



CITY AUDITOR'S OFFICE

Airport Terminal Area Redevelopment Construction Contract

June 4, 2020

AUDIT REPORT NO. 2004

CITY COUNCIL

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Virginia Korte
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June 4, 2020

Honorable Mayor and Members of the City Council:

Enclosed is the audit report for *Airport Terminal Area Redevelopment Construction Contract*, which was included on the Council-approved FY 2019/20 Audit Plan as an audit of a construction contract. This audit was conducted to review procurement, compliance with contract terms, and effectiveness of contract administration.

Improving cost controls during the Guaranteed Maximum Price (GMP) development might have reduced costs. Supporting details for proposed general conditions costs were not obtained and reviewed, and cost negotiations were not documented. As well, additional controls for monitoring and verifying construction costs should be adopted. Supporting documentation showed the CMAR billed approximately \$379,000 more than its subcontractor costs, including change orders. As well, Aviation's contract administration records retention practices should be expanded.

If you need additional information or have any questions, please contact me at (480) 312-7867.

Sincerely,

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AUDIT HIGHLIGHTS

Airport Terminal Area Redevelopment Construction Contract

WHY WE DID THIS AUDIT

An audit of Airport Terminal Area Redevelopment Construction Contract was included on the City Council-approved fiscal year 2019/20 Audit Plan as a selected construction contract. The audit objective was to review procurement, compliance with contract terms, and effectiveness of contract administration for the construction contract.

BACKGROUND

In July 2017, the City contracted with JE Dunn Construction for the construction of the Airport Terminal Area Redevelopment Project. The project involved demolishing the two existing buildings, replacing them with two large executive hangars, a new aviation business center, a fuel farm, and a new parking lot. The construction was split into two phases.

The Aviation department managed the project, hiring a consultant for construction administration, and using Construction Manager at Risk (CMAR) delivery method for construction. This method involved negotiating a Guaranteed Maximum Price (GMP) for the project.

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WHAT WE FOUND

Improving cost controls during GMP development might have reduced costs.

- Supporting details for proposed general conditions costs were not obtained and reviewed during GMP development. Cost negotiations were not documented, and cost review comments clearly addressed.
- Amounts the CMAR added to its subcontractor bids ("bid plugs"), which totaled about \$1.3 million, were not monitored. As well, subcontractor selection plans were not evaluated during CMAR selection.

Additional controls for monitoring and verifying construction costs should be adopted.

- Adjustments to the approved schedule of values were not explained. Some changes approved by Aviation and applied by the CMAR differed, including overcharges of about \$96,000.
- Use of allowances needed better monitoring and verification.
- For some invoiced amounts, supporting documentation was missing or did not match the pay applications. In one instance, CMAR records showed a \$283,000 subcontract price reduction that was not reflected in the pay applications submitted to Aviation.

Record retention standards are needed for Aviation's contract administration documents.

Some records supporting the contract administration process were not being retained, and email documentation should be stored more securely.

WHAT WE RECOMMEND

We recommend the Aviation Director:

- Ensure proposed general conditions are adequately supported with a detailed budget of allowable costs, document cost negotiations, and ensure cost review comments are addressed.
- Require supporting details for cost adjustments, verify the use of allowances, and seek reimbursement for overpaid amounts.
- Adopt policies for retention of contract-related documents.

MANAGEMENT RESPONSE

The department agreed with the recommendations, noting it plans to implement improvements by July 15, 2020.

BACKGROUND

In July 2017, the City contracted with JE Dunn Construction for the construction of the Airport Terminal Area Redevelopment Project. The project involved demolishing the two existing buildings, replacing them with two large executive hangars, a new aviation business center, fuel farm, and new parking lot.

Figure 1. Airport Terminal Area Redevelopment Project Overview Photos



SOURCE: Images from the City's Land Information System (LIS), and photograph from www.DWLArchitects.com (project Architect).

While the City's Capital Project Management (CPM) department manages most City construction projects, the Aviation department directly managed this project, hiring a consultant for the construction administration, and using a Construction Manager at Risk (CMAR) delivery method for the project. CPM assisted with the procurement process, helping to issue the Request for Qualifications (RFQ) and related procurement steps. Other construction administration responsibilities typically handled by CPM were performed by Aviation and Aviation's Consultant, Mead & Hunt, which also provided design and engineering services for the project. Aviation performed coordination and contract administration, while the Consultant provided project management and its subcontractor conducted daily field inspections.

Construction Manager at Risk

For this project, Aviation elected to use a Construction Manager at Risk (CMAR) delivery method. With this method, the owner (the City) contracts with an architectural or engineering firm to produce the project designs and separately contracts for construction management services through a preconstruction agreement with the contractor to obtain constructability input during the design phase. During this preconstruction period, the CMAR reviews the design plans, produces cost estimates, creates a construction plan and project schedule, and obtains subcontractor bids.

At the end of the preconstruction period, the CMAR proposes a Guaranteed Maximum Price (GMP), to complete the project. (Typical GMP components are described in Figure 2 on page 5.)

If the proposed GMP is accepted by the owner, a construction contract is awarded and the CMAR assumes the risk of delivering the construction project on-time and within the agreed-upon GMP.

In May 2016, Aviation solicited Statements of Qualifications for the Airport Terminal Area Redevelopment Project's preconstruction services. Twelve companies responded and in August 2016, Aviation recommended for Council approval the preconstruction services CMAR contract to JE Dunn Construction for \$248,015.

The project's construction work was separated into 2 phases, referred to as Bid Package 1 and Bid Package 2. In early July 2017, the City Council approved Aviation's award of the project's first phase, Bid Package 1 (BP1) CMAR contract with a \$14,193,166 total GMP. This first phase included site demolition, construction of two aircraft hangars with associated office space, a fuel farm, and parking renovations.

The City Council then approved the second phase, Bid Package 2 (BP2), in late August of 2017 as part of the contract's Amendment 1. This phase included construction of the new Aviation Business Center to house the Aviation business offices, the U.S. Customs and Border Patrol offices, an aircraft enclosure, a leased restaurant, and additional leasable space. BP2 increased the CMAR's GMP by \$7,874,909. Together with a City contingency of \$468,004, the final contract price totaled \$22,536,079 as summarized in Table 1 on page 6.

