The Auditor of the City and County of Denver is independently elected by the citizens of Denver. He is responsible for examining and evaluating the operations of City agencies for the purpose of ensuring the proper and efficient use of City resources and providing other audit services and information to City Council, the Mayor and the public to improve all aspects of Denver’s government. He also chairs the City’s Audit Committee.

The Audit Committee is chaired by the Auditor and consists of seven members. The Audit Committee assists the Auditor in his oversight responsibilities of the integrity of the City’s finances and operations, including the integrity of the City’s financial statements. The Audit Committee is structured in a manner that ensures the independent oversight of City operations, thereby enhancing citizen confidence and avoiding any appearance of a conflict of interest.

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Dear Mr. Cornejo:

Attached is our audit of the Public Works Capital Construction Project Management process. The purpose of our audit was to evaluate the management process associated with the construction of capital projects.

I am pleased that real progress is being made to address our findings in this and previous audits. I commend your commitment to addressing these issues. It is my belief that the implementation of our recommendations will save the city money, improve our contracting and prequalification process, and ensure a fair and level playing field for contractors bidding on city projects.

However I am concerned that the Comprehensive Project Management Data System is behind schedule. This project had a planned implementation date of 2012. It is now November of 2012 and it is not implemented; project Managers are still unable to manage their projects in one system. And now, City Council has granted a $2.3 million dollar increase bringing the total to almost $15 million dollars for a system that is not functional! I see this as an ongoing serious problem that must be addressed.

If you have any questions, please call Kip Memmott, Director of Audit Services, at 720-913-5000

Sincerely,

Dennis J. Gallagher
Auditor

cc: Honorable Michael Hancock, Mayor
    Honorable Members of City Council
    Members of Audit Committee
    Ms. Cary Kennedy, Deputy Mayor, Chief Financial Officer
    Ms. Janice Sinden, Chief of Staff
    Ms. Stephanie O’Malley, Deputy Chief of Staff
    Ms. Beth Machann, Controller
    Mr. Doug Friednash, City Attorney
    Ms. Janna Bergquist, City Council Executive Staff Director
    Mr. L. Michael Henry, Staff Director, Board of Ethics

To promote open, accountable, efficient and effective government by performing impartial reviews and other audit services that provide objective and useful information to improve decision making by management and the people.

We will monitor and report on recommendations and progress towards their implementation.
AUDITOR’S REPORT

We have completed our performance audit of the Public Works Capital Construction project management process. The purpose of our audit was to evaluate the Department of Public Works’ (Public Works) management of several components related to the construction phase of capital projects. This included assessing Public Works’ project management policies, practices, and processes and determining compliance with City rules related to prequalification of potential contractors. We also examined accounting processes associated with finalizing capital construction projects.

This performance audit is authorized pursuant to the City and County of Denver Charter, Article V, Part 2, Section 1, General Powers and Duties of Auditor, and was conducted 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.

Our audit revealed systemic weaknesses in the Department’s process for procuring and managing the construction phase of capital projects. Audit testing also identified instances of noncompliance with the City’s Fiscal Accountability Rule regarding the submission of Capital Project Close Out Forms to the City Controller’s Office.

We extend our appreciation to Public Works personnel who assisted and cooperated with us during the audit.

Audit Services Division

Kip Memmott, MA, CGAP, CRMA
Director of Audit Services
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EXECUTIVE SUMMARY

Public Works Lacks Sound Project Management Practices for Capital Projects

The City’s Department of Public Works (Public Works) was responsible for the management and delivery of over $134 million worth of project construction work for the City and County of Denver in Fiscal Year 2012. The life cycle of a capital construction project comprises several phases. These phases consist of construction contract procurement, project construction, and project close out.

Our review indentified several process weaknesses in each of the following three areas:

1. Special Permission Rules – There is a lack of clarity, consistency, and transparency in the prequalification process due to ambiguity in the special permissions rules, which may lead to impropriety in the process

2. Project Management – There are weaknesses in the project management process for capital construction projects

3. Compliance with Fiscal Rule 4.3 – Public Works has not complied with Fiscal Accountability Rule 4.3 regarding the submission of Capital Project Close Out Forms to the City Controller’s Office

Ineffective Special Permission Rules Undermine Prequalification Process

The Departments of Public Works and Aviation have adopted Rules for Prequalification of Construction Contractors (Prequalification Rules) governing the prequalification process. This process allows contractors to bid on City projects up to a certain amount based on their qualifications and financial capabilities. In order to bid on a project that exceeds their limit, a contractor must apply for special permission.

Audit work revealed weaknesses in the process used for granting special permission. First, the requirements for granting prequalification and special permission are identical meaning no additional information about the bidder’s ability to perform the work is reviewed and assessed prior to granting such permission. Second, the special permission rules and process are unnecessarily vague, possibly leading to a perception of impropriety in the process. Third, granting special permission under current provisions appears superfluous since prequalification status is renewed every twelve months.

In addition, our November 2011 Public Works Contracting Process Audit also identified potential weaknesses and problems with regard to the prequalification process, specifically regarding the management overrides to the prequalification process and reviewing the past performance of contractors submitting for prequalification status with the City.¹

Inefficient Project Management Processes Inhibit Effective Administration of Capital Projects

In order to successfully lead and complete capital projects, the Public Works’ project management process allows Project Managers certain latitude to oversee projects. However, unclear expectations caused by this flexibility can create unintended consequences in the construction process. Specifically, Public Works lacks the following project management tools to effectively manage capital projects:

1. Updated and consolidated project management manual – The use of outdated and multiple project management manuals by Public Works creates inefficiencies in managing capital projects
2. Comprehensive project management data system – A comprehensive project management data system, initiated in 2008 and intended to create an “all-in-one” project management system, has yet to be deployed in the City
3. Use of project risk analysis – A risk analysis is not completed as required by the City project management manual
4. Use of change-order information to analyze underlying issues – No root-cause analysis is performed on change orders to determine key learnings from projects and how to apply them to future projects
5. Complete documentation of final walk-through inspections – Documentation is not sufficiently maintained to accurately reflect final walk-through of complete construction projects
6. Contractor performance measures – An emphasis should be placed on performance rather than time and budget alone

Public Works Did Not Comply with Fiscal Accountability Rule 4.3 for Timely Submission of Capital Project Close Out Forms

Public Works is not in compliance with Fiscal Accountability Rule (Fiscal Rule) 4.3. Fiscal Rule 4.3 requires that a Capital Project Close Out Form (close out form) be completed thirty days subsequent to occupancy of a project and submitted to the Controller’s Office. In 2002, the City implemented Governmental Accounting Standards Board Statement 34 (GASB 34), which requires accurate accounting for capital projects from inception to completion, including depreciation. Timely and consistent completion of close out forms will help the City remain compliant with GASB 34.

