

Construction Management Manual for Clean Water Nashville

APRIL 2023

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Acronyms and Abbreviations

BAO	Office of Minority and Women’s Business Assistance
CM	Construction Manager
CMC	Construction Management Consultant
CMM	<i>Construction Management Manual</i>
CSO	Combined Sewer Overflow
CWN	Clean Water Nashville Program
DCM	Deputy Construction Manager
EPA	U.S. Environmental Protection Agency
GIS	Geographic Information System
IBC	International Building Code
Metro	Metropolitan Government of Nashville and Davidson County
MWS	Metro Water Services
OSHA	Occupational Safety and Health Administration
PM	Project Manager
PMC	Program Management Consultant
PMIS	Program Management Information System
PMP	<i>Program Management Plan</i>
PMT	Program Management Team
QA/QC	Quality Assurance and Quality Control
RFI	Request for Information
RFC	Request for Change
RPR	Resident Project Representative
SBE	Small Business Enterprise
SCM	Site Construction Manager
SSO	Sanitary Sewer Overflow
TDEC	Tennessee Department of Environment and Conservation
TDOT	Tennessee Department of Transportation

Section 1

1 Introduction

1.1 Purpose of the *Construction Management Manual*

The Clean Water Nashville Overflow Abatement Program's (hereinafter referenced as CWN or as the Program) *Construction Management Manual* (CMM) serves three interrelated purposes:

1. To **communicate** the Construction Management Consultant (CMC) operational guidance and performance expectations to Metropolitan Nashville and Davidson County Government (Metro) and Metro Water Services (MWS),
2. To **define for** Metro, MWS, the Program Management Consultant (PMC), the CMC Staff, and associated entities the policies and procedures by which the construction phase of the CWN projects will be delivered, and
3. To **integrate** with the work of the Program Management Team (PMT) so that the studies and designs are converted seamlessly into successfully completed construction projects.

Several specific objectives of this *CMM* are outlined in Section 9 of the *Program Management Plan* (PMP) which is referenced throughout this document. The intent of this document is to provide additional detail to the approach described in the PMP.

The intent of this manual is to be a functional component of the PMP, and together with the contract documents for each project, provide the guidance by which the construction management of CWN projects will be conducted. Each year during the course of the Program, representatives from the CMC and the PMC will meet to discuss this document and make changes necessary to improve the processes and procedures used on this Program.

1.2 Scope of Work

This *CMM* will focus on the delivery of two primary Consent Decree requirements:

- Implementation of the *Corrective Action Plan/Engineering Report*, approved August 2017 and Addenda and *CAP/ER Update*, approved August 2021.
- Implementation of the *Long Term Control Plan*, conditionally approved December 2020.

Additionally, there are other projects tangential to CWN, such as Early Action Projects; Capital Improvement Projects; special requests from System Services, Development Services, or Route Services, etc., to which this *CMM* may be applied.

To address these Consent Decree goals, MWS retained a CMC to work in concert with MWS' CWN Director and the PMC in managing the construction-related activities of the Program. These activities will define the critical path needed to keep CWN in compliance and to achieve the deliverables and schedule.

Section 2.3 provides details of the scope of work for the CMC for meeting the goals and objectives of CWN.

1.3 Critical Success Factors

For CWN to be successful, the CMC must meet several critical success factors:

- Achieve Consent Decree milestones through construction scheduling and monitoring
- Facilitate MWS engagement and continuous control of its Consent Decree Program
- Monitor construction costs and implement controls to keep them in budget
- Utilize this *CMM* to manage risks and provide quality and safety
- Conduct a proactive public relations and community outreach plan as part of the PMT to keep the public informed and to reduce complaints
- Apply sustainable, affordable, and environmentally compatible solutions during construction

Ultimately, CWN's success will hinge on the capability and willingness of all parties involved—MWS, the PMC, the CMC, project Designers, Prime Contractor (Contractor), and subcontractors—to function as one team for which the members check and balance each other, as well as complementing and supporting other team members. The remainder of this CMM details the activities by which the construction management aspects of CWN will meet that objective.

1.4 Ethics

For CWN, and specifically for the CMC, it shall be policy that all involved parties hold themselves to the highest of ethical standards. All employees shall adhere to CWN's conflict of interest policy. Should any participant be unable to comply with this policy, they shall immediately notify the Construction Manager (CM) in writing. Compliance with established regulations is not sufficient. The expectation of CWN is to avoid even the perception of impropriety. To this end, each member of the CMC spending more than 25% of their time on the Program shall read, abide by, and sign the CWN Ethics Policy.

Section 2

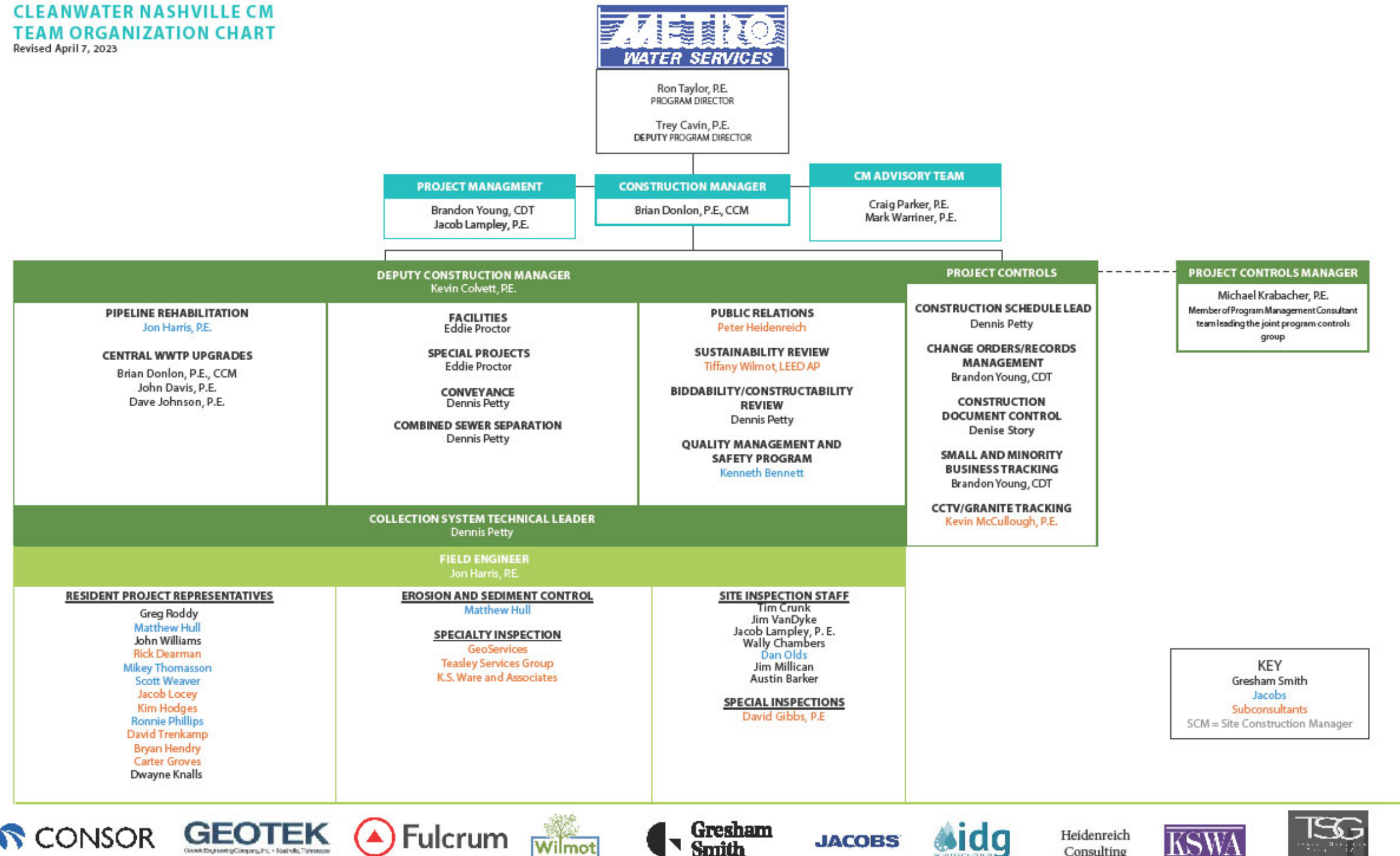
2 Construction Management Team Organization and Roles and Responsibilities

2.1 Team Organization

The PMT includes MWS, the PMC, the CMC, Designers, and the Contractor. A functional organization chart for the CMC is included as Figure 2-1.

Figure 2-1 Construction Management Consultant Organization Chart

CLEANWATER NASHVILLE CM TEAM ORGANIZATION CHART
Revised April 7, 2023



2.2 Roles and Responsibilities of Key Staff

The general roles and responsibilities of the CMC key staff are described in this section.

1. Construction Manager

- Reports to the CWN Director as the primary point of contact
- Leads and manages the CMC team
- Assures appropriate safety training of field staff
- Assigns and supervises Site Construction Managers (SCMs) and Resident Project Representatives (RPRs) Oversees activities of Public Relations Director
- Assures CMC achieves performance objectives
- Acts as liaison to the Program Controls Manager regarding controls-related items as well as quality review and audit review recommendations
- Assures CMC activity coordination with PMC and Program Management Information System

2. Deputy Construction Manager

- Reports to the CM and acts in place of CM when CM is not available
- Supervises all field staff and activities aside from the Central WWTP work which is supervised directly by the CM.
- Assumes the lead role in reviewing and recommending approval or disapproval of payment applications, change requests and claims and forwards the recommendations to the CM for final action.
- Assumes the lead in identifying and resolving resident complaints with the assistance of the SCM.
- Prepares monthly status reports on construction progress.
- Acts as Quality Management Supervisor
- Acts as point of contact with Program Controls Group during Planning and Design Phases and act as primary point of contact during Construction and Closeout Phases. Works with the CMC Controls staff under the guidance of the Program Controls Manager.
- In conjunction with the PMC's Primavera Unifier protocols (see Section 4 of this document), creates project controls guidelines outlining the daily processes and procedures followed by the CMC's Project Controls staff.
- Oversees review and approval of Contractor's final cost and schedule data prior to incorporation into the overall CWN schedule and budget.
- Responsible for the oversight and quality of completed schedules reviewed and commented upon by the Construction Schedule Lead / SCM, document management activities, cost control functions, and reporting (PCM currently)
- Manages construction closeout

3. Site Construction Manager

- Reports to the CM through the DCM for overall direction
- Depending on the specific project's needs, may serve as senior field advisor over multiple RPRs or may serve a more contract administrative function on a project, possibly in conjunction with another SCM assigned to that project on a part-time basis.
- Acts as primary schedule reviewer during construction on linear projects regarding compliance with achieving project milestones and coordinates with Program Scheduler on Facilities projects, and provides schedule completion date to Project Manager on monthly basis. Provides feedback to Program Scheduler for preparation of schedule analysis report.
- Reviews and approves daily reports
- Communicates with the PMC's Project Manager
- Monitors compliance with the CMC *Health and Safety Plan*
- Monitors submittals, requests for information (RFIs), and initiates most change management processes
- Negotiates contract changes for MWS approval
- Validates monthly progress payments
- Leads progress meetings or assists RPR with leading
- Manages RPRs
- Monitors quality assurance (QA) activities of field staff

NOTE: Two positions, currently classified as Site Construction Managers, act as resources across all projects:

- Collection System Technical Lead – is a senior-level (SCM III) resource for projects, attending progress meetings, acting in an advisory capacity to other SCM's and Field Representatives, and occasionally provides input to MWS and the PMT / Designer regarding current and upcoming projects.
- Field Engineer – is a registered Professional Engineer acting in a support role for providing input on engineered systems such as sewer bypass pumping plans as well as information technology for field personnel.

4. Resident Project Representatives

- Reports to the SCM and/or DCM
- Provides project-specific QA during construction
- Observes construction activities for compliance with contract documents
- Monitors Contractor's compliance with Contractor's *Safety Plan*
- Prepares daily reports in a timely manner
- Documents construction progress and work in place, including site photos
- Reviews and recommends monthly progress payment applications to SCM

- Serves as initial point of contact for handling complaints
- Maintains redlined plans depicting the status of construction
- Monitors startup and commissioning

5. Construction Specialized Support

- Reports to the CM
- Provides specialized constructability and operability reviews as well as specialized inspection and start-up services as needed
- Provides guidance to the CMC for processes, procedures, quality standards, *Health and Safety Plan*, operating guidelines
- Audits activities of the CMC to assure compliance with the CMM, the CMC's *Health and Safety Plan*, and conflict-of-interest procedures

2.3 Construction Management Consultant Scope of Services

The CMC operates at both a Program level and a project-specific level within the overall Clean Water Nashville Program.

