

Major Capital Construction Audit

Good progress, but continued vigilance
needed

April 2018



Multnomah County Auditor's Office
Steve March, Multnomah County Auditor



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April 2, 2018

To: Chair Kafoury; Commissioners Meieran, Smith, Vega Pederson, Stegmann;
Sheriff Reese; District Attorney Underhill; COO Madrigal; Department of County
Assets Director Swackhamer; County Attorney Madkour

From: County Auditor Steve March

Re: Major Capital Construction Audit: Good progress but continued vigilance needed

The attached audit on the construction of the new Gladys McCoy Health Department Headquarters and Central Courthouse is the second round of audits of these projects. The audits focus on the areas of greatest risk at particular phases of the projects. The first audit addressed risks in the planning phases of each project. This audit addresses the greatest risk at the construction phase: construction costs.

The two projects met many best practices for controlling construction costs, but lagged in others. For the construction contracts themselves and substantiating the actual costs of construction work, the County took steps to make improvements as needed. In other cases, there were fewer opportunities to meet best cost control practices. One challenge was the hot construction economy in the Pacific Northwest, which played a role in the lack of competition with subcontractor buyout. We tested many aspects of the monthly pay application processes, but the volume and complexity of the data involved prevented us from doing a full battery of construction audit tests. As a result, we recommend that the Department of County Assets hire a specialist construction auditor to help provide greater assurance that the County is only paying for appropriate charges.

We would like to thank the staffs of both projects as well as staff from the Department of County Assets and the County Attorney's Office for their assistance in the completion of this audit and their attention to our questions and recommendations. Principal Auditor Mark Ulanowicz, CIA, and Senior Auditor Fran Davison performed this audit.

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Report Highlights

What We Found

This report follows our previous work on the Central Courthouse and Health Department Headquarters projects as they move through the construction phase. These two projects have a combined budget of \$418.6 million, of which \$311.2 million is budgeted for construction. We reviewed best practices to identify some of the contract features and tools that are used to keep construction costs in check.

- The construction contract is the first line of defense in cost control. The two construction contracts generally followed best practices in terms of monitoring and oversight.
- The project delivery method, where the contractor is brought into the project before design is complete, fit the projects and the County benefited from the method's impact on the construction schedule and risk reduction.
- The Portland area construction boom limited the contractors' ability to take advantage of competition in subcontracting out construction work.
- We applied some construction auditing best practices to the review of pay applications and found relatively few errors, but we were not able to test significant portions of the work due to the volume and complexity of the data.
- The County's internal system for processing payment applications and contract amendments was sufficient to limit the risk of payment delays.

Why We Did This Audit

This is our second in a series of County capital construction audits that began with reports on the planning process for these two projects. We chose to audit these projects for a number of reasons, including: the inherent high risk of undertaking projects of this size; the relative lack of experience the County has with high rise construction; and the fact that the County was starting two projects at the same time.

What We Recommend

In general, the construction of the Central Courthouse and the Health Department Headquarters has gone relatively well. But, the County and the Facilities and Property Management Division could make important improvements for the future:

- In order to get the most value out of the County's actual cost reimbursement contracts, a review of project books and records by a specialist construction auditor is required.
- To benefit from future cost-based construction projects, the County should build the expectation that construction audit standards will be applied to any future projects.

