges are reasonable and conform to the contract conditions. Most sources call for developing an independent cost estimate to evaluate the reasonableness of the firm's or contractor's proposal. When prices are pre-established, these estimates can focus on the quantities contained in the firm's or contractor's proposal.

**Sources:**

- **“Construction Phase Cost Management.”** Written by Scott Cullen and published in January 2011 by the Whole Building Design Guide, a program of the National Institute of Building Sciences. Available: [http://www.wbdg.org/resources/construct\\_cost.php](http://www.wbdg.org/resources/construct_cost.php)
  - **“Performance Audit – Washington State Department of Transportation – Highway Maintenance and Construction Management – Report 1000009.”** Published by the Washington State Auditor's Office in January 2008. Page 181. Available: <http://www.sao.wa.gov/auditreports/auditreportfiles/ar1000009.pdf>
  - **“Performance Audit – Mid-Columbia Public Utility Districts – Report No. 1003384.”** Published by the Washington State Auditor's Office in May 2010. Criteria at page 166. Available: <http://www.sao.wa.gov/AuditReports/AuditReportFiles/ar1003384.pdf>
  - **“Federal Transit Administration's Frequently Asked Questions: Third Party Procurement: Change Orders.”** Answer to Sixth Question. Available: [http://www.fta.dot.gov/funding/thirdpartyprocurement/grants\\_financing\\_6039.html](http://www.fta.dot.gov/funding/thirdpartyprocurement/grants_financing_6039.html) and [http://www.fta.dot.gov/funding/thirdpartyprocurement/faq/grants\\_financing\\_6093.html](http://www.fta.dot.gov/funding/thirdpartyprocurement/faq/grants_financing_6093.html)
  - Interviews with the **Strategic Cost Estimator for a major chip manufacture, Plan B Consultancy, and the Claims and Disputes Manager for the Washington State Department of General Administration.**
- d. **Spot-check the quality of scrutiny provided by A&E firms** that perform construction oversight to make sure detailed pricing information is obtained and the local government is not paying too much for labor, materials, equipment and markups.

**Sources:**

- **“Performance Audit – Seattle Public Schools Construction Management – Report No. 1004710.”** Recommendation No. 3 and 10, Pages 26 and 27. Published by Washington State Auditor's Office in February 2011. Available: <http://www.sao.wa.gov/auditreports/auditreportfiles/ar1004710.pdf>
- **“Washington State Administrative and Accounting Manual.”** Published by the Washington State Office of Financial Management. Section 15.40.55.a – Proactively Manage and Monitor. Section 15.40.55.b – Managing the Contract. Available: <http://www.ofm.wa.gov/policy/15.40.htm>

## B. Sources used to establish pricing benchmarks

Our pricing benchmarks we used for A&E contracts were from the following sources:

- **Local Agency Guidelines**, Section 31.3.31. Item 4.g. Published by the Washington State Department of Transportation in April 2011. Available: <http://www.wsdot.wa.gov/publications/manuals/fulltext/M36-63/LAGManual.pdf>
- **Average Audited Overhead Rates in Washington State** from 2007 through 2010 as provided by the Washington State Department of Transportation.
- **“Performance Audit – Mid-Columbia Public Utility Districts – Report 1003384.”** Published by the Washington State auditor’s Office in May 2010. Criteria at page 166. Available: <http://www.sao.wa.gov/AuditReports/AuditReportFiles/ar1003384.pdf>
- **Guideline on the Briefing and Engagements for Consulting Engineering Services.** Published by Association for The Association of Consulting Engineers NZ and The Institution of Professional Engineers NZ in January 2004. Section 6.4. Available: [http://www.ipenz.org.nz/ipenz/practicesupport/endorsedinfo/BE\\_Guideline.pdf](http://www.ipenz.org.nz/ipenz/practicesupport/endorsedinfo/BE_Guideline.pdf)
- **How to Use the Producer Price Index for Contract Escalation.** Published by the U.S. Department of Labor - Bureau of Labor Statistics. Available: <http://www.bls.gov/ppi/ppiescal.pdf>
- Surveys of architectural and engineering firms as conducted by **PSMJ Resources, Inc.**

The pricing benchmarks we identified for construction contracts were based on our review of other performance audits and specific contracts, general conditions and policies at the following state agencies and local governments:

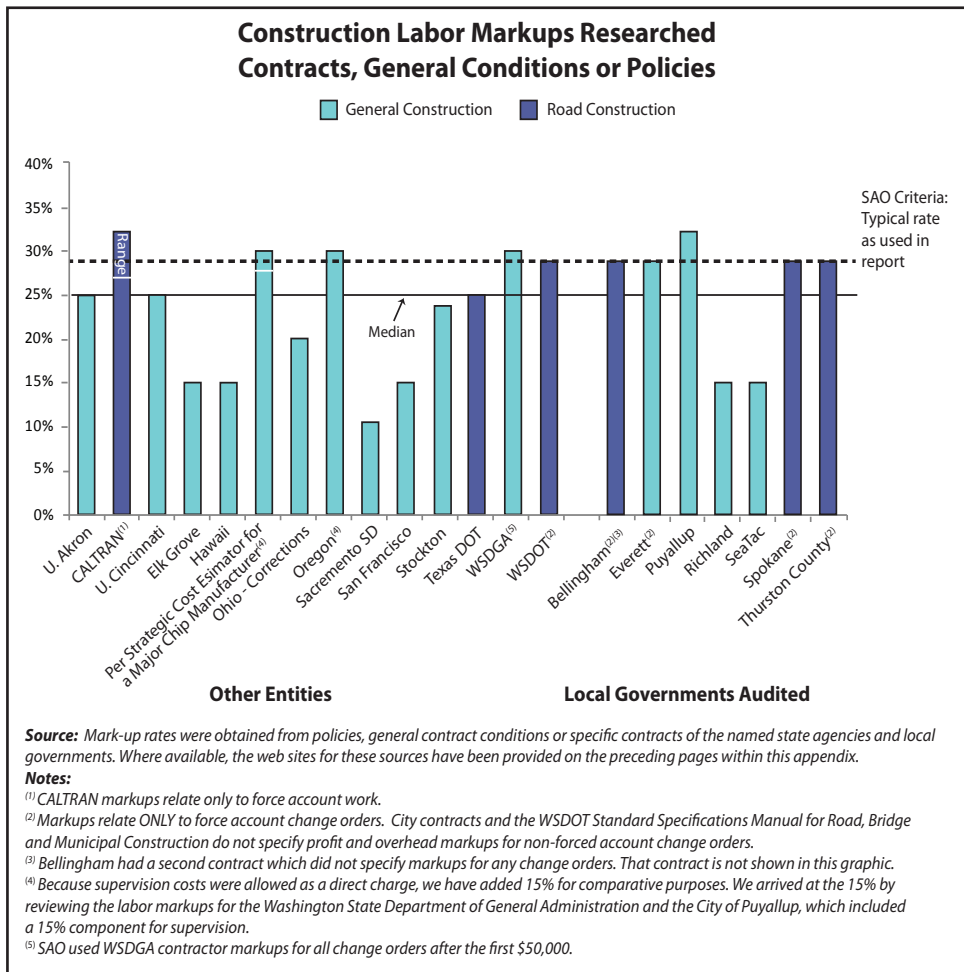
- **Standard Specifications for Road, Bridge and Municipal Construction.** Published in 2010 by the Washington State Department of Transportation. Available: <http://www.wsdot.wa.gov/publications/manuals/fulltext/M41-10/SS2010.pdf>
- **Washington Department of General Administration**, General Conditions for Washington State Facility Construction. Available: <http://www.ga.wa.gov/EAS/EA-References/GENCO697.pdf>
- **State of Oregon** – General Conditions for Public Improvement Contracts. Available: [http://procurement.oregon.gov/DAS/SSD/SPO/docs/procurement/DAS\\_General\\_Conditions\\_1\\_1\\_2010.pdf?ga=t](http://procurement.oregon.gov/DAS/SSD/SPO/docs/procurement/DAS_General_Conditions_1_1_2010.pdf?ga=t)
- **University of Akron** - Form: Change Order Estimate Summary. Available: <http://www3.uakron.edu/caplan/contractorforms/CP11.pdf>
- **Ohio Department of Corrections and Rehabilitation** – Change Order Procedures and Pricing Guidelines.
- **State of Hawaii** – General Conditions. Public Works Division Department of Accounting and General Services. Available: [http://hawaii.gov/pwd/Members/qc/gen\\_cond\\_constr/InterimGeneralConditions1999Edition.pdf](http://hawaii.gov/pwd/Members/qc/gen_cond_constr/InterimGeneralConditions1999Edition.pdf)
- **City of Elk Grove, California** – Standard Construction Specifications. Available: <http://www.egpublicworks.org/standard-construction-specifications.asp>
- **Sacramento City Unified School District** – General Conditions for Contract of Construction. Available: <http://www.scusd.edu/ContractsOffice/Documents/GeneralConditions,revised4-25-06.pdf>

