



County of Allegheny

Office of the Controller

PERFORMANCE AUDIT REPORT
ON THE ALLEGHENY COUNTY
DEPARTMENT OF PUBLIC WORKS
CONTRACT EVALUATION
FOR THE PERIOD
JANUARY 1, 2015 THROUGH DECEMBER 31, 2017

November 8, 2018

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October 24, 2018

Mr. Stephen Shanley
Director
Allegheny County Department of Public Works
542 Forbes Avenue, Room 501
Pittsburgh, PA 15219

Performance Audit Report on the Allegheny County
Department of Public Works Contract Evaluation
For the Period January 1, 2015 through December 31, 2017

Dear Director Shanley:

We have conducted a performance audit to evaluate the Allegheny County Department of Public Works (ACDPW) contracts. Our procedures included contracts for which a payment was made on that contract during the period from January 1, 2015 through December 31, 2017. Our performance audit was performed in accordance with *Government Auditing Standards* issued by the Comptroller General of the United States.

The results of our procedures revealed that numerous change orders were processed due to design omissions and permitting / utility issues. When the project design does not contain all major elements of the project, ACDPW cannot bid a complete project, which leads to excess project costs. The detailed results of our performance audit are included in the attached report.



Director Shanley
October 24, 2018

We would like to thank the management and staff of the Allegheny County Department of Public Works for their courtesy and cooperation during the performance of our procedures.

Kind regards,



Chelsa Wagner
Controller



Lori A. Churilla
Assistant Deputy Controller, Auditing

cc: Honorable John DeFazio, President, County Council
Honorable Nicholas Futules, Vice-President, County Council
Honorable Rich Fitzgerald, Allegheny County Executive
Mr. William D. McKain, County Manager, Allegheny County
Ms. Jennifer Liptak, Chief of Staff, County Executive
Mr. Kenneth J. Varhola, Chief of Staff, County Council
Ms. Mary C. Soroka, Director, Office of Budget and Finance
Ms. Sarah Roka, Budget Manager, County Council
Mr. Michael Dillon, Deputy Director, Public Works

I. Introduction

The Allegheny County Department of Public Works (ACDPW) is responsible for the letting and administration of all contracts involving the construction, reconstruction, alteration, repair, and improvement of county roads and bridges. The Department maintains and improves more than 780 lane miles of roads and over 550 bridges and culverts. There are three divisions in the ACDPW: Accounting and Administration, Maintenance and Operations, and Engineering and Construction.

The Administrative Code of Allegheny County (Administrative Code) includes a formal procurement process, and requires notification to County Council for all capital, operating, maintenance, and professional service contracts and change orders. In addition, all contracts in excess of \$30,000, other than noted exceptions, are required to be published at least one time, a minimum of seven days prior to the bid opening. The successful bidder shall be the lowest responsible responsive bidder meeting specifications, with full consideration of cost, quality, and performance. The Administrative Code provides several exceptions to this requirement. For example, contracts let in cases of emergency and contracts involving professional services are not subject to the formal procurement process and do not require advertising or bidding. Other policies are established in the Administrative Code for the procurement of the exempt items.

The Administrative Code created the Professional Services Review Committee (PSRC) to review and evaluate proposals received for professional services for architects, engineers, financial consultants, legal services, and medical consulting. The PSRC is comprised of five members: County Executive (or his designee), County Manager (or his designee), two members appointed by Council President, one member appointed by the County Executive and approved by County Council. The PSRC considers the terms of the Request for Proposal (RFP), as well as other criteria such as costs, experience, resources, organization, and disadvantaged business enterprise (DBE) utilization to create a short list of at least three acceptable individuals/firms. The office which makes the final selection shall notify the PSRC and County Council of the selection.

The Administrative Code also requires the ACDPW Division of Engineering and Construction to prepare and adopt rules and procedures covering the operation and administration of Public Works contracts. The ACDPW utilizes a Contracting Manual for the Department as well as the Guidelines for Consultant Services for professional service firms. The Guidelines for Consultant Services includes details regarding the procurement process for professional service contracts. Interested consultants submit a Letter of Interest (LOI) in response to a public advertisement. The Qualification Selection Committee (QSC), which is selected by the ACDPW Director for each project, reviews the LOIs and recommends a short list to the Executive Selection Committee (ESC). The ESC consists of the County Manager, the County Solicitor, and the ACDPW Director. The ESC reviews the list and recommends at least three consultants to the PSRC. PennDOT is also involved if federal and/or state funds are used on the project. An RFP is sent to the consultants approved by the PSRC (and PennDOT when applicable). The QSC again makes recommendations to the ESC. The ESC selects the preferred consultant (PennDOT will also review and approve when applicable).

