Appendix B

Construction Quality Assurance Plan
Construction Quality Assurance Plan

Milwaukee Estuary AOC Dredged Material Management Facility

Milwaukee Metropolitan Sewerage District
Milwaukee, Wisconsin

April 2021

MMSD Project I.D.: M98001P01
Foth Project I.D.: 20M144
April 23, 2021

Ms. Bridget Henk  
Senior Project Manager  
Milwaukee Metropolitan Sewerage District  
260 W. Seeboth Street  
Milwaukee, WI  53204

Dear Ms. Henk:

RE:  *Construction Quality Assurance Plan*  
Milwaukee Estuary AOC Dredged Material Management Facility

Attached to this letter is the project *Construction Quality Assurance Plan (CQAP)*, which is intended to meet contract requirements included in Appendix A (Scope of Services, Dredged Material Management Facility [DMMF] Permitting Task) Section B Permitting Assistance, Task 1 of the contract between the Milwaukee Metropolitan Sewerage District (District) and Foth Infrastructure & Environment, LLC (Foth), dated December 7, 2020 (Contract).

We appreciate this opportunity to provide the District with these services and will appreciate your feedback regarding this document when you have had a chance to review it.

Sincerely,

Foth Infrastructure & Environment, LLC

Michael S. Raimonde  
Project Manager

Stephen Garbaciak, Jr., P.E.  
Senior Technology Leader

cc:  Tom Chapman, MMSD  
Steve Laszewski, Foth
Construction Quality Assurance Plan

MMSD Project I.D.: M98001P01
Foth Project ID: 20M144

Prepared for
Milwaukee Metropolitan Sewerage District
260 W. Seeboth Street
Milwaukee, Wisconsin

Prepared by
Foth Infrastructure & Environment, LLC

April 2021

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# Construction Quality Assurance Plan

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<td>AOC</td>
<td>Area of Concern</td>
</tr>
<tr>
<td>BMP</td>
<td>best management practice</td>
</tr>
<tr>
<td>City</td>
<td>City of Milwaukee</td>
</tr>
<tr>
<td>cm/sec</td>
<td>centimeters per second</td>
</tr>
<tr>
<td>COC</td>
<td>contaminants of concern</td>
</tr>
<tr>
<td>CQA</td>
<td>Construction Quality Assurance</td>
</tr>
<tr>
<td>CQAP</td>
<td>Construction Quality Assurance Plan</td>
</tr>
<tr>
<td>District</td>
<td>Milwaukee Metropolitan Sewerage District</td>
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<tr>
<td>DMDF</td>
<td>Dredged Material Disposal Facility</td>
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<td>DMMF</td>
<td>Dredged Material Management Facility</td>
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<tr>
<td>DVD</td>
<td>digital versatile disc</td>
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<tr>
<td>Foth</td>
<td>Foth Infrastructure &amp; Environment, LLC</td>
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<tr>
<td>GPS</td>
<td>global positioning system</td>
</tr>
<tr>
<td>HASP</td>
<td>Health and Safety Plan</td>
</tr>
<tr>
<td>MMSD</td>
<td>Milwaukee Metropolitan Sewerage District</td>
</tr>
<tr>
<td>Port</td>
<td>Port Milwaukee</td>
</tr>
<tr>
<td>QA</td>
<td>quality assurance</td>
</tr>
<tr>
<td>QC</td>
<td>quality control</td>
</tr>
<tr>
<td>Site</td>
<td>Milwaukee Estuary Area of Concern Dredged Material Management Facility</td>
</tr>
<tr>
<td>TBD</td>
<td>to be determined</td>
</tr>
<tr>
<td>USACE</td>
<td>U.S. Army Corps of Engineers</td>
</tr>
<tr>
<td>USCG</td>
<td>U.S. Coast Guard</td>
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<tr>
<td>USEPA</td>
<td>U.S. Environmental Protection Agency</td>
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<tr>
<td>WDNR</td>
<td>Wisconsin Department of Natural Resources</td>
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1 Introduction

This Construction Quality Assurance Plan (CQAP) supports the construction of the Milwaukee Estuary Area of Concern (AOC) Dredged Material Management Facility (DMMF) located directly adjacent to and north of the existing Milwaukee Harbor Dredged Material Disposal Facility (DMDF) at the Lake Michigan Lakefront (Site). The purpose of this CQAP is to outline the construction inspection and documentation procedures utilized before, during, and after construction activities. This CQAP identifies the responsibilities for project personnel during construction activities and procedures for monitoring the performance of the activities through a quality assurance (QA) program. This CQAP establishes the procedures to verify that the construction substantially meets the requirements specified in the design plan drawings and technical specifications in the Final Design Report (Foth, 2020).

Major activities conducted during the construction of the DMMF include the following:

- Mobilize and prepare the site
- Locate coordinates of cell centers
- Perform exploratory probing to identify obstructions and unsuitable material
- Remove obstructions
- Application of protective coating on steel sheets
- Construct cellular cofferdam structure
- Excavate/remove unsuitable material from inside the cells
- Seal of steel sheeting
- Weld interlocks under the platform
- Fill inside of cells
- Construct relieving platform, connecting platform, tie-ins, dolphins and offloading platform
- Install fenders
- Install bollards
- Install guard rails
- Install ladders
- Construct two weir structures
- Construct rubble mound tie-in to the existing U.S. Army Corps of Engineers (USACE) rubble mound structure
- Install grouted mattresses
- Construct dredge header pipeline and manifold valves
- Demobilize and restore site

1.1 Site Location and Description

The DMMF to be constructed is located in the City of Milwaukee (City), along the eastern side of Jones Island, at Port Milwaukee (Port), south of the mouth of the Milwaukee River. The DMMF will be constructed north of and connected to the Milwaukee Harbor DMDF on the lakeshore of Lake Michigan, within Port Milwaukee’s Lakebed Grant issued by the State of Wisconsin. South Lincoln Memorial Drive runs north and south immediately west of the site.
1.2 **Current Site Characteristics**

The construction site falls within the Milwaukee Harbor bordered by industrial areas to the south and west. This DMMF will be adjacent to the existing Milwaukee Harbor DMDF. Existing structures which affect the proposed construction include the Milwaukee Harbor DMDF north dike, the eastern Jones Island Bulkhead Wall, and the Liquid Cargo Pier.

1.3 **CQAP Organization**

The remainder of this *CQAP* is organized into the following sections:

- **Section 2 – Responsibility and Authority** describes the roles and responsibilities of the parties involved in the construction, including U.S. Army Corps of Engineers (USACE), Wisconsin Department of Natural Resources (WDNR), Milwaukee Metropolitan Sewerage District (MMSD), Port, and other agencies.

- **Section 3 – Quality Protocols** describes QA preparedness, preparatory meetings, initial inspections and surveillances.

- **Section 4 – Documentation and Reporting** describes the reporting requirements for DMMF Construction QA activities. These requirements include daily and weekly summary reports, inspection data sheets, problem identification and corrective measures reports, work acceptance reports, and final documentation. A description of the provisions for final records storage (eBuilder) is also included in this section.

- **Section 5 – Material Receipt Inspections** describes the inspection of delivered materials to verify proper configuration, identification, physical and other specified characteristics. Deficiencies identified require additional inspection.

- **Section 6 – Construction Confirmation Procedures** describes the inspection of completed work and the testing of individual portions of work to verify installation meets the design plan drawings and technical specifications.

- **Section 7 – Procedures for Tracking Deficiencies and Corrective Actions** describes the process for identifying deficiencies and non-conformance during construction and the steps to be taken to correct these quality events.

- **Section 8 – Adaptive Management** describes the process for iterative design decision making which shall be used for any proposed design changes.