- **City of Stockton, California** – Modification Procedures.
- **University of Cincinnati** – Change Order Instructions. Available: <http://www.uc.edu/architect/documents/forms/external/Change%20Order.pdf>
- **City and County of San Francisco General Conditions**. Available: <http://www.sfdpw.org/Modules/ShowDocument.aspx?documentid=242>
- Contracts or other sources for markups used by the **Texas and California transportation departments**. Available: [http://www.fhwa.dot.gov/ipd/p3/tools\\_programs/sep15\\_txtoll\\_application\\_13.htm](http://www.fhwa.dot.gov/ipd/p3/tools_programs/sep15_txtoll_application_13.htm) and <http://www.dot.ca.gov/hq/construc/cpb/CPB08-6.pdf>
- **“Performance Audit – Washington State Department of Transportation – Highway Maintenance and Construction Management – Report 1000009.”** Published by the Washington State Auditor’s Office in January 2008. Page 181. Available: <http://www.sao.wa.gov/auditreports/auditreportfiles/ar1000009.pdf>
- **“Performance Audit – Mid-Columbia Public Utility Districts – Report 1003384.”** Published by the Washington State auditor’s Office in May 2010. Criteria at page 166. Available: <http://www.sao.wa.gov/AuditReports/AuditReportFiles/ar1003384.pdf>
- **“Performance Audit - King County Rural Library System Construction Management”** – Report No. 1001408. Finding No. 6, page 34. Published by the Washington State Auditor’s Office in May 2009. Available: <http://www.sao.wa.gov/auditreports/auditreportfiles/ar1001408.pdf>

**The charts that follow show the typical profit and overhead rates we identified for construction contracts.**

These rates were obtained from policies, general contract conditions or specific contracts of the agencies and local governments shown below. Because we did not audit a construction contract at the City of Shoreline, it is not shown in the charts below. The typical markup rates were used to determine the amount of potential savings cited in this report. All local governments can use these charts to assess whether the markups they pay exceed the more typical rates we identified.

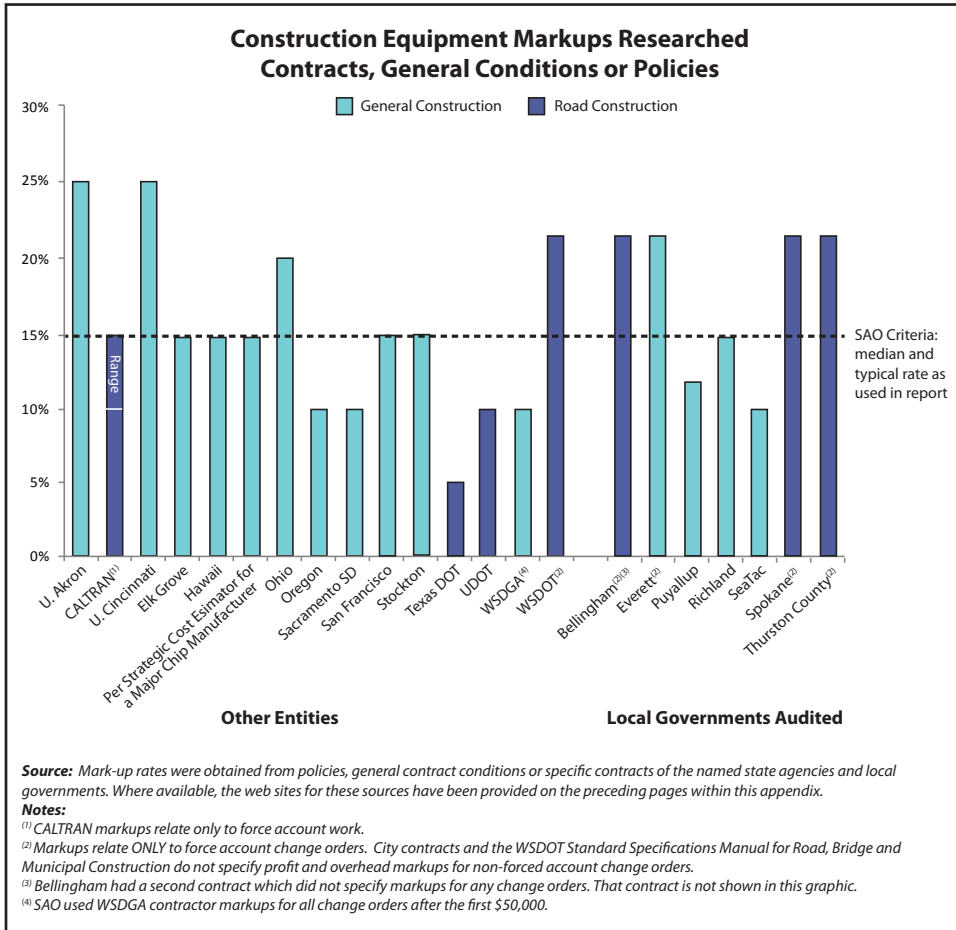
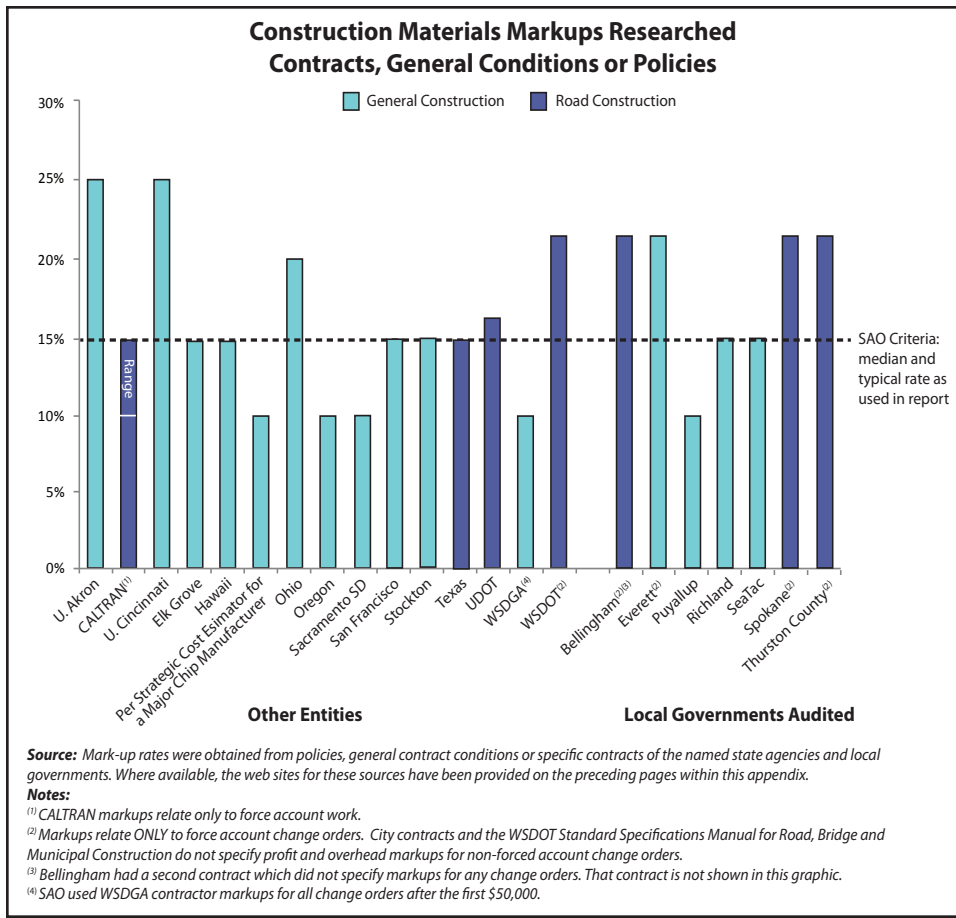
With one exception, the typical markup rate equals the average markup rate for those agencies and local governments shown below. During the audit, one local government voiced concern about the use of the prevailing wage rate as a pricing benchmark for labor charges since some contractors may pay higher wages. We have addressed this concern in two ways. Immediately below **Exhibit 2**, we describe an alternative pricing benchmark used by the Washington State Department of General Administration. We have also set the typical markup rate for labor to the rate used by the Washington State Department of Transportation, which is slightly higher than the average markup rate we identified.