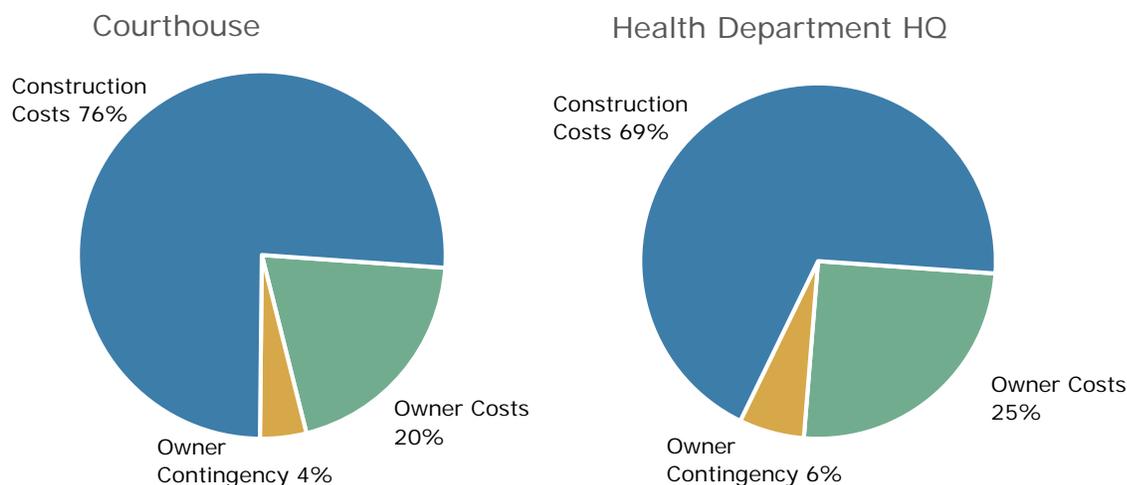
Introduction

This report continues our previous work on the County's two large capital projects – the Central Courthouse and the Health Department Headquarters – as they move through the construction phase. Like our earlier work, which reviewed project planning, this report focuses on the area of greatest risk at this phase of the project: the construction costs. In both of the capital projects, the County hired a Construction Manager/General Contractor (contractor) to manage the construction and the associated costs and an owner's representative to provide project management and construction expertise. The architect and the contractor have roles in construction cost control, but the County and its representative are ultimately responsible for cost control for the entire project budget.

Construction costs are the largest component of project costs. These two projects have a combined budget of \$418.6 million, with \$311.2 million budgeted for construction costs. In January 2018, at the conclusion of our audit, construction on both projects was well underway.

While some owner costs included in the projects, such as land acquisition, design, and most permit fees have already been spent, total construction costs can still be affected by factors such as changes to the work or the schedule. The architect fee was the largest of these owner costs, along with Multnomah County and owner's representative project management charges. City requirements, which include building permits and the additional costs associated with the design review process, also affect ongoing costs. And, the County's aspirational goals, which can be seen as investments in the community – such as meeting sustainability, prevailing wage, or workforce participation goals – add to both construction and other County costs, but are much more difficult to quantify.

Construction costs are the **largest portion** of total project costs



Source: Project budget data

Both the County and the contractor have contingency funds in their budgets to help manage the risks in the projects. The contractor's contingency helps to protect the contractor against unforeseen events within the overall scope of the project. For example, scope gap corrections and safety incident remedies are paid out of the contractor's contingency. The owner's contingency helps to protect the owner from the risk of unforeseen changes in the scope of the project and is used to pay for change orders.

We reviewed best practices to identify some of the contract features and tools that are used to keep construction costs in check.

- The construction contract needs to be carefully written because it provides the legal means for the other cost controls to function.
- The project delivery method should fit the attributes of the projects if it is to aid in controlling costs.
- The selection of subcontractors should fit the project delivery method and provide opportunities for competition to put downward pressure on costs.
- Pay application and change order review can help to ensure that only appropriate charges are paid.
- The smooth functioning of County finance and procurement processes help to ensure that there are no administrative delays that could result in construction claims.

The County's contracts generally contained good cost control language

The construction contract itself is the first line of defense in cost control, as it spells out what is allowed, what information is available, and how disputes are settled. It defines the legal responsibilities of both the contractor and the owner. Both contracts generally followed best practices and contained the language necessary to allow the County to perform its oversight role. In a few instances, where the contracts were lacking, the County negotiated amendments to the contracts to provide the necessary language.

From a risk management perspective, the best contracts are those that clearly define elements of the project such as allowable costs, labor rates, and the disposition of contingency funds. The best contracts also provide a way for disputed charges to be separated from the rest of the project, so work can continue and the contractor and subcontractors can be paid for all completed work aside from areas of dispute.

We reviewed both contracts and compared their features to best practices in construction literature. We found that both contracts:

- had audit clauses that provided the owner with access to the contractors' books and records as well as subcontractors' books and records;
- allowed the owner to specify how pay applications – invoices from the contractor – and change orders should be substantiated and that the owner can recover money from the contractor in the event an error is discovered after payments have been made;
- included language that allows change order work to continue while disagreements about the cost of that work are being settled; and
- had language that specified how the owner or its representative would oversee subcontractor procurements when the contractor or its affiliate was bidding for the work.