Related Contracts

Apr 14, 2015: **2015-059-COS Mead & Hunt**
Engineering Services, including:

May 2015: Terminal Area Concept and Budget

Apr 2016: Terminal Area Design and Bidding

Jul 2017: Construction Administration Services

May 2018: Commissioning Services for Terminal Area Redevelopment

Aug 30, 2016: **2016-091-COS JE Dunn**
Preconstruction Services

July 5, 2017: **2017-060-COS JE Dunn**
CMAR Construction Services

Aug 29, 2017: **2017-060-COS A1 JE Dunn**
CMAR Construction Services (**Amendment 1**)

(continued on next page)

Figure 2. GMP Components

Cost of Work
• Cost of all direct labor, materials and equipment incorporated in the completed construction. • Nearly all Cost of Work for this project was subcontracted.
General Conditions
• A negotiated amount for project supervision and other indirect costs, to the extent incurred by the CMAR. • Costs may include salaries for Project Manager, Superintendent, General Foremen, and other project support and administrative labor. Also, costs may include temporary office and facilities, relocation, travel, permits, fees, fencing, office supplies and equipment, minor expenses, vehicles, fuel, utilities, and communications.
CMAR Construction Fee
• A negotiated fixed fee for project management. The fee includes the CMAR's profit and home office overhead, including administrative costs, home office costs and any limitations or exclusions in the General Conditions. • For change orders increasing the GMP, the contract limits the Construction Fee to 5.5% of the change order's total Cost of Work and Indirect Costs (general conditions, bonds and insurance and taxes).
Construction Contingency
• A negotiated amount of contingency available for the CMAR's use, to cover unforeseen construction expenses which are not a change to the work. Use is subject to City's prior review and approval. • Eligible costs include: overtime premiums and other costs of schedule acceleration and/or compression, cost overruns, gaps in scope of subcontracts or CMAR self-performed work, additional weather protection, additional temporary facility or utility costs, errors in estimating quantities, and additional subcontractor/supplier costs not included within subcontracts and/or purchase orders.
Payment & Performance Bonds and Insurance
• Actual costs applied at the rates detailed in the GMP proposal. • For this project, the rate applied was 3.65% of total construction cost.
Taxes
• Taxes include all sales, use, consumer, and other taxes, paid at actual cost. • The contractor tax rate at this time was 5.17%.
City's Project Contingency
• An amount reserved for the City to cover project cost increases resulting from City-directed changes or unforeseen site conditions. • City Contingency is not included in the CMAR's GMP unless the City authorizes associated work. However, it is included in the overall Contract Price.

SOURCE: Auditor analysis of Contract 2017-060-COS.

Table 1. GMP Summary – Original and Final

	Original GMP	Final GMP
General Conditions	\$ 1,785,497	1,785,497
Direct Costs	16,788,047	17,699,101
Fee	1,093,939	1,121,470
Construction Contingency ¹	510,772	-0-
Bonds & Insurance	805,485	822,559
Taxes	1,084,335	1,107,252
Guaranteed Maximum Price (GMP)	\$22,068,075	22,535,879
City Contingency ²	468,004	200
Contract Price	\$22,536,079	22,536,079

1 – Construction Contingency line transferred into Direct Costs

2 – Approved use of City Contingency was transferred into the various GMP components.

SOURCE: Auditor analysis of Contract 2017-060-COS (and Amendment 1) and CMAR pay applications.

Payment Process

The CMAR submits monthly payment applications based on the work completed. Table 2 illustrates example lines from the Schedule of Values in the contract documents and from a monthly application for payment. As shown, the schedule of values provides costs for portions of the work and is used as a basis for the monthly pay application.

Table 2. Example Schedule of Values and Application for Payment

Lines from the Schedule of Values:

Scope No.	Description	BP1 GMP	BP2 GMP	Cost/sq ft
02B	Structural Demolition	\$ 96,320	\$ 0	\$1.45
07G	Membrane Roofing	\$0	\$110,036	\$5.24

Lines from a Monthly Application for Payment (Pay App):

Description of Work	Scheduled Value	Approved Change Orders / Internal Adjusts	Revised Scheduled Value	Previously Billed	Completed This Period	Total to Date
BP1 – Structural Demolition	\$ 96,320	\$ (2,476)	\$ 93,844	\$ 94,124	\$ 7,018	\$ 101,142
BP2 – Roofing	\$ 110,036	\$ 15,705	\$ 125,741	\$ 114,543	\$ 11,198	\$ 125,741

SOURCE: Auditor analysis of Contract 2017-060-COS and CMAR pay applications.

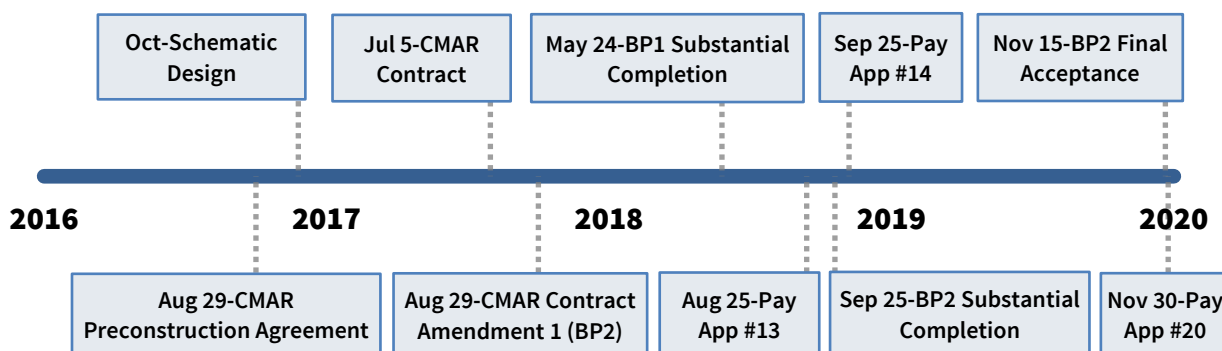
According to Aviation, the Consultant’s construction observer (onsite field inspector) and project manager reviewed the direct cost of work items in the CMAR’s monthly pay applications, and Aviation’s contract administrator reviewed the general conditions costs.