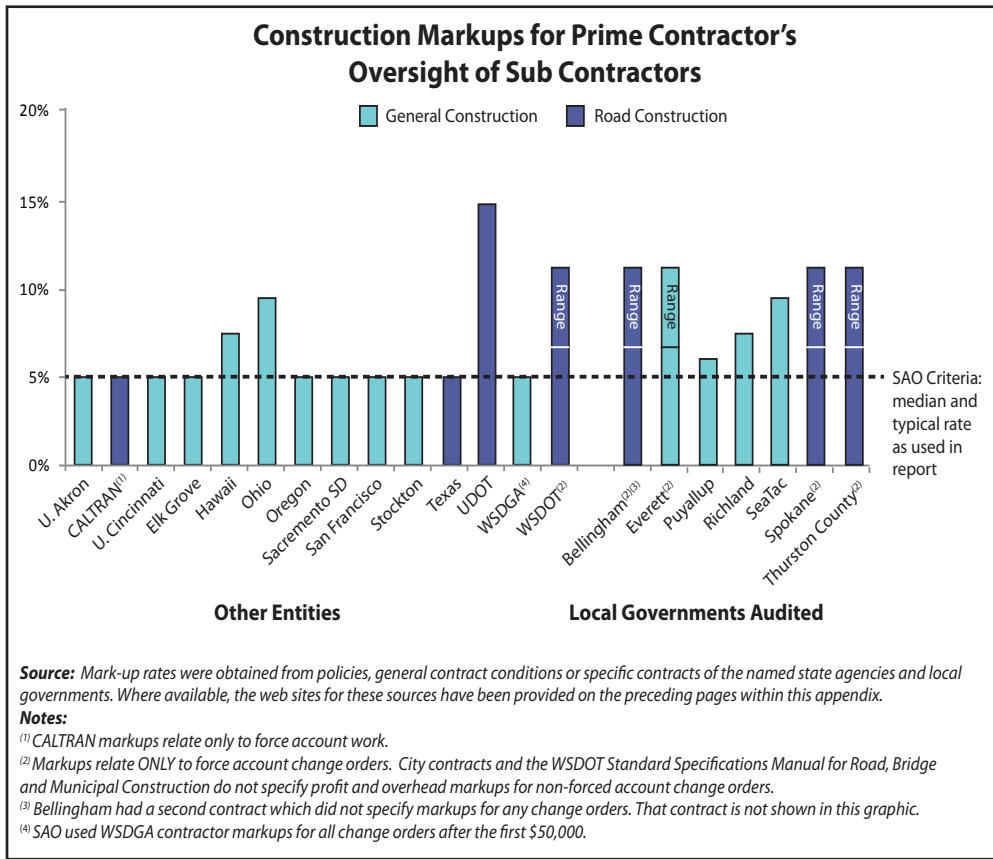


**Source:** Mark-up rates were obtained from policies, general contract conditions or specific contracts of the named state agencies and local governments. Where available, the web sites for these sources have been provided on the preceding pages within this appendix.

**Notes:**

- <sup>(1)</sup> CALTRAN markups relate only to force account work.
- <sup>(2)</sup> Markups relate ONLY to force account change orders. City contracts and the WSDOT Standard Specifications Manual for Road, Bridge and Municipal Construction do not specify profit and overhead markups for non-forced account change orders.
- <sup>(3)</sup> Bellingham had a second contract which did not specify markups for any change orders. That contract is not shown in this graphic.
- <sup>(4)</sup> Because supervision costs were allowed as a direct charge, we have added 15% for comparative purposes. We arrived at the 15% by reviewing the labor markups for the Washington State Department of General Administration and the City of Puyallup, which included a 15% component for supervision.
- <sup>(5)</sup> SAO used WSDGA contractor markups for all change orders after the first \$50,000.





# APPENDIX D: GLOSSARY

---

**Architectural and engineering (A&E) services.** Professional services rendered by any person, other than an employee of the agency, contracting to perform activities within the scope of the general definition of professional practice in RCW chapters 18.08, 18.43 or 18.96. In this audit, A&E services consisted of designing the project specifications used to issue bid solicitations, or managing the construction contract/contractor on behalf of the city or county (typically referred to as construction management or construction oversight services).

**Business & Occupations (B&O) tax.** A gross receipts tax levied by the state of Washington based on the value of products, gross proceeds of sale or gross income of the business.

**Change order.** A modification of the original contract that becomes part of the overall contract. Change orders may increase or decrease the sum of the original contract. Change orders may increase, decrease or modify the nature and timing of the work; change the quantity or type of materials used; and, in some instances, change the prices charged for labor and materials.

**Force account work.** Work ordered by the owner without prior agreement with the contractor. In these situations, the local government reimburses the contractor on an agreed time-and-materials basis, plus markups for profit and overhead. This approach is typically used when work can't be easily or accurately estimated or under emergency conditions. In its Construction Manual, the State Department of Transportation indicates that force account change orders should be a last resort, used only if the work cannot be clearly defined. In contrast, routine change orders establish an up-front agreement on the work to be performed and its cost. Because it is on a reimbursement basis, it is important for local governments to closely manage contractor work performed by force account. The Transportation Department's Construction Manual identifies routine change orders as the best option for controlling the cost of change orders.

