Vivarium Phase I – Phoenix Biomedical Campus Construction Contract

March 2015 **FY15 - #08**

Submitted to:
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Summary

Our audit of the Vivarium Phase 1 – Phoenix Biomedical Campus (“Vivarium”) construction contract was included in our approved Fiscal Year (“FY”) 2015 Audit Plan. The University of Arizona (“UA”) constructed the new facility on the Phoenix Biomedical Campus (“PBC”) with a construction phase Guaranteed Maximum Price (“GMP”) of $15.1 million. Construction projects have been identified as strategic, high-risk areas for the universities. Charges to the project may not comply with the negotiated contract, resulting in overcharges and cost overruns.

Construction administration and project monitoring for UA is provided by Planning, Design and Construction (“PD&C”). Since 2009, we have completed eight audits of construction contracts administered by PD&C.

Background: The Vivarium is a 12,100-net available square foot facility located on the Phoenix Biomedical Campus (“PBC”) and is vital to the advancement of the biomedical research at the PBC. The Vivarium currently supports research activities performed at the Arizona Biomedical Collaborative (“ABC”) building.

The Vivarium construction project is part of the $376 million PBC, Phase II project. One request for qualifications (“RFQ”) was issued, and the contract was awarded to DPR/Sundt (A Joint Venture). The original contract and amendments included the following construction sub-projects:

- Health Sciences Education Building (“HSEB”),
- Vivarium,
- Arizona Biomedical Collaborative II (“ABC-2”) building, and
- Phoenix Union High School Renovation.

Separate GMP and design documents were prepared for each sub-project. As the project progressed, the Phoenix Union High School Renovation and ABC-2 building were put on hold due to budget constraints.

At its December 2009 meeting, ABOR granted Project Approval for $187 million for HSEB, ABC 1 Renovation, and Vivarium, which included $15 million for the Vivarium’s construction costs. The Vivarium’s construction costs included pre-construction phase costs of $226,555 and construction phase costs of $15.1 million (covered by this audit), for total construction costs of $15.3 million (see Chart on the following page). Funding was provided through a $15 million federal stimulus grant awarded by the National Institute of Health, with the remaining funds provided by the University.

GMP Description	Amount
Initial Pre-Construction Phase Fee	$226,555
Final Pre-Construction Phase Fee	**$226,555**
Initial Construction Phase GMP	$14,928,470
Change Orders	164,127
Construction Phase GMP covered by this audit	**$15,092,597**
Total Pre-Construction and Construction GMP	**$ 15,319,152**

PD&C is pursuing a United States Green Building Council Leadership in Energy and Environmental Design ("LEED") Gold Certification, indicating that the facility was designed to have lower operating costs, reduce waste, conserve energy and water, and to create healthy and productive work environments.

The Vivarium was built using the Construction Manager at Risk ("CM@Risk") project delivery method. The CM@Risk selected for this project was DPR/Sundt (A Joint Venture), hereinafter referred to as "DPR/Sundt." The contract with DPR/Sundt included pre-construction design-phase services as well as construction-phase management, including coordinating all subcontracted work. The contract was negotiated and signed prior to implementation of the standard Tri-University construction contract. Therefore, the contract included provisions for fixed-fee general conditions and requirements. As such, the contractor is entitled to the entire fixed fee stated in the contract, regardless of actual expenditures. The revised standard Tri-University contract eliminated this option, allowing for more auditable contracts that would help ensure UA gets value for dollars spent.

The contract included an approved sub-contractor selection plan that allowed for Core Team Partners to be selected by a Quality Based Selection ("QBS") process. This process eliminates the typical request for three subcontractor competitive bids. The QBS selection is based on a subcontractor's qualifications, which include: successful experience with the CM@Risk; successful experience with the UA, ASU, or the City of Phoenix; skill in providing early conceptual estimating and value design options; and financial strength.

The following table lists the top six subcontractors by final subcontract dollar amount. Three of the six, Sundt Construction – Concrete, Sundt Construction – Earthwork, and DPR Construction - Metals, were lump sum subcontracts awarded for self-performed work, as stipulated in the contract.

