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material shall be furnished forty-five (45) or more calendar days prior to the date the Contractor is scheduled to obtain materials from such source(s).

- a. Name and address (Property Owner).
- b. Location, site map, and legal description (or appropriate substitute) of the area.
- c. Previous land use information.
- d. A topographic map of the area.
- e. Photographs showing the area proposed for use.
- f. Written permission of the owners of the proposed non-listed or non-commercially active sources(s).
- g. Written permission of the owners of the access properties involved.
- h. All data required to assess potential environmental impacts. This information is required in order to determine the necessity for environmental documentation for any non-commercially active, non-listed source(s).
- i. Documentation of coordination of the use of proposed non-commercially active, non-listed source(s) with Federal, State and local agencies having an interest and furnish written approval of these agencies for use of such source(s).

(1) Field Supervisor, U.S. Fish and Wildlife Service, Ecological Services, 2651 Coolidge Road, East Lansing, Michigan 48823. Phone: 517-351-2555.

(2) Chief, Planning and Assessment Branch (ME-J19), U.S. Environmental Protection Agency, 77 West Jackson Blvd., Chicago, Illinois 60604-3590.

(3) Chief, Land and Water Mgmt. Division, Michigan Department of Environmental Quality, P. O. Box 30458, Lansing, Michigan 48909.

(4) State Historic Preservation Officer, Michigan Bureau of History, 717 W. Allegan, Lansing, Michigan 48918-1800.

(1) Supervisor, Green Bay Field Office, U.S. Fish and Wildlife Service, 1015 Challenger Court, 43 Business Center, Green Bay, Wisconsin 54311.

(2) Chief, Planning and Assessment Branch (ME-J19), U.S. Environmental Protection Agency, 77 West Jackson Blvd., Chicago, Illinois 60604-3590.

(3) Chief, Compliance Section, Historic Preservation Division, State Historical Society of Wisconsin, 816 State Street, Madison, Wisconsin 53706.

(4) Chief, Lake Michigan District, Wisconsin Department of Natural Resources, P.O. Box 10448, Green Bay, Wisconsin 54307-0448.

(5) Chief, Southeast District, Wisconsin Department of Natural Resources, P.O. Box 12436, Milwaukee, Wisconsin 53213.

(6) Chief, Northwest District, Wisconsin Department of Natural Resources, P.O. Box 309, Spooner, Wisconsin 54801.

(1) Chief, Water Quality Division, Minnesota Pollution Control Agency, 520 Lafayette Road, St. Paul, MN 55155.

(2) Regional Administrator, Minnesota Department of Natural Resources, 1201 East Highway 2, Grand Rapids, MN 55744.

(3) State Historic Preservation Officer, Minnesota Historical Society, 345 Kellogg Blvd. West, St. Paul, MN 55102.

(4) Supervisor, U.S. Fish and Wildlife Service, Ecological Services, 4101 East 80th St., Bloomington, MN 55425.

(5) Chief, Planning and Assessment Branch (ME-J19), U.S. Environmental Protection Agency, 77 West Jackson Blvd., Chicago, IL 60604-3590.

j. The proposed reduction, if any, in the applicable unit or lump-sum prices in the BIDDING SCHEDULE if the request were to be approved by the Government.

#### Buoy Relocation Position

Immediately upon relocating any U.S. Coast Guard buoys the Contractor shall report their position by latitude and longitude in writing.

#### Utility Locating Plan; G-AOF.

Submit a plan of the proposed procedure for locating existing utilities prior to commencing work at the project site. The plan shall include the local telephone number of MISS DIG, if work includes upland excavation.

#### Utility Location Findings; G-AOF.

Submit a copy of the utility location findings prior to commencing work on the site.

#### Traffic Control Plan; G-AOF.

At least fifteen (15) calendar days prior to commencing work at the site, submit a detailed, site specific plan for the control of traffic on the public roadways adjacent to the work area. Coordination of construction traffic with public use of the roadways shall be fully described, including all safety related characteristics.

#### Survey Note Format; G-AOF.

Submit the proposed survey note format prior to performing any survey work

at the work site.

#### SD-07 Certificates

##### As-Built Technician's Qualifications

Submit the identity and qualifications of the persons assigned to prepare the as-built information at least 10 calendar days in advance of preparing the drawings.

As-built Drawings; G-AOF.

Within ten (10) calendar days after the substantial completion date as established by the Contracting Officer, submit the as-built details of the work performed under this contract on a set of blue-line prints of the contract drawings marked in red. Following review and approval by the Government, the Contractor shall prepare electronic and mylar copies of as-built drawings for submittal within 15 calendar days following receipt of comments from the Government. Electronic files shall be submitted in Microstation SE (.dgn) CADD file format, suitable for plotting with Intergraph IPLOT Software. The electronic medium for file transfers shall be agreed to prior to the time of submittal and shall be compatible with current industry standards and hardware configurations.

##### Survey Information

Upon completion of the contract work, the originals of all field notes, sketches, recordings and computations made by the Contractor in performing the layout work shall be submitted in ring binders.

### 1.3 REGULATORY REQUIREMENTS

#### 1.3.1 Additional Work Proposed and Not Authorized

##### 1.3.1.1 Work Subject to 33 CFR 320-330

Any additional work (not specifically shown on the plans or delineated in the specifications) proposed by the Contractor in or affecting navigable waters, including wetlands (as defined in 33 CFR 320-330, published in the Federal Register Vol.51, No. 219, Thursday, November 13, 1986) shall not be performed without a Department of the Army Permit. This requirement shall be applicable to all work, permanent or temporary, and/or fill(s). The Department of the Army Permit shall be approved by the District Engineer or Deputy District Engineer in accordance with the laws of the United States and the regulations promulgated thereunder, including, but not limited to, the River and Harbor Act of 1899, the Clean Water Act and the National Environmental Policy Act of 1969, as amended. Corps employees (Contracting Officer's Representatives (COR) or inspectors) are not delegated authority to authorize such work. Information on making application for such permit(s) may be obtained by contacting one of the offices as listed hereinafter. When applying for information or a permit, a copy of any correspondence should be directed to the Contracting Officer of this contract. If a permit is not obtained, the additional work cannot be accomplished. Any delay in processing the permit will not constitute the basis of a claim under this contract. The fact that the Contractor is performing work under a Department of the Army Contract will give the Contractor no greater rights than any other applicant for a Department of the Army Permit.

MICHIGAN-INDIANA

Regulatory Branch  
Engineering and Technical Services Division  
U.S. Army Engineer District, Detroit  
P. O. Box 1027  
Detroit, MI 48231  
Telephone: 313-226-6813

## 1.3.1.2 Work Subject to 40 CFR 233

Any additional work (not specifically shown on the plans or included in the specifications), proposed by the Contractor, in or affecting waters of the United States, including wetlands, in the State of Michigan (as defined in 40 CFR 233, published in the Federal Register, Vol. 49 No. 192, Tuesday October 2, 1984) shall not be performed without a State of Michigan regulatory permit. Information on making an application for such permit may be obtained by contacting the office listed hereinafter. When applying for a permit or for information, a copy of any correspondence shall be furnished to the Contracting Officer. If a permit is not obtained, the additional work shall not be performed. Any delay in obtaining or processing the permit will not constitute a basis for a claim under this contract.

STATE OF MICHIGAN

Department of Environmental Quality  
Land & Water Management Division  
P.O. Box 30458  
Stevens T. Mason Building  
Lansing, MI 48909  
Telephone: 517-373-1950

## 1.4 PROJECT/SITE CONDITIONS

## 1.4.1 Condition and Use of Project Site

The drawings indicate soundings and elevations at the project site as found in condition surveys made as stated on the contract drawings. A notification of at least five (5) calendar days shall be given to the Contracting Officer prior to bringing any construction equipment or material upon the work site. The Contractor shall be responsible for damages that may be suffered due to its operations. The Contractor shall note CLAUSE titled "PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS."

## 1.4.1.1 Physical Conditions

The physical conditions shown on the drawings are indicative of those that prevailed at the time of the site investigations and may be different than those at the time of construction. Significant variations that would require changes to the plans or specification shall be reported to the Contracting Officer immediately. The information shown on the logs of soil borings [enclosed in SECTION 01999] [on the contract drawings] is from borings located within or near the work areas. While the borings are representative of subsurface conditions at their respective locations and for their respective vertical reaches, localized variations of characteristics of the subsurface materials of this region are anticipated. Field logs of borings taken in the project area, soil samples, and other

subsurface information obtained or prepared for this contract are available for examination upon request at the Engineering & Construction Division Design Branch, U.S. Army Corps of Engineers, Detroit District, 477 Michigan Avenue, Detroit, MI 48226.

#### 1.4.1.2 Work and Storage Areas

Work and storage area will be provided at the site and will be as designated on the contract drawings.

#### 1.4.5 Prevailing Lake Levels

Average water levels in Lake Michigan fluctuate above Low Water Datum (LWD). Lake levels as much as two (2) feet or more above LWD may occur during periods of high lake levels and storms. Portions of the work which could be accomplished above water during average years may have to be accomplished under water if lake levels are unusually high. Information on current and anticipated lake levels may be obtained from Detroit District, Corps of Engineers; CELRE-HH-W; P.O. Box 1027; Detroit, Michigan 48231.

#### 1.4.6 Existing Vegetation, Structures, Equipment, Utilities & Improvements

General locations of applicable existing utilities, vegetation, structures, equipment and improvements, based upon latest information available to the Government have been shown on the drawings. However, it is the Contractor's obligation to establish the exact horizontal and vertical location and size of all existing utility lines which are located within the required work area. The Contractor shall submit a utility locating plan for locating existing utilities and a copy of its utility location findings prior to commencing work on the site. Any utility lines which are not found by the Contractor, but which are known to exist at the project site, shall be reported to the Contracting Officer immediately. The Contracting Officer will have the option of directing commencement of work at the site or requiring the Contractor to submit further plans for locating the utility lines. Once the utilities have been located and marked, the Contractor shall be deemed to have the location made known to it pursuant to CLAUSE titled "PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS." If the Contractor damages any existing utility line, vegetation, structure, equipment or improvement, a report thereof shall be made immediately to the Contracting Officer. In any event, existing utility lines, vegetation, structures, equipment or improvements shall be protected from damage, and if damaged, shall be repaired by the Contractor at its own expense.

#### 1.4.7 Vehicular Access

Throughout the period of work on this contract, the Contractor shall maintain an all-weather roadway through or around its work area when work therein would otherwise block an existing roadway. Such permanent or temporary roadways shall be kept open for use by emergency vehicles, as well as residential and commercial traffic at all times.

#### 1.4.8 Utility Services

##### 1.4.8.1 Contractor-Furnished Utility Services

The Contractor shall furnish, all water, electric current and other utilities required for its use.

#### 1.4.9 Protection and Maintenance of Traffic

##### 1.4.9.1 Haul Roads

The Contractor shall, at its own expense, construct access and haul roads necessary for proper prosecution of the work under this contract. Haul roads shall be constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided. The Contractor shall provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic. The method of dust control shall be adequate to ensure safe operation at all times. Location, grade, width, and alignment of construction and hauling roads shall be subject to approval by the Contracting Officer. Lighting shall be adequate to assure full and clear visibility for full width of haul road and work areas during any night work operations. Upon completion of the work, haul roads shall be removed unless otherwise approved by the Contracting Officer. Any dirt or mud which is tracked onto paved or surfaced roadways shall be promptly cleaned away.

##### 1.4.9.2 Barricades

The Contractor shall erect and maintain temporary barricades to limit public access to hazardous areas. Such barricades shall be required whenever safe and public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Barricades shall be securely placed, clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

##### 1.4.10 Identification of Employees

The Contractor shall be responsible for requiring each employee engaged on the work to wear a hardhat with labeling as required to identify that the person is an employee of the Contractor or to display other identification as may be approved.

##### 1.4.12 Contract Supervision and Representation

The Contractor's local representative shall be available to Government representatives during duty hours, 8 a.m. to 4:30 p.m., on normal working days and shall be available by telephone at other times. The name of the Contractor's representative and the contact telephone number shall be furnished to the Government.

##### 1.4.13 Quantity Surveys

The CLAUSE titled "QUANTITY SURVEYS" is applicable other than for measurement of quantities of work performed for stone construction utilizing new stone. Measurement and payment for stone construction is as specified in SECTION 01025, "MEASUREMENT AND PAYMENT" and SECTION 02486, "STONE CONSTRUCTION".

##### 1.4.15 Traffic Control Plan

The Contractor shall control traffic in accordance with its approved plan.

#### 1.4.16 Temporary Lights, Signals and Buoys Required by Coast Guard

All temporary lights, signals and buoys required by the U.S. Coast Guard must be displayed during the required work. Information regarding required signals, lights, buoys and other requirements may be obtained from the Commander (oan), Ninth Coast Guard District, 1240 East Ninth Street, Cleveland, Ohio 44199-2060, Telephone (216) 522-3990.

#### 1.4.18 Layout of Work and Surveys

##### 1.4.18.1 Layout of Work

The following requirements are in addition to the requirements of CLAUSE titled "LAYOUT OF WORK." The Government has established bench marks and horizontal control points at the site of the work. Horizontal control points and descriptions of bench marks are shown on the drawings and on sheets enclosed in SECTION 01999. The elevations of bench marks are referred to mean water level (IGLD 1955).

##### 1.4.18.2 Surveyor Requirements

From these control points and bench marks, the Contractor shall lay out the work by establishing all lines, grades, range markers and gauges at the site as necessary to control the work. The Contractor shall obtain the services of a surveyor registered in the state of Michigan for the layout work. All survey work shall meet the minimum requirements for third-order control in accordance with the American Congress on Surveying and Mapping, 1978 Edition, of "Definition of Surveying and Associated Terms, Appendix D, Tables I, II and III." All additional stakes and markers as may be necessary for control and guidance of the Contractor's construction operations shall be placed and established under the direction of the registered surveyor. All survey information shall be recorded in accordance with standard and approved methods and in the survey note format approved by the Contracting Officer. All field notes, sketches, recordings and computations made by the Contractor in performing the layout work shall be available at all times during the progress of the work for ready examination by the Contracting Officer or his or her duly authorized representative and upon completion of the contract work the originals shall be turned over to the Contracting Officer in ring binders.

##### 1.4.18.3 Suspension

The Contracting Officer may require that work be suspended at any time when location and limit marks established by the Contractor are not reasonably adequate to permit checking the work. Such suspension will be withdrawn upon satisfactory replacement of location and limit marks. Such suspension shall be at no additional cost to the Government and shall not entitle the Contractor to an extension of time for completing the work.

##### 1.4.18.4 Verification

The Government may make checks as the work progresses to verify lines and grades established by the Contractor and to determine the conformance of the completed work as it progresses with the requirements of contract specifications and drawings. Such checking by the Contracting Officer or his or her representative shall not relieve the Contractor of its responsibility to perform all work in accordance with the contract drawings and specifications and the lines and grades given therein.

## 1.5 SEQUENCING AND SCHEDULING

### 1.5.1 Exclusion of Period in Computing Completion Schedules

No work will be required during the period between 15 November and 15 April inclusive and the days in this period will not be counted when computing the required completion date. The Contractor may perform work, unless otherwise prohibited, during all or any part of this period upon giving prior written notice to the Contracting Officer.

### 1.5.5 Start Work

Evidence that the Contractor has started procurement of materials, preparation and submission of shop drawings, preparation of subcontracts, and other preparatory work will satisfy the requirement that work commence within ten (10) calendar days after receipt of Notice to Proceed. (See Clause titled COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK, FAR 52.212-0003.)

## 1.7 ACCOMMODATIONS FOR INSPECTORS

The Contractor shall, prior to the start of work, furnish a temporary field office for Government personnel, physically and acoustically separated from the Contractor's offices, located near the site of the work, as approved by the Contracting Officer. The Contractor shall have the option of providing the field office facility in an existing or new building, or a trailer. All utilities as specified or required shall be hooked up and in working order prior to the start of work and shall be maintained during the entire contract period. The entire cost to the Contractor for furnishing, equipping and maintaining the accommodations shall be included in the contract price. If the Contractor fails to meet these requirements, the facilities will be secured by the Contracting Officer and the cost thereof will be deducted from payments to the Contractor. All facilities provided for the use of Government personnel under this Paragraph shall remain the property of the Contractor.

### 1.7.1 Field Office

The temporary field office shall have approximately 200 square feet of floor space and a minimum of seven (7) feet of headroom. An eight (8) foot by thirty (30) foot office trailer may be made available in lieu of the building. The field office or trailer shall be provided with a work table, two (2) lockable desks, and five (5) chairs. It shall be weatherproof and be supplied with heat in season, a minimum of one (1) door, electric lights, a telephone answering device with handset, a facsimile machine, a medium production rate plain paper copier with sorter and paper supplies, a sufficient number of adjustable windows for adequate light and ventilation, toilet facilities with a wash basin or waterless hand cleaner with unheated water, and water cooler with approved drinking water. Telephone service to the Government's field office will be provided by the Government. Exterior portable toilet facilities without wash basin may be provided in lieu of interior toilet facilities. The windows shall be screened and provided with locking devices, arranged to open and be securely fastened from the inside. In warm weather, air conditioning shall be furnished which will maintain the office at 50 percent relative humidity and a room temperature of 75 degrees F, or 20 degrees below the outside temperature when the outside temperature is 95 degrees F or higher. In addition to the above requirements, the Government field office or trailer shall be provided with the following:

#### 1.7.1.1 Door Locks

Each exterior door shall be provided with an approved deadbolt lock in the door, key operated from both sides and tamperproof heavy duty hasp bolted to the door. Each lock shall be provided with two (2) keys.

#### 1.7.1.2 Security Window Guards

All exterior window openings and glazed panels of exterior doors shall be provided with security window guards. As a minimum, they shall be round frame stationary window guards consisting of 1-1/2 inch diamond mesh No. 10 W & M gage wire, clinched to 3/8 inch round rod frames, secured to the building or trailer with tamperproof fastenings and shall cover the entire glazed opening.

#### 1.7.1.3 Lighting

A light shall be installed over each exterior door and shall be kept lighted at night, including Saturdays, Sundays and holidays.

#### 1.7.1.4 Storage Closet

The field office building or trailer shall have a closet for storage of pilferable equipment. The closet shall be at least three (3) foot by three (3) foot, floor to ceiling height, and have one (1) upper shelf. The door to the closet shall have an approved deadbolt lock or a hasp with an approved padlock. The hasp shall be installed with tamperproof type fastenings. Two (2) keys shall be provided for the deadbolt lock or padlock. Leaves of door hinges shall be unexposed.

#### 1.7.1.5 Cleaning

The Contractor shall clean the office facility once each work week, or as directed. Cleaning shall include, but not be limited to, sweeping the floor, dusting furniture, collecting trash, floor scrubbing, window washing and toilet facility cleaning.

#### 1.7.1.6 Computer Equipment

##### a. Hardware

(1) Microcomputer, 586 minimum, with 250 MB free space on hard disc exclusive of operating system, 2 communications ports, and 1 parallel port, with mouse and pad.

(2) Monitor, color, equivalent to 256 CRT, SVGA, 80 characters wide, 24 lines minimum, reverse video.

(3) Printer, laser jet type equivalent to HP III or IV.

(4) Modem, 9600 Baud minimum, connected to 1 active communications port if internal or to a serial port if external.

(5) Power Line Filter, industry standard.

(6) Computer Work Station, suitable for above equipment.

##### b. Software

(1) Telecommunications, PC Anywhere, or equal.

(2) Integrated Package, Smartware or equal; or a combination of Mirco Soft Word and Lotus or Excel or equal - latest version.

#### 1.10 REPORT REQUIREMENTS

##### 10.1 Accident Prevention Plan

Contractor shall provide an accident prevention plan including an activity hazard analysis to the Contracting Officer within 15 calendar days after receipt of award. Plan shall be in accordance with Contract Clause entitled "ACCIDENT PREVENTION (NOV 1991) - ALTERNATE 1. A list of required components of the plan shall be found in EM385-1-1 (Rev 3 Nov 2003), Appendix A.

##### 10.2 Payrolls and Basic Records

Contractor shall submit payrolls and basic records in accordance with the CLAUSE entitled "PAYROLLS AND BASIC RECORDS (FEB 1988)".

##### 10.3 Progress Chart

Contractor shall submit progress chart in accordance with the Contract clause entitled "SCHEDULE FOR CONSTRUCTION CONTRACTS (APR 1984)".

### PART 2 PRODUCTS

#### 2.1 MATERIALS

##### 2.1.1 Use of Materials from Non-Listed, Non-Commercially Active Sources

If after award of the contract, the Contractor proposes to use stone from a source or sources other than approved commercially active sources or the sources listed in SECTION 02486, "STONE CONSTRUCTION", Paragraph, "STONE MATERIALS", Subparagraph, "Sources" or to use soil, granular or aggregate materials for fill from a non-commercially active source or sources, the Contractor shall submit data as required in the Paragraph entitled "SUBMITTALS". The data shall be accompanied by a request for approval. Non-listed, non-commercially active stone or material sources shall not be used unless the proposal and use of the source(s) are approved by the Contracting Officer in accordance with applicable provisions of the contract. All expenses incurred by the Government and the Contractor in connection with the Contractor's request for approval for the use of materials from non-listed, non-commercially active sources shall be borne by the Contractor and all use of such materials and all operations in connection therewith shall be at the Contractor's risk. No extension of the time for completion of the work will be granted as the result of disapproval or approval of the Contractor's request to use a non-listed, non-commercially active source or sources. If not approved, the Contractor shall use materials from the applicable listed or commercially active source(s).

#### 2.2 AS-BUILT DRAWINGS

The as-built drawing details shall be accurate and of professional quality prepared those with adequate as-built technician's qualifications.

PART 3 EXECUTION (NOT APPLICABLE)

-- End of Section --

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DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01999

LISTING OF ENCLOSED DOCUMENTS, EXHIBITS AND OTHER ATTACHEMENT

PART 1 GENERAL

1.1 ENCLOSURES

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

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SECTION 01999

LISTING OF ENCLOSED DOCUMENTS, EXHIBITS AND OTHER ATTACHEMENT

PART 1 GENERAL

1.1 ENCLOSURES

This Section contains documents referenced in other Sections of the specifications. They are consolidated in this Section for the convenience of the Contractor and the Government. The Contractor may reproduce the enclosed forms for its use or obtain a supply of the forms from the Contracting Officer.

**TITLE**

CONSTRUCTION QUALITY MANAGEMENT REPORT - NCE FORM 63,  
6 MAY 77. (2 Sides)

PREPARATORY INSPECTION CHECKLIST (3 SIDES)

INITIAL INSPECTION CHECKLIST (2 SIDES)

ACCIDENT PREVENTION PROGRAM ACTIVITY HAZARD ANALYSIS-  
NCE FORM 129, 6 JUNE 1986.

RESIDENT MANAGEMENT SYSTEM FORMS (SAMPLES)

A. CURRENT ACTIVITY SUMMARY (SMPL)

B. INITIAL INSPECTION WORKSHEET

C. PREPARATORY INSPECTION WORKSHEET

D. CONTRACTOR QUALITY CONTROL REPORT (QCR)

E. TRANSMITTAL SHEET (4025-R)

SUBMITTAL REGISTER - ENG FORM 4288, MAY 91

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA,  
MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATIONS  
OF COMPLIANCE ENG FORM 4025, MAY 91 (2 SIDES)

CONSTRUCTION PROJECT AND SAFETY PERFORMANCE SIGNS

GENERAL DECISION NO. IL030018

GENERAL DECISION NO. MI030063

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

-- End of Section --

CONSTRUCTION QUALITY CONTROL MANAGEMENT

DATE \_\_\_\_\_ REPORT \_\_\_\_\_  
CONTRACTOR \_\_\_\_\_ CONTRACT NO. \_\_\_\_\_  
PROJECT NAME \_\_\_\_\_ LOCATION \_\_\_\_\_  
WEATHER TYPE \_\_\_\_\_ TEMP. MAX \_\_\_\_\_ MIN \_\_\_\_\_ RAINFALL \_\_\_\_\_ GAGE READING \_\_\_\_\_  
EMPLOYEES: SUPV. \_\_\_\_\_ SKILLED \_\_\_\_\_ LABORERS \_\_\_\_\_ LENGTH OF SHIFT \_\_\_\_\_ HR \_\_\_\_\_

WORK RESPONSIBILITY: NAME (PRIME OR SUBCONTRACTOR) AND AREA OF RESPONSIBILITY .

- A. \_\_\_\_\_
- B. \_\_\_\_\_
- C. \_\_\_\_\_
- D. \_\_\_\_\_
- E. \_\_\_\_\_

WORK PERFORMED TODAY: (LOCATION, DESCRIPTION, QUANTITY AND RESPONSIBILITY BY LETTER REFERENCE  
( Relate to Items on the Progress Chart or CPM)

INSPECTION: (DESCRIPTION OF INSPECTION AND LOCATION. INCLUDE OFF-SITE, MATERIALS AND EQUIPMENT INSPECTION.)

A. PREPARATORY PHASE:

B. INITIAL PHASE:

C. CONTINUOUS PHASE:

RESULTS OF INSPECTION: (INCLUDE FINDINGS, DEFICIENCIES OBSERVED & CORRECTIVE ACTION)

RESULTS OF SURVEILLANCE CONTINUED:

---

TEST PERFORMED: TYPE, LOCATION, RESULTS INCLUDING FAILURES & REMEDIAL ACTION,  
(ATTACH COPY OF TEST REPORT OR NOTATION WHEN IT WILL BE FURNISHED.)

---

WORK ITEMS BEHIND SCHEDULE: REASON, EFFECT ON PROGRESS SCHEDULE AND ACTION TAKEN.

---

JOB SAFETY: (REPORT CONDITIONS, DEFICIENCIES, CORRECTIVE ACTION & RESULTS.)

---

REMARKS: LIST ATTACHMENT AND OTHER MANAGEMENT ACTIONS TAKEN TO ASSURE QUALITY  
CONSTRUCTION

IF INSPECTION & RESULTS ARE NOT LISTED THEN IT IS ASSUMED THAT QUALITY CONTROL IS NOT BEING  
IMPLEMENTED.  
THE ABOVE REPORT IS COMPLETE AND CORRECT AND ALL MATERIALS & SUPPLIES INCORPORATED IN THE  
WORK ARE IN COMPLIANCE WITH THE TERMS OF THE CONTRACT EXCEPT AS NOTED:

---

CONTRACTOR'S APPROVED REPRESENTATIVE SIGNATURE

ACCIDENT PREVENTION PROGRAM  
ACTIVITY HAZARD ANALYSIS

Page of

1. Contract No.	2. Project	3. Facility
4. Date	5. Location	6. Estimated Start Date

7. Item	8. Phase of Work	9. Safety Hazard	10. Precautionary Action Taken

11. Contractor (Signature & Date)

\_\_\_\_\_

12. Report discussed with contractor/ superintendent on	13. Contracting Officer (Signature & Date)
---	--



US Army Corps  
of Engineers

# Current Activity Summary

08 Jul 2002

Project Name: Repair of North & South Piers, Baloney Harbor, MI  
Contract Number: DACW35-02-C-####

Location Name

Activity Number	Activity Description	QUANTITY	UNIT PRICE	AMOUNT
<b>CLIN 0001</b>	<b>North and South Pier Repairs</b>	<b>1</b>	<b>\$3,437,787.18 / LS</b>	<b>\$3,437,787.18</b>
1001	Bonds			\$49,136.00
1002A	Prepare & Mobilize Equipment			\$94,864.00
1002B	Prepare Site			\$72,500.00
1002C	Office Trailers & Utilities			\$22,500.00
1003A	Demobilize Equipment			\$5,000.00
1003B	Site Restoration			\$2,500.00
1003C	As-Built Drawings			\$2,500.00
1004A	Furnish SSP			\$750,000.00
1004B	Furnish Special Piles			\$50,000.00
1004C	Furnish SSP Pile Shoes			\$30,000.00
1004D	Fabricate Template			\$6,000.00
1004E	Excavate Driving Line			\$100,000.00
1004F	Set & Drive SSP			\$500,000.00
1004G	Backfill Driving Line			\$50,000.00
1004I	South Driving Line Obstruction Removal			\$117,787.18
1005A	Furnish Misc. Steel			\$193,000.00
1005B	Furnish Tie-Rods			\$20,000.00
1005C	Furnish Plate Washers			\$15,000.00
1005D	Furnish Fasteners			\$12,000.00
1005E	Place Misc. Steel			\$280,000.00
1006A	Demo Concrete & Remove (Rubblemound)			\$100,000.00
1006B	Excavate Existing Cribs (Rubblemound Area)			\$185,000.00
1006C	Disposal of Demo Materials (Rubblemound Area)			\$25,000.00
1007A	Furnish H-Pile Materials			\$22,800.00
1007B	Install H-Piles			\$27,200.00
1008A	Furnish Rebar			\$135,000.00
1008B	Place Concrete (2000 CY @ \$250.00/CY)			\$500,000.00
1009A	Furnish Handrails			\$60,000.00
1009B	Place Handrails			\$7,000.00
1009C	Paint Handrails			\$3,000.00
				\$3,437,787.18
<b>CLIN 0002</b>	<b>Fill Stone:</b>	<b>0</b>	<b>\$0.00 / NA</b>	<b>\$0.00</b>
	No Activities Assigned to this Bid Item.			
<b>CLIN 0002AA</b>	<b>First 18,000 tons</b>	<b>18,000</b>	<b>\$22.50 / TN</b>	<b>\$405,000.00</b>
2001	Furnish & Place Fill Stone - 1st 18,000 Tons			\$405,000.00
				\$405,000.00
<b>CLIN 0002AB</b>	<b>Over 10,000 tons</b>	<b>2,000</b>	<b>\$22.50 / TN</b>	<b>\$45,000.00</b>
2101	Furnish & Place Fill Stone - Over 18,000 Tons			\$45,000.00
				\$45,000.00
<b>CLIN 0003</b>	<b>Underlayer Stone:</b>	<b>0</b>	<b>\$0.00 / NA</b>	<b>\$0.00</b>
	No Activities Assigned to this Bid Item.			
<b>CLIN 0003AA</b>	<b>First 4,500 Tons</b>	<b>4,500</b>	<b>\$31.50 / TN</b>	<b>\$141,750.00</b>
3001	Furnish & Place Underlayer Stone - 1st 4,500 Tons			\$141,750.00
				\$141,750.00
<b>CLIN 0003AB</b>	<b>Over 4,500 tons</b>	<b>450</b>	<b>\$31.50 / TN</b>	<b>\$14,175.00</b>
3101	Furnish & Place Underlayer Stone - Over 4,500 Tons			\$14,175.00
				\$14,175.00
<b>CLIN 0004</b>	<b>Scour Stone:</b>	<b>0</b>	<b>\$0.00 / NA</b>	<b>\$0.00</b>



US Army Corps  
of Engineers

# Current Activity Summary

08 Jul 2002

Project Name: Repair of North & South Piers, Baloney Harbor, MI  
Contract Number: DACW35-02-C-####

