Tyco Fire Products LP

Marinette, Wisconsin

BIDDING REQUIREMENTS
AND
CONTRACT DOCUMENTS

for the construction of the

VBW Bulkhead Support and Dredging

*****

****

CH2M HILL

Marinette, Wisconsin

July, 2012

Project No. 438465

TABLE OF CONTENTS

END OF SECTION

SECTION 01 11 00
SUMMARY OF WORK

PART 1 GENERAL

1.01 DEFINITIONS

A. Engineer – CH2M HILL.

B. Contract or Contract Agreement – Written contract between the Owner and the Contractor for the Menominee River Sediment Removal Project.

C. Dredging Contractor – Sevenson Environmental Services Inc, contracted by Tyco for dredging on river sediments outside of the area included in this contract.

D. General Contractor or Contractor – Firm contracted by Tyco Fire Products LP to perform this VBW Bulkhead Support work for the Menominee River Sediment Removal Project.

E. Owner - Tyco Fire Products LP.

F. Owner's Representative – CH2M HILL.

G. Onsite – Within the construction limits shown on the Drawings.

H. Subcontractor – The firm under subcontract to Contractor to perform a portion of the Work.

I. USACE – United States Army Corps of Engineers.

J. USEPA – United States Environmental Protection Agency.

K. WDNR – Wisconsin Department of Natural Resources.

1.02 WORK COVERED BY CONTRACT DOCUMENTS

A. General: This section describes the Project and Work to be performed under the Contract Agreement. Detailed descriptions of the performance requirements and extent of Work are contained in the applicable Specification Sections and Drawings.

B. The following documents describe the Work:

1. Administrative Order on Consent between USEPA and Tyco Fire Products LP dated February 26, 2009.

2. Draft Final Design Report, Tyco Fire Products LP prepared by CH2M HILL dated January, 2012, revised April, 2012.

3. Draft Final Design Report – Supplement 1- VBW Bulkhead Support Design prepared by CH2M HILL dated August, 2012.

C. The Work Includes:

1. Mobilization and Site setup.
2. Implementation of erosion control and sediment resuspension control measures including monitoring, as necessary.
3. Construction of temporary staging and equipment storage area.
4. Control and contact storm water, and decontamination water on Site and transferring it to the Water Treatment Facility.
5. Bathymetric and terrestrial surveys of areas to be dredged or disturbed prior to starting Work and after completion of each phase of the Work.
6. Installation of a VBW sheet pile support system.
7. Mechanically dredging impacted sediments with the Menominee River. .
8. Placement of dredged materials into hopper barges and transporting to offloading area.
9. Placing backfill and rip-rap against sheet pile wall after dredging.
10. Restoration of portions of the Site impacted by remedial activities.
11. Cleanup and demobilization from Site.

D. The Work will be performed under several regulatory permits. Contractor will comply with all permit conditions and requirements related to this Work. Permit conditions and regulations related to this are listed in Section 31 20 25.23, Mechanical Environmental Dredging.

1.03 WORK NOT COVERED BY CONTRACT DOCUMENTS

A. Dredging of the area outside the dredge area shown in these contract documents.

B. Unloading of sediment from hopper barges, handling, stabilization, and disposal of sediments from dredging will be performed by Sevenson.

C. Water Treatment of dredge water, decontamination water, and contact storm water at the Water Treatment Facility will be performed by Sevenson.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 11 01
HEALTH, SAFETY, AND EMERGENCY RESPONSE

PART 1 GENERAL

1.01 WORK INCLUDED

A. Contractor shall assume arsenic concentrations exceed background concentrations in soil, groundwater, and sediment.

1. Arsenic in Soil: Arsenic concentrations in soil on Site are variable, with elevated concentrations at depth in some locations. Concentrations detected in soil samples collected on Site ranged up to 3,400 parts per million (ppm) at depth of 30 feet with higher concentrations at shallower depths. Contractor should anticipate similar or higher concentrations at any location.
2. Arsenic in Groundwater: Arsenic concentrations in groundwater samples ranged up to 8,500 ppm. Contractor should anticipate similar or higher concentrations at any location surrounding the Site.
3. Arsenic in Surface Water: During dredging activities arsenic concentrations in surface water are expected to be elevated within the project area.
4. Arsenic in Sediment: Arsenic concentrations in sediment range up to 20,000 ppm. Concentrations exceeding 50 ppm area expected throughout the area to be dredged.

B. Construction/remediation activities may place Contractor’s personnel, other people present for Work at Site, and public in potentially hazardous situations due to nature of contaminants present on job Site. Due to potential for serious incidents, special emphasis must be placed upon health and safety considerations for all on-site personnel, public, and surrounding environment. Site activities shall involve work exposure to potentially contaminated and hazardous materials. It shall be responsibility of Contractor to provide all facilities, equipment, monitoring instruments, materials and personnel necessary to protect all onsite personnel and off-site receptors from physical injury and potential adverse health effects which could result from exposure to chemical hazards which are on site.

C. Contractor is responsible for implementation and enforcement of Site health and safety requirements along with emergency response requirements, and take necessary precautions and provide protection for following:

1. Personnel working on or visiting Project Site, irrespective of employer.
2. The Site and Work and materials or equipment to be incorporated in Work area on-or off-site.

3. Other property at or adjacent to Project Site.
4. Public exposed to job related operations or potential release of toxic or hazardous materials.

D. Contractor is responsible for initiating, maintaining, and supervising safety precautions and programs in connection with Work. Contractor shall take necessary precautions for safety of employees on Project Site and other persons and organizations who may be affected by Project.

E. Contractor shall be directly responsible for health and safety of their employees and shall not rely on support and services that are already in place on the job Site. In event of any and all issue/emergency, Contractor shall address issue/emergency with their personnel and support systems and provide appropriate notification to Engineer and Owner.

F. Contractor's duties and responsibilities for safety in connection with Work shall continue until such time as Work is complete and Owner has issued notice to Contractor that Work is complete.

G. Contractor shall develop and implement written Health, Safety, and Emergency Response Plan (HSERP) which, at minimum, meets requirements of this section and complies with applicable federal, state, local and site regulations. HSERP shall be the agreed upon method for implementation and enforcement of Site safety, health, and emergency response requirements.

H. Contractor HSERP shall comply with all provisions of these specifications and of Tyco Environmental, Health and Safety Policy EHS-10 and Health and Safety Plan, both of which are attached to these specifications. In the event of conflict between these Specification and the Tyco Environmental Health and Safety policy EHS-10 and Health and Safety Plan, the Contractor shall notify the Owner's Representative of such conflict prior to the finalization of the HSERP.

I. If Contractor does not have capability to prepare HSERP, Contractor shall employ consultants with appropriate capabilities, at no cost to the Owner.

J. HSERP shall be submitted and approved by Owner for approval before any Work on job Site can begin.

K. Approved HSERP, complete with all comments addressed and appropriate revisions, will be made part of Contract Documents.

L. All on-site personnel and visitors to the Site shall comply with requirements of Contractor's HSERP.

M. Payment:

1. Work specified in this section is considered incidental and cost shall be included as part of appropriate lump sum and unit prices specified in Bid Form.
2. The prices in the Bid Form include cost for Work performed in Level D protection.
3. The cost of Level "C" protection is included in appropriate unit price in Schedule of Unit Prices in Bid Form. If upgrade of protection is required with authorization by Contractor, payment shall be made in accordance with Schedule of Unit Prices. Payment for upgrade to Level C protection shall be paid at the unit rate, to the nearest one-half man-day.

1.02 SUBMITTALS

A. Submit copies of HSERP to Engineer in accordance with provisions in Section 01 33 00, Submittals.

B. Submit copy of Contractor Corporate Safety Manual.

C. Submit copies of safety training records of all staff employed on-site.

D. Submit employee drug testing compliance verification prior to beginning Site work.

E. Submit activity hazards analysis (AHA) for all tasks or definable features of the Work.

F. No Work on-Site shall proceed until HSERP has been submitted to and accepted by Owner.

G. Submit formatted MSDS sheets in alphabetized binder, with table of contents, for all chemicals to be used on Site.

H. Submit equipment inspection sheets weekly.

I. Submit a minimum of one safe behavior observation (SBO) daily.

J. Contractor shall certify to Owner by weekly health and safety summary submittal from Contractor Health and Safety Officer that Contractor is in compliance with HSERP. Weekly personnel hours shall be incorporated.

K. Contractor shall be responsible for submitting name, qualifications, training records, and experience of personnel required above in accordance with following:

1. Health and Safety Coordinator (HSC) information shall be submitted to Contractor at Pre-Work conference and before any changes are made.
2. Health and Safety Officer (HSO) information shall be submitted to Owner at Pre-Work conference and before any changes are made.
3. Safety Technician (ST) information shall be submitted to Owner at Pre-Work conference and before any changes are made.

1.03 REGULATORY REQUIREMENTS

A. HSERP shall meet all requirements of this section and applicable requirements including but not limited to these contained in publications listed below.

1. Code of Federal Regulations (CFR):
   a. 29 CFR 1920, Occupational Safety and Health Administration (OSHA) Standards for General Industry.
   b. 29 CFR 1910.120, OSHA Standards, "Hazardous Waste Operations and Emergency Response."
   c. 29 CFR 1910.134, OSHA Standards, "Respiratory Protection."
   d. 29 CFR 1910.1000 through 1910.1048, OSHA Standards, "Air Contaminants - Permissible Exposure Limits."
   e. 29 CFR 1910.1200, OSHA Standards, "Hazard Communication".
   f. 29 CFR 1926, OSHA Standards, "Construction Industry."
   g. 29 CFR 1926.59, OSHA Standards, "Hazard Communication Standard for Construction Industry."
   h. 29 CFR 1926.1118, Inorganic Arsenic.
   i. 40 CFR 260, Hazardous Waste Management System: General.
   j. 40 CFR 261, Identification and Listing of Hazardous Wastes.
   k. 40 CFR 263, Standards Applicable to Transporters of Hazardous Wastes.
   l. 40 CFR 264, 265, 270, and 271, Corrective Action for Solid Waste Management Units at Hazardous Waste Management Facilities, Proposed Rule.
   m. 49 CFR 171, Hazardous Materials Regulations: General Information, Regulations, and Definitions.
   n. 49 CFR 172, Hazardous Materials Tables and Hazardous Materials Communications Regulations.
   o. 49 CFR 173, Shippers - General Requirements for Shipments and Packaging.
   p. 49 CFR 178, Shipping Container Specifications.

q. Other Agencies Minimum Requirements:
   1) National Institute for Occupational Safety and Health (NIOSH).
   2) OSHA.
   3) U.S. Coast Guard.
   4) U.S. Environmental Protection Agency (EPA).
   5) US Army Corps of Engineers.
   6) Wisconsin Department of Natural Resources (WDNR).
   7) Marinette County.
   8) City of Marinette.

r. American National Standards Institute (ANSI):
   1) ANSI Z358.1 - Emergency Eye Wash and Shower Equipment.
   2) ANSI Z88.2 - Practices for Respiratory Protection.
   3) ANSI G-7.11 - Commodity Specification for Air.

s. Comply with applicable laws and regulations of any public body having jurisdiction for safety of persons or property.

B. Other Publications:

1. American Conference of Governmental Industrial Hygienists (ACGIH) - Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, current issue.
2. (1985) Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities.

1.04 RESPONSIBILITIES

A. Contractor shall provide services of Health and Safety Coordinator, Health and Safety Officer and Safety Technicians.

1. Health and Safety Coordinator: Designated Health and Safety Coordinator (HSC) shall be certified in comprehensive practice of industrial hygiene by American Board of Industrial Hygiene (ABIH) and have minimum of 5 years' experience in field of hazardous waste or related chemical industries. HSC must have working knowledge of state and federal occupational safety and health regulations, and demonstrable experience in air monitoring and in development of personal protective equipment programs for working in potentially toxic atmospheres. HSC shall be Certified Industrial Hygienist (CIH) or Certified Safety Professional (CSP).
   a. HSC shall be responsible for development and implementation of HSERP. All site-specific health and safety training shall be approved by HSC, and initial site-specific training shall be conducted by HSC. HSC will not be required to be present at Site for entire duration of

project, but must be available for consultation and/or assistance at all times throughout remedial activities.

2. Health and Safety Officer: Designated Health and Safety Officer (HSO) must have, as minimum, 3 years of on-site remedial action experience on hazardous waste site, working knowledge of state and federal occupational safety and health regulations, and formal training in health and safety. HSO's remedial action experience must include 1 year experience at projects where Level C protective equipment was required. HSO also shall have experience in maintenance, calibration, and use of various air monitoring and other instruments required in this section of these specifications. HSO shall have demonstrable experience in implementation of personal protective equipment programs, basic knowledge of dilution ventilation systems, and be certified in First Aid and CPR by American Red Cross or equivalent.
    a. HSO shall be assigned to Site on full-time basis and report directly to HSC on matters pertaining to site health and safety, air monitoring and public protection. HSC will be responsible for day-to-day implementation of HSERP and Atmospheric/Air Monitoring. The Health and Safety officer shall have no other duties.
3. Safety Technician: Safety Technician (ST) must have 1 year of related experience and basic understanding of current health and safety regulations. In addition to site-specific training given by HSC, ST shall have had additional training in personal protective equipment and air monitoring instruments. ST also must have current certification in First Aid and CPR (American Red Cross or equivalent).
    a. Each crew working in potentially hazardous areas shall include at least one Safety Technician. ST will be responsible for compliance with HSERP. ST shall report directly to HSO on all matters relating to on-site health and safety matters including noncompliance with HSERP.

1.05 HSERP REQUIREMENTS

A. Because this Contract will require work in hazardous environment, Contractor shall develop and implement comprehensive Health, Safety, and Emergency Response Plan (HSERP) to ensure adequate protection for all on-site personnel, visitors and surrounding community.

B. HSERP shall be developed and implemented by Contractor’s HSC. Day-to-day enforcement of HSERP will be provided by Contractor’s HSO in conjunction with Contractor’s ST(s). Formal statement of qualifications and responsibilities of Contractor’s health and safety personnel shall be included in HSERP. Requirements described herein shall be used as minimum outline description of

HSERP. HSERP shall be site-specific and incorporate assessment of hazards associated with Work. HSERP shall address not only potential chemical hazards but also potential physical and biological hazards associated with performance of Work.

C. HSERP shall address following minimum subject areas in accordance with 29 CFR 1910.120(b)(4)(ii):

1. Site Description/History/Evaluation.
2. Health and Safety Organization (responsibilities, qualifications and chain of command).
3. Work Zones.
4. Site Control.
5. Hazard Assessment.
6. Training.
7. Medical Surveillance.
8. Atmospheric/Air Monitoring.
9. Standard Operating Safety Procedures, Engineering Controls and Work Practices.
10. Personal Protective Equipment.
11. Personnel Hygiene and Decontamination.
12. Equipment and Material Decontamination.
13. Emergency Equipment and First Aid Requirements.
14. Emergency Response/Contingency Plans and Procedures.
15. Heat/Cold Stress Monitoring.
16. Hazard Communication Program including (MSDSs).
17. Accident Prevention Plan.
18. Cutting and Welding Procedures (including hot work permits).
19. Spill Control Provisions.
20. Water/Boat Safety.
21. Drinking Water and Supplies.

1.06 HSERP ELEMENTS AND EXECUTION

A. Site Description History/Evaluation: Contractor shall briefly describe Site, history, any evaluations completed with dates and type of contamination. This section should not be more than one page.

B. Health and Safety Organization: Contractor shall describe health and safety organization for project including identification of key personnel, their resumes/professional profiles, their responsibilities, and administrative flowchart or procedures for identifying problems and taking corrective actions.

C. Work Zones:

1. Contractor shall be responsible for establishing Work zones on job Site. Work zones may be fixed locations throughout duration of job or may be adjusted as area of Work activity changes. Work zones shall be defined as follows:
   a. Exclusion Zone: Initially, Exclusion Zone (EZ) will include all potentially contaminated areas of Site where Work is to be performed. Contractor may change Exclusion Zone with approval of Owner during progress of Work; requests for such change shall be in writing and include justification.
   b. Contamination Reduction Zone: Contamination Reduction Zone (CRZ) is transition area between contaminated Work area and "clean area". Distance between Exclusion Zone and Support Zone provided by CRZ, together with decontamination of Work and equipment should limit transfer of potential contaminants into "clean areas". Contractor shall require personnel entering CRZ to wear personal protective equipment prescribed for working in EZ as specified in Contractor's HSERP.
   c. Support Zone: Support Zone shall be utilized by Contractor for administrative and other support functions. Examples of equipment and facilities that will be located in this area include, but are not limited to, lunch and break areas, supplies and equipment storage, parking, Contractor offices and maintenance facilities. Personnel may wear normal work clothing in this zone. Potentially contaminated clothing, equipment and materials shall not be allowed in this area prior to proper decontamination in CRZ.
2. Contractor shall mark outer limits of Exclusion Zone with high visibility markers or flagging.
3. Contractor shall be responsible for establishing means of communication between Work zones, and for workers within same zone. This means of communication shall be documented in HSERP.
4. Contractor shall be responsible for security within each established Work zone.
5. Contractor is reminded that although Work zones shall be established, possibility for exposure to contamination exists anywhere on job Site depending upon activity.

D. Site Control:

1. Contractor shall establish system to control access to job Site. This system shall be incorporated into layout of Work zones and shall ensure that only authorized persons enter Site.
2. Contractor shall keep daily sign in/out logs for all "Work zones". Daily sign in/out logs shall be submitted to Owner weekly with certification statement see Article Submittals of this specification for additional details.

E. Hazard Assessment:

1. Purpose of hazard assessment is to provide information necessary for selecting personal protective equipment, establishing air monitoring requirements and determining health and safety procedures necessary to protect all on-site personnel, environment and public.
   a. Qualitative evaluation of chemical hazards shall be based upon following:
      1) Nature of potential contaminants.
      2) Locations of potential contaminants project Site.
      3) Concentrations of contaminants.
      4) Potential for personnel/public exposure during various site activities.
      5) Effects of potential contaminants on human health.
      6) Physical work area (water and railroad).
   b. Biological Hazards: Contractor shall assess potential biological hazards this Site may pose to personnel.
   c. Physical Hazards: Contractor shall assess potential for physical hazards present at Site and those that may develop as result of remedial activities (e.g. water and railroad).

F. Training:

1. General: Contractor shall certify that all personnel assigned to work on job Site have received required level of training. Those individuals who regularly enter areas of Site other than Support Zone for purpose of performing or supervising work, for health or safety functions, for equipment maintenance, or for any other Site-related function shall have received appropriate safety training in accordance with 29 CFR 1910.120 and other appropriate training. Training shall consist of minimum of 40 hours initial instruction and 3 days on-site experience under direct supervision of experienced supervisor. For equipment operators minimum of 24 hours of instruction off site and minimum of 1 day actual field experience in addition to equipment specific training. HSERP shall describe

training required for each identified job task. In addition, Contractor's supervisory personnel shall have minimum of 8 hours additional, specialized training on managing hazardous waste operations. Documentation of all training shall be submitted to the Owner a minimum of 1 week before any employee will be allowed to work on job Site.

2. Site-Specific Training: All personnel assigned to or entering contaminated areas of Site shall complete site-specific training. Purpose of this training is to ensure personnel are familiar with content of HSERP and general site procedures. This training shall be conducted by HSC and HSO. Contractor shall notify Owner at least two working days prior to initial site-specific training session so that Owner's and other contracted personnel may attend. Follow-up site-specific training sessions for new personnel or visitors shall be conducted by HSC and HSO.
3. In addition to other training required by this Specification, all personnel entering Site shall complete Tyco - Marinette site-specific Health and Safety Training before entry onto Site.
4. Follow-Up Training: "Tail Gate" safety meetings shall be held daily prior to start of Work to discuss safety practices related to on-going Work. Should operational change affecting on-site field work be made, or prior to commencement of new tasks, meeting prior to implementation of change or new task shall be convened to explain health and safety procedures and requirements. Prior to initiating non-routine or new task in any restricted area, HSO shall present health and safety practices and training for operation(s) to persons responsible for accomplishing activity.
5. Refresher Training: All personnel working at this Site shall receive minimum of 8 hours per year of refresher training as required by 29 CFR 1910.l20(e)(4).
6. Records: Contractor shall keep copies on-site of records for all training periods, documenting date, attendance and topics covered. Additionally, Contractor shall be responsible for ensuring and shall ensure that only personnel successfully completing required training are permitted to work on job Site. Training records shall be submitted to Owner a minimum of one week in advance of personnel working on job Site. Training record updates shall be submitted to Owner monthly.
7. First Aid/Injuries: All first aid incidents and injuries shall be recorded and reported to Owner immediately after first aid is given (no matter how minor). Contractor shall define reporting procedure in HSERP.

8. Lost Time Injuries: Any employee who develops lost-time injury or illness during period of contract as result of Work at Site must be evaluated by Medical Consultant. Employee's supervisor shall be provided with written statement indicating employee's fitness (ability to return to work), signed by Medical Consultant, prior to allowing employee to return to work. Accident report within 24 hours of incident/near miss describing events leading up to and causing injury or illness shall be submitted to Owner.
9. Emergency Medical Care: Contractor shall establish emergency routes and communications with health and emergency services.
10. Recordkeeping: Contractor shall maintain and preserve medical records in accordance with requirements of 29 CFR 1910.1020. Access to employee medical records shall also be in accordance with 29 CFR 1910.1020 and 1926.33.

G. Medical Surveillance: Medical surveillance in accordance with 29CFR 1910.120 is required for all personnel entering exclusion zones. Contractor is required to ensure personnel are qualified to work. If respirators are to be worn at Site, Contractor's personnel will receive medical evaluation. Physician or other licensed health care professional may require pulmonary function test as part of medical evaluation along with any follow-up exams he/she may deem necessary.

H. Atmospheric/Air Monitoring: Atmospheric/Air Monitoring procedures and action levels will be identified in Contractor’s HSERP. Contractor will provide qualified personnel to perform air monitoring. Air monitoring may include chemical-specific detectors (Draeger Tubes for arsine gas). All air monitoring results will be recorded by Contractor and submitted to Owner weekly.

I. Standard Operating Safety Procedures, Engineering Controls and Work Practices: Contractor shall develop, implement and enforce safe work practices and Engineering safeguards for Work covered under these specifications. General Site health and safety directives for conducting on-site work which shall be included in HSERP and enforced during Site activities include, but are not limited to:

1. Eating and smoking shall be prohibited except in designated areas as identified by Site, HSC and/or HSO.
2. Illegal drugs, alcoholic beverages and firearms are prohibited on Site.
3. Wearing contaminated protective apparel in any area other than CRZ or EZ shall be prohibited.
4. Buddy system shall be implemented for all Work in Exclusion Zone, including activities during preoperational startup period.
5. Contractor shall provide emergency showers and emergency eye washes which conform to requirements of ANSI Z358.l-2004.

6. Contractor shall develop procedures which eliminate potential of equipment coming into contact with overhead hazards such power transmission lines or cables.
7. Contractor shall implement protocols for unloading and loading materials at Site. These protocols shall include DOT requirements covering such items as grounding, placarding, driver qualifications and use of wheel locks/chocks. Operation of heavy equipment at Site shall be in accordance with OSHA Standard 29 CFR 1926.
8. Ignition sources (e.g., cigarette lighters, matches or other flame-producing items) not required for completion of this project shall not be permitted on job Site.
9. Contractor shall include provisions in HSERP to provide protective equipment for electrical systems construction. Design safety standards shall be incorporated in electrical systems in accordance with OSHA 29 CFR 1910. All installation at this Site shall comply with National Electrical Code (NEC) and Wisconsin state code.
10. For Work conducted during times other than during daylight hours, there shall be minimum of 30 foot-candles of light at working surfaces. Lighting installed for purposes of working at night shall meet requirements of OSHA 29 CF 1910. 120(m). Any lighting required shall provide required 30 foot-candles at working area.

J. Personal Protective Equipment: Contractor shall provide all on-site personnel with safety equipment and protective clothing as specified in HSERP.

1. Respiratory Protection: Contractor shall establish Respiratory Protection Program in accordance with OSHA 29 CFR 1910.134. All respiratory protection devices shall be provided and maintained by Contractor in accordance with ANSI Z88.2-l988 or current standard. Each individual shall be assigned respirator(s) for his/her exclusive use. Contractor shall establish procedures for ensuring daily cleaning, maintenance and replacement of filters, hoses and regulators as necessary. Contractor shall ensure that respirator issued to employee exhibits least possible face piece leakage and that respirator is fitted properly. All cartridge respirators shall be provided with cartridge to protect against Site hazards and type of cartridge required shall be stated in HSERP.
2. Skin Protection: Contractor shall provide and maintain all required protective clothing, including but not limited to hard hats, coveralls, boots, gloves, and other necessary items which are protective against and resistant to chemicals at Site.

3. General Exclusion Zone Requirements: Employees who have been working with contaminated materials or in contaminated environment shall remove all protective and work clothing and shower before changing into street clothes and leaving Site. Prior to eating lunch and taking breaks, personnel leaving Contamination Reduction Zone shall wash their hands, face and exposed skin areas. All protective equipment shall be selected by Contractor's HSC and shall be resistant to degradation and permeation of Site chemicals. Openings (wrists and ankles) shall be taped.
4. HSC shall evaluate work conditions and determine effectiveness of protective equipment and when upgrades/downgrades in levels of protection are appropriate. Any diversions from personal protective equipment levels listed in HSERP shall be provided in writing with justification for change to Owner for approval. Tyvek coveralls should be anticipated for any intrusive work while working within excavations or in intimate contact with Site soil. General requirements for anticipated level of protection are defined as follows:
    a. Level D:
        1) Coveralls and/or Tyvek.
        2) Safety boots/shoes.
        3) Safety glasses or chemical splash goggles with side shields.
        4) Hard hat.
        5) Hearing protection (as needed).
        6) Gloves (chemical-resistant and work gloves).
        7) Reflective safety vest.
5. Task-Specific Levels of Protection: Contractor shall indicate in HSERP levels of protection required to perform specific tasks. Contractor also shall describe in HSERP methods and protocols that will be utilized to upgrade/downgrade levels of protection for each task. Based upon known chemicals and their concentrations at Site, following initial levels of protection are anticipated for conducting specific tasks required under this contract:

Task	Level of Protection
1. Mobilization	D
2. Installation of Temporary Facilities/Utilities	D
3. Site Preparation	D
4. Construction of Staging and Treatment Area	D
5. Sheet Pile Support System	D
6. Sediment Removal and Transport	D
7. Surveying	D
8. Demobilization	D

6. Working On or Near Water: When Work is performed adjacent to or on water, a minimum of two personnel are required where one is watchman. Watchman will have immediate communication access in emergency. All personnel in this area will wear United States Coast Guard approved life vests.

K. Personnel Hygiene and Decontamination: Contractor shall provide personnel hygiene facilities that meet requirements of 29 CFR 1910.120 and 29 CFR 1910.141. Personnel working in exclusion zones shall use shower facilities before changing into their street clothes at end of their work shift, prior to leaving Site. Personnel shall wash hands, face and other exposed skin areas prior to work breaks and eating. Except for Work within Support Zone, no working clothing, shoes or boots shall be worn off site or carried out of project area. Boots, gloves and respirators shall be cleaned and sanitized by means of decontamination procedures prior to exiting Contamination Reduction Zone. Contractor shall develop and implement protocols and procedures for equipment and reusable personal protective equipment decontamination.

1. Personnel Decontamination Area: Contractor shall provide Personnel Decontamination Area in Contamination Reduction Zone where surface contamination and outer protective clothing can be removed. Area shall provide workers protection from weather. This area shall include provisions for washing contamination and mud from boots and protective clothing.
2. Work Area Change Rooms: Contractor shall provide Work Area Change Rooms in accordance with 29 CFR Part 1910.120(n)(7)(I-iv) which meets requirements of 29 CFR 1910.141. This shall include change areas separated by shower facilities. These areas shall include benches and tables needed for changing clothes. One change room, with exit leading off site, shall provide clean area where employees can remove, store and put on street clothing. This area shall have lockers for each employee to securely store personal items.
3. Shower Room: Contractor shall provide, supply and maintain shower room which meets requirements of 29 CFR Part 1910.141(d)(3)(4). Soap, washcloths and towels shall be provided to all personnel required to shower.
4. Lunch Room: Contractor shall provide lunch room for all Site personnel. This area shall be furnished with benches and tables. This area will be free of contamination and be kept in clean and sanitary condition. Area shall be cooled/ heated dependent on season.
5. All areas described above shall be lighted in accordance with minimum requirements defined in 29 CFR Part 1910.120(m), Table H-120.1.