Access to all contractor project books and records is an important feature of the contract. The owner must be able to verify how much the work costs when the contract calls for payment based on actual costs. Contract language that clearly defines which costs are allowed and which are not, as well as criteria for equipment rental, small tool purchases, and material storage can help control costs and reduce the likelihood of disputes. Less obvious, but also important, is being able to isolate areas of dispute from the remainder of the work, because it helps to keep the project on schedule and reduces the likelihood and magnitude of claims later in the project.

The project delivery method fit the attributes of the projects

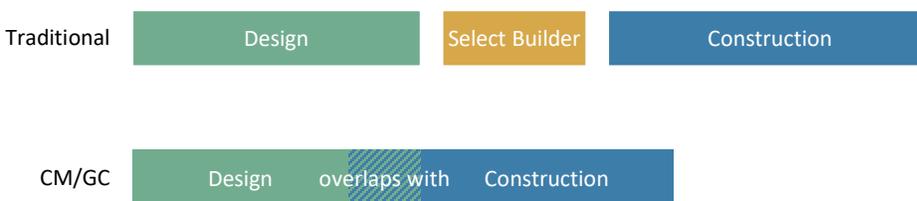
The County is using a Construction Manager/General Contractor project delivery method for both the Courthouse and the Health Department HQ. With this method, the contractor is chosen based on qualifications and project approach, rather than a fixed bid. The contractor is reimbursed for the actual cost of the work and earns a fee that is calculated as a percentage of the cost of the work. This delivery method is well-suited to complex projects and those in which staying within agreed upon budgets is a high priority, as is the often case with publicly funded projects. With this delivery method, the contractor participates fully in the design phase and can offer advice and expertise on issues such as constructability and cost estimating. The County used this delivery method for the East County Courthouse and the Sellwood Bridge projects and it appears to be the appropriate delivery method for the Courthouse and Health Department HQ projects.

Constructability
describes a technique used to review construction processes from start to finish during pre-construction. This technique helps to identify obstacles before a project is built, reducing or preventing errors, delays, and cost overruns.

GMP contract
In a Guaranteed Maximum Price (GMP) contract the contractor is compensated for actual costs incurred, plus an agreed upon fee, not to exceed the guaranteed maximum amount.

Both projects incorporate a guaranteed maximum price (GMP) in their contracts. With this pricing approach, the County reimburses the contractor for the actual construction costs, which include the contractor's fee costs. The GMP is an upper limit on the total amount the County will pay for construction costs. With this type of contract, the risk of a cost overrun is transferred to the contractor. The only way the GMP can rise is by change order. This pricing method can lead to a more accurate estimate of project costs.

The CM/GC delivery method allows the contractor to participate in the design, saving time and helping with constructability



Source: Auditor's Office

Because the projects fit this delivery method well, the County was able to take advantage of some of its commonly cited benefits.

- In terms of the schedules of the two projects, the use of the delivery method appears to have allowed for a shorter total schedule length because the contractor was able to begin construction before the design work was complete.
- Moving quickly into the construction phase also provided some buffer against the escalation of construction costs in the Portland metropolitan area. Both projects were able to secure commitments from subcontractors for significant portions of the construction, as well as for specialty equipment and materials, prior to completion of the construction drawings at the completion of the design phase.
- Both projects benefited from collaboration between the designer and the contractor and its specialists in terms of better understanding the costs and benefits of design alternatives.

Construction boom in Portland reduced the pool of available subcontractors

The contractors' ability to control construction costs depends in part on their ability to secure subcontractors at competitive prices. However, the Portland metro construction environment, with so many projects underway at the same time, made this process more difficult. The lack of responsive bidders for significant portions of the work reduced the effectiveness of competitive

procurements and, in some cases, left the contractors with few options for awarding subcontracts.

Heavy construction activity on the west coast of the United States has produced a shortage of construction labor and is driving up the cost of construction. For example, the Association of General Contractors reported that in 2017, 85 percent of general contractors in the state of Oregon were having difficulty filling hourly craft labor positions and 62 percent expect conditions to remain the same or become more difficult over the next 12 months.