Location Name

Activity Number	Activity Description	QUANTITY	UNIT PRICE	AMOUNT
<b>CLIN 0004</b>	<b>Scour Stone: (Continued)</b>	<b>0</b>	<b>\$0.00 / NA</b>	<b>\$0.00</b>
No Activities Assigned to this Bid Item.				
<b>CLIN 0004AA</b>	<b>First 3,500 tons</b>	<b>3,500</b>	<b>\$27.50 / TN</b>	<b>\$96,250.00</b>
4001	Furnish & Place Scour Stone - 1st 3,500 Tons			\$96,250.00
				\$96,250.00
<b>CLIN 0004AB</b>	<b>Over 3,500 tons</b>	<b>600</b>	<b>\$27.50 / TN</b>	<b>\$16,500.00</b>
4101	Furnish & Place Scour Stone - Over 3,500 Tons			\$16,500.00
				\$16,500.00
<b>CLIN 0005</b>	<b>Bedding Stone:</b>	<b>0</b>	<b>\$0.00 / NA</b>	<b>\$0.00</b>
No Activities Assigned to this Bid Item.				
<b>CLIN 0005AA</b>	<b>First 3,000 tons</b>	<b>3,000</b>	<b>\$28.00 / TN</b>	<b>\$84,000.00</b>
5001	Furnish & Place Bedding Stone - 1st 3,000 Tons			\$84,000.00
				\$84,000.00
<b>CLIN 0005AB</b>	<b>Over 3,000 tons</b>	<b>600</b>	<b>\$28.00 / TN</b>	<b>\$16,800.00</b>
5101	Furnish & Place Bedding Stone - Over 3,000 Tons			\$16,800.00
				\$16,800.00
<b>CLIN 0006</b>	<b>Armor Stone:</b>	<b>0</b>	<b>\$0.00 / NA</b>	<b>\$0.00</b>
No Activities Assigned to this Bid Item.				
<b>CLIN 0006AA</b>	<b>First 6,000 tons</b>	<b>6,000</b>	<b>\$34.00 / TN</b>	<b>\$204,000.00</b>
6001	Furnish & Place Armor Stone - 1st 6,000 Tons			\$204,000.00
				\$204,000.00
<b>CLIN 0006AB</b>	<b>Over 6,000 tons</b>	<b>825</b>	<b>\$34.00 / TN</b>	<b>\$28,050.00</b>
6101	Furnish & Place Armor Stone - Over 6,000 Tons			\$28,050.00
				\$28,050.00
<b>Sum of CLINs</b>				<b>\$4,489,312.18</b>
<b>Sum of Activities</b>				<b>\$4,489,312.18</b>
<b>Difference</b>				<b>\$0.00</b>

## INITIAL INSPECTION WORKSHEET

DEFINABLE FEATURE OF WORK : Site Cast Concrete

### A. ACTIVITIES INCLUDED UNDER Site Cast Concrete -

ABC Company, Inc

1008A	Furnish Rebar	\$135,000.00
1008B	Place Concrete (2000 CY @ \$250.00/CY)	\$500,000.00
		\$635,000.00

### B. QUALITY CONTROL REQUIREMENTS -

#### SUBMITTALS REQUIRED -

00700	1	SF 1413 for Subcontracts		Not submitted
03250	1	Expansion Joint Materials	— A	Approved
03307	1	Batching and Mixing Equipment	F	Receipt
03307	2	Conveying and Placement Equipment	F	Receipt
03307	3	Reinforcing Steel (Mat Steel, Bar Steel)	A	Approved
03307	4	Concrete Mixture Proportions;	A	Approved
03307	5	Cementitious Material	A	Approved
03307	6	Aggregates	A	Approved
03307	7	Manufacturer's Literature	A	Approved
03307	8	Batching & Mixing Equipment - Redi-Mix	F	Receipt
03307	9	Conveying & Placing Equipment - Redi-Mix	F	Receipt
03307	10	Concrete Mix Proportions - Redi-Mix	A	Approved
03307	11	Cementitious Material - Redi-Mix	A	Approved
03307	12	Aggregates - Redi Mix	A	Approved
03307	13	Manufacturer's Data; AEA - Redi-Mix	A	Approved
03307	14	Manufacturer's Data; WRA - Redi-Mix	A	Approved
05500	2	Welders	F	Receipt
05552	4	Mill Certs - Ladder Grab Rails	A	Approved

#### QC TESTS -

CT # 00001	Obtain 1 Cylinder for strength testing at 7 days and 2 Cylinders for 28 days. Minimum of one set per day or 1 set per every 150 CY placed. (ASTM C-94) Required strength at 7 Days = 2,800 p.s.i.; 28 Days = 4,000 p.s.i.		Not Performed
CT # 00002	Check Batch slips for water/cement ratio not to exceed 0.40 by weight		Not Performed
CT # 00003	Check Slump at both mixer and discharge ends: Pumped = 3" - 7" at discharge Maximum of 5" at Mixer if no admixture used Maximum of 7" at mixer if admixture is used 2 checks per shift is minimum required		Not Performed
CT # 00004	2 Air Content tests required per shift. Check approved mix design for maximum and minimum values acceptable.		Not Performed

### C. QA/QC PUNCH LIST ITEMS -

## INITIAL INSPECTION WORKSHEET

DEFINABLE FEATURE OF WORK : Site Cast Concrete

### C. QA/QC PUNCH LIST ITEMS - Cont.

INCLUDE ADDITIONAL COMMENTS ON DAILY REPORT

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

### D. LABOR RATES -

LABOR CLASSIFICATIONS	BASIC RATE	FRINGE BENEFITS	PLUS %	TOTAL WAGE/HR
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

### E. INSPECTION CHECKS -

	IN COMPLIANCE Yes/ No/ NA
1. Check rebar for proper bar sizes, per approved shop drawings.	___ ___ ___
2. Check for 3" clearance of rebar from form sides and top surface.	___ ___ ___
3. Check for proper use of concrete vibrators	___ ___ ___
4. Check for correct finish elevations.	___ ___ ___
5. Concrete finish shall meet approval of on-site Government Representative. Make sure all finishers are aware of approved finishing method and degree of brooming.	___ ___ ___
6. Ensure embedded items are not displaced during placement and finishing of the concrete.	___ ___ ___
7. _____	___ ___ ___
8. _____	___ ___ ___
9. _____	___ ___ ___
10. _____	___ ___ ___

### F. JOB SITE SAFETY -

	IN COMPLIANCE Yes/ No/ NA
1. All employees working over water are required to wear workvests (PFDs)	___ ___ ___
2. All employees are to wear hard hats.	___ ___ ___
3. Concrete Pump must be shut down prior to cleaning.	___ ___ ___
4. Review Activity Hazard Analysis for Concrete Work prior to performing this work.	___ ___ ___
5. _____	___ ___ ___
6. _____	___ ___ ___
7. _____	___ ___ ___
8. _____	___ ___ ___

### G. QA Evaluation Notes -

	DISCUSSED Yes/ No/ NA
1. _____	___ ___ ___
2. _____	___ ___ ___
3. _____	___ ___ ___
4. _____	___ ___ ___

### PREPARATORY INSPECTION WORKSHEET

DEFINABLE FEATURE OF WORK : Site Cast Concrete

#### A. ACTIVITIES INCLUDED UNDER Site Cast Concrete -

ABC Company, Inc.

1008A	Furnish Rebar	\$135,000.00
1008B	Place Concrete (2000 CY @ \$250.00/CY)	\$500,000.00
		\$635,000.00

#### B. QUALITY CONTROL REQUIREMENTS -

##### SUBMITTALS REQUIRED -

00700	1	SF 1413 for Subcontracts		Not submitted
03250	1	Expansion Joint Materials	A	Approved
03307	1	Batching and Mixing Equipment	F	Receipt
03307	2	Conveying and Placement Equipment	F	Receipt
03307	3	Reinforcing Steel (Mat Steel, Bar Steel)	A	Approved
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03307	9	Conveying & Placing Equipment - Redi-Mix	F	Receipt
03307	10	Concrete Mix Proportions - Redi-Mix	A	Approved
03307	11	Cementitious Material - Redi-Mix	A	Approved
03307	12	Aggregates - Redi Mix	A	Approved
03307	13	Manufacturer's Data; AEA - Redi-Mix	A	Approved
03307	14	Manufacturer's Data; WRA - Redi-Mix	A	Approved
05500	2	Welders	F	Receipt
05552	4	Mill Certs - Ladder Grab Rails	A	Approved

#### C. QA/QC PUNCH LIST ITEMS -

INCLUDE ADDITIONAL COMMENTS ON DAILY REPORT

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#### D. LABOR RATES -

LABOR CLASSIFICATIONS	BASIC RATE	FRINGE BENEFITS	PLUS %	TOTAL WAGE/HR
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

## PREPARATORY INSPECTION WORKSHEET

DEFINABLE FEATURE OF WORK : Site Cast Concrete

### E. REVIEW CONTRACT DRAWINGS AND SPECIFICATIONS -

DRAWING / SPEC. NO

COMMENTS / CONFLICTS

DRAWING / SPEC. NO	COMMENTS / CONFLICTS
_____	_____
_____	_____
_____	_____

DISCUSSED

Yes/ No/ NA

- |    |       |     |     |     |
|----|-------|-----|-----|-----|
| 1. | _____ | ___ | ___ | ___ |
| 2. | _____ | ___ | ___ | ___ |
| 3. | _____ | ___ | ___ | ___ |
| 4. | _____ | ___ | ___ | ___ |

### F. REPETITIVE DEFICIENCIES FOUND ON PREVIOUS PROJECTS -

DISCUSSED

Yes/ No/ NA

- |    |       |     |     |     |
|----|-------|-----|-----|-----|
| 1. | _____ | ___ | ___ | ___ |
| 2. | _____ | ___ | ___ | ___ |
| 3. | _____ | ___ | ___ | ___ |
| 4. | _____ | ___ | ___ | ___ |

### G. INSPECTION CHECKS -

IN COMPLIANCE

Yes/ No/ NA

- |    |       |     |     |     |
|----|-------|-----|-----|-----|
| 1. | _____ | ___ | ___ | ___ |
| 2. | _____ | ___ | ___ | ___ |
| 3. | _____ | ___ | ___ | ___ |
| 4. | _____ | ___ | ___ | ___ |

### H. JOB SITE SAFETY -

IN COMPLIANCE

Yes/ No/ NA

- |    |       |     |     |     |
|----|-------|-----|-----|-----|
| 1. | _____ | ___ | ___ | ___ |
| 2. | _____ | ___ | ___ | ___ |
| 3. | _____ | ___ | ___ | ___ |
| 4. | _____ | ___ | ___ | ___ |

### I. QUALITY ASSURANCE EVALUATION NOTES -

DISCUSSED

Yes/ No/ NA

- |    |       |     |     |     |
|----|-------|-----|-----|-----|
| 1. | _____ | ___ | ___ | ___ |
| 2. | _____ | ___ | ___ | ___ |
| 3. | _____ | ___ | ___ | ___ |
| 4. | _____ | ___ | ___ | ___ |

<b>CONTRACTORS QUALITY CONTROL REPORT (QCR) DAILY LOG OF CONSTRUCTION - CIVIL</b>		REPORT NUMBER 92	Page 1 of 2																				
		DATE 22 Jun 2001 - Friday																					
PROJECT North & South Pier Repair, Baloney Harbor, MI		CONTRACT NUMBER DACW35-02-C-#### NA																					
CONTRACTOR ABC Company, Inc. 555 Imagination Road, Fantasy, MI 49494	WEATHER Weather Caused No Delay Temperature Min 80 °F, Max 63 °F; 0.01 IN Precipitation; 10 MPH Wind																						
<b>QC NARRATIVES</b>																							
<p><b>Activities in Progress:</b> Set and drove 24 sheets of SSP</p> <p>Installing Miscellaneous Steel Waler sections c/s 4+00W to 4+50W</p> <p>123 Tons of Fill stone placed between existing structure and req'd SSP wall from c/s 6+25 W to 6+75W.</p> <p><b>Safety Inspection / Safety Meetings:</b> Weekly Safety Meeting held today - Use of PPE - Hrad hats &amp; Work Vests</p>																							
<b>PREP/INITIAL DATES</b> (Preparatory and initial dates held and advance notice)																							
<p><b>A preparatory inspection was held today for the following feature:</b> Miscellaneous Steel &amp; Handrail</p> <p><b>An initial inspection was held today for the following feature:</b> Miscellaneous Steel &amp; Handrail</p>																							
<b>ACTIVITY START/FINISH</b>																							
<p><b>The following activity was started today:</b></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Activity No</th> <th style="text-align: left;">Description</th> </tr> </thead> <tbody> <tr> <td>2001</td> <td>Furnish &amp; Place Fill Stone - 1st 18,000 Tons</td> </tr> </tbody> </table> <p><b>No activities were finished today</b></p>				Activity No	Description	2001	Furnish & Place Fill Stone - 1st 18,000 Tons																
Activity No	Description																						
2001	Furnish & Place Fill Stone - 1st 18,000 Tons																						
<b>QC REQUIREMENTS</b>																							
<p><b>The following 4 QC requirements were completed today:</b></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Requirement No</th> <th style="text-align: left;">Type</th> <th style="text-align: left;">Description</th> <th style="text-align: left;">Results</th> </tr> </thead> <tbody> <tr> <td>CT-00001</td> <td>QC Testing</td> <td>Check Plumbness of piles during driving</td> <td>Completed</td> </tr> <tr> <td>CT-00002</td> <td>QC Testing</td> <td>Check horizontal placement of piling (Check for Pile-Walk)</td> <td>Completed</td> </tr> <tr> <td>CT-00003</td> <td>QC Testing</td> <td>Check vibratory hammer driving rate for SSP - 12"/minute is the minimum rate. If exceeded, switch to Impact hammer.</td> <td>Completed</td> </tr> <tr> <td>CT-00004</td> <td>QC Testing</td> <td>Video Tape Interlocks of piling after driving SSP</td> <td>Completed</td> </tr> </tbody> </table>				Requirement No	Type	Description	Results	CT-00001	QC Testing	Check Plumbness of piles during driving	Completed	CT-00002	QC Testing	Check horizontal placement of piling (Check for Pile-Walk)	Completed	CT-00003	QC Testing	Check vibratory hammer driving rate for SSP - 12"/minute is the minimum rate. If exceeded, switch to Impact hammer.	Completed	CT-00004	QC Testing	Video Tape Interlocks of piling after driving SSP	Completed
Requirement No	Type	Description	Results																				
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CT-00004	QC Testing	Video Tape Interlocks of piling after driving SSP	Completed																				
<b>QA/QC PUNCH LIST</b> (Describe QC Punch List items issued, Report QC and QA Punch List items corrected)																							
<p><b>The following QC Punch List item was issued today:</b></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Item No</th> <th style="text-align: left;">Location</th> <th style="text-align: left;">Description</th> </tr> </thead> <tbody> <tr> <td>QC-00001</td> <td>4+25W</td> <td>Cut-off sheets to finish grade from 4+00W to 4+50W</td> </tr> </tbody> </table> <p><b>No Punch List items were corrected today</b></p>				Item No	Location	Description	QC-00001	4+25W	Cut-off sheets to finish grade from 4+00W to 4+50W														
Item No	Location	Description																					
QC-00001	4+25W	Cut-off sheets to finish grade from 4+00W to 4+50W																					
<b>CONTRACTORS ON SITE</b> (Report first and/or last day contractors were on site)																							
<p><b>No contractors had their first or last day on site today</b></p>																							
<b>LABOR HOURS</b>																							
<p><b>The following labor hours were Reported today:</b></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Employer</th> <th style="text-align: left;">Labor Classification</th> <th style="text-align: right;">Number of Employees</th> <th style="text-align: right;">Hours Worked</th> </tr> </thead> <tbody> <tr> <td></td> <td>IRONWORKER</td> <td style="text-align: right;">3.0</td> <td style="text-align: right;">10.0</td> </tr> <tr> <td></td> <td>PILE DRIVING SETTER</td> <td style="text-align: right;">2.0</td> <td style="text-align: right;">10.0</td> </tr> </tbody> </table>				Employer	Labor Classification	Number of Employees	Hours Worked		IRONWORKER	3.0	10.0		PILE DRIVING SETTER	2.0	10.0								
Employer	Labor Classification	Number of Employees	Hours Worked																				
	IRONWORKER	3.0	10.0																				
	PILE DRIVING SETTER	2.0	10.0																				

<b>CONTRACTORS QUALITY CONTROL REPORT (QCR) DAILY LOG OF CONSTRUCTION - CIVIL</b>		REPORT NUMBER 92	Page 2 of 2
		DATE 22 Jun 2001 - Friday	
PROJECT	North & South Pier Repair, Baloney Harbor, MI	CONTRACT NUMBER DACW35-02-C#####	
ABC Company, Inc.	PILE DRIVER OPERATOR	1.0	10.0
Total hours worked to date:	30.0	Total 6.0	30.0
<b>EQUIPMENT HOURS</b>			
<b>The following equipment hours were Reported today:</b>			
<u>Equipment ID</u>	<u>Description</u>	<u>Standby Hours</u>	<u>Operating Hours</u>
00000002	Vibratory Hammer	0.0	10.0
00000003	Arc Welder	0.0	8.0
00000004	Crane - 100' Boom	0.0	10.0
Total operating hours to date:	28.0	Total 0.0	28.0
<b>ACCIDENT REPORTING</b> (Describe accidents)			
<b>No accidents reported today</b>			
CONTRACTOR CERTIFICATION	<b>On behalf of the contractor, I certify that this Report is complete and correct and all equipment and material used and work performed during this Reporting period are in compliance with the contract plans and specifications, to the best of my knowledge, except as noted above.</b>		
QC REPRESENTATIVE'S SIGNATURE	DATE	SUPERINTENDENT'S INITIALS	DATE

<b>TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE</b> <small>(Read instructions on the reverse side prior to initiating this form)</small>	DATE 06/06/2002	TRANSMITTAL NO. 02486-37.2
---	--------------------	-------------------------------

**SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS** (This section will be initiated by the contractor)

TO: Grand Haven Area Office 307 South Harbor Street P. O. Box 629 Grand Haven, MI 49417	FROM: ABC Company, Inc 555 Imagination Park Road Fantasy, MI 49494	CONTRACT NO. DACW35-02-C-#### NA	CHECK ONE: <input type="checkbox"/> THIS IS A NEW TRANSMITTAL <input checked="" type="checkbox"/> THIS IS A RESUBMITTAL OF TRANSMITTAL 02486-37.1
--	--	-------------------------------------	--

SPECIFICATION SEC. NO. (Cover only one section with each transmittal) 02486	PROJECT TITLE AND LOCATION	CHECK ONE: THIS TRANSMITTAL IS FOR <input checked="" type="checkbox"/> FIO <input type="checkbox"/> GOV'T. APPROVAL
--	----------------------------	--

ITEM NO. <small>a.</small>	DESCRIPTION OF ITEM SUBMITTED <small>(Type size, model number/etc.)</small> <small>b.</small>	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. <small>(See instruction no. 8)</small> <small>c.</small>	NO. OF COPIES <small>d.</small>	CONTRACT REFERENCE DOCUMENT		FOR CONTRACTOR USE CODE <small>g.</small>	VARIATION <small>(See Instruction No. 6)</small> <small>h.</small>	FOR CE USE CODE <small>i.</small>
				SPEC. PARA. NO. <small>e.</small>	DRAWING SHEET NO. <small>f.</small>			
12	Production Test Results	DATA	3	3.2.3.4				F

REMARKS	I certify that the above submitted items have been reviewed in detail and are correct and in the strict conformance with the contract drawings and specifications except as otherwise stated.  <div style="text-align: right; border-top: 1px solid black; width: 100%;">NAME AND SIGNATURE OF CONTRACTOR</div>
---------	---

**SECTION II - APPROVAL ACTION**

ENCLOSURES RETURNED (List by item No.)	NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY	DATE
--	--	------

**SUBMITTAL REGISTER**

CONTRACT NO.

TITLE AND LOCATION						CONTRACTOR											
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION / REVIEWER	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01100	SD-01 Preconstruction Submittals														
			Accident Prevention Plan	10.1													
			Payrolls and Basic Records	10.2													
			Progress Chart	10.3	G AOF												
			Non-listed, Non-Commercially Active Stone or Material Source	2.1.1	G ECD												
			Buoy Relocation Position														
			Utility Locating Plan	1.4.6	G AOF												
			Utility Location Findings	1.4.6	G AOF												
			Traffic Control Plan	1.4.15	G AOF												
			Survey Note Format	1.4.18.2	G AOF												
			SD-07 Certificates														
			As-Built Technician's Qualifications	2.2													
			As-built Drawings	2.2	G AOF												
			Survey Information	1.4.18.2													
		02138	SD-01 Preconstruction Submittals														
			Construction Equipment		G AOF												
			Work Plan		G AOF												
			Dewatering and Water Diversion Plan		G AOF												
			Design Data		G AOF												
			SD-02 Shop Drawings														
			Temporary Works		G AOF												
		02220a	SD-03 Product Data														
			Work Plan	1.2	G ECD												

# SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION						CONTRACTOR											
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION REVIEWER	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02230a	SD-01 Preconstruction Submittals														
			Construction Equipment	1.3.3	G AOF												
			Work Plan	1.7	G AOF												
			Check Survey Report	1.8													
			Erosion Control Plan	3.1	G AOF												
			Disposal of Materials	3.7	G AOF												
			Warning Signs	1.1	G AOF												
			Warning Signs	3.8	G AOF												
		02315N	SD-06 Test Reports														
			Testing	3.8.2	G AOF												
			SD-07 Certificates														
			Supporting system work plan	1.8.1	G AOF												
		02373	SD-03 Product Data														
			Thread	2.1.2	G AOF												
			Manufacturing Quality Control	2.2	G AOF												
			Sampling and Testing														
			SD-04 Samples														
			Geotextile	2.1.1	G AOF												
			SD-07 Certificates														
			Geotextile	2.1.1	G AOF												
		02411	SD-01 Preconstruction Submittals														
			Selected Hot-Rolled or Cold-Formed Steel Sheet Piling	1.4.1	G ECD												
			Work Plan	3.1.5	G ECD												
			SD-02 Shop Drawings														
			Stay-in-Place Cofferdam	1.1	G ECD												

# SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION						CONTRACTOR											
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02411	Stay-in-Place Cofferdam	2.1.2	G ECD												
			SD-04 Samples														
			Barrier Steel Sheet Piling	2.1.1	G AOF												
			SD-07 Certificates														
			Pile Placement Equipment	3.1.2	G AOF												
			SD-08 Manufacturer's Instructions														
			Pulling and Reinstalling	3.1.2.3	G AOF												
			SD-09 Manufacturer's Field														
			Reports														
			Material Test Reports	1.4													
			Driving	3.1.1													
		02486	SD-01 Preconstruction Submittals														
			Equipment Data	3.1													
			Stone Source		G ECD												
			Non-listed Stone Source Data	2.1.2.6	G ECD												
			Substitute Stone Source Data		G ECD												
			SD-09 Manufacturer's Field														
			Reports														
			QC Management Reports and														
			Production Test Reports														
			Non-listed Stone Source Data	2.1.2.6	G AOF												
			Check Survey Data														
		03307	SD-01 Preconstruction Submittals														
			Batching and Mixing Equipment	3.1.6.3													
			Conveying and Placement	3.2.1													
			Equipment														



<b>TRANSMITTAL OF SHOP DRWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE</b> <i>(Read instructions on the reverse side prior to initiating this form)</i>	DATE	TRANSMITTAL NO.
--	------	-----------------

**SECTION I – REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS** *(This section will be initiated by the contractor)*

TO:	FROM:	CONTRACT NO:	CHECK ONE: <input type="checkbox"/> THIS IS A NEW TRANSMITTAL <input type="checkbox"/> THIS IS A RESUBMITTAL OF TRANSMITTAL _____
-----	-------	--------------	---

SPECIFICATION SEC. NO <i>(Cover only one section with each transmittal)</i>	PROJECT TITLE AND LOCATION
---	----------------------------

ITEM NO.	DISCRIPTION OF ITEMS SUBMITTED <i>(Type size, model number/etc.)</i>	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. <i>(See instruction no. 8)</i>	NO. OF COPIES	CONTRACT REFERENCE DOCUMENT		FOR CONTRACTOR USE CODE	VARIATION <i>(see Instruction No. 6)</i>	FOR CE USE CODE
				SPEC. PARA. NO.	DRAWING SHEET NO.			
a.	b.	c.	d.	e.	f.	g.	h.	i.

REMARKS	I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as otherwise stated.  _____ NAME AND SIGNATURE OF CONTRACTOR
---------	--

**SECTION II – APPROVAL ACTION**

ENCLOSURES RETURNED (List by Item No.)	NAME, TITLE, AND SIGNATURE OF APPROVING AUTHORITY	DATE
--	---	------

## INSTRUCTIONS

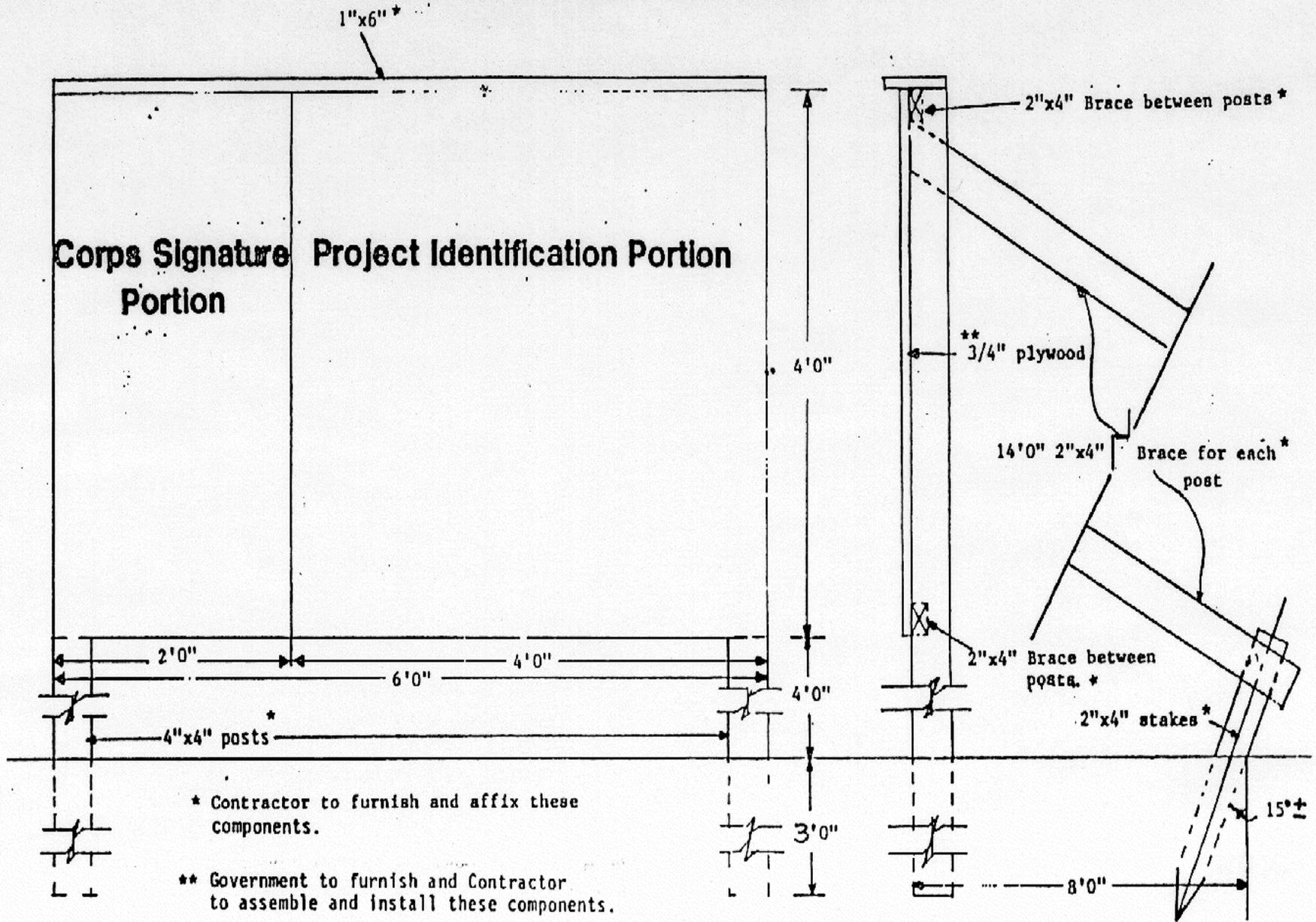
1. Section I will be initiated by the Contractor in the required number of copies.
2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.
3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4288 for each entry on this form.
4. Submittals requiring expeditious handling will be submitted on a separate form.
5. Separate transmittal form will be used for submittals under separate sections of the specifications.
6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specification -- also, a written statement to that effect shall be included in the space provided for "Remarks".
7. Form is self-transmittal, letter of transmittal is not required.
8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.
9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.

### THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

- |  |  |
|--|--|
| A -- Approved as submitted.  | E -- Disapproved (see attached)  |
| B -- Approved, except as noted on drawings.  | F -- Receipt acknowledged  |
| C -- Approved, except as noted on drawings<br>Refer to attached sheet resubmission required. | FX -- Receipt acknowledged, does not comply<br>as noted with contract requirements |
| D -- Will be returned by separate correspondence.  | G -- Other ( <i>Specify</i> )  |

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

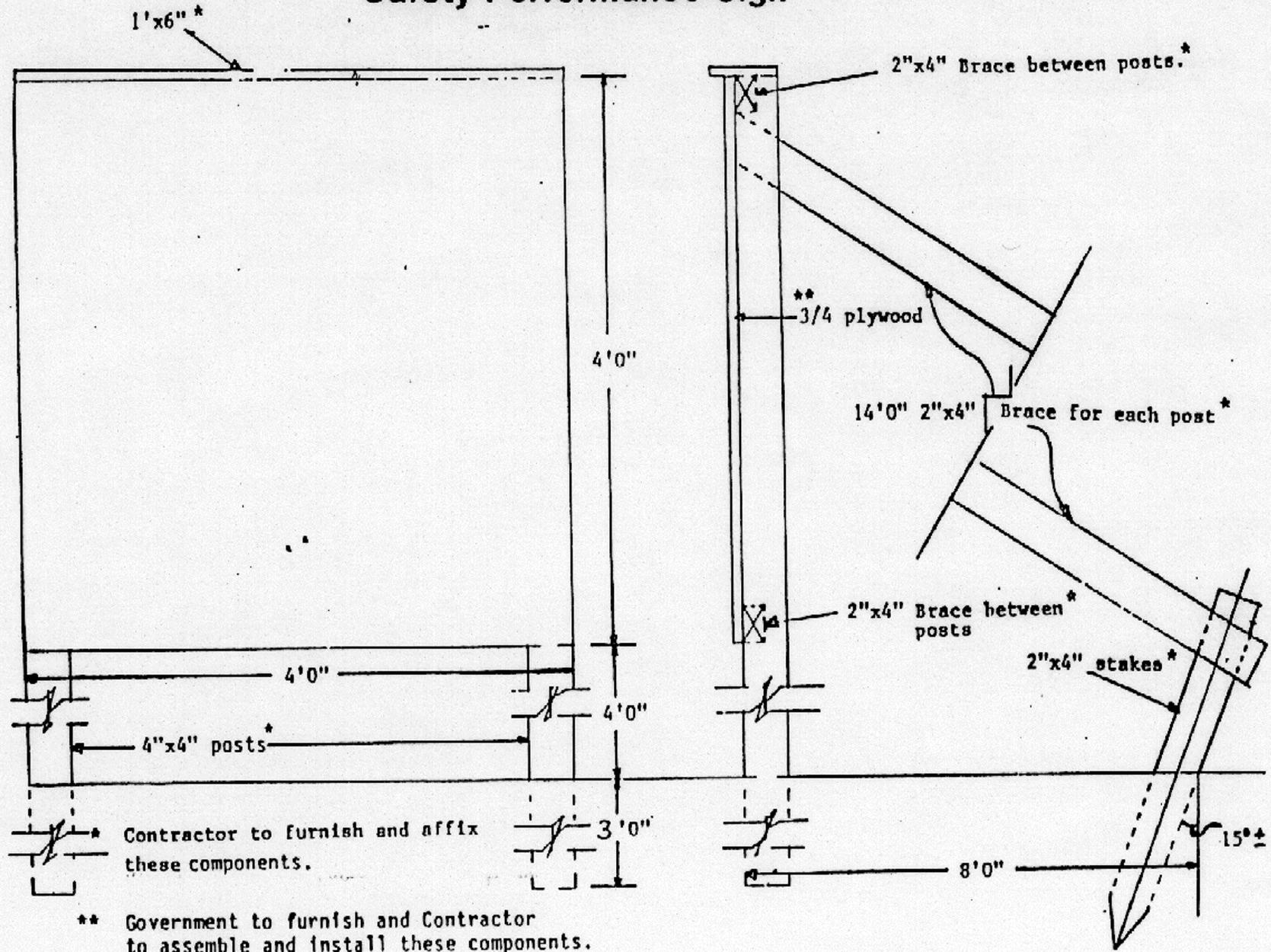
# Construction Project Sign



\* Contractor to furnish and affix these components.