**General Contractor/Construction Manager (GCCM) model.** A management model in which the project owner selects an architect/engineer to design the project and separately selects a GCCM to participate in the design process and to serve as the general contractor. The GCCM assumes the risk for completing the construction project at a guaranteed price and helps the owner evaluate costs, project schedules and implications of alternative designs, systems and materials during and after the design process. GCCMs are selected based on qualifications and experience, and the project price they cite in their proposals. Contracts that use this approach are referred to as **GCCM contracts**.



# APPENDIX E: TRANSPORTATION DEPT. MARKUPS

The State Department of Transportation's *Standard Specifications Manual for Road, Bridge and Municipal Construction* identifies markup rates for force account change orders. In this audit, we observed that some cities and counties automatically use this source to guide markups for all change orders, including those that are not force account work or are not funded by the Department.

The *Standard Specifications Manual* contains the following discussion:

## 1-09.6 Force Account

...The amount to be paid shall be determined as described in this section.

**1. For Labor...***In addition to compensation for direct labor costs defined above, the Contracting Agency will pay Contractor 29-percent of the sum of the costs calculated for labor reimbursement to cover project overhead, general company overhead, profit, bonding, insurance ..., Business & Occupation tax, and any other costs incurred. This amount will include any costs of safety training and health tests, but will not include such costs for unique force account Work that is different from typical Work and which could not have been anticipated at time of Bid.*

**2. For Materials...***In addition to compensation for direct materials cost, the Contracting Agency will pay the Contractor 21-percent of the sum of the costs calculated for materials reimbursement to cover project overhead, general company overhead, profit, bonding, insurance..., Business & Occupation tax, and any other costs incurred.*

**3. For Equipment...***The Contracting Agency will add 21 percent to equipment costs to cover project overhead, general company overhead, profit, bonding, insurance, required by Section 1-07.10 and 1-07.18, Business & Occupation tax, and any other costs incurred. This markup will be over and above those equipment costs and will not be adjusted for any equipment overhead amounts included in the Blue Book rates. Copies of the AGC/WSDOT Equipment Rental Agreement will be maintained on the Contracting Agency's web site at [www.wsdot.wa.gov](http://www.wsdot.wa.gov).*

**For Contractor Markup on Subcontractor's work:** *When Work is performed on a force account basis by one or more approved Subcontractors, by lower-tier subcontractors or suppliers, or through invoice by firm(s) acting in the manner of a Subcontractor, the Contractor will be allowed an additional markup ... to compensate for all administrative costs, including project overhead, general company overhead, profit, bonding, insurance ..., Business & Occupation tax, and any other costs incurred.*

*Markups on Work Performed by Subcontractor(s):*

*(1) On amounts paid for Work performed by each Subcontractor on each force account ... up to \$25,000 12 percent (2) On amounts greater than \$25,000 up to \$100,000 10 percent (3) On amounts greater than \$100,000 7 percent...*

Department engineers said the markups identified in the Standard Specifications Manual are required **only** for change orders done by force account, which is typically performed under emergency-like conditions or cannot be easily estimated. The work is ordered by the owner, who reimburses the contractor for ALL costs associated with the work on a time and materials basis, plus markups for profit and overhead. The Department's "Construction Manual" indicates that force account change orders should be a last resort used only if the work cannot be clearly defined. In contrast, routine change orders establish an up-front agreement on the work to be performed and the cost of that work. Transportation identifies routine change orders as the best option for controlling the price of change orders. Except for the markups on labor, its markups for force account work are more generous than the typical markups we identified for change orders. In fact, the Department indicates in its "Guide to the WSDOT Construction Change Order Process" that "use of Force Account markups for overhead and profits should not be automatic. These markups may not be appropriate for [all] change work." It states in its Standard Specifications Manual that for change order work that is not performed by force account or is not based on unit prices, local governments may use "other agreed upon prices".

# APPENDIX F: DETAILED AUDIT RESULTS

---

## City of Bellingham

### Background

We reviewed larger change orders for two projects: a \$1.5 million building renovation and a \$5 million street improvement. In both cases, the change orders we reviewed represented more than 10 percent of the original contracts.

**Overall, the City followed or partly followed most leading practices for the contracts and change orders we examined.** It hired outside experts to help ensure change orders were sufficiently detailed, fairly priced and consistent with one contract. For both contracts, the City consistently obtained change orders for all additional work. For one contract, the City pre-established pricing and rates for force account change orders and for unit-priced work that was similar to that contained in the original bid. That same contract also required the contractor to submit itemized change orders for force account work. Most change orders for one contract also were appropriately based on unit prices or were sufficiently itemized, and labor charges on change orders tested were at the prevailing wage rate.

The results of our review are described separately for each project below.

### Federal Building Renovation Project

The Federal Building renovation original contract price was \$1.5 million. Change orders totaled \$379,000. The change orders we reviewed were primarily for window repair and replacement and telecommunications.

City officials told us because they are less experienced in managing building construction projects, they contracted with A&E firms to oversee the contract and scrutinize change-order pricing. The City project engineer approved change orders based on the A&E firm's recommendations and supporting documentation.

We noted the City could improve its practices for controlling the price of change orders as follows:

**Establish labor rates, materials pricing and markups in the original contract for subsequent change orders.** The City incorporated language from the American Institute of Architects (AIA) A 201-1997 General Conditions in developing the initial contract. Contract terms call for "agreed upon" prices to be paid for labor, materials and equipment, and "reasonable" markup rates, but do not establish how change orders would be priced.

**Specify the level of scrutiny the City expected the A&E firm to provide over change order prices, and conduct periodic spot-checks of the A&E firm's work.** The City's contract with its A&E firm did not specify the level of scrutiny required. In addition, the City lacked records showing the firm had evaluated change order pricing, and staff did not spot-check the work of the A&E firm to ensure it had obtained the detailed information needed to provide the expected level of scrutiny.

**Obtain itemized change order proposals for additional work or materials.** The City did not obtain itemized change order proposals for \$275,000 of the \$303,000 in subcontractor charges for materials and labor. For about \$200,000 of these charges, the City mostly paid a competitive unit-price based on our review of three vendor price quotes. For the remaining \$75,000 in charges, neither the City nor our auditors could determine whether the prices paid were in line with typical rates we identified.

**Pay typical rates for markups on overhead and profit.** For the change order we reviewed, the City paid the prevailing wage rate for labor charges. However, it also paid the overhead and profit markup rates proposed by the contractor. For example, the City paid the \$450 in bonding and B&O taxes although these amounts typically are covered by common overhead rates. It also paid \$5,495 for the site superintendent’s direct labor, even though this cost typically already is paid for in markups on direct labor. Those rates and charges resulted in profit and overhead charges that were about \$40,000 higher than the more common markup rates we identified.

<b>Exhibit 6</b>				
<b>City of Bellingham</b>				
Federal Building Renovation, Change Orders No. 3, 5 and 6				
Type of expenses	Category total	Amount unable to audit <sup>(1*)</sup>	Amount audited	Potential savings
Labor	\$1,706	\$0	\$1,706	\$0
Materials, equipment and credits	\$916	\$0	\$0	\$0
Markups	\$56,516	\$0	\$56,516	\$40,167
Sub-contractor charges	\$303,067	\$74,555	\$199,426	\$0
<b>Total</b>	<b>\$362,205</b>	<b>\$74,555</b>	<b>\$257,648</b>	<b>\$40,167</b>
<i>Source: City change orders and contract files.</i>				
<b>Notes:</b>				
<i><sup>(1*)</sup> The change orders lacked detailed costs and prices for nearly \$75,000 in subcontractor charges for labor and materials. As a result we could not determine whether the City paid more than typical rates for these charges.</i>				

## Sunset Drive Project

The Sunset Drive Improvement Phase II project was for street improvements at an original contract price of \$5 million and change orders totaling \$722,000. After the project began, the City decided to replace additional water and sewer lines. We evaluated a nine-part change order totaling \$590,000 for a water main extension. We noted the City could improve controls over the price of change orders in four areas:

**Establish labor rates, materials pricing and markups for subsequent change orders.** The contract required unit prices from the original bid to be used to price change orders where more of the same work was being added. It also pre-established rates and prices for labor, materials and markups for force account change orders. However, it did not address the pricing of new materials or limit labor and markup rates for regular change orders.