L. Equipment and Material Decontamination:

1. Contractor shall build an Equipment Decontamination Area in Contamination Reduction Zone. Purpose of Equipment Decontamination Area is to capture and prevent spread of Site contaminated material from leaving Contamination Reduction Zone and Exclusion Zones.
2. In addition to capturing contaminated solids (sediment, soil, debris, etc.), water/detergent solution (rinsate) generated when cleaning contaminated equipment must also be captured and not allowed to contaminate area surrounding Equipment Decontamination Area.
3. Equipment Decontamination Area may include, but is not limited to following:
    a. Installation of concrete pad for contaminated equipment (Decontamination Pad).
    b. Installation of rinsate collection system (sumps, tanks, pumps, etc.).
    c. Secondary containment around collection system.
    d. Installation of absorbent booms along edge of secondary containment.
    e. Installation of plastic liner around secondary containment (with curbing or sloping to prevent run-off).
    f. Installation of drainage system for secondary containment.
    g. Installation of cover to preclude treatment of non-contaminated rain water.
    h. Freeze protection.
4. Spent rinsate solution and contaminated liquids shall be collected and transferred to water treatment system.
5. Contaminated solids and solids collected in decontamination area shall be transferred to soil stabilization area and added to stabilized dredged materials.
6. Contractor shall include design details for Equipment Decontamination Area in this section of HSERP.
7. Information required should include, but not necessarily be limited to following:
    a. Scaled map showing location of decontamination area.
    b. Materials of construction data.
    c. Liner specifications.
    d. Method of rinsate collection.
    e. Decommissioning procedures.
8. Contractor shall address their plans for dealing with these issues in this section of HSERP.
    a. Contractor shall develop set of protocols and procedures for equipment decontamination that will be utilized to prevent spread of contamination into Support Zone and off-site area.

b. Contractor shall decontaminate all equipment prior to bringing equipment on-site.
c. Designated clean area shall be established in Contamination Reduction Zone for performing equipment maintenance. This area shall be used when Contractor personnel are required to perform maintenance on equipment. All equipment within Exclusion Zone or Contamination Reduction Zone shall be decontaminated before maintenance.
d. All items taken into Exclusion Zone must be assumed to be contaminated and shall be decontaminated and inspected before leaving Contamination Reduction Zone. All contaminated vehicles, equipment and materials shall be cleaned and decontaminated to satisfaction of Owner prior to leaving Site.
e. Decontamination shall occur on equipment decontamination pad and shall consist of solids material removal (if required) followed by cleaning with high pressure water and/or steam amended with detergents or solvents as appropriate. Particular attention shall be paid to removal of material on and within undercarriage, tracks and sprockets of crawler equipment, and tires and axles of trucks and rubber-tired mounted equipment.
f. Tools and items for which decontamination is difficult or impossible to verify shall remain on Site, until completion of Work, for subsequent packaging and disposal by Contractor at secure landfill with current permit to accept wastes generated at Site. Examples of such wastes include, but are not limited to, wire, rope and lumber.
g. Upon completion of equipment decontamination, equipment decontamination pad shall be thoroughly washed down and sediments removed from collection sump for disposal.
h. At completion of project, equipment decontamination pad shall be properly decontaminated to satisfaction of Owner.

M. Decontamination Pad:

1. HSERP shall present information regarding decontamination pad design. Information shall include but not necessarily be limited to following:
   a. Scaled map showing location of pad.
   b. Discussion on intended use of pad.
   c. Plan drawing illustrating major features of pad.
   d. Summary of materials used for construction of pad.
   e. Method of rinsate and/or particulate waste collection and disposal.
   f. Decontamination procedures.
   g. Maintenance of pad (inspections and repairs).
   h. Description of pad decommissioning (removal) procedures.

N. Decontamination Pad Design:

1. Following are important design aspects of decontamination pad design:
   a. Pad shall be able to bear load of equipment to be decontaminated and shall be of sufficient size to accommodate largest piece of equipment plus an appropriate space for conducting decontamination activities.
   b. Pad shall be designed to capture all rinsate generated and prevent release of contaminants to environment. This may include shielding to protect from wind dispersion, over-spray, and precipitation events.
   c. Pad shall be designed in manner that will prevent damage from intended use and be sufficient to last through entire scope of Work with minimal maintenance.
   d. Pad shall be designed for eventual decontamination, demolition, and removal in mind.
2. Basic Decontamination Pad Design: Contractor shall include design drawing of Decontamination Pad in this section of HSERP.
3. Engineered Sub-Base: "Engineered Sub-Base" is constructed foundation for pad.
4. Concrete or Asphalt Pad: "Concrete or Asphalt Pad" is working surface for decontamination. "Concrete or Asphalt Pad" design shall include but not necessarily be limited to following:
   a. Material: Concrete or asphalt mixture shall be such that cracking is limited to surface cracks.
   b. Finish: Surface shall be finished to minimize slipping under wet conditions, and allow for drainage to sump.
   c. Sealing: Sealant shall be applied to minimize likelihood that concrete or asphalt becomes contaminated with contaminants of concern.
   d. Slope: Pad shall be sloped so that all liquids drain to sump.
5. Containment: In order to prevent rinsate from escaping into surrounding area, decontamination pads are typically equipped with curbs and/or walls, including water stops.
   a. Material: Containment curbs/walls shall be constructed from concrete.
   b. Height: Containment curbs/walls shall be sufficient height to collect all of decontamination liquid necessary to thoroughly clean larges piece of equipment plus 25 percent.
   c. Sealing: Containment curbs/walls shall be sealed same as Pad, (particularly) where they interface with Pad.
6. Sump: Sump shall be incorporated into pad design. Sump shall be situated at lowest point of pad to collect rinsate and/or rainwater. It shall be designed for installation of pump, and incorporate means for precluding collection of solids. Sump should be easily accessible for an occasional sediment cleanup. If pad is not covered, pad/ sump should provide enough storage capacity to accommodate significant storm event. Since liquid head

could temporarily build up, walls and bottom of sump should be made impermeable.

7. Enclosure (Roof and Walls): "Enclosure" that provides splash protection, rain protection, and or freeze protection shall be considered for Decontamination Pad.

O. First Aid Provisions and Emergency Equipment:

1. Fire Extinguishers: Type and number of fire extinguishers shall be determined by Contractor and submitted as part of HSERP. Fire extinguishers shall be manufactured by Tyco. Inspection and maintenance shall be responsibility of Contractor. As minimum, two 20 pound A, B, C fire extinguishers, manufactured by Tyco, shall be located at entrance to Exclusion Zone, at entrance of each enclosure in Work zone, and in Support Zone. Other fire stations equipped with appropriate type and size of fire extinguishers shall be established by Contractor as needed. These stations shall be clearly marked and identified in HSERP. All combustible or flammable materials used on Site shall be stored in Underwriter's Laboratory (UL) listed and/or Factory Mutual (PM) approved containers. Each vehicle and vessel will have approved, inspected portable fire extinguisher.
2. Emergency Eye Wash: At a minimum, Contractor shall provide and maintain 15-minute free-flow capacity Contractor emergency eye wash unit. This unit may be part of emergency shower specified above and shall be located in Contamination Reduction Zone. Contractor shall establish additional eye wash stations at any area where caustic or corrosive materials will be used. Locations of stations shall be identified in HSERP and identified to on-site personnel during Site health and safety training. Emergency eye wash units shall meet requirements specified in ANSI Z358.1-1981. Each vehicle will have portable eye wash.
3. First Aid Kits: Contractor shall provide and equip first aid kits with supplies applicable to scope of Work. HSERP shall list contents of First Aid Kits. At minimum, Contractor shall provide first aid kits at clearly designated locations in Contractor’s offices and at entrance to Contamination Reduction Zone. Location of first aid stations shall be identified in HSERP. Each vehicle will have first aid kit.
4. Any and all emergency rescue equipment, such as safety harness and lifeline and/or basket stretcher, which is required to rescue individual from excavation cave-in and/or confined spaces. At minimum, one set of this equipment shall be provided in Contamination Reduction zone with current records of inspection.

P. Emergency Response/Contingency Plans and Procedures:

1. Contractor shall develop emergency response and contingency plan for on-Site and off-Site emergencies in accordance with 29 CFR 1910.120(1) which meets requirements of 29 CFR 1910.120(p)(8). This plan shall, as minimum, address following:
   a. Pre-emergency planning.
   b. Personnel roles, lines of authority, training and communication.
   c. Emergency recognition and prevention.
   d. Safe distances and places of refuge.
   e. Evacuation routes and procedures.
   f. Emergency decontamination.
   g. Emergency medical treatment and first aid.
   h. Emergency alerting and response procedures.
   i. PPE and emergency equipment.
   j. Critique of response and follow-up.
2. In event of any emergency associated with remedial action, Contractor shall without delay: take diligent action to mitigate cause of emergency; alert Owner; and institute whatever measures might be necessary to prevent any recurrent of conditions or actions leading to or resulting in emergency.
3. Emergency medical care services shall be prearranged at medical facility in Marinette. Staff at facility shall be advised of potential emergencies that might result and that injured person's clothing and skin may be contaminated.
4. Contractor shall establish emergency communications with health and emergency services. Name of these facilities, points of contact, emergency routes and communications arrangements shall be included in Contractor’s HSERP. Contractor shall post list of all phone numbers that may be used for emergency communications. As minimum, this list shall include following information and telephone numbers:
   a. Telephone number for Site Guard Shack (715-735-3888).
   b. Procedure for prompt notification of Wisconsin Department of Natural Resources, EPA, National Response Center and Contractor.
   c. Any other telephone numbers that may be needed in emergency.
   d. Location of emergency showers and eye washes.
   e. Location of first aid stations.
5. In event of accident or some other incident, Owner shall be notified immediately and receive written notification within 24 hours. Report shall include following items:
   a. Name, organization, telephone number and location of Contractor.
   b. Name and tile(s) of person(s) reporting.
   c. Date and time of accident/incident.
   d. Location of accident/incident (i.e., Site location, facility name).

e. Brief summary of accident/incident giving pertinent details include type of operation ongoing at time of accident/incident.
f. Cause of accident/incident, if known.
g. Injuries.
h. Details of any chemical hazard or contamination resulting from accident/incident.
i. Estimated property damage, if applicable.
j. Nature of damage; effect on project schedule.
k. Action taken by Contractor to ensure safety and security.
l. Other damage or injuries sustained (public or private).

6. Fires: As part of HSERP, Contractor shall describe procedures, equipment and personnel for responding to fires and potential explosion at Site. Contractor will provide training records for personnel who are designated to fight fires.
   a. Small Fires: Small is defined as fire that can be extinguished with available fire extinguishers required under other paragraphs of this section. In event of small fire at Site, Contractor and his designated fire control personnel shall take following action:
      1) Evacuate all unnecessary personnel from area to upwind location.
      2) Notify guard shack (715-735-3888).
      3) Attempt to extinguish fire using portable fire extinguishers or by smothering.
      4) Fire control personnel shall wear appropriate personal protective equipment when responding to fire.
      5) Request emergency response assistance as needed for any injuries or exposures to hazardous chemicals.
      6) Notify Owner of incident.
   b. Large Fires: In event of large fire or fire which cannot be extinguished with on-site personnel and equipment, Contractor shall take following minimum actions:
      1) Evacuate all unnecessary personnel from Site to upwind location.
      2) Notify guard shack (715-735-3888).
      3) Take any appropriate actions to ensure safety of on-site personnel and public.
      4) Notify Owner.
7. First Aid:
   a. Physical Injury:
      1) For minor injuries, routine first aid procedures shall be administered by individual(s) certified in first aid.
      2) For major injuries, guard house shall be called immediately (715-735-3338). On-site personnel shall attempt to stabilize

victim and perform any decontamination possible (that does not compromise condition of injured person or others). On-site personnel shall be prepared to provide paramedics with information about accident and/or chemical exposure if applicable.

b. Chemical Injury:
   1) Appropriate personal protective equipment shall be worn when treating victim(s).
   2) Victim's vital signs and severity of exposure shall be assessed. Ambulance should be called and hospital should be notified of type of injury that is being brought to them for emergency treatment.
   3) Victim shall be removed to fresh air and resuscitated if necessary.
   4) If clothing is chemically contaminated and injuries permit, clothing shall be removed and skin flooded with copious amounts of water.
   5) If eyes are contaminated, they shall be irrigated immediately with copious amounts of water for at least 15 minutes and preferably until victim can be transported to hospital.
   6) If appropriate, Poison Control Center should be contacted for technical advice and assistance.

Q. Heat/Cold Stress Monitoring:

1. Heat Stress Monitoring: Nature of Work combined with use of protective equipment may create heat stress. To prevent heat stress and to monitor body's recuperative abilities to excess heat, one or more of following techniques shall be used. Monitoring of personnel wearing impervious clothing shall commence when ambient temperature reaches 70°F. Monitoring frequencies shall increase as temperatures increase or when employees show slow recovery rates. Monitoring shall be performed by person with current first aid certification and specific training in recognition of symptoms of heat stress. Heat stress physiological monitoring shall include, but not be limited to following:
   a. Heart rates.
   b. Body temperature.
   c. Body water loss.
2. Contractor’s Health and Safety Coordinator (HSC) shall specify work cycle period and rest period based upon ambient temperatures and heat stress monitoring. Work/rest schedules and action levels at which corrective action shall be taken shall be addressed in Contractor’s HSERP.

3. Cold Stress Monitoring: To protect against cold-related injuries, Contractor shall provide appropriate clothing, shelter for rest periods and written procedures which protect employees from potential cold-related injuries and stress. As minimum, Contractor shall follow recommendations in American Conference of Governmental Industrial Hygienists Threshold Limit Values for Physical Agents in Work Environment.

R. Hazard Communication Program: Hazard Communication Program: Contractor's HSERP shall include hazard communication program for all chemicals brought onto Site by Contractor and any contracted personnel. All chemicals which are considered hazardous by 40 CFR shall be correctly labeled, and workers shall be trained on hazard of chemical before using it. Contractor shall maintain copy of all Materials Safety Data Sheets in Support Zone for all such chemicals; these documents shall be readily available to Owner and other Site personnel upon request. All MSDSs will be provided to Owner for approval minimum of one week before material is brought on Site. The MSDS Cover Page, attached to this specification, shall be attached to each MSDS.

S. Accident Prevention Plan: Contractor shall submit for approval as part of HSERP an Accident Prevention Plan (APP). Approved APP shall include accident prevention policy to be followed by Contractor and contracted personnel during construction and remedial action activities. Contractor shall be responsible for implementation of APP by all Contractor and contracted personnel. Accident Prevention Plan shall address, at minimum following items:

1. Safety hazards associated with Work activities and preventive measures to be implemented.
2. Personnel responsibilities.
3. Safety procedures.
4. Contractor supervision.
5. Safety meetings.
6. Fire prevention and protection.

T. Cutting Brazing and Welding Procedures: Cutting, brazing and welding operations shall not be conducted without hot work authorization permit from HSO per OSHA requirements/Contractor procedures and Tyco-Marinette procedures. Contractor shall list requirements for obtaining hot work permit. HSO shall notify Owner of all hot work and provide copy to Owner to obtain Owner's authorization before commencing any such activity. As minimum, requirements shall be in compliance with regulations specified in 29 CFR 1910.252 and these specifications. This requirement applies to welding, grinding, sawing or other similar operation which could be expected to potentially generate combustion-producing temperatures or sparks, or which could evolve potentially hazardous

fumes or vapors. Contractor shall designate individual as fire watch during and after all hot work activities. This person's sole responsibility shall be to monitor hot work and have immediate access to fire extinguishers.

U. Spill Control Provisions:

1. Contractor shall have available provisions for dealing with spills. As part of HSERP Contractor shall provide their procedures or dealing with spills, including upland spills or marine spills.
2. Contractor to ensure compliance with any and all applicable US Coast Guard and Federal marine spill containment and collection provisions.
3. Provide for unexpected spills through provision of following minimum equipment to be kept on-Site and/or on barge if Work is performed from marine-based equipment at all times during Site Work activities.
    a. One front end loader, if used for other Work such as drum moving (not required on barge).
    b. Ten drums (55 gal, UN 17-E or 16-H).
    c. Three hand shovels.
    d. Sorbant pads, containment booms, and other cleanup materials.
    e. Other decontamination supplies and equipment for decontamination of tools and equipment.
    f. Small skiff/boat with life vests and marine spill equipment if materials discharge to sewer or river, or if spill occurs from barge, boat, or marine-based equipment.
    g. Other appropriate materials for use in river with commercial boat traffic.
4. If spill occurs, take following actions:
    a. Immediate action to stop spill and protect/decontaminate affected personnel.
    b. Implement appropriate action as called for in Safety Health and Emergency Response Plan (HSERP).
    c. Take measures to control, confine, and clean up spill.
    d. Notify Owner.
5. Spill cleanup plans and remedies shall be taken by Contractor as approved by Owner.
    a. Recovered liquids may be handled and disposed of off-site in accordance with all applicable regulations.
    b. Remove contaminated soils on-site to depth of up to 1 foot or to depth to remove spilled materials, drum, and handle as specified in HSERP. Excavation to less than 1 foot shall be at Owner’s discretion and will require sampling and analysis of residual samples. Excavation shall be restored to approximately original grade with clean fill material.

c. Spilled flowing oils will be stopped immediately and shall be drummed or placed in tankage and handled as specified for liquid wastes in HSERP.
d. Decontaminate on-site structures to remove traces of spilled material.
e. Spilled solids shall be completely recovered, drummed, and handled as specified in HSERP.
f. If spill or other emergency event occurred for reasons beyond control and responsibility of Contractor as determined by Owner, adjustment in price will be considered.

V. Water/Boat Safety: Personnel associated with Water/Boat safety will be required to wear Personal floatation devices (PFDs). Life vests must be Coast Guard approved and marked for its appropriate use as life vest. Also pay particular attention to structural integrity of docks, piers, and working surfaces. All walking and working surfaces shall be maintained in good repair. Additionally, employees should have work boots with appropriate soles for greater traction.

W. Drinking Water and Supplies:

1. Contractor shall provide bottled water (individual size bottles) for their employees working on Site.
2. Water shall be provided and placed in locations readily accessible to all employees. Water shall be suitable cool and in sufficient amounts, taking into account air temperature, humidity, and nature of work performed, to meet needs of all employees.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 29 00
PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SUBMITTALS

A. Informational Submittals:

1. Schedule of Values: Submit on Contractor's standard form, subject to approval by the Owner's Representative.
2. Application for Payment.
3. Final Application for Payment.

1.02 SCHEDULE OF VALUES

A. Prepare a separate Schedule of Values for each major Work element of the Contracted Work.

B. Upon request of Engineer, provide documentation to support the accuracy of the Schedule of Values.

C. Unit Price Work: Reflect unit price quantity and price breakdown from conformed Bid Form.

D. Lump Sum Work:

1. Reflect lump sum price items as included within submitted Bid Form.
2. List bonds and insurance premiums, mobilization, demobilization, preliminary and detailed progress schedule preparation, equipment testing, facility startup, and contract closeout separately.
3. Provide detail breakdown mobilization and temporary facilities by major features (dredging, sediment stabilization, storm water control, erosion control, site preparation by location, clearing, site security, and other temporary facilities) if requested by the Engineer.

E. Unbalanced or front-end loaded schedules will not be accepted.

F. Summation of the complete Schedule of Values representing all the Work shall equal to the Contract Price in the Contract Agreement.

1.03 SCHEDULE OF ESTIMATED PROGRESS PAYMENTS

A. Develop cash flow analysis which identify estimated payment requests throughout the project lifecycle aggregating to the Contract Price.

B. Base estimated progress payments on initially acceptable Progress Schedule. Adjust to reflect subsequent adjustments in Progress Schedule and Contract Price as reflected by modifications to the Contract Documents.

1.04 APPLICATION FOR PAYMENT

A. Transmittal Summary Form: Attach one Summary Form with each detailed Application for Payment for each schedule and include Request for Payment of Materials and Equipment on Hand as applicable. Execute certification by authorized officer of Contractor.

B. Use detailed Application for Payment Form acceptable to Engineer.

C. Provide separate form for each schedule as applicable.

D. Include accepted Schedule of Values for each schedule or portion of lump sum Work and the unit price breakdown for the Work to be paid on a unit priced basis.

E. Include separate line item for each Change Order and Work Change Directive executed prior to date of submission. Provide further breakdown of such as requested by Engineer.

F. Preparation: Submit Application for Payment, including a Transmittal Summary Form and detailed Application for Payment Form(s) for each schedule as applicable, a listing of materials on hand for each schedule as applicable, and such supporting data as may be requested by Engineer.

1.05 MEASUREMENT—GENERAL

A. Weighing, measuring, and metering devices used to measure quantity of materials for Work shall be suitable for purpose intended and conform to tolerances and specifications as specified in National Institute of Standards and Technology, Handbook 44.

B. Whenever pay quantities of material are determined by weight, material shall be weighed on scales furnished by Contractor, disposal facility or material supplier and certified accurate by state agency responsible. Weight or load slip shall be obtained from scale operator and delivered to Owner's Representative at point of delivery of material.

C. If material is shipped by rail, car weights will be accepted provided that actual weight of material only will be paid for and not minimum car weight used for assessing freight tariff, and provided further that car weights will not be acceptable for material to be passed through mixing plants.

D. Vehicles used to haul material being paid for by weight shall be weighed empty daily and at such additional times as required by Engineer. Each vehicle shall bear a plainly legible identification mark.

E. Quantities Based on Profile Elevations: Existing ground profiles shown on Drawings were taken from a topographic map drawn with contour intervals of 1 feet with supplementary spot elevations to nearest half foot.

F. Quantities will be based on ground surface profiles based on topographic and bathymetric surveys performed by the Contractor before and after Work is performed.

G. The bid items listed in this section are intended to cover the completion of all Work items presented in the Drawings and Specifications. The bid item descriptions are summary descriptions intended to assist with the division of the entire project into measureable items of Work. It is not the intention of the bid item descriptions to include a listing of every activity required to complete that item of Work.

H. Units of measure shown on Bid Form shall be as follows, unless specified otherwise.

Item	Method of Measurement
AC	Acre—Field Measure by Engineer
CY	Cubic Yard—Field Measure based on surveys by Contractor verified by Engineer
DAY	Day (24 hours – up to three 8 hour shifts)
EA	Each—Field Count by Engineer
GAL	Gallon—Field Measure by Engineer
HR	Hour
LB	Pound(s)—Weight Measure by Scale
LF	Linear Foot—Field Measure by Engineer
LS	Lump Sum—Verified by Engineer
SF	Square Foot
SY	Square Yard
TON	Ton—Weight Measure by Scale (2,000 pounds)
WEEK	Week—7 calendar days

1.06 PAYMENT

A. Progress payment will be made on a monthly basis as described in the Contract Agreement.

B. Payment for all Lump Sum Work shown or specified in Contract Documents is included in the Contract Price. Payment will be based on a percentage complete basis for each line item of the accepted Schedule of Values.

C. Payment for Lump Sum Work covers all Work specified or shown within the limits or Specification sections as follows:

1. Bid Item 1, Pre-mobilization, Licenses, Permits, and Submittals: All labor, materials, and equipment required for Contractor's pre-mobilization activities, obtaining all local, state, and federal licenses, permits (besides those already obtained by the Engineer and Owner) and preparation of Project submittals, schedules and required plans. Payment will be made in equal one-half portions with the first two progress payments. The final progress payment may be held or reduced until all major plans are submitted.
2. Bid Item 2, Mobilization/Demobilization for the Work: Contractor shall be compensated for mobilization/demobilization of Contractor's personnel, equipment, supplies, incidentals, field offices, dredging equipment, sediment stabilization equipment, and other facilities required for the performance of the Work under this Contract. Mobilization/demobilization shall be divided into the following four parts.
    a. Initial 2012 Mobilization: Contractor's initial mobilization to the Site at the start of Work.
    b. Winter 2012 Demobilization: Contractor interim cleanup, removal of equipment from the water, winterization, onsite storage, and/or demobilization of personnel, equipment and material from the project Site. Includes cost of maintaining security fencing and other features and equipment to remain on Site over the winter season.
    c. Spring 2013 Mobilization: Contractors, remobilization of personnel, equipment, and materials for the 2013 season. Includes repair or replacement of damaged equipment left on Site over the winter season.
    d. Final Demobilization: Contractor final clean up, decontamination and demobilization of all temporary facilities, equipment, material and personnel for the project Site. Include decontamination of Site and repair of any damage to the Owner's or City's property and/or facilities caused by the Contractor's activities.

e. If Contractor performs additional mobilization/demobilization of personnel, material, and/or equipment at the Owner's expressed written request, Contractor shall be compensated for such expense at Contractor's actual net cost. Contractor shall provide all documentation requested by Owner to substantiate the actual net cost.

3. Bid Item 3, Site Preparation and Temporary Facilities: All labor, material, and equipment to set up and maintain Site facilities required to perform the Project Work. This includes, but not limited to, establishment of Contractor's and Engineer's offices, utility hookups, construction of decontamination pad scale, truck tarping station, setting up Site security, topography surveying, clearing, grubbing, erosion control, turbidity control, site drainage and storm water control facilities, pipeline to water treatment facility, Site grading, haul roads, temporary pavement, relocation, storage, and/or protection of existing facility, traffic control features, material handling, and implementation of other Contractor's Control Plans.
4. Bid Item 19, Re-install 6th Street Docks. All labor materials and equipment to reinstall the dock at 6th street slip, removed prior to the start of Work. Repair any damage caused during removal or while in storage.

D. Payment for unit price items covers all Work necessary to furnish and install the following items:

1. Bid Item 4, Operation and Maintenance of Temporary Facilities: All labor, material and equipment required for the operation and maintenance of temporary construction support facilities outlined in Bid Item 3. Includes all supplies, site security, utility service, traffic control, personnel, Site and facility including regular pavement sweeping. Also includes Contractor's overhead staff, health and safety, quality control, maintenance of project schedule, and operations of facilities associated with Contractors Work plans. Payment will not be made for Contractor-caused delays associated with permits, submittals, schedules, workforce, defective work or equipment downtime. Payment will be made based on the monthly unit price in the Bid Form incorporated in the Contract Agreement. Partial months will be prorated.
2. Bid Item 5, Removal and Disposal of Soil Stockpile West of Building 59. All labor, materials, and equipment to excavate, load, and transport the soil stockpile west of Building 59 for disposal. Includes grading stockpile area in preparation for placement of temporary pavement. Disposal will be at the Waste Management Menominee landfill in Menominee, Michigan. Payment will be made based on the unit price in the Bid Form incorporated in the Contract Agreement per ton received

as validated by landfill scale tickets. Landfill disposal fee will be paid directly to landfill by Owner.

3. Bid Item 6, Dredging Activities: All labor, materials, and equipment to mechanically dredge and transport sediments to the sediment stabilization area. Includes operation and maintenance of turbidity control, navigation buoys, and other on-water facilities. Also includes Contractor's interim or ongoing quality control bathymetric surveys to monitor progress of the Work. Payment will be made based on the per cubic yard unit price in the Bid Form incorporated in the Contract Agreement. Measurement will be made on a volumetric basis using Contractor's before and after bathymetric surveys by surface to surface prismodal methods.
    a. Soft Sediment Dredging: Dredging of soft sediment using environmental clamshell bucket.
    b. Semi-consolidated Material Dredging: Dredging of semi-consolidated sediments using a standard clamshell bucket.
    c. South Channel Dredging: Dredging of sediments for the South Channel Area.
4. Bid Item 7, Re-Dredging Activities: All labor, materials, and equipment to mechanically dredge locations requiring additional sediment removal based on confirmation sampling as directed by the Engineer. Includes movement of dredging equipment to required location, dredging, and transport of dredge material to the stabilization area. Payment will be made based on the per cubic yard unit price in the Bid Form incorporated in the Contract Agreement. Measurement will be made on a volumetric basis using Contractor's before and after bathymetric surveys by surface to surface prismodal methods.
5. Bid Item 8, Bathymetric Survey: All labor, materials and equipment to conduct bathymetric surveys of dredging areas, Bathymetric surveys will be conducted before and after dredging activities as directed by the Engineer. Payment will be made based on the per survey unit price in the Bid Form incorporated in the Contract Agreement.
6. Bid Item 9, Relocation of Equipment for Others Use of Turning Basin: Includes all labor material and equipment to relocate dredging, material handling, turbidity control, navigation buoys and other equipment from the Turning Basin to allow use of the Turning Basin by others, Also includes returning equipment back to original location after the use by others of Turning Basin is complete. Payment will be made based on the unit price in the Bid Form incorporated in the Contract Agreement for each time the equipment is removed and returned back in placed. Price shall account for one day of standby time where dredging cannot occur. Additional standby time will be paid under the Standby Bid Item for additional time dredging at the current or on other location cannot be performed due to the use of the Turning Basin by others.

7. Bid Item 10, Dredging Standby Time: The Dredging Standby unit prices apply only in circumstances when the Engineer or the Owner directs the Contractor in writing not to perform dredging Work at the Site not due to the fault of the Contractor. The Dredging Standby unit prices include all costs of the Contractor associated with not being able to perform dredging activities at the Site due only to Engineer or Owner expressed written request that Contractor not dredge, and no other amount shall be paid by the Owner for Dredging Standby. Payment will be made at the per hour, day, or week Dredging Standby unit prices set forth in the Bid Form incorporated in the Contract Agreement as described as follows:
   a. Dredging Hourly Standby: Standby time greater than one hour up to 24 hours per specific occurrence.
   b. Dredging Daily Standby: Standby time equal to or greater than 1 day but less than 7 days per specific occurrence.
   c. Dredging Weekly Standby: Standby time equal to or greater than 7 days per occurrence. Standby time greater than one (1) week will be prorated at the weekly rate.
8. Bid Item 11, Dredge Materials Handling and Stabilization: All labor, materials, and equipment to unload dredge material from barges, screen out debris, pump decant water to water treatment facility, mix reagents with sediment in pugmill, and move material to stabilization bins for curing. Includes all reagents needed for stabilization as indicated on Drawing G-4. Payment will be made at the per Ton unit price in the Bid Form incorporated in the Contract Agreement based on weight measured at disposal facility by type of dredge material.
   a. Soft Sediment: Material handling and stabilization of soft sediment for all areas other than South Channel.
   b. Low-Concentration Semi-consolidated Material: Material handling and stabilization of all semi-consolidated dredge material from outside area indicated on the Drawings for high concentration semi-consolidated material.
   c. High-Concentration Semi-consolidated Material: Material handling and stabilization of all semi-consolidated dredge material from with the area indicated on the Drawings for high concentration semi-consolidated material.
   d. South Channel Sediments: Material handling and stabilization of soft sediment from the South Channel.
9. Bid Item 12, Additional Sediment Stabilization Reagent: All labor, material, and equipment for additional; amounts of reagents beyond those listed on Drawing G-4. Includes obtaining, delivering to site, and mixing into sediments as directed by the Engineer. Payment will be made based on the per Ton or Gallon unit prices in the Bid Form incorporated in the Contract Agreement.
   a. Fluidized Bed Boiler Ash.

b. 60 percent Ferric Sulfate Solution.
c. Calcium Hypochlorite.