Trades Description	Subcontractor	Original GMP Amount	Net Adjustments	Final GMP Amount
Mechanical	UMEC, Inc.	$ 3,876,307	$ (69,921)	$ 3,806,386
Concrete	Sundt Construction, Inc.	$ 1,499,449	$ 146,270	$ 1,645,719
Electrical	Cannon & Wendt Electric	$ 1,445,359	$ 122,774	$ 1,568,133
Earthwork	Sundt Construction, Inc.	$ 1,383,158	$ 137,509	$ 1,520,667
Equipment	ISEC Incorporated	$ 727,771	$ (53,347)	$ 674,424
Metals	DPR Construction	$ 430,043	$ 117,058	$ 547,101

The Notice to Proceed was issued March 9, 2012, and construction work began on May 14, 2012. The contract called for substantial completion by March 19, 2013. PD&C is satisfied with the quality of the work and that the contractor completed work during the required timeframe, issuing a Certificate of Substantial Completion dated May 13, 2013.[1]

Audit Objectives: To determine whether financial transactions relating to construction activity for the Vivarium project complied with the terms of the contract, including whether:

- contractor billings were adequately supported by actual costs incurred by the CM@Risk, plus overhead, profit, and fees as specified by the construction contract;
- general conditions expenses were charged to the project in accordance with contract provisions;
- contingency funds were managed in accordance with contract requirements;
- *Change Orders* ("*CO*") were priced according to the contract terms;
- the CM@Risk provided the contracted scope of work;
- insurance coverage during construction was in compliance with the terms of the contract;
- quality assurance and control procedures were implemented in accordance with the contract terms; and
- opportunities for process improvements exist.

Scope: Our audit of the Vivarium project included all construction-phase expenses paid to DPR/Sundt from the start of the contract in 2012 through project completion in August 2014. This included *Change Orders 7, 8,* and *10*.[2]

We relied on PD&C's expertise for the construction technical aspects and, therefore, our scope of work did not include any on-site inspections to assess construction methods, materials, or compliance with design specifications. We also did not include any costs associated with the project that were not part of the CM@Risk contract, including architectural fees or PD&C internal costs.

[1] The issue of substantial completion timeliness is discussed further on page 8.
[2] *Change Orders 1* through *6* and *9* were executed for other PBC sub-projects.

Methodology: Our audit objectives were accomplished through:

- preparing a control schedule of the initial GMP, *COs*, and payment applications to ensure payments to the CM@Risk did not exceed the approved GMP;
- reviewing a combination of random and judgmentally selected sample of 12 (48% totaling $9.3 million) of 25 payment applications and comparing the summary information in the payment application to the detailed supporting invoices or payment applications from the subcontractors to DPR/Sundt;
- reviewing UA payments to vendors other than DPR/Sundt to ensure the expenses were not included in the CM@Risk contracted scope of work;
- discussing the project with representatives from PD&C and DPR/Sundt;
- verifying all required insurance coverage and bonds were maintained during the project;
- reviewing the three *CO*s and supporting documentation to ensure the amounts agreed to subcontractor quotes and that the changes were reasonable and approved;
- recalculating the fee, bonds and insurance, and taxes charged on all *COs*;
- consulting with construction contract auditing firms;
- reviewing the itemized list of General Conditions and Requirements and examining pay application line items and supporting documentation to ensure General Conditions and Requirements items were not included as expenses in pay applications;
- ensuring the subcontractor bidding process was performed in compliance with contract terms;
- reviewing the third party assessment of costs for self-performed work areas to ensure reasonableness and compliance with contract terms;
- reviewing subcontracts and bid documents for six judgmentally selected subcontractors to ensure the contract terms were consistent and in compliance with the CM@Risk contract; and
- examining project close out documents to ensure punch list items were resolved and a substantial completion certificate was issued in a timely manner.

Conclusions: Based on our audit work, the financial transactions relating to construction activity, by both DPR/Sundt and PD&C, complied overall with the terms of the contract. Specifically, the CM@Risk provided the contracted scope of work; Schedule of Value ("SoV") line items were based on actual costs and supported with back-up documentation; and contingency funds were managed in accordance with contract requirements. Additionally, quality assurance and control procedures were implemented in accordance with the contract terms.