\*\* Government to furnish and Contractor to assemble and install these components.

# Safety Performance Sign



\* Contractor to furnish and affix these components.

\*\* Government to furnish and Contractor to assemble and install these components.

**General Decision Number: IL030018 02/27/2004 IL18**

Superseded General Decision Number: IL020018

State: Illinois

Construction Types: Heavy (Dredging, and Marine)

Counties: Illinois Statewide.

MECHANICAL DREDGING (CLAMSHELL, DRAGLINE, AND BACKHOE) AND MARINE CONSTRUCTION):

ILLINOIS, INDIANA, MICHIGAN, MINNESOTA, NEW YORK, OHIO, PENNSYLVANIA AND WISCONSIN DREDGING AND MARINE CONSTRUCTION  
Dredging and Marine Construction Projects: floating/land equipment engaged in clamshell, backhoe and dragline dredging, marine construction, bridges, salvage operations and cranes, loaders, dozers, or other equipment used for disposal of dredge spoils or marine construction materials on land at the slip or dock, at the project site, where the above material/spoils is being handled, and all equipment utilized on breakwall/breakwater structures on the Great Lakes, Islands therein, their connecting and tributary waters, including the Illinois Waterway to the Lock at Lockport, Illinois, the New York State Barge Canal System between Tonawanda, New York and Waterford, New York and Oswego, New York, the Duluth-Superior area to the Fond du Lac Bridge Crossing (Minnesota State Highway 23) on the St. Louis River and on the St. Lawrence River eastward to the International Boundary near St. Regis, New York.

Modification Number	Publication Date
0	06/13/2003
1	02/27/2004

\* SUIL2003-001 01/01/2004

MECHANICAL DREDGING (CLAMSHELL, DRAGLINE, AND BACKHOE) AND MARINE CONSTRUCTION):

Rates Fringes

Dredging:

Fireman, Oiler,  
Deckhand, & Scowman  
(with dipper, hydraulic  
or other floating  
equipment engaged in  
hydraulic and dipper  
dredging operations)  
Pipeline men (both  
afloat & ashore  
including loading,  
unloading, maintaining,  
and handling pipelines  
for hydraulic dredges  
and sandboats Rangeman,

Tankerman, Sweepman and service Truck Driver.....	\$ 22.51	7.61+a+b
Lead Deckhand.....	\$ 29.68	7.61+a+b
Hydraulic Dredging		
LAUNCH OPERATOR - Vessel 800 Horse- Power		
Or Less.....	\$ 25.15	7.61+a+b
TUG ENGINEER.....	\$ 26.49	7.61+a+b
TUG OPERATOR - Vessel		
Over 800 Horse-Power.....	\$ 26.49	7.61+a+b
TUG WORKERS: Fireman, Lineman, Oiler, Deckhand, Tankerman. Scowman, (on/or with tugboats, launches, or other self-propelled boats).....		
	\$ 22.51	7.61+a+b
Mechanic		
FLOATING EQUIPMENT:		
Illinois		
Class I.....	\$ 40.50	12.00+b&c
Class II.....	\$ 39.00	12.00+b&c
Class III.....	\$ 34.70	12.00+b&c
Class IV.....	\$ 28.85	12.00+b+c
FLOATING EQUIPMENT:		
Indiana		
Class I.....	\$ 35.75	11.95+b&c
Class II.....	\$ 34.25	11.95+b&c
Class III.....	\$ 30.45	11.95+b&c
Class IV.....	\$ 25.35	11.95+b&c
FLOATING EQUIPMENT:		
Michigan		
Class I.....	\$ 27.50	15.23+b&c
Class II.....	\$ 26.00	15.23+b&c
Class III.....	\$ 23.15	15.23+b&c
Class IV.....	\$ 19.25	15.23+b&c
FLOATING EQUIPMENT:		
Minnesota		
Class I.....	\$ 32.55	9.10+b&c
Class II.....	\$ 31.05	9.10+b&c
Class III.....	\$ 27.65	9.10+b&c
Class IV.....	\$ 23.00	9.10+b&c
FLOATING EQUIPMENT:		
New York: (Cattaraugus, Chautauga, Erie and Orleans Counties)		
Class I.....	\$ 35.00	15.96+b&c
Class II.....	\$ 33.50	15.96+b&c
Class III.....	\$ 29.80	15.96+b&c
Class IV.....	\$ 24.80	15.96+b&c
FLOATING EQUIPMENT:		
New York: (Cayuga, Jefferson, Oswego, and St. Lawrence Counties)		
Class I.....	\$ 29.50	13.10+b&c

Class II.....	\$ 28.00	13.10+b&c
Class III.....	\$ 24.92	13.10+b&c
Class IV.....	\$ 20.72	13.10+b&c
FLOATING EQUIPMENT:		
New York:(Monroe and Wayne Counties and the City of Rochester)		
Class I.....	\$ 27.50	9.00+b&c
Class II.....	\$ 26.00	9.00+b&c
Class III.....	\$ 23.15	9.00+b&c
Class IV.....	\$ 19.25	9.00+b&c
FLOATING EQUIPMENT:		
New York:(Niagara)		
Class I.....	\$ 32.08	14.50+b&c
Class II.....	\$ 30.58	14.50+b&c
Class III.....	\$ 30.84	14.50+b&c
Class IV.....	\$ 22.90	14.50+b&c
FLOATING EQUIPMENT:		
Ohio:(Ashtabula, Cuyahoga, Erie, Lake, and Lorain Counties)		
Class I.....	\$ 32.99	7.60+b&c
Class II.....	\$ 31.49	7.60+b&c
Class III.....	\$ 28.02	7.60+b&c
Class IV.....	\$ 23.30	7.60+b&c
FLOATING EQUIPMENT:		
Ohio:(Lucas, Henry, Ottawa, Wood and Sandusky Counties)		
Class I.....	\$ 31.27	7.60+b&c
Class II.....	\$ 29.77	7.60+b&c
Class III.....	\$ 26.50	7.60+b+c
Class IV.....	\$ 22.30	7.60+b&c
FLOATING EQUIPMENT:		
Pennsylvania:(Erie County):		
Class I.....	\$ 24.80	10.23+b&c
Class II.....	\$ 23.30	10.23+b&c
Class III.....	\$ 20.74	10.23+b&c
Class IV.....	\$ 17.24	10.23+b&c
FLOATING EQUIPMENT:		
Wisconsin:Includes all marine/floating type work on projects in the Superior/Duluth Harbor, Lake Superior.		
Class I.....	\$ 32.00	12.90+b&c
Class II.....	\$ 30.50	12.90+b&c
Class III.....	\$ 27.15	12.90+b&c
Class IV.....	\$ 22.57	12.90+b&c

PAID HOLIDAYS (WHERE APPLICABLE):

- A- NEW YEAR'S DAY
- B- MEMORIAL DAY
- C- INDEPENDENCE DAY
- D- LABOR DAY

- E- THANKSGIVING DAY
- F- CHRISTMAS DAY
- G- PRESIDENT'S DAY
- H- VETERANS' DAY

FOOTNOTES:

- a. \$30.10 per day per employee for medical
- b. Eight paid holidays: A thru H
- c. Hazardous/Toxic Waste Material:

\*Level A \$2.50 per hour

\*Level B 2.00 per hour

\*Level C 1.00 per hour

\*Level D 0.50 per hour

Such wages shall be above the classifications of work listed under mechanical dredging and Marine construction of this general wage decision. \*Working with Hazardous Waste at this level as defined by the U. S. Enviromental Protection Agency.

CLASSIFICATION DESCRIPTIONS

Class I - Master Mechanic - assist and direct  
Class II, Class III, and Class IV, diver/wet tender, engineer (hydraulic dredge)

Class II - Crane/Backhoe Operator and Mechanic/Welder, assistant engineer(hydraulic dredge), leverman (hydraulic dredge), diver/tender

Class III - Deck Equipment Operator (Machineryman)  
Maintenance of Crane (over 50 ton capacity) or Backhoe (115,000 pounds or more), ug/launch operator, Loader/dozer and like equipment on Barge, breakwater wall, slip/dock, Scow, Deck Machinery, etc.

Class IV - Deck Equipment Operator(Machineryman/Fireman) (Four equipment units or more) and Crane Maintenance 50 ton capacity and under or Backhoe weighing 115,000 pounds or less, assistant tug operator.

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WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

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In the listing above, the "SU" designation means that rates listed under the identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

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WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material,

etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

General Decision Number: MI030063 08/20/2004 MI63

Superseded General Decision Number: MI020063

State: Michigan

Construction Types: Heavy

Counties: Alcona, Antrim, Benzie, Charlevoix, Cheboygan, Clare, Crawford, Emmet, Grand Traverse, Kalkaska, Lake, Leelanau, Manistee, Mason, Mecosta, Missaukee, Montcalm, Newaygo, Oceana, Osceola, Oscoda, Otsego, Roscommon and Wexford Counties in Michigan.

HEAVY CONSTRUCTION PROJECTS (does not include airport or bridge construction projects, or sewer or water line work if it is incidental to a highway construction project)

Modification Number	Publication Date
0	06/13/2003
1	03/26/2004
2	05/21/2004
3	08/06/2004
4	08/20/2004

ASBE0047-007 07/01/2003

	Rates	Fringes
Asbestos Workers/Insulator Includes the application of all insulating materials, protective coverings, coatings and finishings to all types of mechanical systems.....	\$ 25.35	11.55

BOIL0169-003 07/01/2003

	Rates	Fringes
Boilermaker.....	\$ 28.853	25% + 5.10

BRMI0010-011 05/01/2001

ALCONA, ANTRIM, BENZIE, CHARLEVOIX, CHEBOYGAN, CLARE, CRAWFORD, EMMET, GRAND TRAVERSE, KALKASKA, LEELANAU, MANISTEE, MISSAUKEE, OSCODA, OTSEGO, ROSCOMMON AND WEXFORD COUNTIES:

	Rates	Fringes
Bricklayer and plasterer.....	\$ 21.53	7.50
Cement Mason.....	\$ 19.43	7.30
Marble, terrazzo and tile finisher.....	\$ 15.33	4.90
Marble, terrazzo and tile setter.....	\$ 19.67	5.45

FOOTNOTE:

Paid Holiday: Fourth of July, if the worker was employed by the contractor in any period of seven working days before said holiday within the current calendar year.

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BRMI0010-014 06/01/2001

LAKE, MASON, MECOSTA AND OSCEOLA COUNTIES:

	Rates	Fringes
Cement Mason.....	\$ 20.27	5.35

FOOTNOTE:

Paid Holiday: Fourth of July, if the worker has been employed by the contractor in any period of seven working days before said holiday within the current calendar year.

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BRMI0010-015 06/01/2001

LAKE, MASON, MECOSTA, MONTCALM, NEWAYGO, OCEANA AND OSCEOLA COUNTIES:

	Rates	Fringes
Bricklayer.....	\$ 21.78	6.23
Marble, terrazzo and tile finisher.....	\$ 16.87	4.30
Marble, terrazzo and tile setter.....	\$ 20.89	5.65
Pointer, cleaner and caulker...	\$ 20.95	5.20

FOOTNOTE:

Paid Holiday: Fourth of July, if the worker has been employed by the contractor in any period of seven working days before said holiday within the current calendar year.

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CARP0100-001 06/01/2003

LAKE, MASON, MECOSTA, MONTCALM, NEWAYGO, OCEANA AND OSCEOLA COUNTIES:

	Rates	Fringes
Carpenter; piledriver; soft floor layer.....	\$ 21.18	7.85

FOOTNOTES:

Work on materials treated with creosote, or those which are wet with "Wood Life" material (fresh cuts of lumber which have been treated with "Wood Life" are not to be considered as wet materials): \$0.25 per hour additional.

Work on any swing scaffold: \$0.15 per hour additional.

Work on chimneys or towers over thirty (30) feet in height: \$0.50 per hour additional.

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CARP0202-003 05/01/2003

ALCONA, ANTRIM, BENZIE, CHARLEVOIX, CHEBOYGAN, CRAWFORD, EMMET,  
 GRAND TRAVERSE, KALKASKA, LEELANAU, MANISTEE, MISSAUKEE,  
 OSCODA, OTSEGO, ROSCOMMON AND WEXFORD COUNTIES:

	Rates	Fringes
Carpenter.....	\$ 19.99	7.66
Piledriver.....	\$ 20.62	7.68

FOOTNOTE:  
 Welding: \$.25 per hour additional.

-----  
 CARP0706-007 07/17/2004

CLARE COUNTY:

	Rates	Fringes
Carpenter (Includes drywall hangers)...	\$ 24.76	9.44

-----  
 CARP1102-006 06/01/2003

ALCONA, ANTRIM, BENZIE, CHARLEVOIX, CHEBOYGAN, CRAWFORD, EMMET,  
 GRAND TRAVERSE, KALKASKA, LAKE, LEELANAU, MANISTEE, MASON,  
 MECOSTA, MISSAUKEE, MONTCALM, NEWAYGO, OCEANA, OSCEOLA, OSCODA,  
 OTSEGO, ROSCOMMON AND WEXFORD COUNTIES:

	Rates	Fringes
Millwright.....	\$ 25.53	20.49

FOOTNOTES:  
 Work on heights over open areas and over fifty (50) ft. high:  
 \$.50 per hour additional.

Welding: \$.50 per hour additional.

-----  
 CARP1102-008 06/01/2003

CLARE COUNTY:

	Rates	Fringes
Millwright.....	\$ 27.89	13.01

-----  
 ELEC0107-001 06/01/1996

MECOSTA AND MONTCALM COUNTIES; AND OSCEOLA COUNTY (Townships of  
 Evart, Hersey, Orient and Richmond):

	Rates	Fringes
Cable Splicer.....	\$ 21.62	3% + 4.28
Electrician.....	\$ 19.22	3% + 4.28

-----  
 ELEC0275-001 06/01/1999

LAKE, MASON, MECOSTA, MONTCALM, NEWAYGO AND OCEANA COUNTIES;

OSCEOLA COUNTY (Townships of Evert, Hersey, Orient and Richmond):

	Rates	Fringes
Electrician.....	\$ 21.49	3% + 5.63

FOOTNOTE:

Work 40' or more above ground, floor or flat roofs, except work on mechanical/hydraulic work platforms which are MIOSHA approved: 10% additional.

-----  
ELEC0498-001 06/01/2004

ANTRIM, BENZIE AND CHARLEVOIX COUNTIES; CHEBOYGAN COUNTY (Township of Mentor); CLARE COUNTY (Townships of Freeman, Garfield, Greenwood, Lincoln, Redding, Summerfield, Surrey and Winterfield); CRAWFORD COUNTY (does not include the township of Lovetts); EMMET COUNTY (does not include the township of Wawatan); GRAND TRAVERSE AND KALKASKA COUNTIES; LAKE COUNTY (Townships of Dover, Eden, Elk, Ellsworth, Newkirk, Peacock and Sauble); LEELANAU AND MANISTEE COUNTIES; MASON COUNTY (Townships of Freesoil, Grant and Meade); MISSAUKEE COUNTY; OSCEOLA COUNTY (does not include the townships of Evert, Hersey, Orient and Richmond); OTSEGO COUNTY (does not include the townships of Charlton, Chester and Dover); ROSCOMMON COUNTY (does not include the townships of Backus, Nestor and Roscommon); WEXFORD COUNTY:

	Rates	Fringes
Electrician.....	\$ 23.77	23% + 5.30

FOOTNOTES:

Work at heights of from thirty-five (35) to sixty (60) feet shall be paid ten percent (10%) of the straight time rate of pay over and above the applicable rate.

Work over sixty (60) feet shall be paid twenty percent (20%) over and above the applicable rate.

Above provisions to be interpreted as follows:

All work to be done while on a bosuns chair or swinging scaffold; while on ladders, towers, scaffolds, unguarded stairs, structural members of temporary structures (such as decks or forms near unguarded areas). Ropes shall not be considered guardrails. High time does not apply to work performed when in an aerial bucket or on the platform of a scissor lift.

The height shall be calculated from floor or ground to the level of the work being done.

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ELEC0692-005 05/31/2004

CLARE COUNTY (Townships of Arthur, Franklin, Frost, Grand, Hamilton, Hatton, Hayes and Sheridan); AND ROSCOMMON COUNTY (Townships of Backus, Nestor and Roscommon):

	Rates	Fringes
Electrician.....	\$ 26.79	6.62+22%

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ELEC0692-009 05/31/2004

ALCONA COUNTY; CHEBOYGAN COUNTY (does not include the township of Mentor); CRAWFORD COUNTY (Township of Lovetts); EMMET COUNTY (Township of Wawatan); OSCODA COUNTY; OTSEGO COUNTY (Townships of Charlton, Chester and Dover):

	Rates	Fringes
Electrician.....	\$ 24.25	6.51+22%

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ELEC0876-007 06/01/2003

	Rates	Fringes
Line Construction: cable splicer.....	\$ 28.13	2.45+22%
Line Construction: ground person.....	\$ 13.86	2.45+22%
Line Construction: light equipment operator/ground person/truck driver/ground pe winch, A-frame, diggers when used for distribution line truck and used for distribution work. Distribution truck driver, 5th wheel type trucks, bucket trucks, ladder trucks and all live boom trucks, all equipment 85 hp or under.....	\$ 17.79	2.45+22%
Line Construction: line technician.....	\$ 27.00	2.45+22%
Line Construction: operator/ground person digger, tractor and setting rig with tracks or rough terrain vehicle, large bombardier, backhoe over 85 hp, hydraulic crane 10 ton or over.....	\$ 20.31	2.45+22%
Line Construction: truck driver/ground person trucks with winch or boom or dump, other than distribution work.....	\$ 16.93	2.45+22%

FOOTNOTE: Operators of 5/8 yd. rated capacity backhoe or over, and operator of 25 ton, rated capacity, crane or over, and operators of heavy duty tension or pulling machinery on 345 KV and above, shall receive the line technician rate of pay.

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ENGI0324-008 10/01/2003

	Rates	Fringes
Power equipment operators - sewer relining:		
GROUP 1.....	\$ 24.87	8.90
GROUP 2.....	\$ 23.48	8.90

SEWER RELINING CLASSIFICATIONS

GROUP 1: Operation of audio-visual closed circuit TV system, including remote in-ground cutter and other equipment used in connection with the CCTV system

GROUP 2: Operation of hot water heaters and circulation systems, water jettors and vacuum and mechanical debris removal systems

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ENGI0324-018 05/01/2004

	Rates	Fringes
Power equipment operators:		
GROUP 1.....	\$ 27.16	13.10
GROUP 2.....	\$ 26.91	13.10
GROUP 3.....	\$ 25.81	13.10
GROUP 4.....	\$ 21.16	13.10
GROUP 5.....	\$ 20.56	13.10
GROUP 6.....	\$ 18.21	13.10
GROUP 7.....	\$ 16.51	13.10

FOOTNOTES:

Crane operator with main boom and jib 300' or longer: \$1.50 per hour above the group 1 rate.

Crane operator with main boom and jib 400' or longer: \$3.00 per hour above the group 1 rate.

PAID HOLIDAYS: New Year's Day, Decoration Day, Fourth of July, Labor Day, Thanksgiving Day and Christmas Day.

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Crane with main boom and jib 220' or longer

GROUP 2: Crane with main boom and jib 140' or longer, tower crane, gantry crane, whirley derrick

GROUP 3: Regular equipment operator, crane, stiff leg derrick, scraper, dozer, grader, front end loader, hoist, job mechanic

GROUP 4: Air tugger (single drum), material hoist, boiler operator, sweeping machine, winch truck, Bobcat and similar equipment, fork truck (over 20' lift)

GROUP 5: Pump 6" or over, well points, freeze systems, boom truck (non-swinging); end dumps and laser/power screed; concrete wire saw (20 h.p. and over)

GROUP 6: Air compressor, welder, generator, conveyor, pump

under 6", grease person and fork truck (20' lifting capacity or less when working on masonry work)

GROUP 7: Oiler, fire tender and heater operator

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ENGI0325-013 05/01/2004

	Rates	Fringes
Power equipment operators:		
(STEEL ERECTION)		
ALLEGAN, BARRY, BERRIEN,		
BRANCH, CALHOUN, CASS,		
EATON, HILLSDALE, IONIA,		
KALAMAZOO, LAKE, MANISTEE,		
MASON, MECOSTA, MONTCALM,		
MUSKEGON, NEWAYGO, OCEANA,		
OSCEOLA, ST. JOSEPH AND		
VAN BUREN COUNTIES:		
GROUP 1.....	\$ 27.51	13.10
GROUP 2.....	\$ 27.26	13.10
GROUP 3.....	\$ 26.76	13.10
GROUP 4.....	\$ 21.81	13.10
GROUP 5.....	\$ 20.16	13.10
GROUP 6.....	\$ 17.66	13.10
ANTRIM, BENZIE,		
CHARLEVOIX, EMMET, GRAND		
TRAVERSE, KALKASKA,		
LEELANAU, MISSAUKEE AND		
WEXFORD COUNTIES:		
GROUP 1.....	\$ 27.51	13.10
GROUP 2.....	\$ 27.26	13.10
GROUP 3.....	\$ 26.26	13.10
GROUP 4.....	\$ 21.51	13.10
GROUP 5.....	\$ 19.86	13.10
GROUP 6.....	\$ 17.16	13.10

FOOTNOTES: Crane operator with main boom and jib 300' or longer: \$1.50 additional to the group 1 rate. Crane operator with main boom and jib 400' or longer: \$3.00 additional to the group 1 rate.

PAID HOLIDAYS: New Year's Day, Decoration Day, Fourth of July, Labor Day, Thanksgiving Day and Christmas Day.

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

- GROUP 1: Crane operator, with main boom & jib 220' or longer
- GROUP 2: Crane operator, with main boom & jib 140' or longer; Tower crane; Gantry crane; Whirley derrick
- GROUP 3: Regular equipment operator, crane, dozer, loader, hoist, straddle wagon, mechanic
- GROUP 4: Air tugger (single drum), material hoist, pump 6" or over
- GROUP 5: Air compressor, welder, generators, conveyors

GROUP 6: Oiler and fire tender

\* ENGI0325-021 06/01/2004

ALCONA, CHEBOYGAN, CLARE, CRAWFORD, OSCODA, OTSEGO AND  
ROSCOMMON COUNTIES:

	Rates	Fringes
Power equipment operators: (STEEL ERECTION)		
GROUP 1.....	\$ 38.64	13.15
GROUP 2.....	\$ 39.64	13.15
GROUP 3.....	\$ 37.14	13.15
GROUP 4.....	\$ 38.14	13.15
GROUP 5.....	\$ 35.64	13.15
GROUP 6.....	\$ 36.64	13.15
GROUP 7.....	\$ 35.37	13.15
GROUP 8.....	\$ 36.37	13.15
GROUP 9.....	\$ 34.92	13.15
GROUP 10.....	\$ 35.92	13.15
GROUP 11.....	\$ 34.19	13.15
GROUP 12.....	\$ 35.19	13.15
GROUP 13.....	\$ 33.83	13.15
GROUP 14.....	\$ 34.18	13.15
GROUP 15.....	\$ 33.19	13.15
GROUP 16.....	\$ 26.38	13.15
GROUP 17.....	\$ 24.97	13.15

FOOTNOTE:

Paid Holidays: New Year's Day, Memorial Day, Fourth of July,  
Labor Day, Thanksgiving Day and Christmas Day.

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Engineer when operating combination of boom and jib  
400' or longer

GROUP 2: Engineer when operating combination of boom and jib  
400' or longer on a crane that requires an oiler

GROUP 3: Engineer when operating combination of boom and jib  
300' or longer

GROUP 4: Engineer when operating combination of boom and jib  
300' or longer on a crane that requires an oiler

GROUP 5: Engineer when operating combination of boom and jib  
220' or longer

GROUP 6: Engineer when operating combination of boom and jib  
220' or longer on a crane that requires an oiler

GROUP 7: Engineer when operating combination of boom and jib  
140' or longer

GROUP 8: Engineer when operating combination of boom and jib  
140' or longer on a crane that requires an oiler

GROUP 9: Tower crane and derrick operator (where operator's work station is 50 ft. or more above first sub-level)

GROUP 10: Tower crane and derrick operator (where operator's work station is 50 ft. or more above first sub-level) on a crane that requires an oiler

GROUP 11: Engineer when operating combination of boom and jib 120' or longer

GROUP 12: Engineer when operating combination of boom and jib 120' or longer on a crane that requires an oiler

GROUP 13: Crane operator and job mechanic

GROUP 14: Crane operator on a crane that requires an oiler

GROUP 15: Hoisting operator

GROUP 16: Compressor or welder operator

GROUP 17: Oiler

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ENGI0325-023 09/01/2003

	Rates	Fringes
Power equipment operators: (UNDERGROUND WORK)		
GROUP 1.....	\$ 25.67	12.35
GROUP 2.....	\$ 21.53	12.35
GROUP 3.....	\$ 21.03	12.35
GROUP 4.....	\$ 20.75	12.35

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Backfiller tamper; Backhoe; Batch plant operator (concrete); Clamshell; Concrete paver (2 drums or larger); Conveyor loader (Euclid type); Crane (crawler, truck type or pile driving); Dozer; Dragline; Elevating grader; Endloader; Gradall (and similar type machine); Grader; Mechanic; Power shovel; Roller (asphalt); Scraper (self-propelled or tractor drawn); Side boom tractor (type D-4 or equivalent and larger); Slip form paver; Slope paver; Trencher (over 8 ft. digging capacity); Well drilling rig; Concrete pump with boom operator

GROUP 2: Boom truck (power swing type boom); Crusher; Hoist; Pump (1 or more-6-in. discharge or larger - gas or diesel-powered or powered by generator of 300 amperes or more - inclusive of generator); Side boom tractor (smaller than type D-4 or equivalent); Sweeper (Wayne type and similar equipment); Tractor (pneu-tired, other than backhoe or front end loader); Trencher (8-ft. digging capacity and smaller)

GROUP 3: Air compressors (600 cfm or larger); Air compressors (2 or more-less than 600 cfm); Boom truck (non-swinging, non-powered type boom); Concrete breaker (self-propelled or truck mounted - includes compressor); Concrete paver (1

drum-1/2 yd. or larger); Elevator (other than passenger); Maintenance person; Pump (2 or more - 4-in. up to 6-in. discharge - gas or diesel powered - excluding submersible pumps); Pumpcrete machine (and similar equipment); Wagon drill (multiple); Welding machine or generator (2 or more-300 amp. or larger - gas or diesel powered)

GROUP 4: Boiler; Concrete saw (40 hp or over); Curing machine (self-propelled); Farm tractor (with attachment); Finishing machine (concrete); Fire person; Hydraulic pipe pushing machine; Mulching equipment; Oiler; Pumps (2 or more up to 4-in. discharge, if used 3 hours or more a day, gas or diesel powered - excluding submersible pumps); Roller (other than asphalt); Stump remover; Trencher (service); Vibrating compaction equipment, self-propelled (6 ft. wide or over); End dump operator

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 ENGI0325-026 10/01/2003

	Rates	Fringes
Power equipment operators: (HAZARDOUS WASTE REMOVAL)		
LEVEL A:		
Engineer when operating crane with boom and jib or leads 140' or longer....	\$ 30.87	12.25
Engineer when operating crane with boom and jib or leads 220' or longer....	\$ 31.17	12.25
GROUP 1.....	\$ 28.22	12.25
GROUP 2.....	\$ 24.07	12.25
Regular crane operator, mechanic, dragline operator, boom truck operator and concrete pump with boom operator....	\$ 29.19	12.25
LEVEL B AND C:		
Engineer when operating crane with boom and jib or leads 140' or longer....	\$ 29.92	12.25
Engineer when operating crane with boom and jib or leads 220' or longer....	\$ 29.81	12.25
GROUP 1.....	\$ 27.27	12.25
GROUP 2.....	\$ 23.13	12.25
Regular crane operator, mechanic, dragline operator, boom truck operator and concrete pump with boom operator....	\$ 28.24	12.25
LEVEL D WHEN CAPPING		
LANDFILL:		
Engineer when operating crane with boom and jib or leads 140' or longer....	\$ 28.37	12.25
Engineer when operating crane with boom and jib or leads 220' or longer....	\$ 28.67	12.25
GROUP 1.....	\$ 25.72	12.25

GROUP 2.....	\$ 21.58	12.25
Regular crane operator, mechanic, dragline operator, boom truck operator and concrete pump with boom operator....		
	\$ 26.69	12.25
LEVEL D:		
Engineer when operating crane with boom and jib or leads 140' or longer....		
	\$ 28.62	12.25
Engineer when operating crane with boom and jib or leads 220' or longer....		
	\$ 28.92	12.25
GROUP 1.....	\$ 25.97	12.25
GROUP 2.....	\$ 21.83	12.25
Regular crane operator, mechanic, dragline operator, boom truck operator and concrete pump with boom operator....		
	\$ 26.94	12.25

HAZARDOUS WASTE REMOVAL CLASSIFICATIONS

GROUP 1: Backhoe, batch plant operator, clamshell, concrete breaker when attached to hoe, concrete cleaning decontamination machine operator, concrete pump, concrete paver, crusher, dozer, elevating grader, endloader, farm tractor (90 h.p. and higher), gradall, grader, heavy equipment robotics operator, loader, pug mill, pumpcrete machines, pump trucks, roller, scraper (self- propelled or tractor drawn), side boom tractor, slip form paver, slop paver, trencher, ultra high pressure waterjet cutting tool system operator, vactors, vacuum blasting machine operator, vertical lifting hoist, vibrating compaction equipment (self- propelled), and well drilling rig

GROUP 2: Air compressor, concrete breaker when not attached to hoe, elevator, end dumps, equipment decontamination operator, farm tractor (less than 90 h.p.) forklift, generator, heater, mulcher, pigs (portable reagent storage tanks), power screens, pumps (water), stationary compressed air plant, sweeper, and welding machine

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ENGI0326-001 05/01/2004

	Rates	Fringes
Power equipment operators - gas distribution and duct installation work:		
GROUP 1.....	\$ 23.49	13.10
GROUP 2-A.....	\$ 23.39	13.10
GROUP 2-B.....	\$ 23.17	13.10
GROUP 3.....	\$ 22.39	13.10
GROUP 4.....	\$ 21.89	13.10

SCOPE OF WORK:

The construction, installation, treating and reconditioning of pipelines transporting gas vapors within cities, towns, subdivisions, suburban areas, or within private property

boundaries, up to and including private meter settings of private industrial, governmental or other premises, more commonly referred to as "distribution work," starting from the first metering station, connection, similar or related facility, of the main or cross country pipeline and including duct installation.