- **Section 9 – Schedule (Construction Schedule with Major Milestones)**

- **Section 10 – References**
2 Responsibility and Authority

The responsibility and authority for the development and implementation of the construction QA program for the DMMF Construction rests with the General Contractor, MMSD and Design Engineer. The General Contractor will perform activities according to this CQAP and the Construction Manager or Designee will observe and document the activities. Lead CQAP personnel are listed in Table 2-1. Additionally, a general project organization chart is provided on Figure 2-1.

Table 2-1

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<th>Name</th>
<th>Affiliation</th>
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<td>General Contractor Superintendent</td>
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This CQAP is to be implemented in accordance with the design plan drawings and technical specifications. In the event changes are necessary to this CQAP due to unforeseen project conditions, these changes will be discussed with MMSD, the Port, WDNR, USACE, and other appropriate stakeholders prior to implementation.

2.1 General

The assigned project personnel will be responsible for reporting issues that could adversely affect the safety, scope definition, cost control, schedule performance, and/or the expected level of quality of work. The project quality staff will be trained to understand project requirements and will be responsible for identifying, reporting, documenting, and verifying that the appropriate construction and/or corrective actions have been implemented to ensure items and services conform to specified contract requirements. The quality staff will maintain a close working relationship with project management and will keep management advised of situations, which if not corrected or controlled, could adversely affect delivery of the expected level of quality of the project.
2.2 Organizations Involved with Construction

Contracts for construction activities will be administered by the MMSD Project Manager. The following organizations will be involved with the construction:

- **Project Manager:** MMSD
- **Construction Manager:** MMSD
- **Design Engineer:** Foth
- **General Contractor:** TBD
- **Surveyor:** MMSD
- **Materials Testing:** TBD

2.3 Responsibility and Authority

2.3.1 WDNR

WDNR is a regulatory authority for reviewing and approving of certain permits associated with the construction of the DMMF. WDNR has reviewed information described in the *Final Design Report* and its supporting documents (including this *CQAP*) for consistency with the DMMF permit requirements and state laws and regulations. WDNR will be working cooperatively with the USACE. USACE will participate in review of documents as described below.

In addition to permitting, WDNR is a funding contributor to the design, permitting, and construction of the DMMF through several legal agreements with stakeholders vested in the interest of the subsequently planned remedial dredging.

The WDNR Project Manager, or designee, will exercise permit oversight for WDNR, coordinate concerns developed by WDNR, and communicate agency observations with MMSD Project Manager and the General Contractor Project Manager. WDNR will work collaboratively with MMSD and the Port to resolve issues or potential issues and concerns.

2.3.2 U.S. Army Corps of Engineers

USACE is a regulatory authority for reviewing and approving of certain permits associated with construction of the DMMF. USACE has provided review of the *Final Design Report* including the design plan drawings and technical specifications for determining permit requirements and approval. They will work with WDNR to provide feedback on design parameters, technical specifications, permitting submittals and overall project construction.

2.3.3 Port Milwaukee

The Port owns the lakebed on which the DMMF will be constructed through the lakebed grant issued by the State. Upon completion of the DMMF, the Port will be the owner of the structure and will use the facilities for commercial maritime transportation activities, and other potential uses as determined by the Port in accordance with the lakebed grant.
2.3.4  **MMSD Project Manager and Management Team**

The DMMF construction will be managed by the MMSD Project Manager and management team. They have the responsibility for implementing the construction project and addressing the requirements of the *Final Design Report*. The MMSD Project Manager will work closely with the General Contractor Project Manager to ensure the goals of the DMMF construction are met. The MMSD management team will consist of the MMSD Construction Manager, MMSD Quality Manager, MMSD Safety Advisor, General Contractor Project Manager, and the General Contractor Superintendent who will report to the MMSD Project Manager. If any concerns arise regarding the implementation of the DMMF construction, MMSD Project Manager will work with the management team and the Design Engineer to propose remedies to address unforeseen conditions, and if warranted, communicate changes to permit reviewers.

2.3.5  **MMSD Project Manager**

The MMSD Project Manager will be responsible for project management and administration of construction contracts. The MMSD Project Manager will be responsible for the following:

- Maintain the project budget.
- Maintain the design objectives, construction performance objectives, and overall project schedule.
- Interact with and coordinate regulatory concurrence of activities with WDNR and USACE as related to permit requirements.
- Maintain open communications with MMSD Construction Manager.
- Review activities with General Contractor Project Manager and General Contractor Superintendent.
- Stop work as necessary for safety and/or quality issues.
- Maintain the overall records management system (eBuilder) for the project that ensures clarity, completeness, accessibility, conformance to contract requirements, and document security.
- Review and approve deliverables.
- Approve change orders internally.
- Review as-built markup drawings.
- Review monthly progress reports and attend bi-weekly progress meetings.
- Evaluate the project schedule and budget.
2.3.6 MMSD Construction Manager

During construction, work activities will be observed and overseen by the Construction Manager, working collaboratively with the General Contractor Project Manager and General Contractor Superintendent. The Construction Manager is responsible for determining whether the work activities and results are consistent with the design intent or if any design modifications are needed. The Construction Manager will be present during construction activities and responsible for the following:

- Interact with regulatory agents and coordinate regulatory permits.
- Oversee overall compliance with construction field schedules, reporting requirements, and performance objectives established in the Final Design Report.
- Maintain the overall records management system (eBuilder) for the project that ensures clarity, completeness, accessibility, conformance to contract requirements, and document security.
- Review change orders and coordinate with MMSD Project Manager, the General Contractor Project Manager and General Contractor Superintendent.
- Review the implementation of approved changes to the design plan drawings and technical specifications.
- Review contractor personnel qualifications to verify conformance with the specifications.
- Review warranty submittals to verify compliance with the specified warranty requirements.
- Review and recommend approval or disapproval of site-specific documentation, including contractor submittals, manufacturers’ information, installer’s information, and reference standards.
- Issue any required, daily non-conformance reports to MMSD Project Manager.
- Educate personnel on site-specific CQA requirements.
- Confirm calibrations of QA/quality control (QC) testing equipment are correctly performed and recorded.
- Confirm that the QA/QC field in-situ measurement activities are properly performed, recorded, and results meet specified requirements.

Oversee the collection, marking, packaging, and shipping of conformance samples and/or data.

- Report any deviation from the CQAP plan drawings and specifications.
- Stop work as necessary for safety and/or quality issues.
- Document a monthly progress report including the General Contractor’s monthly progress report and distribute and store in eBuilder.

The MMSD Construction Manager will also be responsible to identify those field conditions that may warrant deviation from the DMMF construction scope and/or goals. In such circumstances, the MMSD Construction Manager will coordinate with the Design Engineer and the MMSD Project Manager to identify and agree upon any necessary deviations to meet the overall objectives of the work. Any agreed-upon deviations will be documented in the monthly progress reports to the Construction Manager.

2.3.7 MMSD Project Quality Manager

The MMSD Project Quality Manager has the authority to act on quality matters, and is responsible for maintaining the CQAP. The Project Quality Manager will be involved with ensuring compliance with quality requirements identified in the contract documents and for QA/quality control (QC) matters. The Project Quality Manager will be responsible for the following:

- Coordinate CQA and construction data management among all parties.
- Coordinate with the Project Manager(s).
- Review applicable plan drawings, specifications, and the CQAP.
- Educate personnel on site-specific CQA requirements.

