

MANUAL OF CONSTRUCTION
MANAGEMENT PRACTICES



**Construction Mangement Unit
Project Delivery Division
Bureau of Design & Construction**

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This manual was written to outline a systematic construction management process to be followed by Construction Management staff on capital improvement projects. The procedures listed herein have been refined over many years and many projects. The Resident Engineer should refer to a companion volume ***The Resident Engineer's Legal Reference*** for specific procedural information on claims analysis and resolution.

MANUAL OF CONSTRUCTION
MANAGEMENT PRACTICES

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2019

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I. OVERVIEW OF THE CONSTRUCTION MANAGEMENT PROCESS

This document was written to provide an overview of the functions and duties of Construction Management (CM) during the stages of the Construction Phase of a project. A project enters the CM Phase once a bid is awarded and a construction contract is executed and assigned to a resident engineer to implement physical construction.

CIP Tracker 2005

Project No: 1000055 Title: Retirement Office Renovation (R12#1000055)

Project Program Phase Post-Construction PM/PE Louie, Denise Initial Approp FY 16-17

Design / P M Contract Admin Construction Reports

CPO SPO TskOrd Prev Page NextPage

PROJECT INFORMATION page 1

| | | | |
|------------|--------------------|--------------|-----------------------|
| Award Date | Contractor | Amount | Construction Duration |
| | Rockridge Builders | \$200,696.00 | 60 |

Reviewed By [dropdown] Status: Final [dropdown]
Reviewed Date [text] Team: Mach, Rand [dropdown]
R.E.: Montoya, Moises [dropdown] Add Staff

SCHEDULE

| | | | | | |
|---------------------|--------|-------------|--------|----------------------|--------|
| Est Completion % | 0.00% | Precon Date | [text] | Final Walk-Thru Date | [text] |
| Est Completion Date | [text] | NTP Date | [text] | | |
| Sub Completion Date | [text] | NOC Date | [text] | | |

PAYMENTS

| | | | | | |
|--------------------|--------|-----------|--------|-------------------|--------|
| Earned Value | \$0.00 | Retention | \$0.00 | Contingency | \$0.00 |
| Total Liq. Damages | \$0 | Withheld | \$0.00 | Liq. Damage Daily | \$500 |
| Total Paid to Date | \$0.00 | Days Used | 0 | Rain Days | 0 |

Edit Project Print Screen ProjNo: 1000055 Filter

CIP_Minutes Attachment Evaluations FAQ Lookup Find Filter Log Off

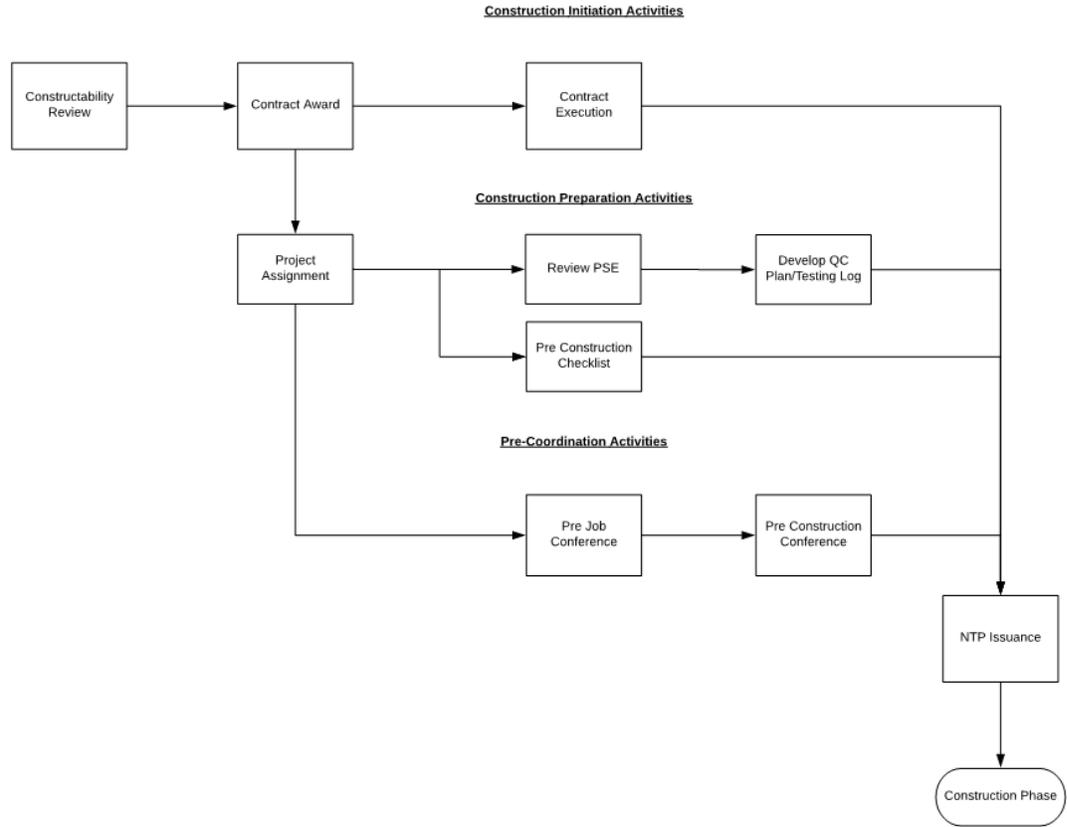
Record: 1 of 1708 No Filter Search

(Visual example of a project's phases – Design, Contract Admin & Construction - in Project Tracking Application)

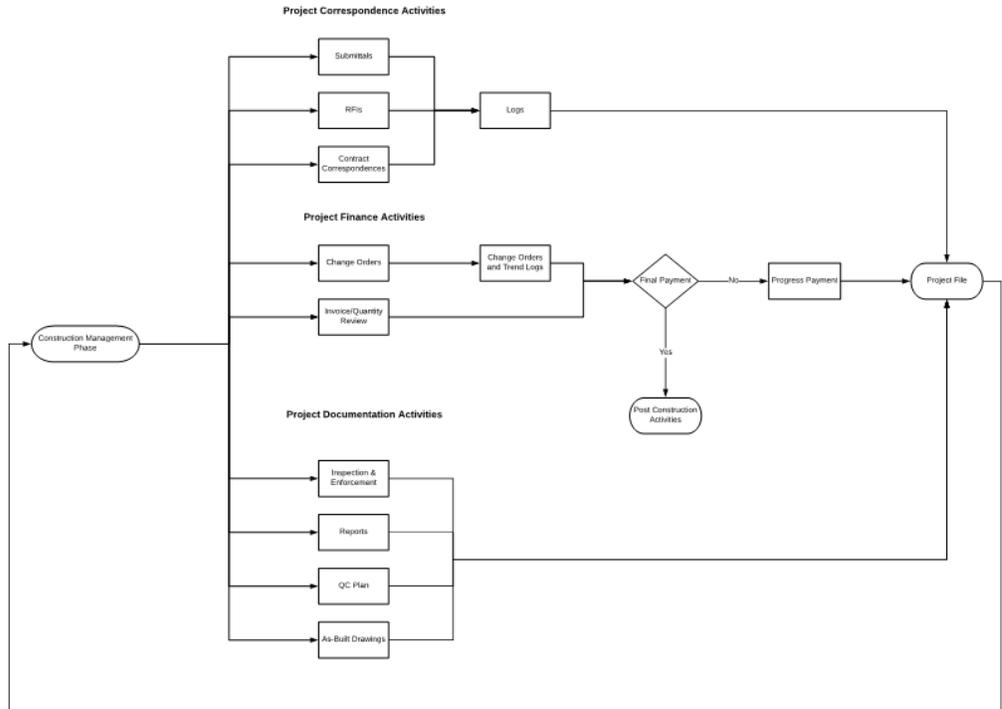
The resident engineer then begins the process for construction management working through the various stages – from pre-construction to construction to project close-out. Within each stage of the project, the resident engineer (RE) performs various activities to help progress the construction towards to goal of project completion and closeout.

A. CONSTRUCTION MANAGEMENT FLOW CHART

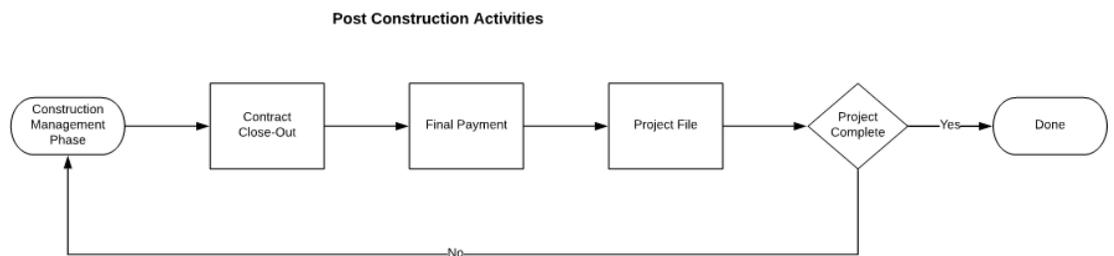
The CM process is broken up into 3 different stages – pre-construction, construction, post-construction. Each stage has specific activities that are laid out in the following flow charts:



(Pre-Construction Stage Flow Chart)



(Construction Stage Flow Chart)



(Post-Construction Stage Flow Chart)

B. CONSTRUCTION MANAGEMENT STAGES

As shown in the above flow chart, the CM phase can be broken in to 3 separate and distinct stages.

1. PRE-CONSTRUCTION STAGE

Prior to projects finalization of design and being advertised for bid (typically 95% design), the Designer/Project Manager shall request constructability review from the CM staff for a constructability review. The RE will provide comments based on experience with construction and from comments developed from the lessons learned log. Once the review comments developed are addressed, the RE can recommend that the Division Manager sign the final drawings before for a bid set.

Prior to contract execution and after contract award, the Supervisor will assign the project to a RE. The RE is responsible for setting up two meetings at this time.

1. A Pre-Job Conference which consists of internal project team, which may include city staff, designers, and the CM team to discuss approach to construction for the current project. At this meeting approaches are discussed on how the team will work with the contractor on this project.
2. A Pre-Construction Conference which consists of the contractor and other stakeholders related to the construction of the project. At this meeting the City will set expectations and discuss how the project will be constructed. It is critical that a base line schedule be established to help with control of work and to identify what may have caused project delays.

In addition to setting up these two meetings, the RE is responsible for developing and distributing project notification letters, notifying the public and any major stakeholders of the upcoming work due to their project. The pre-construction stage concludes once the RE issues a Notice-to-Proceed (NTP), which legally allows the contractor to begin construction work on the project.

2. CONSTRUCTION STAGE

Once an NTP is issued, the construction stage begins. This stage consists of RE overseeing the project and managing various activities moving the project toward completion that have been grouped into 3 sub-groups:

1. Project correspondence activities – this includes but is not limited to submittals, requests for information (RFIs), or correspondences between the contractor, project manager, the public, or other public agencies or departments.
2. Project finances activities - this includes but is not limited to progress payments and change orders, and other financial matters, such as task orders, etc.
3. Project documentation activities – this includes but is not limited to daily inspections and reports, managing as-builts, and implementing a QC plan. It is imperative to track working days with the contractor to ensure the project is being constructed within the contract schedule.

3. PROJECT CLOSEOUT STAGE

When the project is completed and all punchlist items have been addressed, the RE will begin project closeout procedures. These procedures include resolving all outstanding contractual/potential claim items, developing reconciling change orders, processing semi-final/final payments, completing a contractor's evaluation, collecting final as-builts and issuing a Notice of Completion (NOC) to officially conclude the project working days.

C. PROJECT TEAMWORK

Successful projects are constructed by strong teams. Strong teams have members that work together and "pull their own weight". The project team is lead by the RE. Other members of your project team are the:

- Project Manager
- Contractor
- Contract Compliance Officer

- Contract Administration Officer
- PWA Accounting Payment Officer
- Client Agency
- Planning & Building Inspectors
- Construction Division Administrative Assistant
- Design Architect/Engineer
- Testing Lab Technician
- Survey Crew

Our project teams have a matrix organizational structure. The RE has no direct supervisory relationship over the team members. This requires the RE to be a leader, manager, diplomat, coach, facilitator, and policeman. Let's examine each of these roles.

1. The Resident Engineer as Leader

A leader demonstrates vision. The RE must be able to envision the project as completed. He/she must be able to see the pitfalls and problems in advance of them occurring, then take decisive action to prevent problems from compromising the project. A leader is proactive, not reactive. This manual will provide processes and tools to help the RE be proactive in delivering the final phase of the project (in construction).

2. The Resident Engineer as Manager

A manager insures that established operational procedures are followed to construct the project. The Division's procedures such as change order and payment processing, claims review and analysis, inspection, reporting, and project close out are systems developed for efficient and equitable construction management.

3. The Resident Engineer as Diplomat

Conflict is an inherent factor of construction. The RE must keep the project team focused on the final objective. The RE must resolve conflicts between team members and maintain productive working relationships. Calm, objective and rational communication is

utilized to achieve these ends. Treat each team member as an equal and with dignity, courtesy and respect.

4. The Resident Engineer as Coach

Your project team is composed of individuals with different agendas and different work styles. The RE must get all team members pulling in the same direction. The team must sustain the same goal of completing construction levels for the duration of the project. These difficult tasks are the responsibility of the team leader.

5. The Resident Engineer as Facilitator

The matrix organizational structure requires the RE to act as a facilitator. You guide the team by developing consensus around common goals and objectives. The common goal on our projects is "successful completion".

6. The Resident Engineer as Police

The successful completion of the project requires every team member to perform their individual jobs correctly. The RE can not allow any member of the team to exhibit less than competent and professional work habits. Engage your weak team members in frank discussions about their deficiencies. Set a high standard for your team. Live up to the standard yourself. The team sinks or swims together. If necessary, ask your supervisor to seek the replacement of poor performing team members.

II. PRE-CONSTRUCTION STAGE

The main goal of the preconstruction stage is to ensure that the project is ready for construction by reviewing documents and ensuring establishment of expectations for the construction of the project. The procedures have been laid out in the Pre-Construction Checklist (See Appendix).

A. CONSTRUCTABILITY REVIEW

The constructability review process starts when a Supervising Civil Engineer (SCE) receives a constructability review request from a Project Manager (PM). At the point of review, a design is typically between 65%-100% completed. SCE will review the project type and distribute the review to an RE with sufficient experience to adequately review the design. For smaller and less complex projects, constructability review will only be provided at 95% complete. For major complex projects, constructability review can be provided starting at 65% complete to 100% complete.

Before the project is finalized, a constructability review is to be conducted. A review of the plans and specifications for constructability from start to finish needs to be conducted to identify obstacles before the design is finalized and the project is placed out to bid. This reduces or prevents errors, delays, and cost overruns. The review requires intimate knowledge and understanding of the project's intricacies and standard construction practices. The goal is to review the project in the manner the project is to be typically constructed, to address design details that will add missing clarity to the project or prevent ambiguity to the contract. Since the project is in the design phase, comments to be addressed should focus on details that will cause cost, time, or project quality changes or that the contractor will need clarity in order to construct the project. A constructability review can reduce change orders, give more time to review and negotiate change order pricing, and avoid delays caused by problems discovered during the construction phase.

At the 95% constructability review comments, a log for Submittals and Material Test and Special Inspection Services log shall be included in the project special provisions.