Audit work revealed that 47 percent of the projects tested did not have a close out form submitted. Additionally, of the remaining close out forms that were submitted to the Controller’s Office, none were submitted within the thirty day time frame specified by Fiscal Rule 4.3.
INTRODUCTION & BACKGROUND

The Department of Public Works Is Responsible for Managing Capital Construction Projects in the City and County of Denver

The Department of Public Works (Public Works) was created under the authority of the City and County of Denver Charter. The Charter authorizes Public Works to manage and control the design, planning, construction, and reconstruction of all general improvements for the City. Public Works has construction responsibility for all City agencies except the Department of Aviation. Public Works is the City’s second largest General Fund department, employing over 1,100 personnel. As shown in Figure 1, of approximately $375.4 million in budgeted expenditures in 2012, over $134 million (36 percent) were for capital improvements.²

Figure 1
Public Works 2012 Budgeted Expenditures

Public Works facilitates and oversees the construction of City streets, bridges, storm and sanitary sewers, and public buildings. The Capital Projects Management Division within Public Works provides planning, programming, design and construction, and project

² City and County of Denver Mayor’s 2012 Budget, pages 537 and 539.
management services for building and maintaining the City’s infrastructure, including buildings and roadways. These types of projects are commonly referred to as capital construction projects or capital projects. The construction work associated with these projects is usually outsourced to outside vendors. Project management responsibilities may be handled in-house or may be contracted out as well.

The Capital Construction Project Life Cycle

The life cycle of a capital construction project comprises several phases. A project begins with defining and designing the project and is finalized when the City completes final accounting processes and the project becomes available for public use. Figure 2 summarizes the three phases of the construction life cycle, from the time a project is put out to construction contractors for bidding to the time contract close out processes are completed and the project is ready for public use.

![Figure 2](image)

**Construction-Related Phases of a Capital Construction Project**

- **Prequalification of construction contractors**
- **Solicitation of bids from construction contractors**
- **Selection of the contractor**

- **Project management, including change orders and contract compliance processes**

- **Project finalization, including final walk-throughs and completion of punch list items**
- **Accounting processes to close out the project**

Source: Figure 2 was prepared using capital construction process information from previous audits, and the City and County of Denver’s Standard Specifications for Construction, General Contract Conditions 2011 E, commonly referred to as the Orange Book.
Audit work assessed all three phases. Specifically, within the construction contract procurement phase, auditors reviewed processes associated with contractor prequalification. We also assessed project management practices and controls and reviewed construction and accounting practices associated with project close out.

**Contractor Prequalification**

Prior to bidding on City construction projects with a value of $1 million or more, every construction contractor is required to apply for and obtain prequalification status. The Department of Public Works and the Department of Aviation have adopted Rules for Prequalification of Construction Contractors (Prequalification Rules) governing the prequalification process. A panel called the Prequalification Board (the Board) helps evaluate prequalification applications and determine candidates’ prequalification status. The Prequalification Rules were last revised effective July 1, 2009.

The main purpose of the Prequalification Rules is to ensure that companies bidding on major City construction contracts have the experience, skill, financial resources, and integrity needed to perform the type and size of work involved. This goal is achieved by creating a prequalified pool of contractors for different work categories and project dollar amounts to allow for a more efficient bidding process.

Prequalification is granted for a category of work and a financial level based on the contractor’s experience, qualifications, and financial capability. The prequalification requirement is also applicable, regardless of value, to any contract involving work critical to public health and safety, such as asbestos removal or other environmental remediation work, and also to any contract for which prequalification is established as a prerequisite by the Manager of Public Works. The financial limit associated with prequalification means the contractor will be permitted to bid on contracts with a total estimated amount up to that limit.

Prequalification remains in effect through the date that is the earlier of either:

- Twelve months after the last day of the month in which the prequalification certification is issued; or
- Eighteen months after the closing date in the contractor’s reviewed or audited financial statement submitted with the application. This means that prequalification of a contractor is renewed at least every twelve months.

To renew the prequalification category or amount, the contractor must submit a new application and supporting documentation to the Board.

Additionally, a contractor with prequalification in the work category required by a specific City contract but at a financial limit lower than the estimated value of the contract may request special permission to bid on the contract. When determining whether to grant special permission, the Board considers the contractor’s bonding capacity, work history, and financial condition. According to the Prequalification Rules, the purpose of special permission is to maximize the number of bidders on a City contract thereby increasing competition for the contract and possibly obtaining a better price and project outcome.
Project Management

Project management comprises a wide array of administrative activities and processes conducted while a construction project is being built, including overseeing the work contractors perform, inspecting the work, and approving payment of contractor invoices. Audit research revealed common practices that can enhance a project owner’s ability to adequately and effectively manage capital projects. For example, research indicates that project owners should conduct a root-cause analysis to determine the causes of change orders. Additionally, a project management data system can also enhance a project owner’s ability to manage projects and provide more accurate reporting on project status to stakeholders.

Effective project management should include an assessment of the potential risks to the project. In fact, an ongoing formal assessment of various risks to the successful completion of the project is a critical component of the construction phase. This includes potential threats to the project schedule such as inclement weather, as well as potential threats to the quality of the completed project, and what can be done to manage the risks identified if they arise. Both performance and quality of work are critically important to the success of a project.

Project Close Out

The project close out phase of a capital construction project includes steps related to completing construction of the project and accounting steps to financially close the project. The final steps in completing construction on a project involve a walk-through inspection, which is conducted jointly by the Project Manager, the project designer, and the construction contractor. The purpose is to thoroughly inspect the project to ensure that all construction work has been fully completed. Items that have not been completed are documented on a punch list, which the contractor is then responsible for completing. Construction is not considered complete until the Project Manager is satisfied that all punch list items have been completed.