II. Objectives, Scope, and Methodology

Objectives

The objectives of our performance audit were to:

1. Evaluate the following based on interviews conducted with and information provided by ACDPW personnel:
 - The processes for awarding, modifying, and extending construction and professional services (architect, engineer, consultant, etc.) contracts.
 - The process for creating the pool of design engineering firms, consultants, architects, inspection services, etc. which are eligible for professional service contracts.
 - The function of the Public Works Selection Committee.
 - The function of the Professional Services Committee.
 - The process for developing and issuing RFP's and contracts.
2. Determine which professional service firms received change orders, modifications, or increases to their contracts by analyzing the original contract, any extensions or revisions, the number of projects awarded, dollar amounts, change orders/contingencies, etc. for the pool of professional service firms, and verify the changes were done in accordance with policy (on sample basis).
3. For a sample of construction contracts with change orders/contingencies (change orders):
 - Determine the reason for these significant change orders and how these change orders relate to the contract.
 - Determine if the contracts are not specifically addressing certain project requirements resulting in the excessive change orders.
 - Evaluate if there was an issue related to the project design, the cause of the design issue, how the issue was remediated, and who paid any additional expense.

Scope

Our audit procedures covered contracts which received a payment during the period from January 1, 2015 through December 31, 2017. Since we did not limit our scope to completed projects, some of the projects in our sample were still in process at the time of our testing and may have additional change orders that were not included because they were not fully processed at the time of our testing. We conducted our performance audit in accordance with *Government Auditing Standards*, issued by the Comptroller General of the United States. 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.

II. Objectives, Scope, and Methodology

Methodology

Methodologies used to accomplish our objectives included, but were not limited to the following:

- Interviewed ACDPW personnel and reviewed ACDPW manuals to gain an understanding of contract operations, processes, and procedures in order to evaluate the process for awarding and modifying construction and professional service contracts.
- Analyzed the ACDPW contracting manual to ensure it is in compliance with the Allegheny County Administrative Code.
- Reviewed the most recent ACDPW operational analysis report issued by the Controller's Office Audit Division to determine the status of any prior recommendations applicable to our objectives.
- Reviewed ACDPW Status Reports to gain an understanding of the projects that were active during our engagement period.
- Selected a sample of projects from the population of construction contracts identified by ACDPW. We judgmentally selected eight projects, and randomly selected four projects for a total sample of 12 projects. Since a portion of our sample was judgmentally selected, we do not project the results of our testing to the population.
- Tested the construction and design contracts and change orders for the sample selected to determine if the contracts and change orders were issued in accordance with ACDPW policies.
- Analyzed the design and construction contracts and change orders for the sample selected to determine how change orders relate to the contract. We also analyzed the sampled projects to determine if the original contracts did not specifically address pertinent project requirements thus resulting in excessive change orders.
- For projects with a design stage related issue, we examined project documentation to determine the cause of the issue, how it was resolved, and who was responsible for paying any associated costs.
- Our audit also included an assessment of internal controls that are significant within the context of our objectives. Any significant findings related to internal controls are included in the findings and recommendation.

We performed these procedures June through August of 2018. We provided a draft copy of this report to the ACDPW Director for response. His response begins on page 24.

III. Findings and Recommendations

Finding #1

Design Omissions Hinder Public Works' Ability to Bid a Complete Project

Criteria:

Construction projects can include several types of services, which are necessary to complete the project, including a design firm, a construction manager, a construction inspector, and the construction contractor. The project design, as well as the subsequent construction bid, should include all tasks necessary to complete a project. While change orders may be common during major construction processes, according to the Allegheny County Department of Public Works (ACDPW) Deputy Director, the industry standard is 10% of the construction costs.

A design omission occurs when a task required to complete the project or comply with various permitting agencies is not accounted for on the design plans or in the design specifications. The scope of work is altered via an addition or substitution to the original scope of work. Rather than being included at the time of bidding, the omission from the bid package is accounted for through a change order. According to ACDPW, design engineers will normally argue that the project owner (for purposes of this report the project owner is the ACDPW) should be responsible to pay for the cost of the omission since it is considered an unavoidable cost that would have resulted in a higher initial bid from the contractor had it been included in the original bid package. However, project owners often maintain that by competitively bidding a complete package, costs are more controlled and a lower overall project cost is achieved.

Condition:

We reviewed 12 construction projects to determine the reason for any change orders associated with the construction contract. See Schedule I at page 23 for a listing of construction contract costs, including change orders, for all 12 projects. Of the twelve projects reviewed, we identified nine projects with construction contract change orders that contained additional costs related to design omissions.

We identified the following design omissions and associated delay costs during our review of the construction change orders for these nine projects.

Camp Meeting Road Stabilization

Construction work at the Camp Meeting Road Stabilization site was shut down on June 27, 2016 by the PA Department of

III. Findings and Recommendations

Environmental Protection (PA DEP) as the proper permits were not secured prior to beginning construction. As part of the shut-down, the contractor was required to install immediate erosion and sedimentation controls to protect the work site and surrounding areas during the time away from the site. The cost to install these necessary controls amounted to \$86,259, which was paid to the contractor via change order. Additional costs of \$214,787 related to soil testing, hauling and disposal of unsuitable materials, and the purchase of additional fill to replace the unsuitable excavated materials was also paid to the contractor via change order and can be classified as a design omission. These costs totaled \$301,046.