**Allow unit pricing only when appropriate, and for other change orders obtain detailed cost information for labor, materials, equipment and overhead markups.** Almost \$495,000 of the contractor's proposed charges for the additional work used unit prices (cost per square foot), and did not separately detail the costs and pricing for labor and materials.

Leading practices say that unit pricing is appropriate when it is tied to prices in the original contract or to unit prices for similar, recently bid work. However, the unit prices the contractor submitted for most of this change order were for different work and were significantly higher than the prices specified in the original contract. For example, the combined pricing for labor and materials in one case was \$56 per square foot in the original contract versus \$91 in the change order, and in another case was \$29 per square foot versus \$285 in the change order. These differences would have been even greater, but the City reduced the price the contractor initially proposed for the additional line replacements. City engineers indicated the prices were higher because the additional work was more complicated. However, without detailed cost and pricing information about the work performed, neither the City nor our auditors could determine whether the amount the City paid was reasonable.

**Compare change order costs against vendor quotes, invoices, original contract prices, contractual caps or limits, benchmarks, or typical rates.** The contractor provided detailed pricing information for nearly \$76,000 in charges for this change order. However, as with the \$495,000 discussed above, the City lacked evidence to show it consistently reviewed that pricing to ensure it did not pay too much. The City lacks policies and guidance describing how project managers should review change order pricing.

**Pay typical rates for labor, and markups on overhead and profit.** Because the City established unit prices for the change order we examined, which combined all labor, materials, equipment costs and overhead and profit markups into a single rate (a price per square foot), the City and our auditors could not determine the total markups paid. For the nearly \$76,000 we reviewed, the City paid nearly \$16,000 in direct charges for bonds and insurance costs. These costs typically are included in the profit and overhead markups built-in to unit prices. The City also paid labor rates that were slightly higher than the prevailing wage and payroll taxes.

<b>Exhibit 7</b> <b>City of Bellingham</b> Sunset Drive Improvement, Change Order No. 1				
Type of expenses	Category total	Amount unable to audit	Amount audited	Potential savings
<b>Labor</b>	(1)	(1)	\$ 8,371	\$117
<b>Materials and equipment</b>	(1)	(1)	\$52,024	\$0
<b>Markups</b>	(1)	(1)	\$15,553	\$15,553
<b>Total</b>	<b>\$590,000</b>	<b>\$495,015</b>	<b>\$75,948</b>	<b>\$15,670</b>
<p><b>Source:</b> City change orders and contract files.</p> <p><b>Notes:</b></p> <p><sup>(1)</sup> Amounts could not be determined because the contractor submitted unit prices (e.g., cost per square foot) for almost \$495,000 of the additional work to be performed under the change order. The unit prices did not break out detailed costs and pricing for labor, materials and overhead. As a result, we could not break these costs down by category, and could not determine whether the City paid more than typical rates.</p>				

## City of Everett

### Background

At the City of Everett, we audited larger change orders for a \$1.5 million water filtration plant and water transmission line projects and a \$2.6 million sewer system replacement project. We selected these contracts because their change orders exceeded the original contract amounts by more than 10 percent.

**Overall, Everett followed or partly followed most leading practices** for the contracts and change orders we examined. Everett was the only local government we examined that had records showing it had negotiated the contractor's proposed change order amount down before agreeing to pay. The City pre-established pricing and rates for force account change orders and for unit-priced work that was similar to that contained in the original bid. Its construction contract also required the contractor to submit itemized change orders for force account work. The City obtained itemized costs for most of its construction change orders. Labor charges on the construction change orders we examined only minimally exceeded the prevailing wage rate. Increases in the A&E firm's labor rates only minimally exceeded the annual inflation rate for A&E services as shown in the Producer Price Index.

### Clearwell Water Project

Everett used an outside architectural and engineering firm to manage construction contracts for the Clearwell Water Filtration Plant and Water Transmission Lines, which had original contracts totaling \$1.5 million and change orders totaling \$3.9 million. The original A&E services were mostly for project planning, but the amendments were largely for project support and construction oversight. The City used a standard contract template for its professional services on the project.

Based on our review of this contract, we noted the City could improve its practices for controlling the price of change orders in the following areas:

**Require A&E contracts and change orders with detailed costs.** The contracts and change orders we examined combined hourly labor rates, overhead rates and profit. As a result, the contracts and change orders did not show whether the City was charged reasonable profit and overhead rates for the original contract or for the change orders.

**Establish labor escalation rates in the original contract.** The original contracts did not limit labor rate increases the A&E firms could charge on change orders or rates for mileage and overhead. The City's Principal Engineer said he considered a 5 percent annual salary increase to be reasonable.

**Pay reasonable and typical rates and prices and conduct detailed reviews to avoid overpaying.** The increases in some labor rates charged as part of the change orders we reviewed exceeded the City's expectation of 5 percent as well as the Producer Price Index. Holding labor rate increases to 5 percent would have reduced change order prices by \$21,546. Holding them to the Index would have reduced them by almost \$57,000. We also found the City paid \$2,593 in markups for administrative costs that exceeded the \$7.44 per hour allowed in the contract.

<b>Exhibit 8</b>				
<b>City of Everett</b>				
Clearwell No. 2 Project at Water Filtration Plant, Change Orders No. 1 and 2 and Replacement Water Transmission Lines 2 & 3, Change Order No. 4				
Type of expenses	Category total	Amount unable to audit <sup>(1)</sup>	Amount audited <sup>(1)</sup>	Potential savings
<b>Labor, profit and overhead</b>	\$2,579,795	\$0	\$1,605,991	\$21,546 - \$56,620
<b>Markups</b>	\$54,585	\$0	\$54,585	\$2,593
<b>Total</b>	<b>\$2,634,380</b>	<b>\$0</b>	<b>\$1,660,576</b>	<b>\$24,139</b> <b>-\$59,213</b>
<i>Source: City change orders and contract files.</i>				
<b>Notes:</b>				
<sup>(1)</sup> Hourly rates in the City's contract consisted of a combined rate for labor, profit and overhead, but the contract did not break out the three types of expenses. We were able to identify the escalation in these combined rates but could not evaluate the profit and overhead components to determine whether the City paid more than typical rates.				

## Sewer System Project

The original contract for the Sewer System F Replacement project was \$2.6 million. Change orders totaled \$386,000. City staff managed the construction contract. Change orders were for additional labor required because of delays in obtaining permits and unanticipated soil conditions. Additional labor, parts and materials were necessary because of design changes at one of the lift stations.

We noted the City could improve its practices for controlling the price of change orders as follows:

**Establish guidelines for evaluating change order prices, and require contractors to submit change order proposals with detailed pricing for labor, materials and markups.** The City did not require contractors to submit change order proposals with detailed pricing for labor, materials, equipment and markups. It does not have guidelines for evaluating change orders. The nature and extent of these evaluations were left to the discretion of each department. However, City staff stated they would request detailed cost information on lump-sum change order proposals if the proposals did not appear to be reasonable.