The general Program level encompasses the CM, Deputy Construction Manager (DCM), specialized construction support, and the CMC Advisory Team. Services generally include the following:

- Overall construction management and Program direction
- Implementation of this CMM, including quality management and special inspections
- Implementation of conflict-of-interest (ethics) guidance
- Implementation of Program controls and coordination with the PMT
- Program cost tracking and financial reporting
- Integration of activities as detailed in the *Program Management Plan*
- Public relations support for the construction phase of the Program

The project-specific level encompasses the SCMs, RPRs, and associated field services. At times, project-specific tasks will be performed by the CM and DCM. Services generally include the following:

- Participating in project constructability reviews
- Conducting project preconstruction meetings
- Monitoring Contractor's project-specific *Safety Plan* for conformance to Program's safety requirements.
- Reviewing and accepting construction schedules for each project and conveying those benchmark dates to the PMC for inclusion in the Program Master Schedule
- Reviewing and processing Contractor payment requests
- Performing construction management services for various project workflows, such as daily reporting, submittal processing (non-technical only), RFIs, change management, and special inspections

- Providing field services for each project, generally including one SCM and from one to three field staff, depending on project complexity
- Facilitating the resolution of project-specific customer complaints in the field
- Monitoring the commissioning and startup of the completed project
- Monitoring project-specific QA
- Monitoring acceptance testing
- Managing project closeout
- Providing final CCTV acceptance review and record drawings for conveyance and rehabilitation projects

2.4 Transition from Design to Construction Administration

Because each project for CWN will be different—different Designers, different Project Managers, and different contractors, specific information for each project will need to be transitioned through the planning and design phases to the construction and closeout phases. The majority of this information will be formally transmitted from the Program Management Consultant to the Construction Management Consultant at the design-to-construction transition meeting. Prior to each project’s preconstruction meeting, the project management transition meeting will be held with the CMC, PMC, and PM with a standardized exchange of information to meet the specific needs of the project.

The intent of the project management transition meeting is to discuss with the Project Manager the development of the project and the important considerations relative to construction of the project. A general outline of the meeting is as follows:

1. Introduction of the project
2. Organizational structure; roles, and responsibilities
3. Communications
4. Quality control
5. Risk management
6. Design-specific details for the project

Prior to the transition meeting the CMC will provide MWS with an estimated cost budget for Construction Management services. The cost budget will be the estimated cost to complete the services during project construction. The cost evaluation for these services is project specific and will vary depending on project scope, location, duration, and testing requirements. The services will be categorized as follows: Field, Management, Controls, Testing, and Other.

During construction, invoicing for each of the Construction Management services is tracked and added to the project forecast adjustment within the PMIS. If an evaluation of the cost budget shows a projected estimated cost to complete greater than the initial budget request the PM is notified.

Section 3

3 Communications

Establishing and maintaining strong communication links among field personnel, SCMs, the DCM, CM, PMT, Designers, MWS, and public and private stakeholders is critical to the success of CWN. Conversations and written communication both within CWN and with entities outside CWN must be documented carefully to support decisions affecting CWN and MWS. Whether information is transmitted via the PMIS, phone, text, or e-mail, it is vital that communications are clearly and concisely documented and that an acknowledgement is received confirming that the communication was understood. Additionally, with communication being so prevalent and accessible in the form of social media, clear lines of communication are required so that appropriate chain of command processes are followed, with the SCM being the responsible party at each construction site and the CM being the responsible party for the Construction Management Consultant.

In addition to internal CWN-related communications, the CMC is required to interact with the public, particularly in situations where a member of the general public enters a construction site. Successful project completion is aided by maintaining a good relationship with the community and residents/homeowners and providing accurate information when requested. If the “public” is a citizen’s group or something beyond a homeowner or the casual curious onlooker, then the CMC shall not respond unilaterally to the public inquiry but will involve MWS and public relations group to provide a response (see Section 3.2 below). Attention is called to the PMP, Section 10, for further explanation of CWN policies regarding external communications. In any case, the inquiry and response provided will be noted in the daily report and any follow up action will be pursued by the SCM.

Routing of internal and external correspondence, including all construction-related administrative submittals, is addressed in detail in Section 4 of this CMM.

3.1 Day-to-Day Communication

As a general guideline, the RPRs communicate with the SCMs and the SCMs communicate with the CM. On a day-to-day basis, the CM, SCM, and RPR will have primary communication responsibilities, as indicated by the number “1” in Table 3-1. At times, each position will need to communicate directly with others, as indicated by the number “2”. The number “3” in Table 3-1 represents communication that only takes place after first or second level interactions. It is expected that communications will occur as necessary to accomplish the work required under the construction management contract, regardless of the numbers assigned to each position.

Table 3-1 Level of Communication Responsibilities

	MWS	Program Manager	Project Manager	Designer	Contractor	Public
Construction Manager	1	1	2	2	2	2
Deputy Construction Manager	2	2	2	1	1	1
Site Construction Manager	1	2	1	1	1	1
Resident Project Representative	2	3	2	2	1	1

3.2 Guidelines Governing Communications

Specific guidelines governing communications among individual project teams are outlined in the following text.

1. Media

Only MWS shall provide information to the media. Field staff shall immediately refer all media inquiries to a supervisor or the MWS Project Manager for the project, and ensure that this information is available to the SCM, CM, and Public Relations Director. CM team personnel are not to discuss project-related information with any media representatives but are at liberty to inquire “May I have someone contact you?”

2. Internal Communications

Written documents involving the management of a project’s scope, schedule, or budget, including pertinent e-mails, must be retained for the duration of the Program in conformance with the document index in the Program’s document control guidelines. Personal diaries are solely for the benefit of the individual and shall not be acceptable for documentation of CWN-related activities for any CMC personnel.

a. E-mail

E-mail messages that document decisions shall be retained in the PMIS files for each project. In general, the only means for recording decisions is to utilize official documents such as RFIs and submittal responses, change management documentation, and meeting minutes.

b. Internal Oral Communication

Oral communication is often unavoidable when discussing the status of the project on a daily basis among the parties involved, but for all types of issues, written documentation is a minimum requirement. Oral communication is the best method of field problem-solving. When the issues potentially affecting scope, schedule or budget are resolved, the results shall be written and filed with the appropriate project documents in the document management system.

3. External Communication

a. External Written Communication: Letters, Memos, Forms

The following protocol shall be used for external written communication:

- i. Written communication to MWS at any level shall be from the CM or DCM only.
- ii. Written communication to the Contractor will be primarily from the SCM and DCM.
- iii. Written communication to others, such as public agencies, will be from the CM.
- iv. Written communication shall convey only facts and thoroughly researched conclusions and shall not include casual thought, unsupported opinions, or impressions.

4. Communication with MWS

Oral communication is the preferred method of communication with MWS, except for official correspondence, such as memoranda, letters, and transmittals. All employees shall respond to questions from MWS employees if they have the information requested. All employees will return calls to MWS employees as soon as possible. Only the CM or DCM will initiate calls or meetings with MWS.

5. Communication with Contractors

Oral communication is the preferred method of communication with Contractors. The results shall be documented in writing following resolution of the issue. The RPR and/or SCM will work with the Contractor daily.

The Contractor will be discouraged from direct communications with MWS employees without the SCM or RPR present, at least when construction-related decisions are to be made.

Section 4

4 Program Management Information System

Primavera Unifier is the software package that was selected as the PMIS to provide overall integration of business processes for all aspects of the Program, including project controls and workflow progression. Individual workflows within the Unifier system are outlined in Section 8 of this document.

Several workflow processes are used within this system for the routing and review of Change Management, RFIs, and submittals as well as daily reports and meeting minutes. The Construction Management Controls Coordinator will be responsible for the training and user setup of all CMC members and Contractors working within the Program to ensure consistency in document submittal and workflow processes. The CMC will provide status updates on project construction and also will maintain a repository of all construction-related documents within Unifier to enable quick and easy access to all records.

4.1 Schedule Management

The Master Program Schedule is maintained by the PMC and reflects the interaction of all ongoing and planned construction projects. Though Contractors for each individual project are accountable for their own schedule performance, the SCM or designee, working with the PMC's Program Controls staff, will supply schedule information to the Project Manager to update each project's construction schedule and the PMC will reflect this information in the Program Master Schedule. After the "Design to Construction Transition Meeting" the CMC will assume responsibility for the project's schedule, reporting at least monthly to the Project Manager the status of the construction. These schedule updates will help avoid conflicts among competing projects, predict project overruns, and plan bid and award cycles. Attention is directed to the Standard Specifications Sections 01 32 16 and 01 32 17, which detail requirements for schedule development.

The SCM will work closely with the PMC in providing updated information to the Program Master Schedule. The submittal workflow process updates construction schedules monthly as the construction schedules are submitted with the monthly payment applications.

4.2 Cost Tracking

Contractors will submit payment applications monthly to the SCM. The data utilized in generating the payment application is stored each month in a database available to and maintained by the CMC Document Controls Coordinator. Payment applications are to be reviewed and approved by the RPR and SCM and forwarded through the DCM to the Construction Management Controls Coordinator for payment submittal and tracking. The Unifier system will be used to record and track all payment applications received and to provide construction cost reporting to the PMT. If the payment application package is incomplete or inaccurate, the processing of the request could be delayed. Such instances could include, as examples, schedule submittal deficiencies or SBE reporting. Complete payment applications are routed from the CMC Controls Coordinator to the DCM and then to the Program Director. The Project Manager is notified of the recommendation.

For unit price projects, such as rehabilitation projects, the RPR will track in their daily reports the quantity of work accomplished for that day using the cloud-based Fulcrum software. At least monthly, in preparation for review of payment applications, the RPR will review total quantities and update tabulation sheets. Additionally, the RPR and SCM will, at the request of MWS, document construction progress through pictures and videos using Fulcrum which can maintain the same data but interface more readily with GIS. These files, along with project photos and other documentation are backed up monthly in case the field data is lost or compromised.

Typically, twice during the course of a project, the CMC will provide the Project Manager, upon request, with an Estimated at Completion (EAC) cost for the project. This EAC will include ample detail such that anticipated quantity changes can be identified, and if necessary, on unit price contracts, overages may be included in budget adjustments. These EACs are typically generated using Excel spreadsheets and are provided to the Project Manager who files them in PMIS.

Payment applications are submitted typically by the 9th of each month and are first reviewed by the RPR and SCM, then forwarded as a complete package to the Construction Controls Coordinator. If the application is not complete, such as missing a progress schedule, the payment application is returned within 15 days or, at the request of the Contractor, held until such time as all information has been provided. Although it is the Contractor's responsibility to comply with commitments made during the bidding process regarding SBE/MBE/WBE participation, the CMC will provide status updates, typically twice during a project, to the Contractor on the relative status of those commitments.

4.3 Tracking Small Business Participation

Prime Contractors are required by the contract specifications to include all documentation required in the Purchase Agreement "Contract Terms and Conditions" with the Request for Payment, including documentation as required by Metro's Equal Business Opportunity Program). This may include such items as vendor name, address, phone number, summary of services or material rendered, and amount paid. This information is typically provided on the Recap of Small Business/MWBE Participation on Metro Project Report form which is also submitted separately to Metro's Office of Minority and Women's Business Assistance (BAO). The report shall be submitted by the Prime Contractor and routed for review with the pay application package and upon acceptance the associated information is uploaded to PMIS.

During the course of the project, typically twice during construction and coinciding with provisions of Estimate at Completion information submitted to the Project Managers, the Construction Controls Coordinator will provide a summary to the Prime Contractor of their actual project-to-date participation in required Equal Business Opportunity and/or Small Business or Service Disabled Veteran Business Programs versus the percentage that had been committed to during procurement. Responsibility for taking corrective action with the Prime Contractor for issues such as not meeting SBE goals and/or not providing sufficient or timely backup shall reside with BAO. The Construction Manager will coordinate with the Program Director regarding these types of issues and determine the appropriate type of follow-up communication with BAO.

Section 5

5 Safety

The information in this section constitutes the safety guidelines to be followed by the CMC for CWN. While site safety is in everyone's interest and is everyone's responsibility, the primary roles of the CMC and project Contractor can be summarized as follows:

The responsibility for the safety of the construction management staff rests with the CM and the responsibility for the safety of the construction site, including the Contractor's staff, rests with the Contractor. The CMC has the overall responsibility to review the Contractor's *Safety Plan* and to determine if it meets the minimum criteria called for in specification Section 01 35 23 of the contract documents and to bring potentially unsafe site conditions to the attention of the Contractor and Metro Water Services for mitigation by the Contractor.

Nonconformance to the Contractor's *Safety Plan* shall be noted by the RPR or SCM in the daily reports. Immediate threats to safety necessitate notification of the CM or DCM.

Additionally, all CMC personnel are to abide by the COVID-19 Protocols dated June 2020 (if applicable) and to remain in compliance with public health requirements of the State of Tennessee, Metro Nashville, Metro Water Services, and the Program Management Consultant.

5.1 Policy Statement

At the Clean Water Nashville Program, people are the most important asset. It is the Program's primary goal that everyone—construction personnel, MWS personnel, PMC staff, CMC staff, and the general public—goes home safe and healthy every day. The CMC's Health and Safety Program has complete and total management support from every level of every organization involved in the CWN, and the CMC will make every effort to provide a safe environment at all of our project sites. The purpose of this section is to outline our approach to safety and to provide an opportunity for team members to acknowledge an understanding of this most crucial aspect of the Program.

The responsibility for the Health and Safety Program ranges from the most senior executive to the newest employee. Even if it is day one on the job, all CMC personnel have the responsibility to immediately alert the Contractor's on-site supervisor if there is a belief that safety may be compromised. CMC personnel also have the right and responsibility to pursue a stop work order from MWS if the situation has not been promptly and thoroughly addressed by the Contractor. An immediate recommendation to MWS' Program Director is potentially necessary if worker safety or the safety of the public is noted to be compromised OR if there is continued disregard by the Contractor's personnel for maintaining a safe work site, such as repeated refusal to wear a hard hat. Safety is a cooperative effort of all employees to identify and eliminate hazards in the workplace. The CMC's Health and Safety Program is based on three basic principles that are applicable to all site visitors, site workers, and site managers:

1. Identification of Hazards

It is the responsibility of every employee to continuously monitor their work environment for potential hazards. Once identified, these hazards must be immediately reported.