POWER EQUIPMENT - GAS DISTRIBUTION CLASSIFICATIONS

GROUP 1: Mechanic, crane (over 1/2 yd. capacity), backhoe (over 1/2 yd. capacity), grader (Caterpillar 12 equivalent or larger)

GROUP 2-A: Trencher, backhoe (1/2 yd. capacity or less)

GROUP 2-B: Crane (1/2 yd. capacity or less), compressor (2 or more), dozer (D-4 equivalent or larger), endloader (1 yd. capacity or larger), pump (1 or 2 six-inch or larger), side boom (D-4 equivalent or larger)

GROUP 3: Backfiller, boom truck (powered), concrete saw (20 hp or larger), dozer (less than D-4 equivalent), endloader (under 1 yd. capacity), farm tractor (with attachments), pump (2-4 under six-inch capacity), side boom tractor (less than D-4 equivalent), tamper (self-propelled)

GROUP 4: Oiler, grease person

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IRON0025-021 06/01/2003

ALCONA, CHEBOYGAN, CLARE, CRAWFORD, OSCODA, OTSEGO AND ROSCOMMON COUNTIES:

	Rates	Fringes
Ironworkers:		
Machinery mover, rigger		
and machinery erector...	\$ 24.09	16.95

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IRON0026-003 04/01/2001

	Rates	Fringes
Ironworkers - Pre-Engineered		
Metal.....	\$ 18.28	12.04

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IRON0026-005 06/01/2001

ALCONA, CHEBOYGAN, CLARE, CRAWFORD, OSCODA, OTSEGO AND ROSCOMMON COUNTIES:

	Rates	Fringes
Ironworkers:		
Fence erector.....	\$ 18.37	12.88
Ornamental, structural,		
precast erector.....	\$ 25.09	17.48
Siding & decking.....	\$ 20.56	15.41

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IRON0026-012 06/01/2001

ALCONA, CHEBOYGAN, CLARE, CRAWFORD, OSCODA, OTSEGO AND  
 ROSCOMMON COUNTIES:

	Rates	Fringes
Ironworkers:		
Reinforcing.....	\$ 23.50	15.51
Wire mesh.....	\$ 19.87	14.24

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IRON0340-004 06/01/2001

ANTRIM, BENZIE, CHARLEVOIX, EMMET, GRAND TRAVERSE, KALKASKA,  
 LAKE, LEELANAU, MANISTEE, MASON, MECOSTA, MISSAUKEE, MONTCALM,  
 NEWAYGO, OCEANA, OSCEOLA AND WEXFORD COUNTIES:

	Rates	Fringes
Ironworkers:		
Reinforcing & structural....	\$ 22.50	11.24
Rigger; Heavy machinery mover.....	\$ 20.62	8.56

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LABO0005-003 10/01/2002

	Rates	Fringes
Laborers - hazardous waste abatement:		
ALCONA, ANTRIM, BENZIE, CHARLEVOIX, CHEBOYGAN, CRAWFORD, EMMET, GRAND TRAVERSE, KALKASKA, LEELANAU, MISSAUKEE, OSCODA, OTSEGO AND WEXFORD COUNTIES:		
Level A, B or C.....	\$ 18.23	5.69
Work performed in conjunction with site preparation not requiring the use of personal protective equipment;		
Also Level D.....	\$ 17.23	5.69
CLARE AND ROSCOMMON COUNTIES:		
Level A, B or C.....	\$ 20.61	5.69
Work performed in conjunction with site preparation not requiring the use of personal protective equipment;		
Also Level D.....	\$ 19.61	5.69
LAKE, MANISTEE, MASON, MECOSTA, MONTCALM, NEWAYGO, OCEANA AND OSCEOLA COUNTIES:		
Level A, B or C.....	\$ 19.11	5.69
Work performed in conjunction with site preparation not requiring		

the use of personal  
 protective equipment;  
 Also Level D.....\$ 18.11                      5.69

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 LABO0259-004 09/01/2003

	Rates	Fringes
Laborers - tunnel, shaft and caisson:		
GROUP 1.....	\$ 21.37	6.45
GROUP 2.....	\$ 21.46	6.45
GROUP 3.....	\$ 21.56	6.45
GROUP 4.....	\$ 21.72	6.45
GROUP 5.....	\$ 21.98	6.45
GROUP 6.....	\$ 22.29	6.45
GROUP 7.....	\$ 14.56	6.45

TUNNEL LABORER CLASSIFICATIONS

GROUP 1: Tunnel, shaft and caisson laborer, dump, shanty, hog house tender, testing (on gas)

GROUP 2: Manhole, headwall, catch basin builder, bricklayer tender, mortar, material mixer, fence erector and guard rail builder

GROUP 3: Air tool operator (jackhammer, bush hammer and grinder), first bottom, second bottom, cage tender, car pusher, carrier, concrete, concrete form, concrete repair, cement invert laborer, cement finisher, concrete shoveler, conveyor, floor, gasoline and electric tool operator, gunite, grout operator, welder, heading dinky person, inside lock tender, pea gravel operator, pump, outside lock tender, scaffold, top signal person, switch person, track, tugger, utility person, vibrator, winch operator, pipe jacking, wagon drill and air track operator and concrete saw operator (under 40 h.p.)

GROUP 4: Tunnel, shaft and caisson mucker, bracer, liner plate, long haul dinky driver and well point

GROUP 5: Tunnel, shaft and caisson miner, drill runner, key board operator, power knife operator, reinforced steel or mesh (e.g. wire mesh, steel mats, dowel bars, etc.)

GROUP 6: Dynamite and powder

GROUP 7: Restoration laborer, seeding, sodding, planting, cutting, mulching and top soil grading; and the restoration of property such as replacing mailboxes, wood chips, planter boxes, flagstones, etc.

SCOPE OF WORK: Tunnel, shaft and caisson work of every type and descripton and all operations incidental thereto, including, but not limited to, shafts and tunnels for sewers, water, subways, transportation, diversion, sewerage, caverns, shelters, aquafers, reservoirs, missile silos and steel sheeting for underground construction.

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\* LABO0260-003 08/01/2004

	Rates	Fringes
Asbestos Laborer Includes removing and disposing of all insulation materials from walls, ceilings, floors, columns, and all other non-mechanical surfaces; and removal of insulating materials from mechanical systems that are to be demolished; loading/unloading of bagged and tagged materials at the disposal site (includes lead paint abatement clean-up).....	\$ 19.53	7.35

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LABO0334-016 07/01/2003

	Rates	Fringes
Landscape Laborer GROUP 1.....	\$ 16.41	4.05
GROUP 2.....	\$ 12.19	4.05

LANDSCAPE LABORER CLASSIFICATIONS

GROUP 1: Landscape specialist, including air, gas and diesel  
equipment operator and lawn sprinkler installer

GROUP 2: Landscape laborer: small power tool operator,  
material mover and truck driver

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LABO0334-023 09/01/2003

	Rates	Fringes
Laborers - open cut: GROUP 1.....	\$ 18.22	6.35
GROUP 2.....	\$ 18.35	6.35
GROUP 3.....	\$ 18.46	6.35
GROUP 4.....	\$ 18.53	6.35
GROUP 5.....	\$ 18.65	6.35
GROUP 6.....	\$ 15.87	6.35
GROUP 7.....	\$ 14.21	6.35

SCOPE OF WORK:

Open cut construction work shall be construed to mean work  
which requires the excavation of earth including  
industrial, commercial and residential building site

excavation and preparation, land balancing, demolition and removal of concrete and underground appurtuces, grading, paving, sewers, utilities and improvements; retention, oxidation, flocculation and irrigation facilities, and also including but not limited to underground piping, conduits, steel sheeting for underground construction, and all work incidental thereto, and general excavation.

Open cut construction work shall also be construed to mean waterfront work, piers, docks, seawalls, breakwalls, marinas and all incidental work. Open cut construction work shall not include any structural modifications, alterations, additions and repairs to buildings, or highway work, including roads, streets, bridge construction and parking lots or steel erection work and excavation for the building itself and back filling inside of and within 5 ft. of the building and foundations, footings and piers for the building. Open cut construction work shall not include any work covered under Tunnel, Shaft and Caisson work.

OPEN CUT LABORER CLASSIFICATIONS

GROUP 1: Construction laborer

GROUP 2: Mortar and material mixer, concrete form person, signal person, well point person, manhole, headwall and catch basin builder, guard rail builder, headwall, seawall, breakwall, dock builder and fence erector

GROUP 3: Air, gasoline and electric tool operator, vibrator operator, driller, pump person, tar kettle operator, bracer, rodder, reinforced steel or mesh person (e.g. wire mesh, steel mats, dowel bars, etc.), welder, pipe jacking & boring person, wagon drill and air track operator and concrete saw operator (under 40 h.p.), windlass and tugger person and directional boring person

GROUP 4: Trench or excavating grade person

GROUP 5: Pipe layer (including crock, metal pipe, multi-plate or other conduits)

GROUP 6: Grouting person, audio-visual television operations and all other operations in connection with closed circuit television inspection, pipe cleaning and pipe relining work

GROUP 7: Restoration laborer, seeding, sodding, planting, cutting, mulching and top soil grading; and the restoration of property such as replacing mailboxes, wood chips, planter boxes, flagstones, etc.

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LAB00355-011 06/01/2003

LAKE, MANISTEE, MASON, MECOSTA, MONTCALM, NEWAYGO, OCEANA AND OSCEOLA COUNTIES:

	Rates	Fringes
Mason Tender.....	\$ 21.30	6.35

FOOTNOTE:

Paid Holiday: Fourth of July, if the worker has been employed by the contractor in any period of seven working days before said holiday within the current calendar year.

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LABO0355-019 06/01/2004

LAKE, MANISTEE, MASON, NEWAYGO AND OCEANA COUNTIES:

	Rates	Fringes
Laborers:		
GROUP 1.....	\$ 16.96	6.76
GROUP 2.....	\$ 17.21	6.76
GROUP 3.....	\$ 17.71	6.76

LABORER CLASSIFICATIONS

GROUP 1: General laborer; also, work on pumps, well wheels, air, electric or gasoline tools, motor-driven buggies; laborers working on swing scaffolds; carpenter tender; cement finisher tender; heat tender

GROUP 2: Jackhammer operator, crocklayer and caisson worker in buildings

GROUP 3: Top person on chimneys or towers over thirty (30') ft. in height, material mixer, operator of portable mixer and plasterer tender; mason tender; demolition burner

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LABO0355-020 06/01/2004

MECOSTA, MONTCALM AND OSCEOLA COUNTIES:

	Rates	Fringes
Laborers:		
GROUP 1.....	\$ 16.96	6.76
GROUP 2.....	\$ 17.21	6.76
GROUP 3.....	\$ 17.71	6.76

LABORER CLASSIFICATIONS

GROUP 1: General laborer; also, work on pumps, well wheels, air, electric or gasoline tools, motor-driven buggies; laborers working on swing scaffolds; carpenter tender, cement finisher tender; heat tender

GROUP 2: Jackhammer operator, crocklayer and caisson worker in buildings

GROUP 3: Top person on chimneys or towers over thirty (30') ft. in height, material mixers, operators of portable mixers and plasterer tender; mason tender; demolition burner

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LABO1098-007 06/30/2004

CLARE AND ROSCOMMON COUNTIES:

	Rates	Fringes
Laborers:		
GROUP 1.....	\$ 18.90	7.30
GROUP 2.....	\$ 19.40	7.30
GROUP 3.....	\$ 19.90	7.30

LABORER CLASSIFICATIONS

GROUP 1: All construction laborers except workers falling within specified classifications; Also, pumps with a 3-in. or less discharge and not hooked up in battery, mechanized buggy operator & mortar mixer (when done by hand) and mason tender

GROUP 2: Air or electric driven pavement breakers, concrete vibrator, plaster tender, Tunnel miner, tunnel mucker and tunnel and shaft underpinning contributing to the structural support of buildings

GROUP 3: Driller & blaster, burner & welder; Also, refractory work: Work inside or outside digesters, tanks, lime kilns, chests, boilers and boiler tubes, heat treat ovens, and smoke stacks, including the handling of acid, chlorine, chemicals, epoxies, liquids and cleaning of existing precipitators, hydro blasting, hydro washing, and sandblasting

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LABO1098-008 05/01/2004

ALCONA, ANTRIM, BENZIE, CHARLEVOIX, CHEBOYGAN, CRAWFORD, EMMET, GRAND TRAVERSE, KALKASKA, LEELANAU, MISSAUKEE, OSCODA, OTSEGO, AND WEXFORD COUNTIES:

	Rates	Fringes
Laborers:		
GROUP 1.....	\$ 16.06	6.90
GROUP 2.....	\$ 16.66	6.90
Work inside or outside digester, tanks, lime kilns, chests, boilers, and boiler tubes, including the handling of acid, chlorine, chemicals, epoxies, liquids and cleaning of existing precipitators, hydro blasting, hydro washing, sandblasting.....	\$ 17.06	6.90

LABORER CLASSIFICATIONS

GROUP 1: All construction laborers on heavy construction work(except those in Group 2), mortar mixer, mason tender, carpenter tender, material mixer (whether done by hand or machine), vibrator operator, operator of concrete mixer, chipping hammer, tamping machine (whether run by air, electric, or gas), sandblaster, operator of motor-driven buggies, plaster mixer, plaster tender, pipe or crock

layer, caisson work in buildings, fire watch, heater tender,  
all three inch (3") pumps and below

GROUP 2: Concrete breaker (90 lb. hammer or less) and cement  
gun nozzle person

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PAIN0845-017 06/01/1998

NEWAYGO COUNTY (except the townships of Barton, Big Prairie,  
Brooks, Croton, Ensley, Everett, Goodwell, Grant, Home, Monroe,  
Norwich and Wilcox); AND OCEANA COUNTY:

	Rates	Fringes
Painters:		
Brush (falling distance which exceeds 30').....	\$ 17.45	2.31
Brush and roller.....	\$ 16.95	2.31
Spray (falling distance which exceeds 30'); Sandblasting (falling distance which exceeds 30'); High work (all preparatorial work, sand blasting, and painting from a falling height exceeding 30 ft. on the following named structures: water tanks, gas holders, radio towers, church steeple, blast furnaces, smoke stacks, cracking plants, exterior cranes, but not including work performed from scaffolding or a platform or basket suspended from a crane or hoist).....	\$ 18.20	2.31
Spray; Sandblasting; Hydroblast (handheld lance 5,000 PSI and over); Power grinders (7" disc or over).....	\$ 17.70	2.31
Work performed in confined spaces.....	\$ 18.45	2.31

-----  
PAIN0845-021 05/11/2000

MECOSTA AND MONTCALM COUNTIES; NEWAYGO COUNTY (Townships of  
Barton, Big Prairie, Brooks, Croton, Ensley, Everett, Goodwell,  
Grant, Home, Monroe, Norwich and Wilcox); OSCEOLA COUNTY (south  
of Hwy. #10):

	Rates	Fringes
Painters:		
Bridges over highways and railroads:		

Brush.....	\$ 15.41	5.66
Spray.....	\$ 16.41	5.66
Water - sandblast.....	\$ 16.91	5.66
Brush, swing stage; window jacks and belts.....	\$ 15.66	5.66
Brush.....	\$ 15.16	5.66
Electric substations.....	\$ 16.66	5.66
Fireproofing work.....	\$ 16.16	5.66
Interior high work:		
Brush.....	\$ 16.66	5.66
Spray.....	\$ 17.66	5.66
Interior pipes closed vessels and closed tanks:		
Brush.....	\$ 15.66	5.66
Spray.....	\$ 16.66	5.66
Spray or sandblast, swing stage; steeplejack.....	\$ 16.66	5.66
Spray.....	\$ 16.16	5.66
Steamclean.....	\$ 16.16	5.66
Waterblast; sandblast.....	\$ 16.91	5.66

FOOTNOTES: Lead abatement work: \$1.00 per hour additional.

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PAIN1803-007 12/01/2001

ALCONA, ANTRIM, BENZIE, CHARLEVOIX, CHEBOYGAN, CLARE, CRAWFORD,  
EMMET, GRAND TRAVERSE, KALKASKA, LAKE, LEELANAU, MANISTEE,  
MASON AND MISSAUKEE COUNTIES; OSCEOLA COUNTY (north of Hwy.  
#10); OSCODA, OTSEGO, ROSCOMMON AND WEXFORD COUNTIES:

	Rates	Fringes
Painters:		
Work performed on water, bridges over water or moving traffic, radio and powerline towers, elevated tanks, steeples, smoke stacks over 40 ft. of falling heights, recovery of lead-based paints and any work associated with industrial plants, except maintenance of industrial plants.....	\$ 19.40	7.25
All other work, including maintenance of industrial plants.....	\$ 17.98	7.25

FOOTNOTES:

Spray painting, sandblasting, blowdown associated with  
spraying and blasting, water blasting and work involving a  
swing stage, boatswain chair or spider: \$1.00 per hour  
additional.

All work performed inside tanks, vessels, tank trailers,  
railroad cars, sewers, smoke stacks, boilers or other  
spaces having limited egress not including buildings,  
opentop tanks, pits, etc.: \$1.25 per hour additional.

Work involving the actual installation of wallcoverings:  
\$0.30 per hour additional.

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PLAS0016-009 06/01/2003

MONTCALM, NEWAYGO AND OCEANA COUNTIES:

	Rates	Fringes
Cement Mason.....	\$ 19.30	8.35
Plasterer.....	\$ 20.01	8.10

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PLUM0085-002 05/03/2004

ALCONA, ANTRIM, BENZIE, CHARLEVOIX, CHEBOYGAN, CRAWFORD, EMMET,  
GRAND TRAVERSE, KALKASKA, LEELANAU, MISSAUKEE, OSCODA, OTSEGO,  
ROSCOMMON AND WEXFORD COUNTIES:

	Rates	Fringes
Plumbers and Pipefitters		
Industrial work.....	\$ 26.93	14.14
All other work.....	\$ 25.44	14.14

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PLUM0085-011 05/03/2004

CLARE COUNTY:

	Rates	Fringes
Plumbers and Pipefitters.....	\$ 26.93	14.14

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PLUM0174-003 07/01/2002

MECOSTA, MONTCALM AND OSCEOLA COUNTIES:

	Rates	Fringes
Plumbers and Pipefitters.....	\$ 27.00	10.98

FOOTNOTE: Work that requires the use of a respirator with an  
outside air source: 10% per hour additional.

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PLUM0174-008 07/01/2002

LAKE, MANISTEE, MASON, NEWAYGO AND OCEANA COUNTIES:

	Rates	Fringes
Plumbers and Pipefitters.....	\$ 27.00	10.98

FOOTNOTE: Work that requires the use of a respirator with an  
outside air source: 10% per hour additional.

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PLUM0190-006 05/01/2004

	Rates	Fringes
Gas Distribution Pipeline		

Welding in conjunction  
with gas distribution  
pipeline work.....\$ 26.35                   11.70  
All other work.....\$ 18.66                   7.92

-----  
ROOF0070-008 06/01/2001

LAKE, MASON, NEWAYGO AND OCEANA COUNTIES:

	Rates	Fringes
Roofer.....	\$ 16.85	5.10

FOOTNOTES: Application of slate tile: \$0.25 per hour  
additional. Pitch work: \$0.50 per hour additional.

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ROOF0070-009 06/01/1998

MECOSTA AND MONTCALM COUNTIES:

	Rates	Fringes
Roofer; slater.....	\$ 14.15	5.20

-----  
ROOF0149-011 05/01/2001

ALCONA, ANTRIM, BENZIE, CHARLEVOIX, CHEBOYGAN, CRAWFORD, EMMET,  
GRAND TRAVERSE, KALKASKA, LEELANAU, MANISTEE, MISSAUKEE,  
OSCEOLA, OSCODA, OTSEGO AND WEXFORD COUNTIES:

	Rates	Fringes
Roofers:		
Roofer.....	\$ 15.40	6.05
Slater.....	\$ 17.40	6.05

-----  
ROOF0149-012 06/01/1996

CLARE AND ROSCOMMON COUNTIES:

	Rates	Fringes
Roofer.....	\$ 17.76	5.02

-----  
SH EE0007-016 05/01/2001

LAKE, MASON, MECOSTA, MONTCALM, NEWAYGO, OCEANA AND OSCEOLA  
COUNTIES:

	Rates	Fringes
Sheet Metal Worker.....	\$ 23.62	7.67

-----  
SH EE0007-017 05/01/2001

ALCONA, ANTRIM, BENZIE, CHARLEVOIX, CHEBOYGAN, CLARE, CRAWFORD,  
EMMET, GRAND TRAVERSE, KALKASKA, LEELANAU, MANISTEE, MISSAUKEE,  
OSCEOLA, OTSEGO, ROSCOMMON AND WEXFORD COUNTIES:

	Rates	Fringes
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Sheet metal worker.....\$ 21.98            3% + 10.05

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TEAM0007-006 06/01/2002

	Rates	Fringes
Truck drivers:		
Euclids, double bottoms		
and     lowboys.....	\$ 23.045	.50 + a
Trucks under 8 cu. yds.....	\$ 22.795	.50 + a
Trucks, 8 cu. yds. and over.	\$ 22.895	.50 + a

FOOTNOTE: a. \$265.90 per week.  
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WELDERS - Receive rate prescribed for craft performing  
operation to which welding is incidental.  
=====

Unlisted classifications needed for work not included within  
the scope of the classifications listed may be added after  
award only as provided in the labor standards contract clauses  
(29CFR 5.5 (a) (1) (ii)).  
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In the listing above, the "SU" designation means that rates  
listed under the identifier do not reflect collectively  
bargained wage and fringe benefit rates. Other designations  
indicate unions whose rates have been determined to be  
prevailing.  
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#### WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can  
be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on  
a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests  
for summaries of surveys, should be with the Wage and Hour  
Regional Office for the area in which the survey was conducted  
because those Regional Offices have responsibility for the  
Davis-Bacon survey program. If the response from this initial  
contact is not satisfactory, then the process described in 2.)  
and 3.) should be followed.

With regard to any other matter not yet ripe for the formal  
process described here, initial contact should be with the  
Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations

Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

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SECTION 02138

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- 3.7 QUALITY CONTROL

-- End of Section Table of Contents --

SECTION 02138  
CONTROL OF WATER

PART 1 GENERAL

1.1 DESCRIPTION

The work under this section includes furnishing all equipment and performing operations such as, but not limited to, establishing water diversion structures as indicated herein and water control within worksite and cofferdam.

1.2 DEFINITIONS

Where referenced herein, "water diversion" or "diversion structure" identifies a cofferdam system using both temporary and stay-in-place steel sheet piling (SSP) as indicated on the drawings.

1.3 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT)

MDOT-2003 (2003) Standard Specifications for Construction

U.S. ARMY CORPS OF ENGINEER'S ENGINEERING PAMPHLETS (EP)

EM 385-1-1 (1996) Safety and Health Requirements Manual

1.4 CARP LAKE RIVER FLOW DATA

Construction of the lamprey trap is required to be performed in the dry. Three tables are enclosed in SECTION 01999, LISTING OF ENCLOSED DOCUMENTS, EXHIBITS, AND OTHER ATTACHMENTS which provide information on: mean monthly flows for the Carp Lake River, stage discharge table, and monthly flow frequency table. The information is from historic records and not necessarily representative of future conditions. Additional hydrologic information may be obtained by contacting the U.S. Army Corps of Engineers, Detroit District, Hydraulics and Hydrology Branch, Engineering & Planning Division, 477 Michigan Avenue, Detroit, Michigan or the United States Geologic Survey (USGS).

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330, SUBMITTAL PROCEDURES:

## SD-01 Data

## Construction Equipment; G, AOF

At least ten (10) calendar days prior to starting work, a list of all equipment, tools and machines, including their sizes, capacities and operating speeds, to be used in the performance of the work, shall be submitted. Equipment shall be maintained in satisfactory working condition at all times.

## Work Plan; G, AOF

At least ten (10) calendar days prior to proceeding with the work, submit a work plan for all work required under this Section of the specifications. The work plan shall include, but not be limited to, describing the proposed sequence of work, the timing for the placement and the operation and removal of each component of the diversionary structure. Also include procedures to be followed when emergency conditions arise. Protection of personnel, equipment, and property shall be in accordance with EM 385-1-1.

## Dewatering and Water Diversion Plan; G, AOF

At least 15 calendar days prior to commencement of any dewatering and water diversion activity, submit a detailed description of the temporary water diversion and dewatering. This shall include structure and equipment layouts, type and spacing of dewatering devices, number and size of pumps, and other equipment, together with a description of the installation and operating procedures, including relationship to the construction operations. An emergency back-up dewatering system is also required in the event of equipment failure.

It shall be specifically understood that submission of the proposed water diversion and dewatering systems and performance in accordance with the submittal shall not relieve the Contractor of full responsibility for performing the work in strict accordance with these specifications. Describe methodology for dewatering cofferdam for placement of lamprey trap floor. Submit 15 days prior to starting work. All cofferdam work shall be in accordance with requirements in MDOT-2003.

## Design Data; G, AOF

Submit design data for all temporary water diversion systems and protective works and subgrade dewatering, such as, but not limited to, diversion systems, protective works, dewatering wells and pumps. Such data shall clearly describe the functioning of the diversion systems, protective works and dewatering facilities, and the design assumptions and calculations.

## SD-02 Shop Drawings

## Temporary Works; G, AOF

Submit drawings which clearly and completely detail the installation of each temporary water diversion and protective works and the above-grade and subgrade dewatering systems to be used for accomplishing the lamprey trap installation in the dry. Riprap may be placed in the wet.

## PART 2 PRODUCTS

### 2.1 MATERIALS

All materials shall be as required by the Contractor's design for the control of water. Erosion control materials such as silt fencing and silt bags shall be in compliance with SECTION 02230a, SITE WORK.

#### 2.1.1 Steel Sheet Piling

SSP used to accomplish a temporary water diversion system may be new or used. The condition of all SSP used in the work shall be inspected by the COR and shall be in accordance with Section 02411, STEEL SHEET PILING. SSP may be reused if it's condition is found to be satisfactory by the COR. Any unused SSP shall be removed from the site at the completion of the work. Temporary and stay-in-place SSP, where used, shall be as designed by the Contractor.

## PART 3 EXECUTION

### 3.1 TEMPORARY WATER DIVERSION SYSTEM AND PROTECTIVE WORKS

The Contractor shall design, construct, operate and maintain all temporary water diversion and protective works and subgrade dewatering facilities necessary for the control of water to permit all required permanent work on the lamprey trap, including excavation, to be accomplished in the dry. All work and materials shall be provided by the Contractor. All construction, planning, procedures and schedules shall be as specified and in accordance with approved submittals. The means by which the Contractor will react to overtopping conditions shall be fully described in the work plan to be submitted. The Contractor shall furnish, install, maintain and operate all necessary pumping and other equipment required to remove surface water and ground water from within the construction areas. After having served their purpose, all temporary water diversion facilities and protective works shall be removed immediately (see Section 3.6 for details) and shall become the property of the Contractor upon removal from the site.

#### 3.1.1 Water Diversion System

The Contractor shall provide a temporary water diversion system and protective works which shall consist of all facilities necessary to temporarily divert river, and remove all surface water drainage and runoff from the required work areas and maintain the work area in the dry during construction.

#### 3.1.2 Drainage

So that construction operations progress successfully, completely drain lamprey trap construction site during periods of construction to keep soil materials sufficiently dry. The Contractor shall grade the construction area to provide positive surface water runoff away from the construction activity and/or provide temporary ditches, swales, and other drainage features and equipment as required to maintain dry soils. When unsuitable working platforms for equipment operation and unsuitable soil support for subsequent construction features develop, remove unsuitable material and provide new soil material as specified herein. It is the responsibility of the Contractor to assess the soil and ground water conditions presented by the plans and specifications and to employ necessary measures to permit construction to proceed.

### 3.1.3 Dewatering

Groundwater flowing toward or into excavations shall be controlled to prevent sloughing of excavation slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of construction. French drains, sumps, ditches or trenches will not be permitted within 3 feet of the foundation of any structure, except with specific written approval, and after specific contractual provisions for restoration of the foundation area have been made. Control measures shall be taken by the time the excavation reaches the water level in order to maintain the integrity of the in situ material. While the excavation is open, the water level shall be maintained continuously, at least 2 feet below the working level. The Contractor is also responsible for maintaining the site during construction. The Contractor shall operate a dewatering system continuously until construction work below existing water levels is complete. Submit performance records weekly.

### 3.1.4 Time Extensions

Anytime during which the river flow overtops the approved temporary diversion structures and protective works through no fault of the Contractor or the diversion structure and protective works are breached as directed by the Government, and for each interruption required to restore damaged or breached works it will be considered as adverse weather and treated in accordance with the Default clause and the time extension for unusually severe weather clause. Prior to continuing work after an interruption, the work must be fully inspected for damage by the Government.

## 3.2 CONTRACTOR RESPONSIBILITY

The design of the water diversion systems and subgrade dewatering systems is the responsibility of the Contractor and shall be performed by a registered professional engineer. The Contractor must build the cofferdam at the locations shown on the drawing. The top of the cofferdam SSP shall be at elevation 587.82 (N.A.V.D. 88).

## 3.3 MONITORING AND HYDROLOGIC CONDITIONS

### 3.3.1 Scheduling and Monitoring

Diversionary devices shall not be placed in the Carp Lake River earlier than such protective works are needed for work on the foundation and shall be removed at the earliest possible time after the completion of upstream work. The cofferdam can not be in place at any time during March 15 through June 16. The Contractor shall monitor the flow and elevations of the Carp Lake River, monitor weather conditions and shall manage its operations to adjust to anticipated field conditions.

## 3.4 BREACHING DIVERSION AND PROTECTIVE WORKS

### 3.4.1 Flood Stage

For purposes of this contract, "flood" stage corresponds to a water elevation of 587.82 feet (N.A.V.D. 1988). The corresponding flow upstream of the weir is 400 cfs (20% probability to exceed flow). The above elevations are applicable to the construction period between 1 June and 31 August.

### 3.5 DAMAGE TO WORK

The responsibility for damage to any part of the work to be performed under this contract shall be as set forth in SECTION 00700, CONTRACT CLAUSES, titled "PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS" and "PERMITS AND RESPONSIBILITIES." However, if the diversion structures, protective works, pipes, pumps, or similar approved works are constructed in accordance with plans and progress schedules approved by the Contracting Officer, but are overtopped by flood and such flood causes damage to the diversion structures, protective works, pipes, pumps, or similar approved works, or if any part of the Contractor's permanent work or temporary work in place is damaged by flood, which damage is not due to the failure to the Contractor to take reasonable precautions or to exercise sound engineering and construction practices in the conduct of the work, the Contractor shall make the repairs as ordered by the Contracting Officer and an equitable adjustment in the contract for such repairs will be made as established in SECTION 00700, CONTRACT CLAUSE titled "CHANGES".

### 3.6 REMOVAL OF TEMPORARY PROTECTIVE WORKS AND DIVERSION STRUCTURES

The temporary diversion structures and protective works shall remain in place until required construction is completed in a protected area. For required concrete construction, this would require that removal of the temporary works not begin earlier than 7 days after completion of concrete pouring operations. The concrete structures must be allowed, at a minimum, a proper curing period as required in Section 03307, CONCRETE CONSTRUCTION.

All temporary construction materials shall be completely removed. All removed materials shall be properly disposed of off-site. The Contractor shall leave the construction area in a neat, clean and acceptable condition.