There were fewer subcontract bidders and some bids were much higher than estimated

With the Courthouse specifically, bids for roofing and fire protection came in 88 percent and 60 percent above estimates, or a total of nearly \$2.3 million higher than estimated. For the Health Department HQ, bids tended to be closer to estimates although the drywall bid came in 15 percent above estimates, or about \$900,000 higher than estimated.

Owners and contractors can mitigate some of the risk of overpaying in these situations by using cost-based contracts, rather than lump-sum awards.

- When there is only a single bidder for a specific scope of work, the work should be done on an actual cost basis, rather than a lump-sum. With only a single bidder and a lump-sum award, there may be less incentive for the lone bidder to submit a competitive bid. Both of these projects awarded lump-sum contracts to sole bidders. Having too few bidders for some work may have been unavoidable, given that many subcontractors reported they had more work than they could take on. Even though construction audit best practices say an arrangement like this should be actual cost-based, it is only possible if the subcontractor agrees.
- When a contractor with an actual cost-based contract self-performs a scope of work, that contract should also be actual cost-based, rather than lump-sum. Combining cost reimbursable work with lump sum work is contrary to best practices because with such an arrangement, the owner risks paying for work on a cost reimbursable basis that should be part of the lump-sum contract. The County faces this risk with the concrete work at the Health Department HQ.

Sub-contract types

A cost-based contract is where a contractor is paid for actual costs plus a fee, usually a percentage of the cost.

Lump-sum contract (fixed price) is the traditional means of procuring construction. Under a lump-sum contract, a single 'lump sum' price for scope of work is agreed on before the work begins.

Review of payment applications can help ensure only appropriate charges are paid

A detailed review of the contractor payment application is perhaps the most clearly identifiable cost control for construction projects. The payment application serves as an invoice from the contractor, providing an account of work performed and expenses incurred, as well as tracking materials and equipment used.

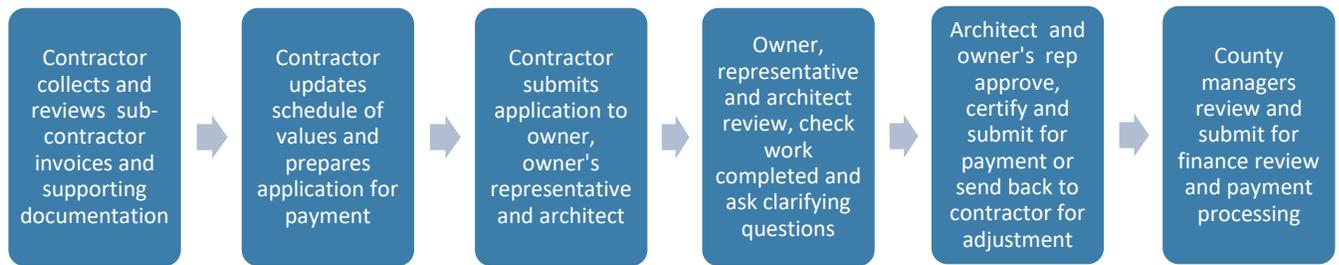
A cost-based contract with a GMP puts more of the risk of cost overruns on the contractor. But, both the contractor and the owner have the incentive to scrutinize construction billings in order to manage their costs. Using an actual cost reimbursable method also means that the contractor must have the administrative capacity to accurately document all the costs of the project. The owner must have the capacity to review the cost documentation if it is to have any chance of demonstrating that the actual cost of the project is below the GMP.

Each month, the contractor collects invoices and supporting documentation from its subcontractors and creates an updated version of the “schedule of values.” The schedule of values shows how much has been billed for each segment of construction work, the amount being billed in the current application, and how much remains in each subcontract. The contractor then aggregates these invoices and calculates the percent of all construction completed. The contractor then submits the pay application to the architect or project design team and the owner for review.

A Schedule of Values (SOV) is based on the approved budget. The entire contract sum is allocated among the various segments of the work and each portion of work is assigned a value.

As work progresses, the schedule of values is updated to show work completed for the pay period, the total work completed for each portion of work and the percent of the value of the work remaining. The SOV is widely used to evaluate a project’s progress as a percentage completion of the overall plan.