2. Elimination of Hazards

Everyone is required to make every effort to eliminate identified hazards from the workplace.

3. Protection from Hazards

If a hazard cannot be eliminated from the workplace, the Construction Management Consultant will provide personal protective equipment or management and engineering controls to protect employees from these hazards. These measures will be used only if the hazard cannot be eliminated from the workplace.

5.2 Goals and Roles

The primary goal of the CMC is to provide construction management and inspection services that will allow achievement of the milestones and mandates defined by CWN, while making sure that every employee goes home safe and healthy, every day. To achieve a safe work environment, every employee needs to take responsibility and be held accountable.

Some of the intended benefits of creating and maintaining a safe and healthy work environment are:

- A safe and satisfying work environment
- Minimization of injuries and accidents
- Minimization of the loss of property and equipment
- Elimination of potential fatalities
- Elimination of potential permanent disabilities
- Elimination of potential Occupational Safety and Health Administration (OSHA) fines
- Reduction of workers' compensation costs
- Reduction of operating costs

The CMC is committed to safety. At each jobsite, safety of ongoing construction activity is the responsibility of the Contractor. The CMC's role is as follows:

1. We will review the Contractor's site-specific *Safety Plan* for each project in conformance with the requirements of Specification Section 01 35 23.
2. During construction, we will abide by the Contractor's site-specific *Safety Plan*.

Specifically, for employees and subcontractors of the CMC, we have accomplished the following tasks, as further defined in subsequent sections in this chapter:

- Appointed a Safety Coordinator
- Established responsibilities for visitors, site workers, and site managers
- Established accountability for employees so they are held accountable for performance of their safety responsibilities
- Established a process for enforcing disciplinary procedures for employees
- Provided and/or instructed appropriate use of proper personal protective equipment

5.3 Safety Coordinator

The CMC has designated a Safety Coordinator for CWN. The Safety Coordinator’s responsibilities include the following:

- Coordinating periodic visits to construction sites to observe Contractor’s compliance with the *Safety Plan*
- Reviewing health and safety plan submissions from Contractors performing the work for each project and relaying comments to the SCM regarding those plans.
- Documenting all topics of safety concerns
- Addressing hazards or potential hazards as needed
- Preparing monthly accident reports and investigations, if necessary

Table 5-1 Safety Guidelines for Site Visitors and Workers

	Site Visitors	Site Workers	Site Construction Managers
Examples	Upper Management Media Tour groups Owner’s Personnel	RPRs CMC subcontractors, including testing and Special Inspections	SCMs as defined and employed by the CMC
Representative Roles	Immediately upon arrival at the site, report to the project superintendent. Remain in safe and secluded area OR be accompanied by an SCM at all times. Remain with trained personnel at the jobsite.	Perform daily inspection and testing duties. Inform SCM immediately of any safety concern. Attend safety meetings, including those conducted by the Contractor.	Regularly emphasize safety to all employees, particularly inexperienced staff. Attend Contractor safety meetings. Report all injuries, regardless of severity, to Contractor’s Superintendent and to the CMC Safety Coordinator.
Representative Training	Wear all personal protective equipment required by the jobsite Contractor, but at a minimum, all visitors must wear a safety vest and a hard hat at all times. Protective eyewear and work boots shall be worn at all times on a construction site.	Familiarize oneself with the CMC’s Health and Safety Guidelines, including project Field Safety Instructions. Acknowledge understanding of the guidelines. Complete safety training as defined in Section 5.5 of the CMM. Request training as needed for any site-specific conditions.	Train employees on the CMC’s Health and Safety Guidelines. Complete safety training as defined in Section 5.5 of the CMM. Provide personal protective equipment for CMC personnel as required.

5.4 Discipline and Enforcement

The CMC seeks to establish and maintain standards of employee conduct and supervisory practices that will support and promote safe and effective business operations. These supervisory practices include administering corrective action when employee safety performance or conduct jeopardizes this goal. This policy sets forth general guidelines for a corrective action process aimed at documenting and correcting undesirable employee behavior. Major elements of this policy include the following:

1. Constructive criticism/instruction by an employee's supervisor to educate and inform the employee of appropriate safety performance and behavior
2. Correcting employee's deficient safety behavior to the extent required
3. Informing the employee that continued violation of company safety policies may result in termination
4. Providing written documentation of disciplinary warnings and corrective action taken

Depending on the facts and circumstances involved with each situation, the CMC may choose any corrective action, including immediate removal from CWN projects. However, in most circumstances, the following steps shall be taken:

1. **VERBAL WARNING**—Documented by SCM, DCM or Safety Coordinator for minor infractions of CMC's Health and Safety Program's rules. The SCM, DCM, or Safety Coordinator must inform the employee which safety rule or policy was violated and how to correct the problem.
2. **WRITTEN WARNING TO EMPLOYEE, WITH THE CM and CM ADVISORY TEAM COPIED**—Repeated minor infractions or a more substantial safety infraction requires issuance of a written warning. Every attempt should be made to reeducate the employee on the desired performance. The employee should acknowledge the warning by signing the document before it is placed in their personnel file.
3. **SUSPENSION**—For 3 working days when employee fails to appropriately respond to verbal and/or written warnings or management determines the infraction is sufficiently serious.
4. **PERMANENT REMOVAL FROM ALL CLEAN WATER NASHVILLE OVERFLOW ABATEMENT PROGRAM PROJECTS**—For repeated or serious safety infractions.

5.5 Safety Training and Education

Safety training is an essential component of an effective Health and Safety Program, addressing the responsibilities of both management and employees at the site. Training is most effective when incorporated into performance requirements and job practices training.

Training programs should be provided as follows:

- Initially when the *Health and Safety Plan* is developed
- For all new employees before beginning work
- When new equipment, materials, or processes are introduced
- When procedures have been updated or revised

- When experiences or operations indicate that employee performance must be improved
- As needed to maintain certifications
- Annually, at a minimum

Tables 5-2 and 5-3 outline the training requirements for CMC staff.

Table 5-2 Required Safety Training for Field Staff

Training	Resident Project Representative	Site Construction Manager	All Other Staff
CPR, First Aid and AED	X	X	X
10-hour OSHA training	X	X	
30-hour OSHA training		X	
Safety Awareness			X

Table 5-3 Suggested Safety Training for Selected Project Requirements

Training	Resident Project Representative	Site Construction Manager	All Other Staff
Work Zone Traffic Control	X	X	

5.6 First Aid and Site Considerations

Planning must be done before starting the project, to provide for prompt medical response in the event of an emergency. The SCM shall ensure that:

1. An appropriate, weatherproof first aid kit is on site. It must be checked weekly. Whether this is a kit solely for the CMC or whether it is shared with the Contractor is at the discretion of the Safety Coordinator. Regardless, this must be available for CMC personnel. At a minimum, first-aid kits include the following:
 - a. Band-Aids or butterfly bandages
 - b. Supplies for cleaning, flushing, or soaking wounds
 - c. Ace bandages and wraps
 - d. Non-prescription drugs at non-prescription strength (Aspirin, Tylenol, etc.)
 - e. Supplies for eye flushing and foreign body removal from eye with cotton swabs
 - f. Hot or cold packs
 - g. Drinking fluids for heat stress
2. All CMC personnel know the locations of the nearest hospitals and walk-in clinics. This information should be included in the Contractor's site-specific *Safety Plan*.
3. Emergency contact information is clearly posted.
4. Evacuation plans are clearly posted for each site.

5.7 Reporting and Recordkeeping

If an injury or accident should occur, employees are to report it to the Safety Coordinator and to the SCM as soon as possible. A log entry and summary report shall be maintained for every recordable

injury and illness. The entry should be logged within 24 hours after the injury or illness has occurred. Coordinate with the Contractor's procedures for this reporting.

An OSHA recordable injury or illness is defined as an injury resulting in loss of consciousness, days away from work, days of restricted work, or medical treatment beyond first aid. If no injury or illness occurred in the year, zeroes must be entered on the total line. The OSHA logs should be evaluated by the employer to determine trends or patterns in injuries in order to appropriately address hazards and implement prevention strategies. In the instance of an accident resulting in injury, all employees shall immediately contact the SCM and the Safety Coordinator.

5.8 Safety Coordinator Accident Response Responsibilities

The Safety Coordinator should take the lead in investigating and reporting safety violations and accidents. When necessary due to logistics, the Safety Coordinator may delegate this responsibility to the DCM. The investigator's responsibilities include the following:

1. Contact the Program Director and Project Manager and be clear and concise in the information relayed.
2. Investigate the incident (injury)—gather facts and employee and witness statements; take pictures and physical measurements of incident site and equipment involved.
3. Complete an incident investigation report form (included in the Field Safety Instructions) and the necessary workers' compensation paperwork within 24 hours whenever possible.
4. Ensure that corrective action to prevent a recurrence is taken.
5. Discuss incident, where appropriate, in safety and other employee meetings with the intent to prevent a recurrence.
6. Discuss incident with the Contractor, other supervisors, and other management.
7. If the injury warrants time away from work, ensure that the absence is authorized by a physician and that contact is maintained with the employee while they remain off work.
8. Monitor status of employee(s) off work, maintain contact with employee, and encourage them to return to work even if restrictions are imposed by the physician.
9. When injured employee(s) return to work, they should not be allowed to return to work without "return to work" release forms from the physician. Review the release carefully and ensure that you can accommodate the restrictions and that the employee follows the restrictions indicated by the physician.

6 Construction Management Services During Design

6.1 Constructability

The Project Manager will coordinate constructability reviews for projects in design development as required, typically at the 50% and 90% design stage of a project. As part of this review process, the CMC will prepare and submit the requisite review forms detailing the results of each constructability review for the Project Manager, who will then coordinate any necessary changes to the contract documents with the Designer and MWS.

In general, the CMC may perform different constructability reviews at varying levels of design. In the Planning stage, the CMC may be asked to share “lessons learned” from previous projects and assist the PMC with general design considerations as requested. At the 50% design phase, the CMC may review the plans and perform, where necessary, a walkthrough of the project, providing written feedback to the PMC. At the 90% design phase, a much more thorough review will be performed of the draft contract documents and written comments will be provided to the PMC. As more detailed information is available on the contract documents, the CMC will provide review and comments regarding the testing, start-up, and commissioning phases of the construction as well. For many projects, there could be separate reviews as well, depending on complexity and necessity. All reviews will be coordinated with the Project Manager.

Also, during design, the CMC will review projects to identify potential risks that could result in change orders, claims, or delays to a project and will work with the Project Manager to include this information on the project’s Risk Registry. Identified risks will be conveyed to the Project Manager and MWS. Next, the CMC will assist the Project Manager in identifying strategies to mitigate the impact or probability of occurrence (or both) of the risk element and work with the Design Team to eliminate risks where possible. Section 6 of the PMP references this aspect of CWN, as well.

6.2 Pipeline Routing and Facility Location

During the design process, the CMC may assist the PMC and Designer to identify the most efficient routing for a specific pipeline project. Routing assistance may consist of walking the proposed route identified by the Designer and confirming the proposed route or suggesting alternative routes that may be more efficient or pose less risk to the construction process.

For rehabilitation projects, the CMC will work with the Designer and the PMC for strategies and approaches for rehabilitation of main lines, as well as laterals. In some cases, the field conditions will dictate that open cut activities are not possible or are unwarranted, while in other locales, lining through manholes or eliminating them altogether might be preferred. Access for refrigeration trucks and associated equipment will be evaluated on a case-by-case basis.

For projects involving facilities such as pumping stations or equalization basins, the CMC will assist the PMC and the Designer in locating the structures in a manner that would be more constructible

and perhaps more economical. Available subsurface conditions such as geotechnical reports will be reviewed, and advice will be provided from the standpoint of constructability.

7 Construction Management Services During Bid and Award

7.1 Pre-Offer Meeting

The CMC typically attends the pre-offer meeting, which is held approximately two weeks prior to the project's bid date, but does not assume management responsibilities for a contract until after the bids are opened and a Contractor has been awarded the project. This process is facilitated by a project management transition meeting called by the PMC. Attendance by the DCM at pre-bid meetings is preferred, but the CM, SCM, or RPR might attend as well, if requested and approved by the PMT Project Manager. For projects procured using IDIQ processes, where a set of pre-selected contractors are bidding on work similar to what has been done multiple times in the past (a cured-in-place-piping rehabilitation project for example), a pre-offer meeting may not take place.

The Design Manager will solicit feedback from the CMC, typically the point of contact being the CM or Deputy CM, for questions that arise during the bid solicitation process. When addenda with information pertaining to construction are to be issued, the CMC will be available to review prior to its issuance.

For delivery methods such as IDIQ procurements and for CMAR projects, the CMC's role will largely be the same as for typical procurements during the Bid and Award Phase.