2.3.8 MMSD Safety Advisor

The MMSD Safety Advisor will be responsible for the following:

- Ensure adequate health and safety protocols have been established for the project.
- Review records of training for all on-site project personnel and subcontractors.
- Review proper decontamination procedures to be implemented at the site.
- Review copies of incident reports, and health and safety reports submitted to the MMSD Project Manager.
- Periodically verify all construction activities are performed according to the site-specific Health and Safety Plan (HASP) for DMMF construction, which will be prepared at a later date prior to construction.
- Perform random surveillances and document in an action report.
- Supervise accident investigation and reporting.
- Stop work as necessary for safety and/or quality issues.
2.3.9  Design Engineer

The Design Engineer is responsible for the framework and performance standards for the DMMF construction such that successful implementation will result in achieving the objectives of the Final Design Report. Additionally, the Design Engineer will provide consultation and, as needed, observations during work to assist with construction in conformance with all applicable design and permit conditions. The Design Engineer will be responsible for the following:

- Review and approval of all changes to the engineered plan drawings and specifications.
- Complete changes to the engineered plan drawings and technical specifications and submit record as-built drawings after substantial completion.
- Maintain design continuity.

The Design Engineer has the authority to provide recommendations for changes to the design for approval by the MMSD Project Manager, as appropriate.

2.3.10 General Contractor Project Manager

The General Contractor Project Manager will be responsible for DMMF construction management and administration of contracts. The General Contractor Project Manager, working with their sub-contractor(s), will implement the construction operations. The General Contractor Project Manager will be responsible for the following:

- Maintain the project budget.
- Maintain the design objectives, construction performance objectives, and overall project schedule.
- Interact with and coordinate regulatory concurrence of activities with WDNR and USACE as related to permit requirements.
- Maintain open communications with MMSD Project Manager.
- Review activities with General Contractor Superintendent.
- Stop work as necessary for safety and/or quality issues.
- Establish an overall records management system for the project that ensures clarity, completeness, accessibility, conformance to contract requirements, and document security.
- Review and approve deliverables.
- Approve change orders internally.
- Submit change order requests to the MMSD Project Manager.
2.3.11 General Contractor Superintendent

The General Contractor Superintendent will be responsible for DMMF construction management and administration of contracts. The General Contractor Superintendent, working with their subcontractor(s), will implement the construction operations. The General Contractor Superintendent will be responsible for the following:

- Maintain the project budget.
- Maintain the design objectives, construction performance objectives, and overall project schedule.
- Interact with and coordinate regulatory concurrence of activities with WDNR and USACE as related to permit requirements.
- Maintain open communications with MMSD Construction Manager.
- Review activities with General Contractor Project Manager.
- Stop work as necessary for safety and/or quality issues.
- Maintain the overall records management system (eBuilder) for the project that ensures clarity, completeness, accessibility, conformance to contract requirements, and document security.
- Review and approve deliverables.
- Approve change orders internally.
- Submit change order requests to the MMSD Construction Manager.
- Maintain as-built markup drawings.
- Provide monthly progress reports for Construction Manager’s review and attend bi-weekly progress meetings.
- Evaluate the project schedule and budget.

2.3.12 Other Subcontractors

Other subcontractors, if utilized by the General Contractor, are responsible for the quality of their work, protection of the environment, and adhering to the requirements of relevant Final Design Report documents. The other subcontractor’s principals will designate a job foreman with
responsibility to see that the work is conducted in accordance with the *Final Design Report* documents.
3 Quality Protocols

3.1 Quality Assurance/Quality Control

QA is part of quality management focused on providing confidence that quality requirements will be fulfilled. QA may include management activities involving planning, implementation, assessment, reporting, and quality improvement to ensure that a process, item, or service is of the type and quality needed and expected. QA verifies that QC is being performed, is being performed properly, and that the project objectives are met. It will include review of QC documentation and conducting actual testing on a periodic basis. The primary function of QA is to complete the project such that the General Contractor’s contractual obligation and the project objectives are met.

QC is part of quality management focused on fulfilling quality requirements and performing necessary observations, testing, and documentation that verify the work performed meets or exceeds the minimum standards established by the project technical specifications. QC involved the systematic inspections that are conducted to verify each phase of the project is in compliance with project requirements.

3.2 Pre-Construction Meeting

Prior to the initiation of any major tasks or activities during construction, a pre-construction meeting will be conducted. The Construction Manager will conduct this meeting and shall be attended by all applicable personnel including the Safety Advisor. The meeting will include the following:

- Review of the project and special or specific requirements.
- Reviewing materials and equipment list necessary to complete the project.
- Reviewing required QC inspections and test requirements.
- Establishing that the required materials and equipment are available for use.
- Reviewing health and safety concerns for the work to be accomplished.
- Discussion of work acceptance criteria.
- Review of objectives, schedule, and proposed work duration.

The Construction Manager will record meeting notes and prepare a preparatory checklist as well as post meeting notes in the daily report. Proper notification will be given (generally at least 24 hours) in advance of the meeting to ensure appropriate personnel can attend.

3.3 Surveillances

Surveillances will be performed on a random basis by the Safety Advisor. Surveillances will be coordinated with managers of the activity in time to allow scheduling of people and facilities.
Surveillance reports will be reviewed and any items requiring corrective action or follow-up will be tracked. A condition or action noted during a surveillance that does not comply with the requirements shall be immediately identified the personnel responsible to allow for correction of the current conditions. Corrections that are implemented during the surveillance shall be reported as such. If serious deficiencies are noted, and with the concurrence of the General Contractor Project Manager, an order to suspend work may be ordered until deficiencies are resolved.

Results of the surveillance will be reported and sent to the MMSD Construction Manager, the Project Quality Manager, and the General Contractor Project Manager. Deficient areas noted and not corrected during the surveillance will be identified as findings in the report. Items that are not elements of compliance, or those that are determined to be minor, will be described in the report as observations. Action items identified in the report will be tracked in the project corrective action log and closed upon resolution. Follow-up surveillances will be performed as needed to ensure implementation of the corrective action is ongoing.
4 Documentation and Reporting

Documentation and reporting in eBuilder for construction QA activities will include pre-construction documentation, construction documentation, and post-construction documentation, as detailed below. The Construction Manager will work closely during DMMF construction activities to collect and generate documentation to verify that the project is being completed as required.

A document control system is established in eBuilder to provide measures to control issuing, distributing, storing, and maintaining of quality related documents. Preparation, review, approval, and issuance of documents (including revisions) affecting quality will be controlled to the extent necessary to determine that the documents include the specified requirements and provide adequate procedures to perform intended activities.

4.1 Document Management System

The Document Control Plan includes maintaining and storing all documents in eBuilder. All types of correspondence including mail, email, faxes, project plans, submittals and all other project records are to be stored in eBuilder. The document management system in eBuilder is accessible and easily retrieves documents as needed. eBuilder is a digital file sharing system utilized to house project documents and also readily accessible to team members.

The following sections describe documentation that will be required throughout DMMF construction activities.

4.2 Pre-Construction Documentation

The following pre-construction documentation will be submitted for review by the Construction Manager.

4.2.1 Shop Drawings and Sample Submittals

Prior to the start of construction, all shop drawings associated with the construction of the DMMF will be submitted for review by the Construction Manager and others to verify products being proposed for usage meet applicable specification requirements. Details of this submittal can be found in Specification Section 01 33 00, Submittal Procedures.

4.2.2 Quality Control Submittals

The General Contractor is required to submit a registry of QC submittals as required by the project specifications. This submittal will require all certifications that products, materials, and installations comply with specified requirements. The Construction Manager will review these submittals for meeting project specification requirements.

4.2.3 Underground Utility Locates

Prior to construction activities beginning, the General Contractor is required to have all underground utility facilities located within the construction area (refer to Specification...

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Section 01 41 00, Regulatory Requirements). The General Contractor will submit in writing to the Construction Manager any identified potential utility conflicts prior to the initiation of construction activities.

4.2.4 Issuance of Notice to Mariners

The General Contractor will work collaboratively with the U.S. Coast Guard (USCG) to issue a notice to mariners regarding the construction work prior to construction commencement. All marine equipment shall meet Federal Regulations regarding lighting and anchoring. The General Contractor will submit plans for review by the Construction Manager for all applicable safety features and signage for construction equipment.