Greensburg Pike Bridge

Construction of the \$20.5 million Greensburg Pike Bridge began in late 2011 as a means to replace the old bridge, connecting Turtle Creek Borough and North Versailles Township, originally constructed in 1925. Project design activities date back to early 1996, approximately 15 years prior to the actual start of construction. Almost immediately after construction began on the project, it was determined that the planned quantity for the disposal of residual waste was significantly less than the actual quantity of waste for the project. The contractor was paid \$322,639 relating to the excavation and disposal of residual waste materials in excess of amounts specified in the original design plans via change order as a design omission. An additional issue relating to a camber (curvature of a steel beam) value design discrepancy caused an immediate need for a 53 day time extension to be issued to the contractor. Extended overhead costs of \$83,240 associated with the time extension were paid to the contractor via change order. Of the \$83,240 in extended overhead costs \$51,917 was reimbursed to the County by the designer.

As construction on the project progressed it was determined that the design plans failed to account for a viable point of entry and exit for construction vehicles. The contractor was required to enter into an access lease agreement with the local privately owned railroad and as a result \$160,826 was paid to the contractor via change order to account for the associated leasing costs.

Based on actual field conditions, ACDPW paid the contractor an additional \$15,046 via change orders for additional construction materials and services which were not included in the original design plans. An additional \$249,021 was also paid to the contractor via change orders relating to slope stabilization and temporary shoring measures for which there were no design provisions.

III. Findings and Recommendations

In total, \$830,772 was paid to the contractor via change orders for the various design omissions detailed above. We did note that \$51,917 was reimbursed by the designer.

Settler's Cabin Maintenance Garage

The original description of work called for the supply and erection of a steel building maintenance garage to include site grading, storm water management, concrete pad, foundation, electrical service, gas service and connections, and plumbing and interior finishes. The project was initiated as a means to replace the original structure that was no longer able to serve the needs of Allegheny County or Settler's Cabin Park.

As a result of the Allegheny County Conservation District's review of the erosion and sediment pollution control plan submitted for the site, significant deficiencies were determined to exist which resulted in various additional costs paid to the contractor via change order. Costs relating to clearing and grubbing, erosion control, excavation and disposal of unsuitable materials, and trucking in additional fill materials totaled \$162,950. Due to the changes in scope necessary to remediate the deficiencies identified in the erosion and sediment plan review as well as costs associated with the corresponding time extensions, the contractor incurred additional expenses of \$49,691 relating to construction facility rentals and project management, and was paid via change order.

Additionally, during excavation of the site the contractor encountered rock approximately 5 feet below the surface at the location of Boring B-1. Per the design specifications and drawings, it was indicated that rock was at a level of 13.4 feet below the surface. Additional costs of \$7,000 for additional excavation were paid to the contractor via change order to account for this design omission.

These costs totaled \$219,641.

Pine Creek Bridge #11

As stipulated in the contract, the designer is responsible for preliminary engineering, final design, and consultation during construction. Utility lines are normally researched, mapped, and incorporated into the earliest stages of the design. During construction, the existing sewer line was discovered to be within the foundation footprint of Abutment 2. A design modification was provided and the contractor was able to install a new manhole outside of foundation footprint, with new connections made to the

III. Findings and Recommendations

existing sewer line. The contractor was paid \$57,099 via change order to account for this design omission.

As a result of the Abutment 2 redesign, the contractor incurred various costs associated with the delay: \$15,000 of temporary shoring at Abutment 2 was required to provide stability; \$25,764 in equipment stand-by costs; and \$31,082 in under-structure heating costs related to winter work – all of which were paid by ACDPW via change order.

Additionally, based on the actual location of the water and sewer utility lines, modification of the caisson (a watertight structure allowing work to be performed on the foundation of bridge piers) size was from 60” to 54” diameter was required to avoid hitting the lines. A net cost of \$14,530 was paid to the contractor via change order for this modification.

These costs totaled \$143,475.

Painters Run Road Lateral Support – Site 1 & Site 2

On February 16, 2016, construction at Painters Run Road Lateral Support – Site 1 and Site 2 was shut down by the PA DEP due to a lack of appropriate permitting documents. The acquisition of the permit was the responsibility of the project designer. After review of the site and construction plans, the DEP required additional erosion and sedimentation controls, testing of water and soils, and a hazardous waste plan. As such, \$70,000 was paid to the contractor via change order to cover the associated costs with this design omission. Project delay costs associated with the DEP shut down were also charged by the contractor through change orders. See Finding #2.

Bull Creek Channel Restoration

The description of work for the Bull Creek Channel Restoration project called for the installation of rock slope erosion protection in four locations on the stream banks, installation of a gabion wall on the eastern bank between the Conrail railroad bridge and the Fourth Avenue Bridge, planting of native species of grass along the eastern bank of Bull Creek, and dredging and post dredging stream habitat mitigation. While the contractor was excavating for the installation of the gabion wall, it was determined that the pier depth of the Tarentum Bridge was too shallow to continue. The excavation was shut down by PennDOT to prevent any further instability to the Tarentum Bridge. The project designer was required to develop an adjacent caisson wall to replace the original as-designed wall and avoid any additional excavation surrounding

III. Findings and Recommendations

the Tarentum Bridge pier. A cost of \$700,000 for the caisson wall was submitted by the contractor and approved by ACDPW. The change order for this design omission totaled \$488,414, as the net change equaled the cost of the new wall less a credit for the cost of the original wall.