Before the assigned RE reviewer initiates the review, the RE shall look into Lessons Learned Folder from the past similar type of projects to familiarize the issues that it will generate, located at the following address: O:\ProjectDelivery\Lessons Learned Folder. The RE will create a project file for this specific project using the prototype, located at the following address: O:\ProjectDelivery\!CMU\Projects. The RE will review the design and supply the PM all comments to be addressed by the designer, via the Constructability Review Form (See Appendix). The designer will address all comments and return them to the RE. *Note: the designer does not have to*

agree with and incorporate all comments in the design. The designer must address each comment and why they are/are not going to be incorporated in the design. If the RE feels that it is pertinent to incorporate the comment due to the potential any constructability risk, they may escalate to the SCE. The SCE will decide if the item needs to be addressed at the supervisory level with the designer's manager. In the event that a change order is required and the comment was brought up and not incorporated during the constructability review, a type C change order would result. After all comments have been addressed the SCE will ask the RE to initial that all comments have been sufficiently answered. The division manager will then sign the project documents allowing it to go out to bid.

B. CONSTRUCTION INITIATION ACTIVITIES

1. BID ADVERTISEMENT & CONTRACT AWARD

At the Award stage, the project has NOT been assigned to the RE yet. The below paragraph is for the RE to understand the Award process.

The bid advertisement & contract award process starts after all Departments' signatures have been received on the design plans and specifications. The PM will take the finalized design plans and specifications and the project will be advertised and contractors will be invited to submit bids to complete the advertised work. A period of time, specified in the bid document, will be available to the contractors to review the bid documents, formulate projected cost, and submit additional questions and clarifications. The bids will be collected and opened on the specified bid submission date. The bids will be reviewed by Contract Compliance and Contract Administration groups to ensure all required paperwork is present and correctly filled out. The PM will also review the bid unit prices and compare them to the Engineer's Estimate to ensure there are no unbalanced bids, or to see if anything was missed in the design documents. The lowest responsible bidder will be chosen and a recommendation will be made to the City Council to accept the bid. If the City Council accepts the bid, the Council will award the contract to the respective Contractor. The bid review and acceptance process typically takes between two to three months, this does not account for the time to advertise and bid the project.

2. CONTRACT EXECUTION

At the Contract Execution stage, the project has NOT been assigned to the RE yet. The below paragraph is for the RE to understand the Contract Execution process.

Contract Execution is initiated after the Contract is awarded by council. An executed contract is a legal document that has been signed off by the Contractor and the City for it to become effective. The contract typically includes the plans and specifications as part of the contract as well. Contract Administration takes the lead in administering/circulating a contract package for signatures. The contract is not fully effective until all parties involved have signed. After all signatures have been obtained, a legal contract has been created. Anything modifying the contract is subject to a change order.

C. CONSTRUCTION PREPARATION ACTIVITIES

1. CONSTRUCTION PROJECT RESOURCE PLANNING & PROJECT ASSIGNMENT

In the Construction Management Unit (CMU) Project Resource Planning phase, the PM and Design Sections provide the upcoming projects to Project Delivery Division. These projects will be input into the Construction Project Resource Planning database. The database allows the CMU Supervisors to plan in advance for project assignment to the Resident Engineers.

Once the Contract is signed by the City and the Contractor, the PM will notify the CMU requesting an RE to be assigned to this project. Since this project is in the Resource Planning database, CMU Supervisors will have the CMU unit resources planned for the upcoming 18 months and will assign the new project to an RE.

By this time, a project folder with the new project name should have been created in the directory of CMU Projects during the Constructability Review activity (Section II.A). If the new project folder is not in the this directory, the assigned RE shall create a

project folder for this project and store all the project files in this folder.

2. REVIEW PLANS, SPECIFICATIONS AND ESTIMATES (PSE)

When the RE receives a new project, PSE should be reviewed (if not previously done via the constructability review) to fully understand the scope of the project and to be able to effectively manage the project. First, the RE should review the constructability comments, which is stored in the start up section of the project file folder, and in the lessons learned log (See Section II.A for log location). If constructability review comments are not found, the RE will inquire with the Supervising Civil Engineer for the document.

Initially, the legends and abbreviations should be reviewed to be able to understand the syntax used on the plans. The general scope of the project should be reviewed next. Plans should be reviewed as closely as possible and the RE should anticipate the order of construction so that when the baseline schedule is provided the RE should be able to sufficiently determine viability. Any items that will cause issues in construction should be brought up with the Project Designer, PM, and/or SCE. Take notice of any notes specified on the plans that special awareness must be made.

Applicable specifications should be reviewed to be able to accurately inspect the construction project. Review any applicable Reports and Logs for potential project issues and concerns. Next, find project location and determine the councilperson whose district that the project is in. Visit the site location. Think about how construction will affect traffic and impact the community. Will there be work on a street under Holiday or Limited Operation? Take pre-construction pictures and/or videos of the area to be affected by construction with additional emphasis on delicate site features that are just outside of the construction area, for example: doorways, driveway entrances, street trees, awnings, and any other features that could be hit, disturbed, destroyed, settled by vibration, or broken by construction activities. Make sure to look overhead where equipment will need room for the extension of mechanical arms. These pre-construction photos may help with claims at the end of the project about damage from construction.

Finally, bid items should be reviewed. Compare Contractor's estimate versus Engineer's estimate. If there are items that should be part of the project that do not have a bid item associated with them and are not included as part of the cost of other bid items, the RE shall question as to why the bid item is missing with the Project Designer, PM, and SCE.

3. DEVELOP QUALITY CONTROL (QC) PLAN

A Quality Control Plan is developed by the RE during the Construction Preparation Activities. In this plan, the RE will identify what tests and material sampling schemes are required to assure quality.

The RE must thoroughly read the project drawings and specifications to determine what materials will be used and what methods of construction will be utilized. The Standard Specifications for Public Works Construction and its modifications determine what tests are required and the pass or fail criteria. Determine what constitutes a passing or failing grade and note it in the plan.

The plan should include two additional pieces of information. Indicate who is responsible for performing the tests and how many tests (or samples) should be taken. Reference the plan to the construction schedule. Know when certain tests or sampling will be required and prepare for it. With this information, a good Quality Control Plan is created (See appendix for a Sample Quality Control Plan). If outside testing support is needed the RE shall notify the PM that consultant support is needed. It is the PM's responsibility to obtain the services but it is in the best interest of the RE to ensure those services are obtained prior to construction.

4. CONSTRUCTION OUTREACH AND NOTIFICATIONS

The CMU is responsible for Construction Outreach and Notification on capital improvement projects. The RE will send letters to residents and businesses of the affected area, meet with interested parties and resolve sensitive community issues before construction begins. This might include the posting of special signs,

advertisement and door hangers. The Supervisor will direct the Construction Outreach effort and ensure through the RE that the public is properly notified of our work. For major construction work that can impact abutting businesses, the RE should work with project management to implement the Construction Outreach program. The project will bear the cost of this public notification and outreach.

a. CONSTRUCTION NOTIFICATION

The RE is directly responsible for the success of the City's outreach effort during the construction phase. This procedure must be followed on all projects, such as street, traffic, bridge, sewer and architectural projects. Project Management will assume the lead role in coordinating the Construction Notification during the planning and design phases, their work will help with the success of notification during the construction phase.

b. LOCAL RESIDENTS

At least one letter is sent to every resident directly abutting the project. This means that every lot served by the improvement and every resident that could be impacted by the contractor's operations will receive written notification of imminent construction. The contractor's traffic flow through a neighborhood will affect many people. Therefore, lots bordering the construction zone will be impacted and these residents must be notified. Do not change the basic structure of the letter. Like our change order format, these letters are office standards.(See sample Public Relations Letter in the Appendix). However the letter should have specific information so residents receiving the letter can understand the area and time of impact.

Construction coordination around schools is very important as it involves children. Therefore, the principal of any school within the construction zone must also receive notification.

A location map must be attached to every letter. If a suitable copy can not be made by photocopying the project location map on the first page of the drawings, have the project designer make a map for you. Get homeowner address labels from GIS. Use the City Planning Department's list of associations to notify these groups within the area. Project Management will provide envelopes, which will be coordinated by the Project Delivery Administrative Assistant. The Administrative Assistant can help with obtaining envelopes, folding, and mailing them. Place a note on the letters that tells the mail room what project number and fund the mailing should be charged to.

During construction, relations with the homeowner can easily become strained if the RE does not follow a few simple rules.

- i. Notify homeowners of special construction operations that will directly affect their property such as street closures, detours, driveway removals, parking restrictions, damages to existing improvements etc.
- ii. Review the contractor's operations daily to insure he is working with minimum inconvenience and nuisance to local residents.
- iii. Treat property owners courteously. Answer their questions and respond to their complaints and comments.
- iv. Don't promise residents anything you can't deliver.
- v. Don't give answers to things you are not qualified to answer. Misinformation is very damaging to Construction Notification. If you do not know and answer it is ok to tell the resident you will find out and get back to them.
- vi. Strictly enforce working hours, traffic control and site cleanliness.

c. TRAVELING PUBLIC

Project Information signs will be erected on all construction projects (See Location: O:\ProjectDelivery\STANDARD FORMS\Template for Project Info Sign). Refer to the project specifications for signage details. A bid item should exist for the construction, erection and removal of these project signs. If no bid item exists, discuss the need for project information signs with project management for change order authorization.

Placement of the signs should be calculated to provide maximum visual effect. Locations should be selected to adequately warn the traveling public before entering the construction zone.

The appearance of the construction site during and after working hours is very important. The RE must:

- i. Frequently check the condition of signing, striping, barricades, lights, plates and reflectors. Visit the site after dark.
- ii. Watch for opportunities improve conditions on the job site.
- iii. Check for dust control, excessive noise, muddy pavement, and loose rock in the traveled way.
- iv. Require debris removal and spoils hauling daily.

d. UTILITIES AND OTHER AGENCIES

The RE should maintain good relations with the utility companies and other agencies. The first step in this direction is to invite the agency representative to your pre-construction meeting. Before construction begins, review the contract documents to ascertain possible utility company impacts to

the project. Make the agency aware of your schedule and your specific requirements for their services.

- i. Keep informed of contractor's schedule where work must be coordinated with a utility.
- ii. Get written agreement on schedules and keep records on utility company work.
- iii. Invite the utility company field foreman to each progress meeting.
- iv. Give the utility fore person a copy of your contractor's work schedule
- v. Make note of conflicts and take pictures for later settlement of claims.

e. COMMUNICATION WITH THE PRESS

In most situations, avoid talking the media. A very small number of people are authorized to talk to the media in our department. Administrative Instruction (AI) 351 spells out Oakland Public Works (OPW) position regarding this matter (See appendix for AI 351). If a media person contacts you forward them to the Public Information Officer in our department and notify your supervisor.

5. PRE-CONSTRUCTION CHECKLIST

The RE should evaluate the project's progress against the checklist before allowing field work to begin. These items are considered critical. Construction will can not start until this list has been completed. Discuss the situation with your supervisor, immediately. While this checklist intends to be comprehensive, there may be other activities that may come up during the pre-construction phase (See Appendix for Pre-Construction Checklist).

D. PRE-COORDINATION ACTIVITIES

1. PRE-JOB MEETING

After the RE has been assigned a project and that RE has reviewed the PS&E, he/she should request a meeting with the project designers, project manager and others who may have a direct interest in the project. The design division or project management division is responsible for inviting the participants to this meeting after the date and time of the meeting is mutually agreed. This meeting is held to review the project, to discuss possible problems, to discuss what the project is intended to accomplish, to resolve errors and ambiguities noted by the RE, to confirm construction management and project contingency budgets, and to establish lines of communication between the RE and the interested parties. This meeting is to include the internal project team and should not include the contractor or outside stakeholders.

2. PRE-CONSTRUCTION MEETING

Prior to commencement of work, the RE is required to schedule a pre-construction meeting with the contractor, client, designers, PM, contract compliance officer, representative from Environmental Services (if necessary), maintenance staff, and others who may have direct interest in the project. The purpose of the meeting is to discuss how the City-Contractor relationship will be conducted and potential concerns from both sides. The RE at that meeting shall establish communications protocol and official project point of contacts. All official and contractual communications shall be through those two points of contact, which is the RE and a contractor representative. Another important item to discuss is the baseline schedule. The RE should make sure a baseline schedule is provided and reviewed prior to the start of construction, typically it should be provided at the time of the pre-construction meeting.

Call the contractor and set up a mutually agreeable time and date. Allow no work to proceed without first holding the pre-construction meeting. The purpose of this meeting is to inform the contractor of our construction management methods and procedures. All RE's must use the template for pre-construction

meeting agenda and attendance sheet (See appendix for sample Pre-Construction Meeting Agenda & Attendance Sheet). Tailor the agenda to the specifics of your project. Do not make significant deletions. It is imperative that the contractor know how to request changes, file claims, etc.

The meeting is chaired by the RE. Have all attendents sign the attendance sheet. Take every agenda item one by one. Encourage the contractor to ask questions. Give clear and direct answers. Make certain the contractor understands that **you** are the construction manager. Contractors usually take directives from the owner's architect or engineer. They will be unfamiliar with our construction management procedures. Tell the contractor to take no directives from anyone except the RE. Explain to the contractor that all authorizations to perform any work must come from the RE.

The RE should invite key City staff on architectural projects. For instance, for a recreation center renovation project, invite the maintenance supervisor from Municipal Buildings and the center operations manager from Oakland Parks and Recreation.

The Contract Compliance Officer may schedule a separate meeting directly with the Contractor. If Contract Compliance Officer attends this meeting, he/she is given a place on the meeting agenda. Allow the Contract Compliance Officer to speak first or second after the introductions. We invite the Contract Compliance Officer as a courtesy. Do not postpone the meeting if he/she cannot make the set date and time.

Have the contractor bring as many submittals as possible to pre-construction meeting. See pre-construction checklist for long lead item submittals and submittals that needs approval prior to start of construction.

Set the start date of construction at the pre-construction meeting. Inform the contractor over the phone before the meeting to be prepared to name a date for the Notice to Proceed (NTP). Make sure the contractor understands that absolutely no field work can take place until the NTP date. Contractors have been known to saw cut the trench on sewer projects before the NTP is issued. This is

not allowed via the contract and in violation of the Oakland Municipal Code. The NTP gives the contractor authorization to work in the street right-of-way. Without this document, the contractor must apply and pay for a Street Excavation Permit from the Right of Way Permit Department.

3. NOTICE-TO-PROCEED (NTP) ISSUANCE

After the Pre-Construction Meeting is held between the RE, Contractor, and Project Manager/Design Engineer to determine the NTP date. The RE will inform Project Delivery Administrative Assistant (AA) of the NTP date. The AA will send the contractor a "Notice-To-Proceed" letter. Prior to sending the NTP letter, the RE must verify that the checkboxes of the pre-construction check list are all checked off. Issuance of the NTP moves the project from the pre-construction phase to

III. CONSTRUCTION MANAGEMENT STAGE

The construction management stage is where the project is actually being built. It is imperative that the RE is proactive at this stage with coordination and documentation. A majority of the project's funds will be spent at this time. Design and construction issues will definitely arise. The RE's proactive responses to these situation is what will help make the project successful.

A. PROJECT CORRESPONDENCE ACTIVITIES

1. SUBMITTALS

Submittals are required by the specifications because the PM must know the quality, size, type, location or model number of materials or devices supplied by the contractor. This procedure for submittals must be strictly enforced. Submittals are critical to insure the quality of material installed on the project.

Examples of submittals are shop drawings, catalog cuts, rug samples, tile samples, and concrete mix designs. All submittals must be approved by the PM. Two exceptions to this statement are the construction schedule and the schedule of values. These two

schedules are approved by the RE. The RE should always send the PM a copy of the construction schedule and schedule of values for comment, not for approval.

The RE must take an aggressive role in the submittal process. Late submittals will result in claims, damages and late completion of the project. Know what submittals are required. The PM can provide an updated list of all required submittals to the RE at the pre-job conference showing when each submittal is needed (see template in appendix). Some submittals are required before the start of construction and some are required before the start of a construction task. Note on the construction schedule when each submittal must be returned to the contractor. Some projects require a submittal schedule from the contractor which can be combined with the submittal log from the Project Manager to create a full submittal list.