Construction costs were typically billed by percentage completion, and the amounts were supported by subcontractor pay applications. General conditions were handled as cost reimbursements up to the agreed-upon amount. Receipts and invoices were submitted to support the invoiced amounts. Any disagreements or questions about the amounts invoiced were returned to the CMAR for responses or revisions. Subsequently, the Consultant and Aviation’s contract administrator approved the revised pay application before payment.

Project Timeline

As summarized in Figure 3, after design and preconstruction, the project’s Phase 1 began in July 2017 and was substantially completed in May 2018.¹ Phase 2 then started in September 2017 and was substantially complete in September 2018. According to Aviation, the CMAR and subcontractors worked to resolve punch list items throughout the next year. Aviation provided its Final Acceptance in November 2019 and paid the CMAR’s final pay application in December 2019.

Figure 3. Project Timeline



SOURCE: Auditor analysis of project documentation.

Project costs and funding

Final construction costs totaled \$200 less than the full contract price, which includes using \$467,804 of the City’s contingency amount. As summarized in Table 3 on page 8, total project costs of \$27.7 million included the related engineering/consultant contract, CIP allocations for the City Treasurer’s costs, and other related expenses.

¹ Substantial Completion is typically defined as the date certified by the architect that work is sufficiently complete in accordance with the Contract documents so that the Owner can occupy or use the work for its intended purpose. Some final finishing work (punch list items) may remain.

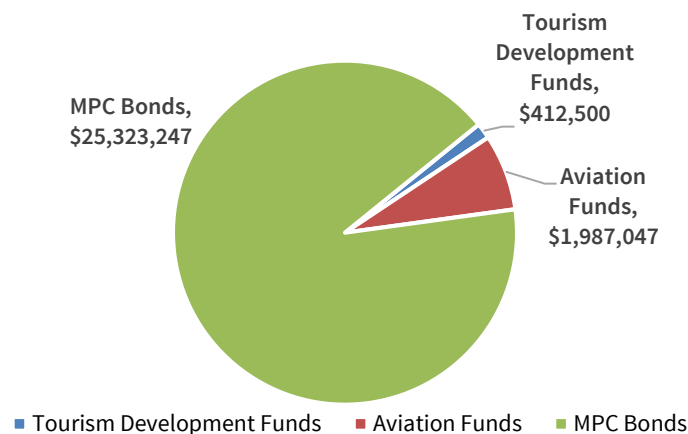
Table 3. Project Costs

Description	Amount	Percentage
CMAR Construction Services - GMP	\$ 22,535,879	81.3%
Engineering/Consultant Contract	3,952,922	14.3%
CMAR Preconstruction Services	248,015	0.9%
CIP Allocation	88,595	0.3%
Other Project Expenditures ¹	897,382	3.2%
Total	\$ 27,722,793	100.0%

1 - Other project expenditures included furnishings, a security camera system, a communications system and public art.

SOURCE: Auditor analysis of SmartStream capital project expenditure reports.

Aviation revenues, including a \$25 million MPC bond to be repaid from future airport revenues, provided the primary funding source for the terminal redevelopment project.² As shown in Figure 4, the Tourism Development Fund paid \$412,500 for design and construction of the memorial shade plaza to display a donated pre-World War II aircraft.

Figure 4. Project Funding

SOURCE: Auditor analysis of SmartStream capital project expenditure and budget to actual reports.

² The Municipal Property Corporation (MPC) is a non-profit corporation created by the City as a financing mechanism for constructing or acquiring capital improvement projects. MPC bonds do not require voter approval as they are to be repaid through project revenues rather than the City's property tax levy.

OBJECTIVES, SCOPE, AND METHODOLOGY

An audit of a selected construction contract was included on the City Council-approved fiscal year 2019/20 Audit Plan. The audit objective was to review procurement, compliance with contract terms, and effectiveness of contract administration for a construction contract. After identifying the larger projects completed within the past few years, we ranked specific risk elements including budgeted and actual amounts spent, cost type or delivery method, use of change orders and available documentation. After evaluating the inherent risk involved with these elements, we selected the *Airport Terminal Area Redevelopment Contract* for this audit.

To understand the elements of the selected construction project, we reviewed the following agreements:

- Contract No. 2016-091-COS with JE Dunn Construction, *CMAR Preconstruction Phase Services, Project No. AB59*.
- Contract No. 2017-060-COS and Amendment 1 with JE Dunn Construction, *CMAR Construction Services, Terminal Area Redevelopment*.
- Contract No. 2015-059-COS with Mead & Hunt, Inc., *Engineering/Architectural Services Contract*, and related Authorization of Service agreements, including *AOS 18-01 Construction Administration Services, Terminal Area Redevelopment*.

To gain an understanding of existing requirements and standards, we reviewed the following laws, policies and procedures:

- Relevant sections of Arizona Revised Statutes Title 34 (Public Buildings and Improvements), particularly Chapter 6 pertaining to *Architect Services, Assayer Services, Construction Services, Engineering Services, Geologist Services, Landscape Architect Services and Land Surveying Services*.
- City Procurement Code Section P2-180.2(B) *Procurement Delegation* to Capital Project Management (CPM) for the procurement of design and construction services using alternative delivery methods and Section 2-200 *Change Orders; Contract Modifications; Council Approval*.
- City Administrative Regulations (AR) including *AR 215 Contract Administration* and *AR 216 Contract Change Orders and Contract Modifications*.

To gain an understanding of construction administration policies and controls and the roles and responsibilities among the project team, we interviewed the Aviation Director and the Assistant Aviation Director. We also reviewed past City Auditor audits of CMAR contracts managed by CPM and the CPM Project Management Guide to understand other established City policies and controls for construction administration.

To determine whether CMAR payment applications were accurate and supported, we:

- Reviewed all pay applications and supporting documentation,
- Requested and reviewed the CMAR's related job cost reports, comparing it against costs billed to the City,
- Selected a sample of 10 major subcontractors and obtained copies of the subcontracts, subcontract change order, and pay applications to compare against project documentation, and

- Reviewed supporting documentation for allowances and all requests for use of Construction and City Contingency.

To evaluate the effectiveness of contract administration and compliance with various contract terms, we reviewed the Aviation department's project documentation, including those related to contract negotiations, review of change orders, requests for use of contingency, allowance logs, review of monthly pay applications, meeting minutes, inspection reports, and close out documents.