During the audit, we identified issues regarding a later substantial completion date and incorrect change order pricing that resulted in a $6,831 overpayment to the CM@Risk. We provided our audit test work results to management for use in developing and issuing Change Order 11 on May 15, 2015 to officially extend the substantial completion date and to recoup the change order overpayment. Additional details can be found on pages 8 through 11.

We found that two of three change orders reviewed included an amount for CM@Risk general conditions that caused total change order markup fees to exceed the 25% markup fee cap established by the contract. This issue was identified in previous audits, and based on our recommendation, the Tri-University contract committee revised the contract in January 2015 to increase the markup fee cap to 27% and to add verbiage to allow flexibility for extenuating circumstances that require larger construction general conditions costs.

Additionally, we noted that the current standard Tri-University contract requires retainage to be withheld from contractor payments. However, ABOR Policy 3-804, *Professional Services and Construction Services Procurement*, dated 6/2006, permits the CM@Risk to provide a substitute security in lieu of retainage. Since this has become a fairly common practice, the Tri-University contract committee should consider including contract language that allows the CM@Risk the option to substitute security for retainage. If the committee elects to revise the contract to permit the contractor to substitute security for retainage, the committee should evaluate whether existing monitoring practices are sufficient to ensure the required amounts are deposited into security escrow accounts.

According to the Institute of Internal Auditors International Professional Practices Framework, an organization is expected to establish and maintain effective risk management and control processes. These control processes are expected to ensure, among other things, that:

- the organization’s strategic objectives are achieved;
- financial and operational information is reliable and possesses integrity;
- operations are performed efficiently and achieve established objectives;
- assets are safeguarded; and
- actions and decisions of the organization are in compliance with laws, regulations, and contracts.

Our assessment of these control objectives as they relate to the Vivarium construction contract is on the following page.

General Control Objectives	Control Environment	Recommendation No.	Recommendation Page
Achievement of the Organization's Strategic Objectives			
• Strategic objectives were met by providing state-of-the-art facilities that help the university achieve its research and educational goals.	Reasonable to Strong Controls in Place		
Reliability and Integrity of Financial and Operational Information			
• Contractor billings were adequately supported by actual costs incurred by the CM@Risk.	Reasonable to Strong Controls in Place		
• General Conditions were charged to the project in accordance with contract provisions.	Reasonable to Strong Controls in Place		
• Contingency funds were managed efficiently and effectively.	Reasonable to Strong Controls in Place		
• *Change Orders* were priced and approved according to contract requirements.	Opportunity for Improvement	2	10
Effectiveness and Efficiency of Operations			
• PD&C adequately monitored the CM@Risk to ensure compliance with construction quality assurance and control procedures.	Reasonable to Strong Controls in Place		
Safeguarding of Assets			
• The CM@Risk provided the contracted scope of work.	Reasonable to Strong Controls in Place		
Compliance with Laws and Regulations			
• Insurance coverage during construction was in compliance with the terms of the contract.	Reasonable to Strong Controls in Place		
• The contract was managed to ensure the CM@Risk complied with all terms of the contract.	Opportunity for Improvement	1	8

We appreciate the assistance of both PD&C and DPR/Sundt representatives during the audit.

/s/

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Audit Results, Recommendations, and Responses

1. The original contractually established substantial completion date was not formally extended.

Condition:

PD&C issued a Certificate of Substantial Completion to the CM@Risk on May 13, 2013, 53 days after the original contractually established substantial completion date of March 19, 2013.

Criteria:

Contract Article 5.3, ***Substantial Completion***, was revised by Amendment V to establish the substantial completion date as "…375 days after receipt of the NTP, subject to adjustments in accordance with the Contract Documents. The date of the Notice to Proceed for **UA Project 10-888, Vivarium Phase 1 – Phoenix Biomedical Campus** will be established in a future Amendment to this contract." The Vivarium project's Substantial Completion date was established as March 19, 2013 in PD&C's Amendment V transmittal letter to the CM@Risk dated March 9, 2012.