In addition to completing construction, project finalization also involves accounting procedures. Specifically, accounting rules require that projects classified as assets must be capitalized before depreciation of the asset can begin. Capitalization and depreciation are required to maintain the accuracy of the City’s financial records. Accounting procedures in the City are guided by the City’s Fiscal Accountability Rules (Fiscal Rules), which were developed to set parameters and assist City employees in conducting financial activities. Specifically, Fiscal Rule 4.3 requires a Capital Project Close Out Form (close out form) to be completed no more than thirty days after a project is occupied, or ready for public use. The close out form is then submitted to the City Controller’s Office, which uses the information to capitalize the asset in PeopleSoft, the City’s financial system.
SCOPE

Our audit assessed Public Works’ policies, practices, and processes related to the three construction-related phases of a capital construction project: construction contract procurement, project construction, and project close out. First, within the construction contract procurement phase, auditors reviewed policies associated with contractor prequalification. Second, within the project construction phase, we assessed project management practices and controls. Finally, within the project close out phase, we reviewed construction and accounting close out processes. Our review also included the Capital Improvement Program (CIP) for the City. Our assessment determined that the City CIP is a formalized and fairly structured process.

OBJECTIVE

The objective of this audit was to evaluate several components of Public Works’ management of capital construction projects by reviewing documentation associated with several projects. Areas of review included:

- Assessing Public Works’ project management policies and practices
- Determining Public Works’ compliance with City rules related to prequalification of potential contractors and capital construction project close out requirements

METHODOLOGY

We utilized several methodologies to achieve the audit objectives. These evidence-gathering and analysis techniques included, but were not limited to, the following:

- Conducting interviews with Public Works management and staff to obtain an understanding of Public Works’ policies and practices for managing capital construction projects
- Reviewing audits conducted by other government agencies related to capital construction project management
- Reviewing legal requirements related to managing capital construction projects, including the City’s municipal code and Public Works guidance documents
- Reviewing and testing of multiple City capital construction projects
- Researching best practices related to managing capital construction projects, including but not limited to an interview with a subject matter expert with extensive knowledge of capital project management practices
• Conducting a survey of Public Works staff with project management responsibilities

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3 We used an online survey tool to deliver a survey instrument to forty-nine staff identified as having project management duties. Because Public Works does not maintain an updated organizational chart we used the best information available, as reported by Public Works management, to select survey participants. The audit team identified participants independently. Fifteen individuals responded to the survey, a 31-percent response rate.
FINDING

Public Works Lacks Sound Project Management Practices for Capital Projects

The life cycle of a capital construction project comprises several phases. These phases consist of construction contract procurement, including determining contractor prequalification status, obtaining and reviewing bids for project construction and subsequently awarding the contract, construction management, and project acceptance and close out.

Our review of these steps indentified several process weaknesses in three areas. Specifically, we determined that there is a lack of clarity, consistency, and transparency in the prequalification process due to ambiguity in special permission rules in the Rules for Prequalification of Construction Contractors (Prequalification Rules). Additionally, audit work indicated weaknesses in project management processes. Specifically, Public Works lacks the following project management tools:

1. Updated and consolidated project management manual
2. Comprehensive project management data system
3. Use of risk analysis
4. Use of change-order information to analyze underlying issues
5. Complete documentation of final walk-through inspections
6. Contractor performance measures

Finally, Public Works was not in compliance with Fiscal Accountability Rule (Fiscal Rule) 4.3 regarding the submission of Capital Project Close Out Forms (close out forms) to the City Controller’s Office.

To aid the reader’s understanding of the weaknesses identified, we addressed them in the order they arise in the construction project lifecycle. In other words, we begin with prequalification processes, followed by project management practices, then the submission of close out forms to properly account for construction projects in the City’s financial records.

Ineffective Special Permission Rules Undermine Prequalification Process

Public Works has adopted Rules for Prequalification of Construction Contractors (Prequalification Rules) governing the prequalification process. One component of the Prequalification Rules is a provision for granting contractors special permission to bid on higher-cost construction projects.

Audit work revealed weaknesses in granting special permission. First, the requirements for granting prequalification and special permission are identical meaning no additional information about the bidder’s ability to perform the work is reviewed and assessed prior
to granting such permission. Second, the special permission financial limit is ambiguous. Third, granting special permission under current provisions appears superfluous since prequalification is renewed no later than every twelve months.

In addition, our November 2011 Public Works Contracting Process Audit also identified potential weaknesses and problems with regard to the prequalification process, specifically regarding management overrides to the prequalification process and reviewing the past performance of contractors submitting for prequalification status with the City.4

**Special Permission Rules Are Vague**

During audit work, the Auditor’s Office received notice of a concern related to the bid awarded for a specific construction project—the Park Hill Storm IV project (Park Hill Storm). The contractor that did not win the contract (Contractor One) alleged that the City had violated the Prequalification Rules in awarding this project to another contractor (Contractor Two).

The allegations included two specific claims—first, that Public Works artificially lowered the project estimate to accommodate and benefit Contractor Two, and second, that it allowed Contractor Two to exceed the special permission granted by Public Works for this project. We reviewed both allegations and did not conclude on the specific allegations in this case due to vague special permission rules; however, our review identified weaknesses in the special permission provisions of the Prequalification Rules. These weaknesses certainly contribute to negative perceptions of contractors who submit losing bids, about the equity and transparency of the Public Works contract procurement process. Additionally, vague and redundant requirements for granting special permission makes it more difficult for Public Works to defend contract award decisions.