7.2 Bid and Award Phase

The CMC may provide input on the evaluation of bids or proposals that have been received from Contractors for various projects as requested by the PMC. In general, the PMC will route bid tabulations and observations to the CMC for review and comment. The CMC will, when requested by the Project Manager, review the information for the following:

- Bidding anomalies
- Contractor experience and qualifications, particularly for RFP's
- Unit price comparison to other projects

During the Award Phase, the CMC will begin to communicate with the contractor, becoming increasingly involved as the Notice of Intent to Award moves to Contract signing and then eventually to Notice to Proceed. The following table provides a summary of CMC actions and communication with the Contractor.

At the stage of the Intent to Award, the PMC and CMC will conduct a transition meeting, during which information generated and collected during design, such as Communication Plans and Risk Registries, will be passed on to the CMC.

Table 7-1 CMC Actions during Bid & Award

Stage	Actions the CM May Facilitate	Contractor Actions
PRIOR TO NOTICE OF INTENT TO AWARD	Very limited	Contact suppliers of major equipment for the project to understand delivery / lead times
POST NOTICE OF INTENT TO AWARD	CMC will contact awardee for general information regarding anticipated management personnel CMC will participate in transition meeting with PMC	Begin looking at schedules / crews / availability Re-read the specifications, specifically Div. 1 requirements
UPON CONTRACT SIGNING	Receive early submittals if provided Propose potential timeframes for pre-con times, NTP dates	Prepare early submittals and schedules Discuss major issues, such as substitutions, with Project Manager and possibly Designer
UPON ISSUANCE OF PURCHASE ORDER	Conduct PMIS training Conduct Pre-construction Conference (pre-con) Receive various submittals Walk the site with the Contractor to review staging / trailer areas Assist PMC with public notification letters	Provide submittals through the Unifier system Meet with CM / Project Manager regarding project schedules and potential project challenges.
UPON ISSUANCE OF NOTICE TO PROCEED	CMC field activities	Begin formal submittals / mobilization within 5 days

8 Construction Management Services during Construction

8.1 Preconstruction Meetings

The CMC will facilitate a preconstruction meeting for each project. Representatives from MWS, the PMC, Contractor, Designer, vendors, permitting agencies, Nashville Department of Transportation, and others will attend, as necessary. A pre-set agenda will be used to assure important project information is conveyed to all parties. The contract Notice to Proceed is typically issued at this meeting.

The purpose of this preconstruction meeting is to review the general requirements of the contract, the contract procedures, the general scope and sequence of work, construction access, environmental controls, temporary facilities, and project closeout.

Prior to construction, all parties shall identify names of key points of contact, review forms, and logs and routing procedures shall be developed to establish the schedule for reviewing, responding to, and processing RFIs and submittals. The CMC will review these processes with the Contractor at the preconstruction meeting (or in a separate meeting) and advise the Contractor to convey the requirements and process steps to its subcontractors and suppliers. The Prime Contractor shall remain the sole point of contact.

8.2 Workflows Regarding Construction Activities

Most construction management activities will be processed through the PMIS system by a pre-determined workflow that outlines the specific steps each individual process must take to be entered successfully into the CMC database. The workflow for each process is to remain consistent across all CWN projects and are outlined in the following pages. As with Health and Safety (Section 5 of this manual) and Quality Management (Section 10), each project will have a defined person in a defined role. Workflows themselves generally will not change from project to project.


Workflows for the following processes are discussed in this subsection:

- Daily Reports
- Payment Applications
- RFIs
- Submittals

Section 5.3.1.2 of the PMP references the communication necessary between the PMC and the CMC in regard to construction scheduling activities.

Section 8.3 details workflow processes for change management.

Figure 8-1 Workflow Summary, Daily Reports

 <h1 style="margin: 0;">WORKFLOW SUMMARY</h1>	
<h2>Daily Reports</h2>	
Overview	Daily reports provide documentation of project events, including a description of physical conditions, a summary of the work accomplished at the job site, a record of visitors to the site, and a report of any problems encountered that day. Activities, summaries, attachments, and photographs can all be added to the project's Unifier digital database.
Input	<ul style="list-style-type: none"> ▪ Site physical conditions—weather ▪ Site work accomplished ▪ Materials & Equipment ▪ Visitors ▪ Problems ▪ Schedule activities ▪ Photographs
Timing	As scheduled or required by the Project Manager, at a minimum created daily and typically submitted within 48 hours of the reporting period.
Responsibilities	Resident Project Representative to create Daily Report. Site Construction Manager to approve, file, and post Daily Report.
Steps	<p>Step 1—Work Activity Include descriptions of progress, milestones, potential delays, scope changes, and new conditions that may affect the project. Prepare a Daily Report.</p> <p>Step 2—Equipment and Materials Track information about the major equipment used on the work site such as type, work area, hours operated, etc. Record information about the items delivered to the site for the day.</p> <p>Step 3—Field Force Track information about the personnel working at the site such as source (which company supplied the labor), category by profession, work area (where labor is performed), workers per category (Supervisors, etc.).</p> <p>Step 4—Visitors Track the names of people or companies that visit the site.</p> <p>Step 5—Testing Record information about testing, including special inspections, performed at site.</p> <p>Step 6—Checklist Complete the standard daily checklist.</p> <p>Step 7—Attach Relevant Files to Unifier Capture documents such as photos documenting deficient conditions, sketches, etc. Coordinate with Document Controls for proper naming convention, filing, etc.</p>




	
Daily Reports	
Output	Historical Record of Daily Activities
Quality Management	The Deputy Construction Manager is responsible for ensuring the quality of all reports. Generally, the RPR generates a daily report and the SCM checks it for completeness.

Figure 8-2 Workflow Summary, Construction Contract Pay Applications

	
WORKFLOW SUMMARY	
Construction Contract Pay Applications	
Overview	Monthly requests submitted by the Contractor through the Construction Management Team for progress payments.
Input	<ul style="list-style-type: none"> ▪ Pay Application form, including cover, Schedule of Values detail, - stored materials log, and copy SBE sent to the BAO ▪ Schedule update ▪ Any photographs for clarification ▪ Other information as required
Timing	As scheduled or required by the Project Manager, but normally created monthly and submitted prior to the 9th of each month.
Responsibilities	<p>Contractor to create the initial payment request by reviewing progress with the RPR and updating the Schedule of Values.</p> <p>Site Construction Manager to review and recommend payment or adjusted payment, then forwards application to CM Controls</p> <p>CM Controls reviews for contract consistency and QC and forwards to CM or DCM for signature.</p> <p>Project Manager is notified by CM Controls or DCM.</p> <p>CM Controls route to MWS Program Director for approval.</p> <p>Metro Water Services to provide payment.</p>
Steps	<p>Step 1—Work Completed Review Based on daily reporting, testing and observation, the Contractor shall generate a preliminary payment request for review by field staff.</p> <p>Step 2—Site Construction Manager Review Review of quantities and work performed, as well as review of the payments to date versus the estimated cost of work completed at completion.</p> <p>Step 3—MWS Review and Approval Following recommendations of the Construction Management Consultant, the monthly payment request will be forwarded to Metro Water Services by CM Controls for processing through Metro Procurement and payment.</p>
Output	<ul style="list-style-type: none"> ▪ SBE update ▪ Monthly payment

Quality Management	The Deputy Construction Manager or Construction Manager is responsible for reviewing all recommended Contractor progress payments for the Clean Water Nashville Overflow Abatement Program. The CM Controls Coordinator is responsible for contractual compliance review, routing, and tracking of payment applications.
THINK SAFETY. IDENTIFY HAZARDS / ELIMINATE HAZARDS / PROTECT FROM HAZARDS	

Figure 8-3 Workflow Summary, Requests for Information

 <h1 style="margin: 0;">WORKFLOW SUMMARY</h1>	
<h2>Requests for Information</h2>	
Overview	<p>The Request for Information (RFI) process provides the Contractor and the Construction Manager/Project Manager with a formal method for clarifying the intent of the Contract Documents. The RFI process provides an avenue for the clarification of the contract scope of work, typically an interpretation of design documents, to establish the Designer’s intent. There are several reasons for the need to interpret the contract documents:</p> <ul style="list-style-type: none"> ▪ Confirmation of the Contractor’s interpretation of the documents ▪ Problems with the contract documents—incomplete design, an area of ambiguity, or a possible conflict in the contract documents ▪ Lack of experience of the Contractor or subcontractor interpreting the documents <p>The resulting interpretation of the documents through the RFI process can often lead to potential or real changes in the scope of work. Regardless of the reason for the interpretation, the RFI process is intended to manage and document the clarification of scope and <i>is not a vehicle for changing the scope of work of the contract</i>. If the RFI response clearly changes contract requirements, the RFI response should state that a Request for Change will be issued to the Contractor to support the resolution outlined in the RFI, and the change management process will be initiated.</p> <p>All RFIs must be submitted through PMIS. Normally, the Design Engineer or designated reviewer provides a written response to an RFI; however, the Construction Manager, based upon the complexity or specifics of the RFI, may provide a written response directly to the Contractor instead.</p>
Input	<ul style="list-style-type: none"> ▪ RFI process in PMIS and supporting documentation.
Timing	<ul style="list-style-type: none"> ▪ An RFI begins with a written request from the Contractor in the PMIS module for the project. <p><i>RFIs should be responded to in accordance with the process established in the Contract Documents and outlined in the RFI Workflow included with this activity to minimize disruption to construction.</i></p>
Responsibilities	<p>Contractor initiates the RFI for action by the Site Construction Manager. The Deputy Construction Manager is responsible for monitoring the RFI process to ensure correct and timely responses are moving the construction forward.</p> <p>The Site Construction Manager is responsible for reviewing the Designer response (when necessary) and generating a Request for Change if warranted by the RFI response.</p> <p>The Designer is responsible for clarifying the intent of the contract documents through the RFI response. As necessary, the Designer will coordinate with the Site Construction Manager or Project Manager for clarifications.</p>



WORKFLOW SUMMARY

Requests for Information

<p>Steps</p>	<p>All forms and transmission of forms among the CMC, the Designer, and the Contractor will be through the Unifier system. Exact response times for each of these steps are determined by the terms of each individual construction contract.</p> <p>Step 1—Originate the RFI The Contractor originates an RFI by initiating the business process found in Unifier.</p> <p>Step 2—Review RFI and Distribute After receiving the RFI from the Contractor, the Construction Management Controls Coordinator will review the RFI for completeness and legibility and forward the RFI through the Unifier system to the designated reviewer.. RFIs that might affect cost or schedule are flagged so that appropriate change management activities may take place if necessary.</p> <p>Step 3—Review RFI and Respond Once the designee receives and reviews the RFI, they will return the response to the CM Controls Coordinator. The response should provide resolution to the question posed by the Contractor. Resolutions outside the original scope of the contract may result in changes to the cost and schedule of the work. Dealing with changes to the cost and schedule are addressed in a separate business process for change management.</p> <p>If the response is not adequate to resolve the Contractor’s questions, the reviewer may be requested to make revisions to the RFI. If the response requires further review, it can be sent to the Site Construction Manager or Project Manager for comment. If the response is adequate, the RFI will be forwarded to the Contractor for action.</p> <p>Step 4—React to and Implement the RFI The Contractor is notified through the Unifier system that the answer to the RFI is available for use. The Contractor retrieves the completed RFI, acknowledges the receipt of the response, and takes the appropriate action.</p> <p>Step 5—RFI Response An RFI does not change the contract but may serve as the basis for a Field Authorization or Allowance Request.</p>
<p>Output</p>	<p>The Deputy Construction Manager is responsible for monitoring RFIs and discussing issues with the PMC and Owner, as necessary. The RFI may be used as a basis for a Request for Change.</p>
<p>Quality Management</p>	<p>The Construction Manager is responsible for checking the thoroughness and quality of the information provided, specifically including:</p> <ul style="list-style-type: none"> ▪ Timeliness of RFI responses ▪ Completeness of RFI responses