Settler's Cabin Connection to the Panhandle Trail (Phase 1)

Phase 1 of this project involves the construction of an 11 foot wide asphalt trail covering a distance of approximately two-thirds of a mile through Settler's Cabin Park. Per the terms of the contract, the contractor was to load, deliver and install an average 3-inch thick layer of recycled asphalt pavement on an existing 3-inch thick subbase. Upon commencement of construction, it was determined that there was no existing subbase on the trail. The contractor was paid an additional \$42,406 via change order to account for the additional 3 inches of asphalt necessary to construct the required 6-inch layer.

Ingomar Road Waterline / North Park Trails

Two projects were bid as part of this contract: 1) ACDPW Project ZCNP-WL06 provides for the replacement of the water line at North Park along Ingomar and 2) Old Ingomar Roads; ACDPW Project ZCNP-LK02 includes work related to the installation of trails, drainage construction, parking lot improvements, tree protection, and landscaping.

Four change orders were submitted under this construction contract, all of which were approved and paid by ACDPW, to allow for additional payments to the contractor. 1) The contractor was paid \$11,419 for exploratory excavation efforts to locate a supply line that was not located where indicated in the plans. 2) An additional \$6,820 was paid to the contractor for grading revisions at the Shaler Pavilion as it was determined that revisions to raise the lot were necessary to properly drain the area. 3) The contractor was paid \$5,083 for the revision of the ¾" water line for the Shaler Shelter bathrooms to a 2" line. This revision was necessary as the existing plumbing, piping, and fixtures at the bathrooms utilized a 2" line. 4) The contractor was also paid \$76,000 via change order for extra work associated with the project designer's revision to the plans relating to drainage features at the west end of Municipal Row Access Drive. In total, \$99,322 was paid to the contractor via change orders to cover the associated costs with the aforementioned design omissions.

III. Findings and Recommendations

Middle Road Preservation

Deliverables for the Middle Road Preservation project include: roadway rehabilitation with milling, base repairs, and bituminous overlay; guiderail and signage updates; and other miscellaneous construction on slightly more than 2 miles of roadway stretching through Hampton and West Deer Townships.

After design omissions were discovered in the field, temporary line painting was requested by ACDPW as a safety measure for the construction crew and motorists during off hours. Geotextile (a permeable material that can reinforce, filter, protect, etc.) was also created at the request of ACDPW for 6" pavement base drain work. Associated costs of \$34,723 for the two aforementioned omissions were requested by the contractor and paid by ACDPW through the change order process.

Cause: Design omissions detailed in this finding could be a product of project complexity, engineering miscalculations, lack of attention or knowledge with regard to permitting requirements, lack of adequate field surveys, and/or inexperience. Design engineers and architects should draft design plans and specifications with a certain level of consistency and reasonable standard of care. Human error is, however, a reality which can often be magnified on large and complex design projects.

Effect: Construction contract change orders due to design omissions and related delays for these nine projects totaled \$2,229,800. It can be argued that costs associated with design omissions should be considered unavoidable as such costs would had to have been paid regardless of whether or not they were included in the initial bid package. However, it is common for costs reported on change orders to have a higher markup than costs bid in the initial bid package. As a result, ACDPW most likely paid more for the work performed on change order than it would have had the work been included in the initial bid package.

Design omissions can also lead to significant delays and disruptions to the planned schedule of work, which in turn can lead to additional costs associated with such delays.

Recommendations: We recommend that ACDPW management:

- Build into the contract provisions for limits on errors and omissions with specific remedies if these limits are exceeded. This will establish a clear understanding going into the project

III. Findings and Recommendations

that there will be a reasonable cost associated with errors and omissions.

- Maintain an open line of communication with its design consultants during the design phase to ensure that projects are designed according to ACDPW and regulatory requirements.
- Conduct a thorough review of design specifications prior to bidding a project to attempt to identify and eliminate any design omissions prior to construction.
- Encourage open communication between the project contractor and designer throughout the project to ensure that any design omissions are identified and quickly remedied.

**Management's
Response:**

ACDPW's response begins on page 24 of this report.

III. Findings and Recommendations

Finding #2

Failure to Obtain Required Permits Resulted in Additional Costs of \$149,262

Criteria:

Through discussions with ACDPW personnel and review of contract documents, all required permits should be obtained prior to the start of project construction.

Allegheny County Department of Public Works (ACDPW) entered into an agreement with WEC Engineers, Inc. (WEC). in March 2005 for engineering and design services on an open-end basis. Allegheny County Contract #40093 was originally for a period of three years with initial funding of \$300,000. The contract has been extended multiple times through December 31, 2016 and funds in excess of \$2.6 million have since been added.

In 2015 ACDPW reviewed WEC's technical and price proposal and engaged them to provide design and engineering services for the Camp Meeting Road Stabilization project under Contract #40093. Their submitted proposal states that, among other duties, WEC will determine the permit requirements for the Chapters 102 and 105 applications and coordinate with the Allegheny County Conservation District and the PA DEP.

In 2005 ACDPW also entered into an agreement with AWK Consulting Engineers, Inc. (AWK) to provide professional geotechnical engineering services on an as-needed basis for various projects throughout Allegheny County. Allegheny County Contract #40094 was originally for a period of three years with initial funding of \$392,311.83. The contract has been extended multiple times through December 31, 2018 and funds in excess of \$4.4 million have since been added.