Request the contractor to submit all submittals prior to the pre-construction meeting. Submittals not submitted prior to the pre-construction meeting shall be submitted to the RE in a timely manner not to delay the project schedule.

Upon receiving the submittal from the contractor, the RE must review the submittal for completeness. Submittals that are incomplete or improper should be immediately returned to the contractor without transmission to the PM. It must be documented in the RE's submittal log that the submittals were sent back as incomplete. This log will be important when used to discuss potential claims. If the submittal is proper and complete, the RE will notate receipt in the submittal log and send the document to the PM for review.

Do not transmit submittals to the PM for review if the prime contractor has not reviewed, stamped and signed the submittal. The stamp must indicate that the prime contractor has reviewed the submittal for compliance or conformance with the project's plans and specifications.

The RE must aggressively track the submittal's progress while in the PM's office for review. Inform the PM verbally and in writing of the required submittal return date. If the PM does not return the

submittal in a timely manner, notify your supervisor and the PM's supervisor of the urgency. Regardless of the PM's responsibility to provide a timely review, it is the RE's responsibility to track the submittal and provide it back to the contractor in a timely manner or to let supervisors know in advance when the submittals are not progressing.

After the PM's reviews, responds and returns the completed submittal, the RE verifies that the PM has signed and dated the submittal transmittal form. Return the submittals to the PM and request their signature if missing from the documents. The RE can now transmit the completed submittals to the Contractor either manually or electronically: For manual handling, the Contractor must provide two additional originals than what is expected to received back. Log submittal in the Submittal Log as returned.

Prepare an email to the Contractor noting the appropriate items to be transmitted. The same email may be used for manual transmission.

The RE emails and attaches the approved submittal back to the Contractor. For manual handling, the RE sends the approved submittal along with the printed email back to the Contractor. The RE always keeps one (1) approved copy for his/her records and the PM keeps one (1). Save a copy of the email used to return approved submittal in the project file.

2. REQUEST FOR INFORMATION (RFI)

All parties in the construction phase should understand that it may be unavoidable for contract documents to be 100% complete and clear. In this case, the Request For Information (RFI) is an great management tool to clarify the design intent during the construction phase that may not be apparent in the Plans/Specification or cannot be resolved in the field by Prime Contractor and RE. These RFIs can come in various categories such as design clarifications, differing site conditions, constructability issues, or request for design change or substitutions. When the issue cannot be resolved in the field, the process is as follows:

- a. The Prime contractor is to issue an RFI form template to capture the questions.**

The question may be initiated by the Prime Contractor or their subcontractors, vendors, or construction team members. However, the RFI must be processed through the Prime Contractor and addressed and submitted to the RE. The RFI form template must contain:

- Reference drawing and/or detail
- Reference Specification Page and Paragraph
- Impacts to the project: Schedule and/or Costs
- Any other information pertinent information

- b. Once the RE has received an RFI from the General Contractor, the RE reviews the RFI for completeness and relevance.**

The RE logs the date of receipt in the RFI log. The RE then forwards the RFI to the PM, and records the date in the RFI log.

- c. After the PM has reviewed and answered the RFI questions, they will forward the RFI to the RE.**

- d. The RE reviews the RFI response for completeness and relevance to the RFI question.**

Confirm with the responsible team members for potential schedule or cost impacts. The RE records the date of receipt in the RFI log

- e. Afterwards, the RE can forward the RFI response to the General Contractor and log the date of Return in the RFI Log.**

3. CONTRACT CORRESPONDENCES

Written communication during the contract period include letters, memos and emails. In addition to providing information and direction among the RE, PM, and the contractor, written communication serves as documentation for the project. The RE should follow up written communication with telephone call or in-person meeting as needed for clarification.

The RE must determine when to use more formal communication or when an email will suffice. The Correspondence Table lists examples of contract communication, the typical format and the requirements for signatures from the RE, PM, contractor or supervisors (See appendix for Correspondence Table). More information guidance is included in the applicable construction manual sections, as referenced in the table. Templates for most written communications can be found in the following file location: O:\ProjectDelivery\STANDARD FORMS\CM_forms.

Email correspondence is useful for regular communications, to exchange files such as photos and drawings, to transmit many of the listed in the preceding table, and to share information with multiple people. However, email is not a substitute for required memos and letters and in many instances, a phone call or meeting is a more efficient form of communication, especially for complex discussions. Final decisions should be documented using the appropriate letters, memos, forms and logs.

4. CONSTRUCTION MANAGEMENT LOGS

To facilitate the RE to manage, maintain, and track all pertinent project documents, a master Microsoft Excel file (Entitled Blank CM Logs) has been created and saved in each project's main folder to log all

- Submittals
- RFIs
- Proposal Requests

- Orders to Proceed with Extra Work
- Trends
- Allowance Work Orders
- Correspondences
- Engineer's Supplemental Instructions, and
- Field Orders.

Each tab in the master Excel file represents respective category of documents to be tracked. The RE shall populate the pertinent project information (i.e. project #, description, location, PM, Design consultant, RE, and General Contractor) in the Submittal log tab and all other logs will automatically populate itself. (Samples of the submittal log can be found in the appendix)

a. Submittal Log

Submittals shall be logged by the RE in the chronological order of submittal received from the General Contractor (GC). The following pertinent information shall be recorded for each respective submittal:

- i. The RE shall record the **Item Description, Use of Item Description**, and applicable technical **specifications sections** provided on the material submittal transmittal cover letter.
- ii. The **Date** and **Engineer** when and from, respectively, a submittal is **received from the GC** and the **Date Routed to PM** should be recorded to assist the RE to monitor the amount of time a response is pending and who to issue the submittal response to.
- iii. The **Dates** a response is **received by the RE** and is **routed to the GC** are recorded to document the turnaround time for potential argument against potential delay claim. When the response is pending, these two (2) dates are color-coded **red** to assist the RE to monitor the amount of time a response is

pending and for the RE to follow up with the PM if a response is not provided in a timely manner. When they are not color-coded, the item is deemed complete.

- iv. When a response is received, the RE shall populate the Review Code from the pull-down menu with pre-determined standardized response. To assist the RE in monitoring the status of the review and approval process of each submittal, the standardized response code is color-coded green when a submittal is approved, reviewed, completed, and no further action is warranted; yellow when follow-up resubmittal is being processed or approved; and red for the GC to address when a submittal is rejected or a resubmittal is required.
- v. The RE is encouraged to note any pertinent Remarks (e.g. exception for which the submittal is approved, reason for rejecting submittal, specified item required for re-submittal, etc.) as a concise summary of the PM's or Designer's response to the submittal.

b. Request for Information (RFI) Log

Request for **Information (RFI)** shall be logged by the RE in the chronological order of RFI received from the General Contractor (GC). The following pertinent information shall be recorded for each respective RFI:

- i. A brief **Item Description** and **RFI Description** shall be given to clearly and concisely describe the nature of the clarification being requested.
- ii. The **Date** and **Engineer** when and from, respectively, an RFI is **received from the GC** and the **Date Routed to PM** is recorded. This will assist the RE to monitor the amount of time a response is pending and who to issue the RFI response to.

- iii. The **Dates** the **RFI Response** is received by the **Resident Engineer** and is **routed to the GC** are recorded to document the turnaround time for potential argument against potential delay claim. When the response is pending, these two (2) dates are color-coded **red** to assist the RE to monitor the amount of time a response is pending and for the Resident Engineer to follow up with the Project Manager if a response is not provided in a timely manner. When they are not color-coded, the item is deemed complete.
- iv. When a response is received, the RE shall populate the **Response Code** from the pull-down menu with pre-determined standardized response. To assist the RE in monitoring the status of the response to the RFI, the standardized response code is color-coded **green** when an RFI response is complete and no further action is warranted; **yellow** when follow-up RFI is being processed; and **red** for the General Contractor to address when a specified item is required for re-submittal.
- v. The RE is encouraged to note any pertinent **Remarks** (e.g. reason for rejecting request, specified item required for re-submittal, etc.) as a concise summary of the PM's or Designer's response to the RFI.

c. Proposal Request (PR) Log

Proposal Request (PR) and Contractor's **Price Quote** shall be logged by the RE in the chronological order of PR received from the PM. The following pertinent information shall be recorded for each respective PR:

- i. A brief **Item Description** and **Extra Work Description** shall be given to clearly and concisely describe the nature of the added extra work being requested.
- ii. For major scope change and added extra work, the PM shall prepare and provide an **Engineer's Estimate**

which will facilitate the RE's analysis of the Contractor's price quote and determine if a change order authorization request is warranted.

- iii. The **Date Received from PM** and **Date Routed to GC** shall be recorded to track the Contractor's response time.
- iv. When the price quote is received from the Contractor, the RE shall record the **Date Returned to the RE**, **Date Routed to PM**, and **Contractor's Price Quote** amount.
- v. The RE shall populate the **Approval Code** from the pull-down menu with pre-determined standardized response. To assist the RE in monitoring the status of the proposal request and price quote evaluation, the standardized approval code is color-coded **green** when the price quote is approved as noted and no further action is warranted; **yellow** when follow-up price quote is evaluated or approved; and **red** for the GC to address when a revision to the price quote is warranted or for the RE to address when the analysis and assessment of the price quote by the RE is pending.
- vi. When the RE and Contractor have reached a mutually agreed upon price for the extra work, the RE shall record the approved **Amount** and **Date** which coincides with the OTP or CCO date, whichever comes first. Otherwise, enter zero for the amount and the date on which the RE provided a response to the Contractor.
- vii. The RE is encouraged to note any pertinent **Remarks** (e.g. See OTP or CCO # if the price quote is approved or directed to move forward with the work on force account, reason for rejecting price quote, reason for Contractor to revise and resubmit price quote, superseded per PR # when a revised price quote is

submitted, etc.) as a concise summary of the RE's response to the price quote.

d. Order to Proceed with Extra Work (OTP) Log

Order to Proceed with Extra Work (OTP) shall be logged by the RE in the chronological order of OTP issued to the GC. The following pertinent information shall be recorded for each respective OTP:

- i. A brief **Reference** (i.e. PR #, price quote, email directive, etc.) and **Extra Work Description** shall be given to clearly and concisely describe the nature of the approved extra work.
- ii. The **Approved Amount** per the reference above and the associated **Payment Method** selected from the pull-down menu of pre-determined standardized payment method shall be recorded.
- iii. The RE shall record the mutually agreed upon **Time Extension** (work or calendar days consistent with the technical specifications) which is also stated on the OTP. However, time extension can only be officially granted via a contract change order.
- iv. The RE shall record the **Approval Status** selected from the pull-down menu of pre-determined standardized approval status and **Approval Date**.
- v. The RE is encouraged to note any pertinent **Remarks** that can be used for future reference when preparing and processing the official contract change order.

e. Trend logs

Trend logs monitoring the overall project finances shall track **Contract Change Orders (CCOs)**, **Pending Contract Change Orders (PCOs)**, **Potential Claim / Credit to City**, and potential over/under-run of base contract bid items. (See

the Trend Log section for additional information.) The following pertinent information shall be recorded for each respective item:

Contract Change Order (CCO)

Fully executed CCO based on mutually agreed upon cost and time extension for extra work shall be logged as follows:

- i. A brief **Reference** (i.e. OTP, Extra Work Order, PCO, price quote, email directive, etc.) and **Description** shall be given to clearly and concisely describe the nature of the approved change order work.
- ii. The RE shall record the mutually agreed upon **Approved Amount**, applicable change order **Type** via the pull-down menu of pre-determined type, and mutually agreed upon **Time Extension** (work or calendar days consistent with the technical specifications).
- iii. The RE shall record the **Approval Status** selected from the pull-down menu of pre-determined standardized approval status and **Approval Date**. The pre-determined approval status is defined as follows:

Approved: Fully executed contract change order based on mutually agreed upon amount and time extension by both parties, Contractor and the RE.

Pending: When both parties mutually agrees on the amount and time extension and awaiting the RE's preparation and processing of the contract change order for approval.

Potential Claim: When Contractor disagrees with the RE's assessment of work as being contract work and proceed to perform the work as disputed work, tracking the time and material, the RE shall log the subject work

as potential claim pending negotiation and settlement with the Contractor.

Unilateral: When Contractor disagrees with Resident Engineer's assessment of cost and time extension for the extra work and refuses to sign off, the City may unilaterally approve and execute the contract change order to compensate the Contractor accordingly.

- iv. The RE is encouraged to note any pertinent **Remarks** that can be used for future reference or to track the status of each individual change order.

Pending Contract Change Order (PCO)

A PCO, for all intents and purposes, is approved extra work that is awaiting the RE's review and analysis for accuracy of Contractor's submitted supporting documents for the total cost and/or time extension of the extra work; Contractor's revision due to RE's review comments; or preparation of the paperwork to process and execute the contract change order. A PCO shall be logged similarly to the above approved CCO. The only difference is the **Approval Status** is **Pending** due to the above reasons.

Potential Claim / Credit to City

Work that has been completed by the Contractor to maintain construction progress and schedule which are disputed as extra work by the Contractor and the RE shall be logged as **Potential Claim**. The Contractor may submit a change order request with supporting documents (e.g. daily extra work tags) for a specified amount and time extension. Otherwise, the RE shall plug an amount and time extension for budgeting purposes.

Work that has been performed by City personnel (e.g. repair to damaged irrigation system or electrical conduits and conductor, troubleshoot existing traffic signal disturbed by the Contractor, etc.) or has been deleted from the contract shall

be logged as **Credit to City**. Typically, an exact cost amount is not clearly defined since the City does not track the time required to complete the repair work. Therefore, the RE shall estimate an amount for budgeting purposes and negotiate with the Contractor to reach a mutually agreed upon credit amount.

The following pertinent information shall be recorded for each respective potential claim or credit:

- i. A brief **Reference** (i.e. change order request, email correspondence, etc.) and **Description** shall be given to clearly and concisely describe the nature of the work claimed as extra work or credit.
- ii. Record the **Claim/Credit Amount** as a specified or plugged amount. Estimated amount should be noted as such in the **Remark** column for better clarity. Credit to the City should also be recorded as a negative number.
- iii. The RE shall record the applicable potential claim/credit **Type** via the pull-down menu of pre-determined type and **Time Extension** (work or calendar days consistent with the technical specifications).
- iv. The **Approval Status** will remain as **Potential Claim** (selected from the pull-down menu) and **Dated** when the claim/credit was initiated until the potential claim/credit is mutually settled by the Contractor and RE. At which point, the approved settled claim/credit item may be moved and processed as an appropriate CCO.
- v. The RE is encouraged to note any pertinent **Remarks** that can be used to track the status of each claim/credit for future reference to settle the claim/credit.

Contract Contingency Summary

When the fully executed CCO, PCO, and Potential Claim/Credit information has been populated per above description, the total amount and time extension for each respective log will automatically be populated in the **Contract Contingency Summary** table. The RE shall provide the **Total Base Contract Over/Under-Run** amount derived from **Exhibit A** prepared with each progress payment and ultimately utilized in preparation of reconciling CCO. Discussion of the preparation of Exhibit A is deferred to other section of this manual. From the above totals, the **Total Tentative Contract Change Order** amount and time extension to date is automatically calculated. This total is used to compare against the **Maximum Allowable CCO Amount** as permitted by the project technical specifications.