THINK SAFETY. IDENTIFY HAZARDS / ELIMINATE HAZARDS / PROTECT FROM HAZARDS

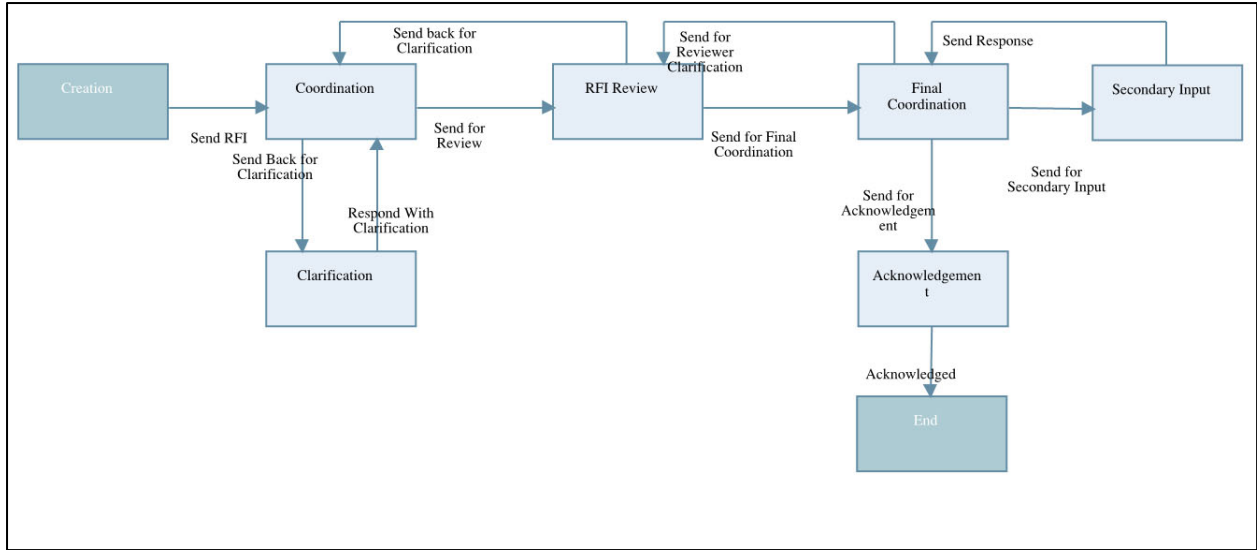




Figure 8-4 Workflow Summary, Submittals

 <h1>WORKFLOW SUMMARY</h1> <h2>Submittals</h2>	
Overview	The Contractor's responsibility for scheduling, reviewing, processing, and implementing the submittal process is described in the Contract Documents. The Site Construction Manager should review the submittal logs on a regular basis to note that submittals are being processed in a timely manner.
Input	<ul style="list-style-type: none"> ▪ Construction Schedule ▪ Submittal Schedule ▪ Submittal Documents ▪ Schedule of Values ▪ Permit documentation ▪ Testing reports ▪ <i>Safety Plan</i>
Timing	The Submittal Delivery activity follows the requirements of the Construction Scheduling specifications for the project.
Responsibilities	<ul style="list-style-type: none"> ▪ Contractor is responsible for: <ul style="list-style-type: none"> – Providing the Submittal Schedule for review and approval by the CMC. – Providing the Construction Management Document Control Coordinator with submittals per the approved Submittal Schedule and conformance with the Contract Documents. – Providing a complete submittal to the Construction Management Document Controls Coordinator, and applying the appropriate completed stamp on all submittals and samples. – Complying with the original design concepts and correcting all submittals not marked "No Exceptions Taken" or "Make Corrections Noted" within the time frame indicated in the Contract Documents, and returning them to the Construction Management Document Controls Coordinator for additional review. ▪ The Design Engineer is responsible for reviewing all technical submittals and determining the disposition for the submittal within the approved timeframe. ▪ The Document Control Coordinator is responsible for ensuring the administrative aspects of the individual submittal files are in compliance.

 <h1 style="margin-left: 20px;">WORKFLOW SUMMARY</h1>	
<h2>Submittals</h2>	
Steps	<p>Refer to the Contract Documents for specific processing and review times for each step of this process.</p> <p>Step 1—Generate Submittal and Assign Submittal Number The Contractor will generate one Electronic Copy of each submittal within PMIS along with a Submittal Transmittal Form identifying the specific submittal and a Contractor’s Stamp of Approval indicating the review and disposition of the submittal. The Contractor will load these documents into the Unifier business process. As each document is loaded, the Contractor will assign the appropriate submittal number to these documents. The initiation of a Submittal to Unifier will alert the CM Document Control Coordinator for the project via e-mail that a new submittal for the project has been received.</p> <p>Step 2—Review and Complete Submittal Properties The CM Document Control Coordinator will complete a cursory review of the submittal for completeness and will then route the submittal documents to the Designer and/or Site Construction Manager to begin the submittal review.</p> <p>Step 3—Informal Review and Distribute The Site Construction Manager will receive an e-mail alerting them that a new submittal has been received. The SCM and RPR may, if requested by the Document Control Coordinator, informally review the submittal and recommend either distribution via Unifier to the Designer for a formal review or a return to the Contractor if the submittal is incomplete or if a change is requested. On rehabilitation projects, many of the technical reviews are not performed by the Designer, but by the PMC.</p> <p>Step 4—Review Submittal, Disposition, and Respond The Design Engineer, and in some cases the PMC, will review technical submittals and samples for completeness and conformance with the contract documents, document their comments, and check the appropriate box on the submittal stamp as:</p> <ul style="list-style-type: none"> ▪ No Exceptions Taken ▪ Make Corrections Noted ▪ Amend and Resubmit ▪ Rejected ▪ For Information Only <p>The Design Engineer will provide the proper explanation for all submittals NOT marked “No Exceptions Taken.”</p> <p>Step 5—Final Review and Distribution The Document Controls Coordinator will complete the review through Unifier and then initiate the final step of the workflow by distributing the submittal document back to the Contractor.</p> <p>Step 6—Receive and Implement Submittal The Contractor will receive the submittal from the Document Controls Coordinator and acknowledge the receipt, which completes the workflow. The Contractor will further distribute to subcontractors and suppliers for incorporation into the work.</p>
Output	<ul style="list-style-type: none"> ▪ Submittal Log (in Unifier) ▪ Reviewed submittals
Quality Management	<ul style="list-style-type: none"> ▪ Number of incomplete submittals is minimized ▪ Submittals returned within scheduled response time, with timing monitored by the Construction Manager
THINK SAFETY. IDENTIFY HAZARDS / ELIMINATE HAZARDS / PROTECT FROM HAZARDS	

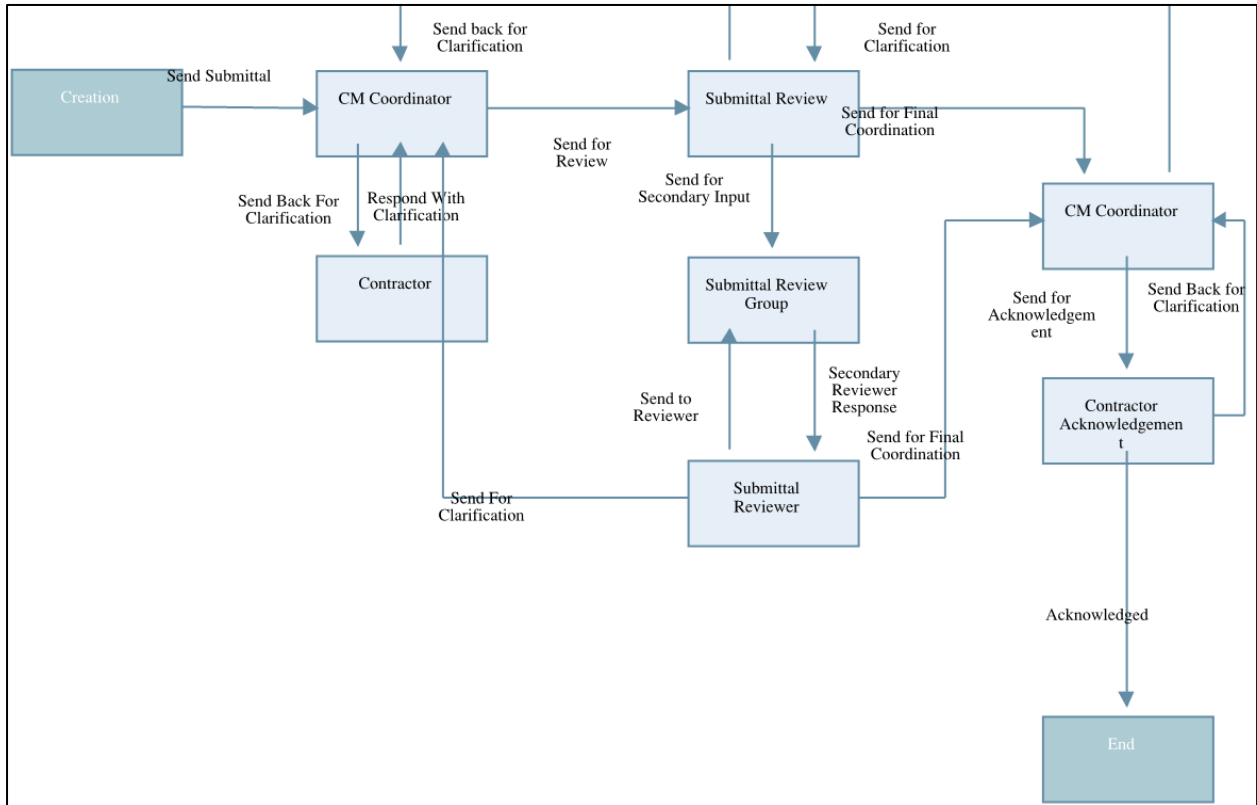




Figure 8-5 Workflow Summary, Special Inspections

 <h1>WORKFLOW SUMMARY</h1>	
<h2>Special Inspections</h2>	
Overview	The Contractor's responsibility for scheduling, reviewing, processing, and implementing the Special Inspections process is described in Section 01 45 33 of the Contract Documents.
Input	<ul style="list-style-type: none"> ▪ Construction Schedule ▪ Special Inspections Program
Timing	The timing of Special Inspections must be diligently coordinated. The program must be developed by the Designer prior to bidding the project, and there must be ample notice given by the Contractor during construction that a Special Inspection is required, typically 48 hours.
Responsibilities	<ul style="list-style-type: none"> ▪ The Prime Contractor (Contractor) is responsible for constructing the project in compliance with the contract documents and providing access per International Building Code for the Special Inspections Program to take place. The Contractor is also responsible for rectifying any issues noted resulting from the Special Inspections. ▪ The Design Engineer is responsible for developing the Statement of Special Inspections. ▪ The Deputy Construction Manager is responsible for implementing and conducting the Special Inspections Program. ▪ Metro Codes Department is the building official in charge of the project and can approve the Special Inspections Program.

	<h1>WORKFLOW SUMMARY</h1>
<h2>Special Inspections</h2>	
<p>Steps</p>	<p>Refer to the Contract Documents and Special Inspections Program Document for specific processing and review times for each step of this process.</p> <p>Step 1—Generate Statement of Special Inspections The Design Engineer, as part of the development of the project, is responsible for developing the Special Inspections Program in conformance with Section 1700 of the International Building Code.</p> <p>Step 2—Review the Special Inspections Program As part of the constructability review process, the CMC will review the Special Inspections Program developed by the Designer.</p> <p>Step 3—Meeting with the Contractor Prior to construction, a meeting to discuss the Special Inspections Program will be held, possibly in conjunction with the Preconstruction Meeting, to review the Special Inspections Program.</p> <p>Step 4—Conduct Special Inspections Throughout Construction As specified by the Special Inspections Program developed by the Designer's structural engineer of record, the Contractor shall notify the Site Construction Manager that a Special Inspection is called for and shall make the site available for such actions to take place.</p> <p>Step 5—Final Inspection As part of the closeout of the project or, if called for by Metro Codes, a final report shall be generated of all Special Inspections on the project.</p>
<p>Output</p>	<p>Special Inspections Test Forms</p> <ul style="list-style-type: none"> ▪ As required by the Structural Engineer of Record's program of Special Inspections
<p>Quality Management</p>	<ul style="list-style-type: none"> ▪ Number of failed tests is minimized. ▪ Document control for maintaining records of Special Inspections ▪ Documentation of Special Inspections reports in Unifier Daily Reports ▪ Review of proposed Special Inspections Program as part of a constructability review
<p>THINK SAFETY. IDENTIFY HAZARDS / ELIMINATE HAZARDS / PROTECT FROM HAZARDS</p>	

8.3 Workflows Regarding Change Management

Efforts shall be made to mitigate all changes, but because changes often are unavoidable and, in some cases, beneficial to Metro, a Program workflow that works within the purchasing guidelines of Metro government is essential. The contract documents and agreements should be studied and followed to resolve problems and prevent disputes. For each change request, the CMC shall evaluate and carefully consider all the options and ramifications of each option.

Section 6.3.5 of the PMP references change management in relation to the overall programmatic governance of the work, and the procedures in this manual are intended to be complementary to those guidelines. Additionally, CWN standard specification 01 26 63 includes specific language for designating monetary thresholds for when Field Authorizations, Change Authorizations, or Change Orders need to be utilized.


The following general approach shall be followed when a potential change condition is discovered:


- The RPR will inform the SCM that a potential change has been identified.
- The SCM will investigate the potential change with the RPR and if necessary Designer to clarify project expectations, interpret the construction documents, and determine the merit of the request. This information will be conveyed to the DCM to continue the process. The SCM or DCM will review the RFC with the Project Manager.
- The CM team will analyze options for the change, obtain independent costs for each of the options if necessary, and negotiate or provide other support as needed to resolve changes to the mutual benefit of MWS and the Contractor. Independent pricing may consist of quotes from competitive vendors, or can be satisfied by comparing to past pricing since much of the work, particularly in rehabilitation projects, is a specialized product and local resources are limited. The CM will use unit pricing wherever possible, and anytime it is not possible, lump sum pricing may be allowed. The lump sum pricing will be broken down to show specific tasks in performing the work. Any lump sum pricing greater than \$50,000.00 will attempt to get competitive comparison pricing, or will be broken down so as to show the cumulative growth of the lump sum item in measurable units that must be done in conjunction and are dependent on each other.
- The CM will advise the Project Manager and then present options, costs, and recommendations to MWS for consideration.
- MWS will review the options and recommendations and approve or deny the potential change.
- The DCM or CM will provide written responses to the Contractor regarding the request.