4.2.5 Implementation Plan

Prior to commencement of work, the General Contractor will submit a plan for environmental protection and will address all applicable project permit requirements. The plan will address applicable best management practices (BMP) and how they will be utilized to protect the environment from the construction activities.

4.2.6 Project Construction Schedule

Prior to the start of construction, a detailed Project Construction Schedule will be submitted which details each construction element. Periodic schedule updates will be submitted following bi-weekly progress meetings.

4.2.7 Health and Safety Plan

A detailed site-specific HASP presenting the minimum health and safety requirements for site activities and the measures and procedures to be employed for protection of on-site personnel will be prepared by the General Contractor. The HASP will cover the controls, work practices, personal protective equipment, and other health and safety requirements that will be implemented in connection with DMMF construction activities.

4.3 DMMF Construction Documentation

During work activities, respective parties will be required to provide a variety of documentation to the Construction Manager, including testing results of received materials, documentation of received materials and products, weight tickets for shipments of materials imported or exported, and survey results. A daily log of activities, as described below, will be maintained. The Construction Manager or a designee will maintain a field report of daily activity. The contents of these reports are described below. Daily and monthly progress reports will be completed by the Construction Manager or a designee and posted to the project data sharing site (eBuilder). The records described in this section will be maintained in the project files.

All final project documentation will be stamped by licensed professionals, as appropriate. Work surveys, including as-built surveys, will be documented on drawings using the same data, unit, and scale as work plan drawings. Record drawings will allow for a direct visual assessment of the quality and completeness of work.
4.3.1 Daily Report

During construction activities, a Daily Report will be prepared by Construction Manager or a designee. At a minimum, this report will record the following:

- Identification of on-site personnel and visitors
- Daily weather conditions
- Activities completed
- Any changes to BMPs or environmental controls
- Materials delivered or used
- Equipment used
- Number of steel sheets driven
- Amount of fill placed
- Number of piles driven
- Amount of materials placed
- Debris removed
- Survey data
- Results of any QC inspections, tests, or other monitoring activities
- Problems encountered or deficiencies and resolution of problems, including measures taken
- Any authorized deviations from the Final Design Report

Daily Reports will be compiled on a monthly basis as part of the Monthly Progress Report as discussed below.

4.3.2 Monthly Progress Report

The Construction Manager or a designee, will prepare monthly summaries of progress. The Monthly Progress Report will identify progress organized by activity and posted to the project date sharing website (eBuilder).
4.3.3 Bi-Weekly Construction Meetings

Bi-weekly progress meetings will be coordinated with Construction Manager or a designee, including pre-notification of time and place of meetings. Conference call access will be provided as needed and requested by the Construction Manager or a designee. Meeting minutes will be prepared and made available to attendees.

4.3.4 General Contractor Monthly Progress Reports to MMSD

The General Contractor shall submit a written progress report to Construction Manager or a designee on the 15th day of each month during DMMF construction activities. This report will be compiled into the Monthly Progress Report developed by the Construction Manager or a designee.

4.4 Post-Construction Documentation

The General Contractor will submit red line as-built drawings to Construction Manager or a designee after completion of DMMF construction activities. The Design Engineer will complete the record as-built drawings,
5 Material Receipt Inspections

5.1 Quality Receiving Inspections

Quality receiving inspections shall be performed to verify proper configuration, identification, dimensional, physical, and other specified characteristics as described in shop drawings, product submittals, and project specifications. Products should be free from damage and clean. If deficiencies are identified, the inspector shall perform applicable re-inspection of the item(s) after the supplier completes any required re-inspection, and record the inspection test results. The inspector then interacts with internal procurement, project and QA/QC personnel. All products not meeting general product conformance and specification requirements will not be used for DMMF construction.

5.2 Requirements for Suppliers of Materials and Services

A management system should be put in place to ensure that procurement processes are controlled and that the procured items and services conform to the requirements identified in the procurement documents. The procurement management system applies to items and services that have an impact on the quality of construction processes and conditions. A part of the procurement process is for the General Contractor to develop a Contractor’s progress schedule as identified in Specification Section 01 33 00, Submittal Procedures, Section 1.3. The schedule will provide dates for key project milestones including procurement of project materials and equipment and appropriate QA testing for all work elements.

5.3 Verification of Imported Aggregate Quality

Imported aggregates used for fill and armoring must meet requirements described in the technical specifications. Prior to any use of imported aggregate, results from required testing as outlined in Specification Section 31 05 10, Soils and Aggregates for Earthwork, Sections 1.4 and 2.2, will be provided for each source of aggregate, verifying it specified physical properties, chemical properties, and gradation. Verification of the physical and chemical properties of imported aggregates will be performed by the aggregate suppliers at the source location prior to shipment to be used on site.

Aggregates to be used during construction range from fill materials to large armoring rock. Gradations of acceptable material can be found in Specification Section 31 05 10, Soils and Aggregates for Earthwork.
6 Construction Confirmation Procedures

The construction of the DMMF is planned to follow the design plan drawings and technical specifications and are included as attachments to the Final Design Report for DMMF. This CQAP provides a general overview of the construction tasks and general QA/QC procedures for documenting successful construction has been implemented. This section describes the specific activities that will be undertaken to achieve QA during the construction project. It also describes the methods used to measure compliance with quality goals defined for the key work elements. Specific activities to be implemented are described, along with specific objectives, criteria, QA measures, inspection and verification activities, and contingency actions. This CQAP does not replace the details spelled out in the technical specifications. Rather, this CQAP has been prepared as a supplemental document to enhance the understanding of the importance of QA/QC on this construction project.

For each construction activity, inspection and verification activities will be implemented to confirm that construction quality goals have been met. During the DMMF construction activities, the QA process will progress as follows:

- The General Contractor to conduct inspection and verification activities (i.e., visual observations, in-situ measurements, etc.) to determine construction quality goals have been met. The MMSD Construction Manager will observe and have final approval authority for all such inspections and for verifying that corrective actions are implemented, if any are warranted.

- The General Contractor will provide documentation to the Construction Manager to demonstrate that specific components of the work are supported by appropriate equipment and materials, assembly and installation of support equipment is satisfactory, and the DMMF has been properly constructed. It will be the General Contractor’s responsibility to provide inspection field forms for each of the task items listed below. Field forms should be constructed to provide the required information as identified in the project technical specifications. The MMSD Construction Manager, in consultation with the Project Quality Manager or the MMSD Project Manager, will determine whether the objectives of the DMMF construction have been met.

The remainder of this section details the construction activities and associated performance objectives and criteria, along with QA measures and specific inspection and verification activities that will be performed to confirm that quality goals have been met.

6.1 Task List

The following activities will be completed at the site, however this list is not comprehensive of each and every task. Tasks maybe added to this list as necessary:

- Mobilization and site preparation
- Locate coordinates of cell centers
- Perform exploratory probing to identify obstructions
- Strip obstructions
- Application of protective coating on steel sheets
- Construction of cellular cofferdam structure
- Excavate/remove unsuitable material from inside the cells
- Sealing of steel sheeting
- Welding interlocks under the platform
- Fill inside of cells
- Construction of relieving platform, connecting platform, and dolphins
- Construction of offloading platform
- Installation of fenders
- Installation of bollards
- Installation of guard rails
- Installation of ladders
- Construction of two weir structures
- Construction of a rubble mound tie back to the existing USACE rubble mound structure
- Install grouted mattresses
- Construct dredge header pipeline and manifold valves
- Demobilization and site restoration

6.2 Performance Objectives and Criteria

Performance objectives and criteria associated with DMMF construction activities include the following:

- Prepare the site, both land and water, for commencement of construction activities, including mobilization of equipment, materials, and personnel.