We concluded that improving cost controls during GMP development might have reduced costs, and additional controls for verifying and monitoring construction costs should be adopted. As well, records retention standards are needed for Aviation's contract administration documents.

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 objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. Audit work took place from December 2019 to May 2020.

FINDINGS AND ANALYSIS

1. Improving cost controls during GMP development might have reduced costs.

Close review of the GMP proposal is critical in a CMAR contract because of the lack of price competition when selecting the contractor. To help ensure reasonable costs, Aviation contracted an independent cost estimator to provide design phase estimates and to review the CMAR's phase 1 proposal. However, some of the cost estimator's comments regarding the GMP proposal do not appear to have been addressed, and negotiations were not documented. As well, amounts plugged into the GMP bid tabulations for expected costs were not separately identified to be monitored and verified. Further, subcontractor selection plans should be evaluated as part of the contract procurement process.

A. General Conditions costs were not closely reviewed during the guaranteed maximum price (GMP) approval process, making it difficult to control costs.

1. Airport staff and its consultant did not ensure a detailed breakdown of general conditions costs was provided for review prior to approval of the GMP. Cost proposals submitted did not describe the cost types, pricing, and quantities the CMAR included in the high-level proposed costs. For example, the CMAR proposed \$715,909 for "Project Management" costs but did not identify the personnel positions or estimated labor hours included in that amount. Personnel rates later approved and incorporated into the contract did not detail the base rates, labor burden, and markups. Similarly, while the contract administrator believed the \$158,110 for "Project Maintenance" to include temporary toilets, general housekeeping, cleaning, dust control, and drinking water, the CMAR did not include any details for the total. Further, as shown in Table 5 on page 13, "cleaning" costs were charged separately.

Guaranteed Maximum Price (GMP)

A contract structure, often used with CMAR contracts, where the Owner and the Contractor negotiate a not-to-exceed (or maximum) price for construction. The contractor is responsible for any cost overruns unless the GMP is modified, such as with change orders. Unlike fixed-price contracts, cost savings are returned to the Owner, or they may be shared with the contractor, if negotiated.

2. Based on the contract terms, certain overhead and preconstruction costs billed by the CMAR should not have been allowed as general conditions.

The administrative and preconstruction costs that we noted totaled more than \$320,000 as summarized in Table 4 on page 12. Specifically, home office administrative costs and overhead are paid separately through the CMAR's construction fee, and preconstruction costs were paid through a separate contract with the CMAR. Typically, administrative personnel that perform company-wide functions are not charged as general conditions. However, the CMAR included these positions in its general conditions Personnel Pay Rates, which Aviation then approved. As well, the CMAR billed \$32,000 for an online portal used for file sharing and more than \$9,000 for Lean Management training. These costs cannot be easily attributed directly to the City's project and should be considered overhead.

Table 4. Preconstruction and Home Office/ Overhead Costs Charged in General Conditions

Cost Type	Amount Billed*
Preconstruction services	\$ 152,944
Administrative Asstnt/Coordinator	95,880
Scheduling	22,140
Online file depository	32,054
Lean Mgmt Training Specialist	9,109
QC Consultant	8,288
Total	\$320,415

*Amount billed is the total through pay application #13, when the general conditions not-to-exceed amount was reached. This pay application was submitted just before substantial completion in September 2018.

SOURCE: Auditor analysis of CMAR pay applications and cost ledger reports.

In addition, preconstruction costs charged to the construction contract totaled almost \$153,000 but were not described in the general conditions proposal. According to the department, splitting construction into two phases caused higher preconstruction costs related to separate bid packages and subcontractor selections and buyouts. However, the CMAR's documents show that about half of the billed preconstruction services were dated after phase 2 construction started.

Further, during the GMP approval process, Aviation rejected costs for a third-party structural review estimated at \$7,500, stating that it was not required. However, this cost was subsequently billed in general conditions costs labeled as QC Consultant.

The lack of detailed support for the high-level cost categories made it difficult for the contract administrator to evaluate appropriateness of the CMAR's billings. Although the contract administrator questioned some billed costs as excessively high, such as the size of the temporary office facility, the number and type of personnel being billed, and travel costs, he did not reject them for reimbursement because the contract did not specifically disallow them. For example, travel costs were not specifically proposed during GMP review, so the contract did not contain language to adopt the City's travel reimbursement policies. Having a more detailed budget of allowable costs and incorporating it into the contract documents could help minimize later disputes and help to better control costs.

(continued on next page)

Table 5. General Conditions – Proposed vs. Billed

Proposal Description	May 2017 Cost Proposal ¹	Jun 12, 2017 - Approved GMP	Invoiced as of Pay App#13 ²
Project Supervision	\$ 421,728	499,305	429,270
Project Management	619,292	715,909	843,257
Safety Personnel	56,272	66,582	32,886
Quality Control	31,806	7,920	29,612
Temporary Site Security	78,350	n/a	54,955
Temporary Site Security Lighting	n/a	10,000	n/a
Temporary Site Facilities	43,381	77,361	50,182
Temp Office Supplies	39,416	21,268	11,948
Project Signage	17,371	n/a	8,780
Safety & Temporary Barriers	50,527	56,842	110,603
Project Maintenance	187,939	158,110	39,956
Temporary Utilities	55,625	95,727	47,198
Equipment Rental	81,875	76,473	75,470
Travel *	n/a	n/a	14,935
QC Consultant *	n/a	n/a	8,287
Stormwater Pollution Prevention Plan *	n/a	n/a	28,158
Subtotal General Conditions	\$ 1,683,582	1,785,497	1,785,497
Classified as Direct Cost of Work			As of Final Pay App
Progress Clean	50,448	61,319	145,638
Final Clean	9,295	19,512	0
Temp Fencing	79,308	15,000	30,691
Dumpster	n/a	64,308	35,420
Total General Conditions Costs	\$1,822,633	\$1,945,636	\$1,997,246

* - Travel, QC Consultant, and SWPPP costs do not fit into the established General Conditions categories.

1 – General Conditions in the May 2017 cost proposal, presented without detail, totaled \$1,683,582. Categories in this table are from the October 2016 cost proposal, which applied the same total General Conditions.