The contractor prepared rough descriptions of some labor and equipment charges for one change order we reviewed. Those descriptions were not always specific enough to determine whether the City paid more than typical pricing benchmarks. For two of the three work items we examined, the City developed its own general estimates of what costs should be under the change orders, and analyzed a breakout of costs obtained from the contractor before agreeing to pay them.

**Establish limits on labor rates, materials pricing and markups in the original contract for subsequent change orders.** The initial contract for this project required unit prices from the original bid to be used to price change orders where more of the same work was being added. It also pre-established rates and prices for labor and materials for force account change orders. However, it did not address the pricing of new materials or limit labor and markup rates for regular change orders.

The City also allowed contractors to charge the markups allowed by the State Department of Transportation for force account work, which is described more fully in **Appendix B**. This approach is typically used when work can't be easily or accurately estimated or under emergency-like conditions. Although the Department's Construction Manual indicates these markup rates can also be used for regular change orders, its *Guide to the Construction Change Order Process* cautions against doing so automatically. The Department's force account markup rates of 21 percent for materials and equipment, and 7 percent to 12 percent for oversight of subcontractors, are higher than typical markups of 15 percent and 5 percent, respectively. Those comparisons are shown in **Appendix D**.

**Pay typical rates and prices.** Contractor records showed that wages charged exceeded the prevailing wage plus payroll taxes by \$441. Had the City paid more typical mark-up rates for profit and overhead for this project, it would have paid about \$4,600 less.

Exhibit 9 City of Everett Sewer System Replacement "F" Project, Schedule A, Change Order 2, Item 61 - Change Order 3 - Items No. 67 and 68				
Labor	\$15,880	\$0	\$13,767	\$441
Materials and equipment	\$67,782	\$0	\$0	N/A
Labor and equipment	\$11,290	\$7,534	\$0	N/A
Markups	\$18,674	\$0	\$18,663	\$4,618
<b>Total</b>	<b>\$113,626</b>	<b>\$7,534</b>	<b>\$32,430</b>	<b>\$5,059</b>
<i>Source: City change orders and contract files.</i>				



## City of Puyallup

### Background

We reviewed the larger change orders for a \$32.1 million City Hall construction contract. We selected this project because change orders exceeded the original contract by \$1.7 million and because it was the only contract identified across the eight local governments we audited that used the General Contractor/Construction Management (GCCM) model:

### City Hall Construction project

This 2006-2008 contract was for construction of a new City Hall. The City relied on an A&E firm and a third-party construction management firm to review the pricing of change orders, which were mostly for tenant improvements and garage and elevator modifications.

**Overall, Puyallup used most of the leading practices we identified.** It was the only local government we examined that contractually required the construction contractor to submit proposed change orders with detailed costs and pricing. Puyallup also was one of the few municipalities whose construction contract limited the pricing of materials on all change orders. In addition, it hired outside experts to help ensure change orders were sufficiently detailed, fairly priced and consistent with the contract. Although we did not audit the contract and amendments for the construction management firm, we noted the City paid a reasonable overhead rate.

We noted the City could improve its practices for controlling change order pricing as follows:

**Establish limits on labor rates, materials pricing and markups in the original contract for subsequent change orders.** The City's contract specified the overhead markup rates to be paid for subsequent change order prices. Those rates allowed for a 32 percent overhead markup on labor and a six percent markup on subcontractor costs. The construction management firm said these markup rates were reasonable and similar to those used on other state projects. However, these rates were slightly higher than more typical rates we saw.

The contract allowed the firm to charge its actual labor costs because City officials thought they were obligated to pay the labor rates contractors paid. Consequently, the City paid the labor rates shown on certified payroll reports, which sometimes exceeded the prevailing wage rates.

**Specify the level of scrutiny the City expected the A&E firm to provide over change order prices, and conduct periodic spot-checks of the firm's work.** The contracts for the City's A&E and construction management firms did not specify the level of pricing scrutiny the City expected. Without that language, the City has less assurance that the firms will perform the work expected.

**Compare change order costs against vendor quotes, invoices, original contract prices, contractual caps or limits, benchmarks, or typical rates.** The A&E and construction management firms did not always obtain itemized change order proposals. When materials were charged on change orders, the City's contract with the GCCM contractor required an itemization and materials invoices that showed the quantity and cost of additional materials reasonable and necessary to perform the change in the work. However, two change orders lacked detailed costs and pricing for almost \$104,000. As a result, the City had no way of knowing whether it received good pricing for materials, labor and equipment.

**Pay reasonable and typical rates and prices.** If the City had paid more typical markup rates (29 percent for labor and five percent for subcontractor oversight), it would have paid about \$9,300 less.

The City also paid almost \$4,500 in overhead markups for performance bonds that ranged up to 2 percent of direct costs, even though the contract obligated the contractor to pay them. The City paid those charges without verifying that the contractor obtained the additional bonding. Moreover, had the City paid prevailing wages plus average payroll taxes, it would have paid about \$11,200 less.

<b>Exhibit 10</b>				
<b>City of Puyallup</b>				
City Hall Construction, Change Orders No. 1, 4, 5, 7, and 9 - 13				
Type of expenses	Category total	Amount unable to audit <sup>(1)</sup>	Amount audited	Potential savings <sup>(1)</sup>
<b>Labor</b>	\$112,594	\$45,410	\$ 38,831	\$11,215
<b>Materials</b>	\$142,220	\$0	\$49,485	\$0
<b>Bonds</b>	\$4,490	\$0	\$4,490	\$4,490
<b>Equipment and other costs</b>	\$150,532	\$58,357	\$0	\$0
<b>Other markups</b>	\$ 87,618	\$0	\$8 7,618	\$9,327
<b>Total</b>	<b>\$497,454</b>	<b>\$103,767</b>	<b>\$180,424</b>	<b>\$ 25,032</b>
<b>Source:</b> City change orders and contract files.				
<b>Notes:</b>				
<sup>(1)</sup> Because the change orders lacked detailed costs and pricing for \$103,767 in charges, we could not determine whether the City had paid more than typical prices or rates for these charges.				

## City of Richland

### Background

We reviewed one change order for a \$9.6 million contract for the City Library. We selected this project because the total cost of change orders exceeded the original contract amount by more than 10 percent.

### City Library Construction project

The City Library was built in 2008 and 2009. The City relied on an A&E firm and a third-party construction contract manager to review the pricing of change orders. The change order we reviewed included 23 amendments totaling \$411,345 for materials, labor and equipment charges for a voice and sound system, street lights, tree removal and other items.

**Overall, Richland followed or partly followed most leading practices** for the contract and change orders we examined. Richland was the only city with a policy that required detailed supporting cost documentation for all contractor change orders, and a detailed review of that cost documentation. Richland was one of two municipalities that contractually required contractors to submit change orders with detailed costs and prices, which is critical to effectively review change order pricing. It also hired outside experts to help ensure change orders were sufficiently detailed, fairly priced and consistent with the contract. Richland's contract pre-established profit and overhead markups for change orders. In addition, it hired outside experts to review the pricing of change orders.

We noted the City could improve its controls over change order pricing as following:

**Establish limits on labor rates, materials pricing, and markups in the original contract for subsequent change orders.** Although the City's contract pre-established profit and overhead markups for change orders, it did not identify what overhead costs were covered by those markup rates. It also did not limit rates for materials or labor.

**Specify the level of scrutiny the City expected the A&E firm to provide over change order prices, and conduct periodic spot-checks of the A&E firm's work.** City officials said the project staff, its A&E firm and the third-party contract manager reviewed change order costs. They relied on the A&E firm and contract manager to scrutinize the pricing and supporting records, such as a list of labor hours, rates, and classifications or invoices for any charges related to materials or equipment rentals.