Cause:

During discussions with PD&C and the CM@Risk, the auditor was advised that ground breaking for the Vivarium could not begin until the City of Phoenix issued a building permit. The CM@Risk was informed on March 22, 2012 that the City of Phoenix would not issue a building permit without confirmation of completion of a Final Drawing Review (FDR) and a Finding of No Significant Impact (FONSI) from the National Institute of Health (NIH). Because UA issued a NTP on March 9, 2012, the CM@Risk was able to bill UA $290,922 in April 2012 for work such as drawings and indirect costs that were included in the $15.1 million GMP. After the FDR and FONSI documents were received from NIH, the City of Phoenix issued a building permit on April 30, 2012. The CM@Risk then proceeded to prepare the site for groundbreaking on May 14, 2012. As a result of the above delays, the CM@Risk was unable to meet the original substantial completion date.

Effect:

The CM@Risk could be liable for liquidated damages for failure to formally extend the substantial completion date.

Recommendation:

PD&C should execute a change order or amendment to retroactively extend the substantial completion date.

Management Response: Implemented.

Please note that it is not unusual, and allowed by the contract, to change the completion date of a project. The initial Notice to Proceed did not take into account the approvals required by both the National Institute of Health and the City of Phoenix as prerequisites to starting the project. The discrepancy was discovered during the audit and PD&C issued Change Order 11, dated May 15, 2015, to formally extend the Substantial Completion Date. Liquidated Damages would not be applicable in this instance because the delay was not the fault of the Contractor. The project was successfully completed within the 375 days allowed by the contract.

2. Change Orders were incorrectly calculated.

Condition:

Even though there were only three relatively small dollar amount change orders issued after substantial completion, we identified issues with controls over change order pricing that resulted in overpayments to the CM@Risk. Specifically:

1) Change Order 7 was incorrectly calculated and resulted in an overpayment of $5,447 due to errors in subcontractor material, labor, and the resulting fees. Also, a deduction was not included for Z-25 insurance[3] as specified in subcontractor contracts. Change Order 8 was overpaid by $862 and Change Order 10 by $522 because of inconsistencies in subcontractor fees and incorrect and duplicate fees.

2) Change Order 7 also included an amount of $11,600 for "Labor Work by General Contractor." The change order was approved for payment without supporting documentation for this amount. At the request of audit, the CM@Risk provided invoices to support the amount; however, some of the invoices were for work not related to this change order.

Criteria:

Paragraph 10.4.1 of the contract states, "The cost or credit to the Owner resulting from a change in Work shall be determined in one or more of the following ways: "…B. By cost…, properly itemized and supported by sufficient data reduced to meaningful unit prices for each assembled component of the Work in order to facilitate evaluation. Such costs shall be itemized by crafts as defined within the Schedule of Values, submitted in a format approved by the Owner, and limited to items directly allocable to the change in the Work…"

Causes:

- The errors in Change Orders 8 and 10 calculations were administrative errors that were not detected during PD&C's change order validation process.
- PD&C's change order validation process that includes reviewing supporting documentation did not identify/detect that not all costs were supported prior to approving the change order for payment.

[3] Z-25 is a Zurich Insurance policy that provides Commercial General Liability coverage for the CM@Risk and all of the CM@Risk's subcontractors of any tier while working on the CM@Risk's projects. The CM@Risk pays the premiums, and a credit is applied to all subcontracts and change orders.

Effect:

Errors were identified in all change orders reviewed, resulting in a total overpayment of $6,831. While this amount is relatively insignificant when compared to the $15.1 million construction phase GMP, the potential for greater error exists until processes are improved to prevent and/or detect errors.

Recommendations:

1) PD&C should initiate action to recoup change order overpayments.

2) PD&C should review and strengthen existing processes to ensure change orders include only amounts that are properly itemized and supported.

Management Response: Implemented.

1) Using the test work results provided by audit, PD&C issued Deductive Change Order 11, dated May 15, 2015 to recoup the overpayment.

2) PD&C agrees that the validation process, at the time of the audit, did not identify the discrepancies noted. However, it should also be noted that all work included in this Change Order did apply to the Vivarium project and any discrepancies would have been noted in the final true up and reconciliation of project monies.