- Prepare and submit all required project submittals for approval prior to commencement of construction activities.

- Contain, prevent, or otherwise mitigate to the extent practicable any environmental effects caused by construction activities such as sheet pile or pile installation.

- Install, erect or otherwise place BMPs to adequately protect environment, project personnel, equipment, materials, supplies, and public.

- Adequately document preconstruction conditions on land and water prior to construction activities commencing. Includes performing a bathymetric survey of preconstruction conditions in the proposed work area and locate centers of cells based on data from design drawings.

- Identify obstructions in the driveline and remove as applicable prior to sheet installation.

- Collect and utilize accurate and defensible water quality data, complying with the requirements applicable permits, to demonstrate that BMPs adequately control the transport and migration of sediment during debris removal.
• Construct cellular cofferdam including sealing and welding of interlocks per the design plan drawings and specifications. Demonstrate that the sealing and welding meet the design specification requirements.

• Driving steel pipe piles to designated depth/capacity to support upper deck of relieving platform and dolphins. Construct concrete portion of these structures.

• Install fender and bollards.

• Construction of offloading structures.

• Construction of the weir structures to be utilized for collecting entrained water from dredged material for future treatment.

• Place the rubble mound portion to tie-in the south-east end of DMMF to the existing USACE rubble mound structure to ensure integrity of the existing DMDF and the new DMMF.

• Restore site conditions to original or better conditions.

6.3 QA Measures, Inspection, and Verification

The QA measures described below will be implemented during construction activities to meet quality goals and complete work according to the project requirements. Inspection and verification activities will be implemented, and the results of the inspection and verification activities will be compared to their associated criteria to determine if quality goals have been achieved. If these goals have not been achieved, contingency actions, as described in Section 7, will be implemented.

6.3.1 Mobilization and Site Preparation

As part of this work item all necessary equipment, materials, supplies, personnel in order to complete the work will be mobilized to the construction site. Items needed to complete this construction project will be detailed in a contractor report which will be provided to the Construction Manager. General Contractor to follow all applicable project specifications including but not limited to Section 01 71 23, Field Engineering.

Items to be measured and recorded as part of this task include such items as recording preconstruction site conditions by obtaining high definition video of the project site and collection of preconstruction surveys of the land and water work areas.

Mobilization shall include all site investigation work to identify site condition including but not limited to, hydrographic surveys, probing in advance of driving sheet piles, underwater inspections of the existing bulkhead, soil borings, or other investigation, the completion of pre-construction submittals, obtaining any necessary permits and approvals not already in place for
the work specified in accordance with the Contract, full reimbursement for the premiums actually paid for performance and payment bonds, all costs connected with the mobilization of the Contractor's plant(s) and equipment, scows, coordination, submittals and preparation for access to the offloading area(s) as required; support equipment or vessels (including all equipment needed for debris handling, separation and disposal), purchase of materials needed for construction, temporary facilities, installation of security measures, and registration/ training of project personnel, compliance with on-site security measures, and construction of environmental controls required by the Permits with respect to protection of the environment; and the coordination with the regulatory agencies, and any other work that is necessary.

6.3.2 Erosion and Sedimentation Controls

Erosion and sedimentation from upland areas, as well as sediment resuspension within the in-water work areas will be controlled as part of the construction. Upland control materials be used may include silt fence, hay bales, or any other method that meets BMPs. In water sediment resuspension control methods may include the use of full depth silt curtains, bubble curtains, or other methods that meet BMPs and permit requirements to minimize sediment resuspension. All applicable project specifications including but not limited to Section 31 25 00, Erosion and Sedimentation Control, are to be followed.

The Construction Manager or a designee will observe the installation of all erosion and sedimentation controls and complete inspections on a routine basis to be sure all controls are functioning as intended. Substandard installation or performance of controls will be noted by the Construction Manager or a designee and reported immediately to the Design Engineer and the General Contractor’s Project Manager, for immediate assessment and corrective action.

6.3.3 Locate Coordinates of Cell Centers

Based on the design plans there is a requirement to locate cell centers prior to any construction work being performed on the cellular cofferdam structure. Project cell center coordinate information can be found on Sheet S01 in the final design plans. Northing and Easting coordinate information referenced to Wisconsin State Plane South, NSRS 2011, U.S. foot is provided for each cell center. The location of the cell centers will guide the exploratory probing requirement as identified below. The Construction Manager or a designee will provide continuous observation and document progress in the daily progress report as centers are identified. All applicable project specifications including but not limited to Section 01 71 23, Field Engineering, are to be followed.

6.3.4 Perform Exploratory Probing to Identify Obstructions

Identification of debris and unsuitable materials to be identified through an exploratory probing exercise prior to installation of steel sheeting. The General Contractor is to develop a probing plan for review with the Construction Manager. The Construction Manager or a designee will provide continuous observation and document debris as it is encountered. The Construction Manager or a designee will provide the noted observations to the General Contractor project manager for review and collaboratively agree on items needing to be removed prior to sheet
installation. All applicable project specifications including but not limited to Section 01 71 23, Field Engineering, and Section 31 62 16.13, Steel Sheet Piles, are to be followed.

6.3.5 Debris and Unsuitable Material Removal

Removal of debris and unsuitable materials is a necessary precursor to sheet pile installation and will be verified by continuous observation of the General Contractor’s debris removal activities (potentially including such additional manual measures as probing the lakebed). The Construction Manager or a designee will estimate the percentage and depth of debris encountered and will also observe its removal and management for disposal. Documentation of stripped materials will be provided in the daily progress reports. All applicable project specifications including but not limited to Section 31 62 16.13, Steel Sheet Piles, are to be followed.

6.3.6 Application of Protective Coating on Steel Sheets

Piles installed outside of the cells are to be coated from top to 5 feet below the dredged mudline with a factory epoxy coating. Factory epoxy coating shall be bar-rust 235 multi-purpose epoxy coating as manufactured by Devoe coatings or equivalent accepted by the engineer. Prior to installation of the piles, inspect the coating for imperfections and complete field-touch up coating as required Specification Section 31 62 00, Steel Piles, Part 2.5C.

In addition to protective coatings, aluminum anodes for passive cathodic protection of steel structures are required. Two cathodic protection anodes will be installed on piles that fall outside of the cells as shown on drawings. The anodes will be supplied with tabs and extension cabling to allow attachment to steel components before and after installation. Requirements are found in Specification Section 31 62 00, Steel Piles, Part 2.5B.

6.3.7 Construction of Cellular Cofferdam Structure

Cellular cofferdam construction is a key element of this construction project. For cellular cofferdams, sheet piles are to be handled, installed and filled in general conformance with ArcelorMittal’s “Design & Execution Manual, AS500 Straight Web Sheet Piles” (ArcelorMittal, 2020). QA/QC documentation steps for this work will be critical in documenting a successful installation of the sheeting and will be described in detail in sub Sections 6.3.6 through 6.3.9.

Per the final design plans, the cellular cofferdams can be installed in any sequence that the contractor prefers. Design Plan General Notes, subtitle Construction Sequence, Note 5 provides a general installation procedure for cells; however, the Contractor will be responsible for its own means and methods. All applicable project specifications including but not limited to Section 31 62 00, Steel Piles, and Section 31 62 16.13, Steel Sheet Piles, are to be followed.

Prior to any installation of steel sheets, submit a list of items as documented in Section 31 62 00, paragraph 1.2 and Section 31 62 16.13, paragraph 1.4 which include items such as subcontractors intended to be utilized, technical data for pile driving equipment, steel certificates for review, welding methods, coating certification and interlock testing procedures. Managing the integrity of the cell wall and interlocks is of prime importance for this project. Specification Section 31
62 16.13, Steel Sheet Piles, paragraph 3.2, C, provides a cellular cofferdam driving procedure recommended construction sequence which should be considered by the General Contractor when determining their means and methods for construction.