Although the contracts for A&E and third-party contract manager services did not specify the expected level of scrutiny over change-order pricing, the City provided evidence both parties had examined some change order costs. However, the City lacked documentation to show it checked the quality of that scrutiny.

**Require itemized construction change order proposals and conduct detailed reviews of change orders to avoid overpaying.** Detailed costs and pricing were not available for about \$133,000 in charges for this change order. For example, \$14,350 in charges for tree removal did not break out the rates and costs for labor and equipment. Also, \$30,655 in charges for the installation of a sound and voice system did not indicate the hours or labor rates charged. Without such detail, neither the contract managers nor our auditors could determine whether the City paid typical or pre-established rates and prices.

**Pay typical rates and prices.** The City’s overhead markup rate for the prime contractor’s oversight of the subcontractor’s work was 8 percent, higher than the more typical rate of 5 percent. Across all amendments, the City paid markups on direct costs and for oversight of the subcontractor’s work that totaled about \$24,000 more than it would have paid if it had used the more typical rates we identified.

<b>Exhibit 11</b> <b>City of Richland</b> Library Construction, Change Order No. 6				
Type of expenses	Category total	Amount unable to audit <sup>(1)</sup>	Amount audited	Potential savings <sup>(1)</sup>
Labor	\$ 89,721	\$63,372	\$0	N/A
Materials	\$33,048	\$29,953	\$0	N/A
Equipment and other costs	\$221,534	\$40,006	\$0	N/A
Markups	\$67,042	\$0	\$67,042	\$23,917
<b>Total</b>	<b>\$411,345</b>	<b>\$133,331</b>	<b>\$67,042</b>	<b>\$23,917</b>
<p><b>Source:</b> City change orders and contract files.</p> <p><b>Note:</b></p> <p><sup>(1)</sup> Because the change orders lacked detailed costs and pricing for \$133,331 in charges, we could not determine whether the City had paid more than typical prices or rates for these charges.</p>				

## City of SeaTac

### Background

We reviewed a change order related to a \$539,500 electrical contract for a fire station. We selected this contract because its change orders exceeded the original contract by more than 10 percent, and because it was part of a larger project managed by city staff.

### Fire Station No. 46 Electrical

The City’s staff reviewed change order pricing for this contract. Change orders totaled \$82,000; the change order we reviewed totaled almost \$25,000 for electrical parts and labor associated with minor design changes required by project inspectors.

**Overall, SeaTac used many leading practices we identified.** SeaTac was the only city we examined whose construction contract limited the contractor’s profit and overhead markup on work and materials to a reasonable and typical rate. Labor charges on the change order we examined minimally exceeded the prevailing wage rate. The change order we examined itemized all costs for labor, materials and markups. The contract also clearly defined overhead costs that were addressed by those markups.

We noted the City could improve controls over change order pricing as follows:

**Establish limits on labor rates, materials pricing and markups in the original contract for subsequent change orders.** The City incorporated language from the American Institute of Architects’ A201/CMA – 1992 General Conditions into its contract. Those conditions call for “agreed upon” prices for labor, materials and equipment, or actual costs if there is a disagreement. The document also called for “reasonable” markup rates, but does not specify any amounts. The City edited those conditions to set limits on profit and overhead markup rates for direct costs and for oversight of subcontractors’ costs, but did not specify rates for direct labor, materials or equipment, increasing the risk that the City will pay more than typical rates.

Although its markup for oversight of subcontractors was 10 percent, which is twice the typical rate we identified, there were no subcontractor charges on this change order. Its other markup rates for direct costs were consistent with typical rates.

**Require itemized construction change order proposals.** Although the change order we reviewed contained detailed costs and pricing, neither the City’s contract nor its policies required this from contractors.

**Pay typical rates and prices.** The City lacks policies and guidance describing how project managers should review change order pricing. It paid labor costs that exceed the prevailing wages plus average payroll taxes by about \$1,100.

Exhibit 12				
City of SeaTac				
Fire Station No. 46 Electrical, Change Order No. 4				
Type of expenses	Category total	Amount unable to audit	Amount audited	Potential savings
Labor	\$17,676	\$0	\$17,676	\$1,073
Materials	\$4,581	\$0	\$0	\$0
Markups	\$3,338	\$0	\$3,338	\$0
Credits	(\$775)	\$0	(\$775)	\$0
<b>Total</b>	<b>\$24,820</b>	<b>\$0</b>	<b>\$20,239</b>	<b>\$1,073</b>
<i>Source: City change orders and contract files.</i>				

## City of Shoreline

### Background

We reviewed most of the change orders for a \$50,000 contract for initial architectural and engineering design services for a road improvement project. This project was funded in part by Washington State Department of Transportation. As such, the City was required to follow the state Transportation Department’s Local Agency Guidelines Manual. We selected this contract because its amendments significantly exceeded the original contract.

### Initial Design Services for the Aurora Corridor Improvement Project

The City contracted with an A&E firm in 2007 to help design the Aurora Corridor Project. The original \$50,000 contract was for survey work and other preliminary design tasks. Change orders totaling \$5.3 million were mostly for the final design. The contract did not include construction management.

**Overall, Shoreline followed almost all the leading practices we identified to help control the price of change orders.** The contract and all amendments specified the overhead, profit and labor rates the City would pay for each firm member who worked on the contract. It was one of two cities we examined with a contract that limited the labor rates charged on change orders. Because the contract was expected to last more than one year, it included a yearly escalation rate of 5 percent for labor costs. We examined A&E contracts at two cities, and only Shoreline’s contract identified and limited profit and overhead charges. The City paid profit markups that were less than the typical 15 percent rate. Because its contract was funded by the Transportation Department and the Federal Highway Administration, the City appropriately paid the A&E firm’s audited overhead markup rates. Its contract amendments contained fully itemized costs.

We noted the City could improve its practices for controlling the price of change orders in the following areas:

**Conduct detailed reviews of change orders to avoid overpaying.** The City lacks policies and guidance describing how project managers should review change order pricing. It did not thoroughly monitor the escalation in some labor rates from one amendment to the next to see that increases exceeded the contract rate. We also identified two amendments in which the subcontractor had increased its labor rates by 5 percent, even though that change order came in just one month after the initial contract had been signed. If the City had paid the rates specified in the contract, it would have spent about \$4,700 less.

Exhibit 13				
City of Shoreline				
Initial Design for Aurora Corridor Improvement Projects, Change Orders No. 1-8				
Types of expenses	Category total	Amount unable to audit <sup>(2)</sup>	Amount audited	Potential savings
Labor	\$1,709,211	\$0	\$1,556,747	\$4,746
Fixed fee	\$505,928	\$0	\$505,928	\$0
Overhead	\$2,796,761	\$0	\$2,796,761	\$0
Reimbursable	\$212,971	\$0	\$0	\$0
Markups	\$41,146	\$0	\$41,146	\$0
<b>Total</b>	<b>\$5,266,017</b>	<b>\$0</b>	<b>\$4,900,582</b>	<b>\$4,746</b>
<i>Source: City contract amendments and contract files.</i>				

## City of Spokane

### Background

We examined larger change orders for a \$5.1 million road improvement project. We selected this project to assess how the City was using its database of historical unit prices to review change order pricing.

### Austin Road Improvements

The State Department of Transportation paid for this contract for improvements from 5 Mile Road to Austin Road. The original contract was for \$5.1 million, and contract amendments totaled \$119,000. The City’s staff reviewed the pricing of the change orders and did not use an A&E firm to manage the project. The change orders added labor hours to accelerate project completion, equipment related to an adjacent transmission line, and excavation, dirt hauling and crushed rock.