### 3.7 QUALITY CONTROL

The Contractor shall establish and maintain a quality control system for all operations performed under this Section to assure compliance with contract requirements and maintain records of its quality control for all operations performed, including, but not limited to, the following:

- a. Design, installation and maintenance of water diversion systems, protective works and dewatering systems.
- b. Provision of site conditions as necessary to accommodate performing required construction in the dry.
- c. Protection of existing service lines, utilities and structures.
- d. Prevention of Contractor-caused flooding outside of required construction area.
- e. Conformance to submittals.
- f. Appropriate scheduling of all work.
- g. Removal of temporary works.
- h. Disposal.
- i. Observance of safety regulations.

j. Final condition of work site.

-- End of Section --

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-- End of Section Table of Contents --

## SECTION 02220A

## DEMOLITION

## PART 1 GENERAL

## 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (1996) Safety and Health Requirements Manual

## 1.2 GENERAL REQUIREMENTS

The work includes demolition, salvage of identified items and materials, removal of resulting rubbish and debris and backfilling voids to match surrounding grade. Rubbish and debris shall be removed from Government property daily, unless otherwise directed, to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the Contracting Officer's Representative. In the interest of occupational safety and health, the work shall be performed in accordance with EM 385-1-1, Section 23, Demolition, and other applicable Sections. In the interest of conservation, salvage shall be pursued to the maximum extent possible (in accordance with Section 01572 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT, if applicable); salvaged items and materials shall be disposed of as specified. The Contractor shall identify items of work in the required Work Plan, as identified in 1.3 SUBMITTALS.

## 1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Work Plan; G, ECD

The procedures proposed for the accomplishment of the work. The procedures shall provide for safe conduct of the work, including procedures and methods to provide necessary supports, lateral bracing and shoring when required, careful removal and disposition of materials specified to be salvaged, protection of property which is to remain undisturbed, coordination with other work in progress, and timely disconnection of utility services. The procedures shall include a detailed description of the methods and equipment to be used for each operation, and the sequence of operations in accordance with EM 385-1-1.

#### 1.4 DUST CONTROL

The amount of dust resulting from demolition shall be controlled to prevent the spread of dust to occupied portions of the construction site and to avoid creation of a nuisance in the surrounding area. Use of water will not be permitted when it will result in, or create, hazardous or objectionable conditions such as ice, flooding and pollution.

#### 1.5 PROTECTION

##### 1.5.1 Protection of Personnel

During the demolition work the Contractor shall continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the demolition site. No area, section, or component of floors, roofs, walls, columns, pilasters, or other structural element will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workmen remove debris or perform other work in the immediate area.

##### 1.5.2 Protection of Existing Property

Before beginning any demolition work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of the work. The Contractor shall take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the Government; any damaged items shall be repaired or replaced as approved by the Contracting Officer. The Contractor shall coordinate the work of this section with all other work and shall construct and maintain shoring, bracing, and supports as required. The Contractor shall ensure that structural elements are not overloaded and shall be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under this contract.

##### 1.5.3 Protection From the Weather

Salvageable materials and equipment shall be protected from the weather at all times.

##### 1.5.4 Protection of Trees

Trees within the project site which might be damaged during demolition, and which are indicated to be left in place, shall be protected by a 1.8 m (6 foot) 6 foot high fence. The fence shall be securely erected a minimum of 1.5 m 5 feet from the trunk of individual trees or follow the outer perimeter of branches or clumps of trees. Any tree designated to remain that is damaged during the work under this contract shall be replaced in kind or as approved by the Contracting Officer.

##### 1.5.5 Environmental Protection

The work shall comply with the requirements of Section 01355 ENVIRONMENTAL PROTECTION.

#### 1.6 BURNING

The use of burning at the project site for the disposal of refuse and

debris will not be permitted.

1.7 USE OF EXPLOSIVES

Use of explosives will not be permitted.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 EXISTING STRUCTURES

Existing structures indicated shall be removed to the limits shown on the plans.

3.2 DISPOSITION OF MATERIAL

Title to material and equipment to be demolished is vested in the Contractor upon receipt of notice to proceed. The Government will not be responsible for the condition, loss or damage to such property after notice to proceed.

3.3 CLEAN UP

Debris and rubbish shall be removed from the site upon completion of required work. Debris shall be removed and transported in a manner that prevents spillage on streets or adjacent areas. Local regulations regarding hauling and disposal shall apply.

-- End of Section --

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-- End of Section Table of Contents --

SECTION 02230a

SITE WORK

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

The work under this section includes furnishing all equipment and performing operations such as, but not limited to, erosion control, protection of trees, clearing and select removal of trees, grubbing of trees and brush where necessary, warning signs, and all related items required to complete the work shown on the drawings and as specified. Riprap as identified herein shall be in accordance with Section 02486, STONE CONSTRUCTION. All work shall be conducted in a manner to prevent damage to plant material and trees which are to remain and to maintain the aesthetics of the site. All work shall be in accordance with the requirements specified herein, as shown on the contract drawings, and as specified in Section 01025, MEASUREMENT AND PAYMENT.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT)

MDOT-2003 (2003) Standard Specifications for Construction

U.S. ARMY CORPS OF ENGINEER'S ENGINEERING PAMPHLET (EP)

EP 310-1-6A/B (1985) Sign Standards Manual, Vol's 1 & 2

U.S. DEPARTMENT OF DEFENSE (DOD)

MIL-P-21035 (Rev. B) Paint, High Zinc Dust Content, Galvanizing Repair (Metric)

1.3 DEFINITIONS

1.3.1 Clearing

Clearing shall consist of the felling, trimming, and cutting of select trees into sections and the satisfactory disposal of the trees and other vegetation, including down timber, snags, brush, and rubbish occurring in the areas to be cleared, which include, but are not limited to, parking area, and walkway from parking area to lamprey trap and barrier. Removal of trees shall be limited to only those interfering with the required construction. The limits of the required aggregate access road shall be governed by least amount of tree removal.

1.3.2 Grubbing

Grubbing shall consist of the removal and disposal of stumps, roots, and matted roots that are extended more than 4 inches above the ground line

from the designated grubbing areas. Trees along the riverbank shall be removed in their entirety in the location of the required riprap, lamprey trap, SSP barrier and SSP backwalls including tie rods. Undisturbed sound stumps, roots, and non-perishable solid objects, which are a minimum of 3 feet below the final sub grade or slope of embankments, may be left, provided they are as nearly flush as possible. Low hanging branches and unsound or unsightly branches on trees designated to remain shall be removed as directed. Limb trees overhanging the parking area, access walk, and lamprey trap to a minimum 7 feet from finished grade. All trimming shall be done by skilled workers and in accordance with good tree surgery practices. Areas requiring grubbing include, but are not limited to, the parking area, walkway from parking area to lamprey trap, lamprey trap area, and SSP barrier, including SSP backwalls and tie rods.

### 1.3.3 Protection of Trees

Existing trees in close proximity to the areas of required grubbing as indicated in Paragraph 1.3.2 shall be fenced to protect branches, roots, and trunks from construction damage. Appropriate Construction Equipment shall be used to protect trees from damage. Root zones of existing plants shall be protected from trenching and compaction during construction. The Contractor shall repair any damage to existing trees and shrubs, and replace existing plants which are extensively damaged or die as a result of construction damage. The Contractor shall maintain tree protection during the entire length of construction.

### 1.4 WORK AND STORAGE

The Contractor shall utilize the area within the construction limits for stockpiling/staging to the maximum extent possible.

If required, the Contractor shall locate and seek approval in writing from the Government for an additional work and storage area prior to mobilization on-site and will utilize this area as an overflow stockpile area. Under no circumstances shall the work and storage area be located within a regulated wetland area.

As material is excavated, it may be temporarily stockpiled in the work and storage area prior to disposal. The temporary stockpiles shall not exceed 8 feet in height or have a slope greater than 1V:2H. Surface stockpiles shall be maintained in neat and well drained condition. At the completion of the work, all temporarily stockpiled materials shall have been placed in the work, in the required locations, or at a location as directed by the Contracting Officer's Representative (COR). All temporarily stockpiled material is to be removed from it's temporary location and the area finish graded and reseeded in accordance with Section 02315N, EXCAVATION AND FILL.

### 1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Construction Equipment; G, AOF

At least ten (10) calendar days prior to starting work, a list of all equipment, tools and machines, including their sizes, capacities and operating speeds, to be used in the performance of the work, shall be submitted. All equipment shall be maintained in satisfactory working condition at all times.

Work Plan; G, AOF

At least ten (10) calendar days prior to proceeding with the work at the site, submit a work plan for the work required under this Section. The plan shall include a description of the means, methods, procedures, and sequence in which the required work will be performed. The protective measures which will be taken to prevent damage to areas outside the specified work area shall be described. The proposed location of the Work and Storage area including all necessary documentation from the landowner, to include assurance the location is not within a regulated wetland area. The proposed locations of temporary stockpiles or excavated material shall be described in detail. The locations of equipment storage, vehicle parking, office trailers, and other Contractor facilities shall be described and shown.

Check Survey Report

A copy of the records of each check survey shall be provided on the next work day following the survey.

Erosion Control Plan; G, AOF

The Contractor shall submit an erosion control plan as specified herein no later than 10 calendar days following notice to proceed.

Disposal of Materials; G, AOF

Written permission to dispose of such products on private property shall be filed with the COR.

Warning Signs; G, AOF

The Contractor shall order required signs no later than 10 days following notice to proceed to ensure proper fabrication time. The Contractor shall ensure Government approval upon receipt of required signs.

#### 1.6 EXISTING CONDITIONS

A. Utility conflicts are not anticipated, however the Contractor shall ensure all utilities are identified through the MISS DIG Utility Location System (1-800-482-7171). The Contractor shall contact the utility companies at least 30 days prior to mobilization on-site to locate, identify and mark all buried utilities.

B. The Contractor shall become familiar with the existing site conditions prior to bidding.

#### 1.7 REGULATORY REQUIREMENTS

A. Conform to applicable code for disposal of debris.

B. Conform to all federal, state and local permit requirements for construction within the waterway regarding dredged and/or fill material.

C. Coordinate bank reconstruction activities including clearing, filling and excavation with utility companies.

D. The Contractor is responsible for obtaining a permit from Emmet County pursuant to Part 91 - Soil Erosion and Sedimentation Control Act of the Michigan Natural Resources Environmental Protection Act (P.A. 451 of 1994, as amended). The Government will obtain all other required permits as indicated below.

1. MDEQ Permit pursuant to Part 17 - Michigan Environmental Protection Act, Part 31 - Water Resources Protection, 301 - Inland Lakes and Streams of the Michigan Natural Resources Environmental Protection Act (NREPA, P.A. 451 of 1994).

2. Water Quality Certification/Coastal Zone Management Permit.

The Contractor shall be required to comply with all regulations and conditions as required in the Government-obtained permits. Contractor shall be required to seek approval of the COR before revising submitted Work Plan.

#### 1.8 CHECK SURVEYS

The Contractor shall verify elevations and dimensions as shown on the construction drawings, prepare and submit a Check Survey Report and notify the COR of any discrepancies. Before beginning any excavation work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of work. The Contractor shall coordinate the work of this section with all other work and shall construct and maintain cofferdams, shoring (if required), bracing, and supports as required. The Contractor shall verify all tree removal and protection with the COR prior to starting work.

#### 1.9 SIGN DELIVERY AND STORAGE

All signs shall be completed and delivered within six (6) weeks of date of authorization to proceed. The Contractor shall store, ship and handle all signs so as to protect them from any kind of damage. Complete sign assemblies shall be shipped disassembled in two (2) units, unless otherwise specified by the COR. One (1) unit shall contain sign panels, frame assemblies, and assembly hardware, and one (1) unit shall contain sign posts. Separately ordered sign panels shall be shipped with all necessary attachment hardware in one unit.

### PART 2 PRODUCTS

#### 2.1 TREE PROTECTION MATERIALS

Materials for fencing of trees to be protected are at the Contractor's option subject to the approval of the COR. Minimum acceptable materials are standard 42 inch wood and wire snow, plastic high-visibility orange fence or wire farm fence supported by studded "T" posts.

## 2.2 SIGNS

All warning signs shall be nominal 0.080 inch aluminum sheet. Rounding of corners is required for aluminum signs. Wording of the signs shall be per the construction drawings. Size of the signs, letter size, and placement of the signs shall be according to EP 310-1-6A/B, except as modified on the drawings. Vegetation shall be trimmed back to allow for clear viewing of signs to the satisfaction of the COR. Signs shall be red with a white legend.

## PART 3 EXECUTION

### 3.1 EROSION CONTROL

Protect existing drainage swales, streams and water impoundments from sediment and pollutants resulting from construction activities. Erosion control materials and methods shall be maintained during construction. Reroute drainage around site to prevent water from coming in contact with disturbed areas. All water leaving the work site shall have less than 50 parts per million (ppm) suspended solids or no visible sediment. Contractor shall provide an erosion control plan as specified in paragraph SUBMITTALS. At a minimum, silt fencing shall be placed around the perimeter of the required construction limits, as indicated on the drawings and in the channel to act as a turbidity curtain during channel excavation operations. The Contractor shall ensure the bottom edge of the silt fencing is buried throughout the duration of construction. All methods of erosion control including, but not limited to, filter bags, sand bags, and silt fencing shall be in accordance with Section 208 of MDOT-2003 and dependent on site conditions.

### 3.2 TEMPORARY FENCING

Fencing must be erected around work site to restrict public access. Acceptable types are chain link, high-density polyethylene fencing and wood snow fencing. Gates shall be provided at vehicle access points.

### 3.3 CLEARING

Trees, stumps, roots, brush, and other vegetation in areas to be cleared shall be cut off flush with or below the original ground surface, except such trees and vegetation as may be indicated or directed to be left standing. Trees designated to be left standing within the cleared areas shall be trimmed of dead branches 1-1/2 inches or more in diameter. Limbs shall be trimmed according to the drawings over the required parking area, access walk, and lamprey trap area. Limbs and branches to be trimmed shall be neatly cut close to the bole of the tree or main branches. Stumps shall be treated with an approved herbicide of recommended rates to prevent root resprouting. Trees and vegetation to be left standing shall be protected from damage incident to clearing, grubbing, and construction operations by the erection of barriers or by such other means as the circumstances require. At least 15 days prior to clearing work, the Contractor will notify the COR and allow for the marking of trees to be retained.

#### 3.3.1 Tree Protection

A. Fence existing trees to remain at outer edge of tree branching as minimum or as approved by COR.

1. Install tree protection prior to the start of any other

construction activities, materials delivery or storage on site.

2. Maintain tree protection throughout project construction and until removal is approved by COR.

B. Protect root zones of existing trees to remain from compaction during construction.

1. Construction vehicles and/or construction workers vehicle parking, and storage of construction materials is not permitted inside the drip line (spread or branches) of trees to remain. All excavation required within the drip line of trees to remain shall be performed by hand.

2. Construction roads shall not pass beneath the drip line of trees to remain unless approved by COR.

### 3.3.2 Tree Repair

A. Remove any branches which are damaged or die as a result of construction.

B. Make all cuts back to a bud, branch or main trunk.

C. Make all cuts flush, leaving no stubs. Proper cutting techniques shall be used to prevent bark stripping on adjacent stems or branches.

D. Trees bruised or scarred during construction shall have the injured cambium layer traced back to living tissue and removed. Wounds should be tapered longitudinally to promote sap flow and healing to entire perimeter of wound.

E. Smooth and shape all wounds so as not to retain water.

### 3.3.3 Tree Replacement

A. Replace any existing trees scheduled to remain which are extensively damaged such as to change the natural habit or shape of the plant; or which die as a result of construction damage.

1. Replace in size and kind any trees 6" and less in diameter measured 6" above the base.

2. Replace trees larger than 6" in diameter with trees of the same kind having a minimum diameter of 6" measured 6" above the base.

### 3.4 GRUBBING

Material to be grubbed, together with logs and other organic debris, shall be removed to a depth of not less than 18 inches below the original surface level of the ground in areas indicated to be grubbed and in areas indicated as construction areas under this contract. Depressions made by grubbing shall be filled with suitable material and compacted to make the surface conform with the original adjacent surface of the ground.

### 3.5 TRENCHING

A. Trenching within the drip lines of trees to remain should be avoided whenever possible. If required to properly execute construction, no trenching operations shall exceed the following minimum distances as measured from the base of the plant:

Less than 6" trunk diameter	- 8' min.
6"-12" trunk diameter	- 12' min.
Greater than 12" trunk diameter	- 16' min.

B. Trenching closer to trees than indicated herein shall be approved by the COR prior to trenching. Any trenching required within the drip line of trees, required to execute the work will necessitate tunneling under the larger roots and shall be approved by the COR prior to construction.

### 3.6 WETTING OF SITE

Use water sprinkling and/or other suitable means to limit dust and dirt rising and scattering in air to lowest practical level. Do not use water when it may create a hazardous or objectionable condition such as ice, flooding or pollution.

### 3.7 DISPOSAL OF MATERIALS

Logs, stumps, roots, brush, rotten wood, and other refuse from the clearing and grubbing operations shall be promptly disposed of outside the limits of Government-controlled land at the Contractor's responsibility, except when otherwise directed in writing. Burning or burial of material on site is strictly prohibited. Such directive will state the conditions covering the disposal of such products and will also state the areas in which they may be placed. The Contractor shall be responsible for compliance with all Federal, State, and Local laws and regulations related to proper disposal of materials.

### 3.8 WARNING SIGNS

WRE-22 signs shall have a legend size (A) of 1.5 inch and be per specification code HDO-5 (1-4" x 4" wood post). UNS-07 signs shall have a legend size (A) of 3" and be per specification code HDO-3, except that signs shall be post-mounted to lamprey trap handrailing. PS-034 sign shall be post mounted to swing gate. HDO plywood signs shall be in accordance with Appendix B of EP 310-1-6A/B. Sign posts shall be in accordance with B.4-5 of EP 310-1-6A/B. Signs mounted to lamprey trap railing or swing gate at entrance of the access road shall be in accordance with Detail 13, page B7.4 of EP 310-1-6A/B.

Recommended Sign manufacturer:  
 UNICOR  
 3901 Klein Blvd  
 Lompoc, California 93436  
 Phone: 805.735.6211  
 Fax: 805.735.4507  
 Attn: James Halbeisen, Factory Manager

The Contractor shall contact the manufacturer no later than 10 business days of notice to proceed to ensure proper fabrication time. The Contractor is required to obtain Government review and approval prior to using the required signs on site.

### 3.9 Field Treatment of Galvanized Surfaces

Repair and recoat zinc coating which has been field or shop cut, burned by welding, abraded, or otherwise damaged to such an extent as to expose the base metal. Thoroughly clean the damaged area by wire brushing and remove traces of welding flux and loose or cracked zinc coating prior to painting. Paint cleaned area with two coats of zinc oxide-zinc dust paint conforming to MIL-P-21035. Compound paint with a suitable vehicle in a ratio of one part zinc oxide to four parts zinc dust by weight.

-- End of Section --

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SECTION 02315N

EXCAVATION AND FILL

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

The work covered by this specification includes, but is not limited to, the following: Excavation of riverbank to allow placement of lamprey trap (required SSP is covered under Section 02411), fill around lamprey trap structure, placement of aggregate for parking area and walkway, excavation to allow removal of existing structure, backfill in location of existing structure, and finishing operations which include grading and seeding disturbed areas as shown on the plans. Water control within the worksite and cofferdam shall be in accordance with Section 02138, "CONTROL OF WATER".

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 33	(2002a) Standard Specification for Concrete Aggregates
ASTM C 136	(2001) Sieve Analysis of Fine and Coarse Aggregates
ASTM D 698	(2000a) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft)
ASTM D 1140	(2000) Amount of Material in Soils Finer Than the No. 200 (75-Micrometer) Sieve
ASTM D 1556	(2000) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	(2000) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft <sup>3</sup> )
ASTM D 2487	(2000) Classification for Soils Engineering Purposes (Unified Soil Classification System)
ASTM D 2922	(2001) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 3017	(2001) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D 4318	(2000) Liquid Limit, Plastic Limit, and Plasticity Index of Soils

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS A-A-1909 Fertilizer

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (1996) Safety and Health Requirements Manual

MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT)

MDOT-2003 (2003) Standard Specifications for Construction

1.3 DEFINITIONS

1.3.1 Hard Materials

Weathered rock, dense consolidated deposits, or conglomerate materials which are not included in the definition of "rock" but which usually require the use of heavy excavation equipment, ripper teeth, or jack hammers for removal.

1.3.2 Rock

Solid homogeneous interlocking crystalline material with firmly cemented, laminated, or foliated masses or conglomerate deposits, neither of which can be removed without systematic drilling and blasting, drilling and the use of expansion jacks or feather wedges, or the use of backhoe-mounted pneumatic hole punchers or rock breakers; also large boulders, buried masonry, or concrete other than pavement exceeding 1/2 cubic yard in volume. Removal of hard material will not be considered rock excavation because of intermittent drilling that is performed merely to increase production.

1.3.3 Cohesive Materials

Materials ASTM D 2487 classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesive only when the fines have a plasticity index greater than zero.

1.3.4 Cohesionless Materials

Materials ASTM D 2487 classified as GW, GP, SW, and SP. Materials classified as GM and SM will be identified as cohesionless only when the fines have a plasticity index of zero.

1.3.5 Seeding

Seeding in areas within the specified work limits, not covered by aggregate or riprap, shall be seeded with an upland permanent mix, as specified herein.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office

that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330, SUBMITTAL PROCEDURES:

SD-06 Test Reports

Testing; G, AOF

Copies of all laboratory and field test reports as indicated herein shall be submitted within 24 hours of the completion of the test.

SD-07 Certificates

Supporting system work plan; G, AOF

Submit design for any temporary earth-supporting system used in earth excavation work. Submit 15 days prior to starting work.

1.5 DELIVERY, STORAGE, AND HANDLING

Perform in a manner to prevent contamination or segregation of materials.

1.6 CRITERIA FOR BIDDING

Base bids on the following criteria:

- a. Surface elevations are as indicated.
- b. Pipes or other artificial obstructions, except those indicated, will not be encountered.
- c. Ground water elevations indicated by the boring log were those existing at the time subsurface investigations were made and do not necessarily represent ground water elevation at the time of construction.
- d. Material character is indicated by the boring logs.
- e. Blasting will not be permitted. Remove material in an approved manner.

1.7 REQUIREMENTS FOR OFF SITE SOIL

Soils brought in from off site for use as backfill shall meet the classifications as stated in Section 902 of MDOT-2003.

1.8 QUALITY ASSURANCE

1.8.1 Required Drawings

Submit supporting system work plan and calculations for earth support structures (bracing and shoring) signed and sealed by a registered professional engineer. Drawings shall include material sizes and types, arrangement of members, and the sequence and method of installation and removal.

1.8.2 Seeding Final Acceptance

Final inspection and acceptance will be at the end of the seeding

establishment period. Acceptance will be based upon a satisfactory stand of the specified species having 95 percent ground cover throughout the seeded area. Areas which do not meet the contract requirements shall be reseeded. Repair rejected areas within acceptable planting dates.

## 1.9 JOB CONDITIONS

### 1.9.1 Seeding

Prior to beginning work, the Contractor shall examine and verify the acceptability of the job site and notify the Contracting Officer's Representative (COR) of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected or resolved.

## PART 2 PRODUCTS

### 2.1 SOIL MATERIALS

Free of debris, roots, wood, scrap material, vegetation, refuse, soft unsound particles, and frozen, deleterious, or objectionable materials. Unless specified otherwise, the maximum particle diameter shall be one-half the lift thickness at the intended location.

#### 2.1.1 Common Fill

Approved, unclassified soil material with the characteristics required to compact to the soil density specified for the intended location.

#### 2.1.2 Backfill and Fill Material

ASTM D 2487, classification GW, GP, GM, GC, SW, SP, SM, SC with a maximum ASTM D 4318 liquid limit of 35, maximum ASTM D 4318 plasticity index of 12, and a maximum of 25 percent by weight passing ASTM D 1140, No. 200 sieve. Backfill behind the lamprey trap shall be in accordance with Section 206 of MDOT-2003.

### 2.2 ACCESS ROAD AND WALKWAY MATERIAL

Aggregate material shall be used as the primary material over a graded subgrade for the construction of the parking area. Aggregate shall also be used in the required walkway areas as indicated on the drawings. Aggregate shall be type 23A in accordance with Section 306 of MDOT-2003.

### 2.3 SEED

Seed shall be an environmental seed mix for upland areas in accordance with Section 816 of MDOT-2003.

2.3.1 Mulches

A. Straw

1. Provide stalks from oats, rye, barley or rice that are free of weeds, mold or other objectionable material.
2. Straw shall be in an air dry condition and suitable for placing with commercial mulch blowing equipment.

B. Cellulose Fiber

1. Provide cellulose fiber for use with hydraulic application of grass seed consisting of specially prepared wood cellulose fiber, processed to contain no growth or germination-inhibiting factors, and dyed an appropriate color to facilitate visual metering of the application of materials. On an air-dry weight basis, provide wood cellulose fiber containing not more than 12 percent moisture, plus or minus three percent at the time of manufacture, with a pH range from 3.5 to 5.0. Provide wood cellulose fiber manufactured so that:
  - a. After addition and agitation in slurry tanks with grass seeds, water and other approved additives, the fibers in the material will become uniformly suspended to form a homogeneous slurry.
  - b. When hydraulically sprayed on the ground, the material will form a blotterlike cover impregnated uniformly with grass seed.
  - c. The cover will allow the absorption of moisture and allow rainfall or applied water to percolate to the underlying soil.

2.3.2 Tackifier

Binding agent used to hold mulch material in place shall be clear non-staining latex based tackifier or a water-soluble polymer such as Curasol, Terra Tack, Fibrex Spray Sod, or approved equal.

2.3.3 Water

- A. Furnish all necessary hose, equipment, attachment and accessories for the adequate irrigation of plant materials.
- B. The Contractor, at his own expense, shall make whatever arrangements are necessary to meet the needs of this contract.

2.3.4 Fertilizer

Provide FS A-A-1909, Type I, Class 2, 10-10-10 analysis fertilizer.

## PART 3 EXECUTION

### 3.1 SURFACE PREPARATION

#### 3.1.1 Clearing and Grubbing

Unless indicated otherwise, remove trees, stumps, logs, shrubs, and brush within the areas of excavation. Remove stumps entirely. Grub out matted roots and roots over 2 inches in diameter to at least 18 inches below existing surface.

#### 3.1.2 Stripping

Strip existing topsoil to a depth of 6 (six) inches without contamination by subsoil material. Stockpile topsoil separately from other excavated material and locate convenient to finish grading area.

#### 3.1.3 Unsuitable Material

Remove vegetation, debris, decayed vegetable matter, sod, mulch, and rubbish underneath areas requiring concrete placement. See geotechnical borings in Section 01999 for further soils information.

### 3.2 PROTECTION

#### 3.2.1 Protection Systems

Provide shoring, bracing, and sheeting in accordance with EM 385-1-1, except that banks may be sloped only when approved by the COR.

#### 3.2.2 Underground Utilities

The Contractor shall contact MISS DIG to verify and mark the location and elevation of the existing utilities indicated a minimum of 10 days following notice to proceed. The Contractor shall also contact known utility companies to verify location of buried utilities in accordance with Section 02230a, "SITE WORK".

#### 3.2.3 Machinery and Equipment

Movement of construction machinery and equipment over pipes or utilities during construction shall be at the Contractor's risk. Repair, or remove and provide new pipe for existing or newly installed pipe that has been displaced or damaged. Notification of both the utility company and the COR shall immediately follow any disturbance of the buried utilities.

### 3.3 EXCAVATION

Excavate to contours, elevation, and dimensions indicated. Reuse excavated materials that meet the specified requirements for the material type required at the intended location. Keep excavations free from water. Excavate soil disturbed or weakened by Contractor's operations, and soils softened or made unsuitable for subsequent construction due to exposure to weather. Replace with backfill and fill material and compact to 95 percent of ASTM D 698 maximum density. Excavation shall also be in conformance with Section 205 of MDOT-2003.

### 3.3.1 Hard Material and Rock Excavation

Remove hard material and rock, if encountered, to elevations indicated in a manner that will leave foundation material in an unshattered and solid condition. Roughen level surfaces and cut sloped surfaces into benches for bond with concrete. Protect shale from conditions causing decomposition along joints or cleavage planes and other types of erosion. Removal of hard material and rock beyond lines and grades indicated unless previously authorized by the COR will not be grounds for a claim for additional payment.

### 3.4 FILLING AND BACKFILLING

Fill and backfill to contours, elevations, and dimensions indicated. Compact each lift before placing overlaying lift. Excavated materials comprising of peat, marl or organic soil shall be disposed of and not reused as fill.

#### 3.4.1 Common Fill Placement

Place in 12 inch lifts. Compact each lift to 90% compaction based on ASTM proctor value. Aerate material excessively moistened by rain to a satisfactory moisture content. Finish to a smooth surface by blading, rolling with a smooth roller, or both.

#### 3.4.2 Select Material Placement

Place in 6 inch lifts. Backfill adjacent to structures shall be placed as structural elements are completed and accepted. Backfill against concrete only when approved. Place and compact material to avoid loading upon or against structure.

### 3.5 AGGREGATE SURFACES

The required aggregate surfaces shall be as specified herein and as indicated on the drawings.

#### 3.5.1 Aggregate Access Drive

The aggregate access drive shall be placed to a 6 inch minimum thickness and within the approximate limits shown on the drawings. Subgrade preparation shall be in accordance as specified herein and Section 205 of MDOT-2003. Aggregate material shall be coarse aggregate, Grade 23A, in accordance with Section 302 and 904 of MDOT-2003.

#### 3.5.2 Aggregate Walk

The aggregate walk shall be placed to a 4 inch minimum thickness and within the approximate limits shown on the drawings. Subgrade preparation shall be in accordance as specified herein and Section 205 of MDOT-2003. Aggregate material shall be coarse aggregate, Grade 23A, in accordance with Section 302 and 904 of MDOT-2003.

### 3.6 FINISH OPERATIONS

#### 3.6.1 Grading

Finish grades as indicated within one-tenth of one foot. Grade areas to drain water away from structures. For existing grades that will remain but which were disturbed by Contractor's operations, grade as directed.

#### 3.6.2 Seed

Scarify finished subgrade. Seed shall match existing vegetation. Seeding shall be in accordance with Section 816 of MDOT-2003, Type ES (environmental seeding for upland areas). Provide seed at 2.5 pounds per 1000 square feet. Provide FS A-A-1909, Type I, Class 2, 10-10-10 analysis fertilizer at 430 pounds per acre. Provide mulch and water to establish a minimum of 70% coverage.

##### A. Seed Installation

1. Do not sow seed during adverse weather or when wind speeds exceed five miles per hour.
2. Do not sow seed in areas where standing water is persistent. Remove excess water by pumping to adjacent upland areas using methods approved by the COR. Recommended seeding dates are during Spring: April 15 to May 30 and Fall: August 15 to September 30.

##### B. Grade Preparation

1. Immediately before seeding, cultivate topsoil with disc or harrow as necessary to bring it to the proper condition.
2. If the prepared grade is eroded or compacted by rainfall prior to seeding, rework the surface as specified.