Workflows for the following processes are discussed in the following pages:

- Request for Change
- Construction Contract Allowance
- Field Authorization
- Change Authorization
- Change Order

Figure 8-6 Workflow Summary, Request for Change

 <h1>WORKFLOW SUMMARY</h1>	
<h2>Request for Change</h2>	
Overview	The Request for Change business process exists as a means for the CMC to solicit pricing for changes and potential changes to the contract scope. The RFC acts as a vetting tool for changes, often leading directly to usage of change management options such as Contract Allowances, Field Authorizations or Change Authorizations.
Input	RFC solicitation.
Timing	The RFC can be used at any point in the progress of the project.
Responsibilities	<ul style="list-style-type: none"> ▪ The Site Construction Manager and/or Deputy Construction Manager reviews the request regarding the out-of-scope work. Such request is routed to the Project Manager for initial conversation and recommendation. ▪ The Contractor provides supporting documentation to answer the RFC, sometimes involving multiple iterations of replies. ▪ The Construction Management Controls Coordinator tracks the status of the RFC, notifying the DCM when the construction contract allowance for changes is 50% and 90% encumbered.
Steps	<p>Each step is intended to take less than 10 business days.</p> <p>Step 1—Out-of-Scope Work Identification The CMC notes work necessary for the completion of the project that was not identified as part of the contract documents. Either the Contractor or the CMC may initiate a Request for Change record in PMIS.</p> <p>Step 2—Formalize Change The DCM formalizes the request by confirming that the RFC has clear description of scope and backup documentation. If the RFC is submitted by the Contractor and is determined to be invalid, the RFC may be cancelled. The DCM determines whether the RFC needs to be reviewed by the Project Manager prior to sending it to the Contractor.</p> <p>Step 3—Solicit Cost The SCM or DCM send the RFC via Unifier to the Contractor.</p> <p>Step 4—Quality Review The Construction Controls Coordinator reviews the record to confirm all required information and approvals are in place before sending the Contractor for acknowledgement.</p> <p>Step 5—Contractor Response The Contractor responds in Unifier to the RFC, providing documentation suitable for use in change management. If the Contractor requests revision, they may return to the DCM.</p> <p>Step 6—Proceed to Change Management The Construction Controls Coordinator links the approved RFC to the proper change management record (either FA or CAR) and closes the record.</p>



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OVERFLOW ABATEMENT PROGRAM

WORKFLOW SUMMARY

Request for Change

Output	<ul style="list-style-type: none"> RFC log update.
Quality Management	<ul style="list-style-type: none"> Timeliness of responses Thoroughness of review of cost/time implications of change. Document control Cost monitoring to determine appropriate change mechanism

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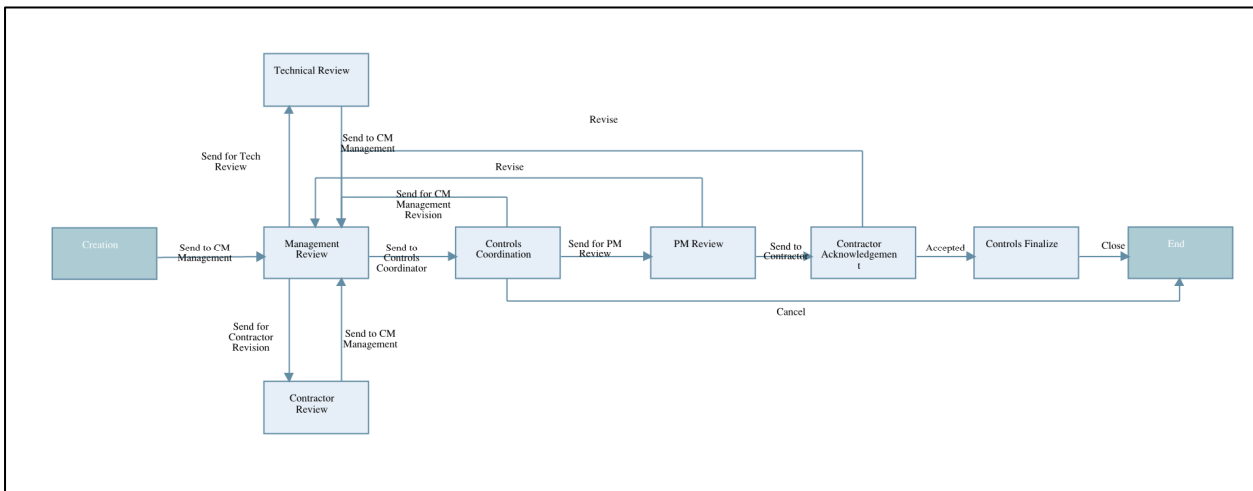



Figure 8-7 Workflow Summary, Construction Contract Allowance

 <h1>WORKFLOW SUMMARY</h1>	
Contract Allowance Request	
Overview	<p>The Contract Allowance Request exists as the initial and preferred method for change management for the CWN. The Allowance is in each contract and should be used whenever possible prior to generating Field Authorizations, Change Authorizations, or Change Orders. It is not a “bonus” or “savings account” for a project. It should only be used with the documented justification that the work exceeds that specifically outlined compensation items in the contract documents.</p> <p>The creation and routing of a Contract Allowance Request record is not required for small, pre-defined allowances for items such as traffic control, etc. The approval of the costs associated with these allowances will be reviewed and processed as part of the Pay Application Procedure.</p>
Input	Change supporting documentation.
Timing	<p>The Construction Contract Allowance typically can be used at any point in the progress of the project.</p> <p>Refer to the specifications for specific project contractual requirements regarding measurement and payment.</p>
Responsibilities	<ul style="list-style-type: none"> ▪ The Site Construction Manager and Deputy Construction Manager review the request from the Contractor regarding the out-of-scope work. ▪ The Contractor provides supporting documentation and performs the work when authorized. ▪ The Construction Management Controls Coordinator tracks the status of the Construction Contract Allowance, notifying the DCM when the allowance is 50% and 90% encumbered.




 <h1 style="margin-left: 20px;">WORKFLOW SUMMARY</h1>	
Contract Allowance Request	
Steps	<p>Refer to the Contract Documents for specific processing and review times for each step of this process.</p> <p>Step 1—Out-of-Scope Work Identification The Contractor notes work necessary for the completion of the project that was not identified as part of the contract documents.</p> <p>Step 2—Determine Cost The SCM or DCM and Contractor meet to discuss the justification for the work and an appropriate cost for its completion.</p> <p>Step 3—Contractor Approval The Contractor reviews and approves the final scope and cost.</p> <p>Step 4—Route for Approval The record is routed for review and approval by the CM, PM, and Program Director.</p> <p>Step 5—Work Completion The Contractor can be authorized to begin this work upon completion of Contract Allowance Request approvals.</p> <p>Step 6—Notifications The PMIS auto-notifies the Contractor, the Site Construction Manager, the Project Manager and the Program Director when the Contract Allowance Request record has been closed.</p>
Output	<ul style="list-style-type: none"> ▪ Updated Construction Documents and Project Budget
Quality Management	<ul style="list-style-type: none"> ▪ Timeliness of Change Approval ▪ Thoroughness of review of cost/time implications of change. ▪ Document control ▪ Cost monitoring to determine appropriate change mechanism
THINK SAFETY. IDENTIFY HAZARDS / ELIMINATE HAZARDS / PROTECT FROM HAZARDS	

Figure 8-8 Workflow Summary, Field Authorization

 <h1 style="margin: 0;">WORKFLOW SUMMARY</h1>	
<h2>Field Authorization</h2>	
Overview	A Field Authorization would often be identified first as an RFI or RFC and is intended to be approved electronically through Unifier. The General Conditions of the Contract specify the documentation requirements needed to process a change.
Input	Change supporting documentation.
Timing	Field Authorizations can be initiated by Metro, the Deputy Construction Manager, or the Construction Manager at any time. Refer to the specifications for specific project contractual requirements regarding change notification and processing times.
Responsibilities	<ul style="list-style-type: none"> ▪ The Site Construction Manager routes the completed Field Authorization to the Construction Management Controls Coordinator. ▪ The Project Manager reviews the Field Authorization and determine its acceptability. ▪ The Construction Management Controls Coordinator compiles and reviews the FA and then tracks the electronic Field Authorization. ▪ The Program Director provides final approval of the FA.
Steps	<p>Refer to the Contract Documents for specific processing and review times for each step of this process.</p> <p>Step 1—Routing of the Field Authorization One of the Construction Management Consultant team members initiates the Field Authorization.</p> <p>Step 2—Determine Acceptability The Deputy Construction Manager prepares the record for the Contractors approval with input from the Project Manager as needed before sending to the Contractor.</p> <p>Step 3—Contractor Approval The Contractor reviews and approves the final scope and cost.</p> <p>Step 4—Route for Approval The record is routed for review and approval by the CM, PM, and Program Director.</p> <p>Step 5—Work Completion The Contractor can be authorized to begin this work upon completion of Field Authorization approvals.</p> <p>Step 6—Notifications The PMIS auto-notifies the Contractor, the Site Construction Manager, the Project Manager, and the Program Director when the Field Authorization record has been closed.</p>
Output	<ul style="list-style-type: none"> ▪ Updated Construction Documents and Project Budget

Quality Management	<ul style="list-style-type: none">▪ Timeliness of Change Approval▪ Thoroughness of review of cost/time implications of change▪ Document control▪ Cost monitoring to determine appropriate change mechanism
THINK SAFETY. IDENTIFY HAZARDS / ELIMINATE HAZARDS / PROTECT FROM HAZARDS	

Figure 8-9 Workflow Summary, Change Authorization

 <h1 style="margin: 0;">WORKFLOW SUMMARY</h1>	
<h2>Change Authorization</h2>	
Overview	<p>A Change Authorization is identified through the Field Authorization Process and tracked electronically through Unifier, but must also be routed for signatures.</p> <p>The General Conditions of the Contract specify the documentation requirements needed to process a change.</p>
Input	Change supporting documentation.
Timing	<p>Change Authorizations can be initiated by Construction Manager, Project Manager, or Program Director at any time, but generally will be dependent on the nature and magnitude of the proposed change(s).</p> <p>Refer to the specifications for specific project contractual requirements regarding change notification and processing times.</p>
Responsibilities	<ul style="list-style-type: none"> ▪ The Project Manager reviews the Change Authorization and determines its acceptability. ▪ The Construction Manager and Deputy Construction Manager review the Change Authorization and determines its acceptability. ▪ The Program Director reviews the Change Authorization and determines its acceptability and routes, through the Construction Management Controls Coordinator, the Change Authorization on to Purchasing. ▪ The Program Management Controls routes the Change Authorization through MWS' Finance Process. ▪ The Construction Management Controls Coordinator notes the need for using a Change Authorization resulting from the Potential Field Authorization process and then initiates and tracks the electronic Change Authorization.
Steps	<p>Refer to the Contract Documents for specific processing and review times for each step of this process.</p> <p>Step 1—Routing of the Change Authorization The Construction Management Controls Coordinator prepares and routes the hard copy of the Change Authorization through the Construction Manager and Project Manager to the Program Director.</p> <p>Step 2—Determine Acceptability At each step along the way, reviewers have the opportunity to determine the acceptability of the Change Authorization.</p> <p>Step 3—Notifications Once the Change Authorization has been approved, notification will be given via Unifier to the Contractor, the Site Construction Manager, the Construction Manager, the Project Manager, and the Program Director.</p>




 <h1 style="margin-left: 200px;">WORKFLOW SUMMARY</h1>	
Change Authorization	
Output	<ul style="list-style-type: none"> ▪ Updated Construction Documents and Project Budget ▪ Updated Change Log
Quality Management	<ul style="list-style-type: none"> ▪ Timeliness of Change Approval ▪ Thoroughness of review by CM of cost/time implications of change ▪ Document control and CMC Controls check the math and revised cost ▪ Cost monitoring to determine appropriate change mechanism
THINK SAFETY. IDENTIFY HAZARDS / ELIMINATE HAZARDS / PROTECT FROM HAZARDS	

Figure 8-10 Workflow Summary, Change Order

 <h1 style="margin-left: 20px;">WORKFLOW SUMMARY</h1>	
<h2>Change Order</h2>	
Overview	A Change Order is identified through the RFI / RFC process and tracked electronically through Unifier, but must also be routed for hard copy signatures and approval. A Change Order for final contract costs balancing is required to close a project and is tracked in PMIS. The General Conditions of the Contract specify the documentation requirements needed to process a change.
Input	Change supporting documentation.
Timing	Change Orders can be initiated by Construction Manager in consultation with the Program Director at any time, but generally will be dependent on the nature and magnitude of the proposed change(s). Refer to the specifications for specific project contractual requirements regarding change notification and processing times.
Responsibilities	<ul style="list-style-type: none"> ▪ The Construction Manager reviews the Change Order and initiates the approval process. ▪ The Project Manager is responsible for providing information to the Program Director regarding the status of contract change orders and negotiations. The project manager shall also review and provide input on the proposed Change Order prior to its routing to the Program Director. ▪ The Contractor signs the Change Order and implements the change(s) in the field once the Changes are approved by Metro. ▪ The Program Director reviews the Change Order, determines its acceptability and routes, through the Construction Management Controls Coordinator, the Change Order on to Program Management. ▪ The Construction Management Controls Coordinator routes the Change Order through the Program Director and on through Metro Finance Procurement.
Steps	<p>Refer to the Contract Documents for specific processing and review times for each step of this process.</p> <p>Step 1—Routing of the Change Order The Construction Management Controls Coordinator routes the Change Order through the Construction Manager to the Program Director.</p> <p>Step 2—Determine Acceptability The Construction Manager can only recommend approval, and the Program Director ultimately determines the acceptability of the Change Order.</p> <p>Step 3—Notifications Once the Change Order has been approved, notification will be given via Unifier to the Contractor, the Site Construction Manager, the Construction Manager, the Project Manager, and the Program Director.</p>

 <h1 style="margin-left: 200px;">WORKFLOW SUMMARY</h1>	
Change Order	
Output	<ul style="list-style-type: none"> ▪ Updated Construction Documents and Project Budget ▪ Updated Change Log
Quality Management	<ul style="list-style-type: none"> ▪ Timeliness of Change Approval ▪ Thoroughness of review by ACM of cost/time implications of change ▪ Document control and CMC Controls review pricing changes ▪ CM reviews and submits to Program Director
THINK SAFETY. IDENTIFY HAZARDS / ELIMINATE HAZARDS / PROTECT FROM HAZARDS	

8.4 Dispute Resolution

When disputes over construction issues cannot be resolved between the RPR or SCM and the Contractor, the dispute resolution process established by contract documents will be implemented. In general, the following process will be used, but in all cases, there is a desire to amicably resolve disputes.