**Overall, Spokane followed most of the leading practices we identified.** The contract established pricing and rates for force account change orders and for unit-priced work similar to that contained in the original bid. It also required the contractor to submit itemized change orders for force account work. Spokane was the only city examined that limited the labor rates charged on change orders to prevailing wage. It obtained itemized change orders or used unit prices when appropriate. Spokane also maintains a database of historical unit prices it uses to review change order pricing. For units of work that differed from those in the original bid, the City carefully compared the prices proposed by contractors to unit prices in its historical database that had been established through competitive bidding. The City paid reasonable prices for the change orders we examined.

Although the City took many steps to minimize change order costs, we noted it could strengthen practices in the following areas:

**Establish limits on labor rates, materials pricing and markups in the original contract for subsequent change orders.** The City’s contract did not:

- Establish labor rates for regular change orders. However, labor charges for the regular change order we examined were at the prevailing wage.
- Limit the pricing for materials for regular change orders. But there were no materials charged for the regular change order we examined.
- Specify markups for regular change order. But the City did pay any markups on the regular change order we examined.

**Establish guidance for staff’s review of change order pricing.** The City also lacks policies and guidance describing how project managers should review change order pricing.

<b>Exhibit 14</b>				
<b>City of Spokane</b>				
Five mile road from Austin Road, Change Orders 10, 12 and 18				
Types of expenses	Category total	Amount unable to audit	Amount audited	Potential savings
Labor <sup>(1)</sup>	\$33,073	\$0	\$33,073	\$0
Units of work <sup>(2)</sup>	\$37,637	\$0	\$37,637	\$0
<b>Total</b>	<b>\$70,710</b>	<b>\$0</b>	<b>\$70,710</b>	<b>\$0</b>
<i>Source: City change orders and contract files.</i>				
<b>Note:</b>				
<sup>(1)</sup> The labor rates for this change order were at the prevailing wage, but we did not evaluate whether the amount paid for payroll taxes was reasonable.				
<sup>(2)</sup> These change orders were based on careful selections of unit prices from past projects.				

## Thurston County

### Background

We reviewed the larger change orders for a \$3.2 million road construction project funded in part by Washington State Department of Transportation. As such, the County was required to follow the Department's *Standard Specifications Manual for Roads, Bridges and Municipal Construction*. We selected this project because the cost of the additional work exceeded the original contract by more than \$1.2 million.

### Bald Hills Road Improvements

For this project, the County's staff reviewed the pricing of change orders and did not use an A&E firm. Change orders primarily were for roads, excavation, fencing and fence installation. The original contract was signed in July 2007 and most additional work was done in 2008.

**Overall, the County incorporated most leading practices and paid typical prices or rates for most of the additional work.** The construction contract established pricing and rates for force account change orders and for unit-priced work similar to that contained in the original bid. The contract also required the contractor to submit itemized change orders for force account work. The County was the only municipality that tied materials prices to an inflation index. In addition, the prices it paid for the additional work performed were in line with typical prices and rates.

We noted the County could improve its practices for controlling the price of change orders in the following areas:

**Establish limits on labor rates, materials pricing and markups in the original contract for subsequent change orders.** Although the County's contract established rates for force account change orders and for unit-priced work that was similar to the original bid, it did not set pricing and rates for regular change orders.

**Obtain change orders for additional work performed or materials used beyond what was called for under the original contract.** The County did not get change orders for almost \$970,000 of the \$1.2 million in additional work performed. Our review showed that all these charges appeared to be reasonable. For example, about \$702,000 of these charges related to unit prices for additional work (e.g., cost per square foot) that were tied to unit prices in the original contract.

Thurston County's practice in this area was consistent with Section 1-04.6 of the Transportation Department's *Standard Specifications Manual*, which allows but does not require written change orders for additional work priced by unit when quantities do not change by more than 25 percent from the original contract. However, leading practices suggest written change orders are important for ensuring that costs and quantities are reasonable and controlled, and for tracking changes to the original contract.

**Obtain detailed prices or rates for labor, materials, and equipment and overhead markups in the change order when it is not appropriate to use unit pricing for that work.** The contractor submitted change orders for almost \$238,000. For about \$220,000 of that work, the contractor used unit prices when it may not have been appropriate to do so. The County and contractor jointly established the unit prices for this additional work, but it was not tied to unit-priced work in the initial contract, and there was no documentation showing that those unit prices related to similar recent work. As a result, neither the County nor our auditors could determine whether the County paid typical prices and rates for this work.

The remaining \$18,000 of that work also was based on unit prices. Our comparisons showed the County paid the same unit prices as contained in the original contract.



**Conduct detailed reviews to avoid overpaying.** For the force account work it paid for, the County paid a higher overhead markup rate than established by the Transportation Department’s *Standards Specifications Manual*. That Manual indicates the markup rate for the prime contractor’s oversight of subcontractors for force account work is 12 percent. The County paid 21 percent, contributing to the slight overpayments in markups. The County lacks policies and guidance describing how project managers should review change order pricing.

<b>Exhibit 15</b>				
<b>Thurston County</b>				
Bald Hill Road Improvement, Change Orders 2 - 10 and additional work done without change orders				
Types of expenses	Category total	Amount unable to audit	Amount audited	Potential savings
<b>Materials, equipment, labor, markups and units of work</b>	\$945,547 <sup>(1)</sup>	\$219,863 <sup>(2)</sup>	\$737,033 <sup>(3)</sup>	\$0
<b>Labor</b>	\$9,728	\$0	\$9,728	\$0
<b>Materials</b>	\$9,912	\$0	\$9,912	\$0
<b>Materials pricing adjustment</b>	\$226,697	\$0	\$226,697	\$0
<b>Equipment</b>	\$9,083	\$0	\$9,083	\$0
<b>Markups</b>	\$7,099	\$0	\$7,099	\$197
<b>Total</b>	<b>\$1,208,066</b>	<b>\$219,863</b>	<b>\$999,552</b>	<b>\$197</b>
<b>Source:</b> City change orders and contract files.				
<b>Note:</b>				
<sup>(1)</sup> Includes \$11,349 in credits that were not audited.				
<sup>(2)</sup> For the \$219,863, we could not determine whether the County paid more than typical rates and prices.				
<sup>(3)</sup> \$702,000 of this work was performed without a change order.				

# STATE AUDITOR'S OFFICE CONTACTS

---

---

## State Auditor Brian Sonntag, CGFM

(360) 902-0361

BRIAN.SONNTAG@SAO.WA.GOV

---

### Larisa Benson

Director of Performance Audit

(360) 725-9720

LARISA.BENSON@SAO.WA.GOV

### Mindy Chambers

Director of Communications

(360) 902-0091

MINDY.CHAMBERS@SAO.WA.GOV

## To request public records from the State Auditor's Office:

### Mary Leider

Public Records Officer

(360) 725-5617

PUBLICRECORDS@SAO.WA.GOV

## General information

Headquarters

(360) 902-0370

Website

[www.sao.wa.gov](http://www.sao.wa.gov)

Twitter

[@WASStateAuditor](https://twitter.com/WASStateAuditor)

---

### Americans with Disabilities

In accordance with the Americans with Disabilities Act, this document will be made available in alternate formats. Please call (360) 902-0370 for more information.

### The State Auditor's Office Mission

The State Auditor's Office independently serves the citizens of Washington by promoting accountability, fiscal integrity and openness in state and local government. Working with these governments and with citizens, we strive to ensure the efficient and effective use of public resources.

---