10. Bid Item 13, Material Shredding: All labor, material, and equipment to segregate material greater than 2 inch, shred to less than 2-inch size, and mix into sediment prior to stabilization. Payment will be made based on the per Ton unit price in the Bid Form incorporated in the Contract Agreement measured on Contractor's on Site scale.
11. Bid Item 14, Water Treatment Geotextile Tube Handling and Stabilization: All labor, material and equipment for the handling and treatment of sediment collected in the geotextile tubes at the water treatment facility. Includes picking up the roll off container that contains the geotextile tube from the 6th Street slip area, transporting the roll off container to the sediment stabilization area removing and stabilizing the material contained in the geotextile tube, disposal of the geotextile tube and returning the roll off to the water treatment facility. Payment will be made based on the unit price in the Bid Form incorporated in the Contract Agreement for each geotextile tube.
12. Bid Item 15, Re-stabilization of Treated Material: All labor, materials and equipment to re-stabilized treated material that did not meet disposal criteria as directed by the Engineer. Payment will be made based on the per Ton unit price in the Bid Form incorporated in the Contract Agreement based on weight measured at the disposal facility. Stabilization reagents for re-stabilization will be paid under Bid Item 12, Additional Sediment Stabilization Reagent.
13. Bid Item 16, Stabilization Standby Time: The Stabilization Standby unit price applies only in circumstances when either (i) the Engineer or the Owner directs the Contractor in writing not to perform stabilization Work at the Site not due to the fault of the Contractor; or (ii) sediment is not available for stabilization due to Engineer's or Owner written direction for Dredging Standby not due to the fault of the Contractor.. The Stabilization Standby unit price include all costs of the Contractor associated with not being able to perform stabilization activities at Site , and no other amount shall be paid by the Owner for Stabilization Standby. Payment will be made based on the per hour, day, or week unit prices in the Bid Form incorporated in the Contract Agreement as described as follows.
    a. Stabilization Hourly Standby: Standby time greater than one hour up to 24 hours per specific occurrence.
    b. Stabilization Daily Standby: Standby time equal to or greater than one day but less than 7 days per specific occurrence.
    c. Stabilization Weekly Standby: Standby time equal to or greater than 7 days per occurrence. Standby time greater than one week will be prorated at the weekly rate.

14. Bid Item 17, Material Loading and Transportation to Disposal Facility: All labor, materials and equipment, for loading sediment into haul vehicles, and transporting to a licensed and approved facility for disposal, Includes truck liners, weighing vehicles, tarping, truck decontamination and manifesting paperwork. Payment will be made based on the per ton by material type unit prices in the Bid Form incorporated in the Contract Agreement based on weight measured at disposal facility. Landfill disposal fee will be paid directly to landfill by Owner.
    a. Miscellaneous Non-shredable Material. Non-hazardous debris and dredge material that cannot be shredded and mixed into stabilized material or can be disposed without stabilization. Disposal will be at Waste Management's Landfill in Menominee, Michigan.
    b. Non-Hazardous Stabilized Material; Non-hazardous stabilized dredge material for disposal at Waste Management's Landfill in Menominee, Michigan.
    c. RCRA Hazardous Waste Material: Hazardous waste material for disposal at the Heritage Landfill near Roachdale, Indiana.
15. Bid Item 18, Remove and Dispose of Temporary Asphalt: All labor, material, and equipment to remove, load, transport, and dispose of the temporary asphalt pavement installed during Site preparation. Includes re-grading area back to pre-construction topography. Payment will be made based on the per square foot unit price in the Bid Form incorporated in the Contract Agreement.
16. Bid Item 20, Revegatate Disturbed Area: All labor, materials and equipment to seed areas disturbed during construction activities. Includes grading back to pre-construction topography, surveying, seeding, and installation of erosion control features. Payment will be made at the per acre unit price in the Bid Form incorporated in the Contract Agreement.
17. Bid Item 21, Repave Damaged Areas of 6^{th} and 8^{th} Street Slips. All labor, material, and equipment to repave damaged pavement areas of the 6^{th} and 8^{th} Street slips as directed by the Engineer. Includes pavement saw cutting, grinding or pavement removal, removed material disposal/recycling, tack coats, pavement and quality control testing. Payment will be made at the per square foot unit price in the Bid Form incorporated in the Contact Agreement.
18. Bid Item 22, Upgrade to Level C PPE: All labor, materials, equipment, safety personnel and monitoring required to upgrade to Level C, personnel protective equipment. Unit price includes all cost of lost productivity due to additional requirements associated with this level of work. Payment will be made based on the unit price in the Bid Form incorporated in the Contract Agreement per person per day required for

this level of protection based on the action levels in the Contractor's Health and Safety Plan.

1.07 NONPAYMENT FOR REJECTED OR UNUSED PRODUCTS

A. Payment will not be made for following:

1. Loading, hauling, and disposing of rejected material.
2. Quantities of material wasted or disposed of in manner not called for under Contract Documents.
3. Rejected loads of material, including material rejected after it has been placed by reason of failure of Contractor to conform to provisions of Contract Documents.
4. Material not unloaded from transporting vehicle.
5. Defective Work not accepted by Owner.
6. Material remaining on hand after completion of Work.

1.08 PARTIAL PAYMENT FOR STORED MATERIALS AND EQUIPMENT

A. Partial Payment: No partial payments will be made for materials and equipment delivered or stored unless Shop Drawings and preliminary operation and maintenance data is acceptable to Engineer and previous arrangements acceptable to the Owner were made for partial payment.

B. Final Payment: Will be made only for products incorporated in Work in accordance with the Contract Documents. Remaining products, for which partial payments have been made, shall revert to Contractor unless otherwise agreed by the Owner, and partial payments made for those items will be deducted from Final Payment.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 31 13
PROJECT COORDINATION

PART 1 GENERAL

1.01 SUBMITTALS

A. Informational: Statement of Qualification (SOQ) for land surveyor.

1.02 SITE COORDINATION

A. Coordination with Work by Others:

1. The Project Work shall be coordinated with the following. The Contractor shall fully cooperate with the Owner's Representative regarding coordination with third parties operation of existing businesses adjacent to or nearby the Project Site.
2. Marinette Marine Corporation and K&K Integrated Solutions use of the Turning Basin.
3. Operations of K&K Integrated Solutions while using their site.
4. Operations of existing utilities and facilities on the Site or in the surrounding areas.
5. Operations of the Dredging Contractor site activities.
6. Operations of other contractors working on the project Site.

B. Communications: All communication with the USEPA, WDNR, or the public shall be conducted by the Owner or the Owner's Representative, as directed by the Owner. If issues arise during the project such as project modifications, public inquiries, public nuisance complaints, accident, spills and/or injuries, Contractor shall notify the Owner immediately.

C. Contractor shall be responsible for all areas of the Site used by it and its subcontractors in performance of the Work. Contractor shall exert full control over the actions of all employees and other persons with respect to the use and preservation of the property and existing facilities at the Site.

D. Contractor and all subcontractors shall cooperate in the coordination of their separate activities in a manner that will provide the least interference with Engineers' operations, the Owner's operations, adjacent businesses operations, and utility companies working in the area and interfacing and connection of the separate elements of the overall Project Work. If any difficulty or dispute should arise in the accomplishment of the above the problem should be brought to the immediately attention of the Owner.

E. The USEPA and WDNR will be conduction inspections of the work in accordance with the AOC. Coordinate with the Engineer and Owner on scheduling and providing required completion and inspection notices. Assist Engineer and Owner with the required inspections.

1.03 RELATED WORK AT SITE

A. General:

1. Other work that is either directly or indirectly related to scheduled performance of the Work under these Contract Documents, listed henceforth, is anticipated to be performed at Site by others.
2. Coordinate the Work of these Contract Documents with work of others as specified in the Contract Documents.
3. Include sequencing constraints specified herein as a part of Progress Schedule.

B. Concurrent Work by Others:

1. Sevenson Environmental Services, Inc., will be dredging sediment, stabilizing sediment, transporting sediment offsite, and operating a water treatment system.
2. Engineer will conduct continuous turbidity monitoring, and periodic contaminant monitoring, during the execution of the Work, and will conduct sediment confirmation sampling as dredging is completed in an area.

1.04 UTILITY NOTIFICATION AND COORDINATION

A. Contractor shall alert Wisconsin's Digger's Hotline or Michigan's Miss Dig a minimum of 72 hours prior to commencing subsurface Work. Contractor is responsible for confirming the location of all utilities prior to excavation. Contractor shall understand that by alerting Wisconsin's Digger's Hotline or Michigan's Miss Dig that all utilities in the Work area may not be identified or that all utilities in the Work area may not be the responsibility for identification by the notified utility provider. Contractor shall utilize an independent utility locating service prior to performing the Work to identify all utilities to the best of their abilities. Contractor shall note in the Contractor's proposal that a private utility locating service is a part of the Work. Contractor shall pothole known utility locations to confirm location and depth prior to excavation. All landside excavation around utilities shall be performed by hand digging. Contractor is responsible for repair and/or replacement of any damaged utilities, not identified for removal and caused by the excavation activities.

B. Coordinate the Work with various utilities within Project limits. Notify applicable utilities prior to commencing Work, if damage occurs, or if conflicts or emergencies arise during Work.

1.05 FACILITY OPERATIONS

A. Continuous operation of Owner's facilities is of critical importance. Schedule and conduct activities to enable existing facilities to operate continuously, unless otherwise specified.

B. Do not close lines, open or close valves, or take other action which would affect the operation of existing systems, except as specifically required by the Contract Documents and after written authorization by Owner and Engineer. Such authorization will be considered within 48 hours after receipt of Contractor's written request.

C. Do not proceed with Work affecting a facility's operation without obtaining Owner's and Engineer's advance written approval of the need for and commencement and duration of such Work.

1.06 ADJACENT FACILITIES AND PROPERTIES

A. Examination:

1. After Effective Date of the Contract Agreement and before Work at Site is started, Contractor, Engineer, and property owner and utility owners shall make a thorough examination of pre-existing conditions including existing buildings, structures, and other improvements in vicinity of Work, as applicable, which could be damaged by construction operations.
2. Periodic reexamination shall be jointly performed to include, but not limited to, cracks in structures, settlement, leakage, and similar conditions.

B. Documentation:

1. Record and submit documentation of observations made on examination inspections.
2. Upon receipt, Engineer will review, sign, and return one record copy of documentation to Contractor to be kept on file in field office.

C. Navigation Channel Use: Marinette Marine operates ship building facilities adjacent to the Owner's property. As part of their operations they use the Turning Basin during "sea trials" of their ships. In addition, K&K Integrated Solutions utilizes the Turning Basin periodically to turn ships for departure. The Contractor shall coordinate the Marinette Marine and K&K use of the Turning Basin with dredging operations. The Contractor will need to remove their equipment from the area needed by Marinette Marine and K&K.

1.07 PROJECT MILESTONES

A. General: Include the initial milestones specified herein as part of the Progress Schedule required under Section 01 32 00, Construction Progress Documentation.

B. Project Milestones: The following are the project Milestones:

1. Project Award:
2. Site Mobilization:
3. Start Bulkhead Support Activities:.
4. Dredging Complete: October 1, 2013.
5. Final Completion and EPA Final Inspection: November 1, 2013.

1.08 WORK SEQUENCING/CONSTRAINTS

A. Include the following Work sequences in the Progress Schedule:

1. Contractor's on-water Work shall be performed during the months of May through November, unless agreed otherwise by the Engineer.
2. Water from decontamination and storm water control operations shall not exceed 150 gpm as to not overload the water treatment facility operations.
3. The Engineer will be collecting sediment confirmation samples for analysis after completing the dredging or excavations in a given area. The Contractor shall assist the Engineer in obtaining these samples. The Contractor shall allow a minimum of 7 days after sample collection for testing and review of the sample results before for completion of dredging activities.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 31 19
PROJECT MEETINGS

PART 1 GENERAL

1.01 GENERAL

A. Engineer will schedule meetings throughout progress of the Work, prepare meeting agenda with regular participant input and distribute with written notice of each meeting, preside at meetings, record minutes to include significant proceedings and decisions, and reproduce and distribute copies of minutes within 5 days after each meeting to participants and parties affected by meeting decisions.

1.02 PRECONSTRUCTION CONFERENCE

A. Contractor shall be prepared to discuss the following subjects, as a minimum:

1. Required schedules.
2. Status of Bonds and insurance.
3. Sequencing of critical path Work items.
4. Progress payment procedures.
5. Project changes and clarification procedures.
6. Use of Site, access, office and storage areas, security and temporary facilities.
7. Major product delivery and priorities.
8. Contractor’s Site Health and Safety Plan and Site Safety Officer.
9. Storm Water Pollution Prevention Plan and Turbidity Control Plan.
10. Submittal status.

B. Attendees will include:

1. Owner.
2. Owner’s Representatives.
3. Engineer’s representatives.
4. Contractor’s project manager.
5. Contractor’s resident superintendent.
6. Contractor’s quality control representative.
7. Contractor’s health and safety representative.
8. Lower tier Subcontractors’ representatives whom Contractor may desire or Engineer may request to attend.
9. Dredging Contractor, if requested by the Owner or Engineer
10. USEPA’s representative.
11. USACE’s representative.

12. WDNR's representative.
13. Others as appropriate.

1.03 PRELIMINARY SCHEDULES REVIEW MEETING

A. As set forth in Section 01 32 00, Construction Progress Documentation.

1.04 PROGRESS MEETINGS

A. Engineer will schedule regular progress meetings at Site, conducted weekly to review the Work progress, Progress Schedule, Schedule of Submittals, Application for Payment, contract modifications, coordination issues, and other matters needing discussion and resolution.

B. Attendees will include:

1. Owner's Representative(s), (and Owner if requested by Owner).
2. Engineer's representatives.
3. Contractor's representative, lower tier subcontractors, and Suppliers, as appropriate.
4. Others as appropriate.

1.05 QUALITY CONTROL MEETINGS

A. Scheduled by Engineer as necessary to review test and inspection reports, and other matters relating to quality control of the Work and operation of water treatment facility by other contractors.

B. Attendees will include:

1. Engineer's representatives.
2. Contractor's representative.
3. Contractor's designated quality control representative.
4. Suppliers, as necessary.
5. Others as appropriate.

1.06 SAFETY MEETING

A. Contractor shall initiate and shall attend brief daily safety meeting at a designated location prior to the beginning of any Work in accordance with Section 01 11 01, Health, Safety and Emergency Response. Job hazard analysis will be reviewed at each meeting for the day's activities. All Contractors' personnel will actively participate in the pre-task work activity review.

1.07 PREPARATORY MEETINGS

A. When required by individual specification sections, convene at Site prior to commencing Work of that section.

B. Required attendance of entities directly effecting, or affected by, the Work of that section.

C. Notify Engineer 3 days in advance of meeting.

D. Provide suggested agenda to Engineer to include reviewing conditions of installation, preparation and installation or other application procedures, and coordination with related Work and work of others.

1.08 OTHER MEETINGS

A. In accordance with Contract Documents and as may be required by Owner and Engineer.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 00
CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.01 SUBMITTALS

A. Informational Submittals:

1. Preliminary Progress Schedule: Submit at least 7 days prior to Preconstruction Conference.
2. Detailed Progress Schedule:
   a. Submit initial Detailed Progress Schedule within 15 days after Effective Date of the Contract Agreement.
   b. Submit an Updated Progress Schedule with each monthly Application for Payment in accordance with the Contract Agreement.
3. Submit with Each Progress Schedule Submission:
   a. Contractor's certification that Progress Schedule submission is actual schedule being utilized for execution of the Work.
   b. Electronic file compatible with latest version of Enterprise Project Manager (P6) by Primavera Systems, Inc., or Project by Microsoft, Inc, unless otherwise approved by Engineer.
   c. Progress Schedule: One legible copy.

1.02 PRELIMINARY PROGRESS SCHEDULE

A. In addition to basic requirements outlined in Contract Agreement, show a detailed schedule, beginning with Notice to Proceed, for minimum duration of 5 days, and a summary of balance of Project through Final Completion.

B. Show activities including, but not limited to the following:

1. Notice to Proceed.
2. Permits.
3. Submittals, with review time. Contractor may use Schedule of Submittals specified in Section 01 33 00, Submittal Procedures.
4. Early procurement activities for long lead equipment and materials.
5. Initial Site Work.
6. Support system installation by area.
7. Dredging by area.
8. Site backfill.
9. Site restoration.
10. Specified Work sequences and construction constraints.

11. Contract Milestone and Completion Dates.
12. Project close-out summary.
13. Demobilization summary.
14. USEPA Inspection at Substantial Completion and Final Inspection and required Notice to USEPA.

C. Update Preliminary Progress Schedule monthly as part of progress payment process. Failure to do so may result in the Owner withholding all or part of the monthly progress payment until the Preliminary Progress Schedule is updated in a manner acceptable to Engineer.

D. Format: In accordance with Article Progress Schedule—Bar Chart.

1.03 DETAILED PROGRESS SCHEDULE

A. In addition to requirements of the Contract Agreement, submit Detailed Progress Schedule beginning with Notice to Proceed and continuing through Final Completion.

B. Show the duration and sequences of activities required for complete performance of the Work reflecting means and methods chosen by Contractor.

C. When accepted by Engineer, Detailed Progress Schedule will replace Preliminary Progress Schedule and become Baseline Schedule. Subsequent revisions will be considered as Updated Progress Schedules.

D. Format: In accordance with Article Progress Schedule—Bar Chart.

E. Update monthly to reflect actual progress and occurrences to date, including weather delays.

1.04 PROGRESS SCHEDULE—BAR CHART

A. General: Comprehensive bar chart schedule, generally as outlined in Associated General Contractors of America (AGC) 580, “Construction Project Planning and Scheduling Guidelines.” If a conflict occurs between the AGC publication and this Specification, this Specification shall govern.

B. Format:

1. Unless otherwise approved, reproducible paper, not larger than 22 inches by 34 inches.
2. Title Block: Show name of the Project and Contractor, date submitted, revision or update number, and name of scheduler.

3. Identify horizontally, across the top of the schedule, the time frame by year, month, and day.
4. Identify each activity with a unique number and a brief description of the Work associated with that activity.
5. Legend: Describe standard and special symbols used.

C. Contents: Identify, in chronological order, those activities reasonably required to complete the Work, including as applicable, but not limited to:

1. Obtaining permits, submittals for early product procurement, and long lead time items.
2. Mobilization and other preliminary activities.
3. Temporary facilities.
4. SWPPP and Turbidity Control and monitoring.
5. Specified Work sequences, constraints, and Milestones, including Substantial Completion date(s).
6. Lower Tier Subcontract Work.
7. Major equipment design, fabrication, factory testing, and delivery dates.
8. Site preparation activities.
9. Site clearing.
10. Pile installation by area.
11. Bulkhead support system by area.
12. Dredging activities by area.
13. Surveying and testing activities.
14. Site Backfill and armor stone installation.
15. Site restoration.
16. Project closeout and cleanup.
17. Demobilization.
18. No activity duration, exclusive of those for Submittals review and product fabrication/delivery, shall be less than 1 day unless otherwise approved.
19. Activity duration for Submittal review shall not be less than review time specified in the Specifications unless clearly identified and prior written acceptance has been obtained from the Engineer.

1.05 PROGRESS OF THE WORK

A. Updated Progress Schedule shall reflect:

1. Progress of Work to within 5 working days prior to submission.
2. Approved changes in Work scope and activities modified since submission.
3. Delays in Submittals or resubmittals, deliveries, or Work.
4. Adjusted or modified sequences of Work.

5. Other identifiable changes.
6. Revised projections of progress and completion.
7. Report of changed logic.

B. Produce detailed schedules during Project, upon request of Engineer, to further define critical portions of the Work such as facility shutdowns.

C. The "Contract Time" is the duration permitted under the Contract Agreement between the Notice to Proceed and Final Completion. "Final Completion" of the Work means completion of all Work, including punchlist work and submittal of close-out documentation, and final inspection and acceptance of the Work by USEPA. If Contractor fails to complete activity by its latest scheduled completion date and this failure is anticipated to extend the Contract Times (or Milestones), Contractor shall, within 7 days of such failure, submit a written statement as to how Contractor intends to correct nonperformance and return to acceptable current Progress Schedule. Actions by Contractor to complete the Work within Contract Time (or Milestones) will not be justification for adjustment to Contract Price or Contract Time.

D. Engineer may order Contractor to increase equipment, labor force, or working hours at no additional cost to Owner, as necessary to complete the Work by the Completion Date if Contractor fails to:

1. Complete a Milestone activity by its completion date.
2. Satisfactorily execute Work as necessary to prevent delay to overall completion of Project.

1.06 SCHEDULE ACCEPTANCE

A. Review and acceptance of the proposed schedule by the Engineer is performed for the benefit of the Owner and the Contractor shall not be permitted to rely on such review. The Engineer is not responsible to the Contractor to determine whether the Contractor's schedule represents a reasonable plan for constructing Project in accordance with the Contract Documents. Engineer's review will not make any change in Contract requirements. Lack of comment on any aspect of schedule that is not in accordance with the Contract Documents will not thereby indicate acceptance of that change, unless Contractor has explicitly called the nonconformance to Engineer's attention in submittal. Schedule remains Contractor's responsibility and Contractor retains responsibility for performing all activities, for activity durations, and for activity sequences required to construct Project in accordance with the Contract Documents and complete the Work within the Contract Time.

B. Unacceptable Preliminary Progress Schedule:

1. Make requested corrections; resubmit within 5 days.
2. Until acceptable to Engineer as Baseline Progress Schedule, continue review and revision process, during which time Contractor shall update schedule on a monthly basis to reflect actual progress and occurrences to date.

C. Unacceptable Detailed Progress Schedule:

1. Make requested corrections; resubmit within 5 days.
2. Until acceptable to Engineer as Baseline Progress Schedule, continue review and revision process.

1.07 ADJUSTMENT OF CONTRACT TIMES

A. Reference Contract Agreement.

B. Claims Based on Contract Times:

1. Where Engineer or Owner has not yet rendered formal decision on Contractor's Claim for adjustment of Contract Time, and parties are unable to agree as to amount of adjustment to be reflected in Progress Schedule, Contractor shall reflect an interim adjustment in the Progress Schedule as acceptable to Engineer.
2. It is understood and agreed that such interim acceptance will not be binding on either Owner or Contractor, and will be made only for the purpose of continuing to schedule Work until such time as formal decision has been rendered as to an adjustment, if any, of the Contract Time.
3. Contractor shall revise Progress Schedule prepared thereafter in accordance with Engineer's formal decision.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 23
SURVEYING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Providing all materials, items, operations, or methods specified, listed or scheduled on the design Drawings or Specifications, including all materials, labor, equipment and incidentals necessary and required to conduct proper surveys required to stake, layout work, prepare record drawings, and measure for payment.

B. The Contractor shall identify Site benchmarks as shown on the Drawings.

C. Bathymetric surveys shall be in accordance with Section 31 20 25.23, Mechanical Environmental Dredging.

1.02 QUALITY ASSURANCE

A. All survey, layout, and related Work shall be performed and signed by a qualified land surveyor registered in the State of Wisconsin.

1.03 SUBMITTALS

A. Submit name, address, telephone number, and qualifications of the surveyor, crew chief, superintendent and all other persons who are proposed to perform surveys or survey-related duties prior to start of any survey Work.

B. Upon request by the Engineer, submit documentation verifying accuracy of survey Work.

C. Survey of existing monitoring wells disturbed and restored after construction.

1.04 PROJECT RECORD DOCUMENTS

A. Maintain onsite a complete, accurate log of control of survey Work as it progresses.

B. All original field notes, computations, and other records for the purpose of layout and quantity surveys shall be recorded in field books. Immediately upon completing and reducing the notes for a survey or portion of survey, a copy shall be furnished to the Engineer. Upon completing a field survey book, the original field survey book shall be submitted to the Engineer for filing.

Field notes must be neat and legible, complete, self-explanatory, and self-checking. Field notes shall include, but not be limited to:

1. Complete index.
2. Date of field work.
3. Names of crew members.
4. Description of controlling survey stations.
5. Recovery description of all stations and TBMs set.
6. Sketches of work where applicable.
7. Recovery descriptions of all control stations.
8. If electronic data collection is used, raw field data output shall be provided, along with sketches and descriptions.

PART 2 PRODUCTS

2.01 GENERAL

A. Unless otherwise specified in individual Specification sections, the following minimum standards shall apply:

1. Control Surveys: Vertical shall close within 0.03 foot. Horizontal control angles shall close to the nearest 20 seconds plus or minus 10 seconds. Measured distances shall be plus or minus 0.01 foot.
2. Measurement Surveys: Elevation shall be to the nearest 0.1 foot plus or minus 0.05 foot. Horizontal distances shall be plus or minus 0.1 foot.

2.02 EQUIPMENT AND MATERIALS

A. Provide all equipment and materials as required to properly perform the surveys, including, but not limited to, instruments, tapes, rods, measures, mounts and tripods, stakes and hubs, nails, ribbons, other reference markers, and all else as required. All material shall be of good professional quality and in first-class condition.

B. All lasers, transits, and other instruments shall be calibrated and maintained in accurate calibration throughout the execution of the Work.

PART 3 EXECUTION

3.01 GENERAL

A. Exercise care during the execution of all phases of the Work to minimize any disturbance to existing property and to the landscape in the areas surrounding the Work site.

3.02 INSPECTION

A. Verify with the Engineer locations of site benchmarks prior to starting Work. Promptly notify the Engineer of any discrepancies discovered. Verify layouts periodically and when directed by the Engineer during construction.

3.03 BENCHMARKS

A. Protect site benchmarks and survey monuments prior to starting Work and preserve the benchmarks during construction. Site benchmarks shall not be relocated without prior written approval from the Engineer. If needed, relocate reference and temporary benchmarks outside of Work zone prior to starting Work. Survey monuments shall be preserved or replaced in accordance with State of Wisconsin requirements.

B. Promptly report to the Engineer the loss, damage, or destruction of any benchmark or relocation required because of changes in grades or other reasons. Replace dislocated benchmarks or survey monuments based on original survey control at the Contractor's sole expense.

3.04 SURVEY REQUIREMENTS

A. Reference survey and site reference points to the benchmarks provided on the Drawings and record locations of site benchmarks, with horizontal and vertical data, on Project Record Documents.

B. Establish lines, levels, and locate and lay out by instrumentation and similar appropriate means site features to be constructed including necessary stakes for cut, fill, placement, and grading operations and stakes for utility locations, slopes, and invert elevations. When it is necessary to remove a grade marker for construction operations, parallel grade line stakes shall be maintained extending at least three grade markers ahead of the construction operation.

C. All marks given shall be carefully preserved and, if destroyed or removed without the Engineer’s approval, they shall be reset, if necessary, at the Contractor's sole expense.

D. Establish the location of all features and facilities (i.e., utilities, walls, vaults, etc.) that will be removed and reconstructed.

E. Survey the location of existing sheet pile bulkhead adjacent to dredging operations prior to the start of work. Monitor any movement of the structure.

F. It shall be the duty of the Contractor to keep the Engineer informed of the times and places at which he intends to work in order that the Engineer may have an ample opportunity to furnish and/or to check the lines and elevations with a minimum of inconvenience to the client or delay to the Contractor.

3.05 PRE-CONSTRUCTION AND POST-CONSTRUCTION SURVEY

A. Perform pre-construction topographic survey of areas for temporary access roads, areas cleared for site access or areas for temporary facilities.

B. Perform post construction of areas disturbed for temporary access areas or facilities after the areas are restored to verify these areas are returned to pre-construction condition.

3.06 SURVEYS FOR MEASUREMENT AND PAYMENT

A. Notify the Engineer prior to starting Work.

B. Perform surveys, in a manner acceptable to the Engineer, to determine quantities of unit cost work and percent of completed lump sum work, including surveys to establish measurement reference lines.

C. The Contractor shall keep a duplicate set of field notes and shall calculate and certify quantities for payment purposes.

D. The cost to the Contractor of all Work and delays occasioned by giving lines and grades, or making other necessary measurements, will be considered as having been included in the unit and lump sum prices for Work items in the Bid Form incorporated in the Contract Agreement.

3.07 SURVEYS FOR RECORD DRAWINGS

A. Perform all surveys required for the maintenance of the record drawings as specified in Section 01 77 00, Closeout Procedures.

END OF SECTION

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 DEFINITIONS

A. Action Submittal: Written and graphic information submitted by Contractor that requires Engineer's approval.

B. Informational Submittal: Information submitted by Contractor that requires Engineer's review and determination that submitted information is in accordance with the Specifications or other Contract Documents Agreement.

1.02 PROCEDURES

A. Direct submittals to Engineer at the following, unless specified otherwise.

1. CH2M HILL
   Attn: Jeff Danko
   135 South 84th Street, Suite 400
   Milwaukee, WI 53214
2. Via Contract Manager.

B. Electronic Submittals: Submittals shall, unless specifically approved otherwise by Engineer, be provided in electronic format.

1. Each submittal shall be an electronic file in Adobe Acrobat Portable Document Format (PDF). Use the latest version available at time of execution of the Agreement.
2. Electronic files that contain more than 10 pages in PDF format shall contain internal bookmarking from an index page to major sections of the document.
3. PDF files shall be set to open "Bookmarks and Page" view.
4. Add general information to each PDF file, including title, subject, author, and keywords.
5. PDF files shall be set up to print legibly at 8.5-inch by 11-inch or 11-inch by 17-inch. No other paper sizes will be accepted unless prior approval from Engineer is obtained.
6. Submit new electronic files for each resubmittal.
7. Include a copy of the Transmittal of Contractor's Submittal form, located at end of section, with each electronic file.
8. Detailed procedures for handling electronic submittals will be discussed at the Preconstruction Conference.