Application for payment process involves multiple reviewers



Source: Auditor's Office

The architect has a contractual responsibility to review the work to verify that it meets the specifications in the construction documents. They review the pay application to determine if they agree with the contractor's estimation of the percent of completion of the various segments of construction in the schedule of values. The owner and owner's representative review the schedule of values and also review the cost documentation to ensure that the charges claimed are accurate and allowable.

In our limited testing of pay applications, we found few errors

The Courthouse contractor performs a relatively robust monthly review of its subcontractors' invoices: they verify the invoice amounts; compare invoice labor rates to contract or prevailing wage rates; check for duplicate invoices; check to make sure charges are allowable; and contractor engineers review the estimated percentage complete. The Health Department HQ contractor largely focuses on the percent completion estimates supplied by its subcontractors. They also compare the rates charged on the invoices to the contracts or the prevailing wages. The Health Department HQ contractor has stated that their internal auditors will audit actual cost-based subcontracts in-depth to ensure subcontractor billings are appropriate and reimbursable. The audits will occur once the construction spending reaches about the half way point and again before the end of construction.

The two owner's representative firms focused their reviews on the schedule of values and the amount of budget left for each scope of work. They also reviewed the expenses charged to make sure they were allowable under the contract and also checked to see that the applications had the proper substantiation for the charges. By January 2018, both contractors were generally providing sufficient substantiation in their pay applications.

We supplemented the pay application review discussed above with several tests that are construction audit best practice review techniques. The combined pay application reviews included the following tests:

- Verifying that the charges in the invoice equaled the amount claimed on the cover summary page.
- Verifying that charged hours were multiplied by the correct pay rates from the contract.
- Verifying that only allowable costs of work were included in the calculation of the contractor's fee.
- Verifying that there were no duplicate invoices for reimbursable costs across pay applications.
- Cataloging tools purchased and rented from the contractor and comparing rates to standard retail rates.
- Verifying that equipment rental rates were consistent with local commercial rental rates.
- Verifying that reimbursable labor costs did not include withholding for workers compensation insurance for the Courthouse project – workers compensation was reimbursed separately under a contractor controlled insurance plan.

With these tests, we identified only minor inconsistencies and these were promptly corrected. For example, we found a duplicate invoice and the owner's representative notified the contractor who fixed the problem. Due to the volume of data, we did not perform a full battery of construction audit best practice tests. For example, we did not review individual subcontractor invoices for duplicates nor did we verify that materials prices were consistent with local costs or that the quality of materials was consistent with specifications. We were also only able to perform limited review of contractor reimbursable labor charges and contractor self-perform lump-sum labor charges, where the same individuals worked on both contracts.

Change order review helps to ensure the change is needed and the cost is acceptable

A change order is an amendment to the construction contract for work that is either added or subtracted from the project and that is significant enough to qualify as a change in the project scope. A change order is the only way the GMP can increase and, as a result, change order activity should be monitored closely. As of the end of 2017, there had been a number of change orders in the Health Department HQ project, but none approved yet for the Courthouse. We found the change order process used by the Health Department HQ project team to be consistent with best practices, but continued monitoring is warranted.

The change order process review involves multiple parties. The proposed change order is first sent to the design team, where architects and/or engineers review the proposal to determine if the change represents an actual change in the project scope and if so, whether it requires additional funding and/or time to be added to the construction schedule. The design team also reviews the proposed change to ensure that the materials used meet project specifications and the estimated cost is reasonable. The owner's representative and owner also review the details of the proposed change and the cost estimate. When the proposed change is approved by the project team members, County contracts staff draft a contract amendment and collect the required signatures. Once signed, the change becomes part of the construction contract.

Best practices tell us that change orders issued within an actual cost-based contract, like the CM/GC GMP contracts in the Courthouse and Health Department HQ projects, should be paid for using actual cost reimbursement rather than a lump-sum payment. We found the change orders processes for the Health Department HQ project have been set up for actual cost reimbursement. The Health Department HQ project has segregated the change order work from the rest of the pay application to make it easier to track the actual costs that go into completing the change order.