During construction, keep daily records of progress. Specification Section 31 62 16.13, Steel Sheet Piles, paragraph 3.2, H, identifies the minimum items to be documented. Records will include, but not limited to, weather and tidal conditions at start of driving, number of sheets installed, depths of penetration, pile tip elevation, final elevation at top of sheet, verification of verticality, field observations, etc.

Prior to final acceptance of the sheet pile cells, per Specification Section 31 62 16.13, Steel Sheet Piles, B, a detailed underwater inspection of the sheet piles is required, which shall include all exposed interlocks. To facilitate this inspection, perform a preliminary inspection of the piles and remove any caked mud or other soil from the sheets that might prevent proper inspection. The Construction Manager may also choose to have an independent third party diver attend the inspection to be sure that no areas of the sheet pile cells are omitted from the inspection. The inspection will begin by marking the pile number at the top of each sheet above water where it can be viewed, then the diver will video tape that number and will proceed down the pile to the bottom, continuously taping the interlock. The inspection shall be performed during conditions when water clarity is optimal enough that the face of the sheet piles can be video recorded by the diver. Taping of multiple, adjoining interlocks is acceptable providing water clarity and video image are acceptable to the Construction Manager. The rate of decent shall be such that the video image remains clear and focused, with adequate lighting. The Design Engineer will also have a representative on the dive vessel during this inspection, and he/she shall have full access to the top-side video display during the inspection. The focus of the inspection shall be to determine if any of the interlocks or junction piles have been compromised in any way. If any interlock separations, or any other condition is encountered during this inspection it shall be brought immediately to the attention of the Construction Manager. The Construction Manager may direct a more detail inspection of any suspect areas.

At the conclusion of the inspection, the underwater videos shall be copied in DVD format and passed on to the Design Engineer, along with a written log of the start time or other reference for the start of each pile inspection. The report shall also include written documentation of any issues encountered during the inspection, including identification of areas of compromised coating and interlock separations.

Perform a complete inspection of the interlocks for the portion of driven piles that extend above ground. All interlock separations will be reported immediately to the Construction Manager or a designee. Results of any inspection will be provided by the contractor in a written report. The report will include documentation of any issues encountered during the inspection.

6.3.8 Excavate/Remove Unsuitable Material from Inside Cells

Upon completion of cellular cofferdam installation, excavate/dredge unsuitable/soft materials from the first nine cells (i.e., cells 1 through 9), their corresponding arcs that fall under the platform, and north tie-in. Excavation depth will vary with location and will be finalized during
construction using combined existing geotechnical information and exploratory probing, see Section 7.3.4. Excavation/dredging will be completed in accordance to Specification Section 35 20 23, Dredging and Debris Removal.

Prior to dredging, submit a Dredging Plan as detailed in Specification Section 35 20 23, Dredging and Debris Removal, paragraph 1.2. The Dredging Plan will include items such as equipment to be utilized, sequencing of operations, measures for turbidity control, plan for large debris removed and QC for bathymetric surveys. The General Contractor to submit daily reports summarizing daily dredging operations to Construction Manager or a designee covering the prior day’s dredging work. The reporting will include, but not limited to, approximate volume and characterization of materials dredged, daily offload quantities, QC depth soundings, and other quantity measurements. The Construction Manager or a designee will observe the dredging activities and document daily observations. In addition to daily reports, the General contractor to also submit weekly summary reports which will summarize weekly activities and productivity.

It will be critical to follow all permit requirements and give key attention to requirements for resuspension of sediments and monitoring of turbidity produced by the construction operations. The Construction Manager or a designee will observe all methods of turbidity control deployed and document the effectiveness of the BMP. All exceedances of turbidity standards will be addressed by the General Contractor immediately and reported in daily and weekly summary reports.

The General Contractor to perform post-dredging QC bathymetric survey(s) that will serve as the initial basis for approval of achieving target dredge elevations. The Design Engineer may opt to audit the post-dredge QC bathymetric survey of the General Contractor in lieu of performing a separate post-dredge QA bathymetric survey. All QA bathymetric surveys will be single-beam with surveying transect grids located no further than 5 feet apart. Grid lines occupied are to be the same lines occupied for preconstruction surveys. Vertical and horizontal position tolerances for bathymetric surveys are listed in Specification Section 35 20 23, Dredging and Debris Removal, paragraph 3.4, B. Records and survey results will be provided to the Construction Manager upon completion.

6.3.9 Sealing of Steel Sheeting
The inner face of the cofferdam wall must have the ability to restrict the passage of lake water/ groundwater movement to a maximum hydraulic conductivity of $1 \times 10^{-9} \text{ cm/sec}$. Sealant systems are considered to stop water penetrating the interlocking joints in sheet pile walls and consequently the actual performance of the sealant system will be a function of the interlock geometry and type of sealant applied. All sheet pile interlocks facing the interior (away from Lake Michigan) of the DMMF shall be sealed using RoxanPlus or AKILA, or an approved equivalent.

Sealant will be applied to all of the inner face cofferdam sheet interlock joints while the sheets are laid flat above ground. Extreme attention to this process to be followed to be sure joints are cleaned well prior to application of the sealant per requirements in Specification Section 31 62 16.13, Steel Sheet Piles. Cleaning of the joints may consist wire brushing and blowing
with compressed air. The Construction Manager or a designee will observe the cleaning and sealing application process and document in a daily report each seal completed. As an example, it is recommended by the manufacturer Roxan that the sealant be applied under shelter at ambient temperatures. The sheet piles are installed with the empty interlock as the leading interlock. Before threading the Roxan treated and lubricated trailering interlock of the following sheet pile, an interlock cleaning tool for expelling soil out of the leading interlock is inserted. Once the product is in contact with water, the said sheet should be driven to grade within two hours to avoid expansion of the sealant.

The testing of these sealed interlock joints will be required to insure a maximum of $1 \times 10^{-9}$ cm/sec hydraulic conductivity is achieved. Ultimately, it will be the General Contractor’s responsibility to verify that each sealed joint is constructed effectively and meets the project requirements. Examples of seal tests are performing a drawdown test, a leach dye test, or measuring applied pressure drop through the seal over time. A seal testing plan will be submitted prior to installation of sheet piles for review and acceptance by the Design Engineer and appropriate agencies. During testing of individual sheet seals, the Construction Manager or a designee will be present to observe the test and document observations and progress of the testing plan.

6.3.10 Welding Interlocks below Platform

Visual inspection of sheet piles to be completed prior to welding to be sure weld surfaces are cleaned to remove all coatings, oil, grease, rust, dirt, mill scale, moisture, and other contaminants within the weld zone. During welding and at completion of welding, a final visual inspection will be completed to verify all slag, spatter, and debris has been removed from the weld surface. The Construction Manager or a designee will routinely visually inspect welds and document observations in their daily progress report. Welds that are rejected for discontinuities must be repaired or replaced. All repairs and replacements will be visually inspected to ensure welds meet requirements.

Welding of steel sheets may also occur as part of repairs to sealed interlocks that are found to have separated, as discussed in Section 7 of this CQAP. All applicable project specifications including but not limited to Section 31 62 16.13, Steel Sheet Piles, are to be followed.

6.3.11 Fill Inside of Cells

Filling of the cells shall conform to Specification Section 31 01 00, Earthwork; Section 31 05 10, Soils and Aggregates for Earthwork; and Section 31 23 01, Excavation and Fill for Roadway. Fill placed below water level must be densified in place by vibro-compaction. A Vibro-Compaction Plan will be submitted prior to completing the work. This CQAP will identify means and methods for achieving preferred soil density. The Construction Manager or a designee will observe vibratory compaction methods and will observe all field performed soil density tests. Results of these tests will be recorded and submitted to the Construction Manager or a designee for review and approval.