##### C. Seeding using Broadcast Method

1. Sow seeds evenly with broadcast spreader at a rate of 150 pounds (PLS) per acre. All areas shall be seeded in at least two directions.
2. After seeding, rake or drag the surface of soil lightly to incorporate seed into the top 1/4 inch of soil.
3. Maintain soil in moist condition until seeds have sprouted and reached a height of 1 inch. Water thereafter at least once every 14 days unless natural rainfall has provided equivalent watering.
4. Spread mulch evenly at the rate of two tons per acre. Place all mulch on given areas within 48 hours after seeding. A mechanical blower may be used to apply mulch material provided the machine has been specifically designed and approved for this purpose. Anchor the mulch by either using a light serrated disc, or a sprayed tackifier. If a tackifier is used, it may be applied either simultaneously or in a separate application. Take precautionary measures to prevent tackifier materials from marking or defacing structures, pavements, utilities or plantings. Apply tackifier at manufacturer's recommended rates.

D. Seeding using Drill Method

1. Perform drill seeding using approved equipment such as a cultipacker seeder and grass seed drill. Each seed pass shall be made perpendicular to previous seed passes. Sow seeds evenly at a rate of 70 pounds (PLS) per acre.
2. Seed shall not be covered by more than 1/4 inch of soil. The seeding device shall lightly roll the seed bed to provide good moisture contact between the seed and soil.
3. Maintain soil in a moist condition until seeds have sprouted and reached a height of 1 inch. Water thereafter at least once every 14 days at the direction of the COR unless natural rainfall has provided equivalent watering.
4. Spread mulch evenly at a rate of two tons per acre as described under Part 3.5.2.C.4 above.

E. Maintenance and Acceptance

Maintain all seeded areas until the specified cover is established or until the substantial completion inspection of the entire project, whichever is greater. Maintenance to include water and reseedling.

1. Acceptance of the seeding shall occur when a dense cover has become established over all areas and after an even stand of grass is established at least 2 inches high. A minimal number of 20 grass plants per square foot of seeded areas is required for final acceptance. Bare spots and washouts will automatically call for rejection of the seeded areas. The total bare spots shall be a maximum 2 percent of the total seeded areas.
2. Within 45 days after completion of seeding, reseed bare spots greater than five square feet in size, or as directed by the COR.
3. Keep all seeded areas clean and protected from damage until accepted. Debris which accumulates shall be removed from the site. Promptly repair damaged areas except those damaged by major storms.
4. Irrigate as directed by the COR to supplement natural rainfall so that all seeded wetland areas receive sufficient water for normal plant growth. Furnish all irrigation equipment needed for watering and be responsible for securing adequate supply of water. Failure to provide supplemental watering will result in an extension of the acceptance period until all seed has successfully germinated.

3.6.3 Protection of Surfaces

Protect newly graded areas from traffic, erosion, and settlements that may occur. Repair or reestablish damaged grades, elevations, or slopes.

3.7 DISPOSITION OF SURPLUS MATERIAL

All waste, excess and unsatisfactory materials resulting from work required

under this Section shall be removed from the site unless otherwise specified and upon removal shall become the property of the Contractor. Disposal of material shall be in strict conformance with Section 205.03 of MDOT-2003 and shall conform to the requirements of Section 01130, "ENVIRONMENTAL PROTECTION", including any applicable federal, state and local requirements. Disposal of refuse and debris and any accidental loss or damage attendant thereto shall be the Contractor's responsibility.

### 3.8 FIELD QUALITY CONTROL

#### 3.8.1 Sampling

Take the number and size of samples required to perform the following tests.

#### 3.8.2 Testing

Perform one of each of the following tests for each material used. Perform 2 to 4 density tests per each lift of fill. Provide additional tests for each source change.

##### 3.8.2.1 Fill and Backfill Material Testing

Test fill and backfill material in accordance with ASTM C 136 for conformance to ASTM D 2487 gradation limits; ASTM D 1140 for material finer than the No. 200 sieve; ASTM D 4318 for liquid limit and for plastic limit; ASTM D 698 or ASTM D 1557 for moisture density relations, as applicable.

##### 3.8.2.2 Select Material Testing

Test select material in accordance with ASTM C 136 for conformance to ASTM D 2487 gradation limits; ASTM D 1140 for material finer than the No. 200 sieve; ASTM D 698 or ASTM D 1557 for moisture density relations, as applicable.

##### 3.8.2.3 Porous Fill Testing

Test porous fill in accordance with ASTM C 136 for conformance to gradation specified in ASTM C 33.

##### 3.8.2.4 Density Tests

Test density in accordance with ASTM D 1556, or ASTM D 2922 and ASTM D 3017.

When ASTM D 2922 and ASTM D 3017 density tests are used, verify density test results by performing an ASTM D 1556 density test at a location already ASTM D 2922 and ASTM D 3017 tested as specified herein. Perform an ASTM D 1556 density test at the start of the job, and for every 10 ASTM D 2922 and ASTM D 3017 density tests thereafter. Test each lift at randomly selected locations every 500 square feet of existing grade in fills for structures and concrete slabs, and every 500 square feet for other fill areas and every 500 square feet of subgrade in cut.

3.9 WETTING OF SITE

Use water sprinkling and/or other suitable means to limit dust and dirt rising and scattering in air to lowest practical level. Do not use water when it may create a hazardous or objectionable condition such as ice, flooding and pollution.

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SECTION 02373

GEOTEXTILE

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

Geotextile shall be placed underneath riprap within the limits indicated on the construction drawings.

1.2 REFERENCES

The publications listed below form a part of the specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 4354	(1999) Sampling of Geosynthetics for Testing
ASTM D 4355	(1999) Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
ASTM D 4491	(1999a) Water Permeability of Geotextiles by Permittivity
ASTM D 4533	(1991; R 1996) Trapezoid Tearing Strength of Geotextiles
ASTM D 4632	(1991; R 1997) Grab Breaking Load and Elongation of Geotextiles
ASTM D 4751	(1999a) Determining Apparent Opening Size of a Geotextile
ASTM D 4759	(1988; R 1996) Determining the Specification Conformance of Geosynthetics
ASTM D 4833	(2000) Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
ASTM D 4873	(2001) Identification, Storage, and Handling of Geosynthetic Rolls and Samples

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

## SD-03 Product Data

Thread; G, AOF

A minimum of 7 days prior to scheduled use, proposed thread type for sewn seams along with data sheets showing the physical properties of the thread.

Manufacturing Quality Control Sampling and Testing; G, AOF

A minimum of 7 days prior to scheduled use, manufacturer's quality control manual.

## SD-04 Samples

Geotextile; G, AOF

If requested, submit geotextile samples for testing to determine compliance with the requirements in this specification. When required, submit samples a minimum of 60 days prior to the beginning of installation of the same textile. Upon delivery of the geotextile, submit duplicate copies of the written certificate of compliance signed by a legally authorized official of the manufacturer. The certificate shall state that the geotextile shipped to the site meets the chemical requirements and exceeds the minimum average roll value listed in TABLE 1, MINIMUM PHYSICAL REQUIREMENTS FOR DRAINAGE GEOTEXTILE. Upon request, supply quality control and quality assurance tests for the geotextile. All samples provided shall be from the same production lot as will be supplied for the contract, and shall be the full manufactured width of the geotextile by at least 3 m 10 feet long, except that samples for seam strength may be a full width sample folded over and the edges stitched for a length of at least 1.5 m 5 feet. Samples submitted for testing shall be identified by manufacturer's lot designation. For needle punched geotextile, the manufacturer shall certify that the geotextile has been inspected using permanent on-line metal detectors and does not contain any needles.

## SD-07 Certificates

Geotextile; G, AOF

A minimum of 7 days prior to scheduled use, manufacturer's certificate of compliance stating that the geotextile meets the requirements of this section. For needle punched geotextiles, the manufacturer shall also certify that the geotextile has been continuously inspected using permanent on-line full-width metal detectors and does not contain any needles which could damage other geosynthetic layers. The certificate of compliance shall be attested to by a person having legal authority to bind the geotextile manufacturer.

1.4 DELIVERY, STORAGE AND HANDLING

Delivery, storage, and handling of geotextile shall be in accordance with ASTM D 4873.

1.4.1 Delivery

The Contracting Officer shall be notified a minimum of 24 hours prior to delivery and unloading of geotextile rolls. Rolls shall be packaged in an opaque, waterproof, protective plastic wrapping. The plastic wrapping shall not be removed until deployment. If quality assurance samples are collected, rolls shall be immediately rewrapped with the plastic wrapping. Geotextile or plastic wrapping damaged during storage or handling shall be repaired or replaced, as directed. Each roll shall be labeled with the manufacturer's name, geotextile type, roll number, roll dimensions (length, width, gross weight), and date manufactured.

1.4.2 Storage

Rolls of geotextile shall be protected from construction equipment, chemicals, sparks and flames, temperatures in excess of 71 degrees C 160 degrees F, or any other environmental condition that may damage the physical properties of the geotextile. To protect geotextile from becoming saturated, rolls shall either be elevated off the ground or placed on a sacrificial sheet of plastic in an area where water will not accumulate.

1.4.3 Handling

Geotextile rolls shall be handled and unloaded with load carrying straps, a fork lift with a stinger bar, or an axial bar assembly. Rolls shall not be dragged along the ground, lifted by one end, or dropped to the ground.

PART 2 PRODUCTS

2.1 RAW MATERIALS

2.1.1 Geotextile

Geotextile shall be a needle-punched, nonwoven pervious sheet of polymeric material and shall consist of long-chain synthetic polymers composed of at least 95 percent by weight polyolefins, polyesters, or polyamides. The use of woven slit film geotextiles (i.e. geotextiles made from yarns of a flat, tape-like character) will not be allowed. Stabilizers and/or inhibitors shall be added to the base polymer, as needed, to make the filaments resistant to deterioration by ultraviolet light, oxidation, and heat exposure. Regrind material, which consists of edge trimmings and other scraps that have never reached the consumer, may be used to produce the geotextile. Post-consumer recycled material may also be used. Geotextile shall be formed into a network such that the filaments or yarns retain dimensional stability relative to each other, including the edges. Geotextiles shall meet the requirements specified in Table 1. Where applicable, Table 1 property values represent minimum average roll values (MARV) in the weakest principal direction. Values for AOS represent maximum average roll values.

TABLE 1  
MINIMUM PHYSICAL REQUIREMENTS FOR DRAINAGE GEOTEXTILE

TABLE 1  
MINIMUM PHYSICAL REQUIREMENTS FOR DRAINAGE GEOTEXTILE

PROPERTY	UNITS	ACCEPTABLE VALUES	TEST METHOD
GRAB STRENGTH	N	[700][_____]	ASTM D 4632
SEAM STRENGTH	N	[_____]	ASTM D 4632
PUNCTURE	N	[250][_____]	ASTM D 4833
TRAPEZOID TEAR	N	[250][_____]	ASTM D 4533
APPARENT OPENING SIZE	U.S. SIEVE	[_____]	ASTM D 4751
PERMITTIVITY	SEC -1	[_____]	ASTM D 4491
ULTRAVIOLET DEGRADATION	PERCENT	50 AT 500 HRS	ASTM D 4355

TABLE 1  
MINIMUM PHYSICAL REQUIREMENTS FOR DRAINAGE GEOTEXTILE

PROPERTY	UNITS	ACCEPTABLE VALUES	TEST METHOD
GRAB STRENGTH	LBS	200	ASTM D 4632
SEAM STRENGTH	LBS	180	ASTM D 4632
PUNCTURE	LBS	120	ASTM D 4833
TRAPEZOID TEAR	LBS	50	ASTM D 4533
APPARENT OPENING SIZE	U.S. SIEVE	40	ASTM D 4751
PERMITTIVITY	SEC -1	.05	ASTM D 4491
ULTRAVIOLET DEGRADATION	PERCENT	70 AT 500 HRS	ASTM D 4355

2.1.2 Thread

Sewn seams shall be constructed with high-strength polyester, nylon, or other approved thread type. Thread shall have ultraviolet light stability equivalent to the geotextile and the color shall contrast with the geotextile.

2.2 MANUFACTURING QUALITY CONTROL SAMPLING AND TESTING

The Manufacturer shall be responsible for establishing and maintaining a quality control program to assure compliance with the requirements of the specification. Documentation describing the quality control program shall be made available upon request. Manufacturing quality control sampling and testing shall be performed in accordance with the manufacturer's approved quality control manual. As a minimum, geotextiles shall be randomly

sampled for testing in accordance with ASTM D 4354, Procedure A. Acceptance of geotextile shall be in accordance with ASTM D 4759. Tests not meeting the specified requirements shall result in the rejection of applicable rolls.

### PART 3 EXECUTION

#### 3.1 INSTALLATION

##### 3.1.1 Subgrade Preparation

The surface underlying the geotextile shall be smooth and free of ruts or protrusions which could damage the geotextile.

##### 3.1.2 Placement

The Contractor shall notify the Contracting Officer a minimum of 24 hours prior to installation of geotextile. Geotextile rolls which are damaged or contain imperfections shall be repaired or replaced as directed. The geotextile shall be laid flat and smooth so that it is in direct contact with the subgrade. The geotextile shall also be free of tensile stresses, folds, and wrinkles. On slopes steeper than 10 horizontal on 1 vertical, the geotextile shall be laid with the machine direction of the fabric parallel to the slope direction. The geotextile shall be laid with enough slack to allow slight deflection as the riprap is placed. The Contractor shall ensure that riprap at the base of the slope is seated in position prior to placing additional riprap further upslope.

#### 3.2 SEAMS

##### 3.2.1 Overlap Seams

Geotextile panels shall be continuously overlapped a minimum of [300] [\_\_\_\_\_] mm 12 inches at all longitudinal and transverse joints. Where seams must be oriented across the slope, the upper panel shall be lapped over the lower panel. If approved, sewn seams may be used instead of overlapped seams.

##### 3.2.2 Sewn Seams

Factory and field seams shall be continuously sewn on all slopes steeper than 1 vertical on 4 horizontal. The stitch type used shall be a 401 locking chain stitch or as recommended by the manufacturer. For field and factory seams which are sewn, the Contractor shall provide at least a 6 feet sample of sewn seam before the geotextile is installed. For seams that are field sewn, the seams shall be sewn using the same equipment and procedures as will be used for the production seams. If seams are sewn in both the machine and cross machine direction, samples of seams from both directions shall be provided. Seam strength shall meet the minimum requirements specified in Table 1. The thread at the end of each seam run shall be tied off to prevent unraveling. Skipped stitches or discontinuities shall be sewn with an extra line of stitching with a minimum of 450 mm 18 inches of overlap.

#### 3.3 PROTECTION

The geotextile shall be protected during installation from clogging, tears, and other damage. Damaged geotextile shall be repaired or replaced as directed. Adequate ballast (e.g. sand bags) shall be used to prevent

uplift by wind. The geotextile shall not be left uncovered for more than 14 days after installation.

#### 3.4 REPAIRS

Torn or damaged geotextile shall be repaired. Clogged areas of geotextile shall be removed. Repairs shall be performed by placing a patch of the same type of geotextile over the damaged area. The patch shall extend a minimum of 300 mm 12 inches beyond the edge of the damaged area. Patches shall be continuously fastened using approved methods. The machine direction of the patch shall be aligned with the machine direction of the geotextile being repaired. Geotextile rolls which cannot be repaired shall be removed and replaced. Repairs shall be performed at no additional cost to the Government.

#### 3.5 PENETRATIONS

Engineered penetrations of the geotextile shall be constructed by methods recommended by the geotextile manufacturer.

#### 3.6 COVERING

Geotextile shall not be covered prior to inspection and approval by the Contracting Officer's Representative (COR). Cover soil and riprap shall be placed in a manner that prevents soil from entering the geotextile overlap zone, prevents tensile stress from being mobilized in the geotextile, and prevents wrinkles from folding over onto themselves. On side slopes, riprap shall be placed from the bottom of the slope upward. Riprap shall not be dropped onto the geotextile from a height greater than 1 m 3 feet. No equipment shall be operated directly on top of the geotextile without approval of the COR. Equipment with ground pressures less than 50 kPa 7 psi shall be used to place the first lift over the geotextile. A minimum of [300][\_\_\_\_\_] mm 12 inches of soil shall be maintained between full-scale construction equipment and the geotextile. Cover soil material type, compaction, and testing requirements are described in Section 02315N, "EXCAVATION AND FILL". Equipment placing cover soil shall not stop abruptly, make sharp turns, spin their wheels, or travel at speeds exceeding [2.2] [\_\_\_\_\_] m/s 5 mph.

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SECTION 02411

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SECTION 02411

STEEL SHEET PILING

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

The work required under this section includes furnishing all materials and equipment and performing operations such as, but not limited to, placement of a steel sheet pile (SSP) barrier, placement of SSP backwalls and tiebacks, and placement of stay-in-place cofferdam SSP for dewatering during construction and to act as scour protection and foundation support of the lamprey trap. All work and materials shall be in accordance with the requirements specified herein and shown on the contract drawings. Miscellaneous metal items are excluded from this section and are included in Section 05500 "MISCELLANEOUS METAL".

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

AISC S 335 (1989) Structural Steel Buildings  
Allowable Stress Design and Plastic Design  
with Commentary

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 27 (2003) Standard Specification for Steel  
Castings, Carbon, for General Application

ASTM A 328 (2000) Standard Specifications for Steel  
Sheet Piling

ASTM A 370 (2002e1) Standard Specification for  
Mechanical Testing of Steel Products

ASTM A 572 (2001) Standard Specification for  
High-Strength Low-Alloy Columbium-Vanadium  
Structural Steel

MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT)

MDOT-2003 (2003) Standard Specifications for  
Construction

1.3 SUBMITTALS

Government approval is required for all submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office

that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330, SUBMITTAL PROCEDURES:

#### SD-01 Data

Selected Hot-Rolled or Cold-Formed Steel Sheet Piling; G, ECD

Submit for approval manufacturer's specifications which demonstrate that the selected hot-rolled section or cold-formed SSP section will meet the requirements specified herein and shown on the drawings. The Contractor shall submit information for approval prior to ordering materials. The steel used in the manufacturing of cold-formed steel sections shall comply with the physical and chemical properties as specified in ASTM A 328 or ASTM A 572. The Contractor shall also submit for approval detailed design analysis, calculations, shop drawings, and layouts for the selected hot-rolled or cold-formed sections, all necessary miscellaneous steel, and special fabricated piling required at transitions and closures.

Work Plan; G, ECD

Submit the means and methods to be used for required stay-in-place cofferdam and barrier SSP construction at least 10 days following notice to proceed. Include measures to be taken to protect partially completed work in the event of cessation of work.

#### SD-02 Shop Drawings

Stay-in-Place Cofferdam; G, ECD

Lamprey trap construction requires the use of a cofferdam as indicated on the drawings. The cofferdam shall be designed to withstand various river levels (see Section 02315N). It shall be assumed the water level may be higher than indicated on the drawings at the time of cofferdam installation. The Contractor is required to verify water levels in accordance with Section 02230a "SITE WORK". The design of the cofferdam SSP shall take into account the location of the waler and any other supports, so that the SSP is continued to be supported following cutoff to the elevation as indicated on the drawings. The Contractor shall provide required SSP embedment, as well as the required SSP section modulus. Once use of cofferdam is no longer required for construction, the cofferdam shall be cut off to the elevation shown in the construction drawings. The proposed scheme on detailed shop drawings accompanied by design calculations sealed by a professional engineer registered in the state of Michigan shall be submitted for review 10 days following notice to proceed and shall be approved prior to start of construction. The review and acceptance of the sheet pile design provided by the Contractor shall only be considered as an agreement that such work may be initiated. The Contractor shall be solely responsible for the adequacy of the design and for installation and maintenance of the cofferdam SSP. Drawings for the cofferdam include dimensions of the steel sheet piling and the proposed method of cofferdam construction. Cofferdam construction shall not start before submitted drawings are approved. The approval of shop drawings will relate only to the requirements for strength and detail of cofferdam construction. Such approval will not relieve the

Contractor from responsibility for errors. Cofferdam design shall be in accordance, at a minimum, with Section 704 of MDOT-2003.

#### SD-04 Drawings

Barrier Steel Sheet Piling; G, AOF

Detail drawings for sheet piling including fabricated sections shall show complete piling dimensions and details, placement starting point, sequence and location of installed piling and diametric pan layout. Detail drawings shall include details and dimensions of templates and other temporary guide structures for installing piling. Detail drawings shall also provide details of the method of handling piling to prevent permanent deflection, distortion or damage to piling interlocks. Drawings shall be submitted for approval at least 10 days following notice to proceed and prior to any construction.

#### SD-07 Schedules

Pile Placement Equipment; G, AOF

Complete descriptions of sheet piling placement equipment including hammers, extractors, protection caps and other installation appurtenances shall be submitted for approval at least 10 days following notice to proceed and prior to any construction.

#### SD-08 Statements

Pulling and Reinstalling; G, AOF

The proposed method of pulling sheet piling shall be submitted and approved prior to pulling any piling.

#### SD-09 Reports

Material Test Reports

Certified materials test reports showing that sheet piling and appurtenant metal materials meet the specified requirements shall be submitted for each shipment and identified with specific lots prior to installing materials.

#### SD-18 Records

Driving

Records of the sheet piling driving operations shall be submitted after driving is completed. These records shall provide a system of identification which shows the disposition of approved piling in the work, driving equipment performance data, piling penetration rate data, piling dimensions and top and bottom elevations of installed piling. The Contractor shall record whether pilings are driven singly or in groups of two or more sheets. The record shall include the blow count per foot of penetration when an impact hammer is used, except for the last foot for which the blow count per inch shall be recorded. The rate of penetration per minute shall be recorded when a vibratory

hammer is used. The driving records shall be furnished each day with the records of inspection. The format for placement records shall be as directed by the Contracting Officer's Representative (COR). Any unusual conditions encountered during pile installation shall be recorded and immediately reported to the COR.

1.4 DELIVERY, STORAGE AND HANDLING

Materials delivered to the site shall be new and undamaged and shall be accompanied by certified material test reports. The manufacturer's logo and mill identification mark shall be provided on the sheet piling as required by the referenced specifications. Sheet piling shall be stored and handled in the manner recommended by the manufacturer to prevent permanent deflection, distortion or damage to the interlocks. Storage of sheet piling shall also facilitate required inspection activities. Piling of different kinds shall not be intermixed in the stockpiles.

1.4.1 Marking

Each sheet pile shall have its ASTM Specification No., steel grade and manufacturer's section identification number painted on or near each end. The identification number shall match that of the Selected Hot-Rolled or Cold-Formed Steel Sheet Piling section in the approved submittal.

PART 2 PRODUCTS

2.1 STEEL SHEET PILING

All steel sheet piling shall be formed from one homogeneous steel sheet of the required thickness. Sheet piling alignment shall be as shown on the plan sheets. The interlocks of sheet piling shall be free-sliding, provide a swing angle suitable for the intended installation but not less than 5 degrees when interlocked, and maintain continuous interlocking when installed. Sheet piling, including special fabricated sections, shall be full-length sections of the dimensions shown on the drawings. Fabricated sections shall conform to the requirements herein and the piling manufacturer's recommendations for fabricated sections. Metalwork fabrication for sheet piling shall be as specified herein and Section 05500 "MISCELLANEOUS METAL". Sheet piling shall be of the type specified and shown and shall have a web thickness not less than that specified herein. Sheet piling sections, including fabricated sections, shall be full length without splices and shall be furnished 1 foot longer than the length indicated on the drawings for cut-off purposes due to damage during placement. Each sheet shall be provided with a standard pulling hole located approximately 6 inches from the top of each sheet pile, unless otherwise shown or directed. The cutoff elevation tolerance for the top of SSP is 0.25 inch.

2.1.1 Hot-Rolled or Cold-Formed Steel Sheet Piling

The hot-rolled or cold-formed steel sheet piling shall meet or exceed the properties listed in the following table, fulfill the requirements of the Paragraph titled Barrier Steel Sheet Piling, and be as approved by the COR.

PROPERTIES OF HOT-ROLLED OR COLD-FORMED SSP

Location in the	Maximum Bending Moment in	Nominal Section Modulus In3 Per Lin. Ft. of Wall
-----------------	---------------------------	--

Project	Kip-Ft	@ 50 ksi Y.S. (ASTM A 572)
Barrier	0.163	0.08

NOTE: The nominal section modulus equals  $M/F_a$ , where  $F_a$  equals allowable bending stress. The allowable bending stress equals fifty percent (50%) of the yield strength (Y.S. or  $F_y$ ).

- a. Web and flange nominal thickness shall be not less than 0.50 inches.
- b. Tie rod spacing shall not be more than 52 feet without redesign of supporting steel. Tie rod appurtenances (tie rod nut and anchor plate) shall be supplied by the tie rod manufacturer and shall be able to accommodate a 14.17 kip/rod anchor pull.

Any changes in pile layout as shown will not be allowed without appropriate design calculations which shall be submitted for approval. Alternate sections of piling will be allowed for use provided that all other requirements of the paragraph entitled "SUBMITTALS" are met, and that the substitution is approved by the COR. The construction of the hot-rolled or cold-formed sheet pile walls using a section other than as shown and specified shall include all related adjustments to other elements of the structure to adapt it to the Contractor's hot-rolled or cold-formed design, and shall be provided at no additional cost to the Government. All other requirements of these specifications for the steel sheet piling structure shall apply.

#### 2.1.2 Stay-in-Place Cofferdam Piling

Cofferdams shall be a partial or total enclosure which will permit construction of the lamprey trap in the dry without damage to the work. The cofferdams shall be well braced, and as nearly watertight as practicable. The interior dimensions shall be as shown on plans. Cofferdams shall be constructed to protect plastic concrete against damage from a sudden rising of the river and to prevent damage to the foundation by erosion.

No timber or bracing that would extend into foundation concrete shall be left in cofferdams except with written permission. Cofferdams which become tilted or moved laterally during the process of sinking shall be righted or enlarged to provide ample clearance. Any necessary correction shall be made with no additional payment. Cofferdam placement shall be in accordance with Section 704 of MDOT-2003. The cofferdam SSP shall stay-in-place and be cutoff at the elevation indicated on the drawings.

#### 2.1.3 Pile Shoes

Piling shall be provided with piling protector shoes. Pile shoes shall be of cast steel conforming to ASTM A 27. Attachment to the piling shall be as recommended by the shoe manufacturer.

#### 2.2 APPURTENANT METAL MATERIALS

Metal plates, angles, bolts, nuts, wales and other appurtenant fabrication and installation materials for special attachments shall conform to manufacturer's standards and to the requirements specified in the

respective sheet piling standards and in Section 05500 "MISCELLANEOUS METAL".

## 2.3 TESTS, INSPECTIONS, AND VERIFICATIONS

Requirements for material tests, workmanship and other measures for quality assurance shall be as specified herein and in Section 05500 "MISCELLANEOUS METAL".

### 2.3.1 Material Tests

Sheet piling and appurtenant materials shall be tested and certified by the manufacturer to meet the specified chemical, mechanical and section property requirements prior to delivery to the site. Testing of sheet piling for mechanical properties shall be performed after the completion of all rolling and forming operations as specified in ASTM A 370.

## 2.4 FABRICATION OF SPECIAL ATTACHMENTS

### 2.4.1 General

The Contractor shall use factory-fabricated special piling or shall fabricate special attachments in accordance with the plans. All special piling shall be fabricated of ASTM A 572, Grade 50 steel sheet piling and structural sections. Additional information can be found in SECTION 05500, "MISCELLANEOUS METAL" and the paragraph entitled BOLTED CONNECTIONS.

### 2.4.2 Bolted Connections

Bolted connections shall be made with high-strength bolts in accordance with the applicable provisions of AISC S 335. Bolted connections for special attachments shall be made with high-strength bolts in accordance with the applicable provisions of AISC S 335. The bolts shall be 1 inch diameter, spaced 12 inches maximum. Slotted holes shall be provided to accommodate the bolts. The connection shall be snug-fit until placement of the special attachment and adjoining SSP is completed, at which time, the bolts shall be tightened. Additional information can be found in Section 05500, "MISCELLANEOUS METAL".

## PART 3 EXECUTION

### 3.1 INSTALLATION

Installation of SSP shall be in accordance with Section 704 of MDOT-2003 and as specified herein.

#### 3.1.1 Restrictions

No pile driving is allowed between sunset and sunrise unless notice and approval from the COR is obtained in writing 48 hours in advance.

#### 3.1.2 Pile Placement Equipment

Pile driving equipment shall be in accordance with the Contractor's submittal for equipment, as approved by the COR.

##### 3.1.2.1 Driving Hammers

Hammers shall be steam, air, diesel drop, single-acting, double-acting,

differential acting, or vibratory type. The driving energy of the hammers shall be as recommended by the manufacturer for the piling weights and subsurface materials to be encountered.

#### 3.1.2.2 Placing

Pilings shall be carefully located as shown on the drawings. Interlocks of piling shall be placed and driven with the ball end leading in the direction of the driving. Pilings shall be placed plumb with out-of-plumbness not exceeding 1/8 inch per foot of length and true to line. Temporary wales, templates, or guide structures shall be provided to insure that the pilings are placed to the correct alignment. Pilings properly placed shall be interlocked throughout their length with adjacent pilings to form a continuous diaphragm throughout the length or run of piling wall.

#### 3.1.2.3 Driving

Pilings shall be driven with the proper size hammer and by approved methods so as not to subject the pilings to damage and to ensure proper interlocking throughout their lengths. Driving piling in pairs is allowed provided damage to piling is not incurred. Driving hammers shall be maintained in proper alignment during driving operations by use of leads or guides attached to the hammer. Caution shall be taken in the sustained use of vibratory hammers when a hard driving condition is encountered to avoid interlock-melt or damage to piling. The use of vibratory hammers should be discontinued and impact hammers employed when the penetration rate due to vibratory loading is 1 foot or less per minute. The work of using an impact hammer in such circumstances shall be at no additional cost to the Government. A protecting cap shall be employed in driving when using impact hammers to prevent damage to the tops of pilings. Pilings damaged during driving or driven out of interlock shall be removed and replaced in accordance with the paragraph "Pulling and Reinstalling" at the Contractor's expense. Pilings shall be driven without the aid of an air or water jet. Adequate precautions shall be taken to insure that pilings are driven plumb. If at any time the forward or leading edge of the piling wall is found to be out-of-plumb in the plane of the wall, the piling being driven shall be driven to the required depth and tapered pilings shall be provided and driven to interlock with the out-of-plumb leading edge or other approved corrective measures shall be taken to insure the plumbness of succeeding pilings. The maximum permissible taper for any tapered piling shall be 1/8 inches per foot of length.

The horizontal alignment of the steel sheet pile wall shall be within 1 inch of required location after completion of placement and after assembly and tightening of wales. Pilings in each run or continuous length of piling wall shall be placed alternately in increments of depth to the required depth or elevation. No piling pair shall be driven to a lower elevation than those behind it in the same run except when the pilings behind it cannot be driven deeper. If the piling pair next to the one being driven tends to follow below final elevation, it may be pinned to the next adjacent piling. If obstructions restrict driving a piling pair to the specified penetration, the obstruction shall, to the extent deemed practicable, be removed or penetrated with a chisel beam at no additional cost to the Government. Should embedded stone or other obstructions render it impracticable to drive a pile to the required tip elevation, the Contractor shall thereupon notify the COR at the site and request direction. The COR will determine any changes in design or alignment of the pile structure that may be necessary to insure the adequacy and

stability of the structure. Upon notification of the COR's findings and determination, the Contractor shall proceed with the work in accordance with the COR's directive. Payment for the additional cost of any required changes will be made in accordance with applicable provisions of the CONTRACT CLAUSES. Piling driven out of interlock with adjacent piling or otherwise damaged shall be removed and replaced with new piling and the removing and retrieving shall be at the Contractor's expense. After piling are driven to the required bottom elevation, the piling shall be cut off to the required top elevation as shown on the drawings, and all sharp edges shall be ground smooth. An absolute tolerance of 0.25 inch above the indicated top elevation must be maintained.