Understanding the actual costs of change orders is important because the owner does not have the benefit of competition in arriving at the cost of the change. The Health Department HQ project team approved \$570,000 worth of changes in the first five months after agreeing to the GMP. We didn't evaluate the extent to which the estimated costs of the changes fit the actual

Potential changes can result in:

- A Change Order and the owner pays with contingency
- A Construction Change Directive and the owner directs the contractor to proceed with the work for later inclusion in a Change Order
- The change is rejected as a change in scope and the contractor continues the work

costs charged in the pay applications, because not enough of the changes had been completed. A comparison of the actual costs to the estimates would highlight problems with the estimating process, if they exist. Comparing change order costs to national labor standard estimates would be another way to spot check change order costs.

We found that the County payment review process was generally smooth and payments were timely

The smooth functioning of County finance and procurement processes help to ensure that there are no administrative delays that could result in late payment claims. The Department of County Assets Finance group responsible for reviewing construction invoices developed a process to review the applications for payment. They look for expenses allowed by the County and spot check to ensure that support documentation is provided. We found that the review process was smooth and payments were timely. There is a rush process available, if needed, to ensure prompt payment and a credit memo process that can be used if a payment needs to be adjusted after approval.

Contract amendment processes may not be working quite as smoothly

We found that the contract staff and the County attorney have generally positive working relationships with the project teams, and have a good understanding of the needs. However, the time for review and approval by multiple approvers can be lengthy – especially for some of the complex amendments. In spite of the slowdown, in most cases, this has not delayed payments.

Recommendations

In general, the capital construction of the Central Courthouse and the Health Department Headquarters have gone relatively well. There are improvements that could be made now and in the future. We recommend:

- In order to get the most value out of the County's actual cost reimbursement contracts, a review of project books and records by a specialist construction auditor is required.
- To benefit from future cost-based construction projects, the County should build the expectation that construction audit standards will be applied to any future projects.

Objectives, Scope, & Methodology

The objectives of this audit were to:

- Identify project risks.
- Determine whether the two capital construction projects follow best practices for cost control.
- Determine readiness of County divisions for processing contract amendments, change orders, and applications for payment.

To accomplish these objectives we:

- Reviewed construction audit best practices;
- Attended construction audit conferences and workshops;
- Attended project management team meetings and leadership team meetings;
- Interviewed project management team staff;
- Interviewed architect, contractor, and owner's representatives;
- Interviewed staff from County finance, the County attorney's office, the budget office and County contract staff;
- Attended meetings to review payment applications and change orders;
- Reviewed construction, architect, and owner's representative contracts; and
- Reviewed pay applications and conducted several tests, including:
 - Cataloging tools purchased and rented from the contractor and comparing rates to standard retail rates
 - Verifying charges in the invoice to determine if they equaled the amount claimed on the cover summary page.
 - Verifying contractor labor charges – charged hours multiplied by the correct pay rates from the contract.
 - Verifying that there were no duplicate invoices for reimbursable costs across pay applications.
 - Verifying that equipment rental rates were consistent with local commercial rental rates.

We also examined a number of County documents, including budget documents, board presentations, financial policies, and procedures.

Our audit period started as the design was being approved in October 2016 and concluded December 2017.

We conducted this performance audit in accordance with generally accepted government auditing standards. 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 objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Audit Staff

Fran Davison, Senior Management Auditor

Mark Ulanowicz, Principal Auditor

Response to Audit



Department of County Management

Date: March 14, 2018

To: Steve March
Multnomah County Auditor

From: Marissa Madrigal
Chief Operating Officer

Subject: Capital Construction Audit Management Response

Auditor March, thank you for your continued, careful analysis of the County's capital construction projects. As you know, we have read the report and met with you and your team to discuss the recommendations. Your recommendations are timely and informative. As we move forward with new projects, we will incorporate them, as appropriate. For the new Health Department Headquarters and the Multnomah County Central Courthouse, we will continue to make appropriate enhancements including the hiring of a third-party construction auditor. We appreciate the work performed by you and your team.

Cc: Deborah Kafoury
Kim Melton
Sherry Swackhamer
Mark Campbell
Henry Alaman
Lisa Whedon

Sincerely,

A handwritten signature in black ink, appearing to read "Marissa D. Madrigal".

Marissa D. Madrigal
Chief Operating Officer and DCM Department Director