2 – On Pay App #13, the CMAR invoiced through August 25, 2018, one month before substantial completion. The CMAR applied a \$98,716 credit to reduce the General Conditions billings to the not-to-exceed amount of \$1,785,497. This credit has been applied as a reduction of the "Project Management" line in this table.

SOURCE: Auditor analysis of project documentation and CMAR pay applications.

- B. About \$1.3 million in bid plugs were not identified as allowances to be tracked and verified.

Within its subcontractor bid tabulations, the CMAR identified work that was part of the planned scope but had not been included in the subcontractor's bid. The CMAR did not explain how the amount was determined, but "plugged" in a cost for the additional work and selected the lowest bidder based on the adjusted costs. These bid plugs essentially function as allowances, which are budgeted for specified work when the exact pricing or quantities are not yet known. For the Airport Terminal project, auditors calculated a total of \$1.3 million in bid plugs were included in the approved GMP proposal.

While certain other allowances were itemized in an Allowance Log that was included with the Contract Documents for purposes of tracking costs charged to allowance budgets, bid plugs were not separately identified and tracked in a log.

Documented communications during the GMP review indicated that the cost estimator identified these as potential savings and the contract administrator requested the CMAR provide a justification of all plugs. The CMAR provided justifications for about \$185,000 of the \$1.3 million, shifted another \$94,000 to general conditions, and reclassified an additional \$90,000 as allowances to be tracked on the allowance log.

- C. GMP cost negotiations were not documented, and some of the Independent Cost Estimator's comments did not appear to have been addressed.

Aviation's consultant hired an independent cost estimator to develop construction cost estimates and review the CMAR's Bid Package 1 (BP1) GMP proposal.³

1. The independent cost estimator commented that the CMAR's proposed general conditions costs appeared higher than typical for the size and scope of the project.

The cost estimator's May 2017 review comments noted that the almost \$1.7 million in general conditions costs proposed did not include the cleaning, dumpster, and site fencing costs that were budgeted separately. These types of costs are typically considered general conditions costs rather than direct cost of work. The cost estimator commented that including these, the total general conditions costs were "on the high side" for new construction when compared to the total construction cost.

However, as shown in Table 5 on page 13, the general conditions costs proposed in October 2016 and in May 2017 increased further, to almost \$1.8 million in the June 2017 approved GMP. The cleaning, dumpster, and site fencing costs were still listed as additional costs. As mentioned in Finding 1B, the increases moved costs that had been classified as "bid plugs" in the Cost of Work but were typically general conditions costs, such as temporary utilities, sweeping, security lighting, and also increased project management costs. Together with the general conditions costs that the CMAR misclassified as "direct costs of work," the general conditions costs totaled more than \$1.9 million. In total, through pay applications, general conditions costs increased by almost \$175,000 after the independent cost estimator had already commented the costs were on the high side.

2. The independent cost estimator noted that the proposed bonds and insurance costs were also "on the high side." According to the review comments, the CMAR proposed bonds and

³ While an independent cost estimate was created for BP2, Aviation did not have documentation showing the independent estimator's review of the BP2 GMP proposal occurred.

insurance costs represented about 3.54% of the total construction cost; the independent cost estimator applied a rate of 2.75%. The even higher costs approved in June represented 3.65% of the total construction cost, or about \$200,000 more than the cost estimator's recommended rate.

Though some proposed amounts changed between the independent cost estimator's May 30, 2017 review and the June 12, 2017 GMP approval, documentation was not retained to record the negotiation process. Most changes appeared related to the independent cost estimator's comments, but the cause for other changes is not apparent.

- D. The CMARs' subcontractor selection plans were not evaluated during contract procurement.

For alternative delivery methods, such as CMAR, Arizona Revised Statutes §34-603 requires that the contractor selection criteria include an evaluation of the firm's subcontractor selection plan or its procedures for implementing the City's subcontractor selection plan. Though required in the Request for Qualifications (RFQ), the CMAR did not submit a subcontractor selection plan with its proposal, and the City's evaluation criteria did not include a review of the plan.

The contract administrator obtained the subcontractor selection plan from the CMAR at the end of the preconstruction phase. The plan indicates that CMAR pre-selects bidders based on qualifications and past performance. Once bids are received, the CMAR evaluates the bids, and selects the lowest bidder for the City's approval. This methodology generally conforms with legal requirements, but no details were provided regarding the competitive bidding process or how adjustments to bids, such as the CMAR's "bid plugs", were used in the selection process. Because the City's CMAR contract selection does not evaluate pricing and the majority of vertical (building) construction costs are subcontracted, the method of selecting subcontractors can greatly impact project costs. By not evaluating subcontractor selection plans during contract procurement, the department lost an opportunity to evaluate potential cost controls before committing to a contractor.

Recommendations:

The Aviation Director should:

- A. Ensure adequate supporting documentation is provided to evaluate the reasonableness of proposed general conditions costs, approve a detailed budget of allowable costs and incorporate the budgeted costs into the contract documents.
- B. Ensure that all allowances are identified and included in the Allowance Log.
- C. Use independent cost estimate results and reviews of the GMP proposal when negotiating the GMP amount and document the negotiations.
- D. Ensure detailed subcontractor selection plans are submitted with RFQ proposals and evaluate them during contractor selection.

2. Additional controls for monitoring and verifying construction costs should be adopted.

The Airport Terminal Area Redevelopment Project was Aviation's largest, most complex CMAR project the department had managed to that point. The department hired a consultant to perform construction administration. The consultant was not required to provide specific policies or procedures relating to monitoring construction costs. Although Aviation developed some informal practices over the years through managing smaller aviation projects, additional controls are needed to monitor and verify construction costs for larger projects. The City's Capital Project Management department (CPM) has established some internal procedures, but Aviation did not obtain and adopt those procedures. With additional guidance, Aviation's processes may have been more effective in controlling costs.

A. CMAR adjustments to the approved schedule of values were not explained.

Beginning in pay application 14 (after substantial completion), the CMAR made significant adjustments to the scheduled contract values. Part of these adjustments were made as a result of approved change orders to fund additional costs through the two contingency budgets, thus moving budget from the contingency to the trade/subcontracted work line items. However, the adjustments also included transfers of funds from one cost category to another to ensure that costs billed did not exceed the scheduled value. These transfers move funds from areas that had cost savings to areas that had cost-overruns.