### 3.1.3 Cutting-Off and Splicing

Pilings shall be cut off to the required top elevation when driven to the point where additional penetration cannot be attained and are extending above the required top elevation in excess of the specified tolerance. Pilings driven below the required top elevation and pilings damaged by driving and cut off to permit further driving, shall be extended as required to reach the top elevation by splicing when directed by the COR at no additional cost to the Government. If directed by the COR, pilings shall be spliced as required to drive them to depths greater than shown on the drawings and extend them up to the required top elevation. Pilings adjoining spliced pilings shall be full length unless otherwise approved. If splices are allowed in adjoining pilings, the splices must be spaced at least 2 feet apart in elevation. Splicing of pilings shall be as indicated on the drawings. Should splicing of piling be necessary, the splice shall be made by an approved butt weld, making a full penetration of the pile section, or as otherwise directed or approved by the COR. Ends of pilings to be spliced shall be squared before splicing to eliminate dips or camber.

Pilings shall be spliced together with concentric alignment of the interlocks so that there are no discontinuities, dips or camber at the abutting interlocks. Spliced pilings shall be free sliding and able to obtain the maximum swing with contiguous pilings. Piling cut-offs shall become the property of the Contractor and shall be removed from the site. The Contractor shall cut holes in pilings for bolts, as shown on the drawings or as directed. All cutting shall be done in a neat and workmanlike manner. A straight edge shall be used in cuts made by burning to avoid abrupt nicks. Bolt holes in steel piling shall be drilled or may be burned and reamed by approved methods which will not damage the surrounding metal.

### 3.1.4 Inspection of Driven Piling

The Contractor shall visually inspect the interlocked joints of driven pilings extending above the water surface. The underwater portion of each interlock, from channel bottom to water surface, shall be inspected by means of a surface controlled remote underwater television camera. Such inspection shall be viewable on a monitor on site as the inspection takes place and shall be tape recorded on standard VHS cassettes. All video shall be clearly identified by interlock location and elevations. The originals of all tapes shall be delivered to the COR at the completion of the taping. Pilings found to be out of interlock shall be removed and replaced at the Contractor's expense. It is the Contractors responsibility to ensure that the entire barrier SSP wall is sealed and all holes within the SSP wall are filled.

### 3.1.5 Pulling and Redriving

The Contractor shall pull selected pilings after driving to determine the condition of the underwater portions of pilings when directed by the COR. The method of pulling shall be in accordance with the approved work plan. Any piling so pulled and found to be damaged to the extent that its usefulness in the structure is impaired shall be removed and replaced at the Contractor's expense. Pilings pulled and found to be in satisfactory condition shall be redriven when directed by the COR.

### 3.1.6 Dewatering

Cofferdams shall be dewatered and sediment controlled based upon the work plan submitted by the Contractor. Pumping will not be permitted for 24 hours after concrete placement, unless otherwise approved by the COR. When dewatering, pumping shall be done from a sump located outside the forms.

## 3.2 CESSATION OF WORK

Whenever the work is discontinued for periods exceeding two (2) calendar days, the Contractor, before closing down operations, shall protect all the exposed partially completed work against damage. The Contractor's means and methods of providing such protection shall be as included in the approved work plan.

## 3.3 QUALITY CONTROL

### 3.3.1 Quality Control System

The Contractor shall establish and maintain a quality control system for all operations performed under this Section to assure compliance with contract requirements and maintain records of its quality control for all operations performed, including, but not limited to, the following:

- a. Quality of Materials.
- b. Testing.
- c. Placement and support of piling: locations, horizontal and vertical alignment, splicing, welding, elevations, and interlocks.
- d. Adequacy of protection against damage for partially completed work.
- e. Pulling of piling for inspection and test.
- f. Observance of safety regulations.
- g. Assurance of SSP cutoff tolerances and completely sealed surface.

-- End of Section --

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SECTION 02486

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## SECTION 02486

## STONE CONSTRUCTION

## PART 1 GENERAL

## 1.1 DESCRIPTION OF WORK

The work required under this section includes furnishing all materials and equipment and performing operations such as, but not limited to, placement of plain riprap immediately downstream of the barrier, lamprey trap, and along the riverbanks. All work and materials shall be in accordance with the requirements specified herein and shown on the contract drawings. All work shall also be in accordance with Section 01025, MEASUREMENT AND PAYMENT.

## 1.2 REFERENCES

The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by reference thereto:

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 127	(1988) Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate
ASTM C 295	(1990) Standard Practice for Petrographic Examination of Aggregates for Concrete
ASTM C 535	(1989) Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM D 653	(1990) Standard Terminology Relating to Soil, Rock, and Contained Fluids
ASTM D 2664	(1986 E-1) Standard Test method for Triaxial Compressive Strength of Undrained Rock Core Specimens Without Pore Pressure Measurements
ASTM D 2845	(1990 E-1) Method for Laboratory Determination of Pulse Velocities and Ultrasonic Elastic Constants of Rock
ASTM D 2936	(1984, Rev 1989) Test Method for Direct Tensile Strength of Intact Rock Core Specimens
ASTM D 2938	(1986 E-1) Standard Test Method for Unconfined Compressive Strength of Intact Rock Core Specimens

ASTM D 3148 (1986 E-2) Standard Test Method for Elastic Moduli of Intact Rock Core Specimens in Uniaxial Compression

U.S. ARMY CORPS OF ENGINEER'S HANDBOOK FOR CONCRETE AND CEMENT (CRD)

CRD C 107 (1987) Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate

CRD C 127 (1985) Standard Practice for Petrographic Examination of Aggregates for Concrete

CRD C 137 (1986) Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate

CRD C 144 (1973) Method for Testing Stone for Resistance to Freezing and Thawing

CRD C 145 (1989) Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

CRD C 148 (1969) Method of Testing Stone for Expansive Breakdown on Soaking in Ethylene Glycol

U.S. ARMY CORPS OF ENGINEER'S ROCK TESTING HANDBOOK (RTH)

RTH 101 (1989) Standard Terminology Relating to Soil, Rock, and Contained Fluids

RTH 102 (1980) Recommended Practice for Petrographic Examination of Rock Cores

RTH 103 (1980) Preparation of Test Specimens

RTH 106 (1980) Method for Determination of the Water Content of a Rock Sample

RTH 107 (1980) Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate

RTH 108 (1980) Method of Determining Specific Gravity of Solids

RTH 109 (1980) Method of Determining Effective (as Received) and Dry Unit Weights and Total Porosity of Rock Cores

RTH 110 (1989) Method for Laboratory Determination of Pulse Velocities and Ultrasonic Elastic Constants of Rock

RTH 111 (1989) Standard Test Method for Unconfined Compressive Strength of Intact Rock Core Specimens

RTH 112	(1989) Test Method for Direct Tensile Strength of Intact Rock Core Specimens
RTH 115	(1980) Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles
RTH 201	(1989) Standard Test Method for Elastic Moduli of Intact Rock Core Specimens in Uniaxial Compression
RTH 202	(1989) Standard Test method for Triaxial Compressive Strength of Undrained Rock Core Specimens Without Pore Pressure Measurements
RTH 203	(1980) Direct Shear Strength of Rock Core Specimens

U.S. DEPARTMENT OF COMMERCE NATIONAL BUREAU OF STANDARDS HANDBOOK  
(NBS)

H 44	Specifications of Tolerances and Other Technical Requirements for Commercial Weighing and Measuring Devices
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1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330, SUBMITTAL PROCEDURES:

SD-01 Data

Equipment Data

Prior to starting work, a list of all equipment, tools, machines, including their sizes, capacities and operating speeds, to be used in the performance of the work shall be submitted. The plant shall be maintained in satisfactory working condition at all times.

Stone Source; G, ECD

When using a listed stone source, the Contractor shall, at least 15 calendar days in advance of using such source, designate in writing the source or one (1) combination of sources from which it proposes to furnish each type of stone materials. The Government shall also at this time be given in writing the specific areas, lifts and geologic units in the quarry or pit to be utilized.

Non-listed Stone Source Data; G, ECD

If, after award of a contract, a non-listed stone source or combination of sources is selected, the Contractor shall submit in writing the name and location of the specific source or combination of sources to be used. Additional information shall

be provided including: (1) areas and lifts of the quarry or pit to be worked, (2) the specific geological strata or stratum to be utilized, (3) available laboratory testing records and (4) previous use records.

Substitute Stone Source Data; G, ECD

If a proposed source is disapproved, submit the required data for a substitute listed stone source.

#### SD-09 Reports

QC Management Reports and Production Test Reports

Prepare and maintain construction quality control management reports and test reports as provided in SECTION 01440, CONTRACTOR QUALITY CONTROL, and as otherwise directed.

#### SD-14 Samples

Non-listed Stone Source Data; G, AOF

If, after award of a contract, the Contractor proposes to use stone from a non-listed source, samples of the proposed stone shall be furnished and delivered to the Government's specified testing laboratory at least sixty (60) calendar days in advance of the time the materials are to be shipped to the work site.

#### SD-18 Records

Check Survey Data

A copy of the record of each check survey shall be submitted within one (1) work day after the survey.

## PART 2 PRODUCTS

### 2.1 STONE MATERIALS

#### 2.1.1 General

The materials to be furnished shall meet all requirements specified in this Section of the specifications. Existing stone materials of appropriate gradations shall, to the extent of their availability, be used in their entirety before using new stone materials. The COR will, at any time during the contract, reject materials not meeting specified requirements at the source or job site. Inspection of materials at the quarry and job site by the COR will be as specified in Paragraph, "QUALITY ASSURANCE." Inspection and testing of materials by the Contractor shall be as stated in Paragraph, "QUALITY CONTROL". Materials which have been delivered to the project site and are rejected, whether in stockpile or in place in the structure, shall be removed from the project site at the Contractor's expense.

#### 2.1.2 Sources

##### 2.1.2.1 Listed Stone Material Sources

The following listed sources have been tested and/or have previously

furnished materials that meet the quality requirements specified. Information for each of the listed sources is available for inspection and use by the Contractor in the Office of the Design Branch, Engineering Division, U.S. Army Corps of Engineers, Detroit District, 477 Michigan Avenue, McNamara Building, Detroit, Michigan. If a listed source is only qualified for certain types of material it is so noted.

- (1) Drummond Island Quarry, Drummond Island, Michigan.
- (2) Cedarville Quarry of the Michigan Limestone Division of the U.S.X. Corporation, Cedarville, Michigan.
- (3) Rogers City Quarry of Michigan Limestone Division of the U.S.X. Corporation, Rogers City, Michigan. (Qualifies for stone up to 1,000 pounds in weight.)
- (4) Inland Lime and Stone Quarry, near Manistique, Michigan.
- (5) Presque Island Quarry of Chemstone Corporation, Presque Isle, (Stoneport), Michigan. (Qualifies for stone up to 1,000 pounds in weight.)
- (6) Ozark Quarry, Ozark, Michigan.
- (7) Sherman Quarry, Pelkie, Michigan (Qualifies for stone up to 1 ton in weight.)
- (8) Wallace Stone Company Quarry, Bayport, Michigan. (Qualifies for stone up to 1,000 pounds in weight.)
- (9) Maybee Quarry, Michigan Division of Maumee Stone Company, Maybee, Michigan. (Qualifies for stone up to 1 ton in weight.)
- (10) Ottawa Lake Quarry, Maumee Stone Company, Ottawa Lake, Michigan.
- (11) Sibley Quarry, Trenton, Michigan, of the Michigan Foundation Company, Trenton, Michigan. (Qualifies for stone up to 2 tons in weight.)
- (12) Banat Quarry, Menominee, Michigan. (Qualifies for stone up to 100 pounds in weight.)
- (13) Rexton Quarry, Rexton, Michigan, of the Sand Products Corporation, Brevort, Michigan.
- (14) Krygoski Quarry, Krygoski Stone Company, Menominee, Michigan. (Qualifies for stone up to 100 pounds in weight.)
- (15) Dundee Quarry, Dundee Cement Company, Dundee, Michigan.
- (16) Roberts Road Quarry, Rockwood Stone Company, Rockwood, Michigan. (3rd lowest ledge.) (Qualifies for stone up to 100 pounds in weight.)
- (17) Monroe Quarry, France Stone Company, Monroe, Michigan. (Qualifies for stone up to 100 pounds in weight.)
- (18) Bichler Quarry, Escanaba, Michigan. (Qualifies for stone up

to three (3) tons in weight.)

(19) Republic Mine Dump, Republic, Michigan.

(20) Groveland Mine Dump, Randville, Michigan.

(21) Lindberg's 480 Quarry, Sands, Michigan.

(22) LaFarge Quarry, Alpena, Michigan (Upper lift only).

(23) Straits Aggregate Quarry, Alpena, Michigan. (Cherty or platy stone not acceptable. Qualifies for acceptable stone up to two (2) tons in weight.)

(24) Dodgeville No. 5 Mine Dump, Houghton, Michigan. (Qualifies for stone up to 100 pounds weight.)

(25) Superior Sand and Gravel, Hancock, Michigan. (Qualifies for stone up to 250 pounds in weight.)

#### 2.1.2.2 Bidding Requirement

Bids shall be based on obtaining stone from any of the sources listed by company name in the above Subparagraph entitled "Listed Stone Material Sources". Bids shall not be based on non-listed sources.

#### 2.1.2.3 Source Potential

The sites listed as potential sources of material have not been investigated with respect to the availability of specific quantities and sizes of the material required for the project. Listing of sources hereinbefore only indicates that there could be some material in the source, if selected zones and appropriate quarrying techniques are used, that meets all the requirements specified. The listing of sources does not guarantee that the quality or sufficient quantities of materials necessary for this contract are available in any of the sources listed nor does it guarantee that economical production can be obtained from that source.

#### 2.1.2.4 Source Verification

Nothing herein is to be construed as implying that sources listed herein are actually interested in or capable of producing or offering stone in the size, gradation, weights or quantities required or that transportation from the source to the project is available. The Contractor shall verify each source selected for its capability to produce the quantity required of the quality, sizes, gradation or weights specified.

#### 2.1.2.5 Material Suitability

The right is reserved to reject materials from certain localized areas, zones, strata, or channels of any source, when such materials are determined by the COR to be unsuitable based upon quality requirements herein. Rejection of any or all material by the COR shall not be grounds for a time extension under SECTION I CLAUSE entitled, "DEFAULT (FIXED-PRICE CONSTRUCTION)." Materials produced from a selected source(s) shall meet all requirements specified.

#### 2.1.2.6 Other Sources

Stone materials shall be furnished from any of the above-listed sources, or subject to the conditions hereinafter stated, may be furnished from other sources. Commercially active non-listed sources or non-commercially active non-listed sources of material will be considered for use only after award of a contract. Information for the source shall be submitted as outlined in the paragraph "Non-listed Stone Source Data".

##### a. Commercially Active Non-Listed Source(s)

If after award of a contract the Contractor proposes to use a non-listed commercially active source(s) of material, the Contractor shall submit the information and data described hereinafter to the COR with a request for approval. The request for approval shall include the proposed reduction in the applicable unit prices shown in the "SECTION B". Subsequent submittals of documents will not be permitted except upon request of the COR. Commercially active non-listed sources shall not be used unless the requested use of such source(s) is approved by the COR in accordance with the applicable provisions of the contract. As appropriate, the COR will adjust the applicable contract unit prices downward to protect the Government's interest if the requested commercially active non-listed source(s) is approved for use.

##### b. Non-Commercially Active Non-Listed Source(s)

If after award of a contract the Contractor proposes to use a non-commercially active non-listed source(s) of material, the Contractor shall obtain approval from the COR in accordance with the provisions of SECTION 01100, "SPECIAL PROJECT PROCEDURES", Paragraph, "USE OF MATERIALS FROM NON-COMMERCIALLY ACTIVE NON-LISTED SOURCES". Subsequent submittals of documents will not be permitted except upon request of the COR. Non-commercially active non-listed sources shall not be used unless the requested use of such source(s) is approved by the COR in accordance with the applicable provisions of the contract. As appropriate, the COR will adjust the applicable contract unit prices downward to protect the Government's interest if the requested non-commercially active non-listed source(s) is approved for use.

#### 2.1.2.7 Notification

When stone materials are to be obtained from a listed source(s), the source(s) shall be selected and the COR notified at least fifteen (15) calendar days in advance of the time the material will be used in the work.

#### 2.1.2.8 Sampling

If the Contractor proposes to furnish the materials from a source or sources not listed hereinbefore but which are commercially active or otherwise approved, the Contractor may designate only a single source or combination of sources for each type of material. Upon receipt of the required information, the COR will inspect the selected non-listed source to verify that it may contain some material that meets all requirements specified and warrants sampling and testing. Sampling, shipping and testing of materials from non-listed sources shall be as follows:

a. Sampling and Shipping. The Contractor shall, not later than sixty (60) calendar days prior to shipment of the materials to the work site, furnish and deliver a suitable sample(s) of the materials proposed to be furnished for testing at the Government's laboratory. The sixty (60) days time shall begin at the time the samples are actually received at the laboratory. Samples for acceptance testing shall be provided as specified in Subparagraph, "Material Sampling and Shipping". Samples shall be representative of the size and quality of materials to be used on the project. Material actually furnished under the contract shall be of quality at least as good, in the judgment of the COR, as sample(s) furnished. The COR shall be present during sampling and approve the selection of all samples before shipment. The COR may elect to personally select all samples. Sampling and shipping of sample(s) shall be at the Contractor's expense. Sample(s) shall be selected from the proposed sources of supply and shall be shipped or delivered to the Director, Ohio River Division Laboratories, Corps of Engineers, U.S. Army, 11275 Sebring Drive, Forest Park, Cincinnati, Ohio 45240-2714.

b. Testing. Necessary testing required to evaluate one (1) proposed source or combination of sources which are not on the list under Subparagraph, "Sources" hereinbefore will be made at the expense of the Government. Testing will be in accordance with Subparagraph, "Material Tests".

c. Completion Time. A maximum of sixty (60) calendar days will be required by the Government to complete evaluation of stone material. The stated contract completion time will not be extended for sampling and testing from non-listed sources.

#### 2.1.2.9 Rejection

If the source(s) so designated by the Contractor is not allowed for use by the COR, the Contractor may not submit for use non-listed sources, but shall furnish the materials from a source(s) listed hereinbefore subject to concurrence of COR and compliance with contract specification requirements at no additional cost to the Government.

#### 2.1.3 Alternate Sources

If it is found during the contract that acceptable materials and quantities of materials cannot be obtained by the Contractor from the source(s) presently being used, the Contractor may request to be allowed to use alternate source(s). If the request is approved, the source(s) to be used shall be selected from the sources listed in Subparagraph, "Sources." Obtaining and furnishing materials from the substitute source(s) shall be at no additional cost to the Government.

#### 2.1.4 Material Sampling and Shipping

When directed by the COR, stone and aggregate shall be shipped to the Government's laboratory for testing for quality prior to the start of placement. Additionally, if before or during the course of the quarry operations conditions are such that, in the COR's opinion, testing to ensure the quality of the production material is warranted, the following action shall be taken:

##### 2.1.4.1 Test Samples

Test samples shall be obtained by the Contractor at its expense. Samples selected for testing shall be representative of material formations in the quarry to be used or being used on the project. The COR must be present and approve the selection of all test samples before shipment. The COR may elect to personally select all samples. When specified sizes are under 2,000 pounds, but larger than 500 pounds, individual rock samples shall be the size of the largest stone specified. Samples of stone groupings with a maximum size less than 500 pounds shall contain at least two (2) stones representative of the higher limit of the stone weights specified. In addition, the sample shall be representative of the gradation specified and the minimum weight of the total sample shall be not less than 500 pounds.

##### 2.1.4.2 Shipping Samples

The samples shall be shipped or delivered by the Contractor, at its expense, to the Director, Ohio River Division Laboratories, U.S. Army Corps of Engineers, 11275 Sebring Drive, Forest Park, Cincinnati, Ohio 45240-2714. Tests performed will be as described in the Subparagraph, "Material Tests."

##### 2.1.5 Material Tests

Tests to which the material will be subjected to will include one (1) or more of the following tests: petrographic examination, specific gravity, abrasion, absorption, wetting and drying, freezing and thawing, soundness, compressive strength, expansion, tensile strength, pulse velocity, gradation, water content, dry unit weight and total porosity, elastic moduli, direct shear and any others determined necessary to assure acceptable material. All tests shall be performed in accordance with the applicable portion of the ASTM C 127, ASTM C 295, ASTM C 535, ASTM D 653, ASTM D 2664, ASTM D 2845, ASTM D 2936, ASTM D 2938, ASTM D 3148, CRD C 107, CRD C 127, CRD C 137, CRD C 144, CRD C 145, CRD C 148, RTH 101, RTH 102, RTH 103, RTH 106, RTH 107, RTH 108, RTH 109, RTH 110, RTH 111, RTH 112, RTH 115, RTH 201, RTH 202, RTH 203, and tests listed in Paragraph, "REFERENCES," except some variations of these tests as developed by the Ohio River Division laboratory (ORD) may be used if applicable to local conditions. All tests will be made by, or under the supervision of, the Government and at its expense, except as specified in Paragraph, "QUALITY ASSURANCE." A series of tests on only one (1) separate proposed source or single combination of sources above those listed in the Subparagraph, "Listed Stone Material Sources," will be made at the Government's expense. Further testing shall be at the Contractor's expense.

#### 2.2 MATERIAL QUALITY

All stone shall be of a quality to insure permanence of the structure in the climate in which it is to be used. The stone shall be durable, sound,

free from detrimental cracks, blast fractures, seams and other defects which tend to increase deterioration from natural causes or cause breakage during handling and placing. It shall be highly resistant to weathering and disintegration under freezing and thawing and wetting and drying conditions. Acceptability of stone material will be determined by the COR from suitable laboratory tests, visual inspection, and service records. Tests which the material may be subjected to are given hereinbefore in Subparagraph, "Material Tests". Inspection for cracks, fractures, seams, defects, and deterioration shall be made by visual examination. Inclusion of objectionable quantities of dirt, sand, clay, chert and rock fines or other deleterious material will not be permitted. Selected varieties of glacial stone will generally meet the requirements of these specifications. Limestone and sandstone will not be acceptable.

#### 2.2.1 Stone Dimensions

The least dimension of any piece of stone shall not be less than one third (1/3) of its greatest dimension.

#### 2.3 QUARRY OPERATIONS AND HANDLING

Quarry operations shall be conducted by the Contractor/Supplier in a manner that will produce stone conforming to the requirements specified and may involve selective quarrying, handling, processing, blending, and loading as necessary. Blasting and handling of rock shall be controlled by the Contractor/Supplier to produce rock of the size ranges and quality specified. Techniques such as the use of proper hole diameter, hole depth, hole angle, burden and spacing distances, types and distribution of explosives, delay intervals and sequences, removal of muck piles between each shot, and special handling techniques will be required as necessary to produce the specified materials. All aspects of blasting operations shall be specifically designed so that the end product is not damaged from the blasting technique and that the stone is suitable for the intended purpose. Stone in excess of 500 pounds each will not be accepted from material which was blasted from the face of the quarry during the period of 15 September to 1 May for quarries located above 43 degrees North latitude and 1 October to 1 May for quarries located below 43 degrees North latitude.

##### 2.3.1 Temporary Storage

Storage of stone materials subsequent to shipment from the quarry prior to permanent placement in the required work and shall be subject to approval of the COR. Underwater storage of stone materials is prohibited.

#### 2.4 GRADATION

Material having the gradations listed below shall be placed in the work at locations shown on the drawings. Gradation limits are in-place requirements. Adjustments in production and placing methods shall be made as necessary to assure final placed materials are within specified ranges.

#### 2.4.1 Plain Riprap

The stones furnished for plain riprap shall weigh between 35 pounds and 350 pounds, seventy-five percent (75%) of which shall weigh greater than 250 pounds each.

#### 2.4.2 Heavy Riprap

The stones furnished for plain riprap shall weigh between 691 pounds and 1.9 tons, seventy-five percent (75%) of which shall weigh greater than 1350 pounds each.

### PART 3 EXECUTION

#### 3.1 GENERAL

All materials shall be placed uniformly within the areas indicated on the drawings or as directed by the COR. Equipment Data for all equipment used for completion of this item shall be submitted prior to construction.

##### 3.1.1 Debris

Any timbers, trees along the riverbank, unsatisfactory material and debris within the reaches of construction in the required riprap area shall be removed except as otherwise directed by the COR and upon removal shall become the property of the Contractor. All materials shall be properly disposed of in conformance with the requirements of SECTION 01430 "ENVIRONMENTAL PROTECTION" including any applicable local requirements.

##### 3.1.2 Riprap

###### 3.1.2.1 Under Water

The method used in placement of riprap shall be such that any soft and organic materials on the channel bottom will be displaced outward away from the riverbank. Geotextile fabric shall be placed as a filter fabric between the riverbed and riprap as indicated on the drawings. The riprap material shall be handled and placed in such a manner as to minimize segregation and provide a well-graded mass. If the materials are placed by clam shell, dragline, or other similar equipment, the stone shall not be dropped from a height exceeding two (2) feet. The finished surface of the material shall be free of mounds or windrows.

###### 3.1.2.2 Above Water

Riprap shall be placed in a manner which will produce a well-graded mass of rock with the minimum practical percentage of voids, and shall be constructed to the lines and grades shown on the contract drawings or staked in the field. Geotextile fabric shall be placed as a filter fabric between the riverbank and riprap as indicated on the drawings. Riprap shall be placed to its full course thickness in one operation and in such manner as to avoid displacing the filter fabric. The largest stones shall be placed at the uppermost layer. Placement shall begin at the bottom of the area to be covered and continue up slope. The finished riprap shall be free from objectionable pockets of small stones and clusters of larger stones. Placing riprap in layers will not be permitted. Placing riprap by dumping it into chutes, or by similar methods likely to cause segregation of the various sizes, shall not be permitted. Placing riprap by dumping it at the top of the slope and pushing it down the slope shall not be

permitted.

3.1.3 Slides

In the event of the sliding or failure of any part of the structure during its construction, or after its completion, but prior to its acceptance, the Contractor shall, upon written order of the COR cut out and remove the slide from the structure and then rebuild that portion of the structure with new materials or reuse the displaced materials for rebuilding if deemed appropriate. The COR shall determine the nature and cause of the slide. In case the slide is caused through fault of the Contractor, the foregoing operations shall be performed without cost to the Government.

3.1.4 Tolerances

The finished surface and stone layer thickness shall not deviate from the lines and grades shown on the contract drawings by more than the tolerances listed below. Tolerances are measured perpendicular to the indicated neatlines. Extreme limits of the tolerances given shall not be continuous in any direction for more than five (5) times the nominal stone dimension nor for an area greater than 100 square feet of the structure surface.

<u>Stone</u>	<u>NEATLINE TOLERANCES</u>	
	<u>Above Neatline (Inches)</u>	<u>Below Neatline (Inches)</u>
Plain Riprap	0	6
Heavy Riprap	0	6

The intention is that the work will be built generally to the required elevations, slope and grade and that the outer surfaces shall be even and present a neat appearance. Placed material not meeting these limits shall be removed or reworked as directed by the COR. Excess material permitted to remain in place by the Government will not be paid for.

3.2 QUALITY CONTROL

3.2.1 General

The Contractor shall establish and maintain quality control for all work performed at the quarry or quarries and the job site under this Section to assure compliance with contract requirements. It shall maintain records of its quality control tests, inspections and corrective actions. Quality control measures shall cover all materials, equipment, tests and construction operations including but not limited to the following:

- a. Testing and inspection during start up operations and during production of materials for rock quality, weights or sizes and gradations of stone materials. Adjustments shall be made in methods and/or procedures as necessary to provide "in-place" stone materials in sizes conforming with the contract requirements.
- b. Placement of all materials in the areas shown on the contract drawings and in accordance with this Section of the specifications.
- c. Conducting all operations in compliance with the requirements of SECTION 01130, "ENVIRONMENTAL PROTECTION".

d. Observance of safety regulations.

### 3.2.2 Check Surveys

Surveys made by the Contractor will be required on material placed for determining that the materials are acceptably placed in the work. The Contractor shall make checks as the work progresses to verify lines, grades and thicknesses established for completed work. At least three (3) below-water check surveys as specified below shall be made by the Contractor for the riprap area downstream of the barrier as soon as practicable after completion. Following placement of the material, the cross section of each step of the work shall be approved by the COR before proceeding with the next step of the work. Approval of cross sections based on check surveys shall not constitute final acceptance of the work. Additional elevations and soundings shall be taken as the COR may deem necessary or advisable. The surveys shall be conducted in the presence of the COR unless waived by the COR.

#### 3.2.2.1 Below Water

For portions of the work that are under water, sounding surveys shall be performed either by means of a sounding pole or a sounding basket weighing about 8-1/2 pounds, each of which has a base measuring twelve (12) inches in diameter.

### 3.2.3 Quarry Test, Inspection and Samples

#### 3.2.3.1 General

All tests specified herein shall be performed by, and at the expense of, the Contractor as part of its "Quality Control Program". Samples for testing shall be selected by the Contractor with the concurrence of the COR. Tests shall be made as specified below and any adjustments to the Contractor's operation necessary to provide material meeting contract requirements shall be at the Contractor's expense. Stone materials which do not meet these specification requirements shall be separated to assure they do not get mixed in with acceptable materials.

#### 3.2.3.2 Pre-production Testing Plan

Stone materials produced during start-up operations at the quarry shall be tested and evaluated for quality, weight and gradations as required to assure compliance with the specifications. Three (3) consecutive tests shall pass all requirements, and be witnessed by the COR, prior to full production operations or shipment of any material to the project site.

#### 3.2.3.3 Quarry Samples

Prior to delivery of any stone to the job site and after pre-production testing is complete, the Contractor's inspector and the COR shall meet at each quarry designated to supply stone material and select stones, with required weight, to be set aside at the quarry as reference samples of the materials to be shipped to the project site. These samples shall be retained until completion of the project. Samples shall consist of at least one (1) stone representing the minimum, average and maximum weight of each size range in the gradation. Basic quarry material inspections shall be provided by the Contractor as part of its "Quality Control Program".

3.2.3.4 Production Testing

Production quality control tests shall be performed at the quarry prior to shipment of materials to the project site and shall be performed at regular intervals throughout the project construction. Tests which do not pass are not counted toward the number of tests required. Production testing may be increased as necessary to maintain quality control when directed by the COR. Increased production testing shall also be at the Contractor's expense. Samples for production testing shall be taken from materials as they are produced. The following minimum tests are required.

<u>Stone</u>	<u>Type of Test</u>	<u>Minimum Size of Sample/Test</u>	<u>Minimum Number of Tests</u>
Plain Riprap	Gradation	1 ton	1
Heavy Riprap	Gradation	1 ton	1

3.2.3.5 Gradation Test

Stone gradation determination shall be as recommended by the Contractor and approved by the COR.

3.2.4 Project Site Inspection and Tests

At the project site, visual inspections shall be made of all materials for size, gradations, fractures, etc., to assure that handling during loading, transporting, unloading and placement does not cause damage to the materials and to assure they are placed in accordance with the requirements of this Section. Any material broken, cracked, out of gradation or weight limitation or improperly placed in the work shall be removed and replaced with new stones or corrected as directed by the COR at no additional expense to the Government.

3.2.5 Retests

The Government reserves the right to test or retest any of the material produced from the sources listed or used on the project at Government expense.