When the **Base Contract Amount** is provided, the **Maximum Allowable Contract Change Order Amount** is automatically calculated as permitted by the project technical specifications. This amount is compared against the **Total Tentative Contract Change Order** to derive the **Remaining Contingency Amount**. The RE shall monitor this remaining contingency amount to ensure the maximum allowable contract contingency has not been exceeded. Otherwise, the PM will need to go back to City Council to request an approval to increase the contract contingency.

f. **Allowance Work Order (AWO) log**

Allowance Work Order (AWO) shall be logged by the RE in the chronological order of AWO issued to the GC. Under rare circumstances, the PM and Designer may choose to include an Allowance base bid item to cover the cost of anticipated work that is indeterminate or the scope of work cannot be definitively defined during design stage. An AWO, like any extra work, must be processed and executed similar to a CCO, where a proposal request is prepared by the PM to solicit a price quote; the price quote is analyzed by the RE to reach a mutually agreed upon price; and an OTP (with advance change order authorization request approved for work of \$25K or more) must be issued to the Contractor prior to commencing work. The only difference is, unless the total expenditure of all AWOs exceeds the maximum allowable allowance amount per base bid, the total expenditure does not count towards the contract contingency. The following pertinent information shall be recorded for each respective AWO:

- i. A brief **Reference** (i.e. OTP #, PR #, Contractor's daily extra work report, etc.) and **Extra Work Description** shall be given to clearly and concisely describe the nature of the approved extra work.
- ii. The **Approved Amount** per the reference above and the associated **Payment Method** selected from the pull-down menu of pre-determined standardized payment method shall be recorded.
- iii. The RE shall record the mutually agreed upon **Time Extension** (work or calendar days consistent with the technical specifications) which is also stated on the OTP. However, time extension can only be officially granted via a CCO.
- iv. The RE shall record the **Approval Status** selected from the pull-down menu of pre-determined standardized approval status and **Approval Date**.

- v. The RE is encouraged to note any pertinent **Remarks** that can be used for future reference.

g. Correspondence log

Correspondence as formal written letters in series for change order request, extra work order, PCOs, notice of delay, potential claim, price proposal, etc. shall be logged by the RE in chronological order received from the Contractor **(See Contract Correspondence section)**. The following pertinent information shall be recorded for each respective correspondence:

- i. Each formal written correspondence shall be categorized from a select pull-down menu of pre-determined standardized Correspondence Type. The pre-determined Correspondence Type is defined as follows:

Change Order Request: When the Contractor submits an extra work order report or PCO for authorized work on force account, the RE shall categorize the correspondence as a change order request pending the RE's verification for accuracy prior to executing a contract change order.

Notice of Delay: When it is the Contractor's opinion that the City's or a third party's action or lack thereof (e.g. failure to respond to RFI or submittal in a timely manner, lack of responsiveness to resolve field conflict, delay by utility company to perform its work, etc.) impacts its critical path schedule, the Contractor may put the City on notice of potential delay which may incur overhead costs. The RE shall independently develop a timeline of sequence of events to counter any illegitimate delay claim.

Potential Claim: When Contractor disagrees with the RE's assessment of work as being contract

work; proceeds to perform the work as disputed work, tracking the time and material; and submits a change order request or extra work report with the total request amount for the disputed work, the RE shall categorize this request as potential claim.

Price Proposal: When Contractor submits a price quote in response to a proposal request for extra work.

- ii. A brief **Description** shall be noted to clearly and concisely describe the nature of the correspondence.
- iii. The RE shall note the **Date**, **From** whom, and requested **Amount** the correspondence is **Received from GC**. The noted date may be crucial for developing a timeline of sequence of events to counter potential claim. The requested amount may be compensation for authorized extra work, disputed work, potential claim, or a price quote for requested extra work.
- iv. The RE shall record the **Response Code** selected from the pull-down menu of pre-determined standardized responses and the **Response Date**. The pre-determined response code is defined as follows:

Approved: Upon verification and approval of supporting documents of submitted change order request, potential change order, or extra work order, the RE may respond to the Contractor to acknowledge approval of the requested compensation. Approval code is then color-coded **green** to indicate item has been completed. The RE shall follow through with the request by preparing and executing an official CCO.

Pending: When the REr has not addressed or made an official response to the Contractor, then **Pending** should be noted as the response code and color-coded **red** for the RE to follow up later.

Reject / Potential Claim: When the RE disagrees with the work as extra work, the RE shall respond to the Contractor rejecting the request for additional compensation.

Responded/Closed: When the Contractor disagrees with the RE's assessment of cost and time extension for the extra work and refuses to sign off, the City may unilaterally approve and execute the contract change order to compensate the Contractor accordingly.

Revise & Resubmit: Upon verification of the supporting documents for the Contractor's request and the RE noted any discrepancy in the accounting of the work or cost amount that requires a correction, then the RE shall note it as such and request a revision to the request and submit updated information. The response code is color-coded **yellow** for a follow-up correspondence to be submitted.

Submit Specified Items: If the Contractor is missing any specific supporting document, then the RE may respond to the contractor requesting additional information for further verification and approval. The response code is color-coded **yellow** for a follow-up correspondence to be submitted.

Others (See Comment): When the above response is not applicable to the submitted correspondence, then the RE shall select this response code and note a specific response in the **Comment / Remark** column.

- v. When the Contractor's change order request, PCO, or extra work order is approved, the RE shall note the **Approved Amount** and monitor the cumulative approved amount to ensure it does not exceed the maximum allowable contract contingency.

- vi. When the Contractor's change order request, PCO, extra work order, potential claim, or delay claim is rejected, the RE shall note the rejected amount as **Potential Claim Amount**. Until the potential claim is fully resolved or the Contractor rescinded the request for additional compensation, the disputed amount may still potentially add to the cumulative total contingency amount. Therefore, the disputed amount should be accounted as potential contract contingency to ensure the maximum allowable contract contingency is not exceeded.
- vii. The RE is encouraged to note any pertinent **Comment / Remark** that can be used for future reference. For instance, an approved change order request, PCO, or extra work order can be noted to reference approved order to proceed number or CCO number; when a correspondence has been superseded by another correspondence with updated information, then it should be noted as such and new correspondence is referenced; or when submittal of specified item is request, then note the item being request.

h. Engineer's Supplemental Instruction (ESI) log

Engineer's Supplemental Instruction (ESI) shall be logged by the RE in the chronological order issued by the Project Manager. In addition to logging the ESI, the Resident shall update his/her as-built plans and technical specifications to include information provided in the ESI. The following pertinent information shall be recorded for each respective ESI:

- i. A brief **Reference** (i.e. submittal, request for information, drawing #, etc. that prompted the necessary plan revisions) and **Revision Description** shall be given to clearly and concisely describe the nature of the plans revision.

- ii. Any relevant **Technical Specifications Section** revised or added because of the plan revision shall be noted on this log.
- iii. The RE shall note the **Date** Received from the PM and the **Date** Issued to the GC. These dates may be required to develop a timeline of sequence of events to counter potential delay claim.
- iv. The RE is encouraged to note any pertinent **Remarks** that can be used for future reference.

i. Field Order

If the Contractor fails to comply with or chooses to ignore the RE's verbal instruction to make any warranted correction for public safety or compliance to contract plans and specifications, the RE shall issue a **Field Order** to formally note the warranted correction so that it may be used to settle or counter a claim, impose a credit, or justify withholding payment from the Contractor, etc. The RE shall log the following pertinent information of a field order in the chronological order issued to the Contractor:

- i. A brief Item heading and Task Description shall be given to clearly and concisely describe the nature of the warranted correction.
- ii. The RE shall log the field order **Issued Date, Issued Due Date** to complete the warranted correction, and **Completion Date** when the correction has been made. These dates may be required to develop a timeline of sequence of events to counter potential delay claim or assess liquidated damages.
- iii. The RE is encouraged to note any pertinent **Remarks** that can be used for future reference.

B. PROJECT FINANCE ACTIVITIES

1. CONTRACT CHANGE ORDERS (CCO)

The purpose of this Standard Operating Procedure for Construction Contract Change Orders is to assure that CCO's are properly utilized and processed. CCO's are intended to make changes required to complete the work as contemplated at the time the plans and specifications were approved.

Because contract documents cannot reasonably cover every condition or contingency, CCO's are a normal part of the construction process. The objective is to limit CCO's to those changes that cannot reasonably be anticipated, or properly accommodated in the original design documents. The RE must guard against and prevent unnecessary change orders requested by either the PM or the contractor. The cumulative cost of CCO's should not exceed five (5) percent of the original aggregate amount of all OPW construction contracts.

The following are some of the specific purposes served by CCO's:

- To change contract plans.
- To change contract specifications.
- To change the order or sequence of work that is different from approved schedule.
- To cover adjustments to contract unit prices for bid quantity overruns or underruns, when required by the specifications.
- To authorize cost reduction incentive proposals such as a substitution request.
- To authorize payment after settlement of claims.

CCO's become a part of the contract documents when accepted by the Contractor and approved by the City. All the provisions and terms are equally binding upon the parties as is the original contract.

a. Initiation of Contract Change Orders (CCO's)

Although CCO's are prepared by the Construction Division, they may be proposed by various other sources such as the Contractor, outside public agencies, private individuals, or other divisions of the department.

A proposal for contract change or Proposal Request (PR) should be reviewed by the RE with respect to the following:

- What additional work must be done?
- Is the additional work clearly beyond the scope of the original contract?
- Is the change required to meet the original design intent, or is it optional?
- Is it practical?
- What is the effect on the original design intent?
- Does the work currently underway need to be changed to accommodate the CCO?
- What will be the effect on contract schedule and time?
- What is the total estimated cost of the change and the method of payment?
- Are there alternate methods of accomplishing the work?
- Is there adequate funding?
- What is the probability of final approval?
- Is the change a result of a design error or omissions?

The Construction Division must responsibly manage the change process. In general, we do not want to change a project's scope and if scopes are significantly change the RE shall notify their supervisor. Our job is to manage the project's scope, time, cost and quality.

b. Standard Procedure

i. Pre-Approval

The ability to issue changes is strictly regulated. In general, no design changes can be made without the designer's written approval. Note that PM's from design groups can not authorize change order work to the Contractor for the approve changes to their designs. The RE must receive written authorization from the appropriate level Construction Division supervisor before issuing an Order to Proceed with Extra Work (OTP) to the Contractor (See the appendix for a sample OTP form).

For major scope changes over \$25,000, a formal preapproval for the proposed change is required. The PM shall prepare a Change Order Authorization Request (COAR) Form and have it reviewed by the RE before routing it for approval (See sample COAR form in Appendix). The approval level by the Design Manager, Project Delivery Manager, Assistant Director, and the Director will be based on the following dollar limits:

- For extra work over \$100,000, approval from the Director of Public Works (OPW) and; or Department of Transportation (DOT) is required.
- For extra work over \$50,000 to \$100,000, approval from the Assistant Director of OPW and; or DOT is required.
- For extra work between \$25,000 and \$50,000, approval from the Construction Division Manager and or Design Manager is required.

ii. Approval

Similar to the pre-approval process, the RE must route all completed change orders for approval to supervisors based on the following dollar limits:

- For extra work over \$100,000, approval from the Director of Public Works (OPW) is required.
- For extra work over \$50,000 to \$100,000, approval from the Assistant Director of OPW is required.
- For extra work between \$10,000 and \$50,000, approval from the Construction Division Manager is required.
- For extra work below \$10,000, approval from your immediate supervisor (SCE) is required. Note that a COAR is not required for this level.

iii. Proposal Request (PR)

When the RE feels that a proposed Change Order is necessary, he/she can begin processing the order. Changes either in the design or affecting the original design concept are discussed with the project manager at this stage. Design documents, including drawings or specifications, with an estimate of costs, are prepared by the appropriate design staff.

Issue a Proposal Request (PR) (See sample Proposal Request form in the appendix) to the Contractor requesting the Contractor to price (in an itemized form) the cost of additional, deleted and/or changed work. An estimate of additional contract time should also be requested. The PR should include:

- A description of the additional, deleted and/or changed work.

- All the necessary drawings and,
- A time frame for return of the quotation.

The PM may proceed with COAR at this time while waiting for pricing to save time and possibly cost. Obtaining the COAR in advance will allow the RE the flexibility to issue an OTP to the Contractor quickly. The flexibility is needed to accommodate a condition resulting from a negotiation and to take advantage of the current schedule minimizing delay. Refer to Section (d), **Emergency Procedure**, for more detail.

Upon receiving the PR from the Contractor, the RE should review the quotation with the project manager, the Supervising Civil Engineer/Construction Supervisor and other parties involved with the requested change. Any comments received from the PM are advisory. Further clarification of the quotation and additional breakdown of the cost proposal are often needed for proper review. The RE should, at this point, remind the PM to initiate the COAR process for proposed changes estimated more than \$25,000. Acceptance of the quotation is made only after careful evaluation, and if necessary, through negotiation to assure a fair price for the work involved. The determination and approval of the change order price rests exclusively with the RE.

iv. Contract Change Order Execution

Contract Change Order

When agreement on cost and time is reached, the RE prepares a proposed Change Order which clearly specifies the following:

- Any work to be deleted, the work to be changed and the work to be added.
- Specification and drawing sheet references.

- Specific location(s) where the work is to be performed.
- The method of payment for the work. Compensation to the Contractor may be made by any or a combination of the methods below:
 - The unit prices of the contract.
 - Unit prices for the Change Order work only.
 - A lump sum price (or prices).
 - Force Account work using the terms outlined in the Standard Specifications.
- Total cost of the Change Order.
- A statement of any necessary time adjustment. The RE should attempt to reach an agreement with the Contractor regarding time before issuing Change Order. The amount of the adjustment must be entered (including zero adjustments).

(See sample Contract Change Order in the appendix)

Contract Change Order Memo

Change items with a value of \$2,500 or less do not require an extensive explanation. It is acceptable to merely repeat the instruction to the contractor used in the Change Order.

For change orders valued at \$100,000 or greater, the memo is addressed to the Director of Public Works. A similar memo is required for change order with lower value and should be based on the approval limits stated above. In general, the memo provides information which is necessary for departmental documentation. The letter should be sufficiently complete to enable a person unfamiliar with the details of the project to review the Change Order

and determine the justification of the work, the reasonableness of the compensation, and the time extension provisions. Following are some of the things commonly required in the memo:

- A brief justification or statement of the circumstances leading to the change. When the change is initiated by units other than Construction Division, its letter requesting the change should contain this information.
- How the change order will correct it?
- What method of payment will be made to the Contractor for the work and why?
- How much the Change Order will cost and impact on project budget? Are there sufficient funds available?
- Who in the design division requested the change order?
- Does the change appear to be a result of a design error omission?
- For Change Orders involving Federal/State financing, indicate whether the change was discussed with a Federal/State representative.
- For Change Orders involving participation by other local agency or utilities, include in the memo sufficient information to identify the portion of work which is applicable to the contribution agency.
- For Change Orders requiring Council approval, indicate date approval was received.

Contract Change Order Types

Each item of extra work must be classified by the RE according to one of six types. A summary of all change orders applying to that particular project will be

given at the end of the memo. Cumulative totals by change order type for all fiscal year capital projects will be kept by the Construction Division for periodic review and reporting.

A specific classification determination may not always be straight forward and can be subject to differences of opinion. Such differences can be positive if they are addressed in a constructive manner. To provide for an orderly process for discussion and evaluation, PM's should offer comment to the RE concerning design changes at the time such changes are being proposed or considered. This will give the designer not only an opportunity to express his/her views as to the causes and reasons for a design change, but should also help to better inform field personnel of relevant information.

For client initiated and/or design prepared changes, a statement relating pertinent facts and causes should accompany the PR when sent to Construction Management Unit for processing. For changes that are contractor initiated and design related, a copy of the contractor's statement will be forwarded to the designer for comment prior to settlement with the contractor.

If differences of opinion surface at this time, discussion can occur between staff project representatives prior to change orders being committed. It is expected that most issues can be resolved at that level. Persistent disagreement results in discussion between division heads, with ultimate determination by the Assistant Director of Public Works.

Type A - Changed Conditions

This category would encompass unexpected subsurface conditions or unforeseen physical

conditions which could not have been reasonably foreseen or discovered as part of the design process. Typical of the type of change orders which may fall within this group are the unexpected or unknown condition, such as utility conflicts, unusual soil conditions, asbestos, or hidden details constructed differently than suggested by available records.