In the City, contractors are prequalified to bid on contracts up to a specified amount. However, Public Works may grant a contractor special permission to bid on a project above their prequalified limit.5 The Rules state that special permission is generally granted to allow a contractor to bid on a contract in an amount not more than 150 percent of the amount of the contractor’s largest completed project.6

For the Park Hill Storm project, the engineer’s estimate was approximately $14.2 million. This allowed contractors prequalified at the $15 million level or higher to bid.7 Contractor One was prequalified at $25 million allowing them to bid on the project. Contractor Two was prequalified at $10 million and would not have been allowed to bid on this project. However, Contractor Two requested, and was granted, special permission to bid on the

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5 Rules for Prequalification of Construction Contractors, Section 4, Financial Limits for Prequalification, Part 4.06.
6 Ibid.
7 Prequalification limits start at $1.5 million and increase to $3, $5, $7.5, $10, $15, and $20 million respectively.
Park Hill Storm project. Subsequently, Contractor Two submitted a bid for $15.2 million and won the bid. Contractor One contended that Contractor Two had exceeded its special permission amount. Specifically, it concluded that Contractor Two should have only been allowed to bid up to $15 million. This rationale was based on Contractor One’s interpretation that 150 percent of Contractor Two’s prequalified amount of $10 million would have been $15 million.

The audit team wanted to identify if the aforementioned case was isolated or systemic in nature. Information provided by Public Works personnel indicated that no special permission was granted from January 2011 to June 2012. However, the special permission granted to Contractor Two occurred in March 2012. When auditors questioned Public Works personnel regarding this inconsistency, it was revealed that Public Works does not track the special permissions that it grants nor does it have a database to do so. Public Works personnel could not accurately identify how many contractors have been granted special permission to do work for the City in the eighteen-month time period in question. Public Works personnel explained that the only way to determine if a contractor was granted special permission would be to manually review the file for every contractor that is prequalified to do work in the City.

We identified three specific weaknesses in the Rules related to granting special permission that could have contributed to the confusion about requirements in the Rules resulting in Contractor One’s complaint. While our review focused on one instance, our observations regarding special permission may apply to other special permission requests based on fact that special permissions are not tracked by Public Works.

**Additional Criteria Should Be Required for Special Permission** – To prequalify, contractors must provide detailed information about their experience, qualifications, and financial capability. To obtain special permission, the contractors submit the same evidence of their qualifications and financial capabilities as those already submitted and a request for special permission. Since the Board uses the same information to support an increase in the contractor’s bidding limit, it is unclear why the contractor did not receive the higher limit as a result of the initial prequalification process.

Using the Park Hill Storm project as an example, the information originally submitted by Contractor Two supported prequalification at the $10 million level. Therefore, we question how the Prequalification Board can use the same supporting information to justify granting special permission to bid on a project estimated to cost approximately 50 percent more than the contractor’s prequalification amount.

**The Special Permission Financial Limit Is Ambiguous** – The special permission rules within the Prequalification Rules state that “[g]enerally, special permission will be granted to bid on contract in an amount that is not more than 150% of the amount of the contractor’s largest completed project.” However, audit work determined that the special

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8 Public Works subsequently cancelled the bid for this project. To date, this project is being redesigned, split into two phases, and rebid.
9 Contractors submit reviewed financial statements for prequalification at financial levels of $1.5 - 3 million, or the certified audited financial statements for any prequalification at financial levels above $3 million.
10 Rules for Prequalification of Construction Contractors, Section 4, Financial Limits for Prequalification, Part 4.06.
11 Rules for Prequalification of Construction Contractors, Section 4, Financial Limits for Prequalification, Part 4.06(c).
permission rules are ambiguous regarding how a contractor’s largest completed project is defined.

There is no provision in the Prequalification Rules indicating whether a contractor’s largest completed project must be a project in which the contractor participated as a prime contractor or whether it is acceptable to use a project in which the contractor acted as a sub-contractor. Depending on which of these two types of contracts qualifies as the largest completed project, the special permission limit could vary considerably. Finally, the use of the word “generally” in the Prequalification Rules, combined with the lack of a specific special permission amount in the letter Public Works sends to the contractor granting special permission, make it very difficult to determine what the special permission limit should be.

Using the Park Hill Storm project as an example, Contractor Two won the contract after applying for special permission to bid on the project. Contractor Two’s special permission documentation included a project history with various projects estimated at up to $20 million in value, indicating that Contractor Two might have been granted permission to bid up to $30 million for the Park Hill Storm project. However, it is unclear from the project documentation whether Contractor Two’s work on these projects was as a prime contractor or as a sub-contractor. The letter from Public Works granting Contractor Two special permission does not state a special permission amount. It merely states that the firm is granted special permission.

**Granting Special Permission Appears Superfluous Since Prequalification Is Renewed at Least Every Twelve Months** – The Prequalification Rules require that a contractor’s prequalification status must be renewed no later than every twelve months. The renewal includes submission of a new application and set of financial data. It is unclear how a contractor’s financial condition can substantively change to warrant granting special permission allowing them to increase their bid between the time of the initial qualification and the subsequent prequalification the following year.

Because Public Works does not track the number of and information about the special permission it grants, the special permission practice itself could be perceived as a subjective determination. A losing contractor may consider the outcome unfair and seek recourse from the City. A policy goal of utilizing special permission is to maximize the number of potential bidders on a City construction contract. However, granting special permission increases the risk of allowing contractors to bid beyond their financial capability.

Public Works should work with the Department of Aviation and the City Attorney’s Office to either eliminate the special permission provision or add requirements and detail to the Prequalification Rules that would reduce the risk of a perception that granting special permission is subjective and that would mitigate the risk of unqualified contractors attaining special permission. Public works should also formally document and track instances of special permission and the basis for granting such permission.

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12 Rules for Prequalification of Construction Contractors, Section 8, Prequalification Term: Renewal, Parts 8.01-8.05.
13 Rules for Prequalification of Construction Contractors, Section 4, Financial Limits for Prequalification, Part 4.06(c).
Inefficient Project Management Processes Inhibit Effective Administration of Capital Projects

In order to successfully lead and complete capital projects, the Public Works’ project management process allows Project Managers certain latitude to oversee projects. However, unclear expectations caused by this flexibility can create unintended consequences in the construction process. Specifically, Public Works lacks the following project management tools to effectively manage capital projects:

1. Updated and consolidated project management manual
2. Comprehensive project management data system
3. Use of risk analysis
4. Use of change-order information to analyze underlying issues
5. Complete documentation of final walk-through inspections
6. Contractor performance measures

Capital Projects Management Does Not Have an Updated and Consolidated Project Management Manual

Information provided to auditors indicated that two project management manuals are currently utilized to guide internal and external staff regarding capital construction project management. One project management manual is from 2000 and is occasionally used in conjunction with a project management manual compiled in 2008 by the contractor CH2M HILL for Better Denver Bond Program (BDBP) projects. The 2000 project management manual does not include specific policies and procedures for project management but instead only includes assorted forms that must be completed. Additionally, much of this information is outdated. Along with the 2000 manual, the BDBP manual is intended to be utilized for all capital construction projects. However, as with the 2000 manual, portions of the BDBP manual are outdated and not all requirements of the manual are followed. For example, Project Managers were unaware of a formal risk analysis and change order log required by the BDBP manual. As a result, auditors question how carefully the manuals are used to guide staff on project management practices within Public Works. Therefore, we recommend that Public Works consolidate the 2000 manual and the BDBP manual and update the information as appropriate to better reflect current project management practices. Further, controls should be put in place to ensure Project Managers adhere to policies and procedures.