3.3 QUALITY ASSURANCE

During the contract period, both prior to and after materials are delivered to the job site, visual inspections of the stone materials may be performed by the COR. If the COR during the inspections, suspects that the stone quality, gradation or weights of stone being furnished are not as specified, supplemental sampling and testing by the Contractor shall be required. Samples of the delivered stone for testing and the manner in which the test is to be performed shall be as directed by the COR. This additional sampling and testing shall be performed at the Contractor's expense when test results indicate that the materials do not meet specified requirements. When test results indicate that materials meet specified requirements, an equitable adjustment for the sampling and testing will be made in accordance with SECTION I CLAUSE entitled "CHANGES." Any material rejected shall be removed from the job site at the Contractor's expense.

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## SECTION 03307

## CONCRETE CONSTRUCTION

## PART 1 GENERAL

## 1.1 DESCRIPTION OF WORK

The work required under this section includes furnishing all materials and equipment and performing operations such as, but not limited to, placement of a reinforced concrete foundation. All work and materials shall be in accordance with the requirements specified herein and shown on the contract drawings. All work shall also be in accordance with Section 01025, MEASUREMENT AND PAYMENT.

## 1.2 REFERENCES

The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the references thereto.

## AMERICAN CONCRETE INSTITUTE (ACI)

ACI 306R	(1988) Cold Weather Concreting
ACI 318	(2002) Building Code Requirements for Structural Concrete
ACI 347 R	(2003) Guide to Formwork for Concrete

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 184	(2001) Standard Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement
ASTM A 615	(2001) Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM C 31	(2000) Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C 39	(2001) Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C 94	(2000) Standard Specification for Ready-Mixed Concrete
ASTM C 143	(2000) Standard Test Method for Slump of Hydraulic Cement Concrete
ASTM C 150	(2002) Standard Specification for Portland Cement

ASTM C 171	(1997) Standard Specification for Sheet Materials for Curing Concrete
ASTM C 172	(1999) Standard Practice for Sampling Freshly Mixed Concrete
ASTM C 231	(1997) Standard Test Method for Determining Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 260	(2001) Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C 494	(1999) Standard Specification for Chemical Admixtures for Concrete
ASTM C 685	(2001) Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing
ASTM C 1064	(2003) Standard Test Method for Temperature of Freshly Mixed Portland Cement Concrete

MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT)

MDOT-2003	(2003) Standard Specifications for Construction
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U.S. ARMY CORPS OF ENGINEERS HANDBOOK FOR CONCRETE AND CEMENT (CRD)

CRD C 400	(1963) Requirements for Water for Use in Mixing or Curing Concrete
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U.S. ARMY CORPS OF ENGINEERS ENGINEERING MANUAL (EM)

EM 1110-2-2104	(1992) Strength Design for Reinforced-Concrete Hydraulic Structures
EM 1110-2-2000	(2001) Standard Practice for Concrete

1.3 QUALITY ASSURANCE

1.3.1 Construction Testing by Government

The Government will maintain the option to sample and test aggregates and concrete to determine compliance with the specifications. The Contractor shall provide facilities and labor as may be necessary to assist the Government in procurement of representative test samples.

1.4 DESIGN AND PERFORMANCE REQUIREMENTS

The concrete mix design shall comply with the provisions in Section 701 for Grade S-2 concrete provided for in MDOT-2003 along with the following provisions within this Section. The concrete mix design shall also comply with Chapter 3 of EM 1110-2-2000.

#### 1.4.1 Strength

Acceptance test results will be the average strength of two specimens tested at 28 days obtained from each pour. The strength of the concrete will be considered satisfactory so long as the average of three consecutive acceptance test results equal or exceed the specified compressive strength,  $f'c$ , and no individual acceptance test result falls below  $f'c$  by more than 500 psi.

#### 1.4.2 Construction Tolerances

Forms shall be placed within a tolerance of 3/8 inch in 10 feet. Unformed surface variations shall not exceed 3/8 inch in 10 feet.

#### 1.4.3 Mixture Proportions

Specified compressive strength  $f'c$  shall be a minimum of 2,600 psi at 7 days and a minimum of 3,500 psi at 28 days. The air content shall be between 5 and 8 percent. The maximum water cement ratio shall be .44.

##### 1.4.3.1 Slump

Concrete placed on this project may be pumped, if approved, or non-pumped (drop bucket, trough etc). Concrete slump shall be within the ranges specified in Table 701.1 of MDOT-2003.

#### 1.4.4 Formwork Design

Formwork shall be designed in accordance with methodology of ACI 347 R for anticipated loads, lateral pressures, and stresses. Forms shall be capable of withstanding the pressure from placement vibration of concrete.

### 1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330, SUBMITTAL PROCEDURES:

#### SD-01 Data

##### Batching and Mixing Equipment

Batching and mixing equipment will be accepted on the basis of manufacturer's data which demonstrate compliance with the applicable specifications.

##### Conveying and Placement Equipment

The methods and equipment for transporting, handling, depositing, and consolidating the concrete shall be submitted prior to the first concrete placement.

#### SD-04 Drawings

Reinforcing Steel, and Formwork Placement Shop Drawings; G, AOF

Detail drawings indicating size, placement location, dimensions, and anticipated quantities of reinforcing bar steel. Formwork shall be submitted for approval prior to construction start-up. For formwork, fasteners, handling, and design computations shall be included in the submittal.

## PART 2 PRODUCTS

### 2.1 MATERIALS

#### 2.1.1 Cement

Cement shall be portland cement and shall conform to the appropriate specifications listed:

##### 2.1.1.1 Portland Cement

ASTM C 150, Type I, IA and Type II

#### 2.1.2 Aggregates

Coarse and fine aggregates shall meet the quality and grading requirements provided for in Section 902 of MDOT-2003. Maximum coarse aggregate is Size No. 8 for Grade S-2. Fine aggregate shall be Size No. 23. Aggregate size shall also meet the requirements of Table 1 in EM 1110-2-2000.

#### 2.1.3 Admixtures

Admixtures to be used, when required or approved, shall comply with the appropriate specification listed. Chemical admixtures that have been in storage at the project site for longer than 6 months or that have been subject to freezing shall be retested at the expense of the Contractor at the request of the Contracting Officer and shall be rejected if test results are not satisfactory.

##### 2.1.3.1 Air-Entraining Admixture

Shall conform with ASTM C 260.

##### 2.1.3.2 Water Reducing or Retarding Admixture

ASTM C 494, Type A, B or D.

#### 2.1.4 Water

Water for mixing and curing shall be fresh, clean, potable, and free from injurious amounts of oil, acid, salt, or alkali, except that unpotable water may be used if it meets the requirements of CRD C 400.

#### 2.1.5 Reinforcing (Mat Steel, Bar Steel and Dowels)

Reinforcing steel bar (mat steel, bar steel, dowels) shall conform to the requirements of EM 1110-2-2104, ASTM A 184 and ASTM A 615, Grade 60. Details of reinforcement not shown on drawings shall be in accordance with ACI 318, Chapters 7 and 12. Reinforcement shall be cold bent unless otherwise authorized. Bending may be accomplished in the field or at the mill. Bars shall not be bent after embedment in concrete. Bar supports shall be steel. Reinforcing steel bar may be cut in the field to make up mat steel and dowels.

### 2.1.6 Formwork

The design and engineering of the formwork, as well as its construction, shall be the responsibility of the Contractor. Form materials may be wood or steel or other approved concrete form material. Formwork shall be designed in accordance with methodology of ACI 347 R for anticipated loads lateral pressures, and stressing. Forms shall be capable of withstanding the pressures resulting from placement and vibration of concrete.

### 2.1.7 Form Coatings

Forms for exposed surfaces shall be coated with a nonstaining form oil, which shall be applied shortly before concrete is placed. Form releasing agents shall be commercial formulations that will not bond with, stain or adversely affect concrete surfaces.

### 2.1.8 Curing Materials

Due to site conditions (weather; exposure to wind and waves), liquid membrane-forming curing compounds are not allowed. Sheet material curing is recommended due to the protection qualities of sheet material. Securing the sheets to prevent loss of coverage shall be the responsibility of the contractor.

#### 2.1.8.1 Sheet Material Curing

Sheet material curing concrete shall comply with the requirements of ASTM C 171, when tested at the rate of coverage to be used on the job. The sheets shall be secured to the structure in a way that is suggested by manufacturer and capable of withstanding adverse weather conditions.

#### 2.1.8.2 Impervious Sheet

ASTM C 171, type optional, except that polyethylene film if used, shall be white opaque. Sheeting used as interface between granular subbase and concrete shall be 6 mil or thicker. Sheeting used for curing shall be 3 mil or thicker.

## PART 3 EXECUTION

### 3.1 PREPARATION

#### 3.1.1 Preparation of Subgrade

Earth surfaces upon which concrete is to be placed shall be clean, damp and free from debris, frost, ice and standing or running water. Prior to placement of concrete, the foundation shall be well drained and shall be satisfactorily graded. Subgrade shall be compacted per Section 02315N, EXCAVATION AND FILL.

#### 3.1.2 Aggregate Subgrade

A 6 inch layer of 23A aggregate shall be placed prior to concrete placement. the surface of the aggregate shall be level to provide an adequate surface to efficiently place formwork and footing concrete.

### 3.1.3 General Concrete Placement

Chamfering of all vertical as well as all horizontal edges as detailed on plans is required with appropriate molding or tooling of edges. Ramps and walkways, as necessary, shall be constructed to allow safe and expeditious access for concrete and workers. Snow, ice, standing or flowing water, loose particles, debris, and foreign matter shall have been removed. Spare vibrators shall be available. The impervious sheet shall be placed across granular subbase and held in place prior to concrete placement. The entire preparation shall be satisfactory to the Government prior to placing.

### 3.1.4 Embedded Items (Deformed Reinforcement Bars, and Dowels)

Reinforcement shall be secured in place; joints, anchors, and other embedded items shall have been positioned. Internal ties shall be arranged so that when the forms are removed all metal shall be not less than three (3) inches from concrete surfaces permanently exposed to view or exposed to water on the finished structures. Embedded items shall be free of oil and other foreign matter such as loose coatings of rust, paint, and scale. The embedding of wood in concrete will not be permitted unless when specifically authorized or directed. All equipment needed to place, consolidate, protect, and cure the concrete shall be at the placement site and in good operating condition.

### 3.1.5 Formwork Installation

Forms shall be properly aligned, adequately supported, and mortar-tight. The form surfaces shall be smooth and free from irregularities, dents, sags, or holes when used for permanently exposed faces. All exposed joints and edges shall be chamfered, unless otherwise indicated. Where existing joints and edges are chamfered, replacement concrete shall be chamfered to match.

### 3.1.6 Production of Concrete

#### 3.1.6.1 Ready-Mixed Concrete

Ready-mixed concrete shall conform to ASTM C 94 except as otherwise specified.

#### 3.1.6.2 Concrete Made by Volumetric Batching and Continuous Mixing

Concrete made by volumetric batching and continuous mixing shall conform to ASTM C 685.

#### 3.1.6.3 On-site Batching and Mixing

The Contractor shall have the option of using an on-site batching and mixing facility. The facility shall provide sufficient capacity to prevent cold joints. The method of measuring materials, batching operation, and mixer shall be submitted for review by the Contracting Officer's Representative (COR). On-site plant shall conform to the requirements of either ASTM C 94 or ASTM C 685. All Batching and Mixing Equipment shall be approved prior to construction.

## 3.2 PLACING

### 3.2.1 General

All equipment shall be approved in accordance with the paragraph "Conveying and Placement Equipment". Concrete placement shall not be permitted when, in the opinion of the COR, weather conditions prevent proper placement and consolidation. Weather conditions that would prevent proper placement and consolidation shall include, but are not limited to, occasions when waves are running up the structure, causing unsafe working conditions. When concrete is mixed and/or transported by a truck mixer, the concrete shall be delivered to the site of the work and discharge shall be completed within 1-1/2 hours or 45 minutes when the placing temperature is 85 deg F or greater unless a retarding admixture is used. Concrete shall be conveyed from the mixer to the forms as rapidly as practicable by methods which prevent segregation or loss of ingredients. The concrete shall not be dropped from a height greater than 18 inches. Concrete shall be in place and consolidated within 15 minutes after discharge from the mixer. Concrete shall be deposited as close as possible to its final position in the forms and be so regulated that it may be effectively consolidated in horizontal layers eight (8) inches or less in thickness with a minimum of lateral movement except as otherwise specified herein. The placement shall be carried on at such a rate that the formation of cold joints will be prevented.

#### 3.2.1.1 Pumping

Concrete may be conveyed by positive displacement pump for both underwater concreting and above water concreting when approved. The pumping equipment shall be piston or squeeze press type. The pipeline shall be rigid steel pipe or heavy duty flexible hose. The inside diameter of the pipe shall be at least three (3) times the nominal maximum size coarse aggregate in the concrete mixture to be pumped but not less than four (4) inches. The maximum size coarse aggregate shall not be reduced to accommodate the pumps. The distance to be pumped shall not exceed limits recommended by the pump manufacturer. The concrete shall be supplied to the concrete pump continuously. When pumping is completed, concrete remaining in the pipeline shall be ejected without contamination of concrete in place and the environment. After each operation, equipment shall be thoroughly cleaned and flushing water shall be wasted outside of the forms but not discharged directly to the river.

#### 3.2.2 Consolidation

Concrete (except that which is placed underwater) shall be consolidated by internal vibrating equipment. Internal vibration shall be systematically accomplished by inserting the vibrator through the fresh concrete in the layer below at a uniform spacing over the entire area of placement. The distance between insertions shall be approximately 1.5 times the radius of action of the vibrator and overlay the adjacent, previously vibrated area by a few inches. The vibrator shall penetrate rapidly to the bottom of the layer and at least six (6) inches into the layer below, if such a layer exists. It shall be held stationary until the concrete is consolidated and then withdrawn slowly at the rate of about three (3) inches per second.

#### 3.2.3 Cold-Weather Requirements

Cold weather concreting shall conform to ACI 306R. No concrete placement

shall be made when the ambient temperature is below 35 deg F or if the ambient temperature is below 40 deg F and falling. Suitable covering and other means, as approved by the COR shall be provided for maintaining the concrete at a temperature of at least 50 deg F for not less than 72 hours after placing and at a temperature above freezing for the remainder of the curing period. Salt, chemicals, or other foreign materials shall not be mixed with the concrete to prevent freezing. Any concrete damaged by freezing shall be removed and replaced at the expense of the Contractor.

3.2.4 Hot Weather Requirements

When the ambient temperature during concrete placing is expected to exceed 30 degrees C, 85 degrees F, the concrete shall be placed and finished with procedures previously submitted and as specified herein. The concrete temperature at time of delivery to the forms shall not exceed the temperature shown in the table below when measured in accordance with ASTM C 1064. Cooling of the mixing water or aggregates or placing concrete in the cooler part of the day may be required to obtain an adequate placing temperature. A retarder may be used, as approved, to facilitate placing and finishing. Steel forms and reinforcements shall be cooled as approved prior to concrete placement when steel temperatures are greater than 49 degrees C.120 degrees F. Conveying and placing equipment shall be cooled if necessary to maintain proper concrete-placing temperature.

Maximum Allowable Concrete Placing Temperature

Relative Humidity, Percent, During Time of Concrete Placement	Maximum Allowable Concrete Temperature Degrees
Greater than 60	33 C 90 F
40-60	30 C 85 F
Less than 40	27 C 80 F

3.3 FORM REMOVAL

Forms shall not be removed before the expiration of 7 days after concrete placement except where otherwise specifically authorized. Supporting forms and shoring shall not be removed until the concrete has cured for at least 7 days. When conditions on the work are such as to justify the requirement, forms will be required to remain in place for longer periods.

3.4 FINISHING

3.4.1 General

No finishing or repair shall be done when either the concrete or the ambient temperature is below 50 deg F.

3.4.2 Finishing Formed Surfaces

All fins and loose materials shall be removed, and surface defects including tie holes shall be filled. Except for major defects described herein after, surface defects shall be repaired within 24 hours after the forms are removed. All honeycomb areas and other defects shall be repaired. All unsound concrete shall be removed from areas to be repaired. Surface defects greater than one-half (1/2)inch in diameter and holes left

by removal of tie rods in all surfaces not to receive additional concrete shall be reamed or chipped and filled with dry-pack mortar. The prepared area shall be brush-coated with a neat cement grout after dampening and filled with mortar or concrete. Patches shall be protected during curing.

### 3.4.3 Finishing Unformed Surfaces

All unformed surfaces shall be float finished to elevations shown on the drawings, unless otherwise specified. Horizontal surfaces shall be sloped for drainage at a slope of one-eighth (1/8) inch per foot. Joints shall be carefully made to match existing joints. Finishing shall not be performed while there is excess moisture or bleeding water on the surface. No water or cement shall be added to the surface during finishing.

#### 3.4.3.1 Float Finish

Surfaces to be float finished shall be screeded and darbied or bullfloated to eliminate the ridges and to fill in the voids left by the screed. In addition, the darby or bullfloat shall fill all surface voids and only slightly embed the coarse aggregate below the surface of the fresh concrete. When the water sheen disappears and the concrete will support a person's weight without deep imprint, floating should be completed. Floating should embed large aggregates just beneath the surface, remove slight imperfections, humps, and voids to produce a plane surface, compact the concrete, and consolidate mortar at the surface. After floating and light troweling, the surface shall be broom finished transverse to the direction of traffic.

### 3.5 CURING AND PROTECTION

Beginning immediately after placement and continuing for at least 7 days, all concrete shall be cured and protected from premature drying, extremes in temperature, rapid temperature change, freezing, mechanical damage, and exposure to rain or flowing water. All materials and equipment needed for adequate curing and protection shall be available and at the site of the placement prior to the start of concrete placement. Preservation of moisture for concrete surfaces not in contact with forms shall be accomplished by one of the following methods:

- (1) Continuous sprinkling or ponding.
- (2) Application of absorptive mats or fabrics kept continuously wet.
- (3) Application of impervious sheet material conforming to ASTM C 171 (polyethylene sheeting - 6 mil).

The preservation of moisture for concrete surfaces placed against wooden forms shall be accomplished by keeping the forms continuously wet for 7 days. If forms are removed prior to end of the required curing period, other curing methods shall be used for the balance of the curing period. During the period of protection removal, the temperature of the air in contact with the concrete shall not be allowed to drop more than 25 deg F within a 24-hour period.

#### 3.5.1 Cold Weather Curing and Protection

When the daily ambient low temperature is less than 0 degrees C 32 degrees F the temperature of the concrete shall be maintained above 5 degrees C 40 degrees F for the first seven days after placing. During the period of

protection removal, the air temperature adjacent to the concrete surfaces shall be controlled so that concrete near the surface will not be subjected to a temperature differential of more than 13 degrees C 25 degrees F as determined by suitable temperature measuring devices furnished by the Contractor, as required, and installed adjacent to the concrete surface and 50 mm 2 inches inside the surface of the concrete. The installation of the thermometers shall be made by the Contractor as directed.

### 3.6 DISPOSAL

All waste, excess and unsatisfactory materials resulting from work required under this Section shall be removed from the site unless otherwise specified and directed and upon removal shall become the property of the Contractor. All disposal shall conform to the requirements of SECTION 01430 "ENVIRONMENTAL PROTECTION", including any applicable local requirements.

### 3.7 QUALITY CONTROL

#### 3.7.1 General

Contractor quality control is that system by which a Contractor regulates, tests, and inspects its procedures, equipment, materials and personnel so that the complete project will comply with the requirements of the project specifications. The individuals who sample and test concrete as required in this specification shall have demonstrated a knowledge and ability to perform the necessary test procedures equivalent to the ACI minimum guidelines for certification of Concrete Field Testing Technicians, Grade I.

#### 3.7.2 Inspection Details and Frequency of Testing

##### 3.7.2.1 Preparations for Placing

Foundation or construction joints, forms, and embedded items shall be inspected in sufficient time prior to each concrete placement by the Contractor to certify to the Contracting Officer that it is ready to receive concrete.

##### 3.7.2.2 Aggregates

Samples of aggregates shall be obtained at the point of batching in accordance with the provisions provided for in Section 702.06.c of MDOT-2003.

##### 3.7.2.3 Strength

Concrete shall be sampled in accordance with ASTM C 143 and ASTM C 231, respectively, when cylinders are molded. Compression test specimens shall be made, cured, and transported in accordance with ASTM C 31. Compression test specimens shall be tested in accordance with ASTM C 39. Samples for strength tests shall be taken not less than once each shift in which concrete is produced. A minimum of three specimens shall be made from each sample; two shall be tested at 28 days for acceptance, and one shall be tested at 7 days for information.

##### 3.7.2.4 Air Content

Air content shall be checked at least twice during each shift that concrete is placed. Samples shall be obtained in accordance with ASTM C 172 and tested in accordance with ASTM C 231.

#### 3.7.2.5 Slump

Slump shall be checked twice during each shift once at beginning of shift and secondly at mid shift that concrete is produced. Samples shall be obtained in accordance with ASTM C 172 and tested in accordance with ASTM C 143.

#### 3.7.2.6 Consolidation and Protection

The Contractor shall ensure that the concrete is properly consolidated, finished, protected and cured.

#### 3.7.3 Action Required

##### 3.7.3.1 Placing

The placing foreman shall not permit placing to begin until he or she has verified that a minimum of two (2) vibrators, which are in working order and have competent operators, are available. Placing shall not be continued if any area is inadequately consolidated.

##### 3.7.3.2 Air Content

Whenever a test result is outside the specification limits, the concrete shall not be delivered to the forms and an adjustment shall be made to the dosage of the air-entrainment admixture.

##### 3.7.3.3 Slump

Whenever a test result is outside the specification limits, the concrete shall not be delivered to the forms and an adjustment should be made in the batch weights of water and fine aggregate. The adjustments are to be made so that the water-cement ratio does not exceed the limits specified in the submitted concrete mixture proportion.

##### 3.7.3.4 Strength

Whenever test cylinder results indicate strength requirements have not been met, the Contractor shall obtain and test cores of the concrete which has been placed from the same batch as the test cylinders. Concrete which is found to be deficient in strength following field investigation shall be removed and replaced to the satisfaction of the COR at no additional cost to the Government.

#### 3.7.4 Reports

The results of all tests and inspections conducted at the project site shall be reported informally at the end of each working day and shall be delivered to the COR within 1 day after the end of each daily reporting period. Format of the report shall be as required in the Section 01440 "CONTRACTOR QUALITY CONTROL". The Government representative has the right to examine all Contractor quality control records.

- End of Section -

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DIVISION 05 - METALS

SECTION 05500

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SECTION 05500

MISCELLANEOUS METALS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

The work required under this section includes furnishing all materials and equipment and performing operations such as, but not limited to, placement of wales, fabrication of handrail, fabrication of lamprey trap appurtenances including; louvers, lamprey screens, grating, debris rack, nuts and bolts, and all incidental work as shown on the drawings and described herein. All work and materials shall be in accordance with the requirements specified herein and shown on the contract drawings.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 36	(2001) Standard Specification for Carbon Structural Steel
ASTM A 325	(2002) Standard Specification for Structural Bolts, Steel, Heat Treated 120/105 ksi Minimum Tensile Strength
ASTM A 563	(2000) Standard Specification for Carbon and Alloy Steel Nuts
ASTM A 572	(2001) Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
ASTM F 436	(2000) Standard Specification for Hardened Steel Washers

AMERICAN WELDING SOCIETY (AWS)

AWS A5.1	(1991) Carbon Steel Electrodes for Shielded Metal Arc Welding
AWS D1.1	(2002) Structural Welding Code-Steel
EM 385-1-1	(1996) Safety and Health Requirements Manual

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation;

submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330, SUBMITTAL PROCEDURES:

#### SD-04 Drawings

Shop Drawings; G, ECD

Detail drawings shall indicate material thickness, type, grade, and class; dimensions; welding details; and construction details. Drawings shall include catalog cuts, erection details, manufacturer's descriptive data and installation instructions, and templates. Detail drawings for the following items shall be submitted for approval prior to the commencement of work: Lamprey trap stop-log plate system, grating locking mechanism, handrails, wales, splice plates, steel sheet pile-special piles, and lamprey screens.

#### SD-08 Manufacturer's Instructions

Grating Manufacturer Data; G, ECD

Submit manufacturer's specifications for grating at least 10 days following notice to proceed. The Contractor shall also provide manufacturer's data for handrail, if the Contractor elects to use manufactured handrail.

#### SD-13 Certificates

Materials

Certified copies of mill reports shall be furnished covering the chemical and physical properties of the material used in the work under this section of the specifications.

Welders

The Contractor shall certify by name welders whom it will use on the job, who have successfully passed the welder qualification test as recommended by the American Welding Society (AWS), and in accordance with welder qualifications in AWS D1.1 Section C5 "Qualification", giving the dates of the tests and name and location of the testing bureau.

### 1.4 GENERAL REQUIREMENTS

The Contractor shall verify all measurements and shall take all field measurements necessary before fabrication. Materials and parts necessary to complete each item, even though such work is not definitely shown or specified, shall be included.

#### 1.4.1 Tolerances

The Contractor shall ensure the tolerance of all cut steel (baffles, flat plate for sliding gate) is no greater than 1/8 inch.

#### 1.4.2 Gaps in Finished Work

The Contractor shall ensure that no gaps greater than 1/2 inch exist between SSP sections, miscellaneous steel connections between barrier and lamprey trap, stop logs, and lamprey screens. The Contractor shall verify any gaps and openings with the Contracting Officer's Representative (COR) prior to finishing work.

#### 1.5 STORING AND HANDLING MATERIALS

All materials which are delivered in advance of contemplated use shall be given protected storage off the ground. All materials which are damaged during storage and are not approved for use by the COR shall be replaced with new materials.

### PART 2 PRODUCTS

#### 2.1 MATERIALS

##### 2.1.1 Bolts, Nuts and Washers

Bolts, nuts and washers shall be of the material, grade, type, class, style, and finish indicated for intended use per ASTM designation. Bolts and nuts shall be hex type unless otherwise indicated.

##### 2.1.1.1 High-Strength Bolts, Nuts, and Washers

- a. Bolts. ASTM A 325
- b. Nuts. ASTM A 563
- c. Washers. ASTM F 436

##### 2.1.2 Wales, and Miscellaneous Members for the SSP Walls

Structural shapes, washers, plates, bars and angles for the steel sheet pile walls, and reinforced concrete slab supports, except as otherwise specified or shown shall conform to ASTM A 36.

##### 2.1.3 Steel Sheet Pile - Special Piles

Special steel sheet piles shall conform to ASTM A 572, High Strength Steel.

##### 2.1.4 Welding Electrodes

Welding electrodes shall conform to the requirements of AWS A5.1, Class E 70. Electrodes for welding steel sheet piling shall be low-hydrogen electrodes.

##### 2.1.5 Fishscreens

Fishscreen perimeter support hardware shall conform to ASTM A 36, and shall have a galvanized finish. Screen mesh, funnels, and rings shall be as shown on the plans.

##### 2.1.6 Handrail

Handrail shall be galvanized steel, fabricated to the heights, and layout as shown on the drawings and as specified in section 21.B of EM 385-1-1.

The handrail shall be a minimum 1.5 inch diameter, galvanized steel tube. Toe boards will not be required. The Contractor may elect to provide manufactured handrail in accordance with the SUBMITTALS paragraph. Typical handrail manufacturers are as follows, or may be an approved equal:

IKG Industries  
270 Terminal Avenue  
Clark, NJ 07066  
1(800)747-8982  
www.ikgindustries.com

Kee Industrial Products, Inc.  
100 Stradtman St.  
Buffalo, NY 14206  
1(800)851-5181  
www.keeklamp.com

Superior Aluminum Products, Inc.  
P.O. Box 430  
555 East Main St.  
Russia, OH 45363  
1(937)526-4065

#### 2.1.8 Grating

Grating shall be galvanized steel, fabricated to the sizes and layout as shown on the drawings. The grating and all support steel shall be able to support a minimum of 85 psf pedestrian loading. The Contractor may elect to provide manufactured grating in accordance with the SUBMITTALS paragraph. Typical grating manufacturers are as follows, or may be an approved equal:

IKG Industries  
270 Terminal Avenue  
Clark, NJ 07066  
1(800)747-8982  
www.ikgindustries.com

McNichols Co.  
P.O. Box 30300  
5505 West Gray  
Tampa, FL 33609  
1(800)237-3820  
www.mcnichols.com

Ohio Grating, Inc.  
5299 Southway, SW  
Canton, OH 44706  
1(800)321-9800  
www.ohiogratings.com

### PART 3 EXECUTION

#### 3.1 BOLTING

All bolts shall be installed at the proper location and set straight and square with connecting members. Plain washers shall be provided under nuts of bolts except where beveled washers are required. Nuts on bolts shall be drawn up tight in accordance with supplier or specification, and where

indicated, threads of bolts shall be peened. Spaces shall be installed as required to prevent distortion of bolted members. Until final acceptance of the complete work, the Contractor will be required to check, straighten and tighten bolts in any part of the structures.

#### 3.1.1 Bolt Holes

Bolt holes in structural members shall be drilled or reamed to not more than one-quarter (1/4) inch larger than the bolt nominal diameter provided washers are used between the hole and bolt head or nut. Washers need not be used if holes are drilled to within one-sixteenth (1/16) inch of the bolt nominal diameter. Bolt holes in steel sheet piling are allowed to be torch burned to a smaller diameter and subsequently reamed to within the above described tolerance. The Contractor may use a template to burn holes. Rough and sharp surfaces resulting from torch burning of holes are not acceptable for final bolting. Any unused bolt holes shall be filled with weld or bolted shut.

#### 3.1.2 Mechanical Anchor Bolts

Mechanical anchor bolts shall be installed in the locations and spacing as called for in the drawings. Manufacturers such as Ramset-Redhead, Hilti, or approved equal may be used.

### 3.2 WELDING

Welded connections shall be as indicated on the drawings, specified, or as specifically authorized by the COR. All welding shall be done in accordance with AWS D1.1. All welding shall be done by certified welders who have passed successfully the qualifications tests of the American Welding Society. Welding procedures as to direction, length, number, and sequence of beads shall be planned carefully so as to be suitable for use with the parent metal at each weld. Electrodes shall be received on the job in unbroken packages bearing the manufacturer's label.

#### 3.2.1 Tack Welds

In completing the wall and anchorage assemblies, unless otherwise shown on drawings, tack welds may be used to maintain alignment prior to tightening. After final tightening, all nuts shall be tack welded to bolts and SSP or wales.

#### 3.2.2 Wales

Wales shall consist of steel structural shapes. The wales shall be fabricated as shown on the drawings and shall be bolted securely to the steel piling at the locations and elevations shown on the drawings. Wales which are tilted, bent, or otherwise damaged during the progress of construction shall be aligned, straightened, or replaced by the Contractor as directed by the COR at no additional cost to the Government.

### 3.3 MISCELLANEOUS STRUCTURAL SHAPES AND PLATES

Where shown on the drawings, miscellaneous structural shapes and plates shall be provided to complete the work. The sizes and method of installation shall be as shown in the details.

### 3.4 STEEL SHEET PLATE ATTACHMENTS

Special steel sheet plate attachments shall be fabricated and installed as shown on the plan sheets, and in accordance with SECTION 02411, "STEEL SHEET PILING".

### 3.5 QUALITY CONTROL

The Contractor shall establish and maintain a quality control system for all operations performed under this Section to assure compliance with contract requirements and maintain records of its quality control for all operations performed, including, but not limited to, the following:

- a. Quality of materials.
- b. Location and installation of required materials.
- c. Fabrication and installation of components.
- d. Welding.
- e. Observance of safety regulations.

The Contractor is responsible for coordinating the submittals for all SSP, and miscellaneous metals (screens, and stoplog plate) to ensure that there are no conflicts.

-- End of Section --