Contract #40094 stipulates that AWK is responsible for, among various other tasks, completion and delivery of the erosion and sedimentation control plan as well as any PA DEP and Department of Army Joint permit applications. AWK's submitted technical proposal for Contract #40094 also states that AWK will be responsible for the preparation of various applicable permits in coordination with the PA DEP as well as preparation of erosion and sedimentation control plans.

Condition:

During our review of 12 construction projects, we found two projects where a required permit was not finalized prior to construction, resulting in project delay cost.

III. Findings and Recommendations

Camp Meeting Road Stabilization

For the Camp Meeting Road Stabilization project, we found that a Water Obstruction and Encroachment permit was submitted by the ACDPW to the PA DEP on March 8, 2016, prior to the issuance of the Notice to Proceed for construction. However, while it appears the DEP began their completeness review of the permit on the date received, the DEP's initial review was not completed until June 30, 2016, almost four months later. After Allegheny County received and addressed three separate deficiency letters from the DEP, the permit was finally issued on October 25, 2016.

Camp Meeting Road Change Orders #1 and #2 submitted to the County by the construction contractor show time extensions of 98 and 97 calendar days respectively. These time extensions are directly related to the suspension of work while obtaining required permits. The original time limit for construction on the Camp Meeting Road Stabilization project was 100 days. We found that a total of four time extensions were submitted to the County and construction on the project was officially finalized 342 days past the initial 100 day time limit. Because of the delays associated with obtaining the DEP permit and the importance of the road to the community and adjacent school district, ACDPW authorized the contractor to continue working through the winter months. Additional compensation of \$112,735 was paid to the contractor for the work inefficiencies caused by working in the winter months of November 2016 through February 2017.

Painters Run Road Lateral Support (Sites 1 & 2)

On February 12, 2016 project designers for Painters Run Road Lateral Support (Sites 1 & 2) submitted a completed Chapter 105 General Permit Registration application for Allegheny County's review and signature. The application was received by the DEP on February 16, 2016 and an approval letter and General Permit was mailed to Allegheny County on April 26, 2016. However, as of February 16, 2016 the Painters Run Road Lateral Support Project (Site 1 & 2) was officially shut down by the PA DEP as the proper permits were not currently in place.

On March 1, 2016, project designers also submitted a request to the DEP to temporarily discharge groundwater collected in drill bore holes, which were necessary for the wall replacement along the creek that runs adjacent to Painters Run Road. The DEP responded on March 2, 2016 by allowing contractors to perform the work under strict discharge monitoring requirements and by requiring Allegheny County and the contractor to comply with DEP Chapter 102 rules and regulations relating to erosion control.

III. Findings and Recommendations

Due to the designer's failure to obtain proper permits prior to the start of construction, the contractor incurred costs of \$36,527 relating to equipment standby costs and various other delay costs.

Cause: The construction Notice to Proceed for the Camp Meeting Road project was issued May 9, 2016 with a required completion date of August 8, 2016 (100 days). Work started on June 20, 2016 and was suspended on June 27, 2016 due to lack of the required DEP permit. The DEP permit was issued on October 25, 2016 and the contractor assembled a crew and work began on site on November 16, 2017. ACDPW authorized the contractor to continue working through the winter months in an attempt to mitigate time lost due to the suspension of work.

The construction Notice to Proceed for the Painters Run Road Lateral Support (Site 1 & 2) project was issued on January 20, 2016, prior to the submission of any permit application to the PA DEP. Work at the site was suspended on February 16, 2016 due to lack of required DEP permits and a time extension of 14 days was issued to the contractor to account for the shutdown. Approval was given to temporarily discharge groundwater collected in the drill bore holes on March 2, 2016 and the DEP General Permit was issued to Allegheny County on April 26, 2016.

Effect: Additional Camp Meeting Road project costs of \$112,735 related to winter work were billed to and paid by the County.

Additional Painters Run Road Lateral Support (Site 1 & 2) project costs of \$36,527 related to project delay costs were billed to and paid by the County.

Recommendations: We recommend that ACDPW management:

- Work closely with design and engineering firms to ensure that proper permits are in place prior to the start of construction.
- Include in the design engineer contract a penalty for not properly obtaining permits.

Management's Response:

ACDPW's response begins on page 24 of this report.

III. Findings and Recommendations

Finding #3

Poor Utility Coordination Leads to Increased Construction Costs

Criteria: Design and construction projects, both large and small, require close coordination with surrounding utility services. The benefits of efficient utility coordination can lead to greater adherence to construction schedules, avoidance of any unnecessary or redundant utility explorations, and can ultimately decrease project design and construction costs.

Generally, the design project engineer is responsible for early-stage coordination with the various utilities that will be affected by the construction of a project. Additional utility coordination becomes the responsibility of the contractor once project construction begins.

Condition: Of the 12 construction projects reviewed, we identified two projects that incurred additional costs due to poor coordination with various utilities.