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14 General training and Project Management training were noted by several survey respondents as a concern.
Comprehensive Project Management Data System Continues to Experience Delays and Increased Costs

Although currently in development, Public Works still has not fully implemented a comprehensive project management data system, which would allow Project Managers to update information directly into a universal data system instead of maintaining individual data systems to track the progress of capital construction projects. The comprehensive system includes several subcomponents:15

- Primavera (P6)
- Microsoft Access
- Oracle
- PeopleSoft
- Alfresco
- Web Application

In 2008, Public Works contracted with CH2M HILL to provide a suite of professional services and create a comprehensive project management data system with an initial cost of $12.6 million. This project had a planned implementation date of 2012. However, Project Managers are still unable to manage their projects in one system, since the comprehensive system is not fully implemented.

Subsequently, in July of 2012, City Council granted an extension to the current on-call contract with CH2M HILL for another eighteen months to work on the project until June 2014. The extension increases the cost of the project by $2.3 million to a new total of $14.9 million.16 Until the implementation is complete, project managers will not have access to a central project management data system and will continue to utilize disparate systems.

Implementation of the comprehensive project management data system will allow Public Works to streamline processes and mitigate the use of disparate systems.17 Redundant tasks can be eliminated when the planned data warehouse is fully operational. Therefore, we recommend that Public Works develop a detailed timeline for complete system implementation for all City stakeholders.

A Risk Analysis Is Not Performed Consistently

Industry practices recommend the utilization of a risk analysis for capital construction projects to determine the likelihood of mistakes and the magnitude of associated project costs. For example, The U.S. Department of Transportation and the Washington State Department of Transportation both recommend conducting a risk analysis as part of the

15 See Appendix B – Management Systems – Data Flow and Architecture
16 CB 12-0564 is a bill for an ordinance approving an amendment to an on-call agreement between CH2M HILL and the City and County of Denver for continuing program and project management services in support of the Better Denver Bond Program.
17 Public Works employs one scheduler and one analyst that have the ability to work with Primavera. This part has been transferred from the contractor to the City. However, the migration plan foresaw the final implementation of a universal data system by 2012.
Public Works does not consistently conduct a formal risk analysis to analyze issues that can be avoided in future projects.

Specifically, the BDBP manual calls for Project Managers to conduct a risk assessment for every project. The department recently reported that it is in the process of drafting and implementing a risk analysis template for mandatory use by Project Managers. We will verify the use of a risk analysis during our follow-up work for this audit.

Lack of Root Cause Analysis of Change Orders Presents Risk to Future Projects

Change orders are an inherent part of the construction process that, when used in excess, might negatively affect a project. Auditors requested change order information pertaining to the construction phase of several projects. After evaluating the change orders of several projects, we observed that Public Works does track change orders as a list but does not perform any in-depth analysis on the data collected. Merely listing change orders does not offer sufficient information to analyze core issues causing the need for change orders. For example, the 14th Street project had seven change orders that amounted to more than 10 percent of the total project cost. The project is ongoing and has accumulated a total of $1.8 million in change orders, increasing the cost of the project by 19 percent. This project has no specified completion date. The 14th Street project originally bid at $9.3 million in June 2010. In capital construction, change orders are considered to be a normal occurrence; however, experts suggest change orders exceeding 10 percent of the contract is concerning. Despite the wide variance in the initial bid price and the current project costs, Public Works has not performed or documented root causes for this increase. Merely noting that there have been seven changes orders associated with the project provides no analysis that, if performed, could possibly avoid or at least better predict wide variances in future project costs.

Public Works should conduct a root-cause analysis to determine underlying project issues and apply the information to future projects. In order to conduct meaningful root cause analysis, comprehensive information is required. This information would provide Public Works with documented reasons and

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19 The 14th Street project involves the reconstruction of a sidewalk area along 14th Street between Market Street and Colfax Avenue.
perhaps trend analysis data related to project changes and would allow the information learned to be applied to future projects to avoid the reoccurrence of similar issues. Using data from root cause analysis will aid in improving the quality of future capital construction projects and is a good practice for demonstrating responsible use of taxpayer dollars. Accordingly, we recommend that Public Works not only track change orders, but conduct a root cause analysis to identify trends for future projects. The BDBP manual already contains a change control template that specifically contains categories including “impact of change” and “rationale” that call for an analysis of the change order data. Public Works recently reported it has been conducting root cause analysis for approximately six months. We will verify this analysis during our follow-up work.

**Evidence of Final Project Walk-Through Inspections Is Incomplete**

The final step in the project management process is the last walk-through of completed construction work. The purpose of a final walk-through inspection is to ensure that work on the project has been fully completed in compliance with contractual obligations. Once the Project Manager is satisfied with the status of the project after final inspection, a document evidencing final acceptance is issued. Auditors reviewed several projects for evidence of walk-through inspections and found discrepancies with regard to the completeness of information. For example, in the Lakewood Gulch project, auditors reviewed evidence of a punch list, but there was no information on whether these items were completed. Another project, Park Hill Pond Phase 1, had a punch list with completion categories that were filled out; however, the corrective action category was not completed. Documents submitted for the Park Hill Pond Phase 2 project only contained a letter of acceptance that a final inspection of the work had been conducted without documentation of previous steps that would allow for such a letter to be issued.