C. Transmittal of Submittal:

1. Contractor shall:
   a. Review each submittal and check for compliance with Contract Documents.
   b. Stamp each submittal with uniform approval stamp before submitting to Engineer.
      1) Stamp to include Project name, submittal number, Specification number, Contractor's reviewer name, date of Contractor's approval, and statement certifying submittal has been reviewed, checked, and approved for compliance with Contract Documents.
      2) Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.
2. Complete, sign, and transmit with each submittal package, one Transmittal of Contractor's Submittal form attached at end of this section.
3. Identify each submittal with the following:
   a. Numbering and Tracking System:
      1) Sequentially number each submittal.
      2) Resubmission of submittal shall have original number with sequential alphabetic suffix.
   b. Specification section and paragraph to which submittal applies.
   c. Project title and Engineer's project number.
   d. Date of transmittal.
   e. Names of Subcontractor, or Supplier, and manufacturer as appropriate.
4. Identify and describe each deviation or variation from Contract Documents.

D. Format:

1. Do not base Shop Drawings on reproductions of Contract Documents.
2. Package submittal information by individual specification section. Do not combine different specification sections together in submittal package, unless otherwise directed in specification.
3. Present in a clear and thorough manner and in sufficient detail to show kind, size, arrangement, and function of components, materials, and devices, and compliance with Contract Documents.
4. Index with labeled tab dividers in orderly manner.

E. Timeliness: Schedule and submit in accordance Schedule of Submittals, and requirements of individual Specification sections.

F. Processing Time:

1. Time for review shall commence on Engineer's receipt of submittal.
2. Engineer will act upon Contractor's submittal and transmit response to Contractor not later than 10 workdays after receipt, unless otherwise specified.
3. Resubmittals will be subject to same review time.
4. No adjustment of Contract Times or Contract Price will be allowed as a result of delays in progress of Work caused by rejection and subsequent resubmittals.

G. Resubmittals: Clearly identify each correction or change made.

H. Incomplete Submittals:

1. Engineer will return entire submittal for Contractor's revision if preliminary review deems it incomplete.
2. When any of the following are missing, submittal will be deemed incomplete:
   a. Contractor's review stamp; completed and signed.
   b. Transmittal of Contractor's Submittal; completed and signed.
   c. Sufficient number of copies.

I. Submittals not required by Contract Documents:

1. Will not be reviewed and will be returned stamped "Not Subject to Review."
2. Engineer will keep one copy and return submittal to Contractor.

1.03 ACTION SUBMITTALS

A. Prepare and submit Action Submittals required by individual Specification sections.

B. Shop Drawings:

1. Copies: Electronic format, unless hardcopy acceptable to Engineer; if hardcopies provided: Four and one reproducible, except copyrighted documents. Identify and Indicate:
   a. Applicable Contract Drawing and Detail number, products, units and assemblies, and system or equipment identification or tag numbers.
   b. Equipment and Component Title: Identical to title shown on Drawings.

c. Critical field dimensions and relationships to other critical features of Work. Note dimensions established by field measurement.
d. Project-specific information drawn accurately to scale.

2. Manufacturer's standard schematic drawings and diagrams as follows:
   a. Modify to delete information that is not applicable to the Work.
   b. Supplement standard information to provide information specifically applicable to the Work.
3. Product Data: Provide as specified in individual Specifications.
4. Foreign Manufacturers: When proposed, include names and addresses of at least two companies that maintain technical service representatives close to Project.

C. Samples:

1. Copies: Two unless otherwise specified in individual Specifications. Package Samples in manner specified to facilitate review of quality. Attach label on unexposed side that includes the following:
   a. Manufacturer name.
   b. Model number.
   c. Material.
   d. Sample source.

D. Action Submittal Dispositions: Engineer will review, comment, stamp, and distribute as noted:

1. Approved:
   a. Contractor may incorporate product(s) or implement Work covered by submittal.
   b. Distribution:
      1) One copy furnished Engineer's Onsite Project Representative.
      2) One copy retained in Engineer's file.
      3) Remaining copies returned to Contractor appropriately annotated.
2. Approved as Noted:
   a. Contractor may incorporate product(s) or implement Work covered by submittal, in accordance with Engineer's notations.
   b. Distribution:
      1) One copy furnished Engineer's Onsite Project Representative.
      2) One copy retained in Engineer's file.
      3) Remaining copies returned to Contractor appropriately annotated.

3. Partial Approval, Resubmit as Noted:
    a. Make corrections or obtain missing portions, and resubmit.
    b. Except for portions indicated, Contractor may begin to incorporate product(s) or implement Work covered by submittal, in accordance with Engineer's notations.
    c. Distribution:
        1) One copy furnished Engineer's Onsite Project Representative.
        2) One copy retained in Engineer's file.
        3) Remaining copies returned to Contractor appropriately annotated.
4. Revise and Resubmit:
    a. Contractor may not incorporate product(s) or implement Work covered by submittal.
    b. Distribution:
        1) One copy furnished Engineer's Onsite Project Representative.
        2) One copy retained in Engineer's file.
        3) Remaining copies returned to Contractor appropriately annotated.

1.04 INFORMATIONAL SUBMITTALS

A. General:

1. Copies: Submit three copies, unless otherwise indicated in individual Specification section.
2. Refer to individual Specification sections for specific submittal requirements.
3. Engineer will review each submittal. If submittal meets conditions of the Contract, Engineer will forward copy to appropriate parties. If Engineer determines submittal does not meet conditions of the Contract and is therefore considered unacceptable, Engineer will retain one copy and return remaining copy with review comments to Contractor, and require that submittal be corrected and resubmitted.

B. Certificates:

1. General:
    a. Provide notarized statement that includes signature of entity responsible for preparing certification.
    b. Signed by officer or other individual authorized to sign documents on behalf of that entity.
2. Welding: In accordance with individual Specification sections.

3. Material Test: Prepared by qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
4. Certificates of Successful Testing or Inspection: Submit when testing or inspection is required by Laws and Regulations or governing agency or specified in individual Specification sections.

C. Closeout Submittals: In accordance with Section 01 77 00, Closeout Procedures.

D. Schedules:

1. Schedule of Submittals: Prepare separately or in combination with Progress Schedule as specified in Section 01 32 00, Construction Progress Documentation.
   a. Show for each, at a minimum, the following:
      1) Specification section number.
      2) Identification by numbering and tracking system as specified under Paragraph Transmittal of Submittal.
      3) Estimated date of submission to Engineer, including reviewing and processing time.
   b. On a monthly basis, submit updated Schedule of Submittals to Engineer if changes have occurred or resubmittals are required.
2. Progress Schedules: In accordance with Section 01 32 00, Construction Progress Documentation.

E. Special Guarantee: Supplier's written guarantee as required in individual Specification sections.

F. Submittals Required by Laws, Regulations, and Governing Agencies:

1. Promptly submit notifications, reports, certifications, payrolls, and otherwise as may be required, directly to the applicable federal, state, or local governing agency or their representative.
2. Transmit to Engineer for Owner's records one copy of correspondence and transmittals (to include enclosures and attachments) between Contractor and governing agency.

G. Test, Evaluation, and Inspection Reports:

1. General: Shall contain signature of person responsible for test or report.
2. Field:
   a. As a minimum, include the following:
      1) Project title and number.
      2) Date and time.

3) Record of temperature and weather conditions.
4) Identification of product and specification section.
5) Type and location of test, Sample, or inspection, including referenced standard or code.
6) Date issued, testing laboratory name, address, and telephone number, and name and signature of laboratory inspector.
7) If test or inspection deems material or equipment not in compliance with Contract Documents, identify corrective action necessary to bring into compliance.
8) Provide interpretation of test results, when requested by Engineer.
9) Other items as identified in individual specification sections.

1.05 SUPPLEMENTS

A. The supplements listed below, following “End of Section”, are part of this specification.

1. Forms: Transmittal of Contractor’s Submittal.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

VBW BULKHEAD SUPPORT AND DREDGING
TYCO FIRE PRODUCTS

CH2MHILL

TRANSMITTAL OF CONTRACTOR'S SUBMITTAL

(ATTACH TO EACH SUBMITTAL)

DATE: _____

TO: _____ _____ _____ _____ _____ **FROM**: _____ Contractor _____ _____ _____	Submittal No.: _____ ☐ New Submittal ☐ Resubmittal Project: _____ Project No.: _____ Specification Section No.: _____ **(Cover only one section with each transmittal)** Schedule Date of Submittal: _____

SUBMITTAL TYPE:	☐ Shop Drawing	☐ Sample	☐ Informational
	☐ Deferred		

The following items are hereby submitted:

Number of Copies	Description of Item Submitted (Type, Size, Model Number, Etc.)	Spec. and Para. No.	Drawing or Brochure Number	Contains Variation to Contract	
				No	Yes

Contractor hereby certifies that (i) Contractor has complied with the requirements of Contract Documents in preparation, review, and submission of designated Submittal and (ii) the Submittal is complete and in accordance with the Contract Documents and requirements of laws and regulations and governing agencies.

By: _____
Contractor (Authorized Signature)

SECTION 01 45 16.13
CONSTRUCTION QUALITY CONTROL

PART 1 GENERAL

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this Section:

1. ASTM International (ASTM):
   a. D3740, Evaluation of Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
   b. E329, Use in the Evaluation of Testing and Inspection Agencies as Used in Construction.

1.02 DEFINITIONS

A. Construction Quality Control (CQC): The means by which Contractor ensures that the construction, to include that performed by subcontractors and suppliers, complies with the requirements of the Contract.

1.03 SUBMITTALS

A. Informational Submittals:

1. CQC Plan: Submit, not later than 30 days after receipt of Notice to Proceed.
2. CQC Report: Submit, weekly, an original and one copy in report form.

1.04 CONTRACTOR'S QUALITY ASSURANCE

A. All Work is subject to Engineer's quality assurance inspection and testing at all locations and at all reasonable times before acceptance to ensure strict compliance with the terms of the Contract Documents.

B. Engineer's quality assurance inspections and tests are for the sole benefit of Engineer and Owner and do not:

1. Relieve Contractor of responsibility for providing adequate quality control measures;
2. Relieve Contractor of responsibility for defects in the Work or failure of the Work to comply with the Contract Documents;
3. Relieve Contractor of responsibility for damage to or loss of the material before acceptance;

4. Constitute or imply acceptance of the Work or any portion of the Work; or;
5. Affect the continuing rights of Engineer or Owner after acceptance of the completed Work.

C. The presence or absence of a quality assurance inspector does not relieve Contractor from any Contract requirement.

D. Promptly furnish all facilities, labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by Engineer, USEPA or WDNR.

E. Engineer may charge Contractor for any additional cost of inspection or test when Work is not ready at the time specified by Contractor for inspection or test, or when prior rejection makes re-inspection or retest necessary. Quality assurance inspections and tests will be performed in a manner that will not unnecessarily delay the Work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

A. Maintain an adequate inspection system and perform such inspections as will ensure that the Work conforms to the Contract Documents.

B. Maintain complete inspection records and make them available at all times to Owner and Engineer.

C. The quality control system shall consist of plans, procedures, and organization necessary to produce an end product that complies with the Contract Documents. The system shall cover all construction and demolition operations, both on Site and off Site, including Work by subcontractors, fabricators, suppliers and purchasing agents, and shall be keyed to the proposed construction sequence.

3.02 COORDINATION MEETING

A. During the Preconstruction Conference, discuss the quality control system.

B. Develop a mutual understanding of the system details, including the forms for recording the CQC operations, control activities, testing, administration of the system for both on Site and off Site Work, and the interrelationship of Contractor’s management and control with the Engineer’s Quality Assurance.

C. There may be occasions when subsequent conferences may be called by either Contractor or Engineer to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures that may require corrective action by Contractor.

3.03 QUALITY CONTROL ORGANIZATION

A. CQC System Manager:

1. Designate an individual within Contractor's organization who will be responsible for overall management of CQC and have the authority to act in CQC matters for the Contractor.
2. CQC System Manager may perform other duties on the Project.
3. CQC System Manager shall be an experienced construction person, with a minimum of 3 years construction experience on similar type Work.
4. CQC System Manager shall report to the Contractor's project manager or someone higher in the organization. Project manager in this context shall mean the individual with responsibility for the overall quality and production management of the Project.
5. CQC System Manager shall be onsite during construction.

3.04 QUALITY CONTROL PHASING

A. CQC shall include at least three phases of control to be conducted by CQC System Manager for all definable features of Work, as follows:

1. Preparatory Phase:
   a. Notify Engineer at least 48 hours in advance of beginning any of the required action of the preparatory phase.
   b. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The CQC System Manager shall instruct applicable CQC staff as to the acceptable level of workmanship required in order to meet Contract requirements.
   c. Document the results of the preparatory phase meeting by separate minutes prepared by the CQC System Manager and attached to the QC report.
   d. Perform prior to beginning Work on each definable feature of Work:
      1) Review applicable Contract Specifications.
      2) Review applicable Contract Drawings.
      3) Verify that all materials and/or equipment have been tested, submitted, and approved.

4) Verify that provisions have been made to provide required control inspection and testing.
5) Examine the Work area to verify that all required preliminary Work has been completed and is in compliance with the Contract.
6) Perform a physical examination of required materials, equipment, and sample Work to verify that they are on hand, conform to approved Shop Drawing or submitted data, and are properly stored.
7) Review the appropriate activity hazard analysis to verify safety requirements are met.
8) Review procedures for constructing the Work, including repetitive deficiencies.
9) Document construction tolerances and workmanship standards for that phase of the Work.
10) Check to verify that the plan for the Work to be performed, if so required, has been accepted by Engineer.

2. Initial Phase:
   a. Accomplish at the beginning of a definable feature of Work:
      1) Notify Engineer at least 48 hours in advance of beginning the initial phase.
      2) Perform prior to beginning Work on each definable feature of Work:
         a) Review minutes of the preparatory meeting.
         b) Check preliminary Work to verify compliance with Contract requirements.
         c) Verify required control inspection and testing.
         d) Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Comparison with sample panels is appropriate.
         e) Resolve all differences.
         f) Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.
      3) Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the QC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.
      4) The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3. Follow-up Phase:
   a. Perform daily checks to verify continuing compliance with Contract requirements, including control testing, until completion of the particular feature of Work.
   b. Daily checks shall be made a matter of record in the CQC documentation and shall document specific results of inspections for all features of Work for the day or shift.
   c. Conduct final follow-up checks and correct all deficiencies prior to the start of additional features of Work that will be affected by the deficient Work. Constructing upon or concealing nonconforming Work will not be allowed.
4. Additional Preparatory and Initial Phases: Additional preparatory and initial phases may be conducted on the same definable features of Work as determined by Engineer if the quality of ongoing Work is unacceptable; or if there are changes in the applicable QC staff or in the onsite production supervision or work crew; or if work on a definable feature is resumed after a substantial period of inactivity, or if other problems develop.

3.05 CONTRACTOR QUALITY CONTROL PLAN

A. General:

1. Plan shall identify personnel, procedures, control, instructions, test, records, and forms to be used.
2. An interim plan for the first 30 days of operation will be considered.
3. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of Work to be started.
4. Work outside of the features of Work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of Work to be started.

B. Content:

1. Plan shall cover the intended CQC organization for the entire Contract and shall include the following, as a minimum:
   a. Organization: Description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff will implement the three-phase control system (see Paragraph QC Phasing) for all aspects of the Work specified.

b. CQC Staff: The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a QC function.
c. Letters of Authority: A copy of a letter to the CQC System Manager signed by an authorized official of the firm, describing the responsibilities and delegating sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop Work which is not in compliance with the Subcontract.
d. Testing: Control, verification and acceptance testing procedures for each specific test to include the test name, frequency, specification paragraph containing the test requirements, the personnel and laboratory responsible for each type of test, and an estimate of the number of tests required.
e. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests, including documentation.
f. Procedures for tracking deficiencies from identification through acceptable corrective action. These procedures will establish verification that identified deficiencies have been corrected.
g. Reporting procedures, including proposed reporting formats; include a copy of the CQC report form.

C. Acceptance of Plans: Acceptance of the Contractor's basic and addendum CQC plans is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. Engineer reserves the right to require Contractor to make changes in the CQC plan and operations including removal of personnel, as necessary, to obtain the quality specified.

D. Notification of Changes: After acceptance of the CQC plan, Contractor shall notify Engineer, in writing, a minimum of 7 calendar days prior to any proposed change. Proposed changes are subject to acceptance by Engineer.

3.06 CONTRACTOR QUALITY CONTROL REPORT

A. Maintain current records of quality control operations, activities, and tests performed, including the Work of subcontractors and suppliers.

B. Records shall be on an acceptable form and shall be a complete description of inspections, the results of inspections, daily activities, tests, and other items, including but not limited to the following:

1. Contractor and their areas of responsibility.

2. Work performed today, giving location, description, and by whom. When a network schedule is used, identify each phase of Work performed each day by activity number.
3. Test and/or control activities performed with results and references to specifications/plan requirements. The control phase should be identified (Preparatory, Initial, Follow-up). List deficiencies noted along with corrective action.
4. Material received with statement as to its acceptability and storage.
5. Identify submittals reviewed, with Contract reference, by whom, and action taken.
6. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
7. List instructions given/received and conflicts in Drawings and/or Specifications.
8. Copies of initial waste manifests (generator and transporter signed only), final facility signed manifests (generator, transporter, and facility signed), weight tickets, and certificates of disposal (CDs).
9. Contractor's verification statement.
10. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in file work and workmanship comply with the Contract.

3.07 SUBMITTAL QUALITY CONTROL

A. Submittals shall be as specified in Section 01 33 00, Submittal Procedures. The CQC organization shall be responsible for certifying that all submittals are in compliance with the Contract requirements. Engineer will furnish copies of test report forms upon request by Contractor. Contractor may use other forms as approved.

3.08 TESTING QUALITY CONTROL

A. Testing Procedure:

1. Perform tests specified or required to verify that control measures are adequate to provide a product which conforms to Contract requirements. Procure services of an independent licensed testing laboratory. Perform the following activities and record the following data:
   a. Verify testing procedures comply with subcontract requirements.
   b. Verify facilities and testing equipment are available and comply with testing standards.
   c. Check test instrument calibration data against certified standards.

d. Verify recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
e. Documentation:
    1) Record results of all tests taken, both passing and failing, on the CQC report for the date taken.
    2) Include specification paragraph reference, location where tests were taken, and the sequential control number identifying the test.
    3) Actual test reports may be submitted later, if approved by Engineer, with a reference to the test number and date taken.
    4) Provide directly to Engineer an information copy of tests performed by an offsite or commercial test facility. Test results shall be signed by an engineer registered in the state where the tests are performed.
    5) Failure to submit timely test reports, as stated, may result in nonpayment for related Work performed and disapproval of the test facility for this Contract.

B. Testing Laboratories: Laboratory facilities, including personnel and equipment, utilized for testing soils, concrete, asphalt and steel shall meet criteria detailed in ASTM D3740 and ASTM E329, and be accredited by the American Association of Laboratory Accreditation (AALA), National Institute of Standards and Technology (NIST), National Voluntary Laboratory Accreditation Program (NVLAP), the American Association of State Highway and Transportation Officials (AASHTO), or other approved national accreditation authority. Personnel performing concrete testing shall be certified by the American Concrete Institute (ACI).

3.09 SURVEY

A. Pre-dredge, Interim and Post-dredge Bathymetric Surveys.

1. Contractor shall procure an independent registered surveyor in hydrographic surveys to take pre-dredge, interim, and post-dredge bathymetric surveys. Alternatively, Contractor shall perform pre-dredge, interim, and post-dredge bathymetric survey using its own qualified personnel, allowing a representative of the Owner or engineer to observe the entire process, including calibration, surveying, and post-processing.
2. Bathymetric survey will be performed in accordance with Section 31 20 25.23, Mechanical Environmental Dredging.
3. Contractor will provide the Engineer for review, specifications and quality assurance/quality control criteria as to how the Contractors surveyor will collect bathymetric data and grid spacing.

B. Pre-Construction and Post-construction Surveys:

1. Contractor shall procure an independent registered surveyor to perform pre-construction of site areas to be disturbed by the construction of temporary roadways or site access areas.
2. Surveyor will perform post-construction survey to verify disturbed areas are returned to pre-construction condition.
3. Survey will be performed in accordance with Section 01 32 23, Surveying.

3.10 COMPLETION INSPECTION

A. CQC System Manager shall conduct an inspection of the Work at the completion of all Work and any Milestone established by a completion time stated in the Contract.

END OF SECTION

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. National Fire Prevention Association (NFPA): 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations.
2. Occupational Safety and Health Administration; Title 29 Code of Federal Regulations.

1.02 SUBMITTALS

A. Informational Submittals:

1. Copies of permits and approvals for construction as required by laws, statutes, codes, and governmental regulations and governing agencies.
2. Temporary Construction Submittals:
   a. Access Roads: Routes, cross-sections, and drainage facilities.
   b. Contractor's field offices, storage yard, and storage building plans, including gravel surfaced area and temporary equipment mats.
   c. Fencing and protective barrier locations and details.
   d. Delivery of decontamination and contact storm water to existing water treatment facilities and other Site Work required by the Contract Documents
3. Temporary Control Submittals:
   a. Storm water control plan and storm water pollution prevention plan (SWPPP).
   b. Dust control and monitoring plan.
   c. Plan for intended haul routes.
4. Specifications and users manuals for all equipment provided by Contractor for Engineer's use.

1.03 MOBILIZATION

A. Mobilization shall include, but not be limited to, these principal items:

1. Obtaining required licenses and permits.
2. Moving Contractor's and Engineer's field offices and required equipment onto Site.

3. Moving all drilling, pile driving, dredging equipment, and other required support equipment.
4. Installing temporary construction power, wiring, and lighting facilities.
5. Providing onsite communication facilities, including telephones.
6. Providing onsite sanitary facilities and potable water facilities as specified and as required by laws, statutes, codes, and governmental regulations and governing agencies.
7. Arranging for and erection of Contractor's work and storage yard.
8. Posting OSHA required notices and establishing safety programs and procedures.
9. Having Contractor's superintendent at Site full time.
10. Establishing erosion control, security and stormwater pollution prevention measures.

B. Use area designated for Contractor's field office, staging, and storage as shown on Drawings. No other area is available at Site on Owner's property or City's property for Contractor's temporary facilities. Provide lands and access to lands for temporary facilities for use by Engineer's for duration of Project.

1.04 PROTECTION OF WORK AND PROPERTY

A. Comply with Owner's safety rules while on Owner's property, in addition to safety requirements under Specification Section 01 11 01, Health, Safety and Emergency Response.

B. Keep Engineer informed of near misses, incidents, serious onsite accidents and related claims, in addition to safety reporting requirements under Specification Section 01 11 01, Health, Safety and Emergency Response.

C. Use of Explosives: No blasting or use of explosives will be allowed onsite.

1.05 VEHICULAR TRAFFIC

A. Traffic Control Plan: Prior to start of Work, provide traffic control plan and haul route for review by Engineer. Changes to the approved plan shall be made only by written approval of the Engineer. Secure written approval for necessary changes so as not to delay progress of the Work.

B. Traffic Routing Plan: Show sequences of construction affecting use of roadways, time required for each phase of the Work, provisions for decking over excavations and phasing of operations to provide necessary access, and plans for signing, barricading, and striping to provide passages for pedestrians and vehicles.

C. Secure advance approval of the Engineer, Owner, and the City for any lane or road closures.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 TEMPORARY UTILITIES

A. Power: Electric power for the Contractor's use is not available on Site. Contractor shall determine type and amount available and make arrangements for obtaining temporary electric power service, metering equipment, and pay costs for electric power used during Contract period. Electric power is not available at other locations of the Site. Make all arrangements and pay for electrical power needed. If Contractor elects to use diesel generators, individual generators must be rated below 10MMBtu/hr for any single generator.

B. Lighting: Provide temporary lighting to meet applicable safety requirements to allow erection, application, or installation of materials and equipment, and observation or inspection of the Work.

C. Water:

1. No construction or potable water is available at Site. Make arrangements for and bear costs of providing water required for construction purposes and for drinking by construction personnel during construction.
2. Hydrant Water:
    a. May be available from nearby hydrants. Secure written permission for connection and use from water department and meet requirements for use. Notify fire department before obtaining water from fire hydrants.
    b. Use only special hydrant-operating wrenches to open hydrants. Make certain hydrant valve is open full, since cracking valve causes damage to hydrant. Repair damaged hydrants and notify appropriate agency as quickly as possible. Hydrants shall be completely accessible to fire department at all times.
    c. Include costs to connect and transport water to construction areas in Contract Price.

D. Sanitary and Personnel Facilities:

1. Provide and maintain facilities for Engineer's and Owner's Representative's employees, Contractors, and other on Site employers' employees. Service, clean, and maintain facilities and enclosures.
2. Telephone Service: Arrange and provide onsite telephone service for use during construction. Pay costs of installation and monthly bills.

E. Fire Protection: Furnish and maintain on Site adequate firefighting equipment capable of extinguishing incipient fires. Fire extinguishers shall be manufactured by Tyco. Comply with applicable parts of NFPA 241.

3.02 PROTECTION OF WORK AND PROPERTY

A. General:

1. Perform Work within right-of-way and easements in a systematic manner that minimizes inconvenience to property owners and the public.
2. No residence or business shall be cut off from vehicular traffic, unless special arrangements satisfactory to owners of said residences and businesses have been made.
3. Maintain in continuous service existing storm water outfalls, oil and gas pipelines, underground power, telephone or communication cable, water mains, irrigation lines, sewers, poles and overhead power, and other utilities encountered a long line of the Work, unless other arrangements satisfactory to owners of said utilities have been made.
4. Where completion of the Work requires temporary or permanent removal or relocation of existing utility, coordinate activities with owner of said utility and perform work to their satisfaction.
5. Protect, shore, brace, support, and maintain underground pipes, conduits, drains, and other underground utility construction uncovered or otherwise affected by construction operations.
6. Keep fire hydrants and water control valves free from obstruction and available for use at all times.
7. Maintain access to all Site monitoring wells unless otherwise approved by the Engineer.
8. In areas where Contractor's operations are adjacent to or near a utility, such as gas, telephone, television, electric power, water, sewer, or irrigation system, and such operations may cause damage or inconvenience, suspend operations until arrangements necessary for protection have been made by Contractor.

9. Notify property owners and utility offices that may be affected by construction operation at least 3 days in advance by calling the Wisconsin utility one-call number (Diggers Hotline) or utility owners directly as appropriate. Before exposing a utility, obtain utility owner's permission. Should service of utility be interrupted due to Contractor's operation, notify proper authority immediately. Cooperate with said authority in restoring service as promptly as possible and bear costs incurred.
10. Do not impair operation of existing sewer system. Prevent construction material, pavement, concrete, earth, volatile and corrosive wastes, and other debris from entering sewers, pump stations, or other sewer structures.
11. Install and maintain erosion and sediment control devices, etc., in accordance with the SWPPP.

B. Site Security:

1. If Contractor removes fencing in order to complete the Work, Contractor shall install and maintain a temporary replacement fence that does not interfere with the Work so that Site access is restricted at all times. Once the Work in that area has been completed, the Contractor shall remove the temporary fence and reinstall fencing along the original alignment.
2. Contractor will be responsible for security of its equipment and materials at the Site during the Work. The Owner and Engineer assume no liability for theft of Contractor-supplied equipment or materials.

C. Barricades and Lights:

1. Provide as required by applicable federal, state, and local regulations and in sufficient quantity to safeguard public and the Work.
2. Provide as necessary to prevent unauthorized entry to construction areas and affected roads, streets, and alleyways, inside and outside of fenced area, and as required to ensure public safety and the safety of Contractor's employees, other employer's employees, and others who may be affected by the Work.
3. Provide to protect existing facilities and adjacent properties from potential damage.
4. Locate to enable access by facility operators and property owners.
5. Protect streets, roads, highways, and other public thoroughfares that are closed to traffic by effective barricades with acceptable warning signs.
6. Locate barricades at the nearest intersecting public thoroughfare on each side of blocked section.
7. Illuminate barricades and obstructions with warning lights from sunset to sunrise.

D. Signs and Equipment:

1. Provide as required to conform to requirements of state and local Department of Transportation.
2. Provide at obstructions, such as material piles and equipment.
3. Use to alert general public of construction hazards, which would include surface irregularities, unramped walkways, grade changes, and trenches or excavations in roadways and in other public access areas.

E. Trees and Plantings: Protect from damage and preserve trees, shrubs, and other plants outside limits of the Work and within limits of the Work, which are designated on Drawings to remain undisturbed.

F. Existing Structures:

1. Where Contractor contemplates removal of small structures such as mailboxes, signposts, and culverts that interfere with Contractor's operations, obtain approval of property owner and Engineer.
2. Replace items removed in their original location and a condition equal to or better than original.
3. Existing structures in river (Railroad Bridge, outfalls, etc.) shall be protected in place from damage during construction.

G. Waterways: Keep ditches, culverts, and natural drainages continuously free of construction materials, sediment, and debris except where necessary to dewater to conduct excavation activities.

H. Archaeological Finds: Should finds of an archaeological or paleontological nature be made within Site limits, immediately notify Engineer and proceed in accordance with the Contract Documents. Continue the Work in other areas without interruption.

3.03 TEMPORARY CONTROLS

A. Air Pollution Control:

1. Minimize air emissions from construction operations.
2. Burning of waste materials, rubbish, or other debris will not be permitted on or adjacent to Site.

3. Conduct operations of dumping and transporting of materials in trucks to cause a minimum of dust. Give unpaved streets, roads, detours, or haul roads used in construction area a dust-preventive treatment or periodically water to prevent dust. Strictly adhere to applicable environmental regulations for dust prevention.
4. All diesel generators shall be rated below 10MMBtu/hr for any single generator.

B. Noise Control: Provide acoustical barriers so noise emanating from tools or equipment will not exceed legal noise levels.