Type B - Scope Changes

This category includes changes in quantity or quality which are usually optional in nature and modify the extent or terms of the intended work as originally contracted. Typical of changes which fall within this group are the lengthening of a sewer project, increasing the dimensions of a new building, or improvements to materials or equipment. This category usually involves scope changes requested by the client, such as for work modifications due to program changes, but may also include contractor proposed changes in specified materials, means, or methods.

Type C - Contract Documents

This category relates to problems with the contract documents where the original intent of the work as contracted cannot be fulfilled without additional costs because of some ambiguity, conflict, error, or omission in the plans and specifications. Examples include critical work items mistakenly omitted, details which violate code requirements, or confusing specification language. Also, this category relates to added scope of work that is beyond the original intended project scope and boundaries that resulted in additional mobilization and traffic control.

Type D - Delay for City Convenience

This category describes delays of convenience for which the City is responsible. These are actions or inactions of the City or its agents unrelated to changed conditions, scope changes, or contract documents which unreasonably retard the contractor's progress and result in the payment of extra costs or time extensions. Examples include failure to process a submittal within specified time limits, failure to respond to requests for information, or failure of a client to vacate a project site area by an expected date.

Type E - Unforeseen Events

This category involves events beyond the control of both the contractor and the City which affects prosecution of work. This includes strikes, civil unrests, inclement weather, or inability to obtain materials or equipment. These types of changes usually involve time but not money.

Type F – Miscellaneous

This is a general category involving administrative and technical disputes during construction which are unrelated to any of the previous 5 groupings. Examples include field instructions which are disputed, such as for rejection of unsatisfactory work or for directives addressing the contractor's means or methods. Other examples might include field technical discrepancies, such as in surveying or materials testing, or administrative disputes, such as for a claim regarding a subcontractor substitution, or for payment processing.

Change Order Approval Format

- The RE will type the Change Order and the memo. (Step 1)

- The Supervising Civil Engineer/Construction Supervisor will review and sign all the Change Order and the memo, correct spelling and grammar and route it to the Construction Engineer (Division Manager) if the change order is over \$10,000 or Type C regardless of the amount. If not, go to Step 5 below. (Step 2)
- The Construction Engineer will review and sign the CCO and then route them to the Design manager and Assistant Director if the Change Order is over \$50,000 or Type C regardless of the amount. If not, go to Step5. (Step 3)
- The Assistant Director will review and sign the CCO and then route it to the Director of Public Works if the Change Order is over \$100,000. If not, go to Step 5. (Step 4)
- The CCO is returned to the Project Delivery Administrative Assistant who will send the original to the Contractor. The contract change order memo remains in the office for internal use only. (Step 5)
- After the Contractor returns the signed Change Order, the Construction Administrative Assistant logs and distributes to everyone on the carbon copy list including the RE. (Step 6)

Authority to Approve Contract Change Orders

City Council Authorization

Staff may change the plans, specifications, character of the work, or quantity of work, provided the total arithmetic dollar value of all such changes, both additive and deductive, does not exceed 25 percent of the original contract price (or as is specified in the contract documents) for projects with a contract value of less than \$500,000. Should it become necessary to exceed the following limitations listed below unless

otherwise stated in the contract, Council authorization is required.

| <u>CONTRACT PRICE</u> | <u>CHANGE ORDER LIMITATION</u> |
|----------------------------|------------------------------------|
| \$5 Million and over | 10% of the contract price |
| \$2 Million to \$5 Million | 15% of the contract price |
| \$500,000 to \$2 Million | 20% of the contract price |
| Less than \$500,000 | 25% of the contract price |

Public Works Department Director Approval

The following types of Change Orders must have approval by the Public Works Department Director:

- If the change jeopardizes other obligations of the Public Works Department.
- If the total cost of the Change Order exceeds \$100,000.
- If the change will significantly delay the project.
- If the Change Order requires a significant "public interest" determination.

Assistant Director of Public Works Approval:

The Assistant Director of Public Works is authorized to approve CCO's not subject to the above restrictions.

c. Return to City Council for Additional Authorization

This doesn't happen very often but staff may need to return to City Council seeking additional authorization for substantial change order work above the original approval limits. This approval process normally takes time and often require careful considerations of its benefits before proceeding due to escalating construction costs and delays.

Other reasons that warrant returning to Council are receive additional grant funding for significant upgrades to the project and pay for a settlement resulted from a claim. Below are a few keys to consider preparing CCO's requiring Council approval before execution:

- i. The Contractor's signature on the CCO should not be obtained prior to seeking Council approval. This will give the contractor false hope that the change will be authorized by the Director and the City Council.
- ii. A council resolution is prepared, along with an agenda report to the City Administrator, signed by the Director for forwarding to the Council. The report to the City Administrator should include:
 - A brief description of the project and why it is before Council.
 - A description of the work.
 - The reason for the work.
 - The cost of the change.
 - How, or from what fund, the change will be paid?
- iii. The change order must include a statement that "City Council Resolution No. XXXXXXXX C.M. S. has authorized execution of this change order."

d. Order to Proceed Procedure

CCO work should not be undertaken until a Change Order has been executed according to the standard procedures. However, the Construction Engineer (Principal Civil Engineer or Division Manager) is authorized to proceed with the work using an OTP issued by the Resident Engineer pending completion of a formal Change Order.

This procedure is used to avoid delays to the work and when it is in the best interest of the City. This authority is

limited to extra work not requiring (1) Director approval and (2) City Council approval.

The Construction Engineer may further delegate this authority to the following positions within the Construction Division:

- i. Supervising Civil Engineer - May authorize Change Order work on behalf of the Construction Engineer.
- ii. Supervising Civil Engineer - May authorize Change Order work which involves a payment of less than \$10,000.
- iii. Resident Engineer - May authorize Change Order which involves a payment of less than \$5,000.

Specific authority to authorize additional work will be conferred by the RE on an individual basis subject to the described limitations at a level commensurate with ability, experience, and the continuing demonstration of responsible judgement. Design changes always require prior written approval from the designer.

The authorizing individual must notify their respective supervisors immediately upon authorizing the Contractor to proceed with the work pending completion of the CCO.

The OTP must include a description of the work to be done and the method of payment.

Every effort shall be made to obtain agreement with the Contractor concerning the amount of compensation, or to go force account where feasible. When this is not possible, the cost of work should be estimated, and a cost not to exceed figure entered. In this case, the OTP directs the Contractor to submit a formal proposal to the City within 15 days.

In all cases, preparation and final approval of CCO for work authorized by OTP must be actively pursued. After cost

and time implications have been determined, conversion to a CCO should occur within 2 weeks.

e. Procedure for Extra Work by Force Account

Extra work performed on force account applies to work outside the scope of the various contract items and is applicable when:

- i. The cost of the work cannot be estimated within reasonable limit of accuracy.
- ii. The work is clearly separable from other portions of the work.
- iii. Agreement cannot be reached on the methods of payments.
- iv. The procedure as prescribed in the Standard Specifications consists of a summation of cost of labor, material, and equipment rental plus fixed percentages.

Labor:

- i. Actual cost for wages prevailing locally for each craft or type of workman.
- ii. Employer payments of payroll taxes, insurance, health and welfare, pension, vacation, and apprenticeship funds.
- iii. Direct costs resulting from Federal, State, and local laws.
- iv. Assessments or benefits required by lawful collective bargaining agreements.

Materials:

Cost of materials reported shall be at invoice or lowest current price at which such materials are locally available and delivered to the job site in the quantities involved, plus sales tax, freight and delivery.

Tools and Equipment:

- i. No payment will be made for the use of tools which have a replacement value of \$200.00 or less.
- ii. The contractor will be paid for the use of equipment at the current rental rates in effect on the date of work as listed for such equipment in the State of California, Department of Transportation publication entitled, "Equipment Rental Rate and General Prevailing Wage Rates." If equipment other than that listed in the above publication is used in the performance of the work, a suitable rental rate will be established by the Engineer.

Markups:

If work is performed by the prime contractor, the following percentage shall be added to the contractor's cost and shall constitute the markup for all overhead and profits (unless otherwise stated in the contract specifications).

| | |
|----------------------------|------|
| LABOR | 33%* |
| MATERIALS | 15% |
| EQUIPMENT RENTALS | 15%* |
| OTHER ITEMS & EXPENDITURES | 15% |

(* - See Note at the End of this Section)

To the sum of the costs (excluding markups) provided for this subsection, the actual bond percentage paid, but no more than three percent, shall be added as compensation for bond.

For work performed by a subcontractor, the above markups shall be applied to the subcontractor's actual cost of such work, to which a markup of 15% on the first \$5,000 of the subcontracted portion of the extra work and a markup of 7-1/2% on work added in excess of \$5,000 of the subcontracted portion of the extra work may be added by the prime contractor.

Procedure:

It is imperative that complete and accurate records be maintained to substantiate the labor, materials and equipment used on the cost-plus Change Order work. To facilitate accuracy and agreement with the contractor, the following detailed procedure should be used for such work:

- i. The RE should prepare a "Daily Extra Work Report" (DEWR) for each day that work is performed and chargeable to the Change Order (See sample DEWR in the appendix). The daily report should be numbered consecutively and the last report shall include the word "final". The daily report shall account only for the time and quantities of labor, equipment and materials used.
- ii. At the close of each working day, the RE should review the daily report entries with the Contractor's representative, obtain his signature and sign the document.
- iii. If a disagreement develops regarding an item, the RE should establish a record of the disagreement by entering appropriate notes on the form prior to signing the document.
- iv. The RE should forward a copy of the signed daily report to the Contractor, a copy to the Supervising Civil Engineer/Construction Supervisor, and retain a copy for his/her own file.

- v. The Supervising Civil Engineer/Construction Supervisor should attempt to resolve the disagreement noted on the daily report with the contractor prior to submittal of the invoice.
- vi. After the contractor submits the extra work invoice, the RE should review the invoice carefully. If the invoice is acceptable, a CCO should be prepared immediately to cover the extra work.

* To this number add the most recent labor surcharge listed in the latest edition of the Labor Surcharge & Equipment Rental Rate Caltrans' website:

<http://www.dot.ca.gov/hq/construc/equipmnt.html>

(11% for both regular and overtime as of 2019)

f. Disputed Work

There will be situations where the City and the contractor cannot reach agreement for changes in the work under any of the above procedures. In these cases, the City may, per Section 3-5 of the Standard Specifications, direct the contractor to proceed with the work. Procedure for handling disputed work is described in Section 3-5 of the Standard Specifications.

g. Review with Design Division

After completion of a project, a review of CCO's with the appropriate design division shall be conducted. Emphasis shall be given to those Contract Change Orders with design errors and omissions. The purpose is to enable the design division to understand what occurred during construction, and to proceed against any other party that may be liable for damages. Recovery of damages should be carefully considered and actively pursued where appropriate.

h. Change Order Tracking

A Proposal Request Log and Change Order Log should be used to keep track of the status of proposed changes on the project (See Construction Management Logs section). A sample of the submittal log can be found in the appendix. These logs should be reviewed on a weekly basis with the designer and the RE's supervisor. Always know what changes (and their cost impact) are proposed or have been executed on the project.

2. INVOICE/QUALITY REVIEW

a. Progress Payment Summary

Contractors are paid for work done on City projects by means of monthly progress payments based on the amount of work completed in each calendar month. Each month, the RE is responsible for reviewing and approving the contractor's progress payment requests, preparing and processing progress payments, and assuring the issuance of timely payment. If the contractor does not provide an invoice for the month, the RE is to still make payments per the steps listed in the contract specifications.

A complete progress payment package processed by the Resident Engineer includes:

- i. Progress Payment Cover Sheet (Include copy of previous cover sheet for reference)
- ii. Prompt Payment Invoice Transmittal Form
- iii. Oracle Report (showing current amount encumbered) as provided by the Project Manager.
- iv. Progress Payment Detail Worksheet
- v. Change Order & Retention Worksheet

- vi. Original Signed Schedule G (Sub-contractor Payment Form) submitted by General Contractor
- vii. Copy of Approved Change Order Applicable Only to Current Payment Period
- viii. General Contractor Approved Submitted Invoice.
- ix. Original Contractor Performance Evaluation Report (For Semi/Final Payment Only, at Project Close Out)

(See a sample of items i-vi in appendix)

Public Contract Code section 20104.50 states that a public agency must issue undisputed payments within 30 days or be charged 10% interest. Prompt Payment Ordinance OMC Section 2.06.040 also requires that Local Prime Contractors shall be paid within twenty (20) business days after receipt of an undisputed invoices or be charged 10% interest. This means that completed change order work must have a properly executed change order and be paid within two pay periods. Invoices that are not disputed must be processed within a day or two by the RE to ensure payment is prompt.

The Progress Payment Detail Worksheet is used to estimate the quantities or percentage of work completed during the payment month and to determine how much the Contractor is to be paid for completed work. This worksheet contains a bid schedule for unit price contracts and/or a schedule of values for lump sum contracts. This worksheet is filled out by the RE. However, the Contractor may prepare a draft estimate of quantities and submit the estimate to the RE for review and approval.

Upon approval of the draft estimate, The RE shall inform the Contractor to submit an original signed invoice, Prompt Payment Transmittal Form, and Schedule G form for further processing.

b. Progress Payment Processing Review

At the end of the month for which payment is being made, the Resident Engineer takes the following actions:

- i. Make the best estimate possible of the work performed during the pay period. Record the quantity or percentage of work completed values on Progress Payment Detail Worksheet. Be as accurate as possible. Walk the site and measure all items that can be measured.
- ii. When possible, review and measure quantities with the Contractor. Discuss and agree on a value of measured quantities with the Contractor after every measurement. The RE's determination of the amount of work completed is final and absolute. The Contractor has no rights of appeal. However, the RE must be able to objectively shown the values by measurement, calculation, or weight tags.
- iii. Payment for materials or equipment stored on-site but not yet installed can be made only if the Contractor has full title to the equipment (supplier has been paid in full). The invoice must indicate "Paid". In general, pay only for materials or equipment properly stored, protected and insured.

Payment for materials or equipment stored off-site may be made only if (1) the material is stored in a bonded warehouse within a 25--mile radius of Oakland City Hall except for plant (nursery) material, for which the radius is 40 miles. An invoice must be provided and indicate "Paid". The RE should visit the warehouse and verify personally that the materials or equipment has been purchased. In general, pay only for materials or equipment properly stored, protected and insured.

- iv. If only a portion of contract change order work has been completed, partial payment may be made just like

partially completed work under the original contract. No payment can be made on any change order work until a formal change order has been fully executed by all parties.

- v. Have the Contractor submit a draft invoice payment request along with a schedule G form. Check the quantities, previous amounts, current amounts, and required retention to verify that it matches the approved amounts. If the values do not match the approved amount, inform the Contractor of the discrepancies and to revise and resubmit the invoice. This review process should take no longer than 5 working days.
- vi. Upon approval of the draft invoice, have the Contractor submit an original signed invoice, Prompt Payment Invoice Transmittal, and Schedule G (Sub-contractor Payment Form) certifying that all subcontractors and suppliers have been paid.
- vii. Upon receipt of the original signed invoice, Prompt Payment Invoice Transmittal, and Schedule G from the Contractor, review the document content for completeness to ensure it matches the approved payment requested amount. After verifying the information is correct, proceed with date stamping the Prompt Payment Transmittal form and gathering all required documents to complete the progress payment package. A list of all the required documents in order can also be found listed in the Progress Payment Checklist.
- viii. Combine all documents listed in the progress payment package and sorting them in order as listed in the Progress Payment Checklist, sign the Progress Payment Cover Sheet, and give it to the Supervising Civil Engineer for review and approval. Weight tags, invoices and other supporting data should be retained and ready for review by your supervisor upon request.

c. Review of Progress Payment by Supervisor

Upon receiving the Progress Payment Package from the RE, the Supervising Civil Engineer/Construction Supervisor does the following:

- i. Make sure the progress payment package is complete and sorted in the order as listed in the Progress Payment Checklist.
- ii. Checks the arithmetic on the Progress Estimate Work Sheets.
- iii. The Project Delivery administrative staff will distribute copies of the Progress Estimate as follows:
 - Resident Engineer (1)
 - Project Manager in the Design Unit (1)
 - Contract Compliance (1)

Preparation and review of the progress payment should take no more than 3 working days.