As shown in Table 6 on page 17, many adjustments made for 10 tested subcontractors were not supported by approved contingency-use change orders.

(continued on next page)

Table 6. Reviewed Subcontract Changes and Final Costs

Subcontractor (by Trade Type)	Original GMP Value	Total paid by City	Orig. GMP less City Payment	Approved Contingency Use
Framing, Drywall, Paint	\$ 831,005	1,053,922	222,917	87,530
Concrete	2,257,550	2,233,918	(23,632)	7,821
Steel - BP2	797,295	1,014,145	216,850	140,439
Mechanical, Plumbing	2,080,588	2,387,722	307,134	151,656
Steel - BP1	1,439,742	1,377,074	(62,668)	(71,473)
Glass & Glazing	754,763	621,248	(133,515)	32,196
Site Utilities *	454,545	540,154	85,609	90,094
Electrical - BP1	899,950	988,613	88,663	43,781
Electrical - BP2	836,573	955,308	118,735	74,528
Site Demo, Earthwork, and Asphalt Paving *	587,690	582,481	(5,209)	(6,594)
Total	\$10,939,701	11,754,585	814,884	549,978

* - Original GMP values included allowances for the potential costs of certain work. For Site Utilities, the Approved Change Orders amount in the table is reduced by \$6,631 in unspent allowances. For Site Demo, Earthwork, and Asphalt Paving, the listed amount is reduced by \$58,840 in unspent allowances.

SOURCE: Auditor analysis of CMAR Pay Applications, approved change orders, allowance logs, and requested subcontract documentation.

Adjustments to the scheduled values were shown in a lump sum for each cost category on the pay applications, without details to substantiate the adjustment. Further, all adjustments were made after substantial completion, after much of the contract had already been invoiced. By not requiring the CMAR to provide adjustment details, Aviation and its Consultant could not easily verify that approved change orders using contingency funds were correctly applied and other costs were appropriate as billed. We reviewed CMAR requests to use contingency funds and subcontract and subcontract change orders (SCO's) for 10 major subcontractors, and noted the following:

1. A City-approved change order moved work from one trade to another, reducing the Steel subcontractor's contract value by \$87,570 and increasing the Mechanical/Plumbing subcontract by \$127,982. However, the subcontract documents show the CMAR did not adjust the Steel subcontractor's payment but did increase the Mechanical/Plumbing payment. While the CMAR's records indicate the CMAR overpaid the Steel subcontractor the \$87,570, this amount would not be a valid City project cost. Further, we do not know whether the Steel subcontractor later adjusted or reimbursed the CMAR.

2. For the 10 subcontracts reviewed, we observed 6 instances where City-approved changes, funded by the contingency funds, exceeded actual costs documented in subcontractor change orders. These City overpayments, including the related CMAR markups, totaled about \$8,900.
3. Approved change orders for the use of City Contingency overstated transaction privilege taxes by about \$1,400. However, pay applications show the correct tax amount was applied, indicating that this “overcharge” of City Contingency was reallocated to other cost areas.
4. Two significant adjustments were not documented as being approved.

	Original GMP Amt	Final Cost	% change
Progress/Final Cleanings	\$80,831	\$145,638	+80%
Site Fencing	\$15,000	\$30,691	+105%

In addition, the CMAR’s subcontracts included a clause requiring the subcontracted companies to clean up after their own work, making the cleaning cost increase even more questionable.

The City’s standard contract language typically limits the cost of individual work items to the agreed-upon amounts and requires that buyout savings become City Contingency, rather than contractor contingency. However, for the Airport Terminal CMAR contract, terms were negotiated that removed these standard contract clauses. Despite allowing the CMAR to reallocate costs between work items, requiring that cost adjustments be supported with details would have allowed Aviation to have better cost control.

- B. Use of allowances needs to be better monitored and verified.

Allowances are used in construction project funding to cover anticipated work for which the details, such as quantities and pricing, are not yet known. As shown in Table 7, in addition to the bid plugs mentioned in Finding 1, the GMP also included \$535,440 in allowances for specific work and a total of another \$405,000 for work that was not yet defined.⁴

Table 7. Allowances

Bid Plugs	\$1,350,803
Misc. Allowances	\$535,440
Left Turn Lane	\$37,289
Aircraft Enclosure	\$236,198
BP1 Addendum 2	\$47,517
BP2 Addendum 2	\$84,165
Total	\$2,291,412

SOURCE: Auditor analysis of Contract Nos. 2017-060-COS and 2017-060-COS A1.

⁴ This amount does not include \$105,000 in allowances budgeted with Bid Package 1 to fund Bid Package 2 shop drawings. These allowances were removed in Amendment 1.

The contract documents do not specify how allowances should be handled. However, industry practices are to process a change order to add or deduct from the contract sum based on their final costs. Therefore, all allowances (including bid plugs) should be tracked. Similar to the contingency fund change orders, the CMAR allocated some allowances to the various schedule of values line items through transfers but did not prepare allowance logs for them.

1. Final costs for Bid Plugs were not tracked or verified. The CMAR did not provide a reconciliation of the \$1.3 million bid plugs. For the 10 major subcontractors tested, we were able to verify only 46% of the bid plugs were added to CMAR's subcontracts. As summarized in Table 8, the remaining 54%, totaling almost \$430,000, were not reported to the City as savings, instead these appear to have been used as additional construction contingency at the discretion of the CMAR.

Table 8. Bid Plugs in Tested Subcontracts

Subcontractor (Trade Type)	Total Bid Plugs	% of GMP Value	Bid Plugs added to Subcontracts	Not added to Subcontracts
Framing, Drywall, Paint	\$83,800	10%	\$63,403	\$20,397
Concrete	\$117,300	5%	\$16,700	\$100,600
Steel - BP2	\$54,750	7%	\$1,165	\$53,585
Mechanical, Plumbing	\$8,500	0.4%	\$8,500	\$0
Steel - BP1	\$186,603	13%	\$161,603	\$25,000
Glass & Glazing	\$165,845	22%	\$15,808	\$150,037
Site Utilities	\$48,050	11%	\$26,450	\$21,600
Electrical BP1	\$81,700	9%	\$74,200	\$7,500
Electrical - BP2	\$0	0%	\$0	\$0
Site Demo, Earthwork, Asphalt Paving	\$51,000	9%	\$0	\$51,000
Total	\$797,548		\$367,829	\$429,719

SOURCE: Auditor analysis of GMP documents and requested subcontract documents.