C. Water Pollution Control:

1. Control and contain all storm water, decontamination and process water on staging soil stabilization area. Collect this water and pump to the water treatment facility shown.
2. Prior to any anticipated rainfall event cover all material stockpiles and clean staging/stabilization area to reduce the potential for storm water to contact contaminates.
3. Divert non-storm waste flow interfering with construction and requiring diversion to sanitary sewers. Do not cause or permit action to occur which would cause an overflow to existing waterway.
4. Prior to commencing clearing, excavation, and construction, obtain Engineer's agreement with detailed plans showing procedures intended to handle and dispose of storm water flow, decontamination water, and other process water including sediment decant water discharges.
5. Comply with procedures outlined in U.S. Environmental Protection Agency manuals entitled, "Guidelines for Erosion and Sedimentation Control Planning" and "Implementation, Processes, Procedures, and Methods to Control Pollution Resulting from All Construction Activity," and "Erosion and Sediment Control-Surface Mining in Eastern United States."
6. Do not dispose of volatile wastes such as mineral spirits, oil, chemicals, or paint thinner in storm or sanitary drains. Disposal of wastes into streams or waterways is prohibited. Provide acceptable containers for collection and disposal of waste materials, debris, and rubbish.

D. Turbidity Control: Turbidity control shall be a specific in Section 31 20 25.23, Mechanical Environmental Dredging and Section 31 21 12, Sediment Resuspension Control.

E. Erosion, Sediment, and Flood Control: Provide, maintain, and operate temporary facilities to control erosion and sediment releases, and to protect the Work and existing facilities from flooding during construction period in accordance with the approved Water Control Plan.

1. Take precautions not to damage existing and installed erosion and sediment control devices.
2. If erosion and/or sediment control devices are damaged, repair or replace them to the satisfaction of Engineer within 24 hours or sooner if erosion would otherwise occur.

3.04 VEHICLE SERVICING AND FUELING

A. Contractor shall prepare and implement an Onsite Fueling and Spill Containment Plan that includes the following minimum requirements:

1. Fuel, petroleum products, and other materials containing hazardous materials shall not be stored at the Site.
2. Vehicles shall only be refueled and serviced onsite by fuel trucks and service trucks that come to the Site only for refueling and servicing and are not parked at the Site.
3. Spill adsorbent material shall be maintained near any refueling or servicing location sufficient to absorb 100 gallons of fuel.
4. Contractor shall dispose of any spent spill adsorbent material following all applicable laws and regulations.
5. In the event of a spill greater than the capacity of onsite spill adsorbent material, the Contractor shall follow the Emergency Response Plan in the HSERP.
6. Contractor shall transport at its own cost and dispose of any soil or other materials on the Site contaminated by fueling and vehicle servicing activities.

3.05 ACCESS ROADS AND DETOURS

A. If necessary to conduct Work, construct access roads within easements, rights-of-way, or Project limits. Include locations of such access roads in the Work Plan.

B. Maintain drainage ways. Install and maintain culverts to allow water to flow beneath access roads. Provide corrosion-resistant culvert pipe of adequate strength to resist construction loads.

C. Provide gravel, crushed rock, or other stabilization material to permit access by all motor vehicles at all times.

D. Maintain road grade to eliminate potholes, rutting, and other irregularities that restrict access.

E. Where access road crosses existing fences, install and maintain gates.

F. Upon completion of construction, restore ground surface disturbed by access road construction to original grade, unless otherwise directed by Engineer.

3.06 PARKING AREAS

A. Control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, Owner's operations, or construction operations.

3.07 VEHICULAR TRAFFIC

A. Comply with Laws and Regulations regarding closing or restricting use of public streets or highways. No public or private road shall be closed, except by written permission of proper authority. Ensure the least possible obstruction to traffic and normal commercial pursuits.

B. Coordinate Site material deliveries and vehicle access with Dredging Contractor's hauling activities.

C. At no time will the facilities emergency access roads be blocked.

D. Conduct the Work to interfere as little as possible with public travel, whether vehicular or pedestrian.

E. Whenever it is necessary to cross, close, or obstruct roads, driveways, and walks, whether public or private, provide and maintain suitable and safe bridges, detours, or other temporary expedients for accommodation of public and private travel.

F. Provide snow removal to facilitate normal vehicular traffic on public or private roads affected by construction. Perform snow removal promptly and efficiently by means of suitable equipment whenever necessary for safety, and as may be directed by proper authority.

G. Notify fire department and police department before closing streets or portion thereof. Notify said departments when streets are again passable for emergency vehicles. Do not block off emergency vehicle access to consecutive arterial crossings or dead-end streets, in excess of 300 linear feet, without written permission from fire department. Conduct operations with the least interference to fire equipment access, and at no time prevent such access. Furnish Contractor's night emergency telephone numbers to police department.

H. Coordinate traffic routing with that of others working in same or adjacent areas.

3.08 CLEANING DURING CONSTRUCTION

A. As may be specified in other Specification sections or other Contract Documents, and as required herein.

B. Provide approved containers for collection and disposal of waste materials, debris, and rubbish. At least weekly, dispose of such waste materials, debris, and rubbish offsite.

C. At least daily when hauling materials, brush sweep entry drive, roadways, and other streets and walkways affected by the Work and where adjacent to the Work.

3.09 SITE DECONTAMINATION

A. Contractor shall decontaminate all areas and equipment used for bulkhead support and dredging support as part of winter 2012 and final demobilization

B. All equipment taken off site or to remain on site after winter 2012 demobilization shall be decontamination as specified in Specification Section 01 11 01, Health, Safety, and Emergency Response.

C. The Owner or Engineer will perform confirmation testing of decontamination activities. Contractor shall re-clean any areas that fail confirmation testing as directed by the Owner or Engineer,

END OF SECTION

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 SUBMITTALS

A. Informational Submittals:

1. Submit prior to Application for Payment for final payment.
   a. Record Documents: As required by the Contract Documents.
   b. Special bonds, Special Guarantees, and Service Agreements.
   c. Consent of Surety to Final Payment.
   d. Releases or Waivers of Liens and Claims: As required in Contract Agreement.
   e. Releases from Agreements.
   f. Final Application for Payment: Submit in accordance with procedures and requirements stated in Section 01 29 00, Payment Procedures and the Contract Agreement.

1.02 RECORD DOCUMENTS

A. Quality Assurance:

1. Furnish qualified and experienced person, whose duty and responsibility shall be to maintain record documents.
2. Accuracy of Records:
   a. Coordinate changes within record documents, making legible and accurate entries on each sheet of Drawings and other documents where such entry is required to show change.
   b. Purpose of Project record documents is to document factual information regarding the nature and extent of the Work completed, both concealed and visible.
3. Make entries within 24 hours after receipt of information that a change in the Work has occurred.
4. Prior to submitting each request for progress payment, request Engineer's review and approval of current status of record documents. Failure to properly maintain, update, and submit record documents may result in a deferral by Engineer to recommend whole or any part of Contractor's Application for Payment, either partial or final.

1.03 RELEASES FROM AGREEMENTS

A. Furnish Owner with written releases from property owners or public agencies where side agreements or special easements have been made.

B. In the event Contractor is unable to secure written releases:

1. Inform Engineer of the reasons.
2. Engineer or its representatives will examine the Site, and Engineer will direct Contractor to complete the Work that may be necessary to satisfy terms of the side agreement or special easement.
3. Should Contractor refuse to perform this Work, Owner reserves right to have it done by separate contract and deduct cost of same from Contract Price, or require Contractor to furnish a satisfactory bond in a sum to cover legal claims for damages.
4. When Engineer and Owner are satisfied that the Work has been completed in agreement with Contract Documents and terms of side agreement or special easement, right is reserved to waive requirement for written release if: (i) Contractor's failure to obtain such statement is due to grantor's refusal to sign, and this refusal is not based upon any legitimate claims that Contractor has failed to fulfill terms of side agreement or special easement, or (ii) Contractor is unable to contact or has had undue hardship in contacting grantor.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 MAINTENANCE OF RECORD DOCUMENTS

A. General:

1. Promptly following the effective date of the Contract Agreement, secure from Engineer at no cost to the Owner, one complete set of Contract Documents. Drawings will be full size.
2. Label or stamp each record document with title, "RECORD DOCUMENTS," in neat large printed letters.
3. Record information concurrently with construction progress and within 24 hours after receipt of information that change has occurred. Do not cover or conceal Work until required information is recorded.

B. Preservation:

1. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
2. Make documents and Samples available at all times for observation by Engineer.

C. Making Entries on Drawings:

1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe change by graphic line and note as required.
   a. Color Coding:
      1) Green when showing information deleted from Drawings.
      2) Red when showing information added to Drawings.
      3) Blue and circled in blue to show notes.
2. Date entries.
3. Call attention to entry by “cloud” drawn around area or areas affected.
4. Legibly mark to record actual changes made during construction, including, but not limited to:
   a. Depths of dredging or excavation where depth differs from that shown.
   b. Horizontal and vertical locations of existing and new Underground Facilities and appurtenances, and other underground structures, equipment, or Work. Reference to at least two measurements to permanent surface improvements.
   c. Locate existing facilities, piping, equipment, and items critical to the interface between existing physical conditions or construction and new construction.
   d. Changes made by Addenda and Field Orders, Work Change Directive, Change Order, and Engineer’s written interpretation and clarification using consistent symbols for each and showing appropriate document tracking number.

3.02 FINAL CLEANING

A. At completion of the Work or of a part thereof and immediately prior to Contractor’s request for certificate of Substantial Completion; or if no certificate is issued, immediately prior to Contractor’s notice of completion, clean entire Site or parts thereof, as applicable.

1. Leave the Work and adjacent areas affected in a cleaned condition satisfactory to Engineer and Owner.
2. Broom clean exterior paved driveways and parking areas.
3. Leave water courses, gutters, and ditches open and clean.

4. Decontaminate any areas or equipment in contact with arsenic contaminated materials as specified in Specification Section 01 50 00, Temporary Facilities and Controls.

END OF SECTION

SECTION 02 61 00
HANDLING, DISPOSAL
OF CONTAMINATED SOIL

PART 1 GENERAL

1.01 SUMMARY

A. This section describes the Work involved in handling and transporting, of mechanically dredged materials, drill cuttings, and excavated materials from the Dredge Project Area.

1.02 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. U.S. Code of Federal Regulations (CFR):
   a. Environmental Protection Agency (EPA), Title 40 Parts 260 through 265 and Part 268.
   b. EPA, Title 40 CFR Part 761, Polychlorinated Biphenyls (PCBS) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions.
   c. Occupational Safety and Health Administration (OSHA), Title 29, Occupational Safety and Health Standards: Part 1910.120, Hazardous Waste Operations and Emergency Response. Environmental Protection Agency (EPA), Title 49, Transportation.
2. Wisconsin Administrative Code (WAC),
   a. Chapter NR 500, Solid Waste.
   b. Chapter NR 660 through NR 665 and NR 668, Hazardous Waste.

1.03 DEFINITIONS

A. CY: Cubic yard, as measured in situ (prior to dredging or excavation), unless otherwise noted.

B. Debris: Materials including boulders, cobbles, logs/trees/stumps/branches, lumber, anchors, chains, rope, cinderblocks, slag, scrap material, and other man-made or naturally deposited material located within the dredging area that is larger than 3 inches in the largest dimension. Does not include cohesive soils that can be broken down to be smaller than 3 inches in diameter.

C. Dredge Project Area: The portion of the Menominee River with arsenic-contaminated materials exceeding 50 milligrams per kilogram.

D. Excavated Waste: Buried solid waste, refuse, demolition waste, and construction waste. Excavated waste does not include demolition debris, solid waste, refuse, construction waste, or special waste created by Contractor incidental to the Work.

E. Friable Material: Cohesive soils removed from the Dredge Project Area that has clumps greater than 3 inches in diameter and can be reduced in size by crushing.

F. Hazardous Soil and Debris: Material which qualifies as a hazardous or toxic waste as defined by 40 CFR Part 261 and WAC NR 661.

G. Higher Contaminated SCM: Higher arsenic concentration SCM that is removed from areas designated as such on the Drawings. This material typically has arsenic concentrations of 500 mg/kg or greater.

H. Hopper barge: Barges used to transport materials removed from the Dredge Project Area to a designated offloading area.

I. Lower Contaminated SCM: Lower arsenic concentration SCM that is removed from areas designated as such on the Drawings. This material typically has arsenic concentrations of less than 500 mg/kg.

J. Nonhazardous Soil and Debris: Material which does not qualify as a hazardous or toxic waste as defined by 40 CFR Part 261 and WAC NR 661 and includes excavated waste as defined above.

K. Offloading Area: The location on the Site at the former 8th Street slip where hopper barges are unloaded and stabilization activities are performed.

L. SCM: Semi-consolidated material that is present in the Dredge Project Area below soft sediment.

M. Wastewater: Water produced by Contractor's operation, including wash down water, used decontamination water, contact storm water and other water that requires handling by Contractor to accomplish the Work. Wastewater may be hazardous or nonhazardous and shall require special handling and testing.

N. Water Treatment System: Temporary water treatment system set up and operated by others to handle contaminated water generated by dredging and stabilization, decontamination, and precipitation. Maximum capacity is 150 gallons per minute.

1.04 SUBMITTALS

A. Action Submittal: Submit Material Stabilization Plan prior to commencement of Work which includes:

1. Equipment and methods to handle and process:
   a. Dredge Sediments.
   b. Drill Cuttings.
   c. Debris.
   d. Wastewater (handling only).
2. Waste Management Plan and Transportation Plan.
3. Comprehensive schedule in accordance with Section 01 32 00, Construction Progress Documentation.
4. Any deviations from suggested approaches and requirements in these Specifications.

B. Informational Submittals:

1. Contractor's Safety and Environmental Performance Questionnaire for any subcontractor used during execution of the Work.
2. Registration and license required for intrastate commerce in each state of operation.
3. Transporter's Certificate of Insurance.
4. Prior to commencement of the Work submit the following:
   a. Permits required for the Work beyond those obtained by the Owner (a complete list of permits to be obtained by Owner is included in Section 31 20 25.23, Mechanical Environmental Dredging, Subsection 1.04).
   b. Provide proof of insurance for each truck and copies of valid commercial driver's license for each driver.
5. During excavation and removal activities submit the following: Daily job progress log detailing information on the review of progress with respect to previously established Milestones and schedules, daily production quantities (pile installation, sediment dredged,), major problems, corrective actions, injury reports, and equipment breakdowns.

1.05 QUALITY ASSURANCE

A. Qualifications:

1. Lower Tier Subcontractors:
   a. Proven history of successfully executing similar projects for a minimum of 3 years.
   b. Proper equipment and personnel experienced in similar work: Personnel shall be formally trained in procedures for contaminated soil and water removal (for example, HAZWOPER training).

B. Codes and Regulations:

1. Comply with all federal, state, and local regulations in handling, testing, transporting, and disposing materials and in performing the Work.
2. The Contractor will adhere to and be in compliance with regulatory requirements under 49 CFR for both highway and rail transportation.
3. Prior to commencing removal operations, obtain applicable local, state, and federal permits and licenses that directly impact Contractor's ability to perform the Work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

A. Contractor shall be responsible for the following:

1. Do not begin dredging or excavation until all erosion and storm water controls are in place.
2. Providing means, methods, and equipment necessary for transferring, loading, and unloading of drill cuttings and mechanically dredged materials and excavated materials from the Dredge Project Area, including debris.
3. Transport of Dredge materials shall be a specified in Section 31 22 10, Dredge Materials Transport.
4. Complying with federal, state, and local requirements for transporting solid and liquid materials from Site through applicable jurisdictions, and be responsible for associated fines, penalties, and other costs for noncompliance.

B. Do not place a surface load of more than 1,000 pounds per square foot within 30 feet of the exterior sheet pile wall.

3.02 MATERIALS HANDLING

A. Dredge Materials. Contain and transport all dredge materials to offloading area as specified in Sections 31 20 25.23, Mechanical Environmental Dredging and 31 22 10, Dredge Materials Transport. Dredge materials from higher contaminated area shown on the Drawings shall be handled separately from other dredge materials.

B. Drill Cuttings. Contain and collect all drill cuttings during drilling activities. Do not allow cutting to enter water or collect on unprotected ground. Immediately place cuttings in hopper barges or haul trucks and transport to unloading area.

C. Excavated soils Contain and collect all excavated soil activities. Do not allow cutting to enter water or collect on unprotected ground. Immediately place excavated soil in hopper barges or haul trucks and transport to unloading area.

D. No temporary stockpiles will be allowed on Site.

3.03 TRANSPORTATION AND OFFSITE DISPOSAL

A. The Contractor shall provide and complete (with Engineers support) all transportation and disposal documentation, labels, makings, etc required for transport via any and all transportation modes and final disposal.

B. Contractor shall provide all personnel, equipment, and materials to complete the scope of work as well as include all costs (taxes, fees, surcharges, rental, drayage, etc).

C. Dispatch bulk transportation in good condition (clean, no leaks, etc) to the Site appropriate for transportation of nonhazardous waste. Trucks shall have liners (or be lined onsite prior to loading), backup alarm, and automatic tarps which will also be in good condition (no tears/holes). Include all costs related to transport via highway.

D. Delivered equipment and containers will be inspected by Engineer at the project site. Equipment that is not in good condition or contain contamination residue will not be loaded and turned away with the costs borne by the Contractor, at the sole discretion of the Engineer. Owner or Engineer will not be responsible for costs associated with any delays caused by delivery of inadequate trucks or equipment.

E. Every load of waste will be sent offsite using appropriate waste manifests and signed by the Owner's representative. Bills of lading will NOT be utilized for waste shipment. The Engineer and the Owner's Representative MUST be made aware of all waste shipments. Only the Owner's Representative will sign waste profiles, manifests, LDRs, etc.

F. Adhere to and be in compliance with regulatory requirements under 49 CFR and State requirements for highway transportation.

G. Follow Site traffic signs including stop, speed limit signs, and signs demarcating transportation routes. Stop at designated location to obtain manifest signature.

3.04 COORDINATION

A. Contractor shall coordinate with others at the Site performing dredging and water treatment.

3.05 EQUIPMENT DECONTAMINATION

A. Decontaminate equipment that has come into contact with contaminated soil or debris, solid waste, or impacted water by methods approved by Engineer. Decontamination shall be as specified in Section 01 50 00, Temporary Facilities and Controls.

B. Wastewater generated by decontamination activities shall be contained and pumped or transported to the water treatment system. Coordinate shipment with the Dredging Contractor.

END OF SECTION

SECTION 31 20 25.23
MECHANICAL ENVIRONMENTAL DREDGING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Provide labor, materials, equipment, transportation, and supervision necessary to perform mechanical dredging of contaminated sediments and to transport material to the offloading area and to exercise control and abatement of pollution resulting or likely to result from dredging and transportation of dredged materials.

B. Environmental Dredging: The primary function of this Project is to improve and protect the environment. A recognized environmental dredge system shall be used to remove contaminated sediments as set forth in Part 3, EXECUTION, below. Certain constraints and limitations shall be imposed on the dredging Contractor and on the operation of the dredge equipment. The Contractor must demonstrate the experience and have the equipment necessary to minimize sediment resuspension and recontamination. The Contractor shall demonstrate that dredge operators have been trained in the proper operation and control of environmental clamshell buckets, standards clamshell buckets and associated machine control software equipment. The Engineer and USEPA shall have access to dredging equipment so they can observe operations and verify that proper operating protocols are being followed in accordance with plans, drawings, and specifications. Engineer and USEPA will comply with Contractor's HASP and instructions during these inspections.

C. Work consists of the following:

1. Mobilization, demobilization, and Site setup.
2. Temporary construction, operation, and restoration of staging area.
3. Installing and operating turbidity control equipment on Project.
4. Installation of a VRW bulkhead support system.
5. Mechanical dredging of contaminated SCM.
6. Transportation of filled hopper barges to the offloading area.
7. Transportation of empty hopper barges from the offloading area.
8. Pre-dredge, post-dredge, and interim bathymetric surveys.

1.02 DEFINITIONS

A. Critical Structures: Consideration of offsets or modified operating plans for docks, bulkheads, outfalls, all utilities, and bridges.

B. Debris: Includes, but is not limited to, material such as posts, stumps, logs, wood, tires, strapping, cable, chain, boulders, cobbles or rock that is larger than 3 inches or would impede closure of an environmental bucket during dredging.

C. Dredge Project Area: The portion of the Menominee River with arsenic-contaminated materials greater than or equal to 50 milligrams per kilogram.

D. SCM: Semi-consolidated material that is present in the Dredge Project Area below soft sediment.

E. Downtime: Lost time associated with Contractor's operational delays (including weather), mechanical delays, traffic or delays imposed on Contractor by Engineer or Owner.

F. Dredged Material: All material removed from below existing bottom and within tolerances noted, regardless of type, nature, or condition encountered, including rock. Dredged material is everything except for Debris.

G. Shoreline Vegetation: Shoreline vegetation includes branches, limbs, trees and wetland vegetation that would otherwise prevent the dredge from accessing sediment along the shoreline of the project.

H. In Situ: Undisturbed physical and chemical condition of dredge material prior to start of dredging.

I. Overdredge Allowance: Maximum thickness below target cutline allowed for acceptance and/or payment.

J. Underdredge Allowance: Maximum thickness above target cutline allowed for acceptance and/or payment.

K. Residuals: Residual contamination leftover after dredging as a result of missed material, sloughing, or resettled contamination.

L. Generated Residuals: Sediment dislodged, but not removed, by dredging which falls back, spills, sloughs, or settles in or near the dredging footprint and forms a new sediment layer.

M. Undredged Inventory or Undisturbed Residuals: Sediment remaining below the cut after dredging has been completed.

1.03 REFERENCES

A. The following is a list of standards that may be referenced in this section:

1. Wisconsin Department of Transportation Standard Specifications for Construction, 2008 Edition, hereafter referred to as WisDOT Standard Specifications.
2. American Society for Testing and Materials (ASTM), Current Edition.
3. USACE, 2005. Silt Curtains as a Dredging Project Management Practice. ERDC TN-DOER-E21, September 2005.
4. Non-Channel Erosion Mat (1052) Wisconsin Department of Natural Resources, Conservation Practice Standard.
5. Channel Erosion Mat (1053) Wisconsin Department of Natural Resources, Conservation Practice Standard.
6. Occupational Safety and Health Administration (OSHA), Title 29 Code of Federal Regulations.
7. USACE Hydrographic Survey Manual EM 1110-2-1003 (01 Jan 02).

1.04 PERMITS

A. Comply with all permit conditions and requirements related to this Work. Permit conditions and regulations related to this Work include, but are not limited to:

1. Clean Water Act- Section 404 - U.S. Army Corps of Engineers- Green Bay.
2. Section 10- Navigable Waterway - U.S. Army Corps of Engineers- Green Bay.
3. US Coast Guard Restricted Navigation Order - U.S. Coast Guard.
4. US Coast Guard Notice to Mariners - U.S. Coast Guard.
5. Section 7 Endangered Species Consultation - U.S. Fish and Wildlife Service.
6. Memorandum of Agreement - Advisory Council on Historic Preservation.
7. Section 401- Water Quality Certification - Wisconsin Dept. of Natural Resources and requirements.
8. Arsenic Water Quality Variance - Wisconsin Dept. of Natural Resources.
9. Chapter 30 Waterway Permitting & Shoreland Grading Permit - Wisconsin Dept. of Natural Resources.
10. Waterway Marker Permit - Wisconsin Dept. of Natural Resources.
11. Wisconsin Pollutant Discharge Elimination System- Construction Site Stormwater Runoff - Wisconsin Dept. of Natural Resources.
12. Wisconsin Pollutant Discharge Elimination System- Carriage & Interstitial Water from Dredging Operations - Wisconsin Dept. of Natural Resources.
13. Remediation Variance Authorization - Natural Heritage Inventory Review - Wisconsin Dept. of Natural Resources.
14. Natural Heritage Inventory (State Endangered Resources) – Wisconsin Dept. of Natural Resources.

15. Natural Historic Preservation Act-Section 106 Review - Wisconsin State Historical Society.
16. Wastewater Coordination- City of Marinette.
17. Erosion Control Permit- City of Marinette.

1.05 SEQUENCE AND SCHEDULE

A. Contractor shall sequence its dredging operations in phases as shown on the Drawings.

1.06 SITE CONDITIONS

A. It shall be Contractor's sole responsibility to review available surveys, tests, reports, conduct additional tests, and otherwise determine to its own satisfaction the location and nature of surface and subsurface features and the sediment and water conditions that may be encountered. Engineer's information on Project Area conditions may be reviewed at Engineer's offices as scheduled with Contractor.

B. Contractor shall modify, and if necessary, suspend dredging operations if resuspension performance standards, as monitored by Engineer, are not met outside the Project Area.

C. Contractor shall be solely responsible for determining the means and methods for meeting the dredging extent (horizontal and vertical) requirements unless otherwise specified herein, except that hydraulic dredging will not be permitted.

D. Contractor shall be solely responsible for utilizing means and methods that protect adjacent structures and utilities from damage resulting from Contractor's operations, specifically including, but not limited to, settlement, consolidation, displacement, cracking, vibration, undermining, washout, and uplift caused by dredging, or other operation. Contractor will accompany Engineer in examination of existing adjacent structures prior to beginning the Work. Examination will be intended to provide Contractor opportunity to document relevant existing structural damage or problems.

E. Contractor shall provide anchoring, mooring, spuds, and other measures required to perform Work in accordance with Laws and Regulations. Contractor shall be responsible for locating utilities.

F. Contractor shall comply with the provisions for Vessels Lying in the Harbor in accordance with the U.S. Coast Guard, USACE, and Port Authority. Specifically, Contractor's vessels shall not be left unattended, shall be lit at night, shall be fastened when not in transport, and shall not obstruct without proper notice to Owner and authorities. Contractor shall be aware that testing and anchoring of vessels by local industrial activities within the Turning Basin may occur on a periodic basis and its operations shall not obstruct without proper notice to Owner and Authorities.

G. Contractor shall coordinate all operations with Dredging Contractor.

1.07 LAUNCH SITE

A. The 8th Street Slip provides a boat launch ramp.

1.08 HEALTH AND SAFETY

A. Health and Safety shall be as specified in Section 01 11 01, Health, Safety and Emergency Response.

1.09 SUBMITTALS

A. Action Submittals:

1. Survey Plan:
   a. Within 7 days after Notice of Award, submit a Survey Plan for approval that includes, but it not limited to:
      1) Describe approach for bathymetric survey, debris reconnaissance survey (if deemed necessary by the Contractor), and utility survey (if utilities are identified in the dredge area).
      2) Survey method to be used.
      3) Approximate number of survey points within a given area.
      4) Precision of equipment.
      5) Accuracy of survey.
      6) Surveyor qualifications and relevant experience.
2. Survey Results Report:
   a. Within 7 days after completion of survey, submit a Survey Results Reports for approval that includes, but it not limited to:
      1) Results of survey.
      2) Deviations from approved Survey Plan.
      3) If applicable, supply data to determine dredge cut prism in electronic format including northing and easting points with top of sediment and required depth of sediment to be removed coordinates. Supply x, y, z_1, and z_2 coordinates as an ASCII file.
3. Dredging and Operations Plan:
   a. Within 21 days after Notice of Award, submit a Dredging and Operations Plan for approval that includes, but it not limited to:
      1) Description and list of operations that will be performed in connection with removal and transportation of dredged materials.
      2) Description of plant and equipment that will be used in removal and transport of dredged materials with pertinent details for each piece of equipment (dimensions, horsepower, bucket size and type, crew).

3) Sequence of areas to be dredged. Dredging generally has to be from upstream to downstream.
4) Schedule indicating start and completion dates for each dredging area.
5) Dredging rates for dredge plants, including proposed average cycle times and hours of operation.
6) A description of the proposed dredging strategy/sequence including drawings showing the width, length, and location of the dredge lanes and target elevations in each lane.
7) Proposed cut or bite height relative to sediment thickness.
8) Proposed staging areas within Project Work Limits provided by Engineer.
9) Method of storage and planned locations for storage of floating equipment.
10) Dredge movement procedure and frequency.
11) Proposed methods for dredging in shallow waters, seawalls, and critical structures, if applicable.
12) Proposed methods for dredging near and protection of utilities, if applicable.
13) Proposed method for sediment transport and barge securement at offloading area.
14) Waterway markers, maintenance of boat traffic during dredging activities, and protection of commercial and recreational watercraft during dredging.
15) Method of cleaning equipment and decontamination at Project completion.
16) Means to control and accurately document positioning of dredge and prevent excessive over-dredging.
17) Management plan for Shoreline Vegetation and Debris removal and disposal.
18) Fueling source, methods, equipment, proper containment protection and location.
19) Describe communication plan and chain-of-command for normal and emergency activities.
20) A detailed schedule of Work as specified in Section 01 32 00, Construction Progress Documentation.

4. Turbidity and Resuspension Management Plan:
   a. Within 21 days after Notice of Award, submit a Turbidity and Resuspension Management Plan for approval. Turbidity and Resuspension Management Plan shall be consistent with Water Quality Management and Monitoring in Part 3 and shall consist of:
      1) Methods and Best Management Practices of turbidity control to meet permitting requirements as specified Section 1.04, including

material, equipment, design and placement, and response to noncompliance.
2) Final design of turbidity control including navigational marking and anchoring systems.
3) Final design of any floating debris and oil booms.
4) Description of materials used.
5) Methods for installing, inspecting, and maintenance of turbidity controls.
6) Performance monitoring plan.
7) Contingency measures to control turbidity from dredging operations should turbidity measures increase above allowable background levels.
8) Procedures for reporting of turbidity monitoring results.
9) Contingency measures to reduce arsenic release should arsenic concentrations exceed threshold levels at river mouth or in public water supplies.

5. Environmental and Spill Response Plan:
   a. Within 21 days after Notice of Award, submit an Environmental and Spill Response Plan including procedures and contingency actions associated with the following:
      1) Waste oil, bilge water, hazardous waste, garbage, sewage, handling, and disposal.
      2) Liability.
      3) Onboard spill notification procedures.
      4) Incident notification procedures.
      5) Transfer mitigation procedures.
      6) Explosion or fire.
      7) Fines and penalties.
      8) Spill control and remediation to land.
      9) Casualty investigation review
      10) Owner and Engineer (primary), and Contractor (secondary) shall be responsible for reporting all spills to WDNR at 800.943.0003.
6. Quality Control Plan: This plan shall be used to document inspections, monitoring, surveys, and other actions to be taken by Contractor to ensure that Work complies with Contract requirements. Contractor shall ensure that required gauges, targets, ranges, and other survey markers are in place and properly maintained. Contractor shall install sufficient gauge(s) or staff(s) at the dredging location so that the dredge operator, dredging inspectors, and hydrographic surveyors can observe the water level at all times. Plan shall include a description of the methods and equipment that shall be used to assure accuracy of the dredging operations.