Greensburg Pike Bridge

When reviewing project documentation for the construction of the Greensburg Pike Bridge, we found that additional costs of \$511,395 were incurred and paid to the contractor for utility design and delay issues encountered during construction. Of this amount, \$321,965 was attributable to an issue with the North Versailles Township Sewer Authority with an additional \$144,492 paid to the contractor as a result of a Verizon claim. The remaining \$44,938 of costs paid to the contractor relating to utility design and delay issues were attributable to a separate issue with Verizon as well as a waterline relocation issue with the Wilkinsburg-Penn Joint Water Authority.

It was known at the bidding of the project that a sanitary sewer line, owned by North Versailles Township Sewer Authority, had to be installed through the limits of the project. However, due to specific wording in the bid and contract documents, the contractor believed that the installation of the sewer line would only affect the construction of Retaining Wall #2. It was not until a Utility Coordination Meeting months into the project that the contractor was given additional information to conclude that the sewer line installation directly affected the construction of Abutment #2 in addition to Retaining Wall #2. Two time extensions were issued by ACDPW to the contractor for 107 calendar days and 98

III. Findings and Recommendations

calendar days, respectively for issues directly relating to the North Versailles Township Sanitary Authority work. Based on the contractor's extended overhead cost which was previously accepted by ACDPW, the contractor was paid an additional \$321,965 relating to delays caused by the installation of the North Versailles Township Sanitary Authority sewer line.

The Verizon work affected all construction activities along the south side of the bridge. The contractor encountered three major issues relating to Verizon's work: 1) Verizon required a redesign of several details of their work, 2) Verizon took substantially longer to perform their required work, and 3) the contractor required preparation and remobilization time to close the old bridge once the Verizon work was complete. The Verizon work delayed the demolition of the old bridge (which in turn delayed the construction of the new bridge) as the existing Verizon facilities could not be taken out of service until the facilities on the new bridge were functional. A time extension was issued by ACDPW to the contractor for a total of 92 days for issues specifically relating to the Verizon work. Based on the contractor's extended overhead cost which was previously accepted by ACDPW, the contractor was paid an additional \$144,492 relating to delays caused by Verizon.

Campbell's Run Road Embankment Stabilization Project

Approximately one year prior to beginning construction activities on the Campbell's Run Road Embankment Stabilization project, ACDPW made known its intent to rehabilitate the roadway. In November 2014, the project designer was forwarded utility plans by the Municipal Authority of the Township of Robinson (MATR) showing the location of the sewer line running within the roadway. In December 2014, after the project designer met with MATR onsite to confirm the location of the sewer line, it was determined by the project designer that the previously marked location by MATR was incorrect. After the site was re-surveyed, the project designer forwarded MATR the correct location of the sanitary sewer line. Additionally, it was determined by the project designer that the sewer line was actually a 15" concrete encased transite pipe, not the 18" reinforced concrete pipe described by MATR.

As it was determined that the sewer line is much closer to the caisson (used as part of the design for roadway stabilization) locations than anticipated in the initial design, additional steel casing to protect the caissons was required. The contractor was paid \$37,500 via change order to account for change in the quantity of casing required. Furthermore, the contractor was paid

III. Findings and Recommendations

an additional \$147,209 via change order to account for delay and mitigation costs associated with working in such close proximity to the existing MATR sewer line. These costs totaled \$184,709.

Cause: It appears this condition occurred as coordination with various utilities was not properly managed by project managers, project designers or contractors.

Effect: Additional costs of \$511,395 were incurred and paid to the Greensburg Pike Bridge contractor for utility design and delay issues encountered during construction.

Additional costs of \$184,709 were incurred and paid to the Campbell's Run Road contractor for additional materials and delay costs associated with the location of the MATR sanitary sewer line.

Design errors are a major contributor to rework, which ultimately leads to schedule delays and cost overruns in design and construction projects.

Recommendations: We recommend that ACDPW:

- Take steps to ensure its project designers, engineers and contractors are proactively involved in the process of utility coordination.
- Take action to hold utility companies who knowingly cause delays to the project schedule financially accountable for the costs associated with those delays.

Management's Response: ACDPW's response begins on page 24 of this report.

III. Findings and Recommendations

Finding #4

Public Works is Unable to Provide Complete Project Information

Criteria: The Allegheny County Department of Public Works (ACDPW) Retention Policy states that contract files, to include bids, proposals, price quotations, qualified contractor memoranda, and executed agreements are to be retained for a period of 12 years after termination of such construction contracts. It also states that construction plans and specifications should be retained until the structure is reconstructed or is no longer property of the County, and that bridge proceedings, to include construction, inspection and maintenance records be retained permanently.

Condition: During the performance of our audit, we encountered several issues in which management of the ACDPW was unable to provide requested documentation.

ACDPW projects involve various types of contracted services such as project designers, contractors to perform the work, construction managers, and construction inspectors. We requested the total project cost and any associated reimbursements for each of the 12 projects we tested, broken down by type of contract. ACDPW management was unable to provide this information. Certain contracts on a project are open-end contracts. These contracts typically include a provision to assign projects on an as-needed basis and thus include numerous projects. Total contract costs are tracked in the County's accounting system. However, ACDPW does not track costs for each specific project within a contract or total costs for a project. ACDPW informed us that in order to determine costs associated with a specific project under open-end contracts, each invoice submitted under the contract would need to be individually reviewed to isolate such project specific costs.