3. PROGRESS PAYMENT

a. Progress Payment Processing

OPW-Fiscal Department prepares a Warrant Requisition which is forwarded with the original Progress Payment package to the Office of Finance, Accounts Payable Section. Accounts Payable will print a warrant after verifying funds available and no Stop Notices are on record. The warrant is then mailed to the Contractor. The original Progress Payment Package is retained in The Office of Finance.

b. Special Reporting (Oracle Report)

Many projects have bond funding, state grant funding or federal funding may have additional documents required with each progress payment.

The RE will need the Project Manager to list all payment funding source information on the Prompt Payment Invoice Transmittal form and provide a current Oracle Report showing fund(s) available and encumbered for the current pay period. This is item no. 3 listed on the progress payment package.

c. Subcontractor Payment Form

With each payment, a subcontractor payment form, Schedule G shall be processed. This form is required for Contract Compliance and City Administrator's Office to monitor compliance with the City of Oakland Local and Small Local Business Enterprise Program.

d. Retention of Funds Due to the Contractor

Under Section 9 3.2 of the Special Provision, the retention may be limited to 5% of the total contract amount performed by the General Contractor. Some projects, depending on the funding source, may require no retention. Specifications require that retention funds are withheld from the contractor to cover such items as:

- i. Correction of defective work.
- ii. Payment of liquidated damages.
- iii. Payment for stop notice claims filed against the project by subcontractors and material suppliers.
- iv. Contract compliance withholdings.

The money withheld, minus any valid claims on it, is normally paid to the Contractor after the lien period has expired. However, if necessary in certain circumstances (i.e.,

failure of Contractor to complete all punch list items), the retention may be held until release is deemed appropriate.

4. Project Cost Overview

During construction and after processing a progress payment, it is a good practice to review the overall project costs and make notes of how the bid items and other changes are trending. As mentioned in the Construction Management Logs, Section 4e, trend logs, it is a good tool to track expenses and allows the RE to get a complete and full understanding of Project Finances. Exhibit A found in the progress payment template provides the latest progress of quantity and cost of each bid item and an overall cost difference against the base bid value. The potential discrepancies between actual and bid quantities, change orders and potential costs would alert the RE how the overall project cost is trending. Additionally, it is imperative to review and discuss with the PM often to avoid possible project cost overrun and to stay within budget and City Council authorized limit.

The Resident Engineer should be aware of the following:

- i. Know the contract value associated with your project and the project contingency based on the contract specifications.
- ii. Understand the construction schedule and compare activities to your progress billings.
- iii. Identify change orders that may cause the budget to go over/under upon completion. Communicate with the PM to control the budget.
- iv. Share lessons learned with the PM for future projects to avoid similar unforeseen costs associated with the project.

Example 1

Project A requires 2000 tons of asphalt to be installed, but review of the progress payment shows that a quantity of 1500 tons of asphalt was installed despite only completing 50% of the specified work on the plans. The Resident Engineer will need to identify the cause of the discrepancy, or work with the Project Manager to determine whether values may have been incorrectly calculated. A trend log showing the scheduled bid item and the actual billed monthly quantities will help to visually assess the situation.

Example 2

Project B specifies the rehabilitation of 1000 LF of 8" sewer mainline by pipe burst method. The job averages installing about 200 LF per billing period but there have been multiple change orders which address reconnection of existing laterals, an integral aspect of construction. Using a trend log can possibly show how many of these overlooked reconnections will be charged per month.

C. PROJECT DOCUMENTATION ACTIVITIES

1. INSPECTION AND ENFORCEMENT

a. Inspection Philosophy

The City's inspection philosophy emphasizes prevention. The RE spends the bulk of the field time talking with the contractor, making sure the contractor will "do the right thing" before the work is begun. The RE must be sure to check materials before they are incorporated in the work. Defective work must be removed, however, it is best to prevent defective work from occurring in the first place. A RE who spends the bulk of their field time merely watching someone work is wasting the taxpayer's money.

b. General Approach to Project Inspection

The RE must administer the construction contract in a fair and impartial manner. The City's standard specifications

give the RE various authorities to oversee and influence the contractor, including financial incentives. The City Administrator, Director of Public Works, and the Courts expect fairness, honesty and integrity from the RE.

The RE must view their contractor as a business partner, and tied together by the construction contract. The RE and contractor are joined until the project is finished. The partnership is more likely to be successful if both parties adhere to the rules set forth in the Standard Specifications, their Modifications, and the project's Special Provisions.

While holding the contractor accountable to the terms of the construction contract, the RE must also ensure that the City upholds its obligations. This includes making certain that the site is ready to receive the contractor, survey control work is performed in a timely fashion, and the Testing lab is ready when the contractor needs them. The RE must process the contractor's payment requests in a timely manner, and prepare and expedite change orders so that they can be paid on the following month's progress billing.

The RE helps protect the City's against bogus or inflated claims. The RE must prepare for the start of work by studying the drawings and specifications to fully understand the project scope of work. The RE must review the construction schedule, and approve or reject it as soon as possible. Throughout the project the RE must know when each construction event will or should occur. Documentation of the project, including logs and trends, is very important as well.

The RE is responsible for assuring the quality and integrity of the work. The RE must be aware of every phase of work, the quality of work required, and the quality and type of materials specified for the project.

Maintain a formal business-like relationship with the contractor. Use the Request for Information (RFI) form to capture the contractor's questions.

The Resident Engineer is responsible for the successful completion of the project. Strive to complete your project on time and within budget.

c. Daily Inspection Activities

Walk through the site at the beginning of every work day. Note the general condition of the site. Note which contractors and subcontractors are working, their crew size, major pieces of equipment and locations of work. Begin your Daily Report by recording the above items. Please note the following:

- i. Make entries to the Daily Report throughout the day, and do not wait until the following day to fill out this important form. It is difficult to remember project details that happened yesterday as well as remembering details that happened 5 minutes ago.
- ii. Accuracy and detail are extremely important. Legal counsel for both sides will use the RE's Daily Reports to bolster their case if litigation occurs.
- iii. Record the substance of verbal directives or clarifications to the contractor.
- iv. Include the precise start and finish daily work location and rate of production.
- v. Note in detail the condition of the site and any changes observed.
- vi. As stated above, fill out the form daily and file it to the projects file.

Some RE's keep a project diary. This is optional but recommended. The official project progress record is kept in the form of your Daily Report. If a diary is kept, make sure there are no statements in conflict with your Daily Reports.

The diary or any handwritten notes can be subpoenaed by opposing legal counsel.

d. Inspection of the Work

Communication with the contractor is essential. Who you talk to on a daily basis will determine if your communication is meaningful. Talk only to the contractor's foremen or the project superintendent. Document your discussions with a Confirmation Note to the contractor. Do not talk to workmen, subcontractor's or their foremen. You cannot hold the contractor accountable if you do not talk to the right person all directives and agreements shall be confirmed in writing to the single point of contact established in the Pre-Job Meeting. The Standard Specifications require the contractor to have an employee on site (at all times) who is authorized to act on behalf of the contractor. This means that a foreman or superintendent with the power to direct the contractor's work force must always be present. Strictly enforce this requirement. Discuss with your supervisor the option of suspending the work until the contractor complies. Failure to enforce this requirement will result in a project out of control.

The RE must never tell a contractor or his workmen how to do their work. The contractor was hired because he claims to be an expert in construction. Architects and engineers are not contractors. Engineers do not learn building trades in school. A contractor who follows the instructions of the RE is not responsible for end product. For this reason, the RE should never "take over the work" without the explicit permission of the division manager.

Our specifications usually provide standards of performance which the contractor must meet. Monitor all tests personally or have an inspector from the Testing lab present to assist you. Work not in compliance must be rejected. Reject materials or work for just cause. You must be able to cite a specification section or plan note to validate your action. Follow through and make certain that rejected work is

corrected and rejected materials removed from the site. This is very important.

The RE must take a personal interest in inspecting every aspect of the work and materials used to ensure that the contractor is in compliance with all specifications.

e. Testing Services

Testing should be used to ensure compliance with the quality control requirements of the specifications. The Resident Engineer should work with the Project Manager to understand and develop the quality control plan before field construction commences. The RE must know which tests must be performed and who will perform them, including services that will be contracted out.

The RE should meet with the Testing Liaison before the pre-construction meeting to review the contractor's construction schedule and determine the scope of work required for all testing. The RE must work with Testing Liaison and the Project Engineer to issue a task order to the on-call consultant for testing. The task order needs to be established so that there is sufficient lead time for performing each test. For example, before the testing consultants can verify the percent of relative compaction of a subgrade, the soil must be sampled, taken back at the optimum moisture- density curve determined. This procedure takes the better part of a day. The RE must arrange for the testing consultant to collect a sample and "run a curve" in sufficient time to meet the contractor's paving schedule.

Paving is an extremely sensitive area to inspect. Dropped and sagging trenches are a direct result of low backfill compaction. The Resident Engineer should request the testing consultant to take random compaction shots on every trench. Compaction shots should be spaced no more than 50 feet apart. Remember, jetting or flooding is not allowed by our specifications.

Before rejecting materials or an item of work, ask the following:

- i. What are reasonable construction tolerances covering this item?
- ii. Are the specifications reasonable considering availability of materials, new technology, and existing site conditions?
- iii. Did the designers approve the use of this material or method of work?

If any of the answers trouble you, discuss the issue with the Project Engineer. A substitution might be a reasonable consideration if our specifications are not clear or defective. If, as RE, you determine that the specifications are ambiguous or defective, discuss that matter with your supervisor to determine the proper course of action. Use a Notice of Non-Compliance to communicate your rejection to the contractor.

Your rejection must be timely. Do not watch defective work being performed and not stop it. Rejected materials should be removed from the site immediately. A careless worker could inadvertently incorporate the defective material in the project. Consider marking the defective material with spray paint to distinguish it from good material.

Respond to the contractor's request for information (clarifications) both verbally and in writing. Give all clarification requests a sequential number and create a log. If you cannot answer the contractor's question yourself, send an Information Request to the Project Engineer. Get both a verbal and written response from the Project Engineer.

Design changes are often necessary during construction. The Resident Engineer is not authorized to make a design change without the written permission of the Project Engineer. A design change is any modification of a design element of the project. For example, changing

materials called for in the specifications or changing the size, slope or alignment of a sewer constitutes a design change.

If a design change is contemplated, inform the Project Engineer and Project Manager. Bring them to the site, if necessary. Consider if the change is a compensable item from the contractor's point of view. If the change has cost impacts, have the Project Manager write a Proposal Request (PR). Negotiate the cost before directing the contractor to make the change. See the section on Change Order processing. Always get the designer's authorization in writing and transmit the change to the contractor in writing.

Determine if the contractor has a safety plan in-place. CAL-OSHA regulations require a health and safety plan for every project. Constantly remind the contractor that job site safety is his/her responsibility. Report dangerous situations to the contractor. If the contractor fails to take immediate action, suspend the work or call CAL-OSHA in to cite the contractor. Set a proper example by wearing personal protective gear while on the job. Walk the site at the end of the day. Make sure the contractor has made the site safe before his /her personnel leave for the evening. If necessary, visit the site after dark to determine if lights and flashers are operating.

Never accept gifts from the contractor. Cost is immaterial. It does not matter if it is a cup of coffee, a free lunch or tickets to a baseball game. Don't accept it (See AI 595 attached in the appendix).

f. Weekly Inspection Activities

Give the contractor a Weekly Statement of Working Days (WSWD) at the end of every work week (Friday). This form is a statement of working days left in the project (See sample WSWD form in the appendix). The contractor is given ten (10) days to protest the assessment of working days. This sometimes occurs due to holidays or inclement weather. This WSWD is to ensure a contractual understanding of the

working days so that the contractor is aware when they need to complete their work by and to help the RE with assessing liquidated damages at the end of the job if necessary.

A weekly progress meeting should be held if the project has a duration of 20 working days or more. The RE and contractor should mutually agree on a time and place for the meeting. The meeting is always chaired by the RE. Discuss the status of the work, give clarifications, discuss potential claims and other problems. The contractor may invite subcontractors only with the permission of the RE. Keep the meeting informal and friendly. Invite the Project Engineer and Project Manager who might want to bring his/her consultant's.

The RE should take minutes of the meeting. These minutes are an official record and must reflect what took place at the meeting. Do not allow the contractor to produce another set of meeting minutes. Distribute the previous week's minutes at the current meeting. Allow corrections to be made at the beginning of the meeting. The format for the progress meeting minutes is fixed. Note the system used to number each item. For example, item 2.3 means that this item was introduced at Progress Meeting Number 2 as item number 3. This allows everyone to research and track the issue to closure.

g. Monthly Inspection Activities

The contractor must submit an updated progress schedule at the frequency required per their contract specifications. Review the update for several items. Determine if the contractor has changed the completion time. The Standard Specifications require the schedule to show an end date which corresponds to the contract completion date. Reject the schedule if necessary. Ask the contractor to respond in writing why the completion date cannot be met. Know if the contractor is due extra working days which you have not yet granted. The contractor can make a valid claim for work acceleration if you reject the schedule and the contractor is owed extra days. Refer to the Claims Analysis

Procedures Section in The Resident Engineer's Legal Reference.

Meet with the contractor near the 25th of every month to receive the contractor's request for payment. A progress payment is based on the value of work completed during the past 30 days. Review your Daily Reports to determine what work was performed during this period.

On engineering projects, the contract bid items and their bid prices are transferred to the Progress Payment Detail Worksheet. The RE's task is now to determine the quantities installed, then multiply the units installed by their bid price.

Architectural projects are normally bid on a lump sum basis. The RE shall ask the contractor for a Schedule of Values (SOV) as his first submittal. The SOV is a breakdown of the contractor's bid for progress payment purposes. The SOV is reviewed and approved by the Resident Engineer. It is customary to send a copy to the Project Manager for their comments. Approval of the SOV is one of the most important tasks of a RE. The SOV must show sufficient detail to allow the RE to determine the percentage completion of items of work. The contractor might attempt to front-load the Schedule of Values. This will allow the contractor to bill large sums of money in the early stages of the project. Typically, items such as mobilization, supervision, bonds, and insurance are front-loaded by the contractor. Demand invoices for as many items as possible. The format of the schedule is left to the contractor. The RE may suggest that the contractor list the work by the 16 CSI divisions as a starting point. Reject the SOV until enough detail is given.

View the contractor's payment request as a proposal. The RE are obligated to screen his/her proposal in fine detail. Agree to pay only what can be verified. The contractor has no appeal rights on this issue. If necessary, call the surveyors in to make a quantity take-off of the work completed. Err on the side of conservatism.

h. Project Tracking Application (PTA) Database Update

The PTA database is designed to track each project's progress from planning, design to construction completion and close out. For a project under construction, the RE would enter pertinent progress information after each monthly progress payment which includes information such as Schedule, Payments and Change orders Listing information (See example in Appendix). The PTA is also used as a tool to provide a brief weekly project update under CM progress. The weekly updates are typically due by close of business day of every Wednesday.

i. Enforcement Methods

There are times when a contractor will refuse to comply with your reasonable directions. The City has given you the tools to get compliance from anyone in any situation. These tools are very powerful. Their use will have impacts far beyond the job site. This section was written to guide you in the prudent use of the tools of enforcement at your disposal.

Approach an enforcement problem with several ideas in mind:

- i. You are a public servant. Treat every citizen with fairness, dignity and respect.
- ii. Solve the problem at the lowest level possible.
- iii. Use progressively stronger tactics.
- iv. Your goal is compliance, not punishment.