7. Contingency Plan:
   a. Within 21 days after Notice of Award, submit a Contingency Plan including procedures and contingency actions associated with the following:
      1) Non-compliance of applicable turbidity criteria during dredging operations.
      2) Arsenic concentrations exceed threshold levels at river mouth or in public water supplies.
      3) Floods, heavy rainfall, and storm surge events.
      4) Failure of sediment controls.

B. Information Submittals:

1. Daily Dredging Reports:
   a. Submit daily reports, addressing progress of Work, beginning with mobilization to Site and ending with demobilization. Submit no later than 4 p.m. of next calendar day following reported day.
   b. Daily Work Report of Dredging Activity:
      1) Day and date.
      2) Project name and number.
      3) Weather conditions.
      4) Location of dredging (station-to-station).
      5) Hours worked.
      6) Hours of downtime. Log of downtime hours will be maintained by both Contractors with explanation for all downtime periods greater than 15 minutes. Log will be signed off at end of each shift by both Contractor and Engineer.
      7) Health and safety incidents and near misses.
      8) Approximate volume and character of materials dredged.
      9) Soundings taken.
      10) Wildlife sightings/encounters.
      11) Accidents, spills, and mishaps, and actions taken to contain and correct incident.
      12) Name of individual making report.
      13) Results of turbidity monitoring.
   c. Water Quality Report:
      1) Date and time of day sample(s) were taken.
      2) Project name and number.
      3) Map indicating sampling and dredging locations.
      4) Methods used in collection, handling, storage, and quality control for sample analyses.
      5) Water temperature.
      6) Depth of water body/water elevation.
      7) Sample depth and coordinates.

8) Weather conditions (wind direction, velocity).
9) Name of individual making report.

2. Weekly Dredging Reports:
   a. Submit weekly reports with daily report for every week of dredging or portion thereof.
   b. Weekly Work Report of Dredging Activity: Map showing areas dredged, estimated volume dredged, results of turbidity monitoring, and depths dredged.
   c. Report survey in weekly progress report. If dredge depths are satisfactory, survey will be deemed as post-dredge bathymetric survey.

1.10 MARINE REQUIREMENTS

A. Make arrangements for all marine equipment and facilities including staging areas, dock facilities, and transportation of equipment, material and personnel to and from Work Site.

B. Provide all necessary equipment and personnel, and otherwise ensure that all of its marine equipment complies with all regulatory and safety requirements.

C. Provide boat and boat operator to support daily arsenic water quality sampling at locations shown on Drawings to be conducted by Engineer.

D. Conduct operation so that marine and recreation traffic is maintained. Notify United States Coast Guard when offshore work is to begin, and furnish a copy of notification to Engineer. Abide by all applicable marine rules and requirements. Conform to requirements of permits and certifications obtained by Contractor.

E. All floating operations shall be in accordance with all applicable laws, rules, and customs.

F. Display signals lights and conduct operation in accordance with general regulations of United States Coast Guard governing lights, day signals, and markers.

G. Prevent spills of fuel or other contaminants. Contractor shall be equipped with supplies and equipment to capture and remove any spills and conform to various regulations for maintaining water quality. Use special fuel barges, as approved by agencies for fueling on-water equipments and tugboats.

1.11 PRE-DREDGE, PROGRESS, AND POST-DREDGE HYDROGRAPHIC SURVEYS

A. Engage a registered Surveyor licensed in State of Wisconsin or certified hydrographer experienced in hydrographic surveys to perform:

1. Pre-dredge hydrographic survey before dredging operations commence.
2. Progress (or interim) hydrographic surveys.
3. Post-dredging hydrographic surveys to document conditions at completion of dredging each phase.

B. Hydrographic survey methods and means for verifying dredged elevations shall be by electronic means and calibrated to Project datum prior to beginning of Work.

C. Pre-dredge Hydrographic Survey: Survey data shall be recorded and confirmed against Project dredge volumes and areas on Drawings. Communicate any differences to Engineer.

D. Progress Hydrographic Surveys: Perform progress hydrographic surveys on a weekly basis during dredging work window.

E. Post-dredge Hydrographic Survey.

F. Hydrographic survey accuracy shall meet the following requirements:

1. Horizontal positioning for depth measurements shall use electronic positioning modes or systems, or hybrid combinations of instrumental and electronic data measurement and recording systems to measure, adjust, correlate, print, plot, and record horizontal and vertical observations.
2. USACE hydrographic surveying requirements per EM 1110-2-1003 Engineering and Design – Hydrographic Surveying, shall be followed.

G. Engineer will be permitted to have an observer present on boat with Contractor during all survey events (and taking of soundings), if desired by Engineer.

1.12 DEBRIS RECONNAISSANCE SURVEY

A. If desired by Contractor, conduct a debris reconnaissance survey throughout dredging areas to assess and evaluate quantity and type of debris.

1.13 UTILITY SURVEY

A. Locate all utilities, including but not limited to, underwater and overhead utilities throughout dredging areas as specified in Section 01 50 00, Temporary Facilities.

PART 2 PRODUCTS

2.01 DREDGE PLANT AND ASSOCIATED EQUIPMENT

A. Dredging Plant Performance Requirements: The primary function of this Contract is to improve and protect the environment. Contractor shall provide a mechanical dredge system, and shall provide operating data to show the ability to achieve certain constraints and limitations as follows:

1. Environmental Dredge Equipment: Dredging of contaminated sediments shall be performed with an environmental clamshell bucket (for all sediments that can be readily removed by this type of bucket) having the following capabilities and characteristics:
   a. Completely encloses the dredged sediment and water captured.
   b. Escape valves or vents that close when the bucket is withdrawn from the water.
   c. Hardware that allows the operator to position the bucket using positioning and machine control software to meet the specified horizontal and vertical accuracy requirements.
   d. Software shall allow the operator to control bucket penetration to avoid overfilling and minimize resuspension.
   e. The heavy duty clamshell bucket, used when the environmental clamshell bucket is not suitable, shall incorporate as much of the characteristics of the environmental clamshell bucket listed above, as approved by the Engineer.
2. Positioning System: Contractor shall employ software capable of monitoring the x, y, and z position of the bucket in real time. The software will be required to provide the following:
   a. A real time view of the barge and clamshell bucket position.
   b. A display indicating the surface derived from existing hydrographic survey data.
   c. A display which provides real time feedback showing current depth, final project depth, target depth, and current bucket depth.
3. Horizontal and Vertical Tolerances:
   a. The following tolerances shall be met:
      1) Horizontal position accuracy shall be plus or minus 1.0 feet.
      2) Vertical tolerance shall be plus zero, minus 0.5 feet.
4. Software shall be capable of recording sensor information so that playback/review of past dredge activities is possible. Contractor must verify its error budget (i.e., quality control check of sensors one time per day) and include it in the daily QA/QC report.

5. Anchoring: Use of spud anchors are acceptable for the dredge or barge equipment as long as their use does result in noncompliance of the water quality criteria. Contractor shall provide means and methods to be utilized to avoid driving contamination deeper into the underlying sediments by using spuds.

2.02 TUG BOATS AND PUSH BOATS

A. Number and size of tug boats and push boats to be used shall be specified in Dredging and Operations Plan. Tug boats and push boats utilized by Contractor for this purpose shall be of a size adequate for pushing the anticipated load and shall have necessary reserve power for maneuvering with material barges under emergency conditions as well as for control of material barges at the offloading area.

2.03 MATERIAL BARGES

A. Provide material barges capable of transporting dredged material to the offloading area. Provide hopper barges or similar for this purpose. Provide a minimum number of barges to suit draft requirements and the minimum production requirements of the project.

B. Provide and maintain markings on material barges clearly indicating the draft of the barge. Each barge shall be used with an ullage table (i.e., displacement table) to provide required information regarding tonnage located in/on the barge.

C. Load barge evenly to maintain the stability of the barge. During loading operations, measure and record on the daily progress report the empty/full tonnage of each barge

D. During the entire period of Work, provide and maintain sufficient spot or floodlights to permit the reading of the draft on the sides of material barges at bow and stern from the tow boat at night and when visibility is impaired. Ensure that adequate time is allowed by the tow boat captain for these readings to be obtained. These tonnage report logs shall be part of the daily progress report.

2.04 SILT CURTAINS

A. Portions of the Dredging Project Area in which dredging, or other sediment-disturbing activities, are occurring shall be enclosed by Contractor with a silt curtain (floating turbidity curtain)/boom system in order to minimize turbidity and control unexpected spills. Silt Curtains shall be installed and maintained in accordance with Section 31 21 12, Sediment Resuspension Control.

B. Contractor shall maintain the silt curtain/boom systems and associated markings/lighting in good and effective operating condition by performing daily inspections to determine condition and effectiveness, by repairing resuspension control materials, and by other protective measures.

2.05 LIGHTS

A. All operations that are performed during the non-daylight hours shall be properly illuminated to allow for the complete performance and inspection of the Work.

B. Lighting shall consist of providing, installing, operating, maintaining, moving, and removing portable light towers and equipment-mounted lighting fixtures for nighttime construction operations for the duration of nighttime Work on the Contract.

C. Each Work night, 30 minutes before sunset and 30 minutes after sunrise and during periods of restricted visibility, provide lights for floating plants, ranges, and markers. Also, provide lights for buoys that could endanger or obstruct navigation.

D. Lights shall be provided for installed equipment being used to perform Work even when not in use.

2.06 COMMUNICATION

A. Contractor shall provide a system of communication between the dredge crew and Engineer personnel performing sampling or monitoring.

B. Contractor shall provide a system of communication between the dredge crew and the other Contractors crew at the offloading area.

C. Radio telephone equipment shall be capable of transmitting and receiving on VHF Channels.

D. Contractor shall provide Engineer with three (3) hand-held VHF radios capable of communicating with the Contractor's marine plant for the duration of the Contract and shall repair or replace an inoperable unit within 24 hours.

PART 3 EXECUTION

3.01 GENERAL

A. Protect adjacent structures and utilities from damage resulting from operations including, but not limited to, settlement, consolidation, displacement, cracking, vibration, undermining, washout, and uplift caused by dredging, or other operation.

3.02 HEALTH AND SAFETY

A. As specified in Section 01 11 01, Health, Safety and Emergency Response.

3.03 DEBRIS REMOVAL

A. Contractor has option to remove Debris prior to dredging or remove it as part of the dredging activities.

B. Debris encountered when dredging will be left in place, to extent possible, unless it interferes with dredging. Debris removed shall be brought to the offloading area in a material barge for offloading.

3.04 PRE-DREDGE

A. Contact utility owner to confirm location of all utilities before dredging. Maintain adequate distance from utilities to prevent damage. Approved operational plan required in advance of working around utilities.

B. Confirm prescribed offsets from critical structures, if applicable.

3.05 DREDGING

A. Dredging shall include removal of material in designated areas to dredge limits, depth, lines, and grade as shown on Drawings and as provided in dredge prism. The intent is to dredge such that vertical removal of any contaminated sediments is accomplished.

B. Areas or higher contaminated materials are shown on the Drawings. The higher contaminated dredge materials shall be kept separate (i.e. separate barges) from other dredge materials at all times.

C. Post-dredge sediment confirmation samples will be collected from the river bottom by Engineer after specified dredge elevations shown on Drawings are met in a Dredge Area.

D. Engineer will determine the extent of any additional sediment removal by evaluating post-dredging confirmation sampling results. Once this evaluation process has been completed and appropriate actions implemented as confirmed by Engineer, Sediment remediation will be considered complete.

E. Remove material according to the following:

1. For areas of SCM to be dredged, remove material to within zero inches above or 6 inches below target dredge final elevation.
   a. Side slopes shall not be steeper than slopes as shown on the Drawings.

b. Remove SCM to specified elevations for at least 90 percent of dredged area. The remaining 10 percent shall be no more than 6 inches above the target elevation.
c. Do not remove any virgin glacial till material.
d. Remove all SCM that has not met these tolerance requirements.

F. Do not disturb sediments outside of dredge footprint.

G. Use dredging techniques that employ best management practices to minimize turbidity and recontamination of dredged areas.

H. Contractor is responsible for all regulatory permit-related damages as a result of excessive over-depth dredging or dredging outside given limits for dredging.

I. Do not discharge, or permit discharge of any oils, fuels, bitumens, garbage, trash, sewage, or other materials into receiving waters which may be harmful to fish, wildlife, or vegetation.

J. Dredging will be performed 12 hours per day, 6 days per week.

K. During dredging, the use of multiple attempts to achieve a full bucket or stockpiling of material within the river or on shoreline is not permitted.

L. Contractor shall design the dredge equipment and methods to minimize the release of resuspended sediments during dredging and entrainment of surface water in dredged material.

M. Each pass shall be complete. There shall be no stockpiling in the water. Leveling of a completed dredge surface by dragging a beam or the bucket is not permitted. High spots shall be removed by dredging only.

N. Contractor's equipment shall be permitted to ground or bottom out in areas that have not been dredged to grade as long as Contract or permit requirements are not violated.

O. Contractor shall not dredge material within 10 feet of a bridge abutment or pier to protect such structures from incidental damage due to impact from the dredge bucket. Contractor will still be paid for removal of material that was originally located within 10 feet of a bridge abutment or pier only if it sloughs beyond 10 feet from the structure during dredging activities.

P. Misplaced Materials: Contractor shall not discharge or cause any dredged materials to be placed into any area other than designated area. Contractor shall be responsible for removal of any misplaced material and shall promptly recover same at their own expense.

Q. Contractor shall implement best management practices (BMPs) for environmental dredging. Best management practices (BMPs) shall be implemented to minimize resuspension during dredging operations. Recommended resuspension control BMPs include, but are not limited to:

1. Barges shall be water-tight and inspected to confirm water-tightness prior to dredging operations and dredged material transport;
2. Sediment shall be dredged from within the dredge prism without excavating beyond the overdredge limit;
3. Work on slopes shall proceed from top of slope to toe of slope;
4. Contractor shall utilize underwater cameras or positioning devices (e.g. GPS) on the dredge bucket to make the operator aware of the location of the dredge bucket in relation to the top of sediment to limit resuspension;
5. Contractor shall use an experienced environmental dredging operator that is capable of implementing BMPs to limit resuspension;
6. Operator shall minimize the overfilling of dredge bucket;
7. Operator shall reduce the rate of bucket descent and retrieval as necessary;
8. Operator shall perform single bites with the bucket; each bucket shall be brought to the surface and emptied between bites;
9. Operator shall release excess water at surface slowly;
10. Operator shall not overfill barges with dredged material;
11. Oil booms should be available for emergency use; and
12. Dredged material shall be separated from barge return water.
13. Use biodegradable vegetable oil in lieu of hydraulic oil to operate dredge hydraulics.
14. Rate of swing for bucket shall be minimized to minimize sediment resuspension and to minimize settling out of re-suspended solids in areas previously dredged.
15. Overlap dredge cuts to avoid leaving ridges or windrows of contaminated sediment between adjacent cuts.

3.06 WATER QUALITY REQUIREMENTS

A. Engineer will continuously monitor turbidity with real time monitoring equipment with results made available real-time on website. Report results with Daily Dredging Report. Engineer will do the following:

1. Transfer turbidity readings by cellular model telemetry, compile, and make available via a password-protected website within 5 minutes after each reading.
2. Store turbidity data at the turbidity monitor in an integrated data logger that can be accessed in the event the telemetry system is inoperable.
3. Record readings once every 10 minutes.

4. Use rolling average of six consecutive readings (1 hour) to compare different turbidity monitoring sites.
5. Flag turbidity outliers and do not include in rolling average calculation. An outlier will be defined as a reading that is outside the range of 50 to 200 percent of the average of the three previous readings. In addition, to be considered an outlier, the following reading must return to a range of 75 to 133 percent of the average of the three readings preceding the outlier.

B. Turbidity shall not exceed a total suspended solids concentration of 80 mg/L above daily maximum background concentration measured at monitoring point as shown on Drawings and at one-half water column depth.

C. Communicate with Contractor after Engineer obtains each arsenic water quality sample result at mouth of river and at public water supplies to determine if modification to dredging resuspension controls are necessary.

D. Provide floating absorbent oil containment to contain oil sheens, debris and contaminants. Replace as necessary to prevent breakthrough.

E. Install, operate, maintain, and remove turbidity control to prevent movement of Total Suspended Solids (TSS) released to surrounding areas.

F. Dredging operations shall follow requirements of Section 31 21 12, Sediment Resuspension Control, which can include a stop to dredging if water quality criteria exceed established criteria at monitoring location. Exceeding water quality criteria will require a revised Turbidity and Resuspension Management Plan shall be submitted to address turbidity problems.

G. Operations shall meet water quality criteria set forth in Section 31 21 12, Sediment Resuspension Control. Corrective measures, as set forth in the specifications, or as may be required to ensure compliance with water quality criteria, shall be accomplished. The following specific criteria shall be met:

1. Dredge shall float at all times. The dredge may create adequate water depth by making a flotation cut only.
2. No cables or anchors will be allowed to hold the dredge in position or to reposition the dredge during dredging.

H. Water Quality Non Compliance:

1. If water quality noncompliance is noted, Contractor shall adjust or modify his operations until compliance is achieved in accordance with Section 31 21 12, Sediment Resuspension Control. Modifications that may be required include slowing swing speed, increasing bucket cycle times, and replacement of the bucket.

2. Contractor shall stop operations should water quality criteria continue to exceed the established criteria in accordance with Section 31 21 12, Sediment Resuspension Control.

3.07 DREDGING EQUIPMENT

A. Use hospital-grade mufflers to limit engine noise on dredge.

B. Dredge to be equipped with Dredge Positioning System consisting of an integrated GPS system that continuously measures vertical and horizontal position of dredge, cutterhead, and real-time dredge prism. System shall provide a permanent record of positions referenced to Project coordinate system.

1. Site Control Points:
   a. Site Control Points are control points that will not be used for establishing further control but are required to support collection of data for dredge positioning.
   b. All Site control marks are to be named in a systematic fashion and fully described.
   c. Site control point positions are to be determined by GPS using static observations or by kinematic techniques to within the following tolerances:
   d. Horizontal Accuracy: +/-0.05 foot.
   e. Vertical Accuracy: +/-0.10 foot.
   f. All Site control points should be clear of obstacles that may cause GPS multi-path problems or radio signal interference such as fences, buildings, and radio masts.
2. Accuracy and Tolerances: Location of bucket shall be measured and recorded to the following tolerances:
   a. Horizontal Accuracy: +/- 3.0 feet.
   b. Vertical Accuracy: + 0 foot /- 0.5 foot.
3. Required Equipment:
   a. Horizontal and vertical angular sensors for bucket positioning accurate at a minimum to +/-0.1 over 30 feet of water depth.
   b. Electronic water gauge for measuring water levels in dredge area.
   c. Real-time tide measurement and positional information through RTK GPS.
   d. Dredge must have two RTK-GPS receivers to provide boom heading information. Antennae for these sensors must be located at least 20 feet apart.
   e. Onboard or remote computer equipment capable of recording all positional data as well as providing accurate, real-time data to dredge operator.

f. Computer interface program (such as DredgePack) with ability to record all dredge and cutterhead position data and to suspend recording and denote suspension of and/or suspend production operations when GPS quality drops below standards detailed under GPS Quality Control.

4. Dredging operations shall be suspended in the event of positioning equipment failure. All such incidents are to be logged by equipment operator and documented on Daily Work Report.

3.08 DAY MARKERS AND VESSEL LIGHTS

A. Provide proper lights at night between sunset and sunrise and day markers between sunrise and sunset on any floating plant connected with Work; upon all ranges and other markers, when necessary; and upon all buoys or structures of such size and in such locations that would endanger or obstruct navigation.

1. When Work at night is in progress, maintain from sunset to sunrise, such lights on or about Project Site as may be necessary for proper observation and control of dredging operations.

3.09 FINAL AND INTERIM EXAMINATION

A. Contractor shall notify Engineer that a defined area has been dredged and is ready for a post-dredge bathymetric survey by the Contractor's third party surveyor.

B. Should the Work be determined to be incomplete, Contractor shall return to the identified area and complete the Work.

C. Post-dredging bathymetric data will be collected until removal of sediment to the lines and grades identified in the Drawings has been verified by Engineer.

D. The Contractor will conduct the confirmation surveys for interim and final acceptance.

1. Interim surveys will be conducted by the Contractor for payment purposes and for interim or partial acceptance.
2. Interim surveys will be conducted by the Contractor at the cessation of the dredging of Soft Sediments overlying SCM sediments.
3. Interim surveys will be conducted by the Contractor at the end of the first season for payment and partial acceptance of areas that must be completed in the next season.

E. After Contractor and Engineer confirm that removal to design elevations is complete, Engineer shall collect sediment samples within the dredged area. Analytical data from these samples shall be used by Engineer and Owner to evaluate post-dredge sediment conditions to determine if additional dredging is required.

3.10 DREDGE RESIDUALS

A. Post-dredge sediment confirmation samples shall be collected from the river bottom by Engineer after the specified dredge line shown on Drawings is met. Total Arsenic sediment concentrations will be compared to performance standards.

B. Outcomes from the confirmation sampling and analysis consist of:

1. No further dredging, place backfill.
2. Dredge additional material and resample.

C. The horizontal and vertical extent for redredging (if necessary) will be defined by Engineer after the post remediation sediment samples have been analyzed. Contractor shall expect 5 days turn-around time for receipt and interpretation of analytical sample results after confirmation sampling. The actual redredging area will be defined by Engineer using:

1. The distribution of contaminants horizontally and vertically prior to dredging;
2. Post-dredging channel bathymetry; and;
3. Post-dredging analytical results from sediment samples adjacent to the sample that indicates redredging is necessary. Once this evaluation process has been completed and appropriate actions implemented as confirmed by Engineer, sediment remediation will be considered complete.

3.11 DREDGE TOLERANCES

A. Vertical:

1. In order to ensure that contaminated material above the dredge neat line is removed, and based on survey and dredge accuracy, the allowable overdredge for payment is 0.5 foot (6 inches) below the dredge neat line as shown in Drawings. Material removed more than 0.5 feet (6 inches) below the dredge neat line without direction of the Engineer will result in an equivalent reduction in dredged volume for payment to Contractor.
2. In general, under dredging will not be allowed, except as stated in 3.05, DREDGING, unless approved by Engineer.

B. Horizontal: Actual dredge limits shall meet the maximum and minimum slopes shown on the Drawings. The side slopes of the dredge cut should not exceed a maximum slope of 4H:1V, unless otherwise specified.

3.12 FIELD QUALITY CONTROL

A. Contractor shall perform field quality control as specified in Section 01 45 16.13, Construction Quality Control.

3.13 CLEANUP

A. Upon completion of Work, pressure-wash all equipment that has handled or made contact with dredge material including, but not limited to, bucket, material barge, and other material handling equipment. Water and material residue shall be appropriately handled and disposed of in same manner as water from dredge material.

B. Contact Engineer for inspection and approval of intermediate and final clean-ups of equipment and transfer and disposal sites.

END OF SECTION

SECTION 31 21 12
SEDIMENT RESUSPENSION CONTROL

PART 1 GENERAL

1.01 DESCRIPTION

A. Work covered under this Section includes providing materials, equipment, labor, and performing operations necessary to: Furnish, install, and maintain sediment resuspension controls to comply with the resuspension performance standards for the Dredging Project Area.

B. Related Work:

1. Dredging per Section 31 20 25.23, Mechanical Environmental Dredging.
2. Dredged material transport per Section 31 22 10, Dredge Material Transport.

1.02 REFERENCES

A. USACE, 2005. Silt Curtains as a Dredging Project Management Practice. ERDC TN-DOER-E21, September 2005.

1.03 SUBMITTALS

A. Informational: Engineer shall provide to Contractor operational water quality data generated by Engineer during performance of the Work.

1.04 RESUSPENSION PERFORMANCE MONITORING STANDARDS

A. Turbidity, as an indicator of total suspended solids (TSS), will be the parameter of interest for resuspension performance monitoring. The action level for the Dredging Project Area is an 80-mg/L increase in TSS (equivalent to an estimated turbidity reading of 80 NTU above upstream conditions). Sustained turbidity above the action level for 30 minutes will constitute an exceedance of the action level.

B. The correlation between NTUs and TSS will be verified during the initial phase of dredging by the Engineer. Samples for TSS analysis and turbidity readings will be collected at varying distances from the initial dredging operation. Upon receipt of the TSS results, a new calibration curve will be established to replace the estimated 1 NTU to 1 mg/l TSS ratio.

1.05 PERFORMANCE MONITORING STATIONS

A. The planned locations of performance monitoring stations will be located: as shown on the Drawings or as required to meet permit conditions. The monitoring stations will record turbidity within the river every ten minutes. The performance monitoring stations will be procured, installed, and maintained by the Engineer.

1.06 SEDIMENT RESUSPENSION CONTROL

A. Approved sediment resuspension control measures shall be implemented by the Contractor to meet resuspension performance monitoring standards. Best Management Practices (BMPs) shall be implemented by the Contractor to minimize resuspension during dredging operations.

B. An example of a sediment resuspension control measure is a silt curtain, or turbidity control curtain. Silt curtains will be deployed within the Dredging Project Area to reduce the transport of sediment into and out of the Dredging Project Area. Silt curtains shall be deployed to a depth in the river channel to allow mudflow beneath the silt curtain and meet resuspension standards for the Dredging Project Area. USACE suggests that extra curtain width (10 to 20 percent) may be necessary to accommodate deflection from current flow. The exact location for the deployment of silt curtains will be at the discretion of Contractor.

C. Deployment of silt curtains and/or other resuspension control measures that are anchored to shore will require permission from the property owner (if property is not owned by the Owner). Contingency resuspension control measures and an oil boom (minimum of 750 feet) will be stored on site, for emergency use in the event of resuspension control measures failure, visible sheen, or exceedance of resuspension performance standards. Dredging operations will not be allowed if resuspension control measures are not in place.

D. If resuspension control measures block the flow of traffic in the Dredging Project Area, Contractor shall make available for the resuspension control measures to be opened for public traffic through the Dredging Project Area and designate a contact person that will coordinate the opening of the resuspension control measures, for which the Contractor will be provided reasonable notice. If any set daily timed openings are planned by the Contractor, the time of this window will be communicated by Contractor to the local marinas and the United States Coast Guard Notice to Mariners (contact info on Drawings).

E. The type and configuration of resuspension control measures used during dredging and offloading operations shall be defined in Contractor's Dredging and Operations Plan and be able to meet the resuspension performance standards for the Dredging Project Area and for offloading at the Offloading Area. Within Contractor's Dredging and Operations Plan, contingency measures will be included that describe how the resuspension control measures will be managed during low, average, and high flow conditions and what contingency measures will be implemented in the event resuspension performance standards are not met. The USACE Dredging Operations and Environmental Research (DOER) Program - Silt Curtains as a Dredging Project Management Practice - ERDC TN-DOER-E21 (USACE, 2005), recommends that silt curtains shall only be deployed when river flow velocities are below 1.5 knots (2.5 ft/s). This velocity is deemed the maximum velocity at which the use of silt curtains is considered effective.

F. Resuspension controls shall be used to prevent previously cleaned areas from being re-contaminated by adjacent dredging activities. Measures shall be taken to eliminate the potential for re-contamination of previously cleaned areas. Additionally, Contractor's Operations Plan shall contain the methods to be used to prevent re-contamination during any winter cessation period of adjacent cleaned areas from areas to be cleaned. Any contaminated material from un-dredged areas that is deposited in previously cleaned areas will be the Contractor's responsibility to remove at his own expense.

PART 2 PRODUCTS

2.01 RESUSPENSION CONTROL MEASURES IN DREDGING PROJECT AREA

A. Per Part 1.06, resuspension control measures of sufficient size and quantity, suitable for use in the Dredging Project Area and Staging Area shall be available as a contingency in the event sediment resuspension controls fail to meet performance standards.

2.02 OIL BOOMS

A. Per Part 1.06, oil booms of sufficient size and quantity, suitable for use in the Dredging Project Area and Staging Area shall be available as a contingency measure for maintaining environmental quality. The booms shall be stored in such a manner that they may be deployed within minutes.

PART 3 EXECUTION

3.01 MONITORING

A. Engineer will monitor the water quality data near the Dredging Project Area that will be used to assess the effectiveness of Contractor's sediment resuspension controls.

B. Data from the upstream and downstream monitoring stations will be used to evaluate the water quality with respect to the performance monitoring standard.

C. Engineer will notify Contractor if such monitoring indicates that water quality criteria have been exceeded.

3.02 EVALUATION OF EXCEEDANCE

A. If turbidity readings from the performance monitoring location downstream of the Project area indicate an increase of 80 mg/L in TSS above the upstream performance monitoring location (> 80 NTU above the upstream performance monitoring location), additional monitoring will be performed to assess the BMPs.

B. Additional monitoring shall include turbidity measurement grab samples between the Dredging Project Area and the downstream monitoring location to determine the cause of the increase in turbidity.

C. If the increase was caused from non-dredging activities, the dredging will continue.

D. If the turbidity was elevated due to the dredging activities, Contractor shall immediately re-assess the effectiveness of the BMPs and take prompt corrective measures to mitigate the exceedance of resuspension performance standards.

E. If Engineer determines that dredging and/or construction activities are responsible for the exceedance of the resuspension standards during dredging beyond a 24 hour period, Work shall stop until Contractor can demonstrate

that corrective measures have been taken and turbidity levels are below the resuspension performance standards.