We attempted to review all change orders related to project design and construction for the 12 projects we selected. ACDPW was unable to provide all design change orders for two of the twelve projects (17%). For an additional three projects (25%), all of which had design services under an open-end contract, ACDPW could not provide any design change orders. This is especially important as the open-end design contracts were funded with an initial funding amount, with funds for additional projects to be added through change orders. We had planned to compare our project costs found through change orders to the project costs provided by ACDPW, but due to ACDPW's inability to provide

III. Findings and Recommendations

complete project costs or all applicable change orders, we could not accomplish this task. For another project (independent of those already discussed above), ACDPW was able to provide one change order for which design services occurred under an open-end contract. However based on our review of the change order, we were unable to determine if this was the only change order applicable to the project or if there were other design change orders that were not provided by ACDPW.

Additionally, we found one construction change order for one of the 12 projects tested for \$488,414 relating to a wall that had to be redesigned as the pier depth of the adjacent bridge was determined to be too shallow to excavate for the originally designed wall type. This change order increased the original construction contract costs by an additional 47%. When reviewing the attached Allegheny County Executive Action (EA), we noted that the EA stated that the County would be pursuing reimbursement of these costs from the designer at a later date. However, when we spoke with management of ACDPW we were informed that no reimbursement was sought or received.

Cause: ACDPW does not utilize a dedicated project management software where all project-related information can be entered, stored, and reviewed. Project managers are responsible for maintaining information relevant to their projects only. Information is not maintained in a central location, and is stored both electronically and in physical form, depending on the project manager's preference. Additionally, project costs are not tracked individually in the County's JDE system or in any other dedicated system.

Effect: While ACDPW does employ outside project managers on most projects, it appears the Department still lacks the ability to put together a comprehensive representation of the project as a whole. Comprehensive project management is critical for effective management of project costs, timelines, and deliverables. If ACDPW is unable to provide all project related information (to include all documentation and cost information) to satisfy an audit request, it would seem improbable that the Department has a good grasp internally on project costs, timelines and deliverables.

Recommendations: We recommend that ACDPW:

- Institute a project management system that can serve as a hub for all project-related information.
- Implement stricter standards for preparing, retaining and organizing project records.

III. Findings and Recommendations

- Consider working with the Controller's Office to institute a system where project costs are easily distinguishable and traceable in JDE.

Management's

Response:

ACDPW's response begins on page 24 of this report.

IV. Conclusion

The Allegheny County Department of Public Works (ACDPW) utilizes a detailed manual to establish guidelines and policies for the procurement, implementation, and management of consultant services. Since the lowest responsible responsive bidder is not required to be selected for professional service contracts, three selection/review committees are involved in the procurement process. During our audit, we noted that the procurement processes were generally followed for the projects tested. However, we did find that even though these policies are in place, there were numerous instances where the project designs produced by the selected consultants were missing key elements or contained unacceptable components. We recognize that on any large construction project unexpected issues will arise. However, major omissions from the project design prohibit ACDPW from soliciting bids for a complete project from construction companies which can lead to overall increased project costs. We also found instances where required permits were not obtained and where issues with utilities resulted in additional work, resulting in increased project costs.

ACDPW needs to strengthen the procedures and controls surrounding the monitoring of the design process to ensure construction project designs are more complete and include the majority of the work that needs to be performed to produce a quality project that will last for many years. ACDPW also needs to develop procedures to track costs by project. Furthermore, information related to design omissions for specific design consultants should be well documented and thoroughly considered by all parties during the procurement process.

Allegheny County Department of Public Works
 Change Order Summay for Construction Contracts Sampled

		<u>Reason for Change Order</u>						
<u>Project Name</u>	<u>Finding #1 Omissions</u>	<u>Finding #2 Permit Delays</u>	<u>Finding #3 Utility Issues</u>	<u>Additional Work/ Unforeseen Conditions/ Other</u>	<u>Total Change Orders</u>	<u>Original Contract Amount</u>		
1 Camp Meeting Road	\$ 301,047	\$ 112,735	\$ -	\$ 60,450	\$ 474,232	\$ 487,296		
2 Thompson Run Road	\$ -	\$ -	\$ -	\$ (26,083)	\$ (26,083)	\$ 2,214,221		
3 Pine Creek Bridge #8	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 987,783		
4 Greensburg Pike Bridge	\$ 830,772	\$ -	\$ 511,395	\$ 2,606,226	\$ 3,948,393	\$ 16,235,957		
5 Settlers Cabin Maintenance Garage	\$ 219,641	\$ -	\$ -	\$ 89,129	\$ 308,770	\$ 679,400		
6 Pine Creek Bridge #11	\$ 143,475	\$ -	\$ -	\$ (75,362)	\$ 68,113	\$ 1,948,462		
7 Painters Run Road Lateral Support Site 1&2	\$ 70,000	\$ 36,527	\$ -	\$ 56,249	\$ 162,776	\$ 2,348,014		
8 Bull Creek Channel Restoration	\$ 488,414	\$ -	\$ -	\$ (83,805)	\$ 404,609	\$ 1,038,038		
9 Campbells Run Road Embankment Stabilization	\$ -	\$ -	\$ 184,709	\$ 1,179	\$ 185,888	\$ 890,951		
10 Settlers Cabin Connection to Panhandle Trail	\$ 42,406	\$ -	\$ -	\$ 57,835	\$ 100,241	\$ 421,921		
11 Ingomar Road Waterline/NP Trails	\$ 99,322	\$ -	\$ -	\$ 664,824	\$ 764,146	\$ 1,335,000		
12 Middle Road Preservation	\$ 34,723	\$ -	\$ -	\$ (383,744)	\$ (349,021)	\$ 2,596,117		
	<u>\$ 2,229,800</u>	<u>\$ 149,262</u>	<u>\$ 696,104</u>	<u>\$ 2,966,898</u>	<u>\$ 6,042,064</u>	<u>\$ 31,183,161</u>		
	7.2%	0.5%	2.2%	9.5%	19.4%			