As stated above, progressively stronger tactics should be employed to get compliance. The Resident Engineer shall follow a four-step process to this end. Step 1 entails clearly communicating the problem to the contractor. Step 2 entails the issuance of a Non-Compliance Notice or Field Order. (See a sample of each in the appendix). Step 3 requires the

issuance of a Warning Notice or Citation; and in step 4, the RE takes the extraordinary action of stopping the work.

j. Communicate

In many cases, there has been a breakdown in communication. Make sure the contractor is not reacting to your personality. Recognize that many people in the private sector have had bad experiences with overzealous public employees. Don't let your ego create communication problems.

The contractor might not be aware that his actions are out of compliance with our regulations. A contractor is required to have a working knowledge of many codes and standards. This is a difficult task for the best contractor. Begin any enforcement action by informing the contractor of the violation. Ask the contractor to review the code section or show him yourself. Always leave something in writing that identifies the violation by code and/or specification section number. Issue a Non-Compliance Notice for minor violations and a Field Order for serious violations.

Give the contractor time to correct the condition. The amount of time will vary with the severity of the condition. Hazardous conditions in the roadway must be cleared immediately. Measure the time for compliance in minutes and hours. Other conditions that will not involve damage or possible injury can reasonably be abated in days. The Resident Engineer must decide which time frame to use. The initial notice should include a clear statement of the time allowed to fix the problem.

k. Violations and Fines

If the Notice of Non-Compliance or Field Order does not work, move to the next stage of enforcement - a citation. The citation process begins with the issuance of a Warning Notice. The Warning Notice must state a specific Oakland Municipal Code (OMC) or Standard Specification section.

If no code section exists to cover your situation, do not issue a Warning Notice or Citation.

The City of Oakland cannot create codes or impose non-existent standards on the contractor. Give the Warning Notice time to work. Write it in the morning and check on the site that afternoon or next day. If the Warning Notice has no effect, move one more level up to the issuance of an actual citation. The Warning Notice is usually a prerequisite to the issuance of a citation. The RE may directly write a citation without the issuance of a Warning Notice if the violation is blatant and outrageous. Use sound judgement.

The mechanics of writing a citation will is briefly outlined below:

- i. Inform the contractor that violation of certain public works codes is an infraction, punishable by fine. The initial fine is \$100.00. A second citation will carry a fine of \$200.00. The third citation will cost the contractor \$500.00. More than three (3) citations will result in the City Attorney charging the contractor with a misdemeanor, punishable with a fine of \$1,000.00 or six months in jail or both.
- ii. Ask the contractor for his driver's license. Copy his name, address and license number. The contractor must sign the citation. If he refuses, call a police officer for assistance. Refusal will result in the contractor's arrest and detainment in jail.
- iii. The citation is turned in at the Wiley Manual Court Building, 661 Washington Street, First Floor, Window 1. Once the "tag" is written, it cannot be destroyed.
- iv. The contractor has the option of paying the citation or requesting a jury trial. Prepare for a trial by taking numerous pictures and making detailed entries in the Field Notebook and Resident Engineer Daily Reports.

Do not cite the contractor for code violations outside of the public works areas.

Your authority to issue citations is limited. Council Resolution 10389 C.M.S. (October 18, 1983) empowers you to enforce by citation Chapter 6, Articles 1, 2, and 6 of the OMC (See location: <https://www.oaklandca.gov/resources/oakland-municipal-code>).

Also, any section of the Standard Specifications can be cited. Do not write citations for anything else. Refer violations of other code sections to the appropriate unit supervisor.

I. Stop the Work

All work must be performed in compliance with the Standard Specifications for Public Works Construction and the project Special Provisions. Section 6-2 authorizes the inspector to suspend the work if the contractor fails to prosecute the work in full compliance with our regulations or in a safe manner.

Stopping the work is the inspector's most powerful enforcement tool. Use this tool only after everything else has failed to get compliance. The contractor is at risk for loss of time and money. The contractor will usually do anything to be allowed to start up again. It is not the RE's job to bring financial ruin to the contractor's door. Be careful. Should the contractor refuse to stop work, call the Police to enforce the action.

The contractor should be directed to make the work site safe before leaving. A contractor failing to leave a safe work site can be charged for all necessary work performed by our Maintenance Department to effect a safe work site (Section 6-2 Standard Specifications).

Have the contractor attend a meeting with you as a condition of release of the STOP WORK order. At this

meeting, restate the specifications and persuade the contractor to acknowledge responsibility for compliance to these regulations.

m. Summary

Use the Notice of Non Compliance for minor contract variances that can be corrected on a routine, non-critical basis. Use the Field Order to notice the contractor of serious or major contract variances that must be corrected immediately. Use the Citation and Stop Work Orders after consultation with your supervisor.

2. MATERIAL TESTING AND SPECIAL INSPECTION REPORTS

As part of the developed quality control plan, the RE must follow its requirements and ensure that material testings and/or special inspections are performed. However, the city doesn't have the resources or the means to conduct the necessary material testings and special inspections work. The RE would need to work with the PM to obtain on-call consultant services for the work. The city hired on-call consultant would serve as an independent third party firm. During construction, the RE would be tasked to determine and coordinate with the testing firm and contractor for all testings and special inspections services. Prior to acceptance, the RE would gather the necessary reports for his/her project file. Below are a few typical types of reports required for the project file.

- Material Tests Reports:
 - Portland Cement Concrete (PCC) compression test.
 - Asphalt Concrete (AC) density.
 - Aggregate Base (AB) gradation and compaction test.
 - Grading/Back fill compaction test.
 - Rebar or rod Pull test.

- Special Inspection Reports:
 - Concrete Rebar Steel reinforcement inspection (typical for large scale project).
 - Pile driving inspection.

- Welding inspection.
- Storm Water Pollution Protection Plan (SWPPP) inspection.
- Shotcrete inspection.

3. **AS-BUILT PLANS**

a. **During the Project**

Having complete, accurate, and retrievable as-built documentation is essential for future maintenance work and for future design work. The RE shall remind the Contractor of their responsibility for as-built documentation during the pre-construction meeting. In addition to ensuring that the Contractor keeps concurrent as-built records, the RE shall do the same.

The RE shall mark any changes to the contract work on a clean set of prints, based upon their own observations and from information provided by the Contractor. Markups must be clear and legible. References shall be made to change orders, proposal requests, field orders, RFI responses, records of conversation, e-mails, or other documents that are related to the change. All changes must be authorized by or confirmed in writing with the PM during construction. In the case of sewer projects, all lateral locations shall be marked and identified by address.

As-built information shall be recorded daily during the construction period. Do not wait until the end of the job and try to remember what was built. Note distances to fixed reference points so that buried items can be located later. Note the depth of buried items. Take photographs of items that will later be hidden (such as plumbing in walls or buried pipelines), and be sure to capture reference points in the picture. Label all photographs with a date and location.

As-built construction documents include specifications. Changes in materials should be noted, with references to submittals or substitution request forms.

b. At Project Completion

The Contractor should provide their as-builts drafted on a clean set of prints, with a signed certification. The RE shall review the contractor's as-builts for accuracy, and mark up as applicable based upon the records they have kept throughout the job. The RE shall stamp and sign the standard certification note and provide a letter to the contractor accepting the as-built drawings.

One copy of as-built documents shall be kept in the construction project files, which will then be sent to the archive repository upon close-out of the project. Note the archive location and box numbers of the files in the CIP database so that the as-builts can be retrieved later.

The original set of as-built documents shall be given to the project manager. A transmittal shall accompany the documents. Ask the PM to sign the transmittal, acknowledging receipt, and place a copy in the project file. The PM shall arrange to have the final as-built information drafted onto an official transparency or CADD drawing. The designer-of-record will then stamp and sign the final drawing.

As-built drawings for sewer projects will be forwarded by the PM to the CEDA Engineering Services section. They will archive the drawings and draft the information onto the official City sewer sheets.

4. PROJECT FILES

The Resident Engineer shall maintain all project record and data files in an organized standardized filing structure in a chronological order by date or in the order received. The RE is encouraged to maintain project record as electronic files to maximum extent practicable as it will conserve resources (i.e. paper and printer toner), reduces the need for off-site storage of hard copy of record data, and is readily accessible on the archive file server. Electronic files will be used mainly to help the RE with minimizing repeated

request to provide documentation. If file structures are standardized management, stakeholders, and other project teams will be able to reference documents for specific projects for their purposes. However, any original documents with wet signatures; such as the order to proceed with extra work, allowance work order, and contract change order shall be retained and archived to an off-site storage facility at project close-out in accordance to file archiving standard operating procedure and city required records storage. All electronic project files shall be saved in the following standardized filing structure:

0 Start Up folder

Start Up folder should retain the following information:

.0 Constructability Review sub-folder shall retain constructability review comments and Designer's responses to the comments for the project plans, specifications, and estimates at 95% and 100% design levels. The RE may wish to review the comments and responses to gain an insight into the project and issues to be cognizant of.

- .1 Contract, NTP & Oracle Report** sub-folder shall retain the executed contract, Notice-to-proceed (NTP) letter, and oracle report. An NTP may not be issued without an executed contract and oracle report showing sufficient funding for the contract amount.
- .2 Plans & Specs** sub-folder shall retain the final bid set of contract plans and technical specifications to be provided by the Project Manager.
- .3 Canvass of Bid** sub-folder shall retain the official bid summary obtained from Contract Services which governs the project's schedule of value.
- .4 Quality Assurance** sub-folder shall retain the project's quality assurance program developed by the RE or provided in the technical specifications to ensure sampling and testing program is implemented to verify and confirm materials and workmanship are in

conformance with the Contract Specifications. The RE shall refer to the Quality Assurance Program Manual, dated 1/1/2010, for further clarification. A copy of the manual is conveniently saved to this sub-folder.

- .5 Submittal schedule** sub-folder shall retain a list of the required submittals by the Contractor. This list is provided in the technical specifications and shall be verified by the RE.

1 Progress Report folder

Progress Report folder shall retain the following information in chronological order by date:

- 1.1 Pictures** sub-folder shall retain all project photos in the following sub-folders:

- 1.1.0 Pre-Construction** sub-folder shall retain photos of pre-construction survey to document existing conditions of existing site improvements to ensure Contractor is held accountable for any damages to existing site improvements.

- 1.1.1 Construction** sub-folder shall retain photos documenting daily construction activities, traffic control, area of concern, and any potential claim. These photos in conjunction with the RE's daily progress report will clearly define the Contractor's daily activities and working site conditions.

- 1.1.2 Post-Construction** sub-folder shall retain photos of project close-out period when Contractor is making necessary corrections to complete the punchlist items. These photos will document post-construction conditions of project improvements to serve as a benchmark for comparison with the conditions at the end of warranty period.

1.1.3 End of Warranty sub-folder shall retain photos of project improvements at the end of the warranty period. These photos shall be compared with post-construction photos to verify if there are any flaw or defect that would warrant a correction by the Contractor at its expense.

1.2 Daily progress report sub-folder shall retain the Resident Engineer's accounts of daily inspection and construction activities.

1.3 Weekly Statement of Working Days sub-folder shall retain counts of working days, rain days, holidays, non-working days, and contract time extension. These statements are essential for discussions related to liquidated damages assessment.

1.4 Construction schedules sub-folder shall retain all baseline schedule and look-ahead schedule that facilitates tracking construction progress, monitoring milestone goals, and projecting completion date. The baseline schedule and subsequent updated schedules are important to establish any delays in the project and to assess the causes of delay.

1.5 RE's Information and Clarification sub-folder shall retain all sketches, exhibits, analysis, etc. by the RE that facilitate communication with the PM, design team, and/or Contractor.

2 Correspondence folder

Correspondence folder shall retain all written communication with various parties in the following sub-folders:

2.1 Contractor sub-folder shall retain all written communication with the Contractor in chronological order by date or by item number issued or received:

2.1.1 To Contractor sub-folder shall retain all written communication and supporting documents (e.g. letters, revised plans, etc.) issued to the Contractor.

2.1.2 From Contractor sub-folder shall retain written communication and supporting documents (e.g. change order request, notice of delay, potential claim, price proposal, construction survey cutsheet, etc.) received from the Contractor.

2.1.3 Field Order sub-folder shall retain all field orders issued to the Contractor for serious violations that require immediate attention or correction.

2.1.4 Notice of Non-Compliance sub-folder shall retain all written communication to officially reject material used that was not pre-approved via material submittal, change in material and design that was not pre-approved via substitution request or RFI, method of work is ineffective or inferior, or finish product is defective.

2.1.5 Confirmation Note sub-folder shall retain written communication to officially memorialize field discussion and instruction to the Contractor's project manager, foreman, or superintendent. Confirmation note may be in the form of an email, inspection report, or field written directive.

2.1.6 Claim sub-folder shall retain all supporting documents (e.g. photos, exhibits, written directives, meeting notes, etc.) to ideally resolve/settle potential claim or counter-claim prior to conducting claim hearing.

2.2 Designers sub-folder shall retain all written communication with the Designer(s) in chronological order by date or by item number issued or received:

2.2.1 To Designer sub-folder shall retain documents (e.g. plans mark-up, traffic control plan, PG&E PM drawing, RE's cost analysis of extra work, etc.) transmitted to the Designer.

2.2.2 From Designer sub-folder shall retain documents (e.g. CAD files, signal timing sheet, sketch, exhibit, etc.) received from the Designer.

2.2.3 A&E Instruction sub-folder shall retain all Engineer's Supplemental Instruction issued by the Designer.

2.2.4 A&E Clarification sub-folder shall retain all sketches, exhibits, analysis, etc. by the Designer that clarifies and facilitates communication with the Contractor.

2.3 Utility & Agency folder shall retain all communication with various agencies (e.g. AC Transit, County agency, AT&T, Caltrans, EBMUD, PG&E, water board, school, etc.). The Resident Engineer shall create sub-folder for each separate agency applicable to the project.

2.4 General & Misc. sub-folder shall retain the written communication for the following:

2.4.1 Inter-Office Letter sub-folder will retain all written documents (e.g. memo, letters, email, etc.) as directives to the RE to perform as it relates to the

2.4.2 Public Relations sub-folders shall retain copies of door hanger and project notification letter to the community to notify the public of the project information and tentative schedule.

2.4.3 Miscellaneous sub-folder shall retain all other communication not related to the above two sub-folders.

2.5 Email sub-folder shall retain all the RE's project related emails which should be archived as a single .pst file and saved here.

3 Request for Information (RFI) folder

Request for Information (RFI) folder shall retain Contractor's submitted RFI in the chronological order of RFI received. RFI's are to have a unique identifying number so that it can be referenced on the RFI log.

4 Submittal folder

Submittal folder shall retain Contractor's submittal (e.g. materials, shop drawings, traffic control plans, concrete mix design, etc.) in the chronological order of submittals received. The RE shall create a sub-folder for each separate submittal. The sub-folder naming convention shall begin with a number prefix representing the submittal number and ending with a brief description of the submittal (e.g. 1_Street Light represent Submittal #1 for street light materials).

5 Meeting folder

Meeting folder shall retain meeting agenda, minutes, and attendance roster in chronological order by date in the following respective sub-folder representing the various stages of the construction.

5.0 Pre-Job & Pre-Construction sub-folder: After the Resident Engineer is assigned a project, he/she shall conduct a pre-job conference with the Project Manager, design team, and others who may have a direct interest in the project. After the contract award by the City Council, the RE shall conduct a pre-construction conference with the Contractor, PM, design team, and others who may have direct interest in the project.

5.1 Construction sub-folder: During the course of construction, the RE shall conduct regularly scheduled progress meeting with the Contractor and design team,

utility coordination with respective utility agency(ies), design team coordination, field meeting, etc.