3.03 CORRECTIVE MEASURES

A. Corrective measures proposed by Contractor shall be reviewed by Engineer prior to implementation.

3.04 OPERATION

A. Sediment resuspension controls and contingency measures shall be in place per Part 1.06.

B. Sediment resuspension controls and contingency measures shall not alter the regular flow through the river channel that could result in erosion of sea walls/embankments, scour of river bed, scour of bridge abutments, or other deteriorating effect on structures or facilities in the vicinity of the Dredging Project Area or the Staging Area.

END OF SECTION

SECTION 31 22 10
DREDGED MATERIAL TRANSPORT

PART 1 GENERAL

1.01 DESCRIPTION

A. Work covered by this section includes:

1. Furnishing supervision, labor, materials, and equipment required to transport mechanically dredged material from the Dredging Project Area to the offloading area.

B. The following tasks will be performed by others

1. Operating unloading equipment at the offloading area.
2. Stabilizing of dredged material.
3. Handling of debris at the offloading area.
4. Load out of stabilized material to transports.
5. Load out of debris from the offloading area to transports.

C. Related Work:

1. Dredging per Section 31 20 25.23, Mechanical Environmental Dredging.
2. Performance of air and noise monitoring in accordance with Contractor's HSERP.
3. Performance of sediment resuspension monitoring and control per Section 31 21 12, Sediment Resuspension Control.

1.02 SUBMITTALS

A. Action: Submit to Engineer for approval Contractor's plan for transport and offloading dredged materials at the offloading area as part of the Dredging and Operations Plan.

1.03 JOB CONDITIONS

A. The material removed from the Dredging Project Area shall be transported to the offloading area as shown on Drawings.

B. Offloading Area Requirements:

1. Hours of Operation: Work operations are 12 hours per day, 6 days per week, unless otherwise specified. Contractor can work fewer hours than this as long as the minimum daily production and average daily production rates are maintained and Work is performed in accordance with the Progress Schedule.
2. Dredge material transfer will occur at the offloading area.
3. Contractor will be responsible for coordinating the movement and storage of loaded and unloaded barges into the dredge area with the Dredge Contractors offloading operations.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 EXAMINATION

A. Contractor shall examine the area and conditions of the offloading area for transfer of dredged materials from the Dredging Project Area.

3.02 PREPARATION

A. Contractor shall protect structures, utilities, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by barge unloading operations.

B. Coordinate with Dredge Contractor and inspect temporary mooring to tie off barges and other equipment during the dredging activities..

C. Review pre-dredge bathymetric survey in the vicinity of the offloading area provide barges that can operate with the existing water depth.

D. If desired by Contractor, an access road can be constructed by the Contractor in order to access the South shoreline as shown on the Drawings. Alternatively, transport excavated sediment from the South Shoreline using haul vehicles.

3.03 SEDIMENT UNLOADING

A. Transport material barges loaded with dredged materials or debris to the offloading area when they are loaded to capacity.

B. Stage barges, whether loaded or empty, that are not actively being filled or emptied in a protected part of the Work area until they are ready to be filled or emptied. Provide mooring facilities for staging these barges away from the offloading area.

C. Coordinate with Dredge Contractor to perform dredged material unloading in a controlled and organized manner utilizing means and methods to minimize the loss of sediment to the vicinity of the Staging Area during unloading operations.

3.04 FIELD QUALITY CONTROL

A. Contractor shall utilize equipment, materials, and procedures which are anticipated to meet the quality requirements specified.

END OF SECTION

SECTION 31 23 23
FILL AND BACKFILL

PART 1 GENERAL

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. ASTM International (ASTM):
   a. C117, Standard Test Method for Materials Finer Than 75-Micrometers (No. 200) Sieve in Mineral Aggregates by Washing.
   b. C136, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
   c. C535, Standard Test Method for Resistance to Degradation of Large-Size Course Aggregate by Abrasion and Impact in the Los Angeles Machine.
   d. D75, Standard Practice for Sampling Aggregates.
   e. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 [600 kN-m/m^3]).
   f. D1556, Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
   g. D4254, Standard Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
   h. D6938, Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.02 DEFINITIONS

A. Relative Compaction:

1. Ratio, in percent, of as-compacted field dry density to laboratory maximum dry density as determined in accordance with ASTM D698.
2. Apply corrections for oversize material to either as-compacted field dry density or maximum dry density, as determined by Engineer.

B. Optimum Moisture Content:

1. Determined in accordance with ASTM Standard specified to determine maximum dry density for relative compaction.
2. Determine field moisture content on basis of fraction passing 3/4-inch sieve.

C. Prepared Ground Surface: Ground surface after completion of required demolition, clearing and grubbing, scalping of sod, stripping of topsoil, excavation to grade, and subgrade preparation.

D. Completed Course: A course or layer that is ready for next layer or next phase of Work.

E. Lift: Loose (uncompacted) layer of material.

F. Geosynthetics: Geotextiles, geogrids, or geomembranes.

G. Well-Graded:

1. A mixture of particle sizes with no specific concentration or lack thereof of one or more sizes.
2. Does not define numerical value that must be placed on coefficient of uniformity, coefficient of curvature, or other specific grain size distribution parameters.
3. Used to define material type that, when compacted, produces a strong and relatively incompressible soil mass free from detrimental voids.

H. Selected Backfill Material: Materials available onsite that Engineer determines to be suitable for specific use.

I. Imported Material: Materials obtained from sources offsite, suitable for specified use.

J. Standard Specifications: When referenced in this section, shall mean Wisconsin Department of Transportation, Standard Specifications for Highway and Structure Construction, 2012.

K. Low-Energy Placement: Placement of granular material resulting in low-energy of the material by controlling the mass rate and velocity of the material delivery.

1. Acceptable methods for low-energy placement include the use of sand/salt broadcast spreaders, submerged clamshell releases, conveyor systems, hydraulic placement with the use of diffusers and tremies.

1.03 SUBMITTALS

A. Action Submittals:

1. Samples: Imported material taken at source if requested by the Engineer

B. Informational Submittals:

1. Manufacturer's data sheets for compaction equipment.
2. Certified test results from independent testing agency.

1.04 QUALITY ASSURANCE

A. Notify Engineer when:

1. Area is ready for backfilling, and whenever backfilling operations are resumed after a period of inactivity.
2. Fill material appears to be deviating from Specifications.
3. Samples collected and analyzed to show backfill material is uncontaminated per EPA Regional Screening Levels, June 2011.

1.05 SEQUENCING AND SCHEDULING

A. Complete applicable Work specified in Section 31 20 25.23, Mechanical Environmental Dredging.

PART 2 PRODUCTS

2.01 SOURCE QUALITY CONTROL

A. Gradation Tests:

1. As necessary to locate acceptable sources of imported material.
2. During production of imported material, test as follows:
   a. Embankment Backfill: ASTM D422, one test per 2,000 tons.
   b. Pit Run: ASTM D422, one test per 2,000 tons.
   c. Aggregate Base: ASTM D422, one test per 2,000 tons..

B. Samples: Collected in accordance with ASTM D75:

1. During production of imported material, provide Samples as requested by the Engineer.
2. Clearly mark to show source of material and intended use.

2.02 IMPORTED EMBANKMENT FILL

A. 3-inch minus well graded material containing less than 5 percent material passing the No. 200 sieve.

B. Free from debris and other deleterious material.

2.03 AGGREGATE (STONE) BASE

A. Well graded gravel or crushed rock meeting the requirements of Section 301 and Section 305 of the Standard Specifications.

B. A total of 95 to 100 percent of material by weight passing the 1-1/4 inch sieve.

2.04 DITCH PROTECTION, CHECK DAMS AND PIT RUN MATERIAL

A. Gravel or crushed rock meeting the requirements of Section 313 of the Standard Specifications.

B. Size as shown.

2.05 GEOTEXTILE

A. Woven geotextile as specified in Section 31 32 19.16, Geotextile.

PART 3 EXECUTION

3.01 FILLING AND BACKFILL ONSHORE

A. Keep placement surfaces free of water, debris, and foreign material during placement and compaction of fill and backfill materials.

B. Place and spread fill and backfill materials in horizontal lifts of uniform thickness, in a manner that avoids segregation, and compact each lift to specified densities prior to placing succeeding lifts. Slope lifts only where necessary to conform to final grades or as necessary to keep placement surfaces drained of water.

C. During filling and backfilling, keep level of fill and backfill around each structure even.

D. Do not place fill or backfill, if fill or backfill material is frozen, or if surface upon which fill or backfill is to be placed is frozen.

E. Compact aggregate base as specified in Section 305 of the Standard Specification.

F. Tolerances:

1. Final Lines and Grades: Within a tolerance of 0.25 foot unless dimensions or grades are shown or specified otherwise.
2. Grade to establish and maintain slopes and drainage as shown. Reverse slopes are not permitted.

G. Settlement: Correct and repair any subsequent damage to structures, pavements, curbs, slabs, piping, and other facilities, caused by settlement of fill or backfill material.

3.02 PLACING FILL OVER GEOSYNTHETICS

A. General:

1. Place fill over geosynthetics with sufficient care so as not to damage them.
2. Place fill only by back dumping and spreading only.
3. Dump fill only on previously placed fill.
4. While operating equipment, avoid sharp turns, sudden starts or stops that could damage geosynthetics.

B. Hauling: Operate hauling equipment on minimum of 3 feet of covering.

C. Spreading:

1. Operate spreading equipment on minimum of 12 inches of fill over geosynthetics.
2. Spread fill in same direction as unseamed overlaps to avoid separation of seams and joints.
3. Never push fill downslope. Spread fill over sideslopes by pushing up from slope bottom
4. Maintain proper overlap of unseamed geosynthetics.
5. Avoid overstressing geosynthetics and seams.

D. Compaction: Compact fill only after uniformly spread to full thickness shown.

E. Geosynthetic Damage:

1. Mark punctures, tears, or other damage to geosynthetics, so repairs may be made.
2. Clear overlying fill as necessary to repair damage.

F. Repairs to geosynthetics shall be made by respective installers as specified in respective specification section for each geosynthetic.

END OF SECTION

SECTION 31 32 19.16
GEOTEXTILE

PART 1 GENERAL

1.01 DEFINITIONS

A. Fabric: Geotextile, a permeable geosynthetic comprised solely of textiles.

B. Maximum Average Roll Value (MaxARV): Maximum of series of average roll values representative of geotextile furnished.

C. Minimum Average Roll Value (MinARV): Minimum of series of average roll values representative of geotextile furnished.

D. Nondestructive Sample: Sample representative of finished Work, prepared for testing without destruction of Work.

E. Overlap: Distance measured perpendicular from overlapping edge of one sheet to underlying edge of adjacent sheet.

F. Seam Efficiency: Ratio of tensile strength across seam to strength of intact geotextile, when tested according to ASTM D4884.

1.02 SUBMITTALS

A. Action Submittals:

1. Shop Drawings:
   a. Manufacturer material specifications and product literature.
   b. Description of proposed method of geotextile deployment, equipment, sewing methods, and provisions for holding geotextile temporarily in place until permanently secured.
2. Geotextile Samples: One-piece, minimum 18 inches long, taken across full width of roll of each type and weight of geotextile furnished for Project. Label each with brand name and furnish documentation of lot and roll number from which each Sample was obtained.

B. Informational Submittals:

1. Certifications from each geotextile manufacturer that furnished products have specified property values. Certified property values shall be either minimum or maximum average roll values, as appropriate, for geotextiles furnished.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Deliver each roll with sufficient information attached to identify it for inventory and quality control.

B. Handle products in manner that maintains undamaged condition.

C. Do not store products directly on ground. Ship and store geotextile with suitable wrapping for protection against moisture and ultraviolet exposure. Store geotextile in way that protects it from elements. If stored outdoors, elevate and protect geotextile with waterproof cover.

1.04 SCHEDULING AND SEQUENCING

A. Notify Engineer whenever geotextiles are to be placed. Do not place geotextile without Engineer's approval of underlying materials.

PART 2 PRODUCTS

2.01 WOVEN GEOTEXTILE

A. Composed of polymeric yarn interlaced to form planar structure with uniform weave pattern.

B. Calendared or finished so yarns will retain their relative position with respect to each other.

C. Polymeric Yarn: Long-chain synthetic polymers (polyester or polypropylene) with stabilizers or inhibitors added to make filaments resistant to deterioration due to heat and ultraviolet light exposure.

D. Sheet Edges: Salvaged or finished to prevent outer material from separating from sheet.

E. Unseamed Sheet Width: Minimum 12 feet.

F. Physical Properties: Conform to requirements in Table No. 1.

Table No. 1
Physical Property Requirements for Woven Geotextile

Property	Requirement	Test Method
Apparent Opening Size (AOS)	30 U.S. Standard Sieve Size	ASTM D4751

Table No. 1
Physical Property Requirements for Woven Geotextile

Property	Requirement	Test Method
Water Permittivity	0.2 $sec.^{-1}$, MinARV	ASTM D4491 (Falling Head)
Grab Elongation	<50 percent, MaxARV	ASTM D4632
Wide Width Strip Tensile Strength at@ 5% Strain	2,000 lb/in.-width, MinARV	ASTM D4595
Puncture Strength	620 lb, MinARV	ASTM D4833
Ultraviolet Radiation Resistance	70 percent strength retention, MinARV after 500 hours	ASTM D4355

2.02 SECURING PINS

A. Steel Rods or Bars:

1. 3/16-inch diameter.
2. Pointed at one end.
3. With head on other end sufficiently large to retain washer.
4. Minimum Length: 12 inches.

B. Steel Washers for Securing Pins:

1. Outside Diameter: Not less than 1.5 inches.
2. Inside Diameter: 1/4 inch.
3. Thickness: 1/8 inch.

C. Steel Wire Staples:

1. U-shaped.
2. 10 gauge.
3. Minimum Length: 6 inches.

PART 3 EXECUTION

3.01 LAYING GEOTEXTILE

A. Lay and maintain geotextile smooth and free of tension, folds, wrinkles, or creases.

3.02 JOINTS

A. Unseamed Joints:

1. Overlapped.
2. Overlap, unless otherwise shown:
   a. Foundation/Subgrade Stabilization: Minimum 18 inches.

3.03 SECURING GEOTEXTILE

A. Secure Geotextile with Securing Pins or Staples:

1. Insert securing pins with washers through geotextile.
2. Securing Pin Alignment:
   a. Midway between edges of overlaps.
   b. 6 inches from free edges.
3. Spacing of Securing Pins:

Slope	Maximum Pin Spacing
Steeper than 3:1	2 feet
3:1 to 4:1	3 feet
Flatter than 4:1	5 feet

4. Install additional pins across each geotextile sheet as necessary to prevent slippage of geotextile or to prevent wind from blowing geotextile out of position.
5. Push each securing pin through geotextile until washer bears against geotextile and secures it firmly to subgrade.
6. Where staples are used instead of securing pins, install in accordance with alignment and spacing above. Push in to secure geotextile firmly to subgrade.

3.04 PLACING PRODUCTS OVER GEOTEXTILE

A. Before placing material over geotextile, notify Engineer. Do not cover installed geotextile until after Engineer provides authorization to proceed.

B. If tears, punctures, or other geotextile damage occurs during placement of overlying products, remove overlying products as necessary to expose damaged geotextile. Repair damage as specified in Article Repairing Geotextile.

3.05 REPAIRING GEOTEXTILE

A. Repair or replace torn, punctured, flawed, deteriorated, or otherwise damaged geotextile.

B. Repair Procedure:

1. Place patch of undamaged geotextile over damaged area and at least 18 inches in all directions beyond damaged area.
2. Remove interfering material as necessary to expose damaged geotextile for repair.
3. Sew patches or secure them with heat fusion tacking or with pins and washers, as specified above in Article Securing Geotextile, or by other means approved by Engineer.

END OF SECTION

SECTION 31 37 00
RIPRAP

PART 1 GENERAL

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. ASTM International (ASTM):
   a. C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
   b. C535, Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

1.02 DEFINITIONS

A. Refer to applicable definitions in Section 31 23 23, Fill and Backfill.

1.03 SUBMITTALS

A. Action Submittals:

1. Shop Drawings: Description and location of proposed sources of riprap bedding and riprap.
2. Survey Plan:
   a. Prior to commencement of survey work, submit a Survey Plan for approval that includes, but it not limited to:
      1) Describe approach for hydrographic survey.
      2) Survey method to be used.
      3) Approximate number of survey points within a given area.
      4) Precision of equipment.
      5) Accuracy of survey.
      6) Surveyor qualifications and relevant experience.
3. Survey Results Report:
   a. Within 7 days after completion of survey, submit a Survey Results Reports for approval that includes, but it not limited to:
      1) Results of survey.
      2) Deviations from approved Survey Plan.

B. Informational Submittals:

1. Quarry Certificate of Conformance and supporting documentation showing proposed riprap bedding or riprap meet Standard Specification gradation and materials requirements for the Class or Type specified.
2. Certified Test Results:
   a. Riprap Bedding:
      1) Gradation.
      2) Abrasion resistance.
   b. Riprap:
      1) Gradation.
      2) Abrasion resistance.
      3) Bulk density.
3. Trip tickets showing source, type, and weight of each load of material delivered to Site.

1.04 QUALITY ASSURANCE

A. Riprap Source: Quarry that has produced riprap and has performed satisfactorily on other projects for at least 5 years.

B. Site Visit: Make arrangements for Engineer to visit quarry site to observe materials proposed for riprap and riprap bedding.

1.05 SCHEDULING AND SEQUENCING

A. Complete dredging as specified in Section 31 20 25.23, Mechanical Environmental Dredging, prior to placing riprap bedding.

1.06 MARINE REQUIREMENTS

A. Make arrangements for all marine equipment and facilities including staging areas, dock facilities, and transportation of equipment, material, and personnel to and from Work Site.

B. Provide all necessary equipment and personnel, and otherwise ensure that all of its marine equipment complies with all regulatory and safety requirements.

C. Conduct operation so that marine and recreation traffic is maintained. Notify United States Coast Guard when offshore work is to begin, and furnish a copy of notification to Engineer. Abide by all applicable marine rules and requirements. Conform to requirements of permits and certifications obtained by Contractor.

D. All floating operations shall be in accordance with all applicable laws, rules, and customs.

E. Display signals lights and conduct operation in accordance with general regulations of United States Coast Guard governing lights, day signals, and markers.

F. Prevent spills of fuel or other contaminants. Contractor shall be equipped with supplies and equipment to capture and remove any spills and conform to various regulations for maintaining water quality. Use special fuel barges, as approved by agencies for fueling on-water equipments and tugboats.

1.07 RIPRAP BEDDING AND RIPRAP HYDROGRAPHIC SURVEYS

A. Engage a registered Surveyor licensed in State of Wisconsin or certified hydrographer experienced in hydrographic surveys to perform:

1. Hydrographic survey to document conditions at completion of riprap bedding placement.
2. Hydrographic survey to document conditions at completion of riprap placement.

B. Hydrographic survey methods and means for verifying riprap bedding and riprap elevations shall be by electronic means and calibrated to Project datum prior to beginning of Work.

C. Survey data shall be recorded and confirmed against Project riprap volumes and areas on Drawings. Communicate any differences to Engineer.

D. Hydrographic survey accuracy shall meet the following requirements:

1. Horizontal positioning for depth measurements shall use electronic positioning modes or systems, or hybrid combinations of instrumental and electronic data measurement and recording systems to measure, adjust, correlate, print, plot, and record horizontal and vertical observations.
2. USACE hydrographic surveying requirements per EM 1110-2-1003 Engineering and Design – Hydrographic Surveying, shall be followed.

E. Engineer will be permitted to have an observer present on boat with Contractor during all survey events (and taking of soundings), if desired by Engineer.

PART 2 PRODUCTS

2.01 AGGREGATE RIPRAP BEDDING

A. Gravel with Cobbles or Crushed Rock with Cobble-Sized Pieces:

1. Gradation, as determined in accordance with ASTM C136:
   a. Well-graded from coarse to fine.
   b. All pieces pass a 6-inch square opening.
   c. Minimum 85 percent by weight passes 4-inch square opening.
   d. Minimum 10 percent by weight passes No. 4 U.S. standard sieve.
2. Abrasion Resistance: Maximum 35 percent wear when tested in accordance with ASTM C535.

B. Free of roots and other organic or deleterious matter.

2.02 RIPRAP

A. Hard and durable quarry stone free from fractures, bedding planes, pronounced weathering, and earth or other adherent coatings.

B. Minimum Dimension of Individual Pieces: Not less than 1/3 maximum dimension.

C. Abrasion Resistance: Maximum 35 percent wear as determined in accordance with ASTM C535.

D. Bulk Density: Minimum 160 pounds per dry cubic foot.

E. Gradation: Smaller pieces shall generally fill voids between larger pieces without either excess or deficiency of one or more sizes of stone.

Class	Thickness (Inches)	Weight (Pounds)	% Greater Than
		800	0 to 5
		400	30
		200	75
III	36	25	90

PART 3 EXECUTION

3.01 PLACING RIPRAP BEDDING

A. Place riprap bedding over prepared subgrade to depth and grade as shown on Drawings.

B. No mechanical compaction of riprap bedding is required; however, work riprap bedding as necessary to distribute it and to eliminate detrimental voids. Avoid overworking or long pushes that result in segregation of particle sizes.

C. Place and grade riprap bedding in a manner that avoids subgrade disturbance**.** Do not push riprap bedding down slope.

3.02 PLACING RIPRAP ON RIPRAP BEDDING

A. Place riprap over riprap bedding to thickness shown on Drawings.

B. Intermix different sizes of pieces to eliminate segregation and to fill voids between larger pieces with smaller pieces and work surface free from irregularities.

C. Use placement and intermixing methods that avoid disturbing riprap bedding or damaging existing facilities, completed Work, or adjacent property.

END OF SECTION

SECTION 31 41 00
SHEET PILE WALL SUPPORT

PART 1 GENERAL

1.01 GENERAL

A. This section applies to the soldier pile modifications to be installed in front of the existing sheet pile wall for stability during dredging operations.

B. The project Design Report shall be referenced for soil and rock layering information and strength information.

1.02 SUBMITTALS

A. Action Submittals:

1. Installer qualifications.
2. Shop Drawings.
3. Movement monitoring plan.
4. Movement measurement and data and reduced results indicating movement trends submitted weekly.
5. Concrete mix design.

1.03 QUALIFICATIONS

A. Installer shall have a minimum of 5 years of past successful experience on 10 projects involving drilled shafts and marine bulkhead work. A minimum of 2 projects shall include barge work and drilling shafts in the water.

B. The proposed superintendant for the installer shall also have the same experience level.

C. Installer shall submit documentation including client contact information supporting the submitted experience.

1.04 QUALITY ASSURANCE

A. Provide surveys to monitor movements of all existing facilities within 100 feet of the sheet pile wall.

PART 2 PRODUCTS

2.01 SOLDIER PILES

A. Meeting the size and material requirements defined on the Contract Drawings.

2.02 TIE-RODS

A. Meeting the size and material requirements defined on the Contract Drawings.

2.03 WALERS

A. Meeting the size and material requirements defined on the Contract Drawings.

2.04 LOCK NUT, BEARING PLATE, THICKENER PLATES

A. Meeting the size and material requirements defined on the Contract Drawings.

2.05 DRILLING EQUIPMENT

A. Suitable type and size to allow for soldier pile to be installed with the required rock socket length. For this project, the high strength rock may require the use of a down-the-hole hammer to achieve the required socket length.

B. Capable of producing a pier without disturbance to material along pier or at pier base.

C. Do not use equipment with bent kelley bars or that wobbles during rotation while drilling.

D. Casing must be utilized during drilling that extends, at a minimum, from above the water surface to the bottom of the hole or top of rock.

2.06 CONCRETE

A. Cement: Shall conform to ASTM C150/C150M.

B. Aggregates: Furnish from one source for each aggregate type used in a mix design.

1. Normal-Weight Aggregates:
    a. In accordance with ASTM C33/C33M, except as modified herein.
        1) Class Designation: 4S unless otherwise specified.
    b. Free of materials and aggregate types causing popouts, discoloration, staining, or other defects on surface of concrete.
    c. Alkali Silica Reactivity: See Article Concrete Mix Design.

2. Fine Aggregates:
   a. Clean, sharp, natural sand.
   b. ASTM C33/C33M.
   c. Limit deleterious substances in accordance with ASTM C33/C33M, Table 2 and as follows:
      1) Limit material finer than 75-µm (No. 200) sieve to 3 percent mass of total sample.
      2) Limit coal and lignite to 0.5 percent.
3. Coarse Aggregate:
   a. Natural gravels, combination of gravels and crushed gravels, crushed stone, or combination of these materials containing no more than 15 percent flat or elongated particles (long dimension more than five times the short dimension).
   b. Limit deleterious substances in accordance with ASTM C33/C33M, Table 4 for specified class designation.

C. Admixtures: Unless otherwise permitted, furnish from one manufacturer.

1. Characteristics:
   a. Compatible with other constituents in mix.
   b. Contain at most, only trace amount chlorides in solution.
   c. Furnish type of admixture as recommended by manufacturer for anticipated temperature ranges.
2. Air-Entraining Admixture: ASTM C260/C260M.
3. Water-Reducing Admixture: ASTM C494/C494M, Type A or Type D.
   a. Manufacturers and Products:
      1) BASF Admixtures Inc., Shakopee, MN; Pozzolith Series or PolyHeed Series.
      2) Euclid Chemical Co., Cleveland, OH; Eucon Series.
      3) W. R. Grace & Co., Cambridge, MA; Daracem Series or Mira Series.
4. Retarding Admixture: ASTM C 494/C 494M, Type B.
5. Accelerating Admixture: ASTM C 494/C 494M, Type C.
6. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F or Type G.
   a. Manufacturers and Products:
      1) BASF Admixtures Inc., Shakopee, MN; Glenium Series, PS 1460, or Rheobuild 1000.
      2) Euclid Chemical Co., Cleveland, OH; Eucon Series or Plastol Series.
      3) W. R. Grace & Co., Cambridge, MA; ADVA Series, Daracem Series, or EXP 950.

2.07 CONCRETE MIX DESIGN

A. Proportion constituents to obtain a minimum 28-day compressive strength of 3,000 psi.

B. Maximum coarse aggregate size shall be 3/4 inch.

C. Slump range shall be 6 to 9.5 inches.

PART 3 EXECUTION

3.01 SHOP DRAWINGS

A. Prepare shop drawings addressing following topics:

1. Details of installation equipment.
2. Details of soldier piles, waler, tie-rods, and connection details including but not limited to shims, brackets, washers, and nuts.
3. Design assumptions and calculations for all items not shown on the contract drawings.
4. Methods and sequencing of installing soldier piles and ancillary elements.
5. Proposed locations of stockpiled materials.
6. Anticipated difficulties and proposed resolutions.

3.02 MOVEMENT MONITORING PLAN

A. Prepare movement monitoring plan addressing following topics:

1. Survey control.
2. Location of monitoring points.
3. Plots of data trends.
4. Interval between surveys.

B. A minimum of one monitoring point shall be installed at each of the six design sections referenced in the Soldier Pile Schedule on the Drawings. Monitoring points shall provide horizontal and vertical movement data. All points shall be established with baseline survey readings performed prior to the installation of the sheet pile support system and any new dredging.

C. A minimum of two slope inclinometers shall be installed behind the existing sheet pile wall to allow for measuring lateral deflection along the depth of the wall. It is recommended to install one inclinometer in the 8th St Slip Area and one just to the East of the 8th St Slip Area. Both slope inclinometers shall be installed into the bedrock and to a minimum depth equal to the bottom of the

proposed soldier pile. A minimum of two baseline readings shall be established prior to installing the wall support system and prior to commencing any new dredging operations.

D. All monitoring points shall be surveyed at a minimum frequency of twice per week during the sheet pile wall support system installation and during the dredging operations. Once the high impact work is complete and the movements have stabilized, the monitoring frequency can be decreased to weekly.

E. The following warning and action limits are proposed for all monitoring information.

1. The warning limits shall be utilized to alert of a potential problem and shall give the Contractor time to determine if modifications need to be made to the wall support system. This warning limit is proposed to be set at 1 inch for lateral movement and ½-inch for vertical movement.
2. The action limit shall be used to alert of damaging movements and is typically the point where work should be stopped and mitigation measured implemented to prevent catastrophic failure of any wall systems. This action limit is proposed to be set a 2 inches for lateral movement and 1 inch for vertical movement.

F. Contractor shall also perform daily visual inspections of the ground behind the existing sheet pile wall. Any observed cracking with a thickness greater than 1-inch shall be conveyed to the engineer. Visual inspection reports shall be submitted with the survey monitoring data.

3.03 INSTALLATION OF SHEET PILE SUPPORT

A. All elements shall meet or exceed the minimum sizes shown on the Drawings.

B. Support system shall be installed following the suggested construction sequence provided on the drawings. Any significant deviations to this sequence shall be submitted for approval by the Engineer.

C. All soldier pile elements shall be installed using drilling techniques. Drilling will ensure that soldier piles are installed parallel to the existing sheeting.. Driving will not be allowed since the piles are likely to walk away from the sheeting during driving in the glacial till.

D. The Design Report provides rock strength and quality data for two rock cores performed out in front of the existing sheet pile wall on the river side. The rock was identified as a dolomitic limestone. The lab tests measured unconfined compressive strengths ranging from 26 to 29 ksi and split tensile

strengths ranging from 1.8 to 2.0 ksi indicating the rock is very strong. The boring logs indicate the upper few feet of the rock may be fractured and should not relied upon for rock socket length.

E. The Contract Drawings provide a soldier pile schedule with estimated lengths and quantities. This information is strictly an estimate and the key to a successful installation will be to install soldier piles to the desired rock socket length based on the actual field conditions encountered during drilling.

F. Soldier piles designed to be installed to the top of rock shall be drilled to refusal as defined by less than 6 inches of penetration of the earth drilling tools in 15 minutes while operating with full crowd and maximum torque of the drilled shaft rig.