The **first level** of construction dispute resolution involves the RPR and the Contractor's Superintendent. CMC and Contractor staff are responsible for working out minor changes and agreeing on the quality standard of the work, and such actions shall be documented in Daily Reports. Minor changes, not involving an increase in time or money, should be documented by the RPR or SCM. Disputes not resolved at the first level of dispute resolution will be elevated to the second level.

The **second level** of construction dispute resolution involves the SCM and DCM as well as the Contractor's Project Manager. Disputes at this level may involve an increase to the contract time or contract price and should be negotiated by the SCM and the Contractor's Project Manager. All second level disputes will be evaluated by the Project Manager and MWS.

The **third level** of dispute resolution will involve Program-level negotiation among the CM, Program Manager, Program Director, and an officer from the General Contractor. Beyond this point, the Contractor shall submit a claim in writing regarding the issue and a meeting shall be held with the Contractor, CM, and Program Director, and if it cannot be resolved at this level, the matter will be turned over to the Metro Legal Department.

Claims shall be addressed in a manner consistent with the procedures established in the Metro Purchase Agreement, Section 17.

8.5 Construction Progress

Each month the CM will prepare a monthly update letter to send to the Contractor which summarizes the status of contract time accounting related to milestones called for in the project's construction contract. The intent of this letter is to only address time. Each letter will include an accounting of calendar days assessed to the project and any known additions due to changes in scope or delays beyond the Contractor's control as defined in the specifications. The Contractor will have 15 days to respond to this letter.

Each project has a fixed "Notice to Proceed" date and a prescribed number of calendar days in which to meet Substantial Completion for the project. Throughout the project, the CMC monitors the time elapsed and time remaining and also makes a determination if any time has been added to the project. This is noted at the bi-weekly progress meetings as well as formally communicated via the above-referenced Calendar Day letters. The Calendar Day letters include a notification for projects more than 30 days behind schedule that withholding a portion of an Application for Payment may occur as allowed in Article 9-C of the Construction Contract. For instances where the Contractor does not complete the work within the contractual time limits, it is possible that the CMC will recommend to MWS that Liquidated Damages are assessed, as allowed by the Contract. This recommendation will be within the Liquidated Damages limits found in the Contract and may in some cases be less than the per-diem amounts, with the intent to recover actual damages.

In some instances, where a single entity is the Prime Contractor on multiple projects, the CM and that contractor may engage in regular “change meetings” where changes and potential changes are discussed.

8.5.1 Progress Meetings

To ensure that the project’s quality, budget, and schedule remain on track, the CMC will conduct weekly, biweekly, or monthly progress meetings at the site with the Contractor and other appropriate staff. Specification Section 01 31 19 provides a discussion of project meetings, as well as guidance on the agendas. In general, the following topics will be covered:

1. Project Safety
2. Project Quality Control and Quality Assurance
3. Project Schedule
4. Design Pending Items/Issues Log
5. RFI Review
6. Submittal Review
7. Change Management
8. Application for Payment
9. Issues and Other Business
 - a. Complaints
 - b. Deficient Work
 - c. Identification of Potential Risk Issues
10. Action Item Review

The CMC will fill in as much agenda information as possible prior to each meeting so that note-taking and opportunities for misunderstanding are reduced when the final meeting minutes are produced. Minutes are to be filed and routed into the Unifier system.

8.6 Permit and Utility Coordination

During the Preconstruction Conference for each project, the MWS staff should be identified and the coordination of work with the MWS staff should be defined. There are permit logs maintained and tracked in PMIS for each project. All utilities coordination issues should be directed through the MWS staff identified at the preconstruction meeting. Although each project will have a specific set of permits and permit requirements, in general, the following permits are the most commonly required.

Table 8-1 Most Commonly Required Permits

PERMIT	CLEAN WATER NASHVILLE CONSTRUCTION MANAGEMENT ACTIONS
Tennessee Department of Environment and Conservation	Require that Contractor maintain TDEC-approved contract documents on the site.
Aquatic Resource Alternation Permit	If required, maintain copy of the permit, and observe and document the Contractor’s conformance.

PERMIT	CLEAN WATER NASHVILLE CONSTRUCTION MANAGEMENT ACTIONS
TDEC <i>Stormwater Pollution Prevention Plan</i>	-Monitor the Contractor's performance for compliance with TDEC's standards. The CMC will provide, typically monthly, a quality control (QC) check of this work.
Metro Nashville Grading Permit and Stormwater Permit	CWN will perform the required inspections (if required) and reporting for compliance with Metro Water Services requirements to ensure that all activities performed under this Contract shall be conducted in full compliance with Metro Code of Law §§ 15.6 et al (Stormwater Management) including §§ 15.64.205 (http://www.nashville.gov/Water-Services/Pollution-Prevention/Illicit-Discharge-Ordinance.aspx). The CMC will provide QC of this work.
U.S. Army Corps of Engineers	Permit is valid for 1 year. Ensure that re-application and re-issuance are performed in a timely manner and that the Contractor is in conformance with the permit requirements.
Tennessee Department of Transportation	Required for work within TDOT rights-of-way. Maintain TDOT-approved plans at the site and comply with the required traffic control and notifications stated in the permit.
Metro Nashville (NDOT) Right-of-Way	Required for work within public rights-of-way. Comply with the required traffic control and notifications stated in the permit.
Metro Nashville Building Department	Specifically, for the CWN, the Construction Management Consultant will oversee and conduct, where necessary, the Special Inspections Program outlined in Section 10 of this document.

8.7 Commissioning

Once initial process and equipment testing is completed, the Contractor is responsible for developing a *Commissioning Plan* for each project. This procedure shall follow the requirements of the specification sections with equipment and systems requiring such action, and the *Commissioning Plan* will outline how the Contractor plans to commission each process unit, pipeline, pump station, or tank constructed under the contract. The SCM and RPR must be familiar with the *Commissioning Plan*, observe the Contractor's actions during commissioning, and provide feedback if the Contractor deviates from the plan.

9 Construction Closeout

9.1 As-Builts

As part of each month's pay request process, the SCM and staff will verify that the Contractor is maintaining as-built drawings, specifications, and other as-built or record documents. The SCM and field staff will review these documents for completeness. Upon completion of the project, the CMC may transmit the documents to the project Designer for use in finalizing the project record drawings if it is within the Designer's scope of work, or the CMC may prepare the record drawings.

For sewer rehabilitation projects consisting primarily of cured-in-place lining, the CMC will maintain a record of the progress of construction as the work is progressing. This information will be tracked on a website maintained by the CMC and made available to Program Management and to MWS personnel. Each segment will be logged according to when construction begins, when service laterals are rehabilitated, and when testing and surface restoration are completed according to the contract documents. When the work is completed, this information will be provided to MWS so that the dates of rehabilitation and other pertinent information can be recorded in the geographic information system (GIS) information management system.

Items such as lateral locations and type of rehabilitation will be noted in the tracking system, but not shown on the plan sheets unless specifically requested by MWS. This digital information can be used in the future should MWS opt to include lateral information on the GIS system.

CCTV data shall be collected by the CMC and provided to Metro Water System Services for incorporation into their Granite system. Only video of final (post-punchlist) work shall be provided to MWS.

9.2 Record Drawings

Record drawings prepared by the Designer will be reviewed by the SCM and staff to determine that information submitted by the Contractor has been included by the Designer in the final record drawings. For rehabilitation projects, PDF drawings of the as-constructed work will be provided to MWS as well as updated GIS information.

9.3 Substantial Completion

When the Contractor believes it has satisfied the substantial completion requirements of the general conditions, the SCM will verify the Contractor has satisfied all conditions. In some circumstances, this verification may take some time to review field conditions, surface restoration or video information, so the Certificate may be issued some time (typically within two weeks) of the Contractor providing notification. If all conditions are satisfied, a Certificate of Substantial Completion will be prepared in accordance with the provisions of the contract documents and signed by the CMC, Project Manager, and Program Director. The SCM, Designer (on facilities projects), and Project Manager will also prepare a coordinated punch list of items to be completed by the Contractor prior to final acceptance of the work. The punch list is transmitted to the Contractor and entered into PMIS. Per the Metro Construction Contract, upon attaining Substantial

Completion, the Contractor may be paid 100% of the work completed, minus 125% of the value of the remaining work.

9.4 Final Completion

After the project has been accepted as Substantially Complete, the CMC shall provide a written punchlist to the Contractor identifying remaining items on the project. Once each of those items have been addressed, the CMC will issue a certificate of Final Completion for the project. Under some circumstances, where there are significant budget under-runs for a contract and at the sole discretion of MWS, contracts may be left open, but the originally-scoped work is acknowledged as complete. In these instances, work that is added to the contract shall be done so through the Field Authorization process.

9.5 Warranties and Bonds

The SCM will coordinate with the Contractor for the submission of required warranties, guarantees, lien releases, and other similar documents required by the contract for construction. The DCM will ensure that all documents are included in the appropriate project files and transmitted to MWS at the conclusion of construction work. The warranty period for most CWN projects is typically 1 year from the date of Substantial Completion, although there are some components of some projects that have a longer warranty time.

9.6 Spare Parts, Maintenance Manuals, and Training

The SCM and staff will verify that the Contractor provides all spare parts, maintenance manuals, and training are provided to MWS in accordance with each project's contract documents.

9.7 Application for Final Payment

When the SCM, RPR, Project Manager, and Designer (if requested) find that the work is acceptable under the contract documents and all punchlist items have been completed, they will give the Contractor final acceptance.

Once the Contractor has received final acceptance, the Contractor may submit the application for final payment in accordance with procedures and requirements stated in the contract. Final payment will include all change orders, including any final change orders reflecting adjustments to the contract sum not previously included in other change orders.

CMC Controls will review the final application for payment to make sure it is complete and includes all supporting documents required by the general conditions.

The CMC Controls will work to complete the construction closeout checklist and then route to the PMC for closing out the project once it completes the warranty period. CMC Controls works directly with the Contractor from the inception of the project, providing forms for pay applications, schedules of value, and other tools for financially managing the project. Included with this information is the appropriate information for setting up a retainage account for the project.

CMC Controls will provide the Program Director with documentation that the Final Change Order has been approved, the project has attained Final Completion, and a copy of the original Purchase Order so that Metro Purchasing may initiate the release of retainage process by completing their "M-6" form.

9.8 Construction Closeout

Commencing at Final Completion, the CMC will begin the process of closing out the construction phase of the project. Typically, within 120 days of the date of Final Completion, the CMC will complete the Construction Closeout Checklist, which is included below. The CM or DCM will provide the SCM and CMC Controls with a copy of this form, identifying any project-specific closeout items as well as any items that are not applicable for the project.

During the closeout phase, CMC Controls distributes a copy of the closeout checklists to the Project Manager on the first of each month as a means of providing a progress update. After the closeout checklist is completed and signed by the DCM, the checklist is provided to the Project Manager for incorporation into Project Closeout information.

A copy of the checklist template is included on the following two pages.

Figure 9-1 Construction Closeout Checklist

Project Name: _____

CWN No. _____ MWS No. _____

Task	Date Completed/ Initials	Notes
Review and approve all final close out documents presented for signature including, but not limited to:		
<i>Final Lien Releases</i>		
<i>Verification from Owner that Start-up and Commissioning is complete</i>		
<i>Any building permits required for the project</i>		
<i>Report to TDEC on any stream crossings within 90 days of project completion</i>		
<i>Warranties</i>		
<i>Verify that all required permit notifications (e.g., Notice of Completion, Notice of Termination) have been issued</i>		
All water usage fees have been paid and temporary meters turned back in to MWS.		
Confirmation that the project sign has been removed		
Lessons Learned memo feedback provided to the Project Manager		
Confirm all field data has been submitted for archive filing and all daily reports have been finalized and closed out		
Follow up on all Submittals/RFIs and change management items until they are completed		
File all electronic documents and hard copies		

Project Name: _____

CWN No. _____ **MWS No.** _____

Task	Date Completed/ Initials	Notes
- Confirm that Substantial Completion form is on file & has been e-mailed to Procurement @ prg@nashville.gov		
Confirm as-built drawings have been finalized and sent to MWS GIS and Mapping. Confirm <i>O&M Manuals</i> have been received by Route Services, if applicable.		
Load PDF of as-builts into Unifier.		
Review Contractor contract requirements to ensure all deliverables have been submitted and received		
Prepare final Change Order for review and process		
Process final payment application		
Prepare and process Final Completion form		
Close out charge numbers		
Granite Database to System Services		
Confirm GIS data warehouse is complete and acknowledged by MWS GIS		
Notify Program Controls of construction completion		

Acknowledged: _____

Date: _____

10 Quality Assurance/Quality Control

10.1 Risk and Issues Management

While mitigating construction risks is largely the responsibility of the Contractor, the CM will work with the Contractor **and** the Designer to review long-range scheduled activities; identify possible controllable and uncontrollable risks to successful project completion; and support the Contractor by helping find solutions that mitigate the risk while maintaining the intent of the original contract scope, cost, and schedule. Risks that go unidentified and unresolved may result in schedule delays and additional costs to the project. Proactive resolution of risks will keep projects on schedule and on budget.