5.2 Post-Construction sub-folder: After completion of the construction, the RE shall conduct post-construction conference with the PM and design team (at PM's discretion) to discuss the lessons learned during the course of the construction. The RE shall create the meeting agenda during the course of the construction when issue arises that the PM may learn from. The lessons learned are critical to avoid similar issues in future projects to eliminate added cost.

5.3 End of Warranty sub-folder: Just prior to expiration of warranty, the RE shall re-inspect project improvements with the owner and/or maintenance staff and note any defect/flaws that may warrant a correction by the Contractor.

6 Change Order folder

Change Order folder shall retain the following documents in chronological order of item issued and/or executed:

6.1 Proposal Request (PR) & Price Quote sub-folder shall retain copies of the PR, prepared by the Project Manager, and the Contractor's price quote for the requested extra work. The RE shall create individual sub-folder (e.g. PR1_Install Street Light) to retain each proposal request and supporting documents in the chronological order of PR issued. The naming convention of each sub-folder begins with the prefix PR, follow by the chronological order of the PR, and then follow by a brief description of the extra work.

6.2 Order to proceed with extra work (OTPWEW) sub-folder shall retain the Resident Engineer's OTPWEW upon approval of the Contractor's price quote and associated approval of change order authorization request form for work \$25,000 or more. The RE shall create individual sub-

folder (e.g. OTP1_Install Street Light) to retain each OTPWEW and supporting documents in the chronological order of OTPWEW issued. The naming convention of each sub-folder begins with the prefix OTP, follow by the chronological order of the OTPWEW, and then follow by a brief description of the extra work.

6.3 AWO & CCO sub-folder shall retain copies of all Allowance Work Order (AWO) and Contract Change Order (CCO) in the chronological order issued in the following sub-folders:

6.3.1 AWO sub-folder shall retain copies of all allowance work order and supporting documents. AWO, liken to contract change order, is considered as extra work and is processed in the same manner. The RE shall create individual sub-folder (e.g. AWO1_Install Street Light) for each AWO in the chronological order of AWO issued. The naming convention of each sub-folder begins with the prefix AWO, follow by the chronological order of the AWO, and then follow by a brief description of the extra work.

6.3.2 CCO sub-folder shall retain copies of all allowance work order and supporting documents. The RE shall create individual sub-folder (e.g. CCO1_Install Street Light) for each CCO in the chronological order of CCO issued. The naming convention of each sub-folder begins with the prefix CCO, follow by the chronological order of the CCO, and then follow by a brief description of the extra work.

6.4 Extra Work Report sub-folder shall retain copies of the Contractor's daily extra work tags and reports that may either be approved as CCO (i.e. extra work on force account) or disputed as potential claim.

7. Payment folder

Payment folder shall retain the following progress payment, measured quantities, and material tag information in chronological order of payment/invoice period and by date:

7.1 Progress Payment sub-folder shall retain progress payment in each individual sub-folder in chronological order by payment number (i.e. PP1_Jan 2018). The naming convention of each progress payment sub-folder denotes progress payment #1 for period ending January 2018 for the sample folder name. The RE shall retain an electronic copy of the necessary paperwork to process the subject payment in this folder. The original hard copy of the paperwork is routed to and retained by Fiscal Services for processing payment.

7.1.1 Invoice sub-folder within each progress payment folder shall retain a copy of the Contractor's original signed invoice when the pay estimate has been verified and approved by the RE (see below for clarification).

7.1.1.1 Pay Estimate sub-folder within the invoice folder shall retain a copy of the Contractor's pay estimate submitted to the RE for verification and approval. It is critical that all relevant analysis and comments of the pay estimate shall also be retained in this folder for future reference when the final billable quantities are reconciled at completion of the project. Additionally, in the event of an audit by Caltrans for federally-funded project, the supporting documents are readily available.

7.2 Measured Quantities sub-folders shall retain all analyses by the RE to determine a cumulative quantity for the project to ensure Contractor's billable quantity is consistent with the Resident Engineer's measurement and analyses.

7.3 Material Tag sub-folder shall retain material tags (for asphalt concrete, concrete, steel reinforcement, steel piles, Class II aggregate base, etc.) submitted by the Contractor to develop a cumulative count of material to ensure Contractor's billable quantity is consistent with the RE's record of submitted material tags.

8 Permits folder

Permits folder shall retain applied and approved permits (e.g. building, electrical, plumbing, encroachment, right of entry, fish and wildlife, Army Corp of Engineers, water board, memorandum of understanding between City and Contractor or other third party, tree removal, sewer discharge, etc.).

9 Test Report folder

Test Report folder shall retain all special inspection test reports in a chronological order by date for the following respective work:

9.0 Soils Compaction sub-folder shall retain soils compaction test report for roadway, landscaping, or trench restoration work.

9.1 Asphalt Concrete sub-folder shall retain compaction test report of asphalt concrete for roadway, driveway, parking lot, or trench restoration work.

9.2 Concrete sub-folder shall retain compression test report for all structural concrete work. Typically, four (4) concrete cylinder samples are taken during concrete pour; one is tested on the 7th day; two are tested on the 28th day; and one is kept as an extra and tested later in case any of the other sample fail to reach the design strength at the 28th day.

9.3 Steel Reinforcement sub-folder shall retain inspection report of steel reinforcement for all structural work.

9.4 Leakage Testing sub-folder shall retain inspection report for leakage test and vacuum test for all sanitary sewer pipeline and manhole, respectively.

9.5 Material Certification sub-folder shall retain copy of certification of materials (e.g. steel reinforcement, steel railings, site furnishings, etc.).

9.6 Miscellaneous sub-folder shall retain inspection report for all other work (e.g. field welding, pile driving, topographic survey, water quality, vibration monitoring, soils profiling, post tensioning, etc.) not listed above.

10 Close Out folder

Close Out folder shall retain the following documents as required to close out the project:

10.1 Punchlist sub-folder shall retain a list of items for correction by the Contractor to close out the project. This list is developed from a final inspection of the completed work with project manager, design team, interested stakeholder(s), maintenance personnel, and RE. Only when the RE has deemed the punchlist items have been substantially complete, then only then the RE may release any retention payment and issue the final payment.

10.2 Report of Completion sub-folder shall retain a copy of the report of completion that is submitted to Contract Services upon completion of correction of all punchlist items by the Contractor for filing with Alameda County.

10.3 Contractor's Evaluation sub-folder shall retain a copy of the contractor's evaluation form at the completion of the project. The form is processed in conjunction with the final payment to close out the project.

10.4 As-Built Plans and Specifications sub-folder shall retain the RE's copy of the as-built plans and technical specifications to compare, verify, and approve Contractor's submitted copy of as-built plans. The approved Contractor's as-built plans are also retained in this sub-folder.

10.5 Warranty & O&M sub-folder shall retain copies of all warranties and Owner's Operation and Maintenance manual for all equipment.

IV. POST CONSTRUCTION STAGE

A. CONTRACT CLOSEOUT

Project closeout involves acceptance of the work , the processing of final payments to the contractor, and the closing of accounts. It is important that the following procedures are followed to assure that the City's rights are protected during the final stages of construction, and that projects are brought to a proper conclusion.

The following two sections (Work Acceptance & Final Payment) are the key steps involved in project closeout. There are slight differences within these steps between Engineering (streets, sewers, traffic) and Architectural (buildings and parks) projects.

1. WORK ACCEPTANCE

The work is legally accepted by the City of Oakland when a Notice of Completion (NOC) is filed at the Alameda County Recorder's office (See sample Notice of Completion in the appendix). This filing is performed by OPW Contract Services.

California Civil Code 3093 states that the "owner" must file a NOC within 10 days after completion of the work. Failure to comply might make the City liable to potential Mechanics Lien claimants. Also, Mechanics Liens/Stop Notices can be extended from 90 to 180 days if the NOC are not filed in a timeline manner.

The Resident Engineer prepares the Report of Completion and Acceptance and forwards ROC to the Project Delivery Administrative Assistant (AA) (See sample Report of Completion in the appendix). The AA then routes the form for signatures (Project and Division Managers) and submits executed ROC to OPW contract services. Contract services then processes the NOC, which is recorded with the County. It is imperative for the RE draft and process a ROC form immediately after the punch list is completed (typically same day). Do not delay making out the ROC for **any** reason other than the work is incomplete or defective. The weekly statement of working days ends when the ROC is drafted.

The project is not "complete" until it is accepted by the Assistant Director of Public Works. The RE recommends actual acceptance via the ROC. A Notice of Completion can only be filed after a Report of Completion is issued by the Resident Engineer.

a. Process Overview

- i. Working with the contractor, the RE will conduct field inspections walk through to verify work completion. All remaining or corrective work must be documented. The walk through should include all stakeholders, including design team (City and/or Consultant) and as applicable City staff from sewers, electrical, traffic, parks, streets, facilities, etc. The RE shall document walk through with meeting invite, sign in sheet, and field notes. Project work is deemed complete when, with the exception of a few very minor items, work requirements have been fulfilled according to the plans, specifications, and approved change orders. The contractor remains responsible for completion of these very minor items, which should be work of an inconsequential nature (1% - 2% of contract value).
- ii. The RE develops a punch list based on field inspections described above (See sample Punch List in the appendix). The punch list is based on the contract documents containing all items to be completed or corrected for acceptance of work. The RE

notifies the contractor in writing of punch list work required prior to project being accepted and deemed complete.

- iii. Upon completion of punch list work, the RE will schedule a final walk through all stakeholders, including design team (consultants and City staff) and as applicable City staff from sewers, electrical, traffic, parks, streets, facilities, etc. Contractor attendance is encouraged but not required. The RE shall document walk through with meeting invite, sign in sheet, and field notes. For Architectural Projects, a Notice of Substantial Completion may be issued with the punch list if the RE's considers the work substantially complete.
- iv. Contractor must transmit all warranties, as-built drawings, and maintenance manuals, and any other required documents per the contract to the Resident Engineer.
- v. If the work is deemed complete and all punchlist items are addressed, the RE will complete a ROC form, and forward it immediately to the PM and Division Manager/Construction Engineer for signature.
- vi. Upon execution the ROC is routed OPW Contract Services who will prepare the NOC to be filed with the County Recorder. The 35 day lien period begins on the date of recording of this notice, mechanics liens/stop notices can be filed within this time period for claims to payment (see Standard Specifications for Public Works Construction, Section 9-3.1). Once the 35 day period has passed, the Resident Engineer can make final payment.
- vii. The signed and dated ROC form is returned to the Project Delivery Division for filing.

- viii. The RE must obtain a copy of the NOC from OPW Contract Services for project file.

3. FINAL PAYMENT

a. Prepare Final Payment

After the NOC is posted for 35 days and all outstanding claims and change orders are processed, the Resident Engineer will prepare a Final Payment in accordance with the procedure described below.

- i. The Semi-Final/Final Payment cover sheet (see sample Semi-Final/Final Payment Cover Sheet in the appendix) and work sheets are completed. NOC should be attached to Final Payment if possible. Appropriate written documentation on how these quantities are determined must be kept. Examples of documentation are weight tags and field notes. All the contract change orders must be included in this Final Payment.
- ii. The Resident Engineer and contractor should be in agreement on all agreed final quantities.
- iii. If the contractor and resident engineer do not agree on the final payment and are unable to resolve the disputed work, the claims procedure should be followed in accordance with Standard Specifications for Public Works Construction, Sections 3-5, 3-6, 3-7, and 3-8.
- iv. If no disputed issues remain, the RE will forward the Final Payment to the Supervising Civil Engineer/Construction Supervisor for further processing.

If disputed issues remain, the RE will forward a Semi-Final Payment to the Supervising Civil Engineer/Construction Supervisor for further

processing. The Semi-Final Payment is intended to release all funds which the City determines are due the contractor, while allowing for possible additional payment pending resolution of claims. A Final Payment must be prepared after all claims and disputes are resolved.

- v. The Final Payment (or Semi-Final Payment in the case of unresolved claims) should be completed expeditiously and forwarded to the Supervising Civil Engineer/Construction Supervisor no later than 20 days after acceptance of work.

b. Review of Final Payment

Upon receiving the Final Payment from the RE, the Supervising Civil Engineer/Construction Supervisor will:

- i. Check the payment and make sure all substantial documentation is included.
- ii. Make sure the As-Built drawings are accurate and all other documents such as warranty letters and maintenance manuals have been received.
- iii. Attach the payment transmittal form and transmit to the Construction Engineer for signature. All substantiating documentation is placed in the project file.
- iv. Copies of the Final Payment are copied to designer/Project Manager in addition to the Resident Engineer's file.

c. Final Payment Processing

Procedure is the same as regular Progress Payment except OPW Fiscal Services will verify the status of Stop Notices and verify that the 35 day lien period has expired prior to releasing payment.

4. ARCHIVAL OF PROJECT FILES

a. The procedure for archival of project record is below:

- i. Clean your file of draft, duplicate, incomplete and unnecessary information such as unapproved shop drawings and rejected submittals.
- ii. The RE places (or has the contractor place) As-Built information on clean copy of the drawings. As-built drawings must be formally accepted and recorded by the RE.
- iii. The Resident Engineer submits As-Built drawings to the PM. The RE sends sewer As-Built drawings and street projects with sewer work to the Wastewater Engineering Management Division. The Project Manager will send the As-Built drawings to the Office of Planning and Building, Engineering Information Counter after updating Engineering Design Division's sewer maps. The project files should be given to the Project Delivery Administrative Assistant (AA) for merging with the office files. The AA will send the completed project files to the OPW Central Storage Facility.
- iv. The RE submits all warranties, equipment maintenance & operation manuals, etc to the PM.
- v. The RE prepares project file for digital archive and physical storage. The digital archived should be saved to a medium that can be included with the physical storage (i.e., cd, usb, etc). File to include all files from the RE & PM. Supervisor to review file prior to archiving/storing. File (Digital or Physical) box must be labeled with project number, name & NOC date. Physical file are transmitted to Project Delivery Administrative Assistant (AA), who will provide box ID # and send to off-site storage.

B. PROJECT COMPLETION

1. PROJECT CONSTRUCTION MEETING

The RE shall set up a post-construction meeting with the Project Manager/Project Engineer after the project is complete to discuss the issues that were encountered during construction. The following should be considered and discussed as needed:

- RFI's
- CCO's
- Final vs. Contract Quantities
- Unforeseen Conditions
- Changes Initiated by Design
- Lessons Learned

This meeting is intended to help both the RE and Project Manager/Project Engineer avoid similar issues on future projects. The goal is to develop better communication, protocol, and documentation to improve project delivery. The discussion on Lessons Learned is critical to this process and shall be part of every Post Construction Meeting Agenda.

The post construction meeting should be documented with meeting minutes (See sample Post Construction Meeting Minutes in the appendix). A section of the meeting minutes are to explain in detail the lessons learned. Minutes are to be distributed for short review period prior to becoming permanent part of project record. The RE and PM should agree what the key issues were and collaboratively propose corrective action for future projects. Recommendation should be clear and incorporated into future designs and/or constructability reviews. Once the meeting minutes are part of the project record, the lessons learned are to be transferred into the Division's Lessons Learned Log saved in the division file server to be used as referenced during constructability review. The Lessons Learned Log will track which recommendations have been implemented and which are still outstanding.

2. CONTRACTOR EVALUATION

The Resident Engineer shall complete Contractor Performance Evaluation Form upon project completion (See sample Contractor Performance Evaluation Form in the appendix). Contractor Performance Evaluation are important to help document persistent challenges with contractors or their strengths which can be analyzed for the next project.

C. RE-INSPECTION AT THE END OF WARRANTY

The Resident Engineer shall re-inspect all projects just before the warranty period expires. The RE will schedule re-inspection walk through with owner and/or maintenance staff from all applicable departments and divisions (e.g. – sewers, electrical, parks, streets, facilities, etc.). The RE should check the project specifications and set a calendar reminder for the reinspection at the end of a warranty period. However, this is usually at 11 months after architectural projects and at 23 months after engineering projects respectively.