Aggregate utilized for fill will be tested for gradation results as dictated in the project specifications. Results of all gradations will be provided to the Construction Manager or a
designee prior to materials being hauled on site for approval. Measurements of all fill material including thickness and quantity will be provided to the Construction Manager or a designee. The Construction Manager or a designee will verify that the appropriate material and sufficient quantity was placed and will be recorded in the daily progress report.

6.3.12 Construction of Relieving Platform, Connecting Platform, and Dolphins

Pile supported relieving platform and dolphins are designed to accommodate berthing and mooring of design vessels. Construction of these structures starts with outlining the location of piles. After piles are driven, false work will be erected to support the forming required to hold the in-situ reinforced concrete until the concrete is set as defined in project specifications. All applicable project specifications including but not limited to Section 31 62 00, Steel Piles; Section 03 11 00, Concrete Forming; Section 03 20 00, Concrete Reinforcing; and Section 03 30 00, Cast-in-Place Concrete, are to be followed.

The Construction Manager or a designee will be on site daily for documenting observations regarding the construction of these facilities. Testing methods, QA measurements, and verifications described in previous sub-sections will carry over to this activity and will follow the technical specification requirements.

6.3.13 Construction of Offloading Platform

The DMMF is designed to provide flexible options for offloading and placement of dredged material from the Milwaukee AOC. The DMMF has been designed to allow for acceptance of dredged material from both mechanical and hydraulic dredging methods. The construction of the offloading platform structure will allow for easier access for mechanical dredge methods. In addition, it will provide USACE with dredged material off loading facilities and access to the DMDF. The design for this structure is detailed on Drawings S16 through S23.

Many components and activities make up this set of structures including sheet piles, pipe piles, concrete flat work, backfilling of aggregates, concrete backfilling of pipe piles, wale installation, etc. The General Contractor will be responsible on a daily basis for reporting on construction activities completed and quantities installed. The Construction Manager or a designee will be on site daily for documenting observations regarding the construction of these facilities. Testing methods, QA measurements, and verifications described in previous sub-sections will carry over to this activity and will follow the technical specification requirements. All applicable project specifications including but not limited to Section 31 62 16.13, Steel Sheet Piles; Section 31 62 00, Steel Piles; Section 03 11 00, Concrete Forming; Section 03 20 00, Concrete Reinforcing; Section 03 30 00, Cast-in-Place Concrete; Section 31 01 00, Earthwork; Section 31 05 10, Soils and Aggregates for Earthwork; and Section 31 23 01, Excavation and Fill for Roadway, are to be followed.

6.3.14 Installation of Fenders

To protect ships from hull damage during mooring, rubber fenders have been specified to be installed on the perimeter of the dolphins, relieving platform, and offloading platform. Fender design and installation requirements are shown on Drawings S16 through S19, S22, and S23.
The General Contractor will be responsible on a daily basis for reporting on construction activities completed and quantities installed. The Construction Manager or a designee will be on site daily for documenting observations regarding the construction of these facilities. All applicable project specifications including but not limited to Section 33 59 13.16, Marine Fenders, are to be followed.

6.3.15 Installation of Bollards
Bollards will be procured with the capacity and type specified in the final project drawing sets. Bollards will be installed in accordance with vendor specification at locations shown on the drawings.

6.3.16 Installation of Guard Rails
Guard rails are comprised of in-situ concrete base and steel pipe framing. All applicable project specifications including but not limited to Section 03 11 00, Concrete Forming; Section 03 20 00, Concrete Reinforcing; Section 03 30 00, Cast-in-Place Concrete; and Section 05 50 00, Metal Fabrication, are to be followed. The General Contractor will be responsible on a daily basis for reporting on construction activities completed and quantities installed. The Construction Manager or a designee will be on site daily for documenting observations regarding the construction of these facilities.

6.3.17 Installation of Ladders
Two types of ladders are designed for this project, one is attached to the relieving platform, and one to the cellular cofferdams. All applicable project specifications including but not limited to Section 05 50 00, Metal Fabrication, and Milwaukee Code of Ordinances Chapter 118, are to be followed.

6.3.18 Construction of Two Weir Structures
The design for these structures is detailed on Drawings S16 through S23. Several components and activities make up this set of structures including sheet piles, backfilling of aggregates, wale installation, etc. The General Contractor will be responsible on a daily basis for reporting on construction activities completed and quantities installed. The Construction Manager or a designee will be on site daily for documenting observations regarding the construction of these facilities. Testing methods, QA measurements, and verifications described in previous subsections will carry over to this activity and will follow the technical specification requirements. All applicable project specifications including but not limited to Section 31 62 16.13, Steel Sheet Piles; Section 31 01 00, Earthwork, Section 31 05 10; Soils and Aggregates for Earthwork; and Section 31 23 01, Excavation and Fill for Roadway, are to be followed.

6.3.19 Construction of Rubble Mound Tie-back to the Existing USACE Rubble Mound Structure
The design for the rubble mound tie-in between the DMMF and the DMDF is detailed on Drawing S26. This construction activity is a key element to insure that the new DMMF ties to the existing DMDF rubble slope and also offers resistance to water flow to limit the flow of
contaminants. This construction activity will consist of placement of armor stone, roadway fill stone, and installation of grout mattresses.

The rubble mound structure will be constructed of two types of armor stone and overlain by a road base gravel connecting the DMMF-DMDF connector to the perimeter road on the DMDF dike.

The General Contractor will be responsible for reporting on activities completed and quantities procured and installed. The Construction Manager or a designee will be on site daily for documenting observations regarding the construction of these facilities. Testing methods, QA measurements, and verifications described in previous sub-sections will carry over to this activity and will follow the technical specification requirements. All applicable project specifications including but not limited to Section 31 01 00, Earthwork; Section 31 05 10, Soils and Aggregates for Earthwork; Section 31 23 01, Excavation and Fill for Roadway; and Section 35 43 29, Concrete Grout Filled Bags for Shoreline Protection, are to be followed.

6.3.20 Installation of Grouted Mattresses

Upon completion of the rubble mound structure, grout-filled mattresses will be placed on the inside portion of the rubble mound dike to protect against contaminants migrating out of the DMMF. The mattresses will be placed as depicted in the final drawings on Drawing S26. Mattresses will extend from 5 feet below the mudline to +12 low water datum (589.5’ IGLD85). The minimum overall grout thickness to be achieved is 4 feet. The contractor will develop a mattress layout plan being sure that seams overlap and joints are staggered to prevent preferential flow patterns. Anchor mattresses as necessary so that they stay in place during pumping. Measurements of grout pumped and overall mattress thickness will be recorded on field forms by the General Contractor to provide documentation that the required thickness of grout has been placed.

The General Contractor will be responsible for reporting on activities completed and quantities procured and installed. The Construction Manager or a designee will be on site daily for documenting observations regarding the construction of these facilities. Testing methods, QA measurements, and verifications described in previous sub-sections will carry over to this activity and will follow the technical specification requirements. All applicable project specifications including but not limited to Section 35 43 29, Concrete Grout Filled Bags for Shoreline Protection, are to be followed.

6.3.21 Construction of Dredge Header Pipeline and Manifold Valves

Upon completion of the construction of the DMDF, a 12” high density poly ethylene (HDPE) pipeline header with eight (8) manifold valves to accept dredge slurry from hydraulic dredging activities will be installed. The header system will be constructed and placed along the perimeter of the DMDF at the approved location identified on drawing S 27. Fabrication and installation of the header will follow Specification Section 33 00 10, HDPE Pipe and Fittings.
6.3.22 Demobilization and Site Restoration

All areas of the site and adjacent properties impacted during construction shall be repaired at the expense of the General Contractor. The General Contractor shall be responsible for all damages caused by construction of the project and shall be responsible for restoring any damaged areas to their original condition (before construction started). All damaged or disturbed concrete and/or asphalt along private and/or public areas, shall be repaired or replaced. Severely damaged asphalt roads shall be replaced.