2. Final costs for most other allowances were reconciled by the CMAR and unspent amounts were moved to City Contingency budget, but supporting documentation was not provided to verify the costs. For example:
 - The CMAR reported that the \$56,000 allowance for purchase and installation of kitchen equipment had been spent. The CMAR's pay application showed this item's final cost as \$54,262 and the original allowance as \$56,315. Including an approved addition of \$6,702 from construction contingency, the available budget totaled \$63,017 leaving \$8,755 in allowances that was not tracked.
 - The allowances labeled "Bid Package 2 Addendum 2" for \$84,165 was reported as spent, but details regarding specific expenditures were not provided. The contract

administrator indicated this allowance was added to the GMP for potential changes that might result from City Plan Review comments.

3. Reports on costs for the Left Turn Lane and the Aircraft Enclosure allowances contained inaccuracies and did not include supporting documentation, such as subcontractor amounts or uses of all applicable allowances or other contingencies.
 - The CMAR reported \$54,128 in Left Turn Lane construction costs, excluding mark-ups already separately budgeted for this allowance. In addition to the \$37,289 labeled as Left Turn Lane allowances, the contract administrator stated that the allowance called “Bid Package 1 Addendum 2” for \$47,517 was also used to fund this scope of work, resulting in a total allowance of \$84,806. However, the remaining \$30,678 in allowances was not tracked, and savings were not credited to the City.
 - The CMAR reported Aircraft Enclosure construction costs of \$355,548 excluding the separately budgeted mark-ups. In addition to the \$236,198 Aircraft Enclosure allowance, about \$103,000 was funded by City Contingency change orders. However, the CMAR did not report on the funding source for the remaining \$16,350 of construction costs. Further, although the CMAR’s report indicated that 2 anticipated costs totaling \$18,451 were not billed to the City, these costs had been approved and were funded through City Contingency change orders.

Ensuring all allowances are identified and actual costs verified is critical to controlling the use of these funds. Unspent allowances should not be used as discretionary contingency for the CMAR. Instead, any savings should be returned to the City.

- C. A change order approval process was not established, and some change orders were approved after work was completed.

Although Aviation stated that change orders were to be approved before the work was performed, the department did not establish a specific request and approval process for change orders in its Preconstruction conference meeting. Also, in reviewing pay applications, we noted several instances where the Consultant questioned amounts billed and the CMAR responded that the change order had not yet been issued or was pending. Even when the CMAR’s pay application did not reflect an approved change order or adjustments, the pay application was approved as billed.

As well, the Aviation Consultant rejected one request for use of City Contingency because the method of construction was determined to be inefficient and resulted in a higher than anticipated cost. However, the work had already been completed, and the CMAR subsequently funded the cost by transferring savings from other work items. Though it appeared the parties mutually agreed the work was necessary, there was no approved change order or construction change directive to formally authorize and fund the work.⁵ For this requested change, the CMAR proposed a cost of \$31,455 although the Consultant estimated about \$10,000; final cost was \$27,118.

Of 61 approved change orders for the use of City Contingency, about 40% were not finalized until after substantial completion in September 25, 2018. Thus, the work was completed prior

⁵ A Construction Change Directive is used to authorize a change to the work when the parties have not yet agreed to a cost. The Change Directive allows the work to proceed and cost to be negotiated later.

to an approved change order. An even higher portion of requests to use Contractor's Contingency, 89% of the 54 requests, was finalized and approved after substantial completion. While use of Contractor's Contingency may not mean a change in the work, it typically is a change in the cost of work.

Request Type	BP 1 Requests Finalized after May 24, 2018	BP 2 Requests Finalized after Sept 25, 2018
City Contingency	42%	38%
Construction Contingency	80%	94%

The CMAR contract contains language requiring City approval of change orders for all "changes to the work." While it does not detail the process for submission and approval of change orders, CPM requires its review and approval of non-emergency change orders before the work is initiated, and that CPM staff maintain a log of the approved changes. As well, best practices suggest obtaining the change order detail and pricing prior to authorizing the work to allow the owner to review the work being proposed and negotiate the price if needed. This practice also helps avoid potential disputes later.

Further, Aviation allowed its Consultant to authorize change orders for contingency use, and the contract administrator then signed-off on batches of change orders. According to Aviation, the contract administrator also received copies of all contingency use requests and discussed any issues with the Consultant although this was not documented. As well, the approval requirements for changes to work that did not result in cost increases were not documented. Establishing policies regarding approval requirements, including whether change orders with higher cost impacts require additional approval, would help ensure consistent expectations are communicated and provide the City more control over changes to the project.

- D. Some invoiced amounts were not supported or did not match the submitted documentation. While Aviation and its Consultant identified many issues when reviewing the CMAR monthly pay apps, we noted additional inconsistencies that were not questioned and one instance where the City appeared to have been overcharged.
1. The contract administrator did not verify that all billed general conditions costs had supporting receipts or invoices. Documentation was missing or inadequate for about \$29,000 in general conditions costs. For example, we noted travel invoices missing the price and duplicated utility billings. Further, almost 40% of the \$145,600 in cleaning costs classified as direct costs was not documented.
 2. Costs the CMAR billed for subcontract work sometimes did not match the supporting subcontractor pay application. We reviewed the final subcontract pay applications and CMAR job cost report for 38 subcontractors and found that, with one exception, the total amounts billed to the City were consistent with the subcontract totals. However, in about one-third of the subcontractors reviewed, the CMAR had to adjust the subcontractor's final pay application for previously over- or underbilled amounts. Because the subcontractors were not required to resubmit corrected billings, this resulted in the CMAR submitting modified documentation to the department.

In the one instance noted where the subcontract documentation did not match the amounts billed to the City, the CMAR's final settlements with the Glass & Glazing

subcontractor resulted in about a \$283,000 price reduction, savings not passed on to the City. According to the CMAR, this subcontractor pay reduction recovered additional general conditions costs the CMAR incurred as a result of issues with the subcontractor's work. The specific general conditions costs recovered from the subcontractor were not identified.