The Orange Book outlines requirements pertaining to final completion and acceptance of work. Accordingly, written evidence should document the inspection of corrections in every case and show that these corrections are in compliance with City standards. We recommend Public Works document final walk-through inspections.

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20 A punch list is a list of items that have not been completed at the time of the final walk-through of a constructed project. “It is important on taking beneficial occupancy that you ensure the construction manager/resident engineer prepares a punch list of open items for the contractor to complete.” Federal Transit Administration, *Construction Project Management Handbook*, http://www.fta.dot.gov/documents/Construct Proj Mangmnt_CD.pdf.

21 Orange Book 2002.2: After the Project Manager has made the final inspection and is satisfied that the work has been completed in accordance with the contract, and is satisfied that all submittals have been made and accepted, all as-builts and record documents have been completed and accepted, all change orders executed, all final quantities agreed to, and all other contract requirements, except for future warranty and guarantee work have been accomplished, the deputy manager shall issue a document evidencing final acceptance. Final payment may then be processed in accordance with the requirements of GC 2003.

22 Orange Book 2002.1: The contractor shall notify the Project Manager in writing when all punch list items have been completed and all clean-up has been done. The Project Manager will then make the final inspection for the purpose of ascertaining that the work has been fully completed in accordance with the requirements of the contract documents. See also Orange Book 2002.2.
Comprehensive Performance Measures for Evaluating Contractors Are Not Utilized

A recent audit issued by the Denver Auditor’s Office concluded that Public Works does not use broad enough criteria when evaluating the performance of contractors. Our July 2012 audit regarding External Architectural & Engineering Design Work revealed that Public Works only measures whether projects are completed on time and within budget. Similarly, in the contracting phase of a capital construction project, Public Works uses time and budget to measure performance but does not measure the performance of contractors in any other way.\(^{23}\)

The 14th Street project provides a good example of why a variety of performance measures are useful in evaluating contractors. The contractor on the project had a reputation of doing good construction work but also of producing poor documentation. As a result, City staff had to create a significant portion of the documentation on behalf of the contractor, increasing project costs. Public Works may benefit from expanding performance measures beyond merely time and budget.

The previous audit recommended not only focusing on time and budget, but including information on the efficiency and quality of the work performed. Both the Denver Revised Municipal Code (D.R.M.C.) and federal regulations require that past performance be considered among the criteria in the competitive and qualification-based selection process. The D.R.M.C. requires that any competitive selection process includes “past performance on similar projects” as an evaluation factor when analyzing each responsive submission.\(^{24}\) The federal government has enacted procurement guidance contained in the Federal Acquisition Regulation (FAR). FAR Subpart 42.15 pertains to recording and maintaining contractor performance information.\(^{25}\) Based on information collected, auditors believe that evaluating past performance will be a valuable tool for planning future projects. For example, if poor documentation but good construction skills are known qualities of a contractor, Public Works could take that into consideration when working again with the same contractor by putting penalties into the contract for non-compliance. Therefore, we recommend that Public Works implement a post-project evaluation process, which would use results from risk and root-cause analyses to determine a contractor’s performance, that could be used in future evaluations.

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\(^{24}\) D.R.M.C. § 20.56.b (3).

\(^{25}\) Federal guidance regarding contractor performance management provides “that past performance information is relevant information, for future source selection purposes, regarding a contractor’s actions under previously awarded contracts. It includes, for example, the contractor’s record of conforming to contract requirements and to standards of good workmanship; the contractor’s record of forecasting and controlling costs; the contractor’s adherence to contract schedules, including the administrative aspects of performance; the contractor’s history of reasonable and cooperative behavior and commitment to customer satisfaction; the contractor’s reporting into databases; the contractor’s record of integrity and business ethics, and generally, the contractor’s business-like concern for the interest of the customer.” See Federal Acquisition Regulations Subpart 42.15 Contractor Performance Information.
Public Works Did Not Comply with Fiscal Accountability Rule 4.3 for Submission of Capital Project Close Out Forms

Fiscal Accountability Rule (Fiscal Rule) 4.3 requires that a Capital Project Close Out Form (close out form) be completed no later than thirty days subsequent to having an asset ready for public use and submitted to the Controller’s Office. Close out forms are used to ensure timely and accurate accounting for City capital projects from inception to completion, including but not limited to timely capitalization and depreciation of a capital project as a City asset.

In 2002 the City implemented Governmental Accounting Standards Board Statement 34 (GASB 34), which requires accurate accounting for capital projects. Timely and consistent completion of close out forms will ensure that the City remains compliant with GASB 34. Agency heads are responsible for ensuring that project management and financial management processes within the agency are integrated and incorporate good communication with regard to the scope of the project. To ensure this, all capital projects must be closed out upon substantial completion of the project. A close out form must be completed no later than thirty days subsequent to occupancy of the asset and submitted to the Controller’s Office. Upon final payment of the project, the close out form should be updated and resubmitted.

Auditors tested thirty-two Public Works capital projects to verify compliance with Fiscal Rule 4.3. Auditors were able to confirm that all thirty-two projects had been either completed or, based on additional information received from Public Works, had reached a stage of completion that met the Fiscal Rule 4.3 definition of an asset as occupied or ready for public use. However, auditors were unable to locate the close out forms for fifteen of the thirty-two (47 percent) projects. Additionally, none of the seventeen close out forms were filed within thirty days in compliance with Fiscal Rule 4.3.

During audit inquiries, Public Works personnel reported that, until recently, they only capitalized completed projects annually. They indicated that they now understand the requirements of Fiscal Rule 4.3 related to project capitalization to be on an ongoing basis rather than as a year-end procedure, and reported that Public Works has recently started to take corrective action and regularly complete and submit the required close out forms. Auditors will verify Public Works’ corrective actions during the current audit’s follow up procedures, and we recommend that Public Works should put adequate procedures in place to ensure timely submission of close out forms in accordance with Fiscal Rule 4.3.

See Appendix A - Capital Project Close Out Form.