The Program Management Team has prepared a Program Risk document, which is to be reviewed and updated at least annually. The risks identified in this document are more general and not specific to individual projects. With each project, the PMT, through the design process, creates and updates a “Risk Assessment Report,” which has input from the CMC during constructability reviews. At the time a contract is awarded for a specific project, the CMC will meet with the Project Manager to update the Project Risk Registry and add pertinent construction-specific risks identified through the course of the Program.

The contract documents for CWN projects reference processes and procedures for maintaining quality. In some instances, a specific *Quality Management Plan*, which will be reviewed by the CMC, will be a required deliverable from the Contractor. QA/QC includes inspection, reporting, and feedback of the Contractor’s work activities, to assure that the constructed quality meets the requirements of the contract documents. Areas of QA/QC oversight and inspection are discussed in this subsection.

1. Testing Oversight

The SCM and RPR will observe all testing of materials by independent testing laboratories as called for in the contract documents and will receive from the Contractor and file appropriately all test reports issued by the testing laboratories via the Unifier system. Reports indicating failed tests will be brought to the Contractor’s attention and plans will be developed by the Contractor to remediate all failed test results. The SCM will observe remediation activities and retesting to assure compliance with the contract documents and the Contractor’s *Remediation Plan*.

2. Inspection Procedures

The SCM, in conjunction with field staff, will monitor the Contractor’s compliance with QC requirements outlined in the contract documents by conducting daily onsite observations of the Contractor’s work to determine whether the Contractor has implemented and preserved the design concept. In addition, the SCM will supervise a team of field staff who will prepare written daily, weekly, and/or monthly reports and other observation records that summarize the Contractor’s progress. The SCM will coordinate with the PMT’s Project Manager and the Designer for periodic review and inspection of the construction work.

Each SCM or RPR responsible for the quality control of a project will:

- a. Review and become thoroughly familiar with the contract documents, with particular emphasis on materials and construction details.
- b. Review all approved shop drawings and other submittals prior to material or equipment delivery to the site.
- c. Become familiar with:
 - i. Storage and maintenance requirements
 - ii. Dimensional information specified as “to be verified”
 - iii. Coordination issues
- d. Refer to the Contractor’s requests for deviations from the documents or approved submittals. Approved submittals do not change the contract requirements unless specifically noted.
- e. Document work progress in the daily inspection report. Record any factual observations concerning different site conditions by written descriptions and photographs.
- f. Ensure that the Contractor’s oral RFIs or clarifications also appear in writing.
- g. The RPR will immediately report deviations from the Contractor’s submittals to the SCM and Contractor and document the deviation.
- h. Report failure to correct nonconforming work to the SCM and CM.
- i. Become familiar with sections of the contract’s general conditions that describe the responsibilities and limitations of authority.
- j. Report safety violations or dangerous conditions to the Contractor, SCM, CM, and MWS.

Quality management is the responsibility of each team member. Specifically, the SCM or designated RPR for each project will act as a QC Manager for that particular project, and the SCMs will in turn report directly to the DCM, who will oversee their work. In order to implement QC measures for CWN, each project will have its own unique set of QC forms and inspections.

Table 10-1 Standard Business Processes and Quality Control Procedures

STANDARD BUSINESS PROCESSES	STANDARD QUALITY CONTROL PROCEDURES
Field Authorization	See Section 8.3
Change Authorization	See Section 8.3
Change Order	See Section 8.3
RFC	See Section 8.3
RFI	See Section 8.2
Pay Request	See Section 8.2
Daily Reports	See Section 8.2
Submittal Form	See Section 8.2

10.2 Special Inspections

In addition to these routine activities, some projects will have special inspections that are required by International Building Code and the Metro Codes Department. Projects requiring Special Inspections will adhere to the plan developed by the Structural Engineer of Record.

10.3 Internal Quality Management

Managing the quality of the Contractor in the field involves various QA measures of the work, including testing, reporting, and documenting any deficiencies. For the CMC, there is a clear line of responsibility for which parties assure the quality of that work: the internal QC of the external QA. For CWN, there are responsibilities to perform specific tasks, and then there are responsibilities to check that those tasks are being completed thoroughly, accurately, and in a timely manner. The following table summarizes activities in this CMM, including those persons responsible for the work and for the QC of the work. Periodically, the CMC will perform a review of these activities and review the findings with CMC personnel and, if warranted, with MWS staff.

Figure 10-1 Construction Management Quality Matrix

Construction Management Quality Matrix				
CM PLAN SECTION	DESCRIPTION	QUALITY MEASURE	PARTIES RESPONSIBLE	QC OF RESPONSIBLE PARTY
1	Introduction			
1.4	Code of Ethics Policy Compliance	Signed Disclosure Statements from all CMT personnel	Document Control	DCM / PMC
2	CMT Organization and Roles and Responsibilities			
3	Communications			
3.2	Guidelines Governing Communications			
3.2.2.b	E-mail	E-mails prepared following guidance in the <i>CM Manual</i>	ALL	Document Control
		E-mails retained in the official project files		
3.2.2.c	Internal Oral Communication	Written documentation of resolved issues filed in official project file	ALL	Document Control
3.2.3.a	External Written Communication: E-mail, Letters, Memos Forms	Protocol followed for external written communications	SCM, DCM, CM	CM / DCM
3.2.4	Oral Communication with MWS	MWS requested changes to construction contract or approach are referred to SCM	N/A	
		SCM informed of all contacts from MWS employees to RPRs		
4	Program Management Information System			
4.1	Schedule Management	Project construction schedule update information provided to PMC	PROJECT CONTROLS	SCM
		Workflow process followed to review and submit updated schedules to the Program Master Schedule	PROJECT CONTROLS	DCM
4.2	Cost Tracking	Approved payment applications forwarded to CMC Controls Coordinator for payment submittal and tracking	PROJECT CONTROLS	DCM
		Unifier used record and track payment applications received	PROJECT CONTROLS	DCM
4.3	Tracking Small Business Participation	Prime Contractor including Small Business Participation Tracking Form with each monthly payment application	PROJECT CONTROLS	PMC
		Copy of SBE Participation Tracking Form included in the Unifier tracking of the payment application	PROJECT CONTROLS	PMC

Construction Management Quality Matrix				
CM PLAN SECTION	DESCRIPTION	QUALITY MEASURE	PARTIES RESPONSIBLE	QC OF RESPONSIBLE PARTY
5	Safety			
5.0	Introduction	RPR is aware of expectations regarding safety.	SCM	SAFETY COORD
5.2	Goals and Roles	Copy of Contractor's site-specific <i>Safety Plan</i> received in conformance with Specifications Section 01 35 23	SCM	DCM
		CMC staff abiding by Contractor's site-specific <i>Safety Plan</i> OR CMC's Field Safety Instructions, whichever is stricter	SCM	SAFETY COORD
5.3	Safety Coordinator	CMC Safety Coordinator identified and performing responsibilities pursuant to <i>CM Manual</i>	SAFETY COORDINATOR	DCM
		Safety Coordinator is overseeing safety practices and training for all site visitors and CMC staff	SAFETY COORDINATOR	DCM
5.4	Discipline and Enforcement	Written documentation of disciplinary warnings and corrective action taken	SCM	DCM
5.5	Training	CMC staff received appropriate training pursuant to <i>CM Manual</i>	Document Control	SAFETY COORD
		CMC staff training is being tracked and reported to Safety Coordinator	Document Control	SAFETY COORD
5.6	First Aid and Site Considerations	First aid kit onsite	SCM	SAFETY COORD
		Locations of nearest hospitals and walk-in clinics provided in Contractor safety submittal	SCM	DCM
5.7	Reporting and Record Keeping	Injuries or accidents are reported ASAP to Safety Coordinator and SCM	SCM	SAFETY COORD
		Log entry made within 24 hours after the injury or illness has occurred	SCM	SAFETY COORD
		Summary report maintained for every recordable injuries and illness	SCM	SAFETY COORD
		Injury or illness coordinated with Contractor's procedures for reporting	SCM	SAFETY COORD
5.8	Safety Coordinator Accident Reporting Responsibilities	Safety Coordinator takes lead in investigating and reporting safety violations and accidents	SCM	SAFETY COORD

Construction Management Quality Matrix				
CM PLAN SECTION	DESCRIPTION	QUALITY MEASURE	PARTIES RESPONSIBLE	QC OF RESPONSIBLE PARTY
6	CM Services During Design			
6.1	Constructability Review	Constructability review comments submitted to PM on requisite form	SCM	CM
		Risk review performed during design phase and identified potential risks communicated to PM and MWS	DCM	CM
		Strategies identified to mitigate risk elements	DCM	CM
		Written documentation of CMC sustainability review (if requested) during design process	DCM	CM
6.2	Pipeline Routing and Facility Location	Written documentation of CMC input (if requested) during design process	DCM	CM
7	CM Services During Bid and Award			
7.1	Pre-Bid Meeting	Attended by SCM or DCM	SCM	CM
7.2	Bid and Award Phase	Written documentation of CMC input (if requested) on bids or proposals	DCM	CM
8	CM Services During Construction			
8.1	Preconstruction Meetings	Meeting agenda prepared using a pre-set agenda	SCM	DCM
		Meeting minutes prepared by SCM and distributed to attendees by Document Controls	SCM	DCM
		Copy of meeting minutes in project file	SCM	DCM
8.2	Workflows Regarding Construction Activities	Documentation in project file that workflows described in this section are adhered to (Daily Reports, Pay Requests, RFIs, Submittals, Special Inspections)	SCM	DCM
8.3	Workflows Regarding Change Management	Documentation in project file that workflows described in this section are adhered to (Construction Contract Allowance, Field Authorization, Change Authorization, Change Order)	PROJECT CONTROLS	DCM
8.4	Dispute Resolution	Dispute resolution process established by contract documents are followed.	Dependent upon Dispute Level	DCM / CM
8.5	Meetings	Progress meetings conducted on established basis covering the topics outlined in <i>CM Manual</i> .	SCM	DCM

Construction Management Quality Matrix				
CM PLAN SECTION	DESCRIPTION	QUALITY MEASURE	PARTIES RESPONSIBLE	QC OF RESPONSIBLE PARTY
		Progress meeting minutes prepared and filed in Unifier.	SCM	DCM
8.6	Permit and Utility Coordination	Utility coordination directed through MWS staff identified in the preconstruction meeting.	SCM	DCM
8.7	Commissioning	Contractor develops and submits <i>Commissioning Plan</i> in accordance with Specifications.	SCM	DCM
		<i>Commissioning Plan</i> reviewed by appropriate GSP personnel before starting testing and startup (Baker for treatment plants, Abraham for pumping stations, Parker for storage tanks).	SCM	DCM
9	Construction Closeout			
9.1	As-Builts	Verify as part of each month's pay request process that Contractor is maintaining as-built drawings, specifications, and other as-built or record documents	SCM	DCM
		For sewer rehab projects, CMC maintains record of progress of construction work as work progresses in accordance with <i>CM Manual</i> .	SCM	DCM
		CM Data Management Application is used to track and document as-built information for rehab projects. As-built information is reviewed prior to transmission to MWS.	SCM	DCM
9.2	Record Drawings	Record drawings prepared by Designer are reviewed for completeness by SCM and inspection staff.	SCM	DCM
9.3	Substantial Completion	SCM has verified and documented that Contractor has satisfied all requirements for substantial completion	SCM	DCM
		Certificate of Substantial Completion issued in accordance with the contract documents	PROJECT CONTROLS	DCM
	Final Completion	Coordinated punch list prepared by SCM, Designer, and PM to be completed by Contractor prior to final acceptance of work	SCM	DCM

Construction Management Quality Matrix				
CM PLAN SECTION	DESCRIPTION	QUALITY MEASURE	PARTIES RESPONSIBLE	QC OF RESPONSIBLE PARTY
9.4	Warranties and Bonds	All required documents are included in project files and transmitted to MWS at the conclusion of construction work	PROJECT CONTROLS	PMC
9.5	Spare Parts, Maintenance Manuals, Training	SCM verifies that all spare parts, maintenance manuals, and training are provided to MWS in accordance with contract documents	SCM	DCM
9.6	Application for Final Payment	SCM, PM, and Designer determine that work is acceptable under the contract documents and Final Acceptance issued to Contractor	PROJECT CONTROLS	DCM
		SCM reviews final application for payment and verifies it is completed with all supporting documentation required by the General Conditions	SCM	DCM