The General Contractor shall be responsible for any damage caused to the dikes of the DMDF. The General Contractor shall coordinate all repairs with the Construction Manager or a designee and USACE.

All repairs made to the site shall be documented by the General Contractor and Construction Manager or a designee and included in daily reports. Equipment demobilized from site should be identified and reported. A final walk through of the site should be completed with MMSD Project Manager, General Contractor Project Manager, and the Construction Manager or a designee to identify a project punch list as appropriate. The General Contractor shall address all items on the project punch list and schedule any additional site walk through as required to verify the site has been brought back to original or better condition.
7 Procedures for Tracking Deficiencies and Corrective Actions

7.1 Deficiencies
Deficiencies consist of materials or work performed that do not have to meet specific requirements such as specifications, but where enhancements can be made to improve quality. Corrective actions that will be implemented to improve quality related to the deficiency will be documented and tracked in the project corrective action log. These deficiencies are managed differently from those that result from work or materials not meeting specifications, which are described below.

7.2 Non-Conformance Report
Work or materials not conforming to the specifications or contract requirements will be identified by the Construction Manager or a designee and documented on a Non-conformance Report. The Non-conformance Report will detail the non-conforming condition, recommended corrective action(s), and evaluation of the corrective action(s). The Non-conformance Report will remain open until the non-conforming condition has been appropriately resolved and verified by QA personnel. All non-conformance items will be tracked in the project corrective action log.

7.3 Identification of a Non-conformance
Work or materials identified as non-conforming will be documented in the Non-conformance Report, which will include the following:

- Detailed description of the non-conformance.
- Referenced criteria against which conformance is measured (e.g., specifications, standard operating procedures, American Society for Testing and Materials, etc.).
- Recommended corrective action to prevent recurrence.
- Affected entities.

7.4 Control and Segregation
Non-conforming materials will be controlled to prevent inadvertent use on the project. Materials determined to be non-conforming will be identified and segregated from acceptable materials. The General Contractor will be responsible for removing non-conforming materials from site as soon as practical.

7.5 Corrective Actions
Once a deficiency or non-conforming condition is identified, corrective actions will be developed to address the initial cause and establish methods and controls to prevent recurrence.
The Construction Manager or a designee will document corrective actions in the project corrective action log to verify that they were properly implemented, accepted, and closed out. The Construction Manager or a designee will track corrective actions resulting from deficiencies and non-conformances to identify any trends in the causes of the deficient or non-conforming conditions and then initiate additional actions to prevent recurrence. This corrective action log can also be used to inform lessons learned discussions during and after the project is complete.

Corrective actions will be undertaken in case non-conformance issues arise during the implementation of DMMF construction activities. The purpose of the corrective actions is to establish measures to prevent, respond to, and report such occurrences. In such events, the Construction Manager or a designee will coordinate with the respective party to implement corrective actions as soon as possible.

The Construction Manager or a designee will report any incidents requiring corrective response conditions immediately to the General Contractor Project Manager for immediate assessment and corrective action.

Possible project corrective actions are listed in subsections below.

**7.5.1 Noise and Vibration Contingency Measures**

Noise mitigation may be necessary to reduce off-site noise levels due to pile driving. A high frequency vibratory hammer is to be utilized during pile driving to minimize noise and vibration. The General Contractor will be required to adhere to all applicable noise and vibration regulations specified by local municipalities. Noise and vibration shall be controlled with BMPs as practical.

**7.5.2 Water Quality Contingency Measures**

During installation of piles and removal of obstructions from the driveline there is potential for water quality impacts due to resuspension of sediments during the construction work. Water quality during construction of the DMMF will be monitored by the General Contractor and required personnel in accordance with permit requirements. If water quality standards are not met possible contingency actions could include one of the following:

- Installation of more aggressive BMPs.
- Operational modifications.
- Work-slowdown or temporary stoppage to further access the source of exceedance, identify effective mitigation measures, and allow the water column to recover.

**7.5.3 Bulkhead and Liquid Cargo Pier Protection Contingency Measures**

Construction of the DMMF will include working around the existing Liquid Cargo Pier and tie-in to existing bulkhead walls (Drawing S01). The General Contractor will take necessary steps to protect existing structures at all times. Heavy equipment utilized around the bulkhead will
utilize contingency measures to avoid striking or damaging the structure, including the tie-back system.

The bulkhead will be clearly identified in the vicinity of construction activities as necessary so that it remains visible during construction. Equipment operators shall take precautions while working near the bulkhead wall, such as installing temporary reinforcement pads to avoid damage to the tie-back system, and operating at lower speed to safeguard against damaging the structure. If necessary, a spotter may be located in the vicinity of the bulkhead wall, who will maintain communication with operator(s) to inform them of any perceived dangers.

Construction activities may require adjustment due to maritime activities at the liquid cargo pier. The General Contractor will coordinate water based activities with the Port Harbormaster and the USCG, to minimize impacts to commercial shipping operations.

7.5.4 Dredged Material Disposal Facility Connection

Design drawings show a rubble-mound structure to be installed as a connection to the existing Milwaukee Harbor DMDF (Drawing S06). This structure has been designed to address slope stability concerns of the existing DMDF and provide an adequate tie-in to the new DMMF. Work around this tie-in location must be performed in a manner not to negatively impact the structural integrity of the existing DMDF.

Further the USACE will continue to operate the DMDF for dredged material placement. The General Contractor will work with Construction Manager or a designee and USACE to coordinate access to the existing dredged material offloading platform prior to completion of the new offloading platform and connection between DMMF and DMDF.

7.5.5 Steel Sheet Interlock Sealing Contingency Measures

A design objective and requirement for the construction of the DMMF is to seal the interlocks of the steel sheeting for the inner wall of the cellular coffer dam. The project specification requires a maximum hydraulic conductivity of $1 \times 10^{9}$ cm/sec water migration rate through this wall. The General Contractor will be sealing the interlocks by using a specified sealant in the interlocks. The interlock sealing above ground and in the water column will be visually inspected for interlock separations. Noted separations will be reported to the Construction Manager or a designee and the Design Engineer for consideration.

The contingency action for separated interlocks on the interior wall will be to correct the issue by welding the separation. The General Contractor will organize the repair and will work with the Construction Manager or a designee to verify the repair has been made in accordance with the specification.
8 Adaptive Management

Adaptive management combines management and monitoring/inspections, with the aim of updating knowledge and improving decision making over time. The urgent need for iterative management decisions, the existence of uncertainty, and the opportunity for learning create favorable conditions for adaptive management.

Stakeholders will be engaged throughout the DMMF construction project and kept abreast of current, completed, and future tasks. Keeping an open line of communication with stakeholders is key in any project to ensure success. Procedures have been put in place based on requirements of the technical specifications, contract documents, and design drawings to ensure the work is completed appropriately. Adaptive management allows for a forum to present inventive ideas that may further the quality of the final design, provide project savings while keeping the same level of quality, or reduce schedule for construction completion.
9 Schedule (Construction Schedule with Major Milestones)

A detailed construction schedule will be created by the General Contractor upon selection by the Owner. The following is a draft construction schedule based on project details currently known.

Construction Schedule for the DMMF

<table>
<thead>
<tr>
<th>Activity</th>
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<tr>
<td>Pre-Bid Activities</td>
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<tr>
<td>Procurement</td>
<td>through December 2021</td>
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<tr>
<td>Contractor Mobilization</td>
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<tr>
<td>Construction</td>
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</tr>
<tr>
<td>Demobilization</td>
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10 References


Figures
Figure 2-1
MMSD DMMF Construction Organization Chart