Auditors’ query of these projects in the City’s PeopleSoft financial system showed that the allocated funds to twenty-six of the thirty-two projects had been fully expended with no additional funding, meaning these projects were completed.
RECOMMENDATIONS

1.1 Revisions to Special Permission Rules – As part of the ongoing effort to update the Prequalification Rules initiated in response to a previous audit, the Manager of Public Works, in coordination with the Department of Aviation and the City Attorney’s Office, should revise special permission rules to:
   1.1.1 Clarify requirements for granting special permission
   1.1.2 Track special permissions granted
   1.1.3 Document special permission activity, to include dollar amount and rationale

1.2 Project Management Processes – The Manager of Public Works should consolidate the project management manual, version 2000, and the BDBP project management manual, version 2008, update the information as appropriate, and train Project Managers on the new material. The new process should include:
   1.2.1 Performing a root-cause analysis to determine the underlying issue for change orders
   1.2.2 Conducting a risk assessment before bidding occurs to mitigate the risk of potential project errors
   1.2.3 Documenting final walk-through inspections
   1.2.4 Completing post-project evaluation on each construction contractor to analyze a contractor’s performance

1.3 Comprehensive Project Management Data System Implementation – Public Works executive management should evaluate the comprehensive project management data system for a detailed implementation plan to include:
   1.3.1 A detailed timeline for system completion
   1.3.2 Quarterly updates to show progress of implementation

1.4 Fiscal Rule 4.3 Compliance – The Manager of Public Works should put controls in place to ensure timely submission of Capital Project Close Out Forms in accordance with Fiscal Accountability Rule 4.3.
APPENDICES

Appendix A: Capital Project Close Out Form

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**Capital Project Close Out Form**

<table>
<thead>
<tr>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>Project Name:</td>
</tr>
<tr>
<td>Business Unit:</td>
</tr>
<tr>
<td>Project Description:</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Project Number(s):</th>
<th>Total Expended on Project:</th>
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<tbody>
<tr>
<td>Official Owner of Asset (name and org):</td>
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<table>
<thead>
<tr>
<th>Asset Name:</th>
<th>Physical Location:</th>
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<tbody>
<tr>
<td>Effective Date Asset is Useful or Occupied:</td>
<td>Useful Life in Years:</td>
</tr>
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</table>

<table>
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<tr>
<th>Fund/Organization:</th>
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<table>
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<th>Type of Asset:</th>
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<tbody>
<tr>
<td>☐ Land Improvement</td>
</tr>
<tr>
<td>☐ Building Improvement</td>
</tr>
<tr>
<td>☐ Repair</td>
</tr>
<tr>
<td>☐ Building/Structure</td>
</tr>
<tr>
<td>☐ Infrastructure (bridges, streets, alleys &amp; traffic signals only)</td>
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<tr>
<td>☐ Other</td>
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<table>
<thead>
<tr>
<th>Asset Details:</th>
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<tbody>
<tr>
<td>Are there any outstanding costs or additional invoices to be paid?:</td>
</tr>
<tr>
<td>☐ Yes</td>
</tr>
<tr>
<td>Are there any commitments or promises for additional work to be performed?:</td>
</tr>
<tr>
<td>☐ Yes</td>
</tr>
<tr>
<td>Does this project add value to an existing asset?:</td>
</tr>
<tr>
<td>☐ Yes</td>
</tr>
<tr>
<td>If yes, complete as much as possible of the following fields that relate to the existing asset:</td>
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<table>
<thead>
<tr>
<th>AM Business Unit:</th>
<th>Current Value:</th>
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<tr>
<td>Asset ID:</td>
<td>Added Value:</td>
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<tr>
<td>Other Identifying Data:</td>
<td>New Value:</td>
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<table>
<thead>
<tr>
<th>Prepared By (print):</th>
<th>Approved By Agency Finance Officer (print):</th>
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<tbody>
<tr>
<td>Prepared By (signature):</td>
<td>Approved By Agency Finance Officer (signature):</td>
</tr>
<tr>
<td>Date:</td>
<td>Full Phone Number:</td>
</tr>
<tr>
<td>Full Phone Number:</td>
<td>Date:</td>
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</tbody>
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*Return to the Controller's Office. Questions? Call the Controller's Office at 720-913-5800*

*Revised 1/1/2010*
October 23rd, 2012

Mr. Kip R. Memmott, MA, CGAP, CRMA
Director of Audit Services
Office of the Auditor
City and County of Denver
201 West Colfax Avenue, Dept. 705
Denver, Colorado 80202

Subject: Public Works Capital Construction Management
Response to Audit Recommendations

Dear Mr. Memmott:

This memorandum provides a written response for each reportable condition noted in the Auditor’s Report final draft of “Public Works Capital Construction Project Management Performance Audit” that was sent to us on October 3rd, 2012. This response complies with Section 20-276 (b) of the Denver Revised Municipal Code (D.R.M.C.).


RECOMMENDATION 1.1: Revisions to Special Permission Rules – As part of the ongoing effort to update the Prequalification Rules initiated in response to a previous audit, the Manager of Public Works, in coordination with the Department of Aviation and the City Attorney’s Office, should revise special permission rules to:
1.1.1 Clarify requirements for granting special permission
1.1.2 Track special permissions granted
1.1.3 Document special permission activity, to include dollar amount and rationale

<table>
<thead>
<tr>
<th>Agree or Disagree with Recommendation</th>
<th>Target date to complete implementation activities</th>
<th>Name and phone number of primary individual responsible for implementation</th>
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<tr>
<td>RECOMMENDATION 1.1.1</td>
<td>Agree</td>
<td>Lesley Thomas – 720-865-8719</td>
</tr>
<tr>
<td>RECOMMENDATION 1.1.2</td>
<td>Agree</td>
<td>Kerrie Shahan – 720-865-2577</td>
</tr>
<tr>
<td>RECOMMENDATION 1.1.3</td>
<td>Agree</td>
<td>Kerrie Shahan – 720-865-2577</td>
</tr>
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</table>
Narrative for Recommendation 1.1:
The Public Works Dept acknowledges the need to manage risk while growing the Contracting community eligible for performing work. The granting of Special Permission is a necessary element to address changes to Contractor status between annual Prequalification reviews, as there are currently no other Prequalification amendment processes available.

All Pre-qualification rules are currently being revised including rules pertaining to Special Permission. We anticipate completing the rule revisions by mid 2013. As a result of this audit, Public Works has already implemented a tracking system for special permissions and is documenting dollar amount, rationale and appropriate dates related to the special permission.