3. One CMAR pay application amount did not match the sum of the individual work items, with the City underpaying about \$13,000. This pay application was paid as invoiced, and the error later corrected through the CMAR's subcontract reconciliation at project close-out. Tracking cumulative amounts invoiced would help ensure the CMAR's monthly pay applications accurately reflect amounts previously billed and verify mathematical calculations.

Recommendations:

The Aviation Director should:

- A. Ensure supporting information is provided for modifications to the approved Schedule of Values and changes are reviewed and approved. Further, Aviation should seek reimbursement for overpaid amounts.
- B. Monitor and verify the use of allowances.
- C. Establish procedures for submitting, reviewing, and approving change requests.
- D. Establish procedures for verifying the accuracy of amounts submitted for reimbursement on monthly pay applications, such as ensuring adequate supporting documentation is provided and tracking cumulative amounts invoiced. Additionally, Aviation should seek reimbursement for overpaid amounts.

3. Record retention standards are needed for Aviation's contract administration documents.

Aviation has established processes to retain documentation of final construction documents, which are permanent records. However, many interim documents supporting the construction administration process were not being retained and email documentation should be stored more securely.

- A. Some documentation was not retained in the contract administration file as required.
 - Project documentation provided by the CMAR through its file share portal had not been downloaded for retention. These included project schedules, daily construction reports, meeting minutes, requests for information (RFI's), consultant's requests to the CMAR for change proposals, and other project documents.
 - Project-related communications were stored in the contract administrator's emails. Project documents such as change orders and cost logs were provided through email attachments. As well, *Administrative Regulation 215, Contract Administration*, requires that correspondence, conversations, and other data pertinent to the contract be maintained in contract administration files. Moreover, if City practices regarding email retention change, public records may be inadvertently deleted.

In past construction audits, we recommended CPM establish consistent record retention policies to prevent the accidental loss of records that were retained on the contract administrator's computer or in emails. Subsequently, CPM required its staff to retain all project-related documentation in the City's Document Management system. A similar document retention process would help avoid accidental loss of public records.

B. Other documentation was not required to be submitted.

- The CMAR was not required to submit a formal request for contract time extensions with supporting detail. Three change orders authorizing contract time extensions did not include the CMAR's original request with the cause and justification for the additional time requested. One of these extensions authorized an additional 63 calendar days for "unforeseen site conditions and City adds" although the change order documentation did not specify which changes triggered this time extension or include revised project schedules. According to the contract administrator, the time approved was a negotiated amount.
- The Aviation Consultant was not required to submit Daily field inspection reports generated by the Consultant's inspector until after project closeout. The contract administrator stated that Aviation visited the work site daily and met with the field inspector, so it did not seem necessary to also review the reports. However, obtaining and timely reviewing the inspection reports can help ensure reliability of the observed conditions that have been documented.
- At project closeout, the Consultant submitted a Construction Report containing a brief summary of the project, the inspection reports, material testing reports, the final contractor pay application, and some closeout documents. However, the meeting minutes, subconsultant's reports, and other project-related documentation were not obtained.

Complete contract administration files are necessary to ensure compliance with public records retention and the City's contract administration requirements and to help resolve any disputes that may arise.

Recommendation:

The Aviation Director should adopt policies and procedures for the retention of contract-related documents.

MANAGEMENT ACTION PLAN

1. Improving cost controls during GMP development might have reduced construction costs.

Recommendations:

The Aviation Director should:

- A. Ensure adequate supporting documentation is provided to evaluate the reasonableness of proposed general conditions costs, approve a detailed budget of allowable costs and incorporate the budgeted costs into the contract documents.
- B. Ensure that all allowances are identified and included in the Allowance Log.
- C. Use independent cost estimate results and reviews of the GMP proposal when negotiating the GMP amount and document the negotiations.
- D. Ensure detailed subcontractor selection plans are submitted with RFQ proposals and evaluate them during contractor selection.

MANAGEMENT RESPONSE: Agree

PROPOSED RESOLUTION: The Aviation Department will work with the City Attorney's office to enhance the definition of "General Conditions" in the City's CMAR contract. The Aviation Department recently administered two new CMAR solicitations. Both required subcontractor selection plans to be included with their proposals. Those selection plans were also evaluated by the selection committee.

RESPONSIBLE PARTY: Aviation Department

COMPLETED BY: 7/15/2020

2. Additional controls for monitoring and verifying construction costs should be adopted.

Recommendations:

The Aviation Director should:

- A. Ensure supporting information is provided for modifications to the approved Schedule of Values and changes are reviewed and approved. Further, Aviation should seek reimbursement for overpaid amounts.
- B. Monitor and verify the use of allowances.
- C. Establish procedures for submitting, reviewing, and approving change requests.
- D. Establish procedures for verifying the accuracy of amounts submitted for reimbursement on monthly pay applications, such as ensuring adequate supporting documentation is provided and tracking cumulative amounts invoiced. Additionally, Aviation should seek reimbursement for overpaid amounts.

MANAGEMENT RESPONSE: Agree

PROPOSED RESOLUTION: The Aviation Department will enhance its controls and monitoring of construction costs. Additionally, we will ensure that our consultants are also required to follow those same processes. We will work with the City Attorney's office to insert new language that will give both the City and CMAR guidance on how to use them. These two processes will also be adopted by establishing a new Aviation Department CMAR process manual. Finally, the Aviation Department will validate and if necessary, seek reimbursements for overpaid funds once we receive the supporting documentation from the Auditor's office.

RESPONSIBLE PARTY: Aviation Department

COMPLETED BY: 7/15/2020

3. Record retention standards are needed for Aviation's contract administration documents.

Recommendation:

The Aviation Director should adopt policies and procedures for the retention of contract-related documents.

MANAGEMENT RESPONSE: Agree

PROPOSED RESOLUTION: Aviation maintained pertinent documents required by AR 215, however will adopt policies and procedures for the retention of contract-related documents. This will be adopted by establishing a new Aviation Department CMAR process manual.

RESPONSIBLE PARTY: Aviation Department

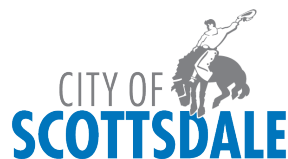
COMPLETED BY: 7/15/2020

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