Source: Department of Public Works Contracts and Change Orders



RICH FITZGERALD
COUNTY EXECUTIVE

November 5, 2018

The Honorable Chelsa Wagner
Allegheny County Controller
104 Allegheny County Courthouse
436 Grant Avenue
Pittsburgh, PA 15219

Dear Ms. Wagner:

Thank you for this opportunity to respond to the Performance Audit Report on Allegheny County Department of Public Works Contract Evaluation for the period of January 1, 2015 through December 31, 2017. We have reviewed your findings and offer the following responses.

Finding #1: Design Omissions Hinder Public Works' Ability to Bid a Complete Project

Response: As a best practice, the Contracts Division has implemented a bid package checklist to be completed prior to the bid of a project to enhance quality control and we continue to implement PennDOT's Policies and Procedures for managing design and construction projects. Further explanation on design omissions and the process of handling them can be found in PennDOT Publication 93 Policy and Procedures for the Administration of Consultant Agreements and PennDOT Publication 2 Project Office Manual.

Every effort is made in design to put out a complete bid package, however due to the complexity of our projects, not all design omissions can be caught after a thorough review. It is through strong project management of County Staff and cooperation with the contractor and designer that project issues are effectively resolved. From 2015 through 2017 the Department of Public Works bid 33 projects that were completed. The total bid opening amounts for these projects were \$81,130,952.38 and the final contract amount for these projects were \$81,333,477.88. This amounts to a \$202,525.50 difference between bid opening and final amount and a change in costs of 0.25% which is significantly below the industry standard of 10% that was cited in your audit.

We believe that by continuing the implementation of our bid package checklist and following PennDOT's Policies and Procedures for the management of design and construction projects, along with strong project management by our design and construction professionals, we will mitigate the risk of future design omissions.

Finding # 2: Failure to Obtain Required Permits Resulted in Additional Costs of \$149,262

Response: Allegheny County Department of Public Works agrees that all permitting issues should be resolved prior to the bid of a project. The Contracts Division has implemented checklists to be completed

CNST-18-0994



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prior to the bid of a project to enhance quality control. The Department sometimes makes decisions that we feel are in the best interest of the public based on the information at that time. Camp Meeting Road had been restricted due to a landslide and was a hardship on the community that required the implementation of a lengthy detour. It was also a public safety issue that delayed emergency response time. Further, PennDOT had a planned project to replace Little Sewickley Creek Bridge Replacement Project that conflicted with our detour. For these reasons the Department of Public Works proceeded with bidding and subsequently constructing the project to fully reopen the road prior to the Little Sewickley Creek Bridge Replacement restriction.

Finding #3: Poor Utility Coordination Leads to Increased Construction Costs

Response: Every effort is made to properly coordinate with utility companies during design to limit the impact they have on a construction project. Designers and Project Managers utilize PennDOT Publication 16 DESIGN MANUAL PART 5 UTILITY RELOCATION in their efforts to limit conflicts. However, due to inadequate records from utility companies on the exact location of their services, and not being able to visually see the location prior to construction utility conflicts will occur. The County is continually striving to improve our relationship with utility companies that provide an essential service to the public. Subsurface Utility Exploration (SUE) is being implemented on projects where underground utility conflicts are anticipated, and every effort is made during construction to limit costs and time caused by utility relocation or conflicts.

Finding #4: Public Works is Unable to Provide Complete Project Information

Response: The design and construction of Public Works projects generates a lot of project information. With the transition over time from paper to electronic files, it does make it difficult to easily access all information in a timely manner. This is further complicated by us using PennDOT's PPCC system on state and federal systems and a separate project management software on County Funded projects. The Department of Public Works has begun to work on a standardized electronic filing system on all projects.

Conclusion: The Department of Public Works is required to award construction projects to the lowest responsible bidder. Consultants are selected in accordance with the Guidelines for Consultant Services. Consultants that perform work for us are continuously evaluated and past performance is a measure used when selecting firms for new work. Our project managers that oversee the design and construction strive to limit project issues and when they arise handle them as effectively as possible. This can be seen through the bid costs and final construction costs of the projects bid through 2015-2017 that have been completed. It is our opinion that this is a more accurate representation of the projects designed and constructed by this Department than those selected for this audit.

Sincerely,



Stephen G. Shanley, PE
Director

Cc: Lori Churilla, CPA, Assistant Deputy Controller, Auditing