RECOMMENDATION 1.2: Project Management Processes – The Manager of Public Works should consolidate the project management manual, version 2000, and the BDBP project management manual, version 2008, update the information as appropriate, and train Project Managers on the new material. The new process should include:
1.2.1 Performing a root-cause analysis to determine the underlying issue for change orders
1.2.2 Conducting a risk assessment before bidding occurs to mitigate the risk of potential project errors
1.2.3 Documenting final walk-through inspections
1.2.4 Completing post-project evaluation on each construction contractor to analyze a contractor’s performance

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<td>RECOMMENDATION 1.2.1 Agree</td>
<td>Currently implemented</td>
<td>Lesley Thomas – 720-865-9719</td>
</tr>
<tr>
<td>RECOMMENDATION 1.2.2 Agree</td>
<td>March, 2013</td>
<td>Lesley Thomas – 720-865-9719</td>
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<tr>
<td></td>
<td></td>
<td>Mitch Kumar – 720-865-2668</td>
</tr>
<tr>
<td>RECOMMENDATION 1.2.3 Agree</td>
<td>March, 2013</td>
<td>Lesley Thomas – 720-865-9719</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mitch Kumar – 720-865-2668</td>
</tr>
<tr>
<td>RECOMMENDATION 1.2.4 Agree</td>
<td>April, 2013</td>
<td>Emily Sheets – 720-913-4542</td>
</tr>
</tbody>
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Narrative for Recommendation 1.2:
1.2: The Public Works Dept is currently in development of updated business procedures at an online web based location, a “single place for business processes”. The implementation of this central web-based resource aligns with development of the Comprehensive Project Management Data System noted in Recommendation 1.3 below.

1.2.1: As a result of recommendations made in previous audits of the Public Works Dept, as of Jan 1, 2012, Public Works has implemented a thorough collection and reporting system for hard bid Construction project Change Order data. Reports of this data (which includes change order source, (root-cause), history, project percentage impacts, etc.) are currently compiled on a regular monthly & quarterly basis.
In addition, since April, 2012, Public Works has been conducting a thorough review and analysis for all selected project Change Orders utilizing a risk-based methodology. These reviews assess Change Orders for compliance with applicable requirements and review same for reasonableness, including source and budget impacts. The results are tracked and trended across projects in order to apply lessons learned to future projects.

1.2.2: The Public Works Dept acknowledges the need for a risk-based approach for performing risk analysis, meaning that some additional procedures will be performed for projects designated as ‘high risk’. Public Works will develop appropriate thresholds for performing risk analysis on Capital Projects before bidding occurs and perhaps even at the design phase.

1.2.3: The Public Works Dept will ensure proper documentation of final walk-through inspection procedures.

1.2.4: As a result of recommendations made in previous audits of the Public Works Dept, as of April 2012 Public Works has implemented means to perform post-project evaluations for selected projects. Projects are selected using a risk-based methodology and results of project reviews are tracked by Contractor. Information currently tracked includes compliance with Contract provisions, Change Order data, and other pertinent information.

Public Works shall continue to evolve this process and will continue to review selected projects and track project performance as a result of these reviews. Public Works will implement quarterly internal reporting to executive management on Contractor performance trends. Methodology for project selection will be discussed internally on a quarterly basis and adjusted as needed to address emerging risk areas.

RECOMMENDATION 1.3: Comprehensive Project Management Data System Implementation – Public Works executive management should evaluate the comprehensive project management data system for a detailed implementation plan to include:

1.3.1 A detailed timeline for system completion
1.3.2 Quarterly updates to show progress of implementation

<table>
<thead>
<tr>
<th>Agree or Disagree with Recommendation</th>
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<td>RECOMMENDATION 1.3.1</td>
<td>Jan, 2013</td>
<td>George Delaney – 720-913-1776</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scott Hergenrader – 720-913-0819</td>
</tr>
<tr>
<td>RECOMMENDATION 1.3.2</td>
<td>Currently Implemented</td>
<td>George Delaney – 720-913-1776</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scott Hergenrader – 720-913-0819</td>
</tr>
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Narrative for Recommendation 1.3:
As noted in the Audit findings, the Public Works Department is currently developing a Comprehensive Project Management Data System. Project Initiation, scheduling and status reporting modules are already implemented and in use for all City capital projects. The web-based component, which will serve as the framework for updated business procedures and processes, has been developed and is currently in testing.
The web based component is planned for implementation by June, 2014. The development of the system will continue to be reported on a quarterly basis. Public Works will create a timeline for the remaining tasks in transitioning this web-based component to the City.

RECOMMENDATION 1.4: Fiscal Rule 4.3 Compliance – The Manager of Public Works should put controls in place to ensure timely submission of Capital Project Close Out Forms in accordance with Fiscal Accountability Rule 4.3.

<table>
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<tbody>
<tr>
<td>Agree</td>
<td>June, 2013</td>
<td>Shanna Tohill – 720-913-1758</td>
</tr>
</tbody>
</table>

Narrative for Recommendation 1.4:
The Department of Public Works acknowledges the need to ensure timely submission of Capital Project Close-Out Forms. Public Works currently coordinates semi-annually with the City Controller’s Office to capitalize projects following the asset being “occupied or ready for public use”. However, the definition of this project milestone can vary depending on contract and/or occupancy procedures for each type of project. Public Works will work with the Controller’s office to clarify and refine the milestone definition currently contained in the fiscal rule to better align the rule with current City practices.

Additionally, the Controller’s Office is in the process of updating fiscal rule 4.3 to extend the timeframe in which a close-out form must be submitted from 30 days to 90 days. Public Works will implement a quarterly review process to ensure close-out forms are completed within the updated 90 day requirement, to align with the change already being implemented by the Controller’s Office.

As in previous Audit responses, we trust that these measures are sufficient to properly address the Audit recommendations. Should you have any questions on our responses, please contact Barbara Puls or Jon Reynolds of our Department.

Sincerely,

Jose Cornejo, P.E.
Manager of Public Works

cc: George Delaney, Lesley Thomas, Jon Reynolds, Barbara Puls