G. The rock socket length defined on the drawings shall be measured from the point where earth auger refusal occurs as defined above. If refusal occurs more than 3 feet above the where the bedrock is defined on the drawings or where encountered in adjacent soldier piles, the refusal shall be considered to be caused by a boulder. In this case, the rock socket shall be extended to match the nearest adjacent soldier pile.

H. Temporary steel casing will be required to aid in collection of the drill cuttings and concrete backfill. All spoils shall be disposed of offsite.

I. Drilled hole shall be cleaned of soil and rock cuttings leaving less than 1/2 inch of loose cuttings on the bottom of the hole.

J. Set soldier in hole using a template to locate the soldier along the side of the casing closest to the sheet pile wall.

K. Place concrete in hole and remove temporary casing.

L. Once the soldier piles are installed, the driven H-piles for the deadman anchors can be installed in accordance with the requirements on the contract drawings and in Section 31 62 16, Steel Piles.

M. Perform shallow localized excavation around the top of the deadman anchors to allow for waler to be on the land side of the deadman anchors.

N. Dig narrow trenches from the deadman anchors to the back of the sheet pile and then install the tie-rods at the locations shown on the Drawings.

O. Attach waler to river side of the sheet pile wall as shown on the Drawings.

P. Steel shims shall be utilized to bring waler into contact with all sheet piles as well as the soldier piles.

Q. Make all connections between sheet pile wall walers, tie-rods, and deadman anchor walers. Tie-rods shall be pre-tensioned to 50 percent of the design load shown on the Drawings prior to performing any dredging operations.

3.04 CONCRETING

A. Concrete shall be placed using the tremie method in all drilled holes.

B. Keep tremie pipe as near as possible to the bottom of excavation, equip with weights as necessary.

C. Prevent water intrusion into tremie pipe.

D. Equip tremie pipe with a bottom plate or floating plug. Vent as necessary to prevent formation of air pockets.

E. Keep discharge end entirely immersed in concrete at all times with a minimum of 5 feet of concrete head once placement begins.

F. Support tremie pipe so that it can be raised to increase discharge rate or lowered to decrease discharge rate.

G. Provide continuous flow of concrete in order for concrete in tremie pipe to maintain a positive pressure differential at all times to prevent water intrusion into the pier concrete.

H. Pour concrete to a maximum elevation equal to 2 feet below the existing mudline at the location of each shaft.

3.05 TEMPORARY CASING REMOVAL

A. Coordinate soldier pile template with the casing removal requirements to allow for casing to be removed while maintaining alignment of soldier pile.

B. Withdraw during concrete placement while concrete is still fluid and plastic, and before initial set.

C. Maintain a minimum 5-foot head of concrete on bottom of temporary casing at all times.

D. Take every precaution to prevent caving of hole sides while concrete is being placed.

E. Prevent arching of concrete as casing is removed.

3.06 REMOVAL OF SHEET PILE SUPPORT

A. Remove portions of the sheet pile support system that will not adversely affect the long-term stability of the sheet pile wall.

B. Do not begin to remove excavation support until support can be removed without damage to existing facilities, completed Work, or adjacent property.

C. Remove excavation support in a manner that does not leave voids in the ground behind or in front of the sheet pile wall.

END OF SECTION

SECTION 31 62 16
STEEL PILES

PART 1 GENERAL

1.01 GENERAL

A. This section applies to the driven H-pile deadman anchor piles to be driven behind the existing sheet pile wall and connected to the sheet pile wall with tie-rods to provide lateral support of the sheet pile wall.

1.02 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. ASTM International (ASTM): A572, Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.

1.03 DEFINITIONS

A. Design Position: The location of the centroid of the pile at cutoff elevation (x, y, and z coordinates) as shown.

B. Dynamic Monitoring: Monitoring performed with Case-Goble Pile Driving Analyzer (PDA). Gauges are attached to pile approximately 3 feet below pile head and connected with cable to monitoring station on ground away from pile. Gauges consist of two accelerometers and two strain transducers.

C. Elevations: Referenced to NAVD 88.

D. Fixed Leads: Leads that are pinned to crane boom at top and equipped with hydraulic spotter at bottom capable of spotting pile to its correct position and maintaining alignment during driving. Degree of rigidity and strength acceptable will be subject to review of Engineer.

E. Obstruction: Sudden and significant increase of penetration resistance and deviation of pile out of tolerance resulting from encountering a subsurface or physical condition.

F. Practical Refusal: Penetration resistance of at least 120 blows per foot for 3 continuous feet, 200 blows per foot for 1 foot, or 50 blows per inch for 2 consecutive inches, whichever comes first, and to continue driving pile would be impractical. These criteria apply only for hammer sizes and operation as specified.

G. Rated Hammer Energy: Diesel Hammers - Product of rated stroke times ram weight.

H. Set: Pile penetration in inches per blow.

I. Sweep: Deviation from straightness measured along two perpendicular faces of pile while not subject to bending forces.

J. Swinging Leads: Pile driving leads that are not pinned at the top and do not have a hydraulic spotter to position the leads.

K. Termination Penetration Resistance: Penetration resistance (blow count) at which driving may be terminated, as established by Engineer.

1.04 SUBMITTALS

A. Informational Submittals:

1. Production pile driving schedule and sequence.
2. Piling Installer Qualifications.
3. Manufacturer's Certification of Compliance: Manufactured Products.
4. Certification of Calibration: Pressure gauge for measuring chamber pressure for closed end diesel hammers. Include a chart for closed end diesel hammers that equates bounce chamber pressure to either equivalent stroke or energy.
5. Proposed method(s) to align and maintain pile alignment, including type of leads to be used with details on methods and equipment to be used to measure alignment.
6. Manufacturer's Specifications of Products, and Maintenance Manuals, for pile hammer and auxiliary equipment.
7. Complete Pile Hammer Data Sheet, attached as Supplement to this Specification. Refer to Part 3, Article Supplements.
8. Wave equation analysis confirming the selected hammer is capable of reaching the specified minimum depth of embedment.
9. Daily Log and Record: At end of each working day, submit two copies of each record for every pile constructed that day.

1.05 QUALIFICATIONS

A. Piling Installer: Minimum of 5 years of past successful experience on ten projects of steel pile installation.

1.06 STORAGE AND HANDLING

A. Do not subject piles to damage by impact bending stresses in transporting to and storing piles onsite.

PART 2 PRODUCTS

2.01 PILES

A. H-Piles: Minimum nominal size and ASTM Standard and Grade shown.

2.02 PILE SPLICES

A. Pile splices shall not be used.

PART 3 EXECUTION

3.01 PILE DRIVING EQUIPMENT

A. Pile Driving Hammer and Driving System:

1. Air, Hydraulic, or Diesel hammers capable of continuous operation at all fuel settings, and not overstress or otherwise cause damage to pile during installation.
2. Size and type to consistently deliver an effective dynamic energy sufficient to drive pile to required minimum depth.
3. Compressor/Boiler Capacity: Furnish with at least 10 percent greater than manufacturer’s minimum requirement.
4. Air Hammer Calibrated Pressure Gauge: Furnish and position on hammer side of all valves, no more than 100 feet of hose away from hammer inlet and located for easy observation.
5. Closed-End Diesel Hammer Calibrated Pressure Gauge: Furnish and position near ground level for easy observation.
6. Minimum Hammer Rated Energy:
   a. Diesel Hammers: 30 ft-kips**.**

B. Hammer Cushion/Capblock: Manufactured from stable and predictable material.

1. Manufacturer and Type:
   a. Metex Corp; Aluminum-Micarta, Force 10.
   b. Penn State Metal Fabricators; Aluminum and Conbest.

C. Helmet: Seat onto pile and bear evenly and concentrically with minimum play upon pile.

D. Pile Head: Free to rotate.

E. Pile Driving Leads:

1. Degree of rigidity and strength sufficient to maintain pile and hammer alignment.
2. Fixed Leads: Provide with hydraulic spotter.
3. Swinging leads to be used with driving template:
   a. Driving Template: Capable of maintaining alignment and position of leads and pile during driving within tolerances specified herein.
   b. Of sufficient length so that lowering the leads during driving is not necessary.
4. Of sufficient length so use of follower is not necessary.
5. Straight and parallel, not deviating from straight line by more than 1/2 inch over 15-foot length.
6. Easily adjustable to permit axial driving without interruption if piles deviate from required alignment.

3.02 PREPARATION

A. Use templates or other suitable methods to ensure required degree of accuracy.

B. Mark piles in 1-foot increments from the pile tip to the top.

3.03 INSTALLATION

A. Perform driving in presence of Engineer.

B. Splicing is not permitted. All piles shall be delivered to the Site with sufficient length to reach the minimum depth with one piece of pile.

C. Pile Marking: At 1-foot intervals for purpose of recording driving resistance and depth of penetration of pile.

D. Pile Driving:

1. Perform in presence of Engineer.
2. Maintain hammer concentric with driving train in axial alignment on pile. Do not use hammer to limit deviation of pile during driving by exerting lateral forces or striking at angle. Where pile orientation is essential, take special care to maintain orientation during driving.
3. Impact driving may be terminated when the minimum depth shown on Drawings is reached.

4. Means or device suitable to indicate penetration of piles which is visible to Engineer at reasonable and safe distance from pile driver.
5. Drive piles continuously, and without voluntary interruption, to minimum depth shown on drawings.
    a. If refusal driving resistance is obtained above minimum toe depth, preboring or other methods acceptable to Engineer may be required to advance pile. Installing an additional pile will be an acceptable alternative.
    b. Proceed with alternative installation method.
6. Redrive piles that are raised during process of driving.
7. Pulling piles into alignment or position will not be permitted.

E. Driving Tolerances:

1. Not more than 2 percent from vertical.
2. Centroid of pile at cutoff elevation shall not vary from design position shown by more than 6 inches after driving.

3.04 PILE CUTOFF

A. Cut square at required elevation with tools that will not damage area below cut surface.

3.05 FIELD QUALITY CONTROL

A. Daily Log and Record: Document for each pile showing as a minimum:

1. Pile identification/location.
2. Weather/groundwater conditions.
3. Date and time start and complete driving.
4. Respective depths of penetration.
5. Pile toe and cutoff elevations.
6. Driving resistance for each foot of driving over entire pile length.
7. Driving resistance shall include the blows per foot as well as the average hammer stroke or operating pressure per foot of driving.
8. Equipment used.
9. Installation method.
10. Final pile head position (x, y, z coordinates) after cut off indicating if pile is installed within the specified tolerances.
11. Nature and location of obstructions encountered.
12. Other pertinent pile driving behavior.

3.06 SUPPLEMENT

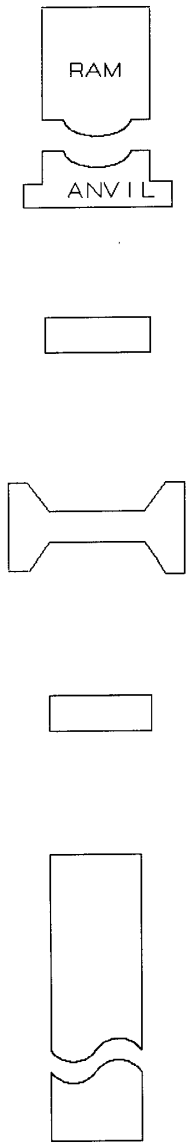
A. The supplement listed below, following “End of Section,” is a part of this Specification.

1. Hammer Data Sheet.

END OF SECTION

HAMMER DATA SHEET

Contract No.:	Structure Name and/or No.:
Project:	
Pile Driving CONTRACTOR or Subcontractor:	
County:	Piles Driven By:



Manufacturer:	Model:
Type:	Serial No.
Rated Energy: @	Length of Stroke
Modifications:	
Material:	
Thickness:	Area:
Modulus of Elasticity - E	(psi)
Coefficient of Restitution - e	
ALL COMPONENTS	Weight:
Cushion Material:	
Thickness:	Area:
Modulus of Elasticity - E	(psi)
Coefficient of Restitution - e	
Pile Type:	Weight/ft
Length in Leads:	
Wall Thickness:	Taper:
Design Pile Capacity:	(Tons)
Description of Splice:	
Tip Treatment Description:	

NOTE: If mandrel is used to drive pile, attach separate manufacturer's detail sheet(s), including weight and dimensions.

Submitted By:_____ Date:_____

SECTION 32 12 16
ASPHALT PAVING

PART 1 GENERAL

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. American Association of State Highway and Transportation Officials (AASHTO):
   a. M17, Standard Specification for Mineral Filler for Bituminous Paving Mixtures.
   b. M81, Standard Specification for Cut-Back Asphalt (Rapid Curing Type).
   c. M82, Standard Specification for Cut-Back Asphalt (Medium Curing Type).
   d. M140, Standard Specification for Emulsified Asphalt.
   e. M208, Standard Specification for Cationic Emulsified Asphalt.
   f. T166, Standard Method of Test for Bulk Specific Gravity of Compacted Asphalt Mixtures Using Saturated Surface-Dry Specimens.
   g. T176 Standard Method of Test for Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test.
   h. T230, Standard Method of Test for Determining Degree of Pavement Compaction of Bituminous Aggregate Mixtures.
   i. T245, Standard Method of Test for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus.
   j. T246, Standard Method of Test for Resistance to Deformation and Cohesion of Bituminous Mixtures by Means of Hveem Apparatus.
   k. T247, Standard Method of Test for Preparation of Test Specimens of Bituminous Mixtures by Means of California Kneading Compactor.
   l. T283, Standard Method of Test for Resistance of Compacted Bituminous Mixture to Moisture Induced Damage.
   m. T304, Standard Method of Test for Uncompacted Void Content of Fine Aggregate (Method A).
2. Asphalt Institute (AI):
   a. Manual Series No. 2 (MS-2), Mix Design Methods for Asphalt Concrete.
   b. Superpave Series No. 2 (SP-2), Superpave Mix Design.

3. ASTM International (ASTM):
   a. D2041, Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures.
   b. D4318, Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
   c. D4791, Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
   d. D5821, Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate.
   e. E329, Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.

1.02 DEFINITIONS

A. Hot Mix Asphalt: All mineral constituents of hot mix asphalt, including mineral filler, SMA stabilizer and separately sized aggregates.

B. Standard Specifications: State of Wisconsin Department of Transportation Standard Specifications for Highway and Structure Construction, 2012.

1.03 SUBMITTALS

A. Action Submittals: Provide certification that the proposed mix design conforms to the requirements of the Standard Specifications.

B. Informational Submittals:

1. Hot Mix Asphalt (HMA) Pavement:
   a. Submit minimum of 15 days prior to start of production.
   b. Submittal to include the following information:
      1) Properties as stated in Sections 455 and 460 of the Standard Specifications.
      2) Gradation and portion for each aggregate constituent used in mixture to produce a single gradation of aggregate within specified limits.
      3) Bulk specific gravity for each aggregate constituent.
      4) Measured maximum specific gravity of mix at optimum asphalt content determined in accordance with ASTM D2041.
      5) Percent of asphalt lost due to absorption by aggregate.
      6) Index of Retained Strength (TSR) at optimum asphalt content as determined by AASHTO T283.
      7) Optimum mixing temperature.
      8) Optimum compaction temperature.
      9) Temperature-viscosity curve of hot mix asphalt to be used.

10) Brand name of any additive to be used and percentage added to mixture.

2. Test Report for Hot Mix Asphalt:
   a. Submit minimum 10 days prior to start of production.
   b. Show appropriate test method(s) for each material and the test results.
3. Manufacturer's Certificate of Compliance for the following materials:
   a. Aggregate: Gradation, source test results as defined in Sections 455 and 460 of the Standard Specifications.
   b. Asphalt for Binder: Type, grade, and viscosity-temperature curve.
   c. Prime Coat: Type and grade of asphalt.
   d. Tack Coat: Type and grade of asphalt.
   e. Additives.
   f. Mix: Conforms to hot mix asphalt design as defined in Section 460 of the Standard Specifications.
4. Statement of qualification for independent testing laboratory.
5. Test Results:
   a. Mix design.
   b. Hot mix asphalt core.
   c. Gradation and asphalt content of uncompacted mix.
   d. Field density.
   e. Quality control.

1.04 QUALITY ASSURANCE

A. Qualifications:

1. Independent Testing Laboratory: In accordance with ASTM E329.
2. Hot mix asphalt shall be prepared by approved certified independent laboratory under the supervision of a certified asphalt technician.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Temperature: Do not apply asphalt materials or place asphalt mixes when ground temperature is lower than 10 degrees C (50 degrees F) or air temperature is lower than 4 degrees C (40 degrees F). Measure ground and air temperature in shaded areas away from heat sources or wet surfaces.

B. Moisture: Do not apply asphalt materials or place asphalt mixes when application surface is wet.

PART 2 PRODUCTS

2.01 MATERIALS

A. Tack Coat: Emulsified asphalt, conform to Sections 450, 455, and 460 of the Standard Specifications.

2.02 HOT MIX ASPHALT (HMA) PAVEMENT

A. HMA: Type E-1, as specified in Sections 450, 455, and 460 of the Standard Specifications.

B. Composition: Hot-plant mix of aggregate, mineral filler, if required, and SMA stabilizer, if required. The several aggregate fractions shall be sized, uniformly graded, and combined in such proportions that resulting mixture meets grading requirements of mix formula.

C. Aggregate; General: As specified in Sections 450, 455, and 460 of the Standard Specifications; however, RAP material will not be acceptable.

PART 3 EXECUTION

3.01 GENERAL

A. Driveways: Repave driveways and parking areas from which pavement was removed. Leave pavement in as good or better condition than before start of construction.

3.02 LINE AND GRADE

A. Provide and maintain intermediate control of line and grade, independent of underlying base, to meet finish surface grades and minimum thickness.

3.03 APPLICATION EQUIPMENT

A. In accordance with Sections 450, 460 and 465 of the Standard Specifications.

3.04 PREPARATION

A. Prepare subgrade as specified in Section 211 of the Standard Specifications.

B. Existing Roadway:

1. Modify profile by grinding, milling, or overlay methods as approved, to provide meet lines and surfaces and to produce smooth riding connection to existing facility.

2. Remove existing material to a minimum depth of 25 millimeters (1 inch).
3. Paint edges of meet line with tack coat prior to placing new pavement.

C. Thoroughly coat edges of contact surfaces (curbs, manhole frames, existing asphalt) with emulsified asphalt prior to laying new pavement. Prevent staining of adjacent surfaces.

3.05 PAVEMENT APPLICATION

A. General: Place hot mix asphalt on approved, prepared base in conformance with Sections 450, 455, 460, and 465 of the Standard Specifications.

B. Prime Coat:

1. Prepare material, as specified in Sections 450, 460, and 465 of the Standard Specifications, prior to application.
2. Apply uniformly to clean, dry surfaces avoiding overlapping of applications.
3. Do not apply when moisture content of upper 75 millimeters (3 inches) of base exceeds optimum moisture content of base, or if free moisture is present.
4. Application Rate: Minimum 0.68 to maximum 2.28 liters per square meter of surface area (0.15 to 0.50 gallons per square yard).
5. Remove or redistribute excess material.
6. Allow a minimum of 1 full day for curing of primed surface before placing hot mix asphalt.

C. Tack Coat:

1. Prepare material, as specified in Sections 450, 460, and 465 of the Standard Specifications, prior to application.
2. Apply uniformly to clean, dry surfaces avoiding overlapping of applications.
3. Do not apply more tack coat than necessary for the day’s paving operation.
4. Touch up missed or lightly coated surfaces and remove excess material.
5. Application Rate: Minimum 0.25 liter to maximum 0.70 liter of asphalt (residual if diluted emulsified asphalt) per square meter (0.05 to 0.15 gallon per square yard) of surface area.

D. Pavement Mix:

1. Prior to Paving:
   a. Sweep primed surface free of dirt, dust, or other foreign matter.

b. Patch holes in primed surface with hot mix asphalt pavement.
c. Blot excess prime material with sand.

2. Place hot mix asphalt pavement in two equal lifts.
3. Compacted Lift Thickness:
   a. Minimum: Twice maximum aggregate size, but in no case less than 25 millimeters (1 inch).
   b. Maximum: 100 millimeters (4 inches).
4. Total Compacted Thickness: As shown.
5. Apply such that meet lines are straight and edges are vertical.
6. Collect and dispose of segregated aggregate from raking process. Do not scatter material over finished surface.
7. Joints:
   a. Offset edge of each layer a minimum of 150 millimeters (6 inches) so joints are not directly over those in underlying layer.
   b. Offset longitudinal joints in roadway pavements so longitudinal joints in wearing layer coincide with pavement centerlines and lane divider lines.
   c. Form transverse joints by cutting back on previous day's run to expose full vertical depth of layer.
8. Succeeding Lifts: Apply tack coat to pavement surface between each lift.
9. After placement of pavement, seal meet line by painting a minimum of 150 millimeters (6 inches) on each side of joint with cut-back or emulsified asphalt. Cover immediately with sand.

E. Compaction:

1. Uniformly compact each course until there is no further evidence of consolidation and roller marks are eliminated. When placement rate exceeds 90 Mg (100 tons) per hour, operate minimum of two rollers for compaction.
2. Roll until roller marks are eliminated and minimum percent compaction as stated in the Standard Specifications.
3. Joint Compaction:
   a. Place top or wearing layer as continuously as possible.
   b. Pass roller over unprotected end of freshly laid mixture only when placing of mix is discontinued long enough to permit mixture to become chilled.
   c. Cut back previously compacted mixture when Work is resumed to produce slightly beveled edge for full thickness of layer.
   d. Cut away waste material and lay new mix against fresh cut.

F. Tolerances:

1. General: Conduct measurements for conformity with crown and grade immediately after initial compression. Correct variations immediately by removal or addition of materials and by continuous rolling.
2. Completed Surface or Wearing Layer Smoothness:
   a. Uniform texture, smooth, and uniform to crown and grade.
   b. Maximum Deviation: 3 millimeters (1/8 inch) from lower edge of a 3.6-meter (12-foot) straightedge, measured continuously parallel and at right angle to centerline.
   c. If surface of completed pavement deviates by more than twice specified tolerances, remove and replace wearing surface.
3. Transverse Slope Maximum Deviation: 6 millimeters (1/4 inch) in 3.6 meters (12 feet) from rate of slope shown.

G. Seal Coat:

1. General: Apply seal coat of paving grade or emulsified asphalt to finished surface at longitudinal and transverse joints, joints at abutting pavements, areas where hot mix asphalt was placed by hand, patched surfaces, the entire 6th Street Slip water treatment area, and other areas as directed by Engineer.
2. Preparation:
   a. Surfaces that are to be sealed shall be maintained free of holes, dry, and clean of dust and loose material.
   b. Seal in dry weather and when temperature is above 2 degrees C (35 degrees F).
3. Application:
   a. Fill cracks over 1.5 millimeters (1/16 inch) in width with asphalt-sand slurry or approved crack sealer prior to sealing.
   b. When sealing patched surfaces and joints with existing pavements, extend minimum 150 millimeters (6 inches) beyond edges of patches.

3.06 PAVEMENT OVERLAY

A. Preparation:

1. Remove fatty asphalt, grease drippings, dust, and other deleterious matter.
2. Surface Depressions: Fill with hot mix asphalt, and thoroughly compact.

3. Damaged Areas: Remove broken or deteriorated hot mix asphalt and patch as specified in Article Patching.
4. Portland Cement Concrete Joints: Remove joint filler to minimum 12 millimeters (1/2 inch) below surface.

B. Application:

1. Tack Coat: As specified in this Section.
2. Place and compact hot mix asphalt as specified in Article Pavement Application.
3. Place first layer to include widening of pavement and leveling of irregularities in surface of existing pavement.
4. When leveling irregular surfaces and raising low areas, the actual compacted thickness of any one lift shall not exceed 50 millimeters (2 inches).
5. Actual compacted thickness of intermittent areas of 100 square meters (120 square yards) or less may exceed 50 millimeters (2 inches), but not 100 millimeters (4 inches).
6. Final wearing layer shall be of uniform thickness, and meet grade and cross-section as shown.

3.07 PATCHING

A. Preparation: Remove damaged, broken, or unsound hot mix asphalt adjacent to patches. Trim to straight lines exposing smooth, sound, vertical edges.

B. Application:

1. Patch Thickness: 75 millimeters (3 inches) or thickness of adjacent hot mix asphalt, whichever is greater.
2. Place hot mix asphalt across full width of patch in layers of equal thickness.
3. Spread and grade hot mix asphalt with hand tools or mechanical spreader, depending on size of area to be patched.

C. Compaction:

1. Roll patches with power rollers capable of providing compression of 350 to 525 Newtons per linear centimeter (200 to 300 pounds per linear inch). Use hand tampers where rolling is impractical.
2. Begin rolling top course at edges of patches, lapping adjacent asphalt surface at least 1/2 the roller width. Progress toward center of patch overlapping each preceding track by at least 1/2 width of roller.
3. Make sufficient passes over entire area to remove roller marks and to produce desired finished surface.

D. Tolerances:

1. Finished surface shall be flush with and match grade, slope, and crown of adjacent surface.
2. Tolerance: Surface smoothness shall not deviate more than plus 6 millimeters (1/4 inch) or minus 0 millimeter when straightedge is laid across patched area between edges of new pavement and surface of old surfacing.

3.08 FIELD QUALITY CONTROL

A. General: Provide services of approved certified independent testing laboratory to conduct tests.

B. Field Density Tests:

1. Perform tests from cores or sawed samples in accordance with AASHTO T230 and AASHTO T166.
2. Measure with properly operating and calibrated nuclear density gauge in accordance with ASTM D2950.
3. Maximum Density: In accordance with ASTM D2041, using sample of mix taken prior to compaction from same location as density test sample.

END OF SECTION

SECTION 32 92 00
TURF AND GRASSES

PART 1 GENERAL

1.01 DEFINITIONS

A. Maintenance Period: Begin maintenance immediately after each area is planted (seed) and continue for a period of 8 weeks after all planting under this section is completed.

B. Satisfactory Stand: Grass or section of grass of 10,000 square feet or larger that has: No less than 80 percent seed germination over all disturbed surfaces.

1.02 INFORMATIONAL SUBMITTALS

A. Shop Drawings: Product labels/data sheets.

B. Quality Control Submittals:

1. Seed: Certification of seed analysis (Pure Live Seed) and germination rate:
   a. Certify that each lot of seed has been tested by a testing laboratory certified in seed testing, within 6 months of date of delivery. Include with certification:
      1) Name and address of laboratory.
      2) Date of test.
      3) Lot number for each seed specified.
      4) Test Results: (i) name, (ii) percentages of purity and of germination, and (iii) weed content for each kind of seed furnished.

C. Contract Closeout Submittals: Description required maintenance activities and activity frequency.

1.03 DELIVERY, STORAGE, AND PROTECTION

A. Seed:

1. Furnish in standard containers with seed name, lot number, net weight, percentages of purity, germination, and hard seed and maximum weed seed content, clearly marked for each container of seed.
2. Keep dry during storage.

1.04 WEATHER RESTRICTIONS

A. Perform Work under favorable weather and soil moisture conditions as determined by accepted local practice.

1.05 SEQUENCING AND SCHEDULING

A. Complete Work under this section within 10 days following completion of soil preparation.

B. Notify Engineer at least 3 days in advance of:

1. Each material delivery.
2. Start of planting activity.

C. Planting Season: Those times of year that are normal for such Work as determined by accepted local practice.

1.06 MAINTENANCE SERVICE

A. Contractor shall perform maintenance operations during Maintenance Period to include:

1. Watering: Keep surface moist.
2. Washouts: Repair by filling with weed free topsoil, and seeding.
3. Fence: Repair and maintain until Satisfactory Stand of grass is established.
4. Reseed unsatisfactory areas or portions thereof immediately at the end of the Maintenance Period if a Satisfactory Stand has not been produced.
5. Reseed/replant during next planting season if scheduled end of Maintenance Period falls after September 15.
6. Reseed/replant entire area if Satisfactory Stand does not develop by July 1 of the following year.

PART 2 PRODUCTS

2.01 SEED

A. Fresh, clean new-crop seed that complies with the tolerance for purity and germination established by Official Seed Analysts of North America.

B. Seed Mix: In wetland areas and along stream banks an annual rye seed (*Elymus virginicus*) of 20 pounds pure live seed per acre with no fertilizer shall be used.

2.02 NETTING

A. Jute:

1. Heavy-duty, twisted, weighing 1 pound(s) per square yard.
2. Openings Between Strands: Approximately 1 inch square.

PART 3 EXECUTION

3.01 PREPARATION

A. Grade areas to smooth, even surface with loose, uniformly fine texture.

1. Restore surfaces to within 3 inches of pre-construction contours. Roll and rake, remove ridges, fill depressions to meet finish grades.
2. Limit such Work to areas to be planted within immediate future.
3. Remove debris, and stones larger than 1-1/2-inch diameter, and other objects that may interfere with planting and maintenance operations.

B. Moisten prepared areas before planting if soil is dry. Water thoroughly and allow surface to dry off before seeding. Do not create muddy soil.

C. Restore prepared areas to specified condition if eroded or otherwise disturbed after preparation and before planting.

3.02 SEEDING

A. Start within 2 days of preparation completion.

B. Mechanical: Broadcast seed in two different directions, compact seeded area with cultipacter or roller.

1. Sow seed at uniform rate of 20 pounds per acre.
2. Use Brillion type seeder.
3. Broadcasting will be allowed only in areas too small to use Brillion type seeder. Where seed is broadcast, increase seeding rate 20 percent.
4. Roll with ring roller to cover seed, and water with fine spray.

C. Netting: Immediately after seeding, place over seeded areas with slopes steeper than 3:1, in accordance with manufacturer’s instructions. Locate strips parallel to slope and completely cover seeded areas.

D. Water: Apply with fine spray after seeding to saturate top 4 inches of soil.

3.03 FIELD QUALITY CONTROL

A. 8 weeks after seeding is complete and on written notice from Contractor, Engineer will, within 15 days of receipt, determine if a Satisfactory Stand has been established.

B. If a Satisfactory Stand has not been established, Engineer will make another determination after written notice from Contractor following the next growing season.

END OF SECTION